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STUDENT Anne McGuinness
TYPE Thesis, Architectural Design Project
TITLE " A Living, Loving Artifact: Developing the Integral Ecology Framework for Design and Its Application in the Design of a Mixed-Use Campus"
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PROJECT ABSTRACT
The setting of contemporary life has become the site of an ever-growing divide between humanity and the natural world. The 'human world' or 'civilization' is both conceptually and physically centered in the built environment. The built environment has become the primary interface through which humanity engages with the natural world, and the building, a basis for regular human activity and experience. This thesis explores how architectural design can renew the human-nature relationship and further the long-term goals of sustainability through a humanistic approach.

This design thesis presents a case for using the philosophical and spiritual vision of integral ecology in the development of a design solution that addresses the problem of human-nature alienation and redefines human creative responsibilities. The design, creation, and operation of a building present opportunities for people to assume their roles as environmental stewards and members of an interconnected community of life.

The principles of integral ecology are used to create a design framework that leverages biophilic and regenerative design strategies and elements. A design solution reflects social, personal, and ecological agenda in that its intention is to shape personal development and social interactions through programming and habituation within the built environment as well as affect restorative ecological change through human participation and building function. The building becomes the central site for the reconciliation of the human person with Nature – a means to mediate environmental conflict, cultivate life, and practice earth care. Ultimately, the goal of the design is to establish a basis for human activity in which the human person enters a renewed relationship with the natural world, facilitating an ecological 'conversion' of the human spirit.

The motivation for this thesis is to generate interdisciplinary discussion among the fields of architecture and design, environmental ethics, and theology.

TOPIC Articulation of integral ecology and its ethical imperatives for environmental and architectural design

THESIS STATEMENT *"A Living, Loving Artifact: Developing the Integral Ecology Framework for Design and Its Application in the Design of a Mixed-Use Campus".* The built environment is the primary interface through which humanity engages with the natural world, and its design is an expression of the fundamental human capacity for creation. Through a design rooted in the philosophy of integral ecology, the building becomes the central site for the reconciliation of the human person with Nature – a means to mediate environmental conflict, cultivate practices of earth care and facilitate an ecological conversion of the human spirit. As a 'living, loving artifact,' the project aspires to serve as an exemplar of human and natural flourishing within the built environment.

PROJECT STATEMENT The primary objectives of the project are the 1) development of a design framework based on the principles of integral ecology to guide the processes of architectural design and site selection and 2) the implementation of the framework in the design of a mixed-use campus in the city of Newark, New Jersey. The proposed design, (tentatively, the "Center for Ecological Living") leverages biophilic and regenerative architectural design strategies while promoting the development of an intentional community organized around the principles of earth care and environmental stewardship.

SCOPE The development and design of 2+ acre brownfield site in Newark, New Jersey into a mixed-use campus providing co-living residential units and shared amenities, grocery and market café, studio and lab space, exhibition and classroom, assembly space, agricultural gardens, outdoor recreation, and a public plaza.

*The work submitted here is not the finished design project, but the most substantial product to date that demonstrates my research exploration.

Research Summary

INTRODUCTION

I began my project with the vague – and slightly overwhelming – desire to leverage this as an opportunity to tackle the fundamentally human factors behind our contemporary environmental crisis. We are currently living in the era of the Anthropocene in which human beings have become the dominant agents of change on the planet in transforming the natural environment. By and large, these transformations have been negative, rather than positive influences on the functioning of Earth's systems. The aggregate effects of human activity the survival and well-being of humanity, but of the earth itself. In facing problems of a human making, we might turn to ethical discourse which deals with human agency and matters of free will or look to spiritual traditions that motivate us to achieve human potential.

A clear relationship especially exists between biophilic-regenerative design and the stewardship model, commonly explored in Christian theology. This relationship is ripe with valuable insights; the extensive philosophical and historical traditions of the stewardship model and moral imperatives can provide a framework for a biophilic building that is regenerative in its relationship with nature and is a catalyst for human environmental responsibility. An architecture that emerges from an environmental ethical discourse will not only be more sustainable by traditional measures of high performance and low environmental impact, but can potentially enhance the human experience through a deeper attachment to and appreciation of the earthly home we inhabit along with the rest of the natural world.

This thesis presents a case for applied integral ecology in the development of a design solution that addresses the problem of human-nature alienation within the scope of the built environment. The result of this thesis will be a developed design project. As a 'living, loving artifact,' the designed building aspires to serve as an exemplar of human and natural flourishing.

METHODOLOGY The purpose of the research is two-fold: 1) to develop a normative framework for design based on a review of environmental ethics, Christian eco-theology, and environmental stewardship models; and 2) to use this framework in the development of a biophilic-regenerative design methodology, or "kit of parts." My research will articulate the relationship between biophilic-regenerative design and principles of environmental stewardship and align the functional and aesthetic qualities of design with the spiritual-moral vision of integral ecology.

CRITICAL DEFINITIONS The following list of terms help explain the summary of my literary findings, as well as the key theoretical underpinnings of my project:

1. **Integral Theory, AQUAL Theoretical Model:** Developed by Ken Wilber Integral Theory is a school of philosophy that seeks to integrate all human wisdom into a singular worldview. It suggests all human knowledge and experience can be placed in a four-quadrant grid, along the axes of "interior-exterior" and "individual-collective", resulting in the All Quadrants, All Levels (AQUAL) model.
2. **Theoretical model of integral ecology:** Developed by Sean Esbjorn-Hargens in his book, Integral Ecology (no relation to the spiritual vision of integral ecology as described in Laudato Si), this model adopts Integral Theory (K.Wilber) specifically for environmental study, research and practice. All environmental phenomena can be assessed from the '4 Terrains': Experience (Individual-Subjective), Cultures (Collective-Subjective), Behaviors (Individual-Objective), and Systems (Collective-Objective). In response to the multitude of ecological approaches and environmental schools of thought, this model accounts for all perspectives and approaches to environmental concerns. A more complete and holistic understanding consequently emerges when one can consider the multiple perspectives outlined in this model.
    a. Experiential (Interior-Individual): the subjective realities of all beings at all levels of awareness; including the emotions and motivations of humans and their spiritual experience; and the forms of experience and perception available to sentient creatures
    b. Cultural (Interior-Collective): the collective attitudes and beliefs that shape the behaviors and action of groups within the social systems
    c. Behavioral (Exterior-Individual): explores the behaviors of individuals within the system, including other creatures
    d. Systems (Exterior-Collective): overlapping natural, social, and political systems and their interaction
3. **Integral Ecology,** philosophy and spiritual vision: Made popular by Pope Francis' encyclical Laudato Si, integral ecology is a philosophy proceeds from the perspective of an ecological ethic, but develops it further in its expression of human spirituality. Integral Ecology embodies beliefs shared by multiple religions and spiritual traditions, such as those explored in Christian eco-theology. The fundamental premise of integral ecology is the interconnectedness of all life, and as such, we must recognize and act according to the fact that we are always in relationship with other humans, other creatures, and all of the Earth community. Integral ecology calls for humanity to embrace the for creative and moral responsibility as caregivers of the earth.
4. **IETF Foundations Fan:** My application of the philosophy of integral ecology, which pertains to the understanding of the relationship between human beings within the environment, to the integral , which pertains to the organization and study of environmental phenomena and interactions. (This is my own creation adapting Hargen's "4-Terrains" organizational model.)
5. **IETF Design Fan:** My adaptation of the IETF FOUNDATIONS towards DESIGN THEORY and application. It aligns various biophilic, regenerative, and other design attributes and strategies according to the "4 Realms" of design embodying the philosophy of integral ecology. (This is my own creation adapting Hargen's "4-Terrains" organizational model and including biophilic and regenerative design elements and attributes as described by S. Kellert and the ILFI's Living Building Challenge.)
6. **IETF Site Selection Fan:** My adaptation of the IETF Design Fan for the site selection process, in which the site is selected based on its reflection of negative conditions. (This is my own creation adapting Hargen's "4-Terrains" organizational model.)

RESESARCH SYNTHESIS The primary research goal is to develop a theoretical foundation for sustainable architectural design, based on the philosophical and spiritual vision of integral ecology, as explored in Laudato Si and subsequent sources. In order to progress into design, the conceptual realm of integral ecology must be adapted in ways that will inform the potential design of built environments.

The theoretical component of this project is divided into 3 main parts:

1. Integral Ecology Theoretical Framework of Conceptual Foundations (IETF Foundations): Distill normative theory (i.e., l moral imperatives, ethical guidelines, values) of Integral Ecology from review of works in environmental ethics, sustainable policy, and religious literature. Identify where these elements manifest in terms of environmental phenomena, using S. Hargen's theoretical model of integral ecology (i.e., the '4 Terrains' and '12 Niches').
2. Integral Ecology Theoretical Framework for Regenerative-Biophilic Design (IETF Design): From the IETF Foundations, develop a design framework reflecting integral ecology values and biophilic design theory. Align principles and values with corresponding architectural design strategies, using established biophilic design, regenerative design, and other 'green' design attributes.
3. Integral Ecology Theoretical Framework for Site Selection (IETF Site): From the IETF Design, develop criteria for site selection. Such site requirements manifest as the antithesis of the IETF design ideal.

In synthesizing my research, I first mapped the key themes of the philosophy and spiritual tradition of integral ecology using Hagens theoretical model of Integral ecology which adopts the integral theory specifically for environmental studies. This became my philosophical foundation for my design.

This philosophical foundation for design however had no direct relationship to architecture. To find that relationship, I simultaneously mapped attributes and elements of biophillic design and regenerative design on this philosophical foundation. Using Kellert's theory of Biophilic design and the Living Building Challenge, I mapped the respective design elements and attributes also according to Hargen's theoretical model. The result is my IETF Design Fan, which categorizes environmental and design strategies and attributes on this continuum.

The IETF Design Fan evaluates 4 'realms' of environmental phenomenon philosophically. The 4 quadrants, or 'realms', form a holarchy. Each realm represents a fundamental design goal:

1. (Experience) SHAPE EXPERIENCE TO RECONCILE HUMAN BEING WITH NATURAL WORLD. Engage the body, mind, and spirit with natural phenomenal; encourage natural affinity and attachments.
2. (Cultures) EMBODY MEANING AND MANIFEST NARRATIVES OF PLACE AND COMMUNITY: Illustrate the place-based relationships and connections of communities to the natural world. Through design, manifest symbiotic relationships of human culture with Nature.
3. (Behaviors) CULTIVATE MATERIAL & FUNCTIONAL HARMONY VIA CREATIVE/ CONSTRUCTIVE CAPACITIES. Establish benign interaction between built and natural elements. Allow for the restoration and encourage improved environmental conditions through building elements and function.
4. (Systems) SYNERGIZE GROWTH & RESILIENCE VIA REGENERATIVE INTERSECTIONS BETWEEN HUMAN AND NATURAL. Provide for the co-evolution of human and natural systems.

Conversely, the IETF Site Selection Fan indicates negative environmental conditions and phenomena that the IETF Design goals seek to address. The 4 quadrants, or 'realms', form a holarchy. Each realm represents a fundamental design problem:

1. (Experience) PERSONAL ALIENATION: Personal Alienation from Nature and Community of Life
2. (Cultures) CULTURAL DISCONNECTION: Cultural Fragmentation and Disconnection from Nature
3. (Behaviors) DESTRUCTIVE BEHAVIORS: Destructive behaviors and human activity.
4. (Systems) SYSTEMIC DEGRADATION:

CASE STUDY EVALUATION AND PRECEDENT SELECTION As there does not exist a green rating system for such a philosophical platform for design, I identified the most sustainable buildings as defined by LBC, AIA COTE top ten, and LEED Platinum. 40 projects were identified and then evaluated according to the IETF Design Fan.

Based on design strategies used and other attributes, each project was given a score between 1-5 in each of the 4 realms (Experience, Cultures, Behaviors, Systems), with 5 indicating the highest level of achievement. The evaluation accounted for whether or not the project features previous identified biophilic-regenerative strategies, as well as external ratings such as LEED and LBC standards. While all 40 projects achieved noteworthy success in areas such as building performance and design quality, my evaluation distinguished those players which have not only a performative success, but also achieve success in demonstrating an integral ecological theory as a measure of ethical superiority.

Six of the highest-scoring projects were selected to serve as architectural and programmatic precedents: the Van Dusen Visitor Centre; Te Kura Whare culture and community centre; the Center for Sustainable Landscapes (CSL); the Health, Wellness & Nutrition Center at the Willow School; the Frick Park Environmental Center; and the Eden Hall Campus Project (Phase 1) at Chatham University.

The bulk of high-scoring projects tended towards single-use, low- or mid-rise buildings in rural or peri-urban settings. Many of the projects served cultural, educational, or recreational uses. Very few projects consisted of multi-family residential, commercial, or healthcare uses, and even fewer were mixed-use developments. Based on the case study findings, the design proposal will focus on the design of a mixed-use development in a dense, urban context.

*NOTE: While metrics such as performance are accounted for, the scores are inherently subjective, based on how well I deem a project meets the aforementioned goals of the IETF design fan. My study of each project has been done through existing documentation, such as images, videos, interviews, and writing. The realms of Experience and Cultures proved to be the most difficult to assess: I was unable to visit most of the projects in person and I did not possess detailed knowledge of the culture of the communities behind each project.

SITE EVALUATION & SELECTION

The site selection process focused on identifying locations demonstrating significant FRAGMENTATION OF HUMAN AND NATURAL RELATIONSHIPS. Such indicators fall within the IETF categories of Experience, Cultures, Behaviors, and systems, as identified on the IETF Site Selection Fan.

MACRO ANALYSIS PRELIMINARY FINDINGS: Focus on United States cities in coastal and urban-industrial regions.

- PROMINENCE OF BUILT ENVIRONMENT: In the United States, the average person spends 90% of their time in the built environment.
- UNSUSTAINABLE CONSUMPTION OF NATURAL GOODS: The US is using 2x the renewable natural resources that can be regenerated. The states with the largest per-person Ecological Footprints and the highest ecological deficits are typically coastal states in the Southwest, Mid-Atlantic, Northeast and Southeast.
- SIGNIFICANT ECOLOGICAL DEGRADATION & LANDSCAPE DETERIORATION: The states with the highest rates of environmental degradation are in the Western half of the U.S., concentrated in Urban-industrial cores, such as the New York, Chicago, and Boston metropolitan regions.

IETF SITE EVALUATION (MEZZO ANALYSIS OF METROPOLITAN REGIONS): Narrowing the focus to cities within coastal, urban-industrial regions and states, 24 cities were then selected based on high population concentration and/or political significance (i.e. capital cities). These cities were than evaluated according to the IETF Site Selection Fan.

As previously mentioned, the IETF Site Selection Fan indicates negative environmental conditions and phenomena that the IETF Design goals seek to address. Each realm represents a fundamental design problem: Personal Alienation from Nature; Cultural Disconnect; Destructive Behaviors; and Systemic Degradation.

Based on information such as population surveys, historical events, environmental mapping, and demographics, each city was given a score of 1 to 5 in each of the four realms, with 1 being the most favorable. The highest-scoring cities were consequently ones who demonstrated significant environmental degradation and cultural decline. 10 cities with the highest score were then identified as potential site selections and examined in further detail. Newark, NJ was ultimately selected due to both its high score and my familiarity with the location and the cultural background.

PROGRAM DEVELOPMENT

DESIGN PROJECT PROPOSAL

"A Center for Ecological Living in Newark"
The project will manifest as a mixed-use, urban infill development for an intentional community: This 'Center for Ecological Living' will house a unique community oriented around the ethos of integral ecology. The program will integrate cultural, educational, and recreational uses with residential and other uses that encourage the active appreciation, cultivation, and understanding of Nature: exhibition and assembly; classrooms and studio space; dining and hospitality; cultivation and gardens; and co-living residential units with common spaces and shared amenities.

CONCLUSION

From the perspective of both designers and environmentalists, the responsible design and construction of the built environment is but one way to positively contribute to environmental and social health, as well as to generate positive change in the trajectory of the current environmental crisis. The built environment is both the locus of the majority of human life and a big factor in global environmental degradation and resource consumption. From this line of thinking, the built environment manifests as the interface, or means, through which humanity engages with the natural world. While designed space does not necessarily determine social action, it provides a context for it and to varying degrees, its designed conditions affect our cognitive-mental, physiological, and emotional-spiritual well-being, both individually and collectively.

With the influential publishing of "Laudato Si," the Catholic Church established itself on the front lines in the fight against environmental destruction. The Church's call for all Christians and people of good will to participate in an "ecological conversion" has stuck with me as a resounding call to revolution, in all aspects of one's life, from our everyday habits to our vocational aspirations. There is no one answer to the environmental crisis and no one story that will collectively motivate humanity to take the necessary actions. This is but one story of the countless that will be needed: a story for "those of good will" who choose to respond to the call to ecological conversion and seek the return to a profound and loving connection with the natural world.

With this project, I hope to generate interdisciplinary discussion among the fields of architecture and design, environmental ethics, and theology. I know I will remain motivated to explore the relationship between architecture and environmental ethics beyond the conclusion of this thesis, as the environmental crisis demands the continual reflection and critique of the status-quo.

A Living, Loving Artifact

Developing the Integral Ecology Framework for Design and Its Application in the Design of a Mixed-Use Campus"

PROJEC T METHODOLOGY

PERSONAL REFLECTION -QUESTION GENERATION

TOPIC & SCOPE

Thesis Statement
"Living, Loving Artifact"
Building off the spiritual-moral framework of integral ecology, a biophilic-regenerative approach leverages architectural design as an opportunity to address alienation, establish positive human-nature relations, and to regenerate ecological systems through design. It seeks to use the building as a site for exterior mediation and interior conversion.

SCOPE
21st c. Environmental Crisis
Western, North American perspective
The Anthropocene
Environmental Ethics
Sustainability in Architecture

Multi-Family Housing +
Community/Education/Wildlife Function

OBJECTIVE
Address the alienation of the human experience from nature in the built environment, within the context of ethics
(1) Establish the INTEGRAL ECOLOGY FRAMEWORK (descriptive-normative) using conceptual themes and moral obligations of environmental ethics
(2) Apply framework to DESIGN CRITERIA

LITERATURE REVIEW

Sustainability-Practical Sources
Living Building Challenge standards
LEED
Resource Efficiency and Conservation (materials, water, energy)
AIA Code of Ethics
Brundtland Report, UNDEP
Earth Charter
Hannover Principles for Design (C2C)

Design & Architecture
"Living Buildings"
Ecological design to integrate within nature; regenerative design not only restores but adds value
Biophilic Design elements and attributes, 14 patterns of biophilic design
Biophilia hypothesis- human affinity for life and life-like processes
Restoration environmental theory
Architectural Phenomenology

Environmental Ethics (Spiritual, Philosophical)

- Integral Ecology (I.E) is a way to see, understand, act; integrates various themes common to many spiritual traditions.
- Environmental Stewardship, Earth Care, Creation Care is essential to human role; unique capacities mean a moral imperative to act.
- Essential issues of interiority-exteriority, alienation, the human-nature divide
- Man is inseparable from nature, we are of the earth, not on it; the earth is a gift and not ours to dominate and exploit.
- *Inter-religious themes:* interconnected web of life, universal common good, creaturely love, earthly/global solidarity, environmental justice, basic human rights, nature's GOODS, ecological commons, gifts/mystery/marvel of nature, intrinsic value of nature, ensoulment from earth, limits of planetary resources, focus on the poor and vulnerable, communion with others and with nature (human and earth families); inter/intra generational equity
- *Inter-religious actions:* Contemplation and reflection; celebration and praise; cultivation/ gardening/farming/growing; sharing; study and learn; protect/conserve/restore; improve;
- Practice of virtues (prudence, temperance, fortitude)
- Holistic understandings of the Earth as an organism, system worthy of moral status; deserves respect and reverence;
- The use of nature and other creatures must be for necessity only.
- Both visionary and pragmatic discourse, calls for new normative models, habits, lifestyle transformations as well as worldview shifts.
- Visionary aspirations: the ideal as indicator of success, cosmological common good Calls for new normative models, habits, lifestyle transformations
- Visionary aspirations: the ideal as indicator of success, cosmological common good

RESEARCH METHODS

THEORY

1. Theory Building - Qualitative
GROUND THEORY-QUALITATIVE:
A multi-method, interdisciplinary approach to establishing a coherent theoretical framework for design that itnegrates various conceptual themes and pinrciples into one narrative; involves rhetorical and and graphic tactics; CONSTRUCTIVE
Integral Ecolgy Perspective
Application to Biophilic Design

DESIGN CRITERIA FOR SELECTION OF CASE STUDIES ("Filters")
Qualitative assessment, interpretation of theoretical framework as design, site, programming criteria, etc.

PROGRAMMING CRITERIA

SITE CRITERIA

2. PRECEDENT STUDIES-QUALITATIVE
Qualitative assessment of precedent projects (artifacts & site) that meet certain design criteria, Involes non-interactive observations and analysis

EVALUATION & REFINEMENT

APPLICATION & DESIGN

2. Theory Building - Qualitative, Contextual
A multi-method, interdisciplinary approach to establishing a coherent theoretical framework for design that integrates various conceptual themes and principles into one narrative; involves rhetorical and and graphic tactics; PRAGMATIC

SELECTED SITE ANALYSIS

CONTEXTUAL ANALYSIS

THEORY

SIMULATION - QUANTITATIVE
Quantitative measurements to assess and inform design decisions

CRITICAL DEFINITIONS

Integral Theory
AQAL Model

Ken Wilber

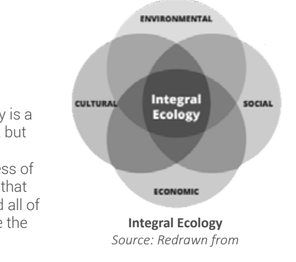
A school of philosophy that seeks to integrate all of human wisdom into a singular worldview. It is portrayed as a "theory of everything" or a "theory for anything" trying "to draw together an already existing number of separate paradigms into an interrelated network of approaches that are mutually enriching."
It suggests all human knowledge and experience can be placed in a four-quadrant grid, along the axes of "interior-exterior" (reflecting subjective-objective realities) and "individual-collective."

