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Abstract

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This thesis seeks to understand the syntactic use of expressive and suppressive details as a strategy for constructing space by identifying construction elements (details) as a set of nested scales within works of architecture.

The argument for this strategy will be two-fold -- an analysis of recent works of architecture following Kenneth Frampton's Rappel a L'ordre and a demonstration of this strategy through the design of a new civic institution in a post-pandemic future.

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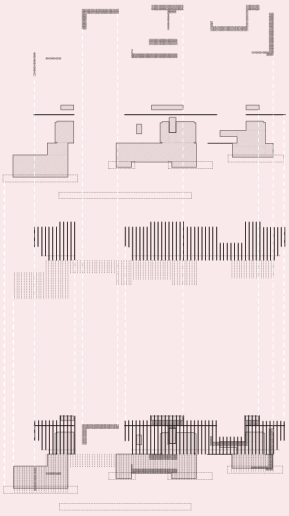

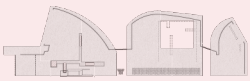

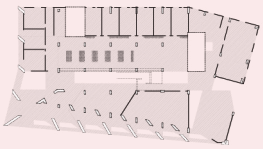

Jin Park

[chair]
Jim Nicholls and
Mary Johnston

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Introduction

The publishing of Kenneth Frampton's *Rappel À l'Ordre* in 1990 marked a call to arms against the "tendency to reduce architecture to scenography" that effectively characterize the postmodern era.[1] His criticism present in this essay towards the commodification of architecture to the detriment of its latent poetic potentials of construction is a sentiment that has been shared by many at the heart of the tectonic debate, and is one emblematic of an issue within the discipline that clearly persists today.

As evidenced by some of the most celebrated works of contemporary architecture, the needle seems to not have budged much in the three decades following the publication of Frampton's essay. In fact, examining the situation outside conversations on tectonics, the issue of commodification has only exacerbated in the 21st century. We are consumed today by a seemingly omnipresent housing crisis that is felt at all socioeconomic strata and even venerable causes within the discipline, such as sustainability, have become tools of commodification that, in its most egregious examples, are used by developers to drive up the cost of property. Perhaps it should be of no surprise that we are still confronting the same issue considering this global economic trend. However, just as works that exhibited meaningful tectonic consideration existed then in the postmodern context, there are architectural outputs today that embody meaning and poetry in this era that may validly be considered one of stylistic *partis*.

We may then speculate that regardless of the stylistic idiosyncrasy that preoccupies the architecture discipline at any given moment, there will always exist work that continues to regard "the structural unit as the irreducible essence of architectural form."[2] Just as the nineties can be equally characterized by the tectonically triumphant Strawberry Vale School by Patkau Architects as well as the atectonic and sculptural Guggenheim Bilbao by Frank Gehry, the current state of the discipline is represented by the awarding of the 2020 Pritzker Prize to the sectionally opportunistic Grafton Architects as the Formgiving exhibition showcasing the diagram-come-to-life works of Bjarke Ingels Group (BIG) completed its tenure at the Danish Architecture Center in January of the same year.

fig.01: Strawberry Vale School, Patkau Architects

A rudimentary examination of the works mentioned allows for a binary categorization based on whether or not a tectonic consideration is one of the primary generators of the architectural form. However, when considering how the details of each project either expresses or suppresses its joints as described by Edward Ford, the binary classification becomes no longer effective. Examining the Strawberry Vale School in particular, there is a clear presence of both expressive and suppressive details. The Patkaus themselves remarked as such in a 2005 email to Frampton:

By the time we did Strawberry Vale School, we were seriously questioning the amount of information that a totally expressive tectonic system gave. A strict expression of tectonics throughout a building seemed to make the building all about itself so much. In a school, children's drawings might well be overwhelmed by tectonic information. The value of calming skins became very real to us in that project and we began to use skins (primarily in classroom spaces) to calm space at times so that the life inside could become dominant, children's drawings didn't have to compete for attention... We continued to realize the potential of both systems in subsequent projects and attempted to deploy them according to circumstance.[3]

The study of tectonics and details -- as exemplified by Framton, Edward Ford, and Marco Frascari -- have focused on narratives as the type of information presented in construction, and the work of the Patkaus demonstrate that a syntactic strategy for modulating expressive details through the simultaneous use of suppressive details is possible. However, a cursory glance at John and Patricia Patkau's body of work seems to suggest that there is perhaps an additional spatial potential to their syntactic strategy -- One where the organization and experience of space is also modulated through and embedded within the architectural form.

Given this understanding, **how does one describe this syntactic strategy in a systematic way? Would answering this question demonstrate that spatial information -- one of form and relationship -- can also be embedded within a detail just as it is commonly understood with narratives?**

The thesis is organized into three parts, with the first two parts consisting of its investigative components. The first part is a survey of previously written work on tectonic theory, details, and spatial sequence. These will be linked to form a cohesive concept and terminology acting as the theoretical framework of the research.

The second part is the establishment of a methodology and a set of case study analyses using this methodology. Three works will be analyzed at the overall building scale, followed by an in depth analysis of a threshold condition at one of these buildings. Analyzed works will consist of contemporary works from the past three decades (1990s-present).

The last part is a design for a new type of community center in a post-pandemic future. The theoretical method through the investigative components of this thesis will be utilized to test its generative potential.

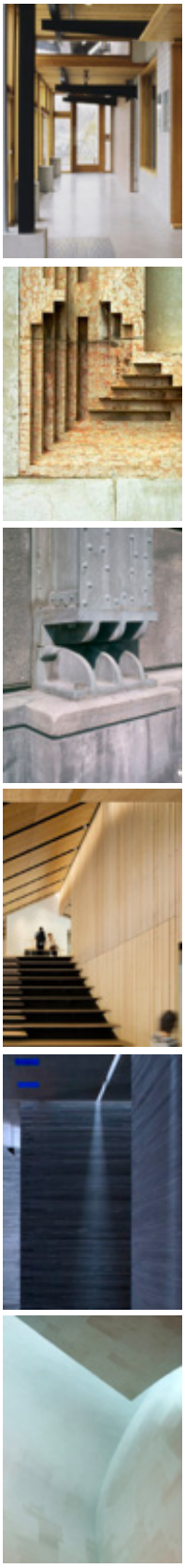


fig.02: Expressive + Suppresive Details

fig.03: La Tourette, Le Corbusier

The Joint as Information

Continuity of the Modern Tradition

The 19th and 20th centuries were pivotal centuries in the development of human civilization. Industrialization transformed all facets of daily life and resulting globalization allowed for dissemination of ideas at a never-before-seen pace. Naturally, architecture also changed, as new methods of construction were developed and a universal mode of thought took shape within the discipline.

Despite a lack of clear delineation of what the first modern architecture is-- functionalist works of the early 20th century for some, gothic cathedrals or Katsura Imperial Villa both of which predate the modern movement for others -- several architecture theorists have consistently considered the development of germanic tectonic theory from Karl Otfried Müller's *Handbuch der Archäologie der Kunst* (Handbook of the Archaeology of Art, 1830) to Karl Bötticher's *Die Tektonik der Hellene* (The Tectonic of the Greeks, 1843-1852) and Gottfried Semper's *Die vier Elemente der Baukunst* (The Four Elements of Architecture, 1851) as theoretical foundation with which modern architecture can be analyzed and framed as a body of work.[4]

Frampton is again an important figure in this discourse with several books suggesting the notion that there is no "new" in architecture, but rather works of architecture are a part of a tradition. Whether it is situating "organization and articulation of built-form… [within] the layered cultural traditions from which such forms derive," in *A Geneology of Modern Architecture* (2015) or the argument that "tectonic resists and has always resisted the fungibility of the world" through its anti-individualistic tradition in *Studies in Tectonic Culture* (1995), he seeks to point out that there is a lineage to the built-form in our discipline.[5]

Even with the technological changes brought by the digital age, we still, for the most part, exist within the modernist tradition that has developed over the past two centuries. What is remarkably different today than a century, or even just a few decades, ago is the sheer amount of information and access that is available with which to study this collective body of work. At the same time, a whole new collection of work is available for analysis that straddles the turn of the millenium, exhibiting a clear genealogical reference to the collective body of work prior, as well as ones informed by theoretical positions set forth by theorists of the past few decades.

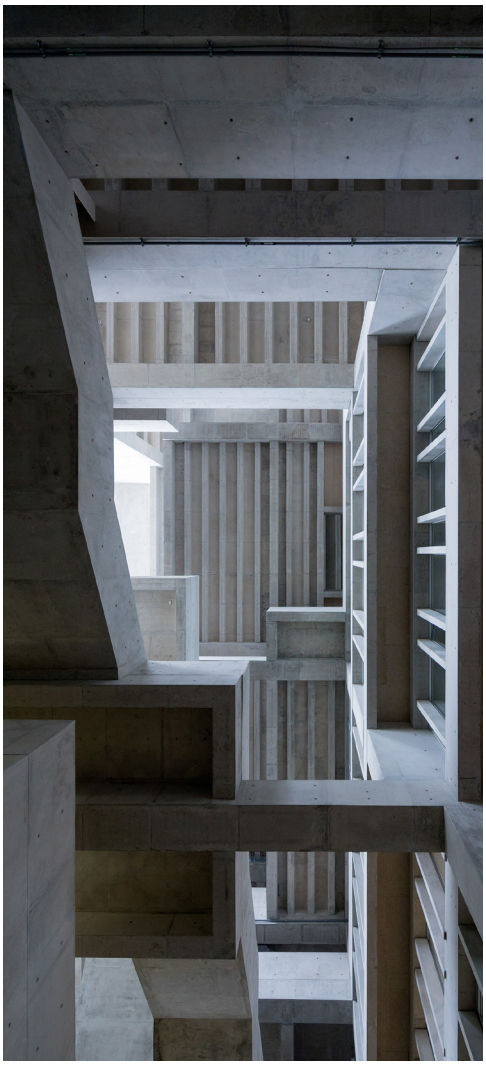


fig.04: UTEC Lima, Grafton Architects

Tectonics

Even if no one cared to ponder for long about how we build, it ought to be very clear, at least, that it is of consequence. Building affects us. The sensitivity toward physical constructions and spaces, like the sensitivity to mathematical notions or to music, is unique and cannot be acquired by borrowing or translating from another art, while not being a prime, conscious and finely developed sensitivity in all people. Building is of consequence also in that it exhibits the way we do things. What we build is proof of our consciousness, directness and powers of reflection, and the thoroughness with which we build is part of the meaning of delineated and configured spaces.

-Carlos Vallhonrat, Tectonics Considered, 1988

It is a simple matter of fact that a building must stand. And to do this, it must be built. Derived from the greek word *tecton*, meaning carpenter or builder, *tectonics* is a structuring principle of architecture that not only alludes to its assembly, but also the poetic potential of construction as it relates to the experience of architecture itself.[6]

fig.05: Stone post & lintel frame

Due to the evolutionary nature of its meaning, we lack a single definition of the term tectonics. Many agree, however, on its importance as an architectural concern. In *Rappel À l'Ordre*, Frampton states that "building remains essentially tectonic... and it may be argued that it is first and foremost an act of construction," and Carles Vallhonrat, in *Tectonics Considered: Between the Presence and the Absence of Artifice*, recognizes its significance when he states that "the grand craft of building can have a greater impact and be of truly fundamental consequence as a generating impulse at the origin and through the evolution of the work of art."[7]

Vallhonrat further expands upon this notion by deconstructing the term as it responds to physical constraints of gravity and materials before recognizing both the experiential and spatial consequences of the tectonic consideration by concluding his brief inspection with "how and why we [put those materials together] affects the way they appear as the surfaces that bound space."[8] Through this statement, he not only alludes to the necessary interdependency of built form and space, but also what is perhaps the most enduring definition of tectonics from both a historical and conceptual standpoint - *tectonics* as "the art of joining."[9]

The Joint

Joining, or 'the joint' as it has come to be understood today, owes a great deal of credit to the work of the 19th century German architect and theorist, Gottfried Semper. Taking an anthropological view towards his meditation on architecture, Semper viewed the knot -- 'the joint' -- as the earliest basic structural artifact.[10] The primacy he gives to the joint as a tectonic concern is conveyed in his seminal work, *The Four Elements of Architecture*, which serves as "a fundamental break with the 400-year-old humanist formula of *utilitas, firmitas, venustas*." Here, he introduces an anthropological dimension to the idea of tectonic form by suggesting that architecture is composed of four elements: 1) a hearth, 2) an earthwork, 3) a framework and a roof, and 4) an enclosing membrane. A further distinction is made between the material procedures of framework and earthwork where there is "the tectonics of the frame, in which members of varying lengths are conjoined to encompass a spatial field; and the stereotomics of compressive mass that, while it may embody space, is constructed through the piling up of identical units."[11] According to Frampton, this distinction with an emphasis on the joint as "the ultimate constituent of the art of building," serves to imply "that fundamental syntactical transition may be expressed as one passes from the *stereotomic* base to the *tectonic* frame, and that such transitions constitute the very essence of architecture."[12] To put it simply, architecture is at its core all about how different elements are joined together.

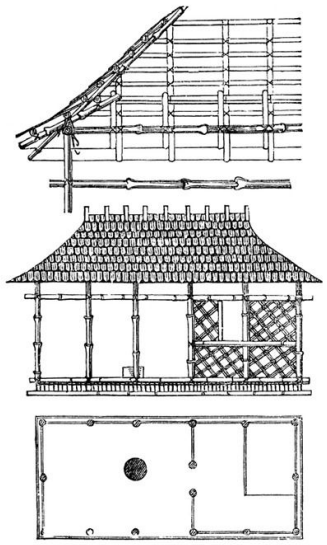


fig.06: Carribean Hut,
Great Exhibition of 1851, London, UK

The study of details is a tangential body of work that helps to both illuminate and expand upon this concept from a material perspective. In several of his works, Edward Ford has presented Carlo Scarpa and Rem Koolhaas as antithetical figures that exemplify the architect's decision to articulate or abstract the joining of materials -- Scarpa's work where "the joint is treated as a kind of tectonic condensation; as an intersection embodying the whole in the part, irrespective of whether the connection in question is an articulation or a bearing or even an altogether larger linking component such as a stair or a bridge," and Koolhaas's work that sees the detail as nothing more than a mere production drawing, one that is either "clamped, folded, glued, or fused."[13] In both instances, the architect is the adjudicator that determines whether the technical problem present in the joining of materials should be solved in a visible way that expresses the information or in a concealed way that suppresses it. Though, "in the well-designed building, [both are] done in the service of the creation of a larger narrative."[14]

Ford describes that in a typical modern building, the constructional "narratives are [often] about concealing rather than describing programme, construction, or even spatial layout, but many... [have] details that tell us about the building's construction

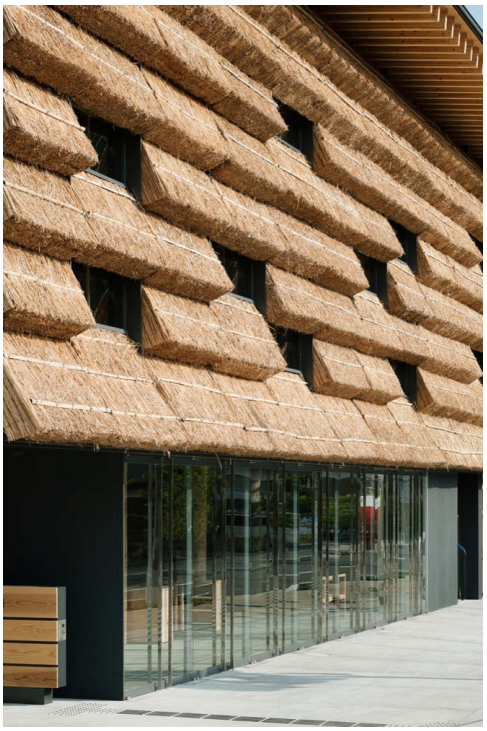


fig.07a: Yusuhara Marche, Kengo Kuma & Associates

fig.07b: Säynätsalo Town Hall, Alvar Aalto

and how we perceive the relation of the part to the whole."[15] Kengo Kuma's buildings are mentioned as an example embodying this condition where its structural narrative is suppressed through the concealment of its steel structural frame while the material narratives of "wood, thatch, stone and other traditional materials" are expressed through its cladding.[16] Frampton echoes this position in *The Geneology of Modern Architecture*, when he states, "In either case [of load-bearing structures in stone, brick, or concrete; or buildings faced in a weatherproof skin or a rain screen], the system of cladding has a decisive effect on the tectonic expressivity of the work," to present Alvar Aalto's Saynatsalo City Hall as an example where the structure is suppressed through its expressed cladding.[17]

Through both Ford and Frampton's analysis and examples, the detail can be understood as a medium for information -- In this case, the structural and material narratives of the part and the whole. This conclusion is incomplete, however, as it fails to incorporate the consideration of space that has long been considered a priority in modern architecture. After all, a hallmark of Modernist work is the spatial condition and narrative of conceptually uninterrupted open space exemplified by "the structural and spatial image of a grid of columns supporting a flat, unbroken slab."[18] One where, through its use of concealed beams rather than true flat slab of concrete, allows for its speculation as the spatio-tectonic precedent of Kuma's detailing.

