Architecture for Well-being
From the Maggie's Centres model to a biophilic application in Turin

Fulya Tanyel

Politecnico di Torino

Architecture for Well-being
From the Maggie's Centres model to a biophilic application in Turin

Fulya Tanyel
s273275

Graduation Thesis
Master Programme of Architecture for Sustainability Design

Tutor:Prof. Riccardo Pollo
Co-tutor:Arch. Elisa Biolchini

CONTENTS

Abstract

In the latest centuries, with many fast changes in the daily lifestyles our built environment became a significant factor on human health and well-being with approximately 90% of our time spent indoors, despite our physiological and psychological functions being dependent on nature throughout our evolvement.Largely urbanized environment that we are currently living in there human beings and natural experiences and relations have become distant.Biophilia is a hypothetical human tendency to interact or be closely associated with other forms of life in nature.There is increasing amount of research made on the relationship betwen human beings state of health, overall well-being and the interaction with nature.This study in the first half of the work, aims to further explain the nature and built environment relation,through the definition of 'Biophilia', how it can be connected to well-being and healthcare architecture.In the second part of the study; it will be examined the ideology of Maggies' Centres, treatment-supportive healing centers focused on cancer patients.Explaining the aim and need for these centers and how they can be implemented.As a result; a conceptual biophilic healing center proposal in Turin,Italy was designed based on the knowledge gathered throughout the research, aiming to articulate the need of healthcare facilities focused on the overall well-being of all occupants that could be achived by the interaction with natural aspects.

Introduction

In the latest centuries, with many fast changes in daily lifestyles, our built environment became a significant factor in human health and well-being, with approximately 90% of our time spent indoors, despite our physiological and psychological functions being dependent on nature throughout our evolvement. In the largely urbanized environment that we are currently living in there, human beings and natural experiences and relations have become distant. With the negative results of this distance becoming more prominent, more research is done focused on the incorporation of natural aspects in the built environment.

The concept of biophilic design is discussed as one of the approaches to conceptualizing and understanding 'nature' in architectural design where natural aspects and human responses are considered as the key point. Biophilia is a hypothetical human tendency to interact or be closely associated with other forms of life in nature. There is an increasing amount of research made on the relationship between human beings' state of health, overall well-being, and their interaction with nature.

This study in the first half of the work aims to further explain the nature and built environment relation, through the definition of 'Biophilia', how it can be connected to well-being and healthcare architecture. The second part of the study; will be examined the ideology of Maggies' Centres, treatment-supportive healing centers focused on cancer patients. Explaining the aim and need for these centers and how they can be implemented. Case studies will be examined to focus on the different implementations.

In the first chapter, the relation between nature and architecture will be examined throughout history. The evolutionary progress of human beings and their ways of relating to and shaping their environments will be discussed. Questions such as how human beings responded to nature with architecture throughout their timeline and why it is important to keep the connection with natural aspects while designing our built environments will be answered. It will be discussed; modernization's effect on the human relationship with natural aspects in our environments, the way some of the architecture responded to the challenge that modernization

brought, and the approaches that should be taken for the built environments now.

Biophilia will be discussed in the second chapter as a way of responding to these changes to human-nature relationships in the built environment. The definition of biophilia and biophilic design will be explained. Two points of view will be explained in detail on the biophilic design. Biophilic design elements and approaches will be examined and the common points of the two views will be discussed.

The third chapter will be focused on the relationship between biophilia and well-being. The study will start with research done on correlations between the built environment and physiological-psychological health. Biophilia and environmental psychology intersection points will be discussed through different approaches. Results of studies done on nature exposition and well-being will be noted. The effects and importance of biophilic aspects in the built environment for human beings' health will be summarized.

Second part of the thesis will be focusing on Maggie Centres. The aim and function of maggie centres will be explained. The story of Maggie Lencks, the originator of the idea will be explained in relation to the foundation of Maggies'.The brief that the Maggies' foundation has prepared for all of the centers to follow will be examined to understand the psychological, communal, spatial requirements and needs of the centers, and their visitors.

Case studies of Maggie centres and one different implementation of cancer centers' will be examined. The studies on the centers will consider the correlation to the brief, the inputs and ideas of the architects, the implementation of the landscape design, and biophilic approaches that were present in the design.

Through the research done in the previous chapters, a methodology for implementing healing centers with the approach of biophilic design will be summarized. This methodology will be worked into a conceptual proposal for a health center in Torino, Italy.

The study aims to articulate the need for healthcare facilities focused on the overall well-being of all occupants that could be achieved by the interaction with natural aspects, supported by a conceptual proposal.

Nature and architecture

Architecture is an important branch in which people communicate with nature and show their approach to nature while shaping their environment. In the last decade, a growing interest in the relationship with nature has emerged. The aim of this new interest has been well-being, improving health, and resilience. (Zhong, Schröder, Bekkering; 2021)

The need for close relations with natural aspects has been a recurring influence on our living spaces throughout the history of architecture. This close relationship with natural aspects has occurred for many different reasons. The most prominent reasoning is the sustainable approach caused by the living factors.

Sustainable planning and design is not a new determinant in planning living spaces, it has existed from the first need for shelter. The word 'shelter' by the description of Cambridge Dictionary is '(a building designed to give) protection from bad weather, danger, or attack' and this explanation is showing the need for alleviating the unfavorable effects of weather and environmental conditions. The basic need of shelter, comfort, and protection resulted in the trial of finding ways to create tolerable levels of comfort. These ideas and considerations from ancient ages remain today in the way we design our spaces.

Throughout centuries many differnet civilizations and communities had to come up with various ways of facing the what the climate conditions required.With the human urge and instict of continuous growth and learning, the strategies used were refined while learning from past and observing the now.The awareness of learning from observing the environment could be the right answer for achieving architectural and societal responses in the future.

First examples of sustainable architecture was the results of climate-responsive or security based decisions that aimed protection or resource finding such as water collection.

The ancient Greeks didnt have any artificial tools that can be used for heating or cooling of their houses.All the heating and cooling solutions they had were based on their seasonal knowdge gains and awareness.In winter, they mostly used portable charcoal-burning braziers as well as the warmth they could gather from the sun during the day. (Tabb, Deviren;2013)

One of the strategies that was based on these knowledge gained by observation was ; the northern facades designed with few or no windows at all, built out of thick masonry walls that would keep out the cold winds of winter.These design decisions crossed class lines reaching from houses to temples and palaces, which resulted in a cultural increasing effect.Climate responsive architectural planning and solutions were present in various differnet zones and conditions.These solutions were focused on modifying the built environment around the problem, rather than controling the danger it was accepted and dealed with whilst trying to create optimum comfort. Examples across both time and geography represent different design responses to various environmental conditions (Tabb, Deviren;2013)

Roman architect, Marcus Vitruvius, in the 1st century BC, developed architectural principles that he gathered in a total of ten books, the oldest extant books written on architecture.These bookes provided planning and design guides on various aspects of built environment.In two of these books,there were parts focused on climate responsive strategies.In Book Vi, Vitruvius describes the importance of thinking about the climate during design process,recognizing that various climates required different approaches.He also addressed the proper exposure of different rooms to qualities of light and exposure to the sun for warmth.

In Book Viii, he described the finding of water, its differing qualities, ways of collecting and exporting it, and uses for it—showering, drinking, and cooking, etc. He felt that rainwater was wholesome- and that the vaporous properties of different waters should be considered. He described the many innovations made in building design to improve the living conditions of the inhabitants. (Vitruvious,1986),(Zhong, Schröder, Bekkering;2021).

In A Green Vitruvius, J. Owen Lewis and Vivienne Brophy suggested that the sustainable principles and practices put forward by Vitruvius in the Ten books on architecture could be distilled into relevant design patterns that could be used in the present day. (Lewis, Brophy; 2011)

The shelter built with a protective roof, thick walls, and openings with the right orientation became the archetype early climatic designs and prospect-refuge relation based architectural patterns.

The roof while providing protection from direct sun,rain etc. became also a symbolic element of a separation between heaven and earth. Since heated air scientifically rises in the colder climates roofs were designed with insulating attributes for containment of the heat inside.Walls were made from local materials were generally quite thick and acted as a base for the roofs as well as defensive and heat protection.

The windows in the primitive times were thought as small holes in walls that were covered with animal hides,wood etc, shutters were also thought of to respond to day-night cycles.In the course of time, the use of translucent materials as windows have started to give protection while still receving the benefits of daylight inside. First civilization to use glass for windows was the Romans, when they discovered the translucent material could also help with the problems of heat flow.Essential to the climate responsive, passive solar technologies; the use of improved glazing systems were necessary to enhance the greenhouse effect and increase the efficiency , firstly amorphous materials, cast glass windows, with poor optical properties were used. Double-glazing, was introduced in the 1930s and was designed as insulative especially for the use in colder climates.(Tabb, Deviren;2013)

Many of these planning and design conditions that existed thousands of years ago continue today, especially the need for shelter, climate design and environmental coordination. However, the vastness of modern global culture has created more complex and broader sustainability challenges.

Launching previously implemented sustainable principles poses a formidable hurdle to overcome in order to re-emerge as an effective countermeasure to today's complexity. If modernism is considered the cause of current environmental problems, it is also responsible for most solutions.

Many green designs have maintained a close connection with modernism, especially using modernist structures, HVAC and material systems, and economic and functional trends. The pervasive nature of modernism was a welcome result of the recording process.

Key leaders of the modern movement have provided valuable architectural works that incorporate sustainable principles and design that inspired the generation of the sustainable architecture.

Although the influence of the modern movement has become a global phenomenon, it has manifested in a relatively unified architectural language. Several architects and their work provided a welcome example of a more environmentally friendly design approach that significantly influenced the subsequent development of green architecture. Many of the leading architects of the 20th century, most notably Frank Lloyd Wright, Le Corbusier, and Alvar Aalto, had a lofty view of “nature”, not only as a “materialist” but also as an opposition to mechanization. (Tabb,Deviren;2013)

F.L.Wright had a strong base of nature-architecture relationship, an architect who adopted the open-plan scheme, dismantled the ‘building box’, and was able to understand the universal by observing the local continously.(Giedion,2009) While Wright, had the perspective of supporting the integration of nature, defined nature as not only limited to the sky, trees, living organisms where nature is which is perceived as an external environment, stating that it is not possible to separate nature from structure of materials, the details and choices in the planning of the buildings.(Tabb,Deviren;2013)

On the basis of F.L.Wright’s organic architecture, the idea that the building does not consist of a roof surrounded by four walls, but that the reality consists of the core, namely the living space, played an important role. Explaining the definition of the word organic as a holistic entity, Wright explained that instead of elements such as columns and beams, interlocking organic elements like tree branches, interlocking with each other, played an important role. with its structural systems.

Alvar Aalto has created heterogeneity and diversity, far from homogeneity and monotony, in the synthesis of ‘rational-reality’ forms and ‘irrational organic’ forms.Aalto has used regional and traditional building materials such as warm wood, natural stone and brick.

To explain his love for nature, Aalto said, “It is not the machine, but nature is the most important model for architecture”.(Giedion,2009)

Aalto is an architect who uses different angles in a period when the right angle is used frequently, leaves it in its natural state at a time when the material is hidden with paint and plaster, and seeks harmony with nature in a period when nature-shaped structures are placed.(Giedion,2009)

In summary; the early beginnings in the greening of architecture were created from survival needs for water, food, fuel, defense and protection, with direct and pragmatic architectural responses to regional climatic conditions.Survival and architecture were considered together. In the 20th century, design responses to the environment drew inspiration from some influential architects such as Frank Lloyd Wright, Le Corbusier, Alvar Aalto, Louis Kahn, Charles Rennie Mackintosh, and Hassan Fathy, and are an important trend for the Green Movement's formative stages in architecture.

Subsequently, in the 1960s, awareness of the impact of contemporary life on the environment stimulated an environmental awakening (Tabb, Deviren; 2013)

Landscape architect and town planner Ian McHarg (1969) suggested an ecological perspective that incorporates the analysis of land, climate, and water into urban planning. The 1960s were also a radical period in architecture. Avant-garde architects such as Mario Bellini, Alberto Rosselli, Ugo La Pietra, Archizoom, Superstudio, 9999, and others reflected on the destructive impacts of modern construction on the natural environment in their projects. Although most were visual and experimental works, environmental awareness triggered a shift in the value of the relationship between humans and nature. (McHarg, 1969)

Interest and obsession with "nature" must be seen in relation to man-made environmental crises and emerging environmental movements.In the 1980s and 1990s, "nature" was explored and associated with a number of environmental problems at the time. New concerns have emerged such as climate change, ozone depletion and biodiversity loss and solutions to these problems have been identified within the need for sustainable development (Leach, 2010).

The definition and concept of sustainable development was brought to public attention in 1987 through the Brundtland Report (UN, 1987) and was further elaborated through the Agenda 21

(UN, 1992) and the 17 Sustainable Development Goals (SDGs) (UN, 2015).However, climate crises, biodiversity loss, air pollution, and many other issues remain urgent challenges today.

Research on understanding the impact of nature-based design in architecture is still limited. The building sector plays an essential role in sustainable development and is responsible for nearly 40% of energy consumption and energy-related carbon dioxide emissions. Buildings also have a significant impact on human health and well-being, as we spend approximately 90% of our time indoors (IEA, 2017).

Especially in the COVID-19 quarantine, most city dwellers have little access to gardens, parks or the budget. In this context, the intended son of “nature” is increasingly celebrated. It is reduced in the public environment, both in children and in applications. Within the sustainable architectural project area, projects related to structures such as green architectural projects, green spaces and vertical gardens are utilized. Some trainings hide their introductory language, real improvement, or simple effectiveness (Leach et al., 2010).

Also, the notion of ‘nature’ can be interpreted in many ways: as essential materials for human survival; as inspiration for architectural design; or just as a romantic idea.The concept of biophilic design is discussed as one of the approaches to conceptualize and understand ‘nature’ in architectural design. (Zhong, Schröder, Bekkering; 2021)

‘The failure of our society to recognize theseverity or, in many cases, even the legitimacy of the environmental crisis allowed architects to conduct their work with minimal attention to the potentially catastrophic effects resulting from this work.’

Phillip Tabb

Biophilia

2.1.The definition of biophilia

Biophilia is a hypothetical human tendency to interact or be closely associated with other forms of life in nature : a desire or tendency to commune with nature.

From an etimologic point of view as a start , -bio meaning ‘life or living things’ and philia meaning “friendly feeling toward” ; biophilia can be etymologically translated as friendly/loving feeling toward life and living things.

The term was firstly used by Erich Fromm in 1964 to describe a psychological orientation of being attracted to all that is alive and vital. But it was coined by the Harvard naturalist Dr.Edward Osbourne Wilson as humanity’s “innate tendency to focus on life and lifelike processes’ mentioned in his book ‘Biophilia’ in 1984.

The human response to natural aspects and stimulations drived from nature were explored relating to the evolutionary effects; in the research it was compared the negative responses such as fear to the images that were shown.The images were a collection of natural and unnatural images such as snakes and guns.The response to the natural aspects were relevantly larger compared to the unnatural ones which didn’t result in a strong reaction.This study was one of the initial studies focused on the natural aspects and our human instinctual reaction that comes from evolutionary emotional connection to nature.(Örman,1986)

The research done on the human instinctual need of connection to nature has been increasing throughout the years to find new ways of designing that will promote well-being and health overall. (Vittori,Guenther;2013)

To be able to gain the benefits from relation to nature, new point of views should be adapted in the way we relate and coexist with nature because human reliance on development and learning is the only constant thing that kept human species continuing.The nature relation should also be learned and developed to the modern world and continue throughout time.

However rather then finding ways of co-exsiting and creaating the necessary mutualistic relationship with nature and antural aspects, the odern society has placed many barriers to the beneficial experience of nature.

The most problematic result of this disconnect from the natural world has been the natural resources both humans all species and natural systems rely upon has been exploited in a rate that is destructive. (Kellert,2008)

One of the most significant impacts of design and development world's disconnection with the nature today is the fact that the "natural habitat" of contemporary people has largely become the indoor built environment where the time spent indoors is now spend 90% of our time.(Zhong,Bekkering,Schröder;2021)

Though the need for contact to nature is at a critical level, the application of this in the built environment has become challenging, because of the outlook on nature has been to review nature as an obstacle that should be dealth with or removed in this spesific field The result of this approach becoming popular has been an increasing disconnect between people and nature in the built environment reflected in inadequate contact with natural light, ventilation, materials, vegetation, views, natural shapes and forms, etc. (Heerwagen, 2011).

The dependence and need of contact to nature, shows the reality of mankind evolving in a not artificial or constructed, mostly natural world.The evolutional view of the development of the mind and body was connected to many sensory features of the natural life, such as sound, light, smell, wind and weather, water, living species (plants,animals) and landscapes.

Our emotional control,critical thinking, problem solving, constructive abilities were created and highly related to the close environment that was the natural systems and processes.These still remain as the critical elements for human mental and physical heath, productivity and growth. (Kellert,2008)

A growing body of work and knowledge suggests and supports the effects such as well-being, productivity and physical health of strong relation between humankind and nature.

The following conclusions and findings are summarized in Kellert,2005 that supports and creates a more clearer look to the relation:

- Contact with nature has shown to be significantly beneficial for healing and recovery from illness or major surgical procedures, this connection to nature can either be a direct contact (natural lighting , vegetation) or a representational or symbolic illustration of nature.
- It has been seen that people living near to open spaces show fewer health problems and social struggles.This was identified independent of rural or urban living , level of income or education.
- Working spaces that has natural lighting, natural ventilation and/or other environmental features show an improved productivity, higher work performance and motivation with lower levels of stress.
- Relation with nature has been linked with the human abilities of concentration and memory.
- Health childhood and maturation has been linked to the contact with natural features.
- Communities with higher quality environments have shown more positive valutations of nature, superior quality of life, a stronger sense of place compared to the communites with lower quality environments.

The results of these studies depicts that the assumption that contact with nature being critical for human functioning and well-being is also scientifically supported.(Kellert, 2005)

As underlined in the first chapter ‘Architecture and Nature’ the approach to design for the modern built environment has mostly encouraged massive degradation and separation from the natural world.This paradigm resulted in unsustainable resource consumption , climate change and humankind distancing form nature.

However this situation is not an inevitable result of modern life but mostly a fundamental design approach flow.

Restorative environmental design is an approach that aims for both sides of the sustainable issue, meaning it has an low-environmental-impact strategy joined by a biophilic design approach that encourages beneficial contact between nature and people in modern built environment.(Kellert,2008)

The approach for sustainability has been unfurtunately one-sided, focused on the low-environmental,impact strategies for avoding harm to natural systems , even though this being necessary and beneficial it has stayed undurable.Because it has overlooked the fact that long term sustainability can only be achieved by restoring and enhancing peoples positive relationship to the nature in the built environment.(Vittori,Guenther,2013)

Efforts of low-environmental-impact do not result in benefit to productivity, wellbeing or human health, therefore becoming unefficient since over time this lack of connection to space creates a need for renewal and restoring of built environment.Keeping buildings in existence for long life spans is a very fundamental element to the sustainability which can only be provided by the people actually caring and connecting with the space they are living in. Without positive assosiations or beneficial gains from built environment people are unlikely to show stewardship to keep them in existance in the long run.(Kellert,2008)

Low-environmental-impact objectives have been studied in detail and shown by actions and goals that can be proven and guided by the certification systems such as U.S. Green Building Council's LEED rating approach.(Kellert , 2011)

For a detailed understanding of Biophilic Design, in the following pages will be explored the two basic dimensions of biophilic design, six biophilic design elements and that can be related to some biophilic design attributes.This spesification to help designers and developers pursue a biophilic approach has been summoned by S.Kellert in 2005.

The first basic dimension of biophilic design is an 'Organic or Naturalistic' dimension, defined as shapes and forms in the built environment that reflect human affinity for nature.

This organic or naturalistic dimension can be direct experience meaning unstructed contact with natural environment such as daylight,plants,animals; indirect experience can demand an ongoing human input to survive such as a potted plant, an aquarium or a water fountain and a symbolic experience can be a rather representational connection through an image, picture, video, metaphor or more.

The second basic dimension of biophilic design is a 'Place-Based or Vernacular' dimension, described as buildings and landspaces that correlate to the culture and ecology of a locatiy or an area.This dimension's focus is on the a sense or a spirit of place.People are rarely sufficiently motivated to take care or have a sense of responsibility towards a built environment unless they form a strong attachment to the culture or ecology of the space.(Kellert,2008)

Despite the whole worlds latest inclanation for mobility, still most people are have a strong physical and psychological need of a place that they can call 'home'.This way of thinking and relating to a space is the reason for a person's connection, care and responsibility feel towards their built environment. (Kellert,2008)

2.2.Biophilic Design Elements Approach

These two basic dimensions of biophilic design can be related to six biophilic design elements:

1. Environmental features
2. Natural shapes and forms
3. Natural patterns and processes
4. Light and space
5. Place-based relationships
6. Evolved human-nature relationship

These six elements are detailed in more than swenty biophilic design attributes.

BIOPHILIC DESIGN ELEMENTS AND ATTRIBUTES

ENVIRONMENTAL FEATURES

Color
Water
Air
Sunlight
Plants
Animals
Natural Materials
Views and vistas
Facade greening
Geology and landscape
Habitats and ecosystems
Fire

NATURAL SYSTEMS AND FORMS

Botanical motifs
Tree and columnar supports
Animal motifs
Shells and spirals
Egg,oval and tubular forms
Arches,vaults,domes
Shapes resisting straight lines and right angles
Simulation of natural features
Biomorphy
Geomorphology
Biomimicry

NATURAL PATTERNS AND PROCESSES

Sensory variability
Information richness
Age and change
Growth
Central focal point
Patterned whole
Bounded space
Transitional spaces
Linked series and chains
Integration of parts to wholes
Complementary contrasts
Dynamic balance and tension
Fractals
Hierachially organized ratios and scales

LIGHT AND SPACE

Natural light
Filtered or diffused light
Light and shadow
Reflected light
Light pools
Warm light
Light as shape and form
Spaciousness
Spatial variability
Space as shape and form
Spatial harmony
Inside-outside spaces

PLACE-BASED RELATIONSHIPS

Geographic connection to place
Historic connection to place
Ecological connection to place
Cultural connection to place
Indegigenous materials
Landscape orientation
Landscape features that define building form
Landscape ecology
Integration of culture and ecology
Spirit of place
Avoiding placelessness

EVOLVED HUMAN-NATURE RELATIONSHIPS

Prospect and refuge
Order and complexity
Curiosity and enticement
Change and metamorphosis
Security and protection
Mastery and control
Affection and attachment
Attraction and beauty
Exploration and discovery
Information and cogniiton
Fear and awe
Reverence and spirituality

2.2.1Environmental Features

The first biophilic design element, being the most obvious, involves use of well-recognized characteristics of natural aspects in our built environment. (Kellert,2008)

Color
Humankind relates with color instinctually given the fact that throughout human evolution colors have been the indications for survival.Either for identifying danger or locating resources , color had a strong impact in our understanding of the world.Therefore, it is easy to understand that certain color uses can provide different relations in for human physical and psychological dimensions. For example, people are attracted to bright flower colors, sunsets, blue skies and other colorful features of the natural world.

