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The Interpretations of Natural Features in Contemporary Landscape Design

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by

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INTRODUCTION

Throughout the history of landscape design, landscape architects drew inspiration from different sources, as a mean to convey their ideas and messages, and help them create open spaces that serve their purpose and contribute to the benefit of society.
The sources of inspiration varied and were influenced by the circumstances of each period of time; the latest inventions, scientific developments, social, cultural, and political atmospheres, art movements, etc.

For example, some styles found inspiration in cultural references that helped the designer highlighting identity, values, society, the history of a certain area, or reviving a style from a certain period of time, such as the Renaissance style in the 15th and 16th centuries, which found inspiration in the ancient concept of the ideal humanity and culture, and admired the aesthetics of antiquity by reproducing classical order structures.
Similarly, the Beaux-arts movement in the late 19th and early 20th centuries, known as "the revival of the revivals" (Brain, D. 1989), also found inspiration in the principles of historical styles of the European Renaissance and Baroque landscapes, and the Islamic gardens of Spain, resulting in an eclectic style of its own.
Another example is the work of modernist landscape architects in the 20th century, who found a different source of inspiration. They created designs marked mainly for their use of abstract geometry, irregular forms, and asymmetry, as they were very influenced by the powerful modernist thinking in fine art and in architecture. Landscape architects drew direct inspiration from Art Deco, Cubism, and Surrealism abstract paintings (Thompson, 2014).

On another hand, there are archetypes that are recurring elements in landscape architecture, and have continued to present a source of design inspiration over time. These timeless references to stylistic typologies appear in many representational elements. An example of which is the amphitheatre, which is known in modern days as a circular, semicircular or curved performance space. This recurring object in landscape architecture, derived from the Ancient Roman and Greek amphitheatres, is a popular element that could survive the test of time for the cultural and social values it adds to the open space.

Furthermore, and in our contemporary era, there are significant developments and concerns that are influencing the field of design and presenting new sources of inspiration. The new tools and digital technologies, along with a worldwide focus on achieving sustainable solutions and mitigating climate change are the main drivers behind new design trends.
Contemporary landscape architects are finding inspiration in evidence-based and smart solutions that answer to climate change and pressing environmental issues. New design trends that rely on the innovations of the digital age are appearing, an example is the growth of evidence-based design, a recent trend (Brwon & Corry, 2011), which relies on tools and technologies in early concept design, allowing designers to get an instant estimate of the potential for carbon emissions and sequestration for design alternatives and see the impact of their choices. This trend's main focus is meeting the physical, biological, social and cultural needs of humanity and the world, by designing human habitat for health and well-being (Brwon & Corry, 2020). A most recent trend is generating designs relying on artificial intelligence AI, a trend that provides highly-automated tools that can test design options and provide analysis to inform a better design.

However, there is a source of inspiration that has been a constant throughout the history of landscape design and is still present in our contemporary era, and that is nature. Over the years, we have witnessed many examples where natural features were used as allegories and manifested in manmade landscapes and gardens, such as the popular artificial grottoes introduced in the Mannerist style to Italian and French gardens of the mid-16th century, or the utilized natural elements in the historical Japanese gardens such as ponds, streams, islands and hills which aim was to create miniature reproductions of natural scenery, and many other examples. These interpretations of landscape features have developed with time, with each style over the course of history having its own language and vocabulary ranging from symbolizing and abstraction to straightforward interpretations.
Nowadays, this naturalistic design approach is still taking place among the new contemporary trends, as contemporary landscape architects are drawing inspiration form natural features and have their own methods and tools to create their interpretations. The new technologies and digital tools allow the designers to experience the natural world with less limits than in previous times, and therefore, designers are able to recognize new attributes of natural features and utilise them as a source of inspiration for their designs.

The research discusses this design approach of interpreting natural features in contemporary landscape designs, highlighting the dependence on mediated perception of nature in the digital age, and the different language methods used by contemporary designers to convey their interpretations.

1.1. Importance of the Study

The design style that draws inspiration from nature is an approach that appeared in past periods of time, and continues to appear nowadays in the contemporary era. This era is marked for its fast-paced changes and digital innovations, leading to developments in all fields, including the field of landscape architecture, making it inevitable for this naturalistic design approach to be influenced by the changes and evolution of this age, and having a clear understanding and definition of this style in the light of the contemporary circumstances is an important contribution to design theory. Furthermore, the variety of the design styles that emerged in this era, as a result of the so-called 3rd Industrial Revolution, such as biophilic design, evidence-based design, xeriscaping, generative design, etc., allow the contemporary landscape scene to be distinguished for this variety. Each design style contributes to shaping the overall character of the contemporary landscape, making it important that each style is defined and have clear specifications of its own; hence, defining the character and tendencies of the naturalistic design style would make an important contribution to painting the overall contemporary context.

1.2. The Research Problems and Objectives

The absence of a classification of the ways in which natural features are being interpreted in contemporary landscape design, and the lack of a clear description of the characteristics of this naturalistic style, present a theoretical gap that motivates the research to delve into this topic and establish some specifications of this contemporary design style and its tendencies.

To tackle this topic, the research raises the following questions:

1. Are natural features being interpreted in contemporary landscape design?
2. How are the interpretations of this naturalistic style in the contemporary era different from its precedents in former periods of time?
3. How are the technologies of the digital age influencing this design style, and to which extent do they contribute to shaping the overall character of the style?
4. What are the general characteristics and tendencies of this design style?

In the light of this discussion, the research aims to:

Detect the influence of natural features, such as landforms, geological formations, patterns and the overall landscape environment on contemporary landscape design in the last three decades, and to define what types of natural features are found inspirational in the contemporary landscape design field.
The research also aims to define the language methods and tools that are being used by contemporary designers to communicate their interpretations of nature.
In addition, the research aims to detect the influence of this design approach in interpreting natural features on the resulted spatial experience and the values promoted by the final design product.

1.3. Hypothesis

There is a contemporary design style that draws inspiration from natural features, and interpret them relying on several design language methods. This naturalistic design style is influenced by the technologies and tools of the digital age and presents new interpretations that are different in comparison to the interpretations of former historic styles, as it is able to perceive the natural world differently and recognize new attributes of natural features.

1.4. Research Methodology and Dissertation Structure

In order to answer the raised questions and achieve its goals, the research divides the study into four main chapters, and synthesizes and combines the conclusions of all chapters to present its new scientific achievements in a fifth chapter.
Figure (1) demonstrates the study approach that aims to encompass the components involved in the process of creating a design that is inspired from a natural feature, which are the source of inspiration itself, the process of perceiving the natural feature and recognizing its attributes, the contemporary designer, who according to his knowledge, background and interests, this process of perception will vary, and finally the design language chosen to communicate the interpretation and produces the final design.
In accordance, the research starts, in Chapter 1, with defining the term “natural features” and exploring what are the types and possible categorization systems of the natural phenomena, highlighting the importance of natural feature analysis to recognize all attributes that contribute to the appearance of the feature. It also presents a theoretical study of the concept of visual perception, highlighting the theory of active perception and other important aspects related to this concept, and demonstrating how mediating digital tools are influencing perception in the contemporary era.
Chapter 2 is a historical review that highlights how past design styles perceived and interpreted nature, highlighting the choice of language of each style in conveying the interpretations.

In Chapter 3, the research conducts a theoretical and analytical study of design language methods by examining examples from the fields of visual arts and landscape architecture, as a way to identify the tools of each method, and specify to what extent the resulted interpretation resembles to the origin in the case of each method.
Chapter 4 discusses the main topic of the dissertation through an analytical and comparative study of landscape design projects that interpret natural features as their design concept. The research assembles a collection of 64 contemporary landscape projects and analyzes key information related to the location of each project, date of realization, site area, design studio, etc., in addition to the type of natural feature that is the source of inspiration, as a way to conclude general tendencies of the naturalistic design style. Furthermore, the research selects 34 projects for deeper analysis and conducts a comparative analysis of this smaller collection in order to detect more design-related tendencies of the style. Finally, in Chapter 5, the research synthesizes and combines all conclusions of the previous chapter, to present its new scientific achievements.

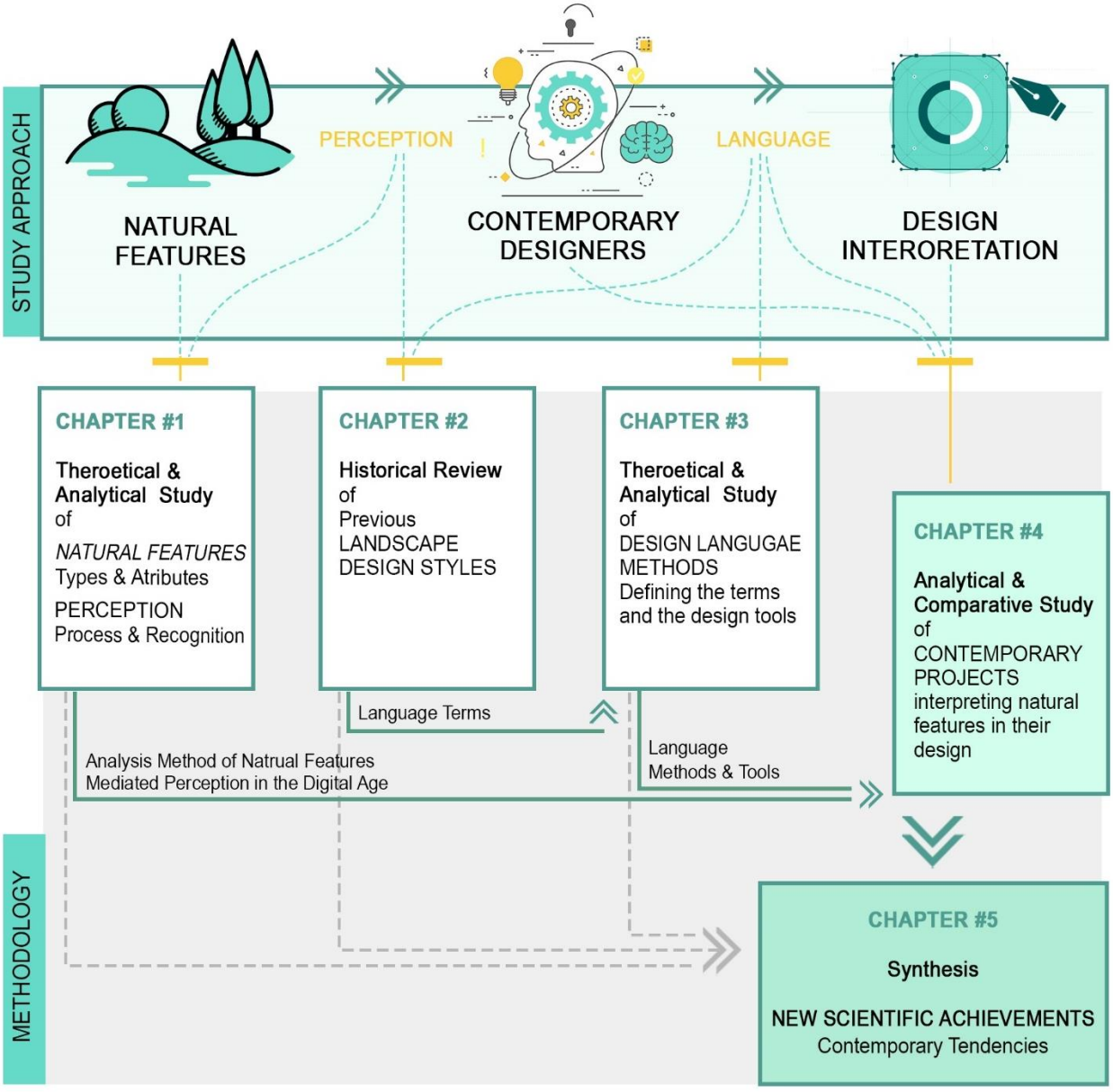


Figure 1: The research methodology, showing the study approach and the constructed chapters accordingly, Source: Author.

1.5. Literature Background and Data Collection

The research relies on a comprehensive review of scholarly sources from diverse disciplines. Sources from the fields of geology, geography, and geomorphology explore the variant types and categories of natural features. Sources from the fields of psychology, and philosophy facilitate the study of visual perception and active perception theory, highlighting the difference between immediate and mediated perception as an important aspect to be considered. Sources on computer science, surveying, mapping and urban planning allow the research to give examples of digital tools and technologies that act as mediators in perceiving natural features in the contemporary age. Furthermore, the research relies on sources from the fields of visual arts, garden design, and landscape architecture to explore the interpretations of nature in past historical styles, to discuss the different language methods, and to create and examine its collection of contemporary landscape projects that interpret natural features.

In terms of data collecting, the research was able to explore the work of 146 contemporary design studios (see Appendix A, Figure 124), relying on books showcasing and discussing contemporary landscape architecture projects (LAE, 2015; Jodidio, 2012; Allen & Mcquade, 2011; Weilacher, 2005), in addition to online landscape architecture platforms and websites with international recognition showcasing landscape architecture projects made by landscape architects and architects from around the globe, such as Landezine[1], LAND 8[2], WLA[3], ArchDaily[4], DeZeen[5] and others.

[1] A platform since 2009. More than 5,000 daily visitors from all over the world. Ranked #1 of the Top 20 Landscape Architecture Websites of 2018 by The Global Grid which base their annual ranking on measuring website traffic.

[2] Landscape Architects Network, an open and free resource, ranked #1 Landscape Architecture Blog & Website in 2023 by FeedSpot which base their ranking on relevancy, post frequency, trafik rank and many other parameters.

[3] A landscape architecture industry website founded in 2007 with over 50,000 monthly readers.

[4] A platform since 2009 oriented for designers to experience the latest projects, products, and trends with 13.6 million readers that visit the platform every month.

[5] A magazine launched in 2006, with over three million monthly readers. It is regularly ranked among the 4,000 most visited websites in the world by Alexa and has won over 50 awards.

Chapter 1 - NATURAL FEATURES, PERCEPTION AND RECOGNITION

1.1. Introduction – Natural Features

Nature on planet Earth presents an extensive scope of features that vary in many aspects, such as materials, components, scale, shapes, forms, origin, life cycles, and processes that created them or transformational processes they undergo over time. This offered variety allows us to recognize natural features for different attributes.

For example, the earth's topography presents features known as *landforms*, like mountains, hills, valleys and canyons. Those landforms are the result of basic processes; volcanism, uplift, weathering and erosion, which occur to different degrees in different places (Bell, 2012), and they are largely defined by their surface form and location in the landscape. They can be recognized for attributes such as elevation, slope, orientation, stratification, and soil type (Twidale. 1990).

Other features are defined by their rock type, known as *geological formations*. A geological formation is a body of rock with a consistent set of physical characteristics that distinguishes it from adjacent bodies of rock, and which occupies a particular position in the layers of rock exposed in a geographical region (Brookfield, 2003), like batholiths, mesas, folds and columnar jointing. They can be recognized for their lithologic properties, colors, form, stratification and layers.

On the other hand, there are water bodies, such as river meanders, braided rivers, deltas, wetlands, lakes, ponds and waterfalls, which also present a type of natural features (Caissie, 2012). They can be recognized for their surface area, edge form, fragmentation, spread, stillness and movement.

On a bigger scale, some natural features can encompass vast areas, such as a landscape mosaic, which appears when a cluster of different ecosystems results in a heterogeneous area (Foreman, 1995). These mosaic landscapes present a type of natural feature known as *natural patterns*. Examples of natural patterns are very variant, given the scope of scale and different environments and processes of creation. In periglacial regions, we can detect distinct and often symmetrical patterns of geometric shapes formed by the deformation of ground material, a feature known as patterned ground (Allaby, 2013). Patterned vegetation, on the other hand, which arises from an interplay of phenomena that differentially encourage plant growth or mortality (Meron. 2019), also presents distinct patterns of an organic appearance, such as the tiger bush or the fir wave patterns. Such two-dimensional features, like patterns, can be recognized for attributes like textures, colors, tessellations, division, rhythm, repetition, uniformity, space filling and numerical relations.

Those different aspects involved give many possibilities for the categorization of natural features. For example, certain interactions between water, sediment and vegetation produce fluvial landscapes, where streams run through a certain type of landform and reshape them with erosion and deposition (Caissie, 2012). Those hydrogeomorphic processes interact with the vegetation of the areas as well, by destroying or offering freshly deposited sediment for its installation, allowing certain types of plants to grow, and the vegetation affects, in turn, the flow of water and stability of the sediment. While each element of the fluvial landscape, the river, the landform and the vegetation, can be considered a natural feature on its own, the combination of these three elements and their interactions that make the fluvial landscape can also be considered a natural feature.

This more complex type of natural features, such as the fluvial landscape, the riverine landscape, the sandy landscape, the mountainous landscape, etc., is known as a *landscape environment*, which is recognized for the overall composition of the physical elements of the land, combined with the living organisms, and the natural processes interacting with those elements.

Hence, an attempt to categorize all types of natural features within a single classification system would be challenging and requires the work of many disciplines together. Therefore, the research resorts to a categorization system considering specific aspects that suit the purpose of the study; aspects that define attributes of the natural feature that are related to the field of design like forms, scale, elevation, orientation, colors, rhythm, etc., regardless of the components, processes and scale of the natural feature, in order to keep any type of natural feature open to discussion and be able to detect which types contemporary designers are perceiving as inspirational.
Hence, the research defines a "natural feature" as follows:

> *a physical element or group of elements found on the Earth's surface and created through natural processes.*

1.2. The Importance of Natural Features Analysis

As mentioned previously, one aspect that draws attention when discussing natural features is their variety. Other important aspects that need to be considered are the complexity and the dynamic state of those features. A natural feature can be a very complex phenomenon and constitute of many elements, in addition, beneath each feature lie the processes that created it.
For example, rocks are slowly recycled over millions of years and transformed between sedimentary, igneous and metamorphic due to the driving forces of the rock cycle, plate tectonics and the water cycle. Another instance is the earth's surface that makes up the terrain, which is constantly subjected to processes of erosion, weathering and deposition, causing features like limestone cliffs to be carved with caves like the Blue Grotto in Capri or a broad valley to be eroded into the largest canyon in Africa; the Fish River Canyon.
Lake Chicot is an oxbow lake that used to be a part of the Mississippi. Processes like erosion and deposition cause a river stream to channel forming a nearly closed loop, and when high water flows across the neck of the loop cutting it off from the main stream and deposited sediments sealing the loop, an oxbow lake is formed.
Furthermore, our entire planet is a dynamic system, and all of its parts are interconnected; making any change that happens in one part is inevitable to reflect in another, and having this reciprocal character rooted in the natural environment makes natural features even more complex, especially nowadays, considering the extremity of global warming and climate change (Armstrong et al., 2018; Toi, 2011), and their role in intensifying certain processes and this domino effect.
Over time, this offered variety and dynamic character of nature have become a main source of inspiration in the design field. Landscape architects can explore within a vast range of scale an immense number of natural phenomena and get inspiration from. One can say that the palmate venation pattern of a maple leaf, in which the veins radiate in a fan shape from the leaf petiole, may be as interesting and inspirational as the mythical Chinese flaming mountains with their striking gullies and trenches caused by erosion of the red sandstone bedrock.
However, the complexity of a natural feature, its constituent elements, and its state of constant change make it a serious task to be able to recognize all its attributes and inspiring potentials.
This opens wide doors for many disciplines to take part in defining a certain natural feature. While *geology* may explain how the feature is formed, its structure, composition, and the types of processes acting on it (Radhakrishna, 2005), *geomorphology* would focus on the form and processes affecting the earth's surface (Dadson, 2012). *Ecology* can explain the ecological networks and ecosystems and how the wildlife's interaction with its habitat would also influence the development of the feature (Chapin et al., 1996), and *planning* would focus on the potentials

of the feature that needs to be preserved, utilized or developed (Dalheim, 2023; Beatkey, 2016). The analysis of each discipline will recognize the attributes that fall within its scope of work, and define the feature accordingly. In the field of *landscape design*, an analysis of a natural feature would focus on attributes related to design elements such as shapes, forms, colors, and textures.

1.2.1. Methods of Analysis

In his book *"Patterns in Nature*", Stevens (1974) studies patterns, a type of natural features, using an analytical method based on observation of many examples with a focus on some of the processes that created them. He abstracted basic types of patterns and expressed them using lines joining dots. Figure (2) demonstrates the abstracted types; spiral, meander, branching pattern, explosion, packing pattern and cracking pattern.

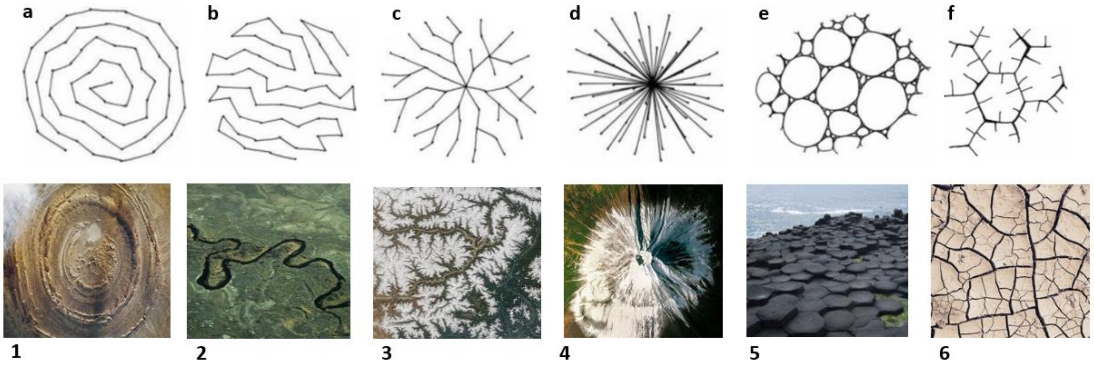


Figure 2: The basic patterns of Peter S. Steven's theory compared to compatible natural phenomena, Source: Author based on (Stevens, 1974).

This analysis method presented a topological study. A critic of it was having limitations, as the approach was still rooted in Euclidean geometry (Bell, 2012). Another study of the same type of natural features, that is patterns, conducts a method of analysis that is similar to the previous one in focusing on the processes of creation. Ian Stewart (1995), a British mathematician, examined in his book *"Nature's Numbers"* numerical phenomena and their role as determinants of form.
On the other hand, in his book *"Li: Dynamic Form in Nature"*, architect David Wade (2007), presents a study of patterns in a different approach, in which he gathers extraordinary surface patterns that he observed in nature, and illustrates them with his own drawing technique, creating a wider, less abstracted categorization of patterns than of Steven's. His analysis method uses descriptive vocabulary and illustrations. Each type of pattern is associated with a short sentence that highlights the main attribute of the pattern and a descriptive paragraph that analyzes examples of the pattern describing their visual characteristics and referring to the processes that created them.

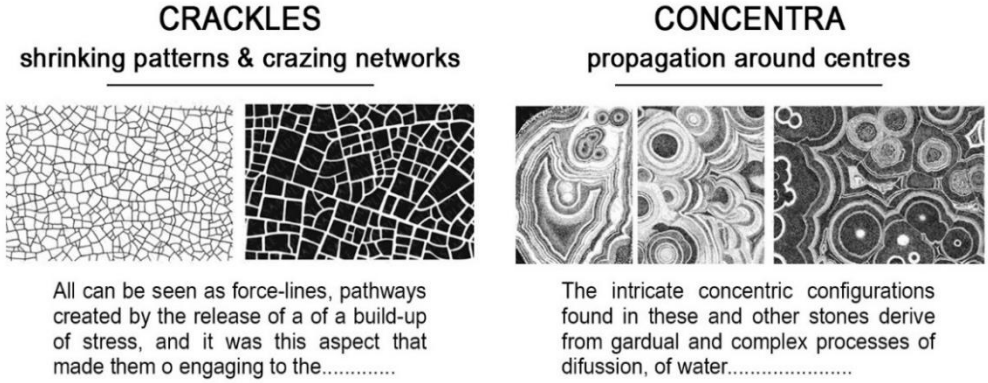


Figure 3: Examples demonstrating the pattern analysis approach by David Wade, Source: Author based on (Wade, 2007).

Furthermore, *"Landscape Pattern, Perception and Process"* is a book by Simon Bell (2012), in which he adopted a more comprehensive method of analysis, he found no need to abstract shapes and considered all visual elements contributing to the final appearance in defining the feature.
His analysis focused on describing the aesthetic qualities of landscape using visual descriptions related to its characteristics, so as to identify the main contributors to its pattern.
He found that design vocabulary has a direct relevance to the properties of patterns and can be used to describe the properties of these patterns, such as position and orientation, shape, interval, texture and density, color, visual force, interlock, enclosure, rhythm, balance, scale and proportion, asymmetry, hierarchy, transformation, similarity and continuity (Bell, 2012).
These examples of pattern analysis demonstrate how different analysis methods can present different ways of recognizing a natural feature. Noting that a pattern is 2-dimensional, which means that an analysis of 3-dimensional features will have even more variations of recognition.
While topological and numerical studies with their results of abstract basic types can be useful in terms of creating a classification system where comparison amongst types would be more feasible, they would also have their limitations by their focus on reducing the geometrical structure of a natural feature into a simple flexible one, as they overlook non-structural attributes with high contribution to the visual appearance of the feature, such as textures, colors and gradation.
On the other hand, an analysis based on observation and description of natural features with a comprehensive approach that considers all elements contributing to the appearance of the feature, allow all attributes that define the character of the natural feature to be recognized.

> As part of an activity conducted at MATE University, Faculty of Landscape Architecture and Urbanism, for the subject "Open Space Drawings and Representations Techniques", 3rd year bachelor students were asked to analyze examples of natural patterns relying on an analysis method similar to Wade's and Bell's, using key visual vocabulary and short sentences to describe the pattern, and then create their designs with the pattern as their source of inspiration (see Appendix B). The products of the activity also showed that this type of analysis method is comprehensive and allowed students to recognize the key defining attributes of the natural patterns.

Furthermore, an analysis method based on observation and description using design vocabulary, and the focus on attributes related to design will filter the scene for the observer. This filtration is an important step that contributes to the process of inspiration and prepares for the design process. However, when talking about filtration and its role in perception. It is important to discuss an even more complex process of filtration, one that is less intentional and precedes the analysis step.

1.3. Visual Perception and Recognition

As discussed before, a natural feature is complex and dynamic, and on the other hand, it is important to note as well, that human perception is no less complex itself, and adds many filters to the process of perceiving a natural feature. It can be dependent on the perceiver's knowledge, background, experiences and subjective emotions.
We speak here of visual perception, which is the most exact kind of perception (Gibson, 1960). Our ocular system is a highly elaborate input system that collects a great amount of information. Our eye uses light to detect shapes, colors, distance and depth. It even fixes and converges on certain details and sharpens the contours (Gibson, 1960; Finkel & Sajda, 1994).
Sight works interconnected with other senses of hearing, touching and smelling, increasing the amount of the sensory data we perceive and giving us information. But the process does not stop

here; this step of collecting data is followed by representation memory and reasoning (Finkel & Sajda, 1994). So, the process of perception does not just involve becoming consciously aware of stimuli, but an important step after perceiving of the stimulus is the ability of the brain to categorize and give meaning to what is sensed, which is known as recognition.
That is when the inspirational process can start, when an individual can recognize the attributes and characteristics of an object according to his own unique filtration system.
This concept of *Active Perception*, which suggests that what the human body senses is processed with subjective filters, is a theory that dates back to ancient times. We know Augustine's initial definition of sense-perception from his *"De Trinitate"* written in AD 400, as follows:

nam sensum puto esso, non latere animam quod patitur corpus

which translates most literally as: sense-perception (sensus) = $_{\text{def}}$ something the body undergoes that is not hidden from the soul (Nawar, 2020).
Even though Augustine further developed this definition later, the remark that perception is not merely a passive collection of data is already there. Active perception is selective and intelligent, it determines what is worth seeing and comprehending in a certain scene.
The recent emergence of convolutional neural networks as models of visual recognition allows us to get an idea of the ways and the kinds of features the visual system may be building in order to recognize and localize the perceived objects (Lupyan, 2017; Zhou, 2016; Krizhevsky et al., 2012).
This concept of active perception explains why different people see different things in a scene and how different people can have a different perception of a certain natural feature depending on their experiences, knowledge, preferences, aesthetic standards and cultural background.
A cultural geographer, a farmer, a forester, a physical planner, an ecologist, an explorer, an archaeologist or an army general are likely to describe the pattern of a landscape based on their own knowledge, experiences and what it provides for them – its affordances (Bell, 2012).
So, in the overall process of perceiving a natural feature, two aspects play an especially important role in the final result. It depends on stimulation, the amount of potential information sensed by the body; and second, it depends on the interest of the individual observer (Gibson, 1960).

1.3.1. External Variables

Furthermore, another aspect to be considered when talking about perception of nature, is related to the context in which the perception process happens. As mentioned before, the amount of information sensed by the body is important in defining the results of the perception process. This information can vary according to some external variables that affect the human perception and may cause the same natural feature to be perceived differently by the same individual.
Time, whether different times of the day or change of seasons, climatic conditions, viewpoints, the spatial context and elements of the surrounding environment, and many others, are all variables that have a dynamic character and can change the perception of a natural feature as they change.
For example, changing the viewpoint from which a certain natural feature is observed can result in detecting different characteristics of it. When a mountain is viewed from a distance, one can recognize attributes like its silhouette, surface textures and colors, whereas hiking up a mountain would allow a better perception of the geology or the variety of vegetation starting at the bottom with dense forest, to smaller shrubs, to open bare slopes, and reaching an isolated summit.
A masterpiece of art that demonstrates this concept of a certain natural feature being perceived differently by the same individual due to the change of external conditions, dates back to the 1830s, the woodblock prints of Katsushika Hokusai, known as "Thirty-Six Views of Mount Fuji" c. 1830-

1832. This series of prints produced in the Edo period, continued a Japanese tradition of celebrating the mythical volcano in literature and art since the 11th century (UNESCO, 2013). In each print, the artist captures Mount Fuji in a moment in time, depicting the mountain at different times of the day, different seasons, different weather conditions, and from a variety of viewpoints.
Following is an analysis of six prints where Mount Fuji can be seen under a clear sky in summer, at sunrise, at dusk, in a storm, surrounded by mist, covered with snow or drowned in clouds.

Figure 4: Six woodblock prints from the series "Thirty-Six Views of Mount Fuji" by Katsushika Hokusai, Source: (a- Christie's, London; b- The British Museum; c-d-e- The Metropolitan Museum of Art; f- The Art Institute of Chicago) modified by author.

a - "Clear Weather, Southern Breeze", also known as "Red Fuji"

Description - The view is of the eastern slope from a point ten or twelve thousand feet in the air. "Southern breeze" is associated with late summer, and little snow remains on the summit. The rising sun strike the upper slopes and turn the black and grey ash a delicate pink. The Japanese call this transient effect *beni Fuji*, or "pink Fuji" (Keyes, 2007). The context of this print, in which the mountain is viewed from a high vantage point at sunrise in late summer, results in perceiving the whole conical form of the mountain, and dividing the mountain's surface into four parts, the lower region with dense forests and still in shadow, portrayed with a texture of dots that indicates the sheer size of the mountain, the middle slopes portrayed with a soft blue-green, being brightened by the light, the upper middle bare slopes that catches the sun, portrayed in a warm red-brown, and the summit, veined with remnants of snow portrayed with a white branching pattern.
Recognized Attributes - An explicit conical form of a huge scale, with variations of colors and textures on its surfaces, the white branching pattern at the summit, the distinct pink color of the bare slopes that gives the print its name, and the doted pattern of the forest.

b - "Thunder Storm beneath the Summit"

Description - The three peaks at the summit suggest that this view is of the back of Fuji on a late afternoon in summer. The fingers of dappled brown and orange that rise to interlock with the descending ribbons of snow suggest deep clefts in the side of the mountain (Clark, 2001).
In the context of this print, where the middle slopes of the mountain are surrounded by a wreath of crumbled thunderclouds and a summer storm erupting at its foot portrayed with a zigzagged bolt of lightning, Mount Fuji is rendered ominously with its slopes being portrayed in strong, heavy tones. The snow-capped peak rises sharply above the clouds, and the storm, highlighting the immense scale of Mount Fuji that dwarfs even the weather.

Recognized Attributes - An immense conical form, with textured and defined contours highlighting the clefts and projecting a rigid character. A unified, homogeneous whole with gradient colors that darken toward the bottom, crowned with snow and rendered rigid and powerful.

c - "The Inume Pass in Kai Province"

Description - The unique relationship between humans and the environment is portrayed as small persons walk the hill as the massive Mount Fuji is seemingly towering over them. The clouds printed behind the travelers show that there is a distance between people and the huge Mount Fuji. The context of this print depicts Mount Fuji from a farther vantage point as an element of a landscape scenery with human activity, highlighting its scale and form in comparison to other elements of the scene. Even though the surface of the mountain expresses characteristics of colors and textures, the characteristic that draws most attention in this print is the shape of the mountain. The contrast between the smooth curvy lines of the fully vegetated hill and the sharp steep lines of the mountain's slopes in the background highlights the explicit triangular shape.

Recognized Attributes - A unique background that contrasts with its landscape, a sharp steep cone with a pointy peak, and of a great scale that fills up the horizon.

d - "Tea House at Koishikawa. The Morning after a Snowfall"

Description - After heavy overnight snow, an elegant party has assembled in a room with a fine vantage point in the crisp early morning sunlight over snow-clad roofs and the Edo River towards Mt. Fuji (Clark et al., 2017). At first, the tea house with its colorful figures grabs the attention of the viewer, but then the attention is quickly shifted towards Mount Fuji due to the pointing gesture of one of the attendees. The context here depicts Mount Fuji in Winter, completely covered with snow with the clear light of the morning sun and from a high vantage point over the clouds that allows to perceive it as an element of a vast, rich landscape scenery with many other elements like the village houses, the river and the vegetation.

Recognized Attributes - A part of a whole, as the entire landscape scene is covered with snow, the mountain is unified with the surrounding environment. A white cone that still draws attention with its distinct shape and sheer volume.

e - "Sunset across the Ryogoku Bridge from the Bank of the Sumida River at Onmagayashi"

Description - With the view of Ryōgoku Bridge in the distance, and a ferry carrying merchants and monks home after a day's work, the mood is subdued as night gradually overtakes the evening sky. The foreground is sharply defined in the aizuri blue-line technique, the background is executed in lineless silhouetted forms of mute grey and green, and the squat pyramid of Mount Fuji is etched against the sky in deep indigo blue (MET, 2025). In this print, Mount Fuji is placed in a wide context, depicted at sunset from a great distance as a part of the skyline's silhouette. Assigning a darker color to Fuji, highlights the great distance and that there are multiple layers of the skyline, and Fuji is even farther away behind the frontal layers of the shore. The contrast of the mountain straight lines in comparison to the arch of the bridge, the organic shapes of the village and vegetation, and the undulating waves of the river highlight its sharp pointy triangular shape.

Recognized Attributes - Although it appears small as an element of the busy skyline, it still commands a strong presence. The symmetrical triangular shape draws attention.

f - "The Back of Mount Fuji Seen from Minobu River"

Description - Five horizontally layered planes make up this mountain landscape: the travelers, the river, the clouds, the mountains and the sky. The snow-capped peak of Mount Fuji, whose northern

slope can be seen here, appears between two imposing rocks. One is exposed to the sun, the other is immersed in the shade. In this context and from this point of view, only the peak of the mountain is visible. Seeing the steep lines of the snow-capped peak rising between the irregular shapes of the other mountains highlights the distinctive shape and the elegance of Mount Fuji.
Recognized Attributes - A distinct, majestic mountain in a mountainous landscape.

These six selected contexts from Hokusai's series demonstrate how external variables, such as weather, time of the day, point of view and elements of the surrounding landscape, resulted in perceiving Mt. Fuji in variant ways and recognizing different attributes in each setting.
In certain contexts, the sovereign mountain imposed itself as the main event, with its sheer volume, perfect symmetrical shape and snow cap. In others, it appeared as part of a whole, unified with its surroundings and other contexts as well; it appeared as a majestic, omnipresent cone that forms the background of a human activity or a dynamic landscape.
On the other hand, this brief study of Hokusai's series gives us as viewers of the paintings a rather different experience of Mt. Fuji from the one of Hokusai. The perception of a space from an individual who had the chance to physically experience the space would be different from another who did not have direct contact with the space but through a mediator.

1.3.2. Immediate and Mediated Perception

Visual perception happens with a direct contact between the perceiver and the scene; it is an immediate perception. However, perception can also happen through a kind of mediation, known as *perception at second hand*, that is, perception through the eyes of another person – a vicarious acquaintance with an absent scene (Epstein, 1980; Gibson, 1960).
Viewing a painting, reading an article or hearing a description of a scene are examples of perception at second hand, in which a person is able to perceive some aspects of the visible world through a representational medium in the same way the artist or the writer did.
A painting is a result of the artist's selective perception and rendering techniques; it presents a filtered version of the scene. According to James J. Gibson (1960), the artist catches and records for the rest of us the most revealing perspective on things.
The selection of information from the scene has already been done. The scene is real, but it is not the literal scene with the unlimited information. It is defined within the conditions of the time when the painting was produced and filtered according to the painter's background, experiences, interests and skills. In that sense, a photograph is also a mediator of perceiving nature. The choice that the photographer takes to capture the scene in an instant, when many variables are interacting together in a certain way, is a selective filter, and choosing the vantage point, the frame and the focal point of the scene is also a directed filter that guides the perception of the viewer.
Accordingly, we can say, there are different degrees of mediation that result in different perceptions of the same natural feature, which is a very notable aspect to be considered in this era we live in, with all the tools and technologies we have nowadays that may have increased the dependence on mediated perception and allowed us to experience the world very thoroughly and even remotely if needed, starting at a microscale of observing molecules with a microscope, to observing Earth with satellites roaming the outer space.

1.4. Perception in the Digital Age

The evolutionary state of the human civilization has constantly changed the way we perceive and interact with the world around us over the years.

Man's relation to nature has developed as decisive shifts occurred in the history of humankind; each phase of evolution provided humans with tools that allowed them to experience nature anew and change their perception of it. The first shift may be as old as when early humans, the hunter-gatherers, started using the power of fire to their advantage, marking a shift in the man-nature relation and initiating a sense of power over nature, and thus a change of perception.

Later, many milestones in human history, like the advent of agriculture about 10.000 – 12.000 years ago (Steffen, 2007), the industrial revolution that started ca. 1800 (Heller, 2011), or the digital revolution in the 1950s (Yang, 2016), contributed to shaping human civilization as we know it today. Each phase produced new possibilities, tools and inventions that influenced all aspects of human life, including man's perception of nature.

Today, we live in an era known as the Digital Age, the age of information technology (Castells, 1996), marked for fast-paced developments, advanced technologies, easy access to information and digital platforms for a worldwide audience. The advanced technologies of this era allow us to see the world with a new lens and to experience our planet differently widening the scope of mediation in perceiving a natural feature and resulting in recognizing new attributes of it.

An example of those technologies is Lidar Technology, which is a remote sensing method that uses light in the form of a pulsed laser to measure ranges to the Earth. These light pulses, combined with data recorded by an airborne system, generate precise 3D information about the shape of Earth and its surface characteristics (McManamon, 2019). It allows mapping broad areas of land and generates multiple products such as digital elevation models (DEM); topographic models of the earth's surface, which in turn can generate slope and hill-shade maps. Another product of Lidar technology is the digital surface models (DSM), which incorporate elevations from natural and built surfaces like buildings and tree canopy, and the canopy height model (CHM), which maps the tree height as a continuous surface (Dong & Chen, 2017).

One can acquire information of vast landscapes, landforms, slopes, canopy, leaf area index, and species identification. The landscape is perceived on a huge scale the human eye would not be able to encompass without a mediator, and the ability to select or overlap information on the topographic surface presents also a kind of selective perception but in a more intentional way.

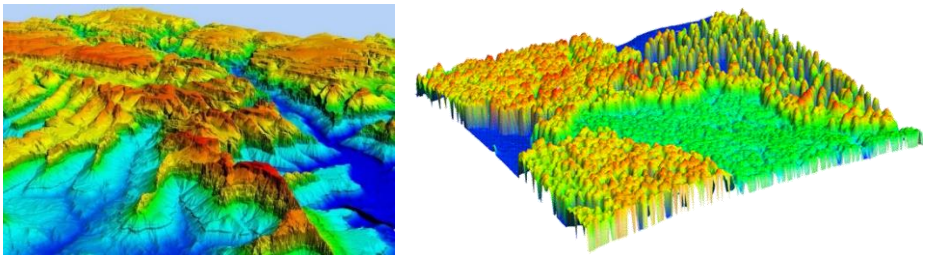


Figure 5: Images derived through the use of Lidar Technology, a digital surface model (DSM) and a perspective view showing tree canopy height (CHM). Source: (Left- Satpalda Geospatial Services, Right- Robert McGaughey, U.S. Forest Service).

Another contemporary tool is the Geographic Information System (GIS), which also advanced the topographic modelling and geochronological techniques (Muzirafuti et al., 2023). GIS is a computer system for capturing, checking and displaying data related to positions on Earth's surface. It can relate and compare different types of data. It can also deal with different data formats, such as cartographic, photographic, digital data or data in spreadsheets.

Having these many types of information to be overlaid on a single map and using location as the key index variable to relate them, allow selecting or combining layers to produce variety of maps and thus help for a better targeted analyses and recognition of the natural feature's attributes.

In addition, the free and easy access to Satellite Imagery through online platforms, such as Google Maps, Google Earth Pro, NASA Worldview or USGS Earth Explorer, where one can see 2D and 3D representation of the surface of Earth, and can even view the same area over different periods of time, allowing the viewer not only to perceive natural features of huge scale, but also to detect the evolution of a certain natural feature over time (Muzirafuti et al., 2023), how it developed, transformed or deteriorated, and thus relate some of its morphological attributes to its formation process. A very useful tool, especially when discussing 2D natural patterns on the surface of Earth. Such tools open doors to contemporary designers not only to view the world from different perspectives and be inspired by natural features, but also to mimic and be inspired by the process of creation itself and to develop new models or restore missing parts.

Figure (6) displays 2-dimensional patterns of natural phenomena, that allow the recognition of new attributes, different from ones detected through immediate perception, such as: a- the branching pattern of an intertwined rivulets network in Australia, b- the organic pattern of the Empty Quarter, in the Arabian Peninsula, c- the circular pattern of floating vegetation patches in Loktak Lake in India, d- the repetitive waves of red sand dunes in Namib Desert in Namibia, e- the explosive pattern of Mount Taranaki in New Zealand, f- the organic pattern of the algae bloom in Barents Sea, g- the circular depressions of the volcanic craters in Saudi Arabia, h- the layered rocks pattern of the Adrar Plateau in Mauritania, i- the cracking pattern of ice floes in Antarctica, j- the linear undulating pattern of the Juruá River meander in Brazil, the branching pattern of the Nile Delta in Egypt, k- the circular pattern of the Richat Structure in Mauritania.

Figure 6: Satellite images of natural phenomena displaying different types of patterns, Source: (2023 Overview) modified by author.

There are many other contemporary technologies and tools that influence the way we perceive nature. Each has its own way of providing information, whether by depending on numerical data

or photographic data or combining different types of data together. An analysis, shown in Figures (7, 8), demonstrates how perceiving a natural feature can vary using different contemporary tools. The Mississippi River (Figure 7), the second-longest river in North America and one of the world's major river systems (Russell et al., 2021), when seen with the naked eye, such information about its length and meander cannot be recognized. Picture *a* demonstrates how the human eye perceives a limited part, when standing in a high vantage point on a sunny day. The river is perceived as a vast water surface with two contrasted edges, one fragmented diffusing through the land and the other is solid, and sloped. The lush vegetation on the banks gives a contrasted texture and color to the water surface, and the smooth curve gives a sense of orientation and slow movement.
Picture *b* is a satellite image that draws attention to the overall shape of the undulating meander. The river is perceived as a 2D linear element with a strong character on a rich Canva of colors.
Picture *c* is a vibrant map produced by Lidar technology, a wavy complex 2D pattern showing historical movement of the river, the meander scars and the flooded plains, where a main linear element appears on a top layer, and faded sub-curves and oxbows accumulate in multiple lower layers. The ability to recognize different layers gives a sense of time, of past and present elements, and allow to recognize processes that continuously transform the meander.

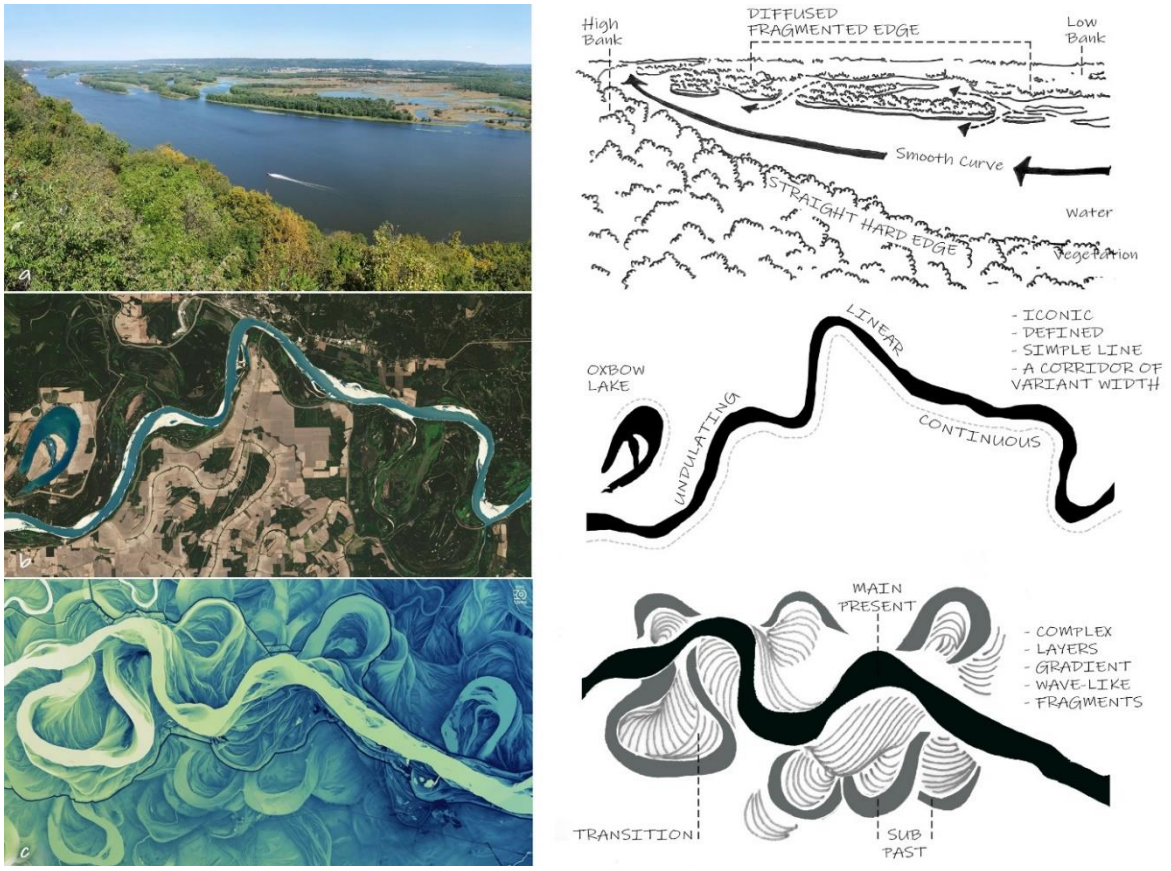


Figure 7: Comparative analysis of immediate and mediated perception of the Mississippi River, Source: Author based on (a- Getty Images/chimpy ; b- Earth Observatory NASA; c- Daniel Coe).

