

Withdrawing:

An investigation into how the iterative process of hand drawing can influence the design of buildable architectural spaces that are responsive to the contemporary blurring of traditional programs, typologies, and contextual conditions.

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Abstract

In the early 21st century environmental, social and cultural changes are confronting the traditional relationship one has with technology, space and subsequently architecture. More specifically the tools of design are becoming integrated, whereby the clarity of tradition is becoming overlapped, becoming blurred. With this in mind the research investigates the opportunities of an iterative hand drawing process to develop architectural responses to movement, time and transformation. Highlighting a future which is inevitably changing, it is important to assess the inherent qualities of our design tools, as they too influence the connection and formation of architectural space.

The research explores hand drawing through a design process which firstly, challenges drawn representation techniques and secondly, emphasises movement and transformation as key architectural drivers within the 21st century. Due to the continual developments within technology, construction practices and design materials, there is an opportunity to question and reflect our changing built environment and hence, the role of movement in architecture. With reference to the theorists Catherine Ingraham and Robin Evans, the research develops the position that the practice of architecture has become restricted by linear ordering systems. This is reflective in the orthographic representation of architecture alongside the built edges and boundaries of architectural spaces. Therefore, today's transforming conditions are used to validate and further articulate Ingraham's and Evans's theories, outlining a design response, using Wellington as a case study, built upon overlaying environmental, social and cultural relationships. The architectural outcome connects rather than dissociates itself to transforming conditions, creating multiple rather than singular boundary conditions through architectural blurring.

Traditional relationships to spatial boundaries and edges are critiqued through the ambiguities and layers of working within an iterative hand drawing process. The influence of hand drawn qualities has provided a way to insert motion into a construct which is perceptually static, hence introducing a means to negotiate and work within a period of transition.

Acknowledgements

To Mum & Dad,
who are no doubt relieved I am at the end of the tunnel.

To my 2011 class,
who have reached the end as well.

And to my supervisor Daniel,
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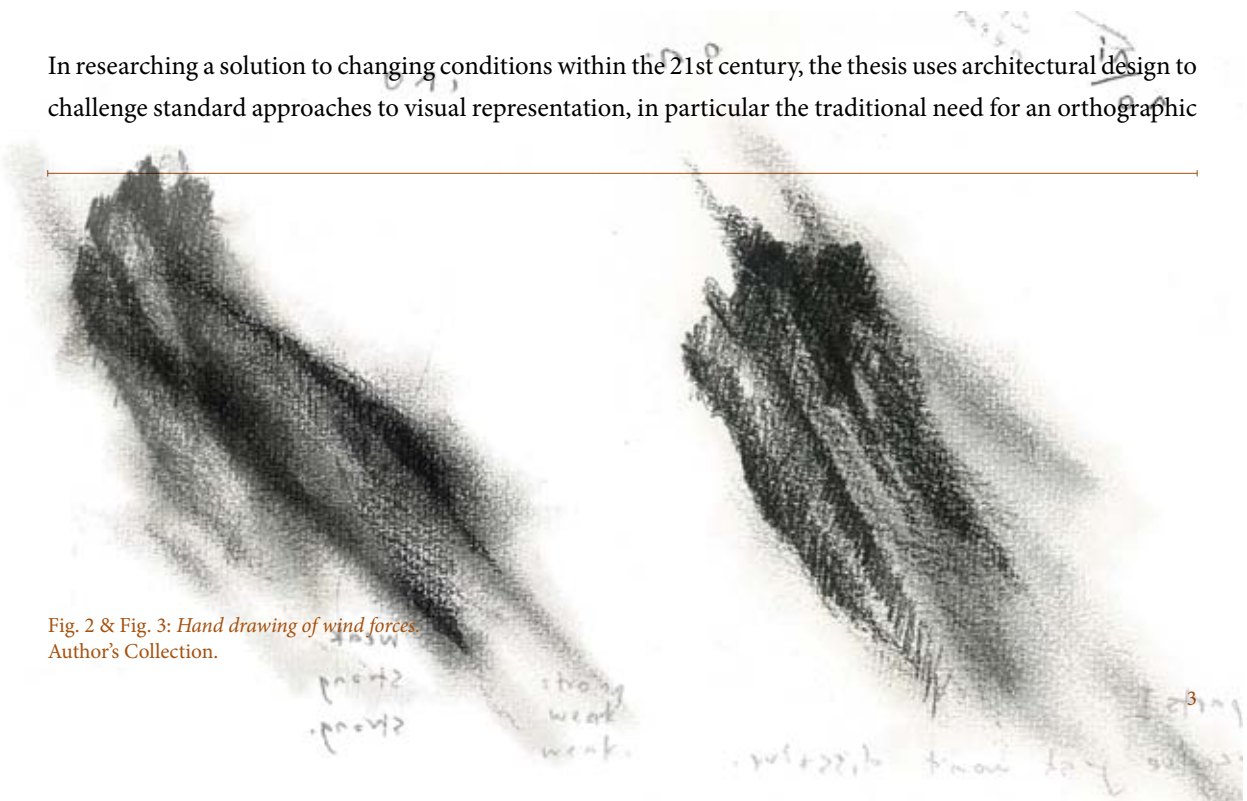
Chapter One: Introduction

In today's design and cultural era, changes in media and technology are enforcing new responses to lifestyle and hence the practice of architecture. Particularly in the last ten years, developments in the speed and accuracy of digital software have transformed traditional approaches to the design processes and subsequent individual expectations. Where design tool have traditionally been hand operated, a new relationship is shaping between conventional and contemporary design approaches. Further, the clarity of design tools and media is becoming interlinked and blurring, requiring specific architectural responses which acknowledge this important phase. This movement within the early 21st century not only implicates individual lifestyles but also induces a new responsibility for architects to recognise the role which their design tools play in the design development.

Due to this, the research investigation addresses the problem of acknowledging and reflecting changing environmental, social and cultural conditions within our 21st century designs. Further, it proposes that a solution to this problem may reside in the role design tools have in shaping architectural outcomes. Inevitably, the process of design becomes embedded within the final built outcome and individual experience. As the theorist Robin Evans notes, "buildings, though not wholly determined by the means of their production (which is to say, from the architect's point of view, the means of their representation), are mightily influenced by them" (Evans, 1995, p. 119). Today this realisation is of increasing importance resulting from the inherent differences between digital and hand design. In particular, these tools show differences in regards to the individual involvement one has with scale, personal signature and time. Regarding the involvement the architect has with the design process, Evans suggests an emphasis on the corporeal properties of artistic construction, focussing on "involvement, substantiability, tangibility, presence, direct action", (Evans, 1986, p. 7) in order to question the level of association between the architect and their design. Here, hand drawing processes can be distinguished from digital. Whereby the hand becomes more closely associated to the qualitative, experiential factors of architecture the digital is more used for addressing the quantitative aspects of building construction. By avoiding placing the hand and digital in conflict with one another, this idea provides the designer with a means to negotiate and work between two media.

In researching a solution to changing conditions within the 21st century, the thesis uses architectural design to challenge standard approaches to visual representation, in particular the traditional need for an orthographic

Fig. 2 & Fig. 3: Hand drawing of wind forces.
Author's Collection.



end product. Further, the iterative process of hand drawing becomes a tool to address the contemporary problem of our need to blur traditional typologies, programs and social relationships.

Principles of orthography (particularly the high levels of order and precision) provide limitations for dealing with change in architecture. Even further, the concept of blurring as it seen within drawn smudges and overlaid drawing layers, directly opposes this. Orthography (in architecture) is commonly acknowledged through orthographic notations-plans, section and elevations- drawings which are conventionally definitive and clear. The implications are noted by Alberto Perez-Gomez, “geometry and rationalisation which are inherent within the drawings and the process of translation leave no place for the “invisible” to emerge.” Although essential communication documents, an evolving drawing system and process are required that extends beyond the conventional formalities of architectural drawing. Due to this, the thesis investigates a means of representation that is separate to the construction documents. The principle objective is to question how standard expectations of architectural form, experience and representation can be challenged through operating within an iterative hand drawn process. An iterative drawing process is selected to strategically enable the blur to be investigated.

The research establishes two factors working in opposition in today’s practice. Firstly, the traditional influence of a linear representation and design system and secondly, the increasingly high level of variances in social, cultural and environmental patterns. Recognising this, the research engages the problem and proposed solution on a theoretical level by applying and challenging the work of Catherine Ingraham and Robin Evans. Firstly, the research uses the theories proposed by the professor and theorist Catherine Ingraham as a way to establish a framework for development and practice of architecture today, specifically in regards to how it effectively deals with change. Challenging the inherent stability and tradition of the architecture practice, Ingraham critiques the dedication that architecture has shown to rules of orthogonality, “strictly defined, the right-angledness” (Ingraham, 1991, p. 66), which influence working intentions, processes and subsequent outcomes. Therefore, the research applies and challenges Ingraham’s theories of a linear orthographic practice by consciously overlaying changing social, cultural and environmental conditions in the drawing process and design outcome. These conditions transform over time and hence, when integrated within architecture require new responses to conventional ordering systems.



Fig. 4: Hand drawing of wind forces using each face of tracing paper.
Author's Collection.

Building upon this, the thesis uses the layers and ambiguities of hand drawing to challenge the acceptance of historical and also, contemporary digital working methods. Specifically acknowledging the capacities of hand drawing enables the research to critique the dedication that architecture has established to linearity and order, principles that are clearly evident in present digital modelling. As has been noted, drawn representations of architecture are intimately connected with principles of orthography. However, the specific treatment and use of drawing media can develop unexpected, new relationships in deriving architectural space. Highlighting the role and influence that drawing has in the design process, the research applies and challenges the theorist Robin Evans. In considering art and architecture, Evans establishes a critique against the quantity of graphical images in contemporary society, arguing that they reduce individual sensitivity in being able to imagine the hidden, subtle qualities of an image. Therefore, becoming increasingly connected with only the clear, apparent and real and neglecting the potential for imagination. Although more clearly recognisable in art this matter also applies to the design of architectural spaces. On this matter, Evans (1989) states:

As soon as we introduce the observer with a capacity to imagine... then the line between the design drawing and the finished article seems to be composed of a series of eddies and circuits rather than a single vector. (Evans, p. 20)

Not only using the qualities of drawing to derive new spatial relationships, drawing in this thesis investigation is also utilised as a means to question standard techniques of visual representation. Representation is therefore not only connected to the presentation of architecture, but its simultaneous creation too.

Research Intention

The role of design is focused upon defining and representing innovative responses to traditional spatial boundary conditions. Contextual relationships, movement relationships and transformative relationships are hierarchically emphasised in the design research process in order to gain an appreciation for designing beyond the lens of orthographic notations such as the plan and section. This imperative has been established as a contemporary response to Ingraham's texts, where she acknowledges how propriety or 'correctness' influences architecture. She (1998) states:



Fig. 5: Hand drawing of wind forces using each face of tracing paper.
Author's Collection.

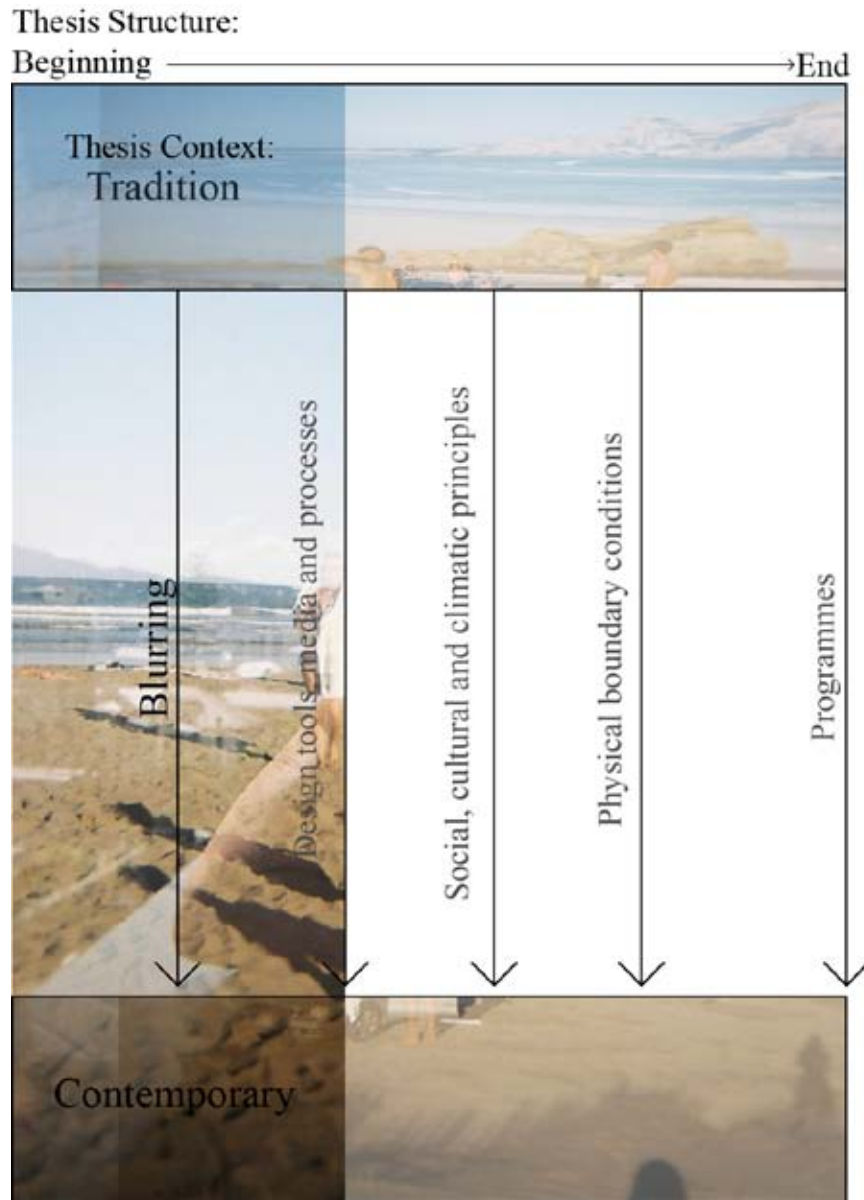


Fig. 6: Matrix of blurring and its application within the thesis structure. Author's Collection.

One of the most powerful forces that architecture exerts on culture is the maintenance of certain proprieties: how space is lived in and named; what type of building is most appropriate to what use; what materials belong to the exterior, what to the interior; and so on. (Ingraham, p. 30)

Not only critiquing architectural drawing, Ingraham posits that accepted architectural principles frame and restrict design innovation. In today's context where the old is confronted by the new, tradition is confronted by innovation and inside is equally as important as outside, a specific focus on boundary conditions can transform standard expectations and relationships with space. Therefore, the design research achieves its focus by explicitly investigating how non-traditional transformative boundary conditions can be developed through application of 'blurring' as a strategic hand drawing tool.

Developing upon this, the notion of blur or blurring is introduced as a direct outcome of today's transitional period. Recognition of blurring allows an architectural response to be created which challenges the clear, apparent and real as was previously outlined by Evans. The design research applies this concept not only to drawing techniques but their translation into built form where movement and transformation lead to new and different ordering systems. Therefore, an iterative drawing system forms a process rather than an orthogonal end product. The idea of a layered drawing process is further supported by Marco Frascari in his statement regarding the effects of digital design, 'the new electronic imaging prevents imagining, and the resulting representations promote acts of merely logical 'thinking about architecture' rather than bringing architects, contractors, clients and critics to think within architecture' (Frascari, 2007, p. 4). Hence, the drawing process becomes a strategic tool within the thesis to influence the connection and formation of architectural space.

In order to reconsider and challenge the role design tools have in shaping architectural outcomes, the research will utilise both a physical (urban) site and a non-physical (drawing board/ paper surface) site. The research will use a drawing board within an architecture studio as a case study for design explorations.

The programme of an Architect's office is used as a tool to address and reconsider the architectural design process and the responsiveness of programme within the 21st century context. The nature and role of blurring as a design research component requires an adaption of the traditional treatment of programme. Programmes of the 21st century need to be reassessed to enable interaction and connection with various climatic conditions, multiple typological readings and movement between interior and exterior spaces. Therefore, program, habitation and typology need to be able to respond to blur, as a means to address various requirements over a day and an annual period. Investigating boundary conditions, the programme also operates as a vehicle to test new relationships and associations between the architect and the public. Moving forward, the architect is increasingly involved with the public, and hence the traditional isolation needs to be reconsidered.

The architectural office is located on a physical site between 110 Oriental Parade and Prince Street in Wellington. The site is particularly appropriate due to its location on a commercial and residential fringe as it requires a typological response which visually and physically blurs the two conditions. As the thesis is undertaken through hand drawing processes, many of the drawn techniques inform the development and also reading of the specific boundary qualities. With this in mind, the boundary is considered as a threshold that operates and is driven by external and internal forces as they evolve and transform over time.

The following section elaborates on the internal and external forces, their relevance to the drawing process and design outcome. An analysis of the architectural imperatives listed above allows the design to be critically responsive to its contextual situation. Through re-examining these imperatives, often taken for granted, the inhabitants can become more exposed rather than concealed to the unspoken changes around them.

Program	The program provides a method for investigating the physical expansion and reduction of the boundary. Being closely connected with daily cycles, the design is reflective of the variations that occur in relation to time and therefore the influence this has on a mobile boundary.
Inhabitants	The architects and students who occupy the studio can be seen to operate predominantly on the interior (habitation within exterior zones in fine conditions) of the building. However, as seasonal variances occur, the external pedestrians become increasingly included within the design. The site responds to the users through varying levels of exposure and privacy.
Social Conditions	<p>Social conditions are defined by the movement of pedestrians and neighbours (exterior/ interior) and relationships between internal inhabitants (interior/ interior) at the site. This emphasises the connection between active and passive users and introduces the role which the design needs to play to accommodate two shifting program users.</p> <p>Social dynamics are intimately connected to seasonal variances that determine how an individual uses a space and therefore the crossover between internal and external elements.</p>
Cultural Conditions	The design is required to respond and mediate between residential and commercial neighbours. Form, scale and materiality are used as devices to vary levels of exposure and privacy and hence, the typological blurring of an architecture practice within the site.
Environmental Conditions	Environmental and climatic conditions including wind, rain and sunlight are analysed and utilised to inform spatial edges and the subsequent transformation as required by the inhabitants.

Fig. 7: Matrix of transformation and its application to the thesis structure. Author's Collection.



Fig. 8: Movement explorations.
Author's Collection. Digital photographs.

Thesis Structure

The aim of the research is to reconsider architectural responses to programs, typologies and social conditions through the concept of blurring. A focus is placed on the development of physical boundaries as they evolve from iterative hand drawing processes. The research has been structured into four chapters with Chapter One being the Introduction:

Chapter Two establishes the research focus using two contemporary theorists. Catherine Ingraham's theory on orthography is used to establish a framework for developing a design which can effectively incorporate external variables. Secondly, the voice of Robin Evans provides a reflection upon architectural drawing and artistic imagery within contemporary society. This is utilised to establish how hand drawing can be utilised to challenge preconceived expectations of the architectural design process and the experience of architectural space.

Chapter Three highlights how the term 'blur' is becoming increasingly relevant within architecture today. Forming a multiplicity of edges becomes the first design step to respond to traditional singular edge anomalies. Five built case studies are used to draw attention to the various historical blurring of boundary edges. Further, this reviews the blur as a component which can dissolve and integrate interior with exterior. Building upon this, the design research establishes a relationship between the periphery and centre as a method to integrate physical movement into the design.

Chapters Two and Three inform the design methodology analysed in Chapter Four. Chapter Four outlines the author's design case study and the role which it has played in formulating a new approach to boundary conditions. The design processes are outlined and included in the following chapters which allow for the visual development of blurring to become apparent.

Chapter Five analyses the design outcome, its responsiveness and key findings to today's period. Important ideas are re-analysed to provide a framework for the future consideration of boundary conditions. It also suggests further possibilities for integrating blurring into architecture programmes.



Fig. 9: Movement explorations.
Author's Collection. Digital photographs.

Research Scope

The research is focused as a reflection of the current Master's of Architecture studio at Victoria University of Wellington. In this studio environment, students operate between design tools, some of whom work predominantly digitally based, some by hand and others who operate back and forth. The students provide a clear indication of the transitional period and tools that architecture has to operate with. Although using the architecture studio at Victoria University as the basis to the research, this situation reflects the process of many students within the school.



Fig. 10: *Blurring, Lindis Pass, New Zealand.*
Author's Collection. Digital photograph.



Chapter Two: Theoretical Foundation

This section of the thesis aims to establish a theoretical framework for the blurring of traditional programs, typologies and social conditions in the 21st century. Questioning the implications which working media have on design output, the research recognises the opportunities provided by an iterative drawing process to integrate movement and transformation into architectural design. Using the voice of Catherine Ingraham, the research outlines that the ability for architecture to respond to change is restricted by a linear working method where an orthogonal end product is sought. Therefore, the design research method invites hand processes to become their own end product allowing the continual blurring of layers to remain visible in the final outcome.

Supporting this, the research analyses the theories of Robin Evans, building upon his argument that individual sensitivities and imagination have diminished with the abundance of graphic imagery and usage of digital mediums in public society. Further, the research builds upon Evans by recognising the key role which architectural drawing plays prior to building. Hence, awareness on the process of design becomes increasingly important for achieving architectural blurring of programs, typologies and social conditions. This section concludes by outlining iterative hand drawing as a valuable tool to challenge traditional, orthogonal design conclusions.



Assessing limits of control |

Theoretical Framework: Catherine Ingraham

The political nature of architecture is rooted more deeply in architecture as enclosure and in the manner in which enclosure is perceived. (Kahn, 1990, p. 85)

Catherine Ingraham has produced several texts which primarily focus on the operations and principles of linearity as they apply to, or govern, architectural creativity. Ingraham refers to the line as a source of power, informing rules of what is proper and expected within architecture, beyond the physical drawing board. Her reference to orthography is used to characterise the stable, reliable position which she believes governs the practice of architecture. Further, orthography is regarded by Ingraham as a factor informing architectural systems and representations between for example, drawing and its clear translation into built form. Ingraham's work sits as a response to particular works by Alberti, Lacan and Le Corbusier where geometry and hence, linearity are outlined. Her work and theories are most important for the thesis as they outline a historical basis to the treatment of the line and linearity, within architectural drawing and the built design. For architectural designs to successfully integrate changing conditions, traditional expectations and reliance upon an orthographic end product needs to be reassessed.

The practice of orthography

Orthography is commonly discussed with reference to the practice of orthographic drawing, visual images which are united by a common method, language and structure. As the process of drawing precedes building, principles of orthography, of order and control, become intertwined within 3-dimensional design and spatial experience. Catherine Ingraham (1991) argues that space is verified through geometry, whereby “the workings of orthogonality- strictly defined, the ‘right-angledness’ of a line” (p. 66) have been an underlying influence within the tradition of architecture. Hence, the effects of orthography become transformed,

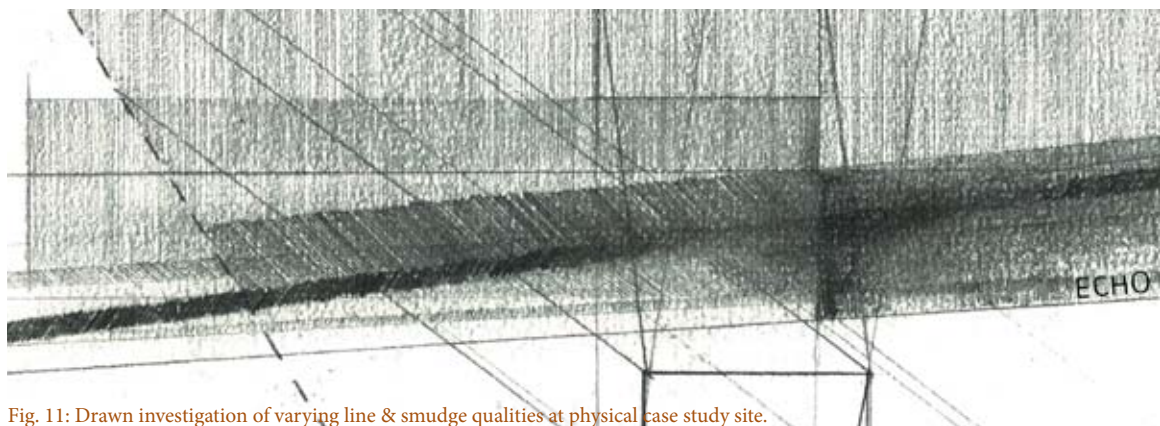


Fig. 11: Drawn investigation of varying line & smudge qualities at physical case study site. Author's Collection.

almost unconsciously into the form, edges and treatment of architectural spaces. For Ingraham, this not only represents the physical form but the perception of what constitutes architectural experience. As the shift from linear to non-linear typologies continues, architecture today no longer needs to adhere to singular programmes or social groups, rigid or predictable climatic conditions. Therefore, where movement and hence blurring are design imperatives, traditional orthogonal design processes and conclusions can be seen to provide negative constraints. Most particularly, this influences the development of flexible living patterns between interior and exterior conditions.

For Ingraham, orthography has resulted in the creation of an 'acceptable' architectural image, practiced and often expected. With reference to the Modernist Period of the early 20th century, this is further exemplified. Specifically, Ingraham focuses on Le Corbusier's early Modernist work where linearity was of increasing importance. Reflecting upon her text, it can be noted that Ingraham herself recognised the constraints and movement beyond rigid ordering systems. The relevance and importance of her theories are reflected in today's design environment whereby traditional approaches require increasing levels of flexibility in order to integrate changing conditions. Referencing and critiquing Le Corbusier's text titled *The City of Tomorrow*, originally published in 1929; Ingraham uses the principle of the line to evidence how conscious intent overrides any doubts which may arise from unknown or insecure matters. She reiterates Le Corbusier's text (1998):

When man begins to draw straight lines he bears witness that he has gained control of himself and that he has reached a condition of order. Culture is an orthogonal state of mind. Straight lines are not deliberately created. (p. 68)

For Le Corbusier working within this period, geometry and mathematical rational had become fundamental tools for the development of an appropriate architecture for the modern age. 'Machinery is the result of geometry. The age in which we live is therefore essentially a geometrical one; all its ideas are orientated in the direction of geometry' (Corbusier, 1946 (1927), p. 1). This is noticeably an important continuation from the working methods of the Industrial Revolution where clarity and order were primary objectives. For Ingraham writing in the late 20th century, linearity became increasingly unimportant however still governed working practices, the geometrical translation between drawing and form and the conventional experience of architectural space.

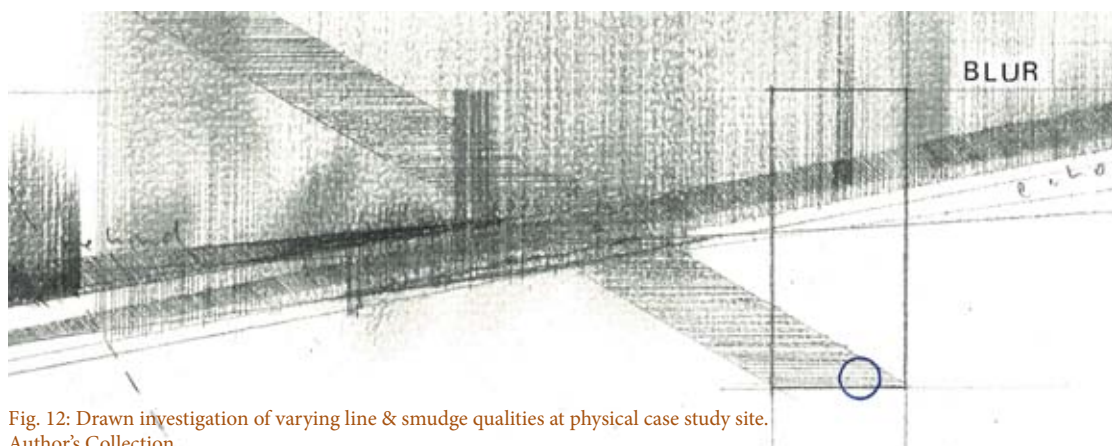


Fig. 12: Drawn investigation of varying line & smudge qualities at physical case study site. Author's Collection.

Within the text, Le Corbusier uses an analogy which compares the pathway of a pack-donkey to man as a means to reflect upon variances of order. The importance of this is the hierarchy and distinction placed upon human rationality rather than the wandering donkey (Ingraham, 1992, p. 136). Hence, in the philosophical sense, the pack donkey exemplifies the natural unknown force of nature, a threat to the modernist view which exemplified order, clarity. In contrast to today, external variances are accepted and acknowledged within lifestyle and architecture. Order and clarity in architecture are becoming surpassed due to the integration of conventional and contemporary media, tools and continual technological developments.

Continuing, the underlying force of orthogonality evidences a larger traditional dedication to closure and protection within architecture. It extends far beyond the two-dimensional drawing. Ingraham (1998) notes:

Orthogonality is a theory about what is it proper for architecture to do, and thus extends beyond the (merely) rectilinear to any form that is erected against the monstrous, speechless, wandering, pathless incoherence of the genealogical line itself, the history of architecture itself. (p. 137)

Hence order, or the necessity for order (Corbusier, 1946 (1927), p. 64) became an essential design principle however simultaneously provided a method for separating nature from architecture; the unknown against the known. As has been noted this view is consistently changing whilst requirements for a sense of architectural order still remain. Where boundary edges blur, order can be maintained or met through material and tectonic considerations which integrate or disclose the exterior from the interior without relying upon strict boundary edges. Reflecting upon Ingraham's theories, the design case study needs to test how the blurring of linear frameworks and edge conditions can still achieve the architectural imperatives of order and separation when necessary.

Responding to Change

Changing environmental, social or cultural conditions provides architecture with the ability to develop responses beyond an orthogonal ordering system. Acknowledging permanence is necessary in the construction of architecture however the importance in today's period is to question the traditional principles which we are reliant upon, as Ingraham outlines, "the stabilisation which architecture requires and loves" (Ingraham, 1998, p. 152). A dialogue between these two positions is clarified by the theorist Herman Hertzberger (1991) by considering change and permanence as being two interrelated components:

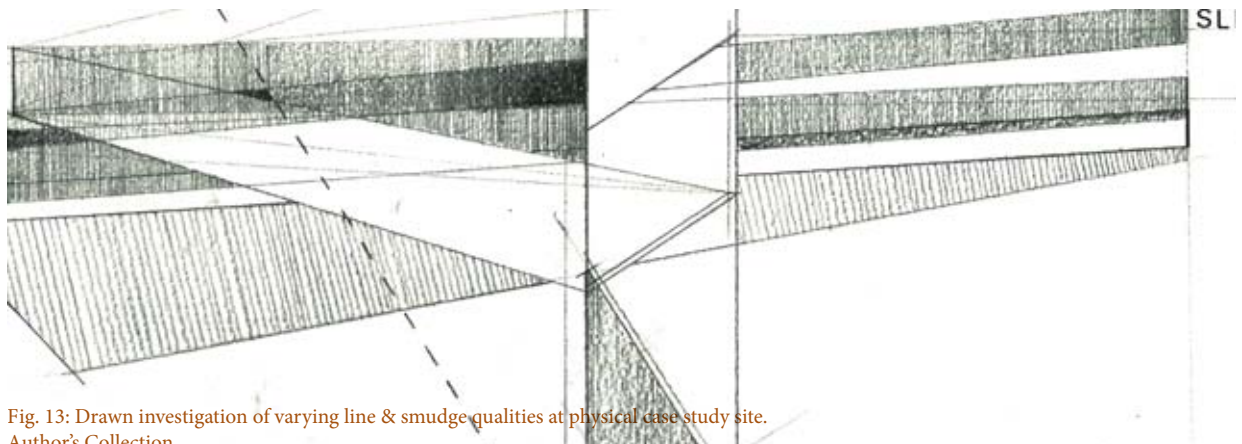


Fig. 13: Drawn investigation of varying line & smudge qualities at physical case study site. Author's Collection.

The process of change must constantly appear to us as a permanent situation, that is why the changeability itself must come first and foremost as a constant factor, which contributes to the significance of each individual form. (p. 149)

This viewpoint provides a bridge of connection between two opposite states, perhaps unknown to Le Corbusier in his view upon nature and building being two opposing conditions. Today, the notion of change not only disrupts practices of stabilisation and control, it can also provoke an investigation into the intangible qualities which evolve in the construction of architectural spaces.

An emphasis can be placed upon the qualitative layers of hand drawing, or could equally engage the unique, uncontrolled properties of light, shade and material. Through this emphasis, persistent control isn't as necessarily required. Perez-Gomez recognises this, emphasising that the drive towards productivity and rationalisation have led to a systematic representation, leaving no room for the invisible attributes of architecture to appear (Perez-Gomez, 1997, p. 34). Not only questioning the 'invisible', Perez-Gomez emphasises the reduction in appreciation for the subtle properties external to the building construction and subsequently daily experience. Andrea Kahn (1991) follows a similar critique regarding our preoccupation with the visible components of architecture, "this oversight of architecture's political effects allows for unwitting acceptance of, or submission to, a controlling power hidden or enclosed within the readily seen" (p. 86). A parallel between the two theorists is apparent in the search for the hidden, invisible qualities that can be revealed and are inherent within architectural drawing and the later built outcome. Aligning with Ingraham, the subjective nature of these qualities is important for allowing an architectural response to be derived which moves beyond an orthogonal or predictable outcome.

This framework provides a basis for establishing a design methodology that challenges the clarity of orthography, on a visual and symbolic basis. Acknowledging the varying levels of transformation within light, shadow and materials can also be extended to engage with moving components. By challenging the constraints set upon representational and formal spatial qualities, the ability to define architecture by its changing conditions can be strengthened. In particular, movement, between one position and another can provide architectural designs with an ongoing yet varying sense of order. Integrating movement within a typically standard edge condition becomes a method for inviting multiple conditions whilst maintaining order in each position.

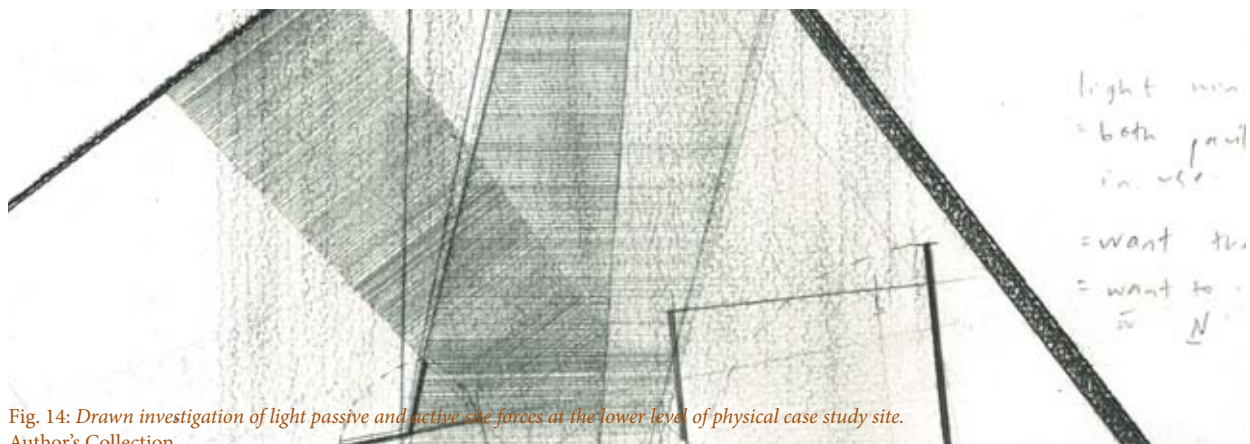


Fig. 14: Drawn investigation of light passive and active site forces at the lower level of physical case study site. Author's Collection.