Water
Being one the most basic human needs, water commonly creates a strong response in people.Many critics,architects,psychologists have remarked the fact that any environment that has the intention of creating high levels of liking or preference is composed with a water element.(Kellert,2005)

WATER

Water is a silent contributor to of all our natural surroundings; coverind %70 of earth surface, water has a undeniable presence in the landscape as oceans,rivers,ponds,ice etc.Water guides all aspects of human habitation with its necessity for continuation of our lives.Being the essence of all landscape, it is an uniting element, on the contrary creating borders and lines of our environment.

To focus on some of the biophilic aspects of water it is; humanistic with humands bond with this natural element, aesthetic from the views of ocean to the creation of rainbow,moralistic with its value of resource and strong image in almost all religions, scientific with relation to chemisty,ecology and biology, symbolic sometimes as strentgh sometimes for purity, negative with the fear of flooding or drowning,doministic with the relation of to or residences, naturalistic with all types of activities done in or on water.These are only a

With some of its physical features being faint, as water has no color,shape,hardness,taste or smell ; surprisingly it has strong animistic traits that creates our humanistic bond and reactions to water.These generally are our physical and physiological responses to water's motion,power,change and sound.Water in motion creates a musical sounds which stimulates our strong relation to musicality as a prominent humanistic trait.It also has a significantly important role in our recreational activites from swimming, ice skating,fishing,sailing to skiing.

Environments including water , landscapes created by water provides many restorational responses.These restorative qualities have been discovered from early ages , it can be clearly seen as an prominent factor of life with Greek and Roman healing baths.

The reflective aspect when the surface of water is calm, the changing hue when interacted with sunlight, the embellished experience of natural materials when contacted with water, strong affect when in motion are some of the biophilic aspect examples to display the strong biophilic character of water.

Interior pools integrated with the design of a room, roof gardens with the need of water for vegetation, indoor plumbing with designed fixtures to realign our connection with water even in our residences,spas and swimming pools for recreation activities, aquariums providing a living ecosystem with attractive elements, waterfalls with the undeniable universal appeal of water in motion, fountains for realigning built environments with natural aspects are only some of the ways to incorporate biophilic aspects of water into built environments.Clearly the affect of water is a generous enchancement to the biophilic qualities of a space.

As well as the biophilic contribution, water has numerous services for civilization; agriculture,transportation,food,hydropower can be given as examples.

A strong example for the attraction power of water is the city of Venice.The water canals that define the main aspect of the city's landscape,they create an undeniable biophilic appeal to the city. The effect that the city has created is so prominent that around the world, other cities or regions can be refered as ' The Venice' of that area.(Mador,2011)

Air

Natural ventilation is preferred to processed air or stagnant air and it is also important the quailities of the air such as pollution rates, movement and flow.Despite this quality not having a visual connection it has a spesific value for stimulation of other sense like feel,smell and obvious health benefits.(Kellert,2005)

Sunlight

Daylight is one of the most important and preferred feature for built environment.Use of natural lighting compared to the use of artificial light can improve comfort,health,morale and productivity.This preference is a reflection of humans daily functions relation to light, how people visual connection to light organizes daily responses and functions of our body.Also throughout evolution people depended highly on daylight for gathering or resources , avoiding danger and securing themselves. (Vittori,Guenther,2013)

Plants

Plants are a fundamental for human existence since they are often sources of food, fiber but also people have depended on plants for security and sustenance.Designing a built environment with the insertion of plants can improve comfort, well-being and performance.

Animals

Being another basic human existence resource for food,protection and companionship , animals can also be related for the factors of danger and fear.While designing an environment its important the amount of resemblance and the feeling that the spesific animal symbols can create on the larger community.

Animals in building interiors mostly occur in representational forms, such as ornaments decoration art , the presence of animal forms provokes satisfaction,pleasure,stimulation and emotional interest.

Natural materials

The preferation being towards the natural materials over aritificial materials are prominent.This aversion is probably due to the inability of the artificial materials' organic processes of aging, weathering etc. (Kellert,2008)

Views and vistas
People express a strong preference to exterior views, especially when the views contain natural features and vegetation.People basic need for the connection to natural world can also be seen here.

These views are more prefered and most satisfying when the scale is compatible with the human experience, not restricted or unfamiliar.

Facade greening
Vegetative facades such as ivy walls or green roofs provoke interest and satisfaction in people, this probably relates back to the instinctual relations throughout evolution benefits of camouflage for protection , organic materials as source for insulation and even food.

Geology and landscape
Creating a compatible connection between the prominent geological features of the landspace and the built environment is a prefered and clever design choice.

Frank Lloyd Wright has achieved a particular success creating spaces that are strongly related with the sorrounding geological elements, benefitting from each other.

Habitats and ecosystems
Buildings, landscapes that show close and compatible relationship with local habitats or ecosystems also tend to be preferred and highly effective.

Fire
Fire elements in built environments while being complicated and a deisgn challenge for how to manage the dangerous aspects and regulations for health, are still are prefered features, being used for cooking especially but also for means of heating and creating a relaxing comforting feel with warm tones and movement creating a pleasurable view. (Kellert,2008)

2.2.2.Natural Shapes and Forms

This element is the representations of natural world and its aspects found in the built environment on facades structures and interiors.

Botanical motifs
A common element of built environments are the shapes, forms and patterns of plants or other types of vegetation.

Tree and coloumnar supports
Throughout the evolution of people, trees have played a significant role; a source of food, a resting hiding spot under, a wayfinder symbol, a source of building material, source of paper etc.

The elements that have the appearance of a tree-like figure or columnar elements are appealing and common in built environment.Tree-like silhouettes, leaf figures can be used repeatedly to create a foresty atmosphere which promotes a sense of natural world.

Animal motifs
Although its to a less extent compared to plant motifs, animal life symbols, claws, paws, stylized animal forms are used in exteriors and interiors of buildings.

Shells and spirals
Simulations and depictions of invertebrates are common design features in the built environment, particularly the shell and spiral forms.Also the shapes and forms of bees,beehives,butterflies,spiders,spiderwebs are also used commonly with different stylizations.Building designs can mimic invertebrate processes; the structure of a beehive or pattern of webs.

Egg, oval, tubal forms
These forms can be used as interior or exterior elements for buildings or even for landscapes , they can be used more metaphorically to remind of the shape and the natural forms to the eye.

Arches,vaults,domes
These elements also resemble forms found in the nature such as nests,cliffs,shell forms and provide functional and decorative

Shapes resisting straight lines and right angles
Since natural forms are often in a flowing state, shapes and figures following these princple and giving the feeling of flow resembles with natural aspects in our minds.

Simulation of natural features
This attribute focuses on simulating rather than replication natural forms.For example designs with features that has also a functional aspect as it is in the nature are much more succesful.Because they use shapes or processes that suggests functional features like structural integrity , flowing state or adaptation rather than only superfiical decoration.

Biomorphy
Architectural designs can sometimes form a resemblance to natural forms without the designer or architect actually intending it to be whilst the process.These designs though not designed to have natural forms appealing as organic forms is generally called Biomorphy.The Sydney Opera House can be given as an example for this kind of architecture.

Geomorphy
Built environment designs mimicing the landscape and geology that they are in proximity of is another type of relation that is find in architecture and nature.Designs with this intention can create an interest because of the aspect that they are in unison with the sorrounding.

Biomimicry
Designs with the tendecy of borrowing from the adaptation features of the natural aspects has been called as biomimicry by Janine Benyus in ther book with the same title. (Kellert,2008)

BIOMIMICRY

The human contentment in the presence of well design is an admiration that has started million years ago with the first objects that we have incountered, our natural habitats.Human beings were sorrounded with beautiful systems and magnificient forms that together made life possible.

Biomimicry is where we as human beings are return to these design cues we got from the natural world.It is the act of learning from nature's wisdom, acquiring strategies that worked for million years in our presence.Surely, this choice of emulation of nature's genius is a natural part of biophilia that focuses on our connection to nature and all its processes.

Biomimicry rather than a style of construction or design product is a perspective to lead the design process , seeking solutions for a functional challenge searching for an organism or ecosystem that perfectly examples it and trying to understand, emulate it to our design.

The key difference between, building design that resembles nature by aesthetics and biomimicry, is the philosophy of ' do as nature does' in order to mimic the functional performance.It is certainly focused on functionality.

Nowadays, the biomimic architects are trying to achieve the mission of creating more life like buildings, that could meet their own needs, providing many benefits not only for the building itself but the whole ecosystem.

Bringing the natures wisdom back to building processes requires for the architects and designers to learn to listen and understand these organisms and ecosystems work, with understanding comes humbleness and a desire to learn more.Putting more value in to nature's advice unites humans and nature.Which makes this a meeting for biophilia; understanding the nature more, co-existing with the it evermore.

Biophilic approach's desire to reestablish positive connections between people and nature in the built environment, all of the elements such as natural light,natural ventilation,natural rhytms are studied by building technologies; which are also being informed by

biomimicry.The same elements that make us feel home and connected to nature, can be lessons learned from the natural habitats. (Benyus, 1997)

2.2.3.Natural Patterns and Processes

The third biophilic element points out the incorporation of qualities found in nature into built environment.

Sensory variability

Human beings survival and wellness has always been accompanied and lead by highly sensuous and complex natural habitats. The satisfaction feel is still reliant on receiving a variety of sensory attractions.

Information richness

Natural world being maybe the most complex and intellectually challenging aspect of our modern age , this quality of creating curiosity, exploration, problem-solving like feelings and experiences often resolves in satisfaction of the built environment.

Age and change

The only unchanging reality of our natural world is change and aging process for all.This progression when applied into built environments tends to create a sense of familarity and pleasure.

Growth

Development and growth are similar expressions to aging, sensed in the built environment often provokes positive outcomes.

Central focal point

Throughout the trials of finding one's way in a natural habitat a central element in a landscape tends to be a pin point, a symbol of knowing where to go.With this tendency in mind, when designing creating an attraction or axes point where the eyes will directly lead to in the central point often results in positive feedbacks.

Patterned wholes

Variability of different aspects united or integrated as a pattern, often is very positively received. (Kellert,2008)

Bounded space
The tendency for bounded spaces is very strong for human beings because it raises feelings of security and safety.Also spaces with clear and consistent boundaries tend to be valued.

Transitional spaces
In between spaces that flow into one another, providing access and movement are often associated with positive responses since these transitions remind of flowing state and continuity.

Linked series and chains
Continuity sense is also very prominent for these spaces supported by the clear organized movement of shapes and spaces.

Integration of parts to wholes
The feeling of additional elements to a whole, gives senses of added structural strength which provides feelings of safety.

Complementary contrasts
For enchancement of interest and stimulation, usage of blending contrast elements is another succesfull way for a design.

Dynamic balance and tension
Contrasting forms and the dynamic feeling between them can cause a sense of strength and durability.

Fractals
In nature elements are very rarely exact copies of each other, related or simiar forms are often called fractals since this a very rare occasion they provoke interest. these patterns can be seen in the succesful designs for buildings.

Hierchically organized ratios and scales
In nature most well-working forms and areas appears in hierchiarchy, this aspect is often an inspiration point for succesful built environment. (Kellert,2008)

2.2.4.Light and Space

Fourth biophilic design element is light and space; seven focusing on light and five focusing on space there are twelve attributes that follows this biophilic design element.

Natural light
Natural lighting has many beneficial and rewarding affects on people both physically and phychologically.

Filtered or diffused light
The affects of natural light can be enchanced by modulating the light and this is a very common and affective lighting process.

Light and shadow
The complimentary contrast that was discussed for other elements is also very prominent here with light and shadow, creating feelings of mystery , provoking curiosity.

Reflected light
The amount of light and the direction/effect of the light can be enchanced by using reflective surfaces with thel light.

Light pools
Interior spaces when there is a presense of pools with connected light to enhance the view, creating light plays on the water particals, human beings tend to be drawn into it. Light pools can also assist way-finding and movement by light patches in dark or shadowed areas.

Warm light
Warm colored lights create the emotional and physiological response that human beings generates towards sunlight, creating a secure,nested feeling.

Light as shape and form
It is possible to create dynamic,sculptural forms with the manipulations of lights.This manipulation stimulates curiosity, imaginative thinking and aesthetic pleasure. (Kellert,2008)

Spaciousness
The spaciousness of spaces, has shown to promote pleasant feelings with the sense of openness that refers to our natural state in the natural world, completely free with endless land. So human beings react to spaciousness with results of satisfaction.

Spatial variability
Experiencing variety within an area or in close proximity to each other, encourages emotional and intellectual stimulation.

Space as shape and form
The effect obtained when spaces are creatively explored and conveyed as shapes and forms, fosters interest,exploration and adds aesthetic value.

Spatial harmony
The effect a space can have on a person is the most effective when the spatial features, lighting,scale etc. blends in a unified way.Creating a sense of security and harmony.

Inside-outside spaces
Atrium and interior gardens could be given as examples for succesful implementations of inside-ouside space relations that often results in heavily positive reactions, since the need of connecting to the natural world is a necessity for human beings, indoor spaces that has the sense of blending interior and exterior are one of the most succesful design choices. (Kellert,2008)

2.2.5.Place Based Relationships

The fifth biophilic design element is place-based relationships, focusing on the realtion between culture and ecology, its affects on the human need for territorial control and belonging.

Geographic connection to place
Connection to a geographic area, often encourages feelings of connection,security, familarity and predictability; all very important positive responsives for human beings.

Historic connection to place
Amount of time spent in a space can result in meaningful emotional connection and relation to the place, creating effective communities and individuals that value participation and awareness of the place.

Ecological connection to place
The connection of humans being ecological transformative organism becomes very important for the space since it can add benefits to the ecological value but can also damage , so the creating awareness around this is the first step to prevention of damage and movement towards benefits.

Cultural connection to place
This connection is an accumilation of the history,ecology,geography of an area since they are all also part of and effective changeables of the culture.Culture is a prominent part of collective and individual identity and it is a human need to have cultural roots.

Indigenous materials
Usage of local and indigenous materials increases the general positive relation to a place , providing reminders of local culture aspects and savings on energy.

Landscape orientation
The orientation of landscape when compatible with the local scenery creates a sense of belonging and space, the visuals coming together as one.

Landscape features that define building form
Landscapes are the number one feature that should be examined in the beginning phases of building design process, the connection or the choice of contrast to the surrounding will be a determining point for the response the building will receive.

Landscape ecology
Landscape ecology should be considered as a long term approach for gaining the most of the place-based designs, considering all elements such as biodiversity,scale,resources,ecological connectivity and more. (Kellert,2008)

Integration of culture and ecology
The connection and true blend of culture and ecology will result in lonfg-term sustainability.

Spirit of place
This term spirit of place, represents the connection to a place becoming strong enough for the place to generate certain feelings immediately, this connection extends to both built and natural environments.

Avoiding placelessness
Placelessness is the antihesis of place-based design.This can be seen very vividly in some of the modern architecture with the complete separation of built environment and culture, ecology.

2.2.6.Evolved Human-nature Relatioships

The fianl biophilic design element is evolved human-nature relationships, focusing more on the fundamental aspects of human connection to nature.

Prospect and refuge
This definition is actually contraductory terms being used together to define a very spesific relation to space that human beings inheritly have.Refuge is a built or natural environment that has the ability to create a safe space,security and protection.Prospect on the other hand,reflects unknown possibilities essential for discerning distant objects, identifying sources of danger or locating resources.These two together would give the meaning of the balance between feeling secure in a space while being on the lookout for danger.It is a very primal instictual habit of perception of space for human beings.

Order and complexity
Order symbolizes structure and organization, while complexity symbolizes detail and variability.These two traits balanced enough to create a harmony from the contrast is the key for the most satisfynig environments. (Kellert,2008)

Curiosity and enticement
This complementary attributes together results in very powerful designs that encourage a high level of imagination.Curiosity is the human need of exploration and enticement only fosters curiosity.

Change and metamorphosis
Change is a constant for humans and natural systems with aging and growth.Designs that could capture the quailty of change according to time whas achieved an unique and strong quality.

Security and protection
The fundamental,instictual reason for built environments is the need for protection, form dangerous situations, weather changes etc.

Mastery and control
Built environments are the reflection of the human desire to achieve mastery and control over nature.This aspect when achieved with respect to the natural aspects is a strong example of human abilities and the possibility of mutualism.

Affection and attachment
The connection, bonding and attachment between human and nature is a essential component for both natural and built environment.The designs and built environment that can create the attachment to the place have achieved a real challenge successfully.

Attraction and beauty
One of the strongest human inclanation is the attraction to pleasing satisfactory aesthetics, fosters curiosity,imagination,exploration. Building designs that could capture the attraction by the aesthetics are one of the most succesful creations.

Exploration and discovery
Nature and natural aspects are the most informationally rich, intellectually challenging thing the human kind encounters, trying to comprehend new information everyday creating a sense of exploration always.To replicate this exploration and challenge in a built environment will result in great attraction and discovery feelings for the occupants.

Information and cogniiton
Humans are inherintly curious and exploring always and being in an environment that could foster this and support will be great success, resulting in more porblem solving and critical thinking. (Kellert,2008)

Fear and awe
Even though 'fear' itself cna be a negative notion and might seem hard to relate to biophilia, the human insticts of creating a built environment for protection comes from the base of fear of the dangers, so it is a at the base of our need for built environments. Moreover the most satisfactory results for design basing it on the feeling or concept of fear would come when blended with the instictual being in 'awe' of something.The unknown as much as it can be frightening is also always interesting, so to use these contrasts together can result in greatness.

Reverence and spirituality
The buildings that establish meaningful relations, fostering feelings of connection,togetherness are the ones that stand the test of time, because the connection to the buidlings continues throughout time. (Kellert,2008)

2.3.The Patterns of Biophilic Design

While Kellert and associates focused on the idea of biophilia and what could be considered an element of biophlia, another popular approach was rather focused on how to implement biophilia into design and which features would be considered as biophilic design dividing and organising them into 'patterns'.

These patterns of biophilic design explains the relation between nature, human attributes of health,behavioural tendencies,senses and the built environment.

2.3.1.Biophilic design decision making

To define 'good' biophilic design, the design have to be focused on people as biological organisms that are responsive and adaptative to their sorroundings (built and natural environment) according to their biological system indicators.Biophilic design approaches that are supported rightfully by heath condition indicators, socio-cultural behavioural tendencies and perceptions, individual perception differences, duration of user experience; results in creation of spaces with restorative, inspirational, encouraging, health promoting qualities.(Browning,Ryan,Clancy;2014)

Design strategies for biophilic design should be flexible, adaptable into different range of circumstances, replicable to be able to create different conclusions and add on biophilic benefits into the a variety of built environments. The design interventions should be based on the spesific requirements and needs of the particular space.

In every project the biophilic design patterns that the designer would heavily rely on will change according to the need of the spesific circumstances.

The diversity of design strategies used for one project/design will have an impact on the amount of health and well-being benefits of biophilic design approach.

Incorparating patterns in combinations will likely result in an increase of health benefits in the space.The mix of different biophilic design patterns can create a design that can satisfy a larger and a variety of users from different backgrounds and user intentions resulting in an environment that is psycho-physiologically and cognitively restorative for wider range of users.However, additional patterns and strategies that are not based on the needs or the capacity of the project itself can backfire, it should always be supported by unified design intentions.

The intention behind the used biophilic design patterns should always consider to be accurately related locally.As mentioned also in the previous part of biophilic elements, the connection to the location, community, geography, climate, culture etc. of the area is a heavy prominent for the decision of approach that could be taken for the design and the user experience itself.

Every place will have its own challenges and opportunities that has to be taken account in the process of design.The key considerations that will frame and influence the design process will be drived from the location's features. (Browning,Ryan,Clancy;2014)

As mentioned in the first chapter 'Nature and Architecture' historically humans have been effected by locally available materials, topography, climate while building shelters for themselves.Use of local materials, the decisions based on climate responsive design and using native,drought tolerant plants to create landscape designs that lasts throughout seasons can be effective strategies when designing for a resilient, biophilic experience.

Another aspect that should be considered while trying to make locally based decisions is relating and adapting to the culture and demograpghy.Cultural constructs, social tendencies of communities will create a variety of different perspectives and user experiences based on what would be considered natural or aesthetically pleasing.This change of perspectives can also differ in many scales, meaning the difference can be between neighbourhoods or ranging to countries and continents.These should all be considerred while determining which approaches to depend on for the most accurate biophilic design result. (Browning,Ryan,Clancy;2014)

2.3.2.Patterns of Biophilic Design

Since Wilson's The Biophilia Hypothesis, the body of work and evidence supposting the biophilic approach has increased considerably. The descriptive term 'pattern' is used to describe these approaches and features of biophilic design.These patterns are ,while comming from the body of work based on science of biophilia, not definite solutions or formulas to apply on every biophilic design project but rather informative guides to assist the design process.

These patterns are organised under 3 categories and are in total divided to fourteen patterns of biophilic design.

PATTERNS OF BIOPHILIC DESIGN

NATURE IN THE SPACE

Visual Connection with Nature

Non-Visual Connection with Nature

Non-Rhythmic Sensory Stimuli

Thermal & Airflow Variability

Presence of Water

Dynamic & Diffuse Light

Connection with Natural Systems

NATURAL ANALOGUES

Biomorphic Forms & Patterns

Material Connection with Nature

Complexity & Order

NATURE OF THE SPACE

Prospect

Refuge

Mystery

Risk/Peril

2.3.2.1.Nature in the space

Pattern 1: Visual Connection with Nature

The pattern of having a visual connection with nature, natural elements , living systems and processes through a view.A space designed with the pattern of visual connection with nature is attractive to the eye because of the stimulation of visuals.It generally results in a feeling of calmness and relaxation.