Details as elements encompassing the spatial has most directly been observed by Marco Frascari. In his highly influential *The Tell-The-Tale Detail* he introduces a conceptual flexibility to what a detail is when he states:

> *Dictionaries define "detail" as a small part in relation to a larger whole. In architecture this definition is contradictory, if nor meaningless. A column is a detail as well as it is a larger whole, and a whole classical round temple is sometimes a detail, when it is a lantern on the top of a dome. In architectural literature, columns and capitals are classified as details, but so are piani nobili, porches, and pergolas. The problem of scale and dimension in those classifications and the relationship between aediculas and edifices makes the dictionary definition useless in architecture. However, it is possible to observe that any architectural element defined as detail is always a joint. Details can be "material joints," as in the case of a capital, which is the connection between a column shaft and an architrave, or they can be "formal joints," as in the case of a porch, which is the connection between an interior and an exterior space. Details are then a direct result of the multifold reality of functions in architecture. They are the mediate or immediate expressions of the structure and the use of buildings.*[19]

It should be noted that Frascari's description of the term detail is not conventional in the contemporary use of the word. It is, however, conceptually consistent with Frampton's reading of Semper's theory. Therefore, the significance of adopting Frascari's particular usage is three-fold: 1) The scope of what we might consider a detail -- or a joint -- is broadened, both in definition and scale; 2) There is a clear establishment of the interdependency between built form and space, not just as it relates to a spatial narrative, but as a spatial form; and 3) 'The joint' is confirmed as constituting the essence of architecture, and allows for the transition differentiation, and **joining of two distinct elements.**

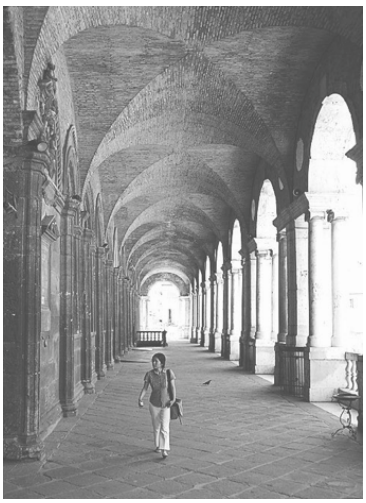


fig.08: Column Capital & Porch

Tectonically Considered

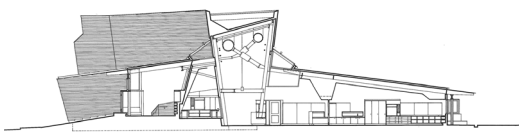
As demonstrated through the discussion of expressive and suppressive details, the consideration of 'the joint' is a necessary concern whether the building is tectonic or atectonic in character. However, just as it is possible to discuss both types of details for all types of buildings, the tectonics of a building can be discussed for all works of architecture, albeit to a limited extent for some.

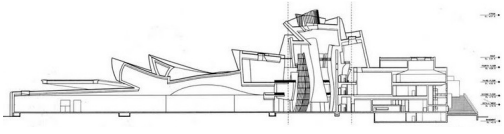
This notion of discussing the tectonics of an atectonic building introduces a semantic ambiguity that is present at several scales. At the building scale, one is able to discuss the tectonics of an atectonic building by discussing its structure that is fully concealed by suppressive details. The same issue is perhaps even more ambiguous at the detail scale since technically there should be no such thing as an atectonic detail. The classification of expressive and suppressive detail, of course counteracts this lexical conundrum. Therefore, given this particular limitation, a more useful distinction then is to classify buildings based on whether or not tectonic consideration is one of the primary generators of the architectural form rather than as tectonic or atectonic.

Revisiting the analogous condition of scenographic versus tectonic of the 1990s and today helps to illuminate the clarity of this classification. In both Strawberry Vale School by Patkau Architects (1995) and Guggenheim Bilbao by Gehry Partners (1997) the primary tectonics of the buildings is the skeletal steel frame. The difference, however, is that the former utilizes it as its organizing principle with the highest presence of its structure in its organizational spine, while the latter completely suppresses the steel structure by cladding it in service of the desired sculptural form. As indicated by the Patkaus, their school hints at the simultaneous use of expressive and suppressive details as a means of modulating information. A somewhat similar selective presentation of information is also present in Gehry's museum as there are indeed details that express the steel structure. Although in this case, they are presented primarily as volumetric or planar elements surfaced in glass and made to accommodate a form

fig.09a: Strawberry Vale School Section, Patkau Architects

fig.09b: Guggenheim Bilbao Section, Gehry Partners





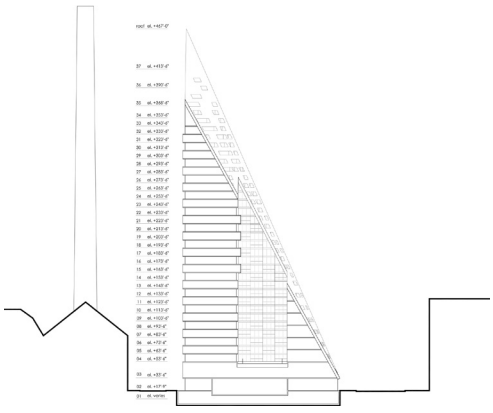


fig.10a: UTEC Lima
Section,
Grafton Architects

fig.10b: VIA 57 West
Section,
Bjarke Ingels Group (BIG)

rather than being organizational.

A comparison of the University Campus for UTEC Lima by Grafton Architects (2015) to VIA 57 West by Bjarke Ingels Group (2016) demonstrates an equally contrasting tectonic strategy. In the former, massive parallel concrete walls are employed as its primary structure that forms "the spatial and structural rhythm" as they transform in section across the site.[20] These structural walls, Inspired by Eduardo Souto de Moura's Braga Stadium, "are interlaced into a complex composite structural frame by the concrete floor slabs and massive concrete beams."[21] While in the latter, the primary structure of two way concrete slabs are suppressed by cladding through the priority given to its sculptural form. Much like Gehry's museum, the primary tectonic element is also made to fit the desired architectural form rather than being the generator.

Thus, it can be observed that, even though the structural material and systems between Grafton's campus and Patkau's school might differ, both buildings -- as tectonically considered works of architecture -- employ their structures as the informationally expressive, primary organizer of space. On the other hand, the Guggenheim Bilbao and VIA 57 West are then the antithetical works to Strawberry Vale and UTEC Lima in allowing their sculptural form to take precedence over their primary tectonic elements. Perhaps this is of no surprise, given that both Frank Gehry and BIG's works exemplify the scenographic trend of their respective decades -- sculptural avant-garde of the 90's in Gehry's work and diagrams-come-to-life stylistic partis of the 2010's in BIG's work. However, it can be determined that both buildings can be classified as not tectonically considered works of architecture.

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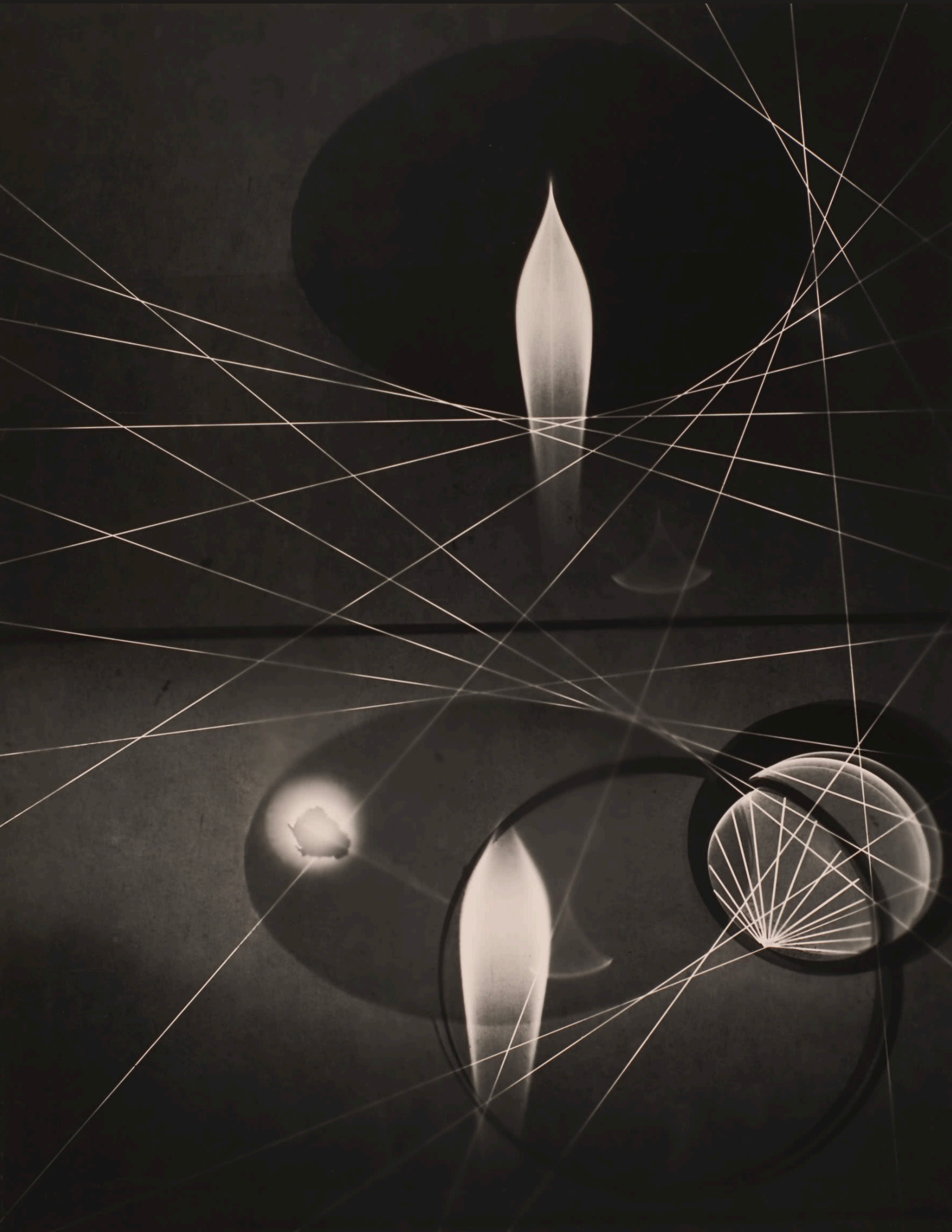


Space + Movement + Pause

Einstein to Le Corbusier

Technological discoveries have extended and reshaped the physical environment. They have changed our visual surroundings partly by actually rebuilding the physical environment, and partly by presenting visual tools that are of assistance to our discernment of those phases of the visible world which were previously too small, too fast, too large, or too slow for us to comprehend... To orient oneself in walking requires a different spatial measurement than is required in riding in a motor-car or in an aeroplane. To grasp spatial relationships and orient oneself in a metropolis of today, among the intricate dimensions of streets, subways, elevated, and skyscrapers, requires a new way of seeing. Widening horizons, and the new dimensions of the visual environment necessitate new idioms of spatial measurement and communication of space. The visual image of today must come to terms with all this; it must evolve a language of space which is adjusted to the new standards of experience. This new language can and will enable the human sensibility to perceive space-time relationships never recognized before.

-György Kepes, 1942

fig.11: Untitled Light Effect, György Kepes (opposite)

As a study concerned with how spatial information might be embedded within a detail, it seems important to acknowledge a few widely accepted architectural concepts regarding space and the development of space as a priority within the discipline. Frampton outlines at the beginning of Studies in Tectonic Culture, "space has... become such an integral part of our thinking about architecture that we are practically incapable of thinking about it at all without putting our main emphasis on the spatial displacement of the subject in time."[22]

A great deal of credit for this simultaneous consideration of space and time can be attributed to one of mankind's greatest scientific breakthroughs, Albert Einstein's theory of relativity. Several architects and thinkers of the twentieth century from Le Corbusier to Sigfried Giedeon were influenced by this theory of space and time, and modernists' emphatic inquiry into this new concept seems clearly responsible in the conceptual establishment of interior and exterior space as a "spatio-plastic unity... [of] one continuous space-time experience."[23]

Le Corbusier's work is notable, in particular, for the direct incorporation of this new mode of thought into a tangible form, and offers several concepts that will be used in this study. The 'architectural promenade' for one provides a clear demonstrable

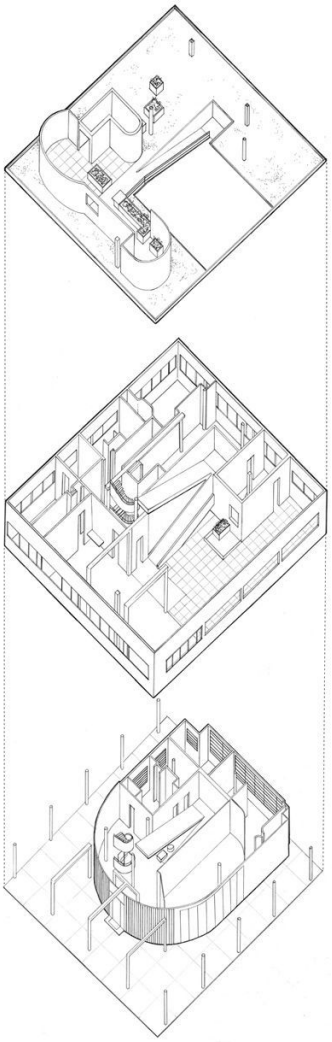


fig.12a: Villa Savoye
Exploded Axon

fig.12b: Villa Savoye,
Le Corbusier

framework as both a generative and an analytical tool with which the orchestration of spaces might be considered in modern architecture. Even his bio-mechanical analogy of objets-types occur "as incidents in the plan like the glasses and bottles in his Purist paintings."[24]

Promenade Architecturale *aka Goal Spaces + Routes*

> *Architecture is experienced as one roams about in it and walks through it...So true is this that architectural works can be divided into dead and living ones depending on whether the law of 'roaming through' has not been observed or whether on the contrary it has been brilliantly obeyed.*
>
> *-Le Corbusier, 1942*

Coined by Le Corbusier, 'architectural promenade' is a term that extends the purely utilitarian role of circulation to encompass the experiential. As described by William Curtis in Modern Architecture Since 1900, the promenade encapsulated his belief that "a good plan would 'contain an enormous quantity of ideas and the impulse of an intention', and would project volumes into space in an ordered hierarchy of a more subtle kind, taking into account the site, the play of light, and the gradual revelation of a building's form and idea over time."[25] At the same time, it was his criticism of "the star shapes and axes of the plans of the École des Beaux-Arts [that, to him,] were mere patterns on paper."[26]

As a hallmark of his, the use of circulation as a primary tool for orchestrating experience is prevalent in Corbusier's works spanning several decades from Maison La Roche (1923) to La Tourette (1960). Along with his 'Five Points of a New Architecture,' the 'architectural promenade' is most clearly demonstrated in Villa Savoye (1929) -- a gestalt that could be considered his essay on what modern architecture should be, combining free flowing space, transparency, the adoption of automobiles, and hygiene. According to Flora Samuel and Peter Blundell Jones in The Making of Architectural Promenade: Villa Savoye and Schminke House, Le Corbusier was influenced by "the picturesque, the film theories of Sergei Eisenstein, games of perspective, and scientific theories of space and time, as well as with the possibilities afforded by the careful curatorship of routes... [to produce] a veritable promenade architecturale, offering aspects constantly varied, unexpected and sometimes astonishing," in his monographic Villa.[27]

Frampton has constructively adopted the term in his systematic reading of architecture through the circulatory typology of route and goal. He describes that "all buildings are structured about a promenade that allows the significance of the total work to unfold in time via a progression through the spatial sequence, [and] in almost every work there is always a point of arrival or

goal. In a private house, it is the main living room, whereas in a public building it is the main honorific space such as the council chamber in a town hall or the main auditorium in a cultural center."[28] A building, of course, is often not singularly absolute and is rather a combination of varied program and circulatory pathways. As such, Frampton adds that "there are often multiple goals [within a building], with each one having its own route."[29]

It is helpful to examine this building scale analysis at a more granular level to better understand its role within the complete promenade. Borrowing from the categorization for path-space relationships described by Francis Ching in Architecture: Form, Space, and Order, as well as the concept of formal joint as described by Marco Frascari, Frampton's definition of goal space and routes can be defined as follows:

Pass by Spaces
- Typically interim goal spaces; Either secondary or tertiary goal spaces
- Adjacent to goal routes
- Places of pause

