



Five levels of soundscape design

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ABSTRACT

Siebein (2010 and 2013) identified five levels of architectural soundscapes: inspiration; planning; conceptual structure; tectonics; and detail. Diagrammatic explanations of the levels are presented to illustrate how architects often use inspiration and planning metaphors to begin the design of a building. A conceptual structure is the underlying set of principles and ultimately geometries that form the basis for the intellectual and formal aspects of the project. Tectonics are the elements that form the architectural system that the soundscape occurs within. Details are the connections among the tectonic elements that support and express the inspiration and the conceptual structure of the project. The diagrams illustrate how these levels define places in the design process where soundscape theory can be effectively implemented. This is an effort to place soundscape theory as an integral part of the creation of architectural space. The diagrams provide a working model for the creation of architectural spaces with designed soundscapes. They also point the way towards an integrated, participatory design process for buildings. These are parts of the process that are philosophical and abstract in nature where one seeks the poetic expression of the essence of the project prior to the beginning of traditional design.

1. INTRODUCTION

There has been significant research conducted in soundscape principles and practice since Southworth (1967) and Schaefer (1979) first discussed the idea. Standards have been developed to assist researchers and practitioners in the processes of data acquisition and analysis. One of the questions that is being explored is what can be done with soundscape analysis techniques to improve the process and quality of the built environment. How can the lives of people be improved by soundscape techniques? How can the ideas about soundscapes be incorporated in the conception, design, construction and occupation of architectural spaces? This paper addresses five ways that soundscapes can possibly contribute to the design process of buildings, urban spaces and natural areas. The five levels are intended to be a possible framework for consideration, exploration and application by those involved in planning, design, construction and post-construction activities of buildings and environments. They represent a working hypothesis and as such are intended to be tested, adjusted, revised and further developed by those working in the field.

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2. THE FIVE LEVELS

The 5 levels are inspiration; planning; conceptual structure; tectonics; and detail. Architects often use metaphors to begin the design of a building.

2.1 Inspiration

They develop the inspiration for a project before any design begins. The inspiration and underlying philosophy guide the design and help set the framework within which design occurs. Buildings are often planned so that special features of the site, context and program are exploited in the scheme.



Figure 1. Concept diagram of the first level of architectural soundscapes: inspiration. The diagram shows a permeable membrane that contains the idea of the project that allows ideas from the site and program to permeate the idea (the arrows oriented outwards) and the idea from the larger world of ideas to permeate the site and program (the arrows oriented inwards). The architect, soundscape designer or artist must be open to accepting the flows of sound and inspiration from within the context of the project and from outside the boundaries of their discipline and the project.

2.2 Planning

Planning is the first step in giving order to the project. Circulation, space and connections are identified. The experience of the building is considered as initial thoughts about the site are formed. Poetic thoughts about the details of the sounds and textures one might experience as s/he approaches the project may be considered as an itinerary is imagined where people flow through the surroundings, approach the site, enter the building and then move through the interior spaces of the building. Special moments or places with designed sensory qualities including sounds may be included to focus one's attention at specific places in the project.

2.3 Conceptual structure

The principles and ultimately geometries that form the basis for the intellectual and formal aspects of the project are the conceptual structure. This is not literally the structural plan of the building, but rather the structure of the ideas and the interwoven, ecological relationships that hold the ideas together. This is an emerging intellectual construct that will become a designed building, park, plaza, landscape or city. A conceptual structure can be developed from readings about ideas or ideals that are transformed into visual form. Sometimes transformational mapping studies of a site and localized contextual influences such as sounds, weather, climate, social forces, circulation systems, traditions, historical influences, spatial and other systems are used to form the conceptual structure of a project. This conceptual structure is ultimately the hidden organizer of a project. It is the ideas from which the internal order of the project arise. It is also the shaper or giver of sound. It potentially “colors” the sounds it receives from the environment by absorption, reflection, diffusion and interactions with other sounds. This can occur indoors or outdoors.

