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TRANSGRESSING SCALE

Architecture and nature: ECO Station, War Island, Belgrade

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ABSTRACT

The aim of this paper is to investigate the potentials of utilizing the notion of scale as a methodological tool during a process of architectural design. This design method is exercised through a framework of *Architecture and Nature* design studio, within the program of undergraduate studies, Faculty of Architecture, University of Belgrade.

The major architectural challenge was the issue of scale of a design (micro) in relation to the scale of the context (macro), proposing micro design as macro concept, the overall significance of concurrent perception of the whole and its parts.

The proposed design method is based on simultaneous design procedures in opposing scales. In architectural design, scale is commonly perceived as a mere tool for optimizing and communicating the project.

During the course of design process, answers for each architectural question are searched for in the scale of the context (a network - topography), as well as in the scale of a detail (a dot - element). Within such a framework, students were expected to give a proposal for localized programmatic and spatial intervention that, as an impulse point, has the potential influence on and affects the ground of the overall context of the War Island.

Keywords: architectural design, scale, micro-macro, nature, education

1. INTRODUCTION

Nature is a lot more than just a site for architecture. Architectural education is a lot more than just learning about existing projects and methods of design. Through questioning the ways in which architecture and nature can be used to their full potential without being detrimental or destructive to each other, architectural education should lead towards socially responsible architect (Djokić, Nikezić and Janković 2014) and simply good and sustainable architecture, as Soria-Lopez (2006) argues, that satisfies simultaneously all dimensions: logical (scientific, technical, functional), ethical (protection, low impact, good use) and aesthetical (beauty, meaning, emotion). In that, project proposal becomes a means to achieving better quality of the context as a whole, not just a goal in itself, just for architecture or nature. The new overview of the territory holds the promise of a new, accurate tool that can greatly simplify and inform the process of design. Despite this, the view from beyond is not merely a utilitarian device, but possesses the poetics of discovering new landscapes and perspectives (Stamenović, Predić and Ereš 2015).

This topic has been explored in the framework of the **Architecture and Nature design studio**, within the program of undergraduate studies (3rd year of studying) at the University of Belgrade - Faculty of Architecture. The studio is based on understanding the complexity and stratification of the interaction between man and environment, through the disciplinary framework of architecture and design process in particular. The aim of the curriculum is focused on developing critical thinking related to design process in a complex spatial and programmatic framework. These education strategies are part of the wider research conducted at the University of Belgrade - Faculty of Architecture with the main scope on situating an architectural intervention in different landscapes (Djokić, Nikezić and Janković 2013; Nikezić and Janković 2012). Having this as a research problem, during one semester, students were invited to give proposals for a specific program of “eco research station” and its positioning in the context of *War Island* (protected natural preserve) inside of Belgrade city area.

The main question was: by which means nature, as a starting premise, affects the process of architectural creation, where landscape is observed and *translated* as an appropriate tool for thinking about architecture. Having in mind that human behavior and actions influence the structure and function of natural surrounding by making a new “cultural landscape” (Longstreth 2008) it is necessary to reconsider the position, scope and program of the architectural intervention and its influence in the wider scale of the location. This line of thinking helped students to shift their understanding the landscape as a contact between our feet and the ground towards thinking about a meeting of our being with the whole natural environment (Van der Laan 1983). Therefore, a new architectural paradigm oriented this way (Nikezić and Janković 2014) should promote resilient design that joins architecture with nature in order to make a unique place-based system in which landscape is neither context nor background, but rather its inherent, structural element.

Having this for the task and working in this kind of the context **the major architectural challenge was the issue of scale** of a design (micro - architectural intervention) in relation to the scale of the context (macro - nature), proposing micro design as macro concept, the overall significance of concurrent perception of the whole and its parts. Based on that as an experimental field this paper aims to **investigate the potentials of utilizing the notion of scale as a methodological tool during a process of architectural design**, taking into consideration both the process of education and architectural practice of acting in a natural environment.