Mount Fuji (Figure 8), a stratovolcano with an immense summit of 3.766 m (UNESCO, 2013), is a natural feature of great cultural and religious values. Picture *a* displays the mountain in the background of green tea fields. When viewed with the human eye from a good distance, one can perceive the entire conical form and recognize its symmetrical and majestic shape. Variations of the mountain's surface are also recognized, with the white snow-capped summit and the grey bare slopes. The bare icy slopes contrast to the surrounding land, accentuates the solitary aspect.

Picture *b* is a satellite image of Fuji from which it is perceived as a circular 2D pattern. The resulted shape indicates that the force behind its creation acted in multiple directions with equal strength. Picture *c* is a simplified geological map of Fuji volcano, a result of different types of data combined and presented on a shaded topography image that was created from a GIS MAP Terrain (DEM). Although the pattern is more complex, it shares the central and explosive attributes recognized from the satellite image. That pattern here displays variety, organic shapes, central spread and tessellated texture, along with other non-morphological information, rather geological ones such as Lava flow, eruption products and types of deposits from different periods of time as well.

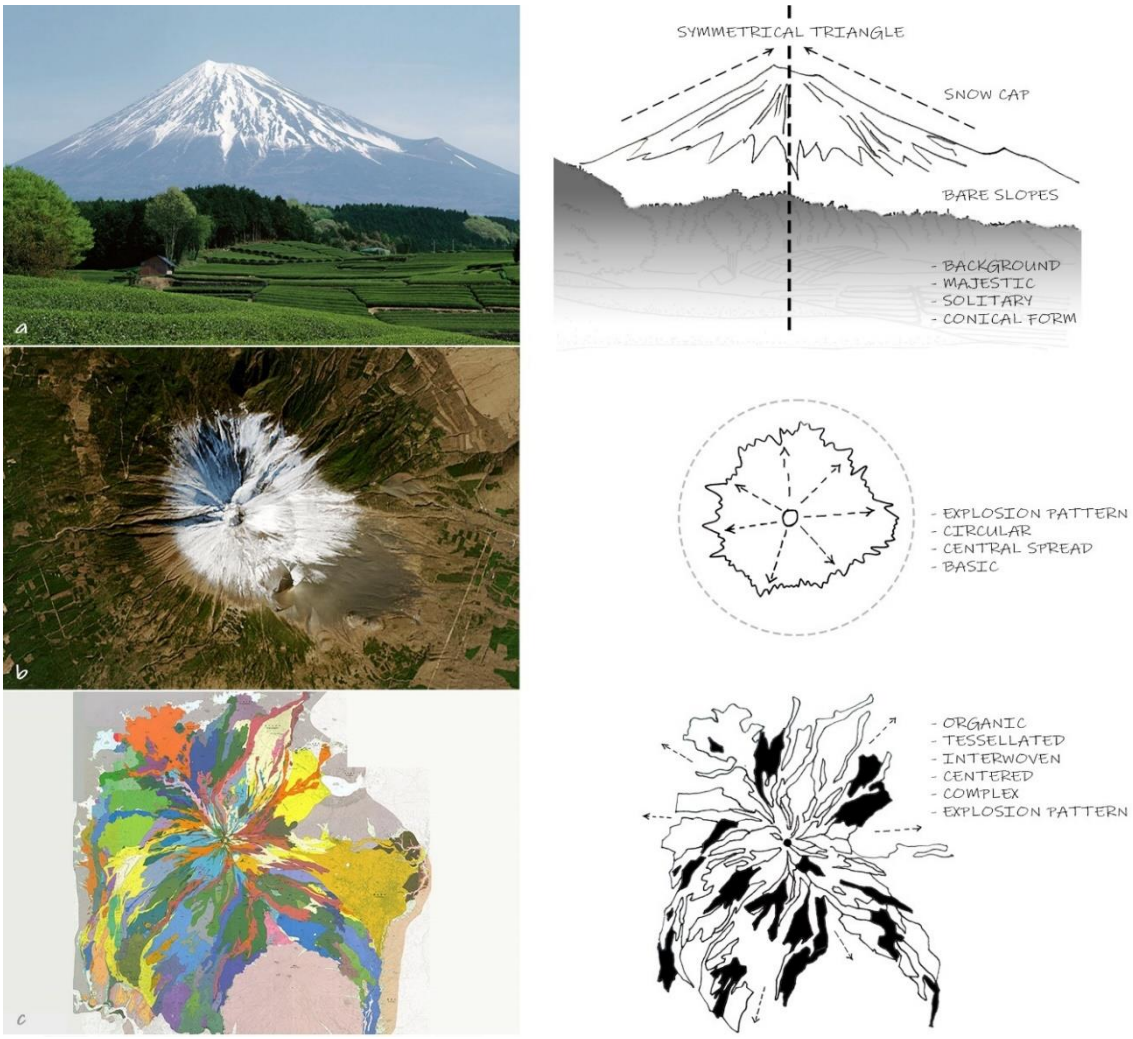


Figure 8: Comparative Analysis of immediate and mediated perception of Mount Fuji, Source: Author based on (a- Corbis RF; b- Earth Observatory NASA; c- GSJ).

1.5. Conclusions of Chapter 1

Natural features are complex phenomena with many constituent elements. They vary in many aspects, such as materials, components, scale, shapes. forms, origin, and life cycles, and can be categorized in different systems accordingly.

The complexity of natural features and the strong interdependency between them and the processes that created them require a comprehensive analysis to fully understand a natural feature. Many disciplines can have a role in defining the natural feature, and each would focus on attributes related to their field of study, making the output of each discipline different from the other.

Analysis in the field of design focuses on attributes that are related to design, such as spatial characteristics of the scene like nearness, interlock, and similarity, or structural attributes like scale, proportion, balance, symmetry and hierarchy, or other visual attributes like colors, textures, position and orientation, etc.

Different methods of analysis can be conducted on the same feature, which will result in focusing on some attributes and overlooking others, and in turn it will affect the recognition of the defining attributes of the natural feature. This leads to the assumption that the method and tools of analysis conducted on the natural feature will probably influence the type of interpretation that the designer chooses later in the design phase.
The products of the activity conducted as part of the subject "Open Space Drawings and Representations Techniques" in MATE University support this assumption, as they share common aspects, such as:

The vocabulary used to describe the pattern in the analysis reflected strongly in the designs.
Most students interpreted the 2D patterns into 3D forms and elements in their designs.
The main design language method used by the students to interpret the patterns is abstraction.

While numerical and topological studies abstract and reduce the natural feature into a simple structure, they have their limitations in recognizing some visual attributes that contribute highly to the character of the natural feature. Whereas an analysis method based on observation and description of natural features with less focus on abstraction and with a comprehensive approach that considers all elements contributing to the appearance of the feature, allow all attributes that define the character of the natural feature to be recognized.

Using design vocabulary to describe the properties of a natural feature such as position, orientation, shape, texture, colors, density, repetition, rhythm, balance, and hierarchy, as a step in the analysis of natural features, allows us to recognize the attributes that are related to the field of design and motivate the creative process of design.

Perception of a natural feature by the same individual can vary according to external variables, such as time, climate conditions and point of view.

The process of perceiving a natural feature is not passive; it is dependent on the perceiver's own filtration system, knowledge, experiences and subjective emotions. Active perception filters the scene when collecting information and refers to past experiences.
The products of the previously mentioned activity demonstrate this notion as well, as different students applying the same analysis method on the same natural pattern still produced variant design solutions and interpretations.

Perception at second hand, or as known, "mediated perception," presents the viewer with an already filtered version of the real world and affects the recognition of the defining attributes of natural features in comparison to the immediate perception.

The current digital age, provides humans with advanced technologies and tools and allows them to perceive the natural world with fewer limitations as before. The easy access to tools and digital platforms led to more dependence on mediation in perception, and thus new attributes are being recognized, changing the perception of natural features in comparison to past periods of time.

Chapter 2 - AN OVERVIEW OF THE INTERPRETATIONS OF NATURE THROUGHOUT THE HISTORY OF LANDSCAPE DESIGN PERCEPTION and LANGUAGE

2.1. Introduction

The concept of being inspired by nature in man-made landscapes dates back to ancient history, we can even say that its first manifestations bloomed in prehistoric times when our ancestors first started interacting with nature and assigned sacred meanings to features in the landscapes they inhabited. This interaction later developed to start altering landscapes, relying on nothing other than the humankind's initiative impulse to dig and mound.

Since those times, the concept of being inspired by nature has come a long way. Each of the styles of landscape design, which appeared over the course of history, has developed its own approach and language in interpreting natural features, in accordance with the tools, circumstances and the context of its accompanying era, especially that not only the perception of natural features varied depending on the available tools, but also perception of nature as a "concept" varied as well as times changed. The medieval man, for example, who lived in walled cities seeking protection from the outer danger, surely had a different perception of nature than the renaissance man who admired the natural scenery and used it as an essential compositional element in designing his gardens.

Nowadays, a man of the digital revolution age with access to a wide range of data and satellite images is able to experience the world at a very large scale, and at the same time to focus on its minute structure. Such freedom of visual limits facilitates new design language and interpretations.

This chapter will present a historical overview of the interpretations of nature throughout the different styles of landscape design. It aims to highlight the general tendencies of each style regarding how nature was perceived, and how it was interpreted, highlighting the particular choice of language of each style, which will provide a base reference that contributes to the attempt of defining the contemporary approach by finding similarities and variances to its precedents.

2.2. Interpretations of Nature in Historical Landscape Design Styles

Following is an overview discussing how the naturalistic approach appeared in different historical landscape design styles, highlighting how nature was perceived in each period, what features were considered inspirational, and what type of language was used to interpret nature.

2.2.1. Prehistory

The man-nature interaction developed during this time from assigning natural phenomena with sacred meanings to starting altering landscapes as an attempt to understand the mysteries of nature, relying on the humankind's initiative impulse to dig and mound (Boults & Sullivan, 2010).

The Newgrange in Ireland is an example that dates back to 3200 BC. One of the oldest prehistoric man-made constructs that was built by Stone Age farmers as a passage tomb and is now recognized as an ancient temple. It had the form of a circular mound covering an area of over an acre (Hensey, 2015). This simple form can be recognized as an imitation of a natural hill resulted from natural processes like erosion and deposits, currents of water or other processes.

The Newgrange is also surrounded by 97 large curbstones, engraved with megalithic art (Powell, 1994). The patterns engraved on the stones, such as circles, spirals and serpentine, are also

imitations of natural patterns. The triple-spiral motif carved on the curbstone that marks the entryway of Newgrange, is similar to natural spirals like ones found in a sunflower, a seashell, the bracts of a pine cone, or even in a whirlpool produced by opposing currents in seas and oceans.

Figure 9: Entrance stone at Newgrange with spiral patterns compared to the natural spiral of a shell, Source: (Left- Padraig Conway; Right- iStock ID:1171640713) modified by author.

Stonehenge in England is another prehistoric example. The circular ditch and bank with standing stones opening to the northeast framing sunrise demonstrate a circular pattern in addition to a concept that will reappear later in many styles over the course of history: the concept of framing views of nature. A very subtle technique to glorify nature and to integrate it into man-made design. The fascination with natural features and assigning them sacred meanings continued to appear later in many cultures. For example, MT. Fuji in Japan was particularly sacred to Shinto followers (UNESCO, 2013); caves also held a sacred status in Greece (around 600 BC), like the cave of Persephone at Eleusis, which was the site of the annual celebration of the rebirth of springs (Boults & Sullivan, 2010); and rivers and trees held an important status in other cultures.

2.2.2. Ancient Times

It was the new trust in human logic that originated in Ancient Greece and Rome that contributed to the evolution from fascination to interpretation of nature.
We can see in Hadrian's villa in Tivoli (118 CE) not only an example of a complex that is very homogenous to nature with its flexible solutions, but also there are many elements that were inspired by specific natural features. The Canopus, which was created with reference to an Egyptian town located in the Nile Delta near Alexandria (Mari & Sgalambro, 2007), is a long rectangular canal between two hills with colonnade on three sides. The elongated canal abstracted the Nile River, communicating the linear stretch of a river with geometrical shapes. The canal is terminated at its southern end by an apse Nymphaeum (Grotto), an emulation of a natural cave.

Figure 10: The Canopus canal compared to the meander of ancient Canopic branch of the Hellenistic and Roman Nile Delta, Source: (Left- Archeolibri; Right- Digital Egypt-maps) modified by author.

Another reference was made by the emperor, who was charmed during his travels by the forest at the foot of Mount Olympus. He called the site where the complex is situated the Vale of Tempe referring to the legendary forest in Greece.

2.2.3. Middle Ages

This era (6th to 15th centuries) brought a shift in the perception towards nature as a result of many circumstances and events of this period of time, especially in Western Europe, where the fall of the Roman Empire and the lack of central authority affected the safety of societies, adding to that the threats of the plague and the Viking raids on Northern Europe, causing people to seek protection in walled castles and retreating away from nature.

The perception of nature transformed from sacred to a wilderness to be tamed, in addition to the great influence of religion, which provided a source of biblical imagery leading to gardens rich with symbols and selected plants (Brown, 2022); a common theme of the Walled Gardens (Hortus Conclusus), the Pleasure Gardens and the Monastic Cloister Gardens of that time.

Those medieval gardens can be understood as metaphorical constructions, representative of a culture's changing perceptions of nature (Boults & Sullivan, 2010). They communicated with their different components a concept of a tamed nature using very defined edges and shapes. Pleasure Gardens emulated a park-like atmosphere with subtle gestures, and instead of copying exact natural features, the style depended on more abstract and sometimes non-visual interpretations; by enhancing the aroma of the garden with the perfume of flowers and sweet-smelling herbs and fruitful trees. The turf benches are an example that emulates the experience of sitting on a lawn.

Figure (11) shows the medieval garden as an enclosed space, infused with metaphorical meanings. The turf bench, the fruit trees and the perfumy flowers are shown as main elements in the garden.

Figure 11: Medieval paintings showing the garden components at the time, Source: (Left- Städel Museum; Right- Condé Museum) modified by author.

2.2.4. 00 8th-10th Century

The Islamic gardens, which appeared in Spain after the Islamic culture spread across the Mediterranean, had a distinctive vocabulary in interpreting nature. Paradise was described in the Qur'an as everlasting gardens under which rivers flow, and the aim of Islamic Gardens was to interpret this promised paradise, which is a picture perfect of enchanted nature. Their interpretation delivered a lush and sensuous space by using strict and geometrical shapes, Quarto Dorado.

Straight water runnels are an abstract representation of the rivers of water, honey, milk and wine in paradise. The shallow cascades are also an abstract of waterfalls (Clark, 2010). Those Elements together with the shaded raised walkways with sunken planting areas, fruit trees, flowers and vines

present a space so rich and lush and, at the same time, characterized with unity and order, combining natural and formal in harmony.

Figure 12: Straight water runnels and shallow cascades in Alhambra courtyards, Source: (Left- iStock ID:469901664; Right- Christine O'Hara) modified by author.

Another interpretation of nature in the Islamic Gardens appears in decorative motifs, which produced very intricate vegetal patterns, imitating the shapes and lines of flowers and plants' leaves. Furthermore, some geometrical motifs that were the result of advanced math in architecture and design can also be referenced to the complexity and the numerical relations of natural phenomena and their formation processes. Figure (13) shows the arcades in Alhambra, with an example of a recurring element in Islamic architecture known as Muqarnas, or stalactite vaulting.

Figure 13: Muqarnas in Alhambra's Court of the Lions compared to natural stalactites and stalagmites in a cave . Source: (Left- Francesco Lagnese; Right- Shutterstock ID:2155820937) modified by author.

On the other hand, and parallel to this period of time in Europe, the eastern gardens developed a rather different approach regarding this concept of drawing inspiration from nature.

In Chinese Imperial Gardens, rocks and water were the main features, referring to mountains and lakes. The importance assigned to those features dates back to 219 BC; at that time, the emperor's search for the elixir of eternal life in the Himalayas led to the simulation of the homeland of mythical immortals in the imperial gardens of the Han dynasty creating the influential prototype of the lake-and-island garden (Boults & Sullivan, 2010; Chiu, 2010).

This interpretation of natural features continued to appear in the Imperial Palace Gardens over time. All features that characterize the landscape of China such as, steep mountains, bountiful

plains, peaceful lakes and dramatic waterfalls are represented and copied to the Chinese gardens, and as a result of copying natural features the concept of Miniature nature appeared.
Furthermore, this approach of copying nature also assigned powerful meanings; rocks and water symbolized the balance of opposites found in nature: rocks as mountains or male and water as lakes or female (Boults & Sullivan, 2010). The Chinese interpretation of nature was very simple and direct; it accentuated the sanctity of nature and reproduced it in smaller settings.
In a similar approach, Japanese culture also perceived nature as an expression of the divine. Garden designs were inspired by poetic concepts, first as subtle allusions to nature, and later as more overt scenography. Figure (14) presents examples of those subtle allusions: the Shimenawa, which recognizes the sanctity of a particular landscape by binding natural features with straw ropes, in addition to the Torii gates, which achieves the same principle by framing certain views.
Later, as the interpretations started creating a bigger scenography, the Pond and Island Gardens that appeared in the Heian period (794-1185) used a mix of language where the pond was created by copying actual coastal scenery, and the islands symbolized the myth of the turtle and the crane.

Figure 14: The Japanese techniques of the Shimenawa and the Torii gate, Source: (Left- Gerald Macua; Right- Alamy ID: 2C6MJND) modified by author.

Furthermore, and by creating an illusion of space and conveying the essential spirit of nature, the Contemplative Gardens of the Kamakura period (1185-1334) presented a new spirit in garden design (Boults & Sullivan, 2010), where the teachings of Zen Buddhism of self-discipline and control reflected in the design approach, by delivering more abstracted interpretations of nature. For example, the Dry Cascade is an element that communicated an illusion of a waterfall depending on the placement of rocks. This method of expressing the water features using a selective language of stone and sand was also adopted in Zen Gardens where rocks were placed carefully within a dry course of water, and in the Kare Sansui Gardens (Goto & Naka, 2015).
Figure (15) presents another distinctive of Japanese Gardens. Which is the concept of Borrowed Scenery or Shakkei; a very subtle way of appropriating nature in gardens, by borrowing the landscape beyond a garden's borders and utilizing it to contribute to the garden's inner experience.

Figure 15: The Karesansui garden with Mt. Hiei as Shakkei in Shoden-ji, and Shakkei in Shinnyo-do, Source: (Left- Damien Douxchamps; Right- Robert Ketchell) modified by author.

Japanese Gardens' approach to interpreting nature is rich and relies on variant language methods. The interpretations are communicated by copying, abstracting, referencing, symbolizing and even borrowing external natural scenery.

2.2.5. 15th-16th Century

Going back to Europe, this was the time of celebrating the rediscovery of nature, a time of Humanism and Renaissance that first bloomed in Italy. Humanists believed that the divine could be perceived in the order of nature. Gardens could be composed to express that order, and landscapes could be appreciated for their scenic value (Keene, 2013; Boults & Sullivan, 2010).
In that sense, the 15th century gardens in Italy opened outwards to the landscape. An approach that is similar to the Japanese Borrowed Scenery but with less explicit framing of the views. So again, a shift in the recognition of nature happened, and unlike the Medieval Gardens, Renaissance Gardens became a place to contemplate nature rather than hide from it.
Later, during the 16th century and as the restored appreciation of nature in the early Renaissance period transformed to promote a more composed nature, the interpretation of natural features became more constructed, for example natural waterfalls were emulated in Villa D'este with a constructed waterfall with grottos, and in Villa Lante with water moving across levels through different structured elements.

Figure 16: The open views and the waterfall of Villa D'este, Source: (Left- Wikimedia ©Ventus55; Right- Alamy ID: MHW86F) modified by author.

2.2.6. 17th Century

During this period of time, the Baroque style was developing in Europe, along with a new recognition of nature as well. The man-made landscapes became greater in scale and more exaggerated and had infinitive views, trying to demonstrate human control and power over nature. The patte d'oie layout, which forms the base of the Baroque Garden, describes a design whereby three, four, or five or more straight roads or paths radiate out from a central point (Curl, 2006). This pattern can be seen as similar to a pattern found in natural features of different scales. The explosion pattern, which according to Steven's theory (1974) is one of the basic types of natural patterns, has a similar principle of radial lines being originated from a central point.
In general, the interpretations of nature in the Baroque style were less naturalistic, copying natural features was not literal, and the designed elements presented a more structured and formal version of natural features. The canals and vast pools were designed with strict straight lines and geometrical shapes, presenting a structured interpretation of rivers and lakes.

Emulating caves with grottos and waterfalls with cascades continued to exist in this style but became greater in scale than in previous styles. For example, La reviere in Versaille is a cascade composed of 53 steps of colored marble (at the retreat at Marly) emulating a waterfall with a more formal and structured element. The Tapis Vert "green carpet" can be seen as a refined version of the natural meadow, and Sunken courtyards as the sunken spaces found in a hilly landscape.

Figure 17: La Reviere cascade, Tapis Vert and the Grand Canal of Versailles, Source: (Left- Archives nationales, Paris; Right- CVersailles) modified by author.

2.2.7. 18th-19th Century

The 18th century was marked by the rise of the middle class and advances in science; England became the force that shaped garden history. English Gardens drew inspiration from landscape paintings by French painters Claude Lorrain, and Nicolas Poussin, who depicted idyllic images of the Roman Campagna, presenting idealized landscapes and pastoral poetry, in addition to the influence of the Chinese Gardens, which charmed the European travelers (Boults & Sullivan, 2010; Mosser & Teyssot, 1991). The descriptions and images of the European missionaries conveyed key characteristics of the Chinese Imperial Gardens, such as the irregular winding pathways and the lack of use of topiary, which influenced the design of the English Garden. Some structures and design elements, like a pagoda, were even presented as point features.

Hence, a return to the naturalistic approach was the main event. The stiff baroque boundaries were deconstructed, and in the attempt to emulate natural settings, trees were planted in variations of clusters (belting, clumping and dotting), serpentine lakes were constructed imitating the free form of natural ones and gently rolling hills were formed. Scenes were not framed but left to be spontaneously discovered as the visitor makes his way along the undulating pathways.

Later, during the 19th century and with many developments in this era and the industrial revolution being its main event, the landscapes became urban, public and romantic.

The Gardenesque style that developed in England encouraged small property owners to enjoy the landscape. Plants did not touch each other, and they were displayed individually. A garden was a work of art, not an imitation of nature. As a result, the approach of interpreting nature was more organized and displayed thoughtful eclecticism.

Whereas in France, the English-style continued to replace the formality of the Baroque style, like in Parc des Buttes-Chaumont where one can recognize the curvy pattern of pathways that distinguished the English Gardens. These undulating, irregular paths of the English Gardens share the attitude and spontaneity of natural features when attempting to adjust to and make way through the natural topography or curve around challenging obstacles.

The naturalistic approach of English Gardens, which influenced the American approach as well, was far from abstraction or allusion, but rather copying and imitating natural features.

2.2.8. 20th Century

In this era, marked with dramatic and fast-paced changes, the influences on built landscapes were various, resulting in diverse styles and no single predominant style to represent this period.
The influence of those changes was pointed out by G. C. Tylor, gardening editor of Country Life, when he observed that "nowadays most people are finding their conception of beauty being strangely changed by all the new shapes and materials around them". His remark on the need to "link the modern white-washed house, with its severe lines, to the soft forms and suave curves of an English landscape" described the efforts of landscape architects to establish a Modern style and philosophy consonant with this mood (Jaques, 2000). Modernism promoted utilitarian function and considered ornamentation not necessary, using abstract shapes and nontraditional materials. It produced a style with a complex of large geometric forms enframing contrastingly small natural forms, using plants for their esthetic impact (Earle, 1657). Similarly, the International Style also adopted the motto of form follows function and expressed industrial materials. Therefore, the design approach was more humanized. Forms were not inspired, but they followed function. It was more serious than artistic and thus there was less copying, emulating, and referencing of nature.
Other styles later organized the space functionally but started demonstrating a play of patterns. The Art Deco style accentuated purity of line, fluid geometric forms and use of color.
Designs with juxtaposed curvilinear and biomorphic forms against orthogonal shapes were artistic and abstract. Thomas Church together with Lawrence Halprin presented a distinctive patterning of the ground in the Donnell Garden, especially with the kidney-shaped pool that was inspired by figures and lines of San Francisco Bay and its marshes and creeks and which later became the ultimate icon of the modernist garden (TCLF, 2016).

Figure 18: The biomorphic forms of Donnell Garden compared to the pattern of saltmarshes, Source: (Left- moderndesign.org; Right- uga.edu) modified by author.

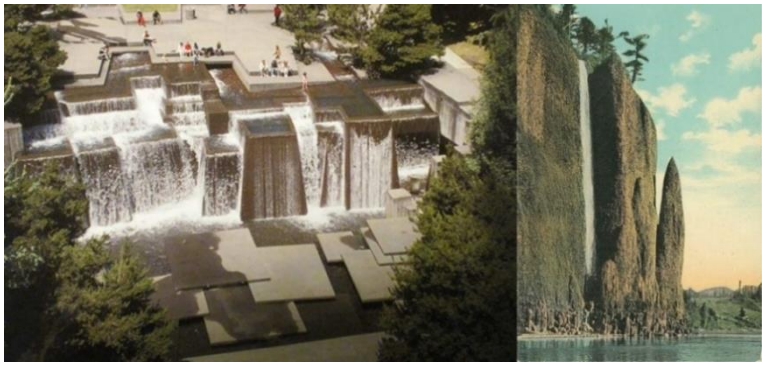


Figure 19: The Keller fountain compared to the rock formations of Columbia River, Source: (Left- tclf.org; Right- columbiariverimages.com) modified by author.

Another distinctive work by Halperin that interpreted a natural feature is the fountain in Keller Park (Figure 19), which was inspired by the natural formations of the local environment. The fountain is an emulation of the rock formations of the waterfalls in Columbia River Gorge.
Figure (20) shows the famous Copacabana Beach, designed by Roberto Burle Marx in the 1970s. The design pays tribute to the cultural heritage of the colonizers, by recreating the wavy pavement pattern of the Rossio Square in Lisbon, which represents the meeting of the Tagus River and the Atlantic Ocean (ArchDaily Team, 2023). Burle Marx modified the design, making the wave pattern parallel to the sea with longer curves and integrating it into a wider graphic set.

Figure 20: The wavy pattern of the Copacabana Beach compared to the waves at the shoreline, Source: (Left- Creative Boom. Ltd; Right- Dan Grinwis) modified by author.

Whether it is the fountain of Halperin, the kidney shaped pool of Church or the colorful ground planes of Burle Marx, this approach of abstracting the free forms and patterns of nature was simple and yet very expressive, and it presented a new way of interpreting nature and recognizing the natural phenomenon for specific attributes individually like the form, the colors or the rhythm.
Later, in Postmodernism style, there was a renewed interest in symbolism; however, meanings were not assigned but rather left to be recognized according to the viewer's own experience. The style was characterized with ambiguity, and space was considered neutral; for example, Parc de la Villette in Paris presented a deconstructed space where people establish their own connections to it. This approach and design mentality also resulted in abstract interpretations of natural features, like in the Garden of Cosmic Speculation, where Charles Jencks presents a tribute to the mysterious universe with playful landforms, lakes and cascades.
Later, during the **21st Century**, in which the state of constant change in all aspects of life persists and new global challenges appear, the evolution and advances in many disciplines, in addition to the surging waves of the digital revolution, have allowed humankind to surpass more limits in experiencing the world we live in, leading to a new perception and interpretations of nature as well, which will be discussed in Chapter 4.

Figure (21) summarizes the historical review of this chapter, demonstrating how each period of time expressed the naturalistic design approach and which language method was used to communicate the interpretation of natural features, and providing a reference for later chapters, in order to define language method types and help compare the contemporary approach to its precedents.

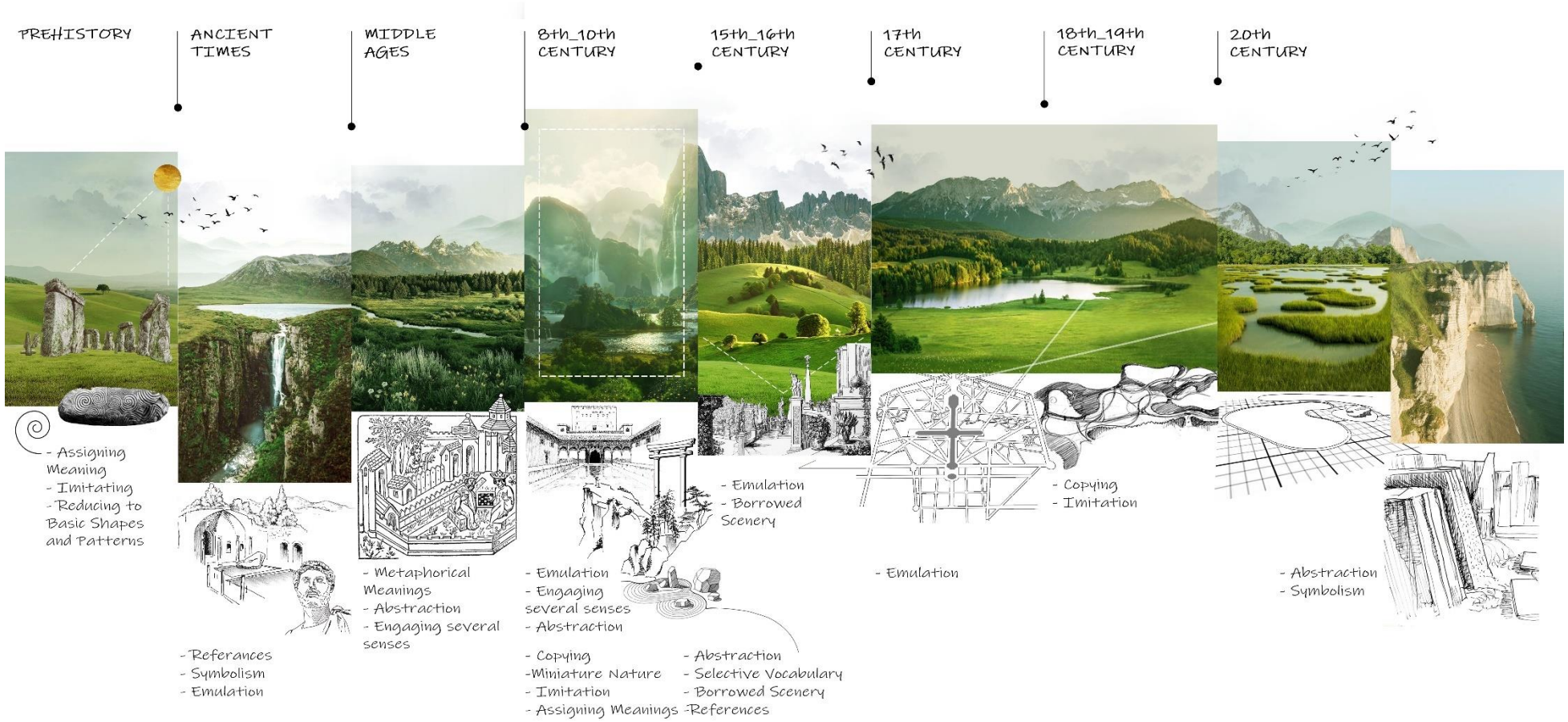


Figure 21: A summary of the language methods in interpreting nature throughout the history of landscape design, Source: Author.

2.3. Conclusions of Chapter 2

The previous study of the different styles of landscape design that appeared over the course of history shows that nature has always been a source of inspiration for humans since prehistoric times, and that the concept of being inspired by nature in man-made landscapes may have been adopted through different approaches and communicated with different vocabulary, but it has survived the test of time.

The interpretation of nature in each landscape design style was influenced by the circumstances and the context of its accompanying period of time. These circumstances changed how people perceived nature, like being considered as the divine and the spiritual, a wilderness to be feared, a poetic product to be admired with fascination, or even as a rival over power to be surpassed and tamed.

Each style interpreted natural features using a certain language method, such as, assigning meanings, using symbols, copying, imitating and abstracting the forms and shapes of natural features, referencing iconic landscapes, creating subtle allusions to others, copying patterns and framing and borrowing scenery.

The Chinese design approach could be considered influential as it was reproduced and followed in later periods and even on different continents. This approach was direct and bold in accentuating the sanctity of nature by recreating scaled replicas of the natural features. It was reproduced in the naturalistic style of the English Gardens, which in turn had its influence over the rest of Europe and even the American approach.

The overview of historical landscape design styles presents variant methods of interpreting nature, each having its own language. The chosen “language method” contributes not only to shaping the visual characteristics and aesthetics of the style but also to its spatial experience.
The research extracted the following terms that were used to define the language methods of the historical styles:

Borrowing, Copying, Imitating, Emulating, Abstracting, Referring, Alluding, and Symbolizing

These terms will be further discussed in the following chapter to help define the contemporary tendencies, and which are the preferred language methods of the contemporary style.

Chapter 3 - DESIGN LANGUAGE METHODS

3.1. Introduction

According to the conclusions of the previous chapter, and as demonstrated through the summary in Figure (21), there are different methods related to the choice of language that were used and developed over the years to communicate an interpretation of nature. Each method had its own tools, techniques and means to deliver the design interpretation.
In this chapter, the "language methods" will be discussed by reviewing examples not only in the field of landscape architecture but also in visual arts, as exploring the language tools of variant works of art can provide a more comprehensive understanding of each method, especially since both fields share common design tools, such as shapes, forms, lines, colors, textures, etc.
The discussion will examine how these tools could affect the representation of the natural features in the final design product, and it will be conducted in descending order, starting with the method that produces the most direct and identical interpretation of a natural feature to ones that rely on an indirect approach.
The results of this chapter, which will present a set of methods and their tools, will be used as a reference in further chapters to help define the contemporary tendencies regarding the choice of design language.

3.2. Design Language Methods

3.2.1. Borrowing

According to the Cambridge Dictionary, the term *Borrowing* is defined as follows: "to take and use an idea from another piece of work".
In the field of visual arts, the term borrowing, is directly connected to the term appropriation, which is a method that has been used by artists for millennia; however, in recent years it was mainly used to express a strategy that appeared in the mid-20th century with the rise of consumerism and the proliferation of images through mass media outlets from magazines and televisions (Bann, 1993). The term borrowing describes the work of pop artists, who borrow and reproduce everyday images as a way to reflect cultural trends and give a critical opinion. Nowadays, the appropriation of popular cultural elements is also common practice.
Figure (22) is an example of this type of art: a collage titled "Meet the People" by Eduardo Paolozzi, which is an image out of a suite of 46 images reproducing collages made from the covers of science fiction journals, magazine advertisements and photographs (V&A, 2009).
Another example is the Screenprint Portfolios of Marilyn Monroe, shown in Figure (23), in which the artist borrowed a publicity still of the actress and reproduced it in different colors.
Each image was printed from five screens: one that carried the photographic image and four for different areas of color (MoMa, 2015).
In that sense, we can say that borrowing in the field of visual arts does not exclude alteration or reproduction of the borrowed object, in order to convey an idea or a certain design; however, in the field of landscape architecture, borrowing is applied differently and in a more direct method.
When mentioning the term borrowing in our field, it is familiar to relate it to traditional East Asian Gardens. Borrowing scenery, which is *jièjǐng* in Imperial Chinese Gardens and *shakkei* in Japanese Gardens, is the famous method of integrating a natural scene into the design of the garden.

Figure (24, 25) are examples of Japanese Gardens, in which natural scenes were integrated into the design. The figures demonstrate the tools of Japanese Gardens in borrowing scenery, such as integrating distant mountains to create a harmonious background of a certain composition, or framing a distant mountain using refined hedges and trunks of trees.

Figure 22: Meet the people, from "Bunk" series, by Eduardo Paolozzi, 1948, Source: Trustess of the Paolozzi Foundation.

Figure 23: Marylin, by Andy Warhol, 1967, Source: The Andy Warhol Foundation for the Visual Arts (Artists Rights Society, New York).

Figure 24: The summit of Sakurajima volcano as a background and a visible part of Senganen Garden's design, Source: Flicker IMG_3566.

Figure 25: Mount Hiei seen from the gardens of Entsuji Temple, Kyoto, Source: Flicker Entsu-ji-10.

Although the principle of *shakkei* seems very direct in incorporating the background landscape into the composition of a garden, one can argue that the tools it uses can have an influence on how the natural scene is perceived, as one of the essentials of borrowing scenery is that the designer edits the view of the distant natural object to reveal only the features they wish to show (Itō, 1973). In addition to hiding unwanted elements between the garden and the distant object.

In that sense, by arranging the natural scene as an element within the composition of the garden, the scene or the natural feature can be considered to be presented in a controlled way and thus perceived through a filtration system, pointing to the possibility that it may be described as altered. However, due to the use of the physically unaltered natural feature itself as a design element rather than a replica or a reproduction of it, the research considers the method of borrowing as the one that produces the most identical interpretation of a natural feature.

According to the previous discussion, we can define some of the tools of the borrowing method:

Design tools of *borrowing*: framing | oriented views | background as a design element.

3.2.2. Copying

According to Cambridge Dictionary, the term *Copying* is defined as follows: "to reproduce something, make a similar or identical version of".

In the field of visual arts, the term copying can be discussed in various situations. It can have a negative meaning when it is copying the work of a more famous artist, or copying a valuable artifact, which is known as forgery, and it can range from misinterpreting a genuine work of art to the outright counterfeiting of a work or the style of an artist (Cohen, 2012; Noble & Bonner, 2023). On the other hand, still-life paintings, which is the art of depicting inanimate objects for the sake of their qualities of forms, colors, texture, and composition, can be considered to depend on a method of copying, although the painting depicts a world that owes its charm to the reflection it retains of inhabitants who have withdrawn from it.

Furthermore, landscape paintings, a genre of art that depicts natural scenery, also uses copying as a method. Starting in the 16th and 17th centuries as landscape backgrounds for biblical stories depicting nature in a stylized way to evoke the landscape of classical Greece and Rome (TATE & Andrews, 1999). At the time, Dutch landscape painters started adopting a more naturalistic approach that depended more on copying nature as they saw around them (Figure 26).

In the 19th century that we could describe landscape paintings as copies of realistic scenes in which the artist produced highly detailed paintings, with British painters, such as John Constable (Figure 27) and J.M.W. Turner, leading the way and producing outdoor scenes with precise details and delicate coloring, capturing dramatic effects of light and shade, all of which facilitated with the invention of tin tube for paint and the portable collapsible easel.

Figure 26: A Wood Landscape with a Pond, by Jacob van Ruisdael, Late 1640s, Source: The Museum of Fine Arts, Houston.

Figure 27: Golding Constable's Flower Garden, by John Constable, 1815, Source: Colchester and Ipswich Museum Service.

In the field of landscape architecture and garden design, the Imperial Chinese Gardens present an example that uses the method of copying natural features. An example of which is the pond and three mountains system, which is based on the legend of the Eight Immortals[6].

Emperor Ying Zheng, founder of the Qin dynasty, was fascinated with the legend of the islands, and thus, he created a garden at his palace with a large lake. On an island in the lake, he created a replica of Mount Penglai. Later, the legend continued to influence other Chinese Gardens, with many of them representing the island of the eight immortals, and with some creating scaled-down replicas of the three Boshan mountins; Penglai, Yingzhou, and Fanghu (Chiu, 2010).

Another example, in a different time and context, is Mud Island River Park (Figure 28). Architect Roy Harrover designed an interactive river museum in which he copied the meander of the lower Mississippi River, creating a scaled-down replica that showed the major cities and small towns along its length. This 610 m-long dry miniature copy of the topography of the Mississippi doubled as a walkway and as an educational element that demonstrated the history and facts about the river.

[6] An ancient legend of Chinese mythology described in the Classic of Mountains and Seas, which tells the story of immortals living on a peak called Mount Penglai located on one of the three islands at the eastern end of Bohai Sea.

Figure 28: Mud Island River Park, Memphis, USA, 1982, Source: Ewald Judt.

According to the previous discussion, we can define some of the tools of the copying method:

Design tools of *copying*: scaled replicas (miniature copies) | exact shapes and forms | same colors, textures and materials.

3.2.3. Imitating

According to Merriam-Webster Dictionary, the term *Imitation* is defined as follows: "to follow as a pattern, model, or example, to appear like".
According to both Plato and Aristotle, the artist imitates nature. Plato believed that a work of art, which reflects nature, is twice far from the reality it represents. Aristotle, on the other hand, argues that a work of art does not imitate nature as it is, but as it should be (Baktir, 2003). In this sense, both philosophers discussed the term of imitation as a representation of reality, which allow us to say that imitation is not the production of an exact replica of an object but a similar object.
In the field of visual arts, the imitation of an artwork is known as a *pastiche*, which is defined as: an artistic work that imitates the style of previous work[7]. Imitating the style of a painter, for example, by using the same color palettes, brush strokes, compositions, and techniques does not produce a copy of his work but rather a similar product.
Hockney studied the landscapes of Van Gogh that are full of color contrasts and wheat stalks swaying in the wind. In his paintings, he imitates the style and techniques of Van Gogh, especially the aspects related to color and movement (VGM). For example, the movement of the grass blades in his "Woldgste Vista" is an imitation of the movement of the wheat stalks in Van Gogh's "The Harvest" (Figures 29, 30). He imitates the contrast of colors between fields, hedges, and vegetation, and uses vibrant colors, strokes and dots, which are Van Gogh's Familiar facture.

Figure 29: Woldgate Vista, by David Hockney, 2005, Source: David Hockney.

Figure 30: The Harvest, by Vincent van Gogh, 1888, Source: Van Gogh Museum.

[7] According to Merriam-Webster Dictionary.

Another example is the work of Cindy Sherman, who created a suite of seventy black and white photographs, posing herself in them in the guises of different female film characters (Figure 31), such as the lonely housewife, the vulnerable naif, etc. The stills imitate in format, quality and scale the staged stills used to promote B movies, and noir films, in 1950s and 1960s Hollywood.

Figure 31: Untitled Film Stills #2 #7, by Cindy Sherman, 1977/1978, Source: The Museum of Modern Art in New York (MoMA).

Figure 32: Puey Park for People and Sustainability, Source: LANDPROCESS.

In the field of landscape architecture, we can find many examples where designers imitate nature, cultural landscapes or historical styles, etc., and create visually similar compositions.
The urban rooftop farm of Thammasat University in Pathum Thani, Thailand, presents an example of this method of imitation (Figure 32). The design draws inspiration from traditional rice-farming practices. It imitates the local rice terrace landscapes, creating a cascading farm in similar compositions and land forms. The farm grows rice crops and types of vegetables, paying tribute to the traditional ingenuity of local rice farmers and responding to a serious climate crisis.
According to the previous discussion, we can define some of the tools of the imitating method:

> **Design tools of *imitation***: same material | same shapes and forms | same size | same compositions and assembly manner.

3.2.4. Emulating

According to Merriam-Webster Dictionary, the term *Emulation* is defined as follows: “to equal or approach equality with - Less similar version, still not abstraction”.
In the field of visual arts, the work of impressionists like Monet, which aimed to capture the fleeting nature of reality and the interplay of light and color, presents an example of *emulation* as an artistic method.
Monet’s emphasis on capturing the essence of nature with his characteristic short, visible brushstrokes resulted in creating paintings that interpreted the overall impression of a certain scene rather than the detailed realism. In his painting “Sunrise”, which was created from a scene in the port of Le Havre, he communicates the orange and yellow hues, contrasting with the dark boats. Monet emulates the atmosphere, lights, and movement of air and water of the French harbor at sunrise. With the hazy background, the depiction of mist, the little details that can be detected in the boats in the foreground, and the different colors sparkling on the surface of water, he delivers the feeling that those little boats are being propelled along by the movement of water.
Figure (33) presents another example of *emulation.* The series of Balloon Animals created by Jeff Koons are sculptures that emulate the form of inflatable toys on a much larger scale. Koons uses

mirror-polished stainless steel with transparent color coating to give the same visual appearance as the latex or rubbery material of balloons.
In the field of landscape architecture, we can consider the Opera Park in Copenhagen (Figure 34), designed by the design team of Cobe, as a contemporary example that uses the method of emulation. The park presents a romantic garden in a contemporary context. The design takes inspiration from the European capital's historical gardens, with winding paths and carefully crafted viewpoints (Cobe, 2023). It emulates the natural scenography of the English romantic gardens and creates similar elements like planned viewpoints and small niches using modern paving materials.

Figure 33: Balloon Animals, by Jeff Koons, 1994//2005, Source: Jeff Koons.

Figure 34: The Opera Park, Copenhagen, Source: Cobe

According to the previous discussion, we can define some of the tools of the emulating method:

> **Design tools of *emulation*:** visually similar material | similar forms (not exact) | adjusted assembly | different size.

3.2.5. Abstracting

According to Cambridge Dictionary, the term *Abstraction* is defined as follows: "to use shapes, lines, and colors in a way that does not try to represent the appearance of things".
In the field of visual arts, abstract art does not attempt to represent an accurate depiction of a visual reality, but instead uses shapes, colors, forms and gestural marks to achieve its effect (TATE).
The word abstract means to withdraw something from something else, and when artists apply this concept to any type of object, the resulted forms are simplified or schematized.
Figure (35) is a portrait of the artist Dora Maar, painted by Picasso in the final days of Nazi Occupation of Paris. He expressed feelings of fear and hope by presenting a complex moment, with the face painted in white and black, the contrasted background with red and purple stripes and the bright green dress.
The Dutch pioneer of abstract art, Piet Mondrian, who shifted in his works from landscape pictures to geometric abstraction, presents in his work, shown in Figure (36), an example of an abstract monochrome painting without any illusion of perspective. In this painting, titled "The Tree A", he abstracted the tree's branches and trunk into a network of horizontal and vertical lines.
If we consider abstraction in landscape paintings, the work of Wassily Kandinsky presents an example of the techniques and tools of this approach (Figure 37). In his painting "Winter Landscape", rather than being dominated by white, Kandinsky expresses the winter landscape with black trunks contrasted with bright colors of blue, pink and yellow that conveys the effects of lights on snow lit by the setting sun.

Figure 35: Bust of a Woman, by Pablo Picasso, 1944, Source: Succession Picasso/DACS 2024.

Figure 36: The Tree A, by Piet Mondrian, 1913, Source: Mondrian/Holtzman Trust c/o HCR International.

Figure 37: Winter Landscape, by Wassily Kandinsky, 1909, Source: The State Hermitage Museum.

The same theory applies to the work of many contemporary landscape painters (Edward & Reeve-Edwards, 2022). In his famous series, "Ocean Park Series", the American painter Richard Diebenkorn created 145 paintings inspired by his Ocean Park neighborhood on the edge of Los Angeles, California (Figures 38, 39). In these paintings, the artist interprets the geometry of the views he could see from his window, abstracting, within the frame of the window, how streets cross one another and trying to deliver the effect of light on the landscape.