Pass through Spaces
- Typically formal joints (thresholds) that are part of goal routes
- Places of movement, but can also accommodate pause

Terminate in a Space
- Typically goal spaces; Primary, secondary, or tertiary
- Typically at the end of a goal route
- Places of pause

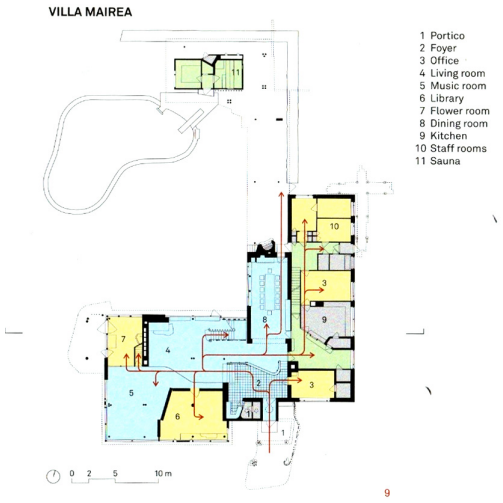
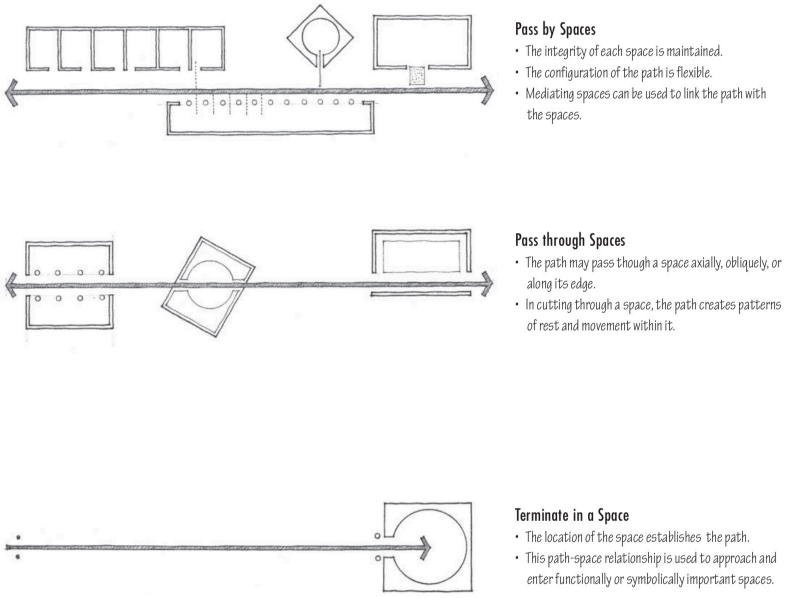


fig.13: Goal/Route Diagram, Kenneth Frampton

fig.14: Path-Space Relationships, Francis D.K. Ching



22. Frampton, Kenneth., et al. *Studies in Tectonic Culture : the Poetics of Construction in Nineteenth and Twentieth Century Architecture*. MIT Press, 1995, p. 1.
23. Ibid., 1-2.
24. Samuel, Flora, and Peter Blundell Jones. "The Making of Architectural Promenade: Villa Savoye and Schminke House." Vol. 16, no. 2, 2012, p. 119.
25. Curtis, William J. R. Modern Architecture since 1900. 3rd ed., [rev., expanded, and redesigned]. ed., Phaidon, 1996, p. 173.
26. Ibid., 173.
27. Samuel, Flora, and Peter Blundell Jones. "The Making of Architectural Promenade: Villa Savoye and Schminke House." Vol. 16, no. 2, 2012, p. 111.
28. Frampton, Kenneth, and Simone, Ashley. *A Genealogy of Modern Architecture : Comparative Critical Analysis of Built Form*. Lars Müller Publishers, 2015, p. 32.
29. Ibid., 32.

S,M,L Analysis

A Study of Nested Scales

Nested Scales of Observations is a method used by NASA scientists for their study of panoramas or Martian landscapes; It is a method that "helps researchers identify smaller-scale features of special interest for examination in more detail" through observations at incremental scales.[30]

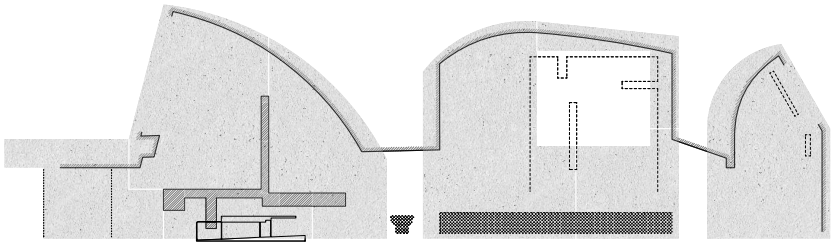
As constructed forms that are assembled at various scales, a similar method of analysis can be undertaken for studying works of architecture. In science, the scales of observation could be somewhat infinite, from the scale of an atom to the scale of the universe (and beyond). However, in architecture, the scales are finite, from the scale of a screw to the scale of the overall construction system. The scales that need to be identified become even more restricted when the construction of space is considered, where the smallest unit of analysis can be established as the smallest possible detail exhibiting spatial territory or direction. Thus, accepting that the primary construction system, or the "tectonics" of the building is the largest scale detail for the containment of space, a spectrum can be established, with the largest scale as the generator of form and space at one end and the smallest scale detail exhibiting spatial information at the other. For sake of clarity and consistency, three scales of small, medium, and large will be used in studying architectural form. Much like NASA's method of observation, the smaller scale will be seen as spatially nested within a larger scale.

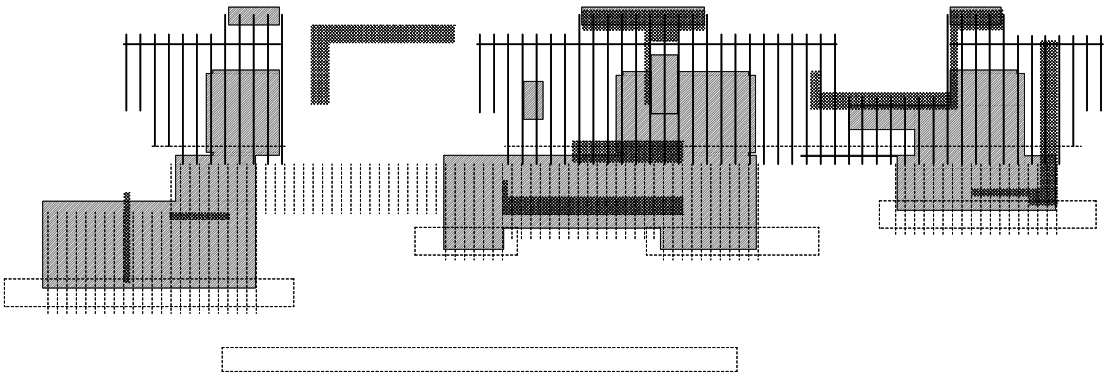
The following case studies will demonstrate the analytical use of this methodology while the design of Eastlake Community Forum will demonstrate the generative potential of this consideration. An additional focus will be provided to a case study in which a particular formal joint will be studied at further detail. This will serve as an in-depth demonstration of how definitions and concepts regarding joints and space outlined in previous chapters can be incorporated for understanding the syntactically generated space.

3 Projects

St.Ignatius Chapel by Steven Holl Architects (1997), Agosta House by Patkau Architects (2000), and University of Limerick Medical School by Grafton Architects (2012) are three projects from the past three decades that clearly demonstrates the effectiveness of S,M,L Analysis despite their remarkable differences in form and method of construction. In this analysis, the St. Ignatius Chapel is described in section extending from the entrance to the blessed sacrament chapel in the back, while Agosta House and the University of Limerick Medical School are described in plan. An in depth analysis of the processional area for the St. Ignatius Chapel will be provided to further demonstrate the use of nested scales of analysis.

fig.15: Nested Scales of Observations,
Mars Rover Curiosity, NASA





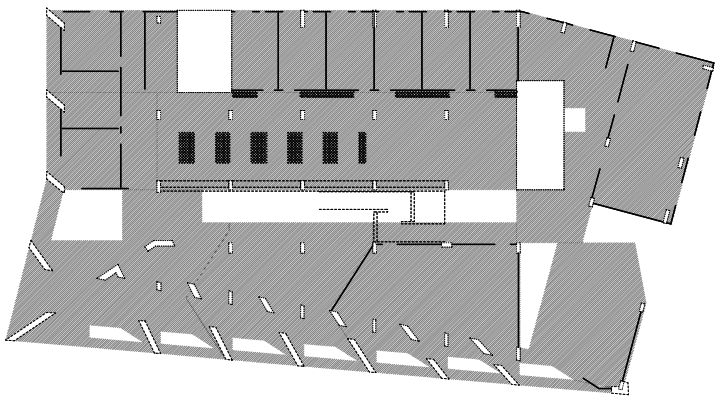
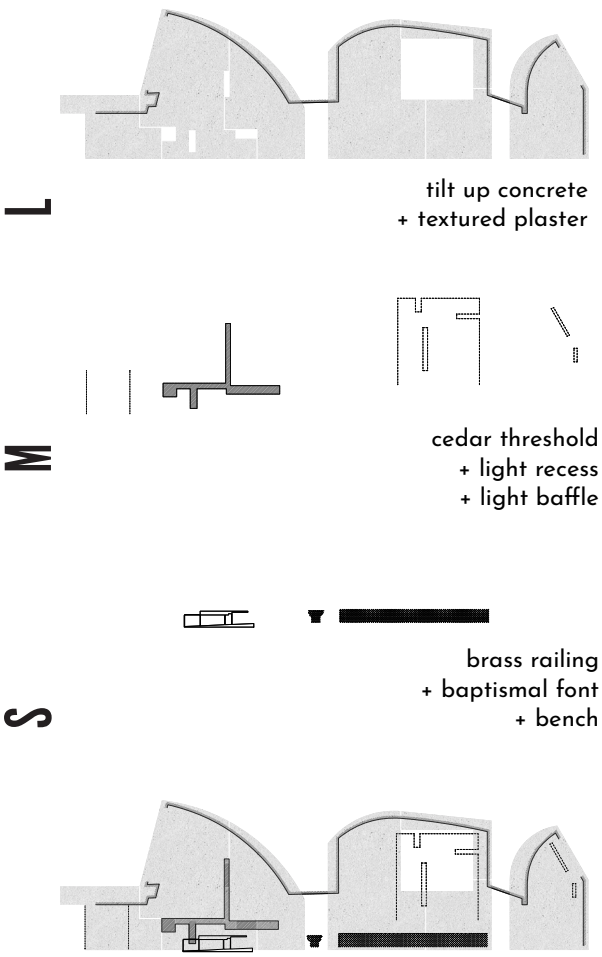


fig.16: S,M,L diagrams

fig.17: St.Ignatius Chapel,
Steven Holl Architects

fig.18: Agosta House,
Patkau Architects

fig.19: University of Limerick Medical School,
Grafton Architects



St. Ignatius Chapel,
Steven Holl Architects,
Seattle (1997)

fig.20: St. Ignatius Chapel
S,M,L diagram

St.Ignatius Chapel

The largest scale details for St. Ignatius Chapel are the tilt-up concrete panels (expressive) and the textured plaster surface (suppressive) that can be understood as a tectonic exterior and a stereotomic interior. In a way, the tilt-up concrete panels are effectively the entire tectonic expression of the building -- its articulation expressing the joining of the various panels and the story of its lifting. The tilt-up concrete is used as a generator of form that provides a constructed rhythm and directionality at the exterior while the texture plaster unifies the interior space as it intensifies the various qualities of light that enters the building.

The medium scale detail represented in this diagram are the cedar threshold at the entrance (expressive), the light recess of smooth recessed plaster and resin windows at processional area (suppressive), and the plaster light baffles that peel off the wall to filter sunlight at the nave and the blessed sacrament chapel (suppressive). All of these are nested within the larger scale textured plaster. The cedar threshold composed of two hand-carved Alaskan Yellow Cedar doors generate containment for the entry foyer and, thus, establishes it as a formal joint. The light recess corresponds to the definition of processional area generated by the form of the tilt-up concrete and the articulation of roof form via textured plaster. It's form reinforces both the horizontal direction of movement and the vertical direction of the space. Priority is given to the horizontal direction through the displacement of its vertical elements. The light baffles correspond to their respective skylights and together reinforces the verticality provided by the building's form.

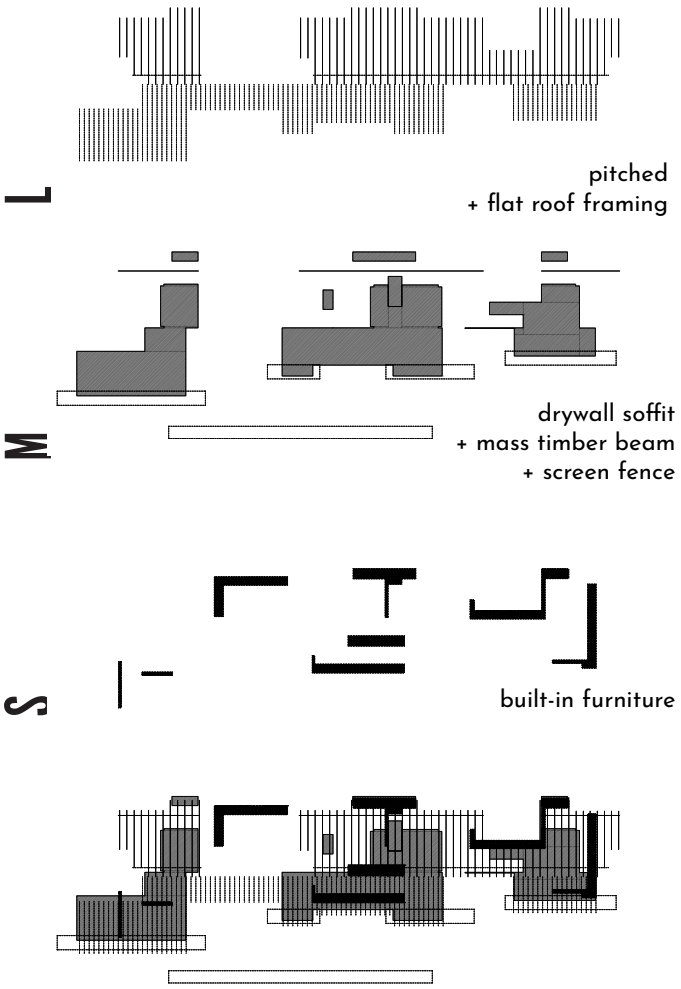
The small scale details represented in this diagram are the brass railing (expressive), baptismal font (suppressive), and the built-in bench(suppressive). The brass railing and the built-in bench both reinforce a sense of edge established by the processional ramp and the exterior wall, respectively. The brass railing also reinforces the direction of the processional area in both its primary and secondary (perpendicular) direction in its detailing. The baptismal font is perhaps one of the most important details of this building, not only reinforcing the threshold condition established by the zone of light between the tilt-up concrete panels, but also generating its own territory marking a significant threshold both spatially and ritualistically.

Agosta House

The largest scale details for the Agosta House are the exposed pitched roof framing (expressive) and the concealed flat roof framing (suppressive) that are both generators of form. The exposed framing is prioritized, however, and reinforces the directionality of the plan through its repetition.

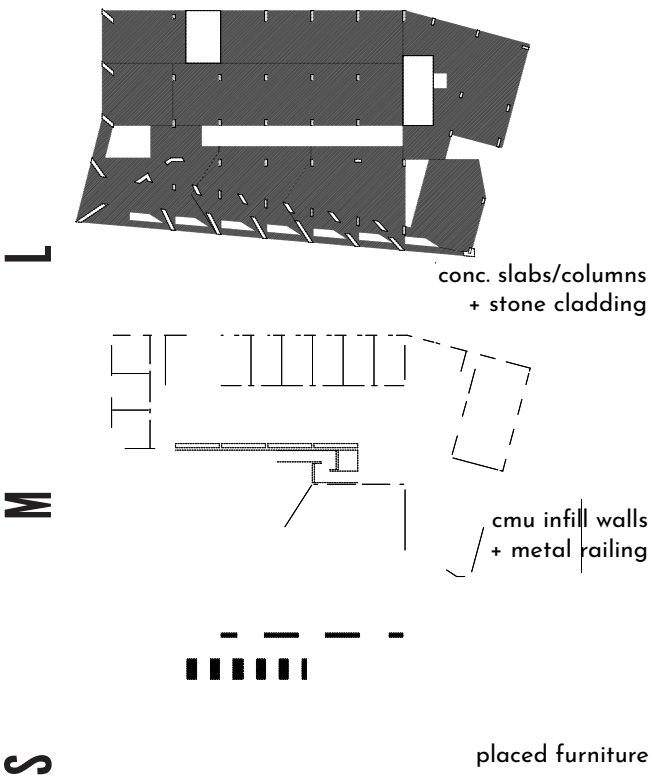
In this project, the medium scale details contain the highest amount of spatial information. They consist of the shaped drywall soffit (suppressive), mass timber beams (expressive), and tilted screen fence (suppressive). The drywall soffits generate a spatial rhythm through their arrayment at the southern guest wing, the public realm of the middle, and the northern bedroom wing -- The gap generated between them helping to reinforce the north-south spatial direction through an alternation of perpendicular east-west directions. It is shaped in various ways to both generate and reinforce spatial territory and a sense of containment, as well as its continuity across several spaces reinforcing a spatial continuity. This detail can be considered an equal spatial contributor to the exposed roof framing. The mass timber beams reinforce the primary north-south direction of the building as well as the continuity of interior and exterior space. The screen fence also reinforces the primary north-south direction and functions as a datum that biases the building towards the western view.