2. INSTRUMENTALISATION - OPERATING WITH SCALE: Non-linear focusing in the process of (architectural) design

The curriculum of Architecture and Nature design studio, within the program of undergraduate studies at the Faculty of Architecture, University of Belgrade, is based on understanding the complexity and stratification of the interaction between man and environment, particularly considering the potentials of the relationship between man and nature, through the disciplinary framework of architecture and design process in specific. The aim of the curriculum is focused on developing critical thinking related to design process in a complex spatial and programmatic framework. Having this as a research problem, during one semester, students were invited to give proposals for a specific program of “eco research station” and its positioning in the context of *War Island* (protected natural preserve) inside of Belgrade city area. The biggest architectural challenge is the scale of a project in relation to the scale of the context.

During the course of the Design studio in question, the scope is placed on the analysis of the architectural design process, or procedure as such. In each process of design, the manipulation of place, space and programme is the core of the task (Steenbergen 2008), but designing does not always play the

same role. Does the role of design decrease if the assignment scales towards the vastness of the landscape, or is it merely the nature of the structure that changes? This raises the question to which extend the architectural design instruments are applicable in the scale of the landscape?

2.1 Notion of scale in the Process of Architectural Design

In architectural discourse, scale refers to the size of an object, in relationship to another object, in this context perceived as separate autonomous entities (whole). In architecture, and respectively, in other complementary disciplines, the relationship in size between an object and the human body is perceived as significant. In experiencing the scale of architectural space, one tends to compare it anthropologically. Therefore, the notion of scale can be discussed as a relative property of an object or architectural space, in reference to individual perception and interpretation. Nevertheless, in this particular scope, the question of the scale of the landscape becomes ambiguous; does landscape have an outline in architectural sense of the word?

Appropriating the concept of scale mentioned above, conveyed design methodology can be addressed on two planes: the internal/integral plane of the design process, and the relational plane of the project adaptability towards the contingencies of the natural environment. The causal relation between these two planes is articulated in opposing scales. This notion was introduced to the design methodology as a solution for operating throughout the whole process of architectural design, towards even detailing, without losing the overview towards the landscape.

2.2 Notion of map in the Process of Architectural Design

The inability of the conventional instruments of representation to cope with design problems in a natural environment, which are not attainable in a still spatial image, rather in the continuous rhythm of changing events and the process itself, points to the need to transgress the framework of planar graphics towards techniques that can become research tools which primarily focus on the process, rather than the image.

2.2.1 Diagram as a Mapping Tool

Whether it is understood as the initial idea of a complex system that architecture solves (Vidler 2000), as an abstract or the substance of the project (Ito 1996), or as an act of creating shapes in architecture (Eisenmann 1999), diagram is a communicator which holds a unique duality; diagram references the generic and specific plane simultaneously, enabling the architect-researcher to always be able to think outside of rigid boundaries of program and space, so to indisputably include all external, borderline influences in the process of spatial creation, at all levels of thought (unique to the diagram is its capacity to integrate non architectural domains of knowledge into the architectural design process). It communicates both internally to the discipline and externally to new research fields, structuring relationships in between the two, and acting as information channel.

Freed from the formal relation towards the structure, freed from the explicit scale, with no obligation to represent form and shape of architecture, diagram becomes the ideal instrument for thinking architecture (Koolhaas 1992). Therefore, the diagram as a specific graphical tool that has an essentially generative component (Lynn 1995) capable of abstracting any external influence and internalizing it into the architectural process.

2.2.2 Digital simulation and Transparency of Scale

Hyper-real, graphically accurate simulation of terrain in software such as *Google Earth*, if considered as a contemporary mapping tool, offers a new set of possibilities for architects, and a wider scope towards their primary subject of desire: the surface (as a construction ground), giving architects a sense of expansion. Expansion in this sense again raises the notion of scale, with regard to new possibilities of a boundless surface. New transparency of scale, distance and topography has therefore enabled a wider scope for architecture (Stamenović, Predić and Ereš 2015). This view from beyond, the elusive scale of satellite imagery today is established as an interactive digital instrument for architectural design and the landscape in particular.

Having in mind the new digital accessibility of territory enables us to easily zoom into the detail of design, and in the decisive moment, zoom out towards the landscape, only to zoom in again, repeating the iterations whenever needed. Every scale shift provides new outlook towards the design, and also towards the landscape, therefore making the process sensitive towards the context, and putting the design product

and the landscape in a cohesive relationship. The rhythm of scaling relies on procedures for partial seeing: scoping, rescaling, extending and reducing the material features of scale models (Yaneva 2005) .