AQUAL Model
Source: Redrawn from Esbjorn-Haagens

Theoretical Model of Integral Ecology
4 Terrains (AQAL)

Sean Esbjörn-Hargens

This theoretical model adopts Integral Theory specifically for **environmental study, research and practice.**
Using the AQAL framework, it states that any environmental entity or event can be assessed from the "4 Terrains" of Experience (Interior-Subjective), Cultures (Exterior-Subjective), Behaviors (Individual-Objective), and Systems (Collective-Objective). Each terrain is further divided into 3 levels of complexity.



4 Terrains with Levels of Complexity
Source: Redrawn from Esbjorn-Haagens

Integral Ecology
Philosophy and Spiritual Vision

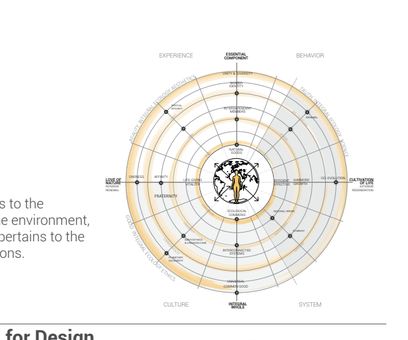
Pope Francis and others

Made popular by Pope Francis' encyclical *Laudato Si*, integral ecology is a philosophy that proceeds from the perspective of an ecological ethic, but develops a deeper expression of human spirituality.
The fundamental premise of integral ecology is the interconnectedness of all life, and as such, we must recognize and act according to the fact that we are always in interrelation with other humans, other creatures, and all of the Earth community. Integral ecology calls for humanity to embrace the for creative and moral responsibility as caregivers of the earth.
(Integral Ecology embodies beliefs shared by multiple religions and spiritual traditions, such as those explored in Christian eco-theology and in the inter-religious principles of the Earth Charter.)

Integral Ecology
Source: Redrawn from

Integral Ecology Theoretical Framework (IETF) Philosophical Foundations
IEDF Foundations Fan Diagram
Anne McGuinness

My application of the philosophy of integral ecology, which pertains to the understanding of the relationship between human beings within the environment, to Esbjorn-Hargen's '4 Terrains' model of Integral Ecology , which pertains to the organization and study of environmental phenomena and interactions.



Integral Ecology Theoretical Framework (IETF) for Design Application
IEDF Design Fan Diagram
Anne McGuinness

My adaptation of the IEDF Foundations for application in environmental and architectural design. It aligns various biophilic, regenerative, and other design attributes and strategies according to the "4 Realms" of design embodying the philosophy of integral ecology.

Integral Ecology Theoretical Framework (IETF) for Design Application
IEDF Design Fan Diagram
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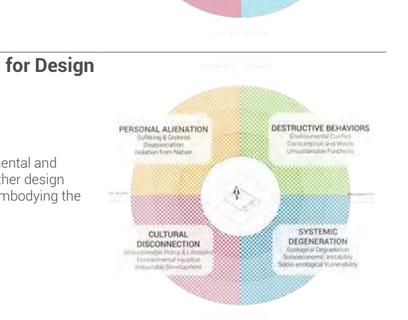
My adaptation of the IEDF Foundations for application in environmental and architectural design. It aligns various biophilic, regenerative, and other design attributes and strategies according to the "4 Realms" of design embodying the philosophy of integral ecology.



FOUNDATIONS

The Need for Environmental Ethics

Addressing Human Powers in the Anthropocene

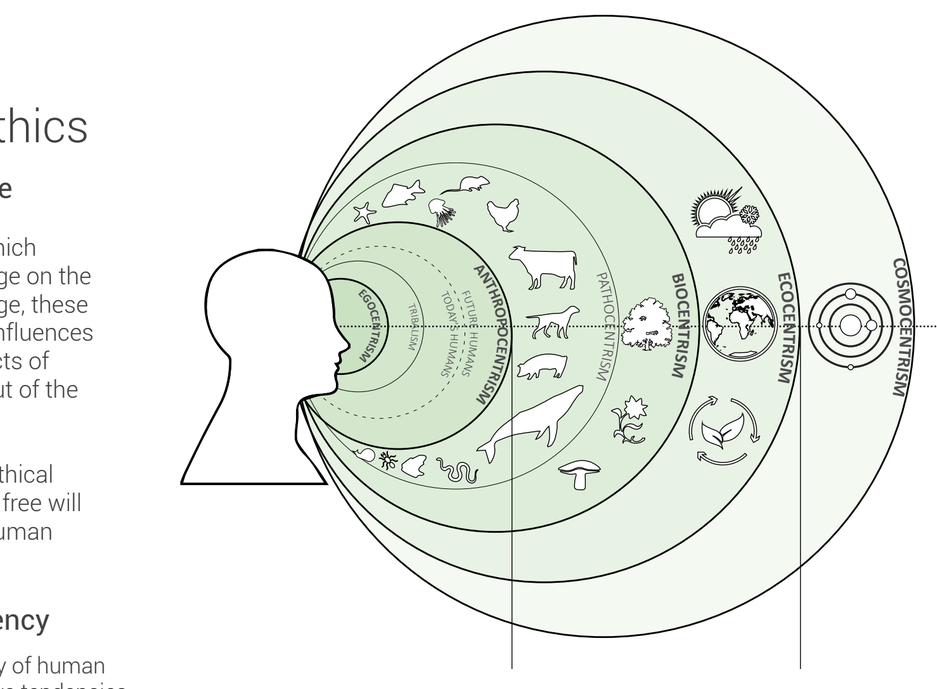
We are currently living in the era of the Anthropocene in which human beings have become the dominant agents of change on the planet in transforming the natural environment. By and large, these transformations have been negative, rather than positive influences on the functioning of Earth's systems. The aggregate effects of human activity the survival and well-being of humanity, but of the earth itself.

In facing problems of a human making, we might turn to ethical discourse which deals with human agency and matters of free will or look to spiritual traditions that motivate us to achieve human potential.

Towards the Constructive Power of Human Agency

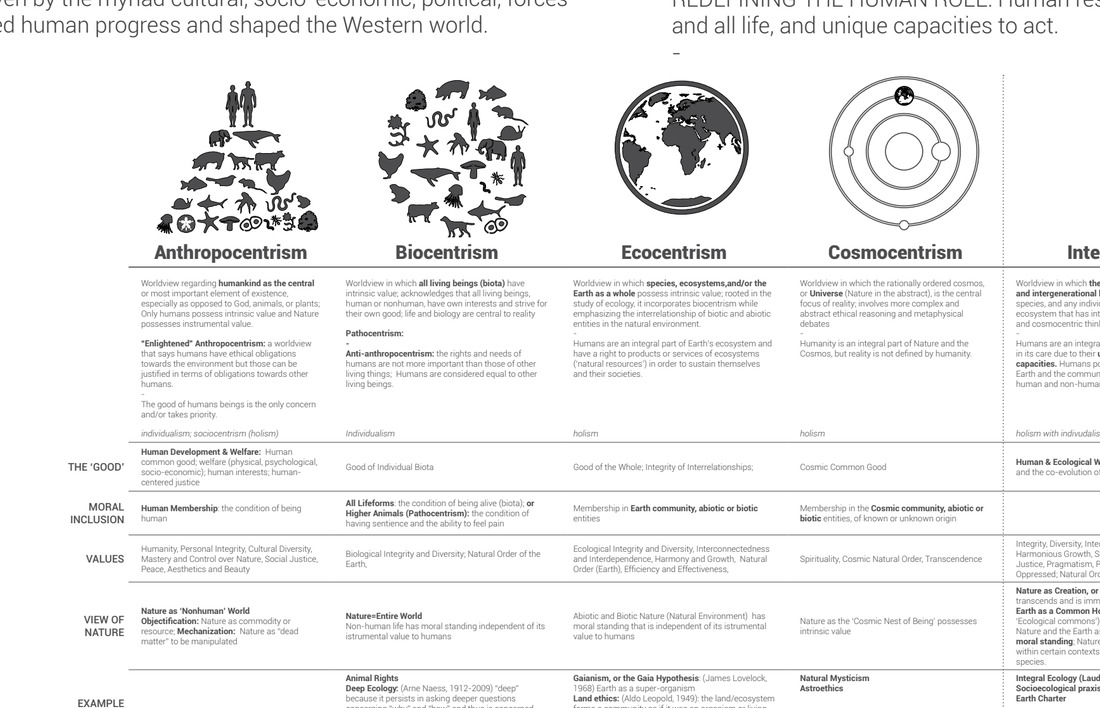
Environmental ethics provides a pathway to shift the trajectory of human development from the "bad" to the "good-" from our destructive tendencies and actions towards constructive mindsets and behavior.

THE HUMAN ORIGINS OF THE ECOLOGICAL CRISIS: ALIENATION
The human-nature separation can be construed as the alienation, or isolation, of the human experience from Nature and the consequent fragmentation of relationships. This separation is both physical and ideological, driven by the myriad cultural, socio-economic, political, forces that have guided human progress and shaped the Western world.



A NEW ECOLOGICAL CONSCIOUSNESS & THE CALL TO AN ECOLOGICAL CONVERSION: From all corners of the globe and across various cultural traditions, disciplines, and professions, people are calling for a dramatic overhaul of the structural systems and cultural patterns perpetuating these problems.

REDEFINING THE HUMAN ROLE: Human responsibility towards the earth and all life, and unique capacities to act.



'Second Nature' Environmental Ethics in the Built Environment

An understanding of the ethical relationship between nature, the built environment, and humanity has more recently emerged and has been explored very little in most design and sustainability works. The realm of environmental ethics has not historically engaged with the design of the built environment, and vice versa.

As a discipline and profession in the service of the common good, it is necessary for architecture to engage not only with environmental ethics. Generally, architecture concerns itself with human development and activity. The built environment sustains nearly all human life and activity, and as such, it is the locaus of human existence. The built environment and building industry are also significant factors in the environmental crisis - affecting the various aspects of ecological degradation, overexploitation of natural resources, and the perpetuation

The Limits of Sustainability

The concept of sustainability, as with sustainable development or design, has become the primary ethic guiding the activities of institutions and the development of the built environment. Over the years the concept has accumulated various definitions and normative applications. In general, its goal is to meet the needs of the present human population without compromising future generations' abilities to thrive. In practice, this translates to specific attitudes and behaviors for the conservation, preservation or restoration of the natural environment. It recognizes the notion of finite planetary boundaries and positions human agency in such a way so as to not surpass these. It recognizes the value of nature primarily in instrumental terms, that is in terms of the earth's "natural resources" or "ecosystem services."

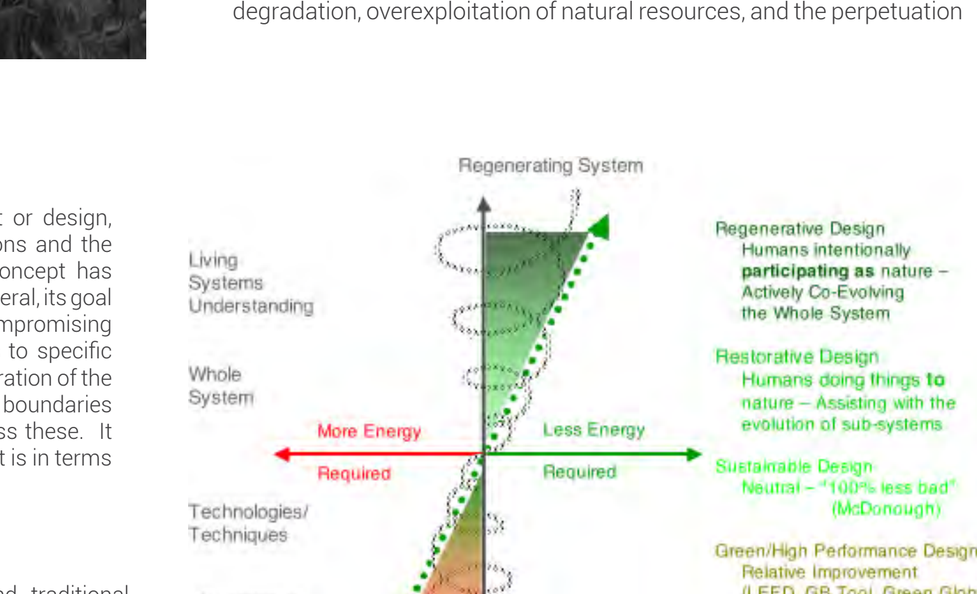
Beyond Sustainability

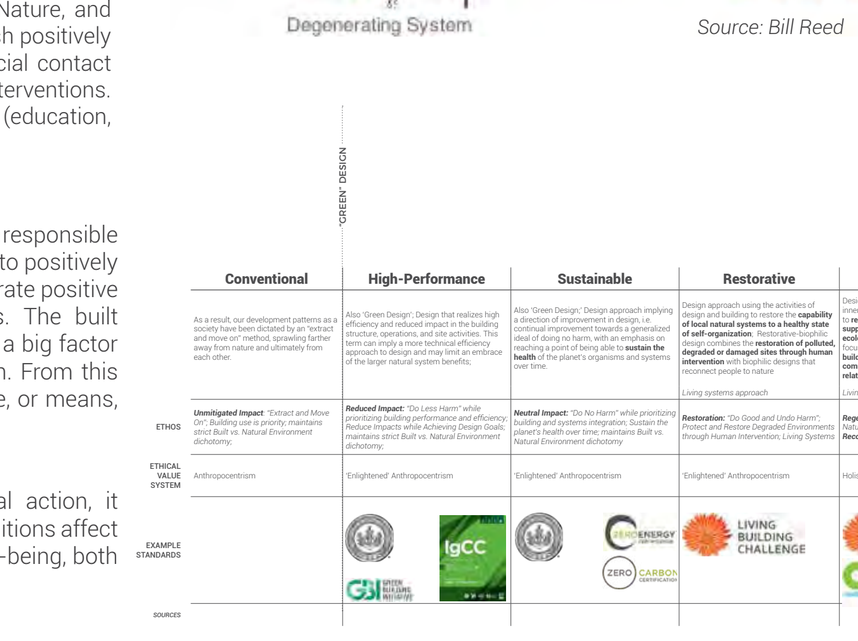
In recent years, there has been a push to advance beyond traditional performance-based, low-impact approaches to sustainable design that confine the scope of design intervention to how the building interacts with the natural environment. Different approaches to design have emerged, reflecting the common goals of heightened relations between humanity, Nature, and the built environment. A holistic design approach seeks to establish positively interactions between the building and Nature, as well as beneficial contact between Nature and human users via the built environment's interventions. Such designs prioritize human experience and human development (education, social/employment resources).

The Agency of Design

From the perspective of both designers and environmentalists, the responsible design and construction of the built environment is but one way to positively contribute to environmental and social health, as well as to generate positive change in the trajectory of the current environmental crisis. The built environment is both the locus of the majority of human life and a big factor in global environmental degradation and resource consumption. From this line of thinking, the built environment manifests as the interface, or means, through which humanity engages with the natural world.

While designed space does not necessarily determine social action, it provides a context for it and to varying degrees, its designed conditions affect our cognitive-mental, physiological, and emotional-spiritual well-being, both individually and collectively.





The New Ecological Consciousness: Integral Ecology

The Vision of Integral Ecology: Love, Reconciliation & Renewal

An ecological ethic prioritizes the serving the good of ecosystems and upholding the integrity of the inter-relationships therein. Integral ecology, originally explored in Laudato Si, proceeds from the perspective of an ecological ethic but develops it further in its exploration of human spirituality.

It functions as both a pragmatic ethic and spiritual-moral vision: By adopting the mindset and practicing earth care in everyday life, one might grow to experience the ultimate goal of communion with life, with Nature itself. This profound oneness with Nature that integral ecology aspires to, is the very antithesis of the alienation from Nature experienced in the contemporary Western life

HUMAN-NATURE RELATIONSHIP

SHAPED BY / MANIFESTED IN: BELIEFS, BEHAVIORS, ARTIFACTS
TRANSFORMED BY: ENVIRONMENTAL PHILOSOPHY ETHICS
MEDIATED THROUGH: THE (BUILT) ENVIRONMENT

ALIENATION
Separation of Human Experiencce from Nature

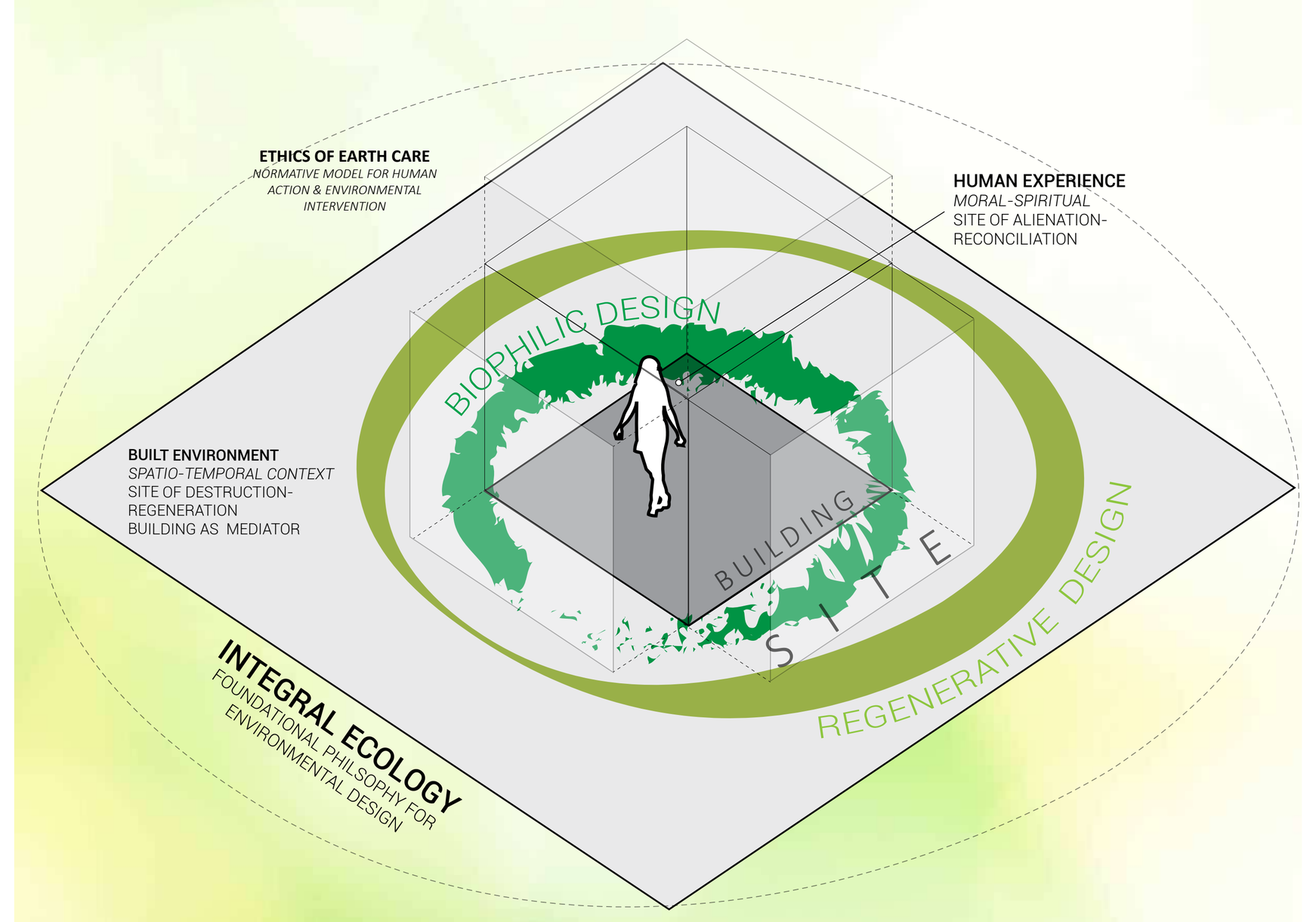
RECONCILIATION
The reunion of human interior and exterior life with Nature

INTEGRAL ECOLOGY CONSCIOUSNESS

DESTRUCTIVE HUMAN POTENTIAL

CONSTRUCTIVE HUMAN POTENTIAL

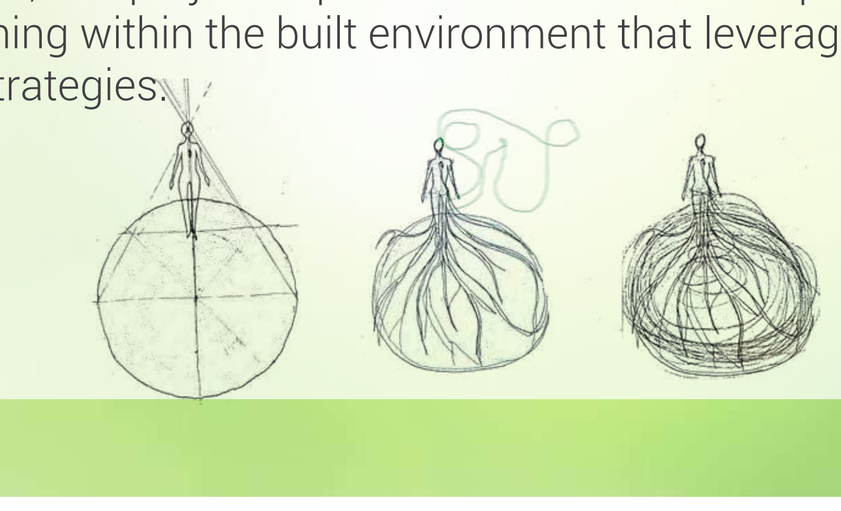
Annie McGuinness
Thesis II, Spring 2020
Advisor Patricia Andrasik
CUArch



