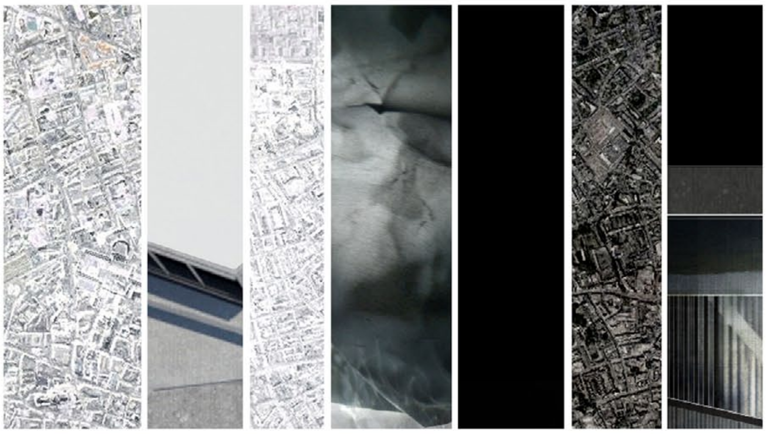
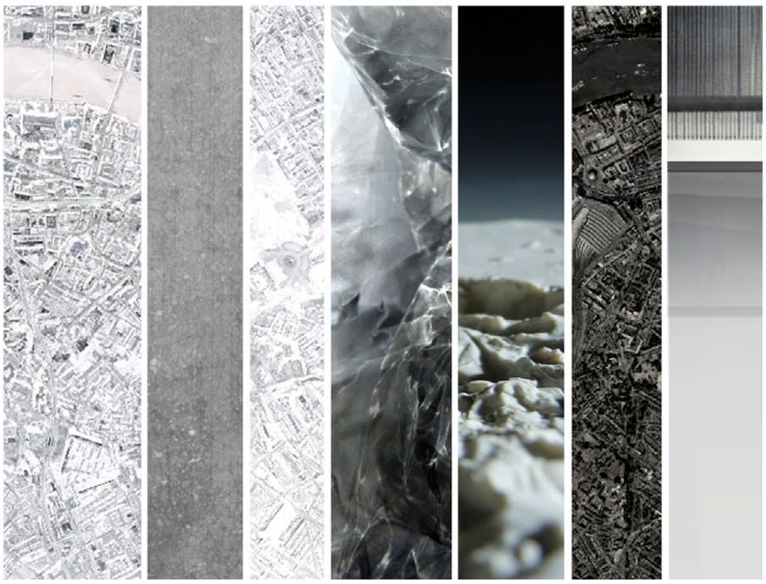


# MATERIAL AGENCY



*for my family*

*Fig 1.01. (Previous) Aerial view of East London site*

# ACKNOWLEDGEMENTS

To my family for being my everything,
To my friends for making every day a happy one,
To Jan and Simon for the invaluable support and supervision,

Thank You.

A 120 point thesis
submitted to the Victoria University of Wellington
in partial fulfilment of the requirements for the
degree of Master of Architecture (Professional)

Victoria University of Wellington
School of Architecture

2017

by Isabelle Bush

# PREFACE

Having grown fond of the East London area since my parents relocated there in 2014, I found myself increasingly concerned with the preservation of its historic fabric. Within parts of the wider city, new structures, new materials and new building uses have created spaces which, at times, feel completely alien to the context, detracting rather than adding to the urban surrounds. In spite of this, there remains a raw historic character to the East End which feels particularly prominent. This research thesis was therefore taken as an opportunity to propose an alternative way to expand and enliven the empty and disengaged spaces within the city, questioning the tendency to treat urban growth as a progression towards the entirely 'new'. In order to do this, materiality was used to anchor the project both culturally and contextually. By better understanding the physical and atmospheric nature of architectural materials, the research seeks to  redefine the new through the old by giving agency to materiality.


*Fig 1.02. Speculative design at public scale*

# ABSTRACT

The 'material turn' of the twentieth century focuses on the vibrancy of matter and non-human agency, providing an engaging platform from which to re-assess, and also promote, the role of materiality in design. The material turn draws away from a 'representational' paradigm towards a focus on materials as being non-objective, performative and responsive, where materials operate as authoritative matter. This design research thesis investigates the agential capacity of materials to amplify atmospheric experience in architecture. Through this research proposition, the thesis harnesses contemporary material perspectives to drive a series of enquiries that explore material agency in design. Within this framework, the design research seeks to strengthen relationships between user, matter and site. This method engages and evaluates materials on a tactile and emotional level, reflected in its atmospheric outputs. Ultimately, the design research employs materiality as an agent in the production of a 1:1 scale installation and two speculative building designs at the domestic and public scale. A historic site in East London has been selected to provide the contextual and material foundations for the design research. This thesis concludes that materials have an ability to exert force on the design process when they are engaged in a responsive feedback loop which acknowledges the transformative capacity of both 'human' and 'nonhuman' elements. The dynamic nature of scaling as a design method supported these findings by encouraging progressive dialogue between matter and design process.


*Fig 1.03 (Right) Historic image of the Norton Folgate site in East London*

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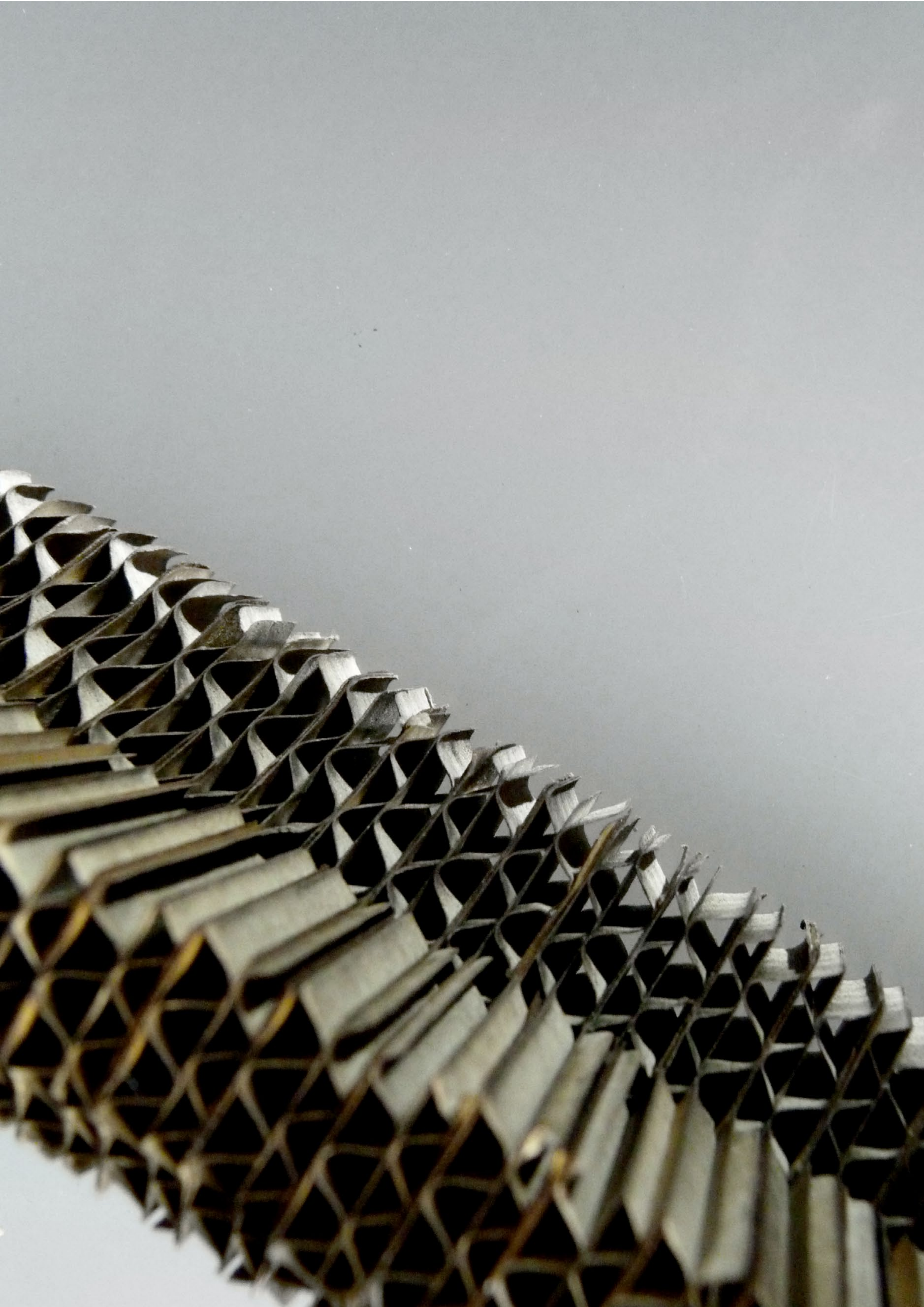
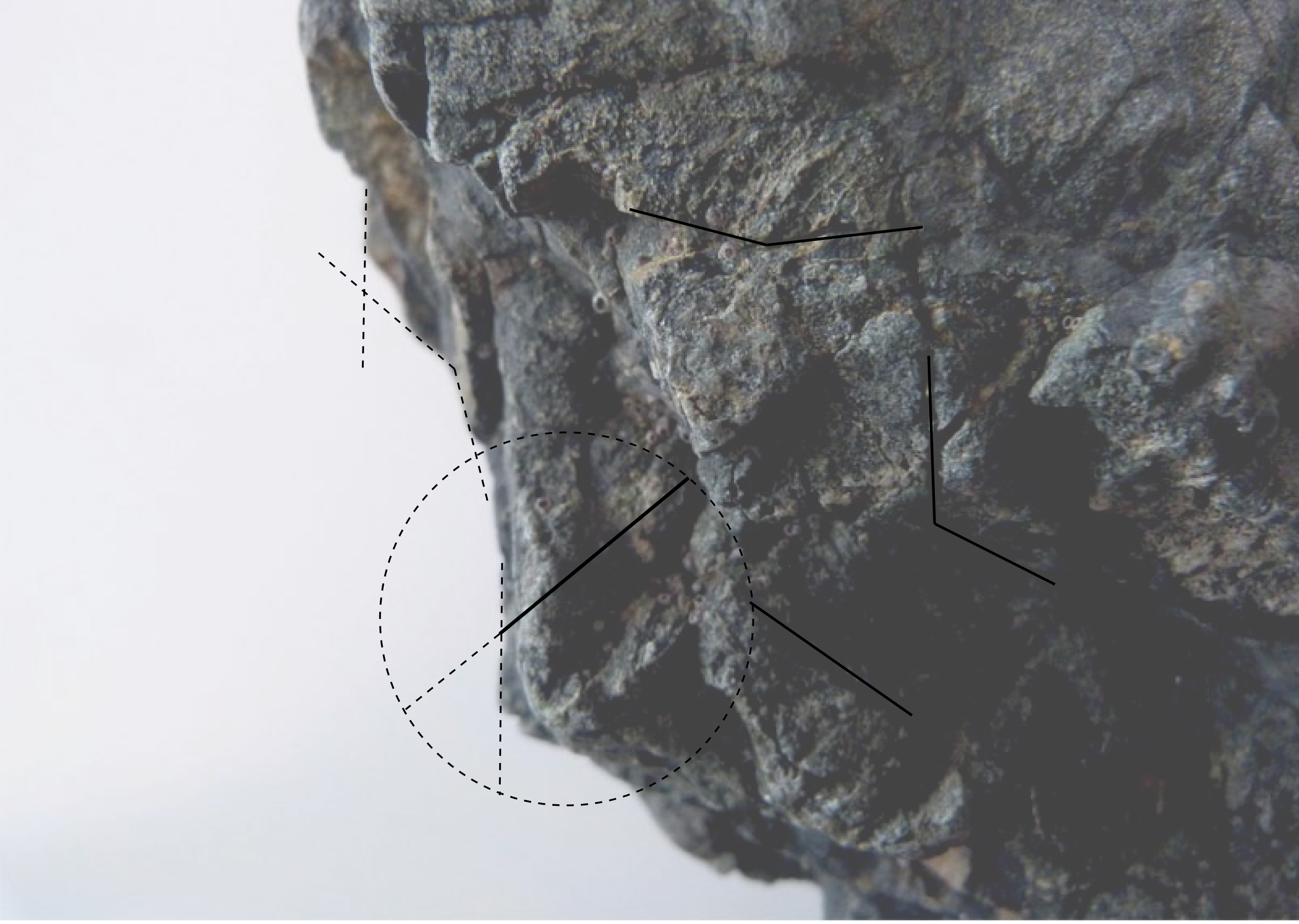
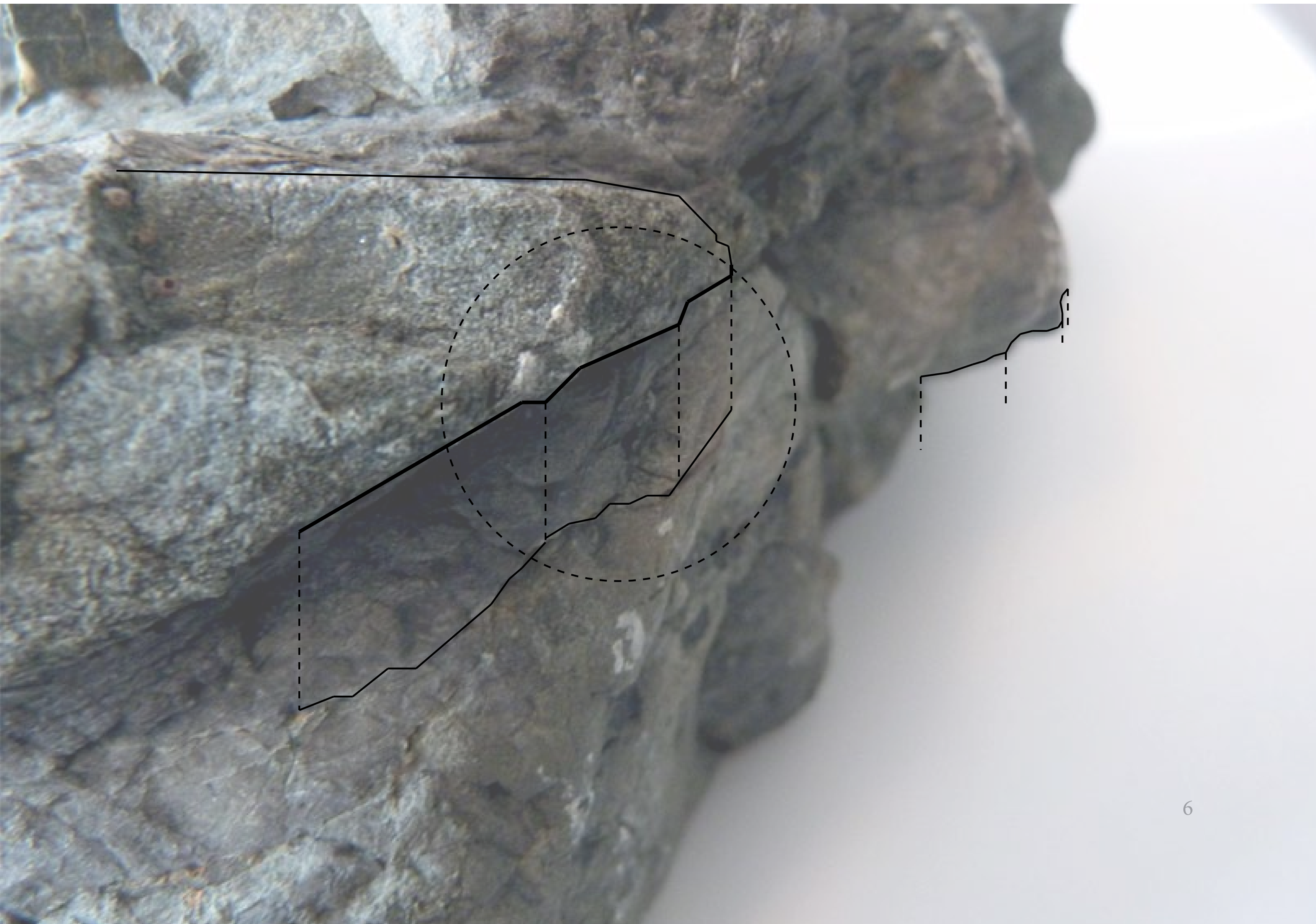
# 1

# INTRODUCTION

*Fig 1.06. Material enquiry at public scale*







## BACKGROUND

In this thesis, the role of materiality in architecture is addressed theoretically and critically through its relationship with matter, site and atmosphere. Contemporary materialist perspectives have been used to generate understandings of and further explore these relationships. The material turn of the 1990's prompted a development in emerging material perspectives as it encouraged a multi-disciplinary reassessment of the way in which materiality and matter was understood (Howes, 2005. 2). Stemming from the universal expanse of sensory studies, which shifted attention to the power of cognitive perception, the material turn was further accompanied by the corporeal turn which introduced ideas of embodiment to cultural analysis (Howes, 2005. 2). In this way, the corporeal turn provided an ethical relevance to studies of affect, motivating an understanding of the" capacity of any body for activity and responsiveness" be it human or non-human (Bennett, 2010. 6). Shifts toward body-centred thinking meant that ethical understandings in practice "could no longer refer primarily to a set of doctrines" but rather expand to consider "relays between moral contents, aesthetic – affective styles and public moods" (Bennett, 2010. 7). From a new materialist perspective, Jane Bennett goes on to critique the separation of 'dull matter' and 'vibrant life' arguing instead for that "the vitality of matter and the lively powers of material formations" (Bennett, 2010. 7).

Contemporary definitions of lively matter extending to include the "durations of movement, speed and slowness" behind each material formation shifts our understanding of inert matter to a type of active non-human agency (Latham & McCormack, 2004. 705). In the past, human consciousness and intentionality was considered imperative in the development of agency, however this dissolution of boundaries between dull matter and vibrant beings allow material matter and human beings to be assessed on an even platform, thus giving currency to notions of non-human agency (Malafouris & Knappett, 2008. 4). Nigel Thrift similarly addresses the need to view materials as a type of active matter which operate as more than "mere cladding" (Thrift 2008, 9). The development of such theoretical practice calls to question the position of materiality and its sensory capacity through many disciplines, including architecture. As a result, the influence of new materialism in architecture is not understood as passive matter, but rather as a dynamic design tool which challenges thinking and practice.



*Fig 1.07 (Left) Initial material observations from the installation*

## RESEARCH PROPOSITION

*This research thesis investigates the agential capacity of materials to amplify atmospheric experience in architecture. The research ultimately questions:*

*"How can the agency of materiality amplify the atmospheric qualities of architecture?"*

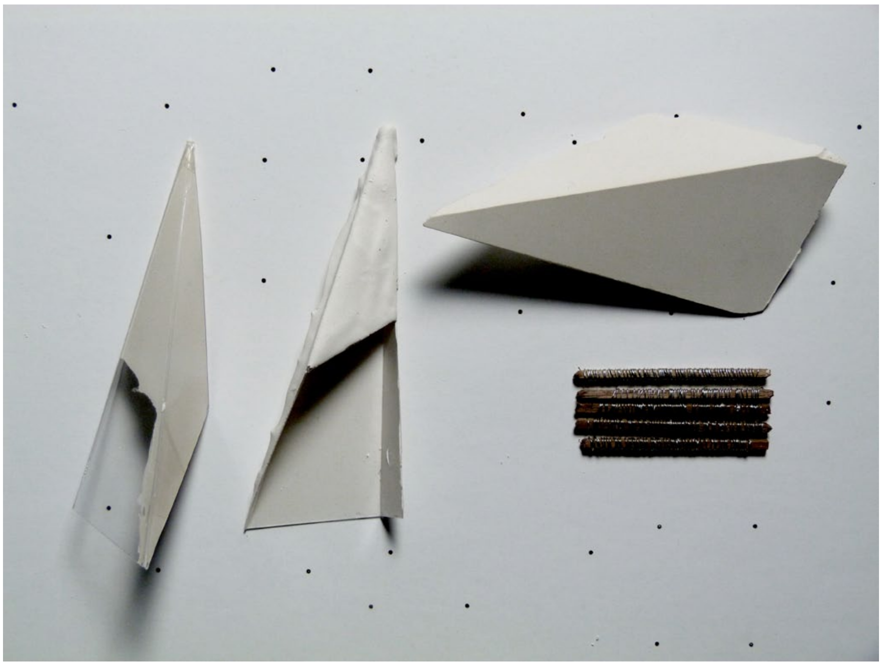


*Fig 1.05. Material models from domestic enquiry*

*Fig 1.08 (Right) Stone model from installation*

# METHODOLOGY

The overreaching methodology used to address the research question was through a design-led research strategy. Jane Rendell states that “in much design research the process operates through generative modes, producing works at the outset that may then be reflected upon later” (Rendell, 2013. 117). Practical work therefore became critical to the design process from the beginning, with the introduction of scaling up and down which was used as a generative framework for practical production. Rendell further observes the extensive knowledge which can be generated when designers “raise questions rather than provide answers” through their design led research (Rendell, 2013. 118). As a result, the research proposition was addressed through a non-linear process, drawing upon successes and failures in order to evaluate, theoretically challenge, and direct the project. Initial stages of ‘research for design established the theoretical context for the following ‘research through design’ stages which relied on practical design methods to challenge and evaluate the theoretical framework (Downton, 2013. 55). In keeping with the structure of the stream, practical design research was initiated from day one of the research enquiry in order to develop a design strategy which tested and accurately represented the theoretical framework. Despite their ongoing correlation, the chapters have been presented separately and in a linear sequence for simplification.

The ‘research for design’ section looks at the work of Peter Zumthor, Herzog and de Meuron, Reiser + Umemoto and Michael Hensel. The relationship between material approach and atmosphere and their varying analogue and digital perspectives were comparatively analysed. Engaging with analogue as well as digitally motivated practices helped to shape the feedback loop between both modes of testing. Digital iterations became more significant within larger scale developments as the project increased in complexity. The introduction of a feedback loop ensured an ongoing dialogue between analogue and digital iterations, thus focussing on the agential role of matter. The practical ‘research through design’ stages therefore became a tangible response to the ‘research for design’.

Three scales were employed as a method to test the research proposition; an installation, domestic and public scale enquiry. Each new scale marked an increase in complexity and a corresponding adaptation of process based upon ongoing critique and reflection of the design led research. The experimental nature of scaling up and down is rooted in its “constant and well equipped observation of possible consequences” when moving between scale models (Yaneva, 2005. 868). According to Yandeva, scaling as a method can be both exploratory and systematic (Yaneva, 2005. 868). This thesis employed scaling as an exploratory method, used it as a framework for the production and reflection of design. In this way, using scale as a method provided friction for the design process, encouraging continuous production and reflection by using each scale shift as a redirection opportunity. The design process and proposition therefore evolved as the scale increased.

Physical modelling was the primary method used to understand each material phase. The model making was approached with as little human direction as possible, relying on the tendencies and affective qualities of each material to drive the production process. This approach prompted a transition from human agency towards “the agency of things that produce effect in human and other bodies” (Bennett, 2010. 7). The atmospheric explorations were documented through photography, using light as a variable to engage different affective conditions. Ongoing stages of making and unmaking at different scales maintained the iterative framework from installation through to public scale.

*Fig 1.09. (Left) Design outcome at installation scale*

## SCOPE

This research thesis was carried out within the Experimental Design research stream at Victoria University of Wellington. The three scale structure of the design research was enforced by the stream and spaced accordingly throughout the research process. The thesis document is outlined by the University as being weighted 75% through practical design work and 25% through written work (Marques, 2016. 7). Due to the brevity of the written component, the body of writing has been contained largely within the context and case study chapters, thus focussing on design through practical stages of development. This means that design was the main focus of the thesis, which is reflected through the presentation of design process, development and refinement. The reduced word resulted in a compression of the written component, rather than allowing for a more extensive review of theoretical explorations on material agency.

*Fig 1.10. Stone model from Installation enquiry*

# THESIS STRUCTURE

*The first two chapters are situated within a 'research for design' phase, which seek to set the contextual foundations for the thesis.*

## CONTEXT CHAPTER
The context chapter defines contemporary understandings and applications of materiality through a series of four key architects. Material understandings are compared and contrasted throughout the chapter. The following section addresses the position of atmosphere in relation to contemporary material perspectives. The context chapter ends with a discussion regarding heritage approach and intangible heritage; a notion which fuses the contextual and theoretical basis of the design research through its physical setting.

## CASE STUDIES CHAPTER
Analyses three materially driven architectural projects by Peter Zumthor and Herzog & de Meuron. The projects are analysed through site approach, material approach and atmospheric manifestation. Project discussion builds upon the theoretical foundations outlined in the context and introductory chapter.

*The 'research for design' chapters are followed by the 'research through design' chapters, which test the theoretical foundations through practical design methods. The site chapter is situated between the domestic and public scale enquiries, at which point the physical setting for the design research was firmly established and a deeper understanding of the physical context was required before the public scale enquiry.*

## INSTALLATION SCALE
Details the material strategies implemented throughout the development of a portable installation. The enquiry is discussed with respect to material approach, atmospheric manifestation and design outcome. The process is then concluded and critically reflected upon.

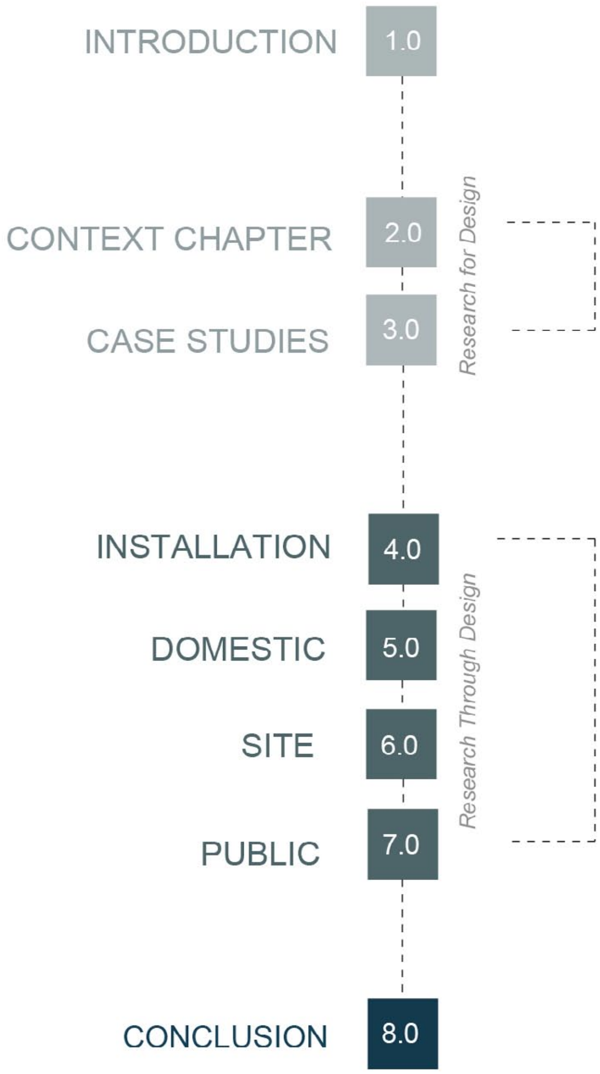
## DOMESTIC SCALE
The domestic enquiry investigates material interactions with the body following introduction of programme, site and structure. The enquiry is discussed with respect to material approach, atmospheric manifestation and design outcome. The process is then concluded and critically reflected upon

## SITE CHAPTER
The site chapter further details the physical context for the design research which was introduced at domestic scale.

## PUBLIC SCALE
Expands on material enquiries and subsequent contextual and programmatic expansions explored through material agency. The enquiry is discussed with respect to material approach, atmospheric manifestation and design outcome. The process is then concluded and critically reflected upon.

## CONCLUSION
The project is briefly summarized and critically evaluated, highlighting the limitations and opportunities for development within the design research.

# ORDER OF CHAPTERS



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CONTEXT CHAPTER 2.0

*Herzog & de Meuron*

*Peter Zumthor*

*Reiser + Umemoto*

*Michael Hensel*

*Position of Atmosphere*

*Heritage Approach*

*Conclusion*

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# 2

# CONTEXT CHAPTER

# INTRODUCTION

In this 'Research for Design' chapter, the role of materiality is addressed theoretically and critically through its relationship with matter, site and atmosphere. Due to the brevity of the thesis, the research for design has been summarized through four main architectural perspectives; Peter Zumthor, Herzog & de Meuron, Reiser + Umemoto and Michael Hensel. Their respective material approaches have been gauged along a gradient from analogue to digital perspectives, discussing analogue approaches first and later noting shifts in material outcomes following the introduction of digital technology. The focus on material agency of the research proposition shifted the research to consider a more practical understanding of material use and design process in architecture, hence the comparison of architectural perspectives rather than expanding on new materialism (DeLanda, 2004; Bennett, 2010;  Hayles, 2014, Coole and Frost, 2010). While each approach within the chapter exhibits material agency, the way in which materials are utilized as a design tool varies greatly through corresponding relationships with site, design development, user experience and form. A brief discussion of the atmosphere of materials follows, and draws on research regarding atmosphere and affect in order to draw parallels between material agency and atmospheric conditions. Given the historic nature of the site and its surrounding heritage, a range of perspectives regarding heritage treatment were also reviewed, with a focus on material use and atmospheric preservation. This heritage section ultimately provided critical information for the formation of a speculative site approach where heritage materials form the site have a force in shaping the design. Following the contextual outline in the next chapter, three case studies have been analysed and evaluated against the findings in this chapter.

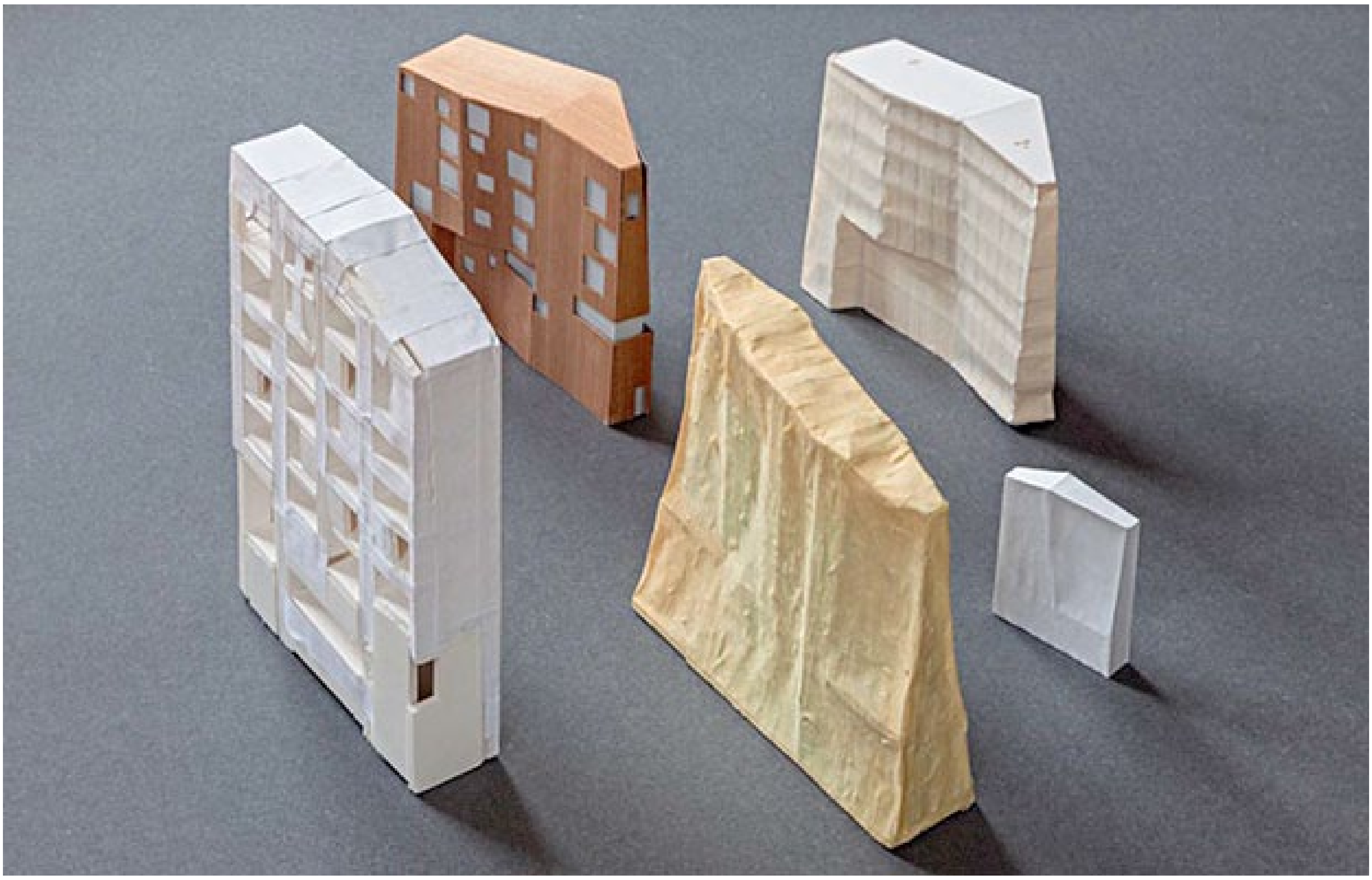


*Fig 2.01. Material models by Herzog & de Meuron*

## HERZOG & de MEURON

*Fig 2.03 and 2.04. Material models by Herzog & de Meuron*

Herzog and de Meuron entrust in the power of materiality to convey the essence of their designs and subsequently aid in drawing out the intended user experience. Herzog positions the 'reality of architecture' to fall into its material inclusions, stating that "they find their highest manifestation…once they have been removed from their natural context" (Herzog, 1989. 209). The removal of materials from their natural environment initiates their metamorphosis into a uniquely purposed surface. Through their intended man-made manipulations, materials offer an informative membrane which is interpreted through the sensory body, thus formulating a vital link between materiality and the embodied experience. This relationship is strengthened by the intensifying of a materials informative barrier, creating opportunities for interactive and endlessly changing material surfaces and applications. The authoritative role that this places upon materiality as a design mechanism is what makes the materials themselves "no longer a purely representative means and therefore no longer restricted to the visible surface" (Herzog cited in Wang, 1990. 14). It is this projection of materiality as an amplification tool which informs this research investigation.

Herzog & de Meuron have been continually inspired by the 'transcendence of matter' and its relationships with those who encounter it (Wang, 1998. 15). While the notion of transcendence of matter may differ from the material turn, their early work does focus on 'perception and the surrounding world', prompted by traditionally objective understandings of the body in space, created concepts which grounded the body in site and structure, activating a "tectonic performance" within the architecture (Simon, 2011. 20). Subsequent events surrounding the 'material turn' and its corporeal offset, encouraged a move within the discipline from "tectonic effect to surface affect", challenging architectural focus and direction (Vidler, 2001. 229). Mariann Simon observed the pronounced shift within Herzog & de Meuron's own practice to one less geometric and rather of 'intensity and totality of the senses' (Simon, 2011. 24). Despite their transformative career, spurred by fluctuations in material and digital context, Herzog & de Meuron continue to be recognized for their prevailing material focus, creating architecture which operates "with an arsenal of material and sensuous effects" (Simon, 2011. 25). Similarly employing materials for their "inherent sensuous qualities", Peter Zumthor's material approach has been assessed in regard to multi-sensory material application and the resulting atmospheric experience (Zumthor, 2010. 10).

*Fig 2.05. Material junction at The Schaulager by Herzog & de Meuron*

## PETER ZUMTHOR

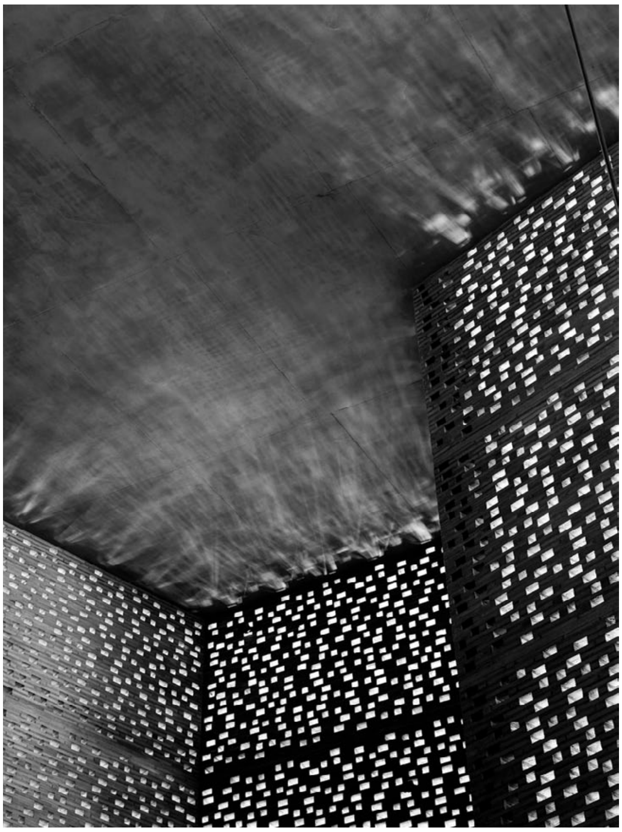


*Fig 2.06. Kolumba Museum by  Peter Zumthor*

Swiss architect Peter Zumthor similarly utilizes materiality in the realization of his architectural atmospheres, with a slight shift from more to less tangible design motivators. While Herzog & De Meuron allow the material to dictate atmospheric conditions, Zumthor treats materials as the joints which link form to body, tangible to intangible, surface to affect. In this way, atmosphere has a power over and further creates dialogue with materiality. The materials become catalysts of atmospheric conditions which he deduces from a series of nine 'categories' of atmosphere (Zumthor, 2006. 9). He considers the culmination of 'material consideration' and the creation of a 'body of architecture' to be two significant contributors in creating an embodied experience within space, stating that stating that "the experience architecture in a concrete way means to touch, see, hear and smell it"" (Zumthor, 2010. 66). Zumthor's abstraction of architecture as a permeable body places focus on a new mode of embodiment; one that is infinitely manipulated through the activity of its porous surrounds. Materials are therefore inherently bound to their atmospheric conditions; one cannot be considered nor experienced without interference from the other.  Within this premise, an intrinsic relationship to materiality is formed and one which gives it great authority in his design process.

While Herzog & de Meuron have transformed into a digital practice, Peter Zumthor has maintained a steady design approach throughout his career, focussing on analogue modes of drawing, discussion and model making to progress his conceptual ideas (Zumthor in Spier, 2001. 29.). Regarding his design approach, Zumthor mentions the need to "work dialectically always", encouraging the multi-dimensional nature of contrasting perspectives to add depth and 'soul' to a design (Zumthor cited in Spier, 2001.17). Throughout his own work this often means addressing light alongside dark, and heavy alongside light. Zumthor seeks design depth through encouraging material interactions, stating that "Materials react with one another and have their radiance, so that the material composition gives rise to something unique" (Zumthor 2010. 25). He considers each material to have 'endless' permutations', with each unique application corresponding to contextual relationships with site and user experience. The overall approach to materiality is dynamic, whereby there is no static expectation of how the material should be applied within a design, yet each material transformation is driven by atmospheric production. The material qualities therefore develop in conjunction with eight other 'considerations of atmosphere' which ultimately accumulate to form a sensory human experience (Zumthor, 2010. 21). Within these building blocks of atmosphere, the complexity of atmospheric manifestation relies on enclosure, pockets of light, material proximity and acoustic conditions (Zumthor, 2010. 25.). Zumthor's more formulaic approach to materiality, fusing it to its atmospheric output, introduces notions of material feedback which are similarly reflected, through different applications, in the work of Reiser + Umemoto and Michael Hensel.