This pattern has been evolved from research done on visual preference and responses to visual connection to natural aspects. The research has shown positive results on emotional functioning, levels of stress and anxiety, condition of concentration.Research done on the effects of visual stimulation of natural views will be detailed in the chapter 'Biophilia and Well-being' carried out through examples. (Browning,Ryan,Clancy;2014)

The design guides the gaze to the outside natural aspects immediately with the floor to ceiling windows designed.

DCPL Southwest Neighborhood Library
by Perkins and Will

The research done on visual preferences has shown that views of flowering plants, non-threatening animals, clean water, trees is prefered.(Orians & Heerwagen, 1992)

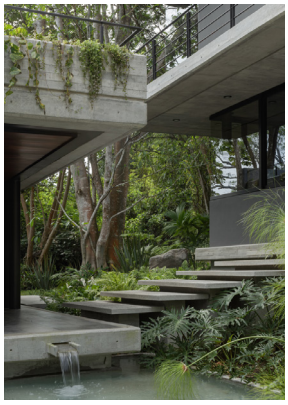
With the swift pace of urbanization, this pattern is becoming harder to achieve in our built environment. However, architects provides creative solutions such as inner courtyards, skylights, artificial natural elements to replacate this visual connection to nature, in daily life built environment.

The New York Times Building
by Renzo Piano

The main objective of the pattern Visual Connection with Nature is creating a shift of focus to the visual natural aspects aiming to relax the eye muscles and improve the state of well-being.The increase of visual connection to natural aspects and the variety of these natural features have been correlated with the positive effect of the intervention. (Orians & Heerwagen, 1992)

Examples of this pattern being present in a built environment can be present naturally such as views of natural flow or body of water,plants and vegetation,non-threatening animals, terrain or these visuals can be stimulated or constructed such as aquariums, green walls, mechanically supported flow of water, artwork of natural sceneries etc. (Browning,Ryan,Clancy;2014)

In order to create a strong visual connection with design the prioritization should be focused on real nature over simulation, biodiversity, shifting the focus to natural aspects for min five to twenty minutes a day for the optimal effect, using the benefits of digital sources to represent natural aspects.



Entreparotas House
by Di Frenna Arquitectos

The visual connection to nature is evident in many aspects of this project, from the presence of natural aspects in the area, large windows to get the most of the visual effect to creation of artificial water elements.

Pattern 2: Non-Visual Connection with Nature

The pattern of Non-Visual Connection with Nature is the design tendency to,promote auditory, tactile, olfactory or gustatory stimuli (perceived with all non-visual senses) that create a deliberate, intentional and positive reference or analogy; to nature, the systems of the living world, or natural processes.

A space designed with the pattern of non-visual connection with nature is a very stimulated space that feels fresh and well-balanced , perceived variable but familiar and comfortable, whereby sounds, aromas, and textures are reminiscent of being outdoors in nature. (Browning,Ryan,Clancy;2014)

The research on the impact of sensory aspects such as sound, vibration, touch, fragnance, taste on cognitive performance,improvements in mental health and tranquility as a result of non-visual sensory interactions with nature.The effects of using all senses to experience a space has also been largely reseached and said to promote a fuller experience generally creating more satisfactory responses and has been a factor that is prominent in design(Crawford,2006)

Examples of this pattern being present in a built environment can be present naturally such as fragrant herbs and flowers , presence of birds , sound of flowing water, weather changes (rain, wind), natural ventilation creating breezeways, textured materials (stone, wood, fur), crackling sounds of fire/fireplace, sound of waves, sunlight creating warmness sense, different heat of surfaces.It can also be built or stimulated additionally, such as digital hearings of nature sounds, highly textured fabrics/textiles that mimic natural material textures, presence of audible water feature etc.

In order to create a strong non-visual connection with design the prioritization should be focused on allowing nature sounds and solutions of blocking urban sounds, use of textiles that are in-contrast of each other near to enchance the difference of touch sense, desgining aspects that can effect more than one sense for increase of perception. (Browning,Ryan,Clancy;2014)

Pattern 3: Non-Rhythmic Sensory Stimuli

The pattern of Non-Rhythmic Sensory Stimuli are probabilistic and short-lived connections with nature that can be statistically analyzed but not predicted with certainty.

A space with the non-rhythmic sensory stimule can be considered well designed if a the users can experience a brief, energizing, momentarily special distraction.

The main objective of the Non-Rhythmic Sensory Stimuli pattern is achieving designing for momentary exposure to unpredictable movement, visions or the periodic experience of scents or sounds that will encourage natural sensory stimuli that attract attention,resulting in replenishment of focus for the tasks.

Examples of this pattern being present in a built environment can be present naturally such as breezes, water babbling, animal movement and with fragrant flowers, trees and herbs that will create a stimulation from time to time.It can also be fabricated by use of materials that move or shine with light, reflections of water on a surface, shadow/light movements/plays etc.

Designs for establishing effective non-rhythmic stimuli; could be to mimic the nature,in the sense of matching the natural seasonal changes of nature by creating non-rhytmic sensory experiences that happen in the span of a year and for the design to be successful repetitiveness such be avoided. (Browning,Ryan,Clancy;2014)

Pattern 3: Thermal & Airflow Variability

The pattern of Thermal & Airflow Variability is defined as subtle changes in air temperature,humidity, airflow across the skin, and surface temperatures that mimic natural environments.

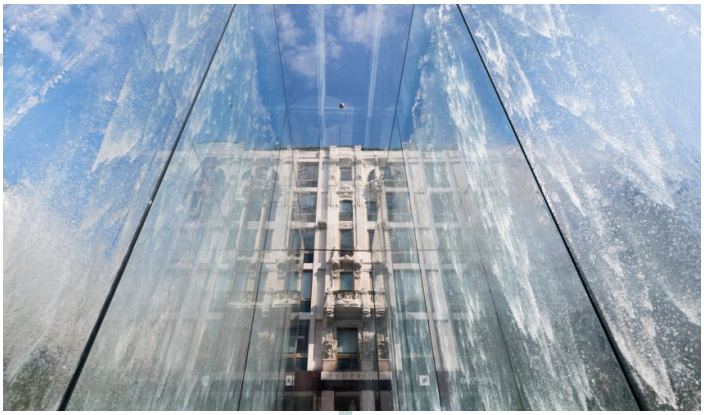
Examples of this pattern being present can be represented naturally such as difference of shadow/shade, radiant surface materials solar heat gain or constructed with system controls, window treatments and operability etc. (Browning,Ryan,Clancy;2014)

Pattern 5: Presence of Water

The pattern of presence of water is a scenery designed to enhance space experience through the all the senses the body of water can be percepted (seeing, hearing or touching of water).

A space with designed with this pattern will promote similar qualities to the water itself, calmness or fluidity creating relaxation,tranquility and/or stimulating.Sound effects of water, lighting interaction, proximity and accessibility to the water would each contribute to whether to experience of the space being stimulating, calming, or both. (Browning,Ryan,Clancy;2014)

The Presence of Water pattern has evolved from research on visual preference and positive emotional responses to environments containing water elements; the results have shown reduced stress, increased feelings of tranquility, and lower heart rate and blood pressure from exposure to water features; improved concentration and memory ; overall improvements of well-being.



Entrance of Apple Store Milano
by Foster + Partners

The water feature included in the design of the entrance to the store by Foster+Partners has created an atmosphere of socialization and resulting in the area around to become a prominenet relaxing area for the city.

The attraction is caused by only the water feature addition, which has a great aesthetic value since the design was aimed to create a multisensory experience with the water elements being supported by lighting choices.

Also the relaxation effect comes from both the visual and sound experience the water features has added to the near by area.

The main objective of the Presence of Water pattern is to promote attributes of water that will effect multiple senses to enhance the experience of a place in order to create a more soothing mood and restorative space.

Interaction with water features that create multisensory responses results in improved concentration, decrease in the levels of stress even if the water features is a small, less prominent one; the results can be beneficial.

It is also explained that as long as the water bodies or features aesthetically look that they provide clean or purified water, the health outcome of just interaction or presence is a very strong mutual , benefial effect. (Kellert,2008)

Examples of this pattern being present in a built environment can be present naturally such as proximity or presence of rivers, ocean, pond, visual access to rainfall or water flows or it can also be built into the environment by a water wall or use of aquarium.

In order to create the maximum benefit the design using this pattern as an objective should prioritize a multi-sensory water experience to achieve the most beneficial outcome and naturally fluctuating water movement over predictable movement or stagnancy. It should be payed attention that high volume, high turbulence water features could create discomfort, impact humidity levels or decrease acoustic quality, so proximity may influence appropriateness. (Browning,Ryan,Clancy;2014)

Footbridge on the water Residential Building
by LOVE architecture and urbanism

The importance of the degree of interaction with the water body present was noticed and acted upon in this project.The sliding doors and windows, large openings,minimal structure to not block the views and creating inside and outside spaces to get the most of out the interaction can be seen int he images.

Pattern 6: Dynamic & Diffuse Light

The pattern of Dynamic & Diffuse Light is the presence of different intensities of light and shadow that change and have movement over time that replecates the similar occasions that occurs in natural environments.

Dynamic & Diffuse Light pattern used correctly and effectively in a space creates expressions of time and movement to foster feelings of mystery and intrigue, with the company of a sense of calmness.

Lighting design has long been used to set the mood for a space, and different lighting conditions results in a variety of different psychological responses.The responses to different intencities, colors or movements of light can creates many emotional responsesn taht can be individual but also expected outcomes for general human mind. (Browning,Ryan,Clancy;2014)

The impact of daylight on performance, mood and well-being has been studied for many years and been a prominent factor in the design of spaces that are intentioned for high focus and concentration such as educational or workspace places.

It has also been researched the many health benefits of daylight and the importance of daylight for the human biological system since the amount and quality of the light that human eyes encounter during the day effects the directly the hormonal systems. (Vittori,Guenther;2013)

The main objective of the Dynamic & Diffuse Light pattern is to provide users with lighting options that stimulate the eye that results in a positive psychological or physiological response, and to help maintain circadian system functioning.

Examples of this pattern being present can be represented naturally such as daylight from multiple angles, direct sunlight, firelight,moonlight or it can be constructed as electric light sources , Illuminance , ambient diffuse lighting on walls and ceiling , day light preserving window treatments, additional personal user dimming controls, providing circadian color references(white light during the day and lack of blue light at night). (Browning,Ryan,Clancy;2014)

Pattern 7: Connection with Natural Systems

The pattern of Dynamic & Diffuse Light is understanding, knowledge and being aware of the natural environment and aspects around, especially realizing the seasonal changes, it's effects and characteristic of the ecosystem.

This pattern is focused on the awareness of changes and creation of strong connection with the sorroundings.Being aware and observing creates fuller experiences that can be enlightening and relaxing.

When having the intention of craeting a space with connection of natural systems, the actions that may be taken can include; focusing on and learning about rainwater collection, treatment of landscape; to have strong access to natural aspects would create the most influence, incorporating responsive design tactics for mutual benefits with nature can also provoke the same results.

Examples of this pattern being present can be represented naturally as climate and weather patterns (rain, hail, snow; wind, clouds,fog; thunder, lightning), hydrology (precipitation, surface water flows and resources; flooding, drought; seasonal arroyos) geology (visible fault lines and fossils; erosion, shifting dunes) ,animal behaviors (predation, feeding, habitation, night sky (stars, constellations, the milky way) and cycles (moon stages, eclipses, planetary alignments, astronomical events), seasonal patterns.It can also be constructed as simulated daylighting systems that transition with diurnal cycles, exposure of water infrastructure, step wells for seasonal rainwater storage. (Browning,Ryan,Clancy;2014)

Pattern 8: Biomorphic Forms & Patterns

Biomorphic Forms & Patterns are symbolic references to contoured, patterned, textured or numerical arrangements that replecate the ones existing in nature.A space focused on Biomorphic Forms & Patterns is interesting, attractive , familiar and possibly captivating. (Browning,Ryan,Clancy;2014)

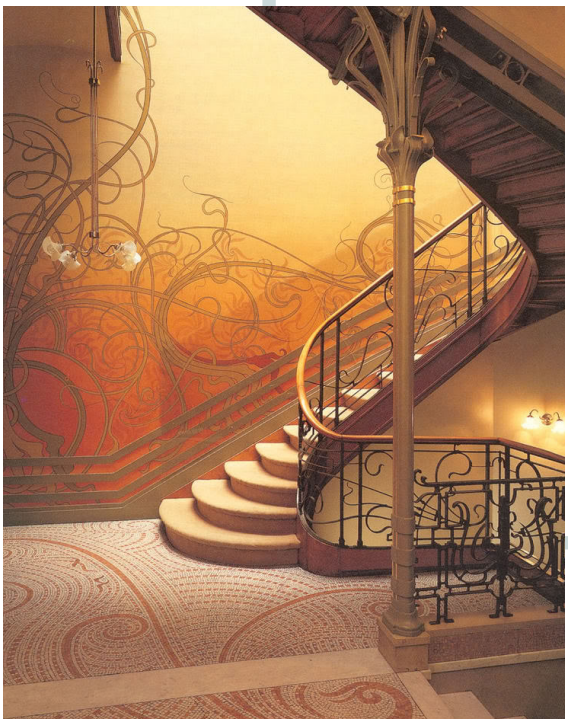
This pattern is based upon variety of research focused on the responses to replications of biological-natural forms found in the nature; applied in production of buildings,landscapes,furniture,products etc.Biomorphic forms as explained previously has biophilic features that results in health and well-being benefits such as shift in focus,reducing of stress.

Although human brain can acknowledge the fact that the biomorphic forms are not living natural organisms, it still has the emotional response do to the symbolic representations of life it presents.

The main objective of Biomorphic Forms & Patterns as it has been said is to provide representational design elements that directs human brain to make connections to nature and natural aspects.

Design considerations that should be taken account for this patterns are avoiding overuse of forms because it can easily led to overwhelming visuals that fosters negative notions.

Examples of this pattern being present can be represented in decor as window details: trims and moldings, glass color, texture, mullion design, window reveal detail , sculptures, furniture details or it can be present as forms. examples include arrangements of the structural system (e.g., columns shaped like trees), building forms,acoustic paneling (wall or ceiling), railings, banisters, fencing, gates etc.(Browning,Ryan,Clancy;2014)



Stairwell, L'Hôtel Tassel

Pattern 9: Material Connection with Nature

A Material Connection with Nature pattern is the tendency of using material and elements from nature that, reflect the local ecology or geology and in result creates a distinct sense of place and belonging.Places designed with a material connection with nature pattern in focus can feel authentic, familiar and warm.

While scientific documentation of the effects material connection with nature pattern being present with the inclusion of natural materials in spaces , on the health impact is limited, the available research is starting to open up opportunities for better informed design choices.

The main objective of the Material Connection with Nature pattern is to understand, explore,observe the local characteristics, quantities and different ways of implementing done in the local area of natural materials. Possibly, there might be various layers of information about the materials and how it is implemented effecting the strength and longevity of the connection.

Examples of this pattern being present can be represented in decor as accent details made (natural wood grains; leather; stone, fossil textures; bamboo, rattan, dried grasses, cork), interior surfaces (veneer, countertops), woodwork, stonework or it can be present as forms. wall construction (wood, stone), structural systems , facade material, furniture form etc.

Pattern 10: Complexity and Order

The pattern of Complexity and Order is rich sensory information that results from the contrasting but well blended spatial features that resembles the ones encountered in natural environment and species.A well designed space with the pattern of complexity and order being the main effect and aim, embraces contrasts in a blends such feelings as engaging , informationally rich, intriguing balancing boring and overwhelming.

Complexity and order pattern has the main features of providing symmetries and fractal geometries(creating contrasts) in a spatial hierarchy in order to create a visually nourishing environment that will have a positive cognitive response.(Browning,Ryan,Clancy;2014)

Pattern 11: Prospect

Prospect pattern is an unobstructed view from a distance for foresight, surveillance and planning. A well organized space with the Prospect pattern gives feelings of freedom, but provides a sense of security and control, especially in lonely or unfamiliar environments.

The expectancy of this pattern has evolved from research done on visual preference, spatial responses and habitation,also taking account of cultural anthropology, evolutionary psychology, and architectural historical analysis accurancy. It is seen that health benefits may include a reduction in stress, feelings of boredom, and perceived vulnerability; as well as enhanced comfort.

Example characteristics of Prospect pattern designed spaces are use of transparent materials,designs of balconies, staircase landings, open floor plans that supports the freedom feeling, elevated planes with the visual giving a sense of advantage, views including shaded trees(security), bodies of water or evidence of human habitation. (Browning,Ryan,Clancy;2014)

Pattern 12: Refuge

Refuge pattern is connected and drawn from the human instict of withdrawal in a secure and safe space ,protected from environmental conditions or flow of activities, the sense is not being in a completly close place but the individual oro group being protected from back or overhead.Individual having the protection sense while still being in a condition for movement or observation.

As the focus point is security and protection, a succesfully implemented refuge pattern should result in spaces that feels safe, provides senses of retreat, rest, pause and healing.The spatial aspects of refuge pattern can have characteristics that are physically embracing or surrounding the individual or group but its shouldnt have a definite distintual separation.

This can be achieved by creating small separations that creative a sense of privacy in a larger public space.Examples can be study corners in libraries, reading corners in living rooms, individual seat-

A secondary aspect can be to limit the visual access to an area or provide semi-visual access by materials such as semi-transparent glass.

Attributes of refuge pattern conditioned spaces can be spaces with visiual or auditory privacy, spaces designated for more reserved activities such as reading,relaxing,meditation.

Pattern 13: Mystery

The pattern of mystery is the sense of more information,sensory attributes that could be achieved only in spesific occasions or view points or the sense of exploration and curiosity poured into a spatial description that will encourage to have a closer look or engage with the built or natural environment.These spaces provides a clear sense of anticipation and the idea of things/information waiting to be achieved creating an excitement and curiosity.

The pattern of mystery is formed on the idea that human beings have two basic needs in all environments: to understand and to explore.

In order to design such place that will trigger mystery pattern related feelings and actions such as willpower, eagerness,curiosity anticipation ; can have curved edges that plays with the perception, shaded areas, sounds or vibrations that doesnt seem to have a clear sources in the first instance,translucent materials and elements etc.

Pattern 14:Risk

The pattern of Risk is the sense of danger accompanied with the knowledge of security.A succesfully designed space with this pattern would have a thrilling rush feel while keeping the charms of exploration and interest.

The way risk can be generated in a space can relate to biological responses that most human beings will experience, such as the likelyhood of falling,getting hurt or wet or lose of control in the situation.

2.3.2.The intersection of approaches

Through the explanations of the biophilic attributes by Kellert and the biophilic design patterns explained by .... in Terrapin; it can be seen that there are some main objectives that both approaches have focused on and explained in detail.

Combining the two approaches, with the focus of the common initiatives the most prominent ways of biophilic approach to design and architecture can be observed and created through these main groups. The biopic patterns indicated and the attributes by Kellert are grouped as they explain close arguments.

The nine groups are joined as the following, from the observations done on the two approaches and the research done around these main indicative researches.

- Visual connection to nature
- Material Connection with Nature
- Forms with connection to natural aspects
- Prospect and Refuge
- Complexity and Order
- Light
- Presence of Water
- Connection with Natural Systems
- Curiosity and exploration

Biophilia and well-being

A recently developing branch of psychology explores the connections between people and environments, built and natural. This branch called Environmental Psychology and it's explorations to well-being possibly has been started with the studies of Proshansky and his colleagues who studied if certain hospital designs would provide health benefits to patients.(Proshansky, Ittelson, & Rivlin, 1970).

Starting from the definition of biophilia in Wilson's hypothesis in 1984 and Kellert's values of biophilia, the following can be considered theorotical basis of biophilic design in environmental psychology (Zhong, Schroder, Bekkering; 2021).

In human evolution, the inherited need of finding habitats and spaces to live in was a very prominent part of daily life since it meant survival(protection, food etc.)(Zhong, Schroder, Bekkering; 2021).

Appleton explored in his Prospect&Refuge Theory the human response to landscapes that make us feel prospect &refuge and how when a place offers them simultaneously, creates the most satisfactory reaction.Since it promotes 'the ability to see without being seen' meaning that it gives the ability to locate resources while being protected from threats(Appleton,84).

This similar experience of prospect in spaces is unobstructed views with varieties in depth and lengths, like in atriums, balconies, and staircase landings.In a space that feels open and airy, yet controlled and purposeful, promotes a sense of calmness.When designing spaces incorporating this pattern, it is essential to combine interesting and information-rich elements such as contrasting heights, planes; as well as creating viewpoints that allow full visual access to the surroundings (Appleton,84).

Refuge is a very instinctual reaction, that could be created in with distinct feelings of boundaries that emphasize intimacy, with protection and limited visiual access from outside.To promote this in a space the design could use lower ceiling heights, acoustic panels etc.
Together they are stronger and can create restorative values into your environment (Appleton,84).

Similar aspects relating to our habitual and evolutionary

connections to how to relate to an environment were studied also by Orians and Heerwagen, in their theory called Savanna Preference (also known as Savanna Hypothesis).It's explained as the tendency to prefer savanna-like environments to other types of environments. Savannas have abundant resources, open views in a mixed woodland and grassland landscape.Nowadays, people still have preferences for savanna-like environments (Orians, Heerwagen;1992)

In 'Origins of Architectural Pleasure' Hildebrand identified five evolutionary survival characteristics for landscape preferences and focused on these aspects as fascinating know-hows for architecture.The five characteristics are: 'prospect and refuge, enticement, peril, and complex order'.Complex order being one of the characteristics argues that a certain combination of spatial and formal complexity and control is necessary to trigger an expectation-refuge response in especially home architecture.(Hildebrand,1999)

Restorative preferences have link with the nature-based and environmental perspectives of spaces. There are theories that focus on restorative environments , how to create them, their effects on perceptions and satisfaction of space (Zhong, Schroder, Bekkering; 2021).

The stress recovery theory by Ulrich (1983), which focused on the responses to situations that are challenging, threating to resources or wellbeing. Stress factor is important to understanding how biophilic design, most evident in healthcare environments, can influence the outcomes.Undoubtedly, stress has a significant negative outcome on patients health and affect many other outcomes. Stress Recovery Theory suggests unthreatened exposure to nature that would produce positive emotions and benefits to wellbeing supported by the use of natural feautres as vegetation, water, vistas etc. (Ulrich, 1983).