Questioning the working medium |

Theoretical Framework: Robin Evans

When projections function as surrogates (replacement) of buildings, when sets of drawings attempt to provide us with a “picture” of an architectural place or object, the buildings produced by such techniques must necessarily reflect the predictive quality of their conception: the possibility of a revelatory dimension is abandoned and the actualisation of the architect’s imagination will inevitably be lost in the translation. (Perez-Gomez, 1997, p. 39)

As an architect, teacher and historian, Robin Evans writes about the architectural meaning within projection, geometry and drawn representations. Primarily his writings are based from the Early Renaissance to the Post-Modern period and closely interlink art with architecture. His focus upon the acts of architectural drawing is triggered by his personal uncertainty regarding the translation process and development between the initial ideas of the imagination, drawing and built form. Using historical case studies, Evans emphasises the underlying role geometry plays in this process forming his theory that architecture is derived upon the translations between imagination, geometry and built form. Geometry is recognised as a mental ordering system in this translation. Emphasising imagination, Evans outlines a requirement to move beyond the standard association of architecture as image, as drawing, which can therefore challenge standard relationships which society has with the experience of art and architectural forms.

Drawn out: Locating architectural drawing

The requirement to investigate the role which representation plays in architecture is grounded in the position that drawing plays in preceding building. Individual technique and methodology informs the artistic and architectural spatial discoveries. Evans notes “... in architecture, (the subject) ‘is brought into existence through drawing. The subject-matter (the building or space) will exist after the drawing, not before it” (Evans, 1997, p. 165). Developing upon the previous section, a focus on architectural drawing is necessary as it informs how

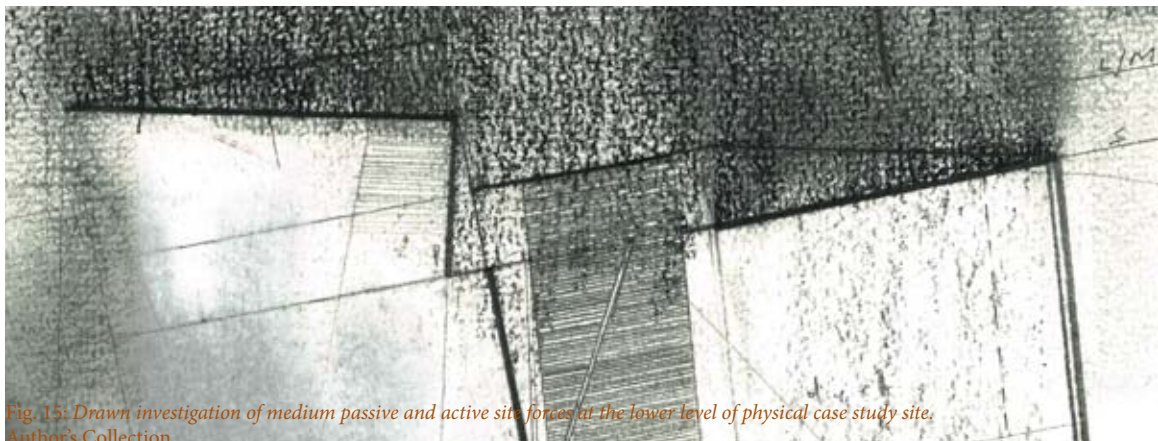


Fig. 15: Drawn investigation of medium passive and active site forces at the lower level of physical case study site. Author's Collection.

non-linear blurred edges are developed in design and finally, experienced.

In the past two decades, architectural drawing has developed, moving beyond its traditional role as an orthographic notation system. However, with reference to Evans it becomes evident that the drawing and the space between the architectural drawing and resultant building isn't as clear as the previous quote may suggest, "...the properties of drawing- its peculiar powers in relation to its putative subject, the building" (Evans, 1997, p. 154). With this in mind, the position that drawing plays in the architectural process is more significant than initially realised. Developing upon this, Evans acknowledges the lack of attention and consideration placed upon the space between each condition, drawing and building. He writes "... the drawings themselves have become the repositories of effects and the focus of attention, while the transmutation that occurs between drawing and building remains to a large extent an enigma." This comment further reflects the development of architectural drawing styles and further, paper architecture, in the past decades.

Working within an iterative drawing process, the role of drawing and representation becomes a process, eventually leading towards an end product. This idea is summarised by Giuseppe Zambonini where he states that "the relationship between representation and its object is one of symbiosis and dependence, even though at some point the representation will be shed by the object and disappear" (as cited in Miller, 1988, p.9). Zambonini aligns with the objectives established by Evans, both acknowledging the ambiguous yet influential properties of hand drawing. Although architectural drawing and construction are clearly differentiated by their practice, the built outcome is often more closely reflective of the drawing stages than accounted for. Hence, a thorough engagement with the drawing process can inform and create architectural opportunities which otherwise may have been overlooked.

The term *process* embodies ideas of development, progression and revision. Relative to architecture this meaning can be understood through the process allowing buildings to be constructed; the architectural drawings. Within architectural drawings (from initial sketches to developed orthographic sets) there is a lack of consistency, attributable to the differing levels of precision that each stage entails. Focussing on the orthographic drawings, we see that the mathematical precision results in a stagnant projection of architecture, contrary to the flexible nature of the preliminary sketch and the resulting habitation of the building. Concerning the presentation of these images, Evans (1989) writes "their status is unclear because they are neither impressions received from a real object, as would be a perspective from life or a photograph, nor

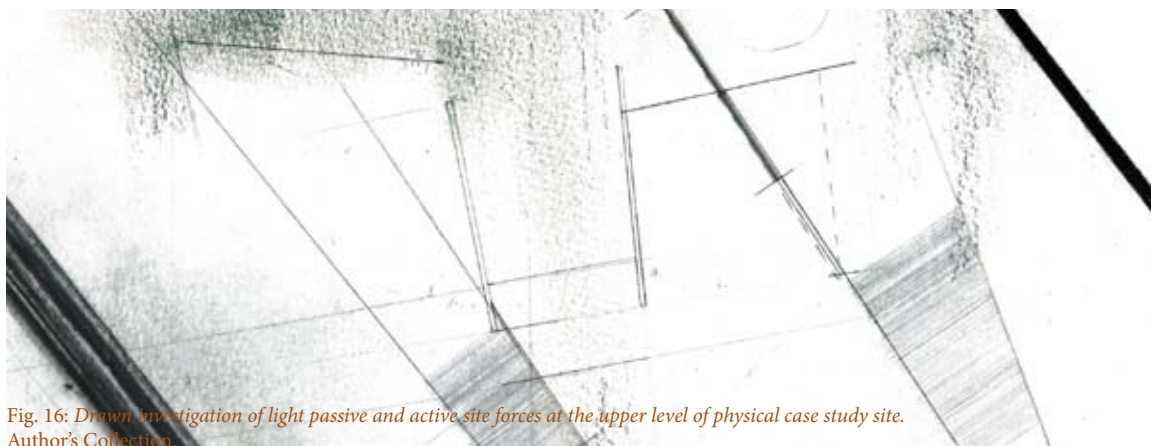


Fig. 16: Drawn investigation of light passive and active site forces at the upper level of physical case study site.
Author's Collection.

are they directly instrumental in the making of what they represent” (1989, p. 7). This becomes a further reflection of his concern that orthographic drawings often leave out the variability’s of everyday life (Evans, 1997, p. 7). Although being integral communication documents, the understanding of how they respond to an extended time frame is limited.

The development of a drawn methodology which encompasses systems of time and its changing variables, would be one way to soften the rigid formalities of space-making, hence using today’s movement and transformations as a means to align with and further challenge the theories of Ingraham and Evans. The following section reviews two architectural designers who actively challenge traditional expectations where architectural drawing is merely a tool to represent building. Referencing the work of Diller & Scofidio and Daniel Libeskind, drawing becomes used to construct and simultaneously question how architectural imagery and form is engaged. Further, the spaces they create are characterised by hazy edges and boundaries. Their relevance today confronts a digital practice, using hand drawing to provoke visual and physical systems of order.

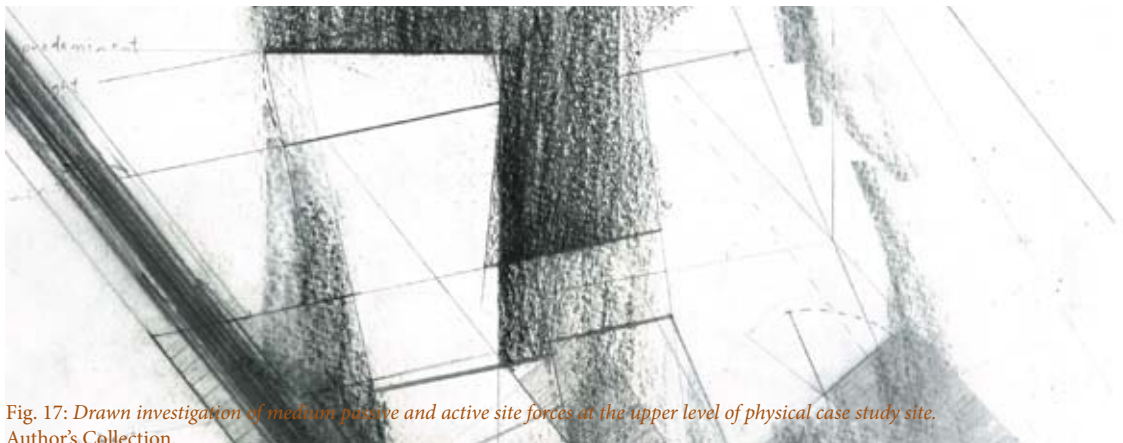


Fig. 17: Drawn investigation of medium passive and active site forces at the upper level of physical case study site. Author's Collection.

Drawing Case Study I: Diller & Scofidio

Slow House (1989)

In the work of Diller & Scofidio architecture is questioned and framed against hand drawn and digital representation techniques, denying the objectifying presence of a viewer. Their work (un-built) is chosen as a suitable case study for establishing a theoretical usage of architectural hand drawing. The thesis will built upon the case study utilising drawing to form buildable architectural spaces.

As designers their work actively aligns with the issues put forth by Evans. This is noticeable in the way they utilise drawing conventions, neglecting any connections of plans, sections and elevations being purely neutral. Their project Slow House of 1989 (un-built) reflects this ambition, being carefully constructed to delineate any hierarchy which could be placed on the visual field and hence the perspective view. This is reflected in the anti-perspectival curvature of the house (Bremner, 2000, p. 110) and subsequent experience of the design. Alex Bremner (2000) notes:

By placing the spectator at what is a rather disconcerting point of spatial divergence, an attempt is made to displace any conventional sense of spatial and, therefore, linear convergence that one might normally expect upon entering a building. (p. 110)

The importance of this gesture questions the position of representational techniques and the implication they have on the viewing and association within the public architecture domain. By using and simultaneously

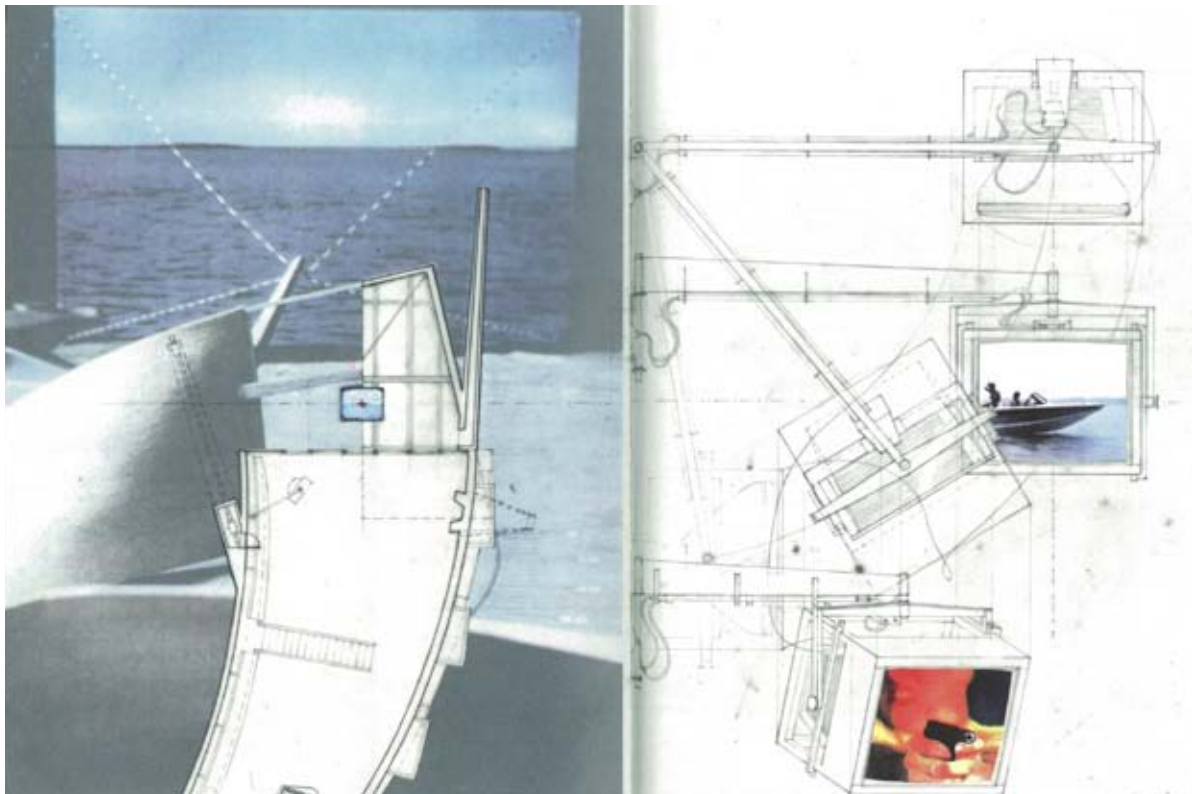
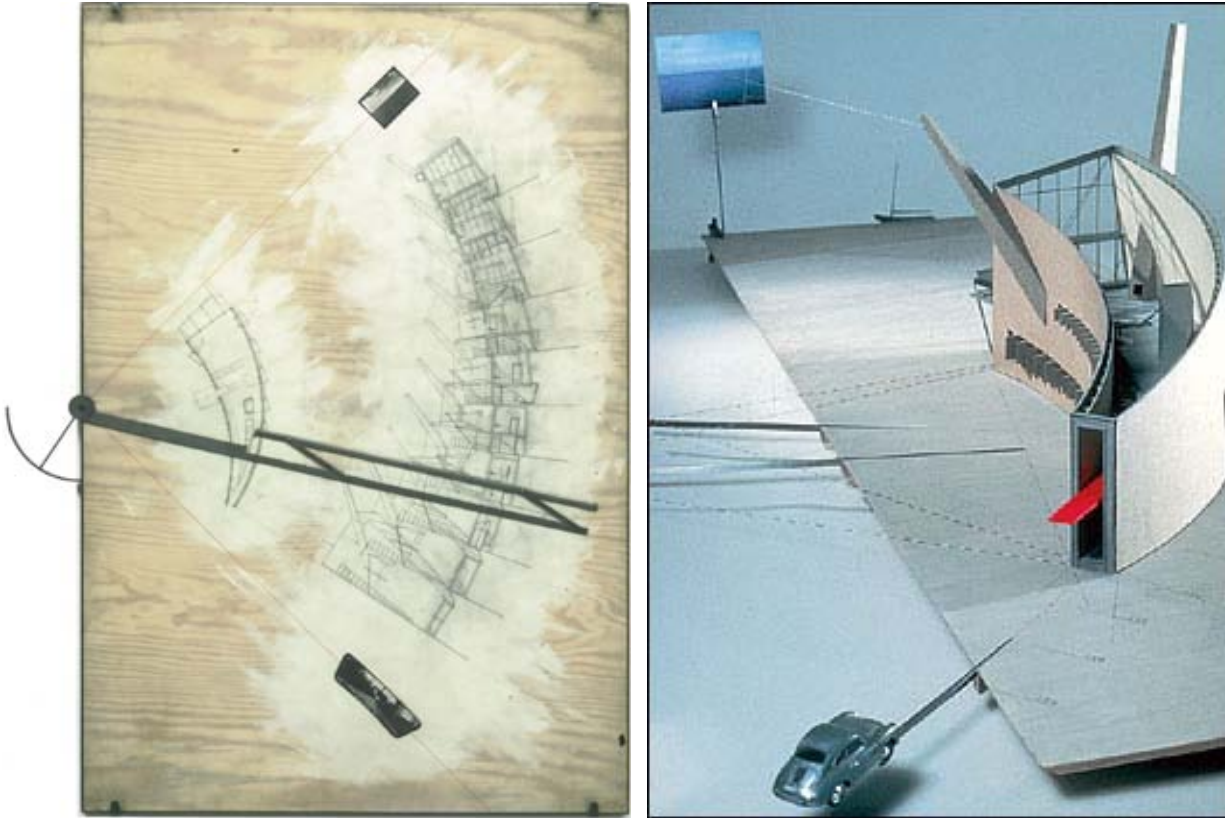


Fig. 18: Diller & Scofidio (1989) Slow House, (perspective and plan drawings). From *Envisioning Architecture* (p. 236-7), 2002, New York: The Museum of Modern Art.



neglecting the perspective, space is reconfigured through the drawing, slipping beyond the view of an arriving visitor. A conscious intent by Diller and Scofidio has been undertaken to interrogate the role of drawing conventions and implicate movement, transformation and time. Bremner (2000) comments:

Although such techniques, over time, have come to be taken for granted, what is particularly important concerning their now prominent role as the principal means of communication within the architectural profession is not so much their employment as techniques per se but, rather, the way in which their often uncritical employment has fundamentally influenced our conception, understanding and, therefore, production of architecture. (p. 106)

As can be noted within this statement, there is an effort to recognise the role and usage drawing conventions have in design outputs. Pursuing this further, when displayed at the Museum of Modern Art in London,

Fig. 19: Diller & Scofidio (1989) *Slow House*, (plan of lower level and sectional drawing). From *Envisioning Architecture* (p. 235), 2002, New York: The Museum of Modern Art.

Fig. 20: Diller & Scofidio (1989) *Slow House*, (model). Retrieved January 18, 2012, from <http://www.users.cloud9.net/~bradmcc/sq/DillerScofidio.html>

the design was presented through a series of transverse sections which arise and sit within the plan view. The juxtaposition of these views provokes a sense of space-making where edges become hazy; “a space of imminence in which traditional conceptions of contained space and spatial container become vague and somewhat irrelevant” (Bremner, 2000, p. 110). By challenging traditional techniques of composing and presenting architecture, Slow House becomes a critical case study on the movement of architectural drawing. Naturally, as Bremner notes, this challenges preconceived prescriptions surrounding boundary anomalies.

Drawing Case Study II: Daniel Libeskind

Micromegas (1979)

In his work, *Micromegas*, Daniel Libeskind disrupts the graphic and conceptual establishment of drawing conventions by creating ambiguous architectural spaces that are limited to a two-dimensional plane. The thesis will build upon this idea, translating the drawings into a built architecture rather than an unbuildable and theoretical project. Libeskind's drawings are recognised by their ability to reveal everything and simultaneously nothing at all, challenging the viewer's response. As Jepprey Kipnis notes, "the zoo of torrid, deep-space graphic effects- rifts, clefts, fissures, fractures, crevices, arroyos, nooks, chasms, vortices... construct no space, add up to nothing, depict nothing, mean nothing." (Kipnis, 2001, p. 110).

Libeskind's work offers no formal system of organisation, no process, no building- challenging everything about a logically structured architectural design process. Constructed from ruled lines they provide a small connection with standard architectural drawings. However by rejecting a visual hierarchy, the *Micromegas* offer no clear focal point, as the "hundreds of mutually contradicting vanishing points zoom in and out" (Libeskind, 2001, p. 2) of the two-dimensional surface. This positions the work in a no-man's land, a state of never-ending flux, constantly drawing the eye to the centre of the drawing before tossing it out without an answer. This is noted by Matilda McQuaid in *Envisioning Architecture* where she states that "instead the lines repel, returning the eye to the surface and ultimately inward to explore the depths of our own imagination" (2002, p. 208). A juxtaposition between surface and depth is created through the intense layering and volume of drawing. The possibility to go beyond the surface level of drawing has been constructed by a new treatment of geometry, testing "the inner life of geometrical order" (Libeskind, 2001, p. 87). Therefore, geometry has

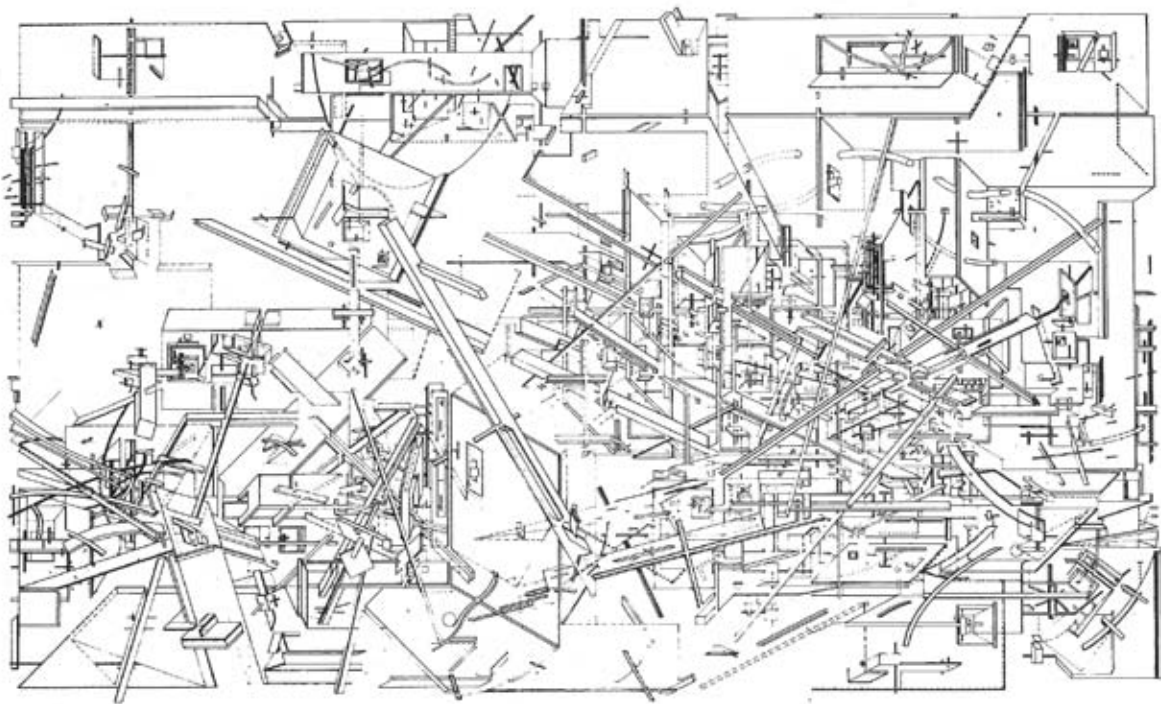


Fig. 21: Libeskind, Daniel (1979) *Micromegas No. 3 Leakage*, (drawing). From *Libeskind at the Soane : drawing a new architecture* (p. 8) compiled by Sir John Soane's Museum, 2001, London: Sir John Soane's Museum.

become its own tool to challenge the perception of order. This comment further establishes the importance of Libeskind's work as a theoretical case study which considers new systems of order. Order, which is requested within orthography but articulated within Libeskind's work.

Reflecting upon the issues raised in Chapter Three: The Practice of orthography, Libeskind's use of architectural drawing challenges and almost escapes Ingraham's critique against the orthogonality of the architecture practice. Breaking the convention that is typically seen within architectural drawings- plan, section and elevation- his work operates within the formal and visual restraints that orthographics permit. The mathematical accuracy of Libeskind's drawings validates Ingraham's statement (1991) where:

Modes of representation in architecture, drawing and model-building for example, are the literal examples of this dedication to orthogonality, but even in the epistemological accounts of its own artistic practice, architecture depends on the orthogonalities of intention, creativity, and intuition. (p. 66)

However, the connection between the drawings and a subsequent building isn't seen until his work on the Jewish Museum in Berlin which opened to the public in 2001 (Architectural Case Study III in Chapter Three). Exhibiting the dynamic political history between Jewish and German culture from the 4th century until the present, Libeskind challenged how program and form were treated dynamically in architecture.

The mesh of lines in *Micromegas* shows a tendency to operate between the visible and invisible, where an in-between space rests within, behind and on the drawn lines. As a resultant, various readings and interpretations can be gained. This is an important feature in an architectural work which focuses on transformation and movement over an extended period of time. Charles Jencks writes:

...Libeskind's spaces are even more ambiguous, because the white flat plane of the drawing insists on a two-dimensionality while, at the same time, hundreds of mutually contradictory vanishing points zoom in and out of this plane. The result is what anthropologists term a liminal in-between space, allowing several mutually contradictory readings...

Ambiguity is a term often unrelated to the accuracy and clarity of orthographic notations, particularly on a two dimensional surface. As the lines provoke ideas about the visible and the invisible they simultaneously

create areas of depth, offering a new framework for a two dimensional drawing. Disrupting convention, the Micromegas series establishes a new and varied relationship between static lines, movement and form.

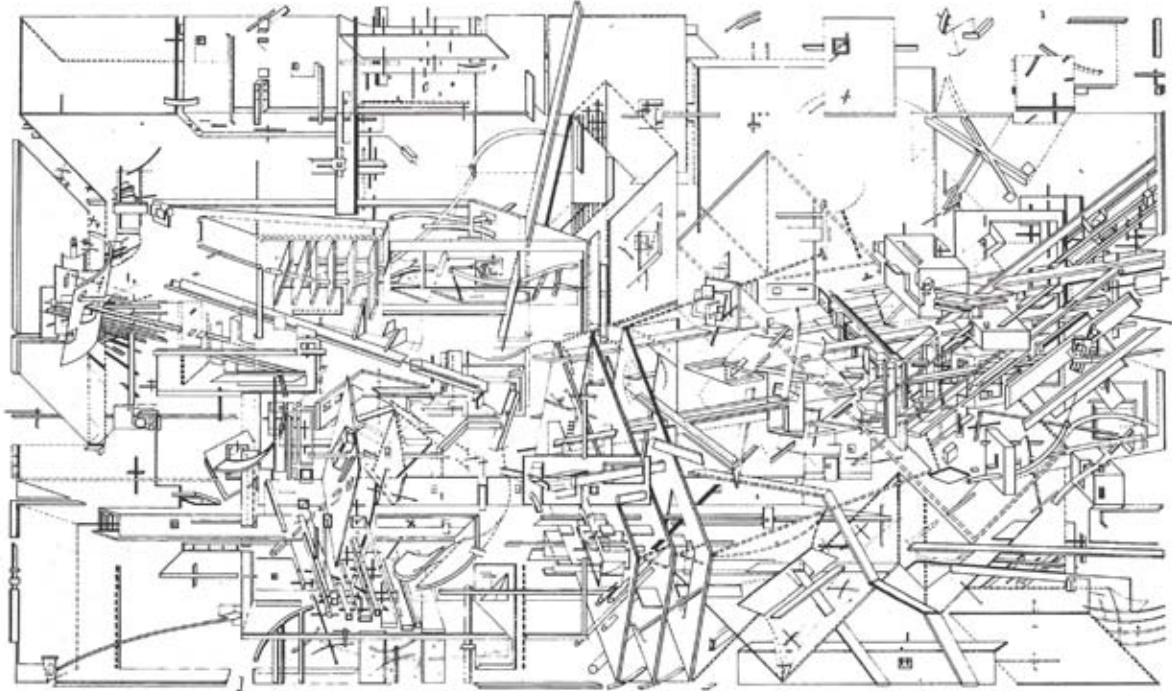


Fig. 22: Libeskind, Daniel (1979) Micromegas No. 2 Time Section, (drawing). From Libeskind at the Soane : drawing a new architecture (p. 7) compiled by Sir John Soane's Museum, 2001, London: Sir John Soane's Museum.

Conclusion

The drawings in this section of the thesis seek to construct a visual and physical process that isn't bound by a rigid framework and hence is able to portray the experience of changing spatial qualities. Due to this, the specific techniques used by Diller & Scofidio and Libeskind are visualised and considered as spatial forces and elements in themselves.

Taking into consideration Ingraham's theories, the Slow House project by Diller & Scofidio and the Micromegas by Daniel Libeskind can be recognised as moving beyond a linear or orthogonal ordering system. In the work of Diller & Scofidio order is achieved by the articulation of orthographic notations, where the traditional emphasis on a hierarchical visual system is reduced. Where the section and plan have been overlaid, hazy edges and interior/ exterior boundaries are formed. In comparison order in Daniel Libeskind's work is comprised of overlaying, shifting lines and line weights generating various focal points. Order in his work is visually static but provokes ideas of movement and depth.

More clearly, Diller & Scofidio's work proves to be an exemplar of a design outcome which is developed and closely interrelated with the drawing process. Therefore, the Slow House project aligns with and visualises Evan's theories on the importance of the drawing process. This reinforces the position of drawing as defined by Evans (1986), "where as in architecture, (the subject) is brought into existence through drawing. The subject-matter (the building or space) will exist after the drawing, not before it" (p. 165). To reinforce the role of the drawing is to reinforce that the tools one uses to draw, whether digital or hand, offer their own limitations and qualities. It is these qualities which become manifest in the architecture. However, as theoretical case studies the translation into built realisation isn't achieved. In the following chapter, five built case studies are highlighted and analysed for their specific boundary conditions. In these cases, blurring is located at the boundary between interior/exterior and within the interior spaces yet most importantly, is taken through into a built realisation.

Fig. 23: *Blurring, Blenheim, New Zealand.*
Author's Collection. Digital photograph.



Chapter Three: Spatial Boundaries

Repression is within, and part of, the controlling structure; secretly chaos permeates domestic order.

(Treadwell, 2005, p. 288)

Within this section of the thesis, architecture is examined through a specific focus on ambiguous and layered boundary conditions. Placing an emphasis on boundary edges is suggested as a technique to re-structure the principles of order and control to meet the varying needs within programmes of the 21st century. Hence, the notion blurring is regarded as a positive quality because it enables the blurred programme of a contemporary Architect's office to be responsive to transforming conditions and therefore, various time periods. The section contains five case studies of built architecture which pursue the dissolution of the boundary using diverse approaches, forming the basis for the design outcome which is outlined in Chapter Four.

Acknowledging blur

Responsiveness is a significant requirement enabling architecture to deal with the transforming context surrounding itself today. Continual developments in media, design tools and living arrangements require designers and the spaces they create, to place priority on flexibility and movement. Reflecting upon the tasks of the architect today, Bernard Tschumi and Irene Chang (2003) wrote:

The term architect encompasses far more than “one engaged in the art of building.” Today, an architect is one who manages information, designs web sites, and decides foreign policy- in short, someone who organises things, and does so within an ever more complex and interconnected global field. (p. 91)

As a technique, blurring is utilised as a design tool in the research to manage the often chaotic, social, urban and climatic conditions of today. The articulation of blurring through formal and material elements can provide architecture with an increasing level of flexibility, extending beyond the initial design intentions. In an article titled, “An Account of Domesticity” (1989-92), Sarah Treadwell discusses how the home is defined through its usage “disrupting the order, the static envisionment of the architect the interior of the home is defined through its use, its openings” (Treadwell, 2005, p. 288). Continuing, Treadwell (2005) writes that the home is composed through a layering of materials and activities, the planned and the spontaneous:

A chaotic and yet systematic layering, folding and woven flow of space and material creating interiors within and internal to exteriors. Preventing a singular reading of the interior, a convoluted flow, swept up in showers of matter, forms pockets of inner depth and opening stretches of space reaching beyond the boundaries of containing rooms. (p. 288)

Treadwell’s reflection on the home is a suitable correlation to the overlapping requirements currently facing architecture and individual lifestyle. Hence, blur isn’t a tool for avoiding spatial definition or for concealing architectural accuracy but a method for articulating and accepting the possibility of numerous spatial conditions and activities. The “layering, folding and woven flow...” (Treadwell, 2005, p. 288) informs an architectural response intricately connected to mobile rather than immobile forces.

As has been noted, prescribed edge anomalies are being transformed by the activity, movement and social

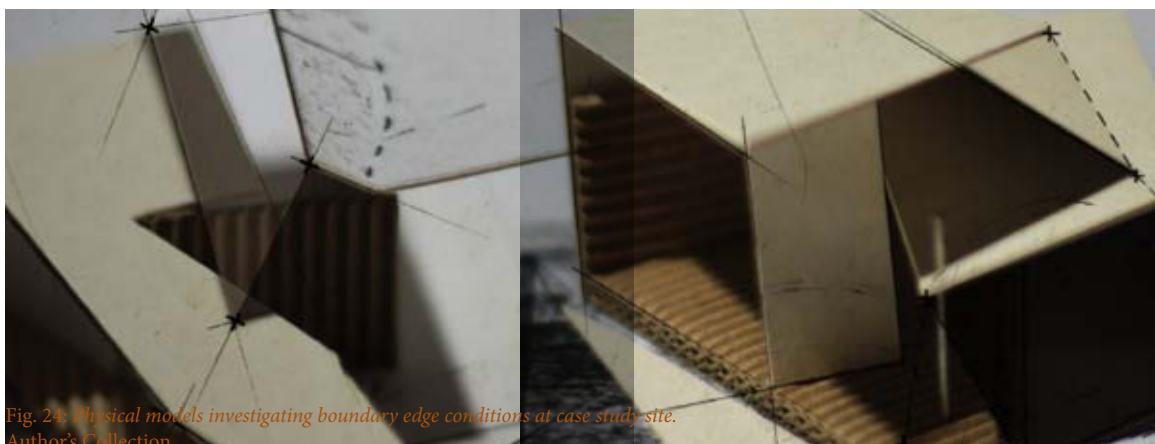


Fig. 24. Physical models investigating boundary edge conditions at case study site.
Author's Collection.