*Fig 2.07. Part of Peter Zumthor's recently designed tourist trail in Norway*

## REISER + UMEMOTO

Kwinter argues the work of Reiser + Umemoto operates "less like architects and much more like chemical engineers" (Kwinter, 2006. 13). Aligning with Jane Bennett's (2010) previously discussed perspectives regarding "the active role of nonhuman materials in public life" (p.2), Reiser + Umemoto's design guide 'Atlas of Novel Tectonics' exemplifies modes of seeking interconnections, relationships and patterns within material qualities to activate their presence in architecture (Reiser & Umemoto, 2006, 22).. Their formulaic approach to the discipline has created a design process which actively embeds materiality into it, stating that "the material becomes more or less coded into the architecture" (Reiser in Anderson, 2003. Web.). Reiser and Umemoto address materiality as the matter within a series of matter-force relationships resulting in the built environment (Reiser and Umemoto, 2006. 21). Derived from theoretical views of Aldo Rossi, materials are discussed as having a 'never diminished, latent' energy within them, for which architects are responsible for incorporating into the design process; in effect, giving materials authority in the design process and further showing their agential capacity (Reiser & Umemoto, 2006. 22).

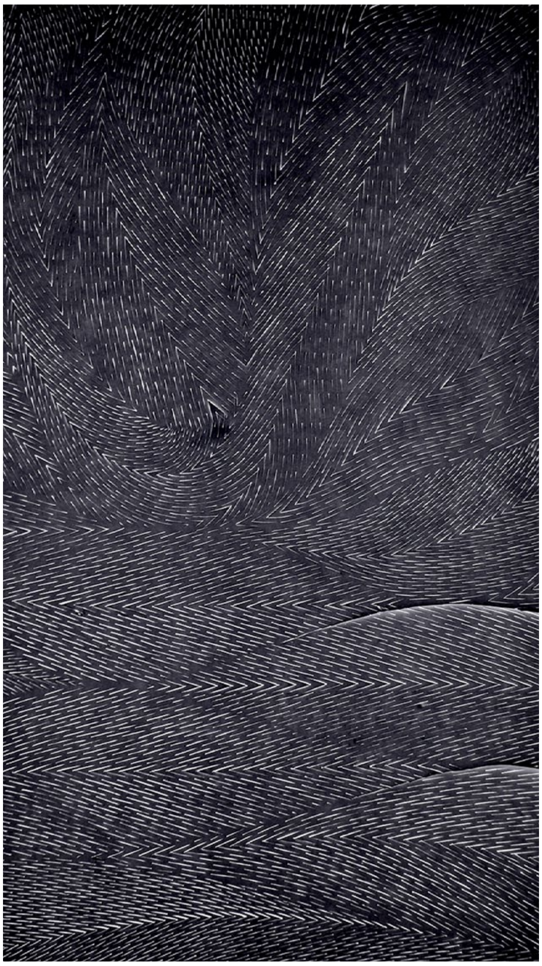


*Fig 2.08 Vector wall by Reiser +Umemoto*

Their employment of material agency is not void of atmospheric consideration, stating that "architecture thus is no longer the brooding and silent witness to the flux of tempo but is as much matter and structure as it is atmosphere and effects" (Reiser and Umemoto, 2006. 23). This approach implies a volatility within materials and atmospheres and how it is observed and responded to. This deviates from the more prescriptive approach observed in Peter Zumthor's 'Atmospheres', which implies a certain predictability within materials in order to convey very specific atmospheric conditions. While Zumthor addresses materials as affective, he attributes less dynamic capacity to their architectural presence.

Within Reiser and Umemoto's perspective, digital and analogue worlds naturally intertwine through their overlapping offerings to the design process and the forces that they extend onto it (Anderson et al., 2003. Web). Within this relationship, the pair believe that computer based design approaches can strengthen the dynamic and tectonic potential that is retained within material surfaces (Anderson et al., 2003. Web). There is an appreciation of digital methods emerging here which can similarly be seen in the material perspectives of Herzog & de Meuron and Michael Hensel. It seems that digital and analogue modes of testing are not considered contrasting or fighting elements, but rather as sources of opportunity to enrich the relationships and patterns within the discipline, and finding new ways to "index" forces within the process. Within this premise, they argue that there is an essence to matter which lies in its irregularities, spontaneity and kinetic ability (Anderson et al., 2003. Web). This perspective is supported by Michael Hensel, who believes that contemporary tendencies to "neutralise the effects of variable material behaviour" in order to produce seamless architecture is restrictive in both design and material capacity (Hensel, 2013. 61).

*Fig 2.09. Reiser + Umemoto's O-14 Tower in Dubai*

## MICHAEL HENSEL

Hensel approaches materiality from a performance orientated perspective. Central to his ideas on performance lie the interactions between four key agencies; subject, environment, spatial and material organization (Hensel, 2012. 43). Hensel's approach to non-human agency and subsequent material use draws parallels with views previously discussed by Bennet, Jones and Cloke. Hensel draws upon the 'actor-network theory' supported by Michel Callon, Bruno Latour and John Law to give currency to notions of performance in design (Hensel, 2013. 18). By supporting an architecture of material performance, Hensel is simultaneously supporting an active architecture which "could be in the service of the natural environment by way of its inherent agency" (Hensel, 2013. 30). This approach embodies the perspectives at play within the material turn, signifying progressive understandings of materials as dynamic entities. Similarly, Karen Barad argues that "materiality itself is always already a desiring dynamism, a reiterative reconfiguring, energized and energizing" (Barad cited in Dolphijn & van der Tuin, 2012, 59).

The dynamic nature of his perspective is comparable with that of Reiser + Umemoto, due to their respective tendencies to favour contextually specific and active understandings of architecture and space. In both instances, the role of materials lie within these interactive relationships; working in and around each corresponding element. Hensel encourages deviation from "perceiving the spatial and material organization complex as a static configuration that alone defines an object to intricate processes of interaction and the capacities and transformations that arise from these interactions" through his design approach (Hensel, 2012. 43).

*Fig 2.10 AA Component Membrane in London. Contributed to by Michael Hensel.*

*Fig 2.11. Michael Hensel's material analysis of a Flamboyant tree.*

Hensel's work is anchored in digital relationships with materiality, favouring parametric tools for their ability to erase material restraints (Cabrinha, 2008. 120). Hensel believes that the kinetic ability of a material should not be suppressed as a consequence of creating a heavily manufactured yet seamless surface (Hensel, 2013. 59). Hensel has positioned himself as in a way which neglects passive understandings of materials in space in exchange for active human engagement and the subsequent role they can play in enriching the embodied experience. Discussing this as the 'performative' capacity of materiality, Hensel brings to light the role of spontaneous and unplanned material behaviour in space. From this perspective, he is encouraging an active and subsequently creative response from users within an architectural environment (Hensel, 2013. 16). The relationship between the body and the material therefore remains largely interactive. For Hensel, parametric methods are a tool for finding deeper engagement with the body and the surrounding environment. Across all four architects, the agential capacity of materials as interactive matter enhances the atmosphere of architecture. The following section expands this idea.

## POSITION OF ATMOSPHERE

Although the unification of materiality and atmosphere is not new to the architectural discipline, its prominence within the discipline is quickly developing (Löschke, 2016. 2). Since emerging through the work of German philosophers Robert Vischer, August Schmarsow and Alois Riegl in the nineteenth century, understandings of the increasingly complex relationship between atmosphere and materiality have continued to develop (Löschke, 2016. 3).

Gernot Böhme explores this relationship and further explains the significance of material staging and subsequent user reception in his article 'Atmosphere as the Fundamental Concept of a New Aesthetics' published in 1993 (Böhme, 1993. 113). Böhme addresses traditional understandings of relationship between material use and atmosphere as often based upon 'indeterminate aesthetics', a notion which acknowledges the capacity of materials to enrich architectural atmosphere, but fails to establish deeper connections with the multi-sensory body in space (Böhme, 1993. 114). Ben Anderson builds upon this perspective and seeks to create a more robust understanding of atmosphere which succeeds in establishing multi-sensory connections with the body. For Anderson, understandings of atmosphere tend to be "vague" yet can be theoretically strengthened by further understanding the notion of affect in architecture (Anderson, 2009. 78). Affect directly relates to the body and observes the range of physical responses that can be encouraged through spatial conditions, stating that "Affective qualities emanate from the assembling of the human bodies, discursive bodies, non-human bodies, and all the other bodies that make up everyday situations" (Anderson, 2009. 80). In this way, atmosphere, which exists as a product of affect, is inherently bound to the arrangement and material matter of space. The vitality of this matter, as outlined by Bennett, has the ability to "aid or destroy, enrich or disable, ennoble or degrade us" (Bennett, 2010. 4). Within this understanding of atmosphere, Anderson questions the origin of atmosphere, attempting to underpin a tangibility to its foundation (Anderson, 2014. 144). It becomes necessary to consider atmosphere through modes of 'staging', thus forming a premise from which an atmosphere can 'emanate' (Anderson, 2014. 144). He addresses Peter Zumthor's 'Atmospheres' as a series of objective design tools which accumulate to create an 'atmospheric effect' (Anderson, 2014. 154). Observing such a strong link between atmosphere, affect and material matter, in the context of this thesis, leads towards an analysis of the historic site, its material make up and the capacity for affective responses within its users.

Fig 2.12. Central Saint Martins development in London

## HERITAGE APPROACH

Norton Folgate's status as a heritage listed area positions the site within a complex ethical and political environment. Similarly affected by the rise of new materialism and affective practice, the modern period "has seen heritage increasingly shift away from a concern with 'things' to a concern with cultures, traditions and the 'intangible'" (Harrison, 2012. 115). While conventional understandings of heritage conservation, outlined by the Charter of Athens and the International Council on Monuments and Sites, prioritise the preservation of physical matter over all else, Miles Glendinning argues that tangible elements alone do little to reflect the expansive intangible histories embedded within historic sites (Glendinning, 2013. 2). Jennifer Hill similarly observes the shortfall in intangible conservation practices, critiquing the Venice Charter for having "never been revised to reflect the wider understanding…of heritage" (Hill, 2004. 20). This research proposition, built upon notions of active and affective matter, supports arguments of intangible heritage preservation and the affective capacity of historic materials.

The Norton Folgate site which has been used for this design research contains numerous seventeenth and eighteenth century stock brick structures, each contextually infused with tangible material changes and intangible historical markers regarding use, culture and community. This unique material climate has been employed as a physical foundation for both contextual grounding and affective development of the thesis. Two empty spaces, located in front of existing heritage structures, have been used as speculative sites for the domestic and public scale enquiries. An interior intervention has been proposed within a nineteenth century warehouse building, retaining all four perimeter walls.

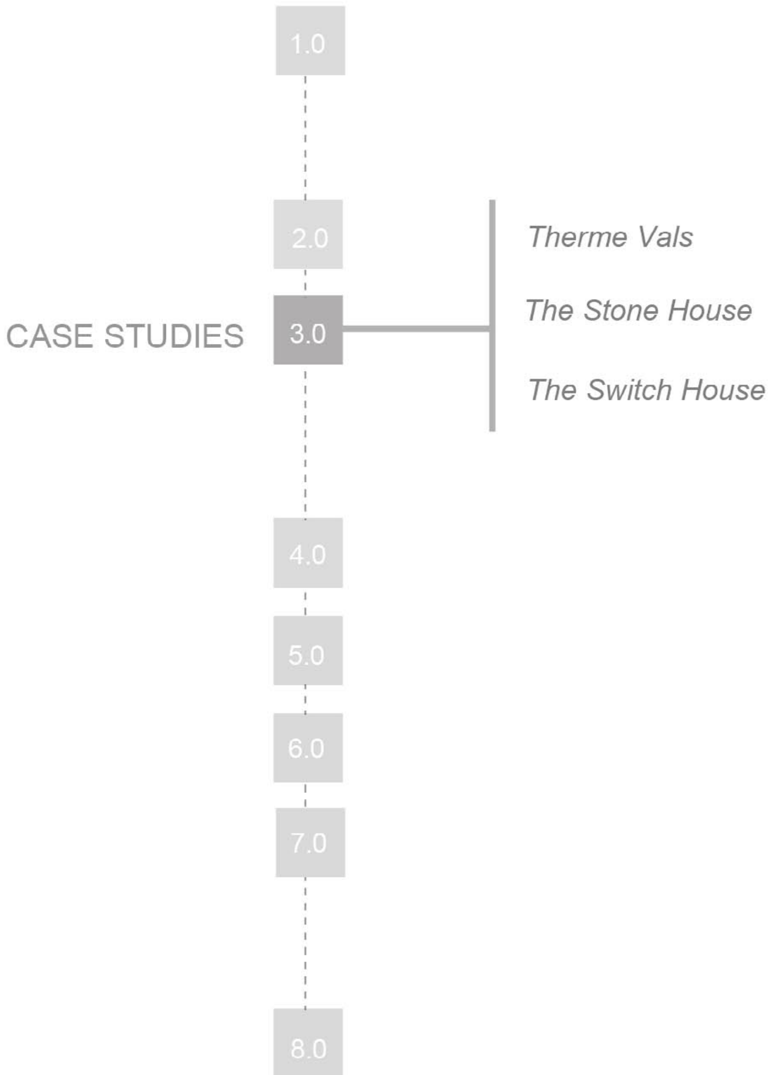
*Fig 2.13. (Left). Heriatge buildings at the Norton Folgate site*

## CONCLUSION

The notion of material agency challenges traditional understandings of agency as having an intentional, conscious and human authority. Theoretical shifts regarding the active nature of matter, ethical implications of affect and the removal of human and nonhuman boundaries however has meant that "the idea of decentralised agency has gained momentum across the social sciences" (Knappet and Malafouris, 2008. 6). The positions explored in this chapter outline a range of material approaches which give agency to materiality by giving it an active authority within the design process, thus working to redefine the relationship between beings and matter.

The position of atmosphere in relation to material agency remains delocalized yet relevant within arguments of affective agential matter. The affective capacity of materials prompts a need to address the existing atmospheric conditions of the site, and to better understand how a new speculative design can amplify these existing conditions rather than diminish them. A consistent aim of the research through design phase was therefore to formulate a productive relationship between materiality and atmosphere which in turn elevated relationships with site and user.

*Fig 2.13. Existing warehouse buildings at the site*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CASE STUDIES
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Therme Vals
The Stone House
The Switch House
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# 3

# CASE STUDIES

## INTRODUCTION

Jones and Cloke explore nonhuman agency in four modes; agency as 'routine action, transformative action, purposive action and non-reflexive action' (Jones and Cloke, 2008. 81). This research proposition treats architectural materials as having the capacity to develop agency through these modes. Matter is observed as being able to "influence future courses of action" and "engender affective and emotional responses from the humans who dwell amongst them" (Jones and Cloke, 2008. 81). In this way, material agency is not about equating materials with humans, but rather acknowledging the affective engagement between humans and materials. Three case studies have been selected which test the theoretical framework outlined in the previous chapter through active relationships between site, material and atmosphere, ultimately aligning them to Jones and Clokes' perspectives on non-human agency. Firstly, Peter Zumthor's Therme Vals have been analysed through site approach, material approach and atmospheric experience. Two contrasting Herzog & de Meuron projects, conceptualised and built nearly twenty years apart, have then been examined through the same structure. A comparison between such contextually separated projects further sought to highlight the impact of the digital turn on material use.

*Fig 3.01. (Left). Material model from installation enquiry*

*Fig 3.02 Peter Zumthor's Therme Vals*

## PETER ZUMTHOR:THERME VALS

**Architect:** Peter Zumthor
**Location:** Graubünden, Switzerland
**Year:** 1996

## INTRODUCTION

The Thermal Vals case study and the following Stone House project by Herzog & de Meuron exemplify projects which are conceptually derived from site and material conditions. Both projects employ historic site materials as primary construction materials, thus extending the existing contextual conditions into the new architecture.

## SITE APPROACH

When explaining the role of the site in his design process, Zumthor states that his buildings are in a "critical dialogue with the site" and seeks to develop a sense that "the building...has always been there" (Zumthor, 2001. 16). The project employs historic site materials as primary construction materials, thus extending the existing contextual conditions into the new architecture. Zumthor described the intention of the project as needing to create a design which "responds to the stone masses of the Vals valley, pressed, faulted and sometimes broken" (Zumthor, 2007. 23). The concept of the design was therefore drawn out almost explicitly from the site, noting structures, textures and scales which could translate into the design (Hauser & Zumthor, 2007. 24).

## MATERIAL APPROACH

Alongside the site specific Gneiss stone, The Therme Vals have been constructed from concrete, brass and glass (Hauser & Zumthor, 2007. 19). The placement of each material was delineated from the surrounding site, with concrete walls facing the mountains (Spier, 2001. 18.). Within the vast stone and concrete surfaces, small details in brass allowed the new architecture to develop its own architectural language. Through such discreet manipulations, the dialogue doesn't detract from the existing material relationships but rather builds on them and brings attention to their specified use, placement and subsequent dialogue with users. As Anderson notes, within Zumthor's architecture "materials reinforce and strengthen one another, producing a type of sympathetic coordination between elements and a type of 'total effect' (Anderson, 2014. 154). While the material palette is relatively small, Zumthor explains his method of using materials collaboratively, believing in the ability of contrasting materials to add value to one another when projected into an orchestrated design environment (Zumthor, 2001. 21). This exchange between human and nonhuman elements in Zumthor's work aligns the material approach with Jones and Cloke's notion of 'non reflexive' action in nonhuman agency (Jones and Cloke. Malafouris. 81). Within this premise, materials have the ability to "engender affective and emotional responses for the humans who dwell amongst them" (Jones and Cloke, 2008. 81).

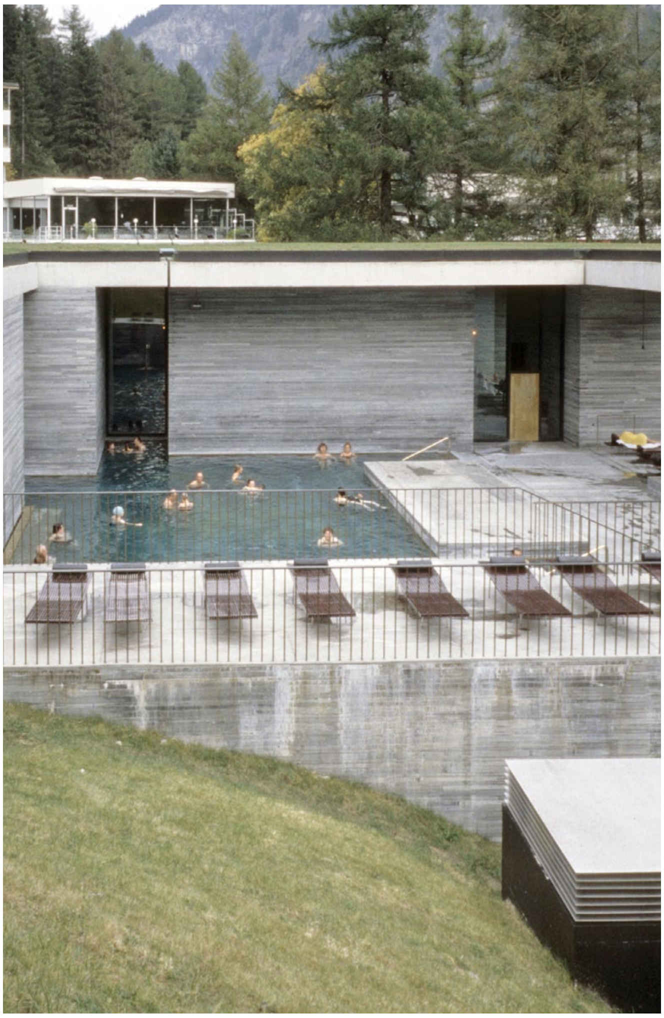

*Fig 3.03 Peter Zumthor's Therme Vals*

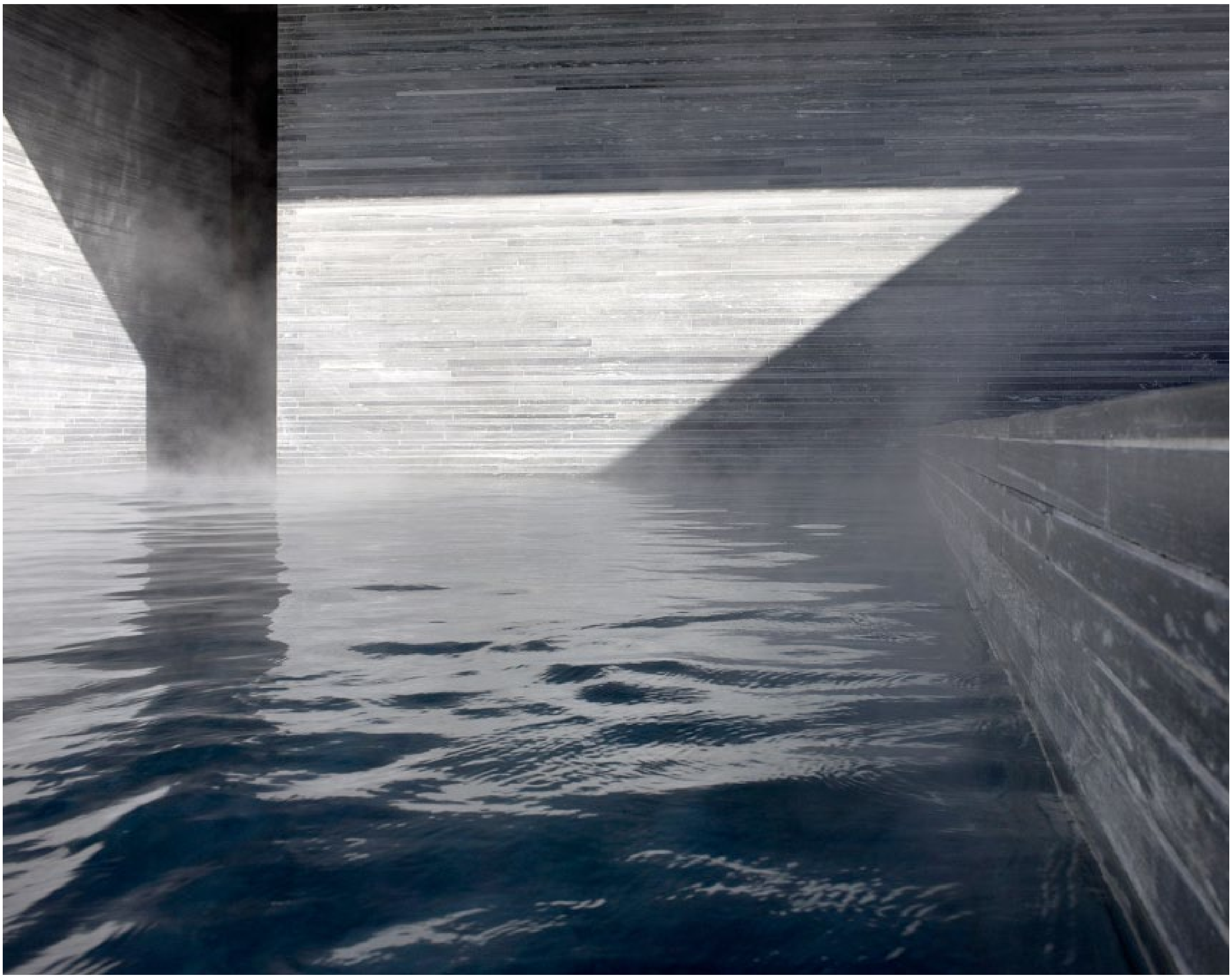
*Fig 3.04. Inside the Therme Vals*

## ATMOSPHERE

The affective manifestation of such 'non reflexive' action is described by Anderson as an experiential 'gut reaction' to space, suggesting that the reaction precedes emotional recognition (Anderson, 2009. 80). Zumthor, as already alluded to, employs nine architectural tools to build upon this reaction to space and subsequently build a more emotional perception of atmosphere (Zumthor, 2006. 6). In this way, the cumulative material layers can become the "origin of an atmosphere" (Anderson, 2014. 154). Zumthor further employs methods of light manipulation, acoustic control and interior tensions as a way of amplifying the atmospheric dialogue with the body (Zumthor, 2006. 21.). The end result seems to be a rather prescriptive mechanism, combining material layers and manipulations to produce the desired atmosphere.

## CONCLUSION

Zumthor's design employs material intimacy as a way of generating affective response. His amplification tools, outlined in his book 'Atmospheres' further seek to frame, bring attention to and engage the body with the sensory atmospheric conditions. The material approach has been conceptualized through an equally intimate relationship with site, drawing the material and immaterial qualities of site into the developed design. By using historic stone to catalyse the transition between new and old site structures, Zumthor has succeeded in creating a building which appears to be at a contextual equilibrium with its surroundings. This speaks to similar conditions of the site where my speculative design is situated. prompting a need to establish an approach to site and material use which embody similar design considerations to those exhibited in the Therme Vals project.

*Fig 3.05. Atmospheric conditions within the Therme Vals*

*Fig 3.06. Entrance to the Stone House*

## THE STONE HOUSE

**Architect:** Herog & de Meuron
**Location:** Tavole, Italy
**Year:** 1882-1888

## INTRODUCTION

The Stone House project was one of Herzog and de Meuron's first projects, conceptually designed to address how "architectural power is based on perception" (Simon, 2011. 22). Mariann Simon observes that the design challenges material and tectonic perception by 'misleading; its audience and further breaking traditional rules of construction in order to convey unexpected qualities of the materials used (Simon, 2011. 21). Within this 'unstable' concept, expressed through structure and contextual material use, Leatherbarrow notes that "the building cannot be traditional, despite the use of local materials" (Leatherbarrow, 2009. 108). Instead, Herzog & de Meuron have constructed a domestic project which alludes to the unexpected qualities of materials which are often overlooked once positioned in an architectural context.

## SITE APPROACH

The Stone House project, similar to the Therme Vals project, involves a concept that was derived from and subsequently iterated through material relationships with site (Forster, 2005. 47). The domestic structure is anchored to its surrounds by its stone fragment façade, which blends the walls of the home with the natural grains within the landscape. While exhibiting a similar site approach to that of the Therme Vals, the ensuing ways in which the materials have been arranged, both structurally and atmospherically, present a number of differences in material approach.

## MATERIAL APPROACH

Primarily composed of local stone and concrete, the materials used are similar to those of the Therme Vals, however they seem to exert agency through different modes. While Zumthor transformed site materials into seamless surfaces and uniform elements, Herzog & de Meuron notably designed the domestic structure to allow for reduced material manufacturing, instead constructing the main façade from layered fragments of stone. In his essay "Pieces for Four and More Hands", Kurt Forster describes the Stone House as existing on the "cutting edge between abstract geometry and found material" (Forster, 2005. 47). In this way, Herzog & de Meuron ignore notions that materials need to be transformed from their natural state in order to achieve architectural status. They designed the house to fit the material rather than vice versa. By giving such direct authority to the stone, material agency is developing through 'purposive' means, as outlined by Jones and Cloke as showcasing an ability to "influence future courses of action"(Jones and Cloke, 2008. 81).

## ATMOSPHERE

Wilifred Wang explains that "Herzog & de Meuron are once again seeking to combine architecture's primary physical dimension with its capacity to embody conceptual qualities" (Wang, 1998. 9). The atmospheric experience is therefore closely tied to the material experience, creating atmosphere through orientation and tectonic. This becomes evident in representations of the Stone House, which largely focus on the exterior of the structure, exposing the orientation, site relationship and scale of the house but often avoiding expressions of contained experience. This moves away from Anderson's description of affective atmospheres, which 'surround' and 'envelop' (Anderson, 2014. 139). Instead, this atmospheric manifestation implies an experience which is "affective by the virtue of its own location" (Ahmed, 2010. 33). Simon similarly observes the somewhat overwhelming tectonic presence of the structure and site, noting that the "outer appearance seems to be more impressive than the interior" (Simon, 2011. 21). Within this approach, the Stone House provides an atmosphere emerging from its tectonics, with materials acting as an experiential language which tie the architecture together. The atmosphere is therefore not contained, as observed in Zumthor's work, but rather delocalized and expansive through site. In this way, the project can be aligned with Bohme's theory regarding the spatial atmosphere and its capacity to exist outside of boundaries and contained spaces (Bohme, 1993. 114).


*Fig 3.07 Exterior view of the Stone House*

## CONCLUSION

Both projects generate an affective response through their material approach. Zumthor uses his 'elements of atmosphere' to build upon this response and dictate a more prescriptive dialogue with the body, in which the "individual subject experiences very specific situations" (Ursprung, 2009. 1.). Conversely, Herzog & de Meuron seem to limit material manipulations as a way of encouraging less specified and more inquisitive understandings of space. Within this staging, there is a noticeable shift from the expanding atmosphere of the Stone House, which extends from the interior to the wider site, to one which is amplified by its own containment. Despite their similarities in site and material approach, the contrasting designs have ultimately created very different atmospheric conditions, therefore demonstrating the capacity of materials to amplify atmosphere in a number of ways.

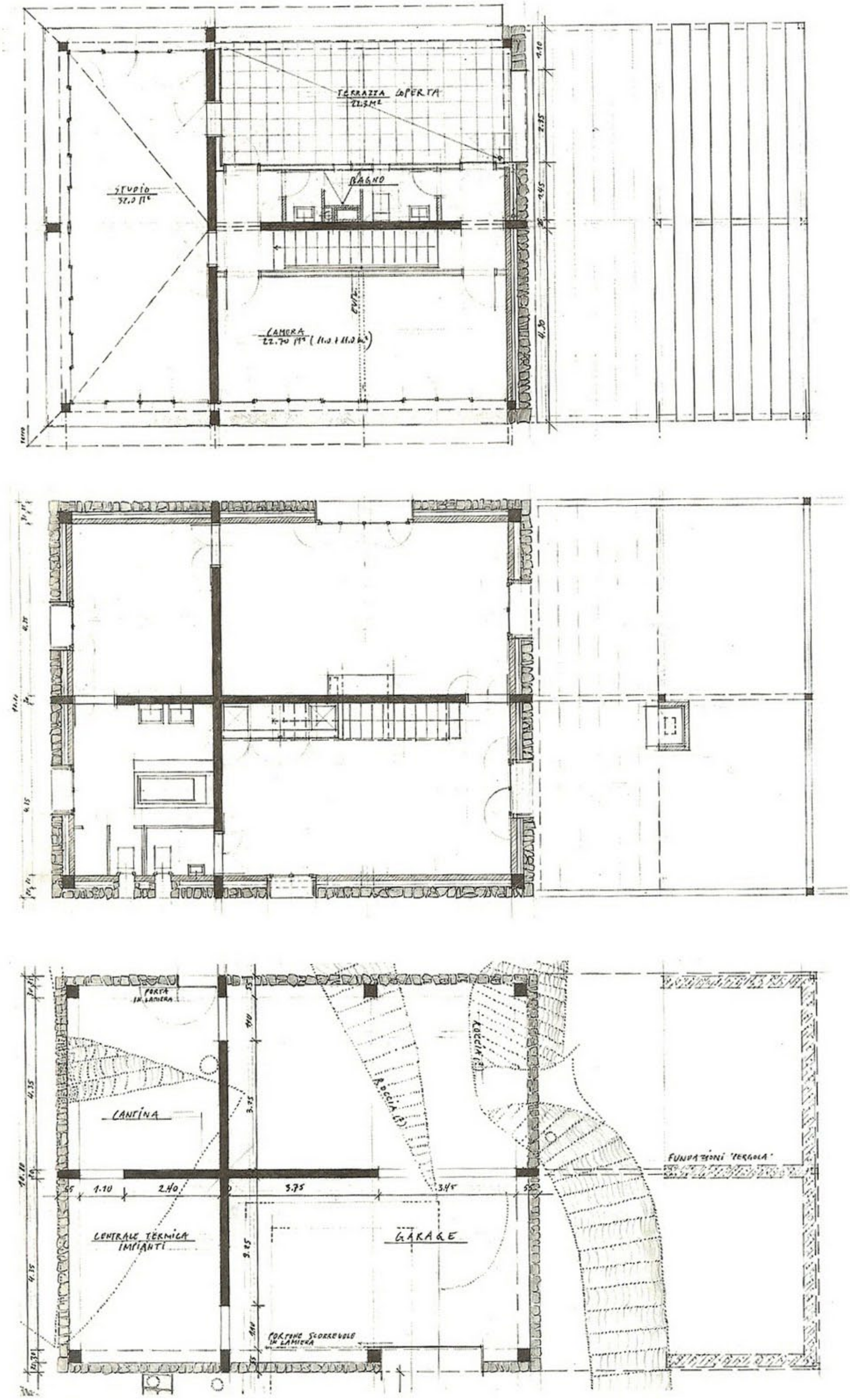


*Fig 3.08 Plan drawings of the Stone House*

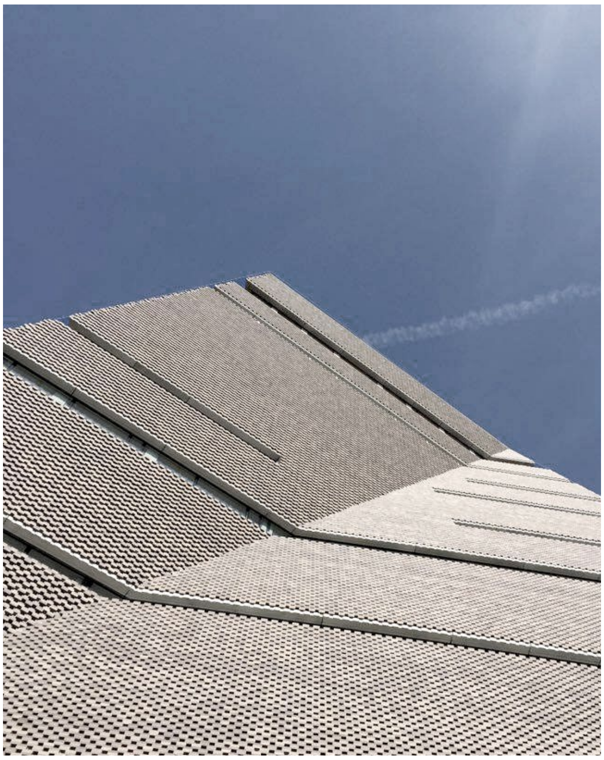
Fig 3.09 *The Switch House facade*

## SWITCH HOUSE EXTENSION

**Architect:** Herzog & de Meuron
**Location:** London, United Kingdom
**Year:** 2016

## INTRODUCTION

A closer look at Herzog & de Meuron's recent Switch House extension was an opportunity to compare shifts in material approach following the material turn and its ensuing effects on sensory considerations. Mariann Simon notes a clear progression within Herzog and de Meuron's more recent projects, increasing the "sensuality of buildings" and seeking to convey "material and spatial effects, as well as definite or hidden messages" (Simon, 2011. 25). The project therefore leans toward an approach to materiality which generates a material authority over the body.

## SITE APPROACH

The Tate Modern is located along the Southbank in London which holds some similar site conditions to those observed at the Norton Folgate site used for this design research project. While the surrounding buildings have a more varied material and programmatic range, the use of traditional brick as a means of anchoring the project to the historical city is an equally relevant design decision within this speculative design research. The Switch House design fuses analogue and digital design methods to create a 10-storey twisted structure of latticed brickwork located towards the South end of the site. The design highlighted the potential risks of inserting new architecture into densely populated urban environments. The high rise nature of the extension and the buildings that surround it have created privacy issues, most noticeably from the viewing gallery on the 10th floor which looks directly into surrounding residential building (Frearson, 2016. Web.).

## MATERIAL APPROACH

Ascan Mergenthaler, a senior partner at Herzog & de Meuron, describes the structure as being “framed by a concrete skeleton and enveloped with a brick veil” (Mergenthaler, 2016. Web). Designed to be a seamless transition from existing to new, the brick materiality ties the structure to its historic surroundings whilst simultaneously showcasing its contrasting aesthetic nature. On the subject of contextual materiality, Latham and McCormack critique the tendency to understand materials based upon their completed and concrete presence, stating that doing so “postpones a fuller understanding of the material” and neglects the incremental processes, both tangible and intangible that ultimately lead to material production (Latham and McCormack, 2004. 705). Herzog & de Meuron have avoided such an approach to material understanding by engaging with the brick structure throughout the manufacturing process. Although the bricks contextually tie the project to the site, the type of brick used is unique in its shape, colour, bond and layout. Herzog and de Meuron designed a two tone brick, composed of two contrasting clay layers which are bound together (Haugh, 2016. Web.). By engaging with the bricks in stages which preceded their ultimate completion, Herzog and de Meuron established an inherent correlation between material manufacturing and design processes. In doing so, they are acknowledging the agential capabilities of materials within their transformative production, which are often ignored once the transformation is complete. By engaging with these incremental processes through the creation of a new brick, the material shows its dynamism as a non-human agency. Jones and Cloke describe the development of material agency through routine action, often with human intervention, whereby materials ‘transcend the passive role’ (Jones and Cloke, 2008. 80).

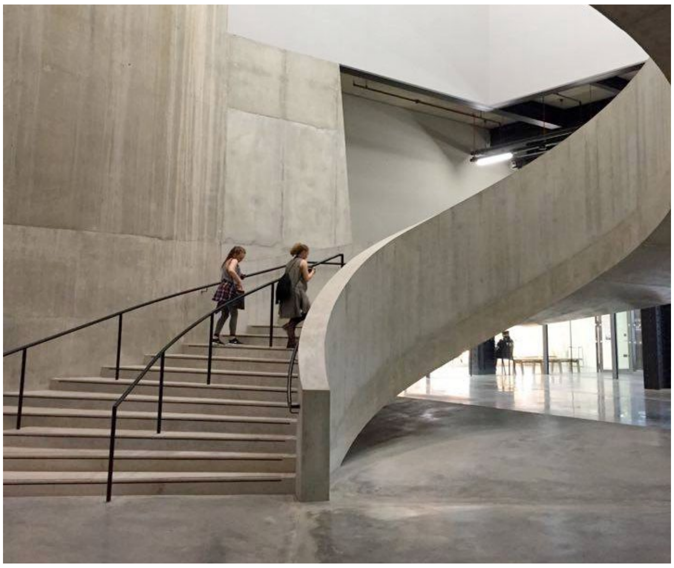

*Fig 3.10 and 3.11. Interior views of the Switch House*

## ATMOSPHERE

On visiting the Switch House extension in June 2016, there was a striking sense of contrast between the exterior and interior aesthetics of the gallery. The sleek and smooth concrete interior presents a surprising experience against the textured brick façade. Powerful relationships with light are established through the perforated brick screens, and the exposure of existing structures within the power station bring to light the cultural shifts within the gallery. Changes in floor level, the creation of enclosed contemplation spaces and the consistent play with surface proximity begin to engage the body in a way which reflects Zumthor's atmospheric approach to the Therme Vals, suggesting a more assertive and specified dialogue between matter and the body in space. As Simon notes, "the body of the visitor is put centre stage" (Simon, 2011. 25). Relationships with the body are less objective and the outcome is less tectonic than that of the Stone House, seemingly seeking to envelop rather than situate the body in space.