Another theory that focuses on restoration is The Attentipn Restoration Theory.The Attention Restoration Theory suggest that in the highly produced and ever-moving fast world that we are living in now, there is an excessive consumption of human attention on cognitive tasks that ends up as brain fatigue and over-stress.The interaction and incorparation of natural aspects and environments, helps regain attention due to the fact that since we are instictively connected to these elements there is no need for exhaustion to

try and comprehend the environment, when we are engaging with natural aspects.(Kaplan, Kaplan; 1989)

Another focus that environmental psychology has that has been related to biophilia is under the title of place, analyzing how and why we relate and choose to stay in places.

The Place Attachment Theory is a combination of different studies that explores sense of space and the connection to space.Hidalgo and Hernandez, argued that people tend to stay in the places that they have a emotional connection to, a sense of familarity(Hidalgo, Hernandez; 2001).Manzo further examined that when incorparated regional features in buildings it promotes a sense of place and community with it comes belonging and familarity feelings.(Manzo,2003)

Theoretical basis of biophilic design in environmental psychology

PERSPECTIVE	THEORY	DESCRIPTION
Biophilia	The Biophilia Hypothesis (Wilson, 1984, 1993)	Biophilia is 'the innately emotional affiliation of human beings to other living organisms.' After human migrated to the built environment, we inherited a need for nature, which evolved into 'thinking about nature'.
	Biophilia Values (Kellert, 1993)	The dependence on nature is 'for survival and personal fulfilment', and the nine biophilia values are: 'utilitarian, naturalistic, scientific, aesthetic, symbolic, humanistic, moralistic, dominionistic, and negativistic'.
Habitat	Prospect-Refuge Theory (Appleton, 1975)	Prospect and refuge occur simultaneously, that is, 'the ability to see without being seen'. Prospect provides 'an unimpeded opportunity to see' (to find and gather sources), and refuge offers 'a shelter to hide' (to be protected from outside threats).
	The Savanna Hypothesis (Orians and Heerwagen, 1992)	The savanna is the mixed woodland and grassland landscape commonly seen in Africa. It affords abundant resources, open views, and climbable trees that are conducive to survival. Today, people still have aesthetic preferences for savanna-like environments.
	The Aesthetics of Survival (Hildebrand, 1999, 2008)	Survival advantageous characteristics are identified to discuss landscape preferences and explain why nature is fascinating in architecture. The five characteristics are: 'prospect and refuge, enticement, peril, and complex order'.
Restoration	Stress Recovery Theory (Ulrich, 1983)	Stress Recovery refers to unthreatened exposure to nature that produces positive emotions and contributes to health and wellbeing. It is supported by some preferred natural features (e.g. vegetations, water, and natural structures, textures, images, and vistas).
	Attention Restoration Theory (Kaplan, Kaplan;1989)	Attention Restoration helps relieve mental stress and brain fatigue. Interactions with the natural environment do not require much cognitive work, which is beneficial to restoring exhausted attention.
Place	Place Attachment Theory (Hidalgo and Hernа́ndez, 2001;	Place Attachment Theory explores the emotional connection with places and explains the 'sense of place' and 'sense of community'.

Relation to nature and/or natural elements in healthcare environments can serve as a pivotal element that shows significant improvements in recovery from stress, and illness and create a space for relaxation, restoration, and fascination.(Gola, Botta, D'Anielo, Capolongo ; 2021)

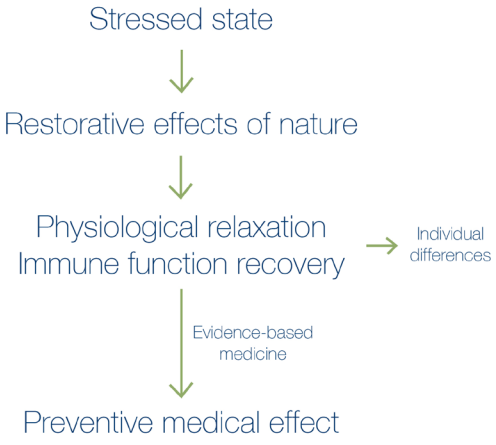
One practice that has been a part of Japanese healthcare since the 1980s that supports the biophilic theory is Shinrinyoku (or Forest Bathing). Shinrinyoku is one of the first experiments done on the physical and psychological benefits that the close relation between nature and people has (Gola, Botta, D'Anielo, Capolongo; 2021). There have been many studies done on this transcontinental Japanese and Chinese method to encourage healthcare designers and professionals to replicate it in future design and to have nature-based therapy be a potential method to be applied as a response to today's 'stress-state'. (Hansen, Jones, Tocchini ; 2017).Shinrinyoku is a traditional practice that allows you to completely immerse yourself in a natural setting while mindfully using all five senses to be able to experience people with different perception patterns. In the 1980s this method became a pivotal change in Japanese preventive healthcare.

This practice is relatively similar to aromatherapy and the use of therapeutic gardens. A therapeutic garden can be described as a garden created to promote benefits for both patients and staff. The benefits of such a garden can be passive use of just existing with the garden, experiencing the garden, or working in/with the garden. (Christie, Hulse, Miller; 2020)

The findings of many studies and research done on Shinrinyoku (or Forest Bathing), could be seen as positive results on immune system functions, cardiovascular system diseases, respiratory system problems, psychological problems like depression, anxiety, mood disorders; mental relaxation of attention problems and the human reaction of 'awe'(promoting gratitude and selflessness). (Hansen, Jones, Tocchini ; 2017).

More in detail, findings pointed out a reduction in heart rate, and blood pressure and an increase in relaxation, increasing feelings

Concept of nature therapy - image (Hansen, Jones, Tocchini; 2017).



of safety and calm, for known alcohol addicts low levels of alcohol abuse were seen after the experiments. Even the research that was involving only the use of nature videos or images had a significantly positive physiological effect. (Hansen, Jones, Tocchini ;2017).

In another research done (carried out based on twenty studies) focused on forest bathing and its health benefits, it was clearly stated that Shinrinyoku is effective for mental health, particularly on anxiety. (Kotera, Richardson, Sheffield; 2020)

In the studies Ulrich that was reported in 1984, the study monitored patients after major surgeries. Patients were divided into two groups, the first group staying in rooms that have views of trees, and plants while the second one was facing a brick wall. The study was done to be able to monitor the healing process, speed, and general mood. In the results of the study it was seen that with the patients that stayed in the rooms with a nature view; the recovery time was faster, there was less need for medication, fewer complaints, and had a general mood compared to the patients that stayed in the room facing a brick wall. (Ulrich,2008)

A different study with a smaller scale showed that there are positive effects the hospital rooms have on indoor plants, including faster recoveries from surgery. This study further supports the suggestion to include indoor plants available in hospital/healing environments that don't have a direct connection with natural environments to achieve better healing processes. (Forster,?)

Another study that took a deeper look into indoor plants and their effect on mood, cognitive performance(attention, productivity, etc.), environmental quality (satisfaction, comfort, attractiveness, etc.) Preparing two study rooms that are the same other than one has added potted plants with a large group of students that went through questionnaires before and after the intervention.(Bogerd, Dijkstra, Koole, Seidell, Maas; 2020)

The questionnaires showed that students had greater comfort and attractiveness to the room with the plants and for their reasons of studying in the room with the plants the second time they came was that there was better environmental quality, a better atmosphere more relaxing feel and better indoor climate. Overall, findings suggest that students preferred the study room with potted plants.

However, the findings do not support the hypothesis that adding potted plants to a study room improves mood or cognitive performance among students since these measures were dependent on personal differences. (Bogerd, Dijkstra, Koole, Seidell, Maas; 2020)

Since building a well-functioning is costly and complicated, sometimes the economic issues can come to the front and it can be hard to buy in the stakeholders, and sponsors investors to give value to the biophilic aspect of the design. However, the look upon this challenge might have changed with the pandemic of COVID-19 that affected the whole world in 2020. Before the pandemic with much research done on this subject, access to nature in healthcare facilities was beginning to be viewed not just as an aesthetic extra component but as an important part of the overall care (Sachs, 2020).

From the beginning of 2020, our living situations had to change rapidly causing many to consider different ways of living, managing, and designing. One of the many outcomes was our relationship with the outdoors changing. When the option of being outdoors was taken away from us, many came to the importance of our connection to the natural world. It was mentioned in the article by Sachs that in many healthcare facilities the outdoor areas and any space that could provide a connection with the natural aspects came of great importance (Sachs, 2020).

It was explored in a study done during the times of the recent pandemic when the constant disruption of daily life affected mood changes (high levels of stress, anxiety, etc.), the influence of 20-30 min nature exposure made. The study was done with experience-based surveys by monitoring the psychological and physical well-being of hospital staff. In the conclusion of the study, it was seen that even a short break in a green space had a significant impact on the mental and physical wellness of the hospital staff.

This study done in extreme times with plenty of negative mood factors going on can show that even a brief moment of connection with nature has strong positive effects on people. (Gola, Botta, D'Anielo, Capolongo ; 2021)

Reviews of studies done on INE (Indoor Nature Exposure)

Author	Natural aspect definition	Health measurement	Discipline	Study outcomes
Chang and Chen (2005)	A window with a view of a tree and potted plants	BVP, brain activity, mood	Horticulture	Nature increased brain activity and reduced anxiety. Just a nature views impacted BVP more than a view of nature and a plant, and a view of a city and a plant
Fjeld et al.(1998)	Potted plants	General health	Planning and design	Complaints of cough, fatigue, dry/hoarse throat and dry/itching
Gladwell et al. (2012)	Photos of nature	BP, HR, general health	Psychology	Viewing nature increased parasympathetic activity
Lohr et al. (1996)	Potted plants	BP, cognition, HR, mood	Horticulture	Nature increased performance and reduced stress
Ozdemir (2010)	A window view of trees and/or vegetation	Attractiveness	Planning and design	Nature increased view satisfaction
Vincent et al.(2010)	Photos of landscapes	BP, HR, pain tolerance	Medicine	Hazardous features of nature influenced pain tolerance and mood

Changes in our lifestyles in the latest centuries centered most of our days living in largely built spaces, despite our physiological and psychological functions that are related and evolve to nature throughout our evolvement. With the largely urbanized environment that we are currently living in, there may be cases that outdoor natural experiences can't be incorporated; to be able to keep the health-promoting effects and positive relations of natural aspects we may start relaying onto indoor plants and increasing indoor nature exposure (McSweeney, Rainham, Johnson, Sherry, Singleton; 2014).

In the 2014 research of McSweeney and colleagues, several studies and research done on indoor exposure effects were gathered to synthesize as evidence to support the relation of indoor nature use as a health-promoting source in a well-studied manner. In Table.02, some of the selected studies on indoor natural elements from the research are shown. Additionally, brief reviews for the studies mentioned are indicated after the table.

Chang and Chen, in their experiment created 4 different rooms with a view of the city or nature and with indoor plants or in absence of indoor plants and documented the reactions of the patients that have stayed in the rooms. Participants were documented as less nervous when watching a view of nature and/or when indoor plants were present. In the case where neither the window view of nature nor the indoor plants were shown, patients suffered the highest degree of anxiety.

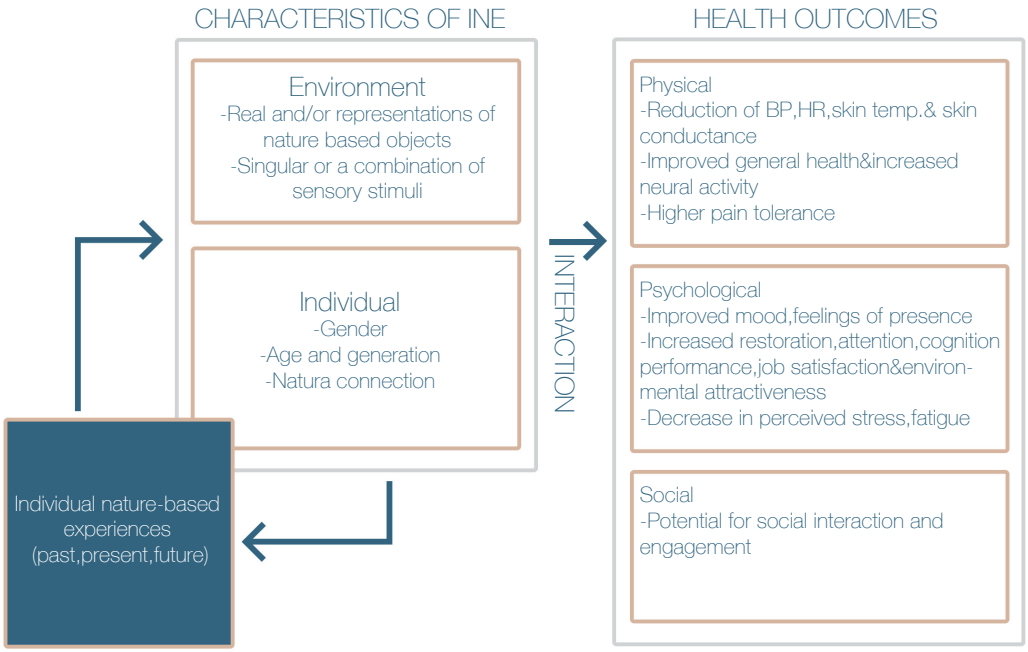
Gladwell and colleagues in their study resulted in the evidence that heart functions are altered by simply the act of viewing natural scenes with increases in vagal activity (activity ensuring that the normal rhythm of the organs is provided more easily and that our body relaxes faster after any stress). (Gladwell, Brown, Barton, Tarvainen, Kuoppa, Pretty, Suddaby, Sandercock; 2012)

Study done by Fjeld and his colleagues, was on the effect of indoor foliage plants on office workers focusing on health and comfort with the use of a questionnaire made out of 12 questions related t neuropsychological symptoms. It was seen that study suggest that an improvement in health and a reduction in symptoms of discomfort can be gained with the introduction of foliage plants into the office environment. (Fjeld, Veiersted, Sandvik, Riise, Levy; 1998)

The study documented the improvement that interior plants can give to productivity and decrease stress even in a windowless environment. During the intervention participants', blood pressure and emotions were monitored and it was seen as a relevant benefit when the indoor plants were added to the space proving better results and overall mood compared to the room without them. (Lohr, Pearson, Goodwin; 1995)

In the visual preference study done by Ozdemir, it was questioned the effect that the windows' view has on the perception of the space. It was seen in the results that as the study predicted, the rooms with the open and natural windows views were perceived as larger and more satisfactory. (Ozdemir,2010)

Vincent and his colleagues; starting with the background that views of nature relieving stress, and pain and being ideal for healthcare settings, made a medical experiment on the effects of



Outcomes: McSweeney, Rainham, Johnson, Sherry, Singleton; 2014).

nature images on pain in hospital patient rooms monitoring indicators like heart rate, pain tolerance. Resulting in the conclusion that the images promoted lower pain responses and that even though the hazardous natural images distracted more from the pain creating better pain responses, patients also responded to them with high mood disturbance which affects the recovery negatively. (Vincent, Battisto, Grimes, McCubbin; 2010)

The outcomes of the indoor exposure study are summarized in the figure support that indoor nature exposure(INE) can be a well-being-promoting aspect both in physiological and psychological senses, through interactions of nature-based stimulations even though it can vary depending on individual characteristics such as gender, age, etc.(McSweeney, Rainham, Johnson, Sherry, Singleton; 2014).

Looking at the healing and environments, 'Optimal Healing Environment' (OHE) is a prominent term that was developed in 2004 that was focused on a healthcare system where patient,family and care giver's healing capasity is all supported.This way of looking at healtcare gives the same value to healing, general health creation and disease diagnose,treatment processes.It is described as a 'holistic, , transformative process of recovery and restore in mind, body and spirit' (Samueli Institute, 2011).

Recent developments on optimal healing enviroments shows the innerchanging relliance and effect of physical,physcological,cultural,economic,social factors.Optimal healing is where all these factors and elements create a bond of supporting the wellbing and bodys ability to heal itself.(Gillis, 2015). With a thorough approach to the environment, biophilic design aims to create an atmosphere where the support and needs of all is in the center.

For the well-being and built environment connection and the importance of relation, The WELL Building Standart(WELL) was the first to focus on the health and wellness of people inside built environments.This standart is a performance-based system that certifyies features that has impact on human health through seven main bullet points: air, water, nourishment, light, fitness, comfort and mind.It is based upon medical research that explores the connection between the built environment that people live and work and the health or wellness impacts on the occupants.

WELL Building Standarts are unified needs for wellbeing that should be present for different types of buildings such as residential,educational, athletic purposes and healthcare.The spesific requirements that are applied for the healthcare buildings are focused on the needs of recovering and ill patients , to create healing, stress-relieving, comfortable spaces for patients and all occupants. Biophilia is part of the features considered for healthcare under the topic of 'Mind'. It is used as an essential tool for cross-checking the health outcome and user experience relation.

Maggies Centre

Maggie Centre is a place for people that are diagnosed with cancer, their families and friends to come to in this difficult time in their life to find support, a sense of community to share the experience with, a place to hide in, a place to get informed and get help.

The centre's are always close proximity to a hospital with large amount of cancer patients , informal buildings with a domestic feel of space where people can get practical,emotional and social support (Maggies Brief,2015).

It is a complete free space funded by charity.The charity is independent from the healthcare systems and the services that Maggie Centre's provide are mostly complimentary to the clinical services of the hospital for the treatments of the patients.

The staff of Maggie Centres come from healthcare backgrounds to provide counselling,support and advice on psychological and physical matters (Martin, Nettleton, Buse; 2019).

4.1.The story behind the idea

Maggie Centre's was founded by Maggie Keswick Jencks after her own experience of having cancer, she had the idea that if given the right support even cancer patients 'wouldnt lose the joy of living in the fear of dying.'(http://maggies.org)

Maggie Keswick Jencks was a writer, gardener and designer(http://maggies.org). In the timespan of seven years, Maggie Keswick has experienced a cancer diagnosis, went through the process of the treatments, remission and had a recurrence. Over these seven years, she grew the vision and experience that would eventually be transformed into the approach of cancer care of Maggie Centres'(Maggie's Brief,2015)

On the day that she and her husband learned that her cancer has come back, they were directed to a corridor that was windowless, staying there trying to process the news, they started talking that there should be a place for cancer patients to go to outside of but nearby to the hospital.It was the start of the idea of Maggie Centres. (http://maggies.org)

Maggie and Charles Jencks designed the blueprints for the centres together and the first Maggie's opened in 1996 only three

years after the initial idea. (http://maggies.org)

Charles Jencks was a cultural theorist, landscape designer and architectural historian.He and journalist Edwin Heathcote co-authored the book 'The Architecture of Hope' that is focused on the history of Maggie's and the architectural tradition of the centres and gardens.

With the belief of Maggie Keswick Jencks that it is important for cancer patients to be active participant and well informed about their own medical treatments and the research that she has done to try and find ways for people to live better with cancer; she visioned a centre that included the patients family friends and sources of support and advice both physical and psychological. (http://maggies.org)

Maggie and Charles Jencks

Approach of Maggie's is the understanding that people diagnosed with cancer need a lot more than just the medical treatment. Maggie Centre's provides many things fort he patients and their loved ones , like having the ability to talk with psychologists and benefits advisors. (http://maggies.org)

Going to the experience herself, she thought that the diagnose of cancer is as hard for the loved ones as it is for the patient. Believing that a calm and welcoming place could help patients and their families to process everything better and the togetherness and community feeling would help with the progress.Maggie Keswick Jencks died shortly before the first Maggie Centre was opened, her vision has lived on with the centres. (http://maggies.org)

Since the first idea of Maggie's were initiated the health service and the need for mega hospitals have doubled in the UK.Only looking at the experience of this spesific country it can be said that the a charity can't keep up with this health explosion in the World, even though the idea of Maggie's has spread outside of UK , with different names but similar intents it has become a model for countries like Denmark with the centers named as Livsrum , where this issue is trying to be resolved as when the a center was built by charity, the goverment built another six centers.(Jencks,2017)

Maggie Centers can be viewed as a first step to translate patient needs into spatially oriented requirements and standarts that was made possible and applied by the community itself. The user experience is the main aspect that creates the bas efor the architect to design.The emotional impact of the building on the user experience is on three levels; the material realization the the built environment, identification that attracts most of the occupants and how the centres design supports the social interactions between patients and eveyone involved.From the realization of these three levels more clinical evidence was researched for the relation of archtiecture and wellness and mostly collected under the approach evidence based design(EBD) (Annemans, Audenhove, Vermolen,Heylighen; 2020).

The last function for the centre is that they operate on the base of belief of the patients, the placebo effect.It can be a beneficial effect produced by attributes that are not related to the properties of their treatment or center itself but due to the patient's belief in that effect of the center. (Annemans, Audenhove, Vermolen,Heylighen; 2020).

Within this context, Jencks defines three possible sorts of effect of placebo. The Style Effect refers that the impact the image of the building can have jsut as a placebo injection can work better than the actual treatment the spesific design can have a larger influence than expected. (Jencks,2017)

The Cultural Effect indicates that it is not just an individual's psychology that matters but also cultural aspects have large impacts. Spesific relations between design styles, functional organizational systems and or social tendencies can have different effects on the view of the people. The third is the Caregiver's Effect. If a doctor, nurse or, in the case of the Maggie's Centres, a caregiver is

convinced that this centre and what is stands for will actually work, chances are bigger that it will since they are the force that drives the information and the actual support.(Jencks,2017)

All three effects, mentioned above, are determined by and dependant on the experience of the building and surrounding environment by its users and occupants. (Annemans, Audenhove, Vermolen,Heylighen; 2020).

4.2.The Design

Maggie Centre's were built on the idea that great design and architecture can help people that need support feel better and create the best healing atmosphere(http://maggies.org). She saw the need for a welcoming, reassuring space for the cancer patients that they could have the private space to be able to cope and understand the situation in their own way and time.(Maggie's Brief,2015)

The architectural brief is more focused on the creation of senses and feels and the overall mood of the environment than the actual physical requirements.In the architectural brief for the Maggie's there is an emphasis on 'hope', it is repeated several times that the experience inside the building should provoke feelings of 'hope' since is shown to be one of the most important mental qualities a cancer patient should have to have the sense that there is a possibility of a future compared to the present situation.This is what the Maggie's brief focuses on. (Martin, Roe;2022)

The view to the trees, birds and a sky accompanied with a thoughtful living was one of the many important visions that Maggie Keswick had for the centres.