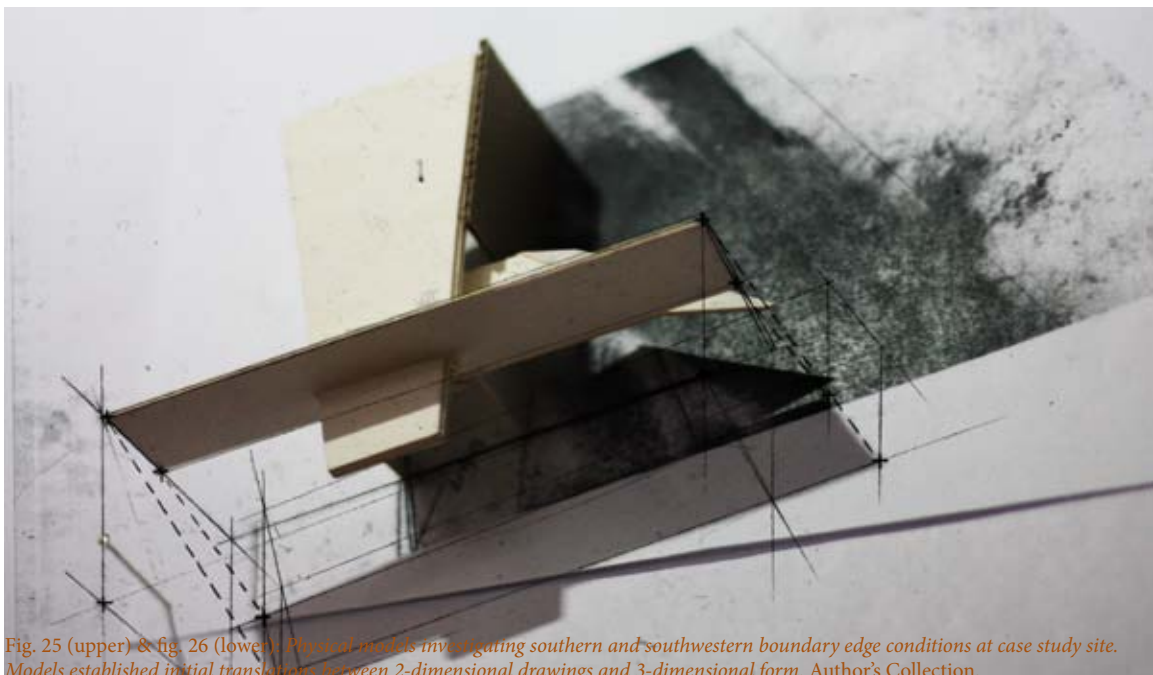
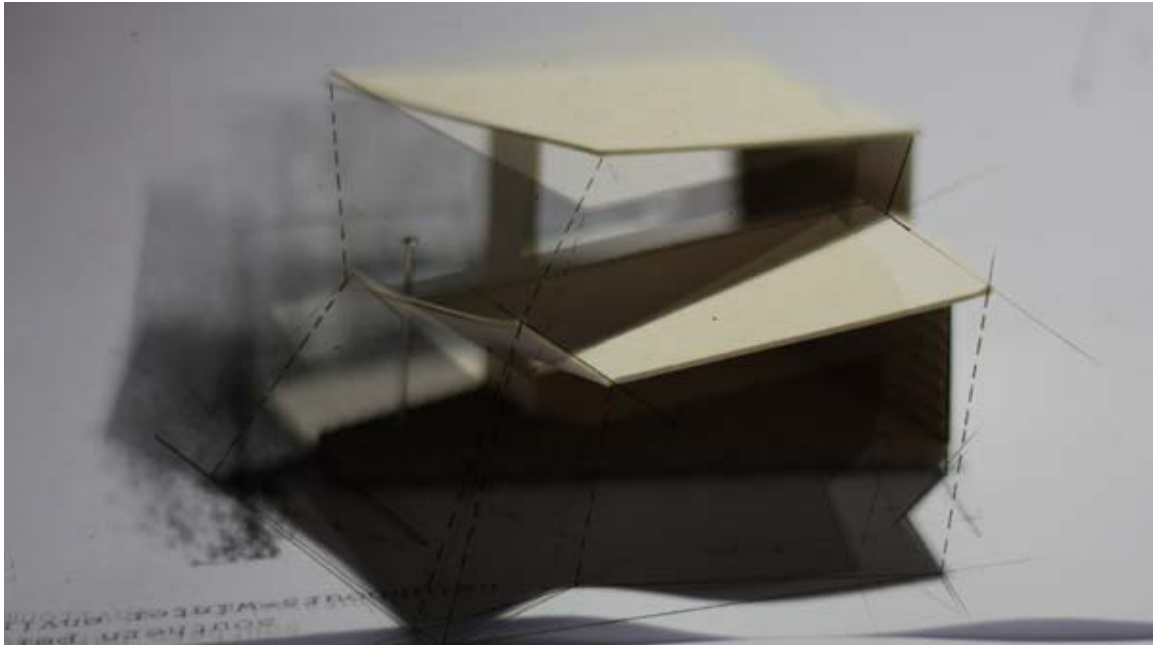


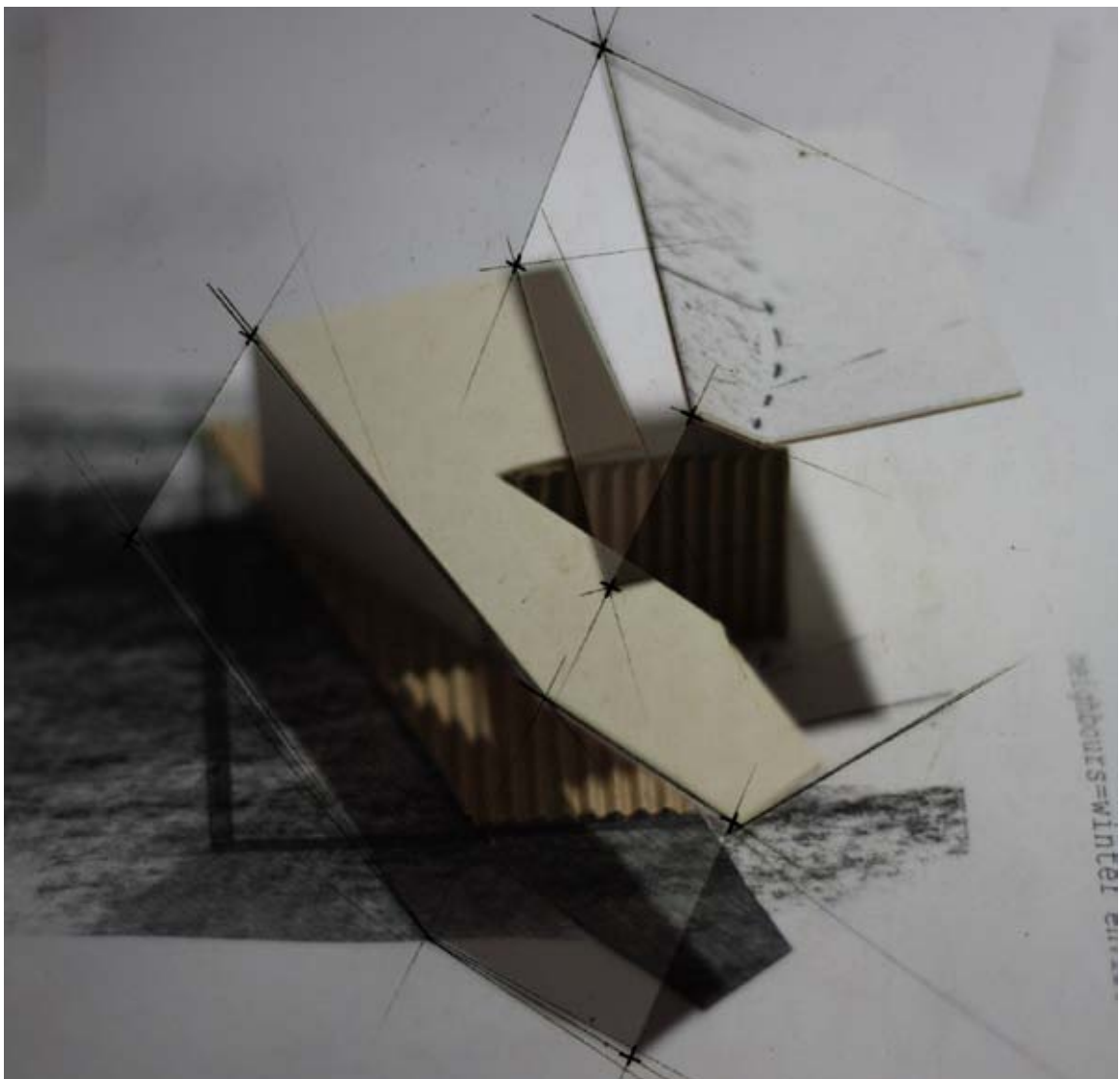
Fig. 25 (upper) & fig. 26 (lower): Physical models investigating southern and southwestern boundary edge conditions at case study site. Models established initial translations between 2-dimensional drawings and 3-dimensional form. Author's Collection.

connections of individual lifestyle today. Hence, traditional approaches to singular, strictly defined boundary edges can be reanalysed through the blurring or multiplicity of edges. This establishes a method for responding to Ingraham's statement regarding our architectural expectation (1998):

One of the most powerful forces that architecture exerts on culture is the maintenance of certain proprieties: how space is lived in and named; what type of building is most appropriate to what use; what materials belong to the exterior, what to the interior; and so on. (p. 30)

Today, users can be a passive or active individuals and therefore become equally influential whether inside or outside the architecture.

Fig. 27 (opposite upper) & Fig. 28 (opposite lower): *Models investigating northwestern and southwestern boundary edge conditions at case study site. Models established initial translations between 2-dimensional drawings and 3-dimensional form. Author's Collection.*



Historical Blurring

The treatment of blurring in architectural history has predominantly been limited to static elements. Five built architectural works will be discussed which evidence blurring between internal public spaces, internal private spaces and/ or between the interior and exterior.

Firstly, Frank Lloyd Wright's Robie House is selected as a case study as it reflects an early approach to the blurring between exterior landscape and the interior home. Predominantly this is achieved by continuous horizontal planes which visually seek to blur distinctions between the interior and exterior spaces. Secondly, internal blurring within the house generates new relationships between the public living and dining spaces. This is achieved by the discontinuous wall partitions, varying ceiling heights and detailing of timber joinery.

Secondly, Carlo Scarpa's Brion Vega Cemetery is selected as a case study due to the blurring that occurs between several private and public spaces and the landscape. In particular, the work shows various levels of detailing to the edge and boundary conditions throughout the various spaces. Blurring in this case study is initially more apparent between the interior and exterior (due to the predominant amount of landscape within and around the design) however the specific detailing of walls, frames, doorways and overhangs suggests a secondary layer of blurring which focuses on connecting with the visitor's individual spiritual experience.

Thirdly, Daniel Libeskind's Jewish Museum is selected as a case study as it creates blurred physical and visual areas by challenging a conventional linear ordering system. The work evidences internal public and private blurring through inhabitable and habitable spaces which are visually continuous, acting to challenge how visitors engage with the Museum and hence, remember or consider the Jewish history. As a result, the Museum's spaces vary in height and form and therefore have altering levels of lightness, darkness and privacy. Due to the zigzag planning, blurring between exterior and interior is achieved by the fractured windows that compel visitors to continuously look back upon the building itself and its internal spaces.

Fourthly, John Pawson's Pawson House is selected as a case study for the blurring that occurs between the interior and exterior living spaces. Blurring in this design is a method to expand the perceived confinements of a small interior space, providing a physically larger habitable and sheltered area for the small apartment.

Through continuous wall tones, joinery elements, tiling, furniture and detailing, the exterior and the interior spaces can operate as two singular spaces or one larger space. This provides the family members with social flexibility as is desired.

Fifthly, Tom Kundig's Chicken Point Cabin is selected as a case study because of the moveable wall systems which create a new approach to the blurring between interior and exterior spaces. Predominantly, the design of the cabin is focused around the large, mobile window which allows the guests to feel closer to the surrounding landscape while still enjoying the comfort and shelter of being inside. Public and private blurring is achieved by internal partitions and wall locations that carefully obscure views when the window is open.

In chronological order, these case studies will be examined to provide a context for the treatment of blurring in built architecture whilst outlining the contextual condition which the architecture was specifically responding to. It is necessary to recognise the achievements and limitations that previous architects have encountered in their design and acknowledgement of blurred boundary conditions.

Architectural Case Study I: Frank Lloyd Wright

Robie House (1908-1910)

The following case study is an early 20th century example that uses interior/ exterior blurring to redefine the enclosure typically associated with the American domestic home. The Prairie Houses that were designed by Frank Lloyd Wright, 1900-1919, utilise continuous horizontal elements to connect the interior spaces with the openness and freedom of the Prairie plains. The Robie House is selected as an appropriate case study for examining the treatment of blurring as it exemplifies that through the combination of static elements, materiality and geometrical forms, defined but continuous spatial regions can be achieved.

Most significantly the design of Prairie Houses outlined a new approach to domestic architecture in America, expressed through an openness rather than closure to the surroundings. By placing an emphasis on the horizontal plane- a common feature in the Prairie works- Wright sought to achieve a sense of spatial continuity between the interior and the landscape, “spaces that were open to one another within and open to the prairie landscape without” (Blake, 1963, p. 37). This was achieved through the use of horizontal planes which appear to be continuous from within the interior to the exterior. The horizontal element became used as a tool, reflecting the external plane of the landscape whilst blurring interior and exterior boundaries by continuing its appearance within the interior. Further, exterior roof and balcony edges overhung the perimeter of the ground floor plan and therefore became a method to visually and physically extend the perimeter and boundary edge into the garden. The design of the Robie House is a clear reflection of these actions, allowing the inhabitant's vision to be compelled to move out along the horizontal, offering a visual extension between the interior spaces and beyond to the exterior landscape.

Unlike traditional European houses, Wright achieved a visual spatial continuity between interior spaces. In public interior spaces this was achieved by partial height wall partitions resulting in a visually continuous ceiling plane. Opposing this, private and public spaces were clearly separated by full height walls. Therefore, Wright's articulation of the wall and partition was an innovative effort to blur interior activities. Further, movement between spaces in the Robie House is located along the internal perimeter, providing a clear link between one space and the next and strengthening a consistent fluidity between public spaces. Commenting

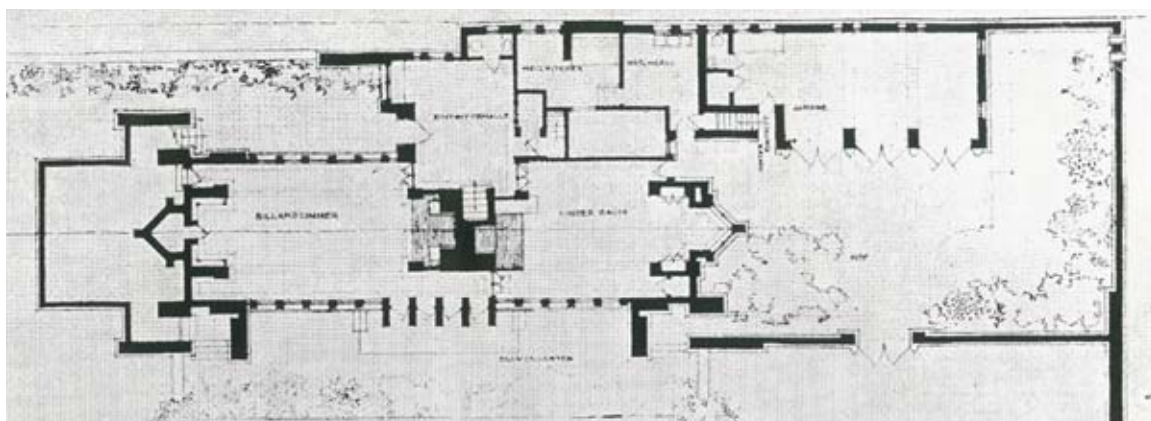


Fig. 29: Wright, Frank-Lloyd (1909) Robie House, (plan). From Frank Lloyd Wright (p. 55) by Vincent Scully, 1969, New York: Braziller.

on this, Peter Blake writes, “a succession of experiences so varied and yet so continuously related that the interior became a symphony of space and light” (Blake, 1963, p. 38). Vincent Scully notes a similar quality, where “a clear understanding of how to open up but still articulate interior space” was being achieved by the “treatment of partitions as separated panels” (1969, p. 15), allowing the continuous horizontal ceiling to become more effective. Although the living and dining room spaces felt visually continuous, they were physically articulated through a change in materials and furniture elements.

As a response to the conditions of the American landscape and the domestic tradition preceding the work, the Robie House provokes a more convincing sense of blurring within the interior rather than at the boundary between interior and exterior. (However, within his later project of 1935, Falling Water reveals a more consistent sense of blurring between the interior and exterior due to the staggered natural toned horizontal and vertical elements, the large window spans and the many entrances that allow movement from the interior to the exterior. This results in a feeling of movement and continuous fluidity between areas between the interior and natural environment.) Where the exterior of the Robie House is light and airy, the interior is often heavy and dark and hence limits the sense of transformation or ability the design provides in being able to respond to various changing external conditions. However, the focus on the centre and its extension towards the Prairie by the horizontal elements is clearly successful.

Developing upon this case study, movement and the exchange between interior and exterior are becoming increasingly more important today. Contemporary architectural designs need to accommodate layered and overlapping climatic, social and cultural situations. Flexibility between interior and exterior spaces provides a way to allow for various users and programmes to work together. Therefore, a contemporary approach to blurring needs to move beyond the visual continuity achieved within Wright’s work and allow for more physical movement between interior spaces and the transition between interior and exterior spaces. Responding to numerous contextual relationships, the combination of horizontal and vertical elements can effectively reinforce the impression of an ambiguous boundary edge as is shown in the Robie House.



Fig. 30: Frank Lloyd Wright (1908-1910) Robie House, (photograph). Retrieved January 18, 2012, from http://www.greatbuildings.com/cgi-bin/gbi.cgi/Robie_Residence.html/cid_1036095689_RobieExt1.html

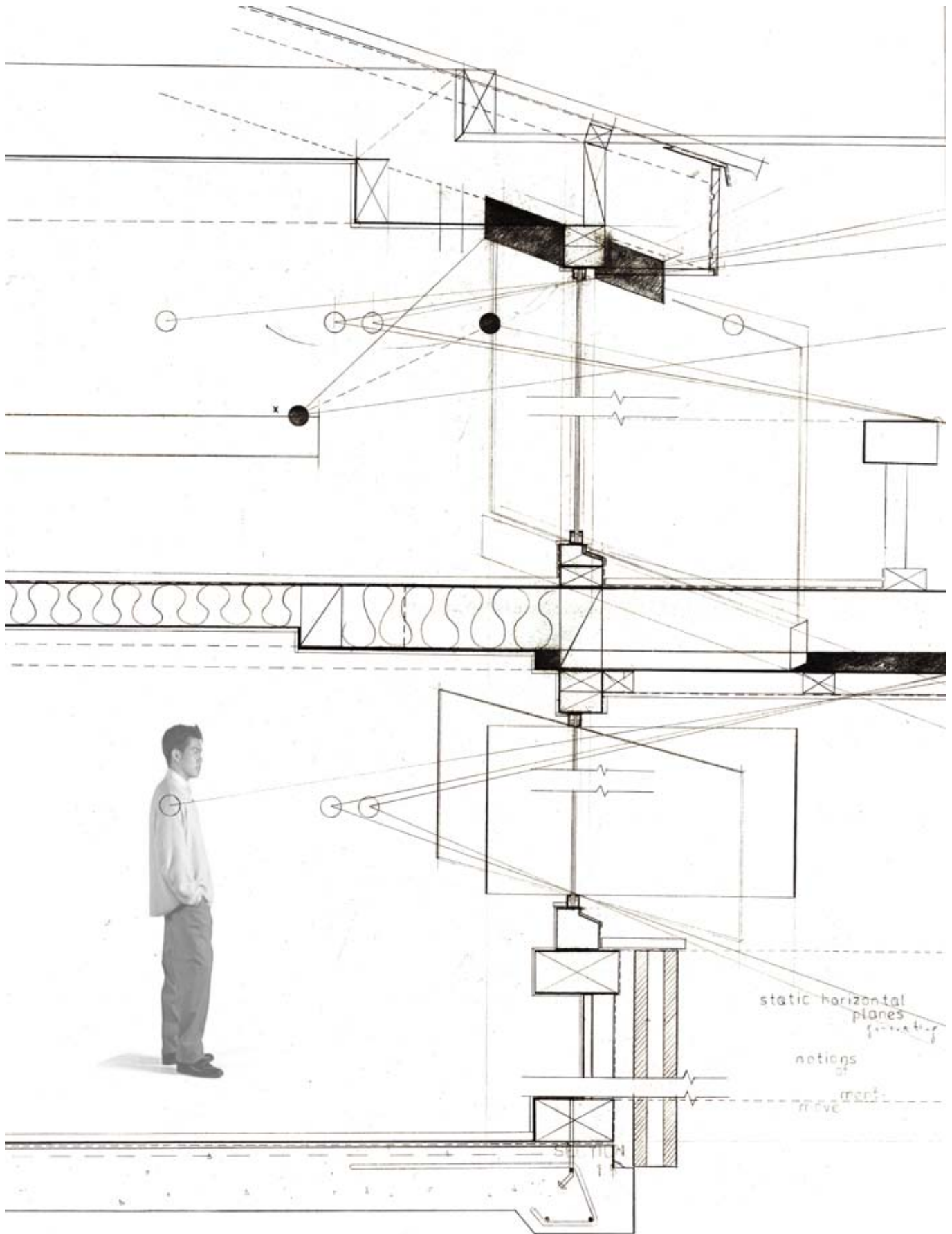


Fig 31: Detail drawing (1:5 at A2) of ground floor interior/ exterior boundary in Robie House, illustrating the predominant horizontal levels at the perimeter boundary. Author's Collection.

Architectural Case Study II: Carlo Scarpa

Brion Vega Cemetery (1970-1972)

The following case study by Carlo Scarpa evidences blurring through explicit boundary detailing. The cemetery is divided into eight key spaces of which five spaces will be discussed for the varying treatment of edges conditions and hence, blurring. Due to its nature as a cemetery, it is necessary to note that the spaces did not require permanent habitability for the visiting public. The Brion-Vega manages to form a dialogue between the permanent concrete forms and the temporal movement of the visitor. This relationship, between the permanence and temporal establishes a unique approach to blurring.

Propylaeum (Entry)

After progressing along the open, linear pathway of the village cemetery, the visitor enters into the entrance mausoleum, a low dark space. With no doorway to establish a formal boundary, the edge condition is formed by the entire depth of the mausoleum itself. Yet, rather than entering into a completely enclosed space, a blurring between the private interior and public exterior spaces is achieved by the two entwined circles which form a visual continuation of the pathway while also marking an axial shift before entering the adjacent areas. Further, the concrete edges of the walls and steps are deep and clearly defined, informing a threshold point before the visitor continues.

The relative darkness of the space is accentuated by the entwined circles as they allow a view of the grass and sunny sky beyond. Further, the architectural lintel creates a symbolic impression of a heavy weight. Therefore, Scarpa uses two interconnected blurring strategies. Firstly, the design of the mausoleum form establishes an entrance edge that challenges the standard perception of perimeter. Secondly, the strong variances between the exterior lightness and the interior darkness allow that Propylaeum to be recognised as a threshold between the corporeal and the spiritual, two themes that are continuously apparent throughout the design.

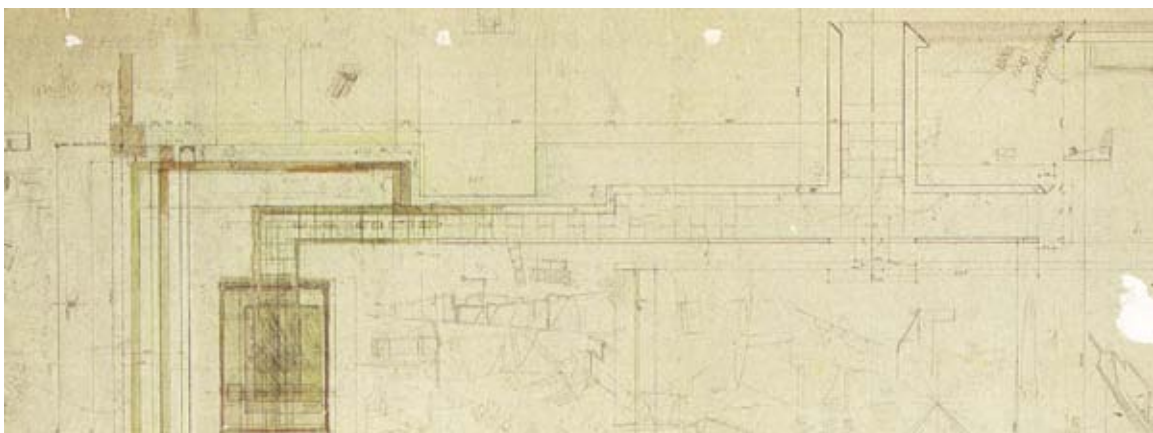


Fig. 32: Scarpa, Carlo (1972) Brion Vega Cemetery, (south-east corridor plan). From *The other city : the architect's working method* as shown by the Brion cemetery in San Vito d'Altivole (p. 74) by Carlo Scarpa, 1989, Berlin: Ernst & Sohn.



Meditation Platform

Unlike the enclosure of the Propylaeum, the Meditation Platform is open to the outdoor conditions yet protected from rain due to the principle roof element. The cornice detail, being relatively low, requires visitors to bow upon entering and forms a symbolic entrance into the sacred space. These details enable a symbolic 'door' and 'wall' to be established. Within the Platform, visitors kneel in order to gain a clear view over the pool of water and the concrete walls beyond. Unlike the previous space, where vision propels movement forward, the walls framing the meditation area enable an inward- focussed space to be formed. Due to this open sequence, blurring between inhabitable and habitable space is recognisable, a further accentuation of the spiritual and the corporeal.

Further, the reflectivity of the pool enables the architecture to challenge Ingraham's theories regarding architectural propriety. Ingraham writes (1991):

From the geometric propriety allowing us to draw straight lines, other proprieties emerge: the proper nature of materials and universal forces, the proper relationship of the building to the ground, the proper scale and structure of a building. (p. 75)

As the architecture is reflected downwards, it avoids any clear sense of being grounded and hence, challenges conventional frameworks about the relationship between architecture and its ground plane. This achieves an architectural blurring between the perception of a heavy ground plane and light sky above.

Tomb of Brion Couple

Within the third space, the Brion Couple Tomb, boundary edges are established at varying heights to allow the spiritual and corporeal to become distinguished once more. Firstly, the grass at ground level surrounds the tomb in a circular form, being the entrance level for the visitors. Secondly, the levels of the tomb are gradually stepped down below ground level, to rest beneath the bridge and allow the 1st threshold to be established

Fig. 33 (left) & Fig. 34 (right): Carlo Scarpa (1970- 1972) Brion-Vega Cemetery, Propylaeum (left photograph), Meditation Platform (right photograph). Retrieved January 18, 2012, from <http://kairosretreat.blogspot.com/2008/10/brion-vega-cemetery-experience.html>

between the visitor and the deceased. Thirdly, the overhanging bridge (a pathway above) partially covers the tombs and establishes the 2nd threshold. Due to this detailing, a gradual blurring is achieved between the corporeal and the spiritual, and the public exterior and private interior of the tombs.

Following this, a small series of steps near the tombs leads the visitor back up to the grass plan. Rather than being a paved pathway which would suggest further movement or progression, the visitor is not inclined to move further, being able to view the 'entry' between the couple's tombs without proceeding any further. As a sacred entry point, a sense of enclosure to the spiritual world is achieved. Blurring the idea of habitable and inhabitable enclosure, enclosure in this section of the tomb is recognised through a personal understanding of sacred space that is reserved for the private spiritual life of the Brion Couple.



Tomb of the Brion Family

Following this, the tomb of the Brion Family is designed specifically for the children. The space is characterised by a heavy roof that requires visitors to 'duck' to enter, emphasising a symbolic children's entrance. Within the tomb, dark surfaces and shadow create a private feeling of enclosure whilst simultaneously, become hazy to clearly delineate. Lighting and shadow become elements to blur the distinct perimeter edge. Importantly, the roof is detailed with a singular hole, challenging the role it plays in forming a complete enclosure. Letting rain drops, 'tears', through this hole, the roof element blurs its traditional role allowing a complete interior protected space. Therefore, the roof element invites a dialogue between the interior and exterior contextual conditions.

Fig. 35 (left) & Fig. 36 (right): Carlo Scarpa (1970- 1972) Brion-Vega Cemetery, Overhanging bridge at the Tomb of the Brion Couple (left photograph), articulation of stair detailing at the Tomb of the Brion Couple (right photograph). Retrieved January 18, 2012, from <http://kairosretreat.blogspot.com/2008/10/brion-vega-cemetery-experience.html>

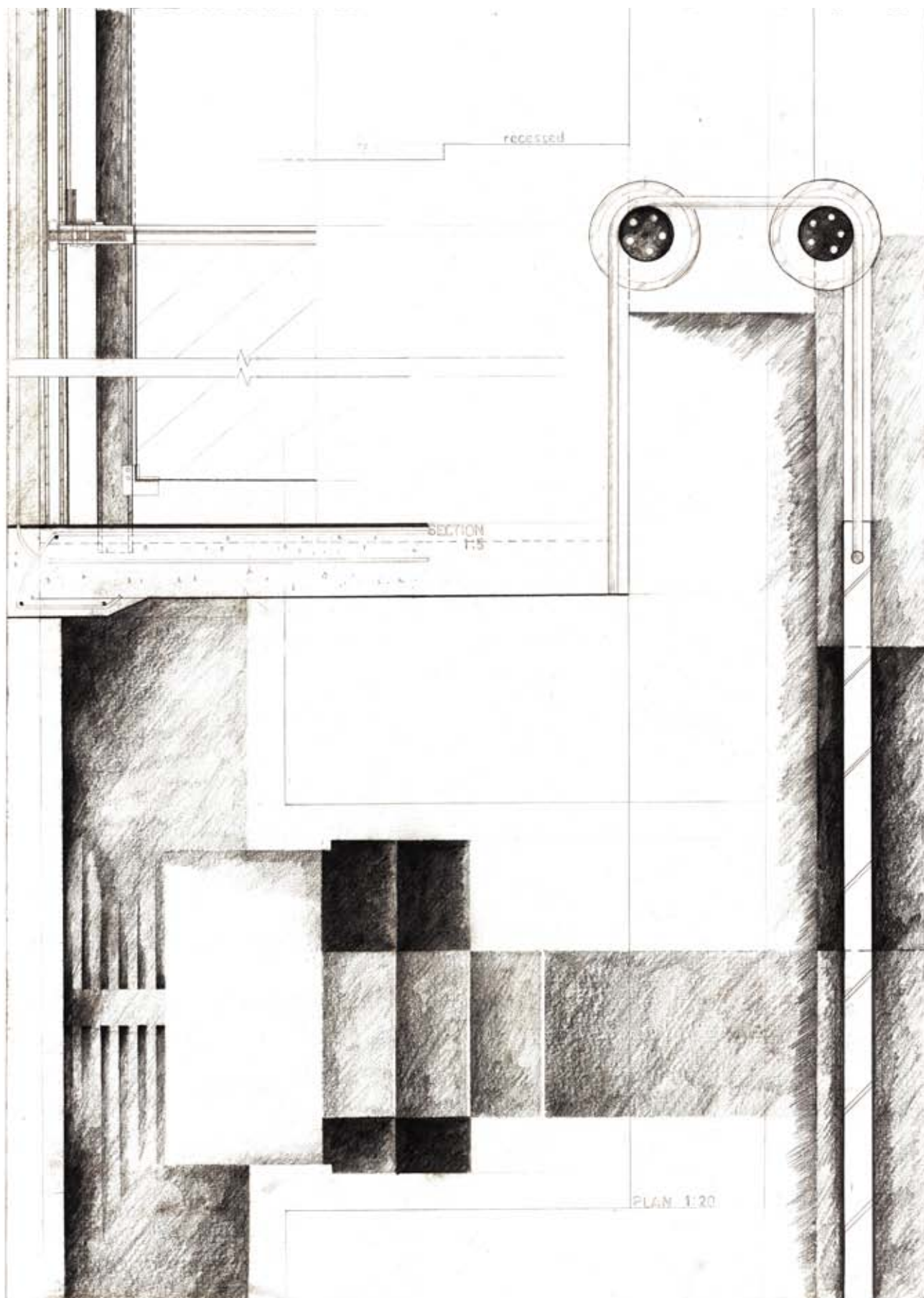


Fig 37: Detail drawing (1:5 at A2, plan with section) of Propylaeum/ entry illustrating the articulation of lighting and shadow to blur a rigid boundary between the corporeal and the spiritual. Author's Collection.

Chapel

Most importantly, the chapel differentiates itself from the other areas because of its intimate enclosure within the cemetery planning. More closely, the chapel is distinguished from the adjacent areas due to its 45 degree rotation in plan. Due to this, upon entering from the chapel passage, the visitors move through two doorway conditions before reaching the chapel itself. Hence, an axial shift from the pathway to the chapel entrance signals a blurred entry into the sacred space.

Although framed by full height walls, the changing ambient lighting qualities within the space soften what could be a rigid boundary. With glazed panels extending from floor to ceiling, light continues to move across the chapel. Therefore, permanence and movement become combined. On the exterior, Scarpa once again avoids a conventional relationship to be formed between the built form of the chapel and the ground plane. Through the articulation of the pool that surrounds the chapel on the exterior, the chapel's form is reflected downwards and becomes another reference to the dialogue between spiritual and corporeal.



Fig. 38: Carlo Scarpa (1970- 1972) Brion-Vega Cemetery, Reflection of Tomb and Chapel in the pool's water (photograph). Retrieved January 18, 2012, from <http://architecturelab.net/2008/08/brion-vega-cemetery-carlo-scarpa/#lightbox/4/>

By engaging the movement of the visitor, Scarpa's Brion-Vega Cemetery initiates a way to move beyond an interpretation of architectural form structured upon specific internal enclosure. The treatment of the perimeter boundary is noticeably different throughout the spaces but relates to the programmatic requirements and spiritual relationship Scarpa sought to achieve.

Firstly, the entrance is characterised by the depth of the mausoleum, creating its own perimeter without needing to use a wall. Importantly, two axial pathways cross to form an entrance threshold. Secondly, the Meditation Platform operates through symbolic architectural elements: walls, doorways and a perimeter frame, that allows the space to appear enclosed while being more obviously, open. Thirdly, the multiple material and level thresholds within the Tomb of the Parents establish boundary edges which differentiate between the spiritual and corporeal. Further, the bridge articulates habitable and inhabitable space, offering shelter below and a pathway above. Fourthly, the Tomb of the Family challenges the conventional enclosure provided by a roof. Therefore, it is able to blur the conditions between a private interior and a public exterior. Finally, the perimeter of the Chapel, the only space which uses full height walls, becomes more transparent due to the articulation of ambient light on the interior and the reflection of the walls on the exterior. As a habitable interior, the chapel is closely connected to exterior climatic conditions.

The prioritisation which is placed upon temporal moments is necessary for activating the personal engagement individuals have with boundary edges and overall built form. The numerous non-traditional boundary conditions operate within a dialogue between enclosed and unenclosed, habitable and inhabitable. Innovatively, Scarpa's boundaries become more than singular edges or frames but allow multiple interpretations and meanings to be created. Developing upon this work in a contemporary context it is necessary to consider how surrounding, changing conditions influence the form and areas of habitable space. As the cemetery is closely designed to become a landscape architectural piece, requirements driven by daily users and programmes haven't been incorporated. This is necessary to allow for multiple social situations to operate in response to changing climatic conditions.

Architectural Case Study III: Daniel Libeskind

Jewish Museum (1989-1999)

The following case study by Daniel Libeskind evidences blur through two imperatives. Firstly, the specific design language establishes a critique against a traditional, Cartesian axial space. Understanding Libeskind's motives, this is significant as it provides a link between his Micromegas drawing series and the Jewish Museum building. Secondly, the programme defines its own imperatives, using architecture as a medium to expose Jewish history and culture. Investigating the two imperatives, the following section will outline how the ideas and motives behind the Jewish Museum can help inform, and further reconfigure the treatment and blurring of boundary edges and their adjacent spaces.