## CONCLUSION

By integrating a unique and contextually driven material formation into their design, Herzog and de Meuron directly involved themselves in the material transformation process whereby material production played an active role in design development. The same can be said for both the Therme Vals and Stone House projects, which acquire naturally occurring materials from the site and transform them for structural and aesthetic use. While Zumthor sought seamless and uniform material layers, Herzog and de Meuron chose to keep large stone fragments within the Stone House as unprocessed as possible, instead employing frames and cages to stack the material parts. Throughout all the projects, the designers have given authority and further agency to materials by allowing them to have a force on the design process, to some degree, through the formation of physical connections to the site, creating specific temperate and acoustic surfaces, and engaging with material manufacturing processes.

*Fig 3.12. (Right). Interior view up the Switch House*

**Research** ***through*** **Design**

1.0

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INSTALLATION 4.0

- *Aim*
- *Method*
- *Material Approach*
- *Atmosphere*
- *Design Outcome*
- *Reflection*

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# 4

# INSTALLATION SCALE

## INTRODUCTION

The installation enquiry was an opportunity to set the material parameters for the research through design. Having outlined the theoretical and physical context for the practical work in the research for design chapters, the following three enquiries, gradually building in scale, illustrate the practical methodologies associated with the research question and subsequently convey their research based design outputs. Within this installation chapter, the aim of the enquiry is explained through material and atmospheric approach. The design outcome is then explained in detail following practical iterative development. The whole process is ultimately concluded and reflected upon, highlighting limitations which subsequently shaped the domestic enquiry process discussed in the following chapter.

## AIM

The aim of the installation was to explore material tendencies and qualities. The enquiry further sought to explore and test how the aesthetic capabilities of materials could be emphasized to provide their authoritative role in the design process.



*Fig 4.01. (Right). Material model from installation inquiry*

## MATERIAL APPROACH

Knowing that the material enquiries would ultimately progress to a speculative public scale design, it was important to establish an approach to the practical inquiry which had the capacity to produce architectural outputs. Initial material research focussed on the work of Kengo Kuma, who formulated a unique approach to materiality which stemmed from a conscious desire to neglect the solidarity associated with architecture. Instead, he believes that "a building should become one with its surroundings" (Bognar, 2005. 8). Rather than making buildings 'disappear' within their surroundings, Kuma used materials to bind the architecture to their wider context, often by using traditional materials in a new and innovative way (Bognar, 2005. 9). Since the installation enquiry was void of a geographical context, space was made for a independently constructed context. In order to develop a material agency, materials acted as both context and product; with the tendencies and qualities of each material forming the foundations for each further iteration. Physical testing at the installation scale provided the framework in which to carry out these independent investigations.

*Fig 4.02. Material model from installation enquiry adding transparent elements to the original stone*



*Fig 4.03. (Right). Material model from installation enquiry using plaster to 'remake' the stone*

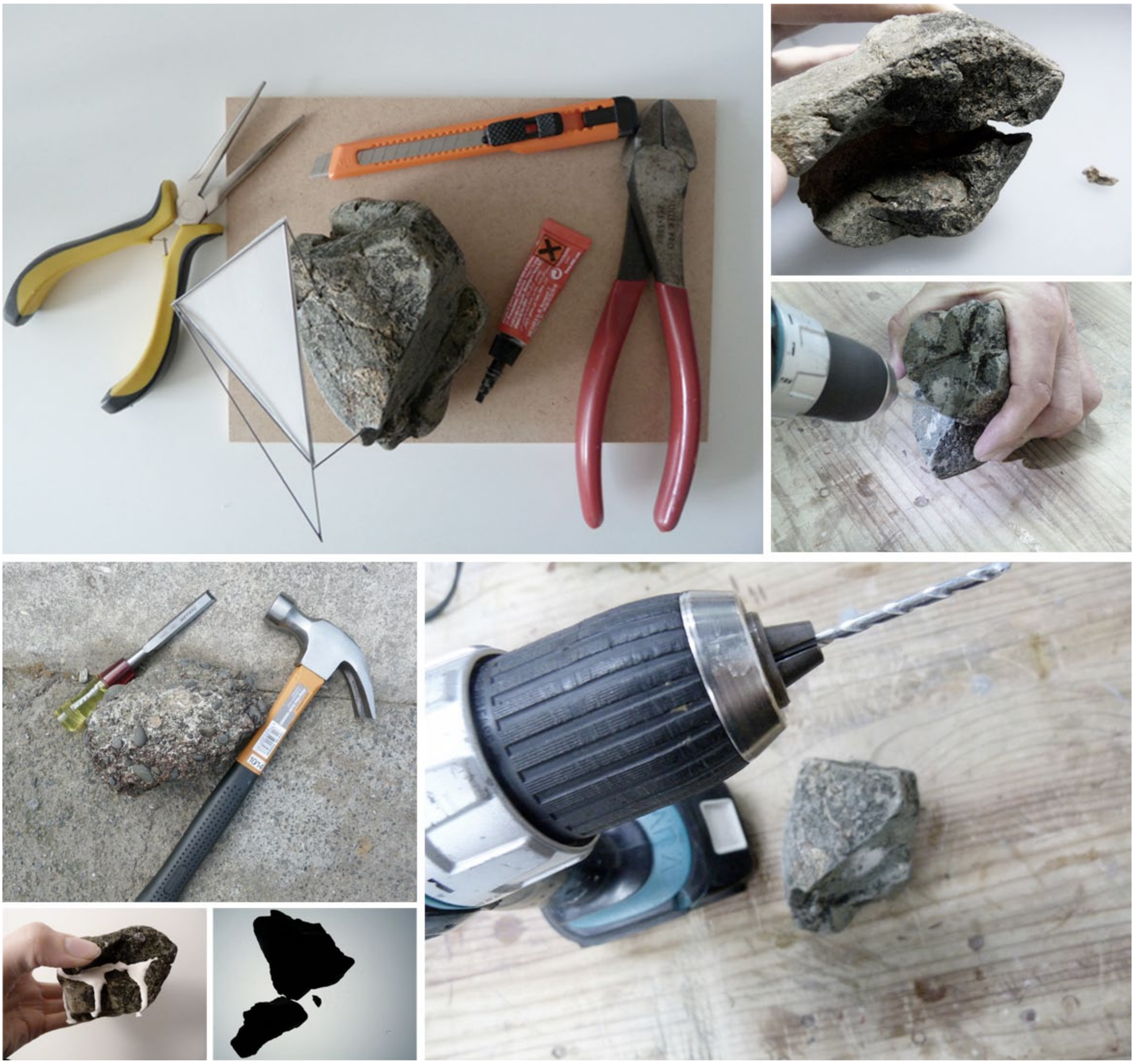


*Fig 4.04. Process images from various material enquiries*

## METHOD

Stone was selected as the starting point for the material enquiry given its ability to represent the historic fabric, primarily masonry, predominant at the Norton Folgate site. The material was progressively altered until it was ultimately recreated as an entirely artificial material object. Methods of abstraction became more invasive over time, moving from small scale additions to irreversible deconstructions, reconstructions and mouldings. Additions were constructed from card, wire, timber and plastic sheeting while more malleable materials such as plaster and clay enabled surface models and mouldings to be made. Processes of 'unmaking' the stone through progressive deconstruction were formulated using drilling and sawing tools in the workshop. A range of media was used in order to intensify material understandings and representations as much as possible, whilst keeping a progressive structure ot the enquiry. Smout and Allen emphasize the need for multiple modes of inquiry by stating that "visual representation by means of drawings and models is a fundamental mode of design enquiry that provides…a register of the investigation, the object of the investigation and its product" (Smout and Allen, 2008. 82). Each material iteration was recorded through photography and the resulting atmospheres evaluated over a series of hand drawings. The photographs and drawings were placed along a three dimensional timeline, illustrating the transition from original to artificial materiality. The images were printed on a variety of transparent materials and subsequently layered up within a wire frame as to highlight the hierarchies, turning points and milestones within the explorative process.

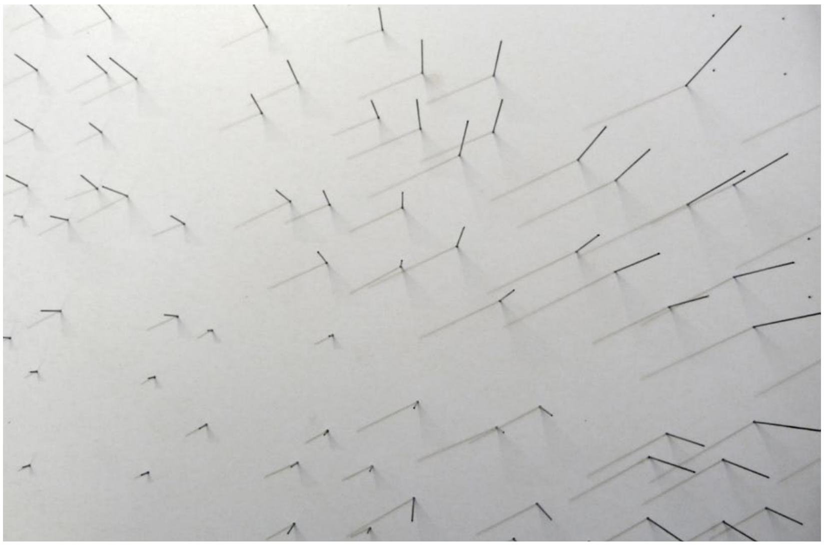


Fig 4.05. and 4.06. Photographs from installation construction



*Fig 4.07. (Left). Material model from installation enquiry*

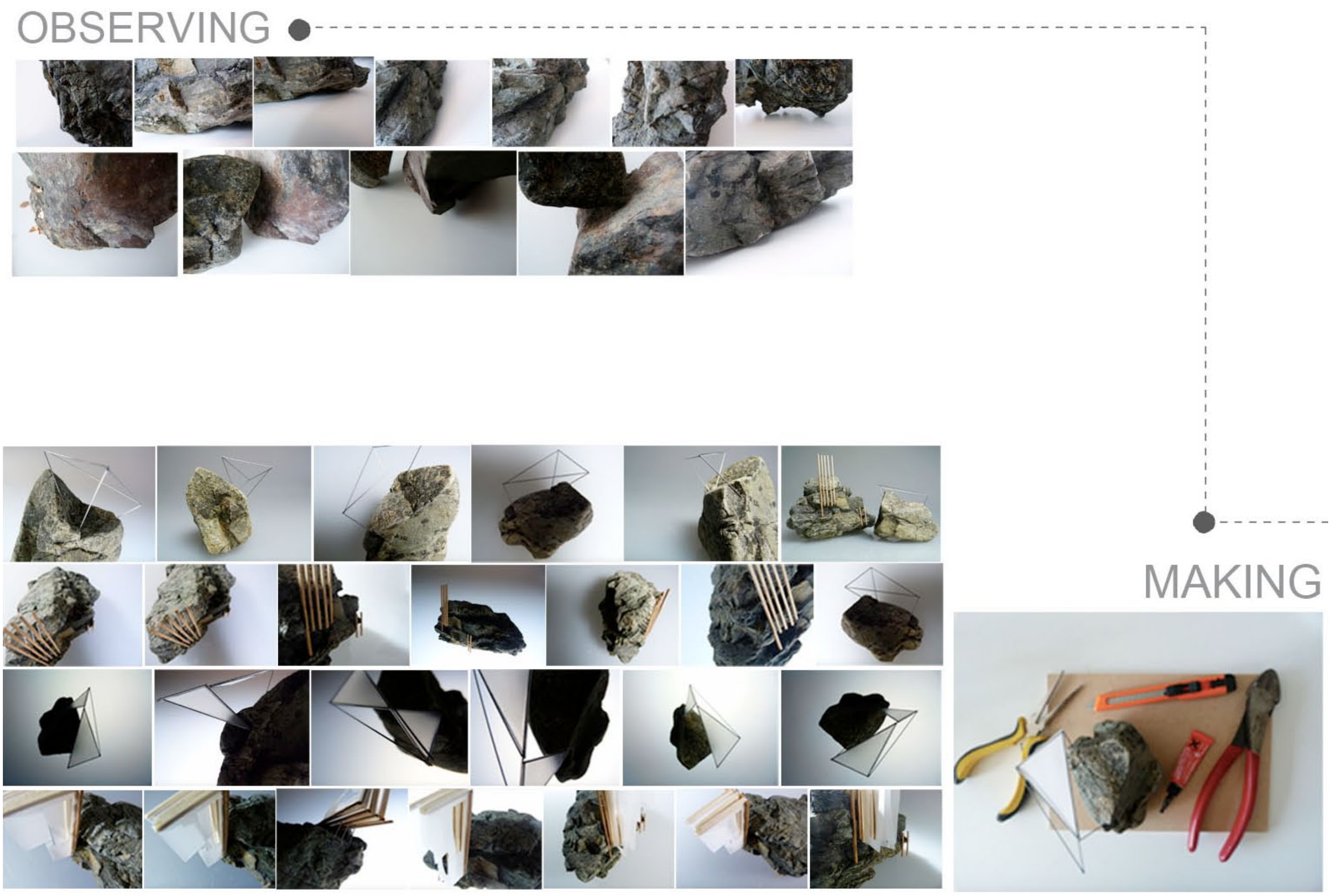





*Fig 4.08. Illustrated process from original material to artificial recreation*

UNMAKING

REMAKING

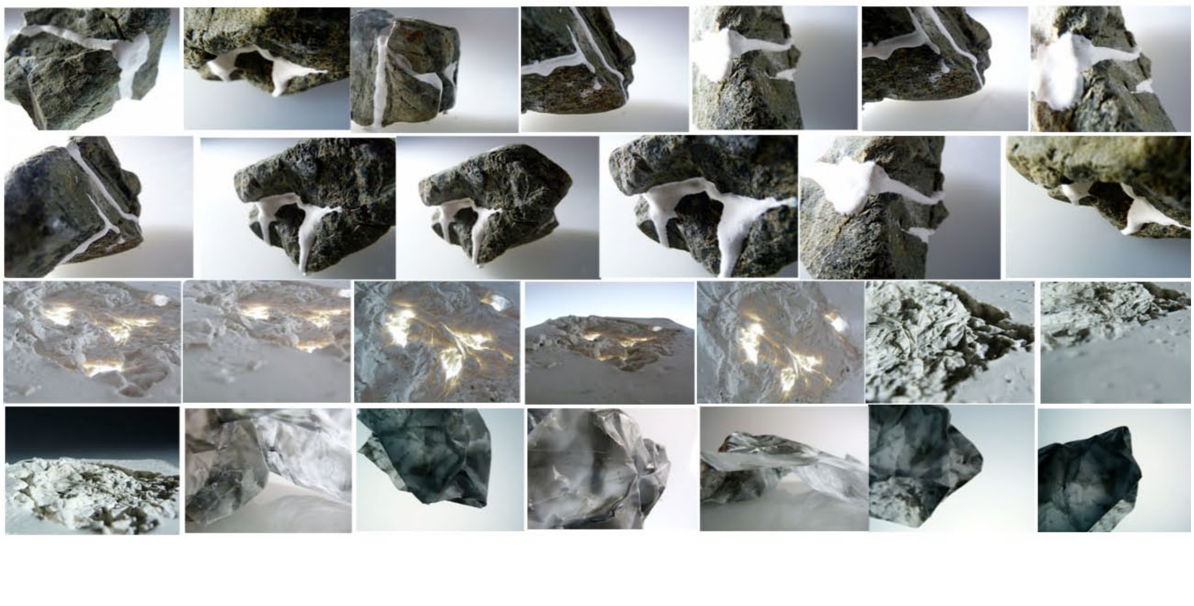


*Fig 4.09. Photograph of stone model making*

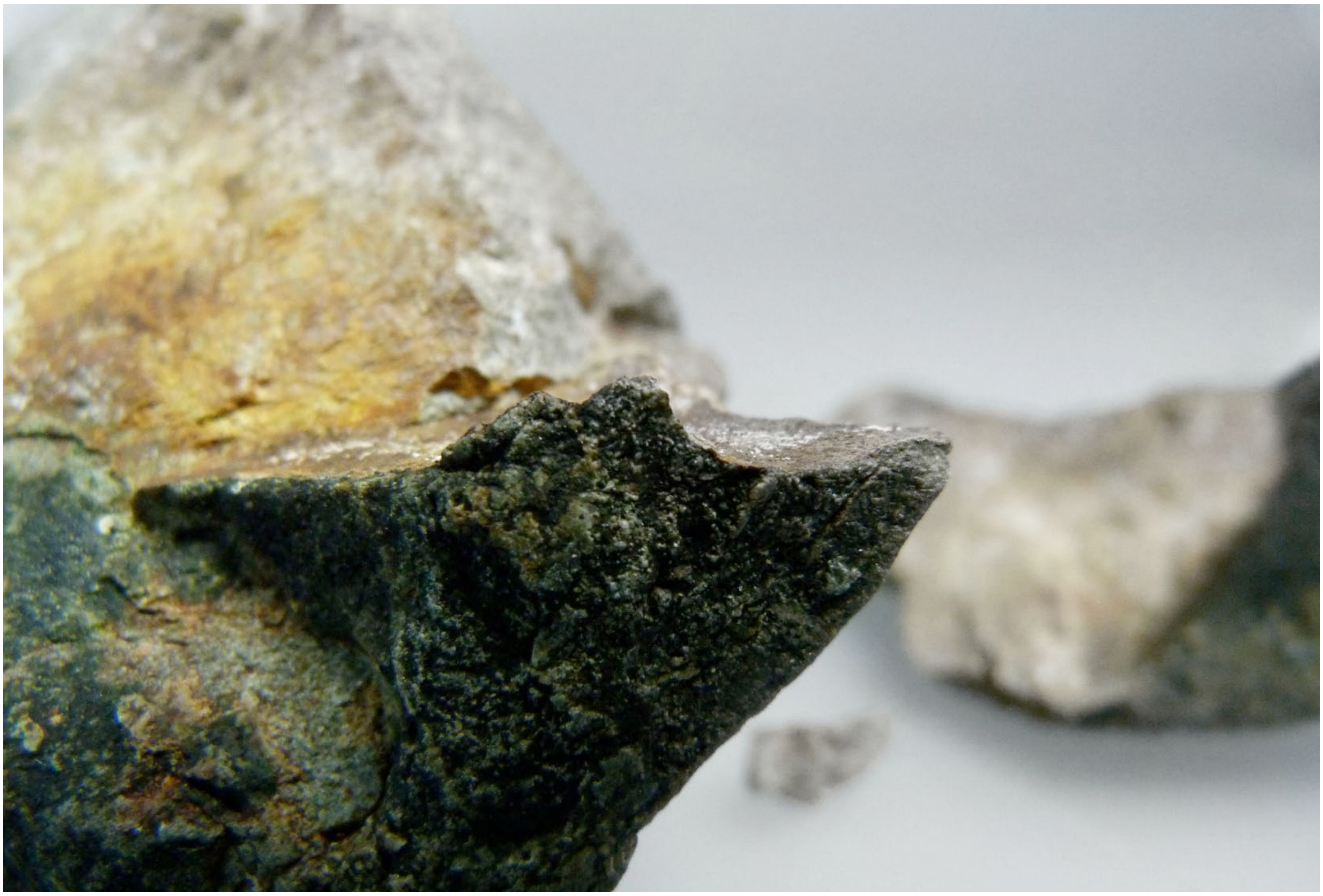


*Fig 4.10. Photograph of stone model unmaking*

*Fig 4.11. Photograph of stone model making*

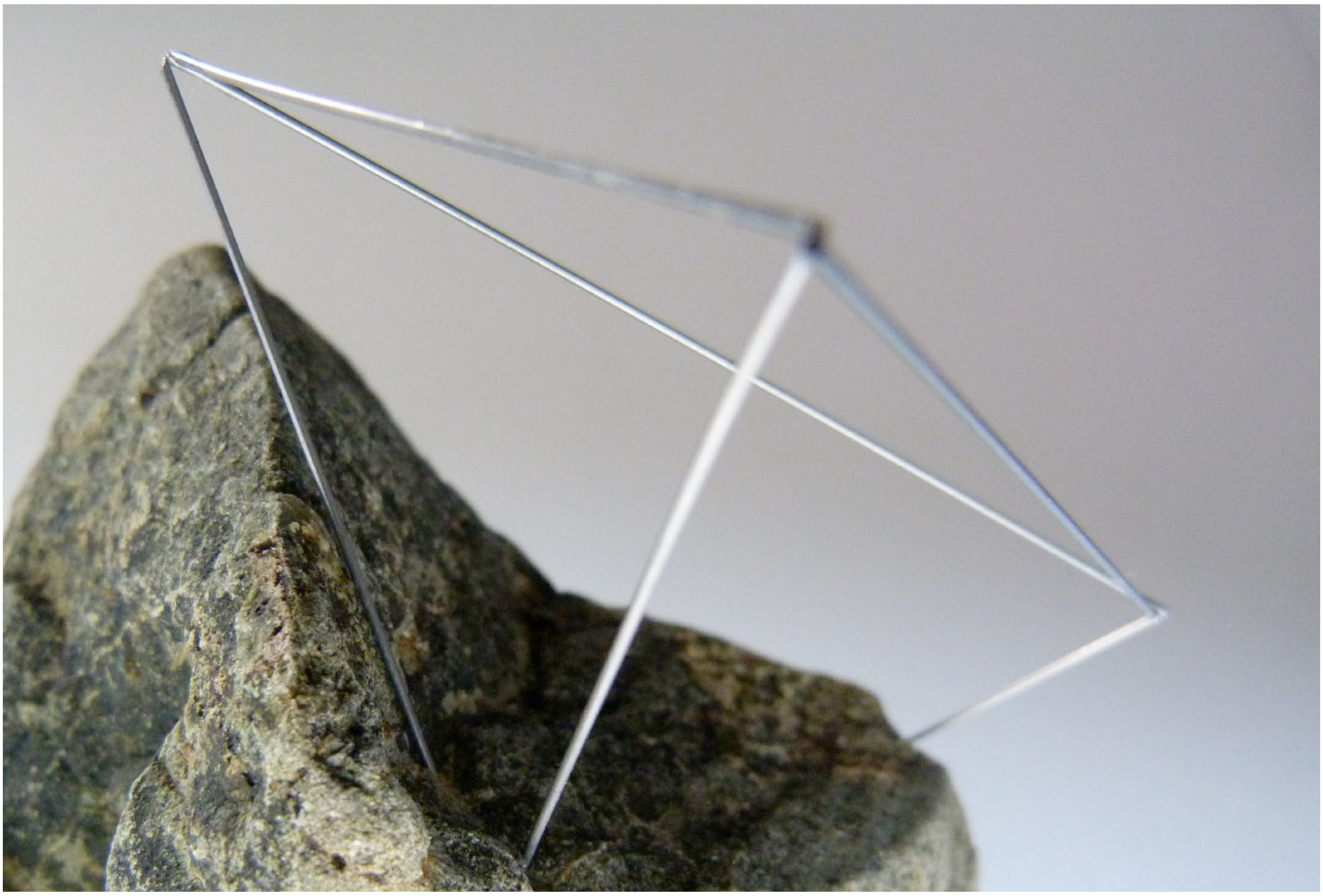


*Fig 4.12. Photograph of stone model making*


*Fig 4.13. Photograph of plaster moulded stone surface*

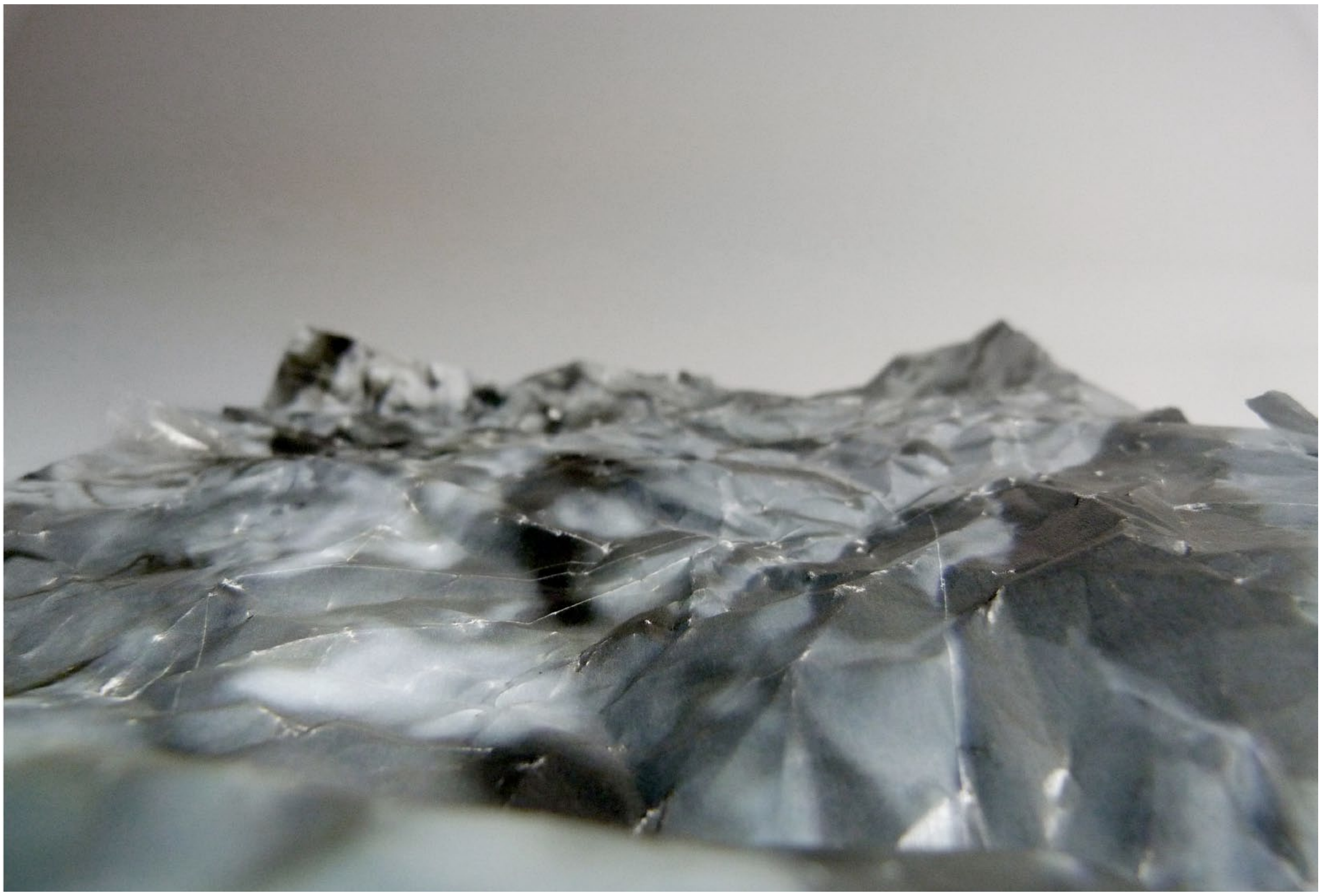


*Fig 4.14. Photograph of plastic surface print*

## MAKING + UNMAKING

Making and Unmaking the Stone
The final process of the enquiry has been outlined below. The process was formulated in order to interrogate the shifts in material authenticity and highlight the tangible and intangible outcomes of the material enquiry.

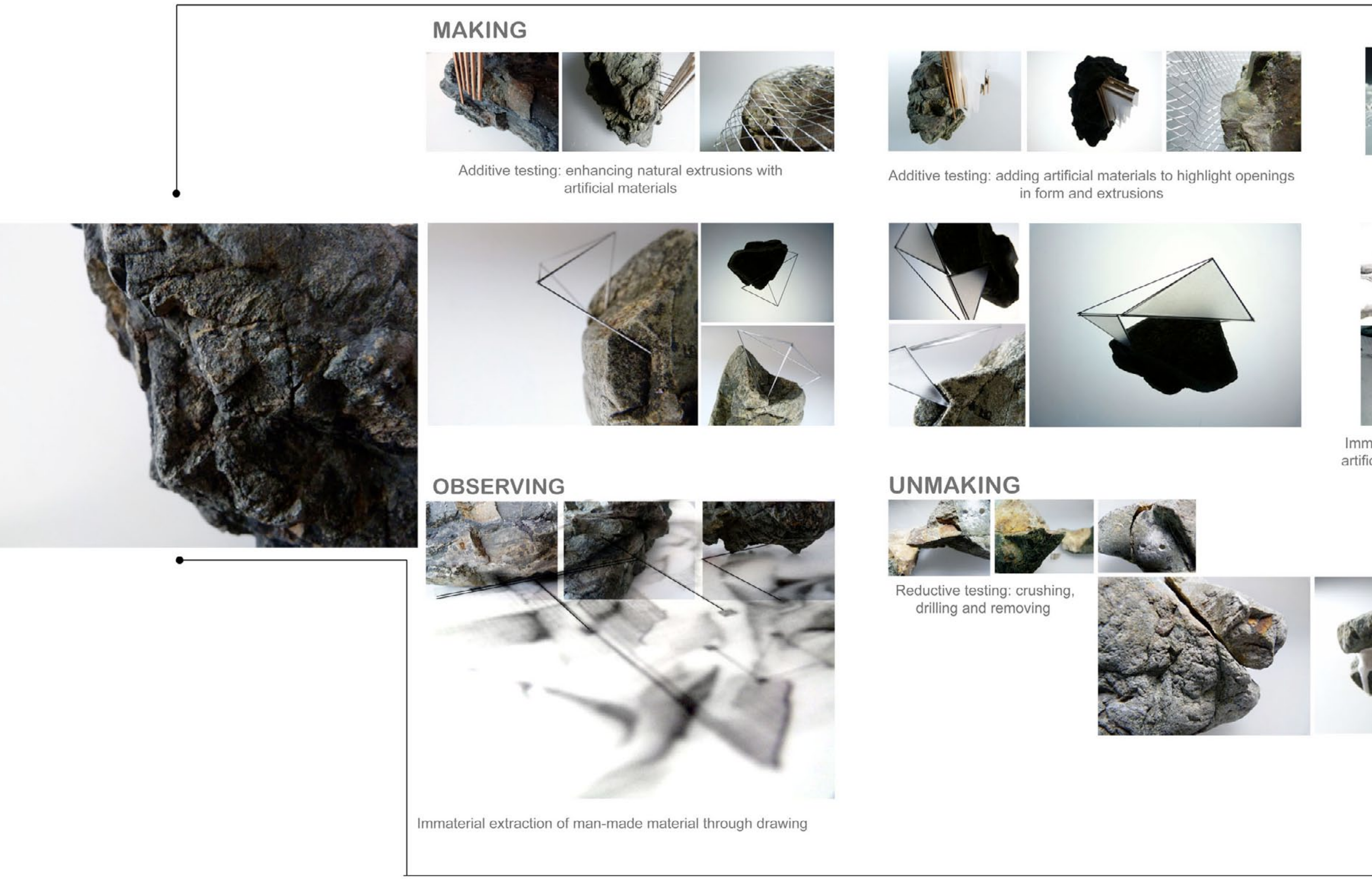
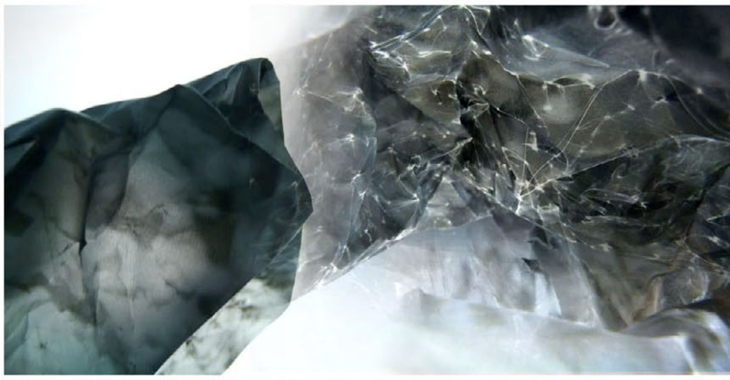



*Fig 4.15. Installation process showing stages of making, unmaking, remaking and drawing*

Moulding and inverting stone surfaces.

## REMAKING

Recreation of stone through surface printing and two dimensional representations



material extraction of
ificial material through
drawing

Reconstruction with artificial material in natural breaks within the stone

Overlays of two dimensional representations as aesthetic point of comparison

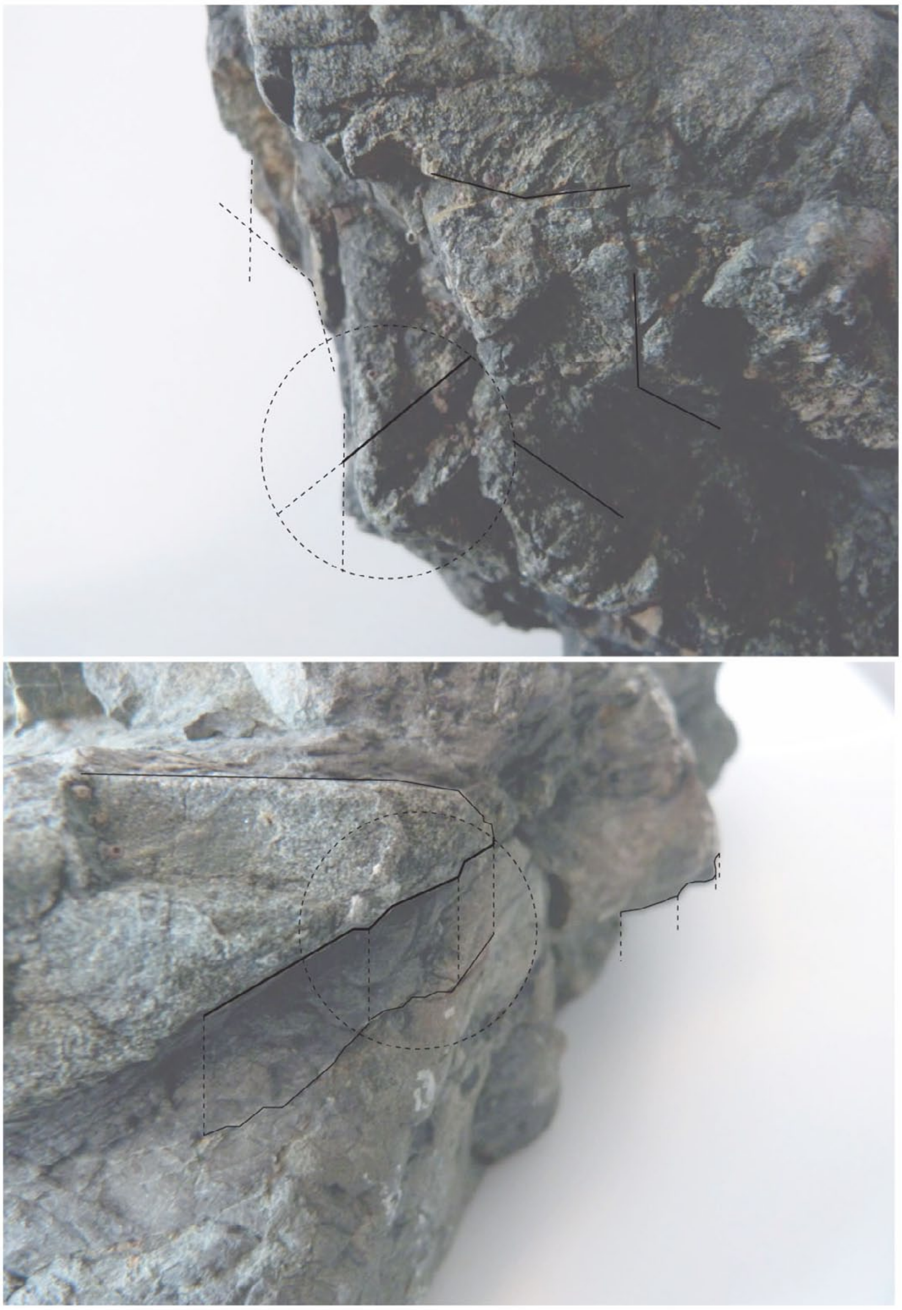


*Fig 4.16. Surface analysis of original material (observation phase)*

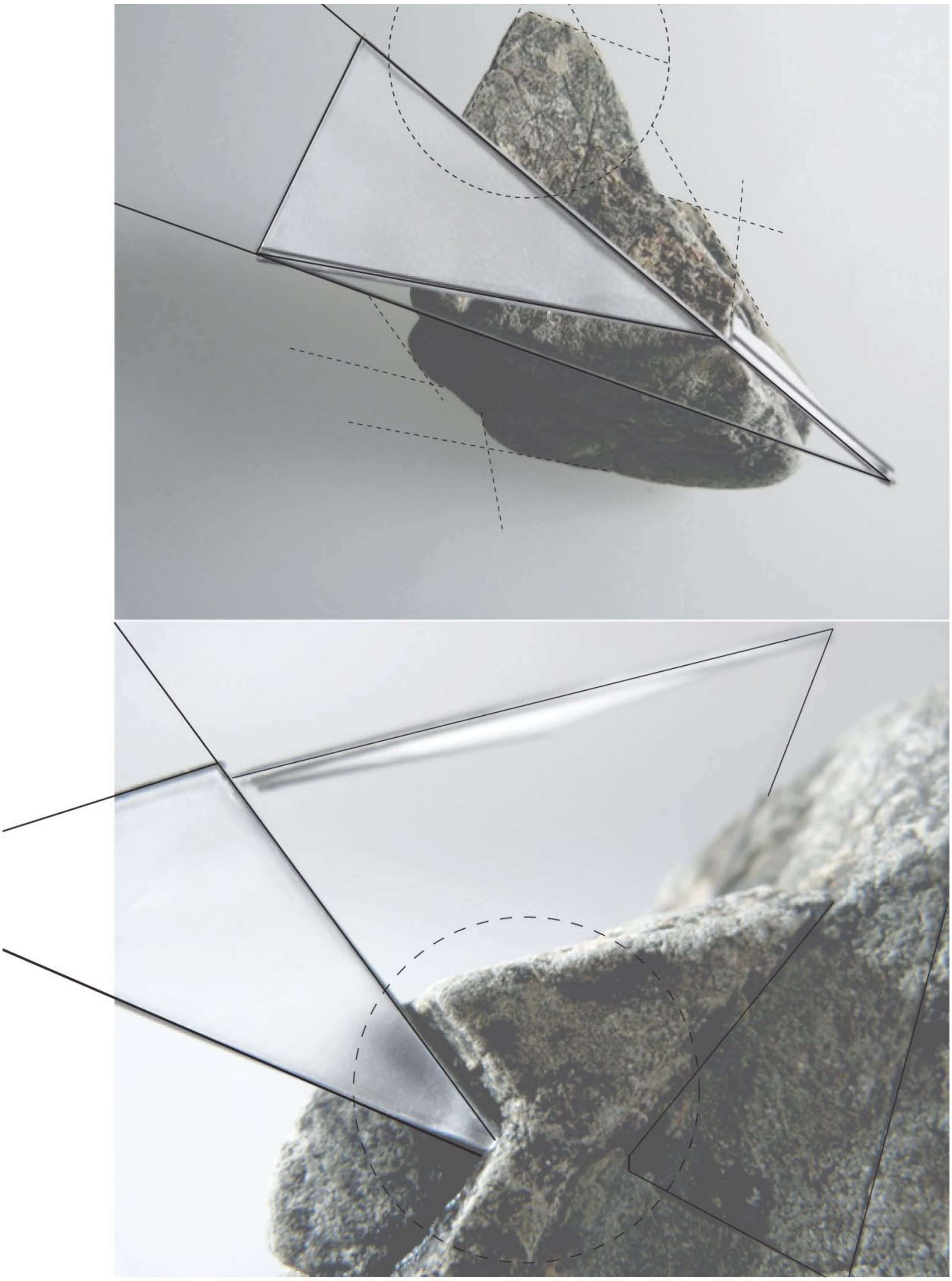


*Fig 4.17. Surface analysis of additive material models (making phase)*

*Fig 4.18. Surface analysis of new material models (remaking phase)*

*Fig 4.19. Surface analysis of new material models (remaking phase)*

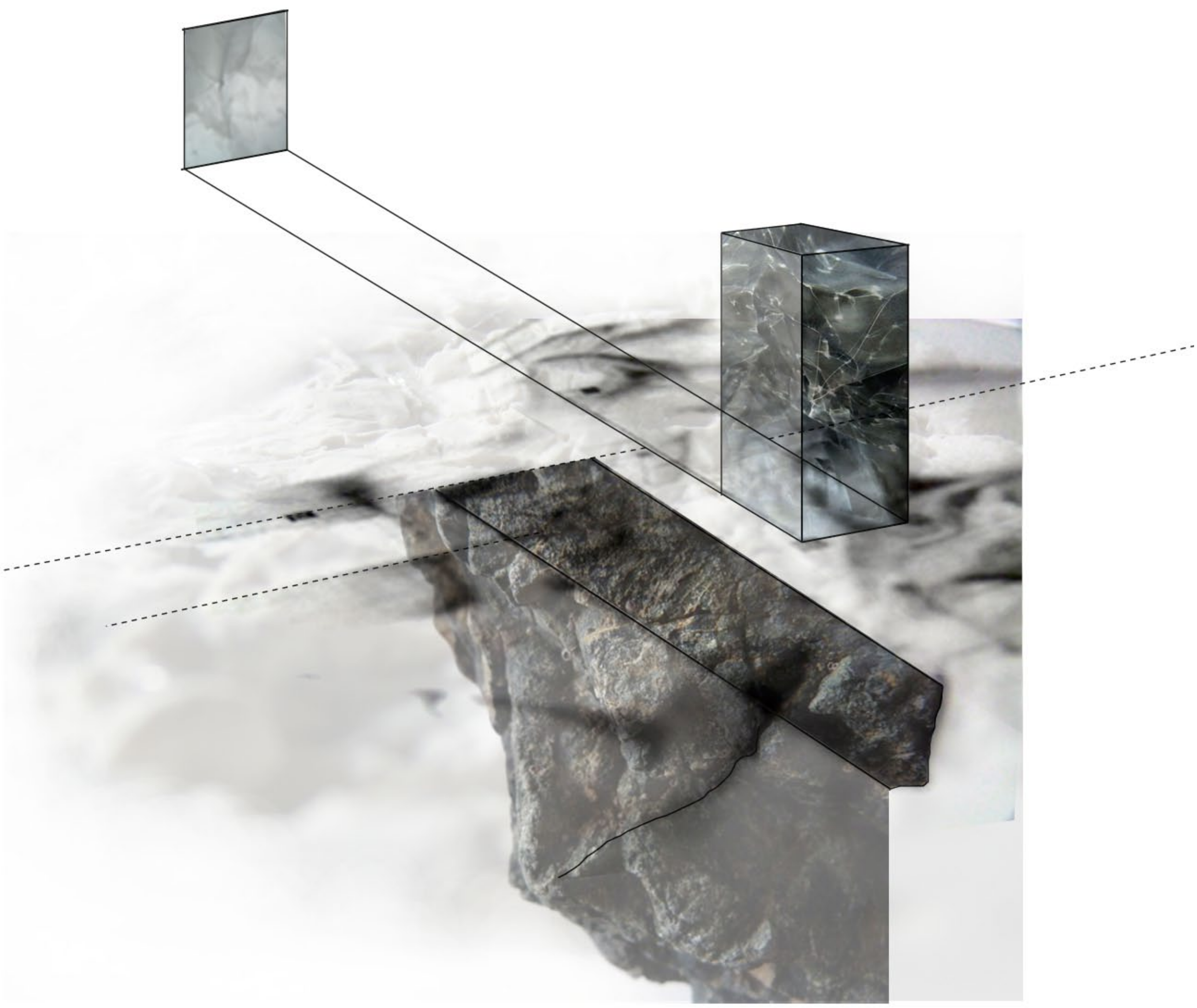


*Fig 4.21. Diagram of perceived atmospheric shifts between original and remade material models*