The smallest scale details of built-in furnitures (suppressive) augment the spatial purpose of the drywall soffits. They help to shape the spatial form of the building that is transformed in section while generating continuity across adjacent spaces.



Agosta House,
Patkau Architects,
San Juan Island (2000)

fig.21: Agosta House
Patkau Architects



Univ. Limerick Medical School,
Grafton Architects,
Limerick, Ireland (2012)

University of Limerick Medical School

The University of Limerick Medical School employs all of its details in a straightforward way. The large scale details of concrete frame (expressive) and stone cladding (suppressive) function spatially in an identical manner to Holl's chapel, except with the interior and exterior conditions flipped; The concrete frame consisting of slabs and columns is the primary generator of space and produces the spatial rhythm and directionality, while the cladding generates exterior continuity by unifying the building.

The medium scale details are the cmu infill walls (expressive) and the horizontal bands of metal railing (suppressive). The former generating spatial containment through its partition of a modernist free plan while the latter reinforces the horizontal spatial direction and continuity through a tight knit repetition of thin vertical rails and its appearance as horizontally organized panels reinforcing verticality through repetition in secondary direction. The railing's continuity as diagonally placed panels at the staircase reinforces the connection between separate levels.

The small scale details shown in the diagram are simple placed furnitures of lockers and desks at the second floor of the building. There is spatial quality also in their arrangement, with the lockers augmenting the sense of containment and protection by deepening the dimension between "private" computer rooms and the "public" self-directed learning space that opens in section towards the rest of the public realm. The desks located in the self-directed learning space reinforce the primary east-west direction of the building through their arrangement in the secondary direction.

fig.22: University of Limerick Medical School
S,M,L diagram

St. Ignatius Chapel
Processional Space

Project Description

Conceived as "seven bottles of light in a stone box," the St. Ignatius Chapel is a small catholic chapel that anchors the northern end of Seattle University's urban campus. At the western edge of the building is the primary axis of the university campus connecting East Madison Street to the student center.

While the interior spaces are rich in quality, the organization and structure of the building is simple. The interior of the building is effectively an open floor plan, with spatial hiearchy defined through subtle means. The ever-present textured plaster on the interior reinforces this notion by making the interior entirely stereotomic. One that constantly transforms with light.

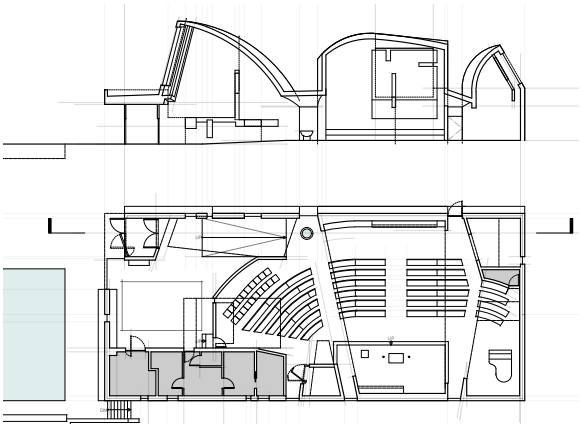


fig.24: St. Ignatius Chapel
Plan + Section

Circulatory Goal + Architectural Promenade

The building is entered from the reflecting pool plaza defined by the chapel and the bell tower through a dim, confined entry vestibule located on the building's southwest corner. The in-turned corner with a double-cantilevered roof is the recessed, covered space that negotiates this transition from outside-in.

The primary public goal of this project is the nave, and the architectural promenade of the chapel follows the "program of Jesuit Catholic worship" in sequence from the entrance and narthex in the front to the nave and blessed sacrament chapel in the back.

The transition from the entry vestibule into the processional area incorporates the principle of spatial release in plan and section by allowing the first vaulted ceiling and the open-floor nature of the building to be revealed in this sequence. Light and material are also incorporated here as there is a stark contrast between the darkness of the former and the brightness of the latter manifest by the heavy, hand-carved Alaskan yellow cedar door and the ethereal textured plaster that are encountered. It is also through this sequence that the spatial narrative of "leaving the world behind" common in religious buildings first comes into play.

Standing in the processional area under the south-lit vaulted ceiling, one is provided the choice of continuing along the architecture promenade towards the nave and the blessed sacrament chapel or turning into the narthex. The slightly inclined ramp is the main path that leads one up through the processional area and introduces a vertical displacement along this path. Another sequence of spatial release begins here as the space compresses in both section and plan – the vaulted ceiling tapers down toward a low ceiling as the floor rises, and the wall to the east tapers to the ramp before running parallel to the west wall for a short segment. This brings one to the baptismal font and the associated spatial joint where the goal spaces at the "back of the building" meet the liminal spaces at the "front"; the font defines the spatial territory

fig.23: St. Ignatius Chapel
Processional Space
(Opposite)

that functions as a spatial hinge. It is here that one's path of movement is displaced in plan by both the south wall that contains the rear bench and the font itself. To continue along the promenade, one crosses the first light gap of the building to enter the vaulted ceiling space of the nave. Another light gap is crossed in order to reach the blessed sacrament chapel which is the private goal of the building.

Space of Analysis

The space of analysis is the processional area which is a formal joint between the entrance foyer, narthex, and the nave. It is a pass-through space that can be considered as an "entrance" in its place along the promenade.

The space is primarily defined in section through the vaulted ceiling generated by the profile of two tilt-up concrete panels (large scale) at the building's western facade. It's experiential boundaries along the promenade begins at the medium scale detail of the interior Alaskan Yellow Cedar door and ends at the baptismal font, where the path of movement is displaced.

The following drawings are early diagramming exercises undertaken that analyzes the experiential encounter of details and the construction of space in search of an answer to the syntactic use of expressive and suppressive details.

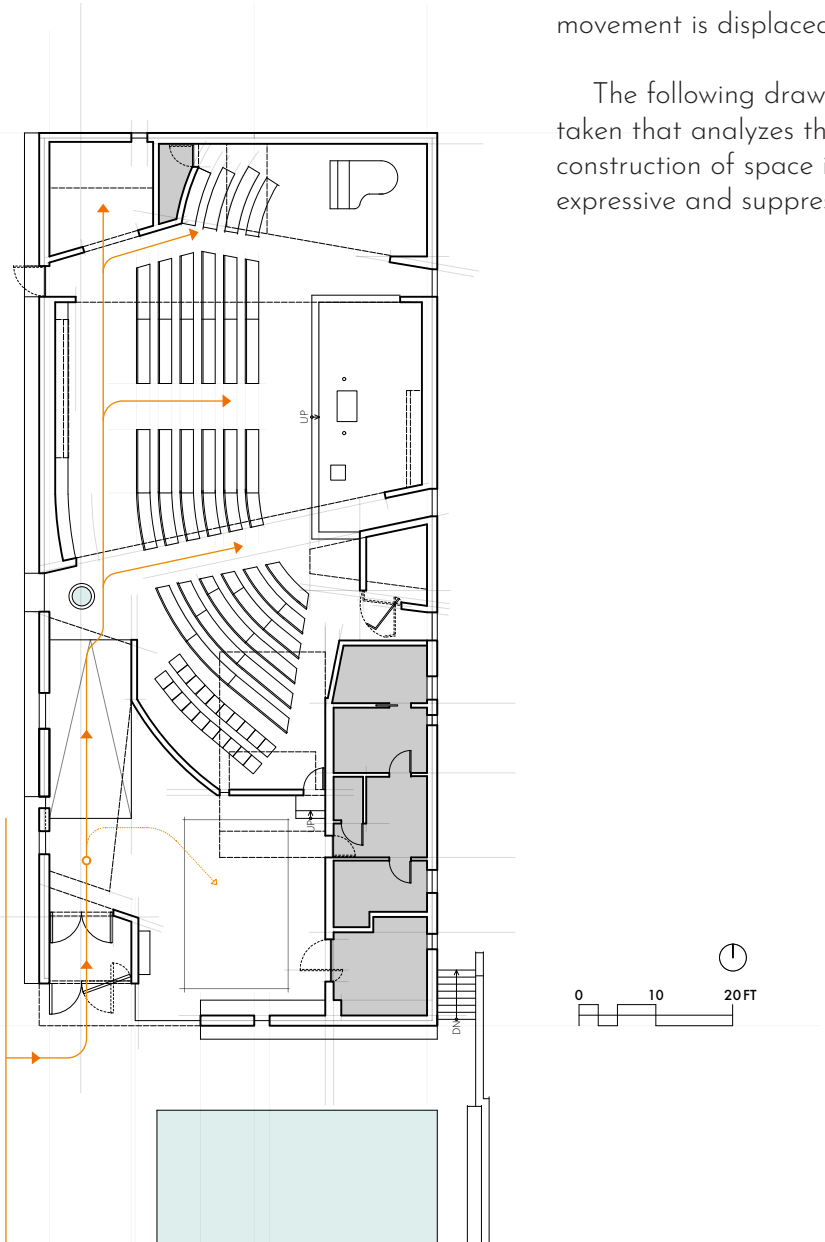


fig.26: St. Ignatius Chapel
Spatial Transformation + Detail Encounter Diagram

fig.25: St. Ignatius Chapel
Architectural Promenade Diagram
(Opposite)

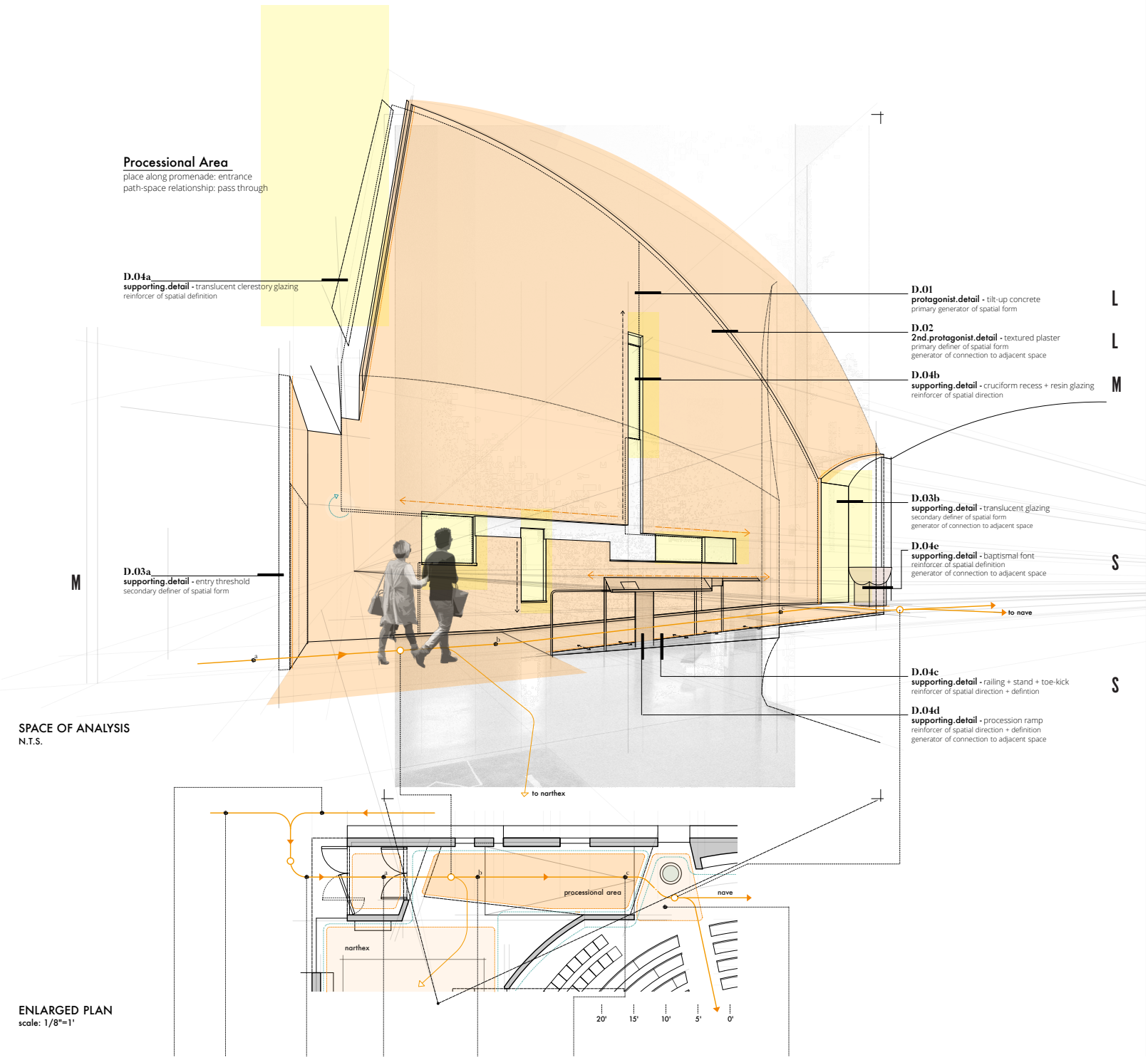
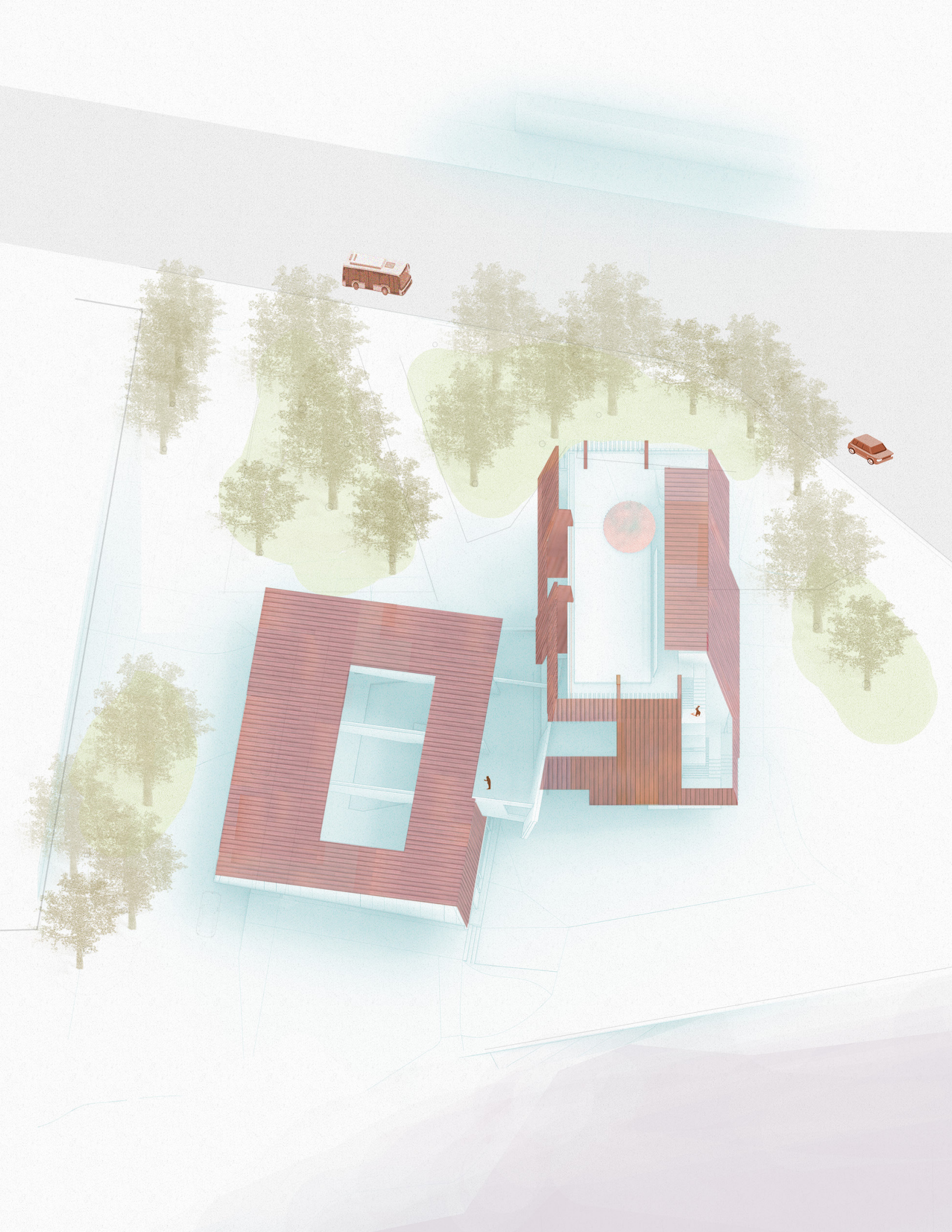


fig.27: St. Ignatius Chapel
Space of Analysis Diagram

30. Greicius, Tony. The Importance of Nested Scales of Observations, Large Scales. 12 July 2016, www.nasa.gov/mission_pages/mars/multimedia/pia17275.html.