The design of the Jewish Museum focuses on a metaphorical and physical dialogue between the two components, 'absence' and 'presence'. Absence is recognised not only in the large voids within the Museum itself, but in the gap that evolved in German and European culture. Hence, the formal response from Libeskind evokes a historical tragedy which pervades all spaces within the Museum. On the role of the Museum, Libeskind (cited in Eisenman, 1999) writes:

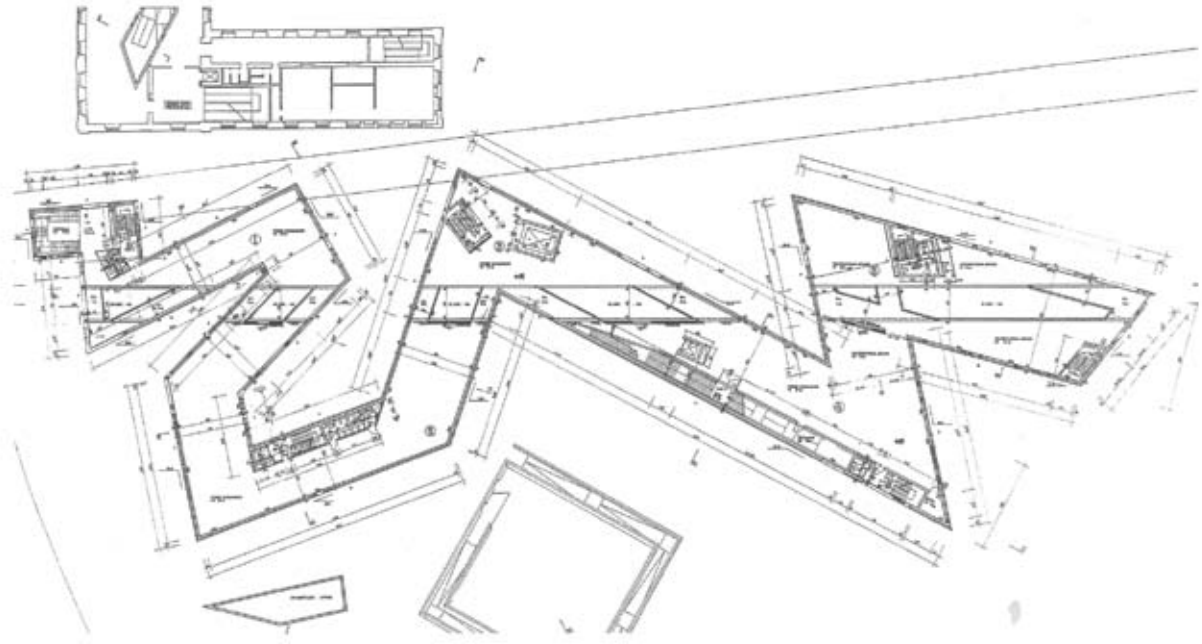
The task of building a Jewish Museum in Berlin demands more than a mere functional response to the program. Such a task in all its ethical depth requires the incorporation of the void of Berlin back into itself, in order to disclose how the past continues to affect the present and to reveal how a hopeful horizon can be opened through the aporias of time. (p. 19)

Developing upon this imperative, the notion of absence and presence within the Museum is further challenged due to a critique against traditional Cartesian logistics and space-making. This critique, which is also visible in the visual language of the Micromegas, is reliant upon the idea of index. A clear example of how index is connected to presence and absence is outlined in the text by Rosalind Krauss. She writes:

The idea of an architectural language becomes problematic when it assumes that any historical context is a stable entity. Because architectural representation is presumed to be a stable relationship between a sign and its object, the idea of the index in architecture seeks to undermine the idea that its language is a decidable physical presence with a one-to-one relationship to a signified. (p. 232)

Through a critique against linear axiality, the architectural experience provides minimal consistency and association between the interior, facade and exterior. Rather than a traditional movement from the entry of a building, through its major spaces, the Museum forces the visitor to move along defined horizontal circulation planes, notable in the 600 ramps which cross over the continuous voids, "... the horizontal axis must be traversed through a sequence of interrupted levels, as stairs and ramps move the subject across the series of voids enclosed in the museum" (Eisenman, 2008, p. 238).

Further, blurring between interior and exterior is accentuated in the small and large fragmented windows which consequently, disconnect the inhabitant from their surroundings by offering no association to the



internal museum and gallery programme. The windows become architectural tools to blur the conventional and reliable relationship between interior and exterior space. With reference to index, Libeskind's architecture denies the visitor from having a constant, predicted experience. This technique provokes an understanding of blur through an irregular relationship between the vertical and horizontal forms, and the visitor. Further, the Museum is a built example which challenges the theories of Ingraham, establishing a new ordering system based around the circulation pathways and the vertical perimeter walls.

Throughout the gradual progression, the visitor is continually subjected to six uninhabitable voids that run through the floor levels to the basement, as was previously mentioned. Extending the entire length of the building, an inescapable emptiness of the loss of Jewish lives pervades the spaces. Segregating habitable and uninhabitable space within the interior becomes a method to accentuate a blurred boundary that visually and physically challenges the traditional relationship a visitor has with interior architectural form. Eisenman (2008) writes:

These voided zones slice through the centre of the zigzagging form of the museum, so that a void zone, which might be comprehended by a legible axis, is never experienced as such and instead becomes one of the devices to impede the subject's movement. (p. 238)

Unlike the majority of architectural spaces, visitors are offered a view of an interior space which they physically aren't allowed to and cannot enter. Therefore, blurring in this aspect of the design can be noticed by the misalignment of visual and physical limits.

Fig. 39: Libeskind, Daniel (2001) Jewish Museum, (Ground floor plan). From *The deconstruction of the axis: Daniel Libeskind in Ten Canonical Buildings 1950-2000* (p. 239) by Peter Eisenman, 2008, New York: Rizzoli.

Libeskind's design for the Jewish Museum is an exemplar study for the critique of conventional relationships in architectural space, such as the dialogue between object/ space and interior/ exterior. As visitors experience the Museum through an ongoing progression, Libeskind simultaneously provides an insight into the Jewish history whilst also using architectural language to break reliable connections with the outside world. The fractured windows, discontinuous floor spaces and large voids to the basement become tools to establish a blur or a revised connection with object and space, which is not solely based at the perimeter. Advancing upon this case study it is necessary for contemporary architectural designs to consider the treatment of habitable enclosure. Therefore, as has been innovatively challenged by Libeskind, the location of a defined public or private interior and exterior space will be modified. Integrating transparency into perimeter edges will allow new ordering systems to arise which accommodate and are formed by interactive programmatic and social conditions. With this imperative, habitable space may not always operate within enclosed areas but shift to meet user requirements.

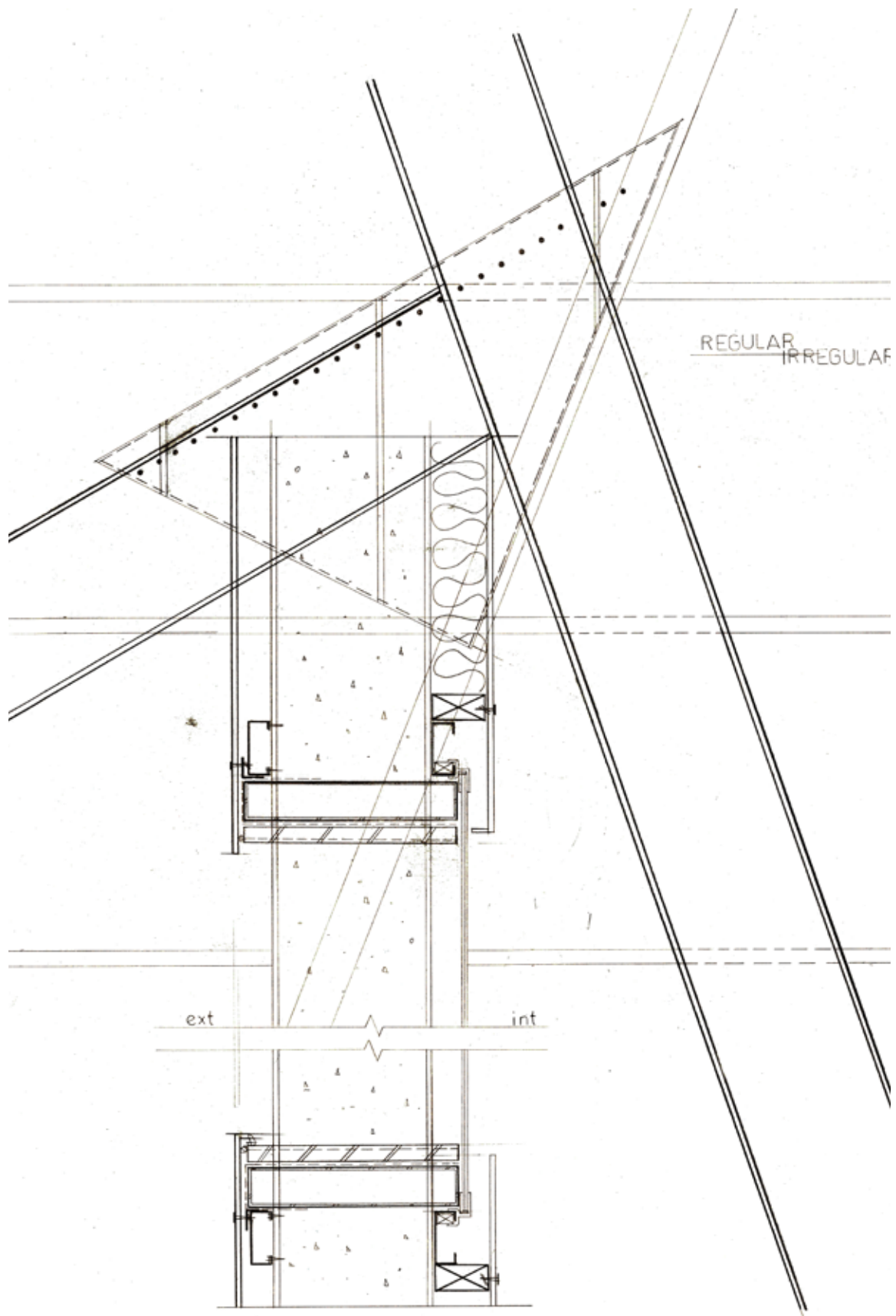


Fig. 40: Detail drawing (1:5 at A2) of interior/ exterior aperture boundary within Libeskind's Jewish Museum. Author's Collection.

Architectural Case Study IV: John Pawson

Pawson House (1999)

The following case study, Pawson House in London, is used to illustrate an approach to architectural design based upon the core principle of simplicity. Pawson's work is significant as a study of public and private, interior and exterior boundary conditions due to this principle, as he effectively manages to dissolve an awareness of spatial edges, corners and material joints.

In the basement of the Pawson House, the boundary between a clearly defined 'interior' and 'exterior' softens due to four main principles: light, material, mass and repetition. This level of the home is utilised for dining, relaxing and entertaining, extending out to form a light outdoor courtyard. The two spaces are separated by continuous floor to ceiling glazed door panels. The following paragraphs will outline these principles more closely, with specific focus on the basement level.

Reducing all elements and detailing to an essential minimum, Pawson innovatively blurs the threshold between private interior and exterior space by incorporating the exterior as a component of the interior. In all his work, Pawson is particularly aware of the affect which uneven surface planes or inaccurate material joints can have to disrupt this fluidity. Due to this consideration, interior and exterior spaces become interconnected by the meticulous usage and play of light. Avoiding any hierarchical distinction between the architectural forms, artificial and natural light is used within the basement living area and adjacent courtyard to generate a gradual rather than definitive change. This acknowledges "the subtle differences between five shades of white" (Chatwin, 1992, p. 12) and hence, becomes a method for blurring the exterior into the interior. Therefore, the play of light and shadow become interconnected to dissolve the threshold between interior and exterior as well as the interior public socialising spaces and the interior private sleeping spaces.

Further enhancing the sense of continuity between living zones is the treatment of creamy-white material finishes. Being reflective on the ceiling, walls, cabinetry and exposed tile flooring, the palette reiterates Pawson's objective in attempting to reduce any junctions which may distract the eye. Although this could

seem restrained, it further exemplifies a focus towards an essence of living based upon necessity. Boundaries initially appear to be clearly distinguished however due to the subdued lighting on the basement level; edges soften, becoming hazy as the daylight changes.



The third principle, mass, is noticeable in the form and scale of the living area. Through an analysis of the space, it is clear that both the furniture and architectural elements designed in response to one another. This further accentuates the blurring of daily activities, as one moves from the bench to the table which are at a consistent height. This is noted in the following statement:

As a wall in its every aspect contributes to or detracts from the crucial qualities of spatial wholeness and visual comfort, so the table- in its form and proportions, in the details of its surface and junctions, in the space it creates around itself and in the patterns of use it implies- has a profound impact on the way the wider space is perceived and experienced. (Pawson, 2005, p. 179)

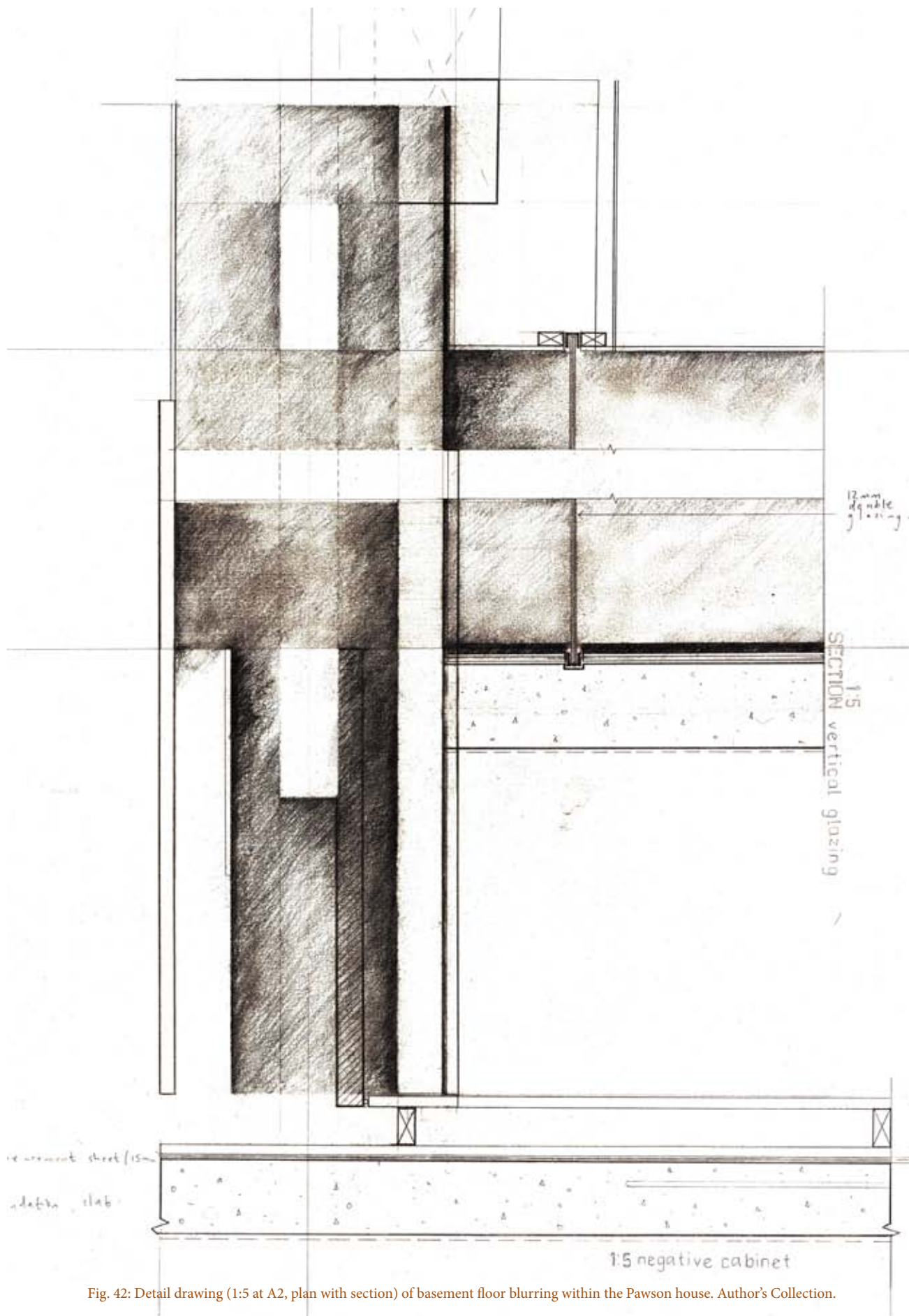


Fig. 42: Detail drawing (1:5 at A2, plan with section) of basement floor blurring within the Pawson house. Author's Collection.

Rather than an over-riding emphasis being placed on one particular detail, all exterior and interior elements have been evenly treated resulting in an increasing level of ambiguity between each condition. For example, no noticeable difference between the appearance and form of the two dining tables or cabinetry can be noted ensuring a clear visual and physical fluidity is maintained.

Finally, repetition is a technique often noticeable in the work by Pawson. Whether through the repetition of physical objects or the location of daily rituals, Pawson seeks to emphasise a domestic setting aligned with the rhythms of each day. Within the basement level, repetition is clearly seen through the alignment of two dining tables, one inside and one adjacent on the outside. Being identical in their form and position, the wooden furniture provides the overall basement level with two clear nodal points. Further demonstrating a focus on detailing can be seen through the continuous, but yet repetitive use of concrete floor tiles. Once again, this technique works to activate an unclear distinction between the interior and exterior spaces.

As has been noted, the simplicity inherent within the design of the Pawson home is carefully and precisely constructed to blur the threshold of an interior private space and an exterior private space. Through a restrained use of material, light and form, the basement level can be viewed as one continuous space, rather than having two distinguishable identities. This flexibility is an important consideration in contemporary architectural designs where users fluctuate in connection with the weather and social gatherings. As the Pawson Home is utilised by one family, it is important to consider how the blurred threshold between interior and exterior would operate for additional public, external users. As overlaid social conditions shift and change, movement between the symmetrical planning of the interior and exterior could either enhance or reduce the perception of a blurred boundary. The articulation of blurred boundary conditions needs to incorporate variations for personal and changing privacy as is required by the users over daily time periods, allowing movement and transformation to become core design principles.

Architectural Case Study V: Tom Kundig

Chicken Point Cabin (2002)

Unlike the uniform language which is evident within the work of Pawson, the following case study by American Architect, Tom Kundig, is highlighted for the specific detailing of large, moveable window and door elements. Through this technique, Kundig's work is an example which blurs the boundaries between interior and exterior, public and private space. The Chicken Point Cabin is selected within the research to exemplify a study of the dissolution of the boundary between the previous conditions being reliant upon physical, mechanical moving components.

The Chicken Point Cabin is situated on the fringe of Lake Hayden and was designed in 2002 for a family of four. The main intention of the work was to open the house, and hence the internal living, towards the water's edge. In this sense, the building was sought to become a bridge between nature and the individual's habitation. The response from Kundig was for the design of a large pivoting window which completely opens the interior to the lake. As Kundig himself said, "Little house, big window" (Kundig & Ngo, 2006, p. 79).

The design of the large window has been treated in a similar manner to a large garage door, enabling all family members ease when opening. This relies upon a counterbalance principle through a set of gears, like that of a bicycle, that allow minimal input of force to pivot the six-ton steel and glass window. (Kundig & Ngo, 2006, p. 79) Hence, as can be noted in the image XX, a distinguishable edge is difficult to locate when the window is opened and the family members reside on the timber deck or further at the lake's edge. Although reliance back to traditional edge anomalies is noticeable when the window is closed, the insertion of physically moving components transforms the standard relationship one has with the wall and boundary. By opening the entire façade rather than smaller components, family members within the lower living and upper sleeping areas equally benefit. Privacy between lower and upper floors has been articulated by wall partitions that allow views out towards the lake and privacy between interior public and private areas. Due to this, blurring occurs along horizontal and vertical planes. More significantly, this enables the boundary to change in response to different weather conditions, an important consideration for contemporary architectural design.

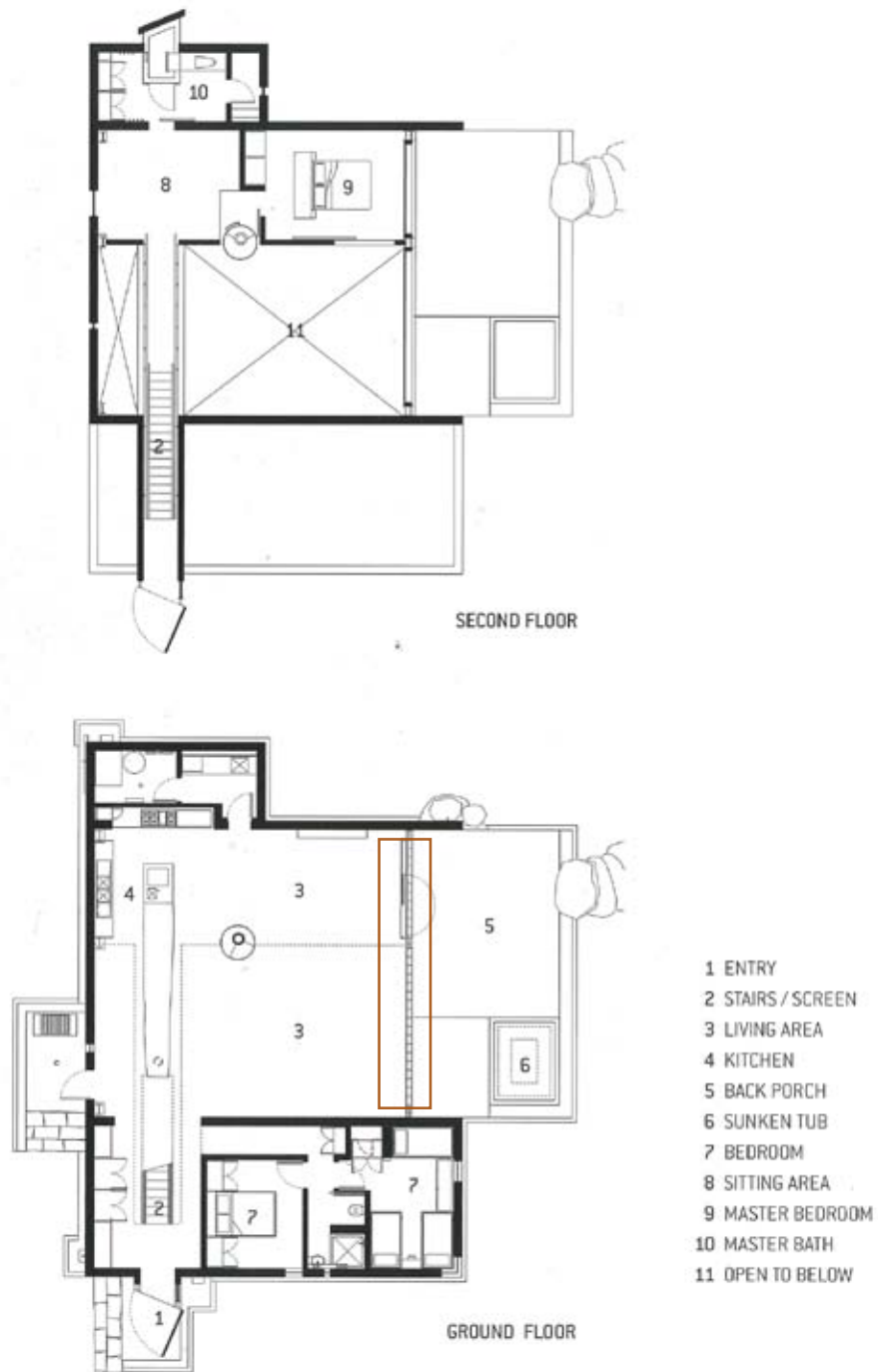


Fig. 43: Kundig, Tom (2002) Chicken Point Cabin (plans). From Tom Kundig: Houses illustrating location of window (p. 92) by Tom Kundig & Dung Ngo, 2006, New York: Princeton Architectural Press.

Kundig's design for Chicken Point Cabin is an exemplar project for the use of large moving architectural elements. As this treatment is relatively new, his work inserts a unique paradigm for the treatment of the boundary from the principle of movement. Building upon this work it is necessary to recognise the relatively stationary and inert character of the remainder of the cabin (excluding the entrance door). Primarily, the blurring occurs at the location of the window, in the living room area. However, when this window is open, the exterior environment blurs beyond the living area, into the kitchen and upper areas. Similarly, being solely reliant on fine weather, the opening is limited in dissolving the edges between interior and exterior. Hence, it is necessary to consider how moving components can engage multiple experiences and locations in a design as a response to transforming contextual and habitational criteria, offering numerous rather than singular responses to the treatment of the boundary. Further dialogue between the centre (interior private and public activities) and the periphery (exterior and interior activities) could provide a way for multiple experiences to coexist.

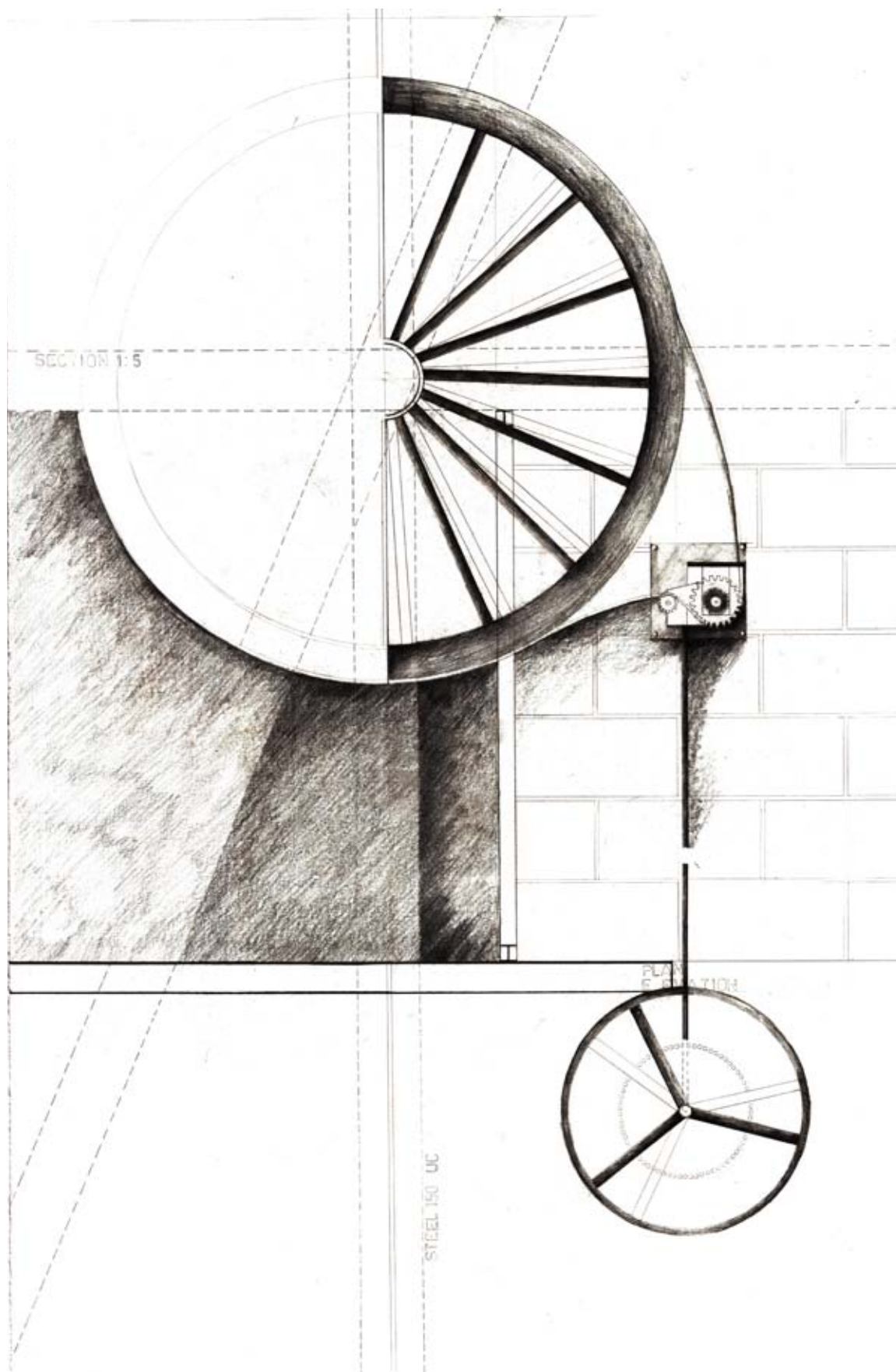


Fig. 44: Detail drawing (1:5 at A2, plan with section) of mechanical gears and pulley system for the opening window within Kundig's Chicken Point Cabin. Author's Collection.

Conclusion

Design developments towards the blurred boundary in architecture have grown immensely during the 20th century. From the Prairie works of Frank Lloyd Wright in 1900-1919 to Tom Kundig in 2003, it is noticeable that architects have recognised the benefit of dissolving boundaries between interior and exterior, and public and private areas. As each met their own limitations, today's transforming context provides new imperatives for designing boundaries which are more closely connected to open, natural conditions.

Various key differences can be extracted from this investigation for the following design research case study. In the early work of Frank Lloyd Wright, dissolved interior public boundaries allowed continuous fluidity to exist. Due to this technique, roof, ceiling and floor planes were accentuated forming an elemental hierarchy between the primary horizontal and secondary vertical elements.

Particularly evident within the Brion-Vega Cemetery is an acknowledgement of the boundary as a space of reflection and temporary habitation between the spiritual and the corporeal. This was noticeable due to the re-consideration of standard elements of walls, roofs, floor plans. Although the architecture is static, the main priority has been to acknowledge the experiential journey and movement of the individual. This is further reflected in the Jewish Museum by Daniel Libeskind however in variance to the Brion-Vega Cemetery, the visitors remain within an enclosed interior. Blurring of private and public interior space is recognised within the design by the large inhabitable voids that are crossed by pedestrian bridges and ramps. Further, Libeskind denies the standard role of an aperture, not allowing it to relate to the interior gallery functions or scale. Therefore, from the exterior and interior the window offers very little information, blurring how one engages with the exterior environment from the interior. Inverting views back into the space, Libeskind uses the perimeter boundary to achieve an inward, reflective focus.

In the work by Pawson, blurring between interior and exterior space is achieved through the articulation of light, mass, material and repetition. Although this successfully works to blur the interior living from the courtyard it is necessary to consider how the two spaces would operate in response to overlaid programmatic and climatic conditions which change daily and seasonally.

Finally, Kundig uses moving components to enable the boundary to change depending on different weather conditions. Blurring of boundary conditions is particularly noticeable at the perimeter. Hence, further interior public blurring could be achieved through a closer dialogue between the centre, internal activities and the perimeter boundary.

Through this analysis the design case study needs to develop innovative responses to enclosure and exposure alongside inhabitable and habitable environments. In most of the case studies, there has been a successful dialogue between visual and physical areas of habitability. Forming the basis to the design, this can further be challenged by changing climatic conditions, overlaid social groups and users.

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Fig. 45: *Blurring, Wellington Waterfront, New Zealand.*
Author's Collection. Digital photograph.



Chapter Four: Design Application

As the users' experience depends on complex juxtapositions of many moments and conditions, whether a building is critical may depend not on instantaneous shock but enduring ambiguity, the ability to appear ever-changing, resist resolution and remain open to interpretation.

(Hill, 2006, p.54)

Within this section of the thesis, architectural design research is utilised to build upon the unbuilt and built case studies that have been discussed in Chapters Two and Three. Within these case studies architects have recognised the need and benefits for blurring architectural boundaries yet have meet individual limitations. Due to this the thesis proposes a new methodology as a way to develop upon these works and simultaneously acknowledge the problem of changing environmental, social and cultural conditions. An iterative hand drawing process is used to generate a design solution, enabling the process to become its own product. This recognises a new shift in the formulation of architectural orders, where a traditional orthographic reliance on linearity is no longer necessary. Within the design outcome, each iteration or movement will enable an overlaid ordering system to be created which simultaneously meets the requirements of habitability.

More closely, the thesis investigation proposes that a solution to this problem may reside in the role design tools have in shaping architectural outcomes. For this reason, the thesis investigates these issues using both a 'physical' (urban) and a 'non-physical' (drawing board / paper surface) site. The non-physical site is particularly important as it establishes an awareness of the changing tools engaged in the production of contemporary architectural design. Further, understanding the influence design tools have in the formation of architectural space may provide a new framework for the treatment of blurred boundary conditions.

Within Chapter Four, a series of drawings will be presented to portray the development of the architectural case study. This will include a series of plan drawings and construction details that articulate how the qualities from an iterative hand drawing process can provide a new approach for the development of architectural boundary conditions and habitability.

Design Intent:

an iterative drawing process, a transforming Architectural office

The design outcome has arisen through a critical reflection upon the drawn processes and theoretical research undertaken in the thesis. This develops upon the case studies outlined in Chapter Two (Unbuilt) and Chapter Three (Built). The process of iterative hand drawing is considered as a solution to the problem of changing environmental, social and cultural conditions within our 21st century architectural designs.

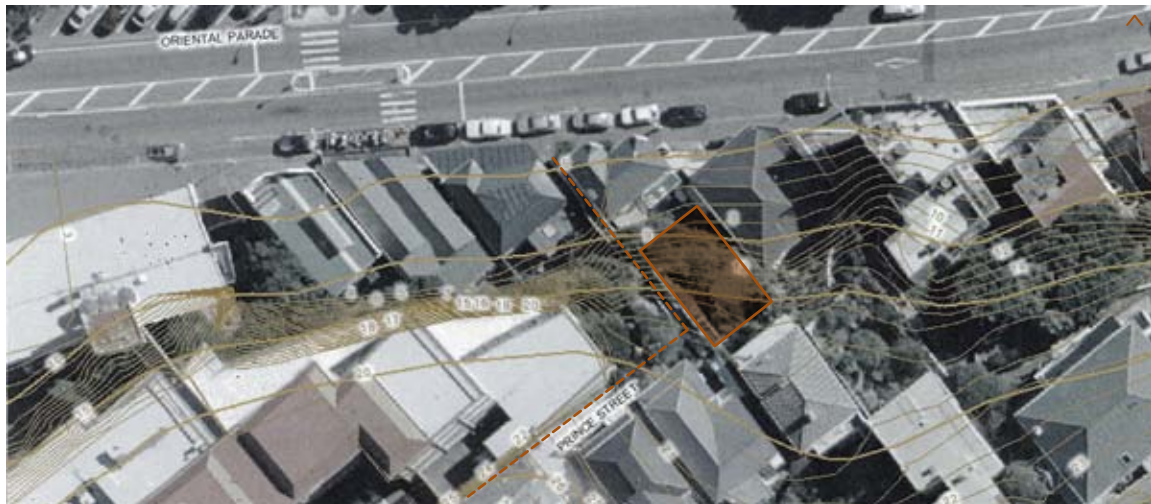
The first site, a non-physical (drawing board / paper surface), is utilised to establish blurring through two-dimensional drawing techniques. This involves layers of tracing paper which become important within the iterative process and design development. The drawn investigation evidences the conditions at the physical site which is situated behind 110 Oriental Parade, connecting to Prince Street. Further it challenges visual representation by incorporating movement/ transformation into the drawing layers to enable new, overlaid ordering systems to be created. Therefore, the two sites, whilst physically independent from one another, become connected and analysed through the iterative drawing process.

The design case study explicitly focuses on developing non-traditional spatial boundary conditions. These are developed through the application of blurring as a critical and strategic approach, enabling hand drawing to be utilised to develop the design outcome. In particular, the introduction of mobile elements is utilised as a method to increase the relationship between periphery and centre in the design footprint. With each shifting movement of the boundary, the design is capable of evidencing a new order. Hence, as the boundary transforms, numerous ordering systems are formed.

The Physical Site

The reasoning for the site selection was due to its position within an uncompromising, exposed terrain which consequently, required specific considerations for allowing habitability. As was noted in Chapter Three, previous architects who investigated blurred external boundary edges struggled to provide reliable habitable areas.