Every centre is unique and designed to feel completely different than a hospital and to fit perfectly into their surroundings. All the spaces are designed keeping in mind the people that will use it and their needs. The open spaces for group activities , kitchen tables for conversations, peaceful corners for quiet moments.There are no reception desks or clocks , to show the idea that that people that enter the centre has plenty of time to enjoy their life. The landscapes are focused to extent the natural aspects with plants that will add colour, odour and attractiveness. (http://maggies.org) connection to the outdoor and nature is a focal point of the planning with maxiumum views and physical connections to the outside. (http://maggies.org)

Maggie's Oxford
by WilkinsonEyre Architecture

The important vision of Maggie Keswick represented with the buildings companionship with the sky and landscape.

convinced that this centre and what is stands for will actually work, chances are bigger that it will since they are the force that drives open spaces for group activities , kitchen tables for conversations, peaceful corners for quiet moments.There are no reception desks or clocks , to show the idea that that people that enter the centre has plenty of time to enjoy their life. The landscapes are focused to extent the natural aspects with plants that will add colour, odour and attractiveness. (http://maggies.org)

In all of the centers there is a focus on flexible , hybrid spaces to allow different social interactions the flexible approach is not only visible on the one design but on the brief itself.Since all the centres have been different answer to the same brief.(Annemans, Audenhove, Vermolen,Heylighen; 2020).

One of the most important physical features of the Maggie Centres , that supports the overall message and aim of the centres is the size. These centres are aimed to create an opposite experience and feel to hospital buildings , a contrast. The much smaller, domestic scale of the centre is a reflection of this contrast (Borrett,2013).

Although this is a very important feature it should also be noted that the centre it self should also be challenging to the user , reflecting their own personal battles. Another manifestation of this need for dissociation from the hospital institutional feeling is the decisions made while creating such as getting rid of narrow corridors with bad lighting, creating more spacious areas with creative ways of division between spaces , perhaps relying more on the perception of spaces to create different purposed spaces within (Borrett,2013).

It can seen in all the approved designs of the centres from the charity that , all the architects involved in the Maggie Centres when defining the right 'feel' for thebuilding, they talk about 'domesticity'. (Borrett,2013). The kitchen is the main objective of the design of Maggie Centres which further supports the domestic feel.It is defined as a long table of gathering where the patients can get a cup of tea or coffee; it is where you get familiar with the space, starting as a frequent stop later turning into the space where you share all your fear and find comfort.

Kitchen organizational placement and clear design creating comfortable gathering area Maggies' West London
by Rogers Stirk Harbour +Partners

Domestic scale and the insclusive feeling of kitchen represented in the design of Maggies' NewCastle by Cullinan Studio.

The buildings of Maggies set the tone for everything that will happen inside. Every choice from the landscape, to the shape of the building, the interior and arts displayed create another dimension and depth for the users that seek comfort in this space. (Maggie's Brief,2015)

Entering the centre is a challenging and demanding experience for the patients, it means acceptance of a harsh reality and this is why the building should have clarity and friendliness in the way that they are designed especially the entrance.The entrance should not be intimidating but encouracing , provoking some sort of attractiveness and curiosity about the centre from the look outside could be a little helping tool for patients' first step inside. (Maggie's Brief,2015)

The centre should also create a sense of being the symbol of hope for the community, people should be able to interested to know and talk about to create a sense of welcoming and a knowledge of the facility in the local community. This need calls for creativity and uniqueness. The community feeling and interest is very important for the centres since its a charity organization, the community is the centres driving force itself.

The unique shape and domestic shape creating a unique union that interests and invites the community. Maggies Nottingham by CZWG Architects

Every centre has their on style that stands out as much as they blend in to create this balance for being interesting enough to get curious ; welcoming enough to give courage to enter. The landscape should be also designed with this in mind. Creating a clear path for the entrance while helping with the stress relieving on the way , helping you along before you reach the front door.The landscape around the entrance spesifically cant be thought as a bridge between the hospital environment and daily life. (Maggie's Brief,2015)

The balance in creating a design that is friendly but remaining with the importance and the seriousness of the illness is a very crucial , sensitive issue. The space should not have too much of a 'cozy' feel because of the main reason of everyone being there.The design should recognize the hardship and support it. (Maggie's Brief,2015)

The unique yet inviting design of the centre and landscape Maggies' Highlands by Page & Park Architects,

The users should be the ones in charge of the use the spaces and items in the surrounding , since with the situation that the patients and their loved ones are facing there is many aspects of

life that cant be controled and that is unknown, the centre should create spaces where the patient can still take initiatives about how they would like to interact with the space.Therefore, creating more flexible spaces with elements that could be moved easily and adjust to different needs is important (Maggie's Brief,2015).

The landscape designer and architect should work in close relation from the beginning of the project to create a unison for the interplay of outside and inside spaces , built and natural environments (Maggie's Brief,2015).

The patients sheltered inside the centre, finding comfort in the inside should be connected with the changes in the outside scene such as seasons to remain the connection.Creating many chances as possilbe to connect with the outer world its is important to have the most visual connection to the outside even if its through a skylight or internal courtyard.This connection should help with the feeling of isolation that could arise with treatments and refraining from the daily activites that the patients have done before.

The organization of spaces should be able to incourage conversations of different sized groups while also creating private areas for alone time; giving the users many opportunities and choices for different situations and feelings.

The relation between the hospital and the supporting cancer center is an understanding that for the desired outcome both are needed.While in the hospital the focus is on the disease itself and the treatment , in the centre the focus is on the patient.They have complementary roles while providing contrast environments.

The seamless connection between the outside and inside created by the internal courtyard view. Maggies Oldham by dRMM

While having clear indications , it is safe to say that in the brief of Maggie's there is also a lot of room for creativeness and uniqueness which helps gives the designer the freedom to create a new experience, gives the occupants and the charity itself a new way of thinking and helps expand the horizons of everyone involved in the process and everyone that experiences the buildings itself.

Maggie's Manchester (2016, by Foster + Partners)

Maggie's Nottingham (2011, by Piers Gough)

Maggie's Lanarkshire (2014, by Reiach and Hall

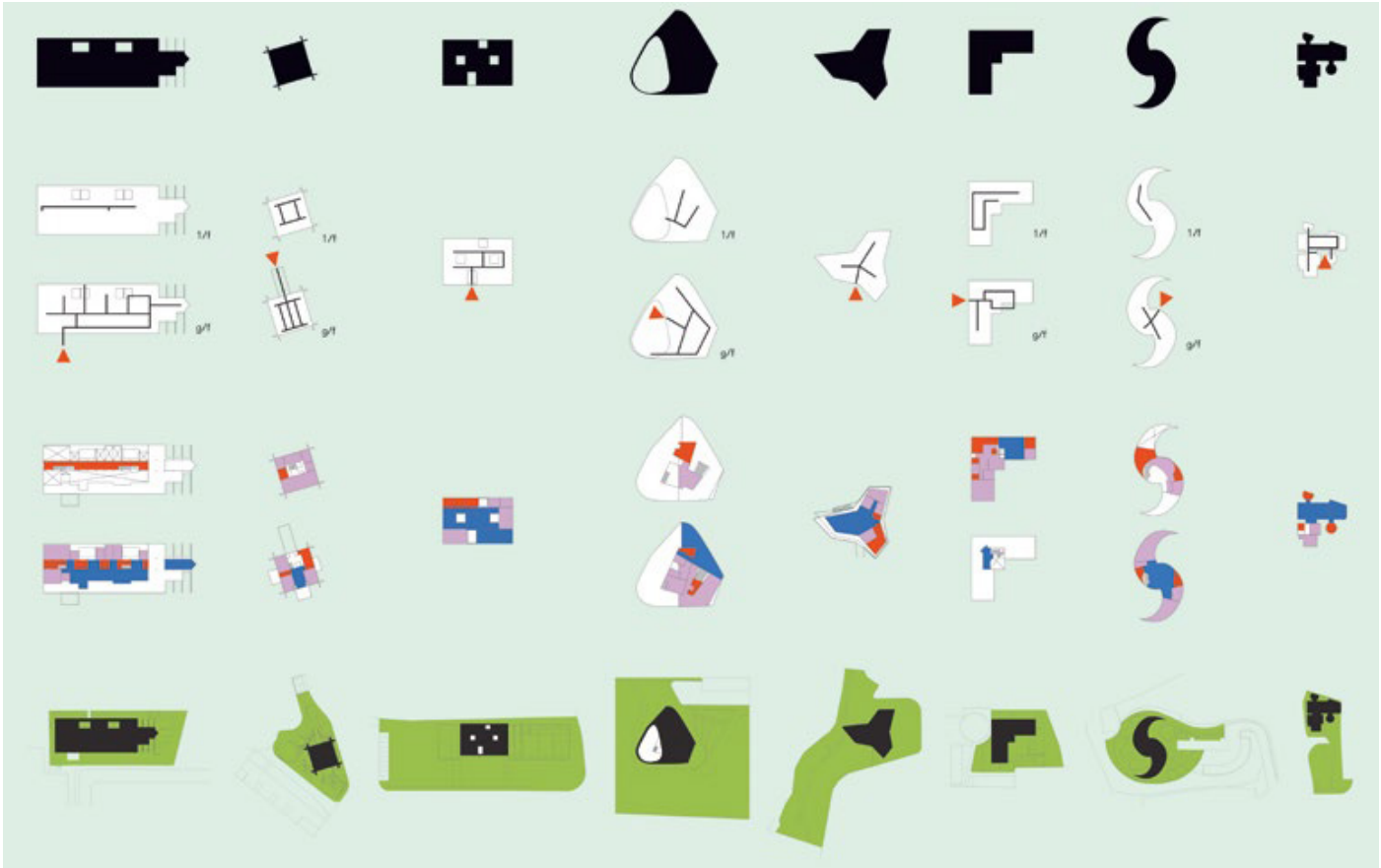
Maggie's Aberdeen (2013, by Snøhetta

Maggie's Oxford (2014, by Wilkinson Eyre

Maggie's Newcastle (2013, by Ted Cullinan

Maggie's Swansea (2011, by Kisho Kurokawa with Garbers&James);

Maggie's Cheltenham (2010, by Richard McCormac).



Maggie's Centres:
different plans for the same brief

4.3.Spatial Requirements

According to the brief published by the charity in 2015 the spatial requirements for a Maggie Centre as the following:

1.Entrance: The view of the entrance from the outside should be obvious, welcoming, encouraging.(Maggie's Brief,2015)

The entrance of Maggie's Oldham has a sense of clarity with definite features whilst having a welcoming atmosphere given by the choice of materials and landscape design.

Maggie's Oldham Entrance
by dRMM

2.Welcome area: This space is defined as a "pause" space, in where someone that is entering the center for the first time has visual connection and an easy general understanding of what's going on without having to be in the happenings immediately. The first impression should be encouraging to see and explore more inside the center.In this area, there should be a sitting area for the newly arriving people and their relatives, where they can have a view of more or less the the building and have a rest before the next step.(Maggie's Brief,2015)

Welcoming area of Maggies' Aberdeen creates a warm atmosphere where visitor can have a moment of pause seated in the armchairs set in this spacious area while also giving the visitor a general idea of the functional and asthetic features
of the centre.

Maggie's Aberdeen
Welcoming Area by Snøhetta

3.Office: This space that is for the members of staff should be located so that it is possible to spot somebody new coming into the centre.Office shouldnt be obvious, it should blend in with the domestic feel but allow the staff to see anyone that might need help if the occasion accurs.

In this space or closeby, a storage room large enough to hold big amounts of stationery, photocopiers, printers etc.Six small work stations are required with the tecnological equipment.

4.Kitchen:This is the main focus of the centre, the heart of all activities and it should be easily accessed from the initial entrance to the center.

Maggie's Lanarkshire Kitchen Area
by Reiach and Hall Architects

The kitchen area desgined for the Maggies' Lanarkshire shows many qualities taken account from the brief such as the location of the kitchen positioned in the middle of the central corridor providing easy access to the kitchen making it a social space everyone can easy blend into.

a. The dining table provided for big groups to socialize together at a focal point of the plan.

b.The kitchen island designed big enough to hold activities and support the kitchen area being the heart of the socialization of the center as it can be seen in the picture.

Kitchen area should have a large table that could fit minimum 12 people.This table is usually the main area where people will gather so the location and design should be designed accordingly, to even further emphatize these features.

Additionally, in the kitchen there should be a large island that has extra seeting for organizing workshops or activities on the island. When designing the people flow it should be taken care of that the free movement around island and table.connection with the rest of the center to provide a space that people can focus on the activity itself.(Maggie's Brief,2015)

5.Computer area or desk:In every Maggie Centre it is a requirement to have an area that is dedicated for accessing information online by using computers.For this intention, the computers that are destined for public use should be located in an area that is easily accesible.This desk or room designated for information research should be in close proximity to the office in case there is need for help.(Maggie's Brief,2015)

The computer area is easily located but private enough to focus on the research that the visitors can do on the computers, can be seen in the highlighted rectangles in the figure.

Maggie's Lanarkshire
by Reiach and Hall Architects

6.Notice board: An area should be purposed to have a notice board that could show thte latest activities or fundraising notices, this board should be located in an easily visible space whilst being blended to the design.

7.Library: In every centre it is important to have a place to find books, information and research.This space should be designed to use comfortably, relax and take in the information.It can be a

The library of Maggies' Newcastle is designed as an interesting focal point of the center with the shelves being incorporated in the design of the stairs, it can attract the visitors to have a relaxing stop.It is designed with a comfortable seating around the shelves with different options to to sit alone or in a group.

Maggie's Newcastle Library Area
by Cullinan Studio

8.Sitting rooms:In the brief for Maggies' , it is stated that there has to be three different types of 'sitting rooms' included in the design. These rooms can be closed or an open space with the related function in mind.

The first large sitting room is intended to be used for helding activities such as relaxation groups, yoga, lectures or meetings. The space should be large enough to provide space for 12 people and a storage area with the equipment that could be used for the activities such as yoga mats for the yoga lessons or folding chairs for meetings etc.These space should be designed flexible to be able to adapt to the different activities that can be held.This rooms should be located and designed to have a buffer between the noise outside of the room to provide a private space that can hold activities without any distruptions from the outside.

The second room can be medium to large sized, meaning it should be big enough to hold a table with seatings for 12 people. This second room is intended to be used for workshops or sessions.The room should have privacy, there shouldn't be a visual

Third room is a smaller sitting or counselling room intended to host for up to 12 people, with a fireplace or stove inside the room to create a warm,friendly atmosphere. (Maggie's Brief,2015)

Images of the largest sitting room and the small sitting room with a fireplace of Maggie's X. can be seen below.

Accordingly to the brief the large sitting room was designed big enough to hold space different uses with furniture that is movable and flexible (couch that can be divided into parts and reorganized) while also having a storage area .

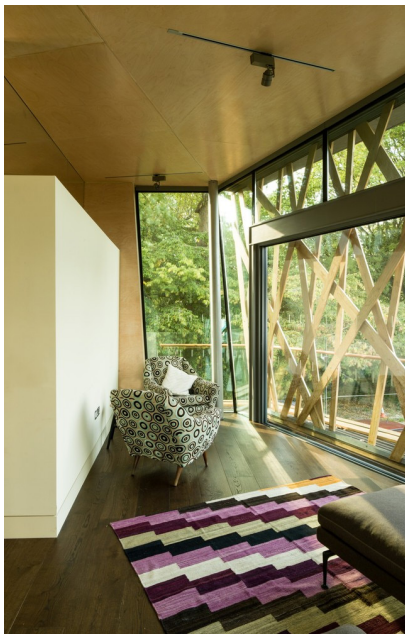
Small room as the brief suggests creates a space of friendly atmosphere with a fireplace .The design is without many borders but also has a clear identification.

Maggie's Newcastle Sitting Rooms
by Cullinan Studio

9.Consultation rooms:According to the brief, two small rooms that would be used for counselling or therapy should be present.The spesific requirement for these rooms are the visual connection with the outside such as windows facing nature outside or a visual of a sky though a skylight.One of the two rooms should be able to fit in a treatment bed.Both rooms have to be sound-proof and private when in use.(Maggie's Brief,2015)

10.Toilets: The required two toilets have spesific features that is stated in the brief.The toilets should be big enough to fit wash-bains, mirrors, a chair and a bookshelf, at least one of the toilets should have diabled access.

The toilets should be designed to have a very private area, that can have space to cry freely, the design should focus on the privacy for example there can't be gaps under the doors of the cabins.(Maggie's Brief,2015)



Consultation room Maggie's Oxford
by WilkinsonEyre

Consultation room of Maggies' Oxford is clearly designed by the objectives given in the brief , creating a comfortable private space where a conversation between two individuals can be held, the treatment bed can be used if needed and the room is provided with complete visual connection to the nature of the outer world creating a sense of calm.

Toilets of Maggie's at The Royal Marsden
by Ab Rogers Design

It can be seen that the toilets are designed in warm colors with the mindset that it should have a comforting feeling where you can feel safe enough to be vulnerable.

11.Retreat area: A very small quiet space to rest in should be designed, probably with the space and furniture to lie down and have a quiet private rest.(Maggie's Brief,2015)

Maggie's Lanarkshire
by Reiach and Hall Architects

In the image of Maggies'Lanarkshire it is possible to locate the retreat area highlighted with the rectangle.

The retreat area is designed very privately but it is in close proximity to the main social areas to give the visitors different choices within the same space.

12.Parking lot:Transportation should be thought in the design which includes a parking space for the arrival by private automobiles.

13.The gardens: Gardens are a very important part of the centre designs.The garden should provide a rich sensory qulity with contrasts of colour, texture, scale, fragrance etc.It should be thought for the maintainance and seasonal changes to choose the vegetation accordingly to have an attractive garden in all times.(Maggie's Brief,2015)

Maggie's Cancer Centre Manchester
by Foster + Partners

The garden of Maggies' Manchester is a very stimulating garden in many aspects, the different colors, fragrance and scale of plants create an atrractive scenery.It is also designed as an interactive space where the visitors can actually have the chance to plant on their own and make contributions to the centre.

Case Studies

In this chapter for a more comprehensive information and understanding four case studies of Maggies' Centre and a cancer center care from Denmark will be examined as case studies.

The case studies after making note on the brief project description of the project, will be examined according to four main keypoints which are;

Answering to the Maggies' Brief

According to the Maggies' Brief both in the detailed description of the user experience, feel and atmosphere of the center and the functional, spatial requirements, it will be examined the most prominent responses to this challenges and how they were integrated in the design.

For the case that is not related to the Maggies' centres, similarities will be observed.

Architects' Input

It will be noted, according to the information that is provided in the architectural studios' documents and interviews of the architects and designers that took a part in the design process, the focus points, the reasons behind the decisions and the aims, the most prominent responses will be included.

Landscape design

It will be briefly noted the approach to the landscape in every design, how it was connected to the design concept and the brief of Maggies' will be observed.

Biophilic design

The most prominent biophilic design attributes or patterns will be observed and noted, with comments on how it was implemented.

Maggies' Centre West London

Architect: Rogers Stirk Harbour + Partners

Location: London, United Kingdom

Year : 2008

Size : 370 sq. meters

The building of the centre was designed by Rogers accompanied by the landscape design by Dan Pearson Studio with the enhancement of the lighting design by Speirs and Major Associates. (Welch,2021)The center is built in between the over-bearing hospital building of Charing Cross Hospital in Hammersmith, a parking garage and a very busy road. The building and the landscape is designed to create a contrast and a contrary atmosphere to its surround-ings.The building consists of 2 floors within the area of 370 squaremeters.

View of the relation and contrast of the Charing Cross Hospital and The Maggies' Centre.

The initial impression gained from the building would be colored walls with a protective canopy but when experience more the buildings gives a sense of a pavilion that you could freely through with a center that is the kitchen.The simple formed building is composed by 5 elements: boundary walls, the kitchen, flexible annexes,small courtyards and garden and a floating roof.(Rogers Stirk Harbour + Partners, 2014)

The building design has earned several awards, one of which was the 2009 Sterling Prize.In the articles about the prize being given to this design, it was mentioned that the way the architects dealed witht the challenge of achieving a healing environment within a busy city atmosphere was impressive.(Fairs,2009)

A clear view of the different components that make up the simplistic design of the centre.

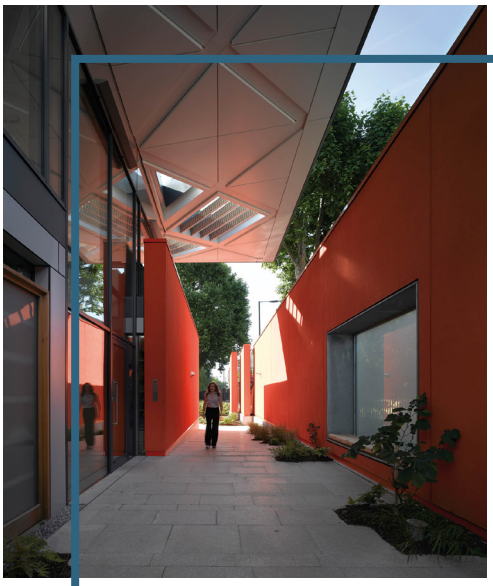
All images on the page are from MaggiesCentre West London

Figure 42

Answering to the Maggies' brief

Choises that answer to the spatial requirements:
a.The sitting/actvity rooms are planned in different sizes to accommodate various activities.
b.Retreat areas are planned as quiet spaces for the users to have private moments.
c.Kitchen is located the center of the plan and in order to acces any other rooms one would have to pass from the kitchen area where they can choose to join the conversations and socialize.
d.Transportation was thought of by including a parking lot.
e.The gardens surrounds the center. (Fairs,2009)

Figure 43



Answering to the Maggies' brief

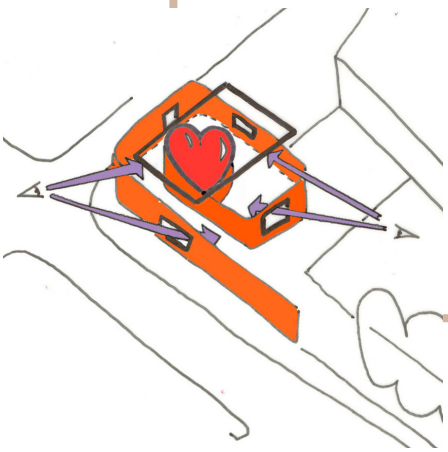
Entrance area is clearly indicated but interesting for the patients that are coming for the first time to enter. (Fairs,2009)

After their research the architects were informed that for the patients entering the center was very challenging that it would take a few trials in the beginning.Responding to this challenge a bench was located in the entrance area so that they can have a place to sit and pause .This bench is positioned next to a large window that has a direct view to the inside of the center for the patients to have an idea before entering, to ease up the process. (Fairs,2009)

Architects' input

Figure 44

All images on the page are from MaggiesCentre West London



The architectural concept that will be the bases of every planning and design decision came from the building having a 'heart' initial idea; which is as represented in the Maggies brief is the kitchen where all the gathering and also daily activites are spent mostly by all visitors. The building having a heart was also reflective of the traditional notion of home with a heart, its has represented itself with the fireplaces in the center.The heart areas qualities of openness and importance is made stronger by the surrounding winter gardens and smaller rooms. (Rogers,2009)

Architects' input

One of the key elements in the brief is the spesific requirements of the kitchen.The design was accurate to the brief providing a large table and an island for the kitchen space.(Maggies,2015)

Answering to the Maggies' brief

The inner courtyards creates a direct visual connection to nature while meeting the expectations of the brief, creating spaces that are 'sheltered inside with connection to nature.(Maggies' Brief,2015)

Answering to the Maggies' brief

Biophilic design

Answering to the Maggies' brief
Biophilic design

The design incorparating many views to the outside world with large windows and innercourtyards brings with it many biophilic design attributes and benefits.The wide windows enchances the natural light entering the space, while also creating a visual connection to the nature.