*Fig 4.20. (Previous). Photograph of stone recreation made from printed plastic film*

## ATMOSPHERE

Atmospheric conditions were amplified as much as possible through lighting changes and material interactions. Photography was the main documentation tool, often relying on the layering up of images to convey progressive relationships throughout the material enquiry. Hand drawing was also employed as a tool to actively 'draw out' the atmospheric qualities within the experiments.  Given the isolating qualities of each material model, having largely been developed void of site and contextual grounding, the resulting atmospheric outputs were of an aesthetic nature. The lack of spatial parameters and inhabited forms meant that atmospheric understandings of the material were predominantly objective, aligning the approach to Anderson's aesthetic descriptions of atmosphere (Anderson, 2014. 79).

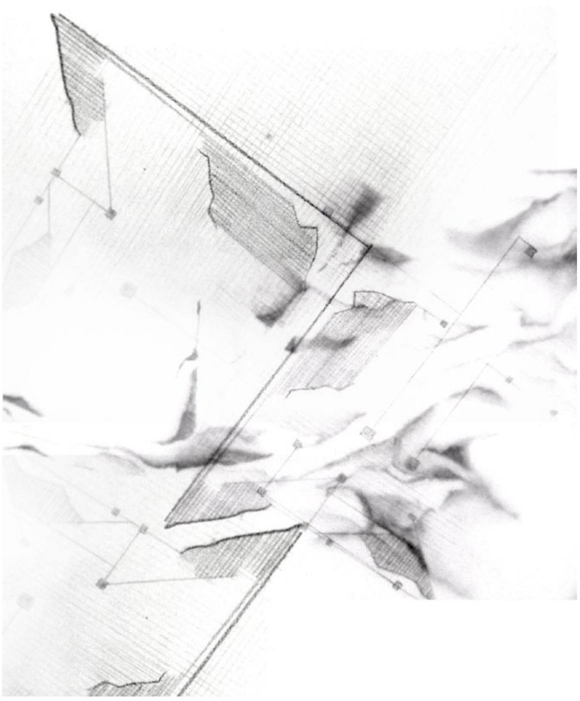


*Fig 4.22. Atmospheric drawing from 'remaking' stages of the enquiry*

*Fig 4.24. Images of stone unmaking to better understand tactile material qualities*



*Fig 4.23. (Left). Photograph of stone model making*

## DESIGN OUTCOME

The final installation became a way of conveying the material enquiry in a way which reflected the integrated and speculative nature of its process. Images of the original stone and contrasting images of its plastic recreation formed the beginning and end points of the process, with images of the 'in-between' material models filling the remaining space. The linearity of the installation allowed for a comprehensive reading from natural to artificial. The images were layered up within a wire framework which was constructed from music wire and embedded into a laser cut base. A hierarchal dimension to the installation was implemented through the varying height of the wire framework, with the highest part embodying the middle of the material enquiry, at which point the investigation shifted from working with the original stone to working entirely independent from it. The layering up of process images within the wire rails allowed the iterations to be ordered not only by their progressive alienation but further by the strength of their relationships with previous models. Images were therefore stacked in groups to show their similarities and differences, both tactile and atmospheric.

*Fig 4.25. Material model from instalation enquiry*

*Fig 4.26. (Right). Photograph of final installation*

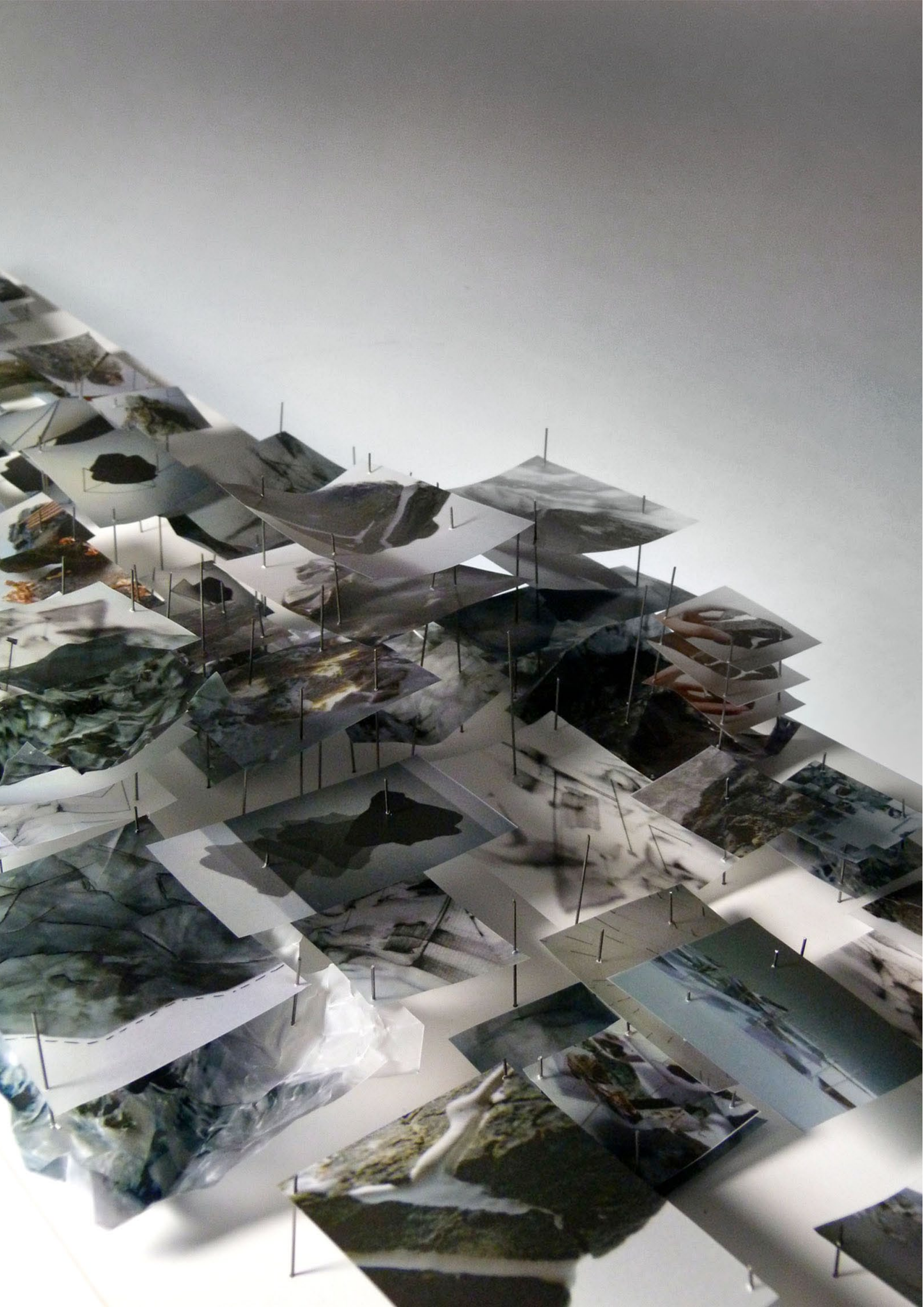


*Fig 4.27. Photograph of final installation*

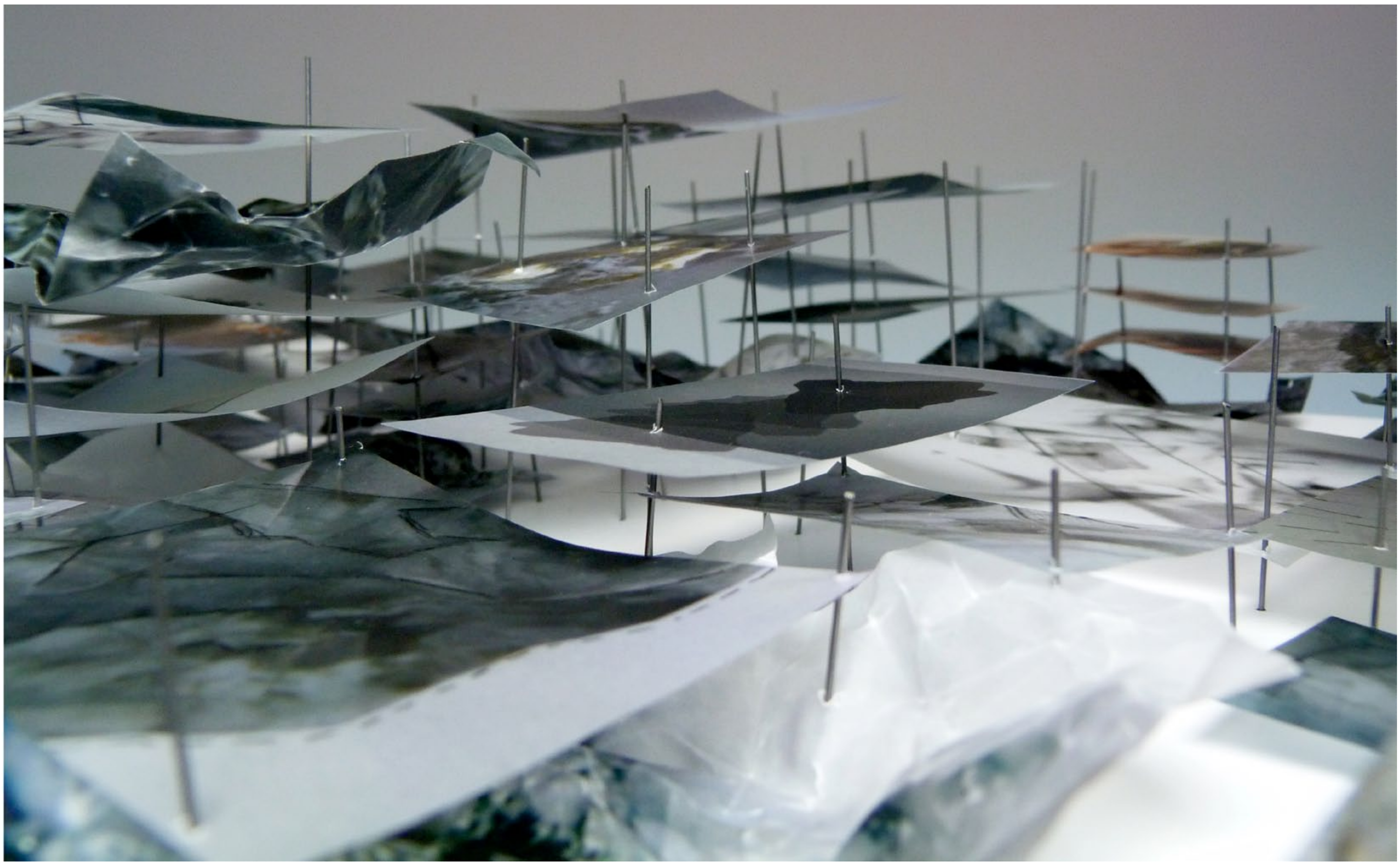


*Fig 4.28. Photograph of final installation*

## REFLECTION

The material enquiry at installation scale introduced a generative framework which ultimately communicated the contrasting qualities of stone, wire, plaster, plastic and paper. Furthermore, the installation process began to define and further test the interplay between material behaviour as its ability to amplify atmosphere. The process of adding to, subtracting from, casting shadow onto and so forth soon became a material toolset, similar to that observed in Zumthor's 'Atmospheres' which sought to strengthen the relationship between materiality and atmosphere. By removing any functional demand from the models and exploring them void of context and programmatic requirements, they became increasingly vulnerable to intervention without limits. In this way, the experiment allowed for an unrestricted mode of making and unmaking, encouraging material responses which may not have been generated if seeking architectural resolution. The material enquiry at this scale therefore remained heavily abstracted, yet the incorporation of atmospheric representations prepared the research for the necessary shift to embodied considerations at the larger scales. Photography, combined with light manipulation techniques, proved to be the most successful tool in conveying both elements of the model series. With this in mind, it seemed necessary to continue using these methods as the primary mode of testing at the domestic scale.

It was noted that the installation enquiry failed to properly articulate the role of atmosphere in relation to material agency. The challenge arose when attempting to formulate an expressive dialogue between the materials themselves and the atmospheric outputs that were associated with each model. The lack of context and spaces of inhabitation seemed to alienate the models to a point where the atmosphere was activated purely through representational post production. This marked the starting point for practical enquiry at the domestic scale.



*Fig 4.29. (Left). Photograph of final installation*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DOMESTIC
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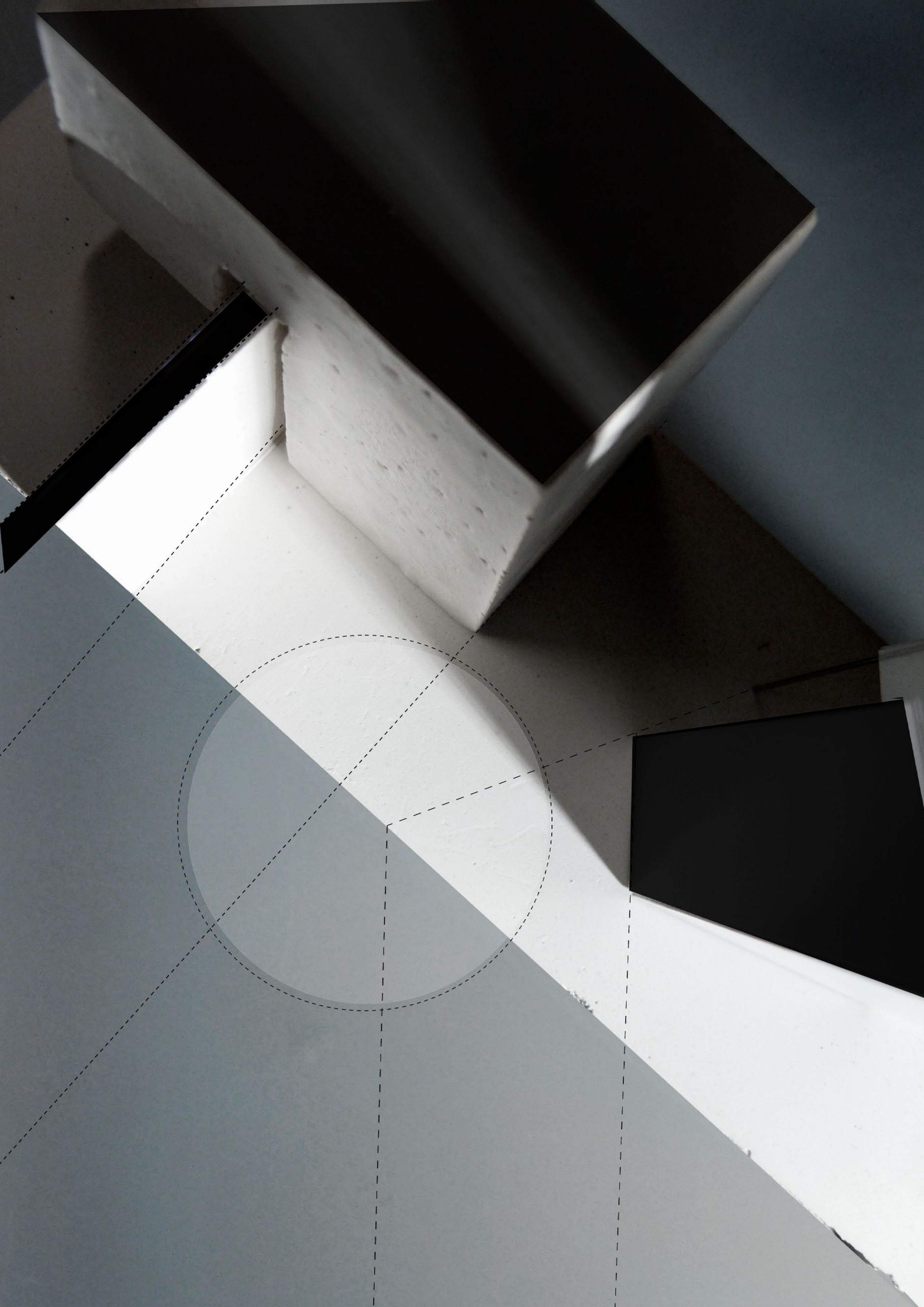
Aim
Method
Site
Material Approach
Atmosphere
Design Outcome
Reflection

# 5

# DOMESTIC SCALE

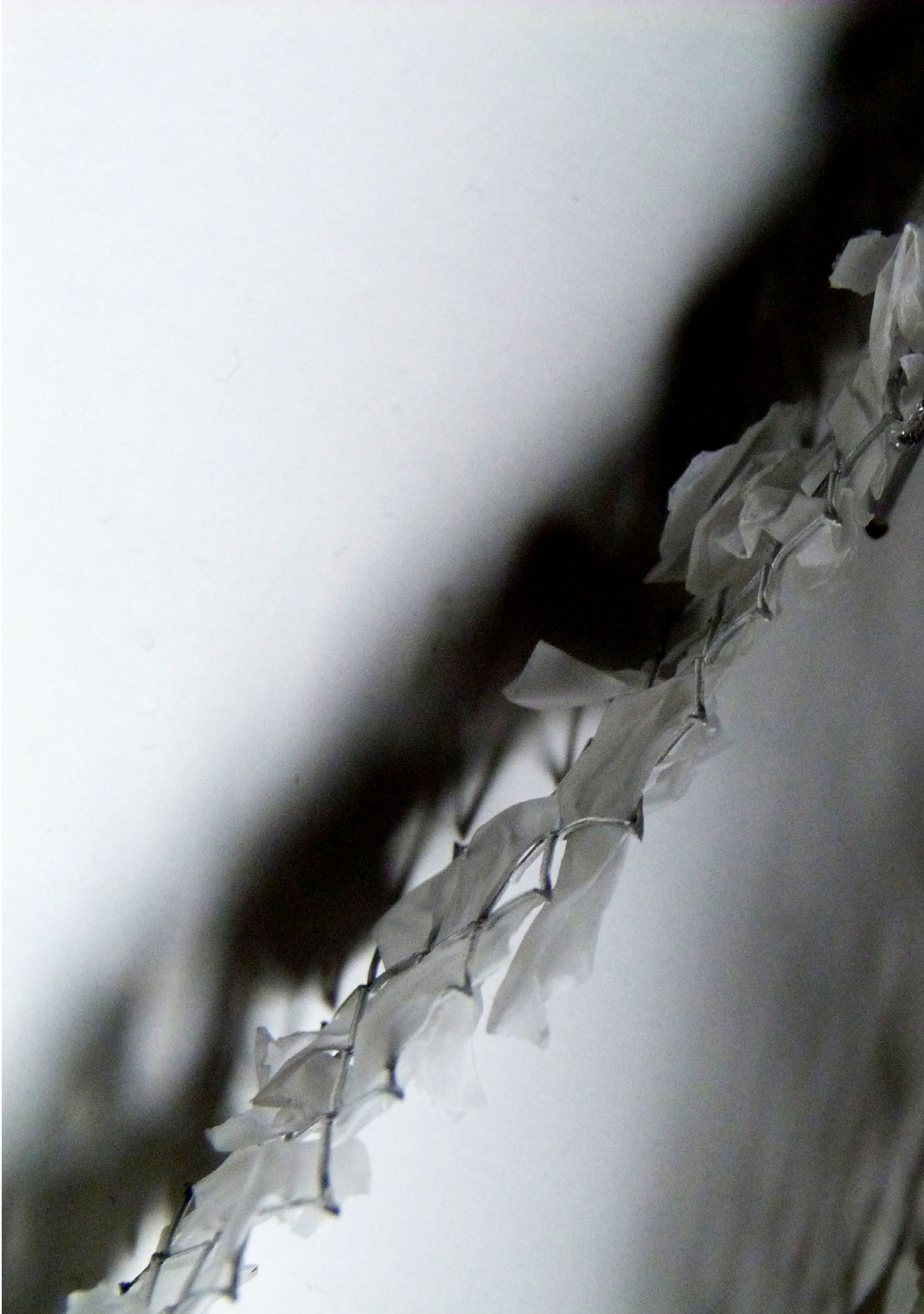


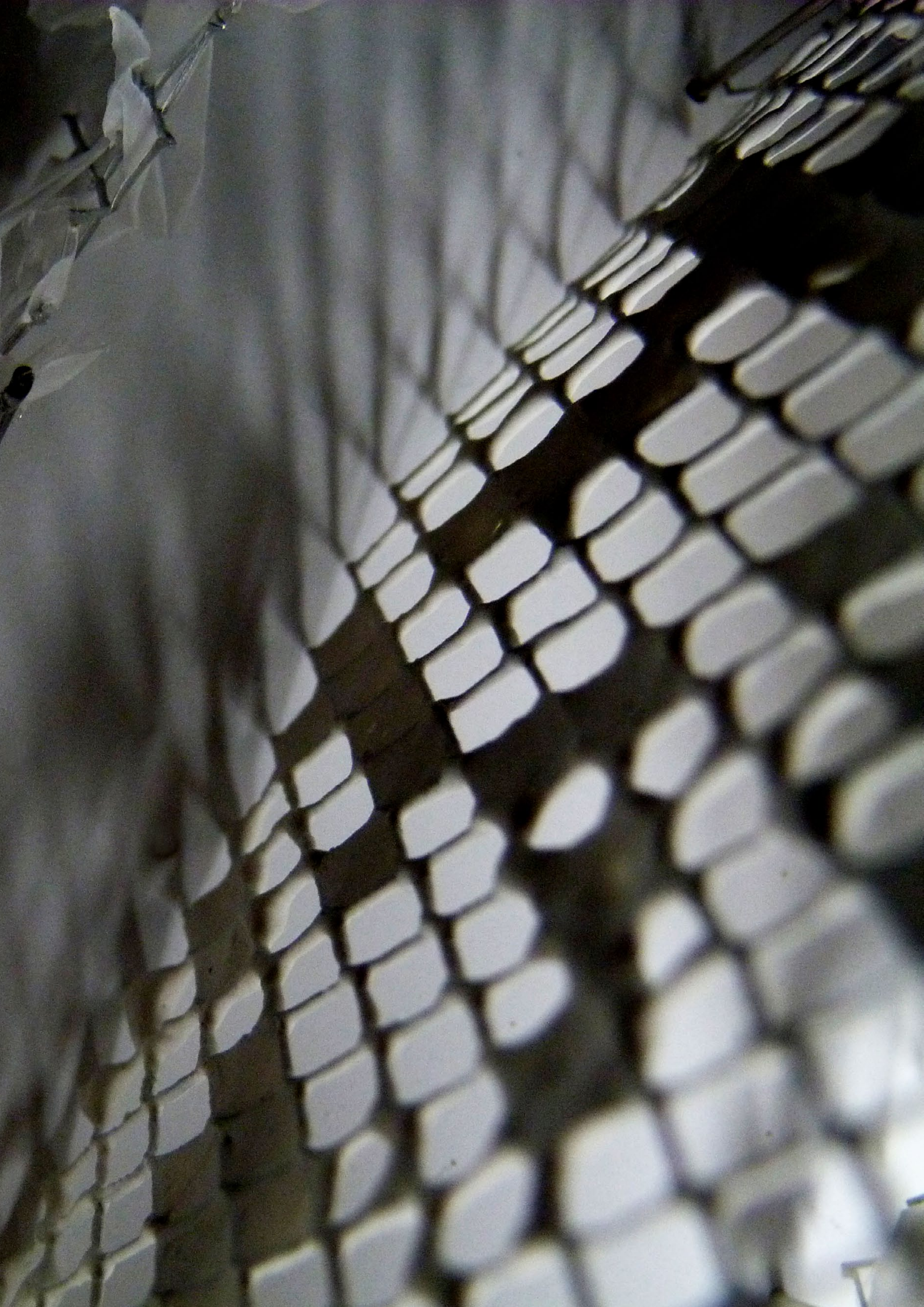
## INTRODUCTION

Practical enquiry at the domestic scale focussed on introducing ideas of space, inhabitation and enclosure. As a result, there was a shift from generating atmospheric qualities through representational means to employing design tools which actively generated a materially linked atmosphere. Rather than addressing atmosphere as an outcome of material development, atmospheric considerations became integral to the material enquiries. This chapter discusses the aims, methods and outcomes of the domestic enquiry, resulting in a speculative work home design. A critical reflection of the process shaped the final enquiry approach at public scale.



*Fig 5.01. (Left). Material model from domestic enquiry with surface analysis overlay*





## AIM

The aim of the domestic process was to direct the abstracted modes of enquiry from the installation scale towards the creation of a functional and inhabitable environment. The purpose of the subsequent enquiry was to identify the capacities and tendencies of a range of materials, and in turn create inhabited forms which responded to these findings in a way which encouraged affective material engagement with users.

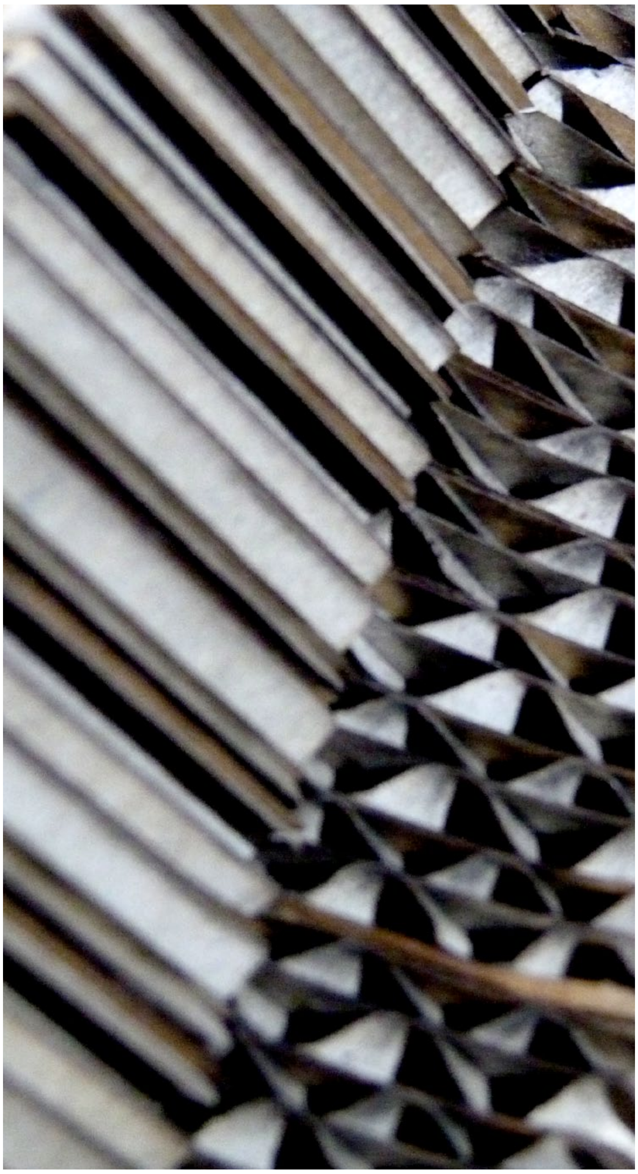


*Fig 5.03. Material model from domestic enquiry.*



*Fig 5.02. (Previous). Mesh model from domestic material enquiry*

# METHOD

The method used to dictate the design process aligns with the overreaching methodology outlined in the introduction, in which model based production was used to encourage speculative reflection. Testing of the research question at the domestic scale was largely focussed on creating authoritative material enquiries, with affective capacities which could eventually amplify atmosphere through program refinement and user engagement. Reflection within early stages of development encouraged the insertion of a narrative which projected previously abstract production into the architectural realm. Cathy Ganoe suggests that narrative provides "a flexible framework for understanding and expanding the meanings of design" (Ganoe. 1991. 1). The narrative framework was therefore employed in order to make the necessary shift from abstract enquiry to designing a home. In his book 'Narrative Architecture', Coates wrote, "personal narratives build on the cognitive mechanisms that arise from existing places and spaces" (Coates, 2012. 14). Rather than dictating the experience of the work home, the narrative was therefore used as a design tool, which facilitated the shift from abstract to inhabited form through the introduction of domestic function.

The Gentle Author, a local blogger residing in Spitalfields, was used to shape the design narrative, with a particular focus on his working process and its stark contrast to the historic working processes observed in the area. While tangible production was exercised through material making, the presence of a design narrative allowed for the programmatic intentions for each material stage to be set. This projected the user into participant role, gradually 'unfolding' events and images in an interactive manner (Ganoe, 1991. 5). The narrative was ultimately used as a means to extract the appropriate spatial conditions from each material enquiry. Materiality was consistently fused to atmospheric output through the affective engagement of material qualities. The amplification of atmosphere was therefore developed through its correlation with material perception, largely informed through photographs. Alongside narrative development, ongoing material enquiries tested the qualities and capabilities of a range of materials, aimed to reflect the existing materials from the site and their speculative additions.

# SITE

With the nature of the material stages more firmly established, the site was analysed in order to test orientation, access and sun exposure. The three components of the programme were further refined in order to utilize the optimal site conditions.