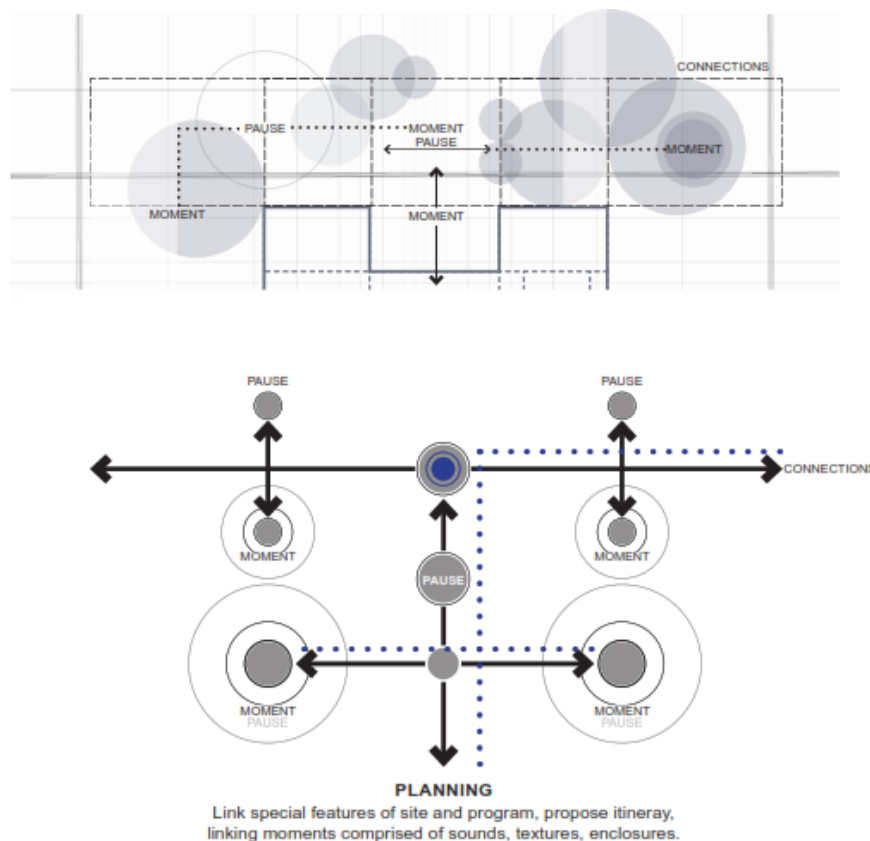


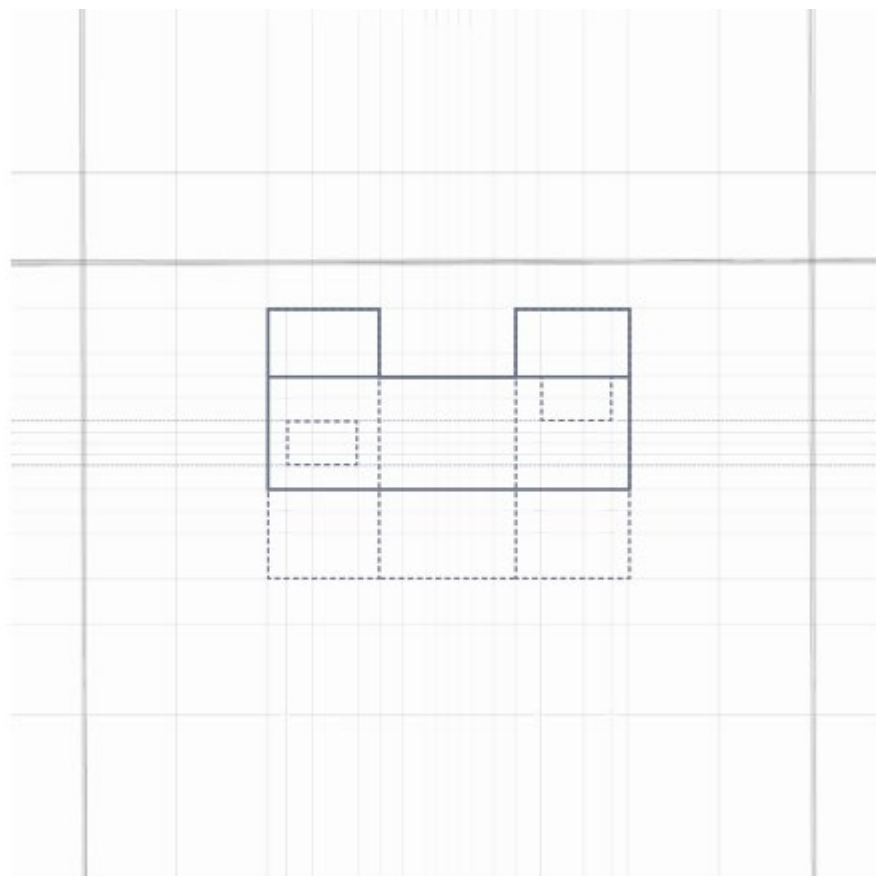
Figure 2. Concept diagram of the second level of architectural soundscapes: planning. Special features of the site and program are used to create “moments” that may have special sounds, luminosity, textures, enclosures and meaning linked via an itinerary of movement through the building.