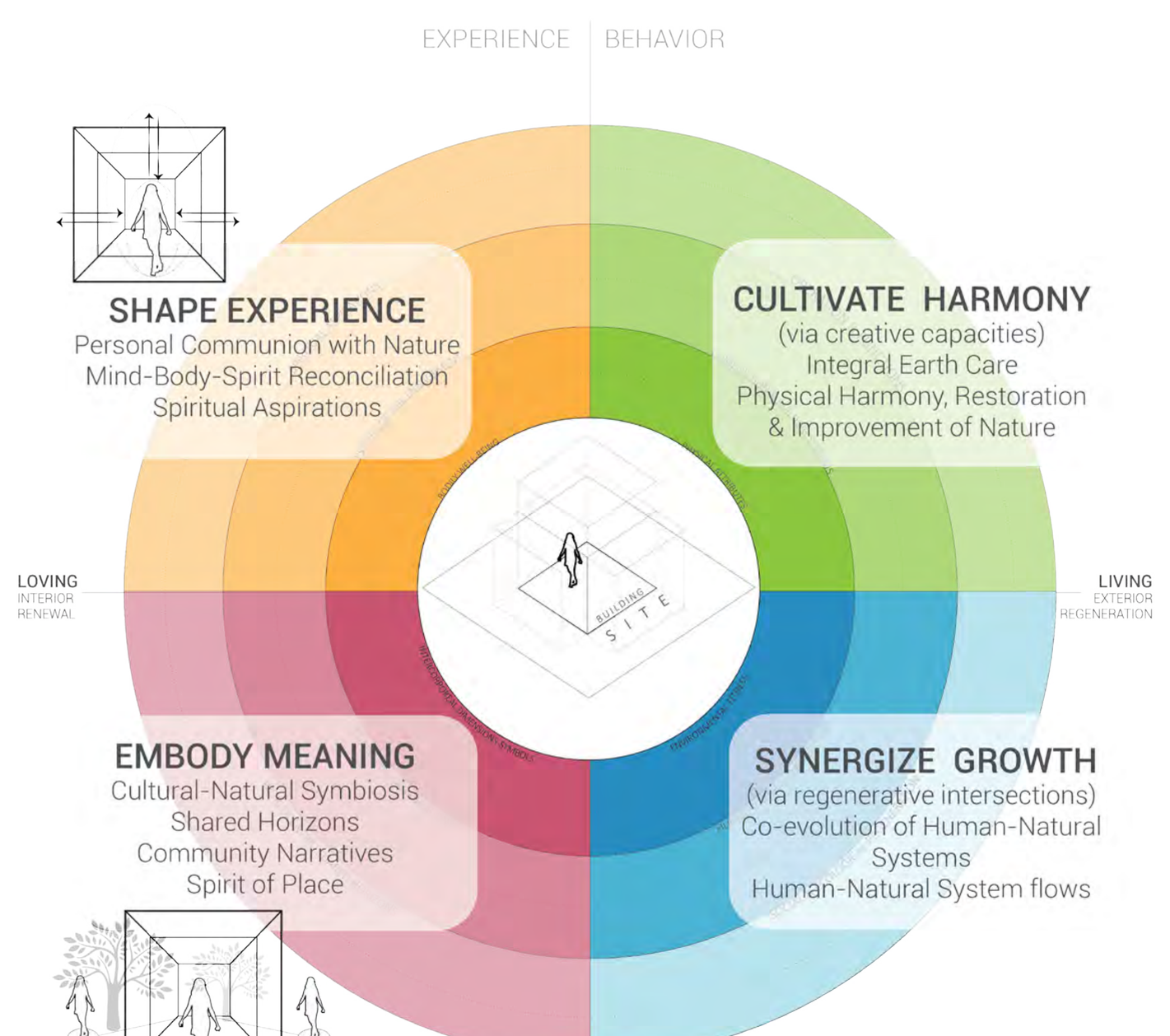
THESIS STATEMENT AND CONCEPT DIAGRAM

A Living, Loving Artifact: Applying Integral Ecology to the Design of a Mixed-Use Campus

The setting of contemporary life has become the site of an ever-growing divide between humanity and the natural world. The built environment is the primary interface through which humanity engages with the natural world, and its design is an expression of the fundamental human capacity for creation. When rooted in the philosophy of integral ecology, the building becomes the central site for the reconciliation of the human person with Nature — a means to mediate environmental conflict, cultivate practices of earth care and facilitate an ecological conversion of the human spirit. As a 'living, loving artifact,' the project aspires to serve as an exemplar of human and natural flourishing within the built environment that leverages biophilic and regenerative strategies.



IETF Design Fan



LOVING: INTEGRAL ECOLOGY AS A GUIDING PHILOSOPHY

LIVING: BIOPHILIC-REGENERATIVE DESIGN AS THE MEANS

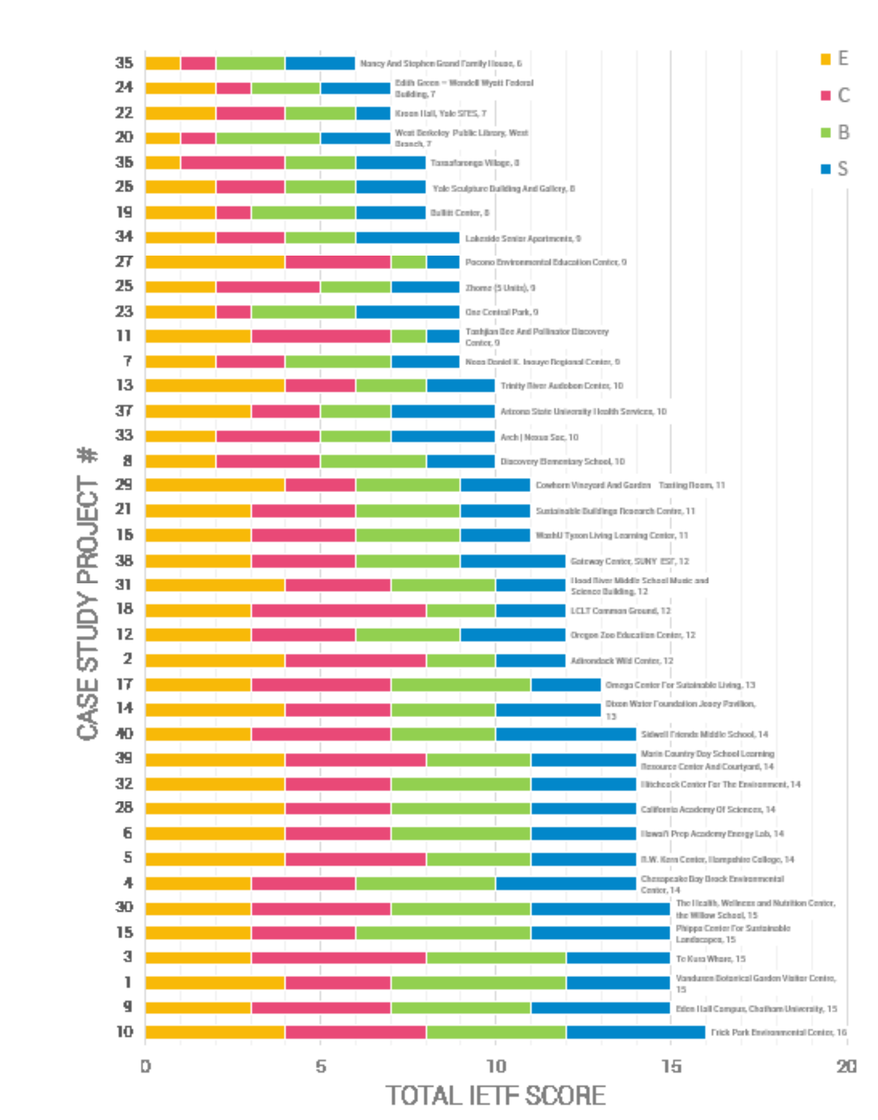
FROM ENVIRONMENTAL MEDIATION TO REGENERATION Illuminated by the insights of integral ecology, DESIGN can become the means for shared flourishing between the human community and the earth, reconciling the traditional divisions of culture-Nature and the built-natural environments

Sustainable Design Case Studies

IETF Design Case Studies

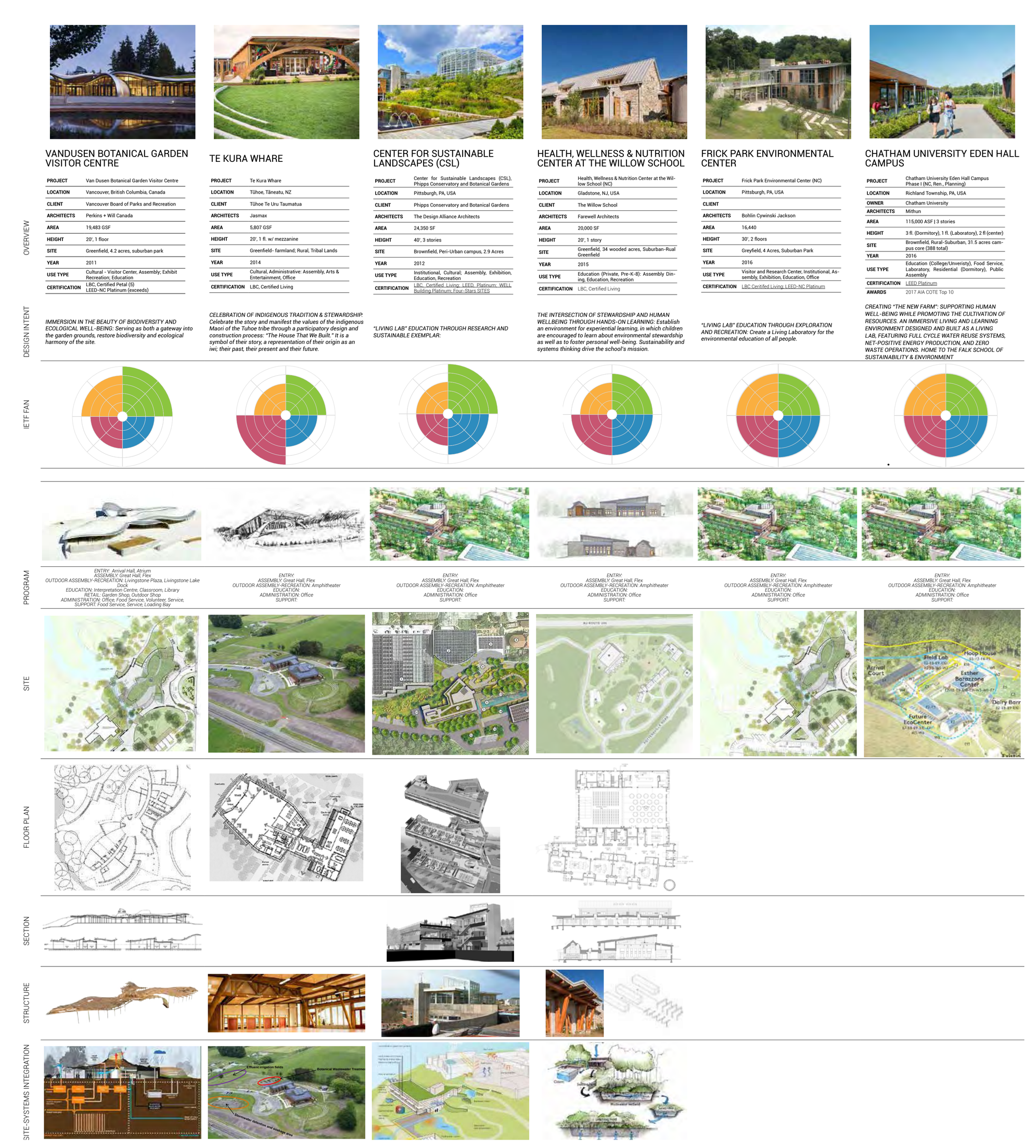
40 of the top sustainable buildings in the U.S. and abroad following the most stringent sustainability standards, including the Living Building Challenge and LEED certification systems.

The following projects were assessed using the IETF Design Fan. Based on design strategies used and other attributes, each project was given a score between 1-5 in each of the 4 realms (Experience, Cultures, Behaviors, Systems), with 5 indicating the highest level of achievement.



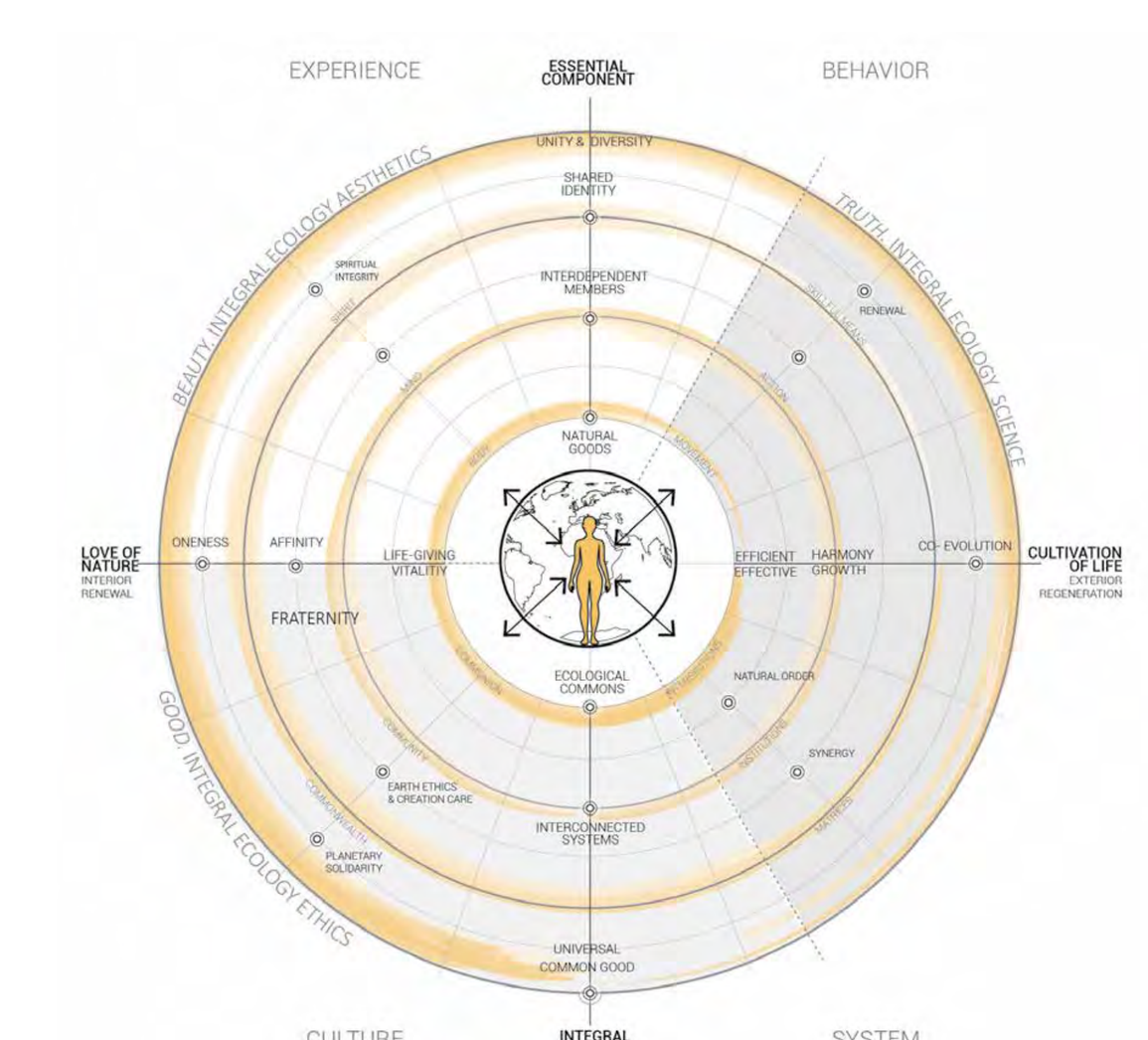
#	PROJECT NAME	YEAR	LOCATION		SITE		CATEGORY/TYPE	AREA (GSF)	ARCHITECT	CERTIFICATION	IETF SCORE
1	VANDUSEN BOTANICAL GARDEN VISITOR CENTRE	2011	Vancouver, BC	CA	SUBURB - PARK	NC	CULTURAL - VISITOR CENTER PUBLIC ASSEMBLY- RECREATION	19,000 +4.2 acre Site	Perkins + Will Canada	LBC, Certified Petal (5) LEED Platinum (exceeds)	
2	ADIRONDACK WILD CENTER	2006	Tupper Lake, NY	USA	RURAL-GREYFIELD	NC	CULTURAL - MUSEUM, EDUCATION PUBLIC ASSEMBLY- RECREATION	54,000 +31 acre site	HOK; Chip Reay	LEED Certified	
3	TE KURA WHARE	2014	Tūhoe, Tāneatu	NZ	RURAL-GREENFIELD	NC	CULTURAL - TRIBAL COMMUNITY, ADMINISTRATIVE PUBLIC ASSEMBLY	5,800	Jasmax	LBC 2.1, Certified Living	
4	CHESAPEAKE BAY BROCK ENVIRONMENTAL CENTER	2015	Virginia Beach, VA	USA	SUBURB - GREENFIELD; WATERFRONT	NC	OFFICE EDUCATION PUBLIC ASSEMBLY	10,400	SmithGroupJJR	LBC, Certified Living LEED-NC, Platinum	
5	R.W. KERN CENTER, HAMPSHIRE COLLEGE	2016	Amherst, MA	USA	RURAL - BROWNFIELD	NC	EDUCATION-HIGHER ED (CAMPUS)	17,000	Bruner/Cott & Associates	LBC 2.1, Certified Living	
6	HAWAI'I PREP ACADEMY ENERGY LAB	2010	Kamuela, HI	USA	RURAL-GREENFIELD	NC	EDUCATION K-12 (LABORATORY, CLASSROOMS)	5,100	Flansburgh Architects	LBC, Certified Living	
7	NOAA Daniel K. Inouye Regional Center	2014	Honolulu, HI	USA	SUBURB-BROWNFIELD; WATERFRONT	A/R, NC	RESEARCH CENTER (LABORATORY, LIBRARY) OFFICE	350,000	HOK; Ferraro Choi & WSP	LEED-NC, Gold	
8	Discovery Elementary School	2015	Arlington, VA	USA	SUBURB - CAMPUS	NC	EDUCATION- K-12	97,600	VMDO Architects	LBC 3.1, Zero Energy Certified LEED Schools, Gold	
9	Chatham University Eden Hall Campus	2016	Richland Township	USA	RURAL - CAMPUS	NC	Campus Planning	115,000 +30 acres	Mithun	LEED Platinum, Certified LBC Targeted NZE Targeted	
10	FRICK PARK ENVIRONMENTAL CENTER	2016	Pittsburgh	USA	SUBURB - GREYFIELD; PARK	NC	CULTURAL - EDUCATION PUBLIC ASSEMBLY- RECREATION	16440 +4 acre site	Bohlin Cywinski Jackson	LBC 2.1 Certified Living LEED-NC, Platinum	
11	TASHJIAN BEE AND POLLINATOR DISCOVERY CENTER	2016	Chaska, MN	USA	RURAL - BROWNFIELD	NC	EDUCATION (CLASSROOMS, LABORATORY) PUBLIC ASSEMBLY - EXHIBITION APIARY	6,700	MSR DESIGN	N/A	
12	OREGON ZOO EDUCATION CENTER	2016	Portland, OR	USA	SUBURB-BROWNFIELD	NC	CULTURAL - EDUCATION, ENTERTAINMENT COMMUNITY	19,000	Opsis Architecture	LEED-NC, Platinum LBC, NZE Targeted	
13	TRINITY RIVER AUDUBON CENTER	2008	Dallas, TX	USA	RURAL	NC	CULTURAL - MUSEUM, PUBLIC ASSEMBLY EDUCATION (LABORATORY, CLASSROOMS)	21,000	Antoine Predock; BRW Architects	LEED-NC, 2.1 , Gold	
14	DIXON WATER FOUNDATION JOSEY PAVILION	2014	Decatur, TX	USA	RURAL - GREENFIELD	NC	EDUCATION PUBLIC ASSEMBLY INDOOR-OUTDOOR PAVILION	5,400	Lake/Flato Architects	LBC, Certified Living	
15	PHIPPS CENTER FOR SUSTAINABLE LANDSCAPES	2012	Pittsburgh	USA	URBAN -CAMPUS BROWNFIELD	NC	EDUCATION & RESEARCH FACILITY OFFICE PUBLIC ASSEMBLY- RECREATION	24,350	The Design Alliance Architects	LBC, Certified Living LEED, Platinum WELL Building Platinum Four-Stars SITES	
16	TYSON LIVING LEARNING CENTER, WASHINGTON UNIV. -ST. LOUIS	2009	Eureka, MO	USA	RURAL	NC	EDUCATION-HIGHER ED (CLASSROOMS, LAB, RESEARCH LAB) Environmental field station	3,000	Hellmuth + Bicknese Architects	LBC, Certified Living	
17	OMEGA CENTER FOR SUSTAINABLE LIVING	2009	Rhinebeck, NY	USA	RURAL-BROWNFIELD	NC	MIXED-USE (EDUCATION, LABORATORY, OTHER)	6,200	BNIM Architects	LBC, Certified Living LEED, Platinum	
18	LOPEZ COMMUNITY LAND TRUST - COMMON GROUND	2009	Lopez Island, WA	USA	SUBURB - GREENFIELD	NC	RESIDENTIAL DEVELOPMENT (11) Single Family homes	2,360 70,000 site	Mithun	LBC 3.0, NZE Certified	
19	BULLITT CENTER	2013	Seattle, WA	USA	URBAN-BROWNFIELD	NC	Office, multistory COMMERCIAL	52,000	Miller Hull Partnership	LBC, Living Certified	
20	WEST BERKELEY PUBLIC LIBRARY, WEST BRANCH	2013	Berkeley, CA	USA	URBAN-BROWNFIELD	NC	LIBRARY - PUBLIC ASSEMBLY	9,400	Harley Ellis Devereaux	LBC, NZE Certified LEED-NC, Platinum	
21	SUSTAINABLE BUILDINGS RESEARCH CENTRE	2013	Wollongong, NSW	AUS	RURAL-BROWNFIELD	NC	EDUCATION - HIGHER ED (CAMPUS) (LABORATORY, CLASSROOMS)	27,000	Cox Architecture	LBC 2.1, Living Certified Green Star, 6-Star	
22	Kroon Hall, Yale School of Forestry & Environmental Studies	2010	New Haven, CT	USA	URBAN-BROWNFIELD - CAMPUS	NC	EDUCATION - HIGHER ED (CAMPUS) (LABORATORY, CLASSROOMS)	68,800	Centerbrook Architects; Planners Hopkins Architects	LEED-NC, 2.2, Platinum	
23	One Central Park	2014	Sydney	AUS	URBAN-BROWNFIELD	NC	MIXED-USE (COMMERCIAL, RESIDENTIAL, RETAIL)	2,750,000	Foster & Partners; Ateliers Jean Nouvel	Green Star, 6-star	
24	The Edith Green – Wendell Wyatt Federal Building	2013	Portland, OR	USA	URBAN - BROWNFIELD	A/R	OFFICE COMMERCIAL	512,474	Sera Architects	LEED PLATINUM	
25	ZHOME (5 UNITS)	2012	Issaquah, WA	USA	SUBURB - BROWNFIELD	NC	RESIDENTIAL NEIGHBORHOOD EDUCATION	13,400	David Vandervort Architects	LBC, Certified Petal (4)	
26	Yale Sculpture Building and Gallery	2007	New Haven, CT	USA	URBAN-BROWNFIELD - CAMPUS	NC	EDUCATION - HIGHER ED (CAMPUS) MIXED-USE PUBLIC ASSEMBLY - ENTERTAINMENT/ CULTURE)	62,000	KieranTimberlake	LEED-NC, 2.1, Platinum	
27	Pocono Environmental Education Center	2005	Dingmans Ferry, PA	USA	RURAL-GREENFIELD	NC	CULTURAL/ VISITOR CENTER MIXED-USE (EDUCATION, PUBLIC ASSEMBLY)	7,750	Bohlin Cywinski Jackson	N/A	
28	CALIFORNIA ACADEMY OF SCIENCES	2008	San Francisco, CA	USA	SUBURB	NC	CULTURAL - MUSEUM, EDUCATION PUBLIC ASSEMBLY	426,000	Renzo Piano Building Workshop	LEED-NC, 2.1, Platinum	
29	COWHORN VINEYARD AND GARDEN - TASTING ROOM	2015	Jacksonville, OR	USA	RURAL	NC	CULTURAL	2,200 48,800 site	Green Hammer	LBC 2.1, Living Certified	
30	THE HEALTH, WELLNESS AND NUTRITION CENTER AT THE WILLOW SCHOOL	2015	Gladstone, NJ	USA	SUBURB	NC	EDUCATION - K-12	20,000	Farewell Architects	LBC 2.0, Living Certified	
31	HOOD RIVER MIDDLE SCHOOL MUSIC & SCIENCE BUILDING	2010	Hood River, OR	USA	SUBURB - BROWNFIELD	NC	EDUCATION - K-13	6,900	Opsis Architecture	LBC, NZEB Certified	
32	HITCHCOCK CENTER FOR THE ENVIRONMENT	2016	Amherst, MA	USA	RURAL - BROWNFIELD		EDUCATION PUBLIC ASSEMBLY	8,950	designLAB Architects	LBC 2.1, Living Certified	
33	ARCH | NEXUS SAC	2016	Sacramento, CA	USA	URBAN - GREYFIELD	A/R	OFFICE	8,252	Holli Adams, Architectural Nexus	LBC 3.0, Living Certified	
34	Lakeside Senior Apartments	2014	Oakland, CA	USA	URBAN-BROWNFIELD	NC	RESIDENTIAL - MULTI-FAMILY AFFORDABLE HOUSING (92 units)	108,000	David Baker Architects	LEED-NC, Platinum	
35	Nancy and Stephen Grand Family House	2016	San Francisco, CA	USA	URBAN-BROWNFIELD	NC	RESIDENTIAL - MULTI-FAMILY HEALTHCARE COMMUNITY (80 units)	90,000	Leddy Maytum Stacy Architects	LEED-NC, Platinum	
36	Tassafaronga Village	2010	Oakland, CA	USA	URBAN-BROWNFIELD	NC	RESIDENTIAL - MULTI-FAMILY DEVELOPMENT AFFORDABLE HOUSING (77 affordable townhouses, 20 units)	238,000	David Baker Architects	LEED-ND, Gold LEED Homes, Platinum	
37	Arizona State University Health Services	2011	Tempe, AZ	USA	URBAN-BROWNFIELD	A/R	EDUCATION- HIGHER ED (CAMPUS) HEALTH CARE	34,300	Lake/Flato Architects	LEED-NC/R, Platinum	
38	Gateway Center - SUNY-ESF College of Environmental Science & Forestry	2013	Syracuse, NY	USA	URBAN-BROWNFIELD	NC	EDUCATION - HIGHER ED (CAMPUS) (LABORATORY, CLASSROOMS) OFFICE	54,000	Architerra	LEED-NC/R, Platinum	
39	Marin Country Day School Learning Resource Center and Courtyard	2010	Corte Madera, CA	USA	SUBURB-BROWNFIELD	NC	EDUCATION - K-12	33,740	EHDD	LEED, Platinum	
40	Sidwell Friends Middle School	2006	Washington, D.C.	USA	PERU-URBAN - BROWNFIELD	NC/R	EDUCATION - K-13	72,200	KieranTimberlake Associates	LEED-NC, Platinum	