The site consists of a large diversity of orientation and typological requirements (outlined on the following pages). In response to this, an overlapping ordering system can be used to meet these demands, rather than a linear approach. Further, transformation is necessary to operate and blur between these contextual requirements as well as meeting the programmatic and social demands of the architecture. Blurring between these requirements becomes a method to establish a suitable design response for this site.



The Programme

The programme of a contemporary architect's office is selected as it no longer operates, or needs to operate from a traditional working structure. Today, the programme and its occupants need to engage with multiple social conditions in order to recognise varying user demands and ongoing modifications to their commercial responsibilities. Therefore, the programme is itself transforming, where further interaction with the adjacent context is becoming increasingly important.

The following section identifies specific site attributes that are used to inform the design response. Individually, these characteristics require specific design responses however collectively they enable a contextually-based design to operate.

Fig. 46: Case study site plan illustrating the position of the site on steep terrain (highlighted area), adjacent to the pedestrian staircase connecting Oriental Parade with Prince Street. Author's Collection.

Site Attributes

Characteristic I: Exposure

Set back from the street edge, the site is accessible by a pedestrian staircase that links Oriental Parade to Prince Street. As the staircase progresses up the Western perimeter, the site is presented in a linear sequence to local pedestrians. Yet confronting this sequence is the building's clear exposure to its adjacent neighbours and those walking along Oriental Parade. This invites an opportunity for the building to consciously participate with its surroundings, being physically and visually accessible. As a level of mediation, the building's 'skin' or boundary becomes a layer of negotiation between the inhabitants and their surroundings. This allows the design to operate between those physically participating within the building and those visually participating with its adaptations.

Not only exposed to neighbouring views, the site is open to the natural elements including wind, sunlight and rain. Of predominance to the individual experience at Oriental Parade are the strong northwesterly, northerly and southerly winds. Connecting to ideas of movement, the wind in particular introduces a requirement for the building to physically adjust and move according to varying climates and the internal occupation. The climate, wind and the changes which it incurs are therefore used as a design tool to dictate how the building is constructed for multiple experiences, times and states of transition.

Characteristic II: Blurring of axial ordering systems

Pursuing the view of the city, a tendency of the adjacent buildings can be seen with their alignment along the northwest axis. This project seeks to operate between two axes- the northwest and the north in order to communicate with the passing pedestrians whilst allowing views across the harbour and city.

The steep verticality encourages a requirement to acknowledge and operate between horizontal strata. On the site, the increasing contour levels allow for varying visual connections with the surroundings. These establish an ordering system which warrants the usage of blurring. This is outlined in the following points:

- Between 8m-10m above SL: The view is limited due to the neighbouring building on the northern perimeter. However, a projection on the northeast axis provides a clear visual link between the site and street.
- Between 10m-13m above SL: The view opens towards the city and harbour. An important connection with the street is provided at this level due to the 3m void between the two buildings on the north- northeast site corner. Within this stratum a clear view across Oriental Parade towards the pedestrians and vehicles is apparent. This connection is equally as noticeable when viewed from across the road.
- Between 13m-18m above SL: The view is predominantly of the city and beyond. At this height, neighbours on the southern side have a clear view of the design case study site.

Site characteristic III: Typological blurring

A juxtaposition of scale and relative building heights is presented due to the irregular contours and close proximity between neighbours. On the southern side, the site is surrounded by residential timber dwellings and on the northern side, a combination of residential timber dwellings and commercial (restaurants and cafes) dwellings. As an architecture firm, the studio needs to operate and mediate distinctions of privacy and publicity providing areas and opportunities for both to exist. The following points outline the adjacent neighbouring buildings which the design, and more closely the boundary edges will respond to:

- Residential home 1: This home is positioned directly in front of the site and is also used as an Accountant's office. The house has a rear courtyard that varies from three to five metres in depth. The site boundary aligns with this courtyard.
 - Residential home 2: This home is positioned on the eastern perimeter of the site however has minimal visual contact with the site due to its orientation towards the street.
 - Residential home 3: This home is positioned on the southern perimeter of the site and has an asymmetrical yard on its northern frontage. The building is nine metres in height and is in poor condition. It provides little shelter from the southerly wind yet has an unobstructed view of the chosen site and city beyond.
 - Commercial residence, Copthorne Hotel: Positioned on the western perimeter, the Hotel is twelve
-

metres from the site however has been constructed through a cantilevered design. The building forms a visual boundary to the view of the city however rests at a relative unobtrusive distance from the site.

Most importantly, the architect's office is a commercial building which needs to comfortably fit within its adjacent residential context. Being within an exposed terrain (visually and climatically), considerations for the occupant's privacy and working requirements need to be met. Therefore, blurring of visual and physical typologies becomes increasingly necessary for an appropriate design to be successful. The design case study predominantly uses exposed concrete and timber materials and detailing to blur these typologies.

Within the planning of a contemporary architect's office, additional considerations for social, commercial and recreational activities need to be addressed. Variations to the office planning provide flexibility to meet ongoing changing individual and collective demands. This also allows the office to become integrated with climatic variances due to a blurring of boundary edges. With these considerations in mind, programmatic blurring is a necessary tool to meet shifting spatial demands while also engaging active and passive site users.

Fig 38: Centre/ Periphery diagram



Constructing the boundary

Multiple

As previously noted in the research, the boundary is considered as a defining element for connecting rather than dissociating one to their surroundings. Moving beyond a singular boundary or edge condition between internal public spaces and interior/ exterior, the research considers multiple boundaries as a technique allowing overlapping connections and associations between passive and active users of the design and adjacent area. In considering the term 'multiple' Herman Hertzberger writes (1991):

In order to withstand changes built forms must be made in such a way that they permit multiple interpretations, i.e. that they can both absorb and exude multiple meanings, without, however, losing their identity in the process. (p. 149)

Reflecting upon Hertzberger, layering becomes a way to move beyond traditional edge anomalies, providing several possibilities rather than one singular answer. Layering is recognised within the design research as the iterative process which simultaneously establishes an end product. Therefore, following the movement from hand to digital design tools, operations within the conventional design studio can also be reanalysed. This directly confronts the statement put forth by Ingraham, where a singular, rather than layered design or response is expected. Ingraham notes (1998):

One of the most powerful forces that architecture exerts on culture is the maintenance of certain proprieties: how space is lived in and named; what type of building is most appropriate to what use; what materials belong to the exterior, what to the interior; and so on. (p. 30)

The understanding of 'multiple' is informed by a response to the continual changes occurring and overlaying within today's living patterns, reflective of a new engagement individuals have with technology and also, their surroundings. Designing to include rather than reject these ideas can be met through acknowledging the diverse requirements of architecture across various periods of time, states and programmatic requirements.

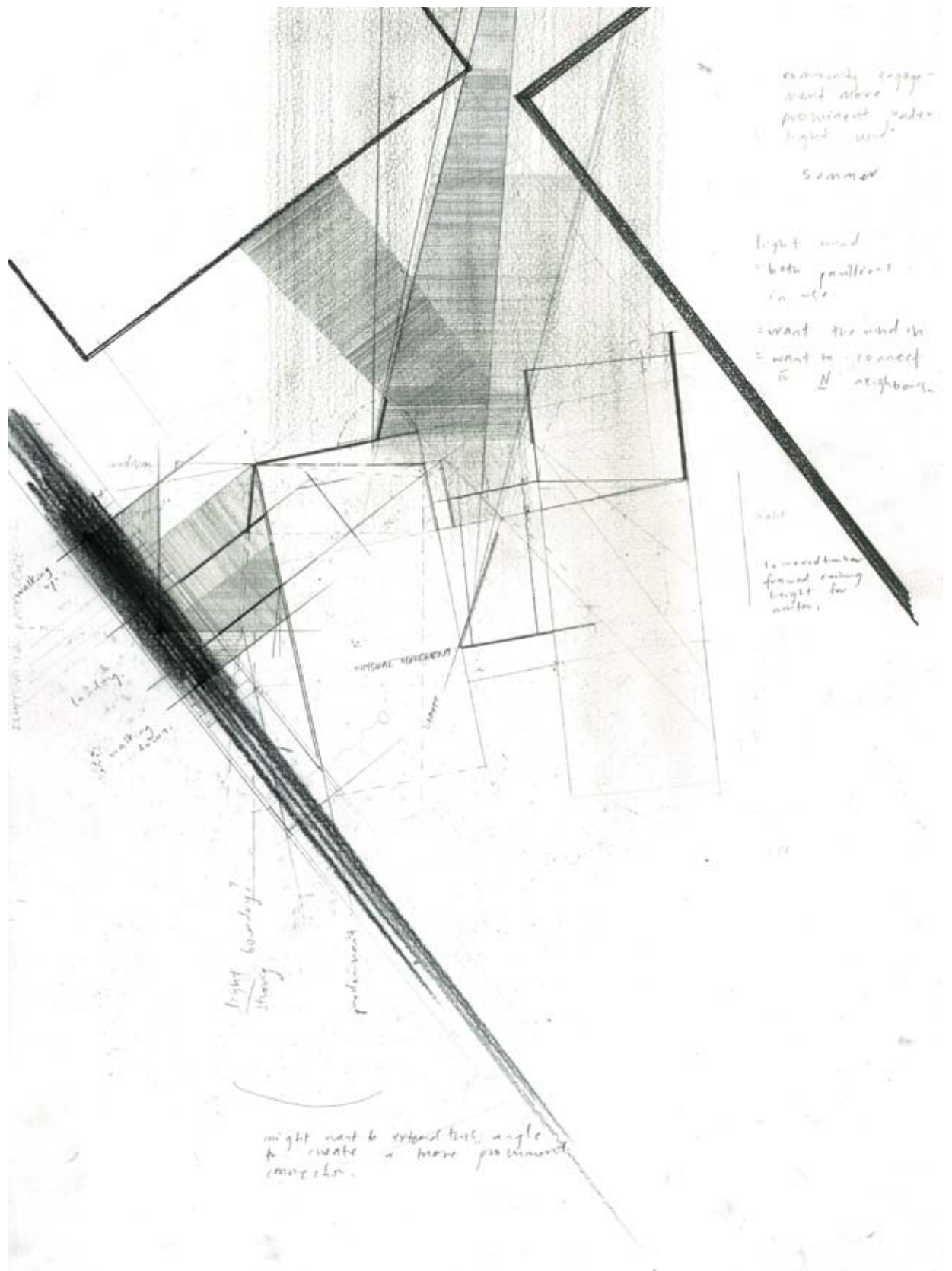


Fig. 47: Iterations of boundary planning in response to active and passive (northern) light (less predominant) forces. Author's Collection. Hand drawn plan.

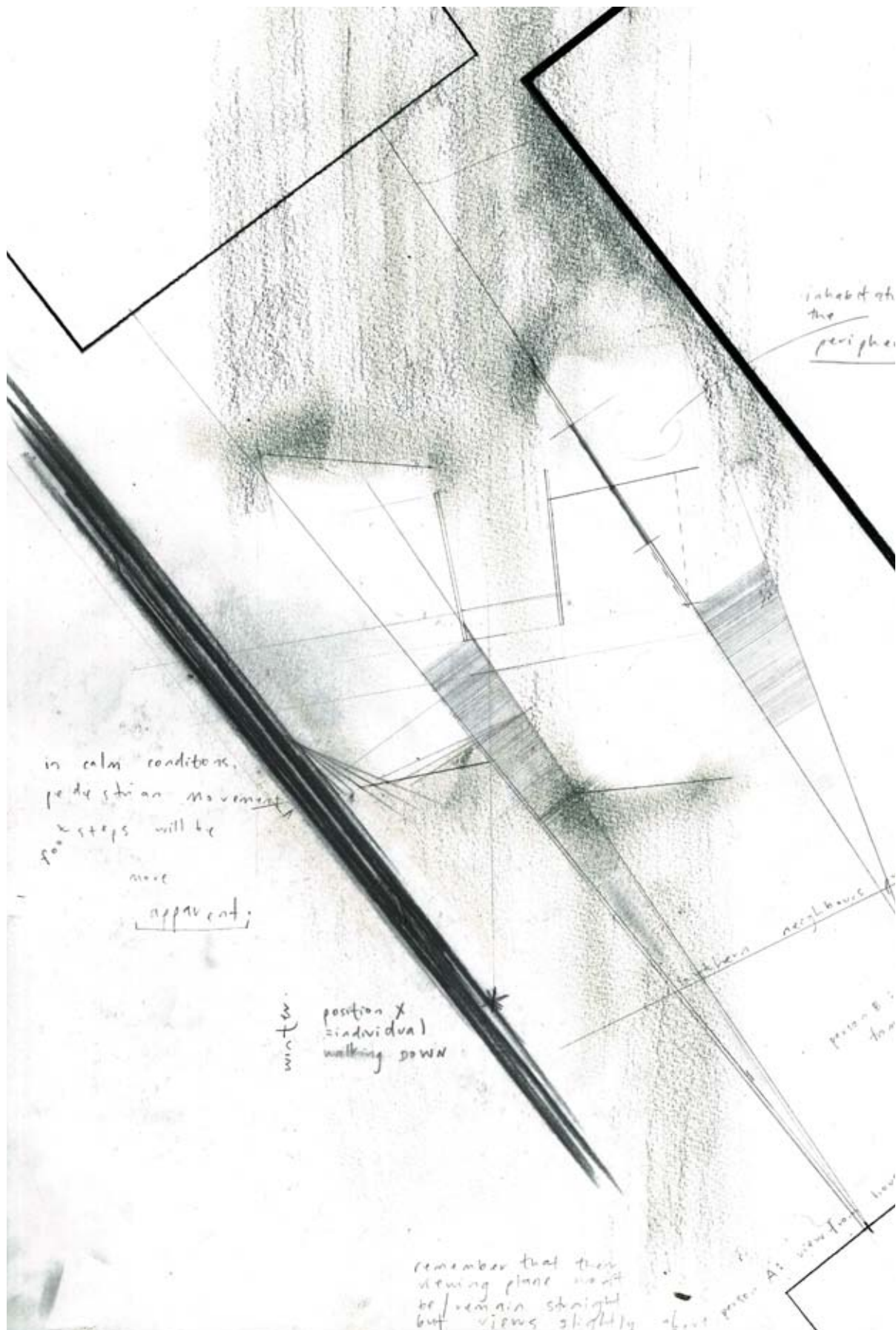


Fig. 48: Iterations of boundary planning in response to active and passive (southern and northern) light (less predominant) forces. Author's Collection. Hand drawn plan.

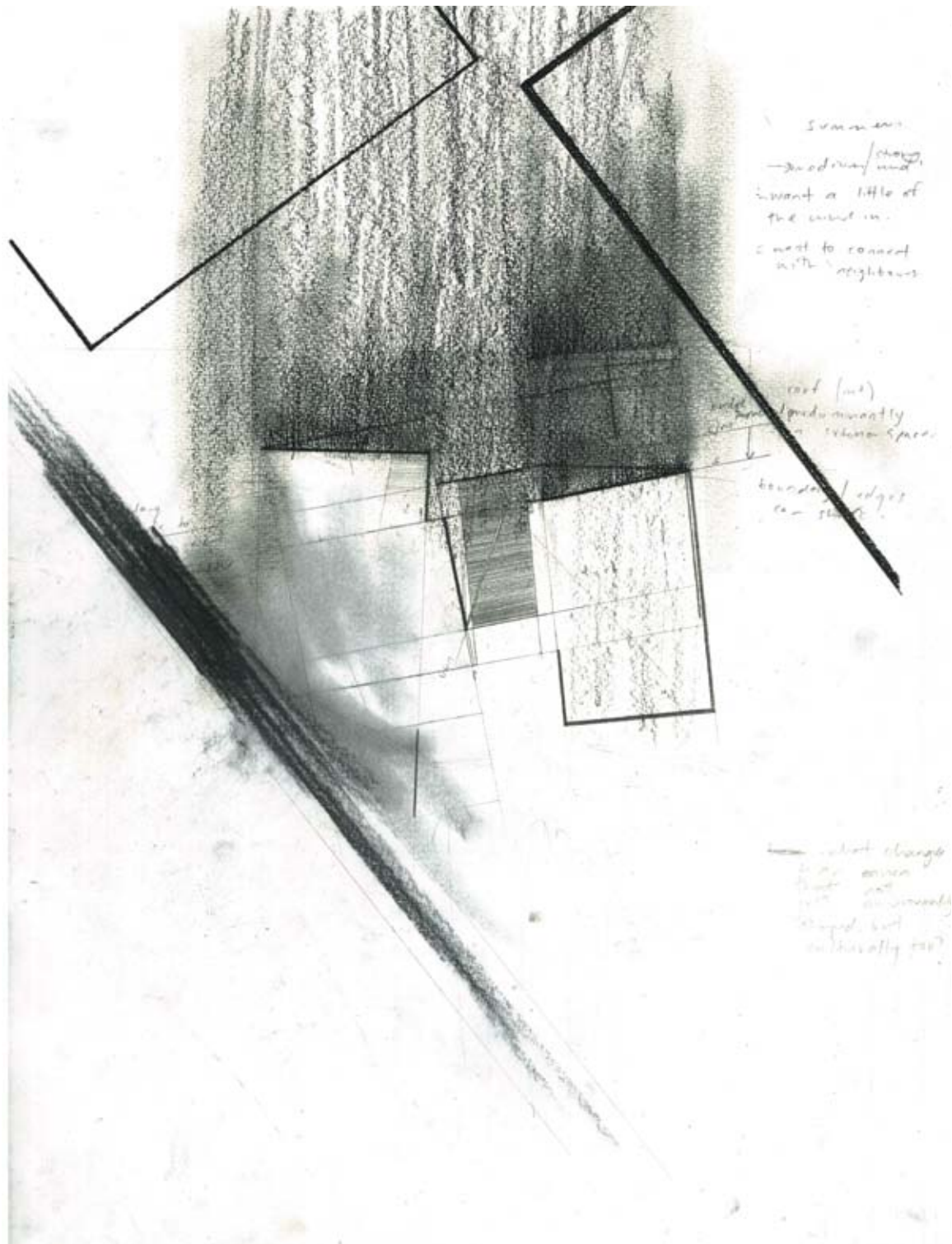


Fig. 49: Iterations of boundary planning in response to active and passive (northern) medium (predominant) forces.
Author's Collection Hand drawn plan.

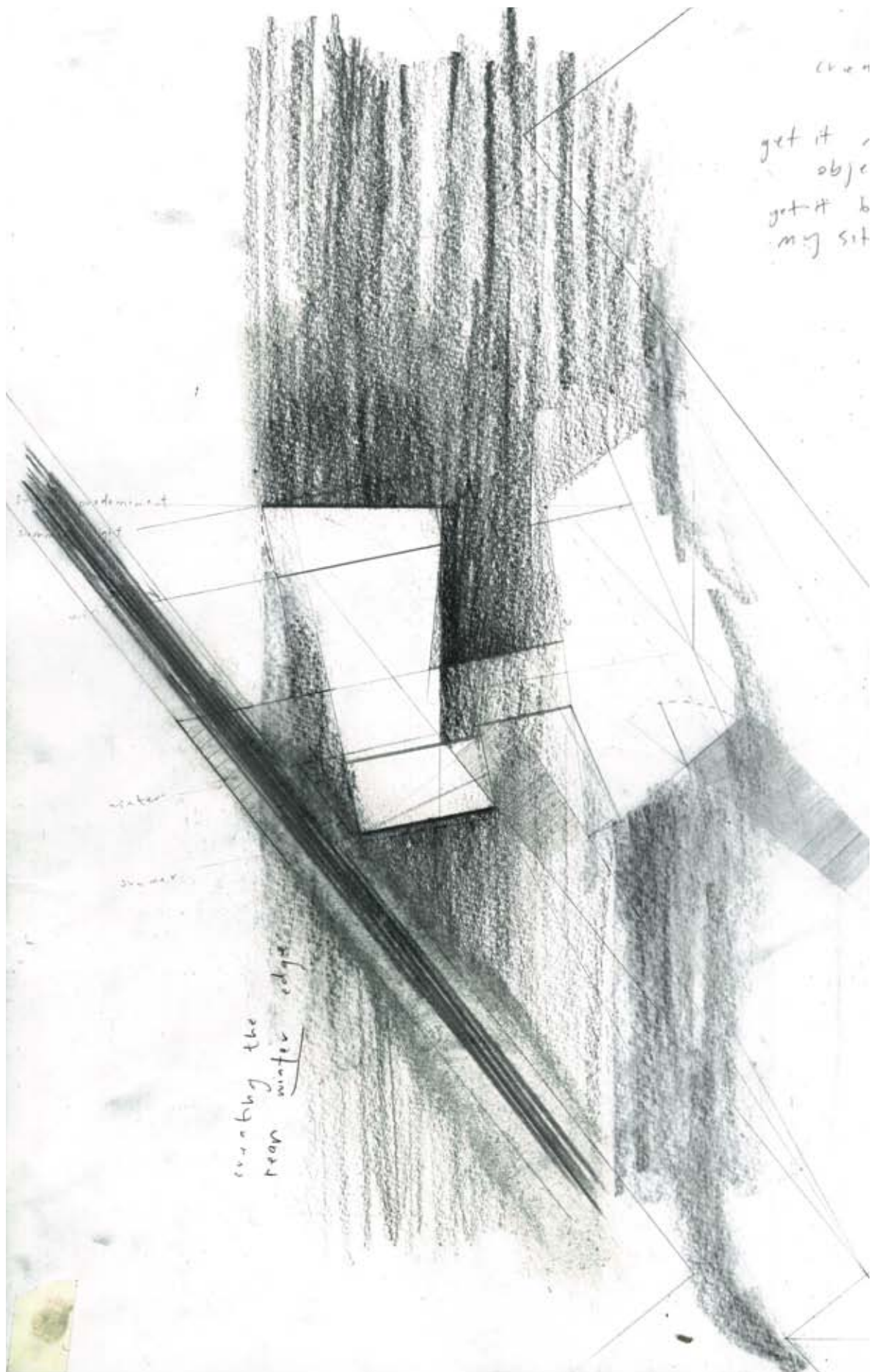


Fig. 50: Iterations of boundary planning in response to active and passive (southern and northern) strong (less predominant) forces. Author's Collection. Hand drawn plan.

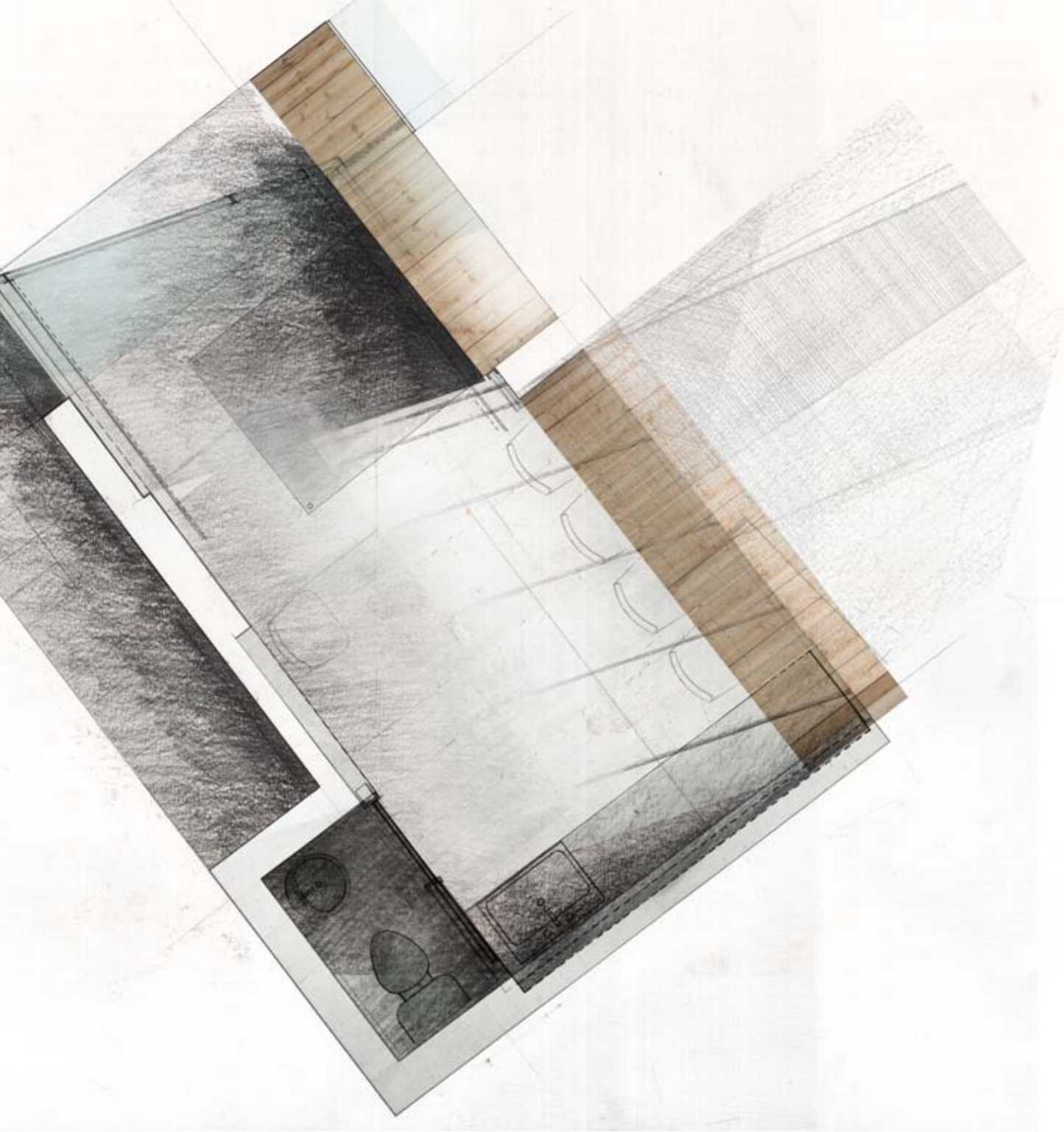
Floor plans

The building is defined by two axis lines, the first running perpendicular to the staircase and the second aligning with the site contours. As a result, continuous visual connections between the exterior and interior spaces have been created, allowing further interaction between direct users on one axis and passive non-users on the other. Being a small site the studio on the upper floor is designed to accommodate two architects and one architectural student. Separating the upper studio and hence two main working spaces is a central staircase and landing which leads down to the lower floor.

To accentuate the dissolution of boundary edges, the thoroughfare/ landing space is defined by a continuous concrete ceiling spanning from the eastern pavilion to the edge of the western pavilion. Whilst aligning perpendicular to the pedestrian staircase, the space avoids being completely enclosed through the design of a half-height retaining wall and no exterior glazing. Most commonly the space will operate as a thoroughfare between the two studios and meeting room; however in conjunction with the south western sliding wall in the western pavilion, the space has the ability to be incorporated, further inviting pedestrian views and providing the design with a strengthened sense of transparency.

On the lower level, a meeting space is fitted with a kitchenette, lunch area and bathroom. Varying in heights (higher for lunch and lower for meetings) the eastern bench provides the space with a clear sense of cohesion. Fine conditions allow aluminium sliding and pivot windows to be opened, extending the working and rest area closer to the external environment. Grounded by a concrete retaining wall, the space opens up, becoming more open on the northern perimeter with a copper clad overhang, signalling the entrance. The following paragraphs outline three techniques utilised in order to manifest a design based upon iterative uses, interpretations and experiences.





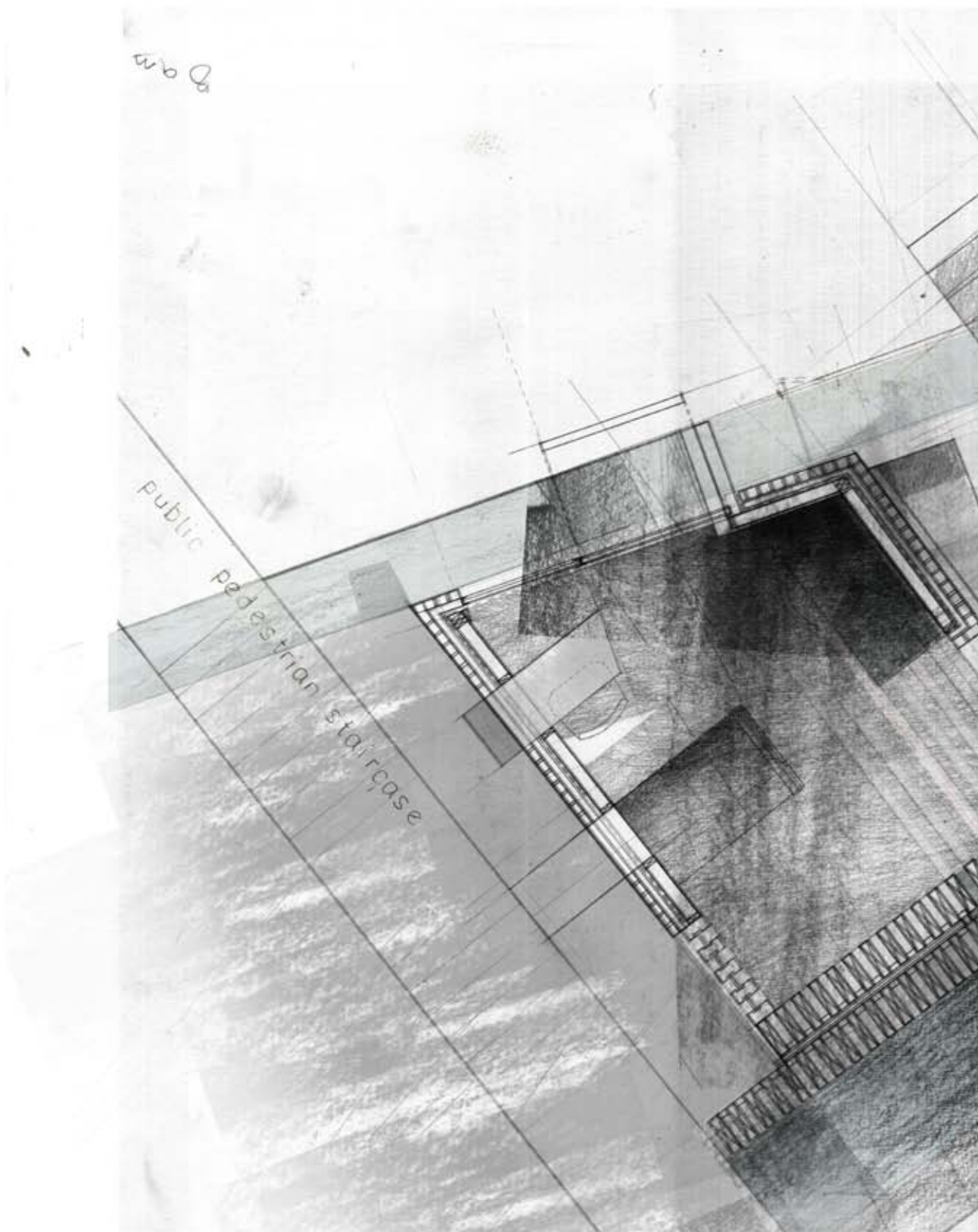


Fig. 51 (previous, tracing paper): Lower floor plan presented at 8.00am illustrating meeting space and kitchenette. Blurring is established through lighting variances and the effect of continuous surface planes. Created by Author. Hand drawn (1:20 @ A2) and digitally composed.

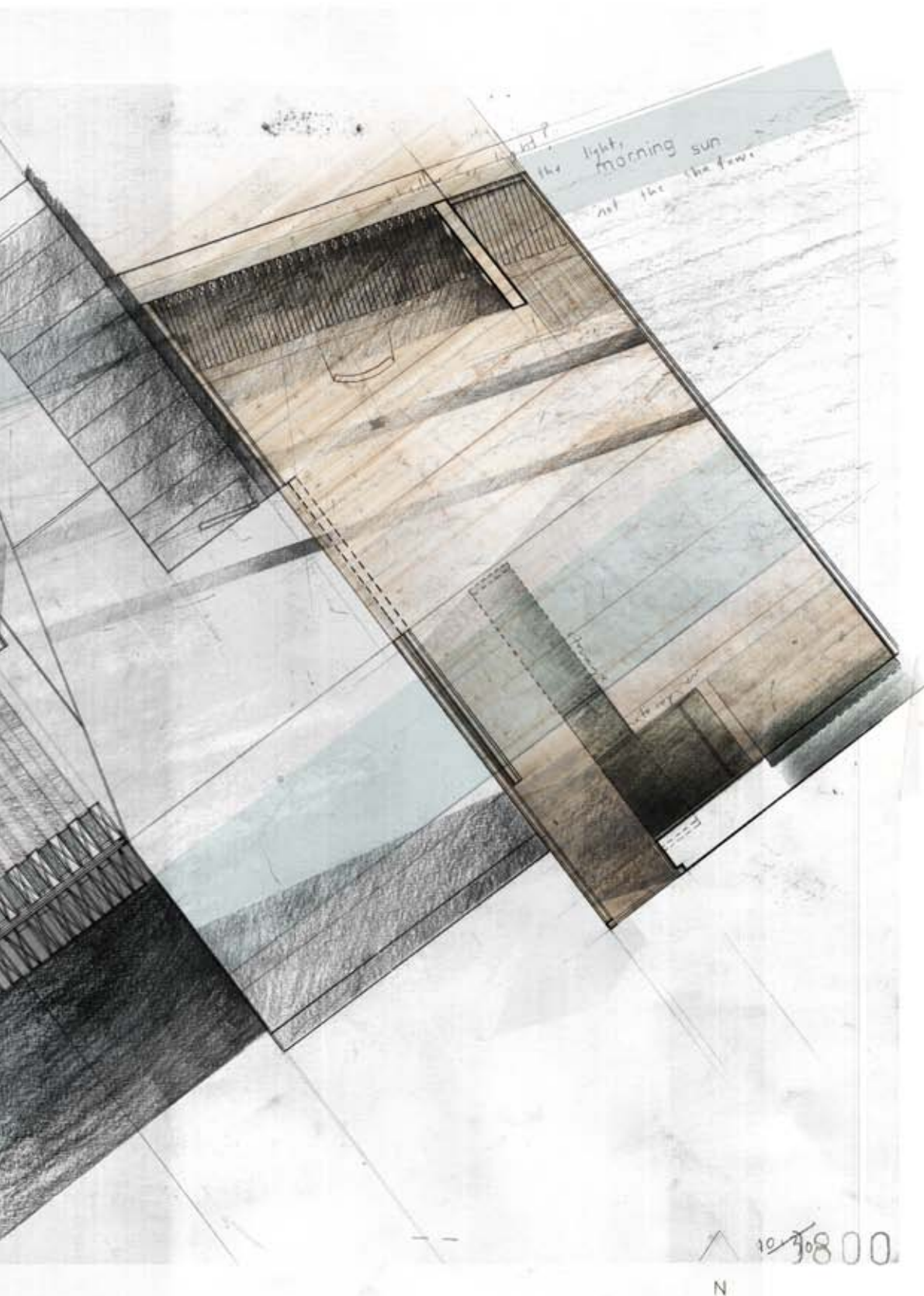
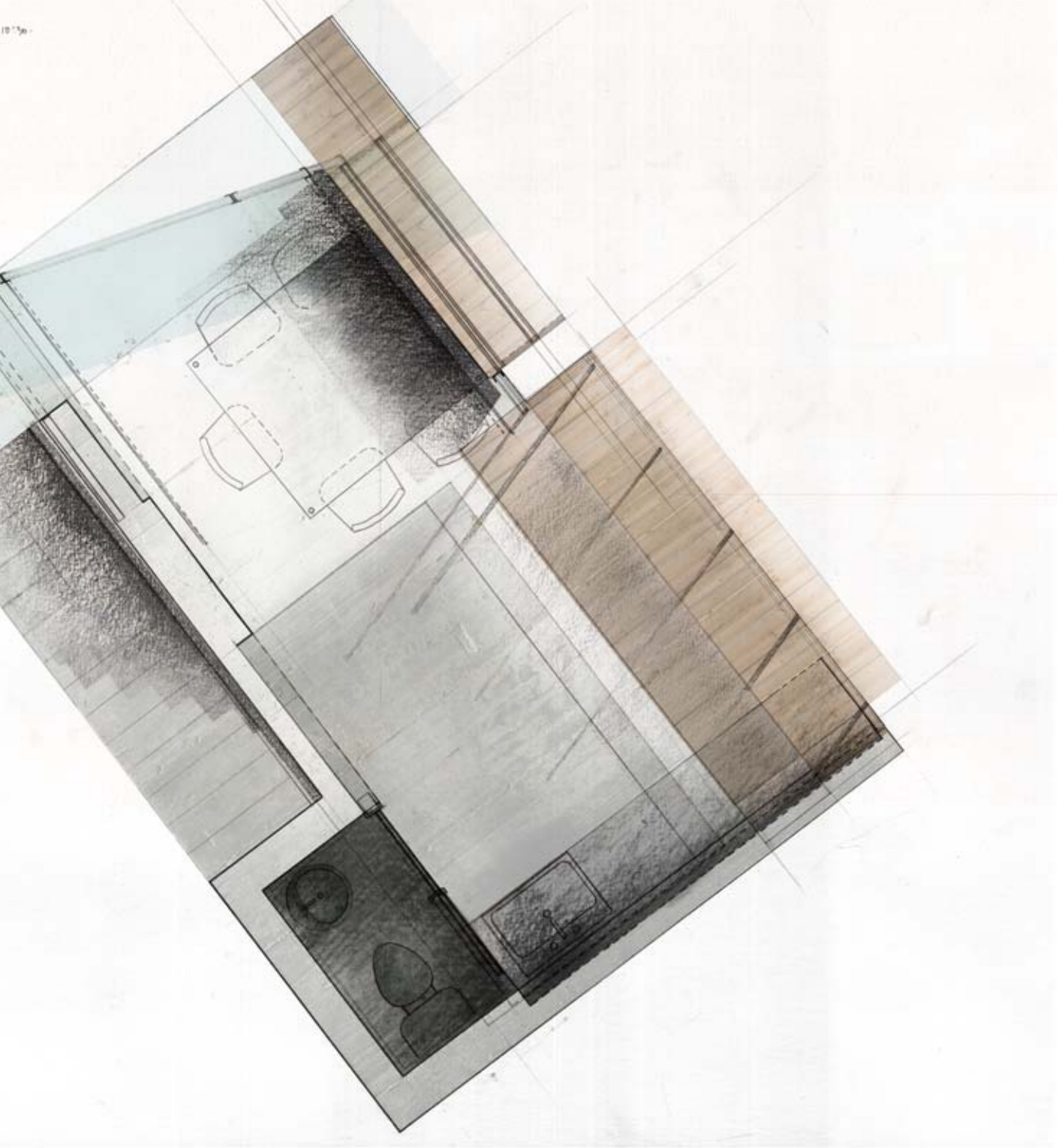


Fig. 52: Upper floor plan presented at 8.00am illustrating the eastern and western studios with stair landing in centre. Blurring is established through lighting variances and the effect of continuous surface planes. Created by Author. Hand drawn (1:20 @ A2) and digitally composed.