*Fig 5.04. Photograph of domestic scale site. Existing brick wall is incorporated into the final design.*

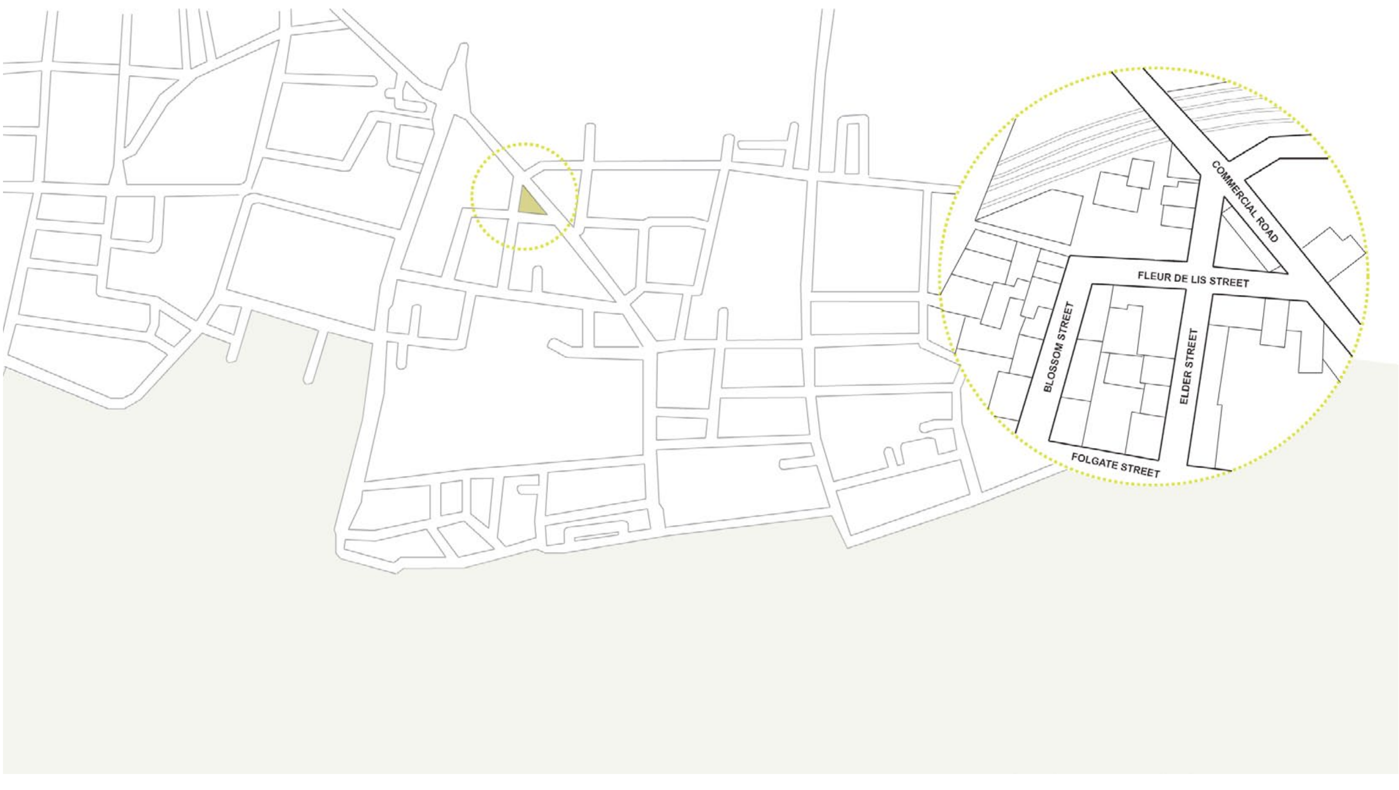




*Fig 5.05. Location of domestic site*

# HISTORIC DOMESTICITY


*Fig 5.06. 1746 Map of East London showing the location of Norton Folgate within the silk weaving district (John Rocque in Guillery 82).*

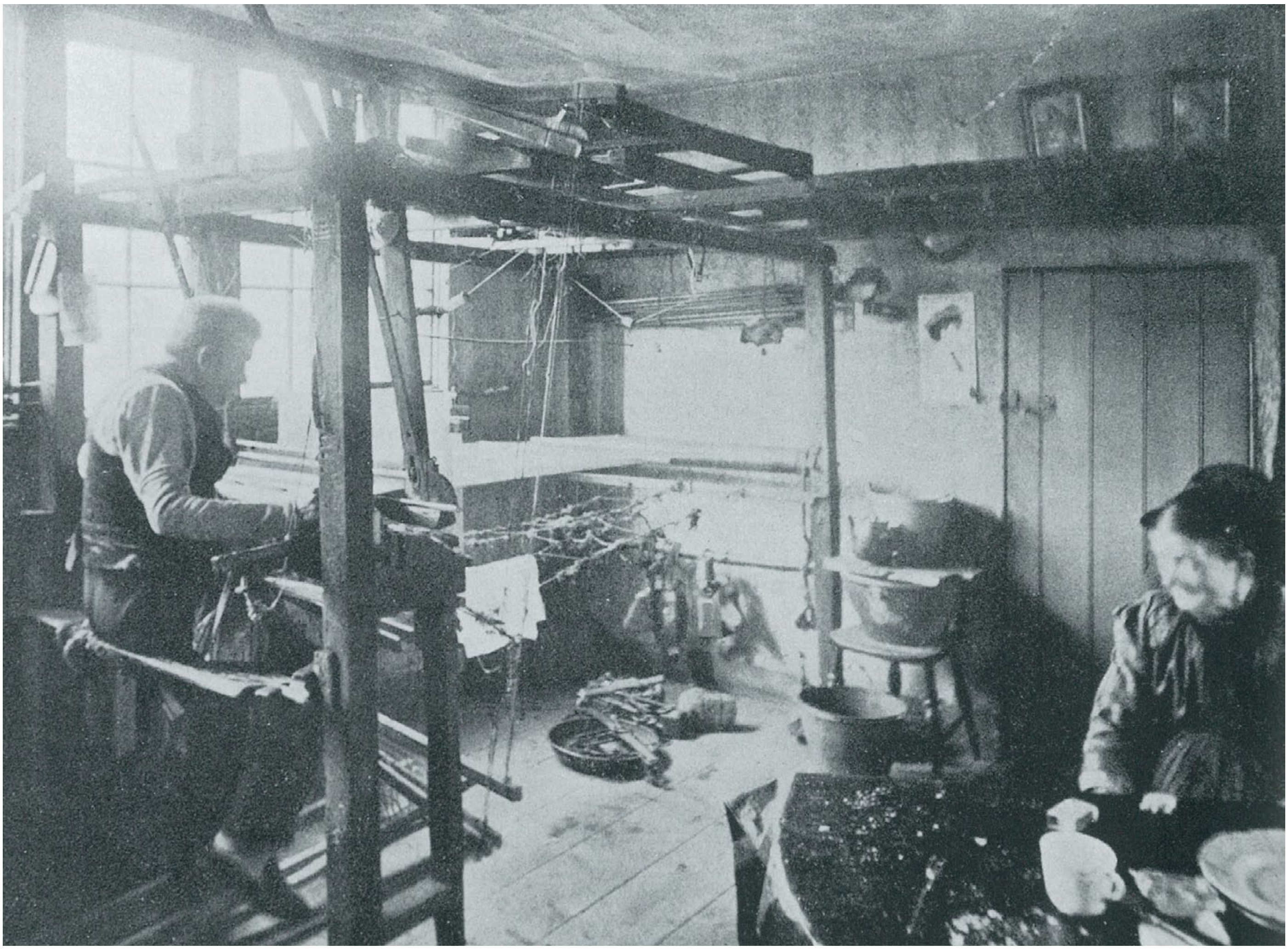


*Fig 5.07. Silk weaving within a home in Spitalfields, 1894 (THLHL in Guillery 84).*

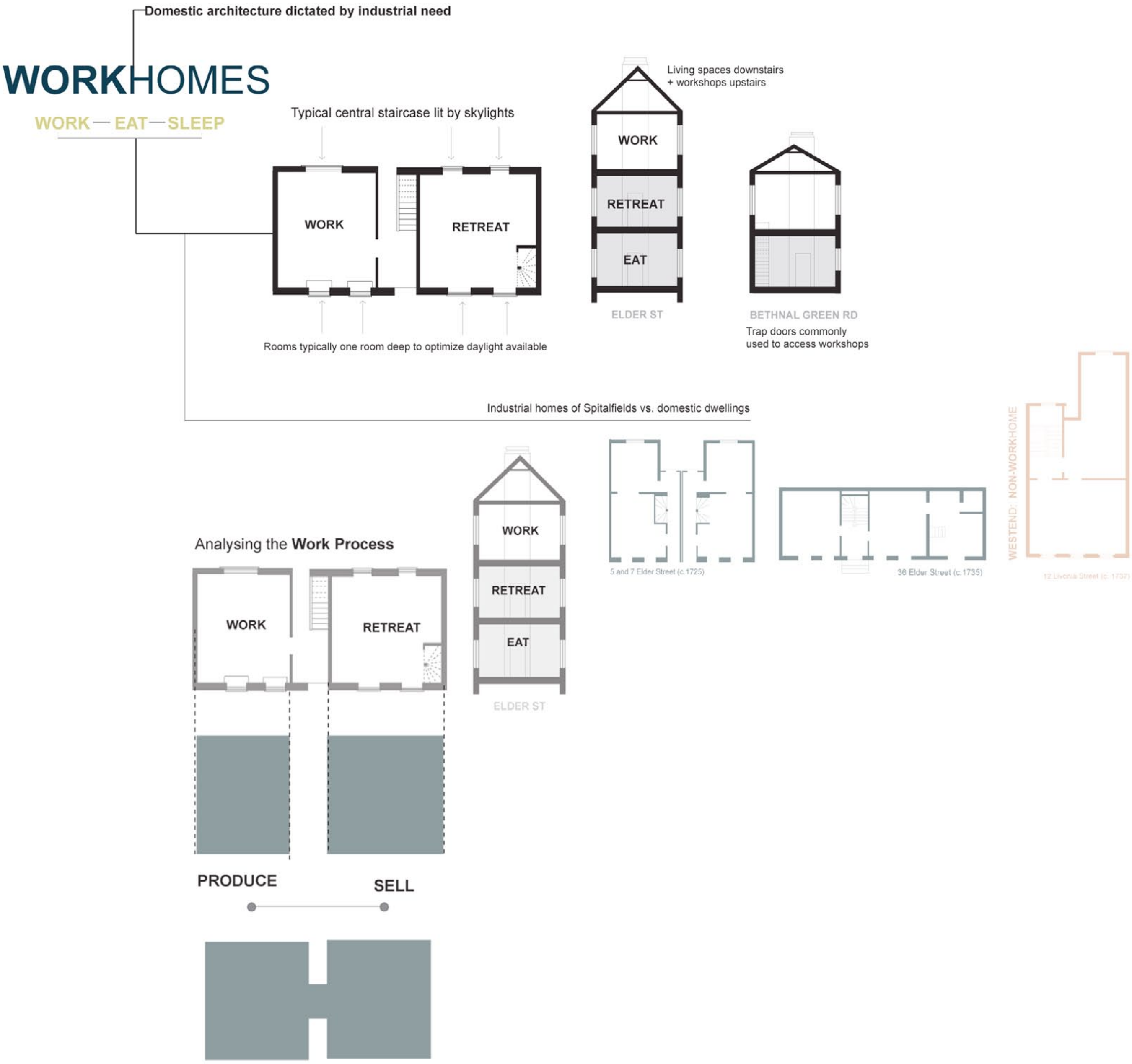



*Fig 5.08. Diagrammatic analysis of workhome functions throughout the nineteenth century. Historic domesticity was investigated through the nature and occupation styles of the eighteenth century work homes within Norton Folgate in order to better understand the contextual premise of the work home. Domesticity was analysed in terms of the working process, the experiential qualities of the dwellings and the resulting architectural requirements. A speculative work home for the Gentle Author was then analysed under the same considerations, noting the contrasting relationships between work production and spatial conditions. This formed the underlying framework for the design.*

*Fig 5.09. Structure of typical Weavers homes in East London (Guillery, 109).*

## THE GENTLE AUTHOR

A writer, known as the Gentle Author, was chosen as the character in which to formulate the contemporary work home narrative through. Living locally and writing through a blog titled 'Spitalfields Life', the Gentle Author is known for his fondness of the area and his passion for saving the Norton Folgate site from proposed demolition (The Gentle Author, 2016. May 11) (See right). Writing about current plans to redevelop the conservation area, he writes that "the current battle is one for the identity of London" (The Gentle Author, 2015. July 21). The work home narrative has been devised to fit the author's work process (below) and further to connect the writer to the Norton Folgate site through active viewpoints and the incorporation of existing structures within the speculative design.

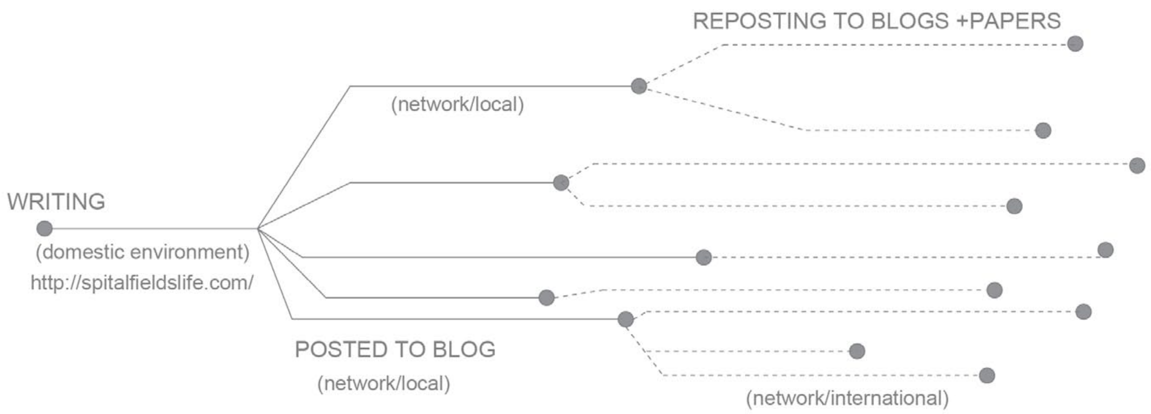



*Fig 5.10. Work process of the Gentle Author*


*Fig. 5.11. Existing Norton Folgate site with domestic site highlighted*


*Fig. 5.12. Proposed demolition*

*Fig 5.13. Protest to save the Norton Folgate site*

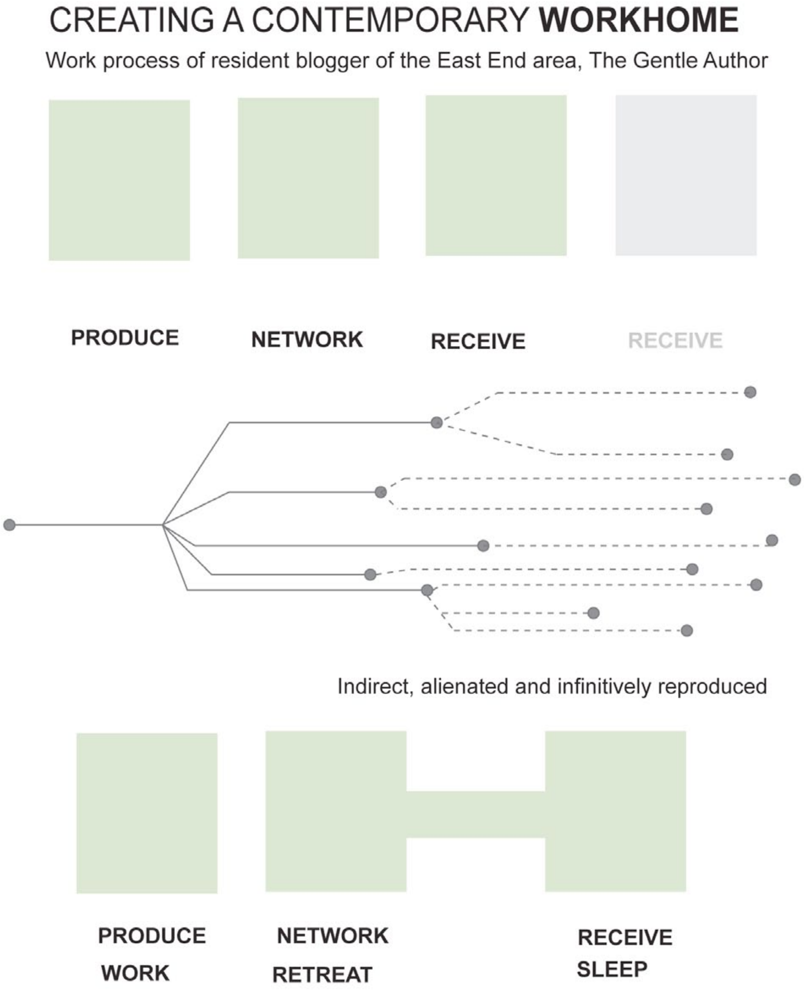



*Fig 5.14. Proposed functional shifts in the creation of a contemporary workhome based upon the working sequence of the local blogger, 'The Gentle Author'*

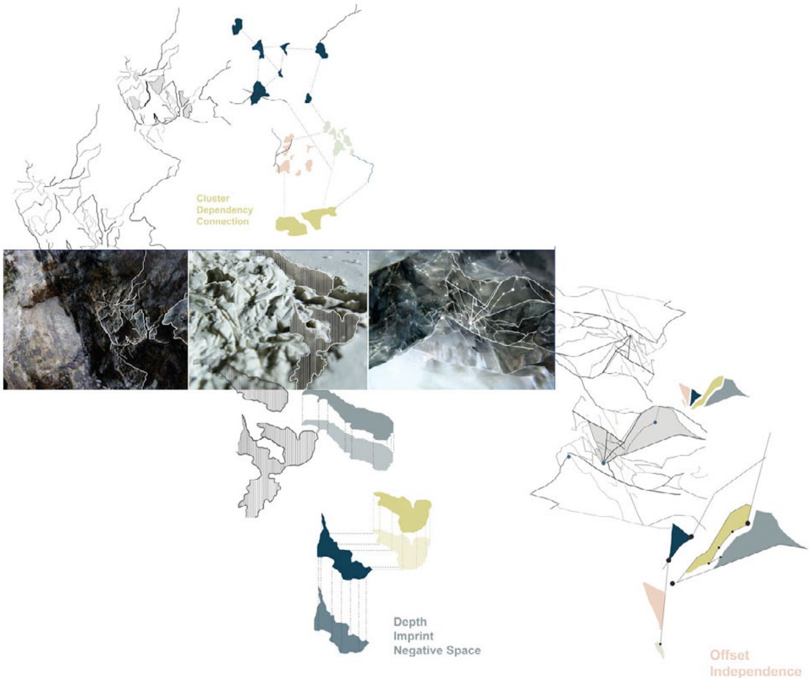



*Fig 5.15. Surface analysis and subsequent drawing abstraction from material models made throughout the installation enquriy.*

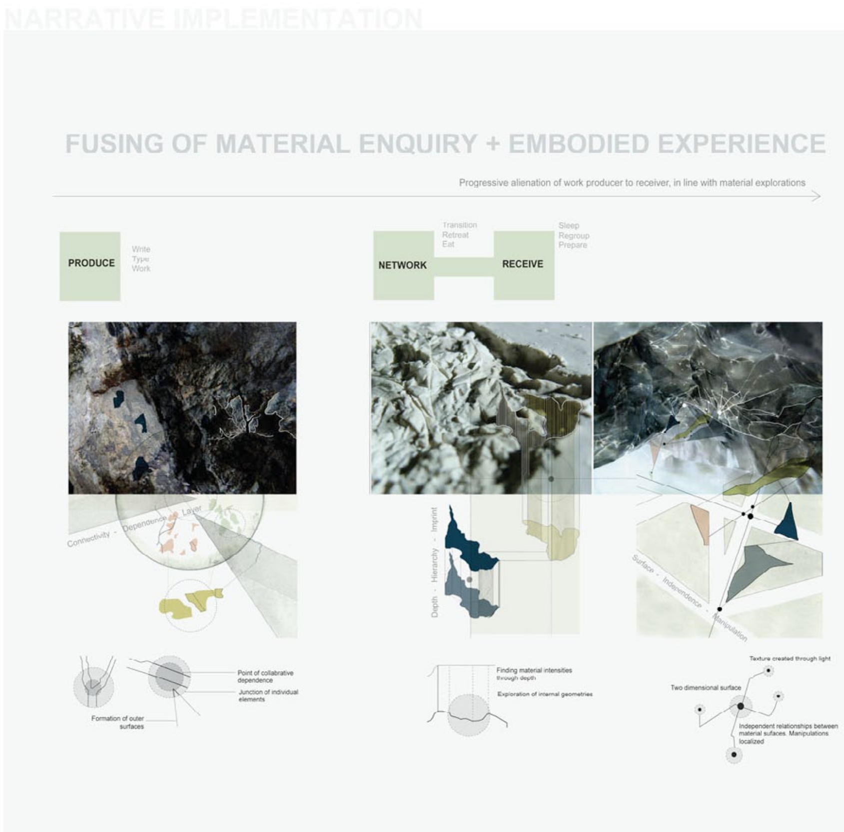



*Fig 5.16. Drawing out material qualities from the installation scale to set the material narrative for the contemporary workhome.*

# MATERIAL QUALITIES

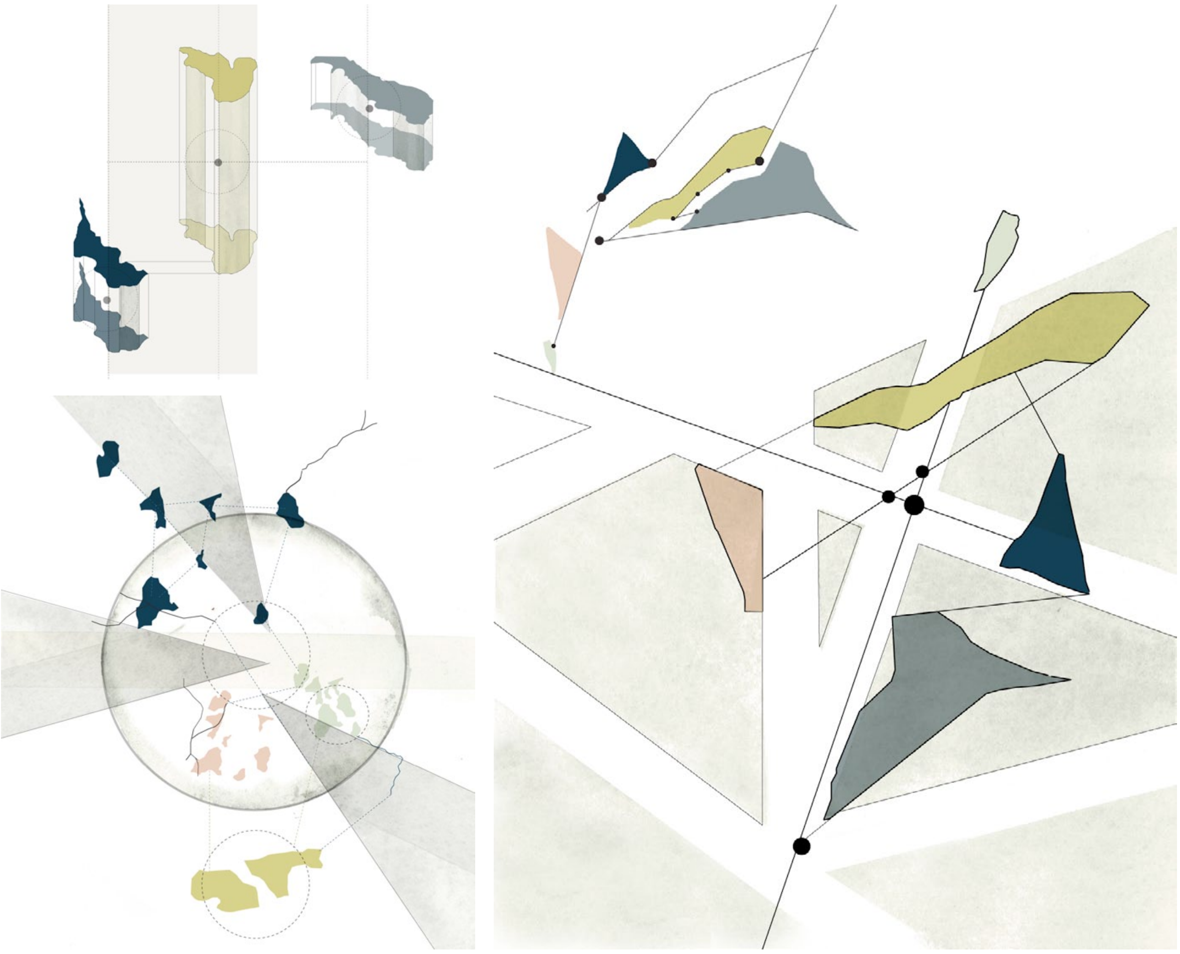


*Fig 5.17. Mixed media images depicting the material qualities used to form the material narrative of the contemporary work-home.*

# SITE CONDITIONS

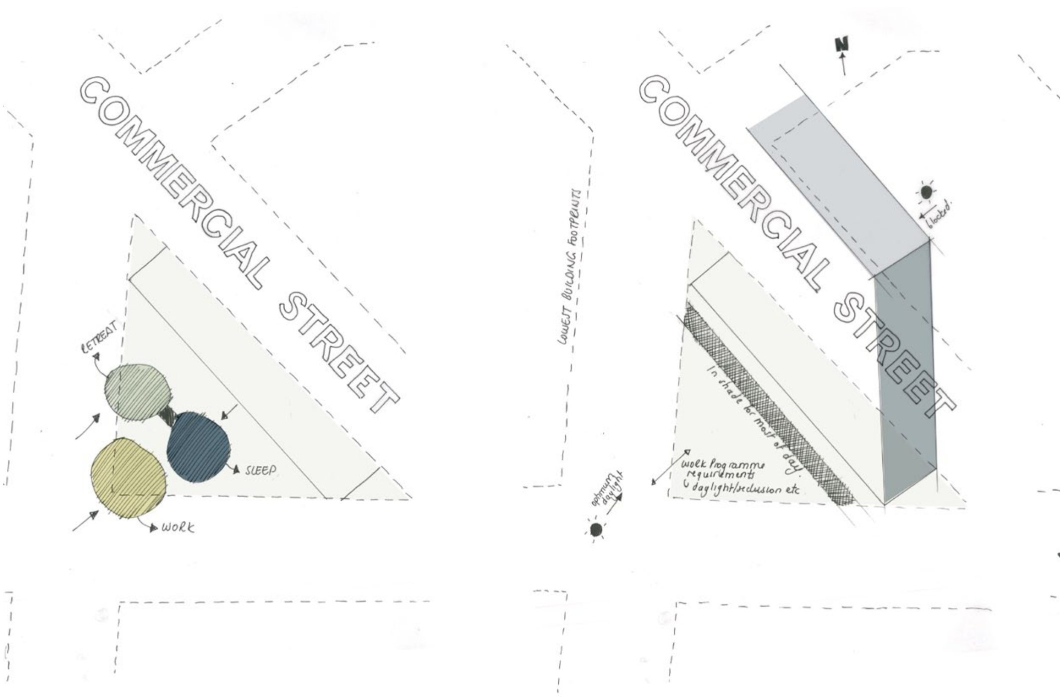



*Fig 5.18. Site analysis and programme placement based on daylighting conditions of site*

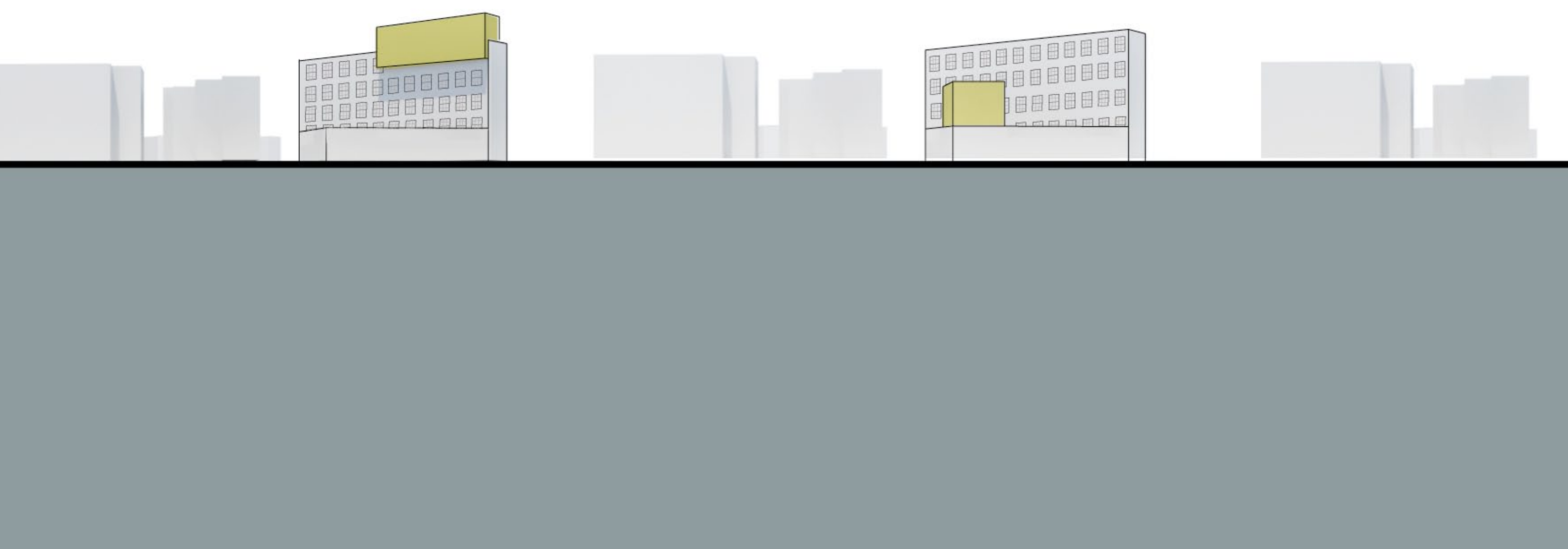


*Fig 5.20 Domestic structure placement iterations*

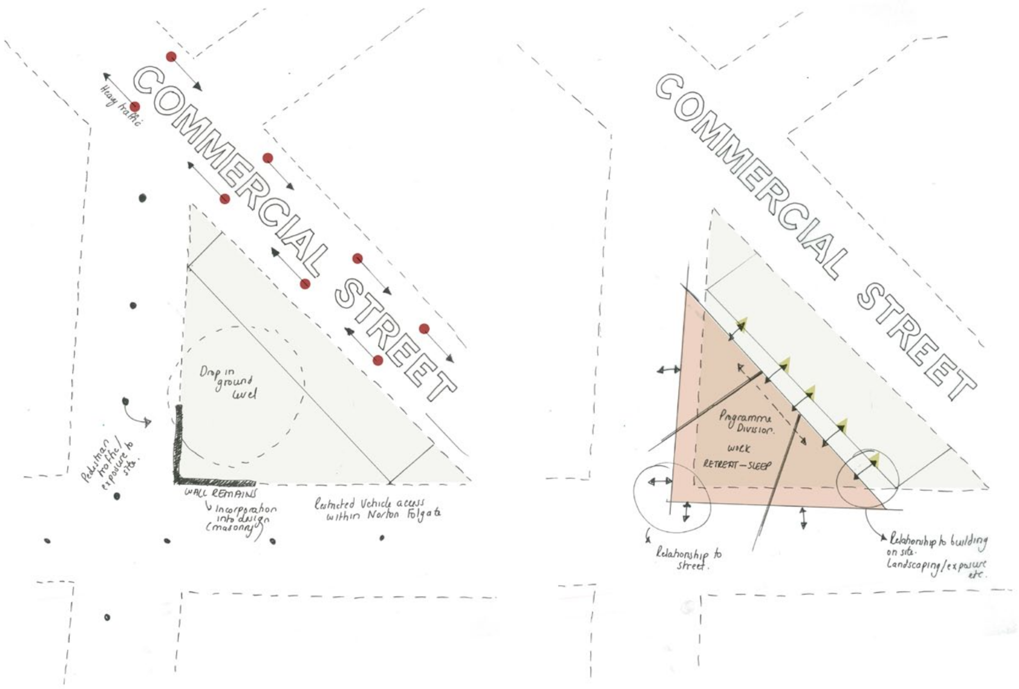
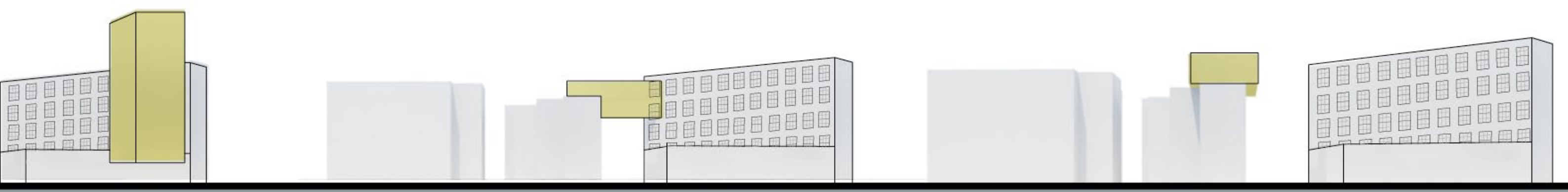



*Fig 5.19. Site analysis showing structure and floor level changes within the existing site.*



## MASSING ITERATIONS

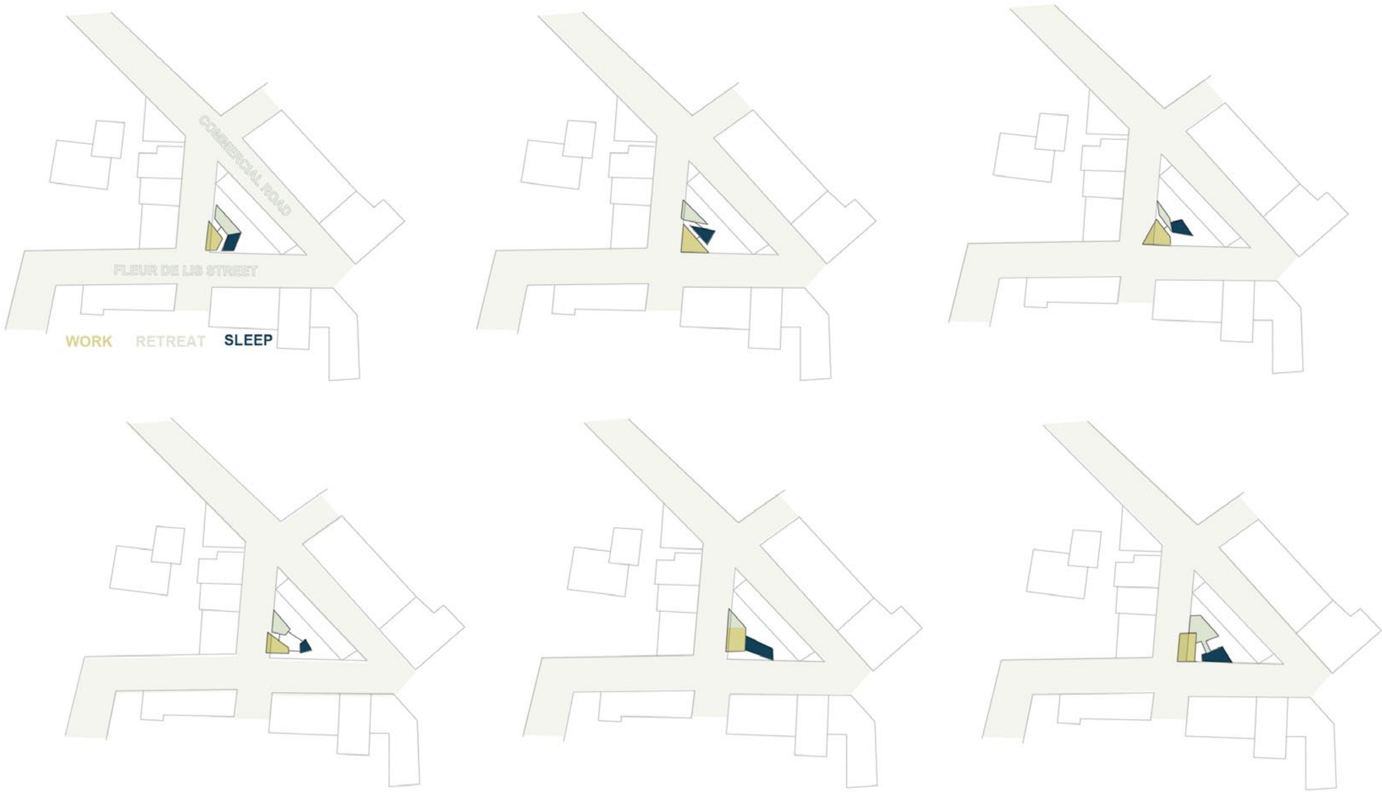



*Fig 5.21. Programme layout iterations on site (in plan)*

# PROGRAM PLACEMENT

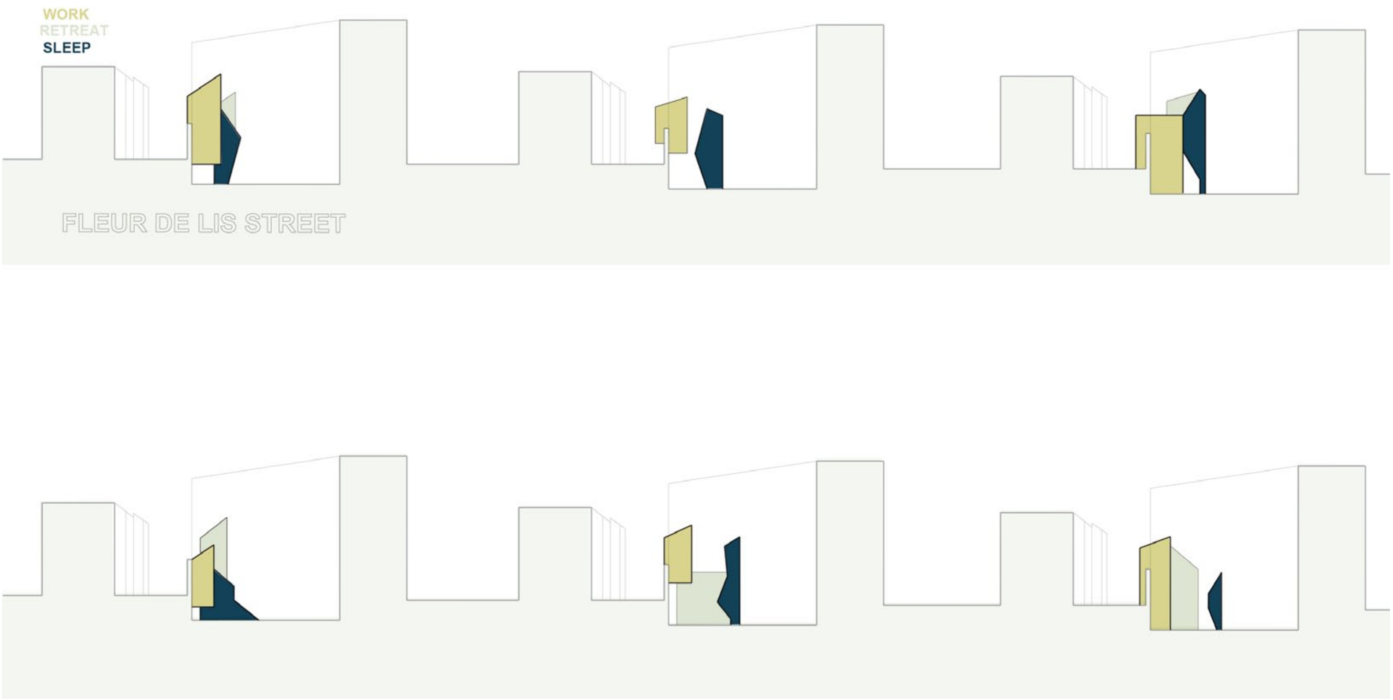



*Fig 5.22. Programme layout iterations on site (in section)*

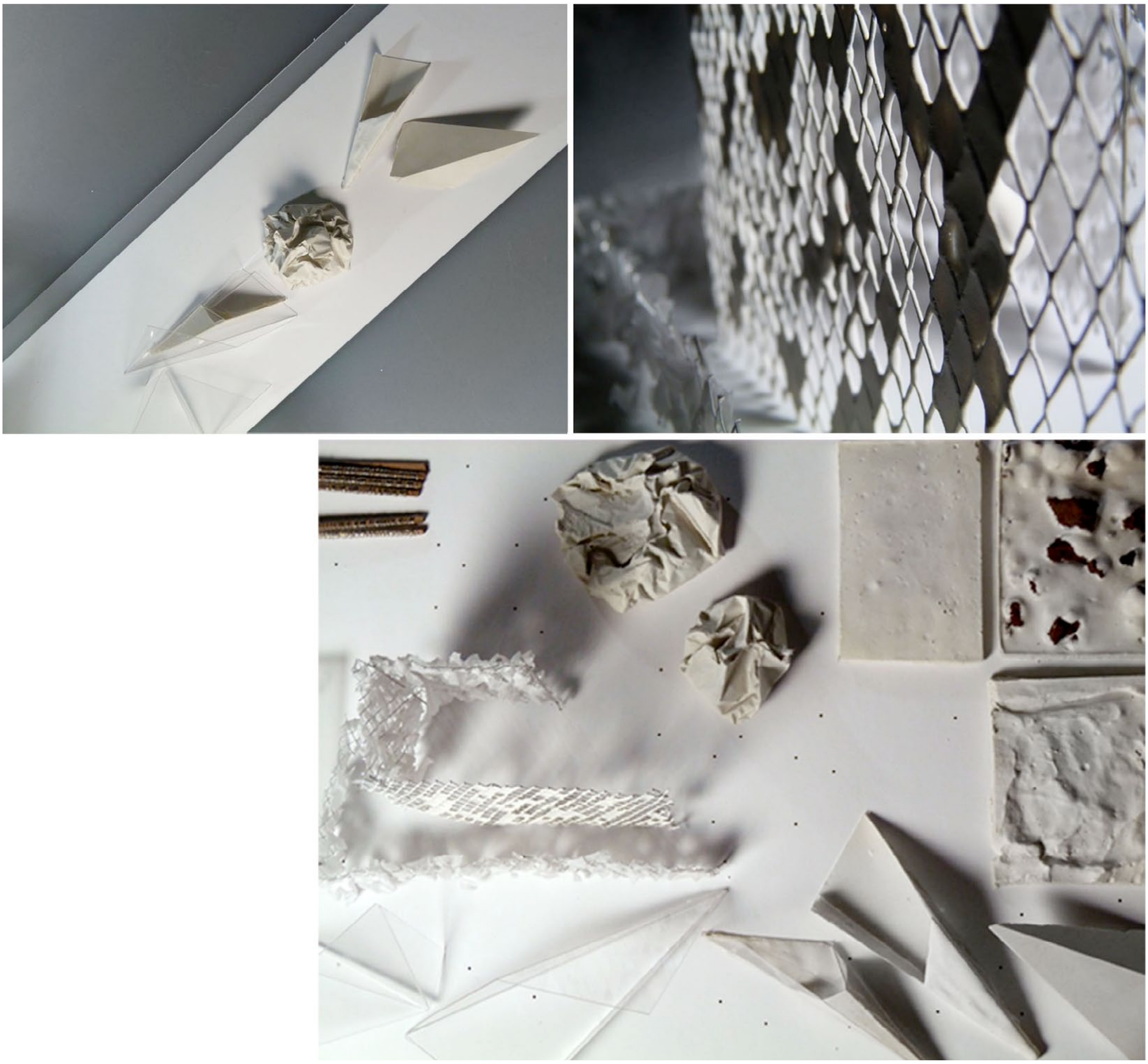
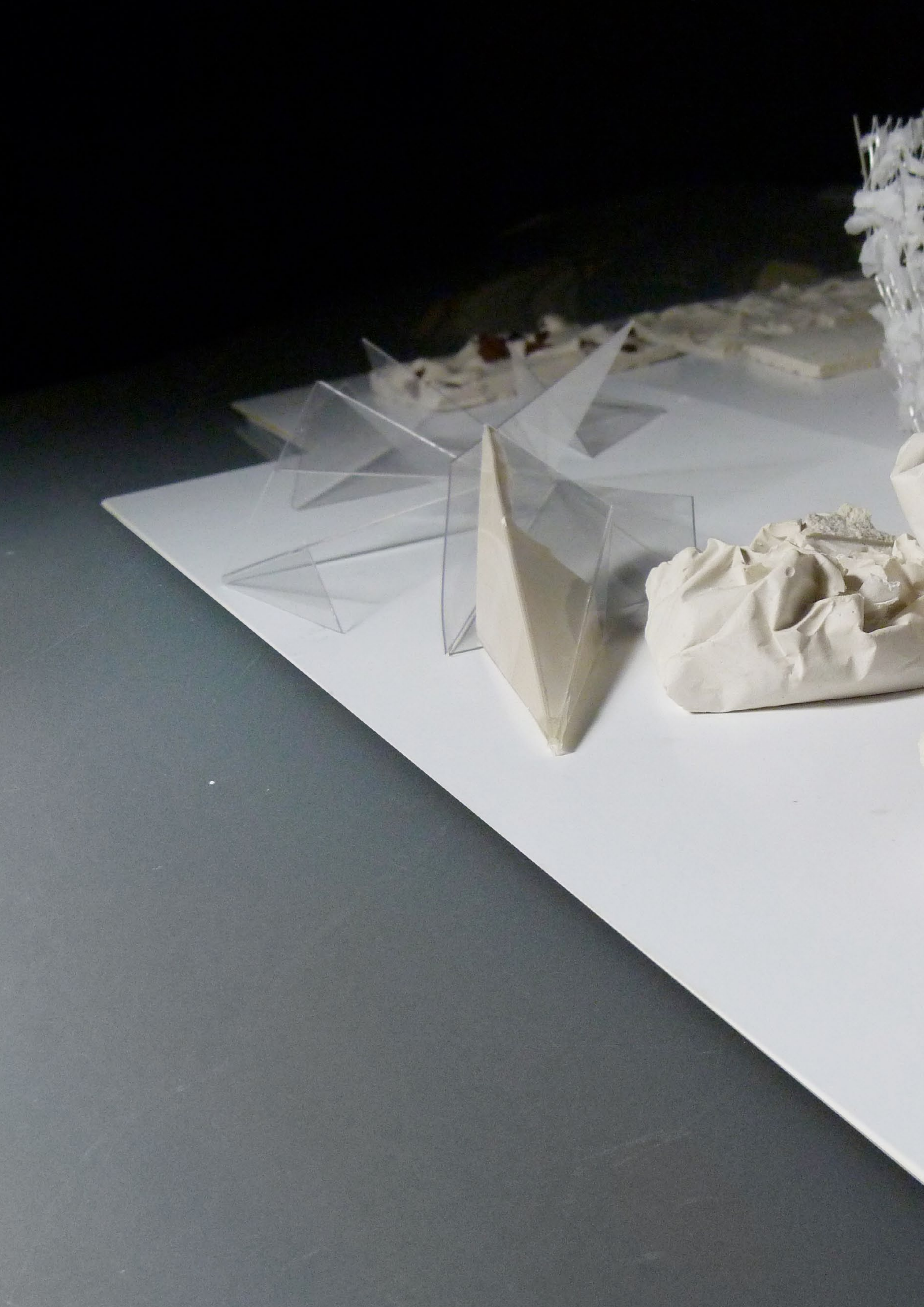


*Fig 5.23. Material models from the domestic enquiry*

## MATERIAL APPROACH

Material making and unmaking was adopted again as the primary mode of material testing, with a focus on the changes in material capacities when seeking to fulfil architectural prescriptions. Materials were explored with spatial, sheltering and programmatic requirements, creating affective rather than aesthetic atmospheres. Working in conjunction with the narrative and subsequently contrasting program, the material enquiries continued to be challenged dialectically, drawing upon observed differences within the investigation to iterate the models further. The enquiry questioned how the qualities of one material can change the natural tendencies of another material. Material qualities were therefore combined; they were moulded upon, pressed between, dipped in to and added on to one another, with a focus on how this changed the aesthetic understanding of the materials. The material approach was formulated within the belief that, to understand materials means to understand "the durations of movement, speed and slowness" within the material product rather than to simply address the objective end of the process (Latham & McCormack, 2004. 705). The majority of the process utilized analogue modes of testing, with digital tools only being used to recreate and formally represent the practical work.