Responding to both biophilic design and the Maggies' brief, natural lighting these large openings creates is supported by the raised roof that allows more light to come in to the space additionally creating light-shadow effects as biophilic attractions with the shading elements of the roof design.(Browning,Ryan,Clancy;2014)

The wrapping around the center was thought as sort of a separation that will support the greenery that will create an oasis inside this space, a contrast to the surrounding busy city rush.
(Rogers,2009)

Architects' input

All images on the page are from MaggiesCentre West London

For people to feel as comfortable as they feel at their home, flexibility was considered a main objective , for this reason there is sliding doors incorparated in design, providing as an additional benefit natural ventilation through spaces. (Rogers,2014)

Architects' input

Answering to the Maggies' brief

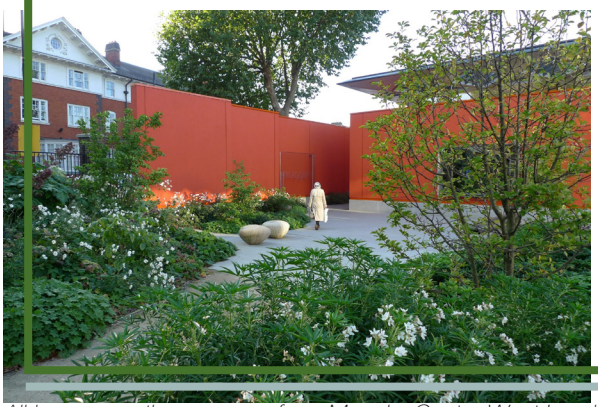
The office designed on the upper floor with a view of the first floor is in fact appropriate and considerate of the Maggies' brief stating that the office should be located in an unobvious way to keep the domestic feel while the staff being able to recognize a visitor entering the center. (Maggies' Brief,2015)

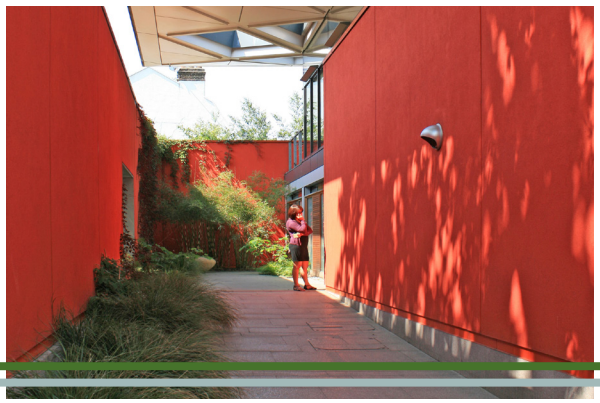
Biophilic design

Two levels that has visual connection and the different ways of dividing spaces such as sliding doors or bookcases as separation elements that create limited visual and light connection while dividng the spatial perception,enchance biophilic features as curiosity, complexity and order. (Kellert,2008)

Biophilic design
Landscape design

For the landscape design the aim was to create a therapeutic environment around the building whilst connecting the main hospital building and the center.Pink-stemmed birch trees surrounds the buidling to create a shield against the urban city life aspects around the area, while also creating a green vista for the upper floor.In the entrance there is a wooden walk path accompanied with evergreen bamboos and sculptures, while the inner courtyards were planted with exotic architectural plants to create attraction throughout the year. (Dan pearson studio,2009)
Landscape and greenery design being integrated all throughout the building from the outdoor areas to the interior, gains the center many biophilic patterns and attributes such as visual and non-visual connection to nature with the presence of different vegetative elements that will trigger various senses.(Browning,Ryan,Clancy;2014)





All images on the page are from MaggiesCentre West London

Maggies' Centre Oxford

Architect: WilkinsonEyre

Location: Oxford, United Kingdom

Year : 2014

Size : 225 sq. meters

The centre was designed by WilkinsonEyre accompanied by the landscape design by Touchstone Collaborations and Babylon Plants and Design.The center is built in support of the cancer treatments done in Churchill Hospital.The center is located in the densely forested site of the hospital.

Taking inspiration by the environment and the aim of creating an uplifting atmosphere surrounded by nature, WilkonsonEyre designed the centre on a treehouse concept.The building is designed as a three parted plan that sits on clusters of columns.The columns are designed tilted to create the vision of tree trunks and support the concept.The lifted treehouse concept allows the visitors to get better views surrounded by greenery,being one with the environment.

The small scale of the building with only 225 sqm area supports the domestic feel and the concept of treehouse feeling, which reminds of spending time together and feelings of joy and peace.

Answering to the Maggies' brief

The entrance for the building is very clearly stated.The ramp allows for easy movement for every user and the outside balcony around the building provides a space for pausing before entering the center. The decorative wooden elements and the treehouse concept creates a welcoming atmosphere and generates interest. (Maggies' Brief,2015)

Biophilic design

The wooden elements used fairly large part of the project, creates a relation to biophilia because of the material's natural source.The feeling when touched and the warmth that the visual brings is all the result of the natural material.

All images on the page are from Maggies Centre Oxford

Architects' input

'The tree house concept maximizes the relationship between the internal space and the external landscape offering discreet spaces for relaxation, information and therapy. it provides a sympathetic and caring retreat, in tune with its surroundings. it is not like a house or a clinic but has a special identity that is a maggie's centre'. - Chris Wilkinson

Biophilic design

The shading elements that are designed in wooden groups that are in different inclanations resemble the tree branches.These elements as much as they are asthetic and functional part of the design, they add strong biophilic value.

Biophilic design

The biophilic design attribute simulation of natural features is prominent in this shading design because it reminises both the physical shape of the natural element and the function that the trees are often used for a space of shadow under from the beginning of evolution.

Providing an element that has both functional and aesthetical relation to the natural element will result in a positive response.(Kellert,2005)

Biophilic design

Another biophilic response that the shading elements creates is the effect of 'Light and Shadow' because of the shape of the design has it not only provides shading but also an interesting pattern of shadow reflected in the interior.(Kellert,2005)

All images on the page are from Maggies Centre Oxford

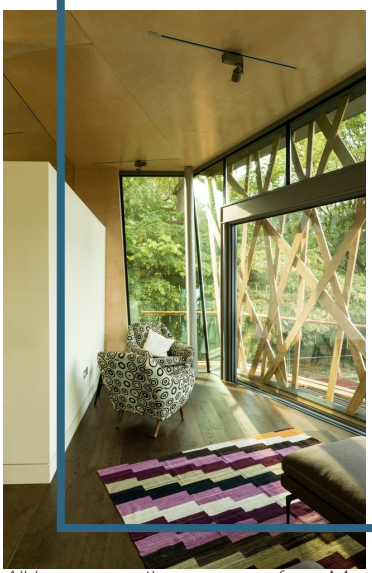
Architects' input

The plan is organized with an open plan that flow into 3 wings in different directions, aiming to create a more flexible space that encourages socialization.At the center is the triangular main table accompanied with a roof light that gives a warmer and stronger essence to the heart of the center.
One of the wings consists of more private spaces like consultation rooms while the others are more socialization centered spaces.The wing with the big lounge room open up to the balcony that surrounds the building.These three wings creates different zones for emotional support, relaxation and information.

Answering to the Maggies' brief

There is a space dedicated for computer use, information gathering as indicated in the brief.(Maggies Brief,2015)

Answering to the Maggies' brief



As mentioned in the Maggies brief the consultation rooms are smaller more intimate and private spaces that should have comfortable seating.

The consultation rooms are also suggested to have views to the outside. Its possible to see all these requirements taken care of in the Maggies Oxford consultation rooms. (Maggies' brief,2015)

Biophilic design

The open plan is also in support of the biophilic design attribute of transitional spaces, receiving a satisfactory and positive response as a result of the free movement and flow of spaces.(Kellert,2005)

All images on the page are from Maggies Centre Oxford

Landscape design

For the creation of the landscape, the focus was to give minimal to no damage to the existing environment while providing an even richer habitat.
Native trees and hedging plants mixed with wildflowers seeds were planted to replicate the natural flora of the wider area. The woodland was cleared out garden waste and unsuitable plants that were damaging the habitat.The added planting was intentioned to strengthen the existing local wildlife.Since completion, a large amount of wildlife has recolonised in the site including many species of bird, butterflies. (Maggies' Brief,2015)

Answering to the Maggies' brief

The sepatation from the hospital concept and feel is supported by the open plan that minimizes the number of closed rooms and corridors.This creates a mental separation from the hospital and gives a more welcoming, domestic feel to the center.(WilkinsonEyre,2014)

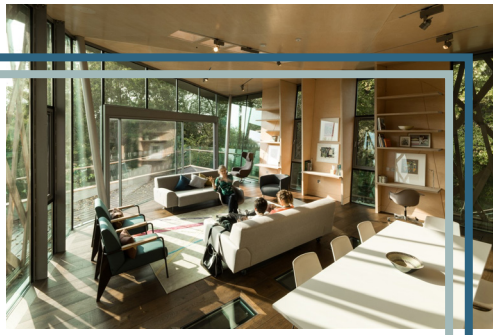
Central area is provided with a main table and an island that allows for various ways of usage. The center area is designed with a triangular table that is modular, that can be arranged in different ways for different activites done in the kitchen area.

A library and seating areas are also provided in the central area to allow different chances for relaxation and socialization.(Maggies Brief,2015)

Answering to the Maggies' brief

Answering to the Maggies' brief
Biophilic design

The seating area embodies the domestic feel that is wanted for the Maggies', with the interior choices made just like a private home design.



The large openings provides various biophilic benefits, providing the maximum natural lighting while minimizing the outdoor-indoor difference, the seating area becoming one with the surrounding trees.(Kellert,2005)

All images on the page are from Maggies Centre Oxford

Maggies' Leeds

Architect: Heatherwick Studio

Location: Leeds, York-shire, United Kingdom

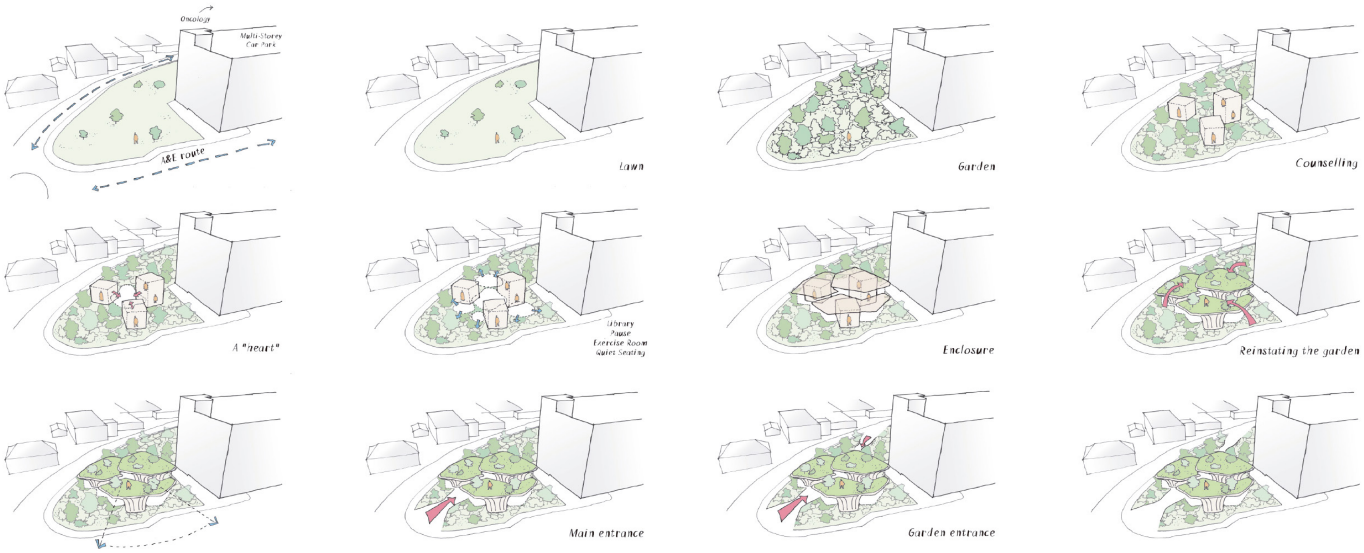
Year : 2020

Size : 460 sqm

The centre was designed by Heatherwick Studio accompanied by the landscape design done by Balston Agius.The centre is a built as a supporting act to the hospital of St James's University Hospital in Leeds. In the campus area of the hospital this land that the project was decided to take place was the one of the few green spaces left, so design was heavily impacted by the intention of keeping the greenery and also the area itself with its strong inclination.

The building was designed as a group of large-scale planters to not compramise from the green effect each holding a piece of garden lifted from the ground, incorparating the greenery into and over the building itself

The building design has earned The Stephen R. Kellert Biophilic Design Award in 2021, as a recognition of achievements in the built environment that demonstrated the principles and benefits of biophilic design.

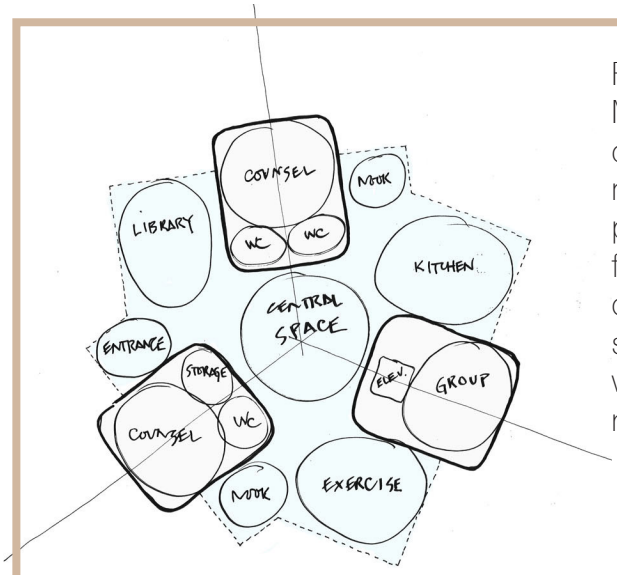


Architects' input

The concept for the design was inspired by the land itself, the only green area in the campus called for a creation of a strong green habitation that will be completely incorparated into the design interior and exterior.The land incline was adjusted with different levels provided.

All images on the page are from Maggies Centre Leeds

Architects' input



Focusing on the fact that Maggies are a support center and one of the most important things they provide is consultation the functional plan was made on the idea of a central space and three axis that will hold the consultation rooms inside.

Biophilic design

The open plan is also in support of the bio-philic design attribute of transitional spaces, receiving a satisfactory and positive response as a result of the free movement and flow of spaces.(Kellert,2005)

Architects' input

The plan is simply organized as three main pillars focused on information and consultation functions, a central space around the table and the different social areas provided around.

Answering to the Maggies' brief

The plans clarity of functional organization is helpful for the visitors that are in need of clarity in a time that nothing is certain for them.Clarity in the organization of the space helps them navigate where to go easily and the open plan encourages to explore freely. (Maggies' Brief,2015)

Biophilic design

The center design is very precise about natural lighting and greenery incorparation.The spaces provides many views to the outdoors through different sized openings that allows also for a rich natural lighting effect.

The design of the building itself being three layered gardens, allows for green views from every interior corner, while also incorparation a fair amount of potted greenery in all of the interior spaces.

All images on the page are from Maggies Centre Leeds

The interiors were designed focused on what the healing environments are usually missing and how that can be provided in this more domestic scale, the result was natural materials, soft lighting and various spaces for socialization opportunites accompanied by private quiet resting spaces. (Maggies' Brief,2015)

Answering to the Maggies' brief

Architects' input

The technical design lead of Heatherwick Studios Nick Ling has explained that most of the time buildings are thought and designed separately from the building, but the studios intention was for the building to become a garden itself with every decision from form to interior.

Answering to the Maggies' brief

Window sills and shelves were introduced into the design in various places to allow visitor custominization, providing spaces that they can bring private decoration and make the space more 'home' sense. (Maggies' Brief,2015)

The central space allows for the visitor to have a clear sense of the space from the entry.The central table creates a point of gathering in the middle as intended in the brief.

The central space allows views and entrances to different levels of the building providing spaces of refuge and prospect while generating curiosity to explore all the spaces with the flowing edges of the design.

The use of natural materials all through the project is strongly evident from the first view to the interiors. (Maggies' Brief,2015)

Answering to the Maggies' brief

Biophilic design

All images on the page are from Maggies Centre Leeds

Landscape design

The rooftop gardens were inspired by the Yorkshire woodlands, english species of plants were used together with evergreen to provide warmth all throughout the year. Another inspiration for the gardens was Maggie Keswick Jencks herself.Her love for gardening was included as the visitors are encouraged to take care of the plants and bulbs on site, while an automatic irrigation system keeps the garden maintained without need of on going maintainance.

Architects' input

One of the most distinctive features of the design is the wooden fins that create the buildings timber skeleton.The fins are inclined and curved at the top with outwards peaks, giving the image of a tree trunk and branches.

Biophilic design

This directly relates to the simulation of natural features biophilic design attribute that the visitors will feel the strong relationship human beings have had with trees throughout our evolution as a resting and hiding space under, a safe space and a food resource , resulting in many positive feelings and connections to the design elements. (Kellert,2005)

Biophilic design

The effect that the wooden fins create is most prominent in the central and communal spaces in the interior. This tree shaped elements coming together as canopy , creates spaces of refuge and prospect, warmth and security while also being complex enough with the different levels and the movement the repetation provides curiosity, complexity within the center as well. (Kellert,2005)

Biophilic design

The center in that sense has succesfully emersed the biophilic attributes of;
Order and complexity
Curiosity and enticement
Attraction and beauty
these together shows the strong biophilic element of Evolved Human-nature Relatioships the center design has achieved, which could be one of the indications of the biophilic design award it has received. (Kellert,2005)

All images on the page are from Maggies Centre Leeds

The Kálida Sant Pau Centre

Architect: Miralles Tagliabue EMBT

Location: Barcelona,Spain

Year :2019

Size : 400 sqm

The building is the first one of the centers that adopt the idea and brief of Maggies' in Spain.

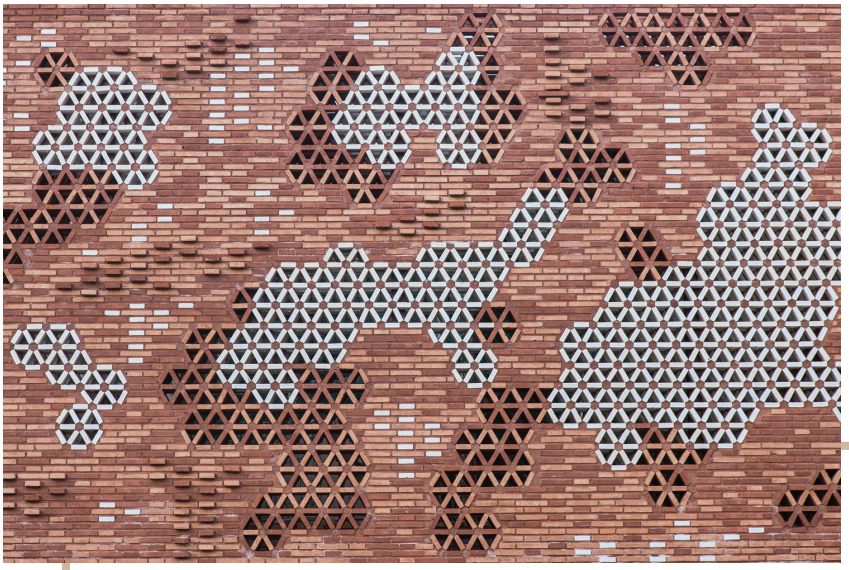
The centre building and landscape was designed by EMBT with the enchancement of interior design done incorparation with Patricia Urquiola.