Eastlake Community Forum

Brief

We are currently in the middle of an unprecedented crisis. A global pandemic that is being monitored on a day to day basis.

Everyday, we are faced with a new reality of lives lost and livelihood disrupted. As of today (March 24th), there have been 414,000 reported cases globally with over 4% of those cases resulting in death. Economists are already saying that the pandemic "has tipped the U.S. into recession," and local businesses and workers around the country are bracing for the worst as they worry how they're going to pay their bills.

Perhaps the most terrifying fact to face is that those of us living in the United States are at the beginning of this outbreak without adequate infrastructure for testing and caring for patients. Dr. James Lawler, a University of Nebraska public health researcher, estimates domestic number of deaths at 480,000 over the course of the illness and epidemiologists at the Centers of Disease Control and Prevention are preparing for four scenarios ranging from 200,000 to 1.7 million deaths. Even the most optimistic scenario being considered by the CDC would make COVID-19 the number four cause of Death behind heart disease (655,381), cancer (599,274), and alzheimer's, dementia, and brain degeneration (267,311). Through it all, the current administration has instilled anything but confidence in the American public.

fig.28: Eastlake Community Forum

Few things are clear at this point as we adjust to a new, quarantined lifestyle. The pandemic has revealed all the cracks in our society: Systemic inequalities deeply embedded within our current capitalistic model, the lack of social safety net for the vulnerable that only worsens this imbalance in a time of crisis, and the obvious fragility of capitalism that favors corporations and shareholders over workers. If any of us were oblivious to these systemic norms prior to the current crisis, it seems all too apparent now.

At the same time, the crisis has demonstrated our increasing interconnectedness, not only digitally, but also biologically. The concept that a pathogen can freely transfer across borders, bodies, and cells irrespective of our race, nationality, or socioeconomic status only strengthens the position that our society should be for all and that its foundation is based on our reliance on one another.

-by author, week 2 of quarantine

At the beginning of the spring quarter, I wrote this statement as I decided that the crisis brought forth by COVID-19 needed to be addressed in some capacity through my thesis. With the grim projection from both the CDC and the New York Times, my first instinct was to design a memorial, but this response quickly shifted as I felt an equal amount of concern for the stark inequalities of our society that was being revealed by the pandemic. This led to a series of questions that resulted in the development of a program for a new type of community forum in a post-pandemic future, equally prioritizing democratic access to information and strategies for resilience, implemented across multiple scales from the site to details.

With a new found conviction for the architect's role in society, the Eastlake Community Forum fully utilizes the S,M,L methodology to consider what I expect will be the zeitgeist of this century -- equity and resiliency.

Program

	qty	area (sf)	total (sf)
Community			
-Lobby	1	3000	3000
-Forum	1	3500	3500
-Café	1	300	300
-Reception	1	150	150
-Broadcast/Recording Studio	2	300	600
-Library	1	2000	2000
-Meeting Rooms	2	300	600
Operation			
-Office	1	1500	1500
-Kitchenette	1	100	100
-Lunch Room	1	250	250
-Conference Room	1	240	240
Outdoor Spaces			
Rooftop [contemplative]	1	2000	2000
Terrace [social]	1	1000	1000
Exterior Staircase	--	--	
General Building Services			
-Custodial Workroom	1	250	250
-WC	4	500	2000
-Elevator	2	150	300
-Electrical/IT room	--	250	
-Mechanical Equipment Room	--	--	
-Storage	--	--	
			17790
			*1.5
		approx.	**26685**

fig.29a: Aerial View of Eastlake Site
fig.29b: Location of Site within Seattle

Site

Site Selection/Context

The Eastlake site adjacent to the lake union drydocks was chosen primarily for its high visibility and accessibility. Due to its placement on the lake union waterfront, the site is visible from various neighborhoods surrounding the lake from South Lake Union to Fremont. The I-5 Freeway is also nearby, allowing Seattlites and passersby alike to see the site as they travel locally and regionally. The site is connected to the public transportation system primarily by bus with a stop only a block north. The Streetcar system terminating at South Lake Union is nearby as well. It is connected to a bike route at Eastlake Avenue and pedestrian traffic from both north and south through Eastlake Avenue and the Cheshiahud Lake Union Loop Trail.

Its condition as an urban junction at the intersection of several neighborhoods and urban fabric was also of interest. Being at the southernmost point of the Eastlake neighborhood where the austere commercial streetscape met the industrial waterfront of the drydock and wide car-friendly intersection of Eastlake Avenue and Fairview Avenue meant that a site wide strategy to develop the site into a generous anchor for the neighborhood could be considered.

The forum's neighbors are biotech research companies at the forefront of this industry. Fred Hutch, a leader in cancer research with experiences in both AIDS and Zika epidemic, is located just south of the site in the historic Lake Union Steam Plant building. Their current engagement with COVID-19 includes tracking the virus' spread, developing diagnostic tests, designing vaccine trials, and working to prevent future outbreaks. Adaptive Biotechnologies, an immune-driven medicine company currently working on antibody therapy, and Bloodworks NW Research Institute, a blood transfusion research companies, are directly next door, just north of the site. Nohla Therapeutics, working on cellular therapy with Fred Hutch, and Gilead Sciences, the pharmaceutical giant with exclusive rights to Remdesivir, are located one block north. These companies' significance in the development of a treatment for the current pandemic was a contributor to the idea for the program. The vision for the community forum being one where various stakeholders can be present from the public to the experts of these research companies whose street frontage seems to indicate anything but transparency.

Site Development

The site's condition as an urban threshold is both embraced and intensified in its development. Recognizing the history of regional development that has led to the transformation of the shoreline, a restorative strategy is undertaken to displace the shoreline between 30 to 80 feet along the site's length to make it a wetland. Around 100,000 cubic feet of excavated brownfield soil is maintained on site by berming the north and east edges of the site. A remediative memorial grove in recognition of the lives lost to this pandemic is planted at the east edge of the site along Eastlake Avenue. The grove functions in both an expressive and suppressive manner, buffering the site from the heavy traffic of Eastlake Avenue while becoming an anchor and a marker at the south end of Eastlake neighborhood, visible from the streetscape and the passersby on I-5 freeway.

fig.30:Site Plan
(opposite)

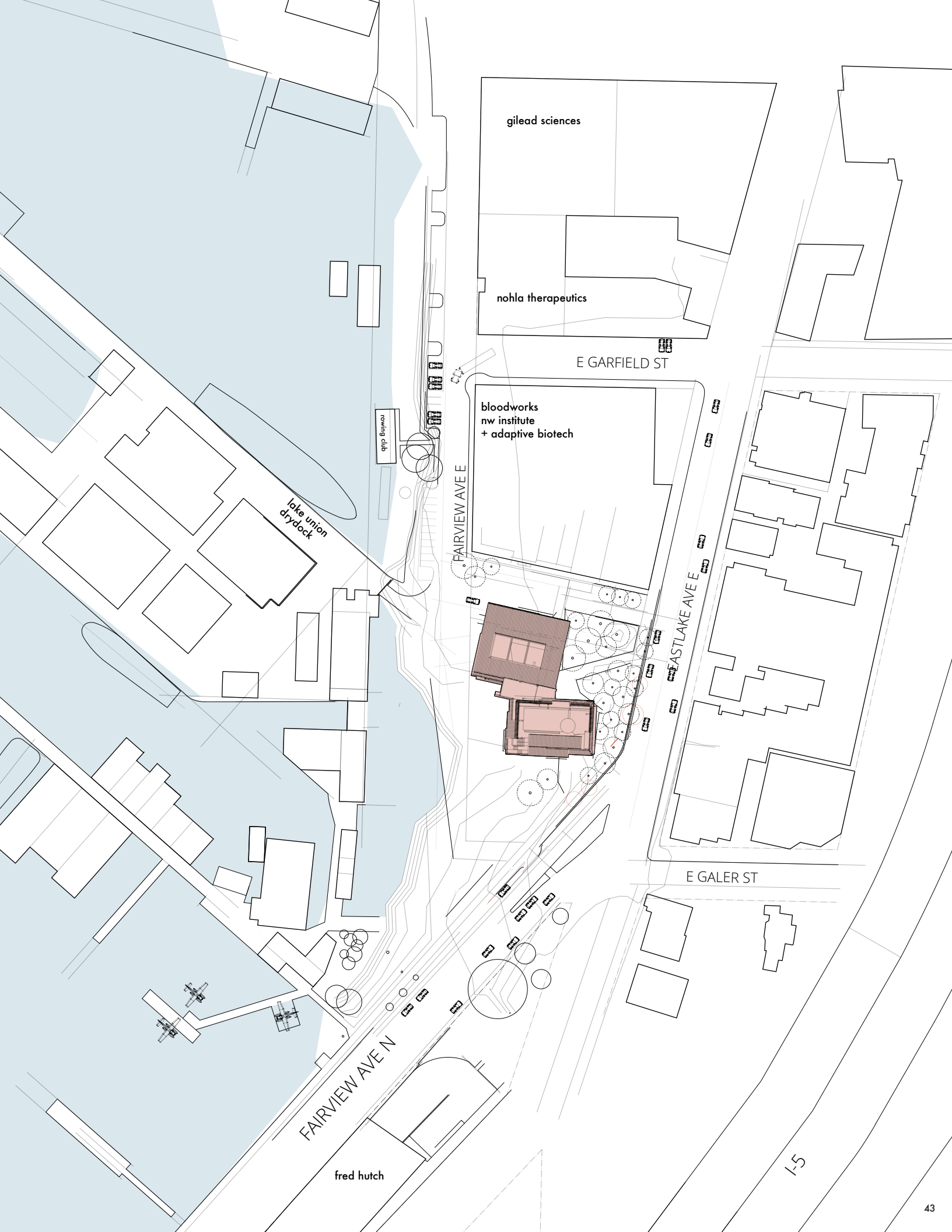
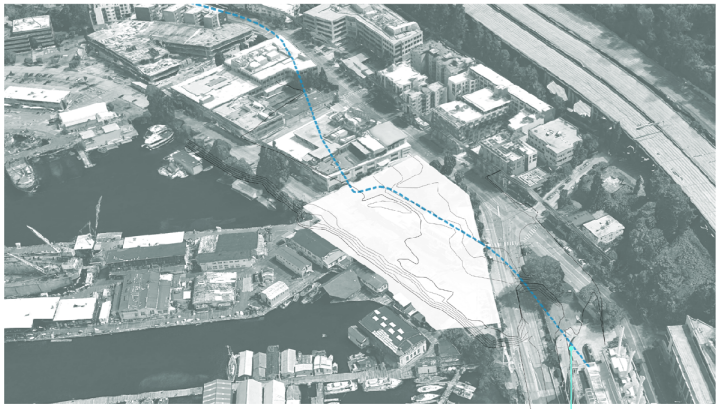
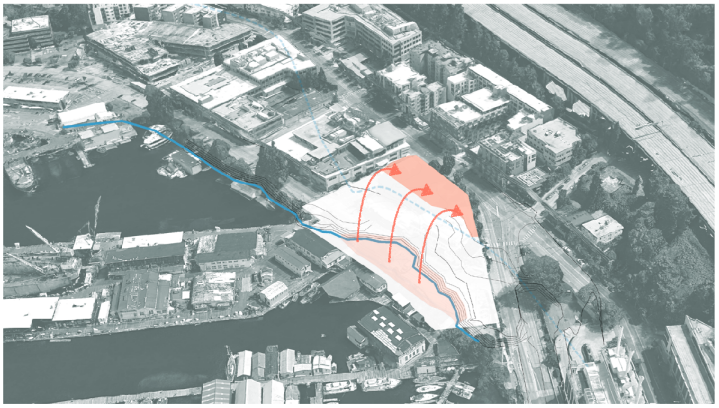

gilead sciences
nohla therapeutics
E GARFIELD ST
bloodworks
nw institute
+ adaptive biotech
rowing club
lake union
drydock
FAIRVIEW AVE E
EASTLAKE AVE E
E GALER ST
FAIRVIEW AVE N
fred hutch
I-5

fig.31:Existing Site Photos

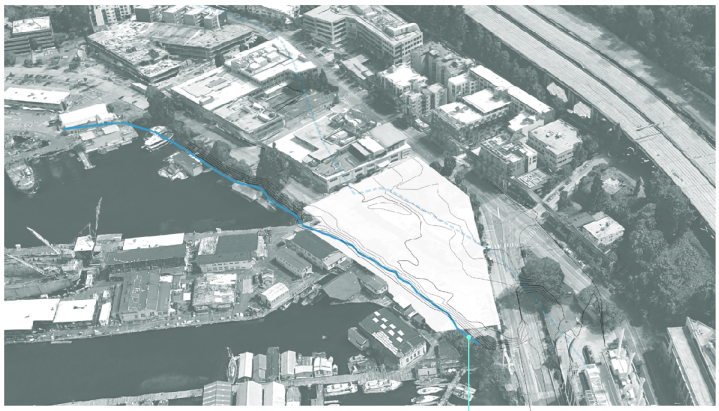
fig.32:Site Development Diagram (opposite)



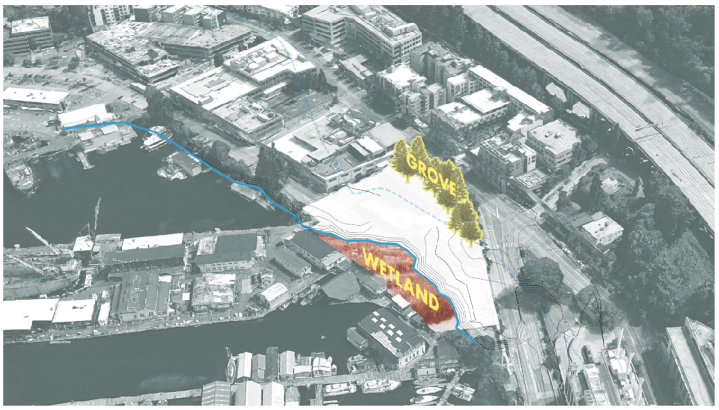
pre-1916
original shoreline

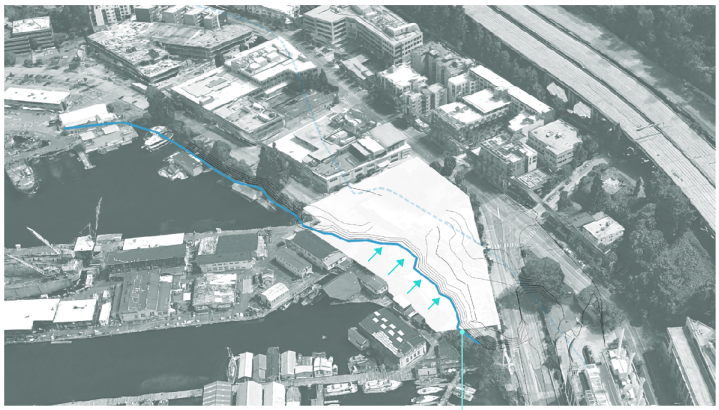


maintained on site



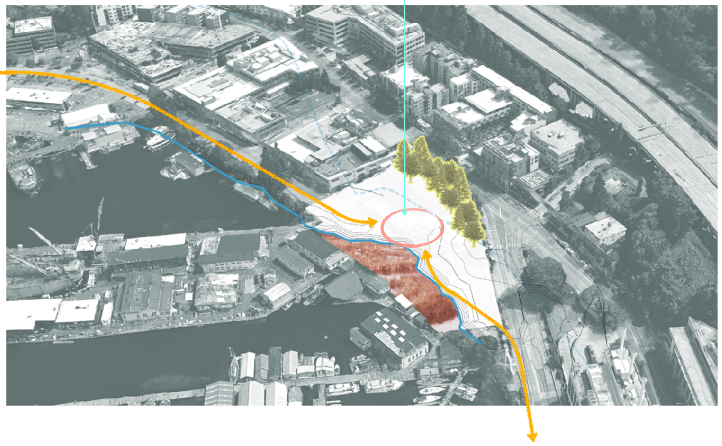
lake union water level lowered 9'
current shoreline