## ATMOSPHERE

Having selected three material stages of the installation enquiry to explore in depth through the implementation of narrative, the qualities of these stages were first extracted further through drawing and painting. The purpose of this exercise was to underpin the atmospheric capabilities of the materials, although at this stage the materials remained isolated and considerations of atmosphere were subsequently more indicative of "mood, feeling, ambience, tone" (Anderson, 2009. 78). Dialogue between materiality and atmosphere was facilitated by the Gentle Author narrative, which encouraged the assertion of programme to material experience. Atmospheric conditions were created through translucent surfaces, light manipulations, level changes and acoustic variation. The shift to inhabited material iterations marked a progression to the development of atmosphere as an affective response; using the expectations outlined by the narrative to influence a sense of 'lived change' through "affective powers of thinking" (Bohme, 1993. 119).

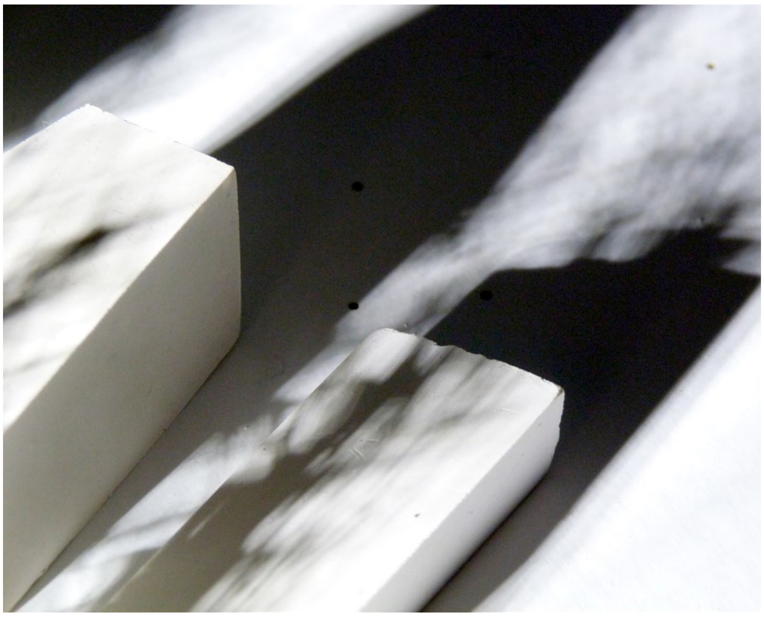


*Fig 5.25. Atmospheric shadow tests on material models*

*Fig 5.26. Material quality drawings overlayed onto site with respect to their placement within the domestic design*

*Fig 5.27. Material models exploring texture and seamlessness in material formation*

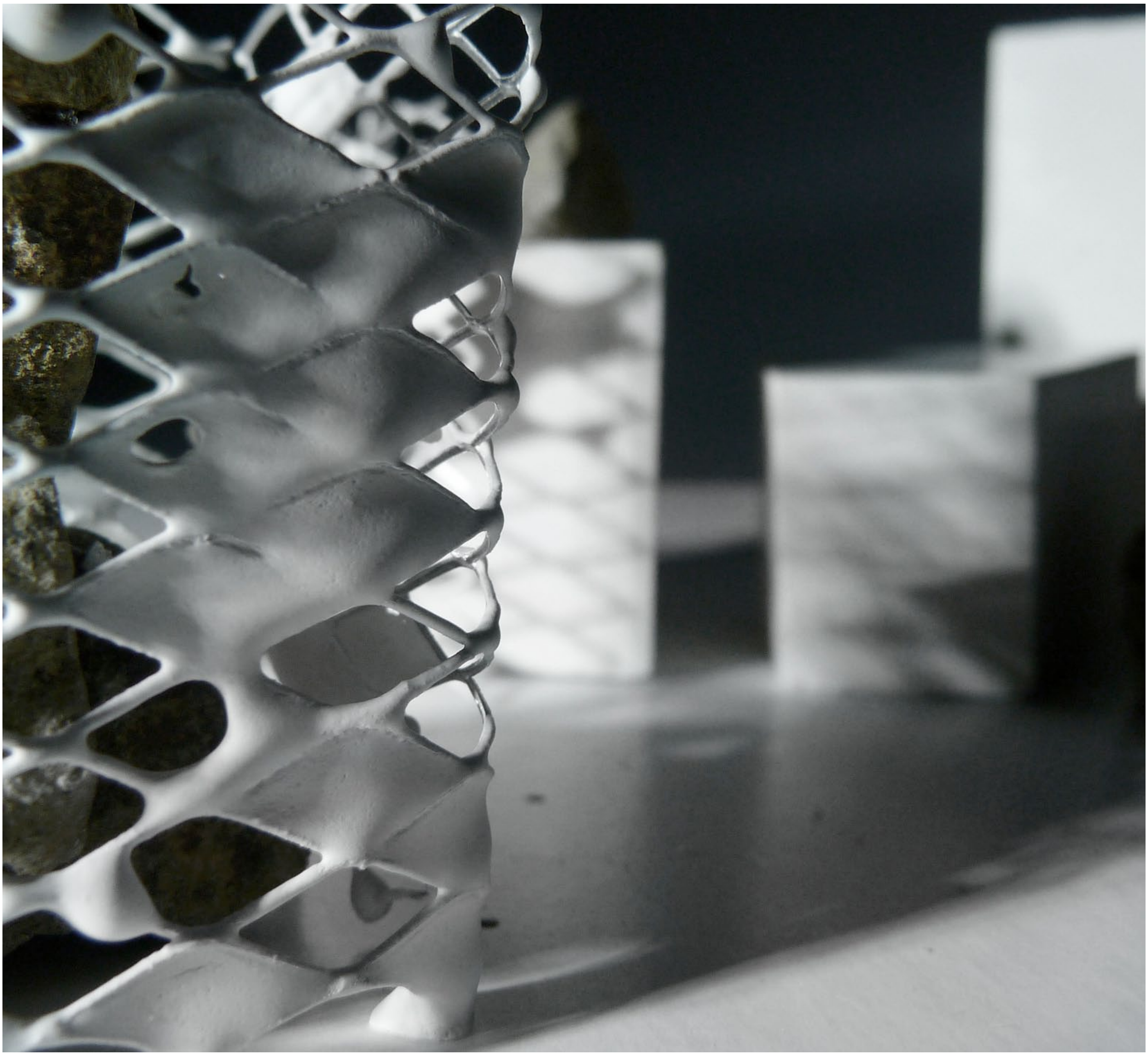


*Fig 5.28. Material models exploring presence and absence in material formation*

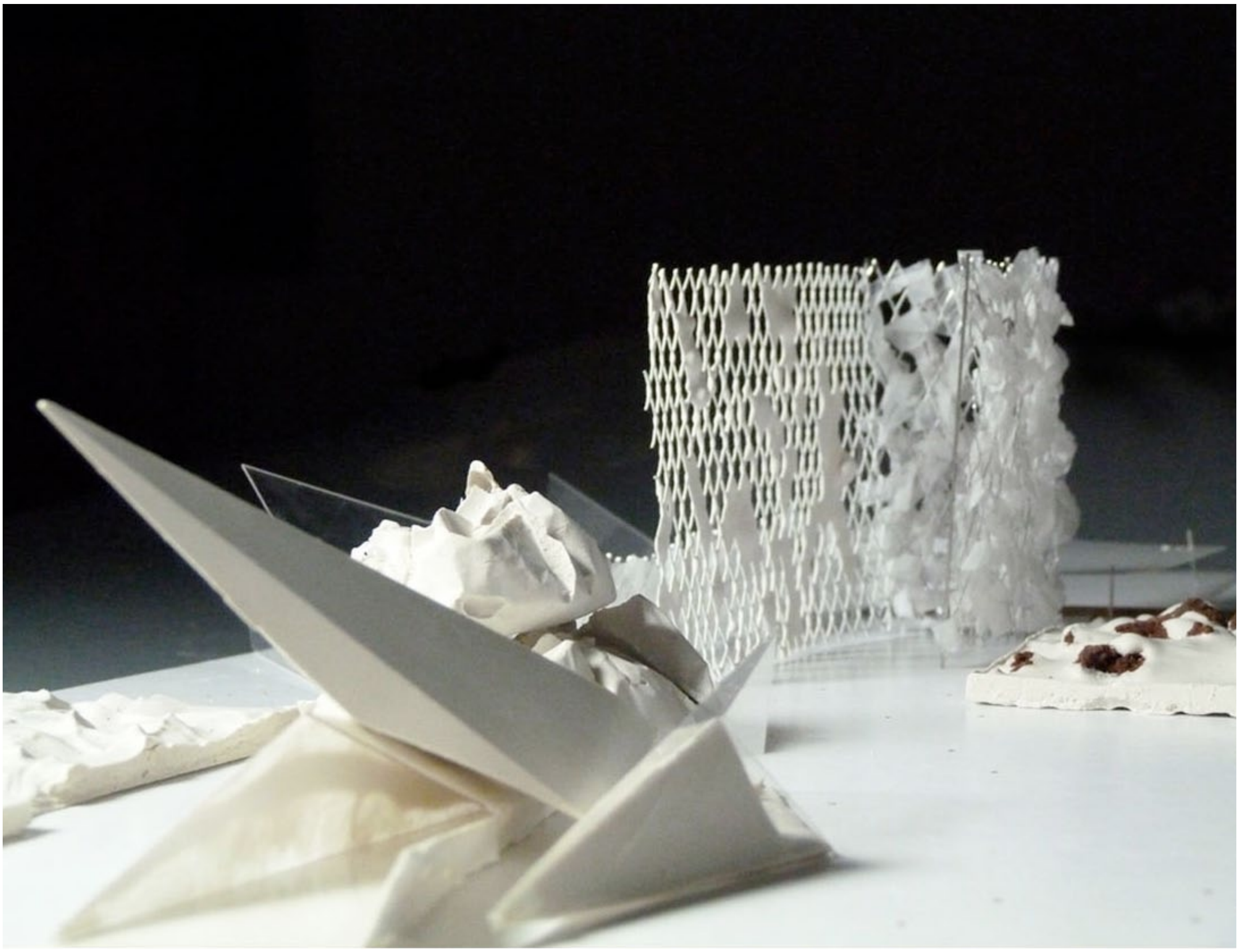


*Fig 5.29. and 5.30 (Right). Material models testing perforations and surface qualities*

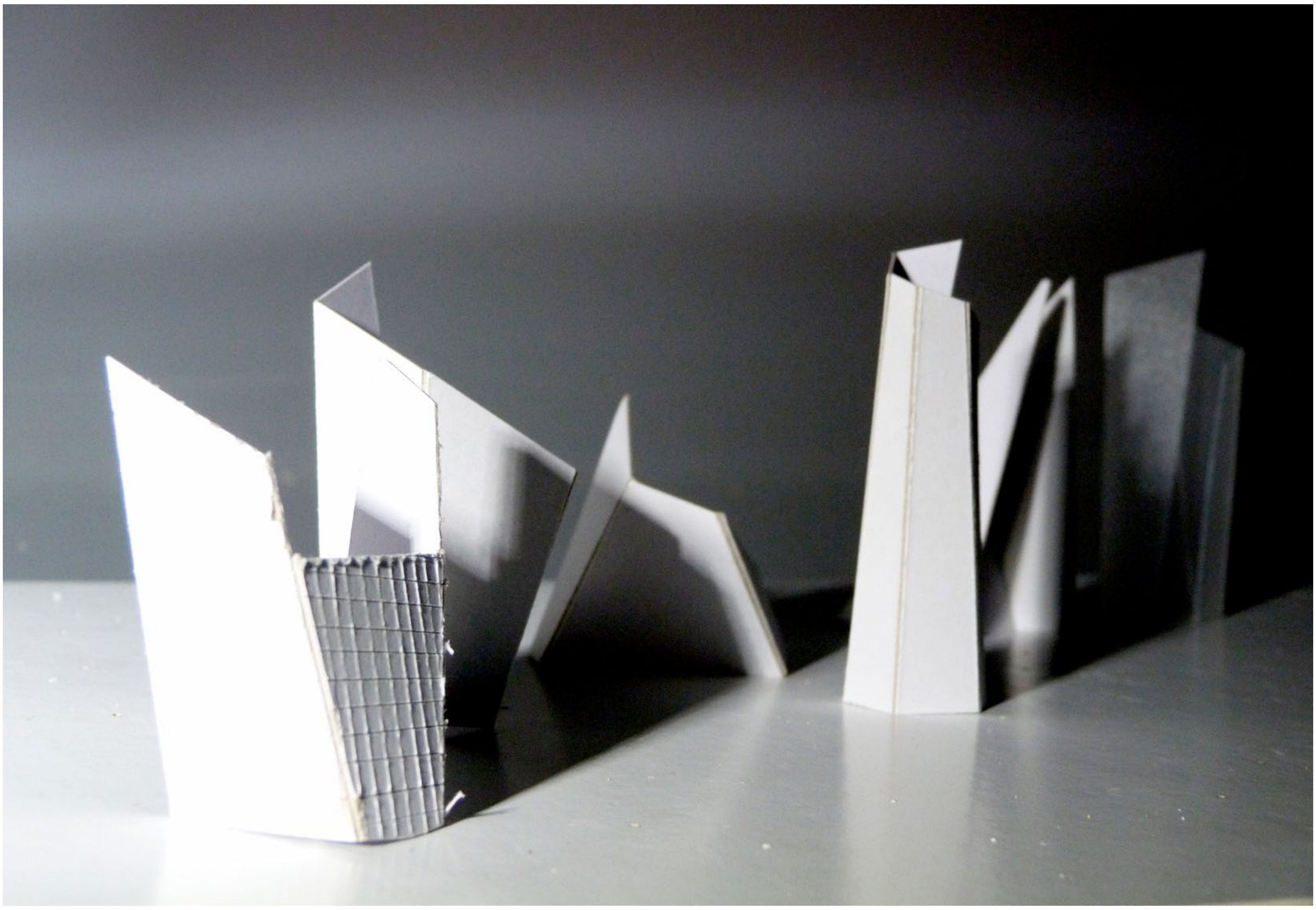


*Fig 5.31. Material models made by folding and twisting*

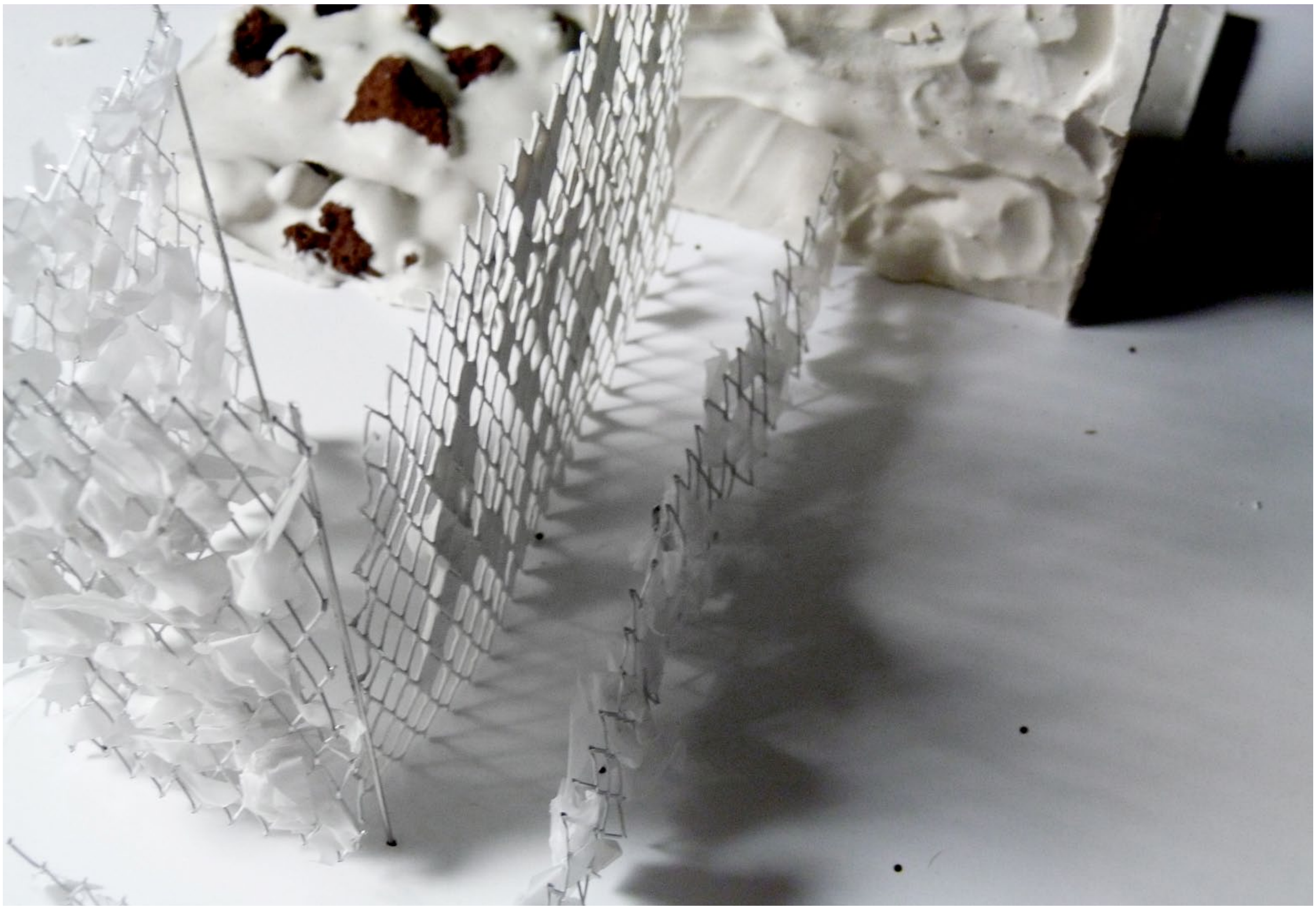


*Fig 5.32. Material models exploring texture and transparency*

## MAKING + UNMAKING

*Fig 5.33. Model making process*

*Fig 5.34. (Right). Material series focussing on form iterations for domestic enquiry. Materials were layered, folded, moulded and stacked until they began to generate architectural forms for the domestic structure.*

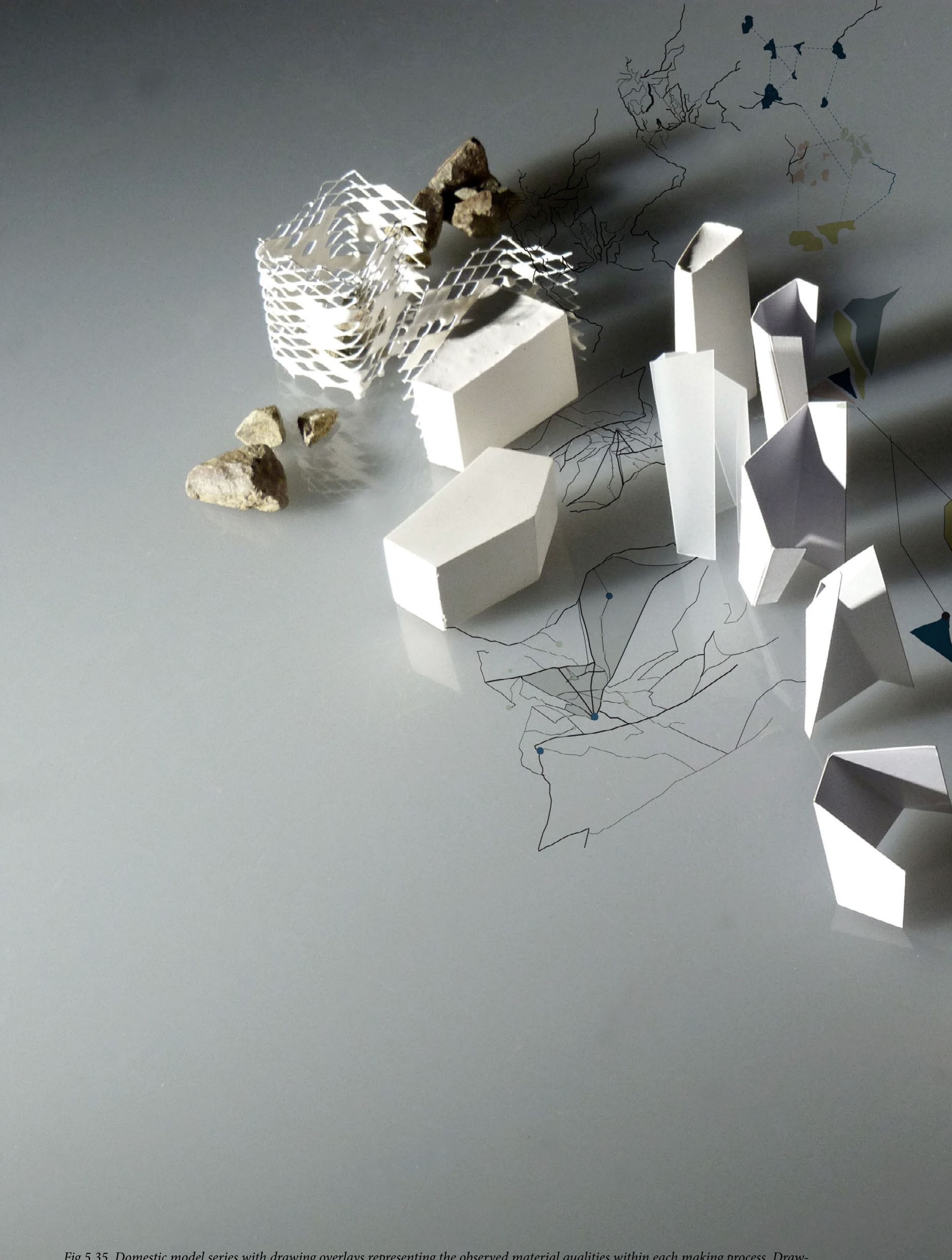


*Fig 5.35. Domestic model series with drawing overlays representing the observed material qualities within each making process. Drawings were representative of tactile as well as atmospheric qualities based on line weights, colour and linearity.*

## MAKING + SITE

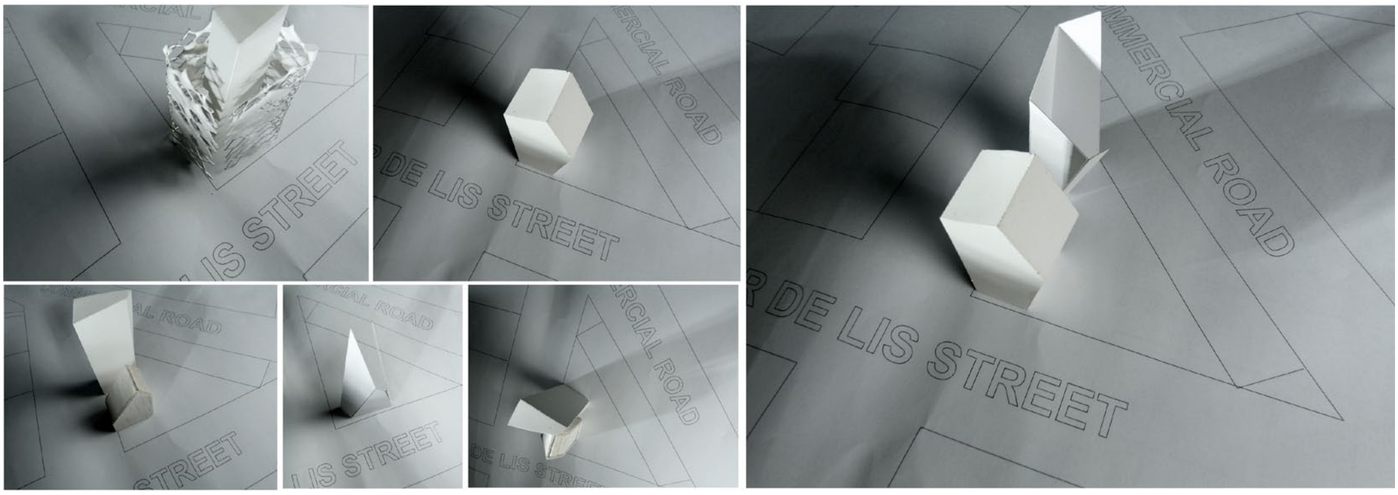



*Fig 5.36. Translating materials to printed site map.*

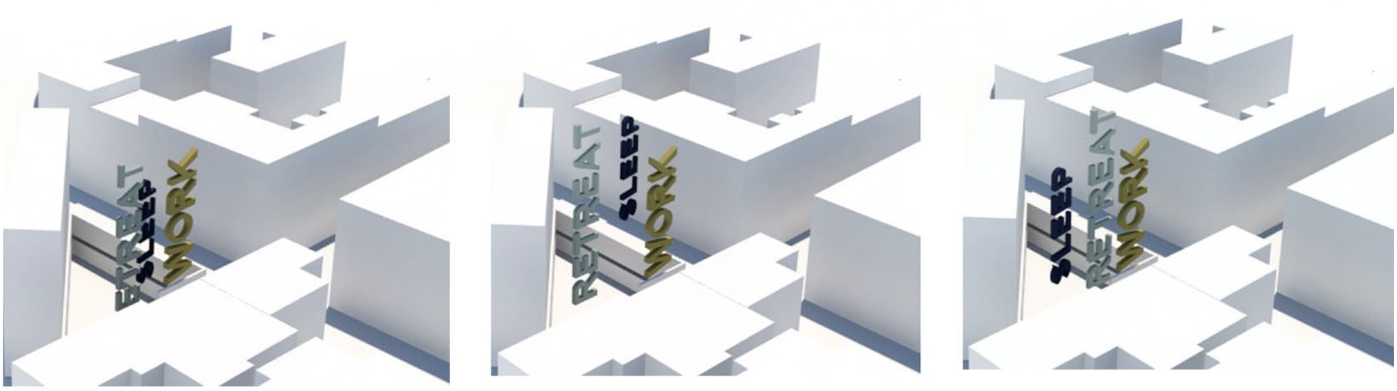



*Fig 5.37. Digital iterations showing possible room placement on site*

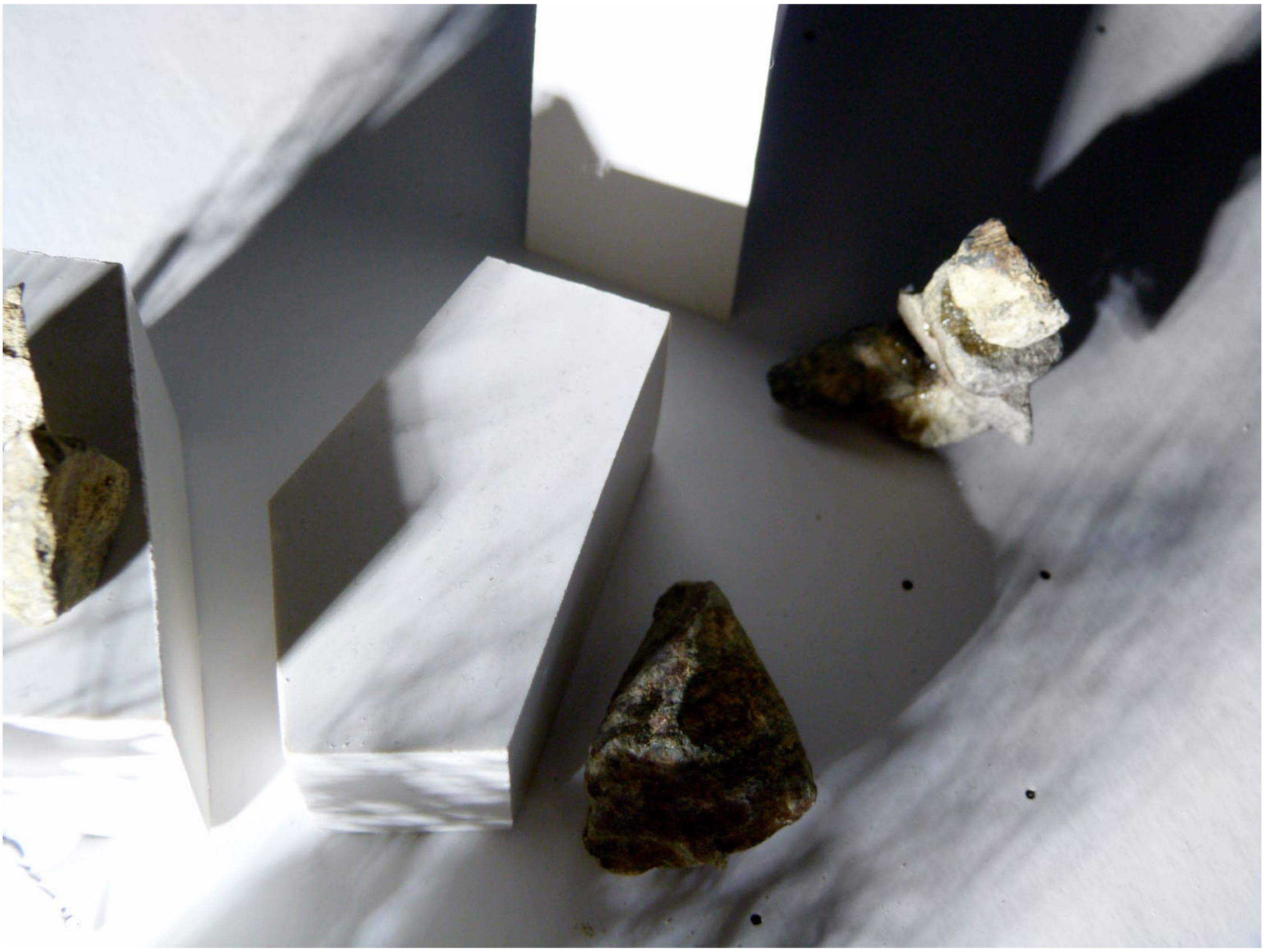


*Fig 5.38. Shadow testing on seamless vs textured surfaces*

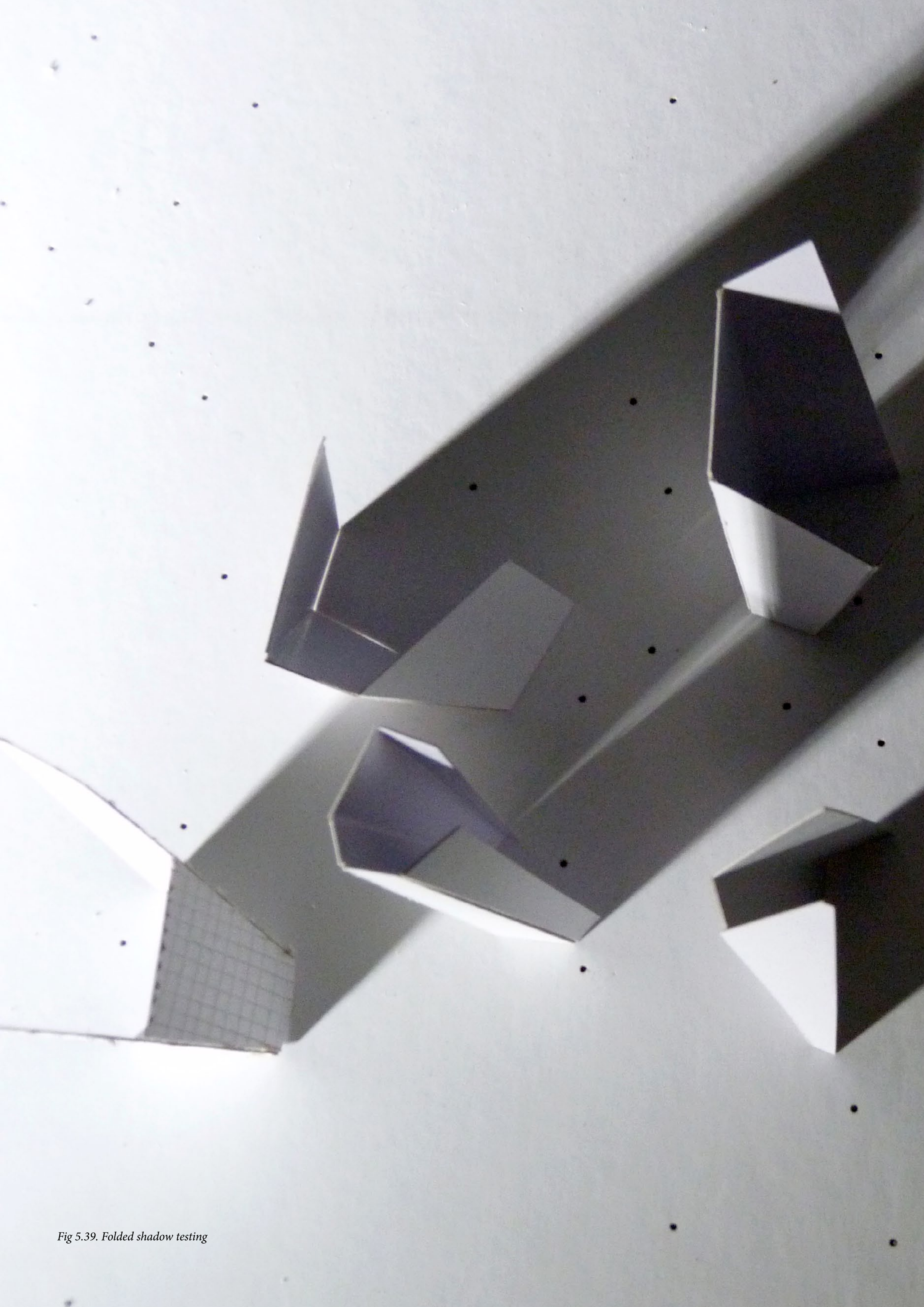


*Fig 5.39. Folded shadow testing*

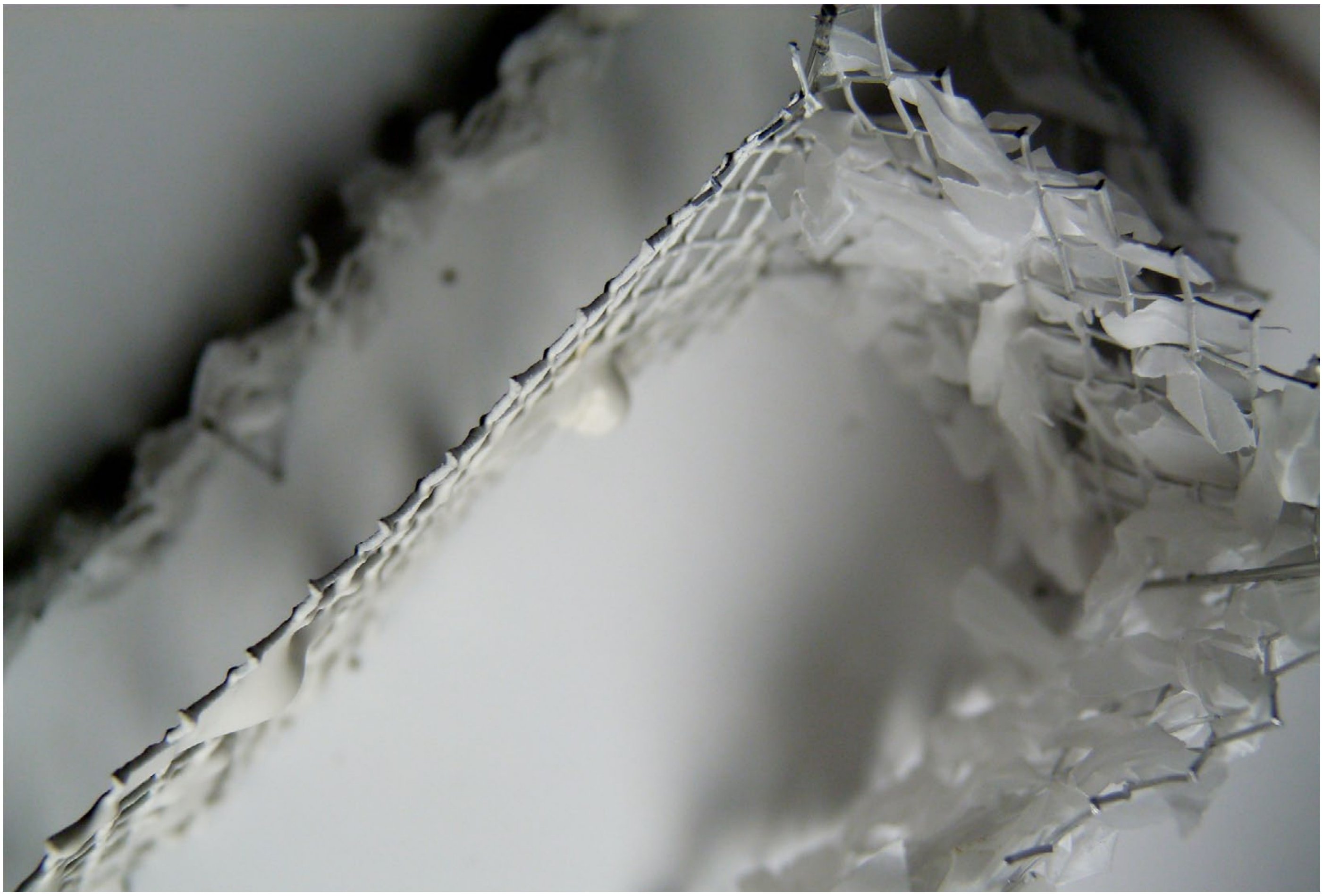


*Fig 5.40. Material enquiry investigating material movement of semi fixed surfaces*