2.4 Tectonics

Tectonics are the elements that form the architectural system that the soundscape occurs within. The tectonic elements are arranged in a conceptual structure derived from an interconnected local ecological system. They express the interrelationships between elements in a pattern or system that can be mapped in their literal, physical or metaphysical dimensions. The tectonics are those elements that give a unique identity and form to a place. The notion of the “genius loci” of a place as Norburg Shultz (1980) defines it, is at once physical, but also metaphysical in the way it is understood by people.

2.5 Details

Details are the local connections among the tectonic elements that support and express the inspiration and the conceptual structure of the project. The details are also the elements that often provide weather protection, connections among structural elements and enclosure systems and elements that allow environmental flows to occur in indoor and outdoor environments. Details are often the unique expressive architectural, acoustical, luminous, landscape, interior, structural, environmental and other technical connections in a project.



CONCEPTUAL STRUCTURE

Underlying principles and geometries to define the intellectual and formal aspects of the project.

Figure 3. Concept diagram of the third level of architectural soundscapes: conceptual structure. These are the underlying principles, geometries and three-dimensional spatial systems used to define the intellectual and formal aspects of the project.

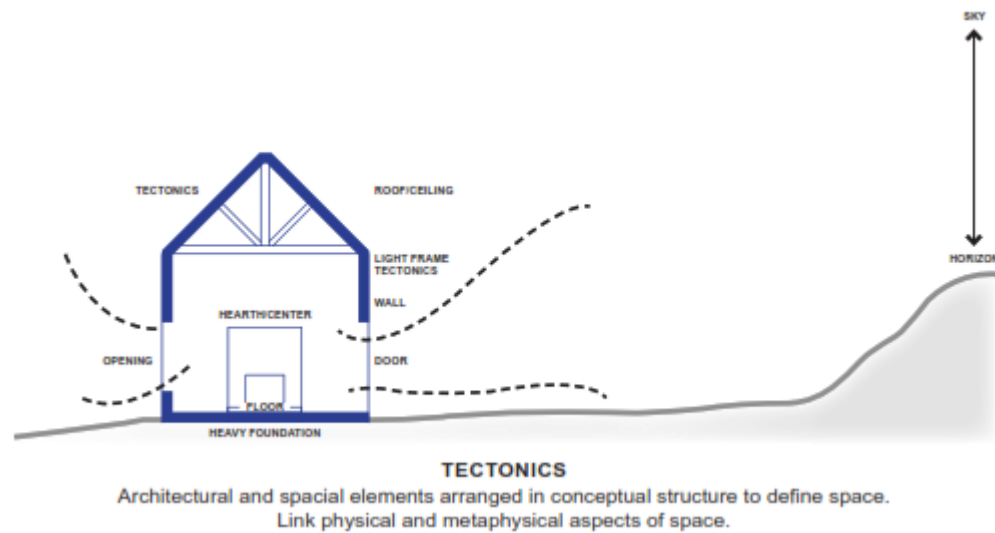


Figure 4. Concept diagram of the fourth level of architectural soundscapes: tectonics. These are the architectural and spatial systems arranged in a conceptual structure to define space that link the physical and metaphysical aspects of space.