Selected Architectural Precedents

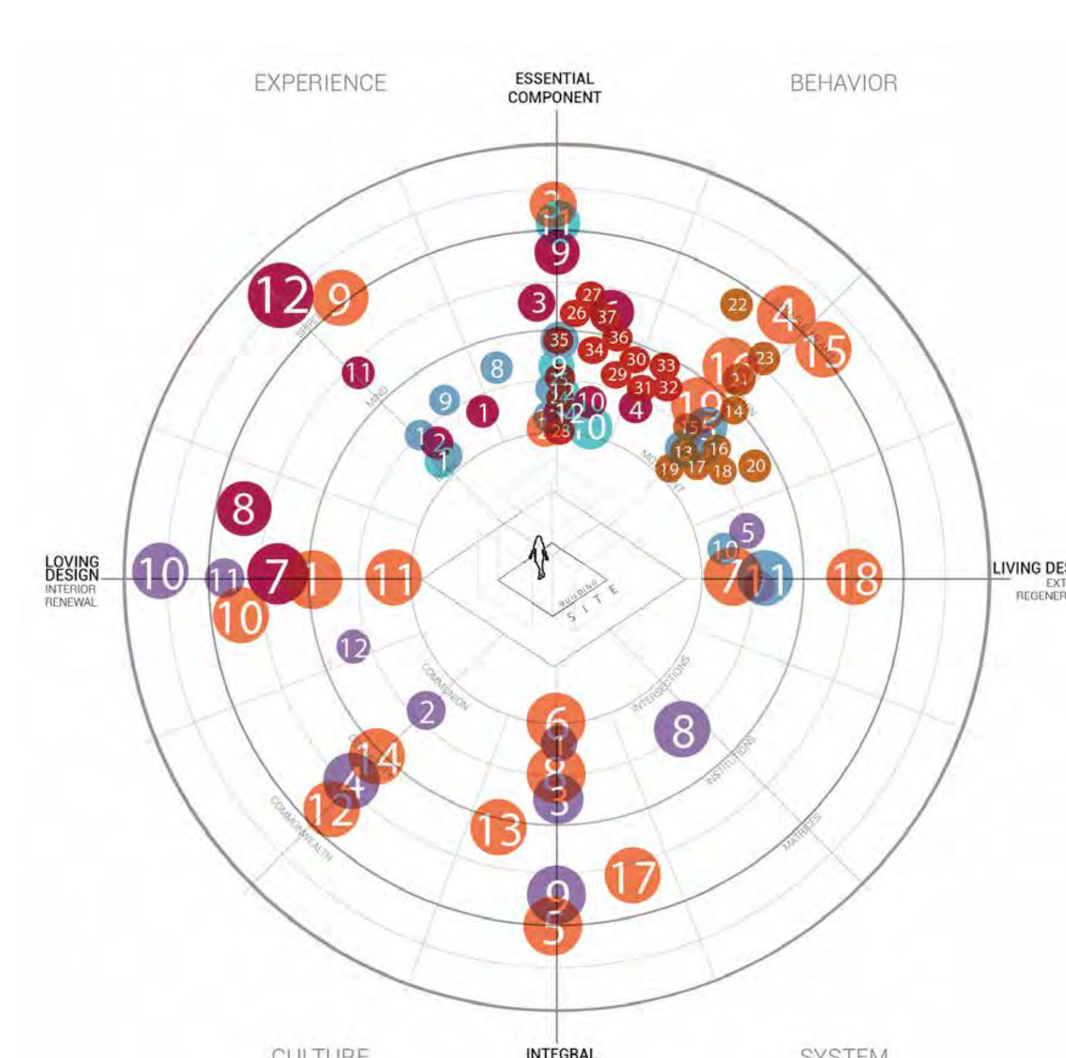


Research Synthesis

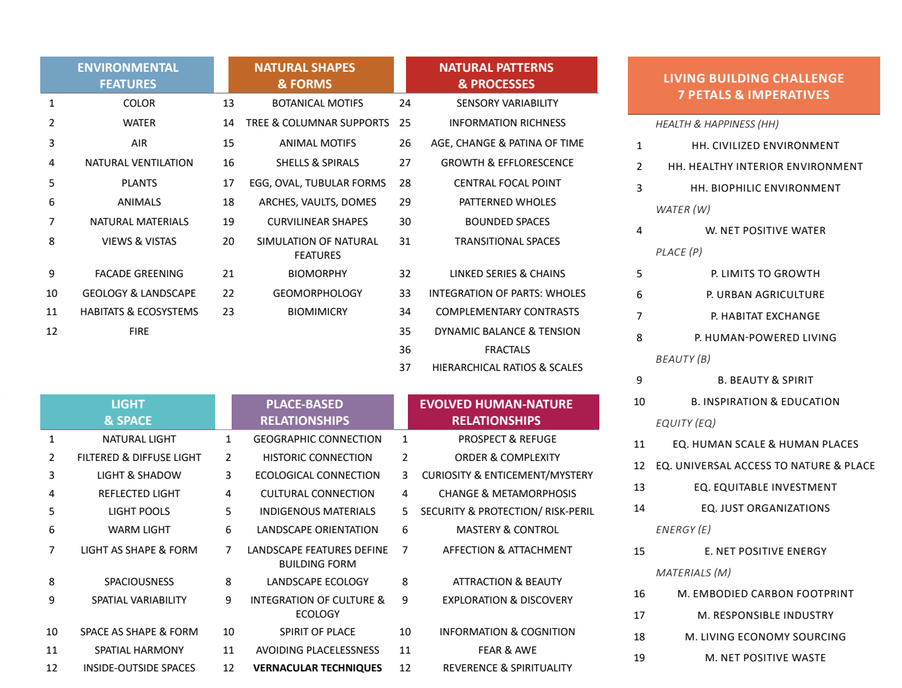
Developing the Integral Ecology Theoretical Framework for Design

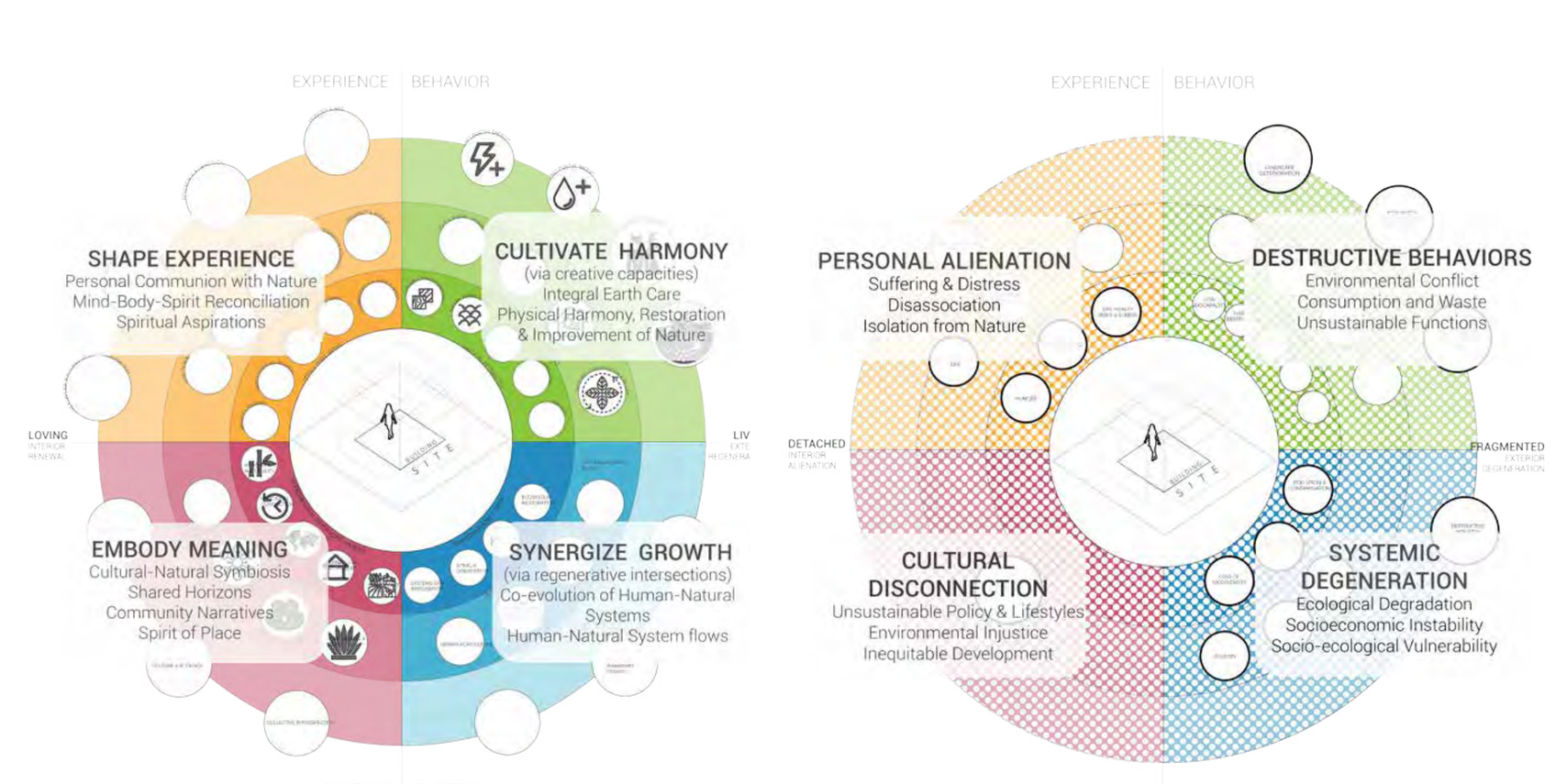


IETF FOUNDATIONS FAN
MAPPING THE PHILOSOPHY & SPIRITUAL TRADITION OF INTEGRAL ECOLOGY



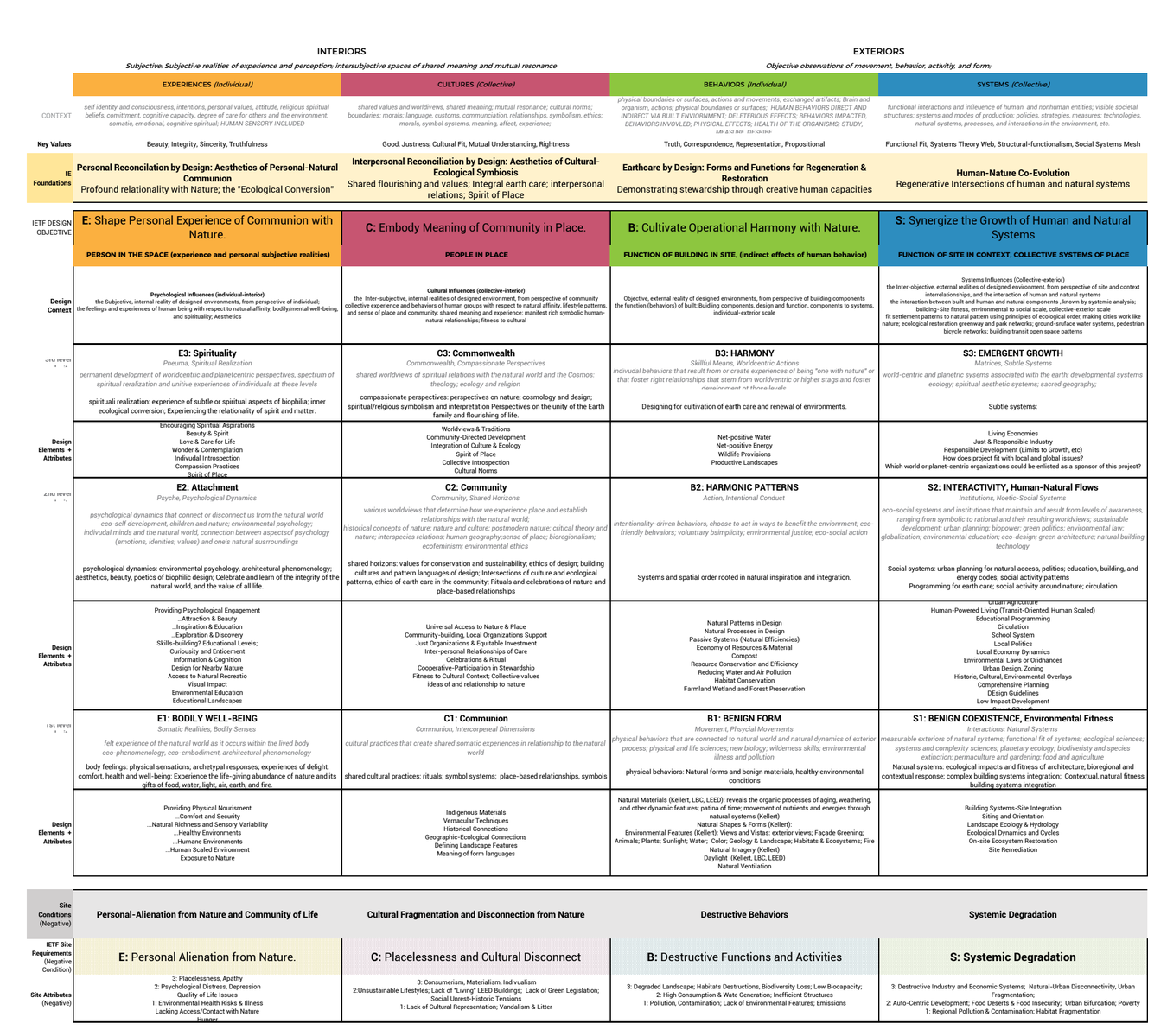
MAPPING BIOPHILIC AND REGENERATIVE DESIGN THEORY ON FOUNDATIONS
Source: S. Kellert, ILFI, Living Building Challenge Imperatives