In the field of landscape architecture, we can also find many examples of abstraction with the same approach of simplifying and depending on geometrical shapes and forms and the power of colors. An example of which is the rooftop courtyard designed by Martha Schwarz that was transformed into a site full of signals to read as a garden. Figure (40) shows how the design elements of the project present garden abstractions similarly to the approach of Japanese gardens, which often imply a larger landscape.

One side of the garden is an abstraction of a Japanese Zen Garden, while the other is an abstraction of a French Renaissance Garden (MSP, 2014). Instead of the rocks of the Zen Garden, we can see topiary pompoms from the French Garden. Some plastic plants are distorted and placed to project off the vertical walls. The bright green palette, accentuates the reference to a garden. The design language relies on geometrical forms and shapes with defined and sharp edges, and strong colors.

Figure 38: Ocean Park No. 24, by Richard Diebenkorn, 1969, Source: Yale University Art Gallery Collection.

Figure 39: Ocean Park No.79, by Richard Diebenkorn, 1975, Source: The Philadelphia Museum of Art Collection.

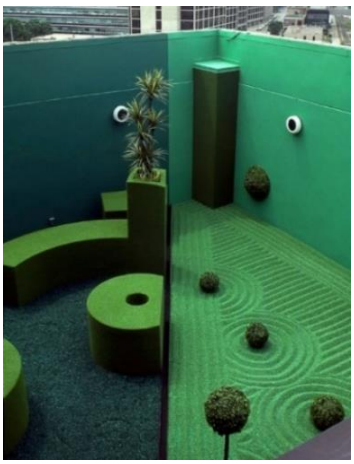


Figure 40: Whitehead Institute, Splice Garden, Source: MSP.

According to the previous discussion, we can define some of the tools of the abstracting method:

Design tools of *abstraction*: different materials | bright colors | simplified geometric forms | refined geometric assembly.

3.2.6. Referring

According to Merriam-Webster Dictionary, the term *Referring* is defined as follows: "to have relation or connection, to direct attention by mentioning".
In the field of visual arts, when an artist wants to express an appreciation of another artist or a historical style, he creates a piece of work with visual similarities to the work of the esteemed artist of the past, which leads the viewer to draw the connection between the two pieces of art. This idea is shown in many examples that reference the classical ideal of Greek and Roman societies.
In Figure (41), the artist used a visual language that helps him refer to the ideal society of ancient Rome, by presenting a roman legend with a background of classical architectural elements, forcing his contemporary viewers to draw the connection to the ideal society of ancient Rome at a time when the French society was at a transformational point in the years of the French Revolution.
In the field of landscape architecture, we can find many cases where designers refer to works of artists, literature, historical styles, natural features, etc. Those references are delivered by different means, such as naming the site or a certain element as the source of reference or by creating elements that represent some of the attributes of the source of reference. A contemporary example is shown in Figure (42): the Sowwah Square in Al Maryah Island, Abu Dhabi.
The design team of Martha Schwartz Partners created a green retreat at the center of a new commercial hub. According to the design studio (MSP, 2018), inspiration was drawn from the culture of the Arabian Peninsula: dunes, oases and Bedouin textiles. However, a reference to French baroque château gardens was made by integrating clipped hedges to the design, which is a popular method in the open spaces of the United Emirates, where this connection to the baroque gardens is reoccurring.

Figure 41: Le Serment des Horaces, by Jacques-Louis David, 1784, Source: 2018 Grand Palais RMN (Musée du Louvre).

Figure 42: Clipped Hedges in the Square referring to the Baroque gardens, Source: MSP.

According to the previous discussion, we can define some of the tools of the referring method:

Design tools of *referring*: direct mentioning | representation of some attributes or materials.

3.2.7. Alluding

According to Merriam-Webster Dictionary, the term *Alluding* is defined as follows: “the act of making an indirect reference to something”.
In the field of visual arts, it is common to find subtle hints or indirect references that artists incorporate in their works to evoke memories, meanings, emotions or cultural narratives.
The paintings of Van Gogh present a rich material in this regard. In “The Starry Night”, he took inspiration from his window at the Saint-Paul-de-Mausole asylum in southern France, creating a masterpiece that is both an exercise in observation and a clear departure from it (MoMA. 2025).
Under the expressive swirly sky is the picturesque village nestled below the hills, where one can see the steeple of a church that does not resemble those found in France but is similar to his hometown, making an allusion to his native Holland.
The cypress tree in the foreground, reaching almost to the top edge of the canvas and linking the land to the sky, is seen as an allusion to heaven or the link between life and death.
Another example is the work of Edward Hopper. In his painting “Nightwalks” (Figure 43), which is considered as one of the most recognizable paintings in American art, the artist stated, “Unconsciously, probably, I was painting the loneliness of a large city” (ARTIC, 2025).
The representation of three disengaged customers, each lost in thought, sitting at a diner with no entrance, and by depicting a darkened street with the light coming from the diner to illuminate it and show the absence of debris in it, Hopper paints an impression of emptiness and alludes to the loneliness of large cities.
Figure (44) is a painting by artist Grant Wood. “American Gothic” features a farmer and his daughter posed stiffly and dressed as if they were, as the artist put it, “tintypes from my old family album” (ARTIC, 2025). Although the ambiguity of the painting led viewers to understand the painting as a critic for Midwesterners not keeping up with a modernizing world, the artist alludes with his figures to the values of rural America and tries to convey a positive reassurance in the face of the Great Depression.

Figure 43: Nighthawks, by Edward Hopper, 1942, Source: Art Institute of Chicago.

Figure 44: American Gothic, by Grant Wood, 1930, Source: Art Institute of Chicago.

In the field of landscape architecture, we can find many examples as well where designers allude to different natural environments or cultural and heritage elements. In Ålgård town square in Rogaland, Norway, the design studio creates a design element that twists and swirls across the square, shown in Figure (45). By adding the illumination below this element, it strengthens the

effect of appearing to float in the air, providing an interesting play element that works as a bench for relaxing as well.
The twists and undulations of this element, which is present all around the square, alludes to the spinning of wool, an industry that has been central to the city's identity (ATSITE, 2017).

Figure 45: Ålgård Town Square, Source: ATSITE.

According to the previous discussion, we can define some of the tools of the alluding method:

Design tools of *allusion*: indirect | evoking memories | no representation of specific forms.

3.2.8. Symbolizing

According to Merriam-Webster Dictionary, the term *Symbolizing* is defined as follows: "to represent by means of symbols, without attempting to create a realistic picture".
In the field of visual arts, when an artist wants to convey a certain meaning using signs or symbols, they are usually direct and readable, and they convey the required meaning virtually without ambiguity. Although a symbol is not a realistic interpretation of an object, it can be very precise in the meaning it embodies, more precise than in the case of abstraction, for instance.
To be more precise, symbolism is recognized as a late 19th-century movement that advocated the expression of an idea over the realistic description of the natural world (TATE).
The works of Klimt, for example, are imbued with rich symbolism. In many of his works, he communicated symbols of the human life cycle, growth and decay, and experiences of love and happiness (Belvedere, 2025).
In his painting, "Baby" (Figure 46), a single figure of a small child is the subject of his painting. With a pyramid of colorful textiles, the artist symbolizes the circle of life.
In his masterpiece, The Kiss, Klimt symbolizes the power of love and the unity of human life, Earth and the cosmos. The embracing lovers, with their bodies merged in a single contour, kneeling on a flower meadow, are united together in unbreakable unity with Earth and cosmos.
More recent example can be the works of Jean-Michel Basquiat, whose iconographic symbols are known for masks, crowns, skulls, snakes, warriors and ballplayers.
In figures (47, 48), we can see the crown as his signature reoccurring motif in his paintings, sometimes as a crown with three peaks, and sometimes as a halo or a crown of thorns.
The artist recognizes the majesty of his heroes: groundbreaking athletes, musicians, writers, etc. he believed he was continuing the work of this noble lineage, and that is why he depicts himself in self-portraits wearing a crown as well (Guggenheim, 2025).
The crown is a symbol of nobility and royalty that connects to power and influence, through which the artist can elevate his figures to a higher metaphysical and spiritual plane.

Figure 46: Baby (Cradle), by Gustav Klimt, 1917/1918, Source: The National Gallery of Art, Washington, D.C.

Figure 47: Untitled (Portrait of Famous Ballplayer), by Jean-Michel Basquiat, 1981, Source: PHILLIPS.

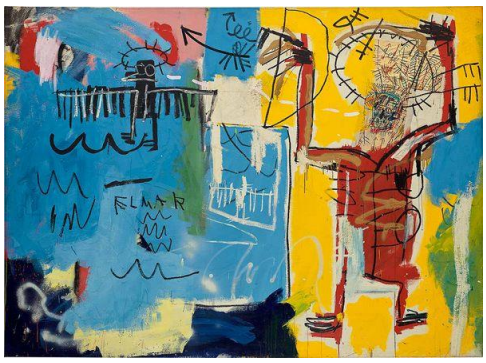


Figure 48: Untitled (ELMAR), by Jean-Michel Basquiat, 1982, Source: PHILLIPS.

In the field of landscape architecture and garden design, throughout history, many design styles also used the method of symbolizing to create unique elements or convey certain narratives. For example, Figure (49) shows an element of the traditional Japanese and Chinese Gardens, the moon bridge, which is a half-circular ornamental bridge that is positioned on a still surface of water to create with its reflection a full circle that symbolizes the moon.

Figure 49: Moon bridge in the Kameido Tenjin shrine compound, by Utagawa Hiroshige, Source: Yale University Art Gallery.

Figure 50: Top view of the Peace Maze Source: Sam Allen Photography.

Another, more recent example, is the Peace Maze in Castlewellan in Northern Ireland (Figure 50). It is one of the largest permanent hedge mazes in the world. It was intended to commemorate the reconciliation efforts and achieving peace in Northern Ireland in the past century.

The design reflects the steps being taken to uphold the peace brought about by ending a period of harsh ethno-political conflict during the late 1960s-1990s. The two halves of the maze that need to be crossed to escape the maze are symbols of the efforts done to reach the state of peace. In the middle of the structure is the peace bell, which can be rung by the users who finished the steps.

So, the simplicity of symbolism that lies in the fact that a symbol is actually what it stands for _ it is a reality itself_ makes it an interesting tool for interpreting natural features. It holds a contradicting nature, in the sense that a symbol may not have the same materials, textures or even shapes and forms of the origin; however, it can be very direct in conveying its meaning and evoking a collective identification.

According to the previous discussion, we can define some of the tools of the symbolizing method:

Design tools of *symbolizing*: creating distinctive elements | no realistic representation.

3.3. Conclusions of Chapter 3

According to the previous discussion, we can conclude that, in the field of landscape architecture, the choice of design language can vary, starting from a language that produces an identical version of the source of inspiration to ones that are indirect and depend on evoking memories and emotions of the perceiver.

Different methods of design language also have different tools and means that help the designer convey ideas and interpreting the source of inspiration.

Figure (51) summarizes the design language methods concluded in this chapter in descending order, starting with the method that creates the most identical version of the source of inspiration. The figure demonstrates as well some of the possible design tools that can be used in each method to achieve the desired results.

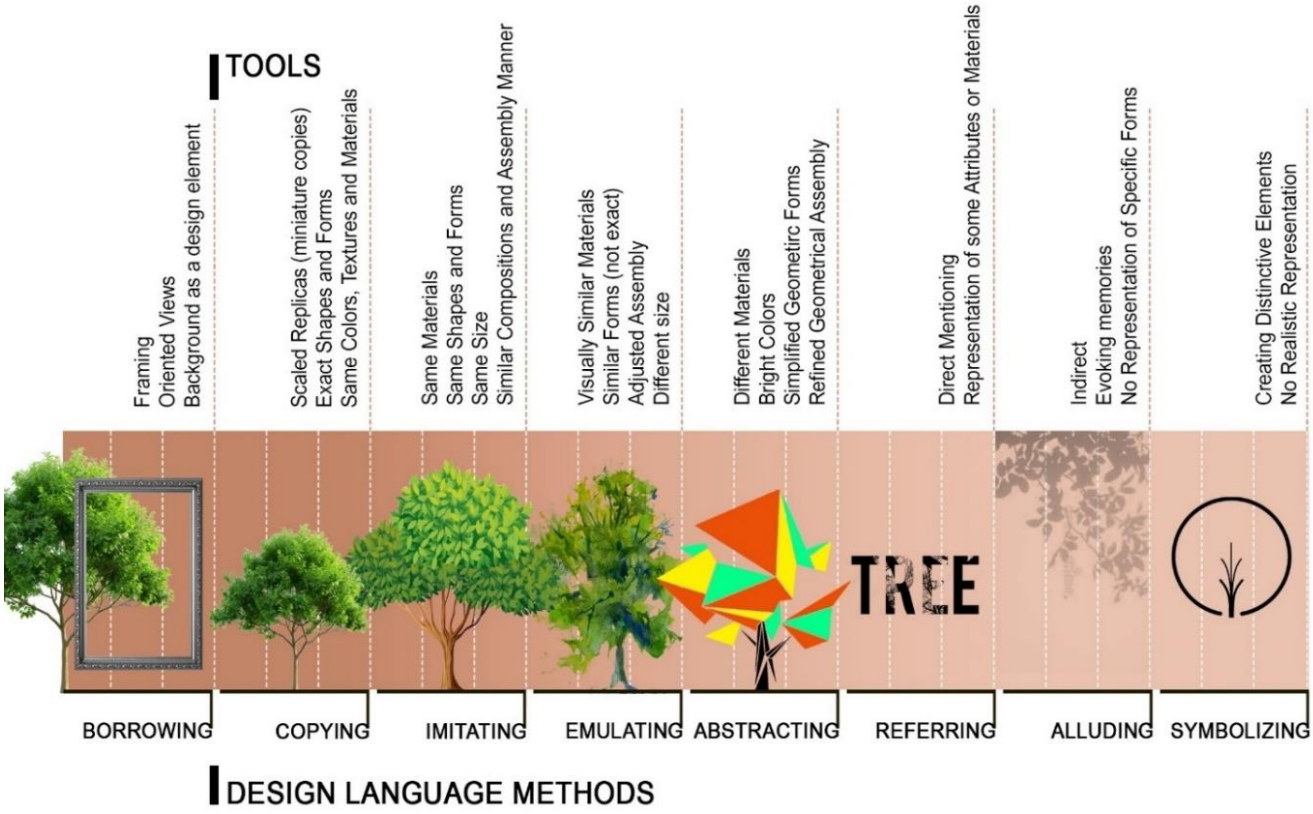


Figure 51: Types of design language methods and their tools, Source: Author.

Chapter 4 - INTERPRETATIONS OF NATURAL FEATURES IN CONTEMPORARY LANDSCAPE DESIGN

4.1. Introduction

The rapid advances in computer, network, and World Wide Web technologies that exploded in the 21st century have brought about a technological shift that has been the mark of the contemporary era, that is known as the digital age; the age of the Third Industrial Revolution (Turner, 2024; Atlantic Council, 2013; Castells, 1996), presenting developments in areas such as, computer-aided design and manufacturing, holography, engineered materials, lasers, fiber optics, etc.
This digital revolution and the advances in science gave easy access to a wide range of data and quick methods to process these data as well.
In the field of landscape design, the influence of these circumstances of the age is unlimited, and the topic of interpreting nature in landscape design is a good example of how different the design process became in comparison to previous times. The designer can examine the natural feature from which he takes inspiration with practically no limits, starting with satellite images showing the largest scale of the phenomenon to studying its minute structure with a microscope, and being able to process the information quickly and deliver with the help of computing methods ideas that were once unachievable. In that sense, the perception and recognition of a certain phenomenon, are enriched with more possibilities, as advanced technologies mediate these processes and allow new attributes to be examined. Hence, the design interpretations can be variant and innovative.
This chapter will examine this notion by discussing the approach of interpreting natural features in contemporary designs. It aims to develop an understanding of the design process, the language methods, and to detect the general current tendencies of the naturalistic contemporary style.

4.2. Interpretations of Natural features in Contemporary Landscape Design

As previously mentioned in the introduction of the dissertation, the research selects and examines contemporary projects that interpret natural features as their design concept. The process of selection relies on books discussing contemporary landscape architecture (LAE, 2015; Jodidio, 2012; Allen & Mcquade, 2011; Weilacher, 2005), in addition to online landscape architecture platforms and websites with international recognition showcasing landscape architecture projects made by landscape architects and architects from around the globe, such as Landezine, LAND 8, WLA, ArchDaily, DeZeen, and others.
The research examined the work of 146 contemporary design studios, shown in Appendix A (Figure 124), in search of projects interpreting natural features as their design concept.
The selection of projects was according to the following criteria:

- A realized project
- The project was realized in 1990 and onwards
- The designer stated clearly that a natural feature is the source of inspiration

The study of projects is conducted in two phases; the first phase creates a collection of 64 projects, which were examined to extract general results. The second phase selects 34 projects from the former collection that are complex in their designs to conduct a deeper analysis and extract more detailed results.

4.2.1. An Overview of 64 Contemporary Interpretations

As shown in Table (1), the research collected 64 projects according to the previously mentioned criteria, and examined the basic data that give an insight about the context of each project, such as the location of the project, the site's area, the type of open space, the year of realization, etc., and the type of natural feature that was the source of inspiration.

Table 1: Identifying data of the 64 contemporary landscape design projects and their associated natural features, Source: Author.

	Project Name	Built Year	City, Ctry.	Type	area m²	Design Studio	Studio's location	Inspiring Natural Feature
1.	**Federal Courthouse Plaza**	1996	Minneapolis MN, USA	Plaza	4.645	Martha Schwartz (MSP)	New York, NY, USA	**Glacial drumlin**
2.	**Interpolis Headquarters Garden**	1998	Tilburg, NL	Corporate Public Garden	approx. 20.000	West 8	Rotterdam, NL	**Slate landscape, Tectonic shifts**
3.	**The Botanical Garden of Barcelona**	1999	Barcelona, Spain	Botanical Garden	140.000	Carlos Ferrater Beth Figueras	Barcelona, Spain	**Montjuïc**
4.	**Victoria Park**	2002	Sydney, Australia	Public Park	240.000	HASSELL	Sydney, Australia	**Wetlands**
5.	**Millennium Coastal Park**	2002	Llanelli, UK	Coastal Park	10 km²	Macgregor. Smith LA	Bath, UK	**Wave**
6.	**Oriental Bay. Three Beaches**	2004	Wellington NZ	Waterfront	approx. 13.400	Isthmus	Wellington, NZ	**Headland**
7.	**Manly Corso**	2005	Manly, Australia	Allee	7.800	TCL	Sydney, Australia	**Waves**
8.	**BUGA 05 Playground**	2005	Munich, Germany	Sunken Playground	approx. 2.960	Rainer Schmidt LA	Munich, Germany	**Hilly landscape**
9.	**LaLaport Toyosu**	2006	Tokyo, Japan	Urban Dock	67.499	Earthscape	Tokyo, Japan	**Ocean scape**
10.	**HtO**	2007	Toronto, Canada	Waterfront Park	22.300	CCxA & J. Rosenberg	Montreal, Canada	**Sand dunes**
11.	**Tianjin Qiaoyuan Park**	2008	Tianjin, China	Urban Park	220.000	Turenscape	Beijing, China.	**Wetlands, Marshes**
12.	**Charlotte Amm-undsens plads**	2008	Copenhagen Denmark	Playground	1.700	1:1 Landskab	Copenhagen, Denmark	**Cliff, Rocky landscape**
13.	**Roombeek the Brook**	2008	Enschede, NL	Urban Street	13.600	Buro Sant en Co	The Hague, NL	**Ripples, Ice cracking**
14.	**Tianjin Bridged Gardens**	2008	Tianjin, China	Sunken Garden	160	Turenscape	Beijing, China	**Marshlands**
15.	**Spiral Garden**	2009	Budapest, Hungary	Corporate Garden	2.100	Újirány	Budapest, Hungary	**Mountain, Lakeside**
16.	**Teardrop Park**	2009	New York, NY, USA	Public Park	approx. 7.300	Michael Van Valkenburgh	New York, NY, USA	**Hudson River valley, Stratum**

17.	**Benidorm West Beach promenade**	2009	Benidorm, Spain	Beach Promenade	18.000	OAB	Barcelona, Spain	**Waves and tides, Cliff**
18.	**The Green**	2010	Basel, Switzerland	Square	6.000	VOGT	Zurich, Switzerland	**Karst landscape**
19.	**The City Dune - SEB Bank**	2010	Copenhagen Denmark	Public Urban Space	7.300	SLA	Copenhagen, Denmark	**Sand and snow dunes**
20.	**Railway Cover Theresienhöhe**	2010	Munich, Germany	Urban Park	16.800	TOPOTEK 1	Berlin, Germany	**Alps & North Sea Landscapes**
21.	**Oatley Reserve Playground**	2010	Paddington Australia	Playground	approx. 470	JMD design	Redfern, Australia	**Geology, Sandstone**
22.	**Esplanade Paul Grimault**	2011	Annecy, France	Plaza	3.400	Agence APS	Valence, France	**Parmelan Lapiaz, Mountain**
23.	**Grønnegade Square**	2012	Odense, Denmark	Plaza	6.000	MASU Planning	Copenhagen, Denmark	**Waves**
24.	**Europaallee 21**	2013	Zürich, Switzerland	Courtyard	approx. 900	Studio Vulkan LA	Zürich, Switzerland	**Rocky landscape**
25.	**BSU Hamburg**	2013	Hamburg, Germany	Roof Gardens	23.000	Landschafts architektur Plus (L+)	Hamburg, Germany	**Northern Germany landscapes**
26.	**Central Park Hunnan Axis**	2013	Shenyang, China	Urban Park	1.3 km²	Atelier Loos van Vliet	Haarlem, NL	**Water source, Canals, Waterfall**
27.	**European Central Bank Premises**	2013	Frankfurt, Germany	Corporate | Public Park	120.000	VOGT	Berlin, Germany	**Floodplain**
28.	**Market Lane**	2013	London, Ontario Canada	Passage-way	approx. 500	Hapa Collaborative	Vancouver, Canada	**Thames valley, Carolinian Forest**
29.	**Etele Square**	2013	Budapest, Hungary	Square	7.682	Újirány	Budapest, Hungary	**Meadow**
30.	**Reynoldsparken**	2013	Porsgrunn, Norway	Waterfront Park	approx. 3000	Grindaker	Oslo, Norway	**Rolling plains**
31.	**Polder Garden & Info Centre Jinzhou**	2013	Jinzhou, China	Garden	3000	Bureau B+B	Amsterdam, NL	**Medow islands**
32.	**Novo Nordisk Nature Park**	2014	Bagsvaerd, Denmark	Park	31.000	SLA	Copenhagen, Denmark	**Scandinavian nature**
33.	**Fujito Park**	2014	Wakayama Japan	Park	114.740	stgk Inc.	Yokohama, Japan	**Nature of Wakayama**
34.	**Metamorphous**	2014	Vancouver Canada	Waterfront	approx. 600	Paul Sangha	Vancouver, Canada	**Sandstone formations**
35.	**Rooftop Park Bulwark Sint Jan**	2015	's-Hertogenbosch, NL	Rooftop Pucket Park	700	OSLO	Berlicum, NL	**Ice floes**
36.	**NINA Roof Garden**	2015	Trondheim Norway	Rooftop Garden	1000	Agraff Arkitektur	Trondheim, Norway	**Glacier, Cracking**
37.	**Barangaroo Reserve**	2015	Sydney, Australia	Public Park Waterfront	approx. 58.000	PWP	Berkeley, CA, USA	**Tessellated pavement**

38.	**Berta Kröger Plaza**	2015	Hamburg, Germany	Plaza	17.000	relais Landschafts architekten	Berlin, Germany	**Waves**
39.	**Fangshan Tangshan Geopark Museum**	2015	Tangshan, China	Museum plaza | Parkland	150.000	HASSELL	Shanghai, China	**Geological activity, Contour lines**
40.	**Valley of Cloud, AVIC Park**	2016	Nanchang, China	Experiment -al Playground	24.500	YIYU Design	Shanghai, China	**A valley filled with clouds**
41.	**Strandgatepar ken**	2016	Hamar, Norway	Playscape	approx. 2.600	Grindaker	Oslo, Norway	**Hilly landscape**
42.	**Landsea Group - Peak in Cloud**	2017	Shanghai, China	Urban Park	8.352	Belt Collins International	Hong Kong, China	**River stream**
43.	**L'enfance du Pli**	2017	Geneva, Switzerland	Park - Playground - Sculpture	2.600	Gilles Brusset Paysarchite ctures	Paris, France	**Jura massif**
44.	**Grand Mall Park**	2017	Yokohama Japan	Urban Park	23.102	stgk Inc.	Yokohama , Japan	**Wave, Ripples, Yokohama rivers**
45.	**Huizhou Sinic City**	2017	Guangzhou China	Corporate Garden	14.865	Metrostudio	Shenzehn, China	**Sea, Island**
46.	**Te Hauāuru Reserve**	2017	Auckland, New Zealand	Town Park	11.000	Isthmus	Wellington , New Zealand	**Waitematā inlets and streams, The kauri forests**
47.	**Foot of Lonsdale Plaza**	2018	North Vancouver, Canada	Plaza, Waterfront	approx. 2.500	Hapa Collaborati ve	Vancouver , Canada	**Shallow waves, Waves**
48.	**Rule Water Street**	2018	Nanchang Kan, China	Plaza	8.000	YIYU Design	Shanghai, China	**Gan River, Waves, Rocky shore**
49.	**Kalvebod Fælled Skole**	2018	Copenhagen Denmark	Playscape | School yard	11.560	BOGL	Copenhagen , Denmark	**Seabed**
50.	**Strindfjordveg en park**	2018	Trondheim Norway	Park	6.000	agraff arkitektur	Trondheim , Norway	**Islands, Sea environment**
51.	**Smith Plaza**	2018	Albuquerq ue, NM, USA	Campus Plaza	approx. 13.355	Surfacedesi gn	San-Francisco CA, USA	**West Mesa**
52.	**Summer Island**	2019	Heilbronn, Germany	Landscape Park	approx. 35.000	LOMA	Kassel, Germany	**Sand dunes**
53.	**The Folds**	2019	Changzhou China	Playground	20.000	Atelier Scale	LA, CA, USA	**Folding landform**
54.	**Karen Blixens Plads**	2019	Copenhagen Denmark	University | Urban Plaza	21.415	Cobe	Copenhagen , Denmark	**Hills and valleys**
55.	**Ketcheson Neighbourhood Park**	2019	Richmond, BC, Canada	Residential Park	approx. 6.475	PWL Partnership	Vancouver , Canada	**Riverine landscape, Fraiser delta**

56.	**Krämeracker School Ground**	2019	Uster, Switzerland	School Playground	11.200	Ganz LA	Zürich, Switzerland	**Uster, Marshes, Forest**
57.	**The Beach at Expedia Group**	2019	Seattle, WA, USA	Waterfront Park	approx. 161.875	Surfacedesign	San Fran, CA, USA	**Pacific coastal landscape**
58.	**Mellemrummet**	2020	Copenhagen Denmark	Residential Park	860	BOGL	Copenhagen, Denmark	**Skerries**
59.	**Åvik River Reed Playground**	2020	Vantaa, Finland	Playground	approx. 6.500	LOCI	Helsinki, Finland	**Riverine landscape**
60.	**Naturkraft**	2020	Ringkøbing, Denmark	Nature Arena | Landmark	approx. 20.235	SLA	Copenhagen, Denmark	**Heathland, Sand dune, Marsh, Forest**
61.	**Sint Wilbertsplein**	2021	Bakel, NL	Public square	approx. 970	Carve	Amsterdam, NL	**Peelrandbreuk, fault**
62.	**Skoleparken**	2021	Hedehusene Denmark	Residential SchoolPark	3.750	1:1 Landskab	Copenhagen, Denmark	**River delta**
63.	**Henning G. Kruses Plads**	2021	Esbjerg, Denmark	Plaza	1000	BIG	Copenhagen, Denmark	**Soft sea waves**
64.	**NIKE EHQ Campus**	2021	Hilversum, NL	Skateable Square	6.750	Bureau B+B	Amsterdam, NL	**Forest in the heather fields**

4.2.2. Analysis of 34 Contemporary Interpretations

A group of 34 contemporary design projects were chosen for further examination in the 2nd phase of the analytical study, as an attempt to detect more detailed tendencies of the style (Figure 52).
As the details of the entire analytical study are not included due to page limits, Appendix (C) provides examples of the analysis, showing the design process, the development of the design concept and design elements of four of the projects.

The following sheets provide a summary of the analytical study of the 34 projects. The discussion of each project starts with an introduction that helps understanding each case within its context and defines the design narrative. The analysis then focuses on the design in relation to the natural feature that was chosen as the source of inspiration, such as the language method used to interpret the natural feature and its tools, the resulted spatial structure and experience, the digital tools and technologies that mediated the perception of the natural feature, and the values that were promoted as a result of this choice of design approach.
In addition, to evaluate the performance of the design, the research seeks the professional and public opinion, when possible, relying on prizes awarded to the projects, which are given for the success of the project and its post-occupancy performance, and by seeking professional comments through different types of media. Furthermore, some projects were evaluated according to the Landscape Performance Series[8], which measures the effectiveness with which landscape solutions fulfill their intended purpose and contribute to sustainability, involving assessment of progress toward environmental, social and economic goals based on measurable outcomes.
A summary figure was developed for each project, highlighting key aspects of the design approach in relation to the natural feature.

[8] Landscape Performance Series is a product of the Landscape Architecture Foundation LAF, a charitable organization whose mission is to support the preservation, improvement, and enhancement of the environment. Among other sponsors of the LPS are ASLA,

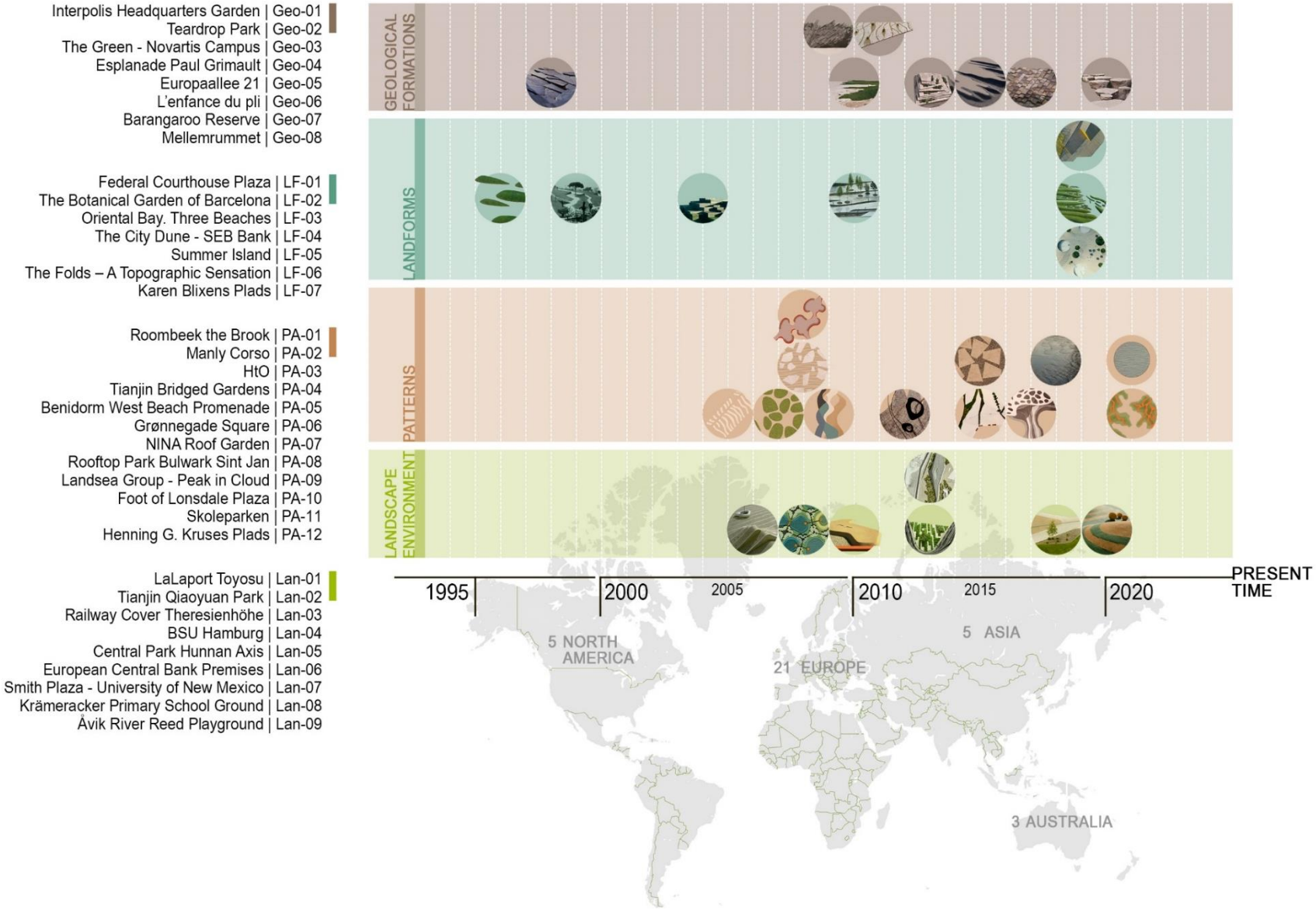


Figure 52: The 34 contemporary landscape design projects selected for analysis, Source: Author.

Geo-01

4.2.2.1.Interpolis Headquarters Garden

1998
Tilburg, Netherlands
Corporate - Public Garden
approx. 20.000 m²

Designer:
West 8
Rotterdam, Netherlands

Project Narrative - The garden forms a retired and calm space designed for relaxation. Although hedges and the fence that encircle the garden create a relative separation from the surroundings, the space is still freely accessible by the public and the employees of the Interpolis headquarter. The garden design is compatible with the large scale of the headquarters. Relying on a design concept that spreads a loose pattern of "tectonic shifts" over vast areas of grass, and chooses large Douglas firs as a counterbalance for the tower building of the headquarters. The garden displays an elongated plateau of "slate" slabs (WEST 8, 2025).

Analytical Study

- **Design Interpretation -** The design is strongly influenced by natural geological features. The grass surface is laid out with a pattern of "tectonic shifts", which contribute along with some elongated water tables of varying length to shaping the spatial experience of the space. The pattern *abstracts* the shapes of faults that appear on the Earth's crust as a result of the movement of the plates, relying on the use of straight lines and sharp edges. These shifting orientation and non-parallel shapes in the garden create a strong, constantly changing sense of perspective in the garden.

Figure 53: Interpolis garden's geometric pattern compared to a natural fault line, Source: (Left- west8.com, Right- Alamy ID:2X59W0J) modified by author.

Natural Feature – *Tectonic shifts* are the movement of the plates that makes up Earth's crust.
This activity characterizes the present-day Earth. It is linked not only to tectonic deformation but also magmatic volcanic activity and all aspects of the rock cycle (Lenardic, 2018).

The design also takes inspiration from another natural feature. An elongated plateau of large, counter-shingled Norwegian slate slabs is laid out against the building, *imitating* a natural "slate landscape" and creating a bleak area as a counterweight to the heavyweight architecture. This imitation is complemented with a punctuating layer of a magnolia grove that spread across the surface, bringing out an esthetical contrast between the rigid feel of the massive slate and the soft feel of the magnolia blossoms.
Slate landscape is a known natural feature for the region, especially that it is known as a source of traditional roofing and flooring materials in the Netherlands. The interpretation of slate presents a merely decorative element that is aesthetically pleasing and with a reference to a known natural feature in the country.

Figure 54: Interpolis's plateau of slate slabs compared to a natural slate landscape, Source: (Left- west8.com, Right- Alamy ID: KK7T85) modified by author.

Natural Feature - *Slate* is a fine-grained, foliated, homogeneous metamorphic rock composed of clay or volcanic ash through low-grade regional metamorphism. Slates display a property called fissility, forming smooth, flat sheets of stone (Allaby, 2013).

- **Digital Tools –** In order perceive a pattern that spreads over thousands of kilometers, such as one resulted of tectonic shifts, mediating tools are needed. An example of which are geological maps, aerial photos and satellite images. Furthermore, understanding the process of pattern creation can be no less important as a way to develop a generating system that produces a similar pattern, since the design team is not creating a replica of a pattern but rather an abstraction of a general phenomenon. The imitation of a slate landscape can be achieved by relying on immediate visual perception, as well as viewing pictures of the natural feature.
- **Promoted Values -** The design interpretation relies on a material that is sourced in the same region of the project, which boosts the sustainable credits of the garden. It also promotes a cultural heritage value by conjuring up slate landscape which speaks to the collective memory of the users, not only by referring to a part of the nature of their country, but also by displaying a traditional material that is used in their architecture and present in their everyday-life.

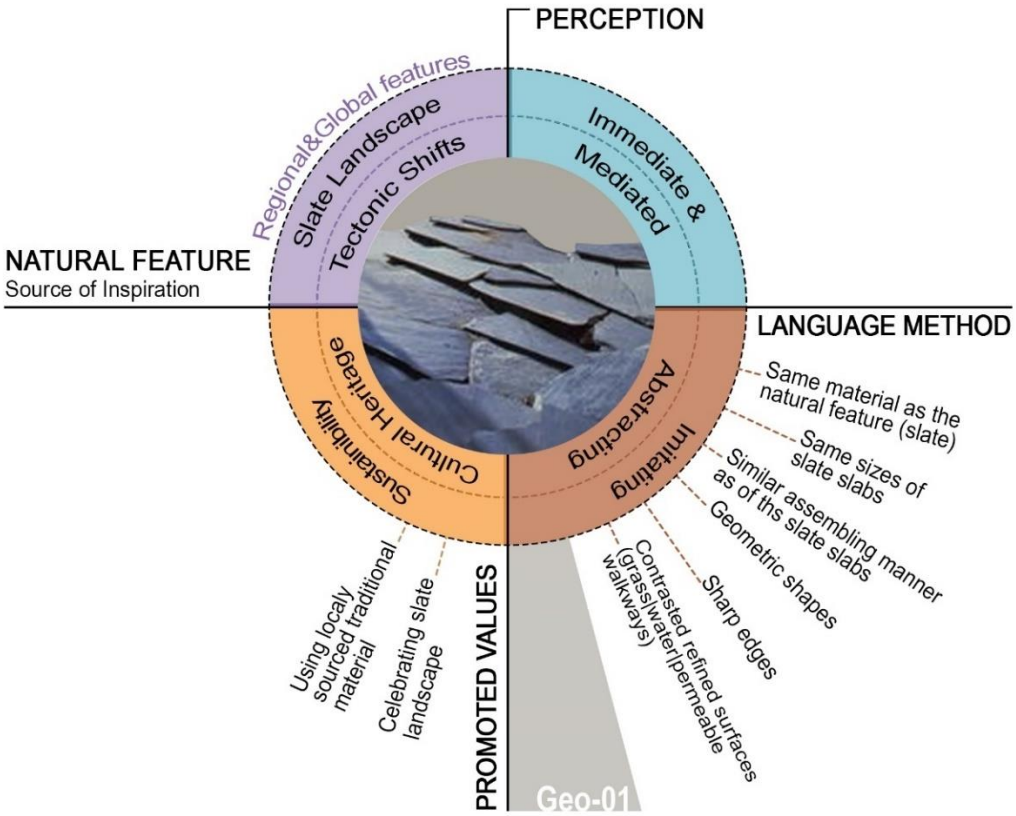


Figure 55: Summary of project Geo-01 analysis focusing on the interpretation of the natural feature, Source: Author.

Geo-02

4.2.2.2.Teardrop Park

2009
New York, NY, USA
Public Park
approx. 7.300 m²

Designer:
Michael Van Valkenburgh Associates
New York, NY, USA

Project Narrative - The park was designed to address an issue: the lack of experiencing natural environments by urban children (MVVA, 2009), since most of urban playgrounds have banished plants in favor of equipment. It reinvents the idea of nature play in the city.
The project takes inspiration from features found in the Hudson River Valley (LANDEZINE, 2009), local natural features, as the Hudson borders the city of New York and the site has direct views to the river.
It applies its design concept with the aim of contributing to the ongoing development of a family-friendly social identity for the neighborhood by creating a landscape setting that appealed not only to children but also to multiple age groups represented in the neighborhood (ASLA, 2009).

Analytical Study

- **Design Interpretation -** The interpretation focused on the geological features of the valley and was applied extensively throughout the entire area of the site, displaying a distinctive dynamic spatial structure. Those features were communicated through a language of *imitation* and *borrowed scenery*, and were utilized not only to have this reference to nature but also to play a functional role as design elements, like the interactive water-play rocks that imitate the "natural rock compositions" found along the Hudson River. Other distinctive interpretations of New York geology are the Ice-Water Wall that is constructed with stacked Alcove bluestones to resemble a "natural stratum" and a planned outward view to the actual Hudson River from the Reading Circle area that incorporates the river itself to become an element of the park design.

Figure 56: The waterplay rocks compared to rocks on the bank of the Hudson River, Source (Left- MVVA, Right- shutterstock ID: 294723539) modified by author.

Natural Feature - The *Hudson River Valley* runs north to south down the eastern edge of NYS, cutting through rock types that include Triassic sandstones, red-beds and ancient Precambrian gneiss. In the Hudson Highlands, the river enters a fjord cut during previous ice ages. In the Tappan Zee region, high cliffs are produced by an erosion-resistant diabase (Van Diver, 1985).

- **Digital Tools –** Considering the close location of the site to the Hudson River, and the type of interpretation that relies on reproducing rock compositions with similar visual appearance and materials, leads to the assumption that the design team is familiar with the natural environment of the valley and had the chance to explore and see directly some of those natural compositions by the river.

- **Promoted Values** - In addition to reinventing nature for urban children, the design's interpretation of local geological features within a program of functions that answers the needs of the local community contributes to creating a strong family-friendly social identity.
  The project's "green" credentials are also of high numbers, as a result of considering the sustainable aspect as the organizing principle of the design, influencing everything from material selection to quarrying and construction practices, relying on constraints of water, sun, and wind in positioning the design program, the kind of plants and ecological communities that could be created, incorporating fully organic soil and maintenance regimes and a recycled grey water and stormwater runoff irrigation system.

Professional and Public Opinion – The park was awarded the 2009 ASLA Design Honor Award[9].The prestige of the ASLA awards program relies in large part on the high-caliber juries that view submissions. The professional award jury classified the park as a successful project that responded to the needs of the community; it described the park as "a true urban oasis. The landscape architect has made a bold gesture on an almost impossible site. It offers intimacy, which is tough for a public park, and takes your mind away from the city. It works for all ages."
In 2010, the design of the park was also awarded the National Park Service (NPS) "Designing the Park" Honor Award[10].

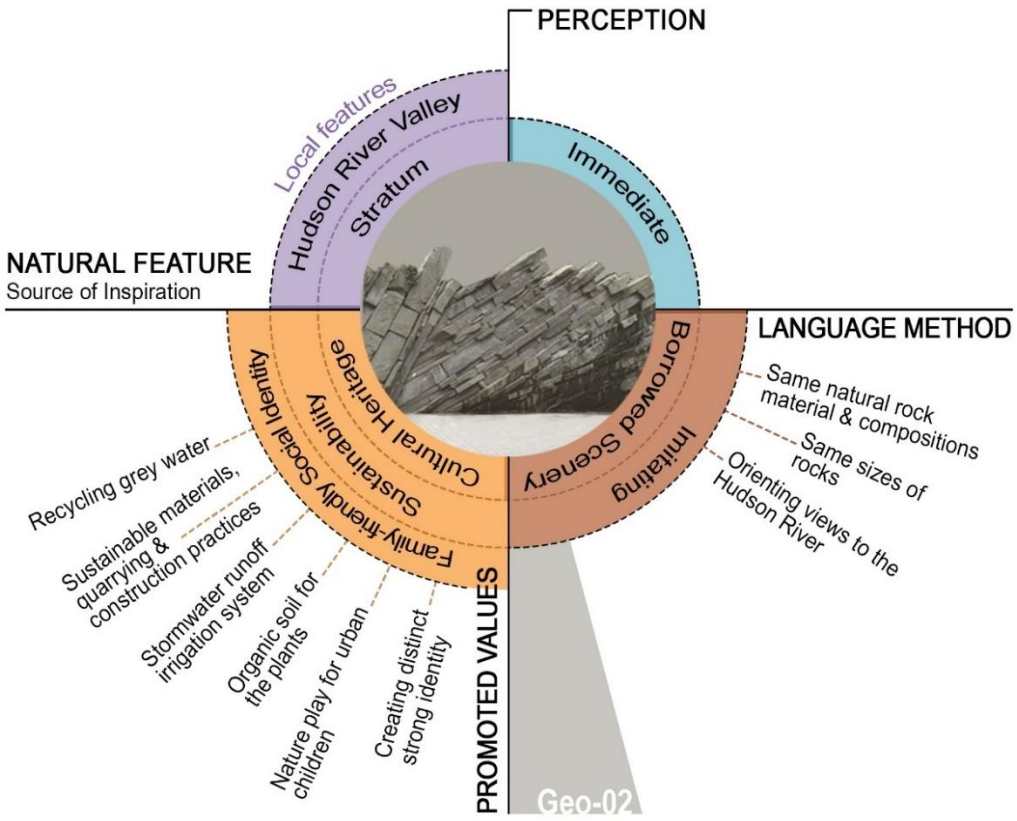


Figure 57: Summary of project Geo-02 analysis focusing on the interpretation of the natural feature, Source: Author.

[9] ASLA Design Honor Award is part of the American Society of Landscape Architects professional awards program that honors every year the best in landscape architecture from around the globe.
[10] The U.S National Park Service is an organization that has worked since 1916 to preserve unimpaired the natural and cultural resources and values of the National Park System for this and future generations.

Geo-03

4.2.2.3.The Green - Novartis Campus

2010
Basel, Switzerland
Square
6.000 m²

Designer:
VOGT
Zurich, Switzerland

Project Narrative - The Green is a hybrid of square and park that was intended as an entree for the surrounding buildings and meeting place for persons from the entire campus.
The site of the project presents certain determinants like the surrounding representative buildings and a soil of 70 cm with a subterranean auditorium, which imposed some restraints regarding the use of large trees or designing an undulating terrain, and thus the design was planned to keep clear views. The design is inspired by "karst landscape", specifically "Silberen" (VOGT, 2010).

Analytical Study

- **Design Interpretation -** The context and the determinants of the site reminded the design team of a specific natural landscape: "karst", where limestone has been eroded by glaciers, water and extreme weather conditions, resulting in barren landscapes that are flat and yet perforated by furrows and holes to be formed. A distinctive character of these landscapes that is very compatible with the site's conditions is that large trees can hardly be spotted in karst. Karst consists mainly of grass and jagged stones, along with small trees and shrubs.
  The design refers to the karst landscape of Silberen, a mountain of the Schwyzer Alps and the most famous karst landscape in Switzerland. It *emulates* a natural feature that is unique and well known to the region and to the residents of Basel.
  Including some subtle discrepancies like the garden plants or the high ash trees surrounding the space, which cannot be found in karst, makes the design interpretation to be a result of geological emulation, indicating an influence of karst landscape by communicating its elements through a two-dimensional carpet with a green lawn in its center and light-colored limestone-flagstones on its brinks, covering the entire surface of the space, and utilizing it in dividing the space and defining different zones and movements within it.

Figure 58: The representation of karst in the project compared to karst on the summit plateau of Silberen, Source: (Left- VOGT, Right- flickr ©Uwe Häntsch) modified by author.