By the use of these mapping tools (diagram and digital simulation), as instruments of communication, and a medium for the exploration of spatial relationships, new possibilities and borderline values of connecting nature and architecture are emerging, which, on different levels, result in changes in the character of the landscape itself.

In this way, these project-mapping techniques are used as reflective tools in the field of architectural education, which enables the architect-researcher to identify, abstract and pinpoint a specific problem, object or idea, while remaining comprehensive.

By using notion of map and notion of scale within the architectural education design process a mapping-based research methodology was created. This kind of methodology provides:

- . Synchronization of general and specific references of the problem;
- . Accessibility of a diverse field of external information that architect must understand and format;
- . Interpretation of the thinking process as a means of communication and
- . Spatial performativity.

3. LOOPING PROCESS: SCALING BACK AND FORTH AS A DESIGN STRATEGY

"God is in the detail." - Mies van der Rohe

The proposed design method is based on simultaneous design procedures in opposing scales. In architectural design, scale is commonly perceived as a mere tool for optimizing and communicating the project. However, **employing the scale through** mapping techniques mentioned earlier can be used during the process of architectural design. Students were conducting research through *zoom-out* and *zoom-in* scales simultaneously; making an overview and contextualizing the assignment, while at the same time zooming into the specific aspects of the program, searching for the clues from within the structure itself.

In the scaling venture, two alternative states of the project are simultaneously achieved and maintained: of being 'less-known', abstract and comprehensive; and a state of being known', concrete and detailed (Yaneva 2005). After multiple up and down transitions between small- and large-scale scopes, the building emerges, becomes visible, material real. These scaling trials bring the relationship between the landscape and architecture tangible and organic.

During the course of design process, answers for each architectural question were simultaneously searched for in the scale of the environment (a network - topography), as well as in the scale of a detail (a dot – an element). Within such a framework, students were expected to give a specific proposal for localized programmatic and spatial intervention that, as an impulse point, has the potential of spreading its impact on the grounds of the overall context of War Island.

Students' results:

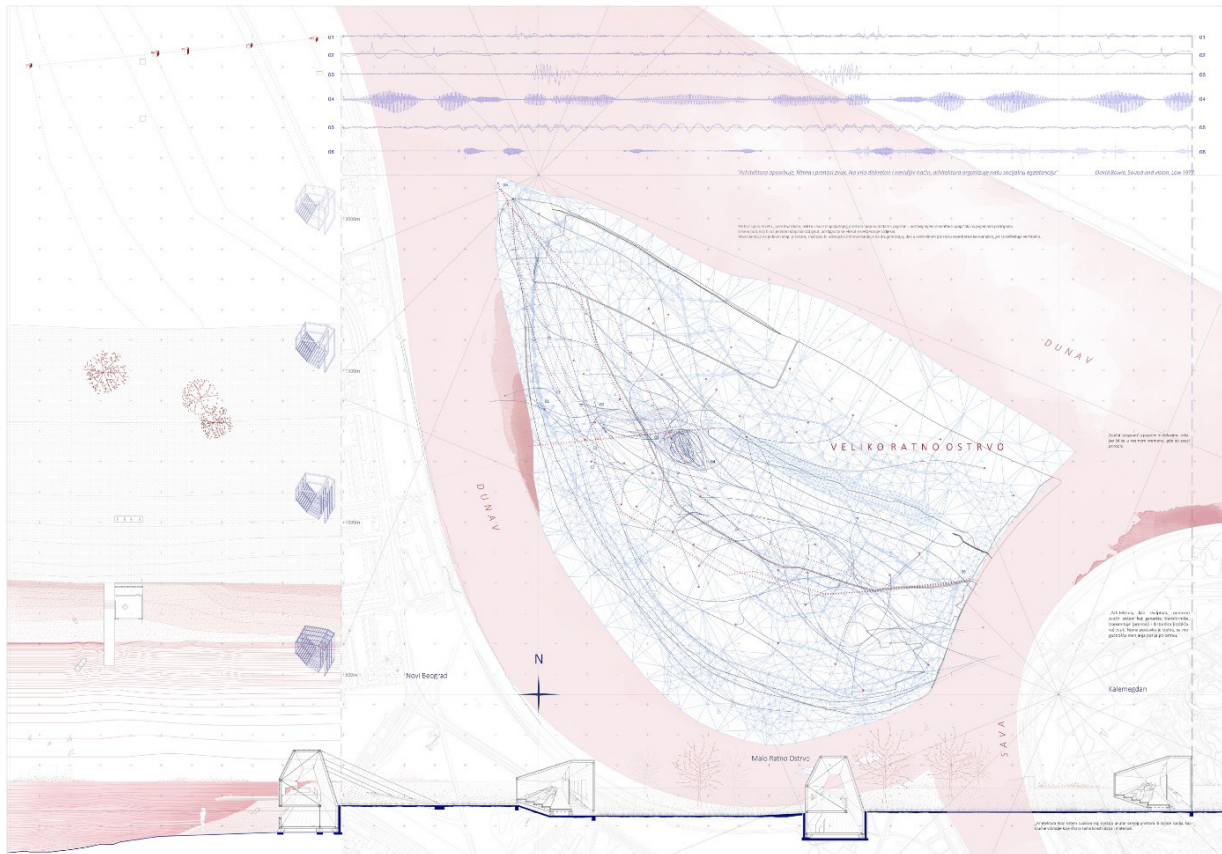


Photo 1. Sensing space (student: Ema Vasiljević)

Sensor sensitive design and site-specific distribution of a network of *sound collectors* within the specific field of War Island. Through processes of scaling and mapping synchronization of general and specific references of the problem and spatial performativity were singled out. The extreme scales of the project, one in direct relation to man and the other related toward the territory of island, were intertwining through sound map. In that way positioning of sound collectors were not random, but structured according to the network of War Island sounds.