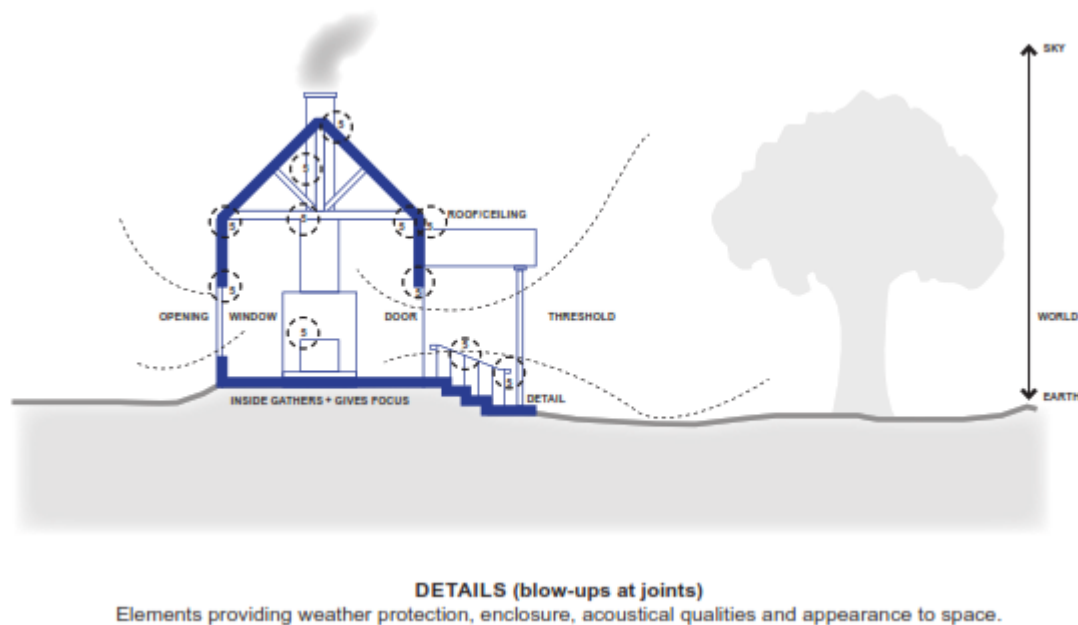
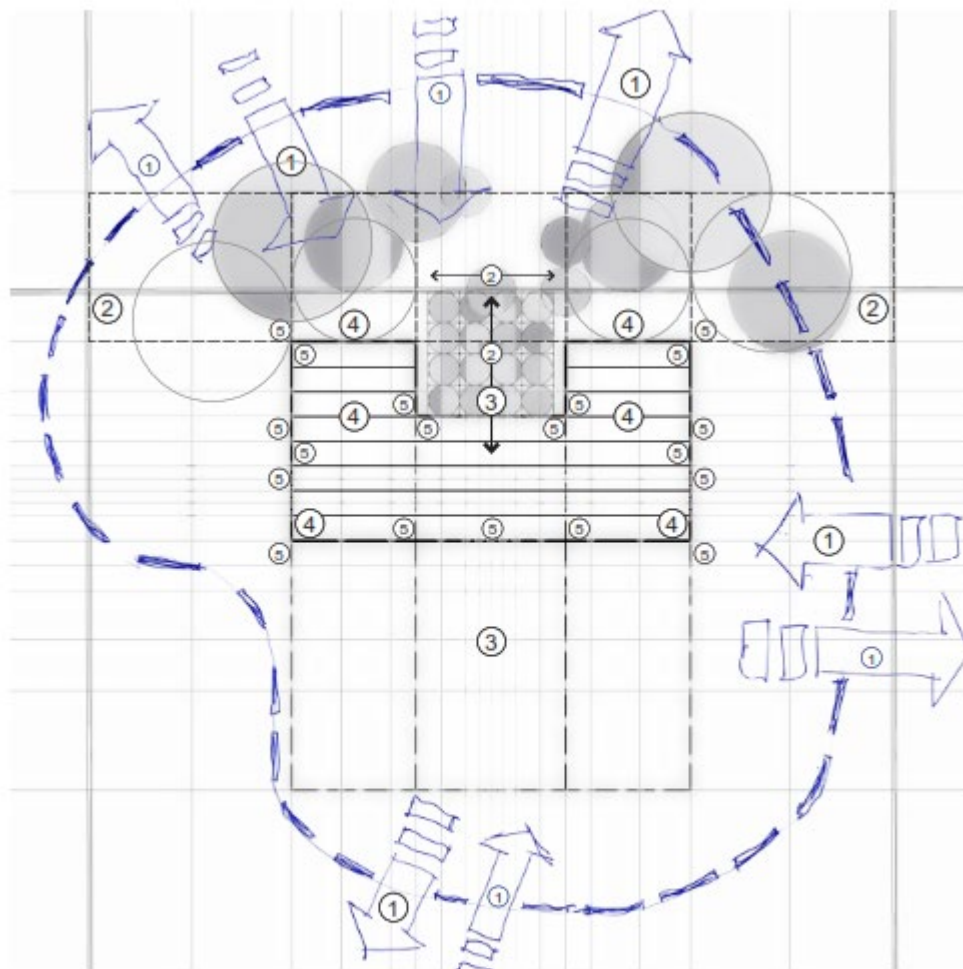