Natural Feature - *Karst* is a topography formed by the dissolution of soluble rocks, including limestone, dolomite and gypsum. It is characterized by skinholes, caves and drainage systems. In the case of eroded limestone, flat barren landscapes are formed, perforated by furrows and holes (Jackson, 1997).

- **Digital Tools –** As the design interprets the pattern of the interwoven rock and grass of karst in a more refined way, the perception and recognition of the attributes of the pattern requires a wider scope of view than what the naked human eye can achieve, and thus, mediation through digital tools can be part of the design process, such as, aerial photos and satellite images.

- **Promoted Values -** The interpretation of karst landscape is very compatible with the context of the site and responds well to the imposed limitations of the site and its surroundings.
  It creates a representative, free space with a unified image and a reference to a unique phenomenon to the region that speaks to the collective memory of the users and promotes a strong identity of the space.

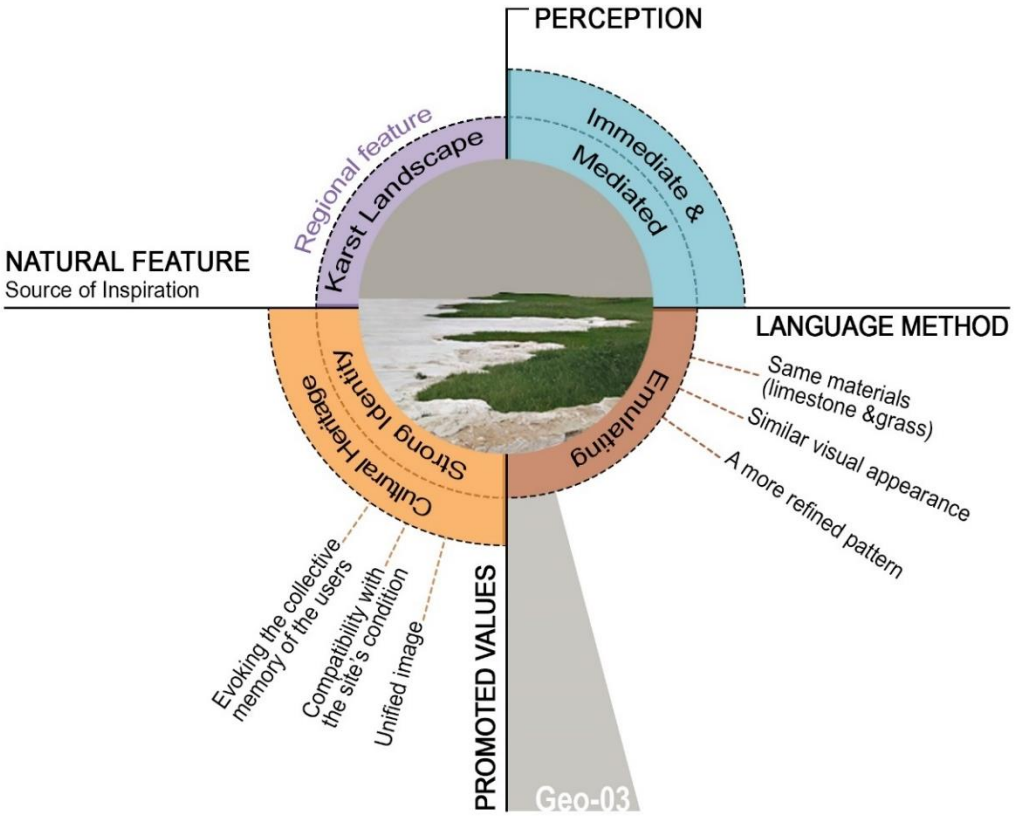
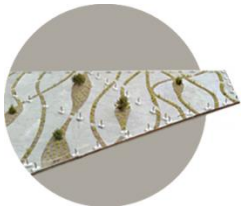


Figure 59: Summary of project Geo-03 analysis focusing on the interpretation of the natural feature, Source: Author.



Geo-04

4.2.2.4.Esplanade Paul Grimault

2011
Annecy, France
Plaza
3.400 m²

Designer:
Agence APS
Valence, France

Project Narrative - The concrete slab of the esplanade provided a clean slate for the design team to recreate the story of this urban plaza. The project adopts a contextual and sensitive design approach in an attempt to refer to places and experiences known by mountaineers and Annecy dwellers. The design team refers specifically to the "Parmelan lapiaz" (Agence APS, 2011).

Analytical Study

- **Design Interpretation -** The project interprets natural features found in the local mountain environment by several means. The triangle north of the esplanade with its location on a flat terrain is designed with a vocabulary that refers to a "limestone plateau", specifically the

"Parmelan lapiaz", a local natural feature, as the Tete du Parmelan is one of the summits of the Bornes massif and one that is visible from Annecy.

The project uses *abstraction* to interpret the lapiaz of Parmelan; the etched fluted limestone surface was expressed as a flat concrete surface patterned with refined geometric curves of vegetation. An interpretation that is two-dimensional and decorative.

Another reference to the local mountain environment is achieved by the principle of *borrowing scenery*, as the design assigns the large central rectangle on the upper slab as an urban terrace with open views. The perched position of this terrace visually opens to the horizons, on the Semonz mountain and on the Bornes massif, *alluding* to the ambience and views that one can detect at high altitudes.

The sloped area that links the high and low slabs is designed as a garden of roses, which is not without a reminder of the "slop" characteristic of the mountain relief.

Figure 60: The concrete and vegetation at the plaza abstracting the grooves of lapiaz compared to the natural appearance of lapiaz, Source: (Left- Agence APS, Right- Jean Philippe Delobelle) modified by author.

Natural Feature - *Lapiaz* is a weathered limestone surface consisting of etched, fluted, and pitted rock pinnacles separated by deep grooves. This rugged surface is formed by the solution of rock along joints and areas of greater solubility by water containing carbonic and humic acids (Britannica, 2008).

- **Digital Tools** – The type of interpretation is very subtle and sensitive, which requires a true understanding of the spatial experience of the mountain environment and having the opportunity for an immediate perception of the natural feature.
  In addition, the abstraction of the lapiaz pattern can be facilitated by studying the pattern from satellite images and aerial photos.
- **Promoted Values -** The interpretation of the mountain environment with references to geological features that are familiar to dwellers of cities in mountainous regions, gives the project an evocative power and allows the users to conjure up memories of their experiences in the mountains. This design approach managed to bring the esplanade into a contextual harmony with its surrounding environment.

Professional and Public Opinion – In 2014, the plaza was awarded the bronze prize of "Les Victoires du Paysage"[11], for the category: Urban Public Space, recognizing the success of the project in achieving a distinctive identity of the space resulted from the contextual and sensitive design approach adopted by the design team.

[11] Les Victoires du Paysage is a competition held under the patronage of the French Ministry of Ecology, initiated in 2008 by Val'hor (a recognized national interprofessional organization for the horticultural and landscape sectors). Its mission is to promote contemporary landscaping and raise awareness among elected officials, business leaders and individuals about the importance of plants and landscaping within the city.

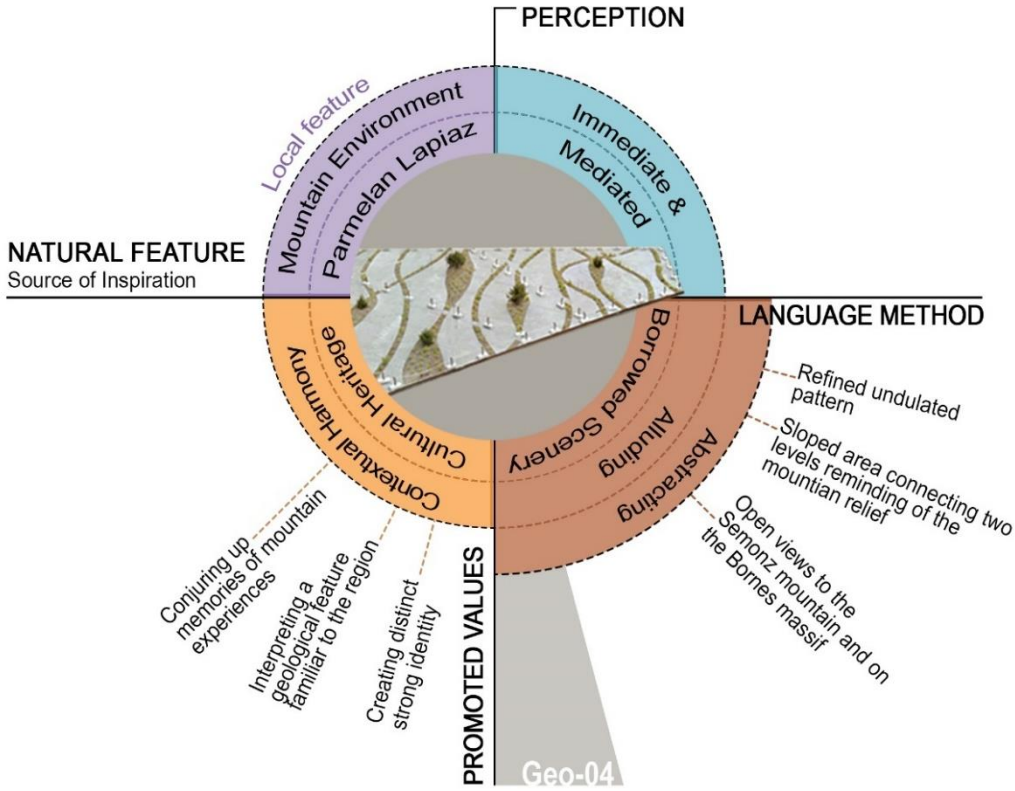


Figure 61: Summary of project Geo-04 analysis focusing on the interpretation of the natural feature, Source: Author.

Geo-05

4.2.2.5.Europaallee 21

2013
Zürich, Switzerland
Courtyard
approx. 900 m²

Designer:
Studio Vulkan Landschaftsarchitektur
Zürich, Switzerland & other branch

Project Narrative - All of a sudden: Silence (Studio Vulkan, 2013). The public courtyard is an intimate space that lies within a compact block, and blends into the fabric of its surrounding boulevards with sweeping archway entrances, connecting two dominant urban spaces in the city. The courtyard, a cube of approximately 30*30*30 meters, was created through the convalescence of various architectural facades that stand in stark contrast to one another in terms of material and topographical design. The design conjures up a "rocky landscape" (Studio Vulkan, 2013).

Analytical Study

- **Design Interpretation -** The design uses cracked shell limestone slabs, cut to size for the floor, with built-in water features to create a spatially divided moss-covered rocky relief in miniature form, conjuring up a "rocky landscape" that manifests an interplay of water and stone. An *emulation* of a natural feature that can be found in the different geographical regions of Switzerland where limestone, water courses and lakes are characteristics of the landscape. However, the design Studio does not attribute its interpretation to a specific local or regional rocky landscape.

This clear distinction from the surroundings and the minimalistic design approach with high attention to details allow the courtyard to serve as an escape from the city and create a tranquil space amidst the urban hustle. The dominance of light limestone that covers up the entire area also brings strong calmness to the space, considering the contrasted facades of the courtyard. The interpretation reduces the natural feature into design elements of stone, water, fern and a slow-growing moss carpet. As the design concept is applied extensively on the entire area of the courtyard, and being utilized in dividing the space and to serve as sitting elements, the need for any other furnishing and design elements was avoided, and thus the sense of calmness and tranquility was strengthened.

Figure 62: The interplay of limestone slabs and the water features compared to a view of a cliff on Lake Lucerne in the Swiss Alps, Source: (Left- Daniela Valentini, Right- Alamy ID: 2CEDE57) modified by author.

Natural Feature - *Folded and Tabular Jura*, north of Switzerland, mainly consist of limestone, marl, clay rocks, anhydrite and gypsum. The Tabular Jura forms a cuesta landscape due to the erodibility of these rock types. The *Swiss Plateau* is characterized by distinctive rivers and lakes. The Northern *Swiss Alps* also consist of limestone- and marl-rich sediments (Reynard, 2020).

- **Digital Tools** – As the design interprets a general natural feature without relating it to a certain rocky landscape, inspiration may be drawn by research and reviewing photos of this type of landscapes. It can also be related to the background of the design team members and their immediate experiences, as the design studio is located in Zürich, Switzerland, the same as the project site, where the rocky landscapes are a familiar environment.
- **Promoted Values -** The interpretation of a natural rocky landscape within the urban environment provided a unique experience for the users and presented peacefulness uncommon in urban public spaces. The clear distinction between this space and its surroundings achieved by emulating a miniature landscape that indulges the senses of the users with its surface materials, glints in the water or the slightly musty smell of moss and fern, promotes a strong spatial identity and an efficient public space which can only boost the performance of the public open spaces network in the city.

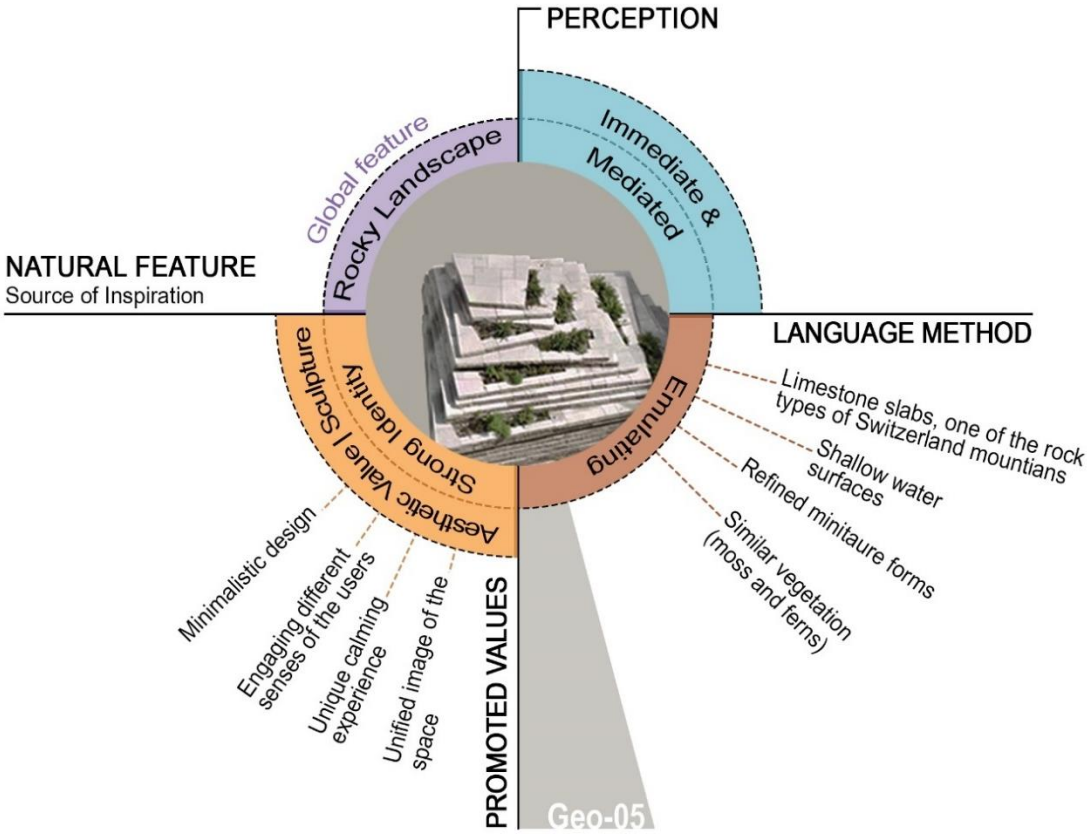


Figure 63: Summary of project Geo-05 analysis focusing on the interpretation of the natural feature, Source: Author.

Geo-06

4.2.2.6.Barangaroo Reserve

2015
Sydney, Australia
Public Park – Waterfront
approx. 58.000 m² (measured with google earth)

Designer:
PWP
Berkeley, California, U.S

Project Narrative - The new harbor park is part of a waterfront renewal project that was intended to provide new contemporary functions and restore the visual geography of Sydney harbor, and it also contributes to restoring the relationship between the natural archipelago of islands in Sydney harbor. The park project itself transforms a concrete container port into a naturalistic park with over 75.000 plantings native to the Sydney region (PWP, 2015).

Analytical Study

- **Design Interpretation -** The design created a foreshore of 10.000 sandstone blocks excavated directly from the site, *imitating* natural "tessellated pavement", a feature that can be found in Sydney's exposed sandstone escarpments, as sandstone forms the bedrock of much of the region of Sydney.
  The resulting configuration, *imitating* the geological formation in a stylized way, was applied intensively along the shoreline lining the tidal slope to the water, providing people with opportunities to engage in a great variety of conditions, highlighting this interpretation as a

main feature in the park. The design allows the transition between the higher level of land and the water level not only to look visually appealing, but also to be utilized by people.

Figure 64: The new harbor foreshore compared to natural tessellated pavements in Australia, Source: (Left- Barangaroo Delivery Authority, Right- robertharding 83-12018) modified by author.

Natural Feature - *Tessellated Pavement* is recognized in several types. The most common type consists of relatively flat rock surfaces, typically the tops of sandstone beds and other sedimentary rocks, which are subdivided into regular rectangles or blocks approaching rectangles by well-developed systematic orthogonal joint systems (Branagan, 1983).

- **Digital Tools** – The design of Barangaroo Reserve aims to restore the historic original headland form. The team relied on different aiding tools to develop a clear perception of the original headland form. Inspiration was provided by historical maps, early paintings and images combined with geomorphologic studies.
  The design team relied on GPS technology and a customized software modeling program in order to create the aspired headland form, setting a new global benchmark for naturalistic construction.

- **Promoted Values -** The interpretation contributes to restoring the visual geography of Sydney Harbor, and provides cultural references, with the sandstone material referring to the topography and the building material of early Sydney. In addition, the project gains ecological credentials with its planting being native to the Sydney region, the sandstone blocks being excavated from the site, and the resulted massive excavation void being utilized to accommodate as a cultural center.
  The project also promotes an active-social identity through the offered variety of activities and opportunities, such as foreshore walks, picnics, nature walks, bicycle pathways, and concerts and festivals, with the sandstone blocks contributing in big parts to this aspect by providing easy access to the water and facilitating variant waterside activities.

Professional and Public Opinion – The project received global recognition for being a carbon-neutral, water-positive and committed to creating zero waste (ASLA, 2019). It turned what was a degraded industrial site into an active civic space.
The park was awarded the 2019 ASLA Design Honor Award. The jury described the project as “a stunning revival of the historic headland that rebuilds a long-lost connection to the pre-colonial past while creating an active, naturalistic, environmentally sensitive civic space, serving both people and animals, on the land and in the water”.
The jury recognized the project for its use of advanced technologies to achieve the complicated design, utilizing special software, GPS, and barcoding each block cut from the ancient rock to track it using a smartphone application. It considered the project to have set a new global benchmark for naturalistic construction.

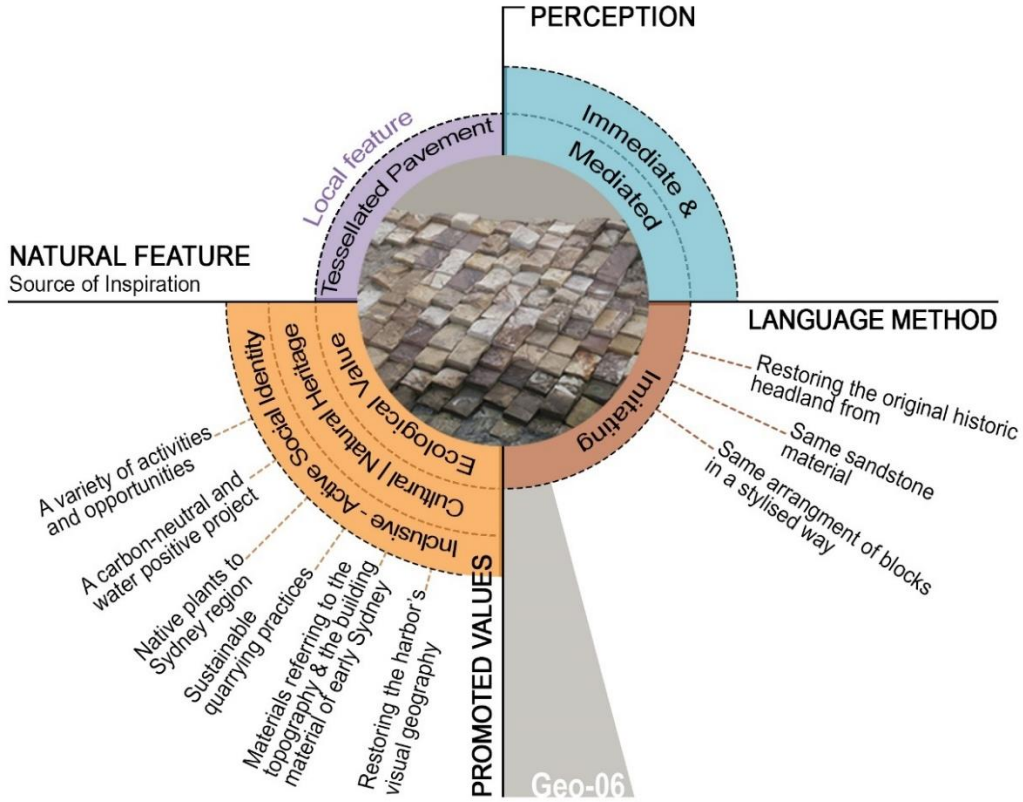


Figure 65: Summary of project Geo-06 analysis focusing on the interpretation of the natural feature, Source: Author.

Geo-07

4.2.2.7.L'enfance du Pli (see Appendix C for more details)

2017
Geneva, Switzerland
Park - Playground - Sculpture
2.600 m²

Designer:
Gilles Brusset – Paysarchitectures
Paris, France

Project Narrative - L'enfance du Pli or the Fold's Childhood is a sculpture-landscape that creates a nature-inspired landscape with an interesting contrast to the nearby orthogonal formal systems of the Meyrin Park and the adjacent flat facades of the École des Boudines. The design takes inspiration from the undulating landscapes of the "Jura massif" (Paysarchitectures, 2020).
It is a response to the tabula rasa, to the deliberate ignorance of the pre-existing landscape. Within the modern "radical" city, the artistic project inscribes a set of differentiated forms, extraordinary in the context of the orthonormal city (LANDEZINE, 11.2020).

Analytical Study

- **Design Interpretation -** The dynamic undulations of this sculpted landscape are an expression of the forces exerted on the Earth's mantle. The designed sculpture is an interpretation of the force that spawned the folded and undulating landscapes of Jura massif.
  The *emulation* of the folded Jura resulted in curves and volumes, intensively applied all over the site, combined with grass-covered areas that remind the viewer of the Jura pastures, creating a simple and clear but yet distinctive spatial structure.

The design offers the children an engaging playground without the need for any traditional equipment or urban furniture. They are provided with a unique physical experience while they move up and down the slopes, hills, and valleys.

The simple design tools, such as relying on only two materials with dark-grey and green colors, and the straight forward curves contrasted with the flat grass surface, contribute to creating a unique visual image of the space.

Figure 66: The spatial structure of the park compared to the ridges and valleys of the Jura Massif, Source: (Left: Pierre-Yves Brunaud, Right: C Pelant) modified by author.

Natural Feature – The *Jura* is a part of the Alpine foreland. The mountain-building process took place in two thrust phases: the first one formed the outer, French chain of ridges, and the second thrust formed the adjacent, higher inner ranges (Becker, 2000). Pastures on the high plateaus are more characteristic of the Jura than are the cultivated fields in the basins and valleys.

- **Digital Tools** – Digital tools and mediators were needed to develop a clear perception of the natural feature, such as geological maps and aerial photos. The design team also relied on tools and software to mimic the forces that created the geological forms by developing a 2-dimensional illustration of the shapes of the Jura landscape and a 3-dimensional sculpture and integrate them to the topography of the existing site.
- **Promoted Values -** The project promotes an artistic-aesthetic value, being a sculpture-play-scape, which was designed as an inscription of one landscape in another brought out with simple solutions and unique forms to present an engaging urban space.

  The interpretation promotes inclusivity and multifunctionality; there is a layered complexity embedded in the simple appearance of the design that responds to various uses.

  Through the extraordinary morphology and the play of shapes and levels, the design not only produces a unique visual language and celebrates a regional natural feature, but also allows a physical experience of a variety of situations, making the space interesting for various age groups and for children of different ages.

Professional and Public Opinion – The project received the LILA Landezine International Landscape Award[12] in 2020. The jury described the project as a sculpture-play-scape, and recognized it for its layered complexity that lies within a simple design, allowing the space to be inclusive and cater for various uses. It praised the unique and strong visual language and its compatibility with the surrounding urban context.

[12] LILA, Landezine International Landscape Award was established in 2026 by Landezine, an internationally renowned landscape architecture platform, with the aim to recognize the most interesting and progressive practices from the field of landscape architecture.

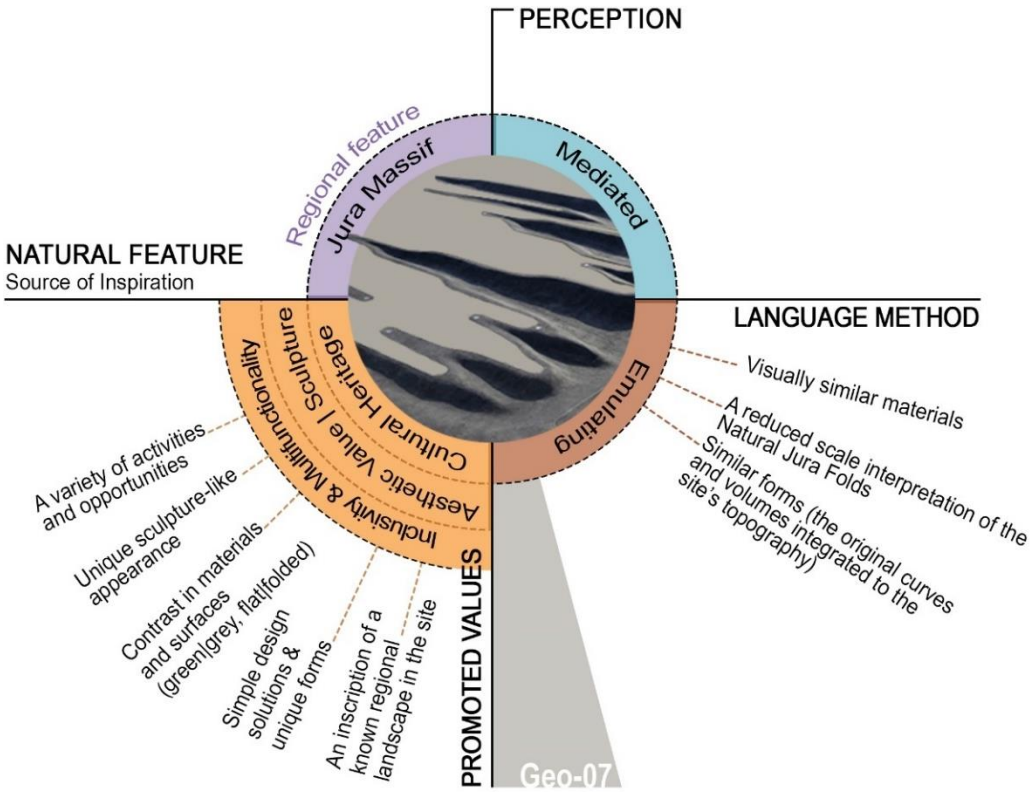


Figure 67: Summary of project Geo-06 analysis focusing on the interpretation of the natural feature, Source: Author.

Geo-08

4.2.2.8.Mellemrummet

2020
Copenhagen, Denmark
Residential Park
860 m²

Designer:
BOGL
Copenhagen, Denmark

Project Narrative - Mellemrummet provides an opportunity to experience nature in Ørestad South, which is a newly developed area known for upscale residential developments. Located on a bare brownfield, the site led the designers to go back to the history of the area, seeking context. Until 1943, the pasture at Kalvebod Fælled was not a pasture, but a seabed in the waters between Amager and Sjælland, characterized by small, underwater skerries (BOGL, 2020).

Analytical Study

- **Design Interpretation –** The source of inspiration is the history and geology of the site itself, both figuratively and literally. A large concrete surface creates a "coastline" towards the green park center, where smaller concrete elements rise as "skerries" in the landscape.
  The interpretation *emulates* skerries using casts of concrete and green grass. The concrete elements are cast directly on the ground, accentuating the geological narrative and providing urban furniture and play elements. They create an urban playground that encourages movement and exploration. Other interpretations of the history of the site are achieved by more subtle *allusions*. Small sprinkles, distributed between the concrete skerries, and with their mist wrapping the park, evoke the idea of the former sea. In addition to the way the rainwater fills the center of the park, which is also reminiscent of this past status of the site.

Figure 68: The composed concrete casts within the grassy area compared to skerries in Kattegat Bay, Source: (Left: Anne-Sophie Rosenvinge, Right: pixabay ID:1332273) modified by author.

Natural Feature - A *Skerry* is a small rocky island, or islet, usually too small for human habitation. Skerries are most commonly formed at the outlet of fjords, where submerged glacially formed valleys at right angles to the coast join with other cross valleys in a complex array. Most of the Scandinavian coastline is cut into thousands of little blocks of land, jagged bits of coastline, which are the skerries (Embleton, 1982).

- **Digital Tools –** The design takes inspiration from the past and the history of the site, which requires hard work and research in order to collect information and develop a clear perception of the situation. In this case, using mediating tools such as Google Earth Platform that could go back 80 years and display satellite and aerial images from that time period would be a useful method to help the first phases of the design process. In addition, bathymetric maps that illustrate the land that lies underwater can also provide aiding information.
- **Promoted Values -** The design brings a cultural value to the residential area with its focus on reinterpreting the local geological history of the site, giving the park the ability to speak to the collective memory of people and connecting the past and the present, while providing a green space that contributes to improving the quality of life for the residents of the area.

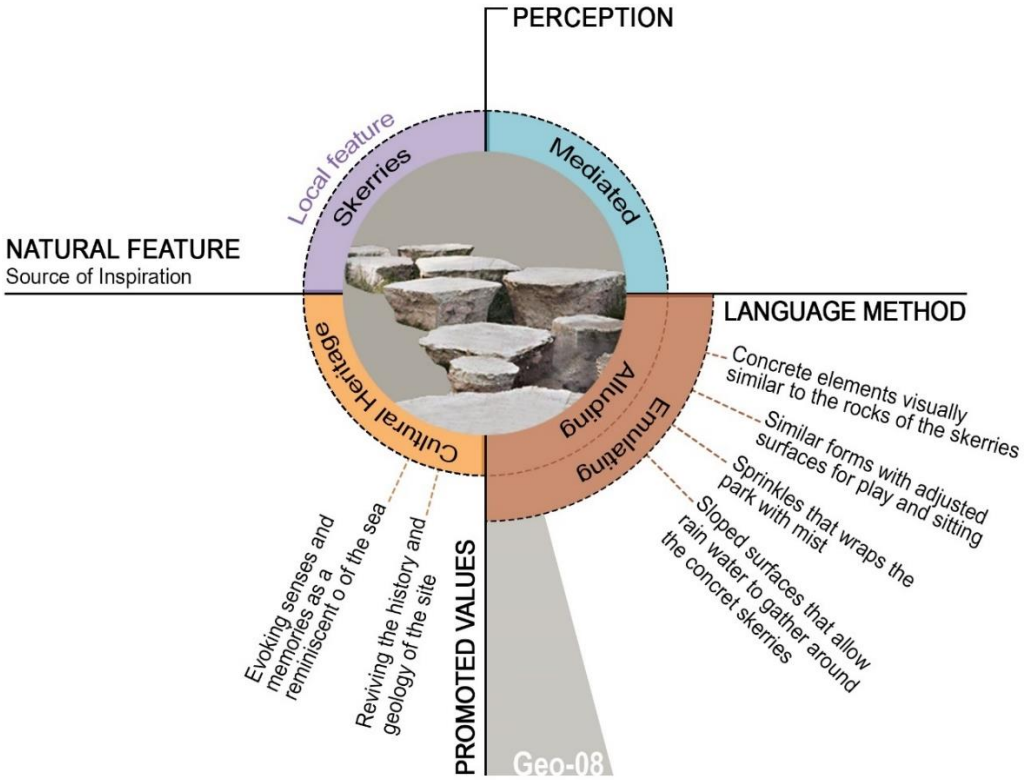


Figure 69: Summary of project Geo-06 analysis focusing on the interpretation of the natural feature, Source: Author.

4.2.2.9.Federal Courthouse Plaza

LF-01

1996
Minneapolis, MN, USA
Plaza
4.645 m²

Designer:
Martha Schwartz Partners
New York, NY, USA

Design Narrative - The plaza is designed in front of the federal courthouse to accommodate both civic and individual activities, with the aim of creating an urban plaza with its own unique identity. The components of the design symbolize both the natural landscape and man's manipulation of the landscape for his own purpose. The design suggests a field of "glacial drumlins" (MSP, 2023). The entire surface of the plaza, which is built on a garage roof, is designed with drop-shaped grass mounds juxtaposed at a 30-degree angle.

Analytical Study

- **Design Interpretation -** The design displays earth mounds and logs, elements related to the history of Minnesota, utilizing these design elements as the plaza's symbolic and sculptural elements. These elliptical mounds are soil planting-piles, intended to evoke a memory of a natural feature known to the state of Minnesota: the "glacial drumlin".
  Although the design's interpretation of drumlins is scaled down, however, the *imitation* of the forms and assembly of a group of drumlins communicates a straightforward reference to Minnesota's cultural landscape history. The simple display of explicit three-dimensional elliptical forms of drumlins leads to viewing the plaza as a stylized hill region, especially as the mounds spread on the entire area of the plaza. This dominance contributes not only to a strong image of the space, but it is utilized as well in organizing the spatial structure of the space and defining movement throughout the plaza.
  The mounds are of different heights, and some are planted with Jack pines, which are a small, stunted species common in Minnesota's boreal forest. With a linear paving pattern of white stripes of concrete creating a carpet for the display of mounds, the final image of the urban space is intriguing and rhythmic.

Figure 70: The artificial drumlins in the plaza compared to the form of a natural drumlin, Source: (Left- msp.world, Right- geocaching ID: GC82N03) modified by author.

Natural Feature - A *Drumlin* is an oval elongated hill formed as moving glaciers deposited tills of clay, sand, silt and gravel on outcroppings in their paths. Drumlins are found in board lowland regions with their long axes roughly parallel to the path of glacial flow, and can be in clusters of thousands called an "egg basket" (O'Sullivan et al., 2018).

- **Digital Tools –** As the source of inspiration, the glacial drumlin, is of a large scale, ranging from 250 to 1000 meters in length, the perception of such phenomenon requires a high vantage point and mediating tools, such as aerial photos, which allow the viewer to recognize the overall form of the drumlin, and the orientation and positioning of several ones together.

- **Promoted Values -** The project promotes a cultural value by communicating references to the history and nature of the state of Minnesota, which has an interesting geological history and contains some of the oldest rocks on earth. During the last ice ages, glaciers expanded and retreated across the region, forming many of the state's lakes and river's valleys and produced new landforms (Lusardi & Dengler, 2017), thus the interpretation of glacial drumlins, a natural feature known to the region, evokes the memory of geological and cultural forms and addresses the collective memory of the visitors leaving them with an emotional imprint.
  Furthermore, the simple and yet unique visual design vocabulary, which combines natural forms with man's artistic trends, contributes to creating a space with a strong, unified image.

Professional and Public Opinion – The design was recognized by several professional institutions. In 1996, the project was awarded with the GSA Design Award[13]. The project is evaluated by a group of leading private-sector experts according to the guiding principles of federal architecture. In 1999, the project received the ASLA Merit Award as one of the best landscape architecture projects of that year. In addition to receiving the NEA Federal Design Achievement Award[14] in 2000.
With each award having its own guidelines and evaluation system, the project was recognized for celebrating cultural heritage and the geological history of the state through a unique urban design.

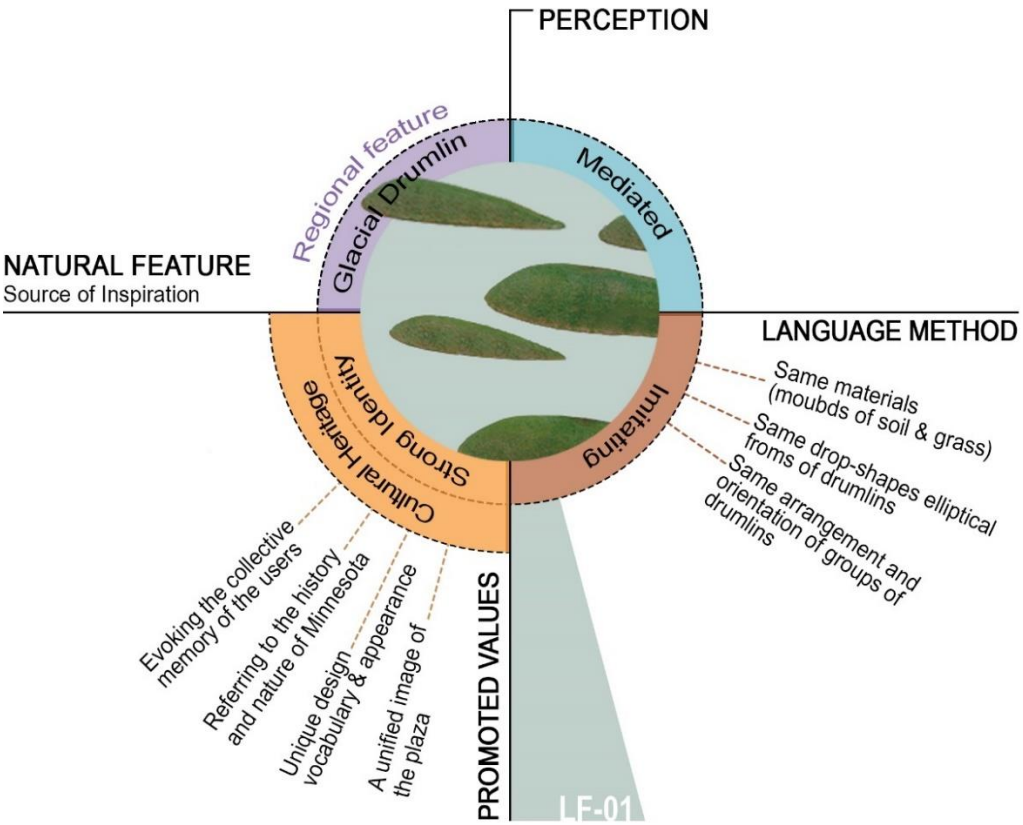


Figure 71: Summary of project LF-01 analysis focusing on the interpretation of the natural feature, Source: Author.

[13] GSA Design Awards are part of the Design Excellence Program of the U.S. General Services administration, which recognizes demonstrations of excellence in the federal built environment.
[14] The National Endowment for the Arts (NEA) is an independent federal agency that fosters and sustains an environment in which the arts benefit everyone in the United States.

4.2.2.10.Botanical Garden of Barcelona

LF-02

1999
Barcelona, Spain
Botanical Garden
140.000 m²

Designer:
OAB
Barcelona, Spain

Design Narrative - The botanical garden located on Montjuïc displays vegetation grouped according to geographic criteria, including the world's five Mediterranean regions, taking into consideration that the plants are combined according to ecological affinity as found in nature.
The design was planned with consideration to the natural topography of the mountain, creating a network of pathways adapted to the natural relief and avoiding large earth-moving operations (OAB, 2025). Achieving those two aspects was the result of the collaborative work of an interdisciplinary team comprising the fields of architecture, landscape architecture, horticulture and biology.

Analytical Study

- **Design Interpretation -** The design enables the mountain itself to generate the scope of the intervention, allowing the new landscape to reveal its form straight out of the original topography and the morphology of the mountain. The result of this approach is an interpretation of the "mountain terrain" itself by creating a refined version of its slopes, with a superimposing triangular-shaped grid applied all over the site and adapted to its topography. Generating the design concept from the mountain terrain itself is an interpretation of a natural feature that uses the language of *borrowed scenery* in a new sense by borrowing the spatial experience and dynamicity of the natural feature instead of only its visual presence.
  The triangular grid is very flexible in adjusting to the site, enweaving itself at the edges and growing or diminishing in area in accordance with the slope, and contributing with many functional aspects to the project, such as providing a hierarchical network of primary and secondary paths with different uses, or organizing the infrastructure, drainage and water supply required for the garden.

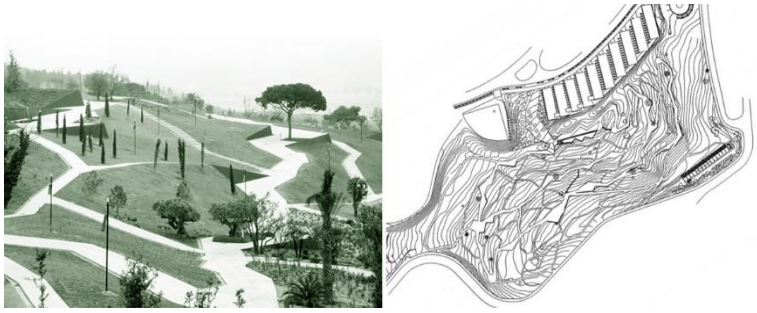


Figure 72: The zones and pathways created by the triangular grid and the adaptation to the contours of the mountain's terrain, Source: OAB, modified by author.

Natural Feature - A *Mountain* is a landform that rises prominently above its surroundings, generally exhibiting steep slopes, a relatively confined summit, and a considerable local relief. *Montjuïc* promontory, in Barcelona, is made up of silicic sandstones and marls, and characterized by a remarkable asymmetric morphology, with a steep sea cliff and gentle slopes towards the Collserola Range (Martinez et al., 2012).

- **Digital Tools –** The design process depended on the aid of several digital technologies and tools, as the design team used a software to visualise the grid, and isolate triangles to observe the planted specimens. To generate this grid, the design team depended on topographical maps, and satellite images that provided them with the accurate base for the triangular grid.
  In addition to visualizing the design elements in each part of the grid with the taxidermic data of the planted species.

- **Promoted Values** - The project, being a botanical garden, promotes ecological and educational values, and the design interpretation contributes to promoting these values with its geometric layout based on the existing site conditions and on botanical and ecosystem issues.
  In addition, the vegetation is planned according to the concept of morphological convergence, which increases the scientific value of the garden.

Professional and Public Opinion – The garden was awarded the first prize for the Innovative Contemporary Concept or Design of a Park or a Garden by the EGHN[15]. The jury praised the simple and coherent design, the high level of details, and how the sharp corners of the walkways and the luscious planting reinforce each other, in addition to its important educational role.

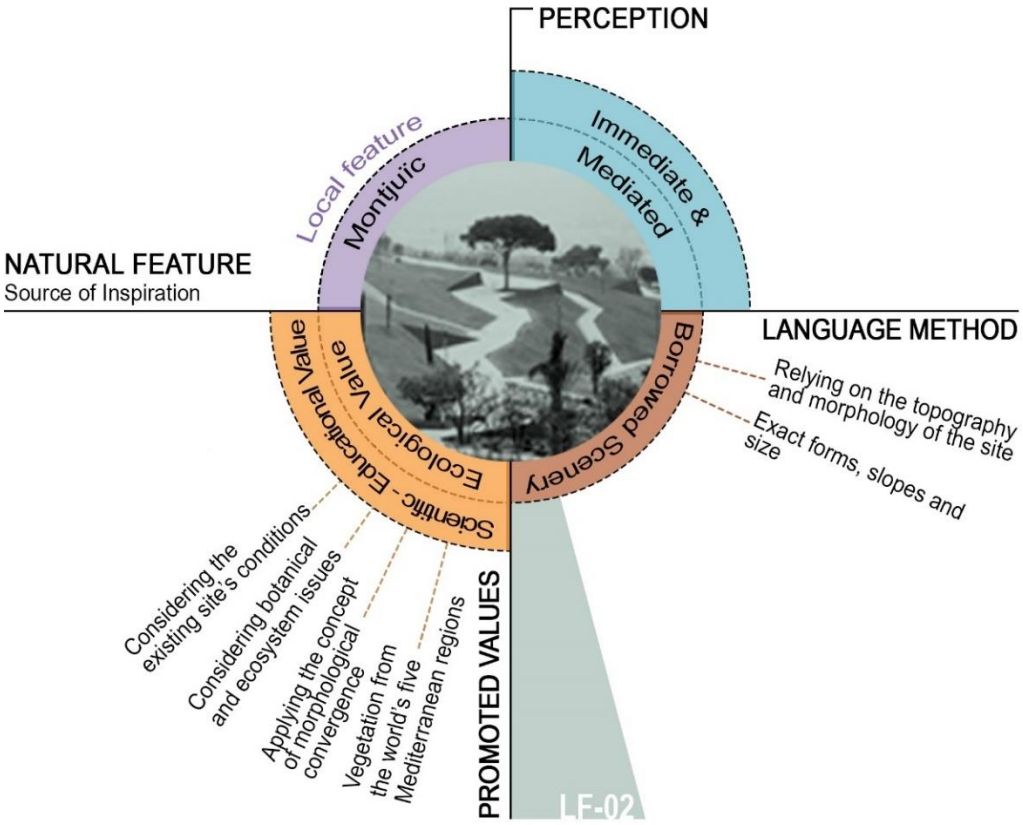


Figure 73: Summary of project LF-02 analysis focusing on the interpretation of the natural feature, Source: Author.

[15] The EGHN European Garden Heritage Network with its partners in 15 European countries started the European Garden Award in 2010 to recognize distinguished projects in two categories: the design of contemporary parks or gardens, and the management of a historic park or garden.

LF-03

4.2.2.11. Oriental Bay. Three Beaches

2004
Wellington, New Zealand
Waterfront
approx. 13.400 m² (measured with google earth)

Designer:
Isthmus
Wellington, New Zealand

Design Narrative - For much of the Wellington's history, the little beach that existed in the area of the site was man-made from the ships' ballast material unloaded there, and later the prevailing northerly wave movement swiftly eroded any top-ups that replenished the stripe of sand (Isthmus, 2025).
To deal with the site conditions of a narrow sand edge and a rocky foreshore at the base of a steep topography, the project provides three control points that elevate the status of the shorefront. A headland extending into the harbor, a series of large rocks, and an underwater artificial reef, all implemented with the aim of correcting the coastal processes that were stripping the bay of sand and creating recreational opportunities.

Analytical Study

- **Design Interpretation** - The design acknowledges the importance of the promenade as the main activity in the harbor, and creates three smaller beaches with different interventions and different character to strengthen the image of the space.
  The design interpretation *abstracts* a "headland" by stacking pre-cast concrete slabs that extend, at an angle, into the harbor. An intervention that helps maintain a wider expanse of sand and provides opportunities for sitting, sunbathing, climbing and socializing.
  The three main interventions in the site, which were meant as beach control points, were seen as landscape features, that had an important role in balancing and maintaining the beach environment.