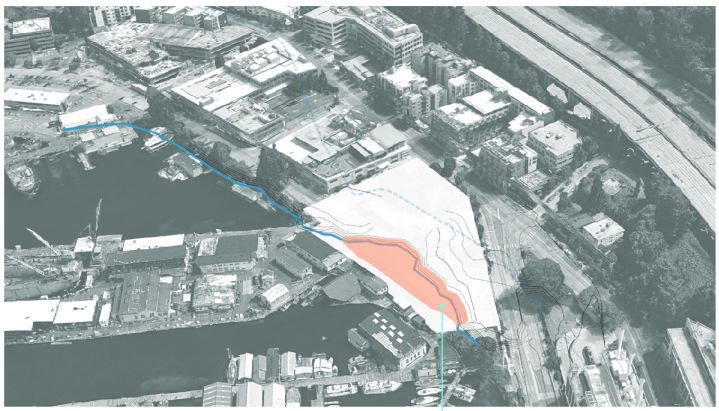


proposed shoreline
shoreline displaced 30'-80'

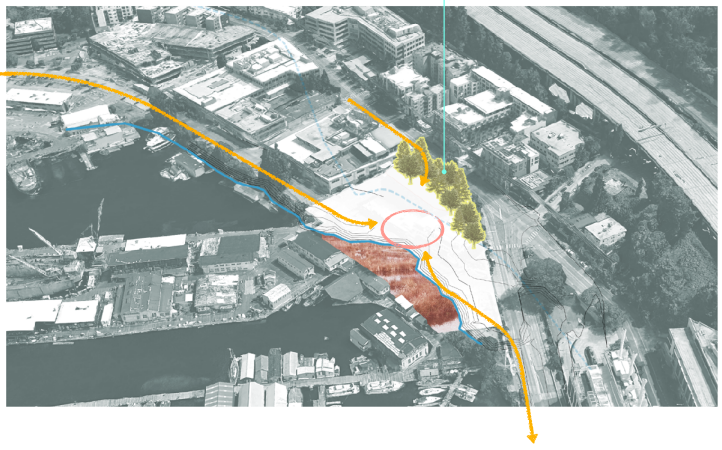
new plaza
trail connected through a new plaza



grove as anchor
pedestrian traffic also rerouted to site



100,000 ft³
excavated brownfield soil



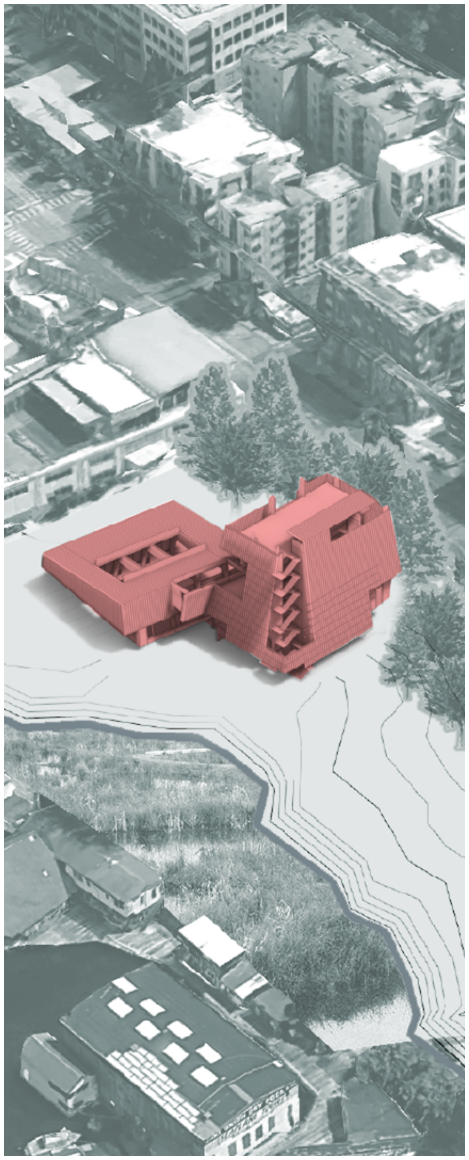


fig.33: Building + Site

The landscape strategy reroutes pedestrian access for both Eastlake Avenue and Cheshiahud Lake Union Loop Trail by re-directing traffic at the west edge of the site into a plaza and the traffic at the East edge of the site through the grove. Access along the north edge of the site maintains vehicular access while functioning as a drop-off location for both the Eastlake Community Forum and Bloodworks NW Research Institute.

Building/Details

Description

The building is located in between the wetland and the grove in the middle of the site. It is organized into two halves of forum (north) and tower (south) with a frontage to the plaza at its west face. The displacement of the two forms generates a small courtyard for entry at the grove to the east.

It's primary structure (large scale detail) is composed of Cross Laminated Timber (CLT) panels,with parallel CLT frames housing the forum and CLT fin walls functioning as both vertical load-bearing and lateral load-resisting structure at the tower. Both CLT and DLT (Dowel Laminated Timber) panels are used to stiffen and span across the primary CLT structure, as floors, roofs, beams, and guardrails. The structural system was chosen not only for its direct expressiveness, but also to take an environmentally positive approach just as it is done for the site. Through their deployment as parallel elements, the system's spatial potential is heightened.

As a response to the pandemic, copper standing seam is used as the primary cladding of the building (large scale detail). This material, not only has antibacterial qualities, but is also used as a reference to the industrial character of the amphibious buildings surrounding Lake Union. It's suppressive quality as a detail is leveraged to unify the forum and the tower, and CLT fin walls and guardrails, where exposed, are typically clad in sheets of copper that are detailed to join the standing seam panels.

The antibacterial strategy is extended to the building's programming as well as the use of shou-sugi-ban as the secondary cladding material. The forum is designed to accommodate various seating arrangements for different types of gatherings, but also socially distanced ones. It is also designed to be transformable, with folding shou-sugi-ban clad wall to the west (medium scale detail) that allows an exterior extension of gatherings and pivoting shou-sugi-ban clad walls to the north (medium scale detail) that allows for the forum's transformation into a drive-through test site. During normal times, these pivoting walls can become stalls for various purposes.

Copious amount of outdoor spaces are programmed into the building also. They consist of a contemplative roof space, a triple height terrace, and various balconies directly accessible from interior spaces. An outdoor staircase with direct access to the roof is also given prominence at the south-west corner, indicated by both the opening of the copper cladding and a 7 story shou-sugi-ban wall (large scale detail) that elicits

L/M

SHOU
SUGI BAN

L

STANDING
SEAM
COPPER

L L

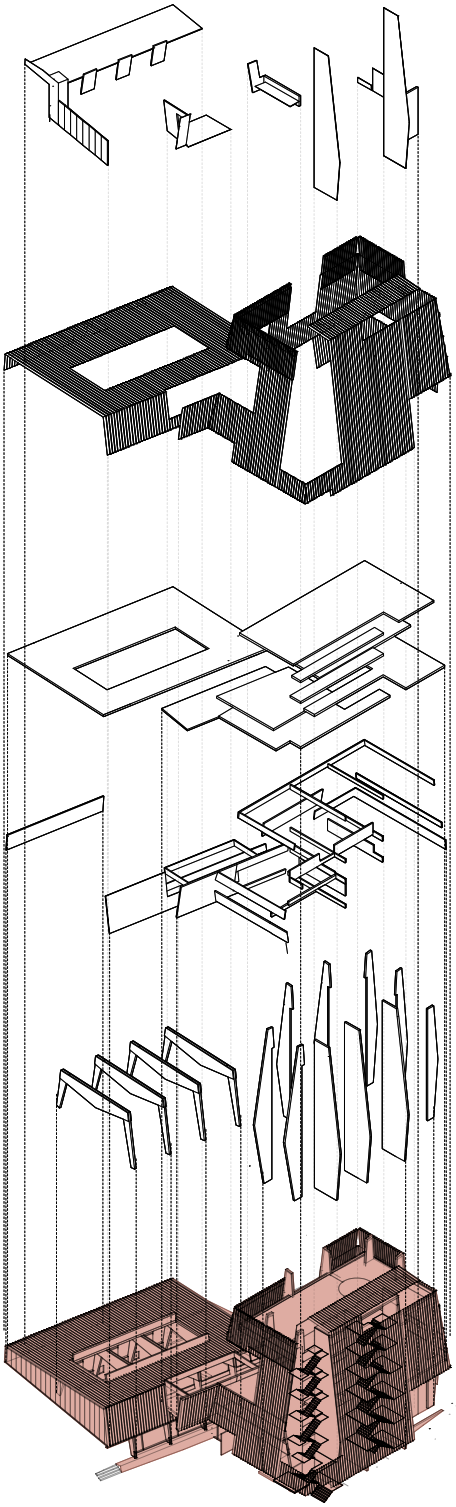
DLT
FLOORS +
BEAMS

L L

CLT
BEAMS +
WALLS

L

CLT
FRAME +
WALLS



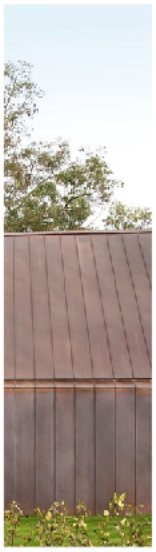


fig.34: Exploded Axon
Construction + Materials

an emotional response through the sense of smell as one approaches the roof. This extension of a contemplative experience into a promenade is reinforced further by copper inserts (small scale detail) that also recognize the lives lost to this pandemic.

At the most practical level, interior circulation is given additional room with a 7' wide interior staircase and generous hallways throughout the building. An interior sink at the lobby (small scale detail), as well as an exterior sink at the grove, are also provided transforming the practical need for cleansing into a celebrated ritual.

Joint

A particular space of importance is the viewing platform on the third floor that functions as a formal joint between the forum and the tower. It is a top-lit space directly accessible from the library and is one of the public goals of this project along with the forum, the terrace, and the roof.

It is both supported and defined by tilted CLT beam-guardrail and beam-wall with DLT floor spanning between the two. The beam-guardrail at the Forum's frame is intentionally placed on the forum side of the frame, allowing the detail to generate a spatial overlap between the forum and the viewing platform.

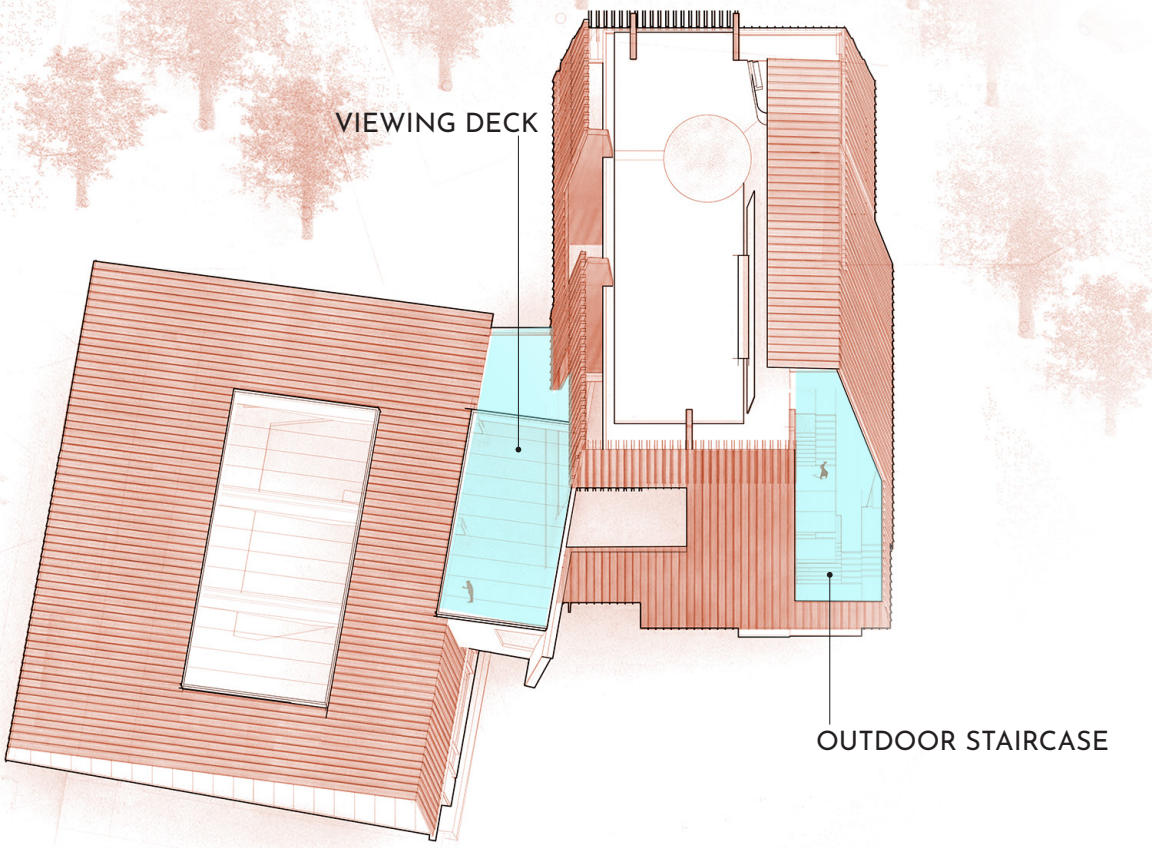
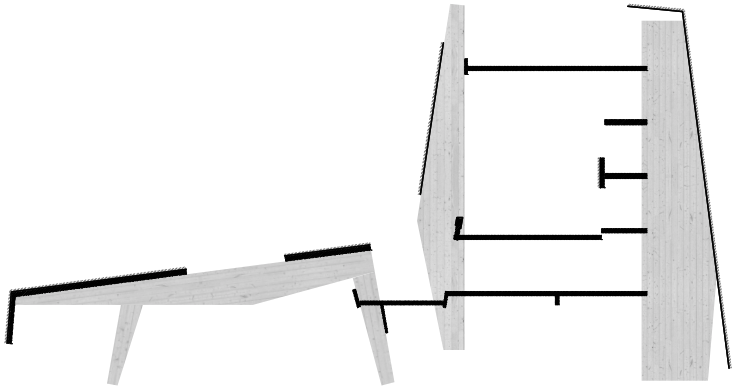


fig.35: Formal Joint Diagram

fig.36: S,M,L diagram (opposite)

L

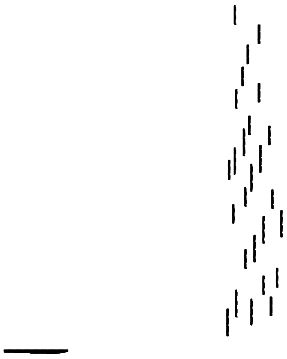


clt walls +
clt beam-guardrail+
clt beam-wall+
dlt floor-beam+
copper standing seam