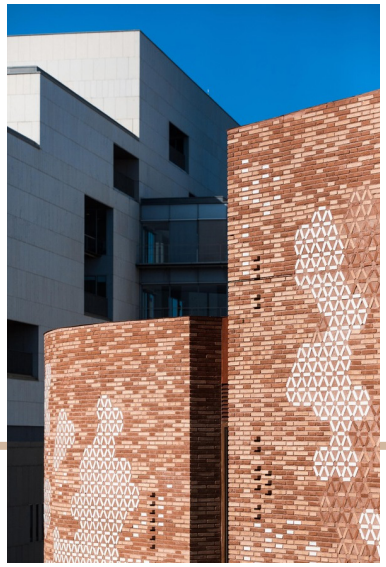
The main focus of the project was to improve the quality of life of the patients and loved ones, architect Benedetta Tagliabue pulled from her own experiences with the illness that she, unfortunately, experienced through her life and working partner.(Ott,2019)

Architects' input

The building is integrated into the Art Nouveau complex of Sant Pau Hospital in Barcelona, a UNESCO World Heritage Site, that was originally designed by architect Domènech i Montaner.One of the fundamental aspects of the project was to plnat new flowers to the garden of the old hospital , from this idea the new landscape design became a pavillion that connects the old and new. (Brickarchitecture , 2019)

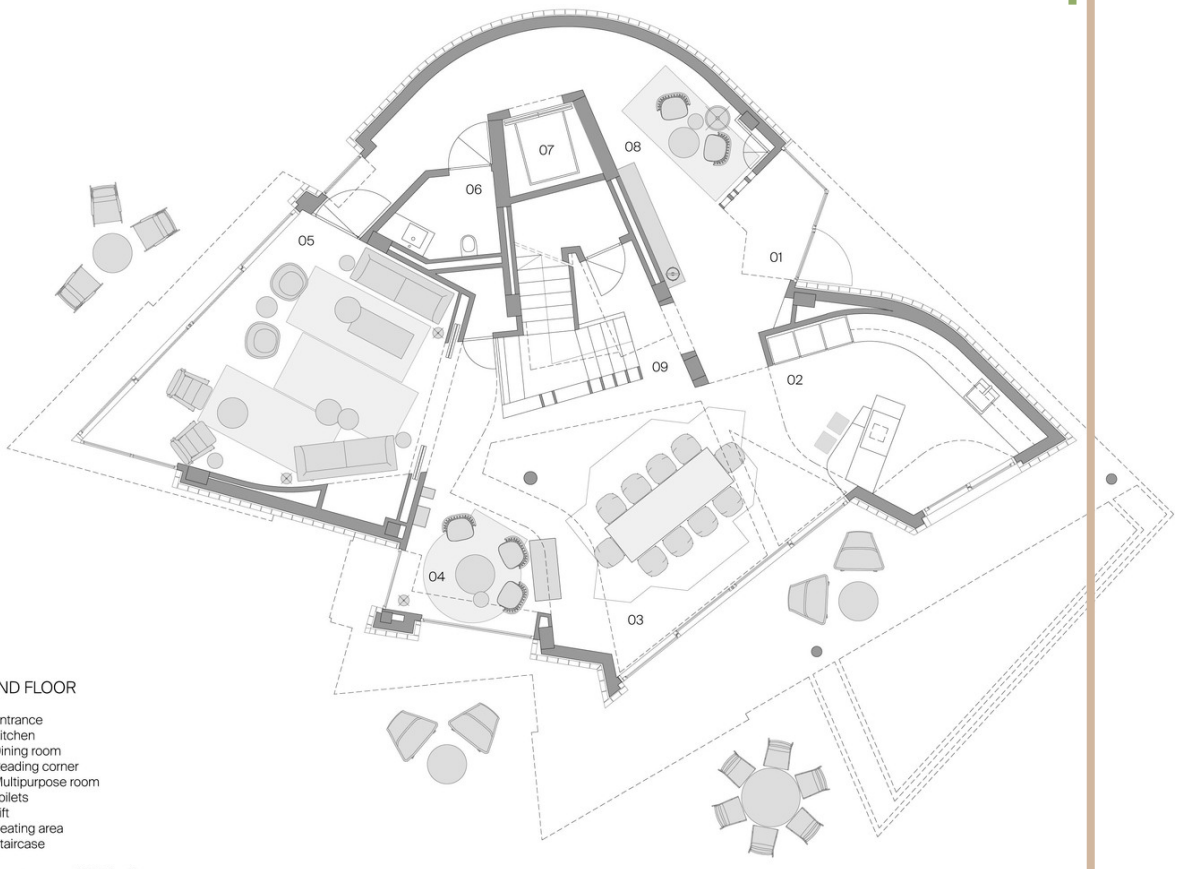
All images on the page are from Maggies Centre Kalida





Architects' input

The facades of the building were inspired by Art Nouveau buildings that are present on the site. The design of the facade is a composition of different materials, textures, and colors that are inspired by the art nouveau buildings, the material was specifically chosen to reflect the sunlight aesthetically which is very strong in the area.(Ott,2019)



GROUND FLOOR

01	Entrance
02	Kitchen
03	Dining room
04	Reading corner
05	Multipurpose room
06	Toilets
07	Lift
08	Seating area
09	Staircase

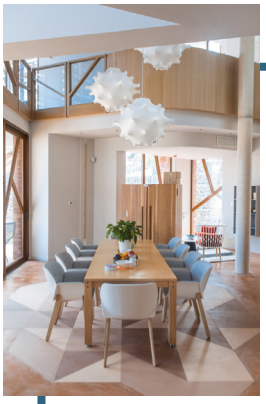
Net floor area	166.60 m2
Gross floor area	198.00 m2

Architects' input

Biophilic design

The building consists of two floors that are approximatately 200 m2 both.
The groundfloor plan is centered around the kitchen were you experience a double hight space with the atrium that gives the space a biophilic value of spatial variability , provoking curiosity and exploration. (Ott,2019)

All images on the page are from Maggies Centre Kalida

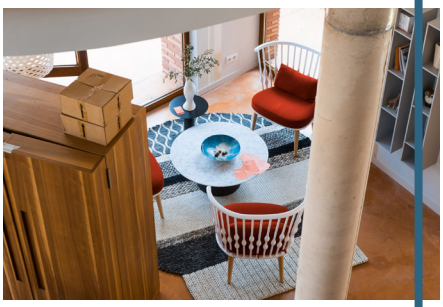


Answering to the Maggies' brief

The kitchen is the focus central point of the organization again in this centre, its importance for the maggies brief as the maib socialization part as socialization can be the most important through such a lonely experience(Ott,2019)

Answering to the Maggies' brief

The interior design has a strong domestic feels with different vibrant colors used together. The comfortable seating options different corners staying by yourself or talking about social life are both designed very detail-oriented which supports the home feel. The details in the interior design and decor elements bring a sense of lived-in feeling that is only possible to gain at our own homes.(Ott,2019)



Biophilic design

Answering to the Maggies' brief

The wooden shading elemetns and blinds are used for ensuring privacy in the south facade while also creating a biophilic effect with their tree-like shapes.(Ott,2019) (Maggies' Brief,2015)

All images on the page are from Maggies Centre Kalida

FIRST FLOOR

10	Counseling room
11	Seating area
12	Offices and meeting room
13	Terrace
14	Multipurpose room
15	Toilets

Net floor area	151.90 m2
Gross floor area	200.00 m2

Biophilic design

Every room is connected to nature and the landscape design with the patios, trees, and pergolas creates a more private, secure feeling space away from the hospital activities. These elements also create a prospect and refuge element allowing the patients to explore the outside world while still feeling protected and safe.(Ott,2019)

Answering to the Maggies' brief

The upper floor is an open plan with sliding doors to create a more flexible space that could be for multiple uses and different needs of the patients according to their desire and need for socialization that day. (Ott,2019)

Answering to the Maggies' brief

The upper floor plan is also situated surrounding the double-height space that holds the kitchen. This idea with the kitchen in the center highlighted on both floors shows the attention to the Maggies brief. (Ott,2019; Maggies'Brief,2015)

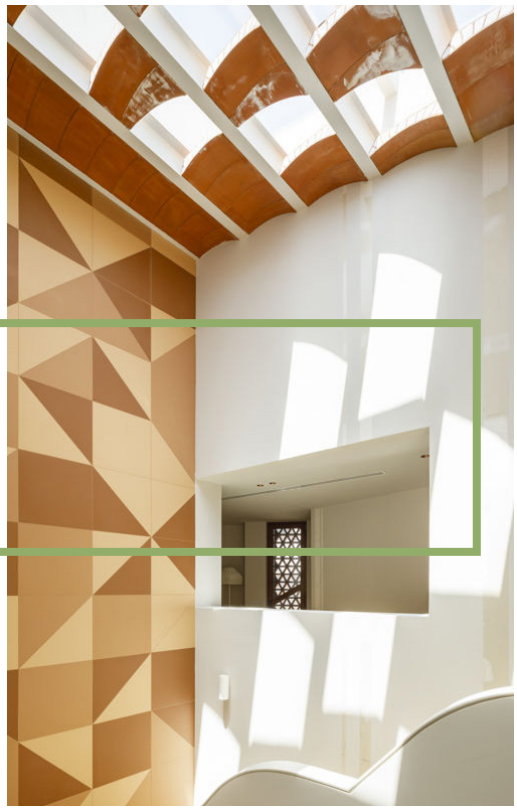
Architects' input

All images on the page are from Maggies Centre Kalida

Biophilic design

The organic shape of the pavilion reminds of leaves intertwined, since the design of the new pavilion was heavily inspired by nature itself the result was an organic shape and flowing transitional spaces.(Ott,2019)

Landscape design



Biophilic design

There is also play of shadow and light present in the interior and exterior design of the center with the roof of the center and the pavilion shading elements geometric designs reflecting dynamic shadows in the spaces. (Kellert,2005)

Answering to the Maggies' brief

The choice of materials and colors supports the domestic feeling with the biophilic approaches taken to use many wooden elements for an instant connection to the space and to create warmth. While the different types of textures have more senses than only the visual. (Ott,2019)

Architects' input

The architecture of the art nouveau building is reflected in every aspect of the center design because Benedetta Tagliabue wanted to stay true to the historical routes of the area. (Brickarchitecture , 2019)

All images on the page are from Maggies Centre Kalida

Centre For Cancer And Health

Architect:NORD Architects

Location: Copenhagen, Denmark

Year:2011

Size:2250 sqm

This case study is differently explored since it's not connected to the Maggies' Foundation but the idea and the aim behind the center are the same.

The center is located in the close to the city center between the two healthcare facilities of Copenhagen University Hospital (Rigshospitalet) and Panum Institute of Medicine to be able to help both facilities patients that might need a space to go to for a better atmosphere, different experience and more knowledge,awareness about the illness.

This explanation and intention the architects indicates that the design is made with the same aim in mind as Maggies'.The architects focus on the effect of a disease like cancer has in your day to day life and the chance that built environment , well-designed spaces can be a piece of the help.

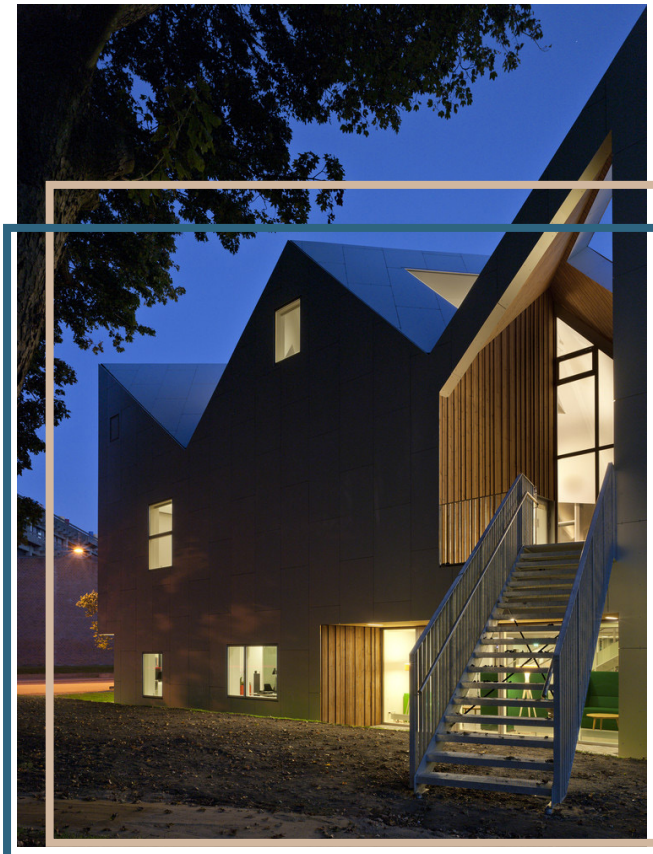
Nord architects continue to say that researchs show that a welcoming well designed atmosphere can show results but most of the healthcare facilities provides the opposite.In a hospital even way finding could be a challenge the architects states and that the center in Copenhagen provides a welcoming space without these challenges.(NORD Architects,2019)

Comparison and relation to Maggies' brief

From these first explanations it can be seen that the idea of Maggies' has spread and different ways of implementing to different scales has started.The scale of the Cancer centre is effectively larger compared to the Maggie centres domestic scale. (NORD Architects,2019 ; Maggies' Brief,2015)

All images on the page are from Centre For Cancer And Health by Nord Architects

One of the results stated from the cancer center getting recognition as a strong designed aesthetic building for the community has generated interest in the center and cancer treatments.This is one of the intentions stated in the maggies brief as well and the reason why the centers are designed by various architects, creating different appealing designs according to the same brief, to create awareness for the disease.(NORD Architects,2019)

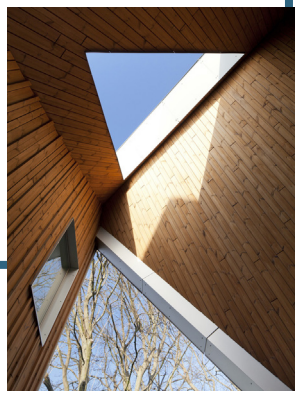


The center is a complex, that combines small houses into one, this design choice was how the architects tried to tackle the issue of the domestic feeling that is needed for a visitor to feel comforted and free in the spaces.

The houses were combined without losing the individual feeling of the interior, while also having typical house-villa roof style that mimics a domestic aesthetic from the exterior as well.

The entrance is led to a lounge area where a visitor would be greeted by the volunteers.The reception desk is also absent in this design, to avoid creating a formal feeling in the center.(NORD Architects,2019)

The different openings throughout the facades of the building and in the roofs provoke a sense of curiosity and attraction while also creating a light and shadow dynamic in the space and surroundings. (NORD Architects,2019)



All images on the page are from Centre For Cancer And Health by Nord Architects

Comparison and relation to Maggies' brief

There are many different spaces used for various activities, there is also a kitchen where everyone can cook and eat together, but the kitchen or more specifically the kitchen table is not the central focus of the organizational planning, but rather the large inner courtyard.(NORD Architects,2019 ; Maggies' Brief,2015)

Biophilic design

The interior spaces are very well lighted with natural light beaming through the many large openings and the white bright color of the center intensifies the natural light. (NORD Architects,2019)

Architects' input

Different spatial features are present in the center's architecture, with double-height atriums, terraces, the inner courtyard and different levels implemented in the design.Creating an interesting design from a biophilic stand pont with the spatial variability. (NORD Architects,2019)

Biophilic design

All images on the page are from Centre For Cancer And Health by Nord Architects

Through the observation done on the case studies, firstly it is once more confirmed that even though the brief is the same, with the room of creativity that brief allows for the enrichment of the architectural craft and the improvement of the centres itselves with experiencing different point of views; it is possible to achieve very diverse results.

The different approaches to the centers and illness itsellf, will generate more attraction to the centers and that will result in more awareness and knowledge and the built environments' role in healthcare will be recognised even more.

The example in Denmark also gives a foresight that the improvement has already started with succesful trials of different implementations of the same core ideals , this could lead to reaching more patients and maybe creating centers that could help a wider range of illnesses.

A healing center proposal

Methodology

According to the research done in this study, the methodology that the proposed concept will follow will be based on three objectives. These objectives are; the most successfully applied features from the Maggie center case studies, the maggie center brief on atmosphere and spatial requirements indicated, and the biophilic design approaches that were common in both studies.

From the study done on biophilic design approaches, it was considered that the common indications given by both approaches were the main objectives that should be followed by a project that will be based on biophilic design. These main objectives complied under nine titles.

Visual connection to nature	Prospect and refuge	Presence of water
Material connection with nature	Complexity and order	Connection with natural systems
Forms with connection to natural aspects	Light	Curiosity and exploration

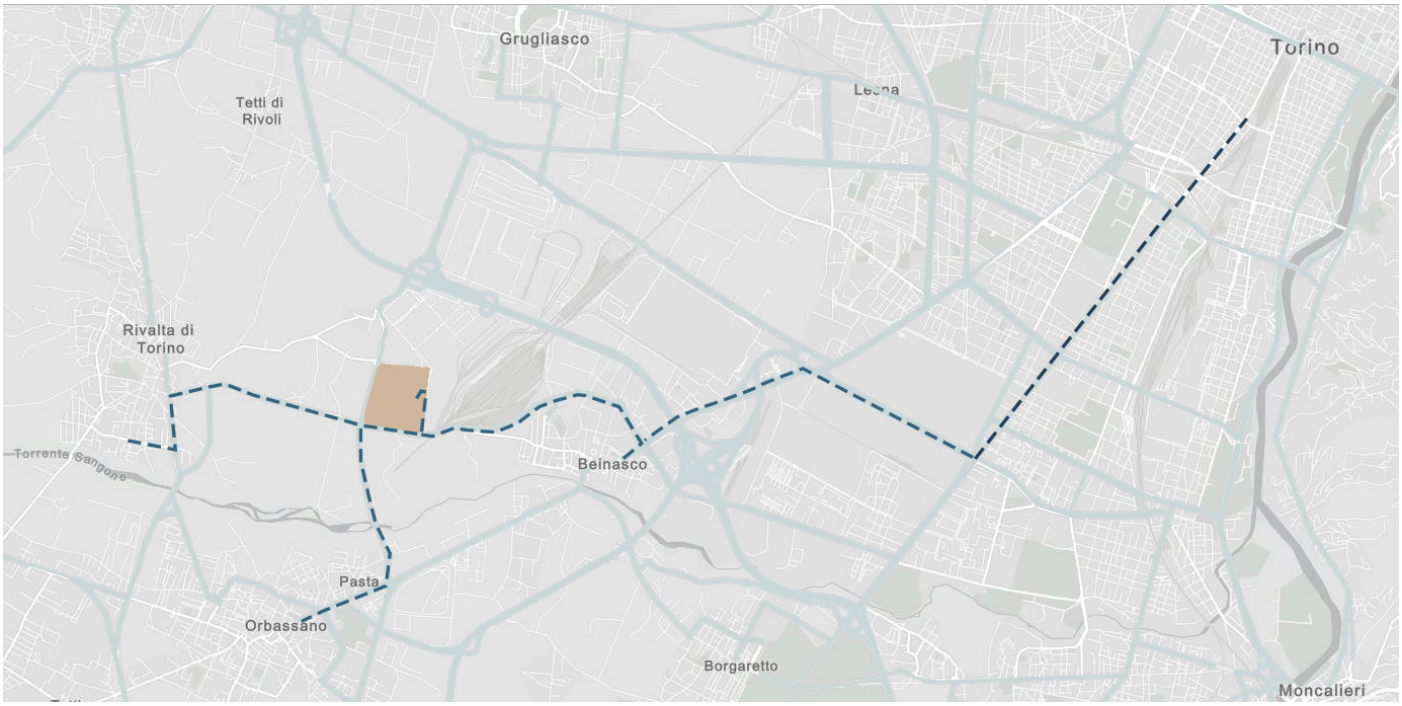
As a result of the study done on Maggies and the given brief, it could be said that there are features that have to be prominent for the success of the center. These features can be

The central area defined by the kitchen table	A well-blended contrast of welcoming warmth and complexity of real struggle.	Outdoor and indoor intertwining
The flexibility of usages of the spaces and the freedom of movement,	The abundance of natural light	Balance of private and social life

There have been also points of view and approach gained from the examination of the applications, these are organizational objectives and biophilic design objectives. Organizational objectives that were successful in the implications were the importance of flexibility of spaces, central focus on the kitchen table, clarity of entrance from the outdoors, and well-balance of private and social spaces. Biophilic implications were large openings for maximum connection to outdoors and most natural lighting gains, rich greenery design for the landscape, spatial variability created by levels or atriums, use of natural materials, light and shadow dynamics, complexity and order created in the spatial planning or aesthetical elements.

The following conceptual proposal will be based on these understandings, is a healing center mainly for cancer patients, connected to the hospital of San Luigi Gonzaga University, located in Torino, Italy.

Site Analysis



It can be seen in the Figure.06 that the San Luigi Gonzaga University Hospital is located in between the zones of Orbassano, Rivalta di Torino, Beinasco, Lingotto(Torino).

Connection to the hospital is mainly by car. The only public transportation to the hospital is by bus and there is only three bus lines(43,48,OB1) provided that passes through the bus terminal that is located in the area of the hospital.

The hospital area is rather further away to all the residential areas being mostly covered by agriculture areas, logistic stations for private companies and the city freight village.

The hospital is in the Orbassano area (even has policlinics connected to the hospital closer to the residentail area of Orbassano) and mostly connected to the patients from that area, even though its relatively close to other work and residential areas therefore there is the potential patients arriving also from other areas.For all these cases it can be said that there is a weak public transportation connection to the hospital.

Masterplan of San Luigi Gonzaga University Hospital

Oncologia
Radioterapia
Green Area
Dense Green Area
Area chosen for the center

The spesfic area was chosen because it was the most beneficial in many aspects;

- The proximity to the Oncologia and Radioterapia buildings of the hospital where most of the cancer patients will be visiting
- Transportation options for the patients are the widest at this point with the bus stop of the hospital in a short distance
- Various options of car parking
- The position of the area is close to the entrance of the hospital campus, if located a new center with an interesting architectural building and/or attractive gardens will provoke interest
- The area itself being completely empty, without the need to cut trees or destroy existing buildings and easy access with cars to the construction site for the safe and quick transportation of materials





pictures of area located inside the campus of San Luigi Gonzaga University Hospital, https://earth.google.com/, 2022

After the observations of the site images; it can also be noticed that;

- the area is avaible for gardening and can grow local vegetation easily on it's own as observed in the sorroundings.

- the area very eaily noticeable from the entrance of the hospital, making it easier for the centre to become an attraction.

- the area is very suitable for an architecture that preferences natural lighting.

- the view and vista of the building and landscape will also be surrounded by nature.

Concept diagram

After establishing a methodology for the approach to the spatial requirements and atmosphere of the space, to define the shape of the form tree fractals were used.

Tree Fractals provide a biophilic background to the form and functional organization of the center. Fractals are biophilic attraction gatherer elements since they are very rarely naturally accruing, strictly organized and symmetrical forms, the rareness, and the complex organization provoke interest and attraction.

Tree fractals on the other hand also embody the tree form and the symbolic meanings behind the tree-human relationships.
The tree fractal is a great symbolic representation of the organizational flows of the spaces.

As the tree is founded and based on a root, supported by the body and then separates into many branches from bigger to smaller.