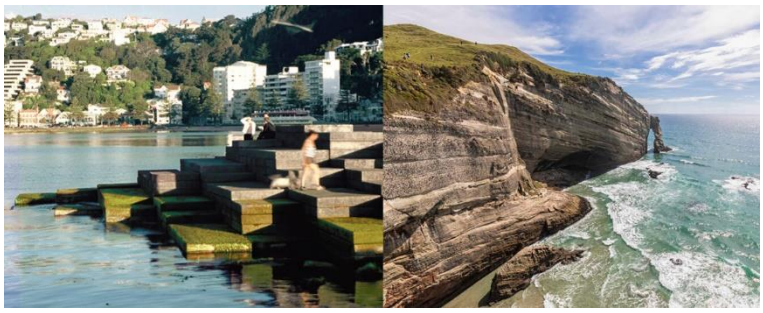


Figure 74: The concrete slabs of the artificial headland compared to Cape Farewell headland in New Zealand, Source: (Left- Isthmus, Right- westend61.de FOF11386) modified by author.

Natural Feature - A *Headland*, also known as a head, is a coastal landform, a point of land usually high and often with a sheer drop, that extends into a body of water. It is a type of promontory. A headland of considerable size is often called a cape. Headlands are characterized by high, breaking waves, rocky shores, intense erosion, and steep sea cliffs (Whittow, 1984).

- **Digital Tools –** As the design draws inspiration from a general natural feature, without specifying a certain headland, the design team can review photos, aerial photos and satellite images of several headlands to study the attributes of this feature. In addition to considering the beach environment and the steep topography of the site itself.

- **Promoted Values -** The project of three beaches promotes ecological and cultural values, providing enhancement to an important part of the city that is well known and loved by the locals and a part of the Wellington city's experience. By providing materially and qualitatively enhancements to the shorefront, it revived the active presence of people, and the beach sand is now in a balanced state with almost no natural loss and little natural supply.

Professional and Public Opinion – The project was recognized by the NZIA[16] and acquired the NZ Regional Architecture Award in 2004 for the category: Urban Design, in addition to the NZIA Supreme Architecture Award in 2006.

The institute recognized the risk of "making modifications to a well-used and loved public space, as the Oriental Bay is part of every Wellingtonian's and all their visitors' experience". It recognized the enhancement, not only of the ecological state of the beach, but also of the experience quality of the space, especially that great care was given to both what is below the surface and above it.

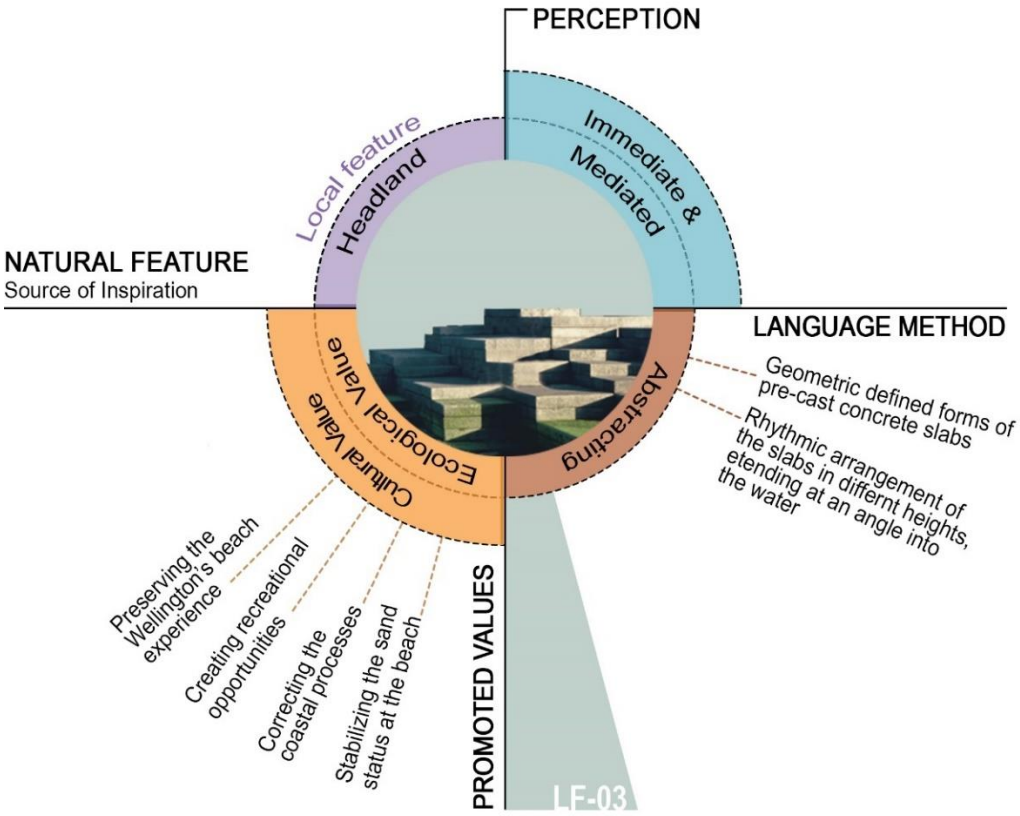


Figure 75: Summary of project LF-03 analysis focusing on the interpretation of the natural feature, Source: Author.

[16] The New Zealand Institute of Architects, which celebrates through different types of awards the distinguished careers and up and coming talents at national and regional levels.

LF-04

4.2.2.12. The City Dune - SEB Bank (see Appendix C for more details)

2010
Copenhagen, Denmark
Public Urban Space
7.300 m²

Designer:
SLA
Copenhagen, Denmark

Design Narrative - The City Dune is an artificial terrain of white concrete plaques that rises from street level to the second-floor level, elevated seven meters above the surroundings and covering the SEB Bank's parking garage in Copenhagen.
Drawing inspiration from sand dunes and snow dunes (SLA, 2024), the design creates an urban green space for employees of the bank and residents of the city as well.

Analytical Study

- **Design Interpretation -** The design is inspired by natural processes that create a unique type of Danish landscapes. It *emulates* the folding movement of "sand dunes" of northern Denmark and the snow dunes of the Scandinavian winter.
  The interpretation of sand dunes appears to act in great compatibility with the functionality and spatial dynamicity expected in this space; the winding ramps emulating the folded movements of the dunes connect the bank's two buildings at two levels smoothly throughout the site. It creates a dynamic space that opens in different directions. It also provides opportunities for pedestrians, cyclists and wheelchair users, making the space accessible and inclusive for different categories of users.
  Many design elements were integrated within the concept of this winding blanket to handle lighting and drainage. The plantations of trees and herbaceous vegetation are placed in fissures between the horizontal planes of the design, and there is a variety of routes for different users, creating an ever-changing urban space.

Figure 76: The artificial terrain appearance with its winding ramps compared to a migrating coastal dune in Denmark, Source: (Left- SLA, Right- Matthias Schalk) modified by author.

Natural Feature - *Dunes* in northern Denmark are shoreline dunes. They were formed by aeolian processes and made up of large-scale sand deposition. They are not only extensive, but also include some of the most active dune landscapes in Europe (Doody, 2008). Raabjerg Mile is a migrating coastal dune between Skagen and Frederikshavn. It is the largest moving dune in Northern Europe and the only major stretch of migrating dunes in Denmark.

- **Digital Tools –** As the design studio is based in Copenhagen, designers may have had a past experience of the northern sandy environment of Denmark and could develop an immediate perception of the sand and snow dunes. However, further research is required to fully understand the folding movement of the dunes and the process of creation in order to interpret it and adjust it into functioning ramps and pathways. By viewing satellite images and aerial

photos of sand and snow dunes and studying the pattern, forms, group arrangements and orientation of the natural feature, the perceiver can recognize the defining attributes and characteristics of the dunes.

- **Promoted Values -** Applying the design concept of folding sand dunes resulted in a space with a unified unique image, giving the urban space an added economical value.
  According to the CEO of SEB, the branding value of this landscape was five times bigger than what a regular branding campaign with the same budget could have given (SLA, 2024).
  It also gives a recreational value to a part of the city of Copenhagen. Furthermore, the city Dune is climate-adapted urban space, promoting sustainability by its rainwater harvesting and reusing system, by the root friendly bearing layer provided in the terrain making it possible to have Nordic trees and vegetation and providing a strong Nordic identity, and by the choice of material of white concrete that reflects the sun and contributes to creating a natural cooled microclimate during the warm months.

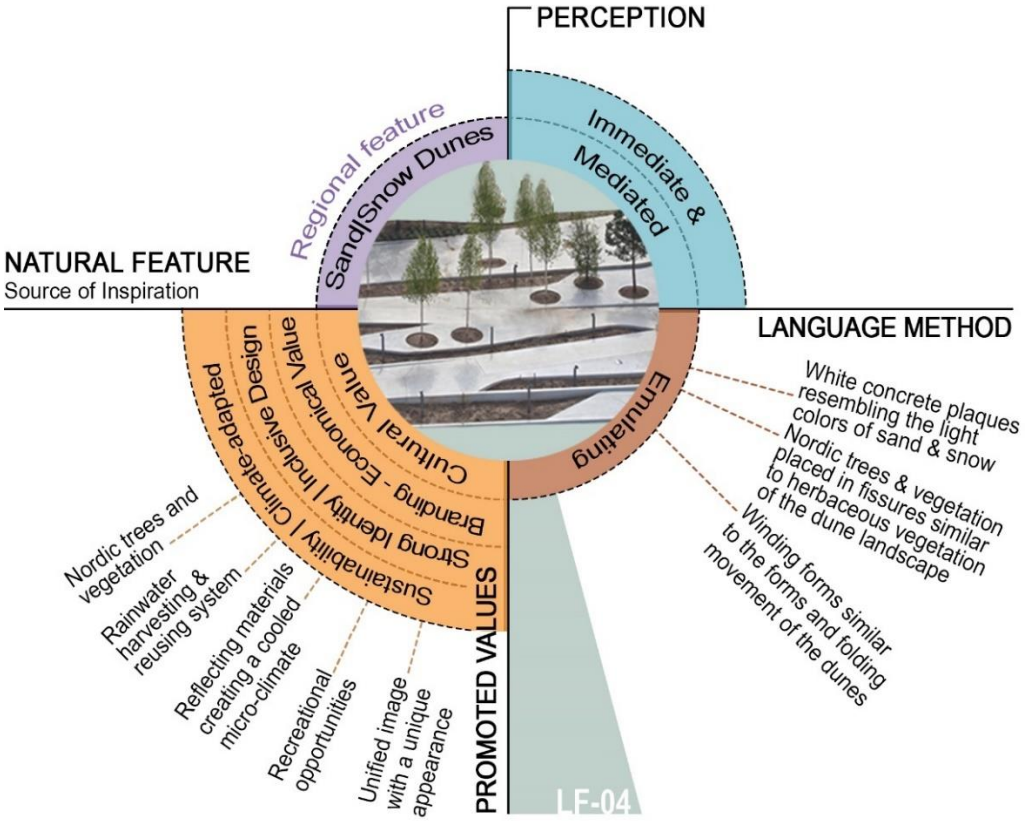


Figure 77: Summary of project LF-04 analysis focusing on the interpretation of the natural feature, Source: Author.

LF-05

4.2.2.13. Summer Island

2019
Heilbronn, Germany
Public Landscape Park
approx. 35.000 m²

Designer:
LOMA
Kassel, Germany

Design Narrative - The park is one of the world's first digitally designed and built parks (LOMA, 2025). The conditions of the site sparked the initial design concept, the site was an area where excavation work has left amounts of loamy alluvial land from the Neckar River, creating by chance a landscape that led the designers to ask, how landscapes are created, how wind, water, and glaciers shape the landscape, and how the designers can make these natural phenomena their own.

Analytical Study

- **Design Interpretation -** The design presents organically shaped terrain-waves joined up diagonally at an angle to *emulate* a sandy landscape and its ephemeral patterns, natural shapes of dunes and moraines.
  The design process started with a 3D-generated landscape, based on the study of natural processes, that was later adjusted to the site, relying on data matrixes, GPS controls and other tools, to be able to recreate the virtual landscape in reality.
  The designed organic forms are the generators of the entire spatial experience. There is neither an entrance nor an exit, no paths and no benches, since the green dunes divide the space and serve these functions.
  The green dunes offer variant opportunities for people to sit, climb, sunbathe or joyfully roll around.

Figure 78: The organically shaped terrain-waves of the park compared to linear dunes of an erg, Source: (Left- Nikolai Benner, Right- nasa.gov ID ISS047-E-23405) modified by author.

Natural Feature - A *Sand Dune* is a landform composed of wind- or water-driven sand. It typically takes the form of a mound, ridge or hill (Jackson, 1997). Two similar types of forms are described by morphology. 1: Sand Waves are created at the bottom of the bed by the process of traction load. 2: Ripple marks are created by wind, and their forms are parallel with each other.

- **Digital Tools –** As a first step, terms such as "fluids", "turbidite systems", and "ripple marks" were studied to examine the process of creation and the possibilities of generating such features. In order to recognize the attributes of the moraines and dunes, many photos and satellite images were reviewed, and architects entered drawings of moraines, dunes, and sand waves into the computer using Rhino 3D, a software that constructed dynamically optimized hulls.
- **Promoted Values -** Applying the design concept of folding sand dunes resulted in a space with a unified image and a unique spatial experience, in addition to promoting an aesthetic

value, as the green sea of ripples presented a "walkable sculpture" for people to enjoy. Most importantly, the design process promotes digital innovation and encourages exploring new methods and utilizing the contemporary digital technologies not only as an aiding tool but as a co-creator of the design as well.

Professional and Public Opinion – The project won the German Landscape Architecture Award[17] in 2021 for the category of Digital Innovation. The jury was particularly fascinated with the tension between the purely technical-digital aspect of the work and the lightness and poetry of the resulting landscape.

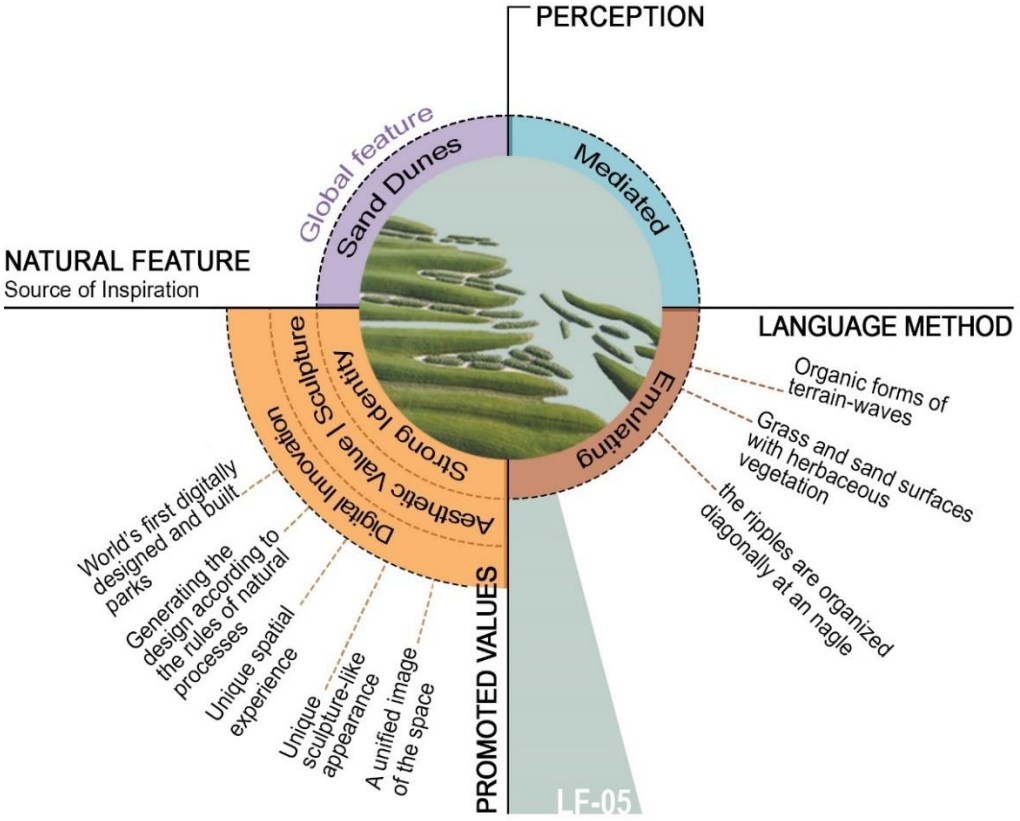


Figure 79: Summary of project LF-05 analysis focusing on the interpretation of the natural feature, Source: Author.

LF-06

4.2.2.14. The Folds

2019
Changzhou, China
Playground
20.000 m²

Designer:
Atelier Scale
Los Angeles, CA, USA

Design Narrative - The Folds is a playground for children that was planned as a part of a larger system of community gardens and pocket spaces, in a residential development in the city of Changzhou.

The playground is designed with the notion of returning to the basics through the folding of spaces. It mobilizes children's perceptions with landform (Atelier Scale, 2025).

[17] The Deutscher Landschaftsarchitektur-Preis, known until 1991 as the BDLA prize, is an award that has been presented every two years by the association of German Landscape Architects (BDLA) since 1977.

Analytical Study

- **Design Interpretation –** The design *abstracts* a "folding landform" resulted from natural compressional forces, creating different features of sloped surfaces and enclosed voids.
  The folding gesture creates a continuous dynamic spatial structure, starting with a series of rolling lawns and turning into folding wood decks, with accent metal frames with nets colored in a bright yellow. While the kids make their way up and down the folds, they can discover caves under them.
  The design interpretation of the natural feature, which is not necessarily inspired by a local known landscape in the area, is applied on the entire area of the site and allows the space to minimize the use of traditional playing equipment by providing a dynamic structure that presents a sensational experience, relying more on the user's instinct rather than a planned program of functions. It allows the children to have a physical experience similar to one they can have in nature by being able to run, climb, hide and perceive the space with their hands and feet.

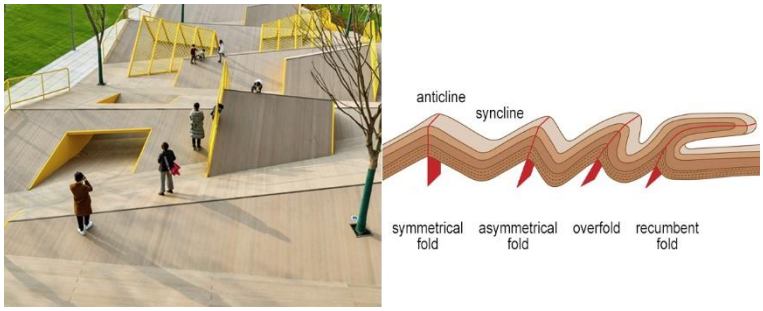


Figure 80: The folding gesture with sloped surfaces and voids compared to anticlines and synclines resulted from different types of folds, Source: (Left- Atelier Scale, Right- Encyclopaedia Britannica, Inc.) modified by author.

Natural Feature - A *Fold* is an undulation or waves in the stratified rocks of Earth's crust. Folds vary widely in size; some are several kilometers or even hundreds of kilometers across, and others measure just a few centimeters or less. They are generally classified according to the attitude of their axes and the appearance in cross-sections perpendicular to the trend of the fold (Britannica, 2022).

- **Digital Tools –** The design requires an understanding of the forces that create the folded landforms. Tools like cross-sections, and geomorphology maps created with GIS, which provide a graphic representation of landforms of an area and indicate the several past and present influences leading to these forms, can contribute to the process of perceiving the natural feature, in addition to aerial photos of vast areas that depict the overall undulating surface of a hilly area. The undulations of an open area of rolling lawns can be perceived with the human eye and as a person makes his way up and down the hills.

- **Promoted Values –** By reducing the natural feature to its essence and interpreting elevation, scale, texture, and atmosphere with basic vocabulary, the design presents a "pure" space where the interaction between people and the environment emerges naturally.
  The playground creates a unique experience for children in the urban environment. It encourages spontaneous behavior with fewer restrictions of the built environment, providing a space that elevates the quality of the open spaces in its surrounding residential area.

Professional and Public Opinion – The project was recognized with the Merit Award in 2020 by WLA[18], in the Built Small category. The jury considered the Folds as a project that provides solutions that are relevant, adaptive and innovative.

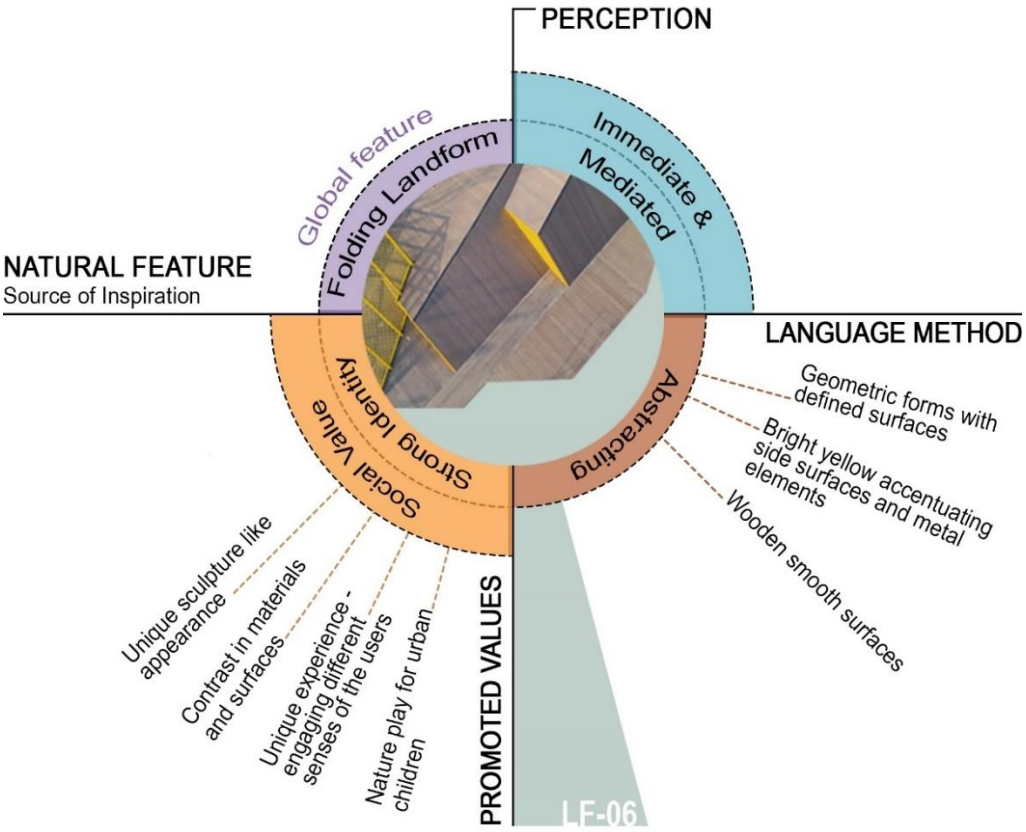
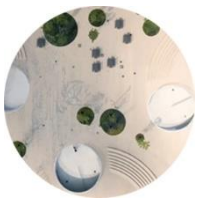


Figure 81: Summary of project LF-06 analysis focusing on the interpretation of the natural feature, Source: Author.



LF-07

4.2.2.15. Karen Blixens Plads

2019
Copenhagen, Denmark
Urban Plaza / University Plaza
21.415 m²

Designer:
Cobe
Copenhagen, Denmark

Design Narrative - The plaza is one of the biggest public squares in the city. It is an urban space at the University of Copenhagen South Campus next to the nature reserve Amager Commons. The connection between the plaza and the reserve is achieved gradually with transitional smaller spaces, strengthening the natural aspect of the plaza and making it regarded as a hybrid of park and public square, with a design inspired by a hilly landscape (Cobe, 2019).

Analytical Study

- **Design Interpretation -** The design interprets a landscape of "hills and valleys", with a superimposed undulating surface, a floating carpet, that provides two functional levels, one in the voids created underneath the hills where the necessary infrastructure and the parking

[18] The World Landscape Architecture is a leading online platform bringing together a global community of landscape architects, designers, and industry professionals, offering inspiration, knowledge, and resources.

pockets for 2000 bicycles are accommodated, and the other is at the top of the 3-dimensional man-made hilly landscape, where sitting areas, routes, green surfaces and student hangouts are taking place.

The design *emulates* hills and valleys with grassy surfaces that fade gradually into the site, transforming to light concrete undulated surfaces, which were thoughtfully designed and organized to accommodate the needs of the site. The undulated blanket allows a smooth connection of the three main entrances of the university, provides a central meeting place at the heart of the plaza where students can gather for lecture, group works and other events, and eases the transition between a built urban fabric and the natural reserve, through the gradual densification of grass-covered hills merging the greenery and the urban materials effortlessly. The design concept helped transform the site from a passive parking for bikes rarely used by people, with no kind of spatial hierarchy much needed for such a large-scale open space, into an efficient plaza with an important functional and recreational role.

Figure 82: The undulating surface of the plaza compared to a hilly landscape, Source: (Left- Cobe, Right- gettyimages ©Mitch Diamond) modified by author.

Natural Feature – A *Hill* is a landform that rises above the surrounding terrain and has a relatively confined summit. Hills are formed by different types of geological activity like faulting, erosion or moving glaciers. A *Valley* is an elongated depression of the Earth's surface that may occur in a relatively flat plain or between ranges of hills or mountains (Whittow, 1984).

- **Digital Tools –** As the design takes inspiration from a general natural feature without referring to a certain hilly landscape, inspiration could be drawn from past experiences of the design team members, photos and paintings of hilly landscapes, and aerial photos that provide a wide view of vast areas and allow detecting different attributes of the landscape.
- **Promoted Values –** The design interpretation creates a space that is well-connected to the city and easily accessed by all users. It provides an inclusive and accessible space.

  The project bases its design concept to respond to the context and the needs of the city. Copenhagen is one of the world's leading bicycle cities, with a high number of the city's inhabitants using bikes for their daily commute. That highlights an aspect that cannot be ignored when designing the open spaces of the city, and the plaza deals with this issue with a flexible approach that integrates a large capacity for bicycles within its hilly landscape interpretation. Thus, the design promotes and encourages the sustainable goals of the city while offering an aesthetic experience in its own as well.

Professional and Public Opinion – The project is the winner of Dezeen Awards[19] as the Landscape Project of 2020. It was recognized for its innovative solutions and for promoting green transportation and climate change.

[19] Dezeen is an influential architecture and design platform, with an annual awards program that identifies the world's best design and sustainability projects.

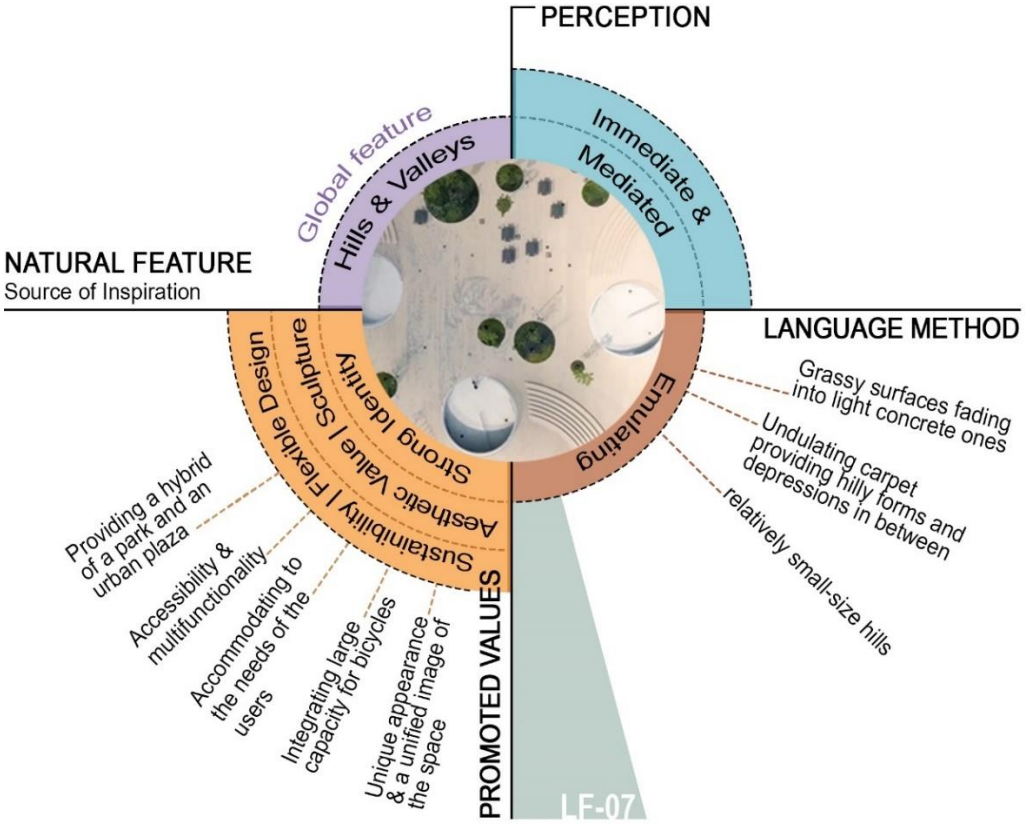


Figure 83: Summary of project LF-07 analysis focusing on the interpretation of the natural feature, Source: Author.

PA-01

4.2.2.16.Manly Corso

2005
Manly, Australia
Allee
7.800 m²

Designer:
TCL
Sydney, Australia

Design Narrative - The Project is an iconic place in Sydney's Consciousness (TCL, 2024). It is a pedestrian zone with shopping centers and arcades, and pedestrians wander across its length in large numbers, to get from the Sydney Harbor Ferry terminal to Manly Beach on the Pacific Ocean. With the different recreational functions found in the Corso, which makes it an entertaining street, and its main role as an important route that connects the harbor with the beach, the project dealt with organizing a space that would contain different paces of pedestrian flows and giving an identity to such a vibrant and essential open space in the city.

Analytical Study

- **Design Interpretation -** The project's main design elements are namely: a wave-patterned granite pavement, a linear water feature, a linear spontaneous placement of Tree Palms, an overhead lighting system, and seating elements.
  The pavement pattern is visually the strongest, most dominant design element that is setting the general feel of the space. It *abstracts* the undulating pattern of "waves" with two colors of pavers, creating 2D curvy stripes with a contrasted dark background, and the seating elements are custom-designed to further accentuate the pattern.

The inspiration comes from the site itself, with the beach lying right at the end of the Corso, making the interpretation of this local natural feature even more recognized and readable by the users, and forming the perfect background to the Corso's passing parade.

Figure 84: The pavement pattern of the Corso compared to the waves at the shoreline, Source: (Left- Gerd Kohlmus, Right- Dan Grinwis) modified by author.

Natural Feature - A *Wave,* or wind-generated wave, occurs on the free surface of bodies of water as a result of the wind blowing over surface. Waves can range in size from small ripples to ones over 30m high(Tolamn, 2010). As waves approach the shoreline, their height and length are altered by refraction and shoaling.

- **Digital Tools –** as the project has a direct connection with the beach, there is the opportunity to view the waves and their undulated shapes at the shore immediately. However, patterns are best recognized from a top view, which can be provided through mediators, such as satellite images. The attributes of the pattern of ripples of waves, such as repetition, arrangement, and rhythm, can be recognized clearly through a top view.
- **Promoted Values -** The interpretation provides the space with a unified image. It is laid out orthogonally to the axis of the street, making it a welcoming space and creating a dynamic feel with its undulations. Its visual strength gives the space an iconic unique image and speaks to the users, who are used to the sea environment and the beach as a daily part of their lives.

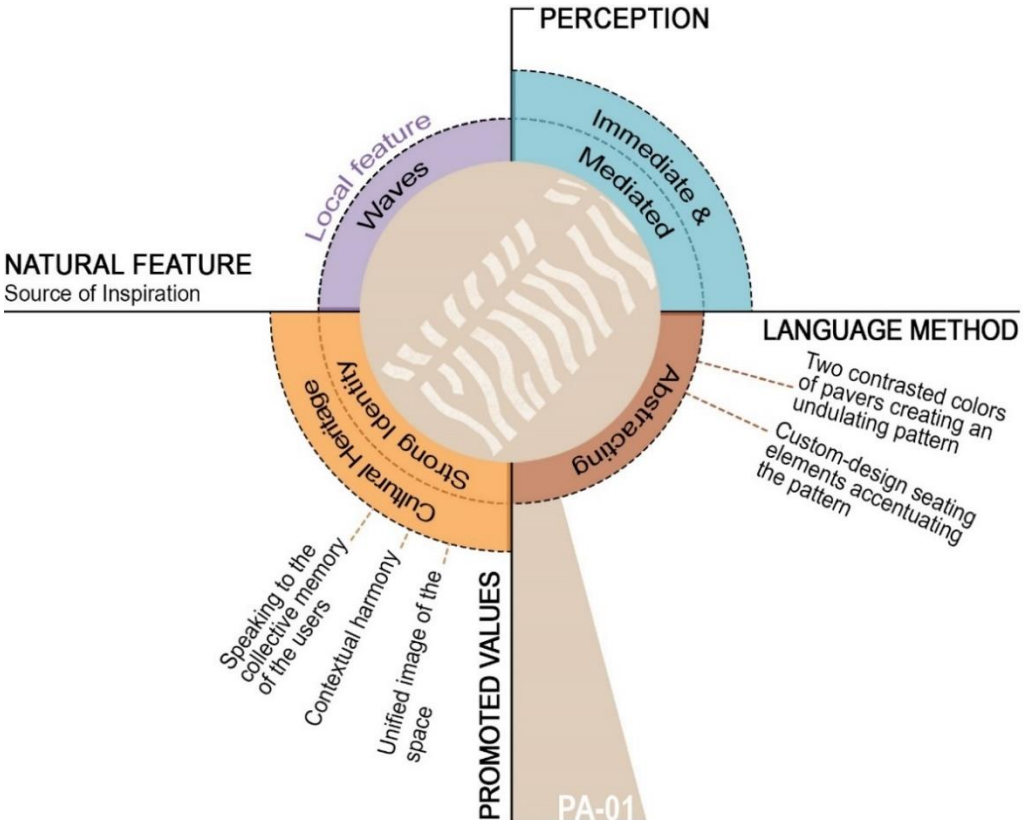


Figure 85: Summary of project PA-01 analysis focusing on the interpretation of the natural feature, Source: Author.

PA-02

4.2.2.17.HtO
2007
Toronto, Canada
Waterfront Park
22.300 m²

Designer:
CCxA and Janet Rosenberg & Studio
Montreal, Canada

Design Narrative - An urban beach was developed on Toronto's waterfront on Lake Ontario, to strengthen the residents' relation to the water and encourage them to rediscover the lake, providing them with an escape from the noise and the hustle of the city.
The design aimed to bring the atmosphere of a modern re-enactment of Georges Seurat's "Un dimanche aprè-midi à l'ile de la Grande Jatte" (1884-1886), with its bright colors, play of light and shadows, and sense of peaceful refuge. The design is an urban take on "sand dunes" (CCxA, 2025).

Analytical Study

- **Design Interpretation -** The project is divided into two parts: one is the hardscape beach with grassy lawns and shadowing trees, and the other is the sandy beach closer to the water and equipped with distinct yellow umbrellas, lounge chairs and a wooden deck at the edge of the lake to allow direct interaction with the water.
  The grassy area is an *abstraction* of the "sand dunes", which can be found in the sandy beaches of Lake Ontario, which was achieved by creating organic-shaped islands of grassy lawns, distributed on a paved surface to define zones and movement. The islands, shaded by weeping willows, create opportunities for people to gather and relax facing the lake, especially that the topography of the site helps this orientation of views with the surface sloping up from the city and down towards the lake, hiding the city and opening views to the water.
  Although the design takes inspiration from a 3-dimensional natural feature, its interpretation reduces the third dimension of the dune's form, with some of the lawns being only slightly elevated, focusing instead on the organic shapes and the pattern created by groups of sand dunes. In addition, the contrast of the green grass and the light-paved pathways accentuates the resulted 2-dimensional organic pattern and highlights it as the dominant feature of the site.

Figure 86: The organic pattern of the grass islands compared to sand dunes, Source: (Left- CCxA, Right- flicker ©Jeffrey Sullivan) modified by author.

Natural Feature - A *Dune,* is a landform composed of wind- or water-driven sand. It typically takes the form of a mound, ridge or hill (Jackson, 1997). An area with dunes is called a dune system or complex. A large dune complex is an erg or a sand sea. They are most common in desert environments, where lack of moisture hinders the growth of vegetation, and in seashores.

- **Digital Tools –** The design takes inspiration from a local natural feature, as the project is located right at the beach, and sandy dunes are part of the local environment, and thus, the design team may have had an immediate perception of the natural feature. However, as

previously mentioned, patterns are best recognized from a top view. Satellite images and aerial photos can facilitate the recognition of attributes of patterns that may expand on vast areas.

- **Promoted Values -** This project of urban beach celebrates an important cultural expression of the city; Lake Ontario, which is very well-connected to the identity of Toronto.
  Having transformed an industrial site into a park with high design standards, the project provides a welcoming, dynamic, colorful and branded destination for the locals and visitors of the city. It promotes an ecological value, with on-site water management systems and fish habitats along the edge of the site, in an attempt to revive the natural ecologies in the lake.

Professional and Public Opinion – The project was awarded in 2007 with the Gold Medal Design Exchange20, for the category of Urban Design. In 2008, it was recognized by the Canadian Society of Landscape Architects[21] with the Regional Honour, in addition to the ASLA General Design Honor in 2009, which recognized the cultural and social importance of the project, as the jury acknowledged the efforts in "helping Toronto reclaim its lakefront with strong, bold graphic moves". The urban beach is seen as a flexible space that works well in summer and in winter.
According to the ASLA (2009) research and post occupancy evaluation of the space, it is enjoyed by people of all ages, for its multi-functionality, with the ability to relax, enjoy the views and the direct connection to the water, and the ability to skateboard or rollerblade on the paved surfaces.

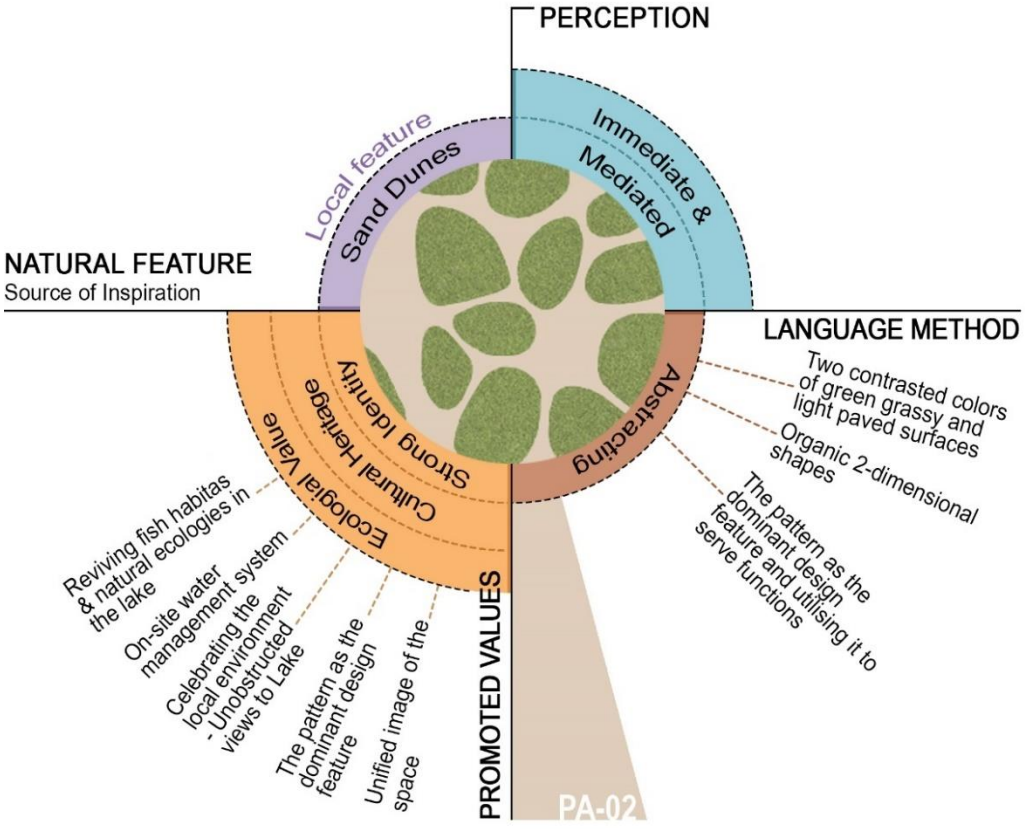


Figure 87: Summary of project PA-02 analysis focusing on the interpretation of the natural feature, Source: Author.

[20] The Design Exchange (DX) is a design center and museum in Toronto, Canada, an internationally recognized non-profit educational organization, with a mission to promote the value of design.
[21] The CSLA's honours and awards programs promote awareness of landscape architecture as a profession professionally, academically, and in communities, and acknowledges the work of its members within the profession.

PA-03

4.2.2.18.Roombeek the Brook

2008
Enschede, Netherlands
Urban Street
13.600 m²

Designer:
Buro Sant en Co
The Hague, Netherlands

Design Narrative - The commercial street is in a central area of the city with a small stream, Roombeek River, that used to run underground. The project brings the stream up to the surface and restores its public persona.
Roombeek is one of the streams of Enschede, a city that once had the highest number of streams in The Netherlands but lost many of them due to industrialization (Land8, 2016). The design refers to nature and is a symbol to a past incident in a fireworks factory in the area (Sant En Co, 2008).

Analytical Study

- **Design Interpretation -** The design displays a distinctive composition of sharp-edged stepping stones. The randomness of the stones floating on the surface *emulates* a cracked pattern that can be seen in nature, like the "ice cracking" pattern. The base of the stream also displays a pattern emulating "transverse ripples" composed of a rough concrete structure and reflects beautifully on the water surface. These ripples are applied on the entire area of the stream bed, and contribut to slowing the flow of water, which means that people can enjoy the presence of more water, and water can be heard constantly.
  The interpretation of natural features related to the water environment and using a selective language of concrete to express water and movement suit the context of the project and remind of the Japanese Zen Gardens, using stone and sand to express dry courses of water.

Figure 88: The spontaneous arrangement of sharp-edged stepping stones compared to the cracking pattern of ice floes, Source: (Left- Sant en Co, Right- freepik) modified by author.

Natural Feature - *Cracking* is one of the main basic patterns found in nature. Cracks are linear openings that form in materials to relieve stress. When a material stretches or shrinks uniformly, it eventually reaches its breaking strength and fails suddenly in all directions, creating cracks in a certain angle (Stevens, 1974).

- **Digital Tools –** Both the "cracking" and the "ripples" patterns are natural phenomena that occur in water bodies of cities with cold winters, such as the cities of the Netherlands. The attributes of these patterns, such as repetition, rhythm, arrangement, size, shapes, and randomness, are best recognized through satellite images and top views.
- **Promoted Values -** The stream appears in a stylized image with its straight wide course, displaying unique patterns with a calm, thin water membrane. Those characteristics, along with the deciduous trees parallel to its course, and the urban furniture, all create a space with a unique visual identity and a sense of place, allowing it to become a city symbol.
  Restoring the Roombeek solved many issues related to regulating the level of groundwater, collecting excess rainwater and draining it, and providing cooling in the summer as well (Sant

En Co, 2008). An important achievement that contributes to the spatial quality of the district promotes sustainable and cultural values.

Professional and Public Opinion – The project was awarded the Gouden Piramide in 2007 recognizing the efforts of managing such a project, and the approach of a participatory design that includes people in deciding how the stream area will be developed. Including the public's ideas and feedback results in a space that wins the public's approval and can be enjoyed by its users.

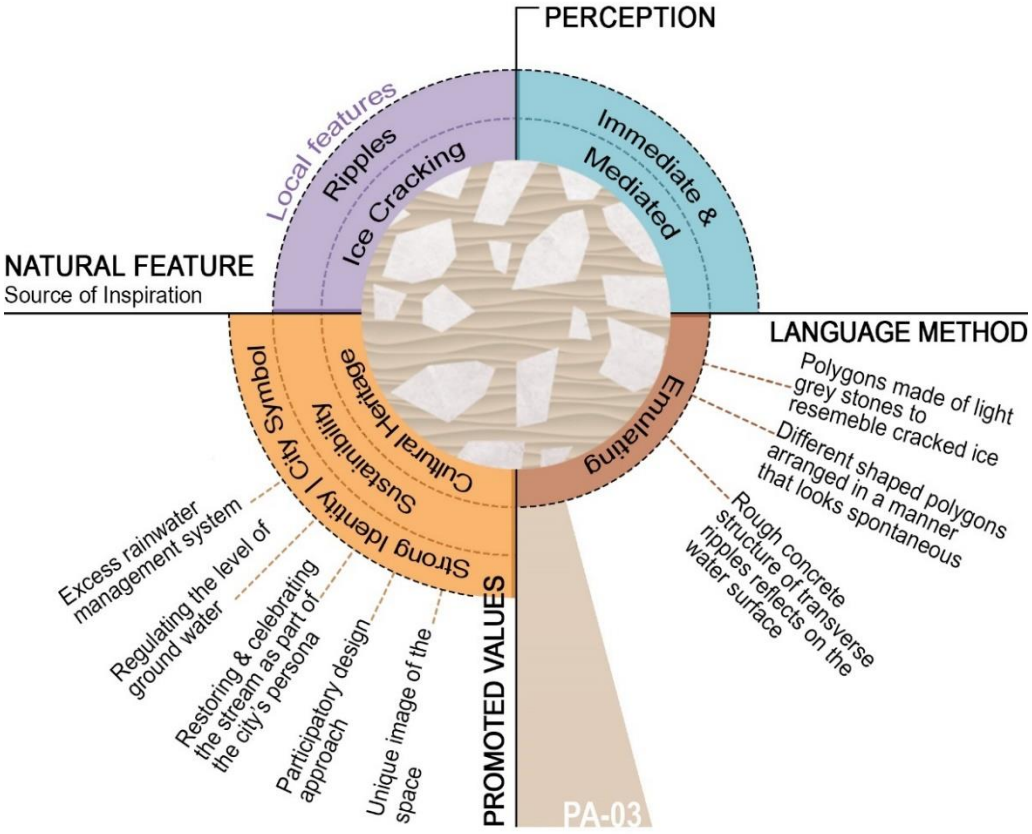


Figure 89: Summary of project PA-03 analysis focusing on the interpretation of the natural feature. Source: Author.

PA-04

4.2.2.19. Tianjin Bridged Gardens

2008
Tianjin, China
Sunken Garden
160 m²

Designer:
Turenscape Design Institute
Beijing, China

Design Narrative – One of the nine sunken gardens of "Tianjin Bridged Gardens" that were inspired by local land patterns, including water borders, crop fields, harvested farmlands, flowering rivers, meadows, pastures and for this specific case the marshes (TURENSCAPE, 2016).

Analytical Study

- **Design Interpretation –** The project relies on interpreting the organic pattern found in "marshlands" as the main design element. It *emulates* the curves and undulations of the pattern dividing the garden into two zones, one occupied by vegetation and the other for the users.

The design uses wooden paving material, bordered by red steel edges of the vegetation basins. This bright red element plays a significant role in defining the spatial experience of the garden, as it organizes the space, provides sitting elements, and sets the visual character of the space.

Figure 90: The curvy forms of the sunken garden compared to the organic pattern of marshlands, Source: (Left- Turenscape, Right- Terry Whittaker) modified by author.

Natural Feature – A *Marsh* is a wetland that is dominated by herbaceous plants rather than by woody plants (Thomas, 2016). They form a transition between the terrestrial and aquatic ecosystems at the edges of lakes and streams, and they are often dominated by reeds and grasses.