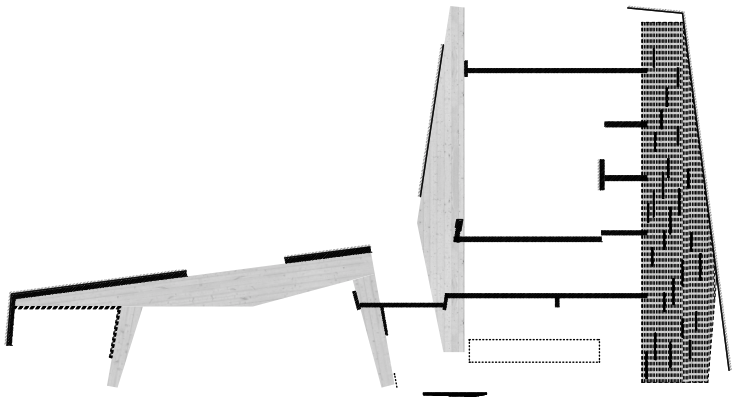
M

shou-sugi-ban +
metal guardrail

S



copper sink+
vertical copper inserts



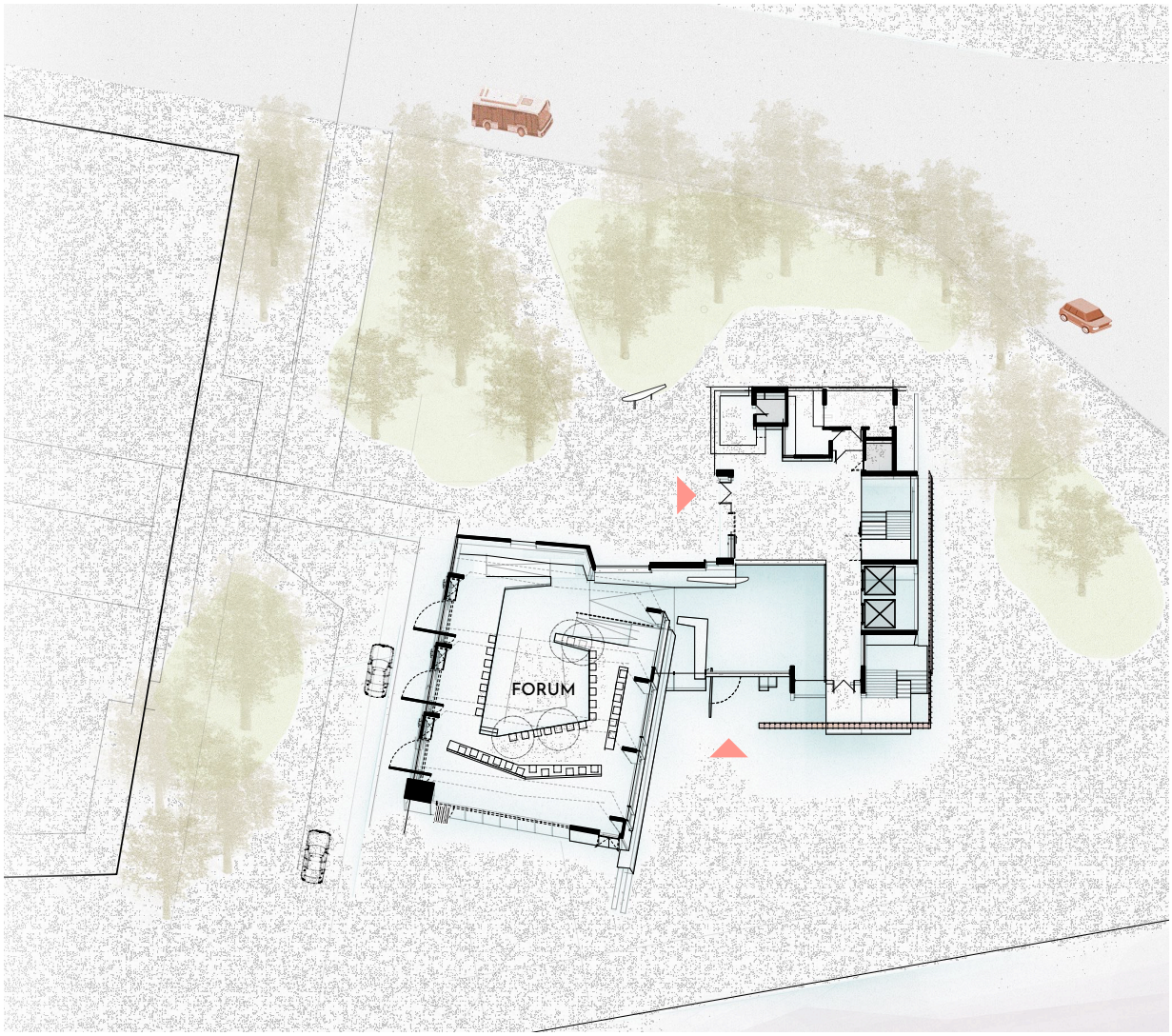
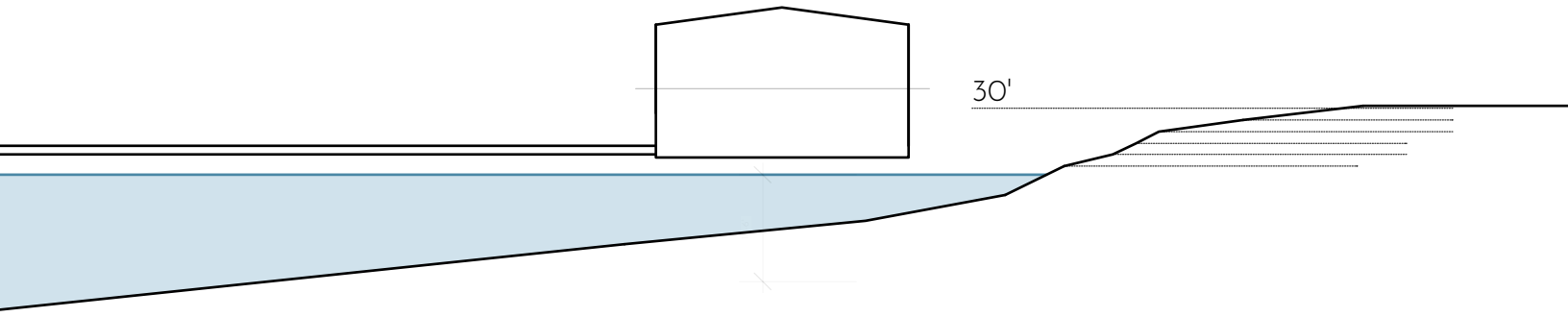


fig.37: Plan F2 (Mezzanine)

fig.38: Plan F3

fig.39: Plan F4

fig.40: Roof Plan


30'

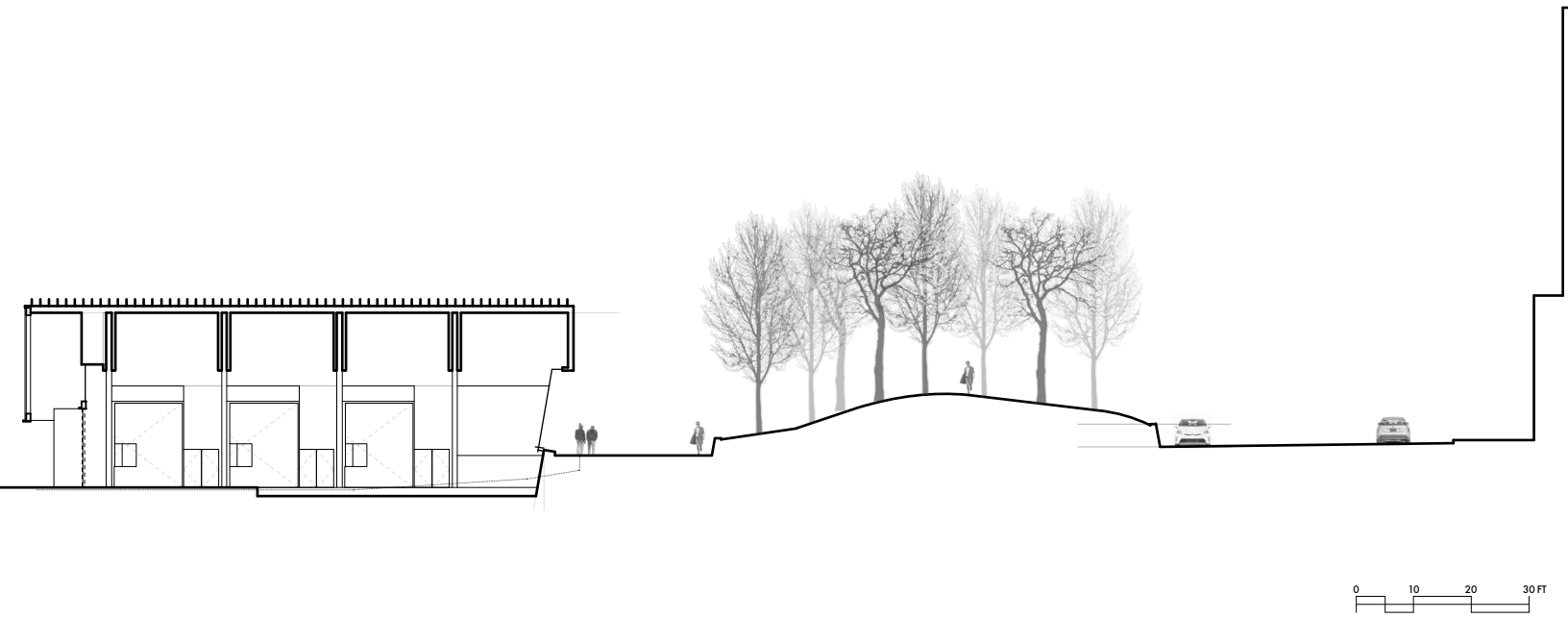
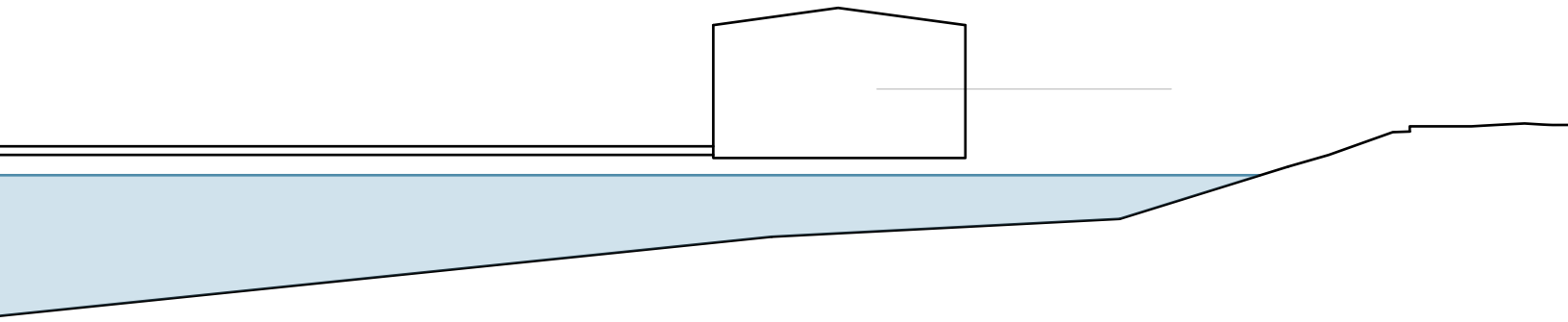


fig.41: East-West Section, Forum



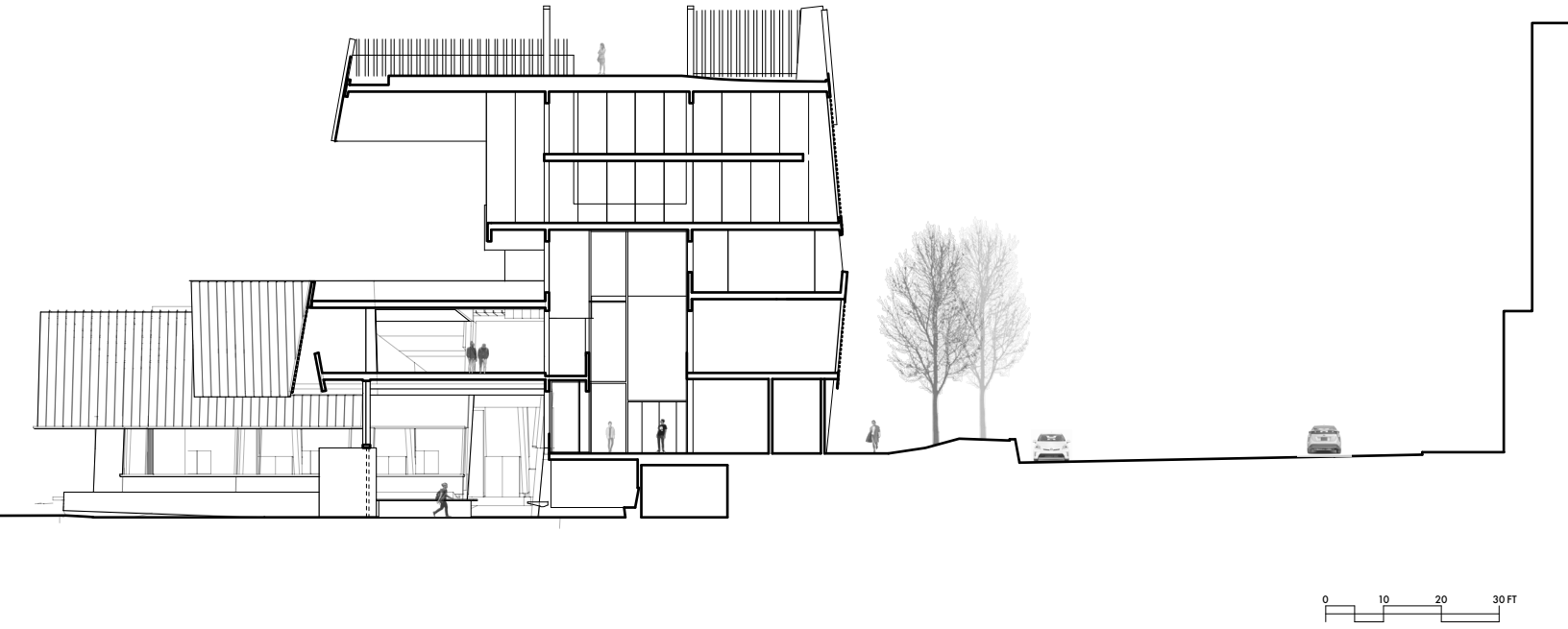


fig.42: East-West Section, Tower

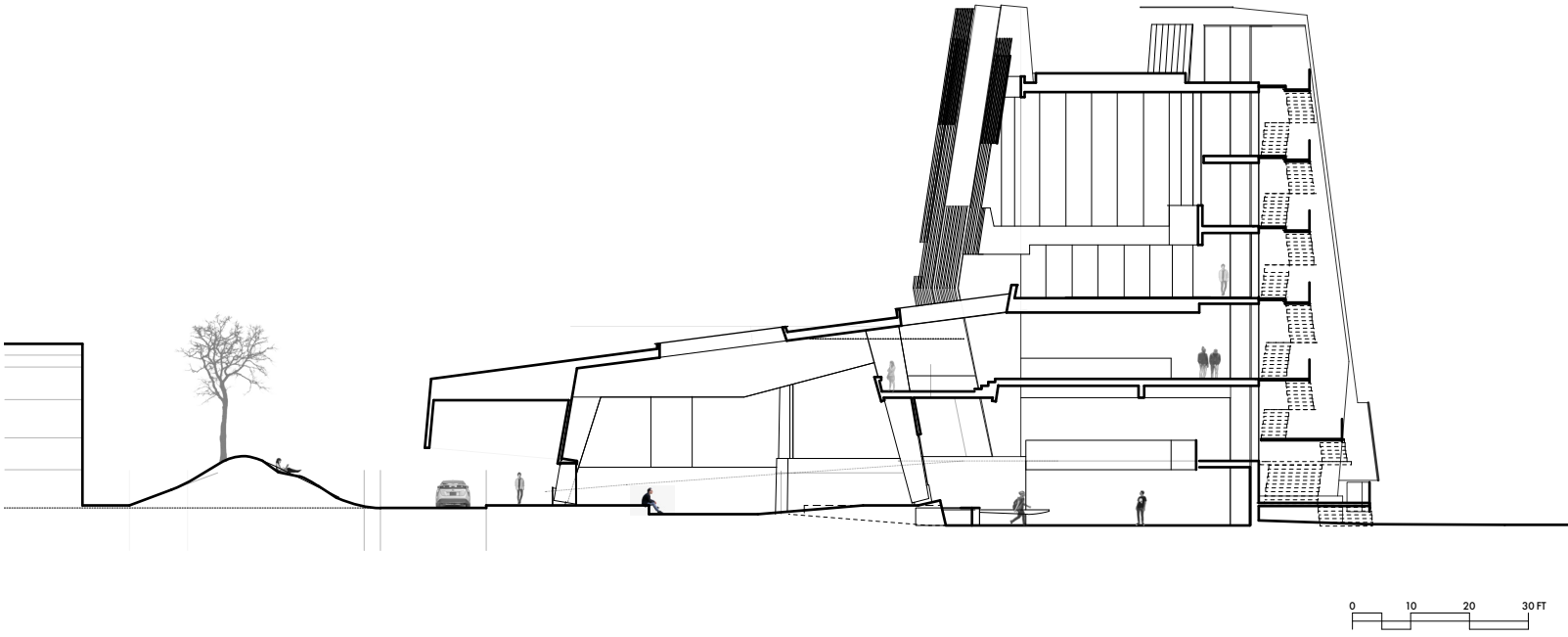
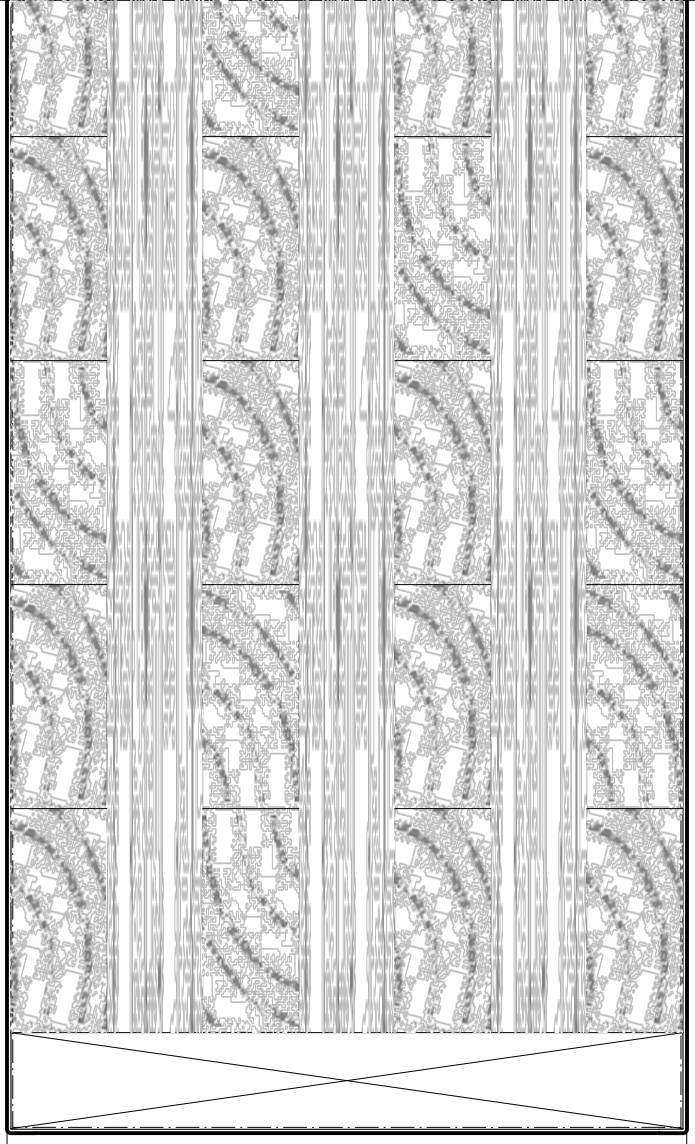