IETF DESIGN FAN

IETF SITE SELECTION FAN

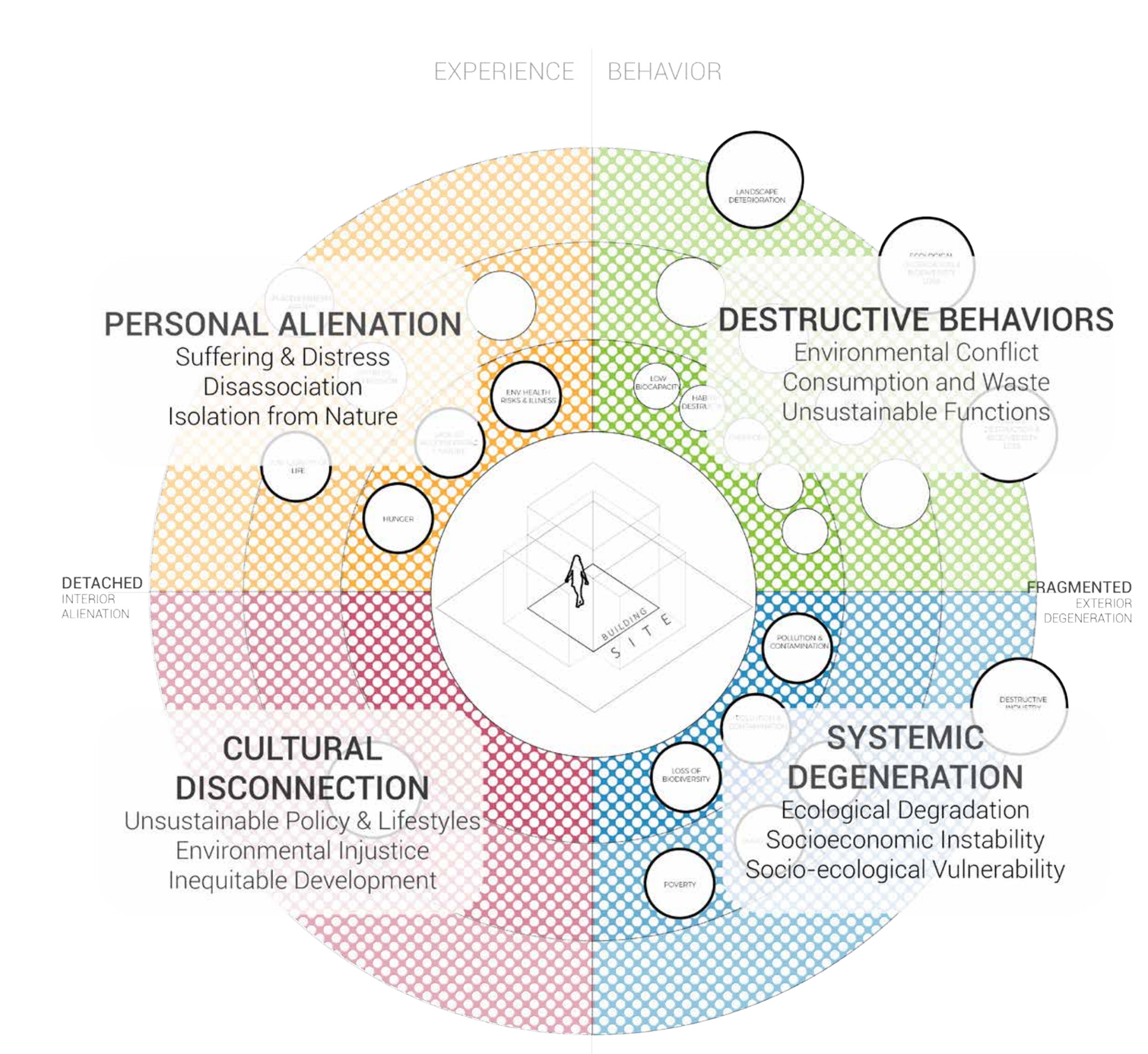


	EXPERIENCES (Interior-Individual)	CULTURES (Interior -Collective)	BEHAVIORS (Exterior-Individual)	SYSTEMS (Exterior-Collective)
Values	Beauty	Goodness, Justness	Truth, Brain and Organism	Truth, Functional-Fit
IE FOUNDATIONS	PERSONAL-NATURAL COMMUNION RELATIONALITY WITH NATURE & "ECOLOGICAL CONVERSION"	CULTURAL-ECOLOGICAL SYMBIOSIS SHARED FLOURISHING & SPIRIT OF PLACE	INTEGRAL EARTH CARE RESTORATION & IMPROVEMENT OF NATURE & ENVIRONMENT	CO-EVOLUTION OF HUMAN & NATURAL SYSTEMS
DESIGN INTENT (IETF)	SHAPE EXPERIENCE FOR PERSONAL RECONCILIATION WITH NATURE	EMBODY MEANING & MANIFEST NARRATIVES OF COMMUNITY AND PLACE ENLIVENED BY NATURE	CULTIVATE HARMONY VIA CREATIVE & CONSTRUCTIVE CAPACITIES	SYNERGIZE SYSTEMIC GROWTH VIA REGENERATIVE INTERSECTIONS
3rd level complexity	SPIRITUAL CONNECTION, TOWARDS ONENESS Human Spirit Interconnectedness of natural aspects of spirit and matter.	GLOBAL SOLIDARITY Commonwealth Perspectives on the universal common good and shared spiritual traditions	BENEVOLENT MEANS World-centric Actions Strategies directed at the holistic renewal of the natural and built environment.	MATRICES OF DEVELOPMENT Subtle, Emergent Systems Coevolution of natural and human systems; indicators of integral development
2nd level complexity	ATTACHMENT & INVESTMENT, TOWARDS LOVE Human Psyche Psychological dynamics of emotional and intellectual connection with Nature; through experience of space and aesthetics.	SHARED HORIZONS OF THE ECOLOGICAL COMMONS Community Intersection of natural and cultural heritage and the practice of an ethics of earth care	HARMONIC STRUCTURES & PROCESSES Action & Strategy Systems and order rooted in natural processes and patterns	SYNERGIES FOR GROWTH & RESILIENCE Institutions & Social Systems Socio-ecological synergies and confluence of human and natural activity
1st level complexity	WELL-BEING & HEALTH Body Feelings Vitality and comfort from engagement with natural world.	INTERCORPOREAL ENGAGEMENT Communion Manifest narratives of place and embrace community traditions.	NATURAL INTEGRITY & ORDER Movements Natural forms and benign material intervention	FUNCTIONAL INTEGRATION Environmental & Natural Systems Contextual, natural, ecological fitness Building systems integration

Chart Structure abstracted from: Esbjörn-Hargens, Integral Ecology Theoretical Model

IE PHILOSOPHICAL FOUNDATIONS 4 REALMS OF INTEGRAL ECOLOGICAL DESIGN

IETF Site Selection Fan



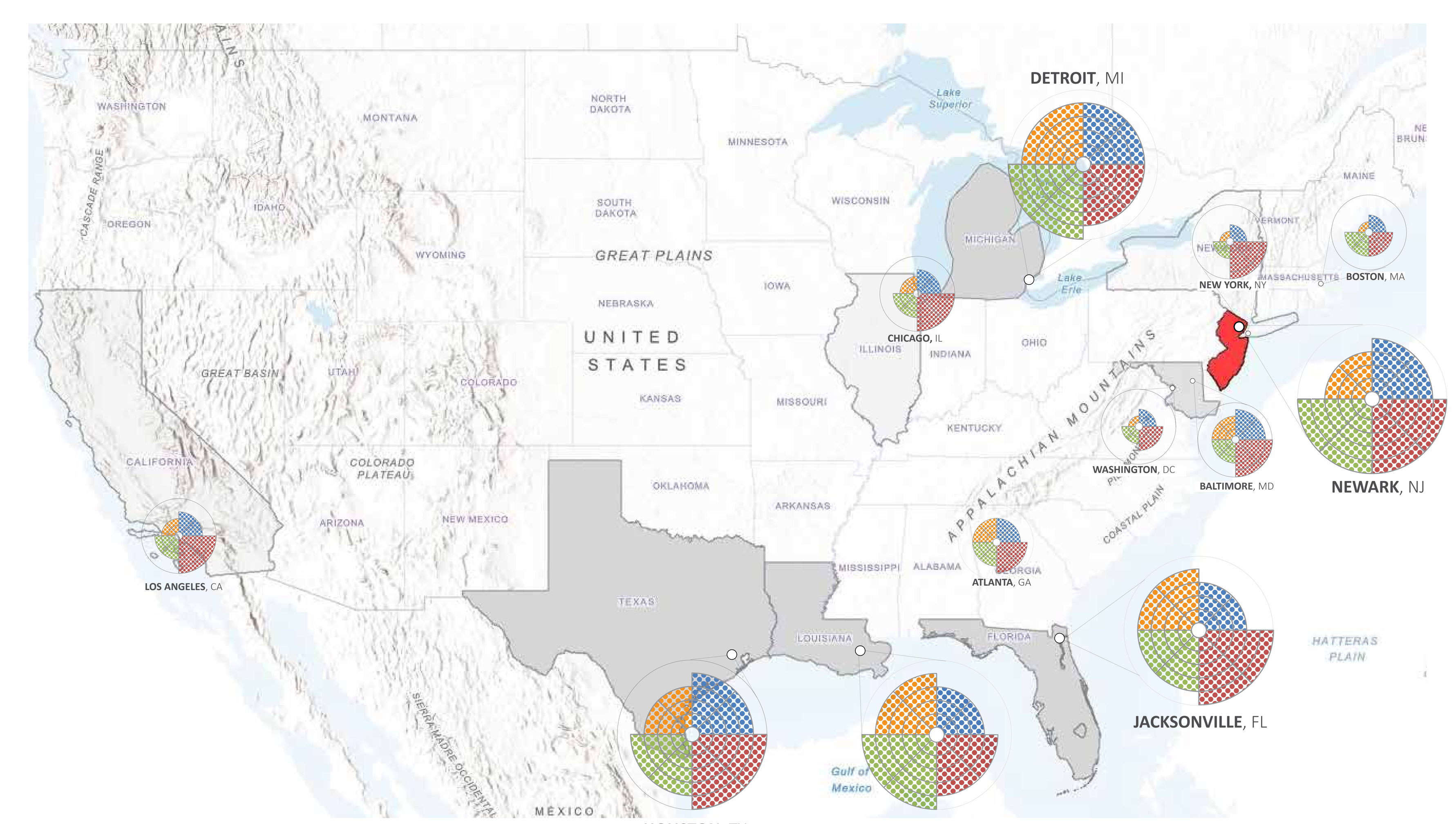
SITE FOCUS **United States, Coastal and Urban-Industrial States**

(1)UNSUSTAINABLE CONSUMPTION OF NATURAL GOODS: The US is using 2x the renewable natural resources that can be regenerated within its borders. The states with the largest per-person Ecological Footprints and the highest ecological deficits are typically coastal, heavily urbanized states.

(2) SIGNIFICANT ECOLOGICAL DEGRADATION & LANDSCAPE DETERIORATION: The states with the highest rates of environmental degradation are in the eastern half of the U.S., concentrated in Urban-industrial cores, such as the New York, Chicago, and Boston metropolitan regions.

IETF Site Selection

Prelminary Site Assessment for Site Selection

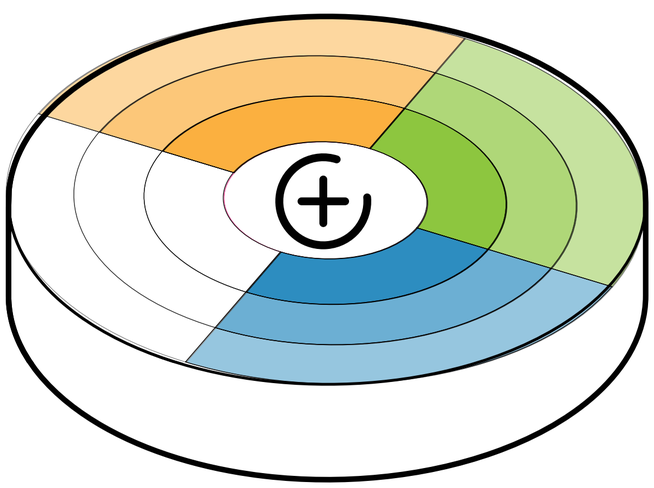


METROPOLITAN, MAJOR U.S. CITIES

IETF PROCESS (CONCEPTUAL DIAGRAM)

Application of the Integral Ecology Theoretical Framework for
Design and Site Selection

IETF DESIGN FAN



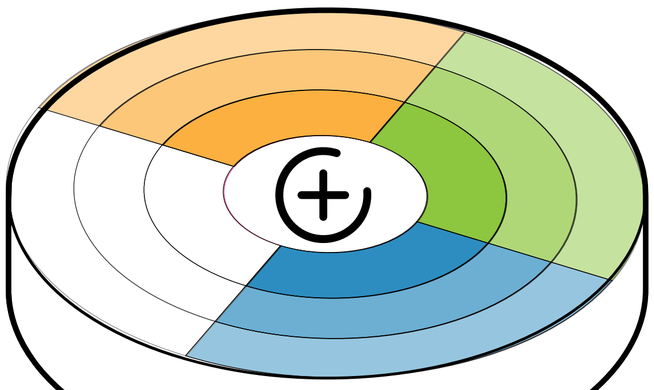
IETF DESIGN FAN
POSITIVE CONDITIONS

PROGRAM

POSITIVE CONDITIONS

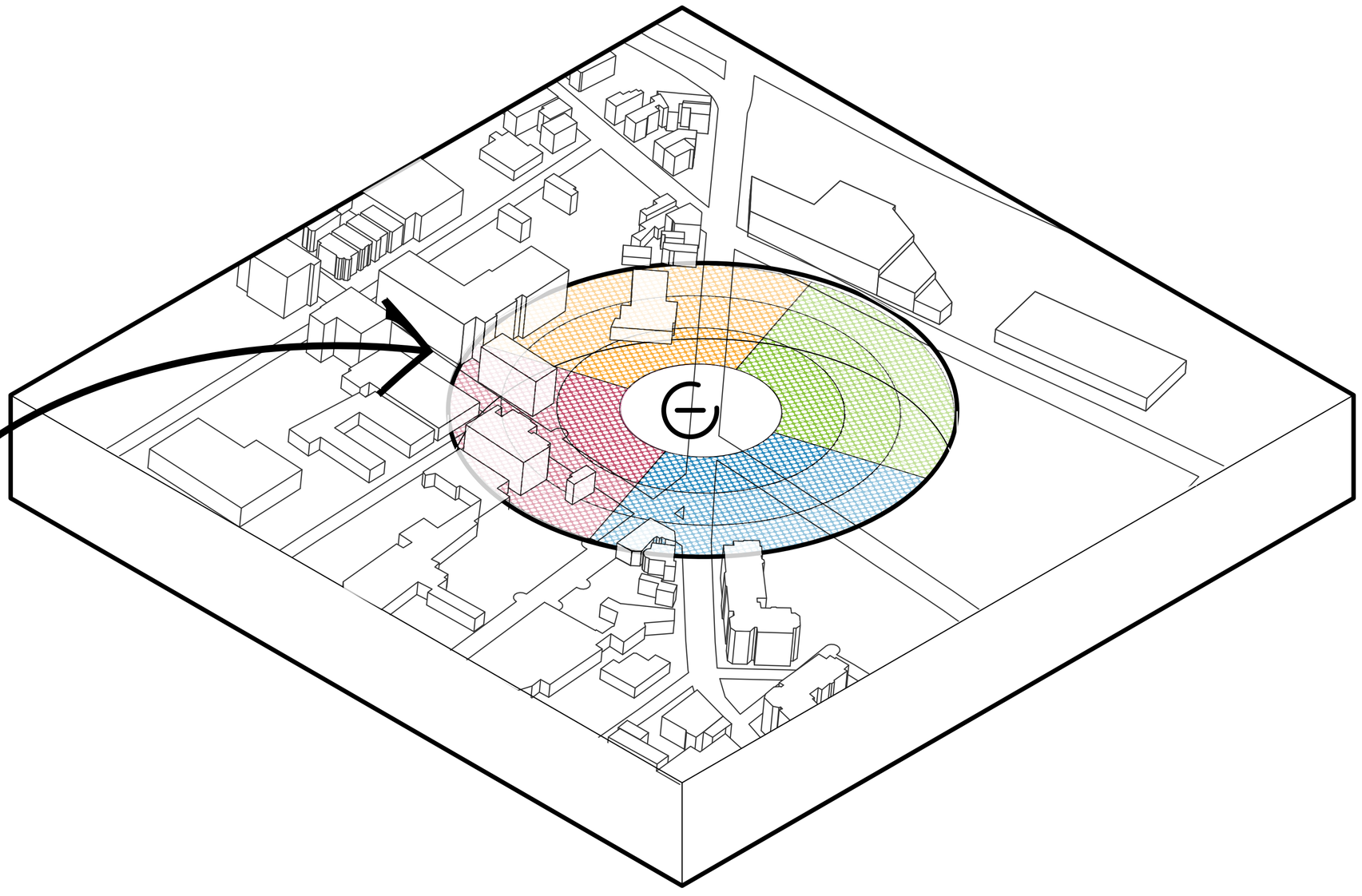
IETF DESIGN FAN

POSITIVE CONDITIONS



SITE

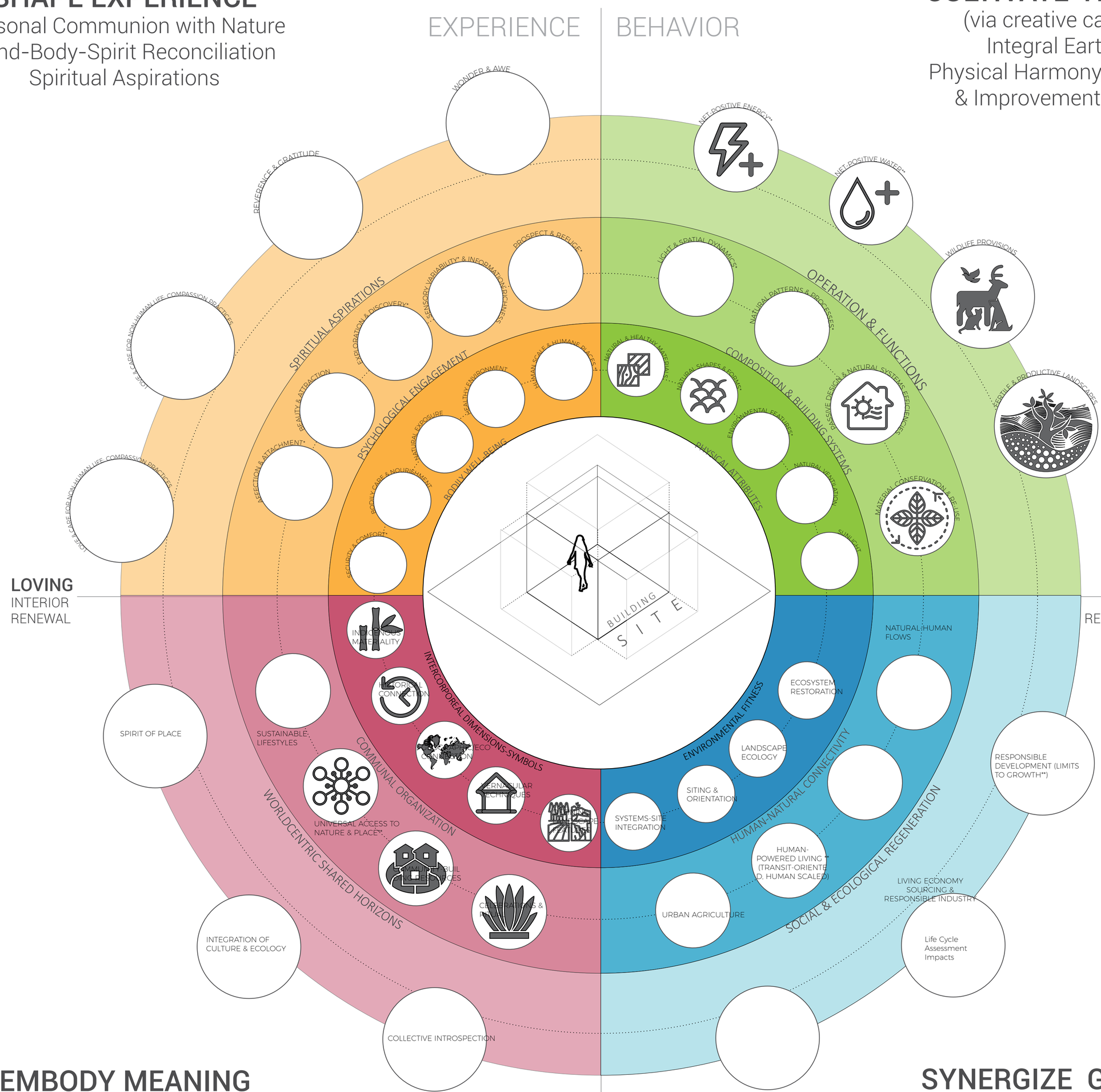
IETF SITE FAN
NEGATIVE CONDITIONS



IETF DESIGN FAN

SHAPE EXPERIENCE
Personal Communion with Nature
Mind-Body-Spirit Reconciliation
Spiritual Aspirations

CULTIVATE HARMONY
(via creative capacities)
Integral Earth Care
Physical Harmony, Restoration & Improvement of Nature



EMBODY MEANING
Cultural-Natural Symbiosis
Shared Horizons
Community Narratives
Spirit of Place

SYNERGIZE GROWTH
(via regenerative intersections)
Co-evolution of Human-Natural Systems
Human-Natural System flows