Figure 5. Concept diagram of the fifth level of architectural soundscapes: details. The details are elements that provide weather protection, enclosure, acoustical qualities, luminosity and appearance to the space. Details are often developed in very unique ways by individual architects even though the function of the details may be similar from project to project.



1 Inspiration & Underlying Philosophy: Exchange of ideas and ideals between the yet to emerge world of the building and the larger world of ideas representing a duality of the flows from the world of ideals used to create the approach to the building and the reciprocal flow of ideals from the not yet building to shape the world. A dually permeable membrane or fabric, yet to receive form, expression of the structure of the world is in.

2 Planning (arrows and idea links): Link special features of site and program, purpose, itinerary, linking moments comprised of sounds, textures, enclosures.

3 Conceptual Structure (gray lines in the background): Underlying principles and geometries to define intellectual and formal aspects of the project.

4 Tectonics (hard lines): Architectural and spatial elements arranged in conceptual structure to define space. Link physical and metaphysical aspects of space.

5 Details (blow-ups at joints): Elements providing weather protection, enclosure, acoustical qualities and appearance to space.

Figure 6. Composite diagram of the five levels of architectural soundscapes overlaid on each other. This diagram illustrates the interplay between each of the five levels and how they work together as a system. The potential impact of each level is interwoven with the levels that precede it as well as those that follow.

3. CONCLUSIONS

These levels represent some of the places in the design process where soundscape theory can become an integrated part of the creation of architectural space. The levels provide a framework for those involved with the design of architectural spaces to include the soundscapes of the spaces as part of an integrated, participatory design process. Often acoustical design occurs after the inspiration, planning and conceptual structure of a building are already completed. Acoustical ideas or ideals are often solved only as tectonic, or detail items, inserted into a project later in the process. Sometimes this happens after construction and occupation of a building are complete. An architect may conceive of a space, a conceptual framework or “box”, into which other consultants must insert the systems, materials and concepts that they are developing. This may be the addition of materials built as an internal or external layer in a construction assembly in traditional acoustical design. For example, it could be the addition of an internal layer in an assembly to reduce sounds propagating from one space to another such as a layer of “acoustical gypsum board” or a mass loaded vinyl interlayer. It could

also be the addition of an external layer that is shaped with a material selected to absorb, reflect or diffuse sounds inside a room to alter the way in which sounds are heard in the space.

In some projects, the inspiration, planning and conceptual structure for a work of architecture may occur before an acoustical consultant or soundscape designer begins work on a project. These are parts of the process that are philosophical and abstract in nature where one seeks the poetic expression of the essence of the project (Heidegger, 1977; McLeary, 1983). However, these are also the parts of the process that can benefit from the inclusion of soundscape ideas in the generation of form and space.

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