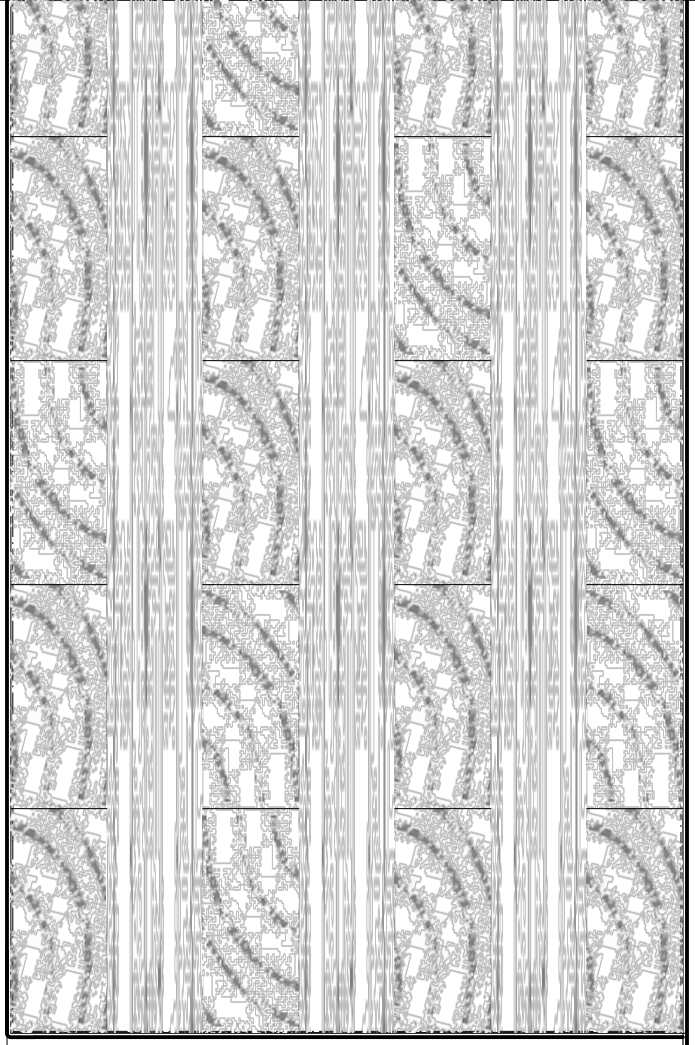
fig.43: N-S Section



Detail [L]

CLT Wall x Copper Cladding, Typ.

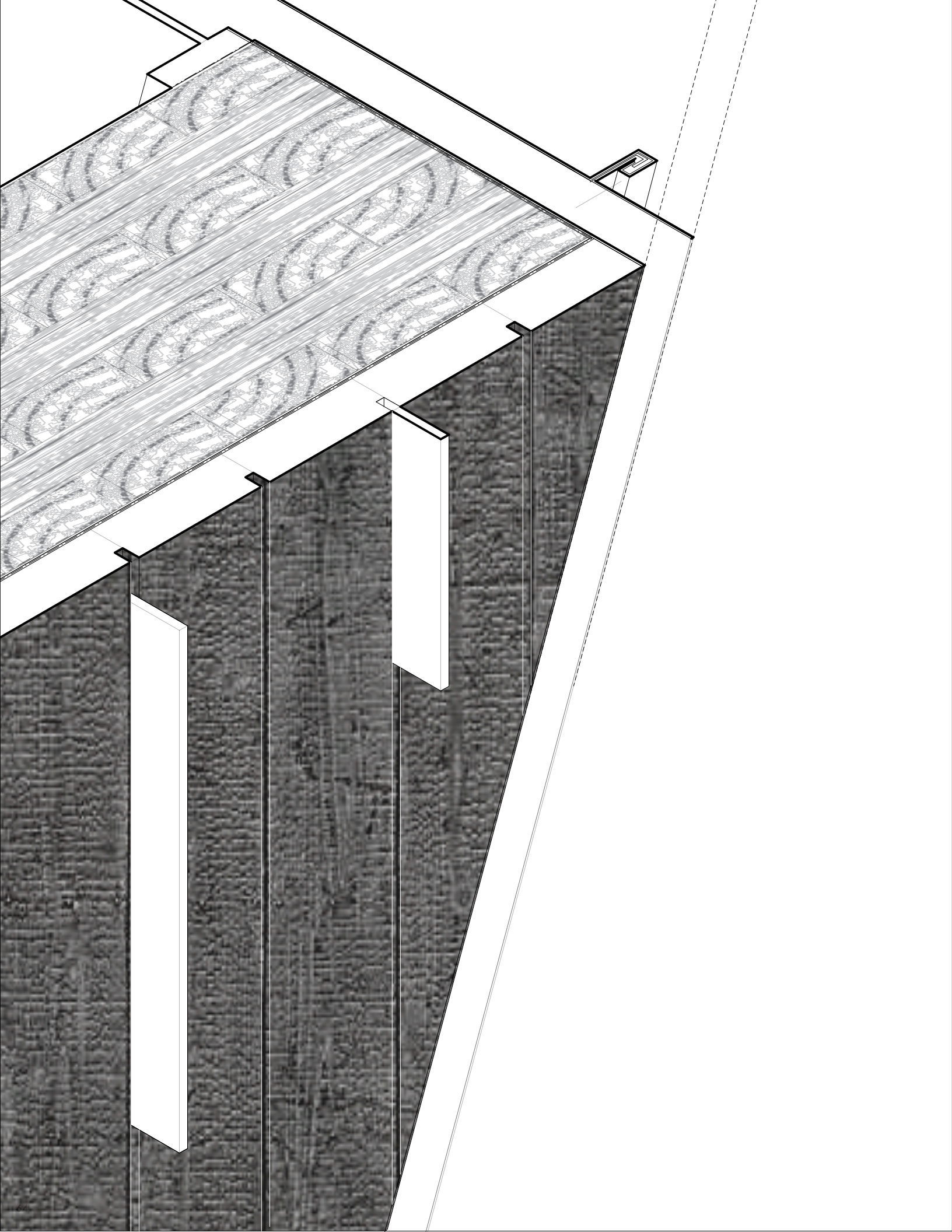
fig.44: detail



Detail [L]

CLT Wall x Copper Standing Seam Screen, Typ.

fig.45: detail



Detail [S]

Memorial Copper Inserts

Detail [M]

Exterior Stair Shou-Sugi-Ban Cladding

Detail [L]

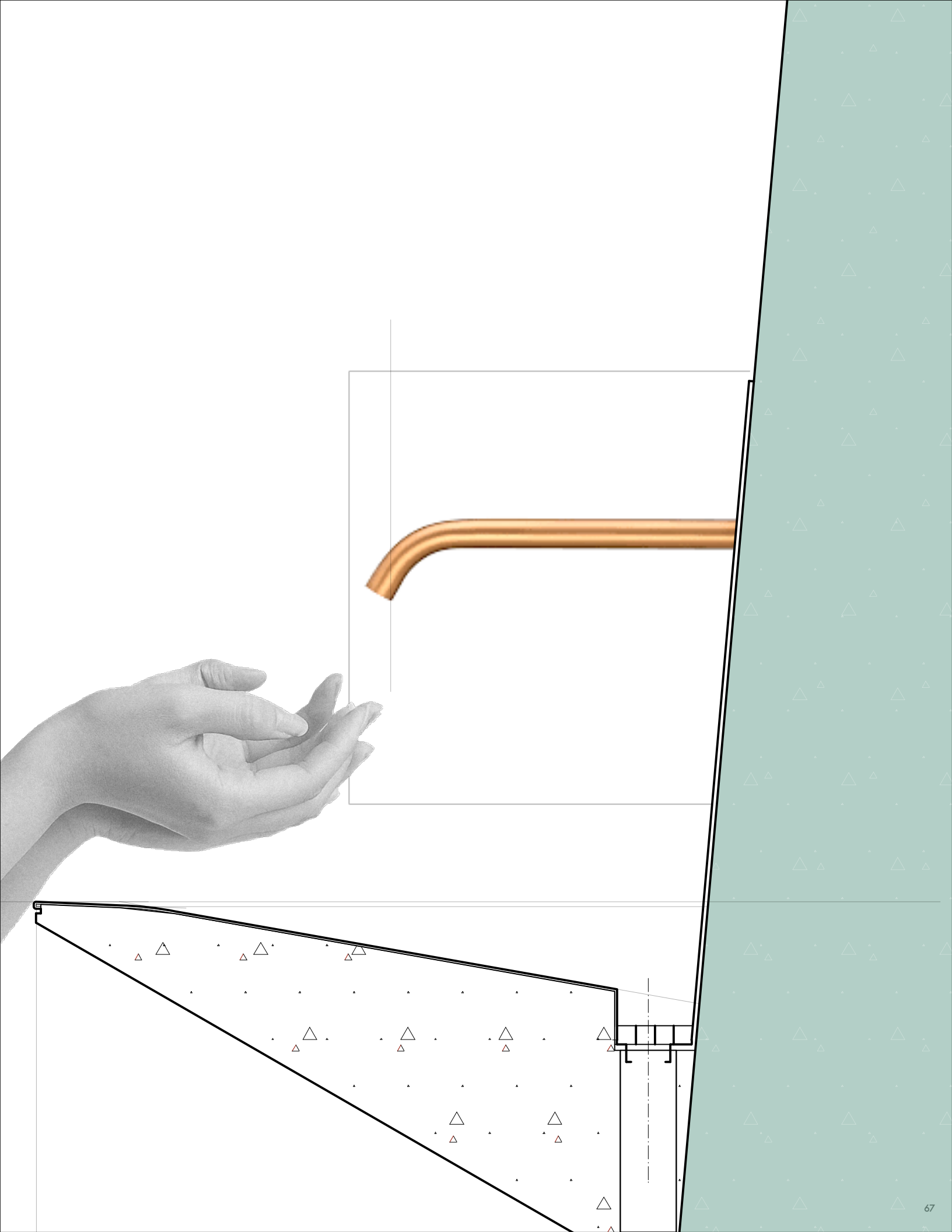
CLT Wall

fig.46: detail

Detail [S]

Lobby Handwashing Station

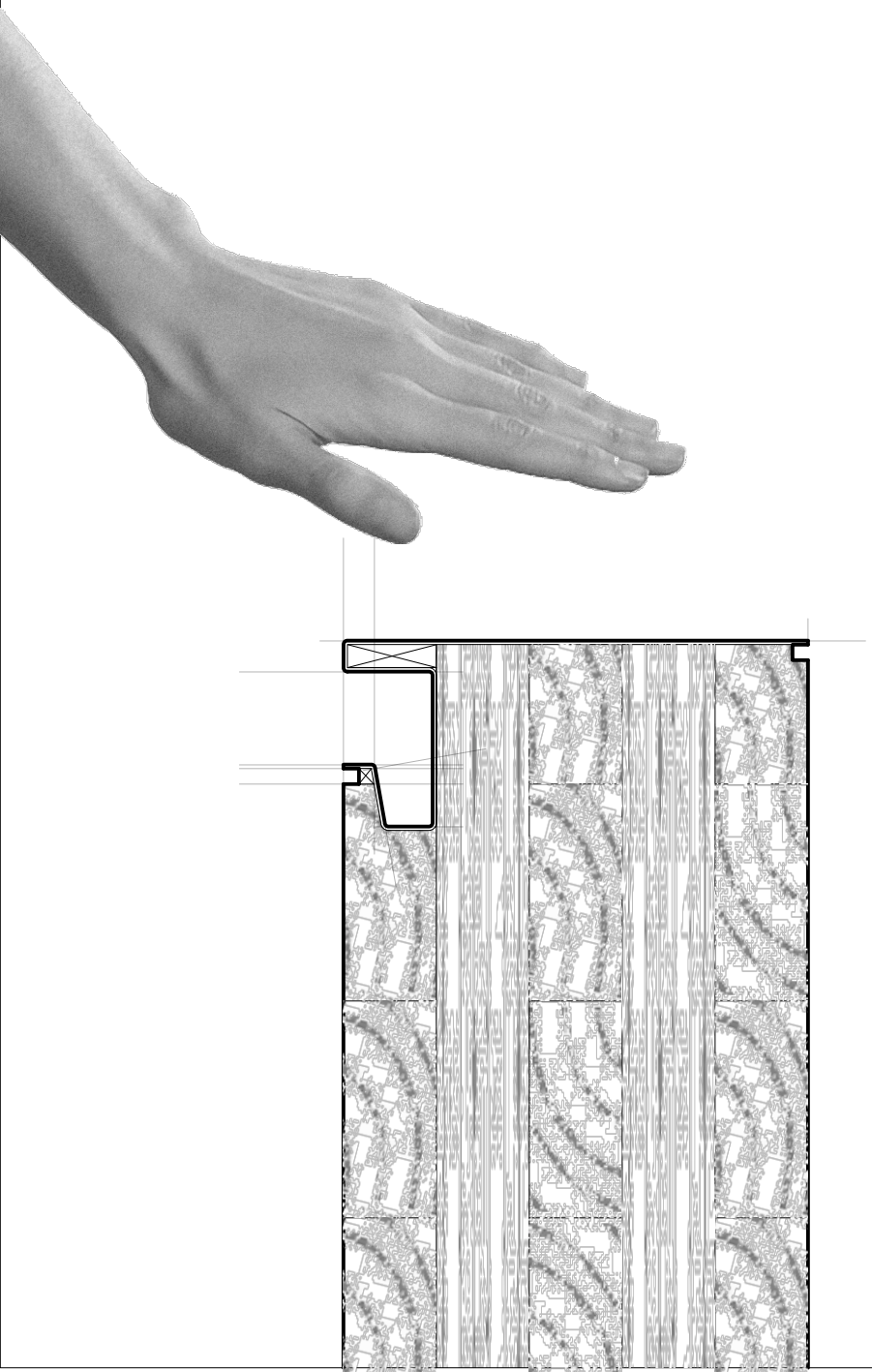
fig.47: Detail



Detail [S]

CLT Guardrail/Beam, Typ.

fig.48: Detail



Conclusion

As we find ourselves yet again in a context where the discipline is saturated with scenography while the vestigially resistant core continues its fundamental pursuit, I am led to believe that this is simply a symptom of our society as a whole -- a condition that will continue to persist unless a drastic reevaluation of our collective values takes place. While this can certainly be frustrating, I also find great relief in the recognition of this status quo, for it validates our efforts for those of us that continue to believe in "the structural unit as the irreducible essence of architectural form."

I began my graduate studies with the following statement: "My Primary interest in architecture is form. I understand this as a language that describes the way a building, object, or space is articulated related to its use, spatial characteristics, material, and environment." This statement was not only a representation of my interest that would directly translate to this thesis, but also my declaration of curiosity for the knowledge gained through this inquiry. The research undertaken is a small step for establishing a system to spatially consider details.

We are a part of a modest profession. But one with both an extensive tradition to learn from, and the liberty to embrace big ideas in our artistic pursuit. As with any craft, the foundational knowledge is of paramount importance for a successful practice. S,M,L, [detai]L is my dedication for discovering this knowledge -- A strategy that will continue to be developed through my modest contribution to our society.

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