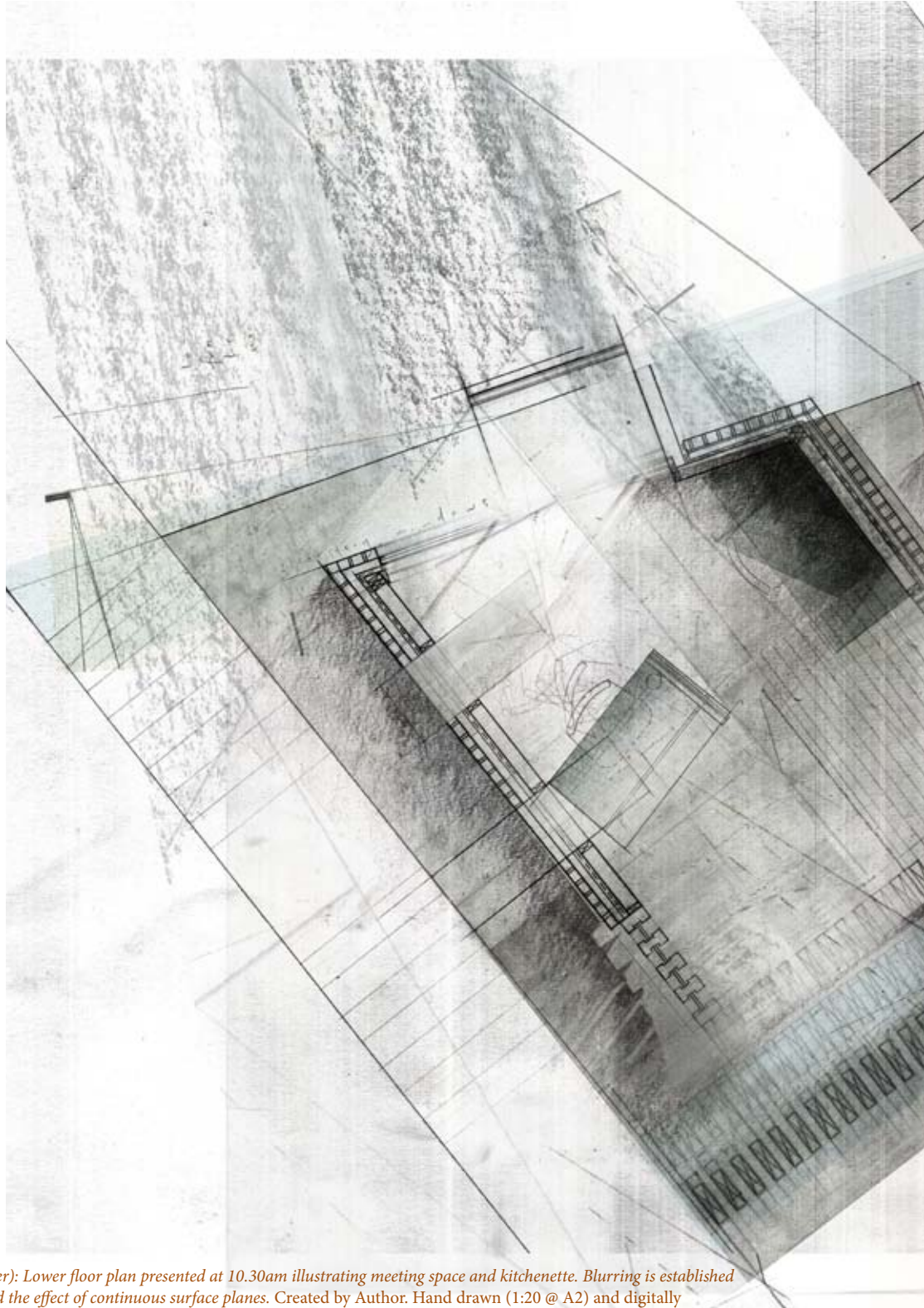


Fig. 53 (previous, tracing paper): Lower floor plan presented at 10.30am illustrating meeting space and kitchenette. Blurring is established through lighting variances and the effect of continuous surface planes. Created by Author. Hand drawn (1:20 @ A2) and digitally composed.

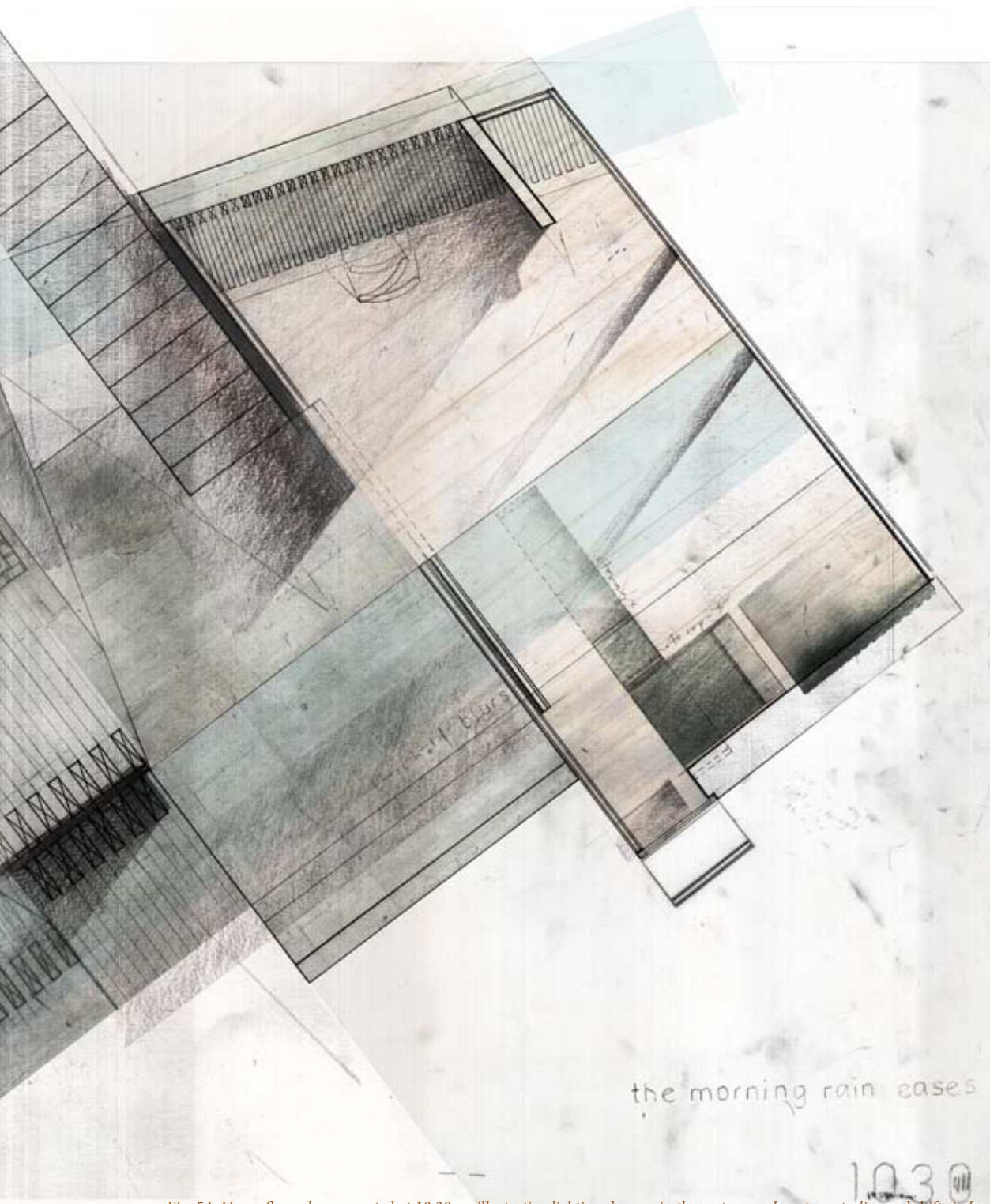
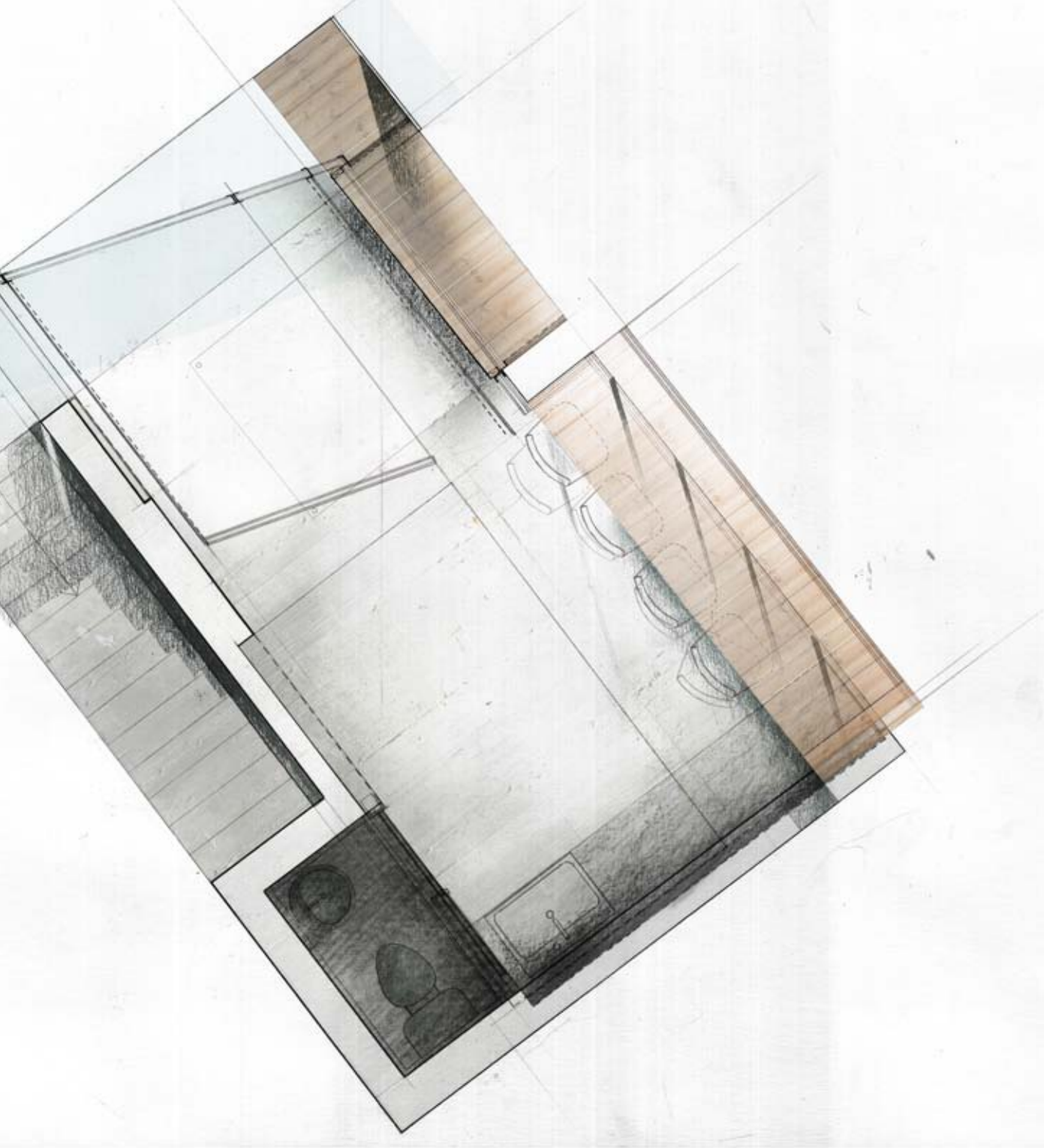


Fig. 54: Upper floor plan presented at 10.30am illustrating lighting changes in the eastern and western studios and shifts in boundary edges at the southwestern and southern corners, and northern entrance (western studio). Therefore, boundary blurring is established through lighting variances, the effect of continuous planes and the initial movement stages. Created by Author. Hand drawn (1:20 @ A2) and digitally composed.



1:10
1:50



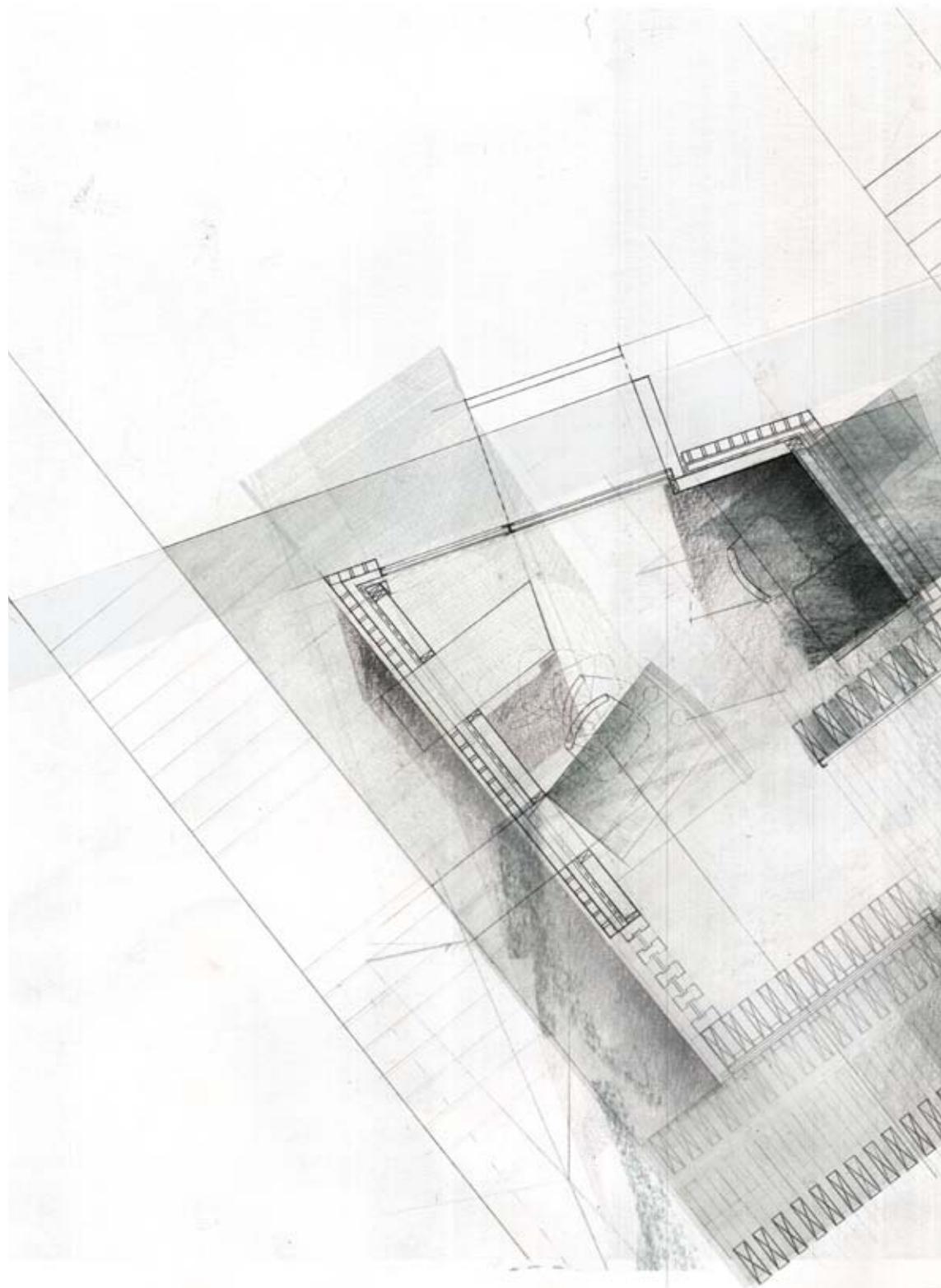


Fig. 55 (previous, tracing paper): Lower floor plan presented at 1:20 illustrating meeting space and kitchenette. Blurring is established through lighting variances and the movement of glazing systems to inform new spatial working or rest zones. Created by Author. Hand drawn (1:20 @ A2) and digitally composed.

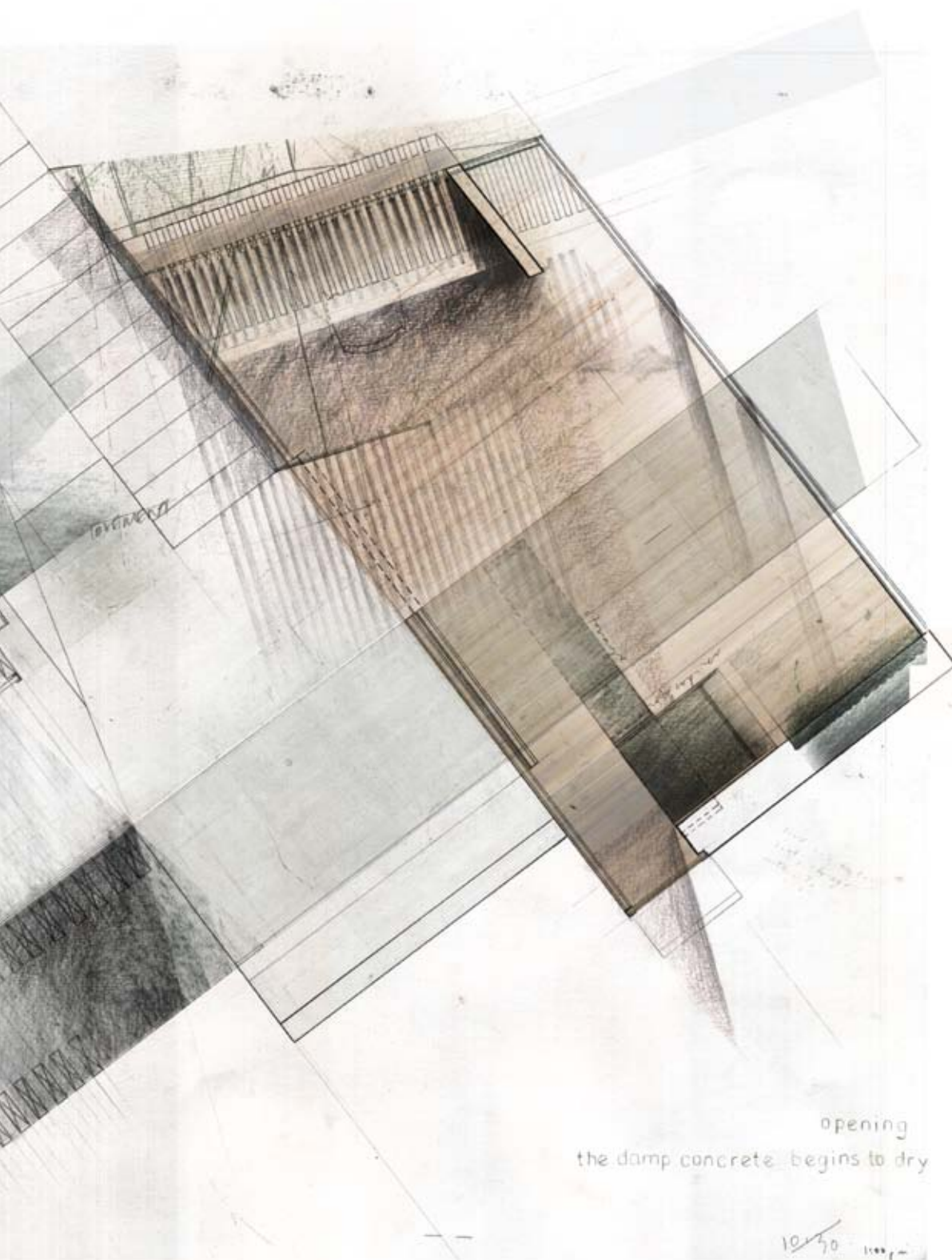
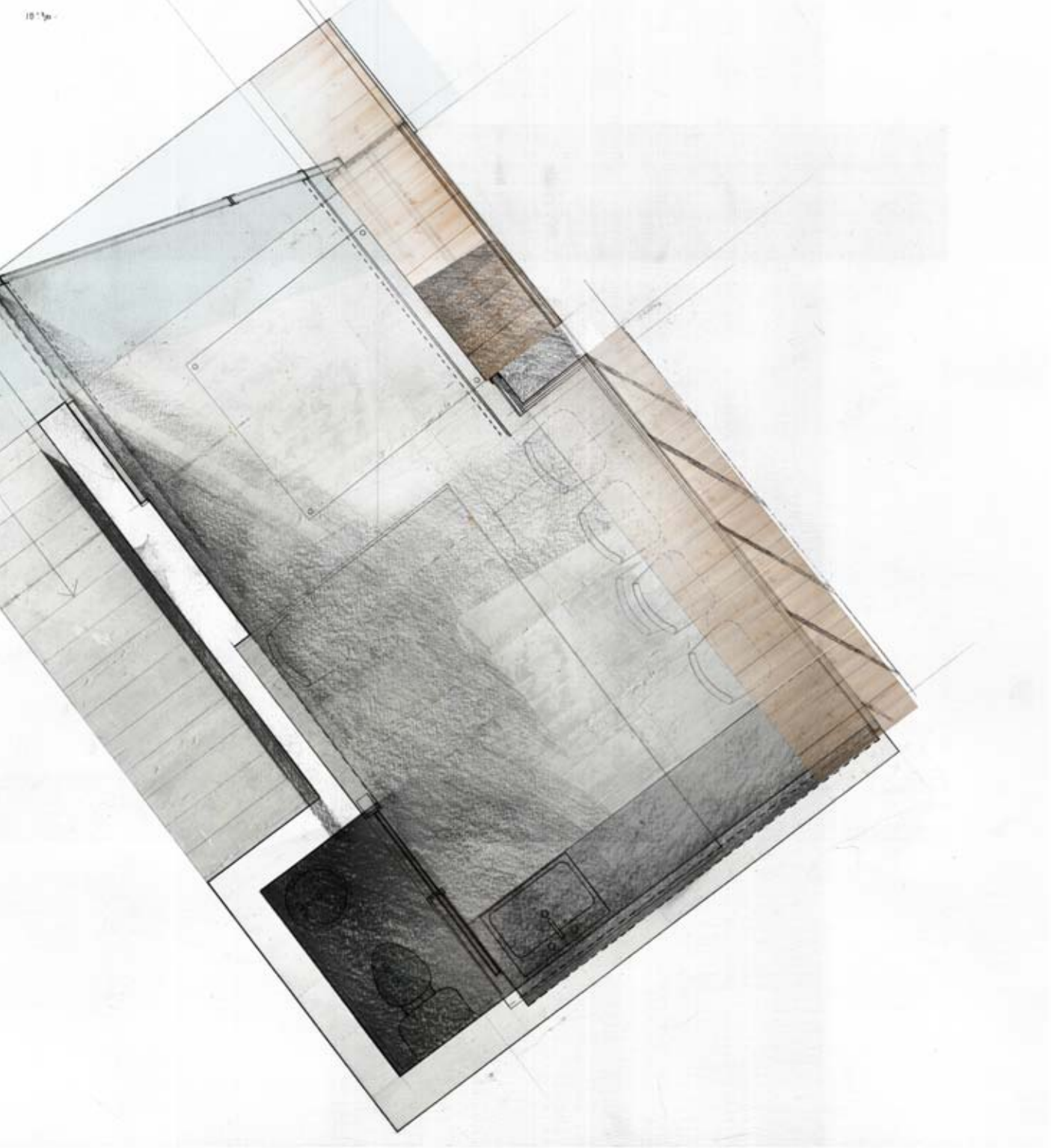


Fig. 56: Upper floor plan presented at 1.00 pm illustrating lighting changes in the eastern and western studios and shifts in boundary edges at the southwestern and southern corners, northern wall (eastern studio) and northern entrance (western studio). Therefore, boundary blurring is established through lighting variances, the effect of continuous planes and the movement stages (more influential as climatic conditions allow). Created by Author. Hand drawn (1:20 @ A2) and digitally composed.





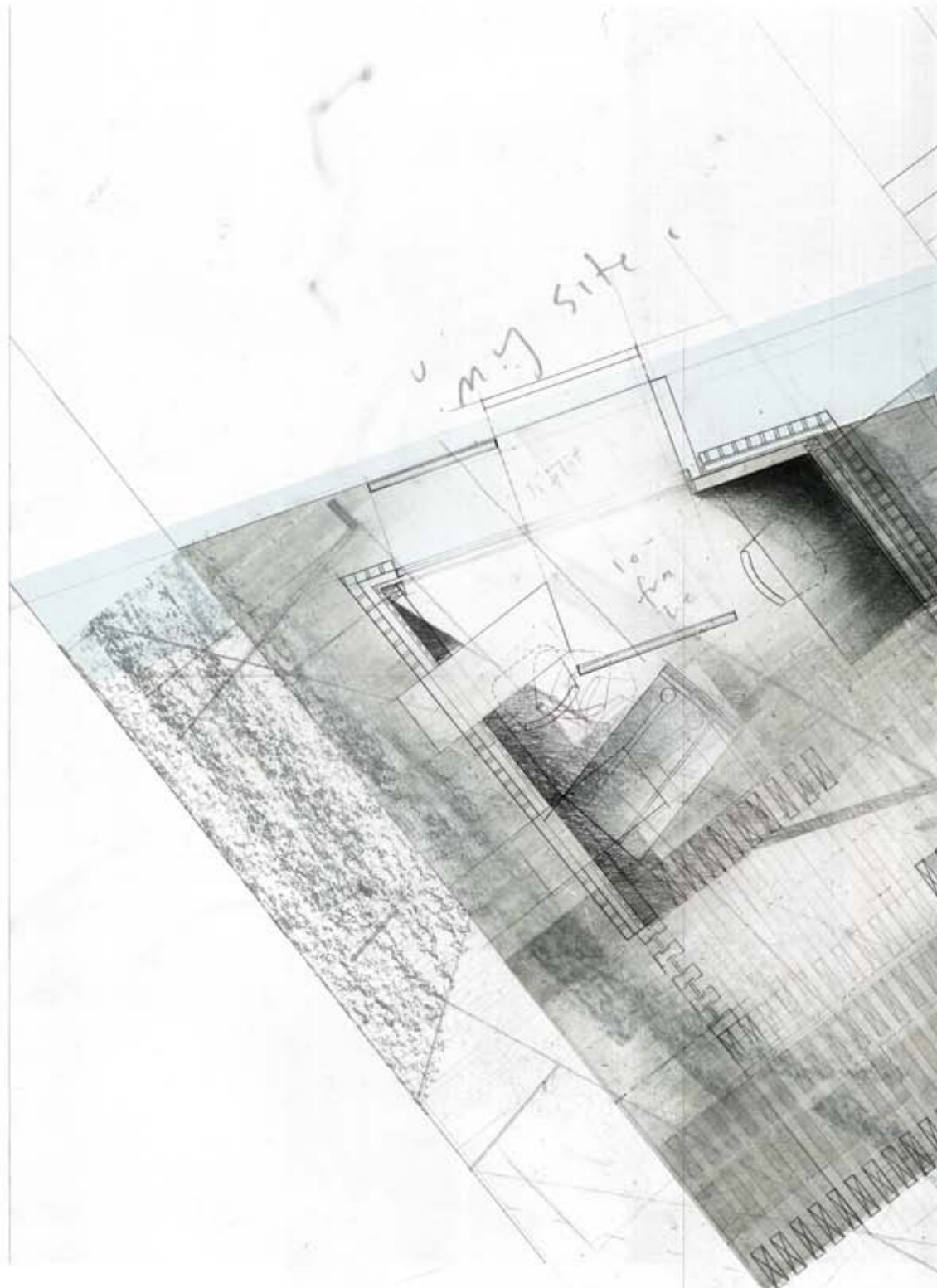


Fig. 57 (previous, tracing paper): Lower floor plan presented at 3.30 pm illustrating meeting space and kitchenette. Blurring is established through lighting variances and the effect of continuous surface planes. Created by Author. Hand drawn (1:20 @ A2) and digitally composed.

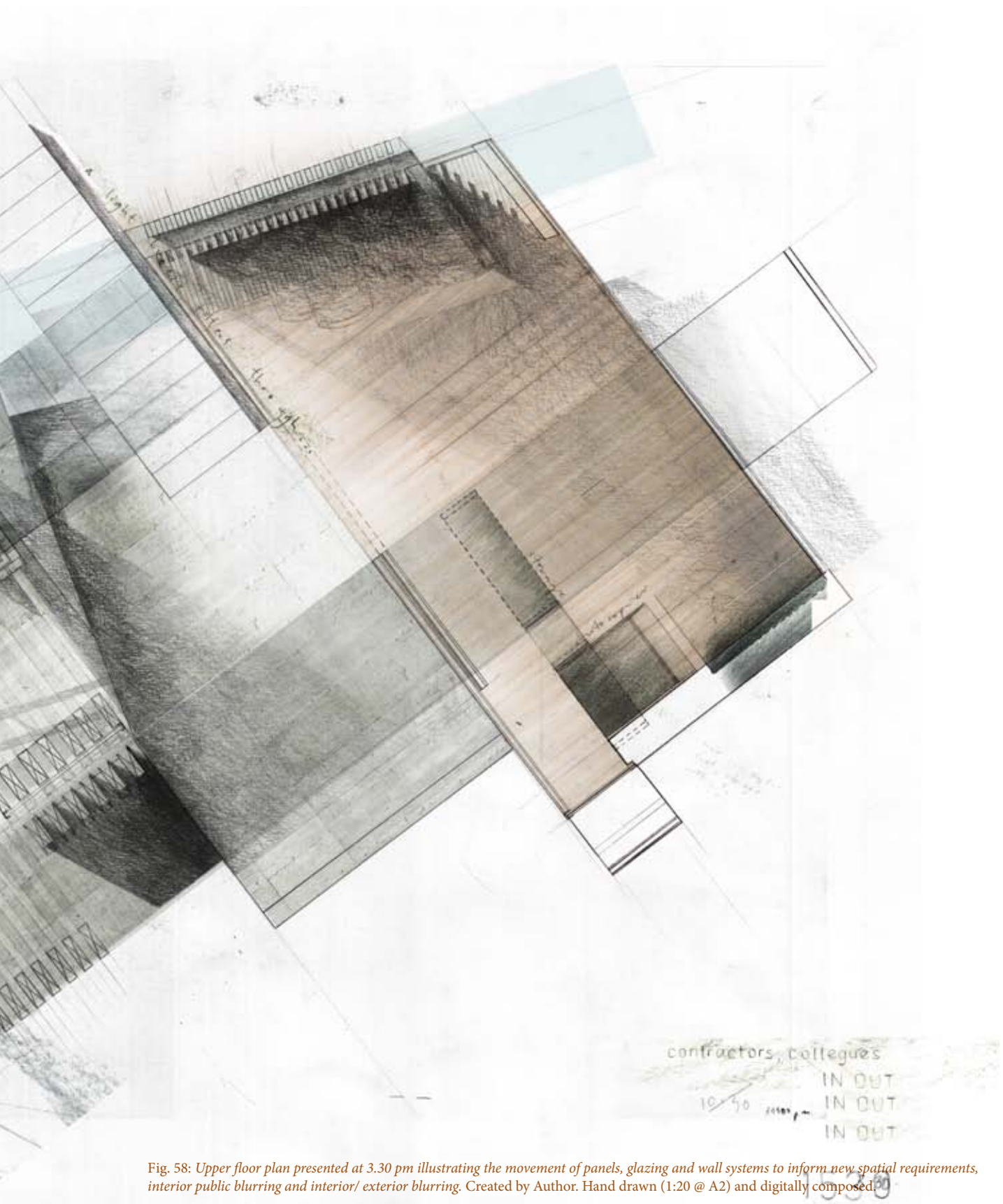
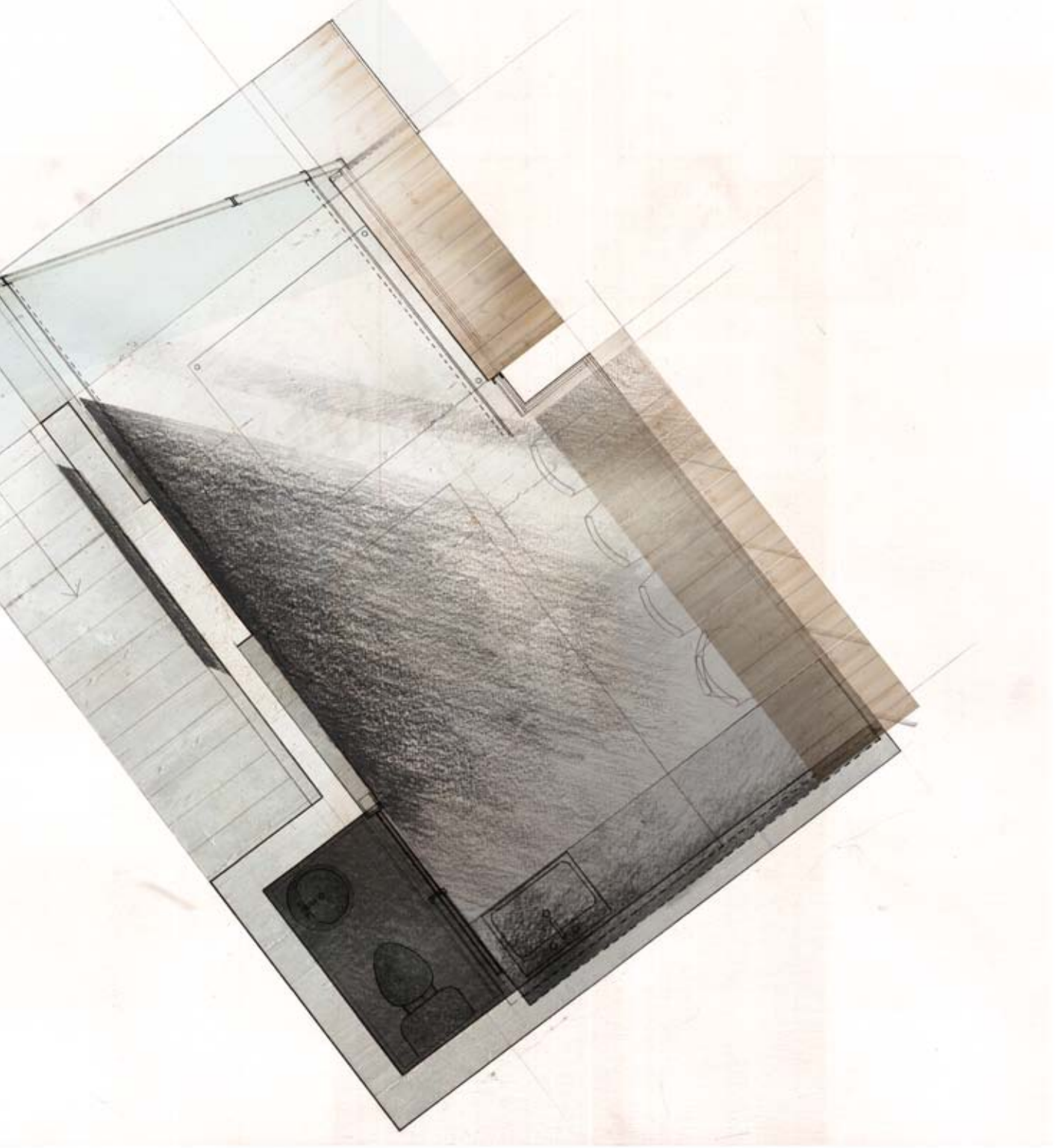


Fig. 58: Upper floor plan presented at 3.30 pm illustrating the movement of panels, glazing and wall systems to inform new spatial requirements, interior public blurring and interior/ exterior blurring. Created by Author. Hand drawn (1:20 @ A2) and digitally composed.