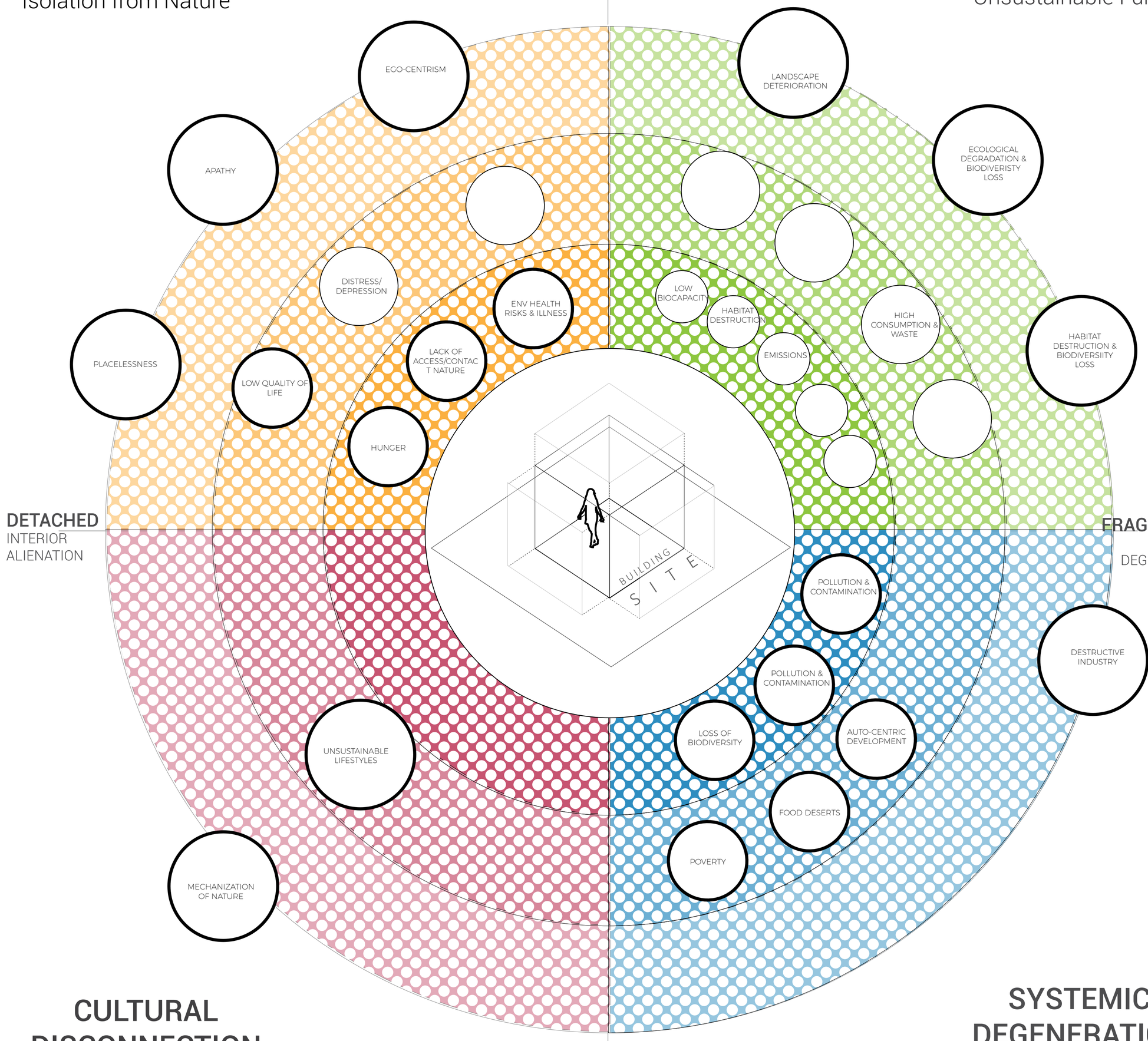
IETF FAN FOR SITE SELECTION

Application of the Integral Ecology Theoretical Framework in the Formulation of the Design Problem and Identification of Sites

PERSONAL ALIENATION
Suffering & Distress
Disassociation
Isolation from Nature

EXPERIENCE | BEHAVIOR

DESTRUCTIVE BEHAVIORS
Environmental Conflict
Consumption and Waste
Unsustainable Functions



CULTURAL DISCONNECTION
Unsustainable Policy & Lifestyles
Environmental Injustice
Inequitable Development

CULTURE | SYSTEM

SYSTEMIC DEGENERATION
Ecological Degradation
Socioeconomic Instability
Socio-ecological Vulnerability

PROGRAM DEVELOPMENT

GOALS/CONCEPT

- *COHOUSING AS A CONCEPT IS A WAY OF LIVING BASED AROUND SHARING. IT INCLUDES THE SHARING OF COMMON FACILITIES ALONG WITH THE SHARED AIMS, IDEAS OF LIVING AND ACTIVITIES.*
- *THE PLANNING OF ANY COHOUSING SCHEME USUALLY BEGINS WITH THE PLACEMENT OF THE CORE AREAS THAT IS THE COMMON HOUSE, COMMUNITY GARDENS AND OTHER SHARED SPACES. THE LIVING UNITS ARE EITHER CLUSTERED AROUND THE INDIVIDUAL COMMUNAL FACILITIES OR ONE LARGE COMMON HOUSE SURROUNDED BY DWELLINGS, CATERS TO THE NEED OF ALL THE JOINT FACILITIES.*
- *CO-HOUSING/CO-LIVING: PRIVATE DWELLING UNITS WITH SHARED RESOURCES; COMMUNAL LIVING FOR YOUNG ADULTS, YOUNG FAMILIES (BUT REALLY ANYONE*
- *STACKED TOWNHOME-STYLE MASSING!! FOR VARIETY & CHARCTER*
- *DIAGRAM NEW MODEL OF SHARING-CULTIVATION-EARTH CARE*

PRELIMINARY FINDINGS

KEY CASE STUDY FINDINGS

- **HIGHEST-SCORING TYPES: Single-use**, **low- or mid-rise** buildings; most common are **visitor centers** and **educational buildings**.
- **HIGHEST-SCORING USES:** CULTURAL, EDUCATIONAL, and RECREATIONAL.
- **HIGHEST-SCORING SITES**: **Rural or peri-urban sites**, rather than dense urban locations
- **LOWER-SCORING USES:** A small share are commercial and mixed-use; notably absent in top scores are multi-family residential and mixed-use residential.

PROJECT OBJECTIVES, for Site & Program

- **MIXED-USE DEVELOPMENT FOCUS (1 PART),** TIE INTO GREATER MASTER PLAN AND FUTURE BAXTER TERRACE DEVELOPMENT
- **URBAN LOCATION:** HIGHER DENSITY, URBAN ENVIRONMENT
- **MID-RISE, MEDIUM DENSITY**
- **EFFECT A LANDSCAPE/GROUNDS EXPERIENCE**
- INTEGRATE **CULTURAL, EDUCATIONAL, RECREATIONAL ELEMENTS**
- INTEGRATE A DEDICATED FOCUS ON **NATURAL HERITAGE SPACES**
- **UNIQUE COMMUNITY @ ONE ETHOS:** CO-LIVING SPACES, GARDENS, COMMUNITY & NATURE CENTER

KEY SITE ANALYSIS FINDINGS

- **MISSED CONNECTIONS TO SITES OF "NATURAL HERITAGE":** BRANCH BROOK PARK IS WELL-LOVED AND KEPT; PASSAIC RIVER HAS BEEN LONG MIS-TREATED DUE TO DESTRUCTIVE INDUSTRY BUT IS NOW FOCUS OF CITY REVITALIZATION AND REGIONAL CONSERVATION--***RIVERFRONT, WOODLANDS, PIEDMONT***
- **QUALITY OF LIFE CONCERNS:** AREA COMMUNITY (BASED ON PAST SURVEYS) STILL RETAINS CONCERNS ABOUT QUALITY OF LIFE ISSUES SUCH AS ***POVERTY, CRIME, HOMELESSNESS, UNEMPLOYMENT, DRUG SELLING, GUNS, GANG ACTIVITY, HEALTH PROBLEMS, RUN-DOWN PUBLIC SPACES, MENTAL ISSUES; LITTERING; VANDALISM/GRAFITTI*** (COURTINNOVATION.ORG STUDY)
- **FOOD DESERT:** DESPITE PRESENCE OF INSTITUTIONAL ANCHORS, AREA STILL RETAINS HIGH POVERTY/CHILD POVERTY RATES AND HAS LOW FOOD OUTLET DENSITY (
- **BIODIVERSITY & HABITAT CONSIDERATIONS:**
    - **BRANCH BROOK PARK** IS THE LARGEST, MOST PROMINENT NATURAL FEATURE IN NEWARK AND HOSTS VARIETY OF PLANTS AND SMALL WILDLIFE SPECIES (BESIDES THE PASSAIC RIVER)- SMALL GARDENS ARE SCATTERED THROUGHOUT NEWARK, URBAN PARKS (MILITARY PARK AND WASHINGTON PARK) ARE CONCENTRATED IN DOWNTOWN
    - OVERALL, HIGHLY URBANIZED ENVIRONMENTS LACK SUFFICIENT BIODIVERSITY TO SUPPORT LIFE-SUSTAINING ECOSYSTEMS.
    - INCLUSION OF ***SMALL WILDLIFE HABITATS (BIRDS, BUTTERFLIES, BEES)*** IS AN EFFECTIVE AND RATHER SIMPLE WAY TO ENHANCE BIODIVERSITY IN AN URBAN SITE
- **LOW DENSITY RESIDENTIAL AREA:** INCORPORATE RESIDENTIAL, MODERATE HOUSING DENSITY USES
- **NO COMMUNITY GARDENS, OUTDOOR RECREATION, ACCESSIBLE -WELCOMING PUBLIC SPACE WITHIN WALKING DISTANCE:** INTEGRATE PLAZA/ GARDENS FOR RECREATION & PUBLIC USE
- **U/D VACANT LOTS ADJACENT TO SITE & FUTURE BAXTER TERRACE MIXED-HOUSING DENSITY DEVELOPMENT;** TIE INTO LARGER SCHEMATIC MASTER PLAN, BASED ON ANALYSIS AND EXISTING PLANS?
- **HOSTILE STREETSCAPE:** INCORPORATE STREETSCAPE STRATEGIES
- COMMUNITY RESOURCES AND COMMUNITY ORGANIZATIONS ARE VALUED HIGHLY AMONG RESIDENTS; DESIRE FOR COMMUNITY (COURTINNOVATION.ORG STUDY);
- **YOUNG, DIVERSE DEMOGRAPHICS:** AVERAGE AGE IS AROUND 29; FAMILY, FAMILIES WITH CHILDREN, AND MOSTLY NON-FAMILY HOUSEHOLDS OF ABOUT 3 PEOPLE

IETF PROGRAM DEVELOPMENT CONCEPT

1. Dwelling in Communion

Center of family and individual life and personal development with shared commons and living spaces; ***life of moderation and simplicity.***

Experiences of comfort and care; interpersonal relationships, Bodily Nourishment at home

Residents

PEACE, HARMONY, PARTICIPATION, INTERPERSONAL RELATIONS

Moderate-Density Housing
Accessible, Affordable and Efficient Housing
Shared Utilities and Resources
Modest Living Spaces

(MULTI-UNIT RESIDENTIAL)
SHARED-LIVING SPACES
"CO-LIVING" RESIDENTIAL UNITS
COMPOST COLLECTION

2. Cultivation and Earth Care

Restoring nature's vitality; transforming landscape to provide food and other resources to people and wildlife

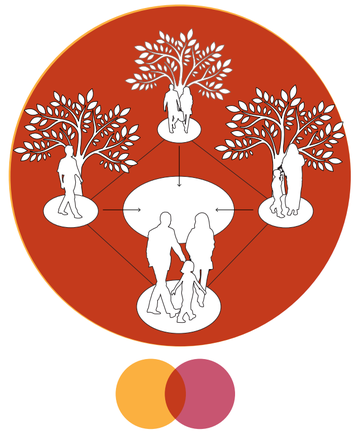
Wildlife Provisions, Fertile & Productive Landscape, Compassion Practices,

Residents, Staff, Volunteers

PARTICIPATION, CULTIVATION, GROWTH, IMPROVEMENT, NOURISH, FEED,

Residential and Community Gardens/Public Open Space
Participation by residents and volunteers in tending gardens and grounds

NATIVE AND/OR EDIBLE GARDENS
WILDLIFE HABITATS (Butterfly Gardens, Bee Apiaries, Bug Hotels, Bat Boxes)
GREENHOUSE, COMPOST
PARTICIPATION IN GARDENING
WATER HARVESTING



3. Welcome and Hospitality

Extending hospitality towards others and sharing in natural goods; the gathering of community in celebration of Nature

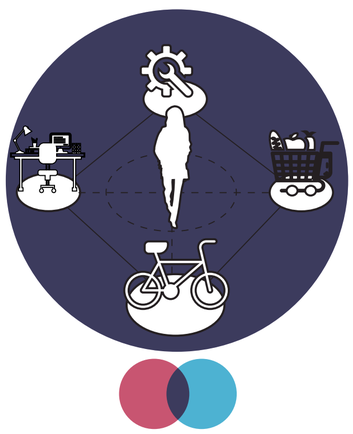
Bodily Nourishment, Social Interaction, Community Rituals,

Residents, Visitors, Volunteers, Staff

CELEBRATION, GRATITUDE, INCLUSION

Public Assembly-Gathering
Local community programming, events and outreach
Celebration of cultural-natural heritage through rituals and traditions
Gathering and community-building

GREAT ROOM-ASSEMBLY HALL
DINING/CAFE
EVENT PROGRAMMING
PUBLIC PLAZA (OUTDOOR PAVILION)
EXHIBITION



4. Empowering Healthy, Sustainable and Balanced Livelihoods

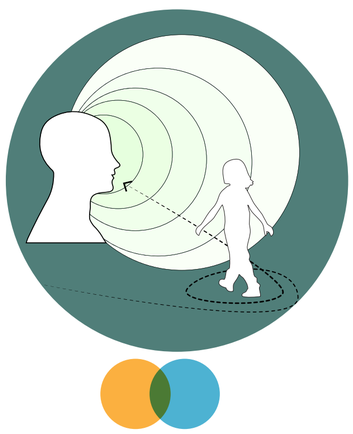
Providing a foundation for living more sustainably; meeting the needs of everyday life and providing for economic employment

Residents, Visitors

EMPOWER, NOURISH, CREATIVITY

Commercial Uses, Public Assembly
Sustain residents and contribute to socio-economic flourishing of local community
Celebration of cultivation and craft activities

WORKSHOPS, FLEX SPACE
TRAINING & EDUCATION
FLEX CLASSROOMS
FOOD MARKET



5. Exploration & Discovery

Promote observation, exploration, and education activities to promote a deeper intellectual connection to nature; educational outreach to increase ecological literacy and awareness; **indoor-outdoor**

Exploration & Discovery, Introspection and Reflection; Wonder and Awe; Educational Social connections

Visitors

INSPIRE, EDUCATE, CURIOSITY, ENTICE, EXPLORE, DISCOVER, BEING PRESENT, JOURNEY, TOUCH, SENSE

Community Assembly-Exhibition & Education
Education on local environment and ecology
Recreation and exploration

INDOOR-OUTDOOR CLASSROOMS
EXHIBITION
LIBRARY
PUBLIC OPEN SPACE
MEDITATION ROOM
OUTDOOR GARDENS/LANDSCAPES

PROGRAM DEVELOPMENT (PRELIMINARY)

Mixed-Use Development

ZONING OVERVIEW

ZONING	RDV, Residential	
IBC OCCUPANCY	R-2; A-3	
SITE FOOTPRINT (GSF | ACRES)	**72,000**	1.65
MAX LOT COVERAGE (TOTAL IMPERVIOUS SURFACE)	55%	
MAX GROUND FLOOR FOOTPRINT (GSF)	**39,600**	
RES UNITS/ACRE	30.00	
MAX # UNITS (Residential)	49.50	
MAX FLOOR AREA/OCCUPANT	200 (RES)	30

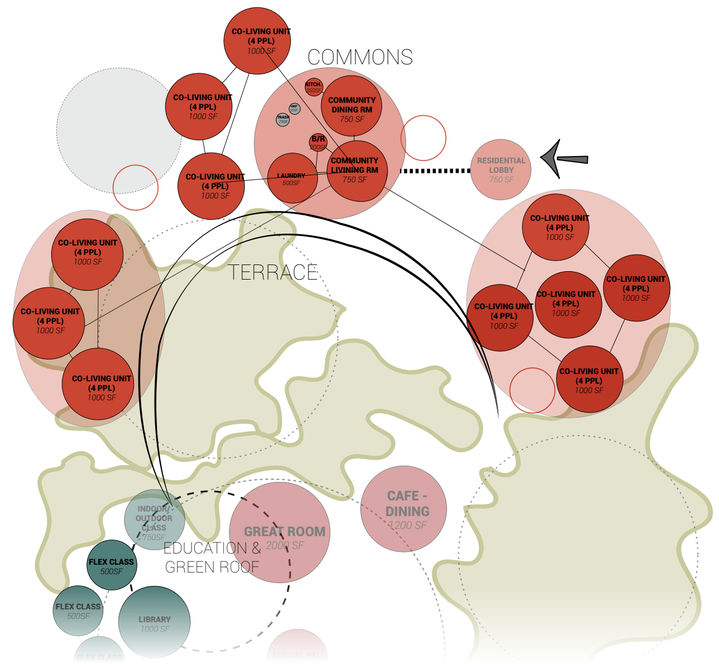
PROGRAM PRINCIPLES

A	Dwelling in Communion
B	Livelihoods and Lifestyle
C	Welcome and Hospitality
D	Exploration and Discovery
E	Cultivation
D	Support/Infrastructure