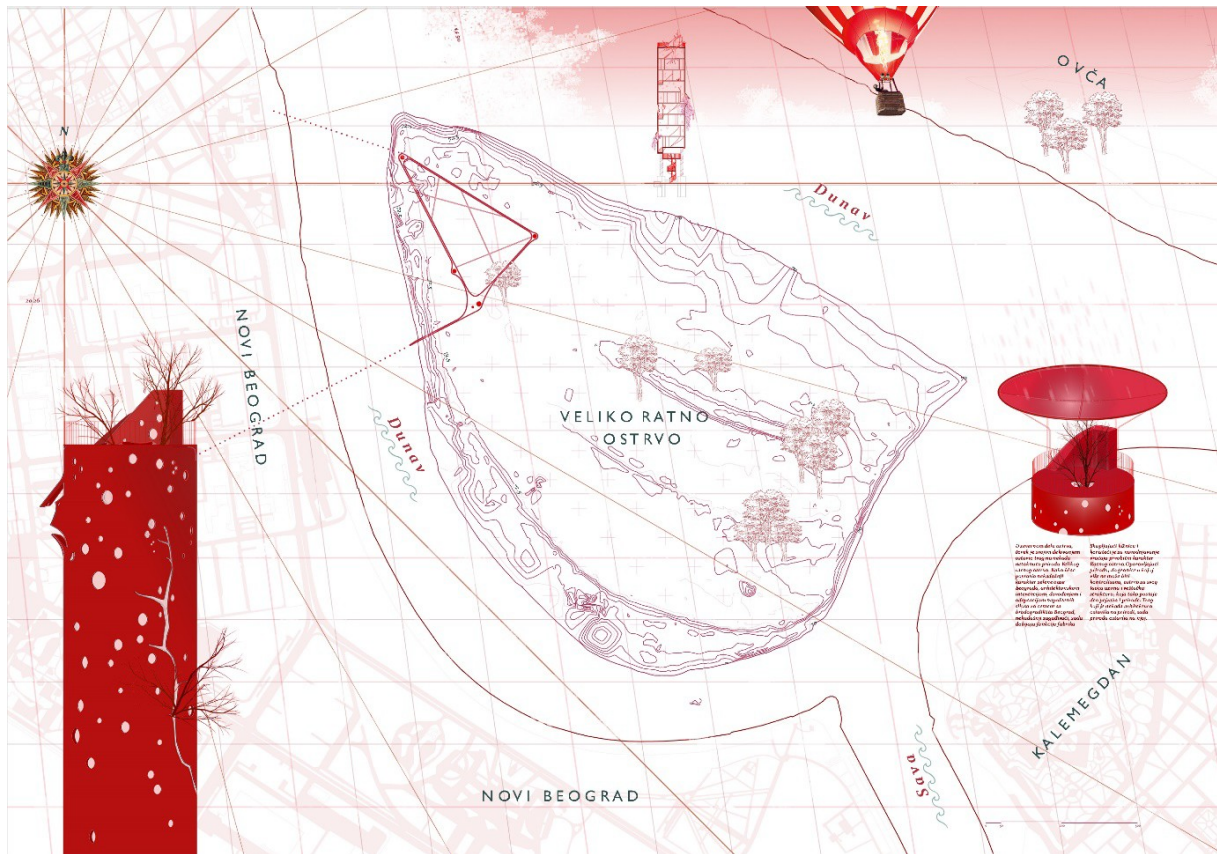


Photo 2. Appropriating the urban context (student: Kosta Dimitrijević)

By transporting and translating abandoned elements from the urban structure of Belgrade and introducing them into a natural environment a scenography for a new (fourth) nature was created. In that way War Island becomes a new point on the cultural map of Belgrade – viewpoint, observation deck, tower, periscope, etc. Through processes of scaling and mapping the accessibility of a diverse field of external information the architect must understand and format was evident. This was possible only through the interpretation of the thinking process as a means of communication in-between War Island and the overall structure of Belgrade.

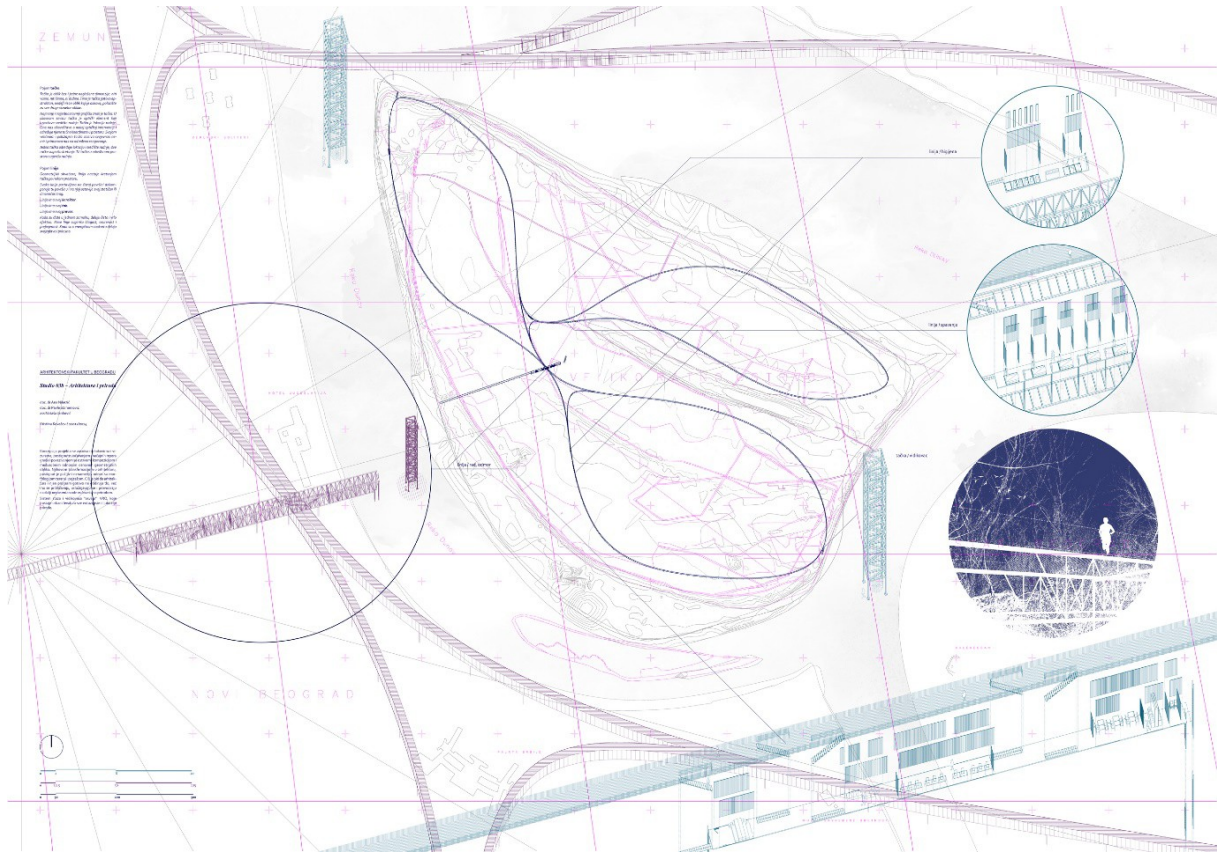


Photo 3. Structuring the artificial landscape (student: Kristina Kovačević)