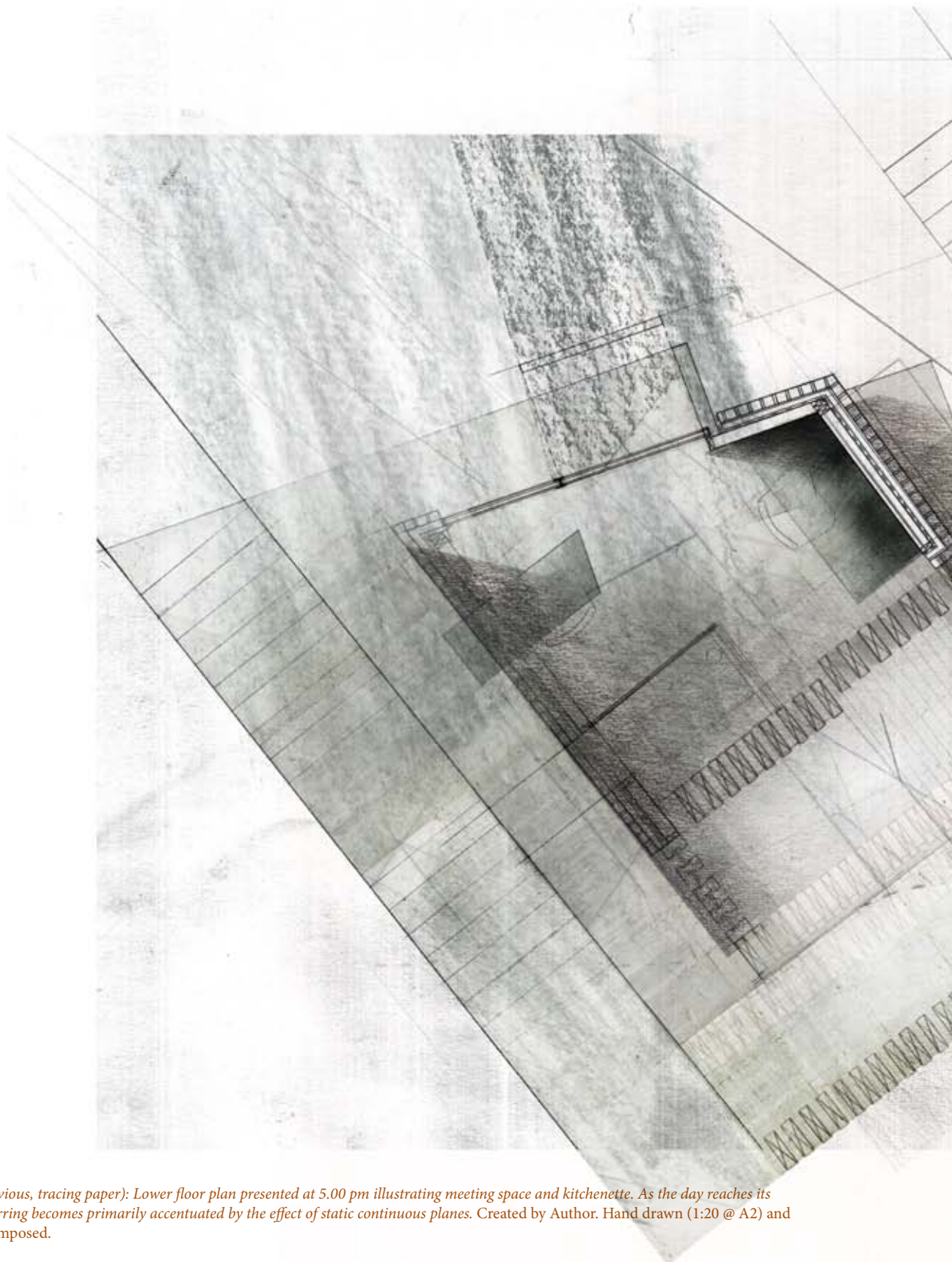


Fig. 59 (previous, tracing paper): Lower floor plan presented at 5.00 pm illustrating meeting space and kitchenette. As the day reaches its closure, blurring becomes primarily accentuated by the effect of static continuous planes. Created by Author. Hand drawn (1:20 @ A2) and digitally composed.

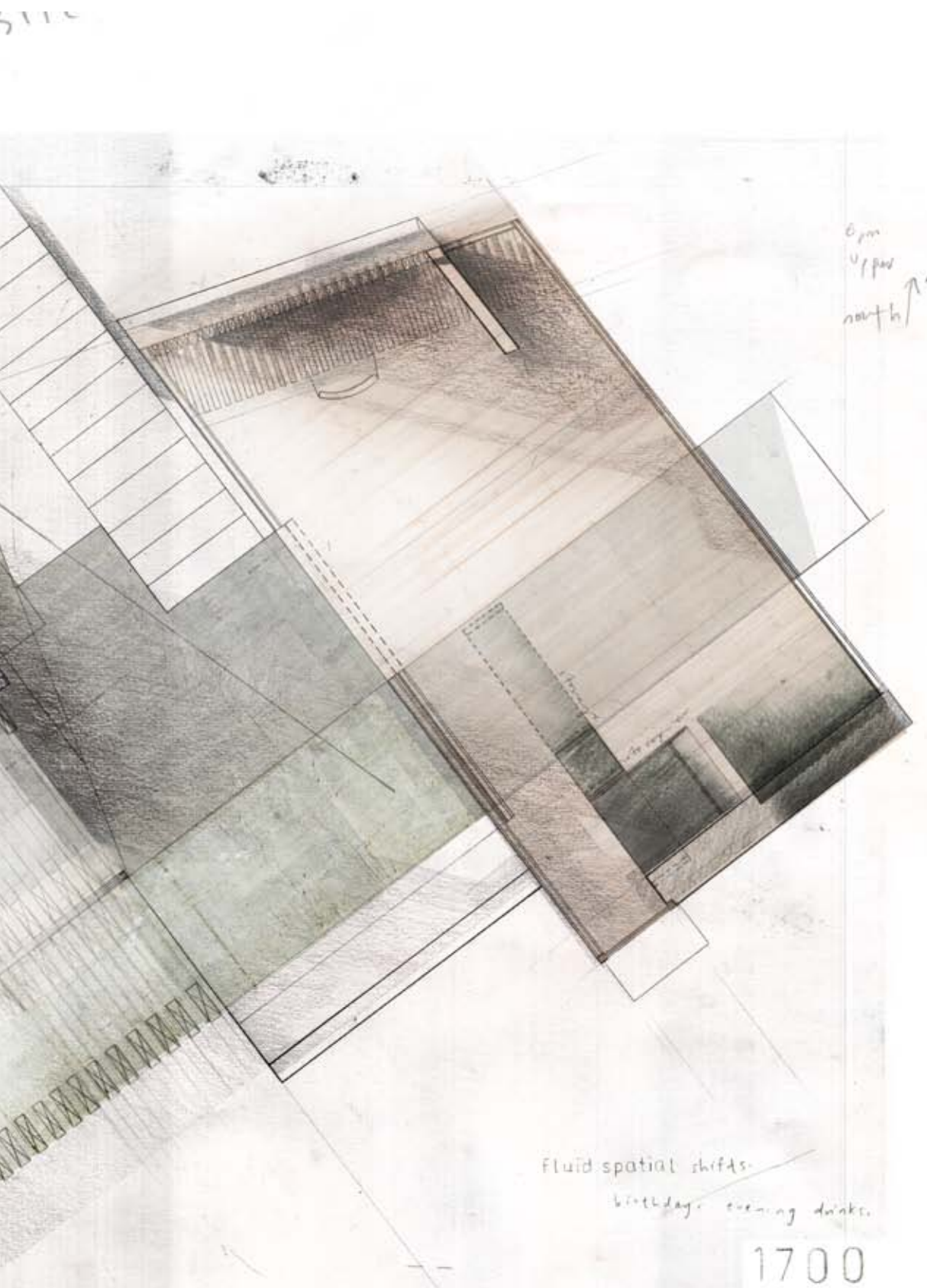


Fig. 60: Upper floor plan presented at 5pm illustrating lighting changes in the eastern and western studios and shifts in boundary edges. Movement at the southwestern corner establishes the complete formation of an outdoor courtyard while other movements provide new iterations to the working studio providing further ventilation, light and movement. Therefore, boundary blurring is established through lighting variances, the effect of continuous planes and the movement stages. Created by Author. Hand drawn (1:20 @ A2) and digitally composed.

Technique I: Continuity between interior and exterior surfaces

The design provokes traditional edge anomalies by using floor, furniture and ceiling elements which continue beyond the perimeter footprint. This technique operates to connect and integrate interior and exterior activities in a subtle and harmonious manner, attempting to open up the interior to the pedestrians and neighbours walking by. As pedestrians move up and down the staircase bordering the site perimeter, engagement with the design consistently occurs through changing levels. Therefore the standard relationship with the three strata; floor, furniture and ceiling become reframed by the moving body and associated sight planes.

On entering within the upper floor architectural studio, a continuous concrete floor is used to bridge the connection between interior studio and the existing concrete staircase. Hence, this seeks to reduce any obvious distinctions in materiality upon entering the building. Within the studio, a continuous concrete-panelled desk unit performs two functions- a working desk for the Architect on the interior and a seat for passers-by on the exterior (refer to Fig. 39). With glazing extending to the ceiling, the activities on either side of the boundary are clearly visible. Thirdly, the ceiling plane (refer to Section AA) can be seen to overhang, informing a layered edge which avoids being defined by a singular plane.

This consideration is also apparent in the detailing of the timber bench unit within the lower floor meeting room and kitchenette. Located on the north eastern perimeter, the bench responds to two opposing conditions. On the eastern side, the facade (and the interior) is largely sheltered from the wind and has a high level of privacy. Opposite this, the northern facade is highly exposed to both the wind and the public. With this in mind, the unit is designed using sliding glass windows and a continuous bench surface to link the two axes (refer to floor plan x and the section DD). This detailing allows the design case study to address the blurring between interior/ exterior and two internal public spaces. Secondly, the detailing enables the blurring of two axial ordering systems. Due to this, the design case study informs a relationship with the street edge that moves beyond the nearest northern facade, and hence connects the periphery with the centre (refer to Fig 59). The design utilises the variance in climatic conditions as one of the reasons to produce two boundary edges. When the sliding window is closed, the bench space provides the inhabitants with a comfortable dining/ break area. However, when the windows are open, inhabitants are able to access the extended surface area, providing additional room for reading in fine weather (refer to Fig 41). As can be noted in Fig. 40, the bench is detailed to continue beyond the interior. Specifically, this continuation aligns with entrance door and the

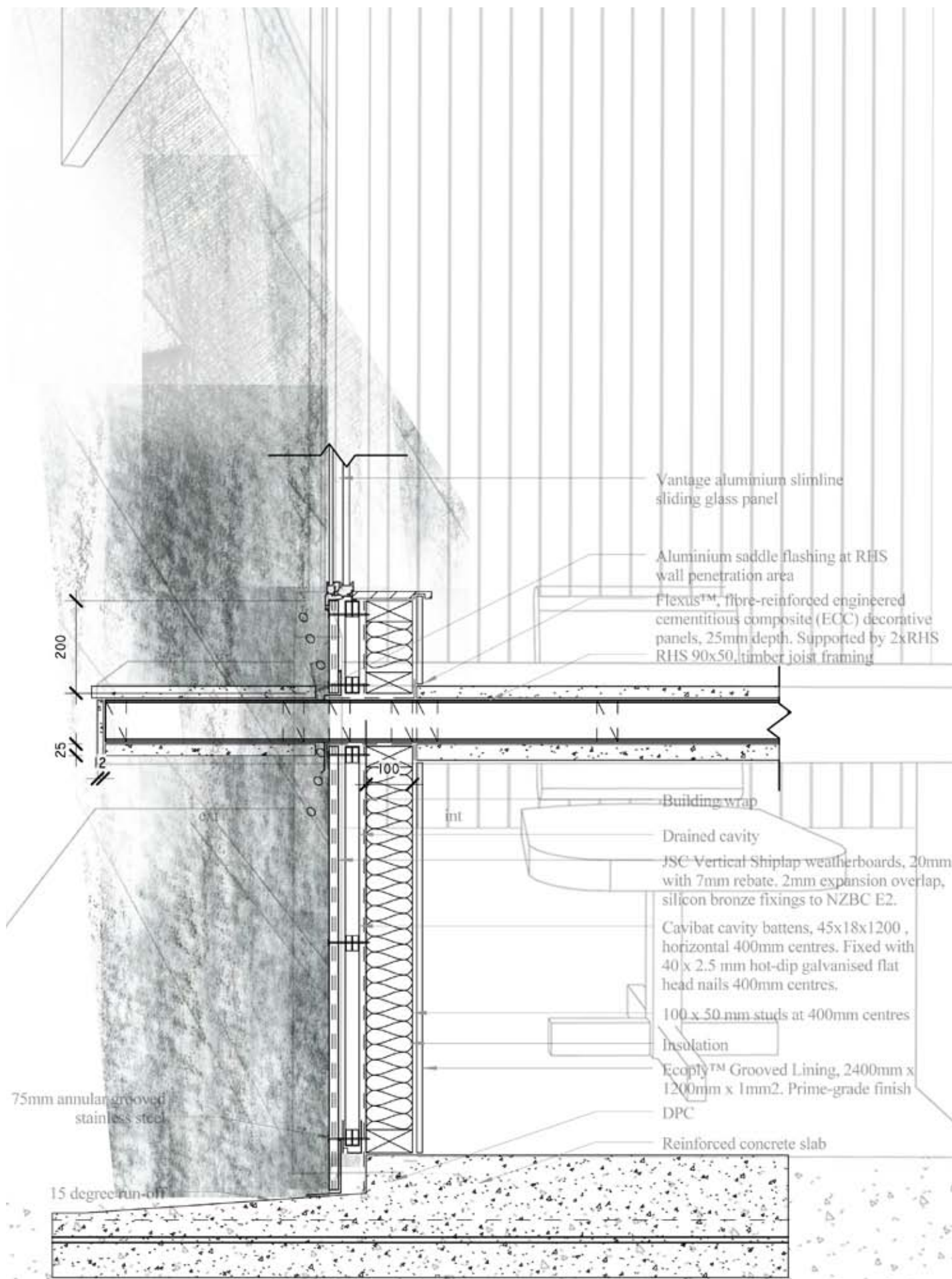


Fig. 61: Detail I (1:10). Working bench & seat within western studio enabling blurring between exterior public and interior private. Created by Author. Hand and digitally composed.

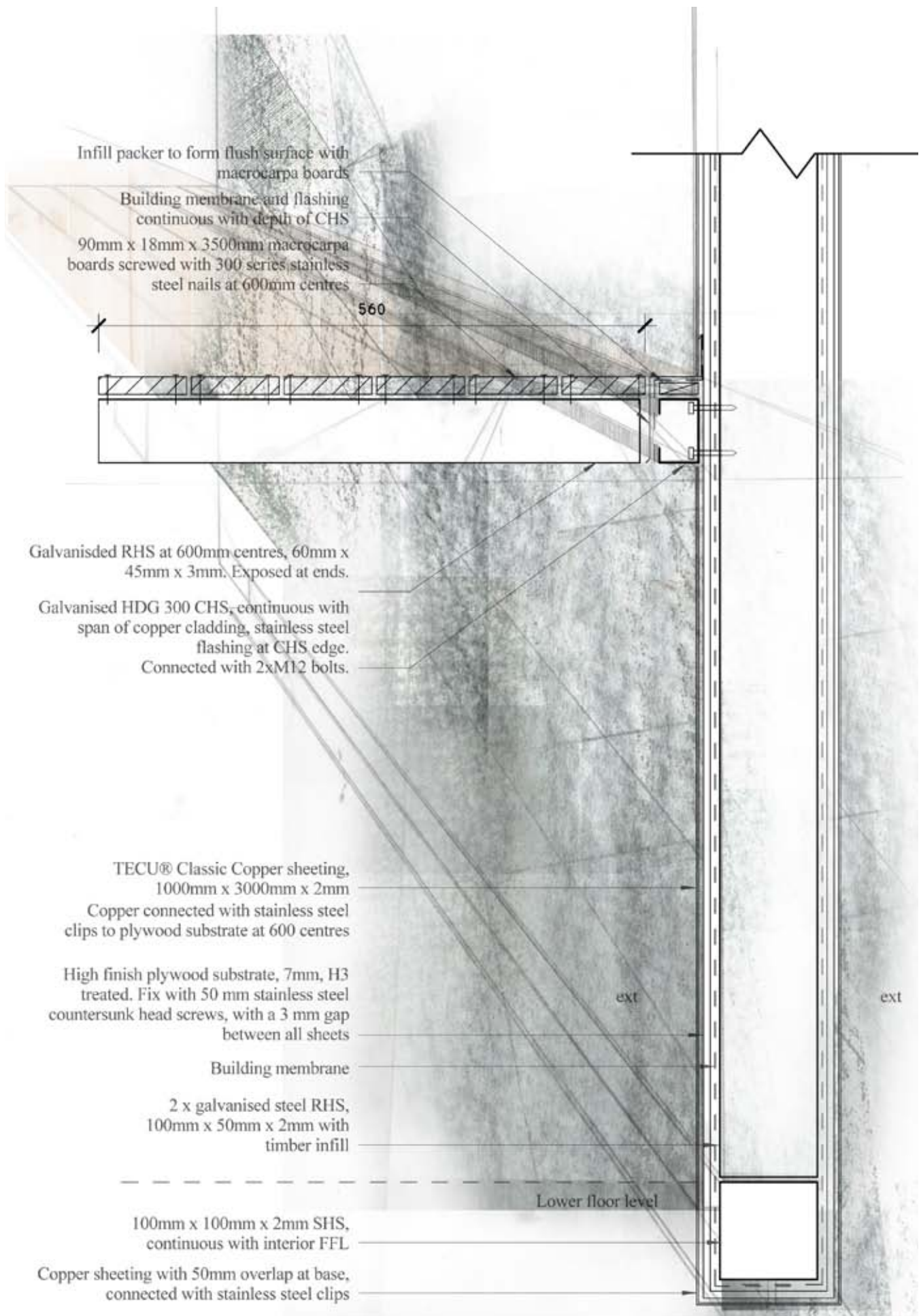


Fig. 62: Detail II (1:5). Timber bench unit with copper overhang extending beyond the perimeter of the lower floor meeting and kitchenette area that enables interior/ exterior and public/ private blurring. Created by Author. Hand and digitally composed.

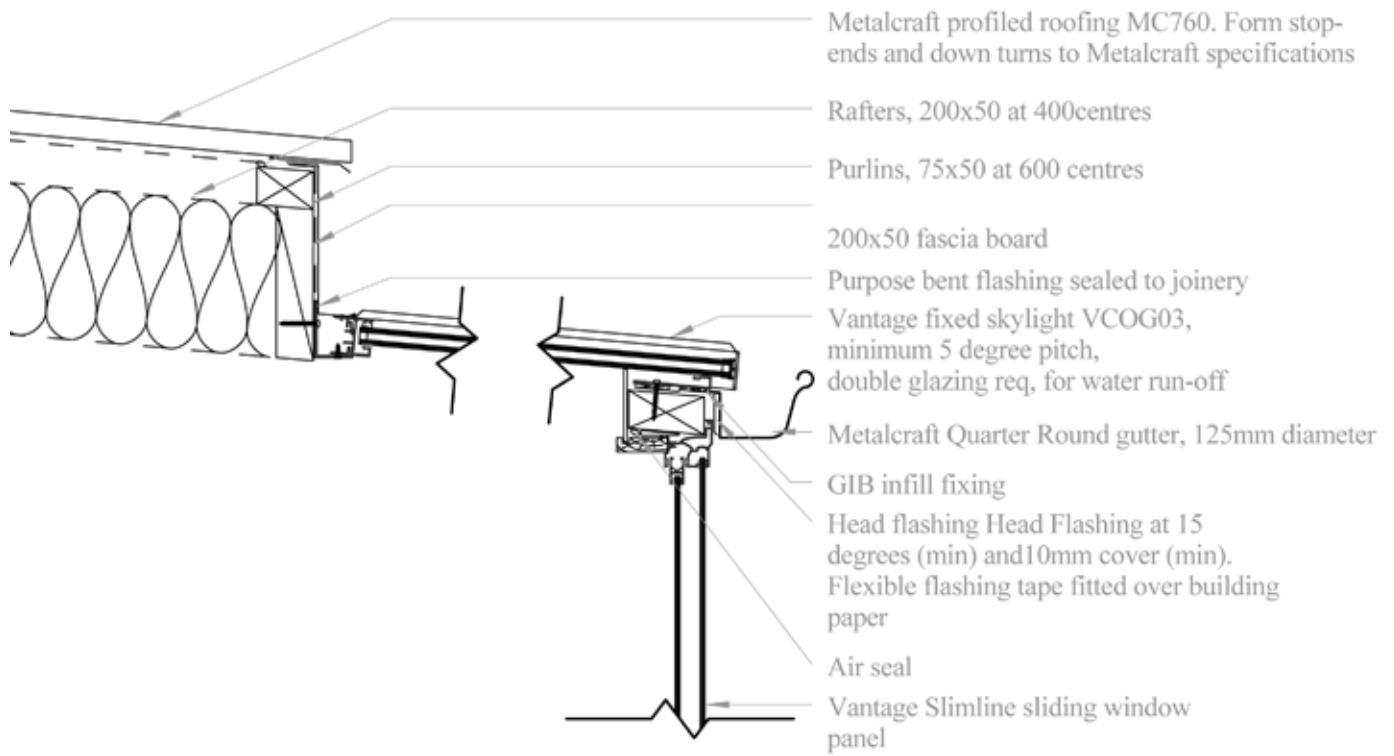


Fig. 63: Detail III (1:10). Continuous skylight above work bench within lower floor meeting and kitchenette area. Additional sunlight enables interior/ exterior blurring to be accentuated. Created by Author. Hand and digitally composed.

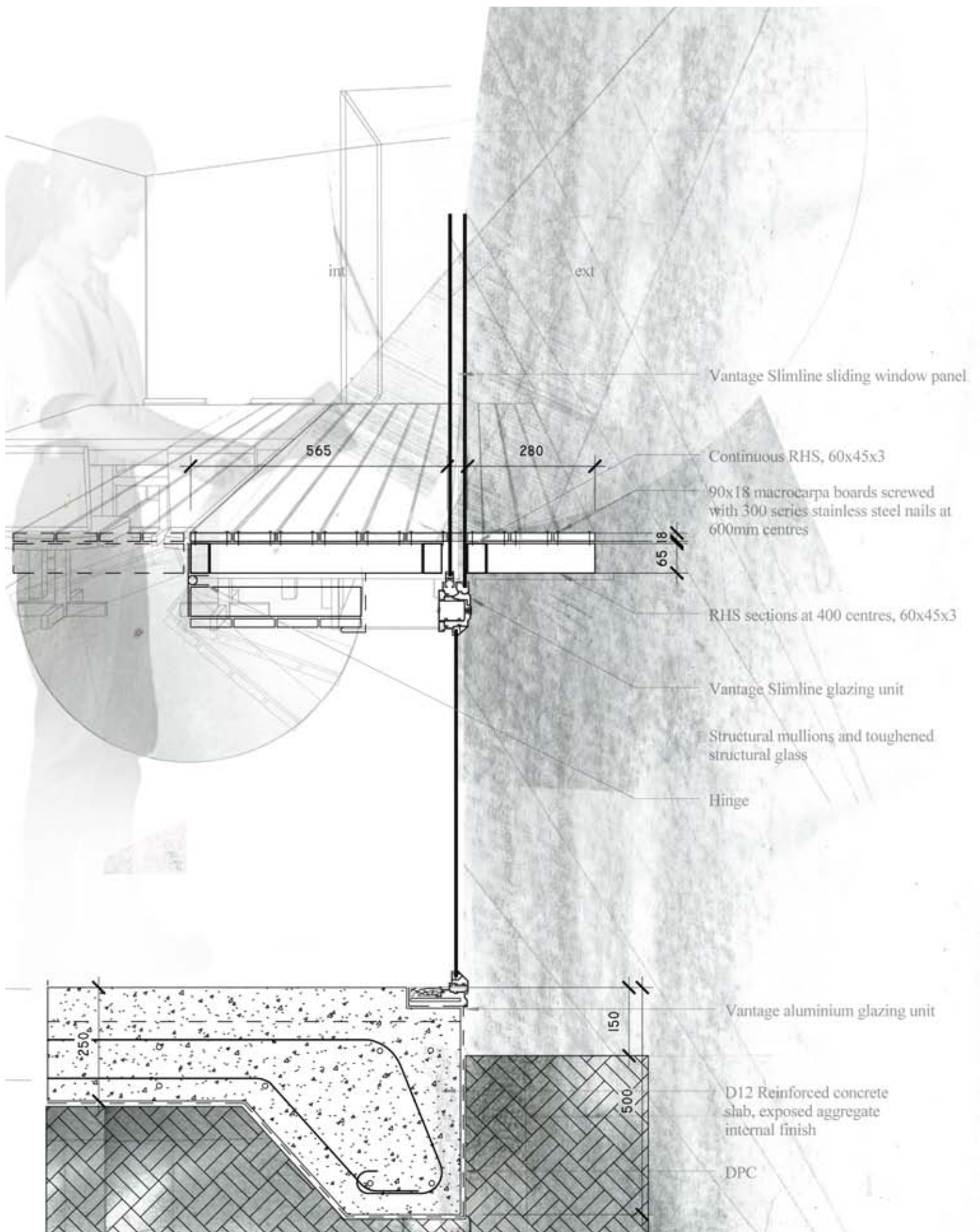


Fig. 64: Detail IV (1:10). Work bench and glazing unit within lower floor meeting and kitchenette area enabling blurring between exterior/interior and interior public spaces. Created by Author. Hand and digitally composed.

movement into and out of the space. Once again, this detailing blurs two axial ordering systems being the eastern perimeter and the northern perimeter.

Therefore, continuous planes work to soften edge conditions between the public and private whilst also allowing the inhabitants to work and respond to multiple social, programmatic and environmental changes as they desire. The detailing fuses visual and physical axial pathways to extend the perceived location of the boundary.

Technique II: Moving elements

The relationship between change and permanence, mobile and static is used to inform boundary edges which operate along several axes and hence inform various identities and ordering systems for the operating studio. Ambiguity moves beyond the surface of the drawing to inform overlapping relationships between the centre of the design and periphery of the design (refer to fig. 57). Importantly, ambiguity occurs within the transitions between different static positions or ordering systems. This extends upon Hill's description of ambiguity as it provides "continual perceptual transformations" (Hill, 2006, p. 54). Hill continues to state that "ambiguity may be dictated by the architect, user or site but it is the user who has their own sense of perception and reflection of ambiguity" (Hill, 2006, p. 54). With this in mind, the mobile and static boundary conditions are utilised as a method to heighten the awareness one has with their surroundings. The inhabitants have an active relationship with the architecture along with the observers whose perception of the built form continuously changes. Recognising changes within the form and occupancy of the architecture, the observer is able to gain a "direct and authentic perception" (Evans, 1989, p. 20) of the relationship between the built form and its environment.

Sliding and pivoting movement

The design addresses movement through two devices: sliding and pivoting mechanisms. Firstly, pivoting movement (awning windows and doors) continues a close connection with the periphery or perimeter as was noticed in the case study analysis on Kundig's Chicken Point Cabin. Secondly and more significantly, sliding movements (wall and glazing panels) have the ability to extend beyond the periphery allowing the interior spaces to become more easily connected to external changes. The importance of this is that transformation isn't restricted to the edge as has been a historical prevalence but is now more closely in tune with the internal social and working dynamics.

This consideration is apparent in two particular areas of the design. Firstly, at the southwest corner of the upper floor studio where the site has two strong distinctions: being exposed to the southerly wind whilst being predominantly protected from the northerly and north westerly winds, and being in a clear visual path of the neighbouring southern neighbours and pedestrians. When partially open, the sliding wall system allows natural indirect lighting and ventilation into the space yet when completely extended, the existing boundary dissolves to form an outdoor courtyard. This results in the users being able to inform the level of privacy

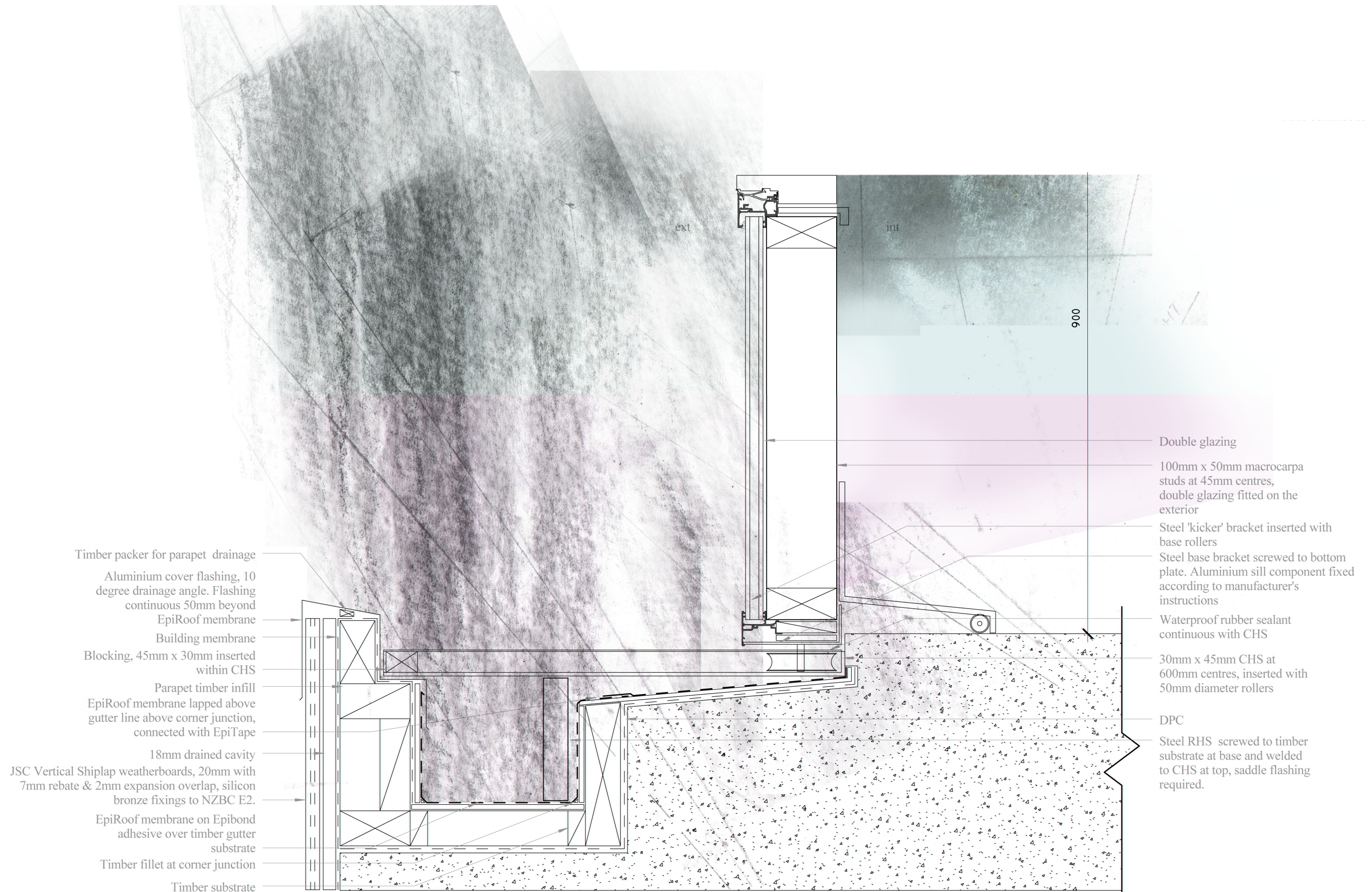


Fig. 65: Detail V (1:5). Sliding lower wall & parapet detail at northern boundary of upper eastern studio enabling sunlight to fall at feet/ base of working desk. Created by Author. Hand and digitally composed.