- **Digital Tools –** The recognition of the curves and undulations of the marshlands pattern is best perceived from aerial photos or satellite images, which highlight the organic shapes and the distinction of the contrasted two surfaces: water vs. vegetation.
- **Promoted Values –** The project promotes a cultural value as it celebrates a local land pattern in a stylized artistic way. It highlights the aesthetics of the pattern with the bright red curves, making this pattern the main element defining the image and function of the space.

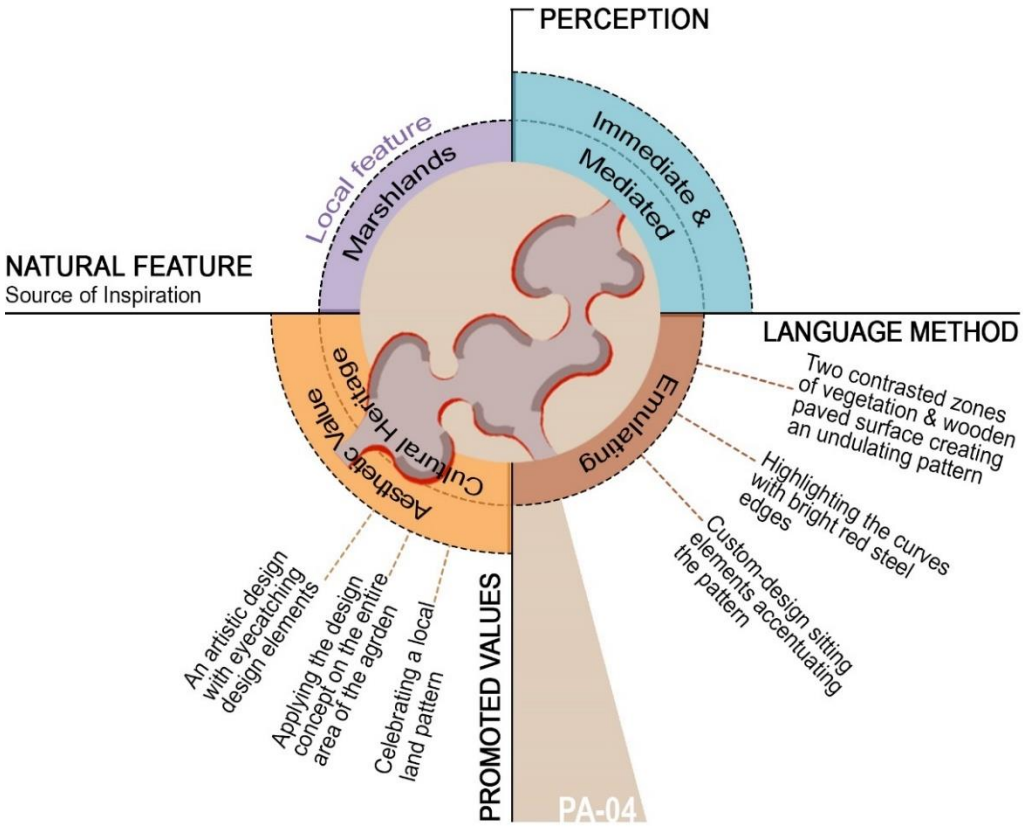


Figure 91: Summary of project PA-04 analysis focusing on the interpretation of the natural feature, Source: Author.

PA-05

4.2.2.20.Benidorm West Beach Promenade (see Appendix C for more details)

2009
Benidorm, Spain
Beach Promenade
18.000 m²

Designer:
OAB
Barcelona, Spain

Design Narrative - The promenade's location sets the transition between the urban fabric of the built city and the beach along the sea.
The design team aimed to render this transition permeable by trying to create an intermediary space instead of a borderline or a frontier between these two areas. The design concept is a nexus of sinuous interwoven lines evocative of the pattern of moving "waves and tides" as well as the fractal structure of a "cliff" (OAB, 2019).

Analytical Study

- **Design Interpretation -** The project takes inspiration from the local environment right next to the site; its design concept *emulates* the natural organic shapes of the pattern created by "waves and tides", highlighting the undulations with colorful paving materials. The transition from the level of the promenade to the lower level of the beach is achieved by *emulation* as well, creating a fractal structure similar to a "cliff", and the result is a dynamic structure of a distinctive topography that accommodates a variety of functions, and organizes circulations and access to different levels.
  The resulted dynamic structure of this interpretation not only provides a unique image of the space with its undulations, platforms and colorful ceramic paving, it is also very efficient. It accommodates harmonically all sorts of needed functions and activities, such as easy smooth access to the beach, integrating and organizing the longitudinal and transverse flows of different circulations, a high vantage point to the sea, a direct connection to the parking, integrated urban furniture, water features, and vegetation, an uninterrupted area for strolling, zones for relaxation and socializing, integrated infrastructure and a system for collecting excess rainwater. All combined within a limited surface that does not invade the surface of sand and reduces the asphalt surface.

Figure 92: The interwoven lines of the promenade compared to the tides and wave shapes at the opposite beach, Source: Alejo Bagué, modified by author.

Natural Feature – A *Cliff* is a rock formation with a general angle defined by the vertical or nearly vertical. It can be formed by processes of erosion and weathering or by glacier movements. A *Tide* is the alternating advance and retreat of seawater along a coastline caused by the gravitational pull of the moon and the rotational force of the Earth (Thomas, 2016).

- **Digital Tools –** Inspiration is drawn from the site itself, where the difference of levels allows viewing the tidal curves at the beach. In addition, west of the site, the topography of the area

elevates towards the sea to form a cliff that can be clearly viewed from the beach. As previously mentioned, patterns are best viewed through mediums that provide top views, such as satellite images and aerial photos. The complex design with its variant solutions relied on advanced building technologies in order to implement the ideas as planned.

- **Promoted Values -** The homogeneous design celebrates the local environment, as the beach plays a big part in everyday life of the city's dwellers. It combines aesthetics with functionality, through a sculpture-like appearance that leaves nothing to chance and embeds solutions to all issues into the preliminary design concept itself. The project presents a welcoming space in the city with a unique image and raises the value of the waterfront.
  It is considered a predecessor to the new architecture of the 21st century by combining technology and nature in a single whole (OAB, 2019).

Professional and Public Opinion – The project received a huge professional recognition as a successful project. In 2006, the project won the first prize at the Salón Inmobiliario de Madrid, and the first prize at the ASPRIMA Awards for the best development of tourism. In 2009, the project was awarded with the first prize of the ASCER Ceramic VIII Architecture Awards, which recognized the role of the project in presenting a new geometric order amid the chaos of the city, the beach and the sea. In 2010, the project won the COA Valencia Architecture Award, the Award Aplus, the FAD Award, the Chicago Athenaeum International Award, the SALONI Award, and the FOPA Award. In 2011, it won the CEMEX Building Award and the WAN Award, and in 2018, the project was granted the ASPRIMA-SIMA Award for the category of Best Urban Generation Initiative.

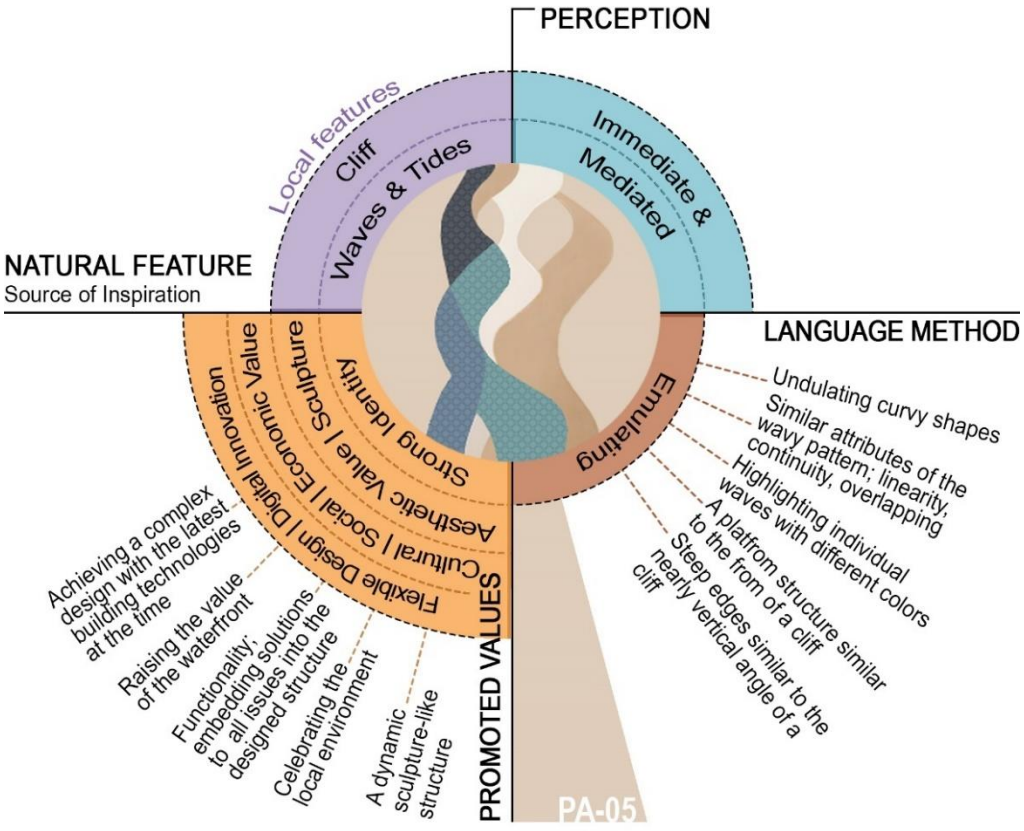


Figure 93: Summary of project PA-05 analysis focusing on the interpretation of the natural feature, Source: Author.

PA-06

4.2.2.21. Grønnegade Square

2012
Odense, Denmark
Plaza
6.000 m²

Designer:
MASU Planning
Copenhagen, Denmark

Design Narrative - The square has an important location at the center of the city and in front of the art museum and culture institution of Brandts.
The square is designed to provide a new, diverse city space for activity and recreation. Although the simple spatial design seemingly hides this diversity, it can be recognized by the presence and movement of people. The design displays a large wave-like pattern (MASU, 2012).

Analytical Study

- **Design Interpretation -** The brick paving with its warm yellow color is a traditional material that is recognized in most of the public spaces of Odense. It binds the city together and reflects tradition and qualitative awareness of city space.
  In Grønnegade square, it is given an irregular touch by introducing large, wave-like patterns. The design applies the classic brick pavement in a stylized innovative way as an ornamental carpet, which serves as the base for the different activities in the square, *emulating* the undulations of the "waves pattern" onto the 2-dimensional surface of the square.
  Other elements are designed in coherence with this organic layout, like the organically shaped seating elements and the interactive water and lighting features.
  The unique shapes of the large seating elements provide places for recreation, hanging out, relaxing and playing. They allow multi-use by different categories of users, including teenagers and children, and they contribute along with wave pattern in orienting movement and flows through the square.
  Although the interpretation is 2-dimensional and acts mainly as an ornamental carpet, this urban carpet unifies the visual appearance of the space and gives it a distinctive visual identity. It stretches to include the adjacent road, allowing the space to blend smoothly with its surroundings.

Figure 94: The stylized undulating pattern of pavement compared to a top view of ocean water waves. Source: (Left- MASU Planning, Right- Adobe Stock #577468596) modified by author.

Natural Feature – A *Wave*, or wind-generated water wave, is a regular oscillation that occurs on the free surface of bodies of water as a result of the wind blowing over the water's surface.Wind waves can range in size from small ripples to waves over 30 m high, being limited by wind speed, duration, fetch, and water depth (Thomas, 2016).

- **Digital Tools –** As the design is located in Odense, the main city of the green island of Funen, the city dwellers are familiar with the sea environment. In addition, the design team located in Copenhagen is also familiar with this environment, and perceiving the natural feature can

be an immediate occurrence. However, attributes of the wavy pattern, such as continuity, repetition, and interwovenness are best recognized and studied through mediums providing a top view of the feature.

- **Promoted Values -** The interpretation of a natural pattern using a traditional material promotes a local tradition and a cultural value, as well as pointing to the future by creating an inclusive, active, multi-functional, and aesthetically appealing space in the city. The pattern provides an active surface as a base that encourages the creativity of the users and allows a variety of functions to take place.

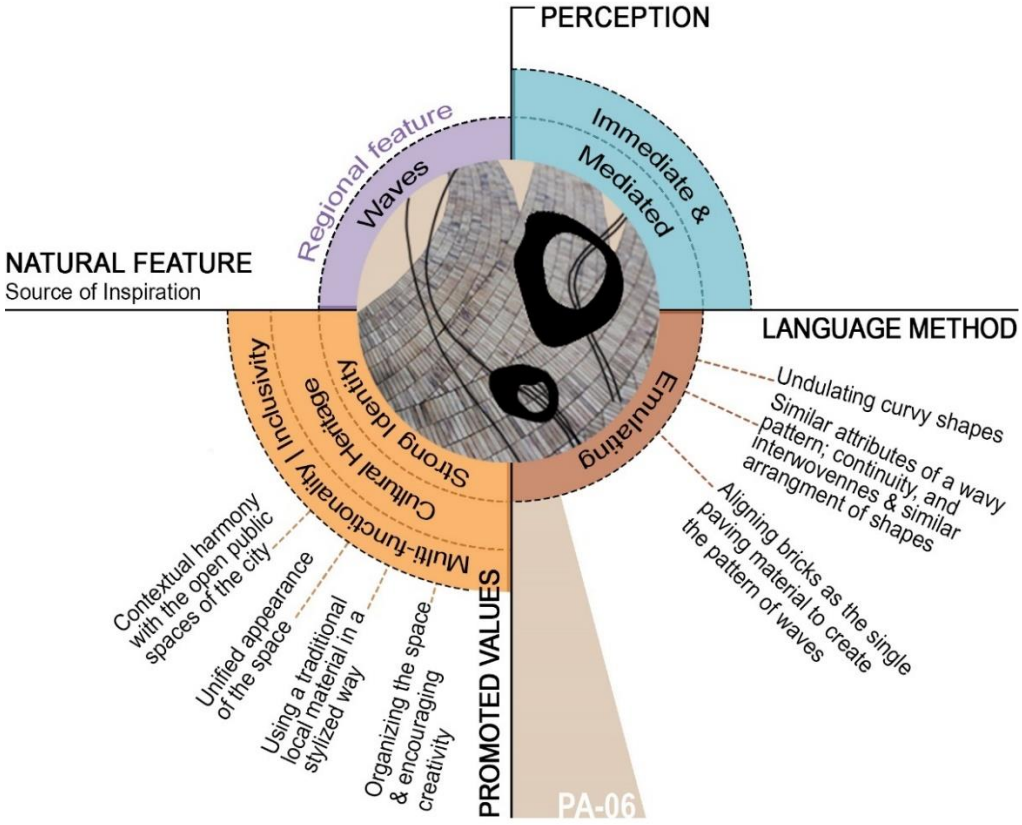


Figure 95: Summary of project PA-06 analysis focusing on the interpretation of the natural feature, Source: Author.

PA-07

4.2.2.22.NINA Roof Garden

2015
Trondheim, Norway
Rooftop Garden
1000 m²

Designer:
Agraff Arkitektur
Trondheim, Norway

Design Narrative - A new outdoor area for work premises was designed as a roof garden for the new building of the Norwegian Institute for Natural Research, NINA, located close to the Norwegian University of Science and Technology Campus.
The roof garden, on top of the building's basement floor, strongly connects the building and the landscape. It gives, along with the façade on the plinth, the illusion of a glacier, on which the rest

of the building rests (LANDEZINE, 2022). The used vegetation is specifically cultivated for this project to represent different areas of Norway (Agraff, 2019).

Analytical Study

- **Design Interpretation -** The design interprets a "glacier", a regional natural feature as many are found in Norway, relying on white concrete material and cracks open in crevasses to *emulate* the "cracking pattern" that can be seen on the surface of a glacier.
  Unlike the void cracks of a glacier, the crevasses of this roof garden are filled with vegetation that represent both the coastal and mountain areas in Norway. The combination of the white patterned surface with lush green vegetation presents an art sculpture that can be enjoyed on the office premises that has a view over the roof garden.
  The interpretation is applied on the entire roof surface and is utilized with 3-dimensional play of surfaces to create zones and seating elements, providing opportunities for people to sit, socialize or have their lunch outdoors in the summer.
  A glass roof divides the artificial glacier in two parts and lights an indoor hall. It is designed to have the same characteristics of the cracking pattern and gives the users inside the building the illusion of being under a glacier.

Figure 96: The cracking pattern of the rooftop design compared to the crevasses of a glacier, Source: (Left- Kristoffer Wittrup, Right- gettyimages ©Simonkr) modified by author.

Natural Feature - A *Crevasse* is a deep, wedged-shaped opening in a glacier. They usually form in the top 50 meters of a glacier, where the ice is brittle. A *Glacier* is a mass of dense ice that is constantly moving under its own weight. It forms where the accumulation of snow exceeds its ablation over many years, often centuries. It slowly flows and deforms under stresses induced by its weight (Thomas, 2016).

- **Digital Tools –** Many glaciers are found in Norway, including the second-largest glacier in Europe, and the pattern created by the crevasses of a glacier can be clearly viewed from a high vantage point, and the attributes of a cracking pattern can be recognized clearly through mediators that provide a top view of the phenomenon.

- **Promoted Values -** The project interprets the natural feature as a piece of art, promoting the aesthetics and characteristics of a glacier. It also utilizes the shapes and forms of this natural feature to embed the functions, design elements and Norwegian vegetation seamlessly into the design concept, providing a functional space with a unique image.
  The reference to a natural feature that is slowly disappearing due to climatic changes plays a role in raising awareness and attention to global warming issues.

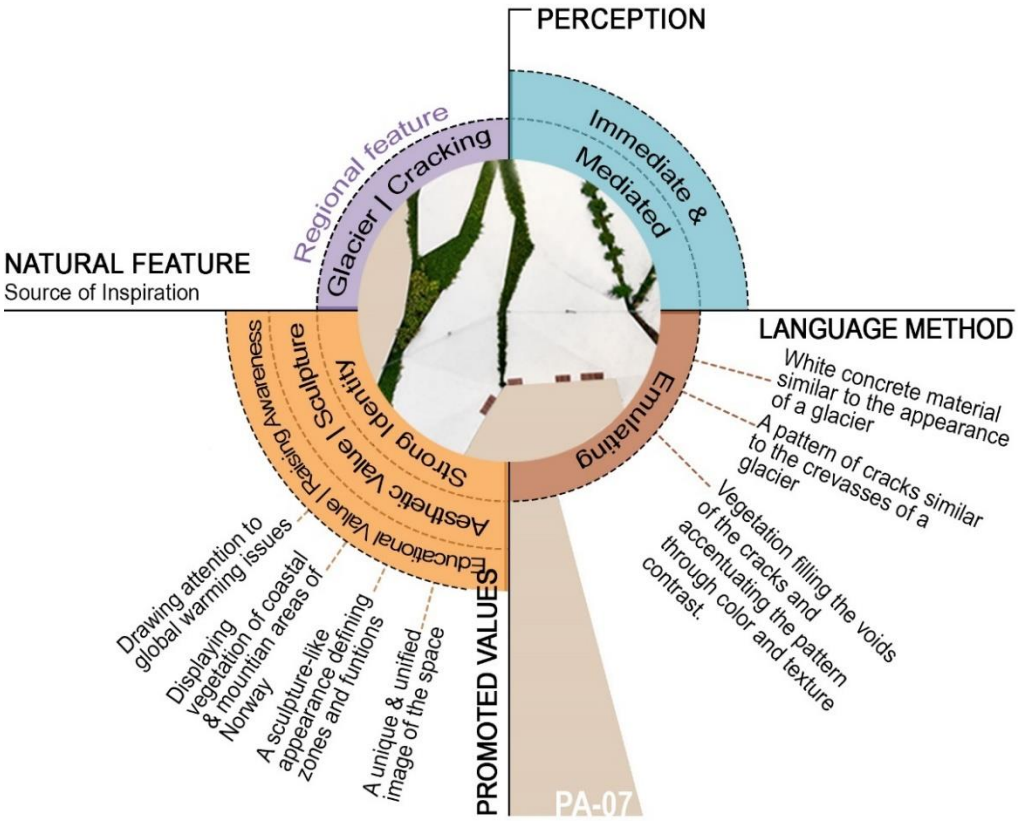


Figure 97: Summary of project PA-07 analysis focusing on the interpretation of the natural feature, Source: Author.

PA-08

4.2.2.23.Rooftop Park Bulwark Sint Jan

2015
‘s-Hertogenbosch, Netherlands
Rooftop Pocket Park
700 m²

Designer:
OSLO
Berlicum, Netherlands

Design Narrative - The park is located at the edge of the city’s river Dommel. Its location has historical importance and is part of the story of the city.
Bulwark Sint Jan on the Dommel was one of the entrances to the historic fortified town, and it was demolished in order to have the river water drained faster. Later, a subterranean museum that exhibits remnants found in this site, was built, and the walls of the bulwark were partly raised again, providing the surface on which this park takes place (OSLO, 2015). This rooftop park provides views to the Dommel. The design takes inspiration from “ice floes” (Land8, 2015).

Analytical Study

- **Design Interpretation -** The design uses paving tiles that *abstracts* “ice floes”, with their random placement and refined, sharp angles. The interpretation is composed of geometric polygonal concrete tiles, with the exact same unit laid within a solid gravel carpet, that contribute to irrigation of the plants. Although the tiles are unified, unlike the random variant polygons of ice floes, the interpretation is readable.
  The sharp angels of the tiles and the flexibility in their arrangement help deal with the sharp angles of the building itself and allow the design to easily fit the layout of the site. The pattern

forms a distinctive carpet on which other design elements flow, such as a communal table, the planting beds contained by wooden planks and the wooden benches.
The design's inspiration is a natural feature known to the region as the Netherlands' location is by the North Sea, and the reference to the water environment also speaks to the residents of 's-Hertogenbosch, considering the city's special relation to water and its canal system.

Figure 98: The carpet of floating concrete tiles compared to the pattern of ice floes in the ocean, Source: (Left- Niels van Empel, Right- alamy ID: BX5W8M) modified by author.

Natural Feature - An *Ice Floe* is a large pack of floating ice defined as a flat piece at 10s of meters across at its widest point, and up to several kilometers across (Thomas, 216). Several ice floes compose a field of sea ice called drift ice. They may cause ice jams on freshwater rivers.

- **Digital Tools –** The cracking pattern of ice floes is a phenomenon that the residents of cities in the Netherlands are familiar with, and they have had the chance to view it over the cold winters. Attributes, like the randomness of the distribution of the polygonal shapes and their sizes, are best recognized through mediums that provide a top view of the phenomenon.
- **Promoted Values -** The project's interpretation is simple and 2-dimensional and yet integrates sustainable solutions in its design regarding the drainage and irrigation systems. Its application on the entire area of the site assigns the space with a unified, unique image with references that speak to the collective memory of the users.

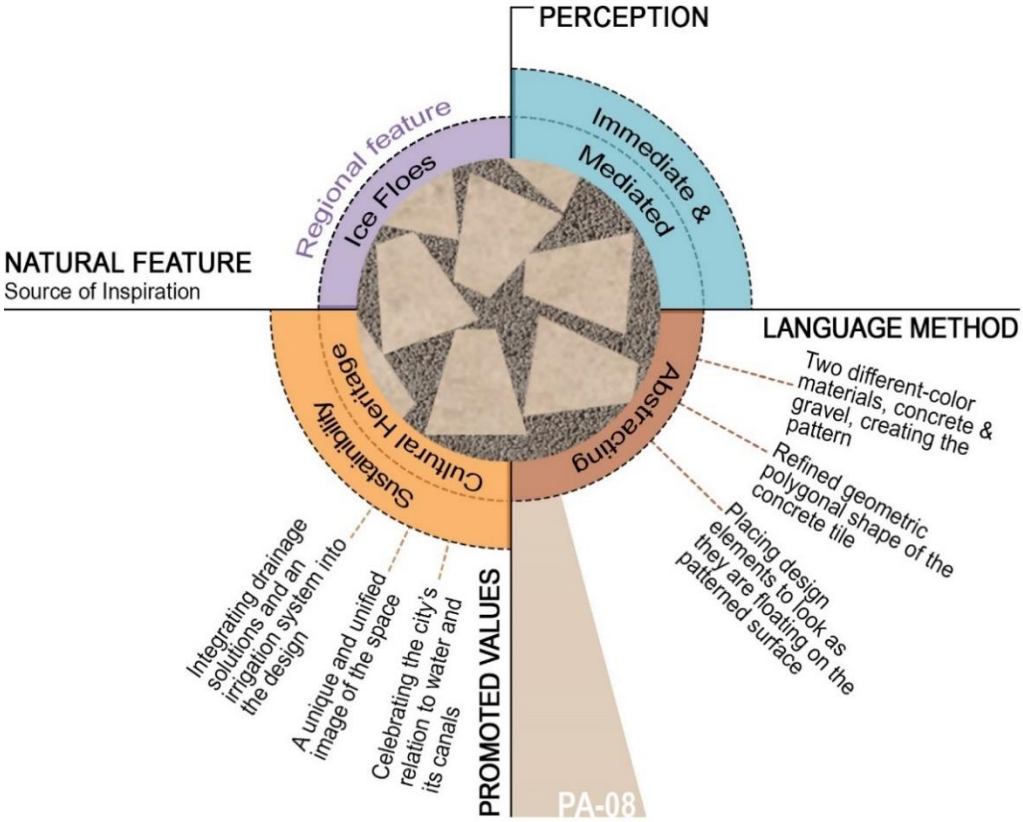


Figure 99: Summary of project PA-08 analysis focusing on the interpretation of the natural feature, Source: Author.

PA-09

4.2.2.24.Landsea Group-Peak in Cloud

2017
Shanghai, China
Urban Park
8.352 m²

Designer:
Belt Collins International
Hong Kong, China

Design Narrative – The urban landscape is located in Changfeng core commercial area in Shanghai. It was designed to be compatible with the developing features in this area and the Landsea Group Ltd.'s green industry objective. The project's design concept takes inspiration from the running water of a "stream" (Credaward, 2021).
The design of the urban park displays an artistic style with unique features that raise the overall quality of the space.

Analytical Study

- **Design Interpretation -** The design *abstracts* the running water of the "stream" into lines and different tones of grey paving materials, creating an undulating pattern that leads people into the site.
  Similar to the behavior of the water in the stream when faced with barriers or stones along its course, the lines meander around the design elements, blending them smoothly into the pattern.
  The water features, sculptures and vegetation zones are all integrated into this carpet-like pattern with organic shapes and interwoven continuous lines.
  The pattern is applied to the entire area of the site and plays a role in orienting movement and defining the different zones in the park. It leads the visitors to an eye-catcher located deep in the park: a white pergola designed to appear as light as a butterfly, providing an artistic sculpture and a shaded place for people to gather and socialize.
  The design team does not refer to a specific stream or a river as the source of inspiration for this concept. The stream can be considered a general natural feature that is not related to the site's context, recognized for its generally known attributes, even though it is not unusual for the Chinese landscape designs to express a strong connection to water and having the Chinese Imperial gardens with their exceptional interpretations of water landscapes.

Figure 100: The undulating pattern curving around water features compared to the river stream curving around a small island, Source: (Left- credaward.com, Right- Pensamento Verde) modified by author.

Natural Feature - A *stream* is a continuous body of surface water flowing within the bed and banks of a channel (Langbein & Iseri, 1983). According to its size, characteristics and location, the stream can be categorized into different types. For example, a large stream is usually called a river, whereas a smaller, more intermittent stream is called a brook or a creek.

- **Digital Tools –** The meandering pattern of a stream can be viewed from a high vantage point, depending on the scale of the water body. Its attributes are best recognized through mediums such as satellite images or LIDAR images, which can detect the history of the meander and how it changed courses over the years as well.
- **Promoted Values -** The park displays an artistic design that combines nature with art and creates a unique visual image for this open space.
  Through instrumenting the design elements with the pattern and thoughtfully placing sculptures, the spatial experience ascends, leading to a spectacular sculpture. The park promotes an aesthetic value and provides its visitors with a unique experience.

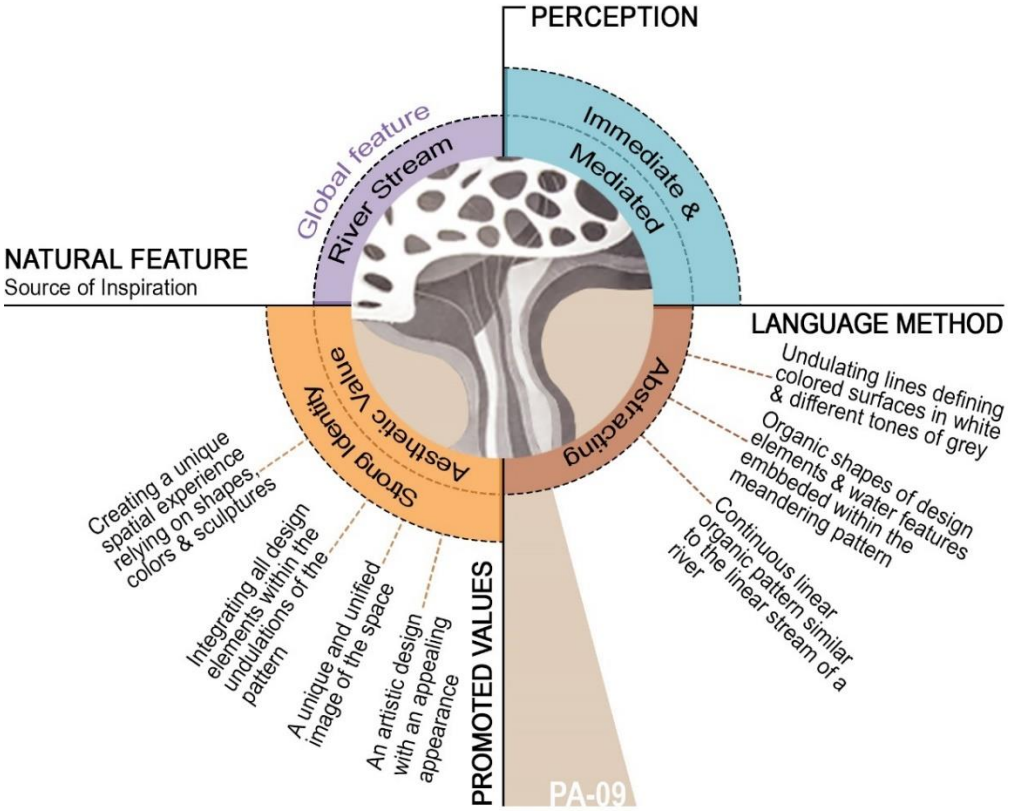


Figure 101: Summary of project PA-09 analysis focusing on the interpretation of the natural feature, Source: Author.

PA-10

4.2.2.25.Foot of Lonsdale Plaza

2018
North Vancouver, Canada
Public Plaza, Waterfront
approx. 2.500 m² (measured with google earth)

Designer:
Hapa Collaborative
Vancouver, Canada

Design Narrative - The project lies at the foot of North Vancouver's main street, Lonsdale Avenue, and right at the waterfront of the city.
The site was transformed from a leftovers landscape of dwindling industrial waterfront and parking lot into a public plaza designed in an approach with great attention to placemaking (HAPA, 2018). The plaza is framed with contrasted surrounding: the elegant modern Polygon Gallery, a heritage warehouse that serves as a restaurant, the stretch of Lonsdale Avenue, and the opposite skyline of

Vancouver, all presenting the perfect framework for a lively public space. The design takes inspiration from the surroundings and the local environment (HAPA, 2018).

Analytical Study

- **Design Interpretation -** The design takes inspiration from water-related natural features. The two main design elements are a large interactive water feature and a 50-meter-long mega bench, both referring to the movement of "waves".
  The interpretation of two over-scaled elements with a reference to the local environment, speaks of a sensitive approach that capitalizes on the site's context and its surroundings, while giving its own dynamic character.
  The interpretation takes advantage of the site's natural slope, creating a thin membrane of water that flows calmly over a serrated textured stone surface, creating a soft effect that *emulates* the gentle "shallow water waves". Granite boulders placed as islands interrupting this water plane, offering opportunities to play and hang out.
  The mega bench, structured of red cedar boards, *emulates* an ocean wave through creating similar forms to the crest and trough of a wave, offering an interesting structure for people to sit and hang out, and facilitating the transition between the higher level of the plaza and the walkway along the edge of the water.

Figure 102: The moiré effect of the water feature and the granite boulders compared to a view of the thin water plane and the rocks in the nearby Vancouver Island, Source: (Left- Hapa Collaborative, Right- North Island Kayak) modified by author.

Natural Feature - A *Wave*, or wind-generated water wave, is a regular oscillation that occurs on the free surface of bodies of water as a result of the wind blowing over the water's surface. Wind waves can range in size from small ripples to waves over 30m high, being limited by wind speed, duration, fetch, and depth (Thomas, 2016).

- **Digital Tools –** As the design takes inspiration from natural features that can be found in the local environment, the design team, which is located in Vancouver as well, may view and perceive the natural features immediately, however the 3-dimensional emulation of a wave requires a further study of the dynamics creating the crests and troughs of the wave, and thus, mediating tools and technologies can be used to facilitate the process.

- **Promoted Values** - The unconventional forms of the design elements encourage people to occupy the site in their own ways. The organic bench can be seen as a seating element, a children play element, or an artistic sculpture with a reference to the local environment, encouraging the creativity of the users and contributing to the popularity of the plaza.

Professional and Public Opinion – The plaza is a treasured destination, and a testament to what a well-considered design can do to create and energize a public space (HAPA, 2018).
The project won the National CSLA Award for Excellence in 2019. The project was recognized for instantly becoming a popular destination through its placemaking and innovative design. It was praised for its own uniqueness, boldness, and elegance, and for complementing its vibrant surroundings at the same time.

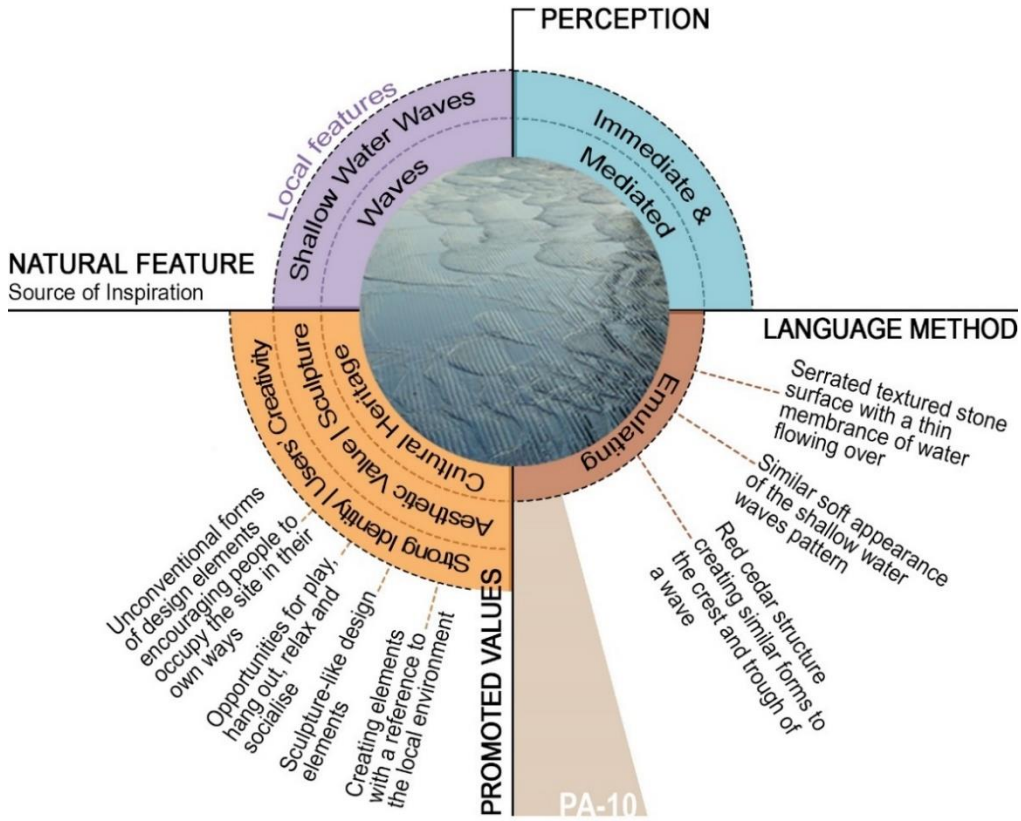


Figure 103: Summary of project PA-10 analysis focusing on the interpretation of the natural feature, Source: Author.

PA-11

4.2.2.26.Skoleparken

2021
Hedehusene, Denmark
School Park
3.750 m²

Designer:
1:1 Landskab
Copenhagen, Denmark

Design Narrative - The Skoleparken is a part of the recreational green loop connecting the new district Nærheden to Hedehusene, that is meant to provide opportunities for recreation, activities and play. The design takes inspiration from the "river delta" (1:1 Landskab, 2021). The park, with its untraditional shapes, provides a green passage and a place for hang-outs.

Analytical Study

- **Design Interpretation –** The design *abstracts* the meandering soft forms of a "river delta" to create the geometry of the paved and vegetated areas in the site.
  The interpretation contributes to creating a playful appearance, while the geometry plays a role in defining the desired functions. The main passage is clear and paved with asphalt, and the other parts are designed as grass hills with exercise-friendly rubber traces of a distinct orange color, which divide the surface into niches and zones in different sizes for different functions, like break areas for lunch, exercise spots, playing or hangout areas after school.
  The interpretation of the delta pattern is applied over the entire site in a 3-dimensional form, with hills embedded under the branching pattern and providing enticing exercise spots with steep paths, thus elevating the spatial experience and making it more challenging, and fun.

The plants' selection also contributes to the overall image of the space, with the focus on special selection criteria, such as the color palette. The contrast in color and texture between the vegetated zones and the orange rubber traces accentuates the branching shapes even more.

Figure 104: The soft geometry of the paths in the park compared to the organic branching pattern of the delta, Source: (Left- 1:1Landskab, Right- NASA/JPL-Caltech) modified by author.

Natural Feature - A *River Delta* is a landform shaped like a triangle. It is an accumulation of river-derived sediment deposited at the coast as the river enters slower-moving or stagnant water; an ocean, sea or a lake (Thomas, 2016). The triangular shape of the delta displays a branching pattern with soft shapes and geometry.

- **Digital Tools –** As the design team does not refer to a certain river delta as the source of inspiration, the study of the shapes and branches of a river delta can be done through satellite images and aerial photos, through which a clear top view of the phenomenon is provided.
- **Promoted Values -** The design interprets the fragmented surface of the delta channels as green hills packed with trees and tall grass, promoting biodiversity, and being a part of a bigger green loop connecting the town with its surroundings increases the project's green credentials. The design creates an unconventional school park with more connection to nature and new opportunities for children; it creates an efficient space with a distinctive identity.

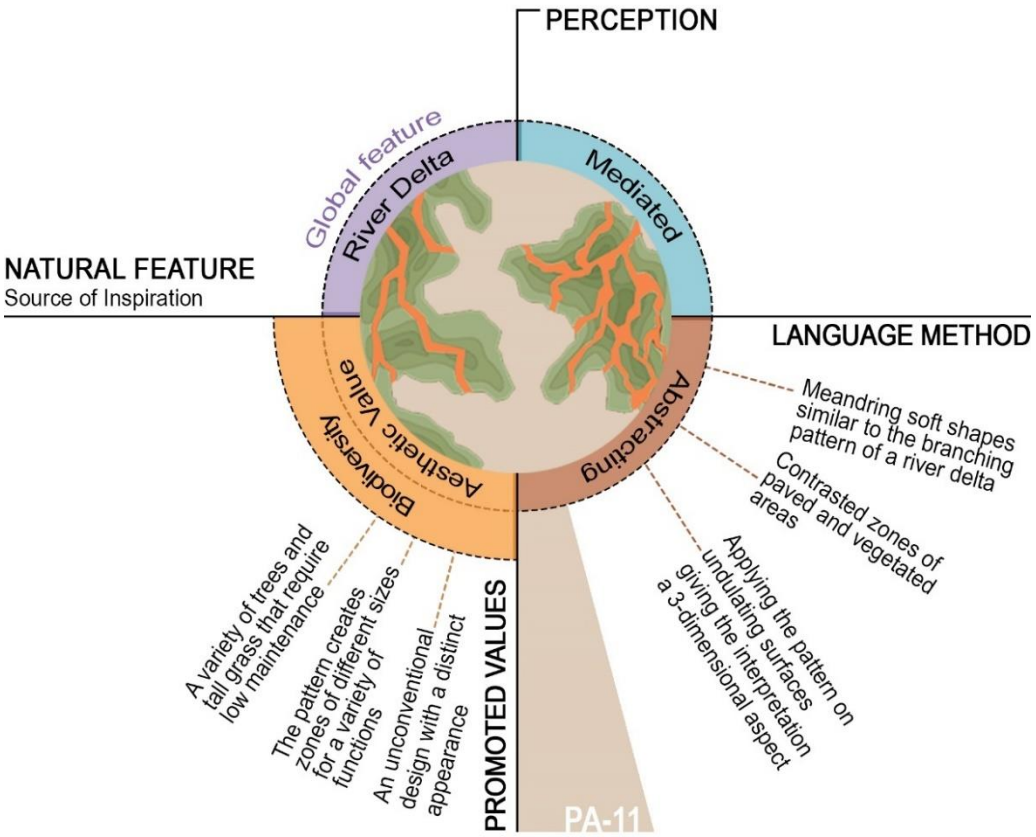


Figure 105: Summary of project PA-11 analysis focusing on the interpretation of the natural feature, Source: Author.

PA-12

4.2.2.27.Henning G. Kruses Plads

2021
Esbjerg, Denmark
Plaza
1.000 m²

Designer:
BIG
Copenhagen, Denmark

Design Narrative - The plaza is another cultural landscape project in which the port city of Esbjerg invests to make life more enjoyable for its residents and to create a more lively public realm (BIG, 2021).
The plaza is located right in front of the local concert hall, Musikhuset. It provides an intimate public space with a forest-like dotted distribution of Betula Pendula Birch trees, which blends harmonically with the columns of the adjacent music hall, especially with the light color of their trunks similar to those white columns.
The design draws inspiration from the "sea", combined with a consideration of the existing architecture of the local music center and the music conducted in this hall.

Analytical Study

- **Design Interpretation -** The interpretation creates a *reference* to the city's strong relation to the sea, by placing a cymatic shallow pool at the center of the plaza, which picks up on the music vibrations in the adjacent concert hall or via pre-programmed vibrations. The thin water surface displaying the vibrations reminds of the soft "waves pattern" that can be seen on the surface of a calm sea.
  The dotted grid of trees extended from the grid of the concert hall's columns surrounds this 10 m circular water basin, celebrating the city's relation to the sea, and creating a gathering place for the locals who can sense the performances inside and outside.
  The result is a poetic place that conveys music like waves. A place not only for people to calm and reflect, but also kids can appreciate and interact with.

Figure 106: The circular basin at the centre of the plaza compared to the calm surface of the sea, (Left- BIG, Right- Thomas Vimare) modified by author.

Natural Feature - A *Sea* is a large body of water, a division of the ocean that is enclosed or partly enclosed by land. All seas are saline, and can be categorized into: nearly enclosed seas, partly enclosed seas, and hypersaline lakes (Rutledge et al., 2023). The North Sea is an inland sea that connects to the Atlantic Ocean and the Norwegian Sea.

- **Digital Tools –** The soft waves of a calm sea surface can be viewed immediately and clearly in certain weather conditions; however, as the pattern is generated according to music vibrations, a deeper study must be conducted to produce the required visual result, a process that can be facilitated through the aid of digital technologies.
- **Promoted Values -** The location of the Esbjerg near the sea has shaped the city's history and its development, starting with the opening of its port for navigation in 1874, until today being

the fifth largest city in Denmark and a gateway to many green energy projects in the North Sea (LANDEZINE, 12.2021). The reference to the sea with a central feature in the plaza that create a calm atmosphere and gathers people promotes a cultural value and is an expression of appreciation of the city's maritime history, which speaks to the collective memory of the residents and contributes to strengthening the identity of the place.

The design's approach respects the existing built structure and utilizes it to creates a space that blends with its surroundings. It also pays great attention to details and finishes and uses customized urban furniture to achieve an overall harmonious image of the space.

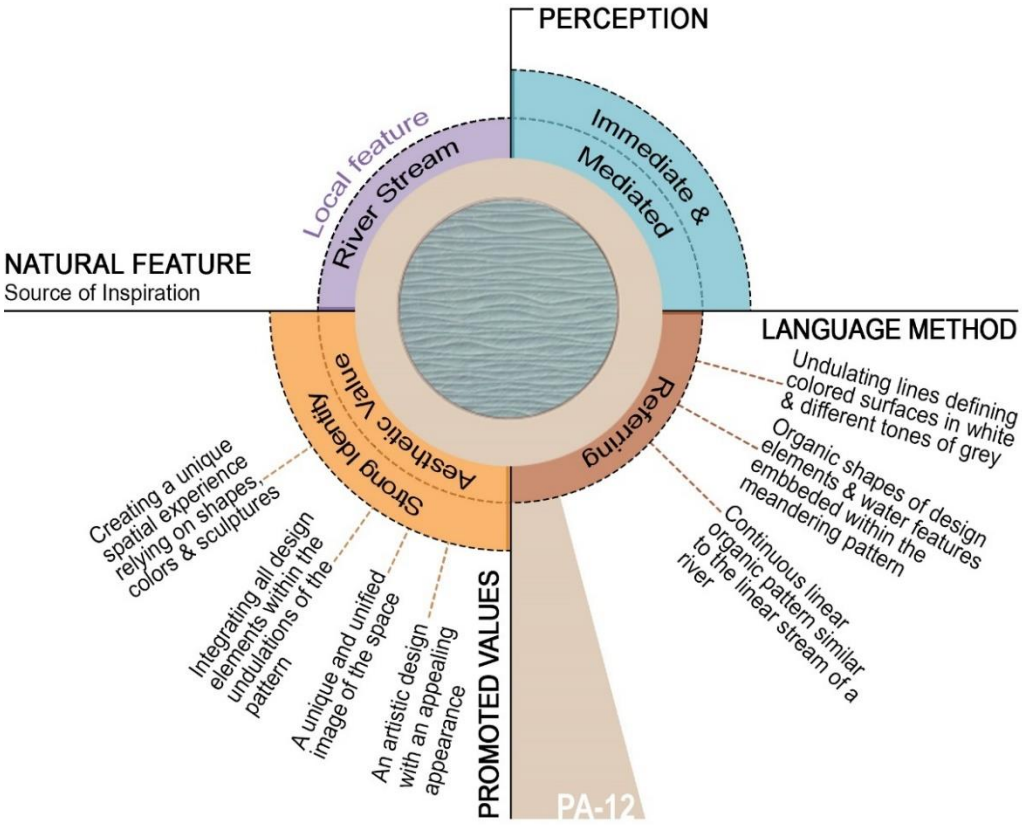


Figure 107: Summary of project PA-12 analysis focusing on the interpretation of the natural feature, Source: Author.

Lan-01

4.2.2.28.LaLaport Toyosu

2006
Tokyo, Japan
Urban Dock
67.499 m²

Designer:
Earthscape
Tokyo, Japan

Design Narrative – The project transforms two old docks in a site, that used to be a shipyard, into a park and a public plaza that hosts a variety of uses.