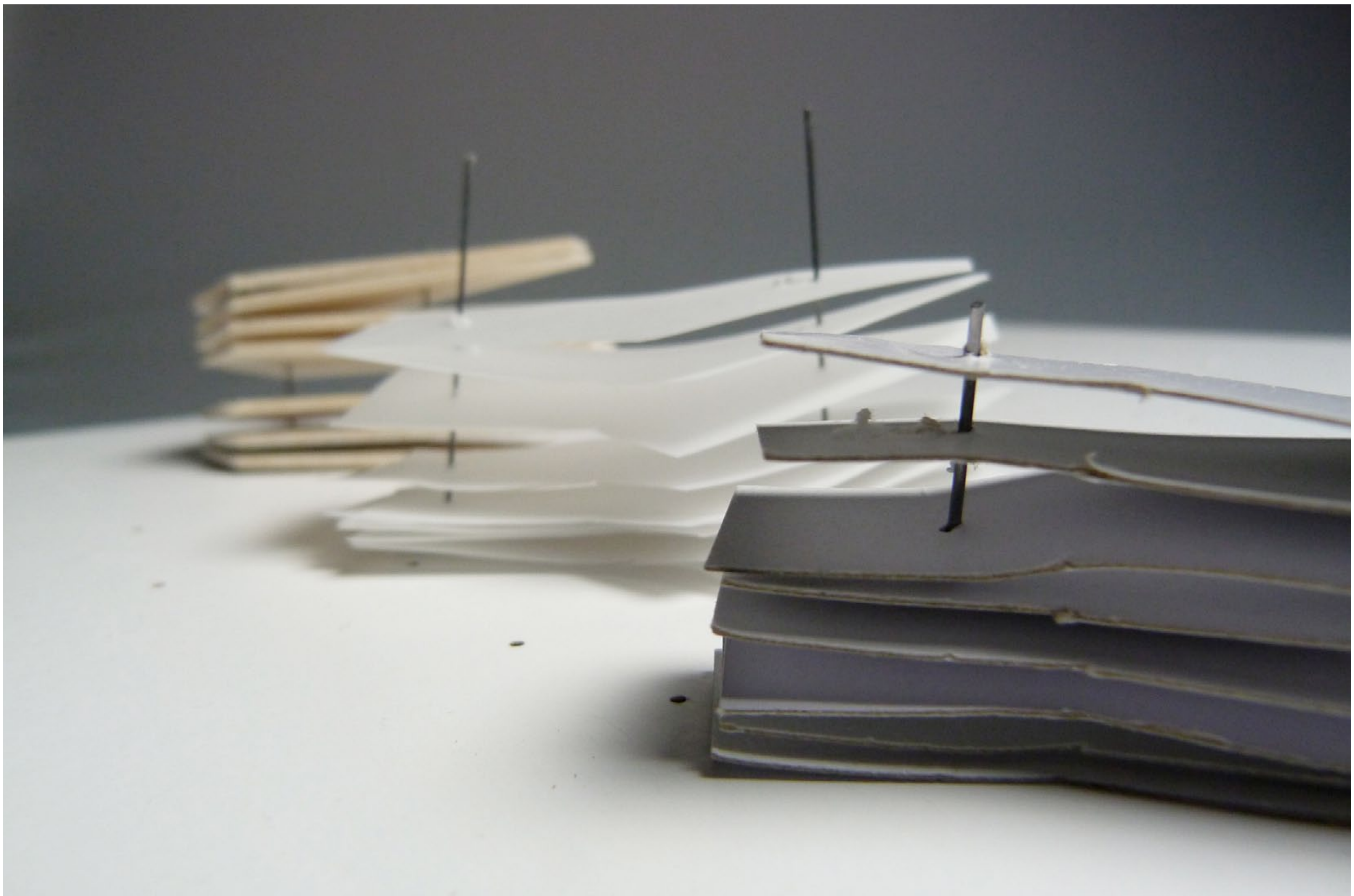


*Fig 5.41. Material enquiry into semi fixed layering of materials*

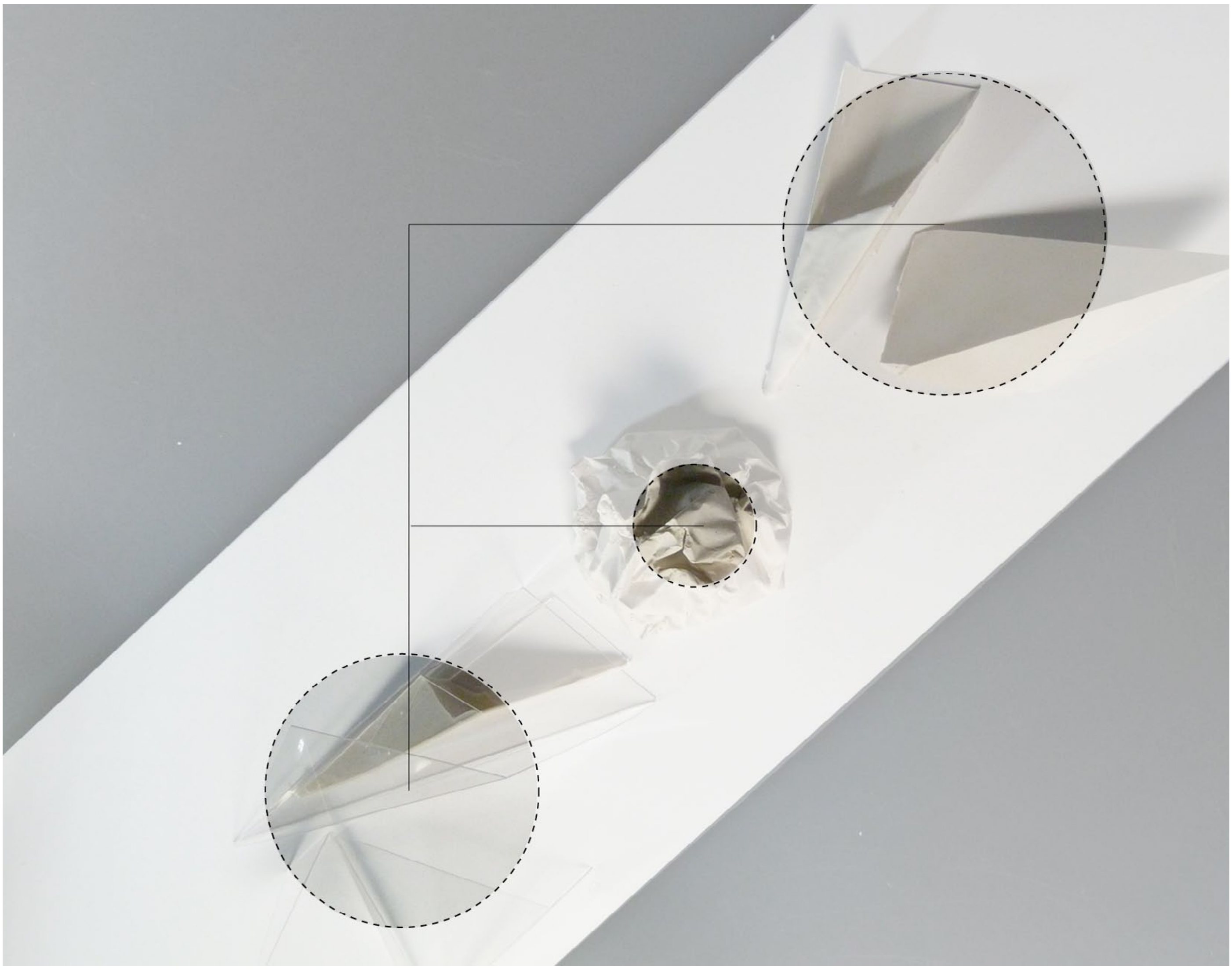
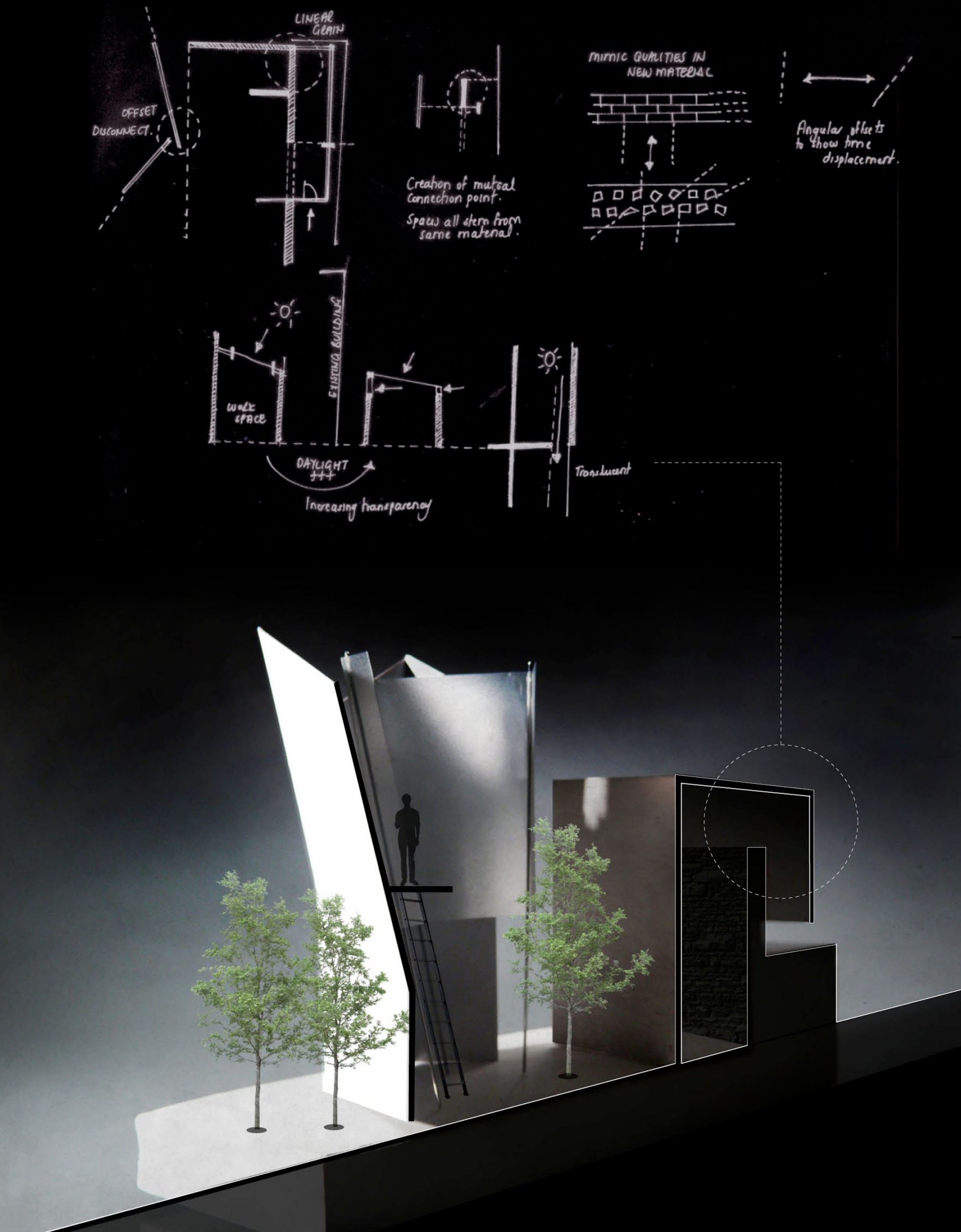


*Fig 5.42. Matriel enquiry challenging the ability to 'recreate' material qualities of one material in a contrasting material*

*Fig 5.43. Material enquiry focussing on creating contrast in tactile and atmospheric material qualities.*


LINEAR GRAIN
OFFSET DISCONNECT.
Creation of mutual connection point.
Spaces all stem from same material.
MIMIC QUALITIES IN NEW MATERIAL
Angular offsets to show time displacement.
EXISTING BUILDING
WORK SPACE
DAYLIGHT +++
Increasing transparency
Translucent

## FINAL SKETCH DESIGN

The proposed home for the Gentle Author consists of three materially contrasting structures responding to working, retreating and sleeping requirements. The existing masonry wall sitting within the site provided the grounding element from which the design slowly alienated itself from as the author moved away from his work space. The physical dilution of the working space within the home was prolonged with the insertion of retreat space, forming a contrasting relationship between the contemporary and historic work homes. The final design intended to allude to the historic nature of the site, both materially and atmospherically, whilst making the displacements of time, function and culture evident. The contemporary work home was ultimately designed as three separate components as a response to the progressive alienation of the worker from his audience through the networking process. The three components houses working, retreating and sleeping spaces. Material properties assessed at the installation scale were then used to define three functional spaces, corresponding to their alienation from the traditional spaces found within the historic work-homes on site and through a dialogue with the working process of The Gentle Author. A final sketch design was reached by selecting models from the material enquiry and positioning them on site in response to the functional layout, which was derived through analysis of the site and programmatic requirements. The physical model was then digitally recreated and drawings were extracted once computerized.

*Fig 5.44. Final domestic sketch design*

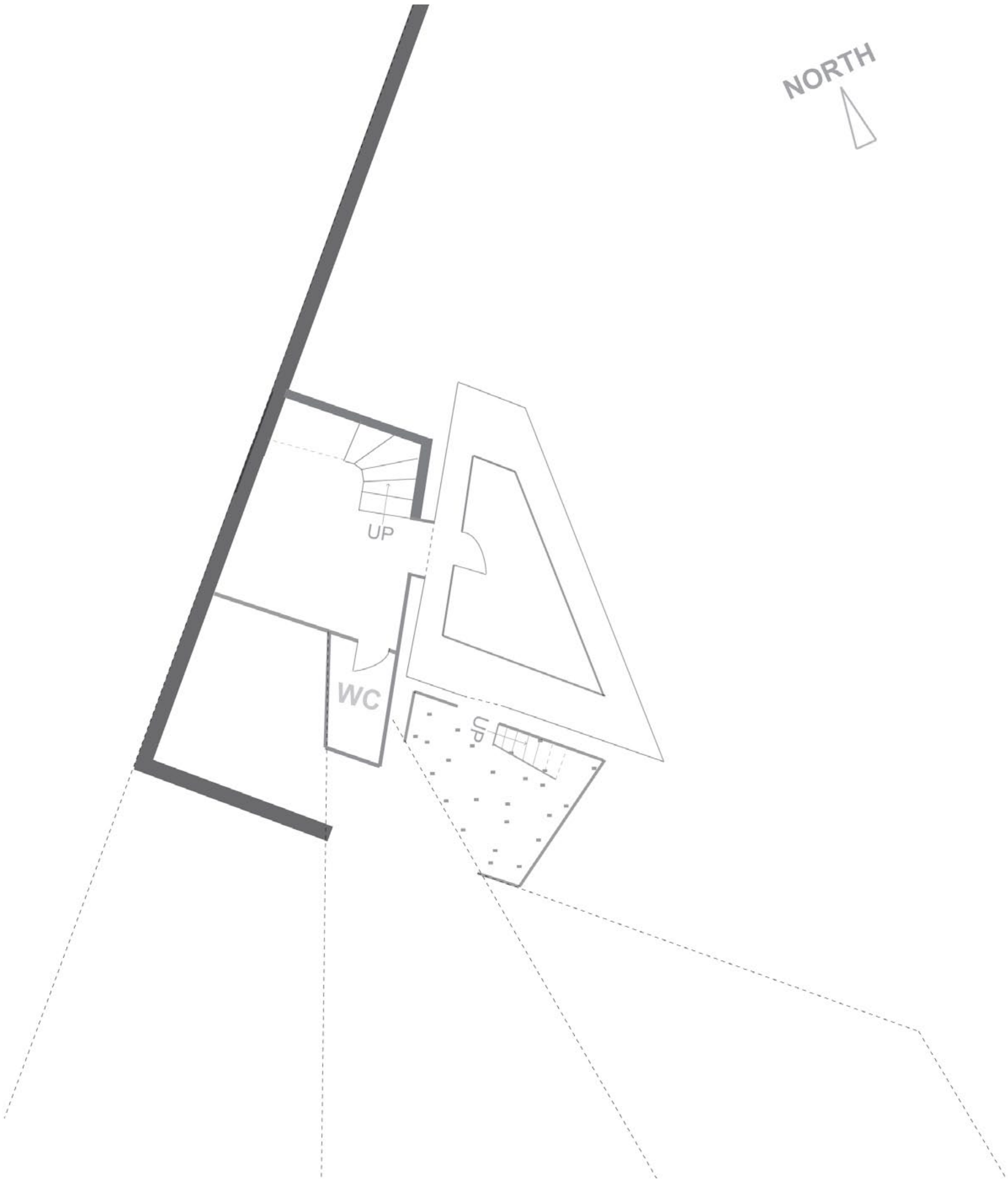



*Fig 5.45. Ground floor plan of contemporary workhome*

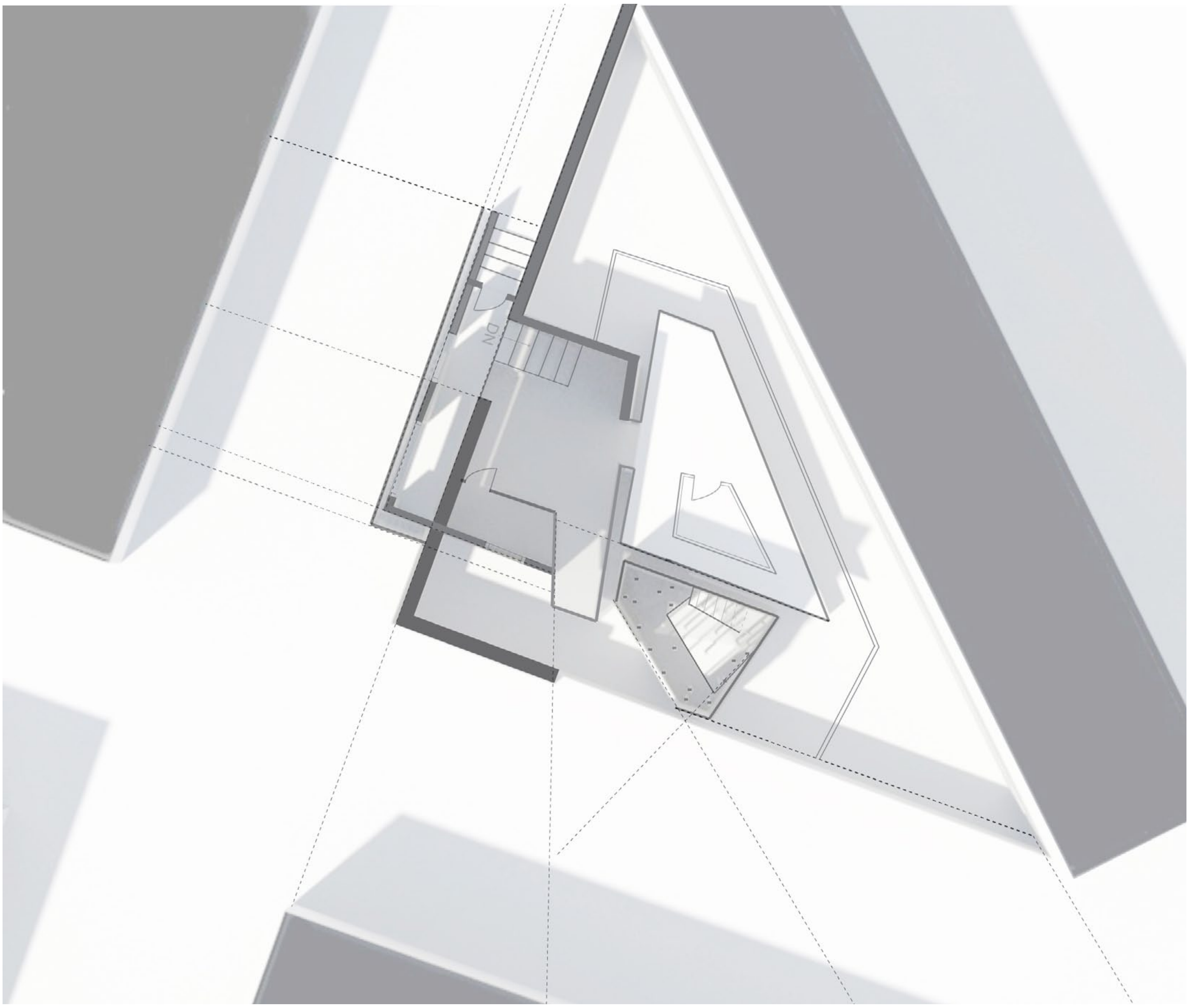



*Fig 5.46. First floor plan of contemporary wokhome*

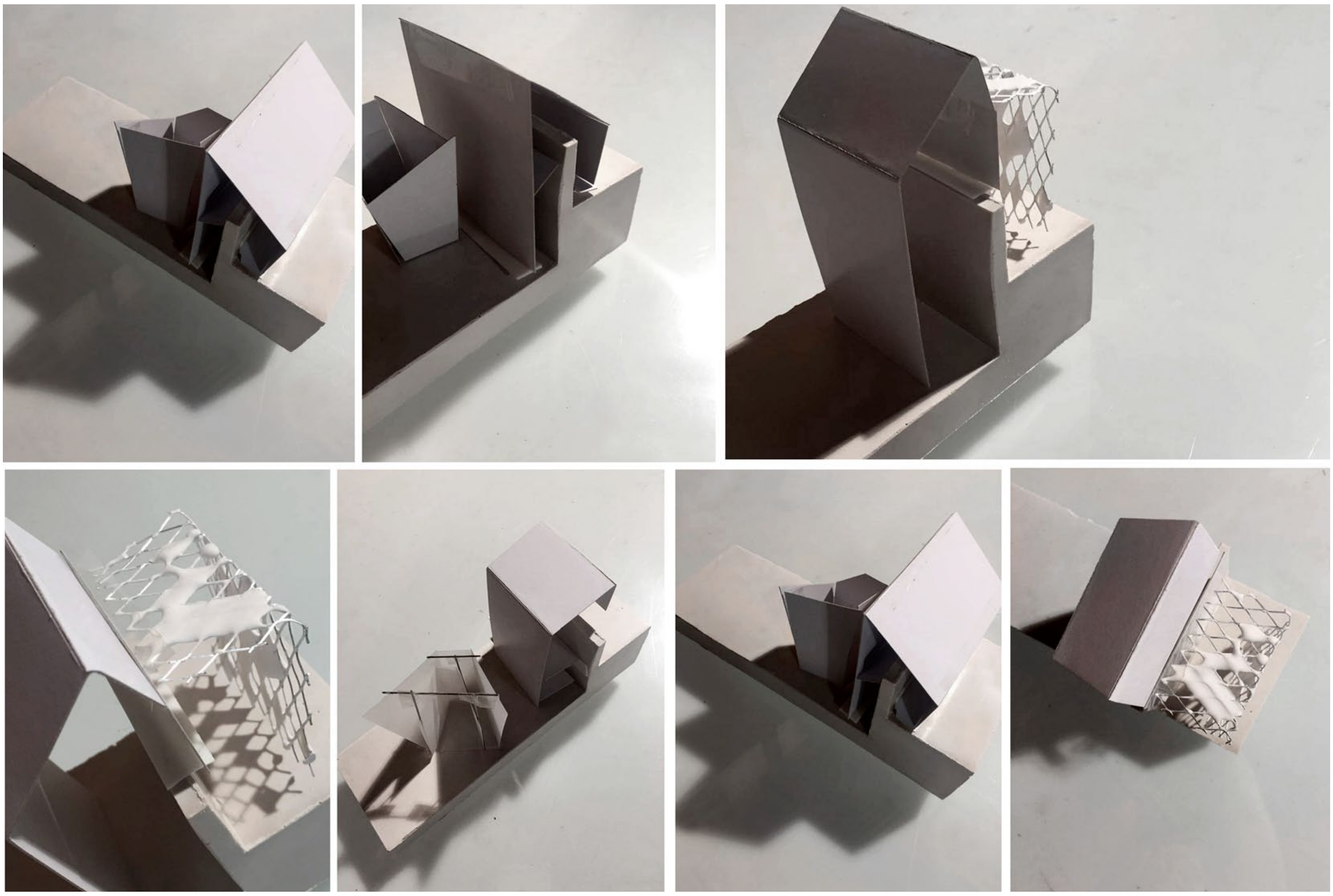


*Fig 5.47. Material model placement, explored in section, surrounding existing masonry wall (moulded in plaster)*

*Fig 5.48. Digital renders of final sketch design*

## REFLECTION

The design process for the Gentle Author's home emphasized the importance of iterative material models as an analytical tool in this research enquiry. Rather than using materials to express a predetermined environment, the materials were tested until they defined their own material agency, allowing them to stay in an authoritative role throughout the process. The speculative insertion of a contemporary work home within the site reflected the historic function of the area and, through this programmatic direction, the intangible qualities of the heritage area regarding its historic programme were introduced and methods of incorporation were tested. Evaluation of the final design highlighted the consequences of using the material models iteratively without contextual grounding, resulting in a design which lacked dialogue with its surrounds. Site analysis throughout the enquiry was fragmented and only carried out when contextual orientation felt completely lost. Before architectural enquiry at a larger scale, a deeper understanding of site was therefore necessary. While the implementation of a narrative allowed the material qualities to be translated into an embodied domestic experience, the subsequent programmatic refinement through digital production proved limiting to the aesthetic language which was instilled through the practical iterations. Digital and analogue design methods were therefore identified as being too disconnected. Further evaluation highlighted the need to strengthen dialogue between atmospheric and tectonic expression when testing the research question at a public scale.

Given the disconnection between practical testing and digital representation, the domestic design halted at a sketch design stage where the digital model 'took over' from the practical enquiries and failed to establish a progressive dialogue with the design development. The sketch design was deemed a suitable end for the small scale enquiry, however a change in design process became critical in the larger public enquiry in order to ensure a more complete design outcome.

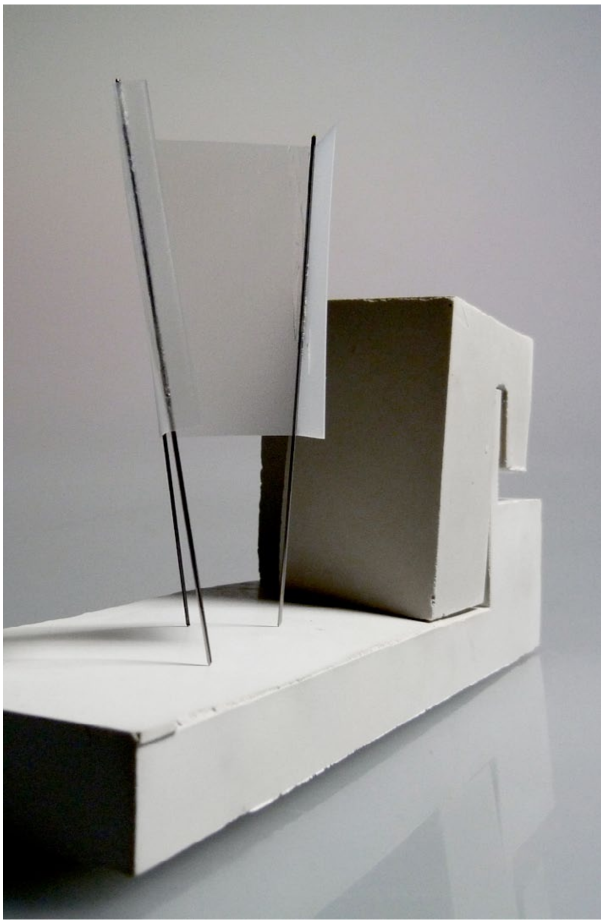
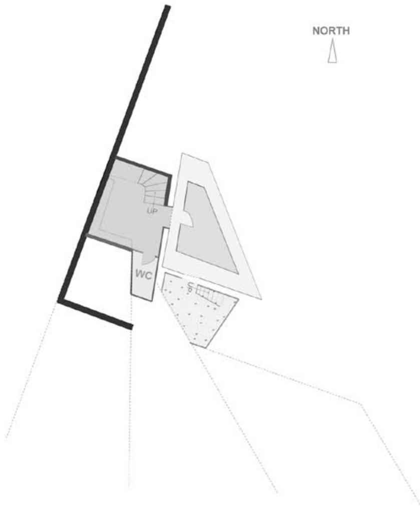
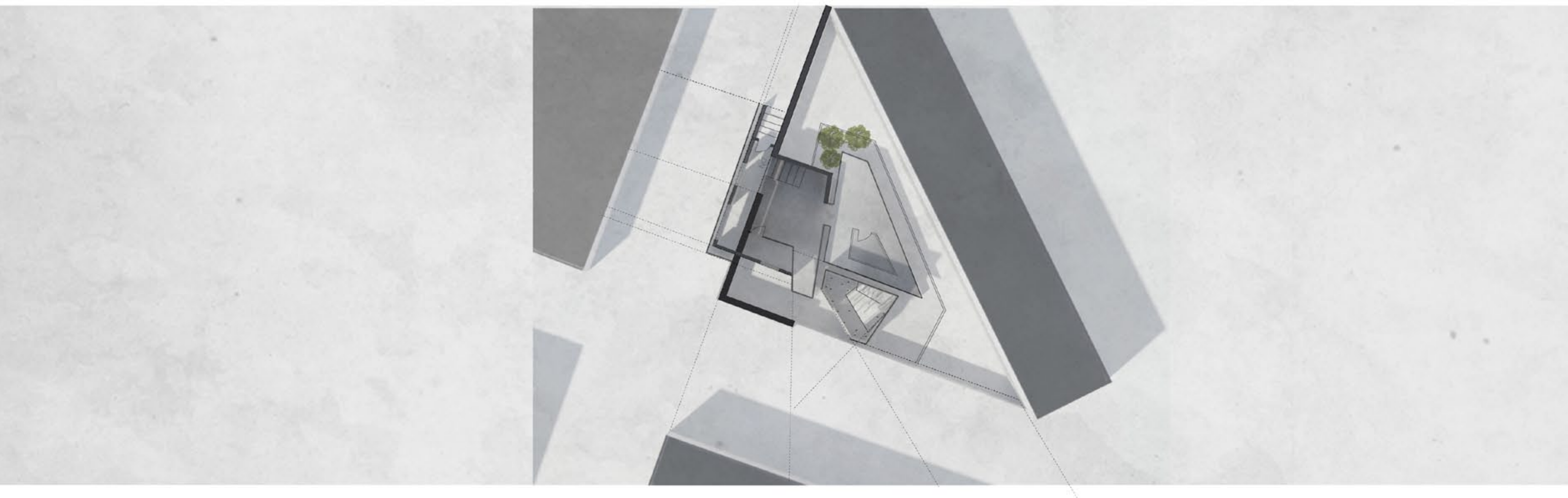


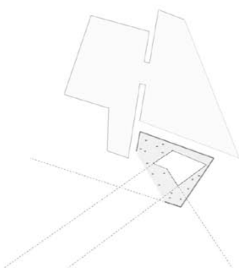
*Fig 5.49. Material model of final sketch design*




GROUND FLOOR PLAN



FIRST FLOOR PLAN



SECOND FLOOR PLAN

*Fig 5.50. Sketch design floor plans in series*

1.0

2.0

3.0

4.0

5.0

SITE 6.0

- *Norton Folgate*
- *The Creative Site Survey*
- *Designing the Site Survey*
- *Site Survey Outcome*
- *Site Analysis*
- *Site Approach*

7.0

8.0

# 6

# SITE

# INTRODUCTION

This chapter introduces and analyses the proposed site in East London. Following reflection at the domestic scale, it became evident that design research required an analysis of the site which would activate a material as well as an atmospheric response as a foundation for the speculative architecture. The site was therefore observed and recorded through a variety of ways relating to both its tangible and intangible qualities. Theoretical positions proposed by Butterworth and Vardy formed the basis for non-linear site analysis, which sought to express the affective impact of site materiality (Butterworth & Vardy, 2008). A practical design enquiry ran alongside this theoretical research, resulting in the production of a three dimensional site map. The practical work was further guided by discussions regarding user integration and perception from Jonathan Hill (Hill, 2003). More linear data regarding the cultural and functional shifts within the Norton Folgate and wider Spitalfields area were then researched and expressed predominantly through diagrammatic notation. Lastly, physical qualities of the site, both data based and as recorded from site visits were expressed through digital models and maps.

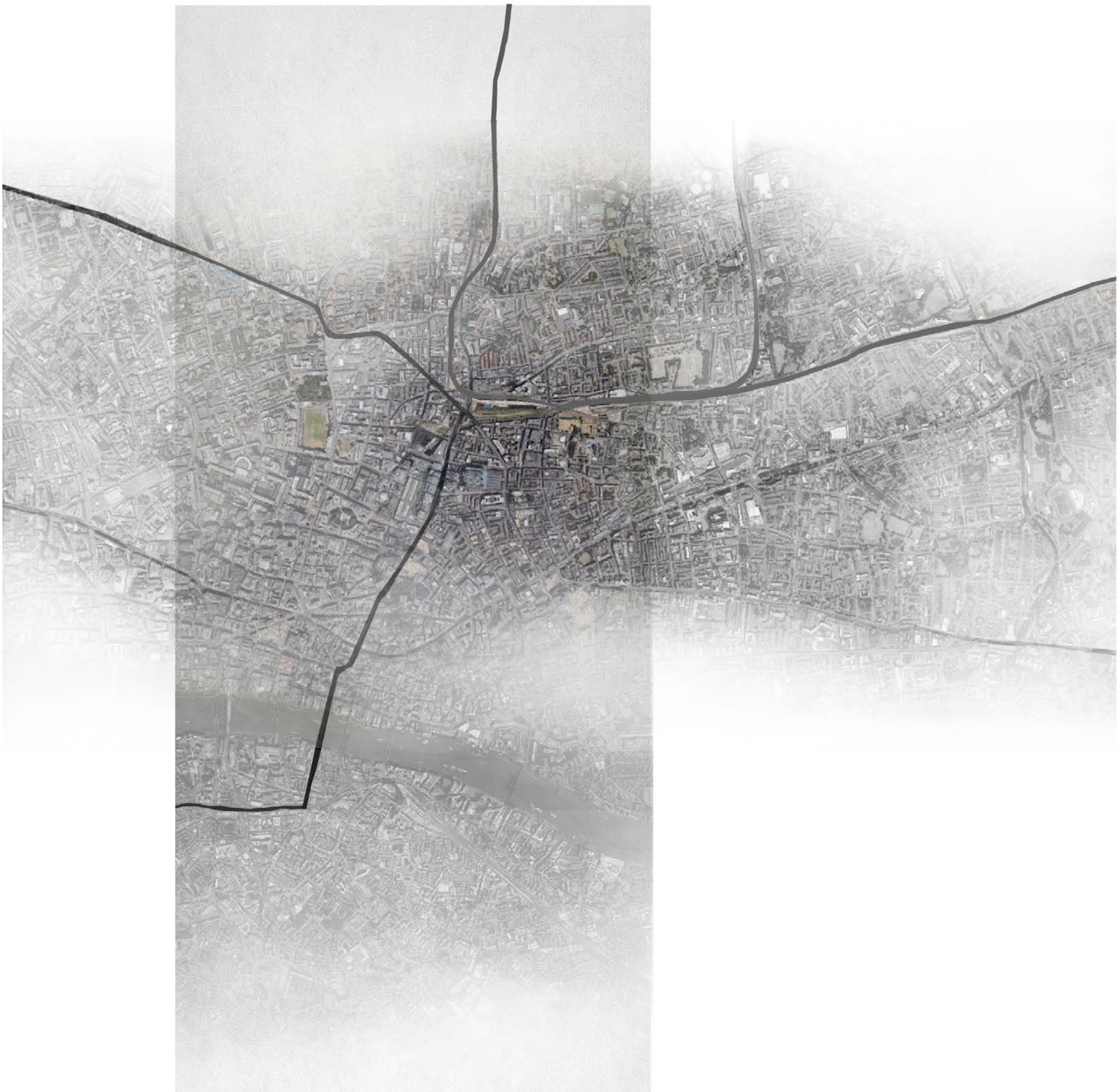


*Fig 6.01. Site map of London*


*Fig 6.02. Location of public and domestic sites*

*Fig 6.03. Domestic site photograph*

*Fig 6.04. Public site photograph*

## NORTON FOLGATE

The Norton Folgate area, which housed both the domestic and public sites, is located within London's East End. A recently approved redevelopment has meant that the Conservation area is set to face extensive demolition in order to make way for a new mixed use development by British Land (Bickersteth, 2016. Web). Having once been the silk weaving district of London, the existing buildings within the Norton Folgate site are predominantly historic work homes of the seventeenth and eighteenth century (Guillery, P. 2004. 102). The majority of the site is composed of London stock brick, with occasional stone and stucco additions. Timber and iron can be found within the historic interiors. The rich history of the site offers a materially and atmospherically charged canvas in which to insert the speculative design. Harnessing the qualities of the site was an important step in defining the existing and subsequently refining the hypothetical atmospheric conditions for the proposed design intervention.