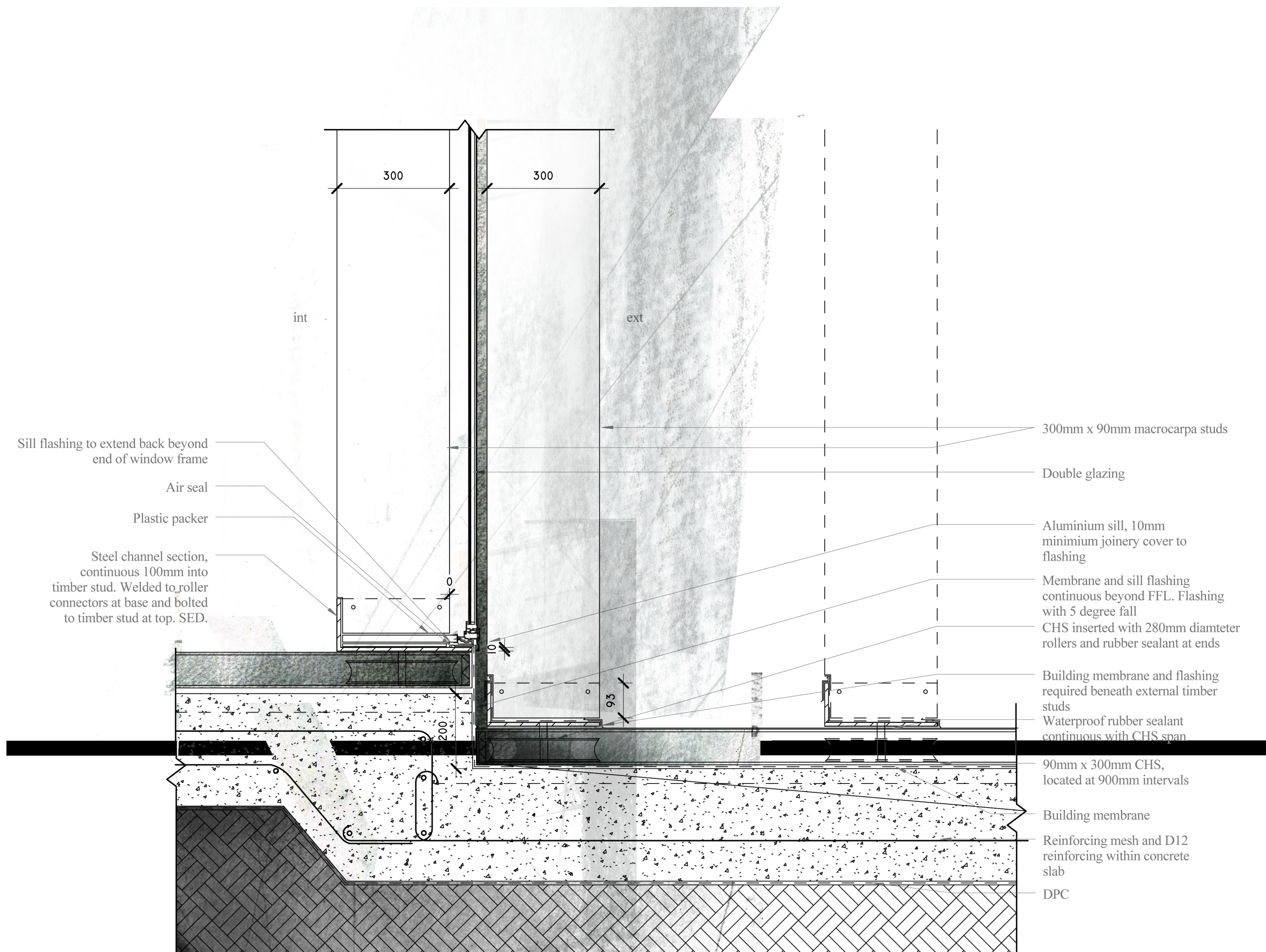
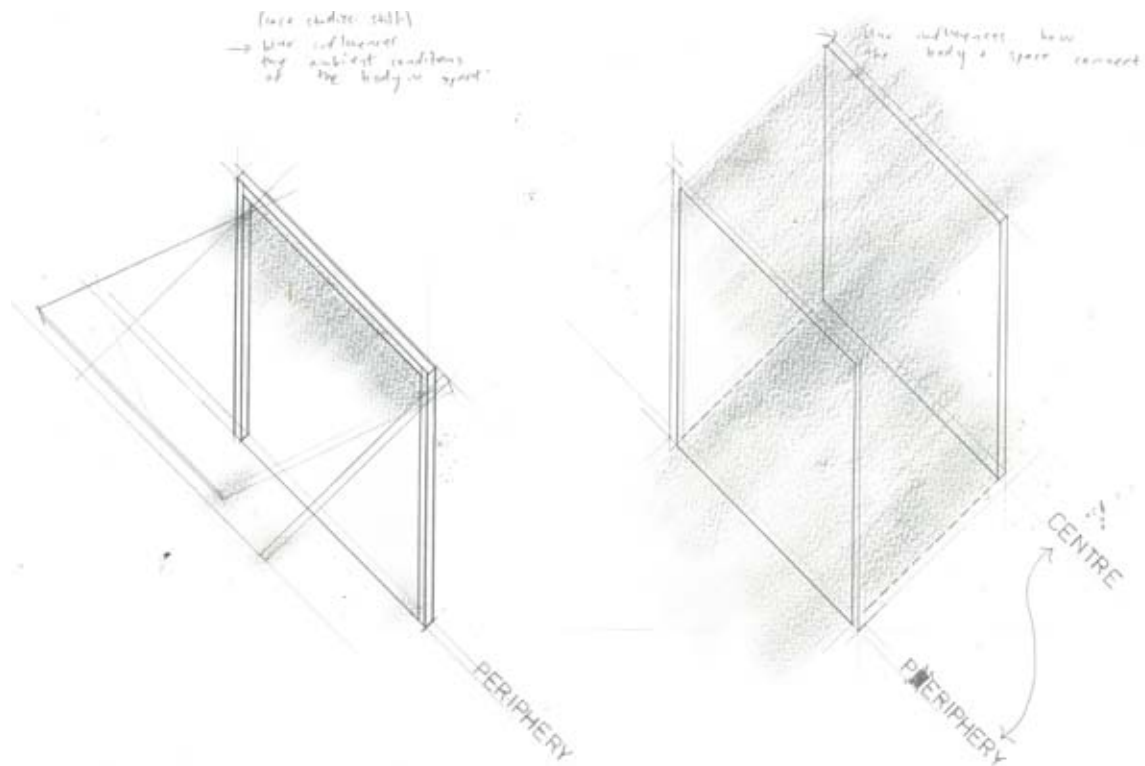


Fig. 66: Detail VI (1:10). Sliding wall detail at southern perimeter of upper western studio enabling interior studio extension and formation of exterior courtyard. Created by Author. Hand and digitally composed.



desired between themselves and the surroundings whilst enabling personal responses to climatic variations (refer to Fig 43). Although more subtle, this treatment is also considered for the northern boundary of the eastern upper floor studio. In this case, sliding movement is restricted to a limited distance but when open, allows for sunlight and ventilation at floor level (refer to Fig 43). Pedestrians passing by these movements are clearly noticeable from the interior working position, enforcing a relationship which is not static but in flux.

Fig. 67: Hand drawn diagram acknowledging design consideration to interconnect planning of centre and periphery (or perimeter).
Author's Collection.

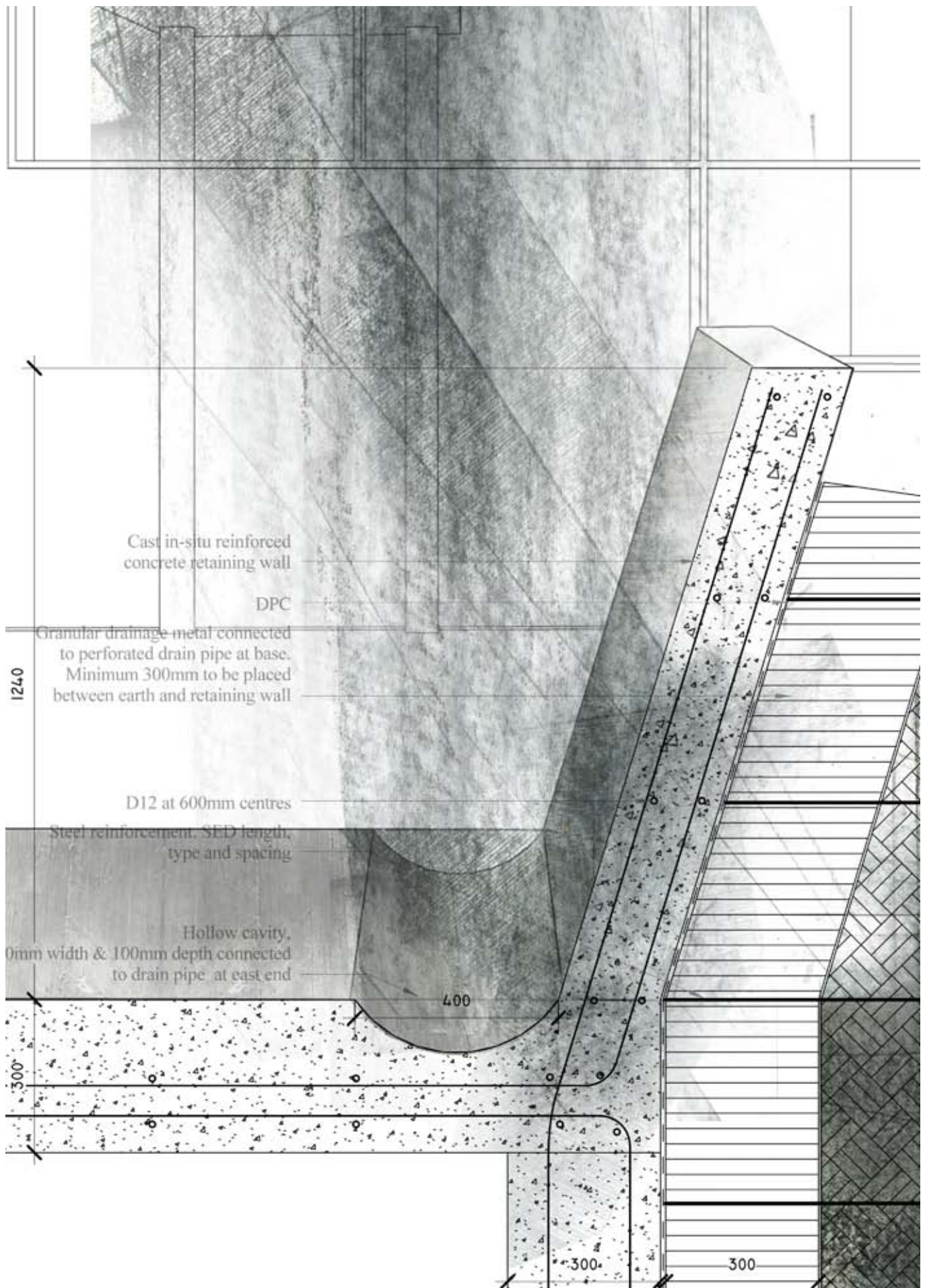


Fig. 68: Detail VII (1:10). Upper floor retaining wall at rear of stair landing that enables public/private blurring between users and southern neighbours, and the collection and trace of rain water in poor weather. Created by Author. Hand and digitally composed.

Technique III: Variances in lighting and shadow

Subtleties in lighting provide a technique for increasing depth at boundary edges. Specific lighting qualities which change over the daily period and the monthly seasons enable the visual properties of the timber, particularly when it has shifted position, to transform. This technique works to increase the ambiguity of a distinct barrier between interior and exterior, allowing an inhabitable space to be created which varies with the seasons and location. Steven Holl comments on the haziness of the shadow, important as it verifies the shadow as having levels of tonal variance, “shadow, sunlight, and geometry are interlocked in experiential phenomena. Looking at my own shadow on the ground I notice that the shadow of my own head is blurry while shadows of my feet are sharp” (Holl, 2007, p. 12).

This consideration can be noticed in several areas of the design where extensions and reductions in floor, furniture and ceiling planes provide natural variants in lighting. This is useful as it allows the privacy within the studio spaces to vary according to the degree of exposure to direct sunlight or wind. Importantly, the studio can become increasingly private for independent work or opened to invite social discourse and information sharing between staff members or with members of the public. In particular, the detailing of the retaining wall on the upper floor stair landing, angled and hollowed at its base, collects rainwater in poor conditions whilst providing a casual seating area for staff in fine conditions. Rather than being at 90o the wall captures sunlight (and views from the southern neighbours), highlighting disparities within the exposed concrete (refer to Fig 45). Therefore, the boundary becomes an area for habitation in itself.

Secondly, the effect of daily lighting patterns can be noticed in the detailing of the northern wall in the eastern upper studio. In this area of the design, timber studs are detailed with continuous double glazing allowing lighting patterns to infiltrate the space. When the lower wall is pushed out, further light can flow into the space (refer to Fig 43). Although subtle, these details are required to provide the design with a delicacy which is stimulated at dawn and concluded at dusk.

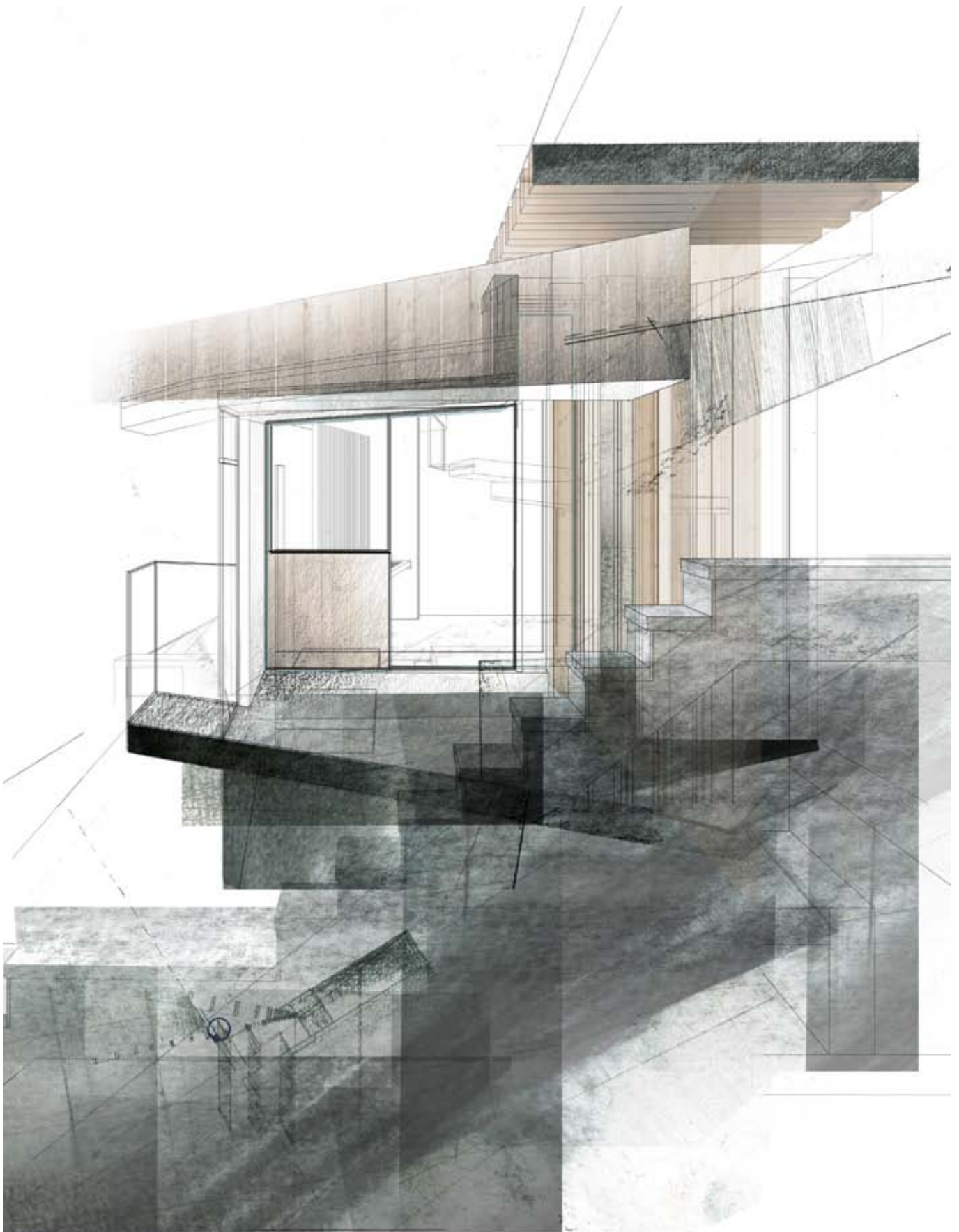


Fig. 69: *Sectional Perspective I | View through western upper studio.* Created by Author. Hand drawn and digitally composed.

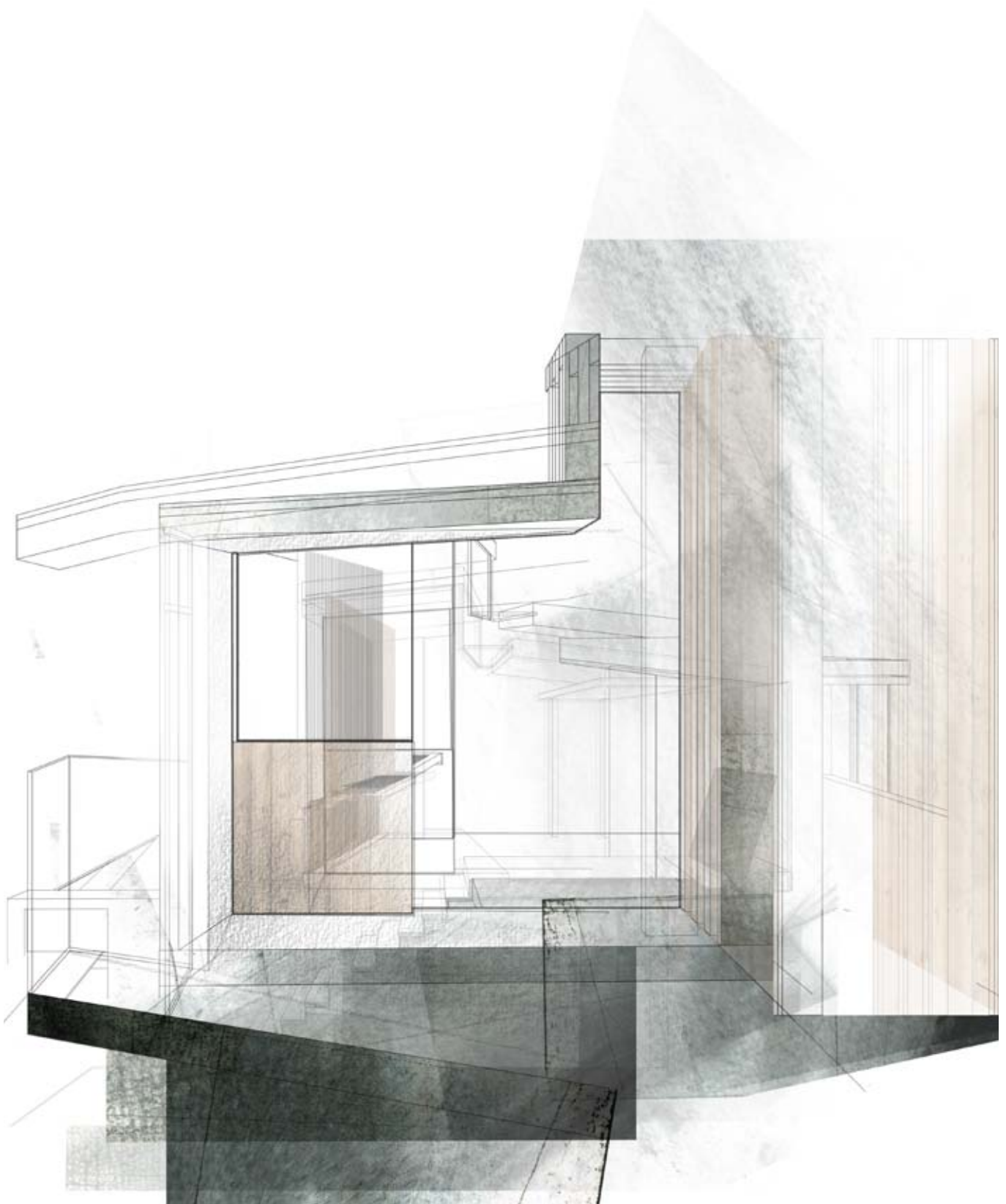


Fig. 70: *Sectional Perspective II | View through western upper studio.* Created by Author. Hand drawn and digitally composed.

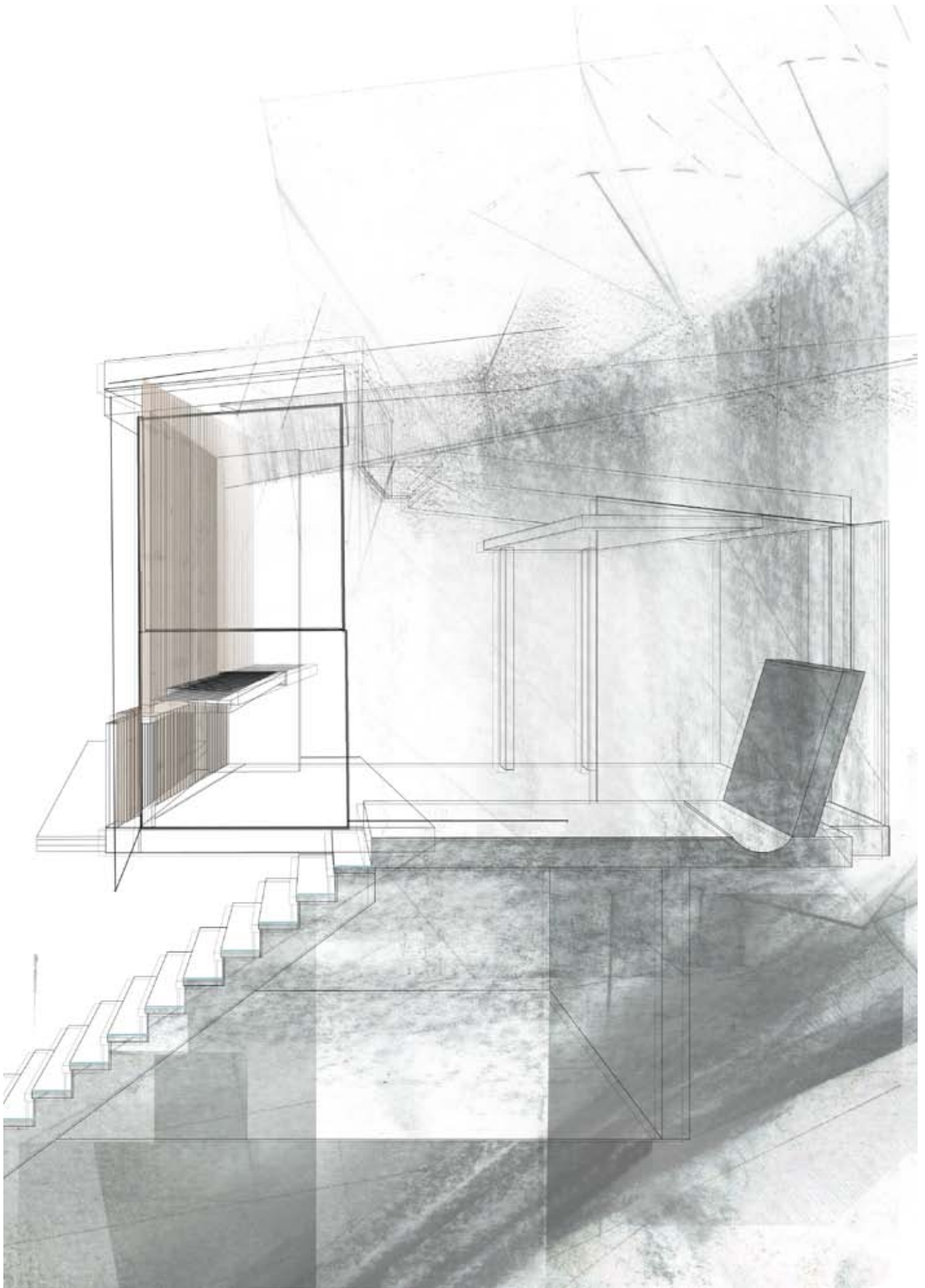


Fig. 71: *Sectional Perspective III | View of staircase landing and eastern upper studio.* Created by Author.
Hand drawn and digitally composed.



Fig. 72: *Sectional Perspective IV | View into lower floor meeting and kitchenette space.* Created by Author.
Hand drawn and digitally composed.

Conclusion

The design case study has been utilised to challenge standard approaches to visual representation in order to explicitly invite the iterative process of hand drawing to address the contemporary problem of our need to blur traditional typologies, programs and social activities. Using a hand drawing process as its own end product, the design outcome becomes composed of layered, multiple boundaries and edges. Introducing movement into these boundary conditions, the design is able to establish numerous ordering systems and identities that relate to the typological and orientation site requirements.

Within the case study, blurring has been recognised between the interior and exterior, between the internal public spaces and between public and private spaces. Firstly, blurring between the interior and exterior spaces has been achieved through continuous surface planes, moving elements and overhangs which create variances in lighting and shadow. As the pedestrians' walk directly past the architectural edge, these conditions provide moments where ambiguity of interior and exterior is increased and interaction can be stimulated. Further, as the pedestrian is continuously moving up and down the staircase, their physical and visual connection with the spaces changes, blurring the static position of floor, furniture and ceiling elements. As wall, window and furniture elements move and shift, the relationship between a previous private space and a converted public space is continually changing. These considerations enable a blurring to be achieved between internal private and public spaces, and internal private and external public spaces.

Secondly, blurring between the internal public spaces has been achieved due to the alignment of the studios on two axial ordering systems: the first aligning with the site contours and the second running perpendicular with the pedestrian staircase. Due to this, each studio aligns with one axial pathway resulting in a blurred relationship between their visual and physical areas of habitation. Supporting this, blurring has been achieved through the articulation of lighting and shadow, allowing variances between the exposures of each space over a daily period.

Within the interior, public and private blurring has become closely connected with available view shafts. Specifically, the eastern studio becomes increasingly private at various times in the day due to the roof articulation (allowing neighbours views into the studio but above the working height of occupants) and the wall positioning (allowing pedestrian's views into the facility area while not viewing the working desk).

Movement and transformation of the architectural elements has evolved from the iterative layering of hand drawing. The architecture serves to become an ongoing process rather than an orthogonal end product which is why the iterative hand drawing process is suitably used in the thesis investigation to influence the connection and formation of architectural space.

In the design case study, equal treatment has been placed upon the external conditions and the internal programme in order to derive the boundary forms and establish a new connection between the centre and periphery. Therefore, habitable spaces are achieved that can be either completely interior, partially interior/ exterior or completely exterior. As the architectural elements move into a new static position, the architecture generates an overlaid ordering system, responding to the transforming exterior and interior conditions. This enables movement to have a principle rather than decorative role and blurring to become a principle and ongoing architectural factor. Further, this movement enables the standard relationship between a mobile observer and a static built form to be challenged. As the visual perception of the architecture is continually shifting, the observer becomes increasingly aware of the connection the architectural spaces have to their immediate yet changing social, cultural and environmental context.

Fig. 73: *Exterior perspective I, view of Architect's office as seen from the moving pedestrian on Oriental Parade.* Created by Author.
Hand drawn and digitally composed.



Fig. 74: Exterior perspective II, transforming view of the Architect's office as seen from the pedestrian walking along Oriental Parade. View of staircase becomes apparent. Created by Author. Hand drawn and digitally composed.



Fig. 75: Exterior perspective III, transforming view of the Architect's office as seen from the pedestrian walking up the public staircase. **View into lower meeting room and upper studios becomes clearer.** Created by Author. Hand drawn and digitally composed.



Fig. 76: *Exterior perspective IV, transforming view of the Architect's office as seen from the pedestrian walking up the public staircase.*
Created by Author. Hand drawn and digitally composed.



Fig. 77: Exterior perspective V, view of Architect's office as seen from the *southern neighbours*. Created by Author.
Hand drawn and digitally composed.



Fig. 78: *Blurring, Wanaka, New Zealand.*
Author's Collection. Digital photograph.



Chapter Five: Conclusion

The photographs and the drawing suggest a space that isn't fully defined but is taking advantage of its shifting notion of boundaries, its shifting notion of light, its shifting notion of inside and outside...

(Mid-year studio critique, 5th August, 2011, comment by Peggy Deamer)

The thesis challenged how non-traditional transformative boundary conditions could be developed in architectural design. Through the application of blurring, the design process and outcome acknowledged the problem of changing environmental, social and cultural conditions within our 21st century designs. Importantly, this process allowed the research to challenge the traditional need for an orthographic end product, enabling the process to become its own outcome, and the variables of movement and transformation to be equally considered within the design process.

In forming a solution to the research problem, the thesis challenged the theoretical principles of Catherine Ingraham and Robin Evans. Applying Ingraham's theories within today's context, the thesis discovered a shift beyond linear or orthographic ordering systems through the iterative process of hand drawing. Due to this process, multiple, superimposed ordering systems were created and provided a new framework for the treatment of order in today's architectural designs. In addition, the research built upon the theories of Robin Evans, allowing architectural hand drawing to have a significant role in formulating non-linear blurred boundary edges. Moving beyond the traditional precise and accurate orthographic notations was necessary to allow for contextual environmental, social and cultural changes to be visually represented and evident within the design outcome. Therefore, the thesis recognised the important role which these documents have in the construction of architecture however outlined that for designs to be responsive to changing conditions, a different representational system is required.

The iterative hand drawing process reinforced the role which drawing plays in the construction and formulation of architectural space. Further, the method of layering, of creating multiple interpretations, allowed the individual lines and drawn gestures to gain a visual and physical presence within the ongoing design development. Arising from the iterative process, multiple became an important factor in the development of blurred boundary edges, providing a method to develop a design based upon iterative uses, exchanges and experiences.

A design case study arose through this research process, as well as through an analysis of unbuilt and built case studies of blurred boundary conditions. Importantly, the historical case studies established a requirement for architectural blurring between interior and exterior boundaries. Yet, several case studies became limited as the blurred boundaries resulted in an inhabitable space. Predominantly, this was noticeable in the designs by Scarpa and Kundig where climatic conditions dictated how the boundary operated and hence how the adjacent space was experienced. Building upon these case studies it was necessary for the design case study to develop innovative responses to enclosed and exposed habitable space. The design case study explicitly deals with this issue through the integration of mobile components and the development between centre and periphery (or perimeter). This allows for habitable blurred spaces to exist beyond the periphery edge and become integrated with programmatic demands. Therefore, the success of the blurred boundaries rested in their ability to provide ongoing habitable areas for the architecture office and the pedestrians.

The iterative drawings created to investigate blurred boundaries were successful as they avoided becoming reliant on a linear working method. Fortunately, this often resulted in unexpected outcomes which may not have been met if following a linear system. Although the graphic representation of movement (pedestrians and architectural elements) and transformation (weather) was unproblematic, numerous drawn layers and models were constructed to translate the gestures into form. Therefore, where motion was represented in a two-dimensional format it became increasingly difficult to interpret into a three-dimensional form. As a result, hand modelling became a more successful and appropriate tool to transform and convert between each order. Following the drawings, the physical site formed a significant component to the investigation as it naturally provided blurred typological and orientation requirements. Additionally, the programme of an architect's office was selected as it no longer operates or needs to operate from a traditional, linear working structure. Due to these factors, the research suggests that an acknowledgement of specific contextual qualities is necessary for the realisation of appropriate built blurred boundary conditions.

As conditions within the 21st century continue to overlap, it is inevitable to neglect how change and transformation are integrated into architectural designs. For architecture to effectively respond to today's situation, it needs to acknowledge change as a primary factor. Hertzberger writes (1991):

The process of change must constantly appear to us as a permanent situation, that is why the changeability itself must come first and foremost as a constant factor, which contributes to the significance of each individual form. (p. 149)

The design emphasises Hertzberger's statement, using the relationship between the periphery and centre as nodal points for informing an architectural response which is equally in motion as it is static. Further, in each static condition the design is able to evidence a new ordering system for the operating studio. As these movements shift, various overlaid ordering systems and identities are formed. Therefore, the transforming spaces can consistently evidence a visual and physical order. Transformation has become an element which integrates the exterior and interior programmes whilst also responding to changing conditions.

The ability for architecture to be responsive to social and cultural changes requires new initiatives in how architects deal with the traditional concept of programme. Rather than a rigid framework, blurring can be used as a tool for further investigation to consider how programmes such as banks, post offices and supermarkets can be integrated and adaptable to their surroundings or, co-exist together. Re-examining these imperatives on a larger, more accessible site would provide varying boundary outcomes and would enable a framework to be established which recognises the explicit influence of external and internal forces. Due to the site restrictions at the design case study site, movement between the centre and the periphery is limited and hence, engagement between passive and active programme users is predominantly through visual axial lines. Further, the effect of moving elements would become more beneficial to the public on a site that is integrated into primary circulation pathways. With this in mind, many more possibilities could be examined



Fig. 79 (left) & Fig. 80(right): Application of blurring strategy to inform developments beyond presumptive programmes such as banks (BNZ & Westpac featured), post offices and supermarkets in the 21st century. Author's Collection.

on exposed sites in residential or commercial areas.

It is necessary to recognise the potential problems which could arise if the treatment of blurring isn't strategically considered. Issues may arise if movement is hierarchically positioned over static or stationary design elements which are essential for structural stability and integrity. If this occurs, chaotic, disorganised spaces may develop which become rejected and uncomfortable for dwelling. With this in mind, the research suggests an awareness of two interconnected, shifting situations. Firstly, the direct movement and programmatic requirements of the habitants and secondly, community and cultural changes which influence the formal responses of the architectural design. In the design case study, the opening and closure of elements creates challenges in providing consistent shelter and protection in Wellington's varying seasonal climates. However, due to the residential context, specific considerations were required to enable privacy between adjacent



neighbours. Therefore, in acknowledging change and utilising blurring as a design tool, designers need to be aware of its influence upon the internal inhabitants, the programmatic requirements and its position within a wider urban context.

The thesis aimed to use the iterative process of hand drawing to address the contemporary problem of our need to blur traditional typologies, programs and social engagements. Concluding, the research highlights the ongoing influence which changing social and cultural patterns are going to have in the development of architectural design. Blurring of boundary conditions has become a strategic tool to develop a design response which simultaneously questions the tools of design and the responsiveness of architecture to changing conditions. Layering superimposed ordering systems enabled the architecture case study to move beyond its traditional orthogonal framework and preceding case studies, becoming reflective of the transformations and movement within lifestyles and architecture today.

Fig. 81 (left) & Fig. 82 (right): Application of blurring strategy to inform developments beyond presumptive programmes such as banks, post offices and supermarkets (New World) in the 21st century. Today's period evidences a movement beyond traditional edge anomalies (Wellington Public Art Gallery). Author's Collection.

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Fig. 83: *Blurring, Castle Point, New Zealand.*
Author's Collection. Digital photograph.