The vision of the design aimed to create a space that promotes opportunities for discoveries, to consider and highlight the symbolic background of the old shipyards and the view of Tokyo Bay, and to provide a contemporary space for the city of Toyosu. The design concept depicts the entire landscape as an "ocean", and people who travel through the area as voyagers (EARTHSCAPE, 2006).

Analytical Study

- **Design Interpretation -** The inspiration is drawn from the site itself, being on the shore of Tokyo Bay that is connected to the North Pacific Ocean.
  The interpretation of the ocean scape *abstracts* its waves with three different sets of vocabulary; three refined waves of green, water, and earth divide the space into three areas with different characters, all contributing to creating the experience of freely navigating through the undulations of the surface and encountering new discoveries.
  Throughout the wavy surface, one can encounter a café, a radio station and a museum scattered resembling "islands", and white benches that abstract the "foam and coral" found in the ocean.
  The 3-dimensional extensive interpretation of the waves with undulating ground provides a spontaneous playful space with a changing topography, regarded as a platform for experiences, that encourages creative interactions with people and provides a space for children to play without having to provide traditional play equipment.
  The history of the site is highlighted with design elements that evoke the memories of the old shipyard, and with sitting areas that allow people to appreciate the view of Tokyo Bay.

Figure 108: The wavy surface of the dock compared to natural waves of the ocean, Source: (Left- Earthscape, Right- freepik) modified by author.

Natural Feature - An *Ocean* is a body of saltwater that is contained in enormous basins on Earth's surface. The *North Pacific Ocean* extends from 60º S parallel in the south to the Arctic in the north, and lies between the continents of Asia, Australia, North America and South America. It is the largest of the three major oceans, occupying about one third of the globe (Morgan, 2025).

- **Digital Tools –** The ocean's surface waves can be viewed immediately from the site; however, a wider view of the ocean's surface can be provided by satellite images and aerial photos, through which one can recognize more attributes of the shapes and form of the waves.
  In addition, the field of oceanography, which relies nowadays on advanced technologies, can provide rich data that explains the generating process, forms, and types of surface and tidal waves.

- **Promoted Values -** The project celebrates the history of the site and the importance of the natural setting in which the site is located, with its connection to the water and the views of Tokyo Bay.
  It strengthens people's connection to water and provides a space with a unique identity and aesthetics that motivates people to explore and experience refreshing, surprising events during the course of their day.

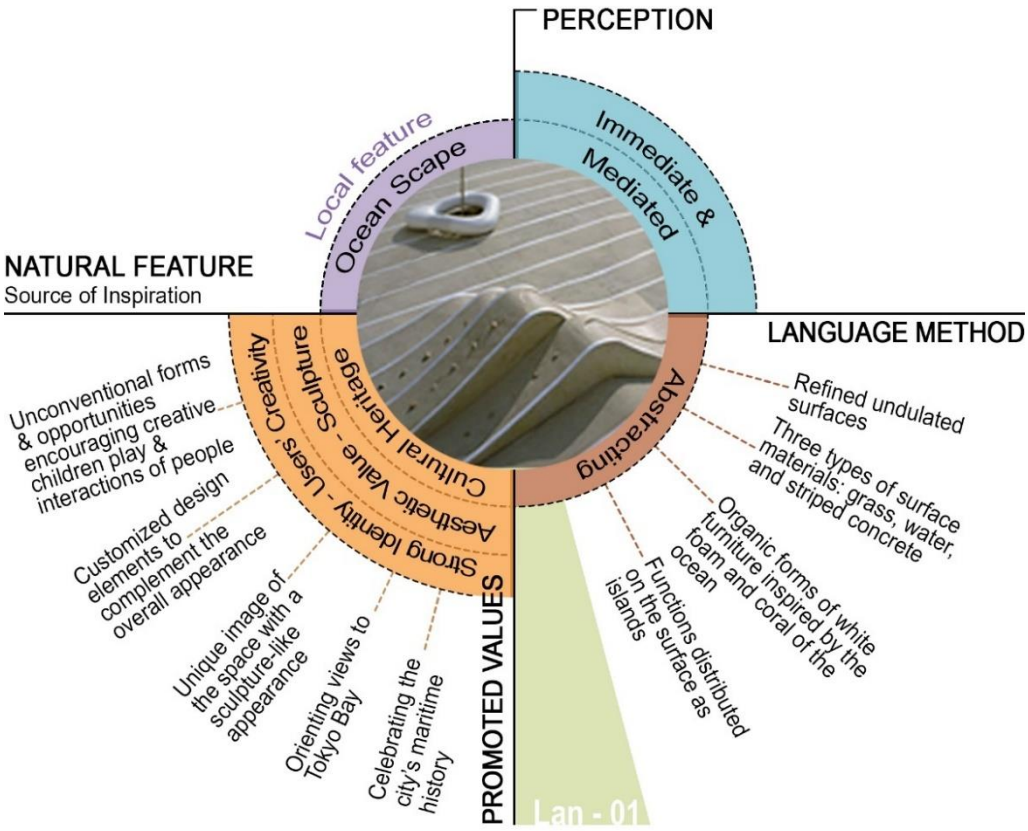
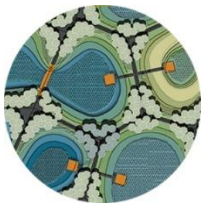


Figure 109: Summary of project Lan-01 analysis focusing on the interpretation of the natural feature, Source: Author.



Lan-02

4.2.2.29. Tianjin Qiaoyuan Park

2008
Tianjin, China
Urban Park
220.000 m²

Designer:
Turenscape Design Institute
Beijing, China

Design Narrative - The project transforms a heavily polluted degraded site, a former deserted shooting range that has been used as a garbage dump, into an urban park.
The design aimed to create a low-maintenance park that provides several nature's services for the city; a sustainable storm water system, improving the soil alkalinity, improving environmental education, and creating an aesthetic experience. The design takes inspiration from the adaptive vegetation communities that dotted the landscape in the region, which was once rich in "wetlands and marshes" (TURENSCAPE, 2009).

Analytical Study

- **Design Interpretation –** The design *imitates* "wetlands and marshes" by developing a solution called the Adaptation Palette, which is designed to let the nature work.
  The regenerative design approach responded to the circumstances of the site, as the saline-alkali soil didn't support growing trees, which made the interpretation of the ground cover and wetland vegetation a suitable solution. Pond cavities of different sizes were created, some of

which turn into wetlands or water ponds according to the precipitation levels, and some remain as dry cavities.

Regenerating a landscape of wetlands by creating cavities, initiating natural processes and letting nature take its course is a very close interpretation of what a copy of a natural feature would look like. It *imitates* the dotted ground pattern with mixed plants and native species, allowing natural processes to continue the evolution of the landscape.

Built elements facilitate the circulation flows and functions throughout the park, such as the red-colored asphalt strolling paths that weave between the cavities or the wooden platforms that provide people with sitting areas closer to the vegetation. To elevate the experience, an information system describing the native plants and the natural processes is installed along the paths.

Figure 110: The adaptation palette patches compared to dotted vegetation common in the region, Source: Turenscape, modified by author.

Natural Feature - A *wetland* is a distinct ecosystem that is flooded or saturated in water, whether permanently or seasonally. It is considered among the most biologically diverse ecosystems, serving as home to a wide range of plant and animal species. A *Marsh* is a wetland dominated by emergent vegetation like reeds, and sedges (Thomas, 2016).

- **Digital Tools –** The design draws inspiration from a landscape habitat, that is known to the region, and has many components, such as the pattern, the vegetation, and the generative natural processes. Recognizing the attributes of each component can be facilitated through digital technologies that can provide visual and numerical data and allow combining them.
- **Promoted Values -** The project promotes an aesthetic value celebrating nature's messiness and continuous evolution. It also promotes sustainability with its reuse of the old railroad ties in constructing its observation platform and bridges and its storm water system. Furthermore, the project provides educational opportunities and improves ecological awareness. Its ecological benefits, such as increasing numbers of plant species and animals, improving water and soil quality, and reducing noise levels, allow improving the life quality of the city.

Professional and Public Opinion – The project won the WAF[22] Awarad in 2009, and the ASLA Honor Awarad in 2010, which evaluated its performance after two years of construction, and recognized its success in producing a place for people, through the simple pattern, which not only created a deliberately "messy" native landscape, but also a visual appeal. According to ASLA, during the first few months after the park was open for the public, 200.000 people visited the park, and thanks to the separate walkways, the delicate landscape was preserved with low maintenance. In addition, according to surveys and measurements of Landscape Performance Series[23]: the project registers high credentials on ecological, social, and economical levels.

[22] World Architecture Festival WAF is an international awards competition dedicated to celebrating and sharing architectural excellence from across the globe.

[23] **Landscape Performance Series** is an online set of resources that measures the effectiveness of landscape solutions. It involves assessment of progress toward environmental, social, and economic goals based on measurable outcomes.

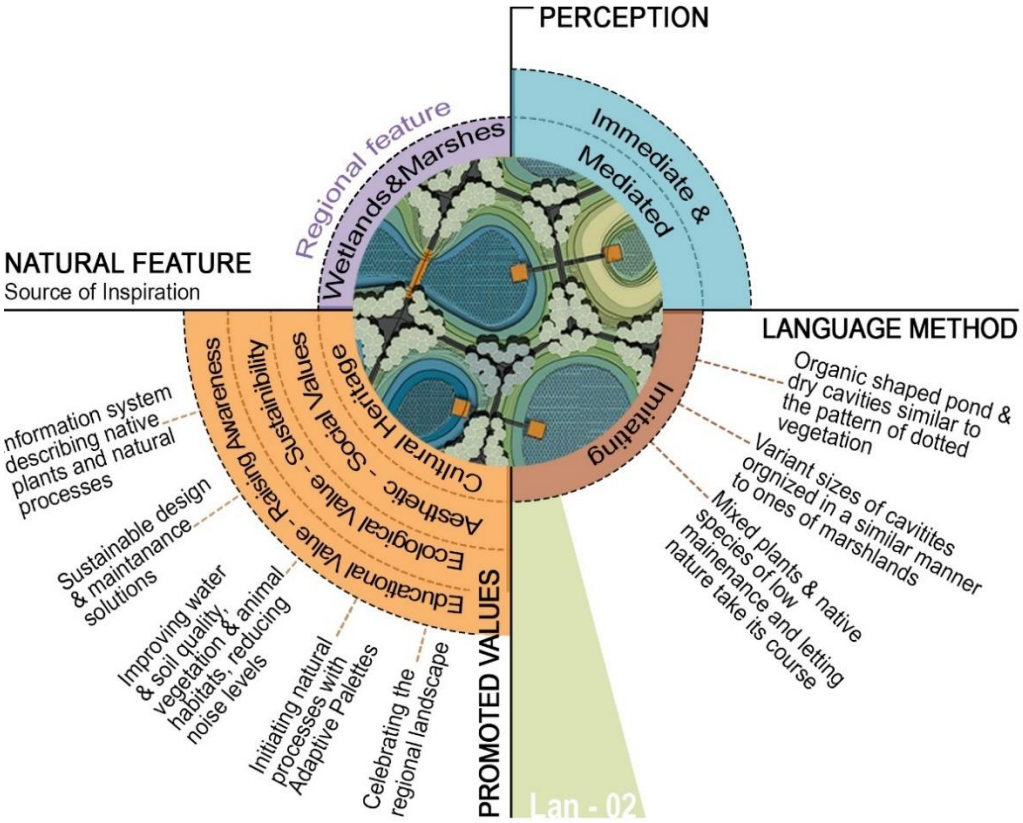


Figure 111: Summary of project Lan-02 analysis focusing on the interpretation of the natural feature, Source: Author.

Lan-03

4.2.2.30.Railway Cover Theresienhöhe

2010
Munich, Germany
Urban Park
16.800 m²

Designer:
TOPOTEK 1
Berlin, Germany

Design Narrative - The project is located in the former grounds of the Munich fair that was transformed into a new urban district.
It was meant to develop a bridge structure in this district that dates back to the 1980s, which is a reinforced concrete slab of 300x50 meters above the railway tracks, and transform the top of the bridge into an urban park for play and recreation. The design combines several landscapes in the region together to form the German dream view according to Tucholsky's "Das Ideal", which is the vision of the Alps in the background and the sea in the foreground (Topotek 1, 2010).

Analytical Study

- **Design Interpretation -** The design concept draws inspiration from the journey of the trains passing underneath the bridge that stretches from the "North Sea to the Alps", joining two very different landscapes together.
  As the structure of the site imposes limitations in relation to the possible type of vegetation and the bearing load of materials, the design had to choose a compatible approach to present its interpretation using lightweight and quasi-hollow sculptural elements.

The design *abstracts* the landscape of mountains and shore in green and beige, that is, sandy beaches on one side and grassy hills with grazing animals (also abstracted as pommel horses) on the other.

The artificial dunes are designed with a rubber material in refined organic shapes and flat surfaces. The playing elements were designed to fit the artistic vision as well, with climbing structures and small trampolines sunk in the beige rubber flooring.

A heavier element of concrete is positioned over the bridge's supporting pillars, serving as a sitting element in a good distance from the active space and creating a frame surrounding the grass area and the sand sculpture. Its vibrant orange color and position make it the perfect framing to the artistic scene.

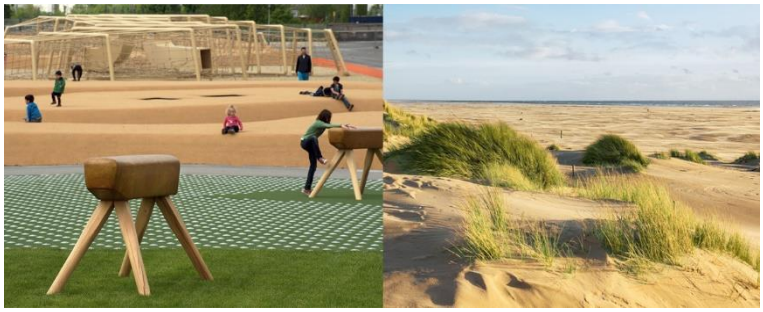


Figure 112: The beige sculpture compared to the sand dunes on the shoreline of the North Sea, Source: (Left- TOPOTEK 1, Right- Rico K) modified by author.

Natural Feature - The *Alps* are the highest and most extensive mountain range that is entirely in Europe. They are divided into Western, Central and Eastern segments, each of which consists of several distinct ranges. Shoreline *Dunes* are formed by aeolian processes and made up of large-scale sand deposition (Jackson, 1997).

- **Digital Tools –** With the design team being based in Germany, immediate perception of some of the natural features can be experienced; however, exploring the elements of regional landscapes extending on vast areas requires a deeper study.

  Satellite images of sand dunes, aerial photos of hilly areas, elevation maps of mountainous areas, data of vegetation types and character, etc., are all mediators that can be utilized in the design process.

- **Promoted Values -** The interpretation promotes cultural and artistic values. The combination of the ideal landscapes of the region evokes the emotions of people and gives the space a significant status.

  The project with its distinguishable shapes, materials and colors transforms the site successfully into an interactive sculpture, and the abstract and obvious artificial interpretation gives the space a distinct character that engages the imagination of the viewer.

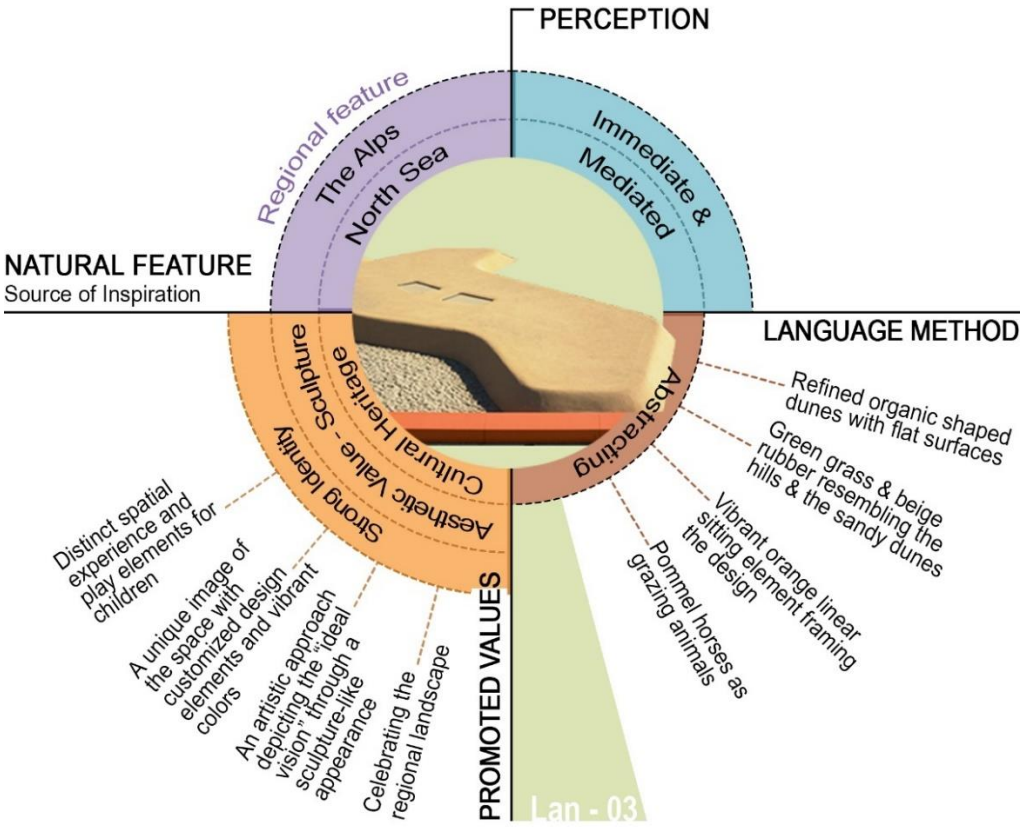


Figure 113: Summary of project Lan-03 analysis focusing on the interpretation of the natural feature, Source: Author.

Lan-04

4.2.2.31.BSU Hamburg

2013
Hamburg, Germany
Roof Gardens
23.000 m²

Designer:
Landschaftsarchitektur Plus (L+)
Hamburg, Germany

Design Narrative – The project deals with the open spaces of the building of the department of urban development and environment in Hamburg and its surrounding landscapes. The project site lies on Wilhelmsburg river island, which is surrounded by Northern and Southern Elbe River and was the focus of a comprehensive urban development plan to increase the appeal of the area and reconnect it to the rest of the city.
Six different exterior spaces complement the building: a courtyard garden above the underground parking, elm avenue, schoolyard, arrival areas, garden terraces and extensive greening on the roofs of the building. Approximately half of the outside surfaces are located on built-over areas as extensive and intensive vegetation. The design takes inspiration from the historical and contemporary "landscapes of Hamburg and Northern Germany" (LANDEZINE, 01.2021).

Analytical Study

- **Design Interpretation -** The design of the courtyard garden interprets a grassy landscape *emulating* the character and pathways of a "tideway landscape", as seen close to the BSU in the national park Heuckenlock located in the south of Wilhelmsburg.

The garden terraces *abstract* the "marsh landscape" of Northern Germany, with refined geometric zones of pavement and vegetation, interpreting the branching water surfaces as straight linear stripes of pavement. The Pine trees are bizarrely shaped by the forces of wind, *alluding* to the trees typically seen at "Northern Germany coasts".

All external spaces are designed according to the concept of interpreting a local or regional landscape by emulation and subtle gestures that remind the viewer of a certain element in the landscape. The application of this concept to the entire area of the space creates a naturalistic image and an interesting combination with colorful facades of the building.

Figure 114: The grass landscape interpretation in the courtyard garden compared to vegetation in nature reserve Heuckenlock.Source: (Left- L+, Right- wikimedia.org) modified by author.

Natural Feature – a *Tidal Wetlands* are flat, vegetated areas that are subject to regular flooding by the tides. The most familiar form of tidal wetlands is the salt marsh, characterized by plants such as Spartina alterniflora, and Distichlis spicata (Thomas, 2016). The Heuckenlock nature reserve is a freshwater floodplain habitat that is unique in Europe. It is located in the river splitting area of the Elbe, an important remaining area of a tidal floodplain landscape.

- **Digital Tools –** The project draws inspiration from nearby landscapes and interprets them in a language that is subtle, which requires an immediate perception of the natural feature in order to develop this kind of sensitive perception and recognition of the phenomenon. Mediation through platforms like Google Earth or through photographs in perceiving other features, such as the pattern of marshlands, or how grassy landscapes appear with seasonal change, can facilitate the process of recognizing the attributes of the natural feature.
- **Promoted Values -** The interpretation of local and regional landscapes that evoke the memory of the users promotes a cultural value and presents a collection of external spaces that together create a space with a unique poetic image.

Professional and Public Opinion – The landscaping of the external spaces of the project, combined with the design of the building itself, meet the guidelines for the gold certificate for sustainable construction from Deutsche Gesellschaft für Nachhaltiges Bauen[24] (LANDEZINE, 01.2021).

[24] The German Sustainable Building Council (DGNB) is a globally recognized organization that has developed a comprehensive certification system to make sustainable construction practically applicable, measurable, and comparable. This system is considered a "global benchmark for sustainability".

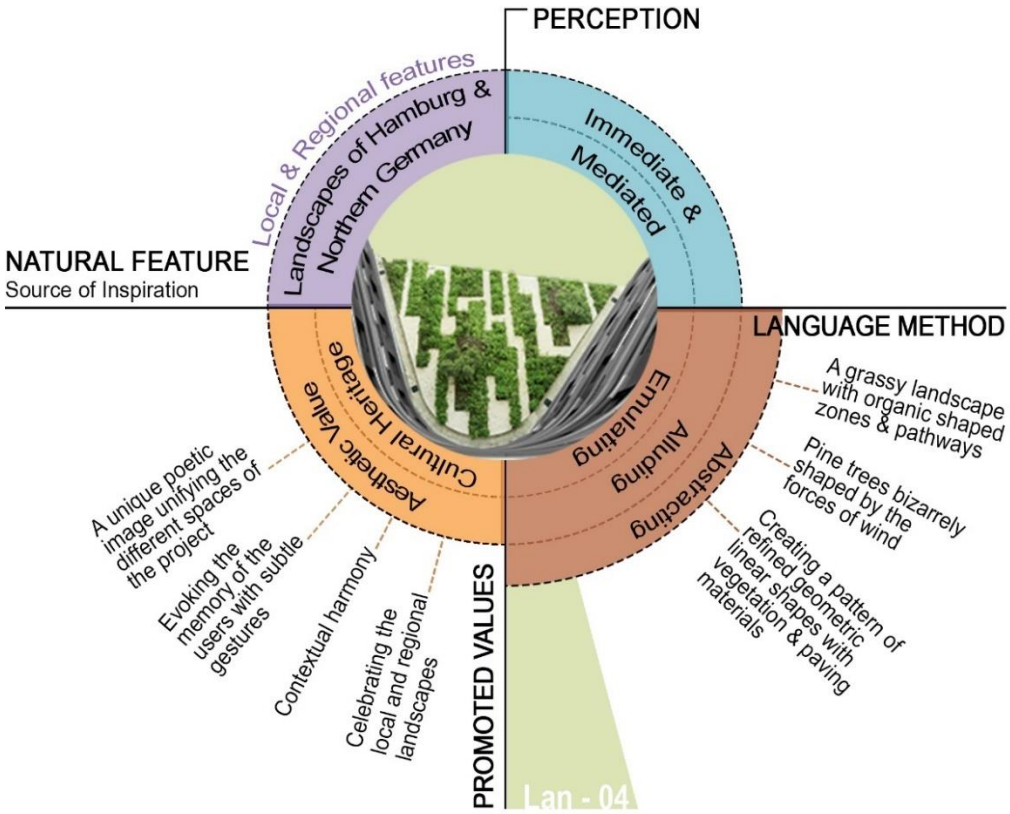
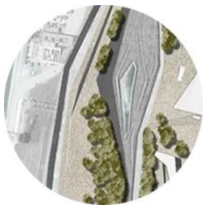


Figure 115: Summary of project Lan-04 analysis focusing on the interpretation of the natural feature, Source: Author.



Lan-05

4.2.2.32.European Central Bank Premises (see Appendix C for more details)

2013

Frankfurt, Germany

Corporate - Public Park

120.000 m²

Designer:

VOGT

Berlin, Germany

Design Narrative - The project is designed as a landscape surrounding the new headquarters of the European Central Bank, located at an area where the banks of the Main River meet the large open space of the greenbelt of Frankfurt, which required a design that is scaled to the landscape. The design is an interpretation of a "floodplain" (VOGT, 2013).

Analytical Study

- **Design Interpretation –** The design takes its que from the river, the most powerful feature of the site, and incorporates the existing topography of the floodplain as the main design concept, with elements like the cutbanks, the point bars, the oxbow lakes and residual water.
  The interpretation of these elements *emulates* their smooth forms and flowy appearance in a more refined way, creating a dry riverbed with small areas of water to appear like islands, which acts as surprising elements that catch the attention of the viewer.
  Vegetation combines the local floodplain trees with wetland species from North America that were brought by the wind or the river. The poetic combination results in an ambiguous view between a park and landscape, contributing to this surprising feel of the unexpected.
  Furthermore, in order to fully experience the fluvial landscape, the design attempts to allow

the user to fully experience the riverine world. Unlike the clear and defined paths of parks or urban spaces, this park does not have traditional defined paths, leaving the user in charge of creating his experience in exploring the park and allowing for variant possibilities.

Figure 116: The dry river bed terraces and undulating forms compared to the undulations in a floodplain, Source: (Left- Florian Holzherr, Right- National Geographic/Paul Nicklen) modified by author.

Natural Feature - A *Floodplain* is a relatively flat surface adjacent to a stream. Floodplains stretch from the banks of a river channel to the base of the enclosing valley and experience flooding during periods of high discharge (Thomas, 2016). Geomorphic features of floodplains include: natural levees, oxbows, point bars and terraces.

- **Digital Tools –** As the design concept is inspired by the site itself, immediate perception of the river and its adjacent surfaces is the main way in recognizing the attribute of the natural feature. However, as floodplains can stretch over vast areas and many geomorphic features can be detected along the stream, using platforms that provide digital photos and satellite images of such phenomena can help recognize attributes related to the created pattern.

- **Promoted Values -** The design poetic approach in recreating the existing landscape and highlighting its unique features is achieved using the natural materials and vegetation of this landscape, which promotes an ecological value. It presents a project that effortlessly merges into its surroundings and creates a smooth transition between the built environment and nature.

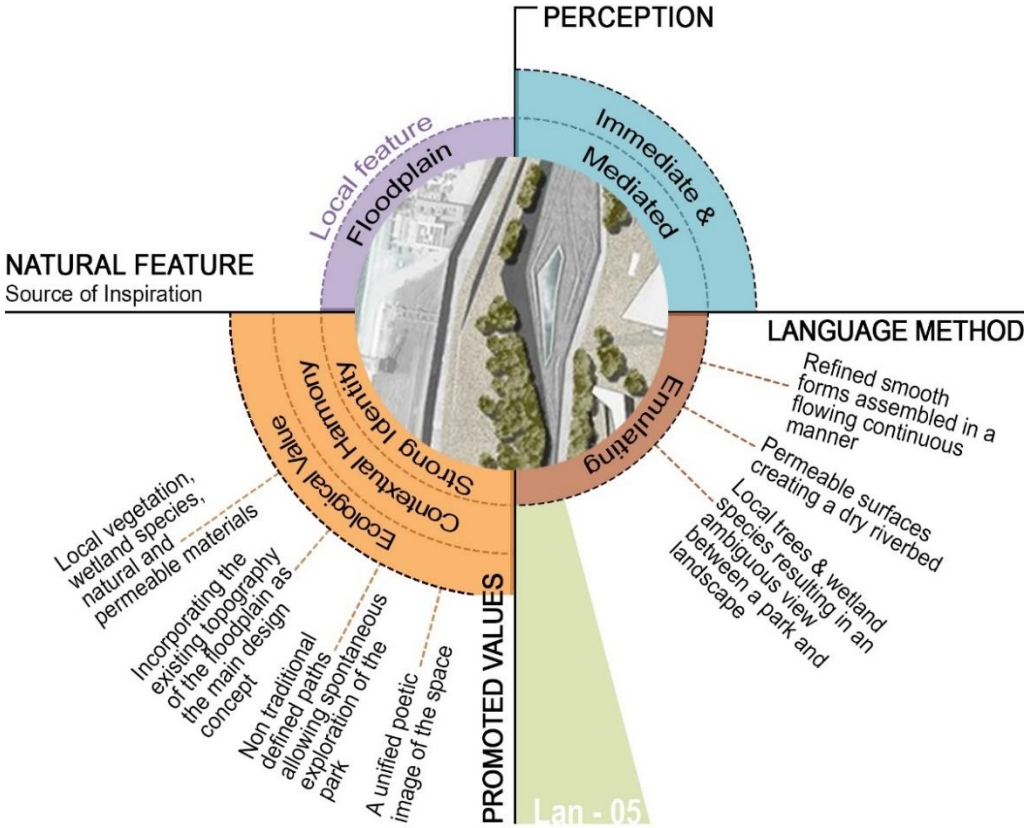


Figure 117: Summary of project Lan-05 analysis focusing on the interpretation of the natural feature, Source: Author.

Lan-06

4.2.2.33.Smith Plaza
2018
Albuquerque, NM, USA
Campus Plaza
approx. 13.355 m²

Designer:
Surfacedesign
San Francisco, CA, USA

Design Narrative - The plaza is located at the heart of the University of New Mexico campus. It is a popular, busy social gathering space for students, staff and the locals. Surrounded by the historic library, Student Union building, and academic halls, the plaza is a vibrant space that accommodates a variety of functions.
The design aimed to bring authenticity to the place along with robust functionality, and it is inspired by the "West Mesa" and nearby plateaus in the Albuquerque area (Surfacedesign, 2024).

Analytical Study

- **Design Interpretation –** The design relies on *emulation*, and *referencing* in communicating the characteristics and elements of the "West Mesa landscape". It creates a lower plaza, *emulating* with its forms and curves the arroyos of the region, which in turn results in higher plateau terraces similar to the forms and almost vertical edges of a mesa. The resulted hierarchy of plateau terraces provides zones for plantation and functions. They also contribute to organizing the spatial structure of the space and the multi-circulation flows.
  The *reference* to the local landscape appears in all aspects of the design, including the choice of materials. The bricks used for the shifting wall surfacing recall the earthen clay character and material recollection of the Albuquerque Basin. In some parts, the brick layers tectonically shift, revealing a stratified profile and calling upon the New Mexico geology. Furthermore, deeply colorful and textural stone aggregates allow stormwater runoff to infiltrate at the plaza edges, reminiscent of a gravel arroyo eroding the plateau. These references contribute to producing a strong identity of a space that is layered with formation and use.

Figure 118: The plateau terraces and the lower plaza compared to the characteristics of an arroyo, Source: (Left- Blake Marvin, Right- wikipedia.org) modified by author.

Natural Feature - A *Mesa* is a tableland; a plateau terminating on one or both sides in a steep cliff. The West Mesa is an elevated landmass lying west of the Rio Grande in Albuquerque. An *Arroyo* is a dry riverbed in a semiarid or desert region and subject to flash flooding during seasonal or irregular rainstorms. It is noted for its gullying effects and rapid rates of erosion (Thomas, 2016).

The design also highlights the culture of New Mexico by using shading elements that display traditional ornamental ironwork and tinwork, while improving the protection from the strong desert sun at the same time. The rolling lawns and the native and adapted plantings also contribute to improving the environmental comfort and creating a calming oasis feel at the heart of campus.

- **Digital Tools –** As the design team is based in a different state from the site, they may not be familiar with or have immediate experience of all elements of the landscape; thus, conducting research to develop a comprehensive understanding of the characteristics of such a desert environment is required. Aiding digital tools displaying imagery combined with data of temperatures, vegetation species, precipitation in relation to green coverage, surface patterns etc., can facilitate the perception process and allow for a more genuine interpretation.
- **Promoted Values -** The interpretation utilizes its elements in a subtle and sensitive approach that results in great compatibility between the design elements and the functionality of the space. It promotes cultural and environmental values, while providing an inclusive design with flexible solutions provided in gestures like the movable furniture that people can adjust to their needs and allow the program of the plaza to be adaptable.

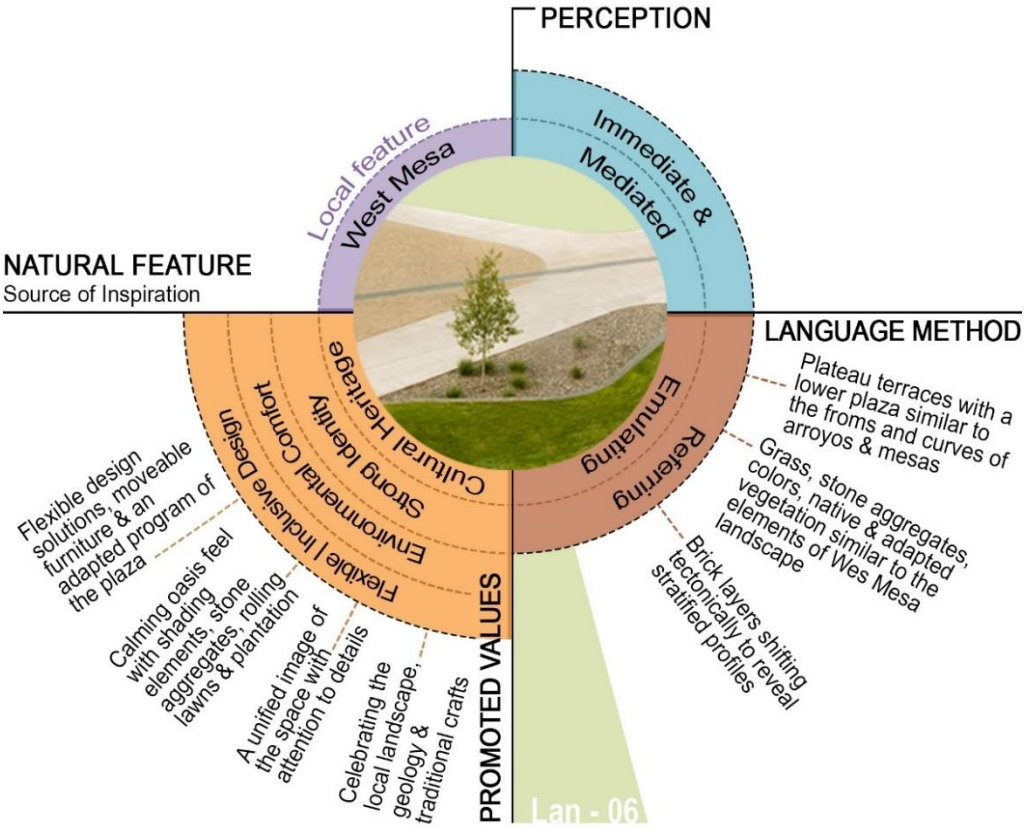


Figure 119: Summary of project Lan-06 analysis focusing on the interpretation of the natural feature, Source: Author.

Lan-07

4.2.2.34.Åvik River Reed Playground

2020
Vantaa, Finland
Playground
approx. 6.500 m² (measured with google earth)

Designer:
LOCI
Helsinki, Finland

Design Narrative - The Åvik project, which is located on a hill and surrounded by dense old trees, is part of a bigger river park developed as an Oasis, and it includes a playground and the rivershore.

The design tells a story of the local nature with a theme titled “Hissesses in the Reed”. The design of the playground interprets the local “Keravanjoki River landscape” and nature, in addition to highlighting the cultural history of Tikkurila (LANDEZINE, 09.2020).

Analytical Study

- **Design Interpretation –** The design features many elements and species of the river landscape, displayed playfully as 3-dimensional formations, patterns and play equipment.
  A main feature is a *miniature copy* of the meander of the adjacent Keravanjoki River, a granite waterplay with the iconic old riverside buildings and bridges that provides an interactive and educational element where kids can experience how water dams function.
  Striped play mounds are an *abstraction* of an endangered species of freshwater mussels that live in the Keravanjoki, which play an important role in the river ecosystem.
  These mounds bring the underwater world to the interpretation of the river landscape as well.
  The steel fence and other play elements are an *abstraction* of reeds, contributing to the experience of playing amid the natural landscape.
  All the design elements provide opportunities for people to view and interact with the water, whether on the wooden platforms, the water seating stair, or the viewing deck.

Figure 120: The miniature copy of the river meander compared to a natural scene of the river, Source: (Left- Pyry Kantonen, Right- damremoval.eu) modified by author.

Natural Feature - The *Keravanjoki River* is a 65 km long river in Finland that starts from Lake Ridasjärvi in Hyvinkää. It is a tributary of the Vantaa River that flows into the Gulf of Finland at Helsinki. A riverine landscape includes the c-ecosystems (all living things; plants and animals) in and around the river area.

- **Digital Tools –** The project lies right next to the source of inspiration, and immediate perception of this riverine landscape is possible. However, producing an exact copy of the river meander requires further assistance through technologies that provide exact measurements on a map, which can be produced combining data from satellite images, mapping systems like SONAR and LIDAR technologies, etc.

- **Promoted Values -** The project promotes cultural values by interpreting a local landscape in a sensitive approach, highlighting the history of the city. In addition to providing opportunities for playing, relaxing, and interacting with water, it plays an educational role by giving information on iconic structures by the river and raising awareness on endangered species.
  The design also promotes an ecological value, as it implements a new technology to handle stormwater. This technology was implemented in the old stormwater pipe that collects stormwater for the city. The system is hidden under the viewing deck; it filters and cleans the water as it reaches the shore.

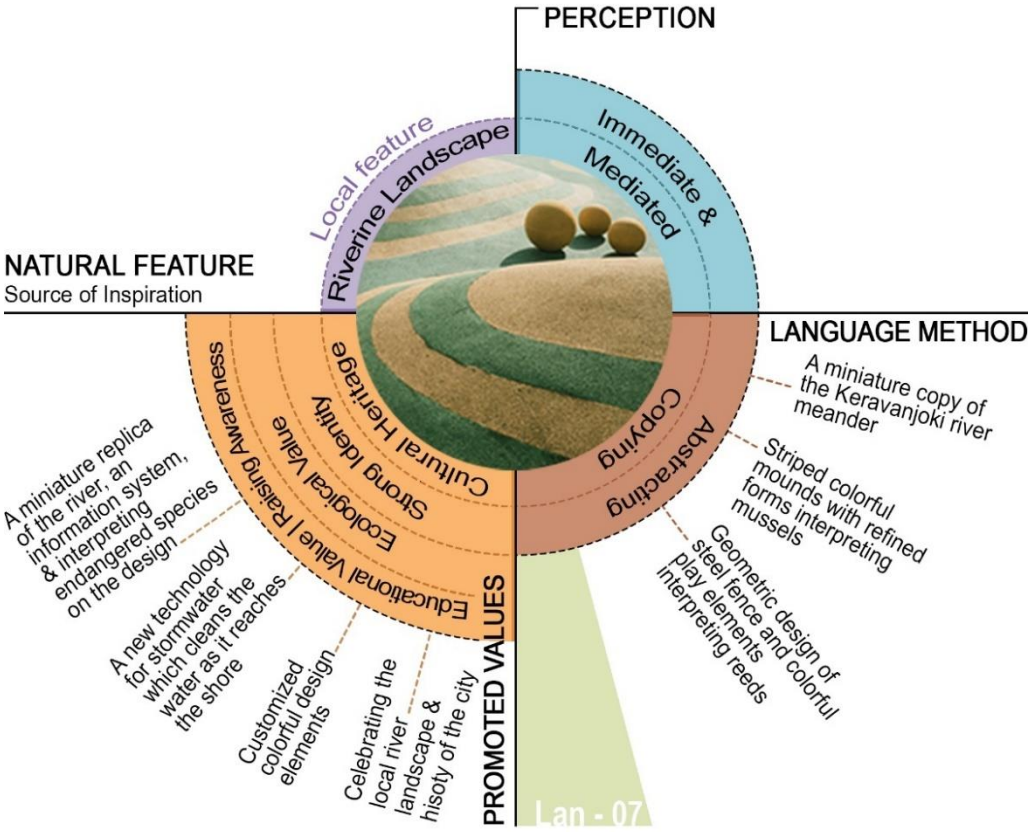


Figure 121: Summary of project Lan-07 analysis focusing on the interpretation of the natural feature, Source: Author.

4.2.3. Comparative Analysis

In Table (2), provided in "Appendix D", the research conducts a comparative analytical study on the 34 projects according to a system that focuses mainly on the aspect of interpreting a natural feature as a source of inspiration. It is designed to define and evaluate the choice of interpreting a natural feature and its influence in different phases of the design process, and to detect the general behavior and tendencies of contemporary designers when adopting this naturalistic approach.
The system is divided into three main categories as follows:

(1) "Significance of the Natural Feature", this category aims to detect the motivation behind choosing the particular natural feature as a source of inspiration, and its relevance to the community of users, which is established by defining aspects like:

- **Locality of the natural feature** (in relation to the location of the site)

  Local: a natural feature found in the town or the city of the site and its surroundings, well known for the locals and contributing to their everyday lifestyle whether by merely being perceived visually or by providing a physical, recreational, or nature experience activities.

  Regional: a natural feature found in the country or in a region that the city of the site is part of, well known to the residents of the city, even though the visual perception or interactions with the feature may be of less occurrence, but it is still part of the collective memory of the residents or have a significant value of some kind.

  Global: a natural feature found on Earth that does not have a direct relation to the location of the site and does not contribute to the lifestyle or the residents of the city. It can be a general natural phenomenon that is generally known to people from around the world.

- **Significant value of the natural feature**

  The natural feature is chosen for promoting a certain value, such as:

  Cultural Value: the natural feature is associated with a significant historical event, or with traditional activities, is valued by the locals, a part of the distinct geological history of the area, preserved as a heritage landscape, etc.

  Aesthetic Value: the natural feature demonstrates appealing attributes that can be found inspirative in the field of design, such as distinct forms, textures, colors, etc.

  Ecological Value: the natural feature is valued as part of an ecosystem, its role in creating a balanced habitat, its positive contribution in supporting life forms, etc.

  National Symbol: the natural feature is associated with the identity of a country, region, or a certain area and is valued by people as a representative of their community.

(2) "Design", This category aims to define the tendencies of the contemporary approach in interpreting the natural feature as a design concept. Starting with how it is perceived by the designer and defining the choices of language method and tools used by the designer to communicate his interpretation. This category is established by defining aspects like:

- **Dependence on digital technologies in perceiving the natural feature**

  Immediate perception: the natural feature is perceived directly by the designer, and it can be encompassed with all its elements within the capacity of human vision.

  Mediated perception: the natural feature is perceived with the aid of mediators. Mediators can provide graphic, numerical, or combined data.

  Both immediate and mediated perception

- **Dependence on digital technologies in creating the design**

  In recent years, advanced technologies in the field of design have provided generative systems that helps create (in whole, or in part) generative designs, using a visual programming language and by building algorithms. The use of such systems and applications can influence the design process and its output.

Completely digitally generated	*Partly digitally generated*	*Only for drawing and visualization*

- **Spatial expression of the natural feature**

  2D shapes and patterns: the natural feature is interpreted as a 2-dimensional surface.

  3D volumes and forms: the natural feature is interpreted as 3-dimensional elements.

  Both 2D and 3D elements

- **Design elements used to express the natural feature**

  Colors, Textures, Cladding materials, Vegetation, Urban furniture, Water features, Built elements – Sculptures, Oriented views, etc.

- **Senses engaged in detecting the natural feature in the design**

The design introduces the natural feature by engaging different human senses. It merely presents forms, shapes and colors to be seen by the user, or it can evoke certain images of nature by providing scented plants, sprinkles of mist, a sound of running water, etc. It can also allow the user to experience the natural feature through physical movement.

Sight	*Touch (tactile experience)*	
Hearing	*Smell*	*Kineasthetic (perceived through movement)*

- **Language used to interpret the natural feature in the design**

  The language method used in each of the 34 projects is defined according to the concluded set in the second and third chapters of the dissertation.

Borrowing	*Copying*	*Imitating*	*Emulating*
Abstracting	*Referring*	*Alluding*	*Symbolizing*

- **Dominance of the natural feature as a design concept and in the site**

  Limited: the natural feature appears only in a limited area in the site or as an element that is part of the design.

  Moderate: appears in different areas and contributes to defining the spatial experience.

  Intensive: appears over the whole site and is the main definer of the space that organizes all design elements.

(3) "Performance", this category decides to what extent the design and the spatial experience are shaped by the natural feature, and how it manifests through tangible elements, or the overall character and experience of the space. It also defines the role of the natural feature in the performance of the project and the aspects that were boosted as a result of this interpretation, which is established by defining aspects like:

- **Contribution of the natural feature in the spatial experience**

Decorative	*Providing opportunities for socializing | activities*
Defining functions | zones	*Creating a unique image*
Organizing movement	*Unifying the visual appearance of the site*
Providing urban furniture	*Experiencing nature in urban environment*
Providing interactive | play elements	*Evoking the collective memory of the users*
Allowing multifunctionality	

- **Aspects promoted as a result of interpreting the natural feature**

Sustainable design	*Contextual harmony*	*Branding - Economical value*
Ecological design - Biodiversity	*Artistic design - Sculpture*	*Climate-adapted design - Environmental comfort*
Inclusive design	*Flexible design*	*Digital innovation*
Strong identity	*Social importance*	*City symbol*
Cultural heritage	*Educational role - Raising awareness*	*Users' creativity*

Chapter 5 – NEW SCIENTIFIC ACHIEVMENTS CONTEMPORARY TENDENCIES

5.1. New Scientific Achievements

In this chapter, the research synthesizes and combines the results of the theoretical and analytical studies of the previous chapters in order to define the character and detect the tendencies of the contemporary style that interprets natural features.

The review of the collection of 64 projects, shows that the naturalistic design approach is becoming a popular one for contemporary designers. Figure (122) demonstrates results from analysing key data of these projects, such as location, year of realization, design studios, and the natural features they take inspiration from, etc.