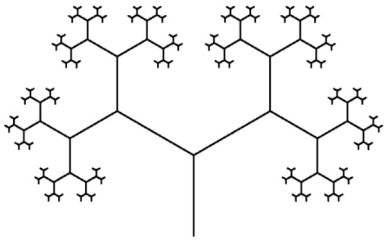
The shape of the fractals as an indicator for the from and the concept of a tree coming together with the maggie brief as indicators of the organizational flow.

Answering to the Maggies' brief

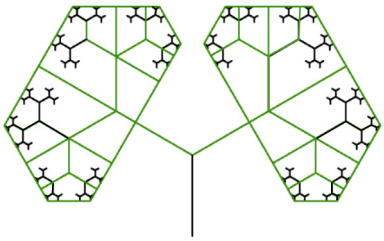
The importance of the kitchen table as the heart and center of the Maggies was incorporated and intertwined with the tree fractals, as the body where the branches come out is the center part where the kitchen table is located, while the root of the tree is the kitchen and social area that supports and creates all the activities that will take place around the table.

Biophilic design

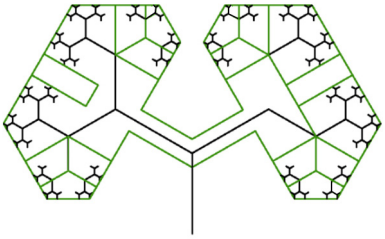
The natural shape of trees' being described by a fractal is the base of the projects plan, organizational choices and form.



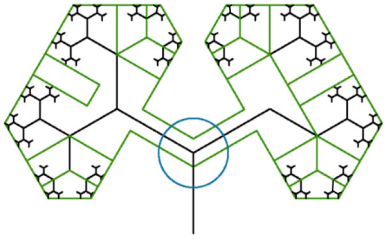
1.Tree fractal that follows 60 degree of angles



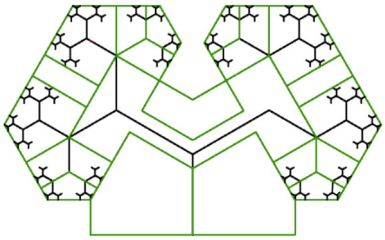
2.The initial separation of spaces as the two wings through the fractal axes



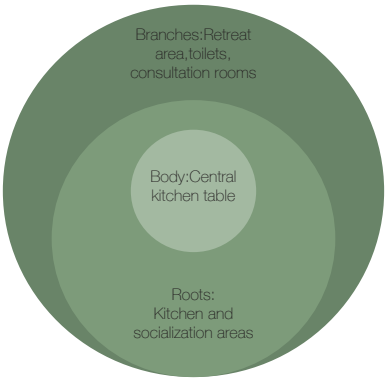
3.Creating a closer image to a tree balanced on the body by an offset of the main axes



4.The heart of the center form the Maggie's brief aligning with the tree fractal



5.Finalization of the form on plan by the creation of strong roots through the axes of the fractal

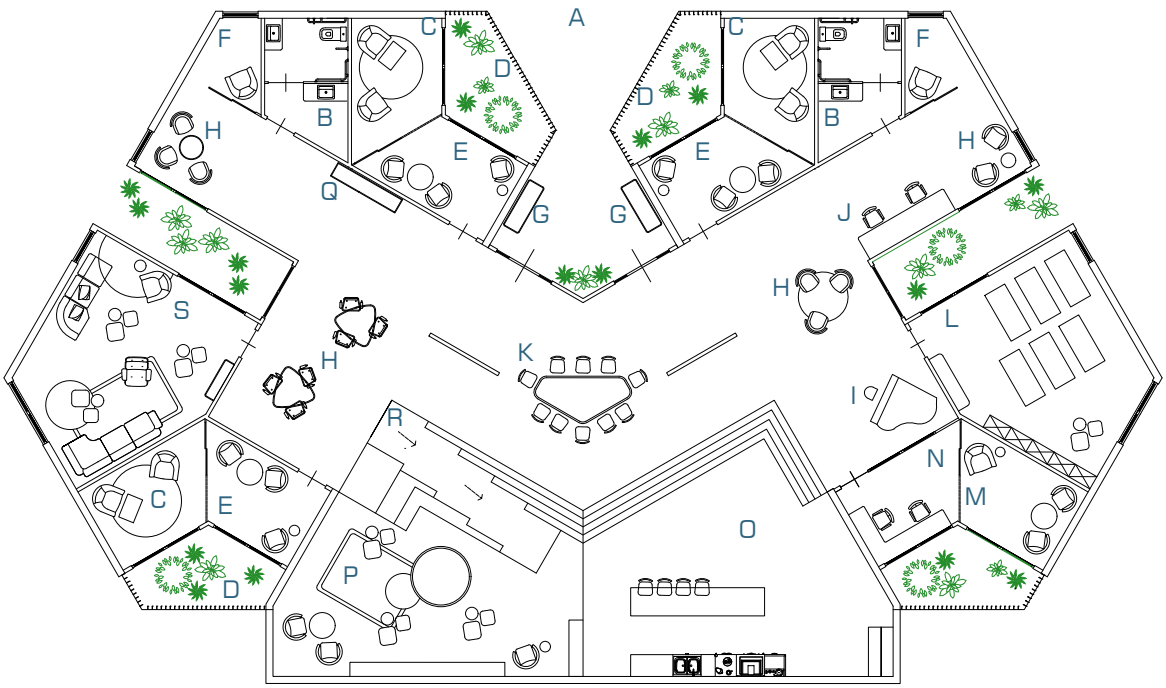


Functional organization
Maggies brief
Tree fractal
Relationship

Landscape design

Landscape plan of Healing Center San Luigi
Gonzaga University Hospital
scale 1:500

Floor plan



A.Entrance
B.Wc
C.Consultation room
D.Inner garden
E.Waiting room/social area
F.Retreat area
G.Entrance benches
H.Social area
I.Music/social area
J.Computer area
K.Central multi-purpuse table
L.Activity room
M.Volunteers resting room
N.Office
O.Kitchen
P.Sitting room/library
Q.Notice board and desk
R.Ramp
S.Sitting room

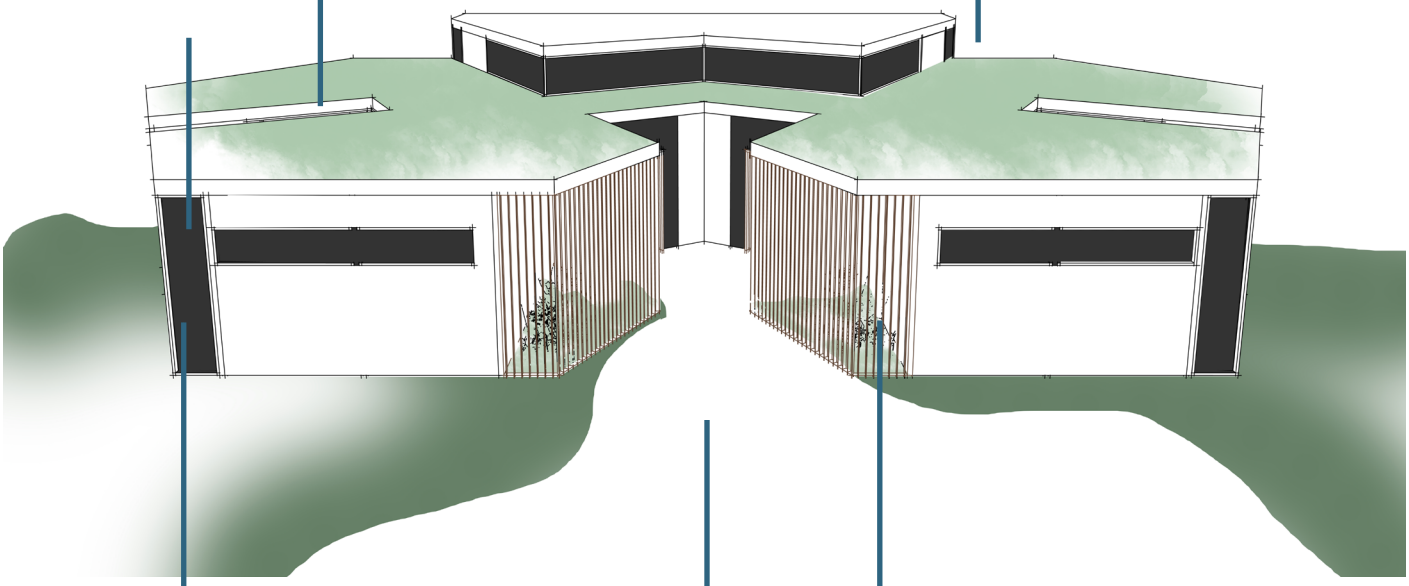
Floor plan of Healing Center San Luigi Gonzaga University Hospital
scale 1:200

The sketch of the center from the outdoors looking at the

Large windows in various places for the best possible natural lighting

Double height spaces for better natural lighting and spatial variousity

The unique shape created from a fractal allows natural light to go in in various angels



Large windows in various places for the best possible natural light-

A welcoming entry way that resembles a hug and provides a space of pause in the middle.

Having a pause before entering guests can sit in the benches in the area and look inside the center through the glass doors

The garden that is covered from the top and separated with wooden elements creates a welcoming look while also providing green views and privacy to the interiors.

Initial visualization of consultation rooms with the flexible sliding doors and teh view to the outdoor garden designed for the consultation areas.

Initial visualization of view of kitchen and the central table from the entrance.

The main table in the centre of the plan and the lifted kitchen with the large island can be observed.

The level difference accompanied with the double -height ceiling creates spatious variability.

The two main functions in the root of the fractal are the kitchen and the library because it is the base of the healing centers too; socialization and gaining knowledge,awareness.

The ramp design allows for all users to access while creating oppurtunites for different usages like seating and play.

Conclusion

Throughout our evolution, human beings were in close contact with nature, this affected our ways of living and the shaping of our built environment, but built environment has lost the connection to nature more and more in the recent years.The answer to this challenge can be biophilic design approaches.

From the information that this research has complied, it is undeniable that the relationship between natural aspects and our built environments has significant effects on our well-being. One of the design approaches that tackle this issue is biophilic design. The improvement of a space's biophilic attributes and the well-being of the users-occupants, favorability of the space are directly linked.

Built environments with purposes such as education, well-being, and healthcare should be the most reliant on biophilic design approaches since the outcomes and the experience in these spaces are focused on improvement and well-being.

The previously discussed, most prominent biophilic approaches should be considered as the bases for design challenges of wellbeing.For these well-being challenges, design should be considered one with the surroundings and biophilic attributes of both interiors and exteriors should be in the focus of these considerations, resulting in benefits not only for the buidling itself but the surroundings.

Maggies' Centres are a highly beneficial and successful support system for the hospitals, for the patients to be able to have better results, more knowledge about their illness and treatment options, create less confusion making the process easier not only for the patient but for the doctors that are providing the treatment too and an overall better life experience throughout the process. The addition of a healing support center like Maggie's to a hospital would be a clear improvement for the institution that generates improved rates of survival, patient, and healthcare staff experience.

There are a lot of patients that have to visit the hospitals very frequently for treatments and controls, this doesn't only apply to cancer patients. For this reason, research should be done on the

types of patients that require frequent visits and the types of support they might need, in order for their inclusion in the healing centers as well; creating a center not only for the cancer patients but allows a warm welcome to all heavily affected patients and families. These centers can shift the view of hospital visits to an improved experience that has the center as an activity or place to look forward to being a part of.

Additions of healthcare centers that are designed based on the biophilic design approaches that offer the support system and a healing atmosphere Maggies' centers provide, would be a great improvement for the planning of the future healthcare campuses of the hospitals or the expansion or renovation plans of the existing ones.

Bibliography

Annemans M. , Audenhove Ch. Vermolen Van, H. , and Vermolen A. ;2020; What makes an environment healing? Users and designer about the Maggie's Cancer Caring Centre London Conference: 8th International Design and Emotion Conference Appleton,1984; Prospects and Refuges Re-Visited- - Board of Regents of the University of Wisconsin System

Borrett Emily Sîoned,2013 ; AD392: History and Theory in Spatial Design: Dissertation, The Maggie Centres: Architecture and Healing, University of Brighton / Interior Architecture

Browning William D., O.Ryan Catherine; 2020 ; Nature Inside: A Biophilic Design Guide

Chen-Yen Chang, Ping-Kun Chen; 2005; Human Response to Window Views and Indoor Plants in the Workplace- HortScience Volume 40 Issue 5

Christie Mark, Hulse Louise & Miller Paul K. , 2020; Time for a (Gardening) Break: Impacts of a Green Exercise Initiative for Staff Health and Wellbeing in a Corporate Environment, Journal of Therapeutic Horticulture 30.1.

Fjeld, Veiersted, Sandvik, Riise, Levy; 1998; The Effect of Indoor Foliage Plants on Health and Discomfort Symptoms among Office Workers - Indoor and Built Environment Vol. 7, No. 4.

Forster Peter M, 2010; A brief introduction to environmental psychology,Charles Darwin University.

Giedion Sigfried, 2009 Space,time and architecture: The growth of a new tradition, Harvard University Press.

Gillis Kaitlyn , Gatersleben Birgitta,2015; A Review of Psychological Literature on the Health and Wellbeing Benefits of Biophilic Design,University of Surrey

Gladwell V.F. , Brown D.K. , Barton J.L. , Tarvainen M.P. , Kuoppa P. , Pretty J. , Suddaby J.M. , Sandercock G.R.H.; 2012, The effects of views of nature on autonomic control

Gola Marco, Ph.D., M.Arch1 , Monica Botta, M.Arch2, Anna Lisa D'Aniello, Dipl. NLP3, and Stefano Capolongo, Ph.D., M.Arch,2021 ; Influence of Nature at the Time of the Pandemic: An Experience-Based Survey at the Time of SARS-CoV-2 to Demonstrate How Even a Short Break in Nature Can Reduce Stress for Healthcare Staff, Health Environments Research & Design Journal

Guenther Robin and Vittori Gail,2013; Sustainable Healthcare Architecture, Wiley Series in Sustainable Design Ser

Hansen Margaret M., Jones Roe and Tocchini Kirsten;2017 Shinrin-Yoku (Forest Bathing) and Nature Therapy: A State-of-the-Art Review; ; International Journal of Environmental Research and Public Health

Hildebrand G. ,1999; Origins of Architectural Pleasure

International Energy Agency ,2017; World Energy Outlook Report

Jencks Charles,2017; Maggie's Architecture:The Deep Afinities Between Architecture and Health

Jencks Charles,2017; Maggie's Architecture:The Deep Afinities Between Architecture and Health

Kaplan S, Kaplan K,1989 ; The experience of nature: A psychological perspective.

Kellert Stephen,2008 , Biophilic Design: The Theory, Science and Practice of Bringing Buildings to Life-

Kotera Yasuhiro, Richardson Miles, Sheffield David, 2020; Effects of Shinrin-Yoku (Forest Bathing) and Nature Therapy on Mental Health: a Systematic Review and Meta-analysis; ; International Journal of Mental Health and Addiction.

Leach Melissa, Scoonesa Ian, Stirling Andrew; 2010; Governing epidemics in an age of complexity: Narratives, politics and pathways to sustainability.

Lewis J.Owen, Brophy Vivienne; 2011; A Green Vitruvius: Principles and Practice of Sustainable Architectural Design.

Lohr, Pearson, Goodwin,1995; Interior Plants May Improve Worker Productivity and Reduce Stress in a Windowless Environment. Department of Horticulture and Landscape ArchitectureWashington State University, Pullman, WA 99164-6414

Maggies foundation; *http://maggies.org*

Maggies Foundation,2015; Maggie's Architecture and Landscape Brief.

Martin Daryl, Nettleton Sarah, Buse Christina,2019; Affecting care: Maggie's Centres and the orchestration of archite tural atmospheres , Department of Sociology, University of York.

McHarg Ian L,1969; Design with natur; the American Museum of Natural History.

Orians, Gordon H. Heerwagen, Judith H.; 1992; Evolved responses to landscapes.The adapted mind: Evolutionary psychology and the generation of culture (pp. 555–579). Oxford University Press.

Ott,2019 , Kálida Sant Pau Center / Miralles Tagliabue EMBT, https://www.archdaily.com/916960/kalida-sant-pau-center-miralles-tagliabue-embt?ad_medium=gallery

Öhman Arne,1986; Face the beast and fear the face:Animal and social fears as prototypes for evolutionary analyses of emotion, The society for psychophysiological research , vol23 no.2 .

Özdemir Aydin, 2010; The effect of window views' openness and naturalness on the perception of rooms' spaciousness and brightness: A visual preference study, Department of Landscape Architecture, Ankara University.

Roger S. Ulrich, 2008; Biophilic Design: The Theory, Science and Practice of Bringing Buildings to Life.

Roger S. Ulrich, 1983; Biophilia, biophobia, and natural landscapes.

Rogers Stirk Harbour + Partners 2014;Maggie's West London Charing Cross Hospital Design Guide

Ulrich Roger S.,1983; Aesthetic and Affective Response to Natural Environment - - Part of the Human Behavior and Environment book series (HUBE,volume 6)

Index of figures

Maggie and Charles Jencks, Last accessed: 22.06.22 < https://www.bbc.com/news/uk-scotland-50056219>

Maggie's Cancer Centre Manchester by Foster + Partners,Last accessed: 24.06.22,<https://www.archdaily.com/786370/maggies-cancer-centre-manchester-foster-plus-partners
Last accessed: 24.06.22

Maggie's Centres:different plans for the same brief,Jencks Charles,2017; Maggie's Architecture:The Deep Afinities Between Architecture and Health, Last accessed: 14.05.22

Maggies' Highlands by Page & Park Architects,Last accessed: 17.05.22, <https://www.archdaily.com/547453/design-with-empathy-an-exhibit-honoring-maggie-s-architecture-of-cancer-care/540fb6c5c07a803fb300009f-design-with-empathy-an-exhibit-honoring-maggie-s-architecture-of-cancer-care-image>

Maggie's Lanarkshire Kitchen Area by Reiach and Hall Architects, Last accessed: 15.05.22, <https://www.archdaily.com/620480/maggies-lanarkshire-reiach-and-hall-architects>

Maggie's Lanarkshire by Reiach and Hall Architects photo two,Last accessed: 15.05.22,<https://www.archdaily.com/620480/maggies-lanarkshire-reiach-and-hall-architects>

Maggie's Lanarkshire by Reiach and Hall Architects, Last accessed: 20.05.22,<https://www.archdaily.com/620480/maggies-lanarkshire-reiach-and-hall-architects>

Maggies' NewCastle by Cullinan Studio, Last accessed: 14.05.22 <https://www.archdaily.com/415127/maggie-s-newcastle-cullinan-studio?ad_source=search&ad_medium=projects_tab>

Maggie's Newcastle by Cullinan Studio, Last accessed: 25.06.22, <https://www.maggies.org/our-centres/maggies-newcastle/architecture-and-design/>

Maggie's Newcastle by Cullinan Studio photo two, Last accessed: 25.06.22, <https://www.maggies.org/our-centres/maggies-newcastle/architecture-and-design/>

Maggies Nottingham by CZWG Architects, Last accessed: 15.05.22,<https://www.archdaily.com/254535/maggies-nottingham-czwg-architects?ad_source=search&ad_medium=projects_tab>

Maggies Oldham by dRMM, Last accessed: 14.05.22,<https://www.archdaily.com/874795/maggies-oldham-drmm?ad_source=search&ad_medium=projects_tab>

Maggie's Oldham Entrance by dRMM, Last accessed: 14.05.22 <https://www.archdaily.com/874795/maggies-oldham-drmm?ad_source=search&ad_medium=projects_tab>

Maggie's Oxford by WilkinsonEyre Architecture, Last accessed: 16.05.22,<https://www.archdaily.com/558757/maggie-s-oxford-wilkinson-eyre-architects>

Maggies' West London by Rogers Stirk Harbour +Partners ,Last accessed: 20.05.22, <https://rshp.com/projects/health-and-science/maggies-west-london-centre/>

Photo one of Footbridge on the water Residential Building by LOVE architecture and urbanism, Last accessed: 15.05.22, <https://www.archdaily.com/975623/footbridge-on-the-water-residential-building-love-architecture-and-urbanism?ad_source=-search&ad_medium=projects_tab>

Photo two of Footbridge on the water Residential Building by LOVE architecture and urbanism, Last accessed: 15.05.22, <https://www.archdaily.com/975623/footbridge-on-the-water-residential-building-love-architecture-and-urbanism?ad_source=-search&ad_medium=projects_tab>

Photo three of Footbridge on the water Residential Building by LOVE architecture and urbanism, Last accessed: 15.05.22, <https://www.archdaily.com/975623/footbridge-on-the-water-residential-building-love-architecture-and-urbanism?ad_source=-search&ad_medium=projects_tab>
Pictures of area located inside the campus of San Luigi Gonzaga University Hospital, Last accessed 12.07.22 https://earth.google.com/, 2022

Photo one of Entrance of Apple Store Milano by Foster + PartnersFigure,Last accessed: 14.05.22, <https://www.archdaily.com/978489/apple-piazza-liberty-foster-plus-partners?ad_source=myarchdaily&ad_medium=-bookmark-show&ad_content=current-user>

Photo second of Entrance of Apple Store Milano by Foster + PartnersFigure,Last accessed: 14.05.22, <https://www.archdaily.com/978489/apple-piazza-liberty-foster-plus-partners?ad_source=myarchdaily&ad_medium=-bookmark-show&ad_content=current-user>

Photo third of Entrance of Apple Store Milano by Foster + PartnersFigure,Last accessed: 14.05.22, <https://www.archdaily.com/978489/apple-piazza-liberty-foster-plus-partners?ad_source=myarchdaily&ad_medium=-bookmark-show&ad_content=current-user>

Redrawn figure of outcomes;McSweeney, Rainham, Johnson, Sherry, Singleton; 2014). Last accessed: 20.05.22

Stairwell, L'Hôtel Tassel
Last accessed: 25.06.22, <https://insideinside.org/project/horta-lhotel-tassel/>

The New York Times Building
by Renzo Piano Last accessed: 14.05.22, <https://www.fondazionerenzopiano.org/it/project/the-new-york-times-building/#section-images-873>

Toilets of Maggie's at The Royal Marsden by Ab Rogers Design, Last accessed: 20.05.22,<:https://www.dezeen.com/2020/02/17/royal-marsden-maggies-centre-ab-rogers-design/>