By tracing the paths of War Island a new infrastructure for the landscape was formed. Through processes of scaling and mapping general and specific references of the problem were synchronized through specific program and distribution of the structure. The activation of traced paths resulted in a new spatial performativity of the War Island.

The results vary from inspired associations to creative dialogues, from designs that complement the environment to those that contrast nature. Although the diverse concepts have produced a series of diametrically different solutions, they are all very sensitive to the context of the Great War Island. Proposals for architectural interventions vary in terms of disposition, size, specific program thematisation and the scope, but however they are united in terms of complementing the materiality and sensuality of the place by proposing resilient design in order to relate designed structure to the natural environment.

The majority of students' projects accepted a new way of thinking where scale and map were used as a means of communication with the projects itself and in-between different project design. It has been noticed that spatial performativity rose both in respect to the structure of the project and towards relation to the context. Under the influence of looping as a process of architectural design external resources were successfully were integrated into the concept of architectural design. The main focus of the project shifted from figurative to structural - building a system instead of a form.

4. CONCLUDING REMARKS

New paradigms in architectural education should include all the complexity of the environment as a resource, where nature together with architecture makes a unique place-based system in which it is not the context or background, but its structural component (Djokić, Nikezić and Janković 2013). Based on the interpretative potential of the given spatial and methodological framework, the proposed projects differ in terms of disposition, size and specific thematization of the program framework, but they are united in a high degree of sensitivity towards the natural characteristics of the location, where architecture is seen as an infrastructure that is base (groundwork) for a new sensitive landscape of The Great War Island.

Summarizing results, it can be concluded that it is necessary to redefine the relationship between architecture and nature, as well as examining the potential of transgressing the scale between the size of the architectural intervention and its possible field of influence. Concerning this, certain conclusions have been drawn:

1/ **the relationship between architecture and nature has been changed.** Regardless of its static nature, the role of architecture is to redefine its relation both to the context and its user. Interpretation of the thinking process as a means of communication

re-examined the scope of its possible impact towards the environment;

2 / **it is necessary for the process of architectural design to be "elastic" and "resilient".** Through exploring a diverse field of external inputs and influences of a specific place in the narrow sense, as well as the possibilities of various influences on the wider environment, the material and sensitive properties of architectural intervention are changing.

3 / **the focus of the intervention is neither on the nature nor on the architecture.** Sensitive landscape is shaped through the operation of architectural intervention in relation to the overall complexity of the context, whereby the size of the intervention and the fields of action do not have to be proportional - it is possible to achieve a "big" impact through a "small" intervention.

The experience drawn from this Design Studio shows four foundational points that this methodology brings:

1. Self-conscious educative process where students become capable of correcting their own concepts in the process of design;
2. Keeping the concept plausible in large and small scale;
3. Synthetisation of thoughts through rhythmic scaling up and down of the project;
4. Self-reflective thinking as one of the major goals in respect of research by design methodology.

The contextuality of an architectural project therefore takes on a new, more complex sense in light of proposed techniques. The new overview of the territory holds the promise of a new, accurate method that can greatly simplify and inform the process of design. Despite this, this approach is not merely a utilitarian device for design, but possesses the poetics of discovering new landscapes and perspectives in the field of architecture. The territory of the planet is once more a field of exploration; using holistic apparatus for surfing over scales and datascares, this exploration has no borders for obstacle (Stamenović, Predić and Ereš 2015).

The aim of this work, as well as the selected program, location and applied methodologies within the design studio, aims to inform and supplement the conventional practice of architectural education (and future practical work) of a socially responsible architect (which also implies other forms of responsibilities (Nikezić and Janković, 2014)). The educational process based on understanding of, accepting of and active involvement with the environment direct towards resilient design and sustainable context.

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