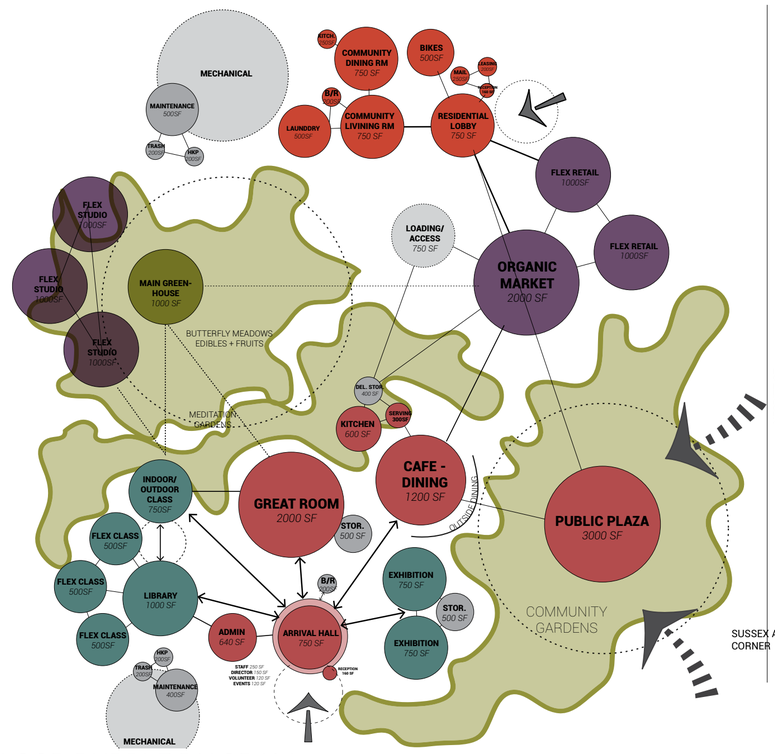
	BUILDING PROGRAM	USE	IBC	DESIGN AREA QUANT.	DESIGN AREA NSF	DESIGN AREA TOTAL NSF	DESIGN OCCUPANCY LOAD FACTOR (SF/PERSON)	DESIGN OCCUPANCY TOTAL OCCUPANCY	LOCATION	USERS	GROUND FLOOR	TERRACE FLOOR	PUBLIC	PRIVACY	DAYLIGHT	PLUMBING
1	**MIXED-USE RESIDENTIAL-COMMERCIAL**		R-2			**67,710**										
1A	**RESIDENTIAL** Dwelling in Communion		R-2			**57,640**										
	Residential Units					**51,600**		**258**								
A	Co-living Units: 4 beds, 2 full bath, Shared kitchen, living	LIVING	R-2	33	1200	39,600	200	198	TERRACE, 1; UPPER- 2, 3, 4	RESIDENT				X	X	X
A	Family Units: 3-5 beds, 1 full bath, Living-kitchen	LIVING	R-2	12	1000	12,000	200	60	UPPER- 2, 3, 4	RESIDENT				X	X	X
	Residential Commons					**4,240**		#DIV/0!								
A	Inter-Floor Lounge	ASSEMBLY	R-2	3	500	1,500	15	33	UPPER - 2, 3, 4	RESIDENT				XX	X	
A	~~Hall Bathroom2~~	SUPPORT	R-2	0	150	-		#DIV/0!	UPPER - 2, 3, 5	RESIDENT				XX		X
A	Laundry Room	SUPPORT	R-2	1	500	500		#DIV/0!	TERRACE, 1	RESIDENT		X		XX		X
A	Reflection/Wellness Room		R-2	1	250	250		#DIV/0!	TERRACE, 1	RESIDENT		X		XX	X	
A	Public Unisex Toilets	SUPPORT		2	120	240		#DIV/0!	TERRACE, 1	RESIDENT	X			XX		X
A	Community Kitchen	ASSEMBLY	R-2	1	250	250		#DIV/0!	TERRACE, 1	RESIDENT		X		XX	X	X
A	Community Dining	ASSEMBLY	R-2	1	750	750			TERRACE, 1	RESIDENT		X		XX	X	
A	Community Living Room	ASSEMBLY	R-2	1	750	750	15	50	TERRACE, 1	RESIDENT		X		XX	X	
	Public					**1,800**		#DIV/0!								
A	Resident Lobby	ENTRY		1	1000	1,000	5	200	GROUND, 0	PUBLIC	X		X		X	
A	Reception	ENTRY		1	160	160		1	GROUND, 0	PUBLIC	X		X		X	
A	Mail Boxes	SUPPORT		1	200	200		#DIV/0!	GROUND, 0	RESIDENT	X			XX		
A	Public Unisex Toilets	SUPPORT		2	120	240		#DIV/0!	GROUND, 0	PUBLIC	X		X			X
A	Leasing Office,1-2 ppl	ADMIN		1	200	200	100	2	GROUND, 0	PUBLIC, STAFF	X		X		X	
1B	**COMMERCIAL** Livelihoods & Lifestyle					**7,000**		#DIV/0!								
B	Grocery/Food Market	LIVELIHOOD		1	2000	2,000		#DIV/0!	GROUND, 0	PUBLIC	X		X		X	X
B	Flex Studio	LIVELIHOOD		2	1000	2,000			GROUND, 0	RESIDENT	X					
B	Flex Retail	LIVELIHOOD		2	1000	2,000		#DIV/0!	GROUND, 0	PUBLIC	X		X		X	
B	co-op store	LIVELIHOOD		1	1000	1,000		#DIV/0!	GROUND, 0	PUBLIC	X		X		X	
1C	**Building Support**					**3,070**		#DIV/0!								
A	Housekeeping Closet (Res. Floor)	SUPPORT		3	50	150	50	3	UPPER	Staff				X		X
A	Telecommunications Closet (Res. Floor)	SUPPORT		3	80	240	80	3	UPPER	Staff				X		
A	Electrical Closet (Res. Floor)	SUPPORT		3	80	240	80	3	UPPER	Staff				X		
A	Trash/Recycle (Res. Floor)	SUPPORT		3	80	240	80	3	UPPER	Staff/Residents				XX		
	Trash Recycle	SUPPORT		1	250	250		#DIV/0!	GROUND, 0	Staff	X			X		
A	Bike Room - Storage	SUPPORT-STORAGE		1	500	500		#DIV/0!	GROUND, 0	RESIDENTS, STAF	X		XX			
	Housekeeping Supply Storage	SUPPORT- STORAGE		1	200	200		#DIV/0!	GROUND, 0	Staff	X			X		X
	Maintenance Storage	SUPPORT		1	500	500		#DIV/0!	GROUND, 0	Staff	X			X		
	Centralized Loading Access/Delivery	INFRASTRUCTURE		1	750	750		#DIV/0!	GROUND, 0	Staff				X		
	Mechanical Room(s)	INFRASTRUCTURE		1					BASEMENT; GROUND, 0	Staff				X		
2	**ECO-CULTURAL CENTER**					**12,750**		#DIV/0!								
	2C COMMUNAL Welcome and Hospitality					**6,200**		#DIV/0!								
	Public					**5,560**		#DIV/0!								
C	Lobby-Arrival Hall	ENTRY		1	750	750	5	150	ground		X		X		X	
C	Reception/Information Desk	ENTRY		1	160	160		#DIV/0!	ground		X		X		X	
C	Public Unisex toilets	SUPPORT		1	150	150		#DIV/0!	ground		X		X			X
C	Great Room (Public Assembly) (no fixed fu	ASSEMBLY	A-3	1	2000	2,000		#DIV/0!	ground		X		X		X	
C	CAFÉ - Kitchen/Food Prep	SUPPORT		1	600	600					X			X		
C	Café Delivery/Storage	SUPPORT		1	400	400					X			X		
C	CAFÉ - Counter Serving Area	ASSEMBLY		1	300	300					X		X		X	
C	Café Dining (Indoor/Outdoor)	ASSEMBLY		1	1200	1,200					X		X		X	
	Administrative					**640**		**6**								
C	Volunteer	ADMIN		1	120	120	100	1			X			XX	X	
C	Director's Office	ADMIN		1	150	150	100	2			XX			X	X	
C	Events & Programming	ADMIN		1	120	120	100	1			X			XX	X	
C	Staff Office	ADMIN		1	250	250	100	3			XX			X	X	
	2D EDUCATION (ECO-CULTURAL) Exploration and Discovery					**4,750**										
D	Exhibition/Gallery	LEARN; ASSEMBLY	A-3	1	1500	1,500	30	50	ground or upper, can be split		X		X		X	
D	Indoor-Outdoor Classroom	LEARN		1	750	750		#DIV/0!			X				X	
D	Flex, Classrooms	LEARN		3	500	1,500		#DIV/0!	upper		X		X		X	
D	Library Reading Room	LEARN	A-3	1	1000	1,000		#DIV/0!			X		X		X	
D	Meditation Garden								outside							
	Building Support					**1800**		#DIV/0!		GROUND						
	Trash Recycle	SUPPORT		1	200	200		#DIV/0!		ground	X			X		
C	Events/Great Room Storage	SUPPORT		1	500	500		#DIV/0!			X			X		
D	Exhibit Storage	SUPPORT		1	500	500					X			X		
	Housekeeping	SUPPORT		1	50	50	50	1		ground	X			X		X
	Electrical	SUPPORT		1	50	50	50	1		ground	X			X		
	Maintenance Storage	SUPPORT		1	500	500		#DIV/0!		ground	X			X		
3	**EXTERIOR GROUNDS**					**3,050**		#DIV/0!								
C	Public Plaza	ASSEMBLY, OUTSIDE				**1,000**					X		X		X	
3	**AGRICULTURE** Cultivation & Earth Care					**2,050**										
E	Community Garden			1	1000	1,000										
E	Rainwater Cistern					-										
E	Compost Section			1	50	50										
E	Butterfly Garden					-										
E	Bee Apiary					-										
E	Greenhouse			1	1000	1,000					X					
E	Green Roofs															

TOTALS	**NET SF**
Total Building Net SF (Enclosed)	80,460
Interior Walls, Circulation, etc. (35% multiplier)*	28,161
TOTAL GROSS SF (Enclosed)	**108,621**
Total Ground Net SF	**24,840**
Max Footprint	39,600
Area Remaining	**14760**

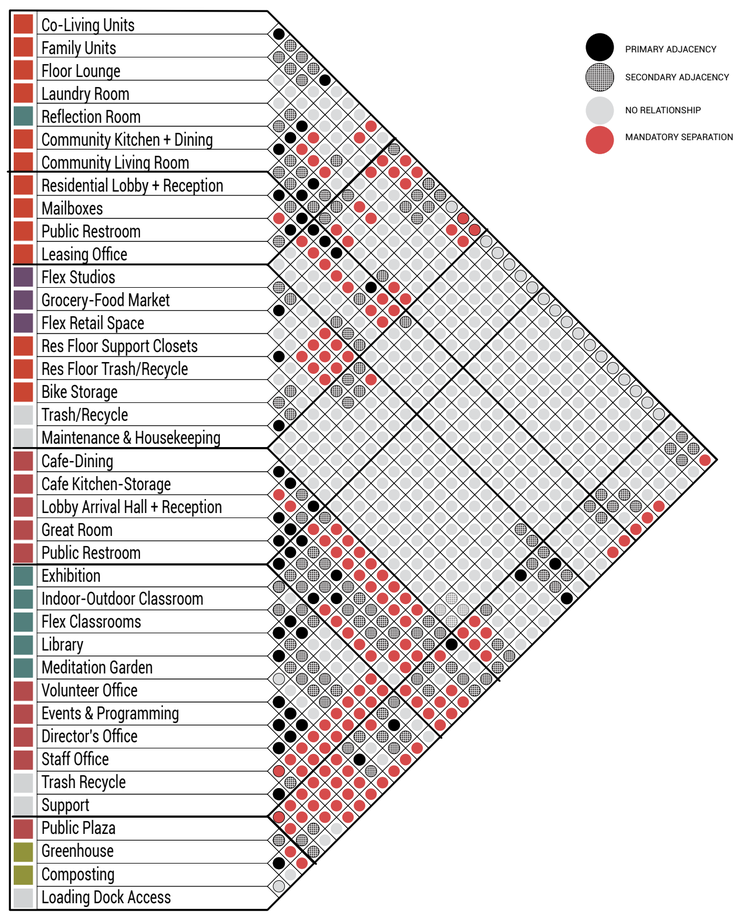
PRELIMINARY PROGRAM



TERRACE FLOOR BUBBLE DIAGRAM



GROUND FLOOR BUBBLE DIAGRAM

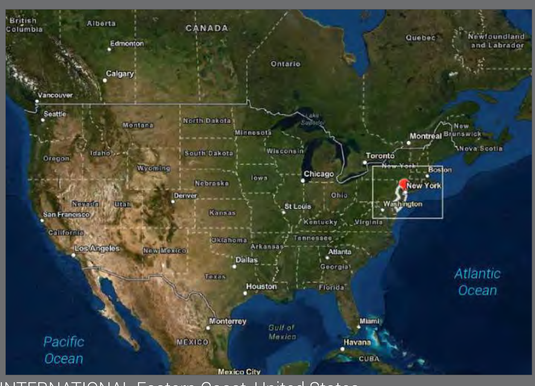


ADJACENCY MATRIX

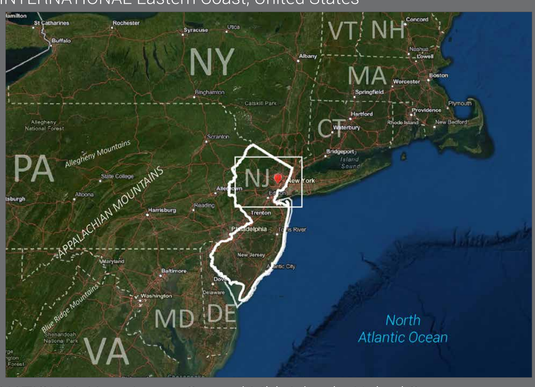
	INTERIORS		EXTERIORS	
	Subjective: Subjective realities of experience and perception; intersubjective spaces of shared meaning and mutual resonance		*Objective observations of movement, behavior, activity, and form;*	
	EXPERIENCES *(Individual)*	CULTURES *(Collective)*	BEHAVIORS *(Individual)*	SYSTEMS *(Collective)*
CONTEXT	*self identity and consciousness, intentions, personal values, attitude, religious spiritual beliefs, comittment, cognitive capacity, degree of care for others and the environment; somatic, emotional, cognitive spiritual; HUMAN SENSORY INCLUDED*	*shared values and worldivews, shared meaning; mutual resonance; cultural norms; boundaries; morals; language, customs, communciation, relationships, symbolism, ethics; morals, symbol systems, meaning, affect, experience;*	*physical boundaries or surfaces, actions and movements; exchanged artifacts; Brain and organism, actions; physical boundaries or surfaces; HUMAN BEHAVIORS DIRECT AND INDIRECT VIA BUILT ENVIORNMENT; DELETERIOUS EFFECTS; BEHAVIORS IMPACTED, BEHAVIORS INVOVLED; PHYSICAL EFFECTS; HEALTH OF THE ORGANISMS; STUDY, MEASURE THESE*	*functional interactions and infleuence of human and nonhuman entities; visible societal structures; systems and modes of production; policies, strategies, measures; technologies, natural systems, processes, and interactions in the environment, etc.*
Key Values	Beauty, Integrity, Sincerity, Truthfulness	Good, Justness, Cultural Fit, Mutual Understanding, Rightness	Truth, Correspondence, Representation, Propositional	Functional Fit, Systems Theory Web, Structural-functionalism, Social Systems Mesh
IE Foundations	**Personal Reconcilation by Design: Aesthetics of Personal-Natural Communion** Profound relationality with Nature; the "Ecological Conversion"	**Interpersonal Reconciliation by Design: Aesthetics of Cultural-Ecological Symbiosis** Shared flourishing and values; Integral earth care; interpersonal relations; Spirit of Place	**Earthcare by Design: Forms and Functions for Regeneration & Restoration** Demonstrating stewardship through creative human capacities	**Human-Nature Co-Evolution** Regenerative Intersections of human and natural systems
IETF DESIGN OBJECTIVE	**E:** Shape Personal Experience of Communion with Nature.	**C:** Embody Meaning of Community in Place.	**B:** Cultivate Operational Harmony with Nature.	**S:** Synergize the Growth of Human and Natural Systems
	PERSON IN THE SPACE (experience and personal subjective realities)	**PEOPLE IN PLACE**	**FUNCTION OF BUILDING IN SITE, (indirect effects of human behavior)**	**FUNCTION OF SITE IN CONTEXT, COLLECTIVE SYSTEMS OF PLACE**
Design Context	**Psychological Influences (individual-interior)** the Subjective, internal reality of designed environments, from perspective of individual; the feelings and experiences of human being with respect to natural affinity, bodily/mental well-being, and spirituality; Aesthetics	**Cultural Influences (collective-interior)** the Inter-subjective, internal realities of designed environment, from perspective of community collective experience and behaviors of human groups with respect to natural affinity, lifestyle patterns, and sense of place and community; shared meaning and experience; manifest rich symbolic human-natural relationships; fitness to cultural	Objective, external reality of designed environments, from perspective of building components the function (behaviors) of built; Buidling components, design and function, components to systems, individual-exterior scale	Systems Influences (Collective-exterior) the Inter-objective, external realities of designed environment, from perspective of site and context interrelationships, and the interaction of human and natural systems the interaction between built and human and natural components , known by systemic analysis; building-Site fitness, environmental to social scale, collective-exterior scale fit settlement patterns to natural pattern using principles of ecological order, making cities work like nature; ecological restoration greenway and park networks; ground-srufuace water systems, pedestrian bicycle networks; building transit open space patterns
3rd level	**E3: Spirituality** *Pneuma, Spiritual Realization* *permanent development of worldcentric and planetcentric perspectives, spectrum of spiritual reralization and unitive experiences of individuals at these levels* spirituali realization: experience of subtle or spiritual aspects of biophilia; inner ecological conversion; Experiencing the relationality of spirit and matter.	**C3: Commonwealth** *Commonwealth, Compassionate Perspectives* *shared worldviews of spiritual relations with the natural world and the Cosmos: theology; ecology and religion* compassionate perspectives: perspectives on nature; cosmology and design; spiritual/relgious symbolism and interpretation Perspectives on the unity of the Earth family and flourishing of life.	**B3: HARMONY** *Skillful Means, Worldcentric Actions* *indivudal behaviors that result from or create experiences of being "one with nature" or that foster right relationships that stem from worldvientsc or higher stags and foster development at those levels* Designing for cultivation of earth care and renewal of environments.	**S3: EMERGENT GROWTH** *Matrices, Subtle Systems* *world-centric and planetric syaems associated with the earth; developmental systems ecology; spiritual aesthetic systems; sacred geography;* Subtle systems:
Design Elements + Attributes	Encouraging Spiritual Aspirations Beauty & Spirit Love & Care for Life Wonder & Contemplation Indivudal Introspection Compassion Practices Spirit of Place	Worldviews & Traditions Community-Directed Development Integration of Culture & Ecology Spirit of Place Collective Introspection Cultural Norms	Net-positive Water Net-positive Energy Wildlife Provisions Productive Landscapes	Living Economies Just & Responsible Industry Responsible Development (Limits to Growth, etc) How does project fit with local and global issues? Which world or planet-centric organizations could be enlisted as a sponsor of this project?
2nd level	**E2: Attachment** *Psyche, Psychological Dynamics* *psychological dynamics that connect or disconnect us from the natural world eco-self development, children and nature; environmental psychology; indivudal minds and the natural world, connection between aspectsof psychology (emotions, idenities, values) and one's natural susrroundings* psychological dynamics: environmental psychology, architectural phenomenology; aesthetics, beauty, poetics of biophilic design; Celebrate and learn of the integrity of the natural world, and the value of all life.	**C2: Community** *Community, Shared Horizons* *various worldviews that determine how we experience place and establish relationships with the natural world; historical concepts of nature; nature and culture; postmodern nature; critical theory and nature; interspecies relations; human geography;sense of place; bioregionalism; ecofeminism; environmental ethics* shared horizons: values for conservation and sustainability; ethics of design; building cultures and pattern languages of design; Intersections of culture and ecological patterns, ethics of earth care in the community; Rituals and celebrations of nature and place-based relationships	**B2: HARMONIC PATTERNS** *Action, Intentional Conduct* *intentionality-driven behaviors, choose to act in ways to benefit the envionment; eco-friendly behvaiors; volunttary bsimplicity; environmental justice; eco-social action* Systems and spatial order rooted in natural inspiration and integration.	**S2: INTERACTIVITY, Human-Natural Flows** *Institutions, Noetic-Social Systems* *eco-social systems and institutions that maintain and result from levels of awareness, ranging from symbolic to rational and their resulting worldviews; sustainable development; urban planning; biopower; green politics; environmental law; globalization; environmental education; eco-design; green architecture; natural building technology* Social systems: urban planning for natural access, politics; education, building, and energy codes; social activity patterns Programming for earth care; social activity around nature; circulation
Design Elements + Attributes	Providing Psychological Engagement ...Attraction & Beauty ...Inspiration & Education ...Exploration & Discovery Skills-building? Educational Levels; Curiousity and Enticement Information & Cognition Design for Nearby Nature Access to Natural Recreatio Visual Impact Environmental Education Educational Landscapes	Universal Access to Nature & Place Community-building, Local Organizations Support Just Organizations & Equitable Investment Inter-personal Relationships of Care Celebrations & Ritual Cooperative-Participation in Stewardship Fitness to Cultural Context; Collective values ideas of and relationship to nature	Natural Patterns in Design Natural Processes in Design Passive Systems (Natural Efficiencies) Economy of Resources & Material Compost Resource Conservation and Efficiency Reducing Water and Air Pollution Habitat Conservation Farmland Wetland and Forest Preservation	Urban Agriculture Human-Powered Living (Transit-Oriented, Human Scaled) Educational Programming Circulation School System Local Politics Local Economy Dynamics Environmental Laws or Ordinances Urban Design, Zoning Historic, Cultural, Environmental Overlays Comprehensive Planning DEsign Guidelines Low Impact Development Food Growth
1st level	**E1: BODILY WELL-BEING** *Somatic Realities, Bodily Senses* *felt experience of the natural world as it occurs within the lived body eco-phenomenology, eco-embodiment, architectural phenomenology* body feelings: physical sensations; archetypal responses; experiences of delight, comfort, health and well-being: Experience the life-giving abundance of nature and its gifts of food, water, light, air, earth, and fire.	**C1: Communion** *Communion, Intercorpereal Dimensions* *cultural practices that create shared somatic experiences in relationship to the natural world* shared cultural practices: rituals; symbol systems; place-based relationships, symbols	**B1: BENIGN FORM** *Movement, Phsycial Movements* *physical behaviors that are connected to natural world and natural dynamics of exterior process; physical and life sciences; new biology; wilderness skills; environmental illness and pollution* physical behaviors: Natural forms and benign materials, healthy environmental conditions	**S1: BENIGN COEXISTENCE, Environmental Fitness** *Interactions: Natural Systems* *measurable exteriors of natural systems; functional fit of systems; ecological sciences; systems and complexity sciences; planetary ecology; biodiveristy and species extinction; permaculture and gardening; food and agriculture* Natural systems: ecological impacts and fitness of architecture; bioregional and contextual response; complex building systems integration; Contextual, natural fitness building systems integration
Design Elements + Attributes	Providing Physical Nourisment ...Comfort and Security ...Natural Richness and Sensory Variability ...Healthy Environments ...Humane Environments ...Human Scaled Environment Exposure to Nature	Indigenous Materials Vernacular Techniques Historical Connections Geographic-Ecological Connections Defining Landscape Features Meaning of form languages	Natural Materials (Kellert, LBC, LEED): reveals the organic processes of aging, weathering, and other dynamic features; patina of time; movement of nutrients and energies through natural systems (Kellert) Natural Shapes & Forms (Kellert): Environmental Features (Kellert): Views and Vistas: exterior views; Façade Greening; Animals; Plants; Sunlight; Water; Color; Geology & Landscape; Habitats & Ecosystems; Fire Natural Imagery (Kellert) Daylight (Kellert, LBC, LEED) Natural Ventilation	Building Systems-Site Integration Siting and Orientation Landscape Ecology & Hydrology Ecological Dynamics and Cycles On-site Ecosystem Restoration Site Remediation
Site Conditions (Negative)	**Personal-Alienation from Nature and Community of Life**	**Cultural Fragmentation and Disconnection from Nature**	**Destructive Behaviors**	**Systemic Degradation**
IETF Site Requirements (Negative Condition)	**E:** Personal Alienation from Nature.	**C:** Placelessness and Cultural Disconnect	**B:** Destructive Functions and Activities	**S: Systemic Degradation**
Site Attributes (Negative)	3: Placelessness, Apathy 2: Psychological Distress, Depression Quality of Life Issues 1: Environmental Health Risks & Illness Lacking Access/Contact with Nature Hunger	3: Consumerism, Materialism, Indivualism 2:Unsustainable Lifestyles; Lack of "Living" LEED Buildings; Lack of Green Legislation; Social Unrest-Historic Tensions 1: Lack of Cultural Representation; Vandalism & Litter	3: Degraded Landscape; Habitats Destructions, Biodiversity Loss; Low Biocapacity; 2: High Consumption & Wate Generation; Inefficient Structures 1: Pollution, Contamination; Lack of Environmental Features; Emissions	3: Destructive Industry and Economic Systems; Natural-Urban Disconnectivity, Urban Fragmentation; 2: Auto-Centric Development; Food Deserts & Food Insecurity; Urban Bifurcation; Poverty 1: Regional Pollution & Contamination; Habitat Fragmentation