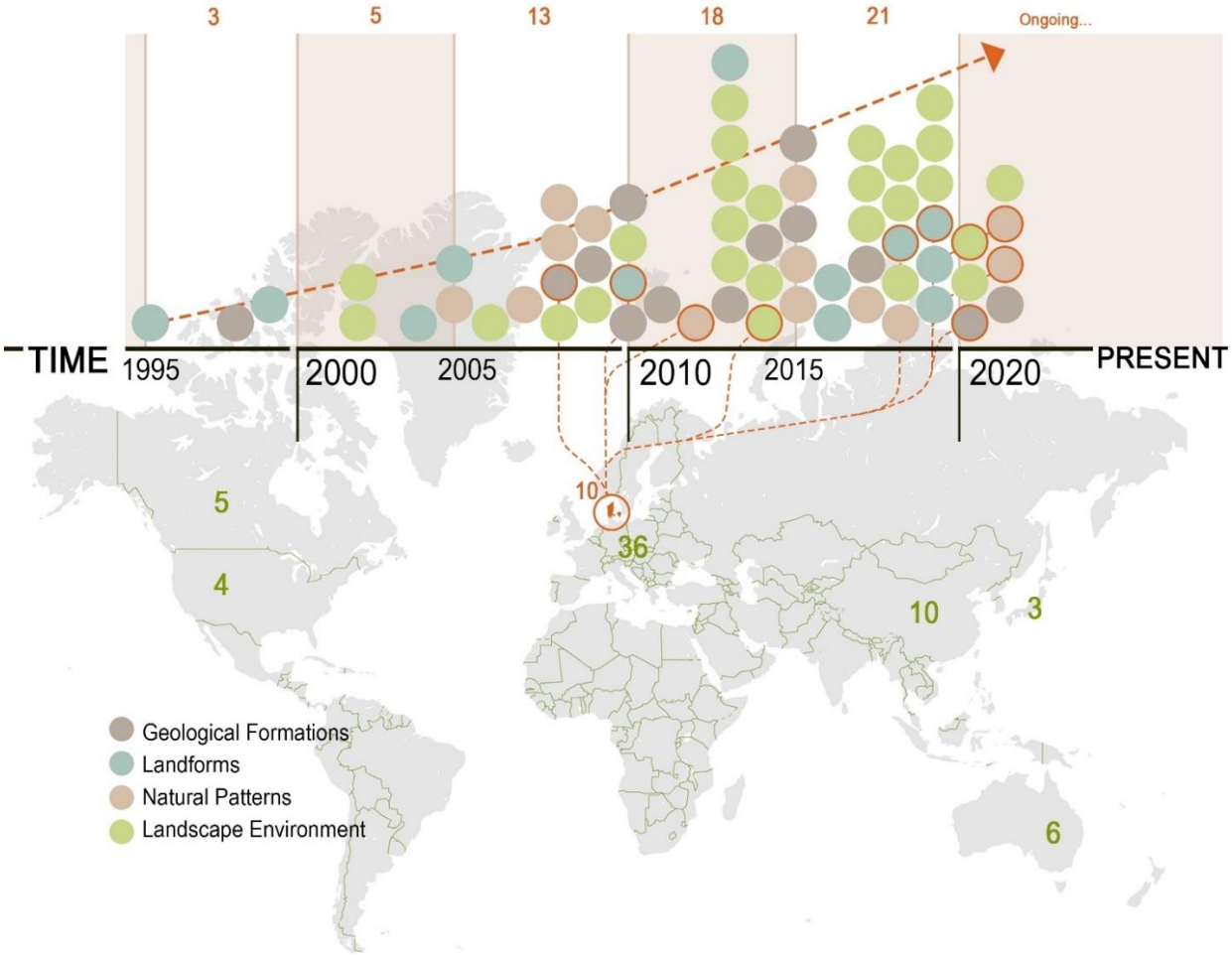


Figure 122: Analysis of identifying data of 64 contemporary landscape design projects that interpret natural features. Source: Author.

The analysis shows that, in the contemporary era, the number of designs that draw inspiration from natural features has increased progressively over the years, which is a positive scene, as this design approach is able to promote cultural, social, environmental, and economical values as a result of its interpretations of natural features.
This design approach can be found in different parts of the world; however, its popularity seems to prevail in Europe, scoring a high number of this type of projects, with 56% of the projects, and 58% of the design studios taking place in this continent. Furthermore, Denmark presents 28% of the European projects, which are all designed by Danish design studios such as, SLA[25], and 1:1 Landskab[26], which found in this approach a way to deliver their philosophy in design and have several projects realized in this style.
In accordance the research presents the following theses:

> **Thesis 1 : Since 1995, the contemporary landscape design approach, which interprets natural features as a source of inspiration, has gotten more popular over the years, with a progressive increase in the number of projects designed according to this approach.**
>
> **Thesis 2: The contemporary landscape design approach of interpreting natural features is reoccurring in Europe in large numbers in comparison to other continents, and is very popular, particularly in Denmark, with many projects designed in this style and many design studios that conduct it, such as, SLA, and 1:1 landskab.**

- Furthermore, and as previously mentioned, the research was flexible and kept the types of natural features open during the phase of selecting projects, in order to detect any type that contemporary designers are finding to be inspirational.

According to Table (1) and the analysis presented in figure (122), there are main categories of natural features that can be recognized when reviewing the 64 project's source of inspiration.
Several projects draw inspiration from *geological formations*, such as tessellated pavements, slate, and stratum, which present a source of inspiration for attributes like stratification, layers and forms.
A second category that appears in several projects is *landforms,* such as hilly landscapes, drumlins, dunes, etc. Their morphological attributes allow designers to create a dynamic spatial experience and engage the users kinaesthetically.
The third category is *natural patterns*, such as rivers' meandering pattern, the ripples of waves, the branching pattern of a river delta, etc., which demonstrate clearly how contemporary digital technologies are influencing the perception of the natural world, as that designers are drawing inspiration from features that need to be viewed in 2-dimenstional representation and can be large-scale features that the human ocular system cannot encompass their entirety.
The fourth category is *landscape environment*, which scores the higher number among the rest, with 41% of the projects taking inspiration from a natural landscape with all its cmponents, such as the marsh landscape of Northern Germany, the West Mesa landscape, and the riverine landscape, etc., interpreting the landform, the lakes or streams, the soil, the vegetation, etc., that makes up this specific landscape environment and make it unique.

[25] SLA is an international landscape design studio whose main offices are located in Denmark. The design team present itself as a "nature-based design studio working globally with cities, nature, places, and people".
[26] 1:1 Landskab is a landscape design studio based in Denmark, whose approach focuses on building "carefully, durable and carefully".

In accordance, the research presents the following thesis:

Thesis 3: The types of natural features considered inspirational for contemporary designers fall under 4 categories:

- **Geological Formations**
- **Landforms**
- **Patterns**
- **Landscape Environment**

Landscape Environment is the most popular type as a source of inspiration, as contemporary designers tend to interpret several elements and attributes of a certain landscape.

- On the other hand, by reviewing the summary figures of the analytical study of the 34 cases, and by intersecting the scores of the Table (2), we can draw a connection between a set of (*design tools, results, and promoted aspects*).

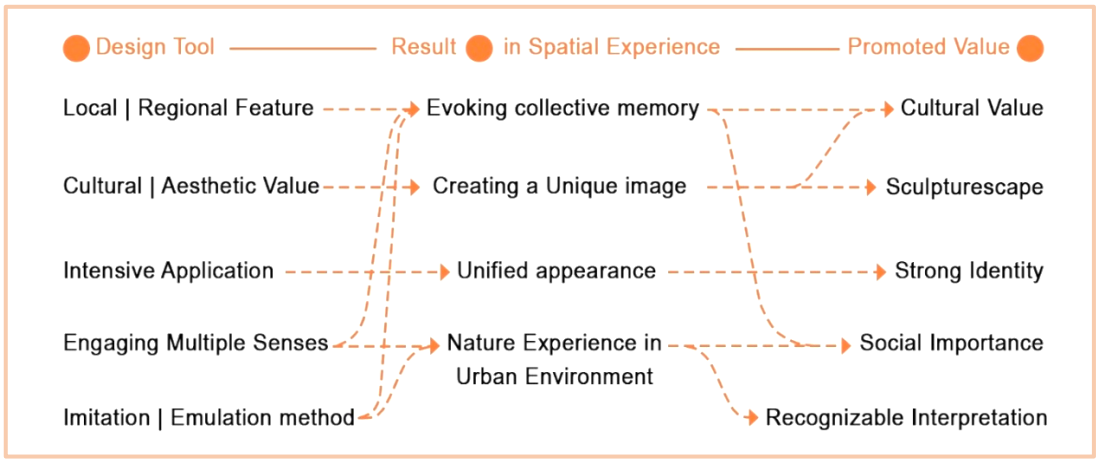


Figure 123: Trios showing repetitive patterns when interpreting a natural feature in the design. Source: Author.

According to Table (2), 53% of the case studies chose a local natural feature as their source of inspiration, that is known to the dwellers of the town or the city of the project, and 32% of the case studies chose a natural feature that is found in the country or the region of the project and well known to the dwellers of the project's city.

Furthermore, 74% of the chosen natural features are valued by the locals and hold a cultural significance, whether for being associated with traditional activities, a significant historical event, or for being part of a distinct geological history of the area, etc., and 65% of the natural features have an aesthetic value, as they demonstrate appealing attributes that can be considered inspirative in the design field, such as distinct forms, textures, colors, etc.

When contemporary designers choose natural features of this kind, and as Figure (123) demonstrates, they are able to evoke the collective memory of the users and create spaces that not only have a unique visual image but also promote the cultural heritage of the area, which in turn contribute to strengthening spatial attachment and producing more efficient open public spaces.

This result, that is the strengthening spatial attachment can be a very important outturn of the naturalistic design approach, for its many benefits, as it engenders feelings of belonging and safety, enhances mental and physical health, strengthens the sense of community through shared place

meanings, etc., which all contribute in turn to the sustainability credentials of the design, and the development of a space with strong identity.
In accordance, the research presents the following thesis:

> **Thesis 4: Contemporary designers tend to draw inspiration from local and regional natural features that are known to the locals, and not only demonstrate aesthetically appealing attributes, but also hold a cultural or heritage value that speaks to the collective memory of the people.**

- According to the analytical study of the 34 projects, the scores of Table (2) (points 5,6, 9,10,11), and the trios of Figure (123), the projects in which designers applied their interpretation of the natural feature in an intensive way, which is the case of 85% of the analyzed projects, allowing it to be a dominant feature that appears over the entire area of the site, and the main definer of the space that organizes all design elements, result in creating a space with a unified unique image, which in turn contribute to a space with a strong identity, especially that this contemporary approach shows a tendency to using more site-specific and custom-made design elements that are compatible with the design concept, rather than traditional pre-fabricated play equipment, urban furniture, water features, etc.

Only 26% of the analyzed projects present a 2D interpretation of the natural feature, whereas the rest tend to express their interpretations in 3D forms and volumes or a combination of both cases, a tendency that also appeared in the outcomes of the previously mentioned activity that was conducted twice at MATE University, for the subject "Open Space Drawings and Representations Techniques", were the work of 3rd year bachelor students coherently relied on 3D interpretations (see Appendix B).
In addition, the majority of the projects employ the feature's attributes and morphology to serve in both structural and decorative ways, by defining zones, creating decorative, functional or interactive elements, and providing activities and socializing opportunities, etc., which gives the natural feature a significant role in defining and shaping the spatial experience, rather than only serving as a decorative element like in many previous historical styles.
In accordance, the research presents the following thesis:

> **Thesis 5: The contemporary interpretations of natural features are intensive and applied to encompass the entire area of the project, and designers tend to express their interpretations in 3D forms and volumes, allowing the natural feature to play a significant role in shaping the spatial experience and contribute to unifying the appearance of the site and creating a space with a strong identity.**

- Furthermore, in Chapters 2 and 3, the research was able to categorize a set of design language methods and their tools, through which landscape designers communicate their interpretations. The analytical study of the 34 projects examined the language choices of contemporary designers according to this set of methods.

The scores of Table (2) (Point 8) detect the prevailing choice of language that is being used in contemporary interpretations, as 47% of the projects used an *emulating* method, and 38% used an *abstracting* method, and unlike many historical styles, copying, duplicating and borrowing scenery are not the preferred language of this contemporary approach, but rather a more subtle and adaptive language.

When intersecting the scores of Table (2) (point 8 with points 5,6,7), as shown in the following table, we can recognize the tools through which contemporary designers apply each method.

Table 3: An evaluation table demonstrating the design tools of the contemporary language methods *(Pt.5. Spatial Expression, Pt.6. Design Tools, Pt.7. Engaged Senses, Pt.8. Language Methods)*, Source: Author.

	Pt. 8	Borrowing	Copying	Imitating	Emulating	Abstracting	Referring	Alluding	Symbols
Pt. 5	2D								
	3D								
	Both								
Pt. 6	Colours								
	Textures								
	Cladding								
	Veg.								
	Furniture								
	Water. F.								
	Sculpt.								
	Views								
Pt. 7	Sight								
	Hearing								
	Smell								
	Touch								
	Kina-								

Contemporary designers apply the borrowing method by smoothly integrating the natural feature through designed oriented views, or by integrating the natural feature itself as part of the spatial experience.

Contemporary designers copy natural features by producing miniature replicas of the features, with the same materials, forms, and textures, which allow the perceiver to recognize the source of inspiration, not only visually but also through tactile and, in some cases, kinaesthetic experience.

Contemporary designers imitate natural features, relying on 3-dimensional interpretations that convey most of the visible attributes of the feature, using vegetation, cladding materials, water features, and custom-built elements, and engaging different senses of the perceiver to deliver a clear, readable interpretation.

Contemporary designers emulate natural features mostly through 3-dimensional interpretations that does not reduce important attributes of the feature, using a wide range of design vocabulary and engaging different senses of the perceiver.

Contemporary designers apply their abstracting method, relying mainly on 2-dimensional interpretations, using cladding materials and vegetation to create their canvas, and highlighting some accent elements with bright colors.

Contemporary designers use the referring method to communicate a straightforward reference to the natural feature, with simple custom-design elements and depending on one or a limited number of elements to deliver the reference.

Contemporary designers apply the alluding method using 2-dimensional and 3-dimensional elements, vegetation, water features, oriented views, etc., to evoke the notion of the natural feature or the experience of it, which can be achieved by engaging different senses of the perceiver or even allowing a similar kinaesthetic experience.

On that note, and by referring to the trios of Figure (123) as well, one can recognize that the interpretations resulted from applying the *imitating,* and the *emulating* methods are complex and

elaborated as they are achieved by combining variant design elements and engaging different senses of the perceiver, which allow the user to experience nature within the urban environment, making the source of inspiration very clear and recognizable by the users.
Similarly, the *abstracting* method also combines variant design elements and is complex and elaborated, and even though it does not provide a literal presentation of the natural feature's attributes, the focus on presenting key morphological attributes in a basic vocabulary makes the interpretation recognizable by the users of the space as well.
In accordance, the research presents the following thesis:

> **Thesis 6: "Emulating" and "Abstracting" are the most common language methods that are used by contemporary designers in conveying their interpretations of natural features, resulting in elaborated interpretations that allow the source of inspiration to be recognizable by the users.**

- Furthermore, there is a clear tendency on depending on digital tools and technologies in perceiving and studying the natural feature. The results of Chapter 1 and the results of the analytical study of the 34 projects clearly show that dependence on mediated perception influences the design process of contemporary design studios. Most designers rely on satellite images, maps and digital data to study and analyze their source of inspiration, and some even rely on new technologies and software in generating their designs. This leads to the assumption that many of the contemporary design tendencies may be a result of this influence, for example, the tendency to create sculpture-like landscapes that dominate the site conveying vast areas of hilly topography or sandy landscapes, depends on mediators that allow these vast areas to be seen from a high vantage point, or the tendency to create 2-dimensional patterns that organize the space and present a visually appealing element also depends on technologies that present a top view of the source of inspiration in order to recognize the attributes of its pattern.

The availability and easy-access of these digital tools and mediators in the contemporary era are unprecedented, considering that they are becoming part of our everyday life, not only in professional fields and contexts, but also outdoors at any time, with mobile phones allowing instant access to maps viewer, and drones exploring the surrounding areas, etc., making the influence on the design process in this age inevitable.
In accordance, the research presents the following thesis:

> **Thesis 7: Contemporary designers depend largely on mediated perception in perceiving natural features. The available advanced technologies and tools of the contemporary digital age allow them to perceive the natural world differently and to recognize new attributes in comparison to past periods of time, which allow them to produce new types of interpretations.**

Finally, the research draws a remark to the fact that many of the projects score high credentials in responding to the concerns of the age regarding mitigating climate change and answering to sustainable concerns, which can be a common aspect shared with other contemporary trends that were previously mentioned at the beginning of the dissertation.

5.2. Further Research Recommendations

An ongoing debate has started, on whether the Third Industrial Revolution has already ended and the Fourth Industrial Revolution (4IR) has started, a term that started to be used in 2016 as a result of developments in areas, such as artificial intelligence, robotics, the Internet of Things (IoT) and biotechnologies, etc. (Moloi, & Marwala, 2023; Zhang, 2022; Philbeck & Davis, 2018; Schwab, 2017). Many of which are still in their infancy, but they are already growing rapidly as they build on and amplify each other, shaping what is starting to be described as the Imagination Age.

This new revolution, which would fundamentally change the way we live, is making way for new discourse and suggesting new research streams that need to be explored. The research suggests exploring the shifts that can occur in the field of landscape architecture as a result of such innovations. The research recommends examining the influence of these innovations, particularly on the naturalistic design approach, which draws inspiration from natural features as new possibilities reveal, ones that allow emulating not only the visual attributes and natural processes but also the intricate natural algorithms that have evolved and thrived over billions of years.

Furthermore, as a step to achieve its aims, the research has categorized design language methods (Borrowing, Copying, Imitating, Emulating, Abstracting, Referring, Alluding, Symbolizing) that landscape designers use to interpret nature, and examined examples of these methods in the fields of visual arts and landscape architecture in order to define their tools and means of application. The research finds these language methods as a rich topic for discussion, and recommends further research exploring the language methods and their tools in the field of landscape architecture, and examining to which extent the outcomes of each method resemble the source.

SUMMARY

The concept of being inspired by nature in man-made landscapes has a long history, and this design approach continues to appear in the contemporary landscape design scene. The circumstances and developments of the contemporary era have a significant influence on the way landscape designers are perceiving the natural world, as the available digital tools and technologies allowed the contemporary designers to explore the natural world and examine their sources of inspiration with less limitations than in previous periods of time.

The research investigates this contemporary naturalistic design style and its tendencies in light of the digital innovations, highlighting how the availability and easy access of these technologies are resulting in a more dependence on mediated perception of natural features and the recognition of new attributes that could not be perceived in past times, and thus allowing the contemporary designers to produce new types of interpretations.

The research begins with exploring the types of natural features, highlighting the complexity of these phenomena and their dynamic state, with the many components and processes contributing in their formation and transformation. In addition, the research discusses the theory of active perception and the difference between immediate and mediated perception, making the connection of how perception in the digital age can influence the recognition of natural features' attributes and thus, the contemporary interpretations.

Furthermore, the research examines how natural features were perceived and interpreted in previous historical styles, and what language methods were utilized in order to convey these interpretations, as a way to create a reference base that can contribute to defining the contemporary approach by finding similarities and variances.

In addition, the research discusses language methods and analyzes examples from the fields of visual arts and landscape architecture in order to create a clear definition of each method and its tools and identify how the product of each method resembles to the original source of inspiration, which also allow creating a reference base to identify the language methods of the contemporary interpretations.

The Core of the research analyzes selected cases of contemporary landscape design projects that interpret natural features as their source of inspiration, and conducts a comparative analysis that is focused on demonstrating and evaluating the role of the natural feature as a source of inspiration throughout the design process, and in the resulted spatial experience and promoted values, in order to detect the contemporary tendencies of this design style.

Ultimately, the dissertation presents original research findings derived from this analysis and the conclusions of all chapters. These findings contribute to defining the character of the contemporary naturalistic design style and present common tendencies of the style.

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APPENDICES

Appendix A

Figure 124: The contemporary landscape design studios, whose work was examined, and their location, Source: Author.

Appendix B

An activity sheet for 3rd year bachelor students studying landscape architecture at MATE University, which aims to test a comprehensive analysis method of natural features, based on observation and description, in addition to samples of the students' illustrated work.

MATE University
Faculty of Landscape Architecture and Urbanism
Institute of Garden Art and Landscape Design

6KMRSZAT3NB - Rajz és szabadtér-ábrázolási technikák 3 - 2021/2022 – ősz

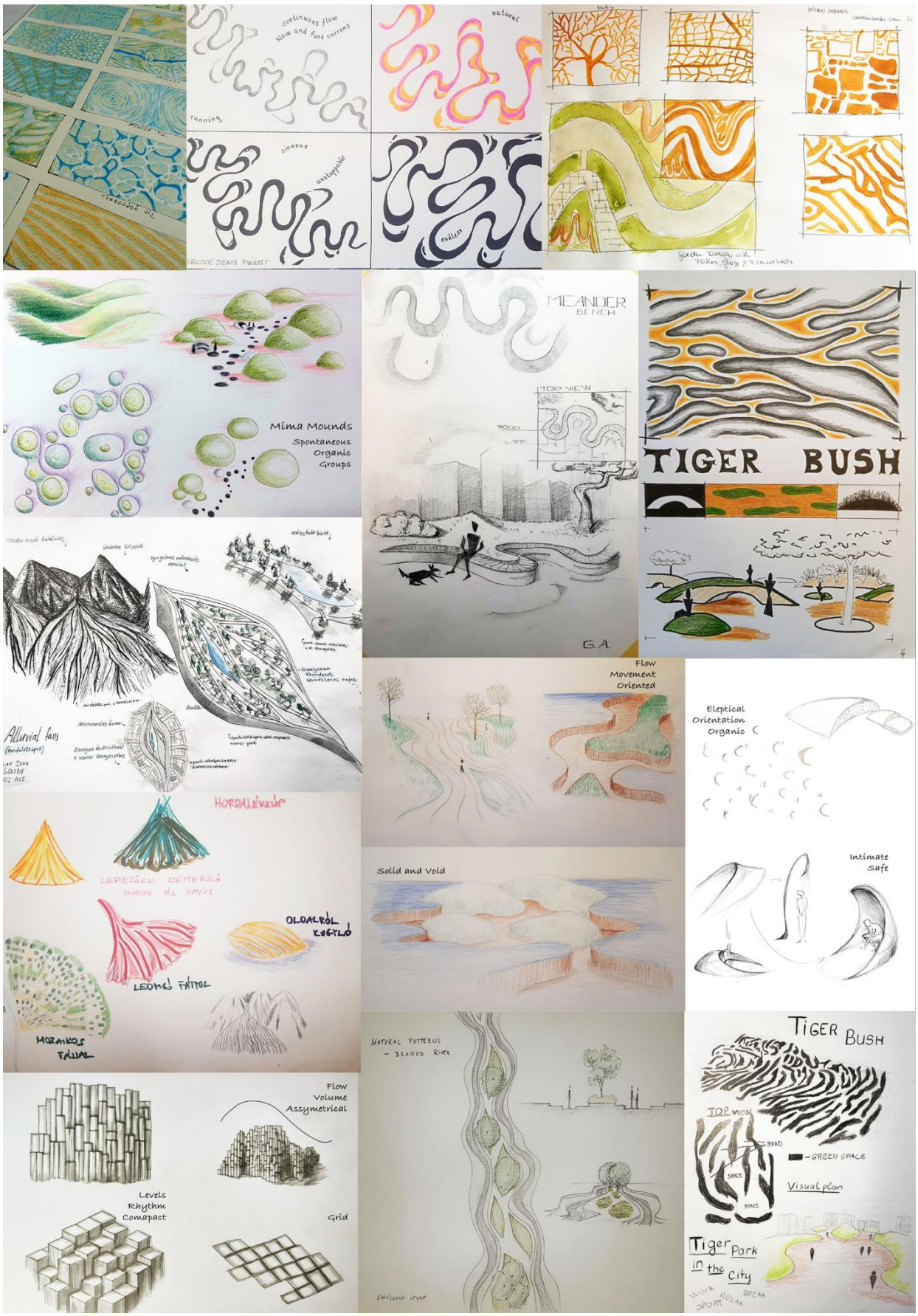
Lecture: **Communicating Natural Patterns in Contemporary Landscape Design**
Exercise: 03.11.2022 (Duration 10:00 - 13:30)

The exercise aims to allow each student to experience the process of utilising a natural feature as a source of inspiration in order to develop a design concept.
Students will work individually on assigned natural features that each create a visually distinctive natural pattern. The task is of two parts. First, an analytical study through which the student's perception of the pattern will be expressed in graphic and written from. The second part is a design task aiming for the student to create an interpretation of the pattern within a landscape design context.

According to the table below, find your assigned Natural Pattern and present the following ideas on 1 to 3 sheets of paper:

1. **Form-study of the Natural Pattern**
   View aerial photos and satellite images of the natural feature, and draw several versions of its pattern with different drawing techniques or colours.
   Recognise the attributes of the pattern and use written vocabulary and short sentences to describe and identify the characteristics that you find inspiring. (Try using adjectives that describe characteristics related to the field of design, such as rhythm, textures, position, orientation, balance, symmetry….)
   Combine the drawings and written materials on one sheet that demonstrate your overall perception of the pattern.
2. **A design interpretation of the Natural Pattern**
   Use the pattern as a source of inspiration for a design concept, propose some design ideas that can be found in open spaces.
   You can choose the type and scale of the open space (urban square, playground, allée….).
   Present your design ideas with a plan / section / Sketches….

Natural Feature	Student	Natural Feature	Student
River Meander	Viola Cseh Denis Durkovic Emőke Farkasdi	**Tiger Bush**	Kinga Réka Ostorházi Boglárka Pusztai Kamilla Ráckevei-Rácz
Mud | Ice Cracking	Márton Bella András Borbás	**Mima Mounds**	Anna Luca Mohácsi Kende Nyilas
Braided River	Anna Flóra Fehér Anna Fülöp	**Sand Dunes**	Nándor Szikszay Krisztina Tatai Vivien Tuskán
Columnar Jointings	Levente Homoki Borbála Kiss Sára Lola Mádi	**Salt Marshes**	Enikő Zacher Dániel Fülöp Dorottya Zámbó
Alluvial Fan	Dóra Bíró Eszter Nagy		


continuous flow
slow and fast current
running
natural
sinuous
unstoppable
endless
Mima Mounds
Spontaneous
Organic
Groups
MEANDER
BENCH
TOP VIEW
WOOD
LAMP
G.A.
TIGER BUSH
Alluvial fans
Flow
Movement
Oriented
Eleptical
Orientation
Organic
Intimate
Safe
Solid and Void
HORDALÉKKÚP
OLDALRÓL
KIGYÚLÓ
Flow
Volume
Assymetrical
Levels
Rhythm
Comapact
Grid
NATURAL PATTERNS
- BRAIDED RIVER
TIGER BUSH
TOP VIEW
ROAD
GREEN SPACE
Visual plan
SPACE
Tiger Park
in the City
WORK
RELAX
BREAK
SPORT

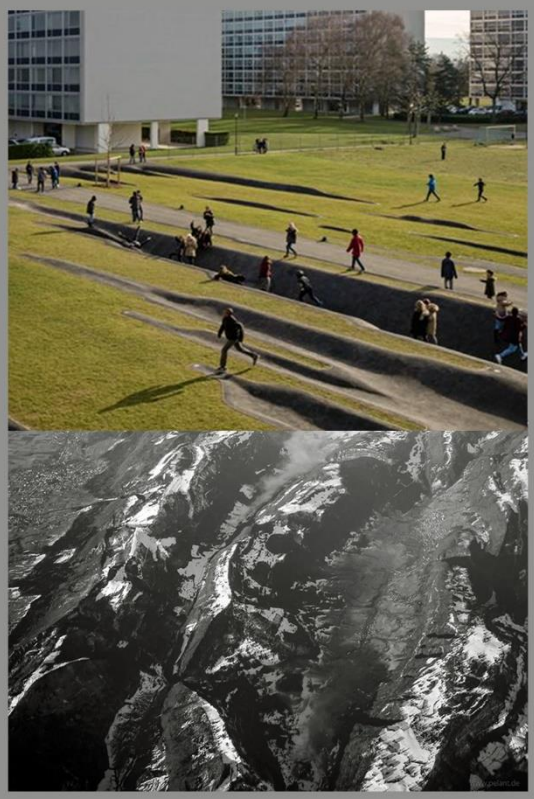
Appendix C

Following are examples of the analysis conducted on the 34 case studies, providing more information and illustrations of the design process, development of the design concept, and the design elements.

L'enfance du pli (Fold's childhood)

Location: Geneva, **Switzerland**
Stats: Realised in **2017**
Typology: **Park** - Playground - Sculpture
Area: **2.200 m²**
Designer: **Gilles Brusset** Paysarchitectures (Paris, France)

A picture evocative of the folded and undulating landscapes of the Jura



Design

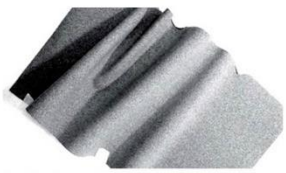
An interpretation of the force that spawned the folded and undulating landscapes of the Jura massif. The sculpted landscape emerges with dynamic undulation of the ground creating a unique space for children. The design is simple and clear, the grass reminds us of the Jura pastures.

Natural Feature

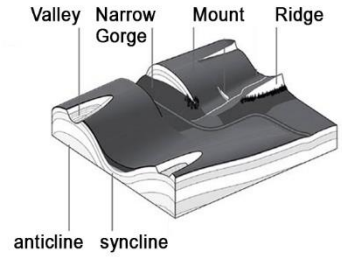
The Jura is a part of the Alpine foreland. Toward the northeast and along the outer ridges of the arc, the elevations of the crests are lower. The main thrust of the deformation process occurred from the southeast during the Pliocene Epoch. Pastures on the high plateaus are characteristic to the Jura .

An inscription of one landscape in another

Landscape Sculpture as an Expression of the Forces Exerted on the Earth's Mantle

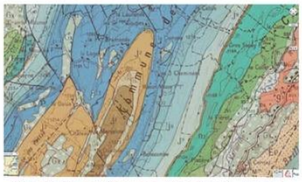


Westward Compression from the Alps = Pleated Ground Pattern



2D Interpretation of Jurassian Folds

Expression of shapes and Forces of Pleating



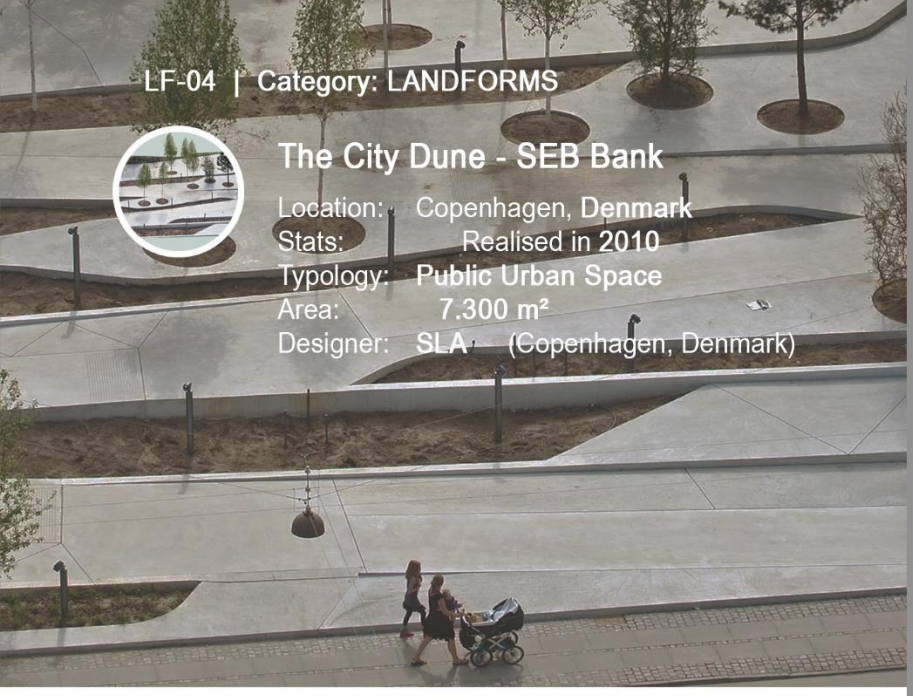
An Extract from a Geologic Map

An Extract from Aerial Photo

The design appears in curves and volumes, providing children a physical experience of a distinctive spatial structure.

Different digital tools and mediators were contribted to developing a clear perception of the natural feature and to reinterpret the process and forces that created the geological forms and integrate them to the topography of the existing site.

The design team developed a 2-dimensional illustration of the shapes and forms of the Jura landscape, and a 3-dimensional sculpture expressing the forces that created the phenomenon.



LF-04 | Category: LANDFORMS

The City Dune - SEB Bank

Location: Copenhagen, Denmark
Stats: Realised in 2010
Typology: Public Urban Space
Area: 7.300 m²
Designer: SLA (Copenhagen, Denmark)

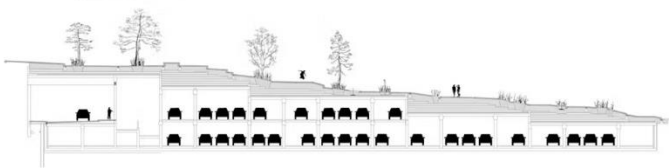
An emulation of the folding movement of sand dunes

Design

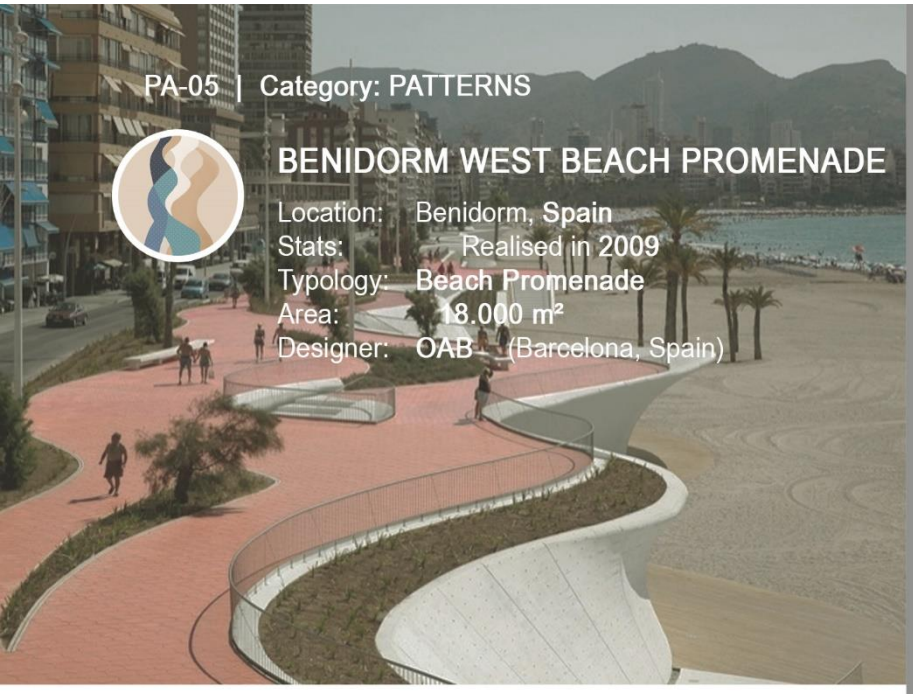
An artificial terrain that rises from street level to the second-floor level, covering the bank's parking garage. It is inspired by natural processes and emulates the folding movement of the sand dunes of Northern Denmark and the snow dunes of the Scandinavian Winter.
The design of the terrain handles drainage, accessibility, lighting, plantation and offers a variety of routes for different users, creating an ever-changing urban space.

Natural Feature

The dunes in the north part of Denmark are called shoreline dunes. They were formed by the aeolian processes and made up of sand. Dried sand on the banks was accumulated by wind from sea alongshore. Shoreline dunes may stand alone or be clustered.



The abstraction of folding movement of the dunes provided the answer to functional and technical demands, and at the same time endows this urban space with a strong and unique Nordic identity. The rhythms of planting design also echoing the succession habitats. The design concept is intensive and applied to the whole area of the site, playing a functional role and bringing a sense of identity.



PA-05 | Category: PATTERNS

BENIDORM WEST BEACH PROMENADE

Location: Benidorm, **Spain**
Stats: Realised in 2009
Typology: **Beach Promenade**
Area: **18.000 m²**
Designer: **OAB** (Barcelona, Spain)

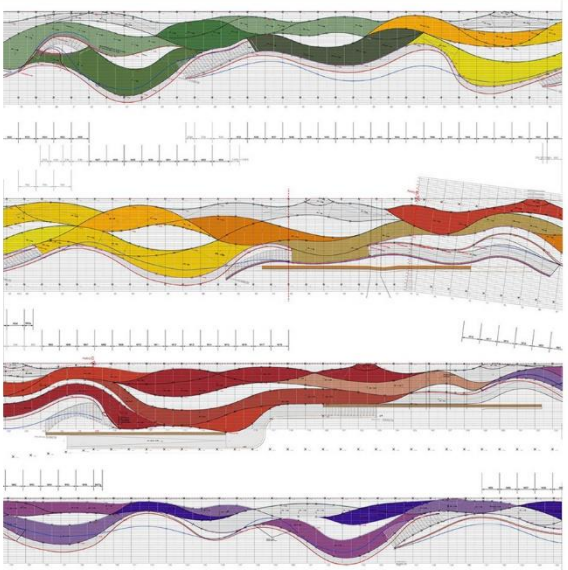
An emulation of the motion of waves and tides

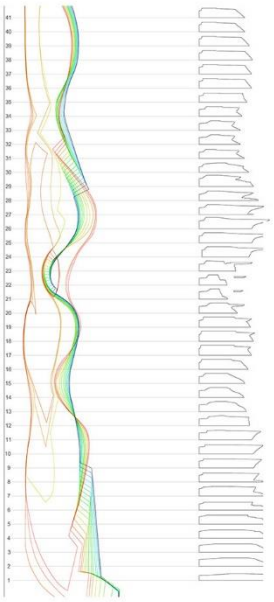
Design

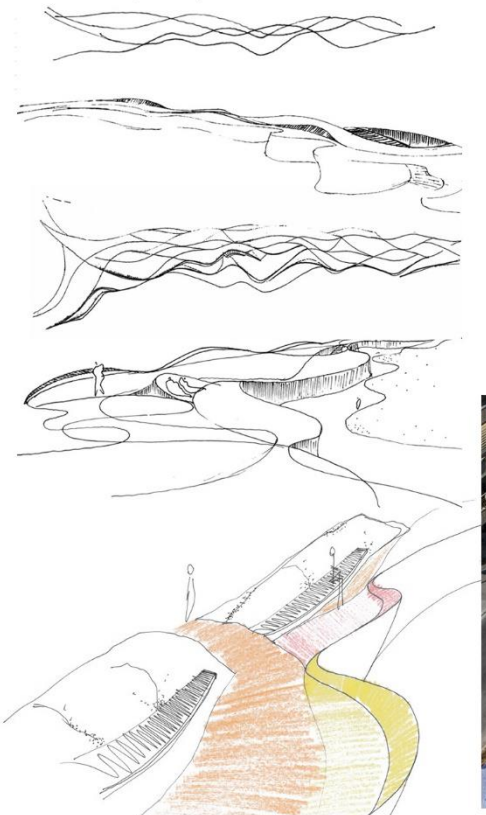
A transitional location between built city and the beach, integrating the different circulations in its undulations and platforms, eliminating a barrier and constructing a place for people to be in.
A nexus of sinuous interwoven lines which sets up the different spaces and adopts various natural and organic shapes evocative of the motion of waves and tides as well as the fractal structure of a cliff.

Natural Feature

Tides are the rise and fall of water levels in the ocean due to gravitational pulls.
Waves are a series of crests and troughs in the water that are formed due to the impact of wind or other forces.
A cliff is an area of rock which has a general angle defined by the vertical, or nearly vertical and are formed by the processes of weathering and erosion, with the effect of gravity.







The design interprets the pattern in 3dimensional forms and utilise the curves to create transitional points from one level to another. The design is complex and requires each curve to be illustrated in details for implementation.

The wavey organic shaped pattern is accentuated with bright colors cermaic tiles that contribute to defining the undulations and the unique character of the design.

Lan-05 | Category: LANDSCAPE ENVIRONMENT

EUROPEAN CENTRAL BANK PREMISES

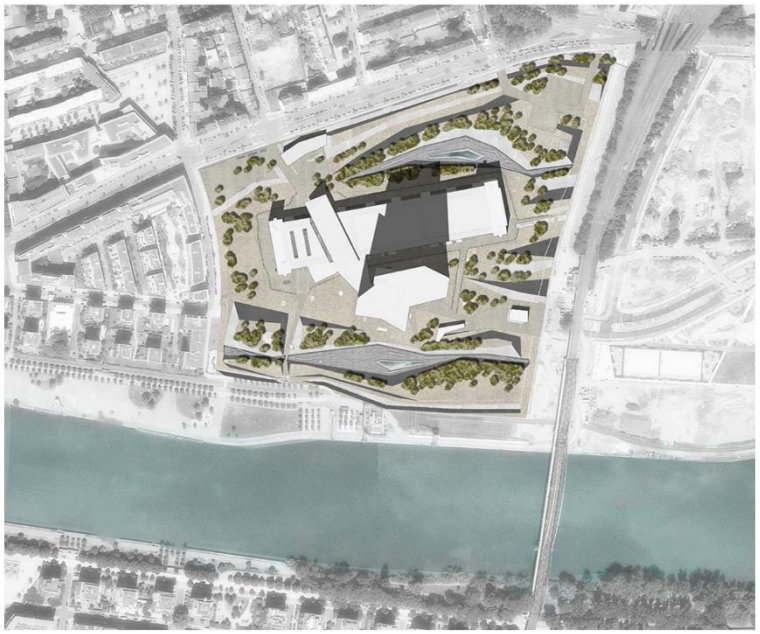
Location: Frankfurt, **Germany**
Stats: Realised in **2013**
Typology: **Park**
Area: **120.000 m²**
Designer: **VOGT** (Berlin, Germany)

Design

The design takes its basic idea from the most powerful feature of the site, the river. The park is a stylised alluvial landscape with clefts and plateaus, backwaters, undercuts and slopes abstracted to a dry river bed in simple geometric forms, creating several zones within the dynamic of the moving terrain.

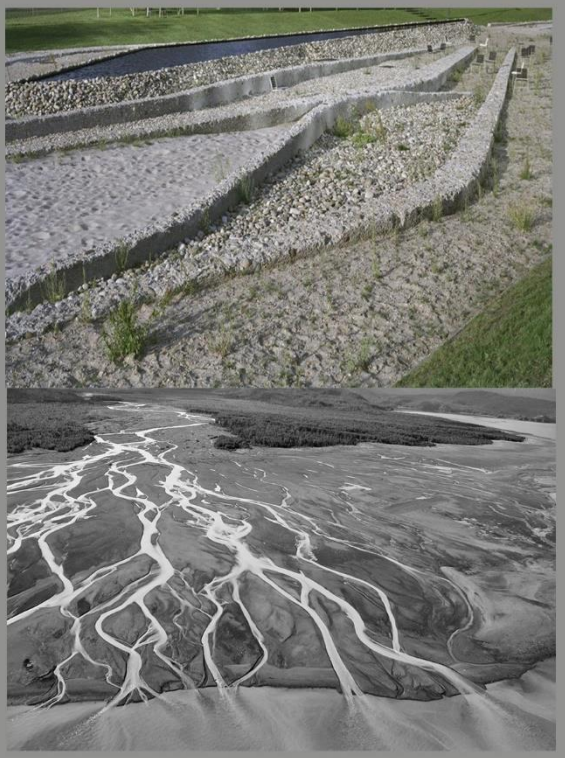
Natural Feature

Alluvial streams flow on their own alluvium (= material deposited by rivers).
A flood plain is an area of land adjacent to a river. It stretches from the banks of a river channel to the base of the enclosing valley, and experiences flooding during periods of high discharge.
Most floodplains are formed by deposition on the inside of river meanders and by overbank flow.



The reference to the alluvial landscape with a sense of perplexity and the use of clear geometric lines and shapes, and various size, color of gravels – like sediments, allow the park to ease the transition between the buildings of the site and the river. The interpretation of an alluvial landscape is intensive and attempts to present a complex habitat with materials, plants and forms.

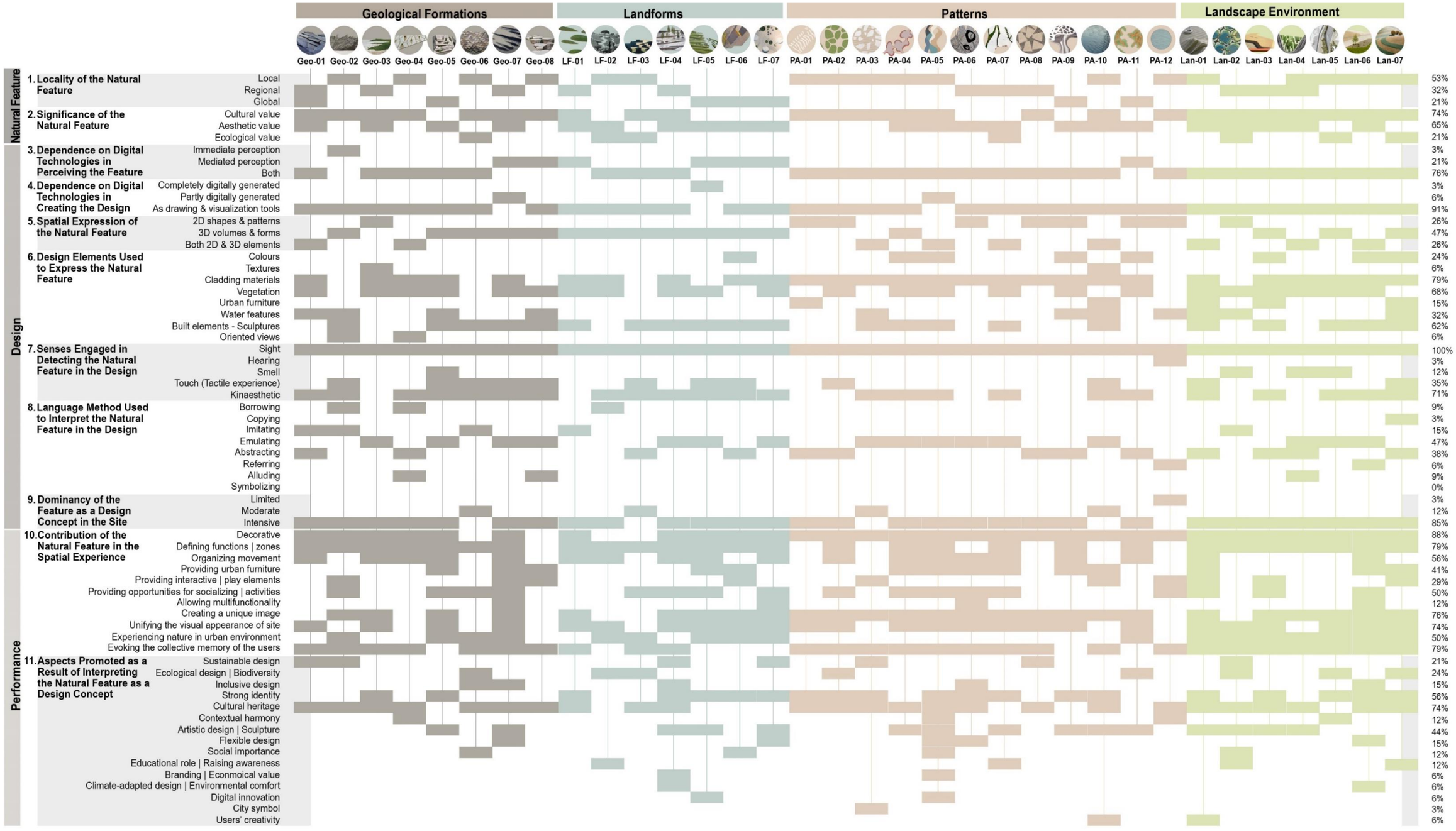
An abstraction of the flood plain typical terrain



The vegetation represents the alluvial environment, even though it does not exclusively display native alluvial species.

Appendix D

Table 2: A comparative analysis of the 34 contemporary landscape design projects that interpret natural features in their designs, Source: Author.



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Thank you | شكراً | Köszönöm szépen