ACTIONS	DESCRIPTION	RELATED	*Biophilic Attributes*	E	C	B	S	EXAMPLES	SOURCES
IE Foundations									
ATTENTIVENESS	Awareness, bodily access to and sensory experience; "SERENE" attentiveness, present	INTROSPECTION	curiosity & enticement; exploration & discovery; change & metamorphosis	X					EC, EV
CARE & PROTECTION	Protection of Nature (wildlife), with understanding, compassion, love; protect the rights of people		affection & attachment		X	X			LS, EC
CARE-TAKING	responsible management; custodianship, stewardship, environmental responsibility	NOURISH; CULTIVATE; PROTECTION	mastery & control						LS, EC
CELEBRATION & GRATITUDE	Active Appreciation, Giving Thanks, Festivity, Praise	WONDER & AWE; COMMUNION		X	X				LS
COMMUNION	Gathering, embrace, solidarity, interpersonal relations, social interactions, intercorporeal	SHARING	affection & attachment	X	X				LS
CULTIVATION	Growing, nourishing the Earth; producing natural Goods/natural bounty		mastery & control	X		X			LS
DISCOVERY	Exploration, Understanding, Learning, "Ecological Conversion", Sensory Indulgement		Exploration & Discovery; Information & Cognition; order and complexity; curiousity & enticement	X					LS, EC, SK
DWELL	Live, habitual activites; needsd of everyday life; Adopt lifestyles emphasizes quality of life, over consumerist and materialist desires	SIMPLICITY & PRESENCE	security & protection;						
EDUCATION	Understanding, Learning, promote the exchange of knowledge and increase ecological and sustainability literacy among communities	DISCOVERY; INTROSPECTION	exploration & disovery	X			X		LS, EC, SK
EMPOWERMENT	Developing gifts and talents, protect and provide employment options, participatory, just, sustainable, peaceful democratic societies; JUSTICE	SOLIDARITY		X	X		X		LS, EC
GROWTH & HARMONY	Balanced growth, Harmonious wholes, growth in richness and diversity	CULTIVATION, RESTORATION, HARMONY, BALANCE				x	x		LS, SK
HOSPITALITY	sharing with one another, gratituitousness, generositiy	Welcome							
HARMONY & PEACE	Promote the common good, inner peace and peace with our neighbors, all life, and with God	SOLIDARITY	affection & attachment	X	X	X	X		LS, EC
INTROSPECTION	Contemplation, Meditation, Reflection, Relaxation, being present, finding inner peace	WONDER; ATTENTIVENESS; PEACE	reverence & spirituality	X					LS, EC, EV, SK
NOURISHMENT	To nourish and be nourished; care for; grow; feed		security & protection;	X	X	X			LS,
PARTICIPATION & PRACTICE	Cooperation, unity; active responsibility	SOLIDARITY		X	X			in building mgmt; in site mgmt; in gardening; in sharing resources	LS, EC, EV
PRUDENCE & SELF-DISCIPLINE	Moderation; Modest Living, Personal maturity, Gratitude, Self-Discipline, Non-consumerism, return to simplicity; prudent consumption (reduce, reuse, recycle, upcycle), act with restraint and efficiency	SIMPLICITY & PRESENCE		X	X	X	X		LS, EC
RESPONSIVENESS	ability to internalize knowledge to act in accordance			X					LS, EC
RESTORATION	Improve, regenerate, grow, nourish	NOURISH; CULTIVATE	mastery & control			X	X		LS, EC
SHARING & GRATIUTITY	communal life and participation of individuals, capacity for living together and communion	COMMUNION			X				LS
SIMPLICITY & PRESENCE	Adopt lifestyles emphasizes quality of life, over consumerist and materialist desires; material efficiency		dwell	X	X				LS, EC, EV
SOLIDARITY	Sharing in common good; Shared flourishing and suffering, unviersal destination of goods								LS
WELCOME	welcoming others, gathering	hospitality; celebration							
WONDER & AWE	Active appreciation, reflection	CELEBRATION & GRATITUDE; DISCOVERY	fear & awe, reverence & spirituality; attraction & beauty	X					LS, SK
Biophilic Attributes			Prospect and Refuge	X					LS = Laudato Si
			Order & Complexity	X					EC = Earth Charter
			Curiousity & Enticement	X					EV= Ecological Virtues
			Change & Metamorphosis	X					SK= Stephen Kellert, Biophilic Design
			Security & Protection	X					
			Mastery & Control	X					
			Affection & Attachment	X					
			Attraction & Beauty	X					
			Exploration & Discovery	X					
			Information & Cognition	X					
			Fear & Awe	X					
			Reverence & Spirituality	X					

Geography

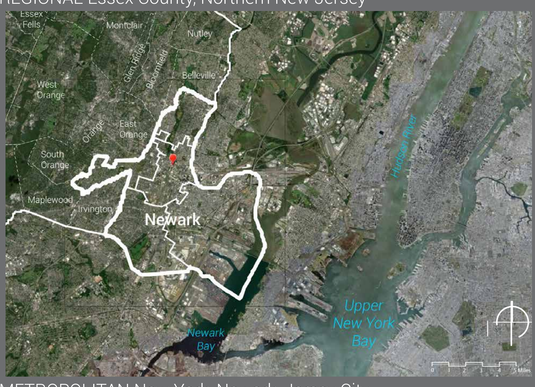


INTERNATIONAL Eastern Coast, United States

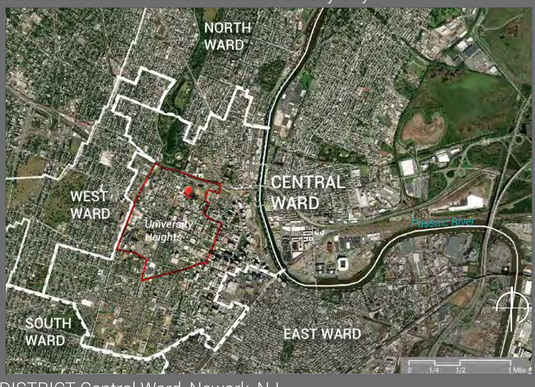


NATIONAL New Jersey, Coastal Mid-Atlantic, United States

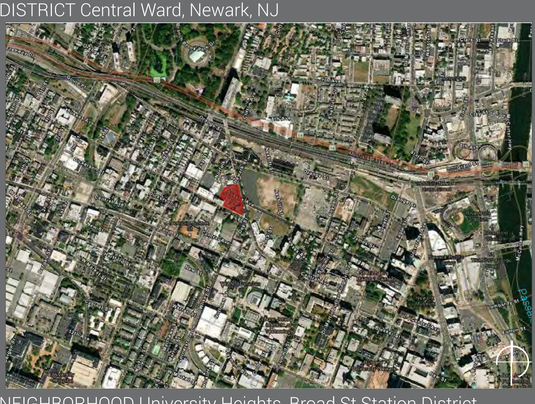
REGIONAL Essex County, Northern New Jersey



METROPOLITAN New York-Newark-Jersey City



DISTRICT Central Ward, Newark, NJ



NEIGHBORHOOD University Heights, Broad St Station District

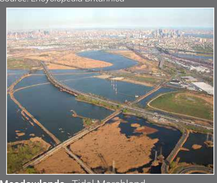
Appalachian Mountains
Source: Getty Images

Atlantic Ocean
Source: Encyclopedia Britannica

Eastern Deciduous Forest
Source: Encyclopedia Brittanica, Wikipedia, NPS.gov,

Northern Piedmont (Sourland Mtns)
Source: Stavislost.com

Palisades- Bluffs
Source: Encyclopedia Britannica



Meadowlands- Tidal Marshland
Source: The Architect's Newspaper

Hudson River + New York Harbor
Source: Encyclopedia Brittanica, Haikai Magazine

Passaic River
Source: Wikipedia.com

Passaic River Basin (Great Falls, Paterson)
Source: Montclair.Edu

Newark Bay
Source: Wikipedia

Passaic River, Newark Riverfront
Source: Flickr, Hector.org

Newark Riverfront Park
Source: MAST Construction

Branch Brook Park
Source: Rhodeside & Harwell, Essex County Planning

Location Overview

LOCATION	40.72 N, 74.18 W
ELEVATION	0'-230' (13' avg), 100' (SITE)
ORIENTATION	26.59 deg, NE (SITE)
CLIMATE ZONE	ASHRAE 4A Mixed Continental Humid
ECOLOGY	Eastern Temperate Forest (EPA) Eco Region Northern Piedmont, Triassic Anthropogenic Biome: Urban, High-Density, High Intensity Land Use
HYDROLOGY	Passaic River Drainage Basin Lower Passaic Water Management Nature Drainage flows from NW to SE
ANTHROPOGENIC BIOME	Urban High-Density, High Intensity Land Use (KEY ISSUES: Water/Air/Land Pollution from Traffic/Industrial Processes, Heat Island Effect, Impervious Surfaces)

Site Overview

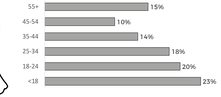
ADDRESS	NESBITT ST & SUSSEX AVE, NEWARK, NJ UNIVERSITY HEIGHTS NEIGHBORHOOD BLOCK 2853, LOTS 1.02, 57, 59, 60
OWNER	City of Newark
SIZE	1.66 ACRES- 72,000 GSF
EXISTING CONDITIONS	Vacant Lot, Brownfield Environmental Contamination
USES ZONING	Parking/ Auto-Industrial Use, Tire Store, Guard Booth RDV: Broad Street Station District Redevelopment Plan Baxter Nesbitt Residential Neighborhood Moderate Density Housing: 14-30 units/acre Lot Coverage: 55%, or 39, 600 GSF

	S *Strengths*	W *Weaknesses*	O *Opportunities*	T *Threats*
EXPERIENCE	• Proximity to **spiritual spaces** (New Hope Baptist Church)	• **Public Safety & Quality of Life Concerns** • **Placelessness & Hostile Streetscapes** • Lacking Access to Healthy Food • Lacking Access to Natural Spaces	• Create an "oasis" of natural vitality (nourishment, beauty) • Educational/intellectual engagement	• **Solastalgia,** or environmental distress, coinciding with gentrification
CULTURES	• Religious communities • School and university communities, educational values	• Stigma of area around Baxter Terrace • Historic Struggles with Social Inequity and Instability ("white flight", race riots, urban renewal history) • Lack of "Living' Buildings	• **Urban Agriculture:** Tap into growing movement of community gardens • **Sustainable Education:** Community-based initiatives (GNC, SWAG, etc.) • **Institutional Supports**: from spiritual and educational groups	• **Gentrification** of Area and risk of losing residents • **"Clean Slate" Development** & Losing Historic and Cultural Character of Place
BEHAVIORS	• **Temperate Climate** • Corner Site • No towering buildings, minimal shade	• **Widespread Land Degradation** (Site is Under Environmental Investigation) • **Vacant & Abandoned Properties** • **Lack of Public Open (Green) Space**	• Evoke landscape and ecological connections of forests, Passaic River, Branch Brook Park • Southern Exposure for solar gain	• Proximity to Arterial Streets and Rail (Noise/Traffic/Pollution) • Windward Exposure • Potentially contaminated site
SYSTEMS	• Proximity to Educational and cultural institutions • Proximity to health services • Proximity to Public Transit (rail, bus, LRT)	• **Low Residential Density** • **Urban Environmental Hazards** (Air Pollution, Contaminated Water, Heat Island) • **Widespread Lack of Biodiversity & Habitat** • **Socio-economic Vulnerability** (High Poverty, Food Desert, Crime) • **Barriers** to Branch Brook Park (I-280 & Rail) • Urban Fragmentation and discontinuity	• **Transit-Oriented Development** (Broad Street Station) critical, but underutilized transit hub within 0.5 mi.; bus stations; LRT • Historic Fabric: nearby historic district and buildings; Newark's history of innovation and invention • Connection to **Greater Newark Conservancy** & Gardens • Connection to **Broad Street Redevelopment Plan**	• Worsening climate change and unpredictability • Rapidly changing development and industrial landscape

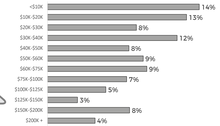
DEMOGRAPHIC PROFILE

Population **11,500** people

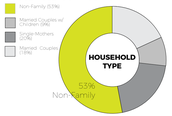
AGE DISTRIBUTION



HOUSEHOLD INCOME DISTRIBUTION

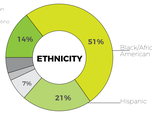


HOUSEHOLD COMPOSITION



53% Non-Family Households
47% Family Households

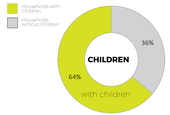
Median Age **29.7** years *University Heights*
33.7 years *Newark*



Median Income (2016 Census) **$29,591** *University Heights*
$31,100 *Newark*

Poverty Rate (HH Below Poverty Level) **35.5%** *University Heights*
28.3% *Newark*

Unemployment **10.7%**



64% Households with Children
47% Households without Children

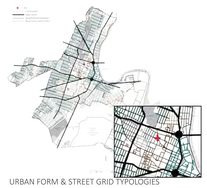
Site Analysis **Newark, New Jersey**

Sussex Avenue, Broad Street Station District
University Heights

MACRO: City

BASE MAP & CITY DISTRICTS

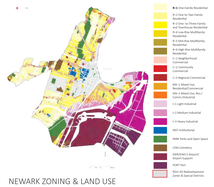
TRANSIT & CORRIDOR NETWORK



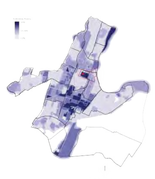
URBAN FORM & STREET GRID TYPOLOGIES

NATURAL FEATURES & TOPOGRAPHY

ACCESS TO PARKS & RECREATION

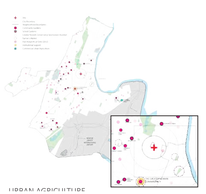


NEWARK ZONING & LAND USE



POVERTY RATE (2014)

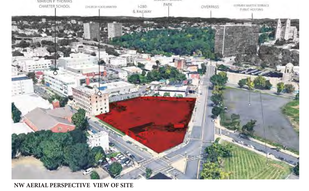
FOOD OUTLET DENSITY (2014)



URBAN AGRICULTURE

NE AERIAL PERSPECTIVE VIEW OF SITE

SE AERIAL PERSPECTIVE OF SITE



NW AERIAL PERSPECTIVE VIEW OF SITE

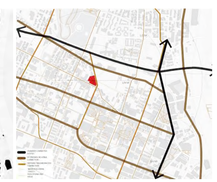
SW AERIAL PERSPECTIVE OF SITE

MEZZO: District

BASE MAP: NEIGHBORHOODS & STREETS

TRANSIT NETWORK

FIGURE-GROUND

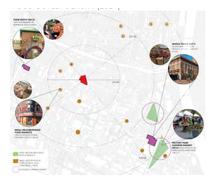


STREET HIERARCHY

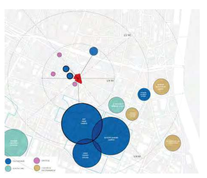
ACCESS & BARRIERS TO NATURE

NEWARK ZONING & LAND USE

PROXIMITY TO SCHOOLS

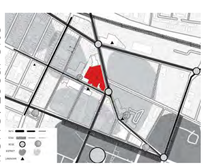


ACCESS TO FOOD OUTLETS & HEALTHY FOODS



INSTITUTIONAL & COMMUNITY ANCHORS

MICRO: Local Site



LANDMARKS, EDGES & NODES

LOCAL TRANSIT CONNECTIONS

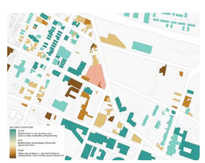
AXES & COMPOSITION

STREET HIERARCHY & PEDESTRIAN ACTIVITY

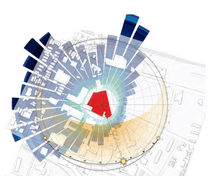
LANDSCAPE & VEGETATION

EXISTING LAND USE

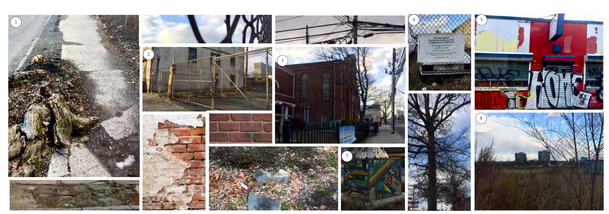
RESIDENTIAL TYPES



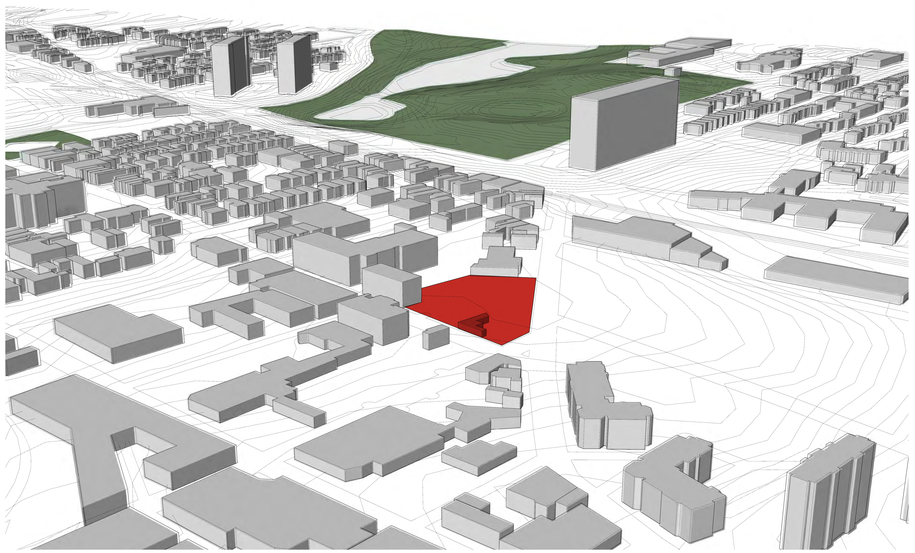
BUILDING CONDITIONS



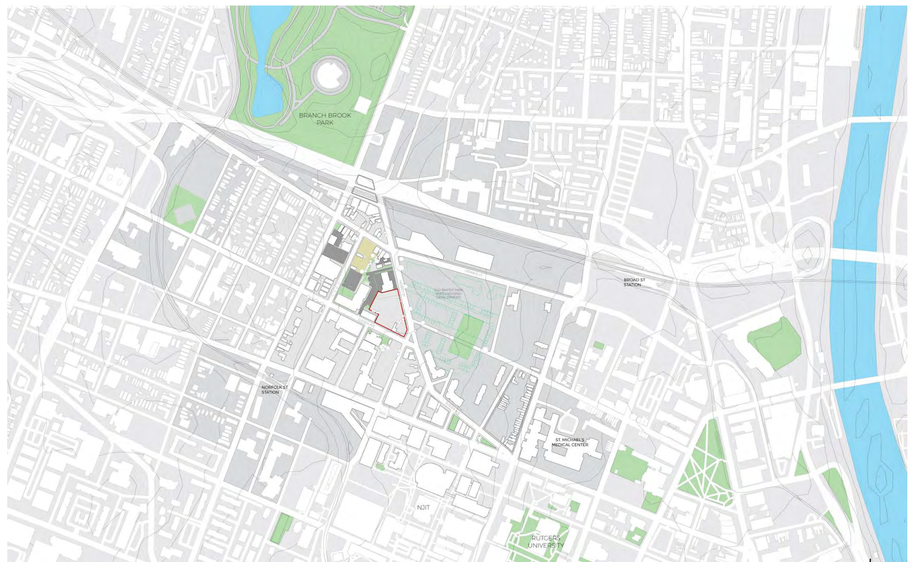
SUN/WIND ENVIRO



MATERIALS AND SITE EXPERIENCE



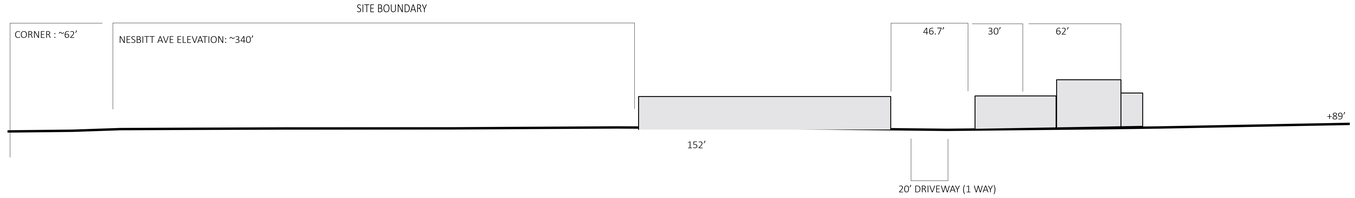
AERIAL PERSPECTIVE OF SITE, LOOKING NE



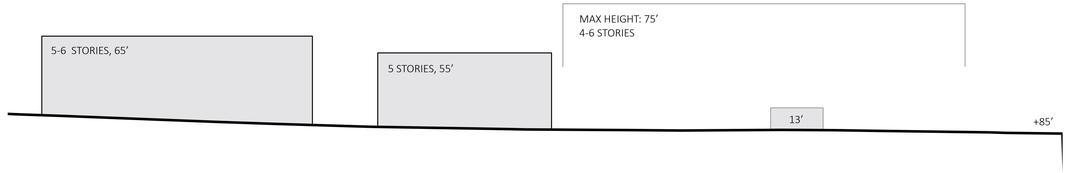
CONTEXT SITE MAP 1:100

EXISTING SITE PLAN 1:50

SECTIONS



NORTH-SOUTH SECTION THROUGH SITE



EAST-WEST SECTION THROUGH SITE

ELEVATIONS

NESBITT ST ELEVATION

SUSSEX AVE ELEVATION

STREET VIEWS

VIEW LOOKING OUT FROM SITE, NESBITT ST

VIEW LOOKING OUT FROM SITE, SUSSEX AVE