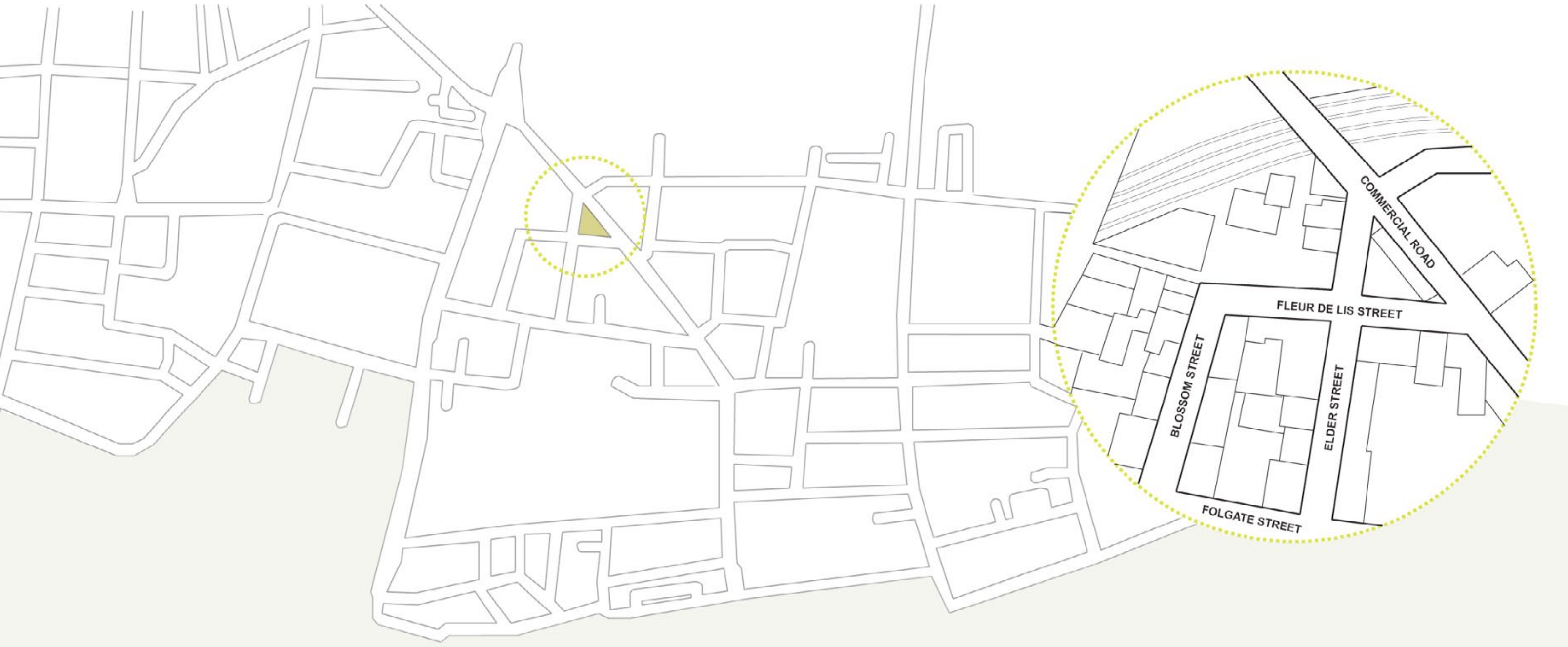


*Fig 6.06. Aerial image highlighting site location and surroundings*



*Fig 6.05 (Left). Site Map*

*Fig 6.07. Photograph taken alongside the public site, showing surrounding buildings*

*Fig 6.08. Heritage listed buildings in the streets surrounding the site*

## THE CREATIVE SITE SURVEY

Butterworth and Vardy consider the 'creative site survey' to be an analytical tool, complimenting traditional site analysis, which seeks to orchestrate non-objective relationships between users and site (Butterworth & Vardy, 2008.128). The development of this analytical model stems from a critique of the traditional ways in which site information is incorporated within the design process, arguing that site analysis too often "becomes the site for the purposes of the design" despite existing as a series of codified representations (Butterworth & Vardy, 2008. 127). They observe the tendency of site information to be restricted in its physicality and further abstracted through its representations to a point which strips any affective depth from the physical site itself. Henri Lefebvre similarly argues that "a space reduced to blueprints…is the enemy of the imagination" (Lefebvre, 1991. 361). It becomes evident that individualised and affective understandings of space need to emerge before design development, at the time of primary site analysis. This further questions the need for collectively comprehensive site information within a discipline which is beginning to favour multi-sensory understandings of space.

*Fig 6.09. Masonry wall enveloped within the domestic scale design proposal*

## DESIGNING THE SURVEY

Modes of presentation for the site analysis draw from Hill's views of the role of the user and the potential of using montage as a strategy for acknowledging their creativity within this role. Hill suggests this is achieved through actively encouraging the user to find resolution through the appropriated and often juxtaposed collection of information (Hill, 2003. 3). Hill describes the sensory power of montage to lie in the tensile relationship between images and gaps (Hill, 2003. 110). The disassociation of informative fragments, when challenged by purposeful gaps and overlaps, aligns with the interactive intentions of this research and its subsequent design outcomes. Whilst engaging the body in developing understandings of space, the significance of materiality, through both tangible and intangible conditions needed to be evident. Fragments of information were constructed from images of the site and images of material models. The material models were constructed as a response to the observed qualities of the site materials, however they were represented void of context, prompting the user to observe shifts in their interpretations of the materials. Fragment placement and the introduction of gaps therefore become necessary in alienating the material from its constructive conditions, and prompting the user to consider materials creatively. Creative site studies in this thesis are therefore explored through methods of montage, explored both two and three dimensionally in order to construct an architectural language which can be translated to design at the public scale.

## METHOD

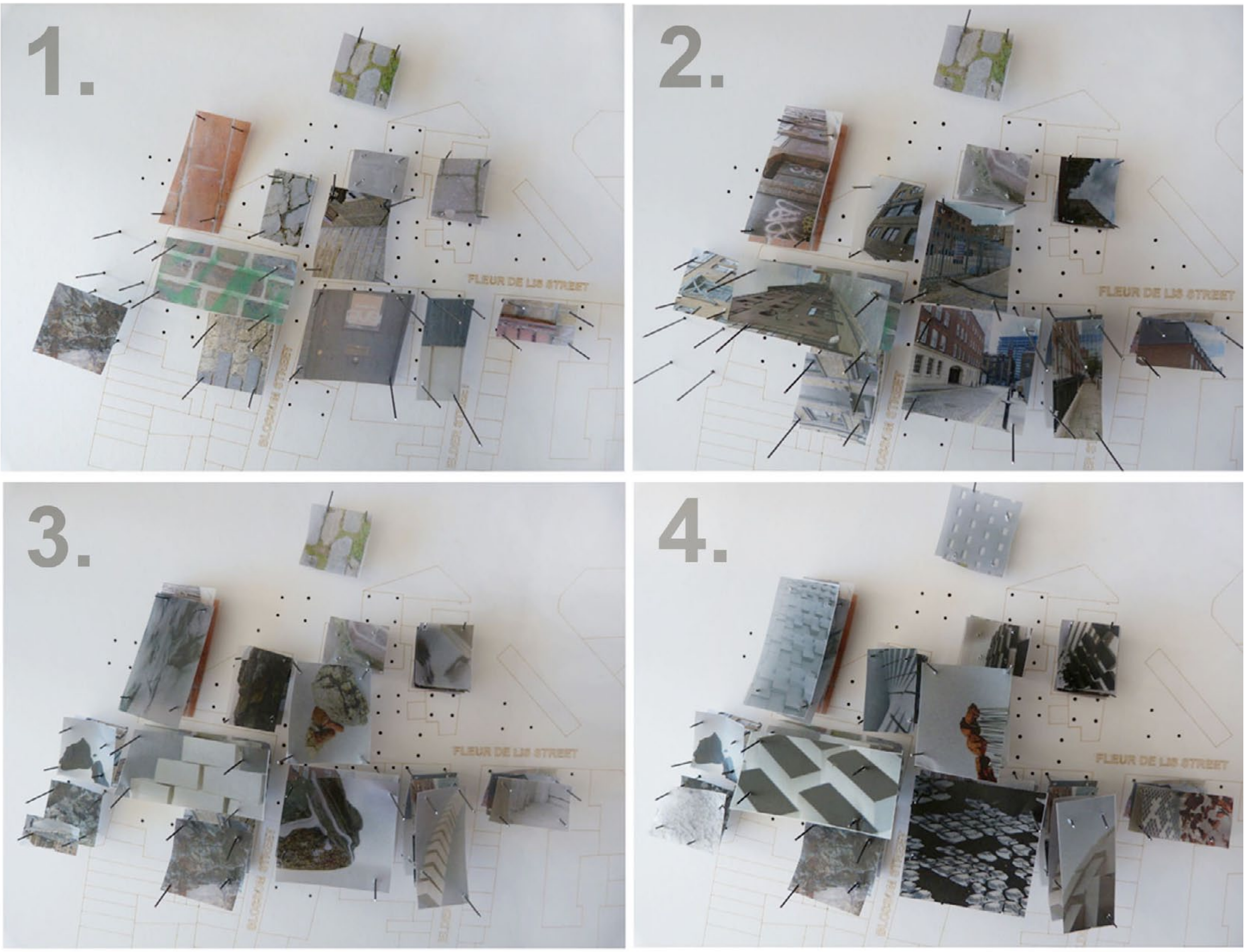



*Fig 6.10. Illustrated method showing each layer within the 3D site map*


20

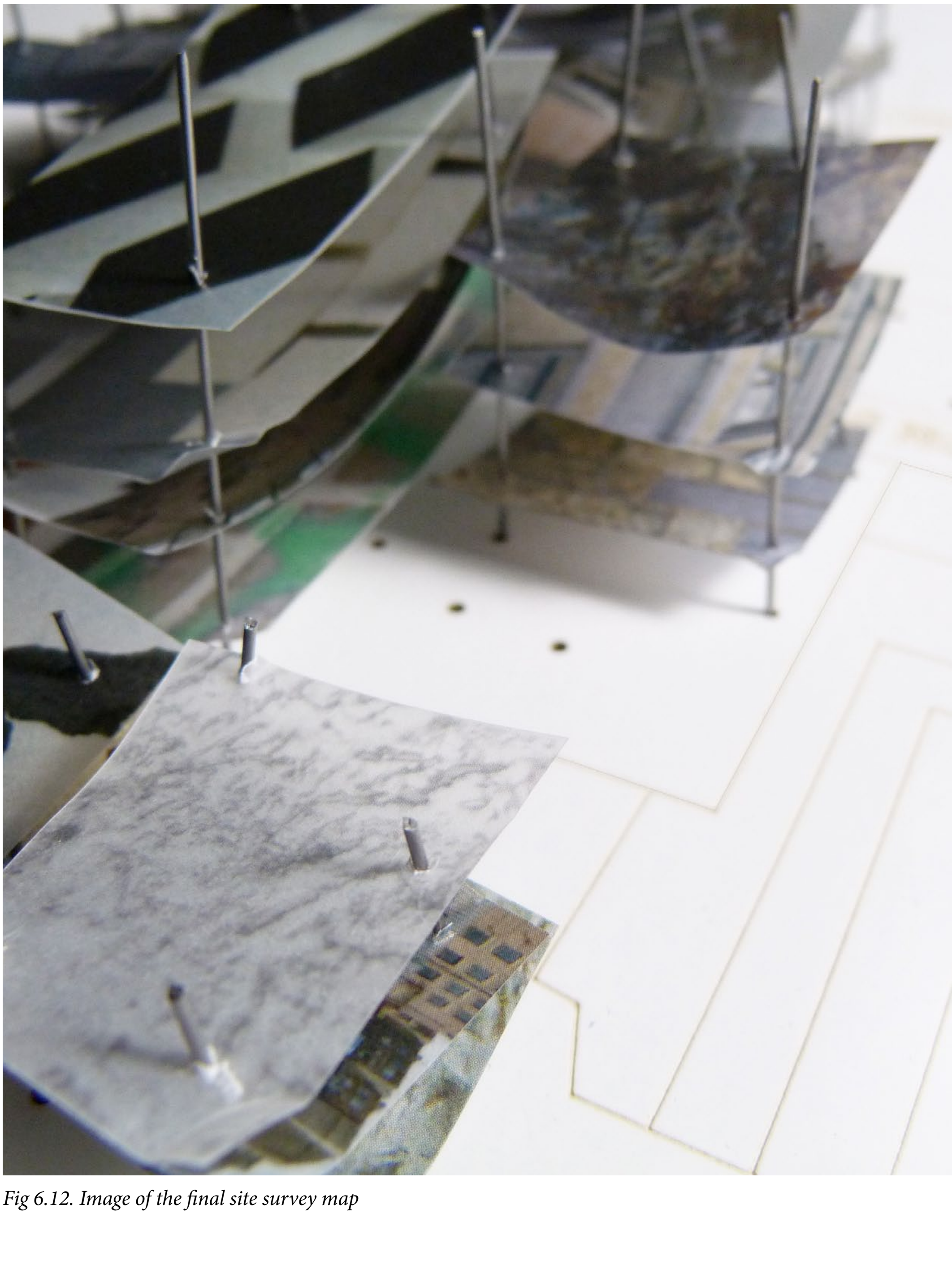


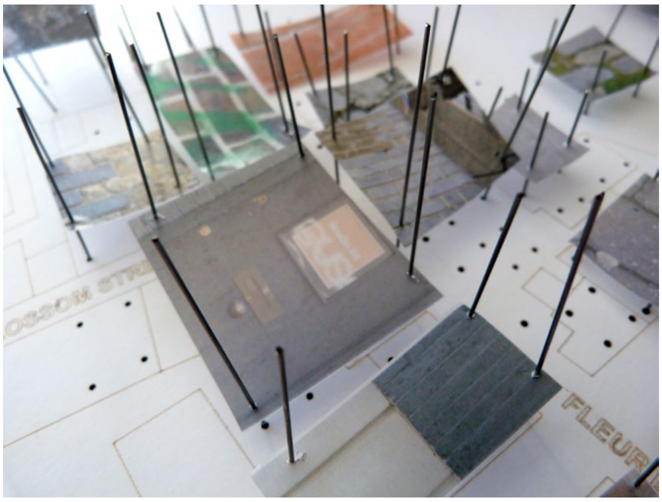
*Fig 6.12. Image of the final site survey map*



*Fig 6.11. (Left). Existing warehouses along Blossom Street (opposite the public site)*

## SITE SURVEY OUTCOME

Drawing upon Butterworth and Vardy's site survey model in which "emphasis is placed upon a participatory user", the design sought active engagement with its audience (Butterworth & Vardy, 2008. 125). Rather than producing a flat series of images for interpretation, a three dimensional method was therefore employed using layers of stacked images, printed on translucent materials, which encouraged an 'active comprehension'. The site survey of Norton Folgate was composed of four 'layers' of montaged images. The first layer consisted purely of material photographs taken directly from site, forming the database for the experiment. In the second layer, the materials are shown in their wider context, and subsequently shown through handmade material representations. Material models were composed of red brick, plaster, acrylic, transparent plastic and balsa wood, each model mimicking the qualities of the site materials as much as possible. The models were then photographed in different lighting environments, forming the final layer of survey images. The exercise became a way of establishing a relationship to site and a mode of representing its materiality having been able to visit it only twice in person throughout the research process.



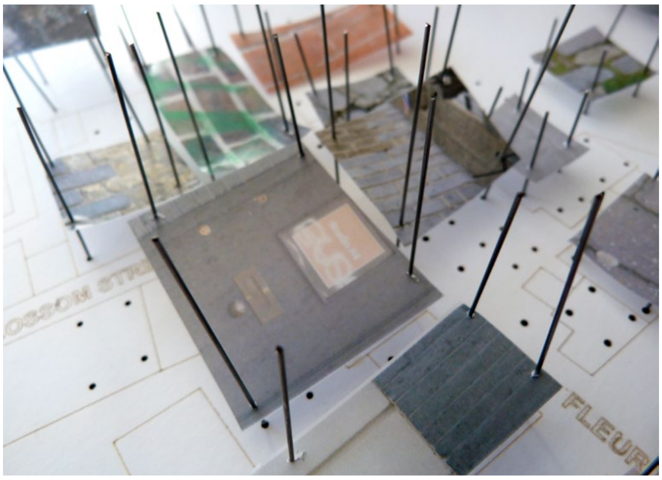


*Fig. 6.13 and 6.14. Images of the final survey*



*Fig. 6.15. Image of the final survey map*

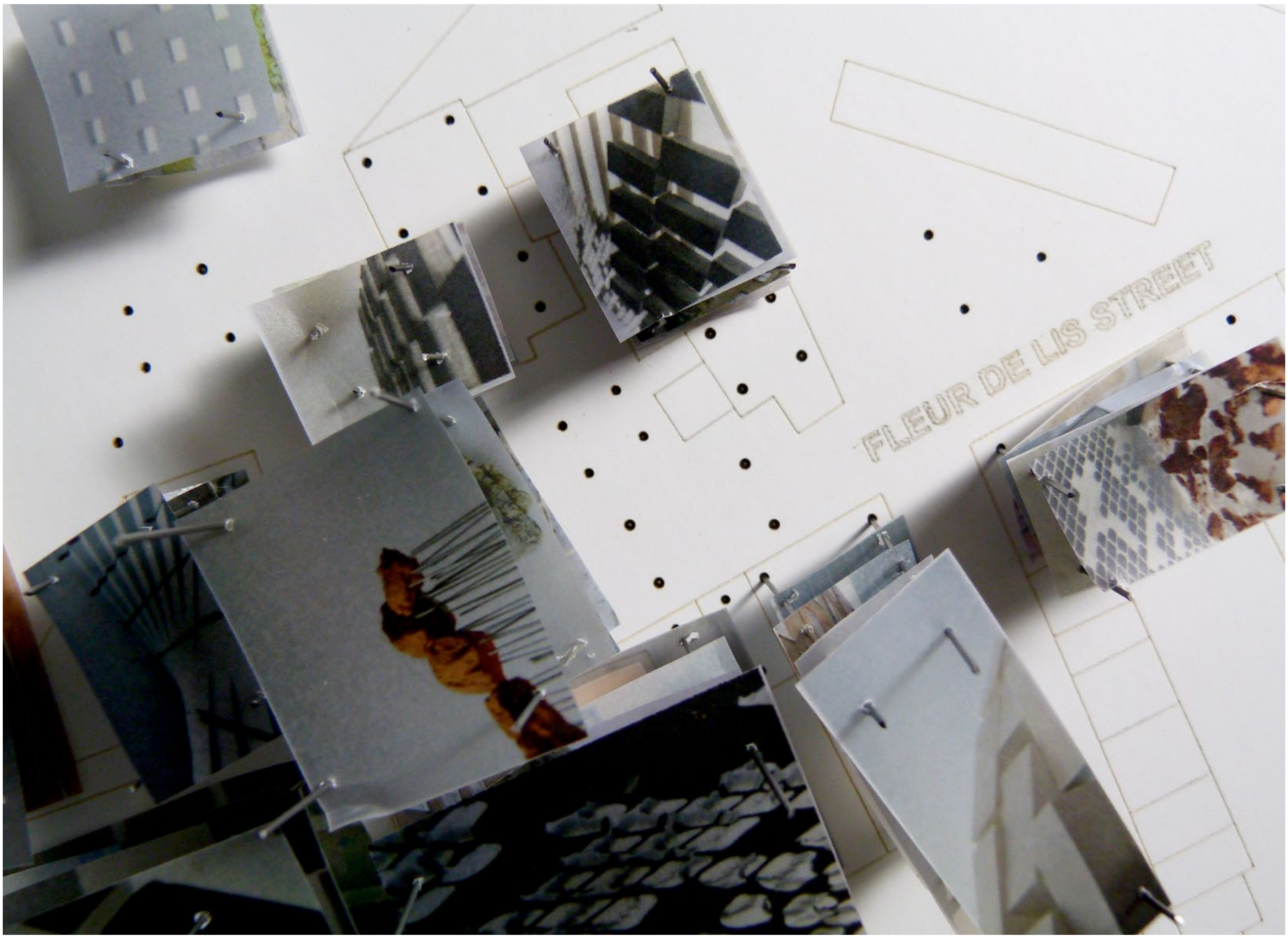


*Fig. 6.16. Final survey map*

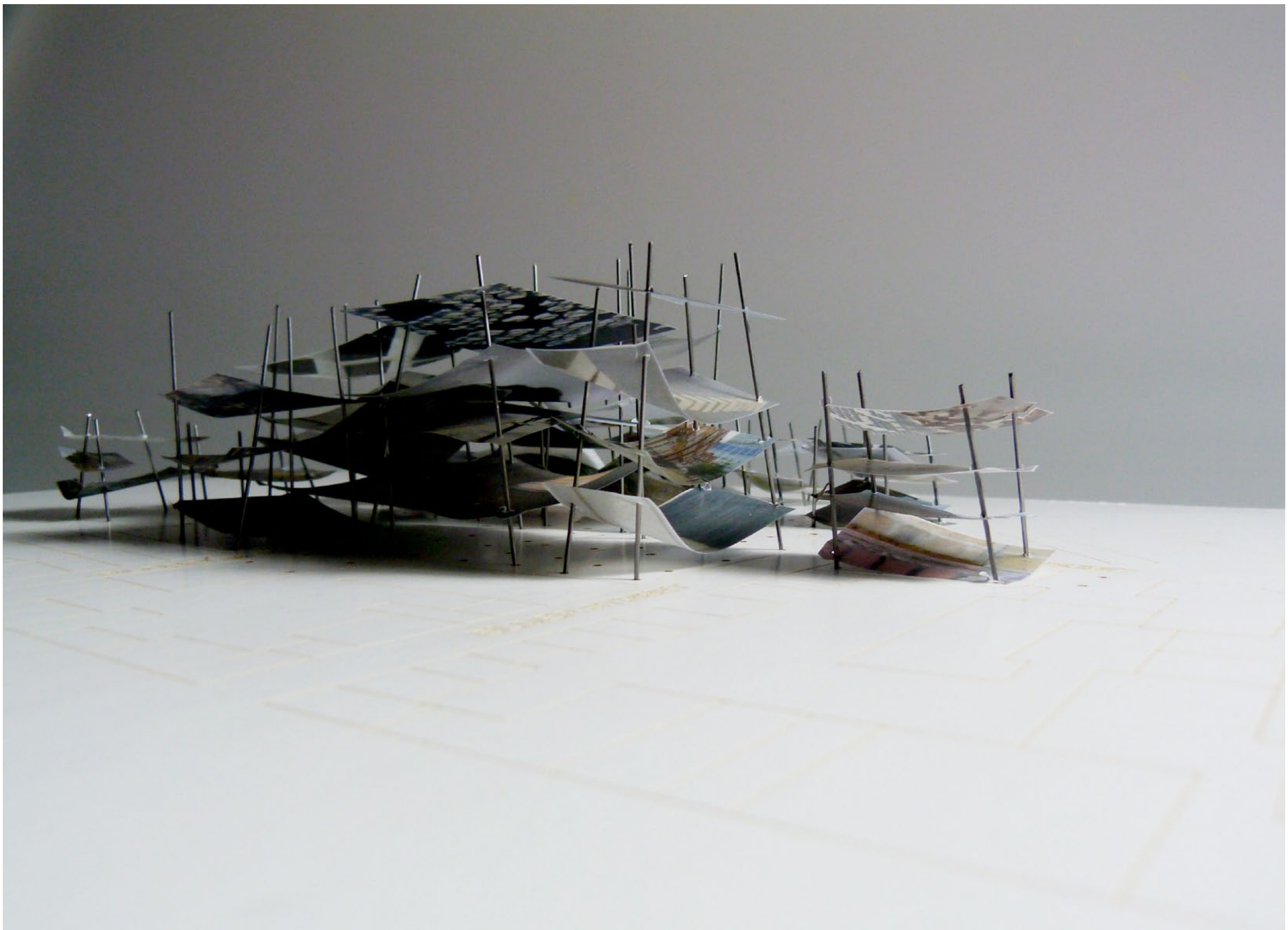


*Fig. 6.17. Final survey map*

## SITE CONDITIONS

Alongside the site survey, it was important to establish physical conditions of the site which would ultimately contribute to the design process. The site was therefore quantitatively assessed for its urban grain, accessibility, daylight conditions and heritage listings.

*Fig. 6.18. Elevations of surrounding buildings*

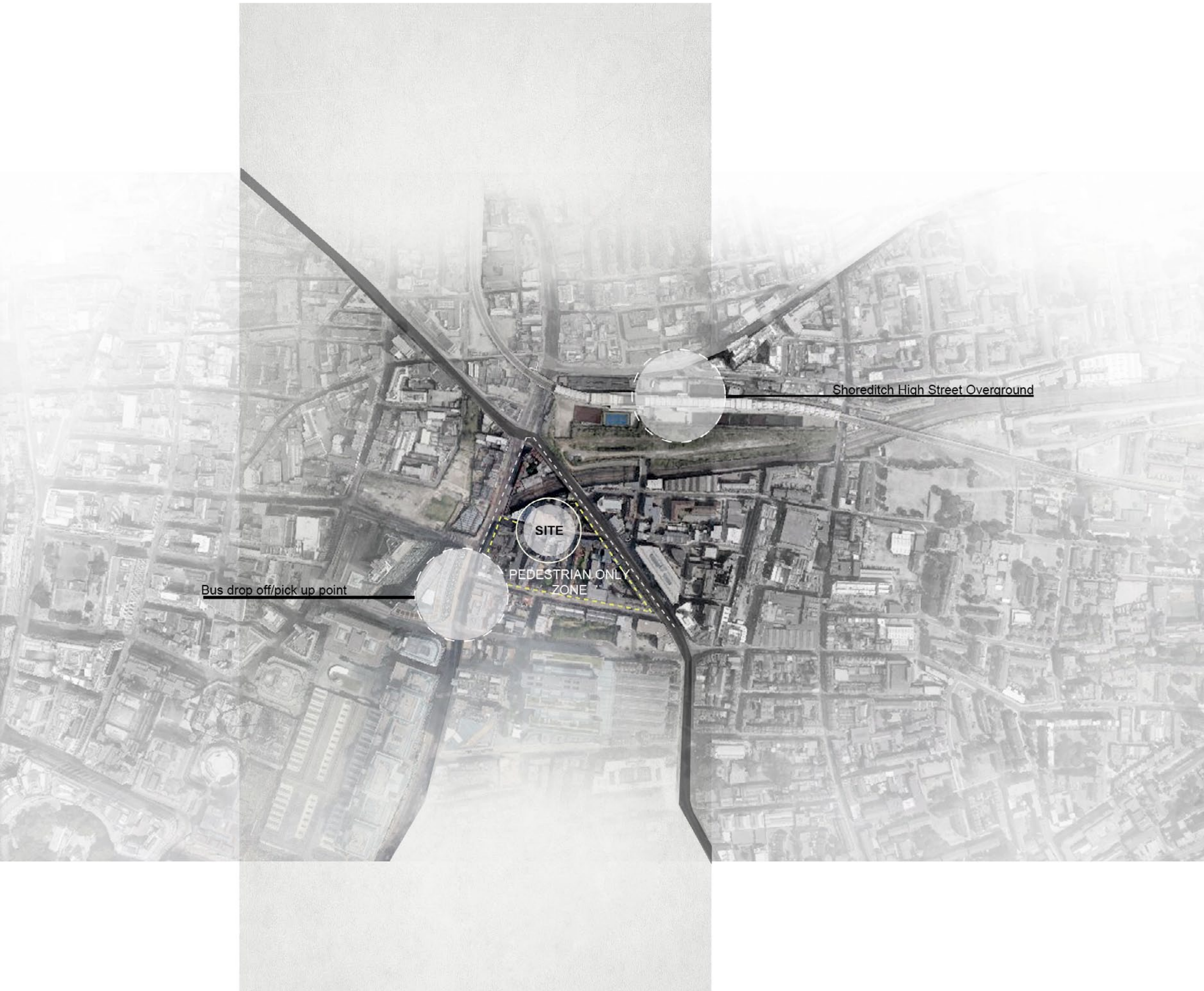


*Fig. 6.19. Site location within London city*


SITE

URBAN GRAIN STUDY

*Fig 6.20. Study into the grain of the site*

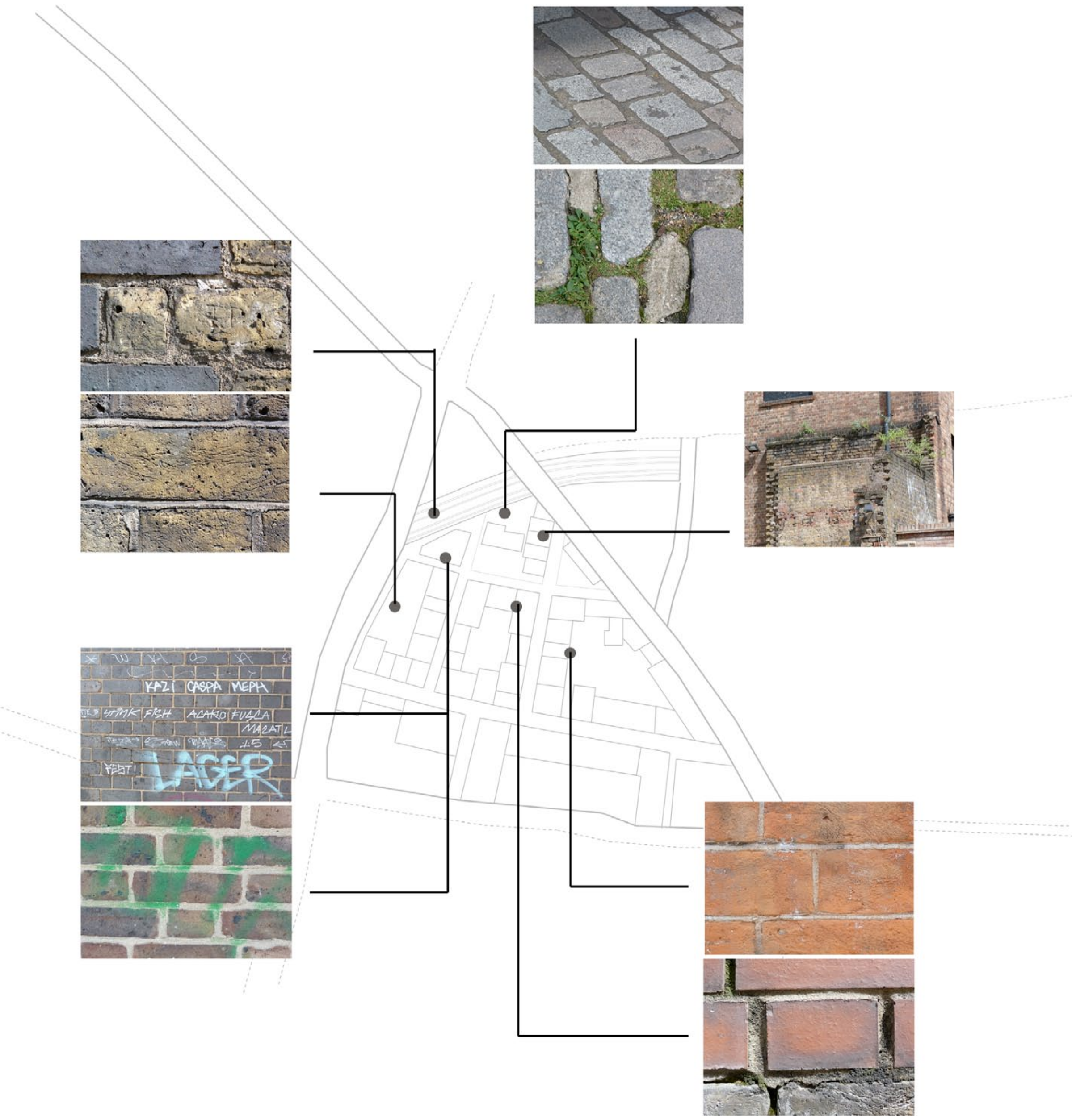



## SITE ACCESSIBILITY

*Fig 6.21. Site map showing main roads surrounding Norton Folgate*


MATERIALS ON SITE

*Fig 6.22. Collage of material photographs taken at the site*




## MATERIAL PLACEMENT

*Fig 6.23. Study into material placement on site. The study continues over the next two pages, which further observe material dispersal throughout the site.*

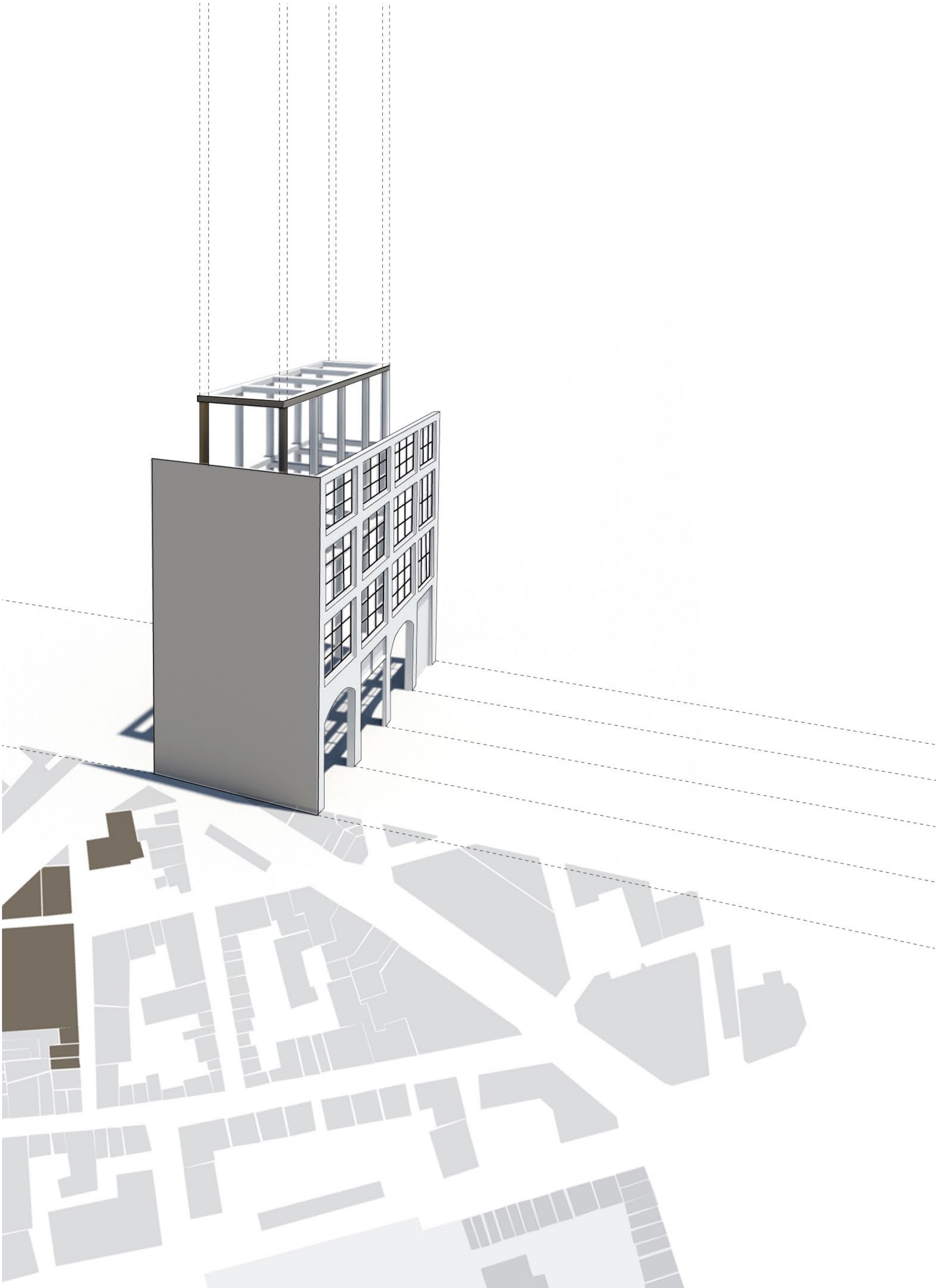


*Fig 6.24. Stock brick warehouse placement within Norton Folgate*


*Fig 6.25. Red brick placement within the site*

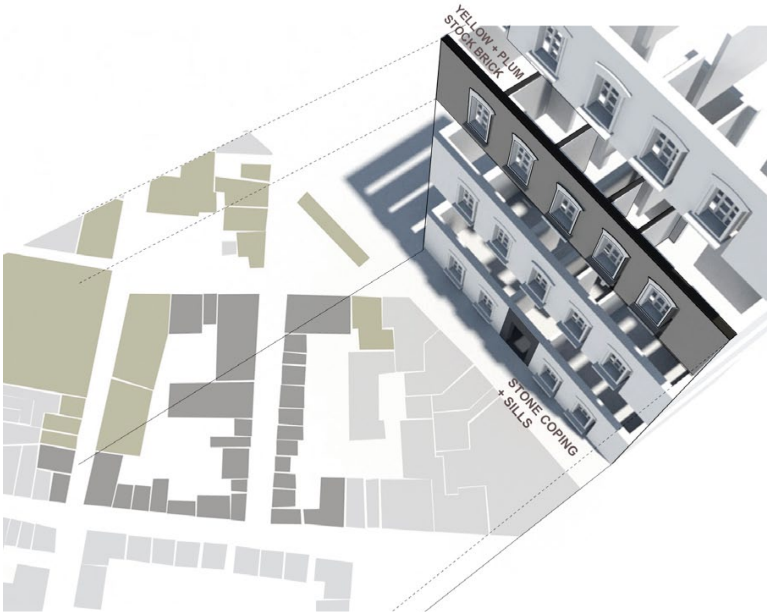
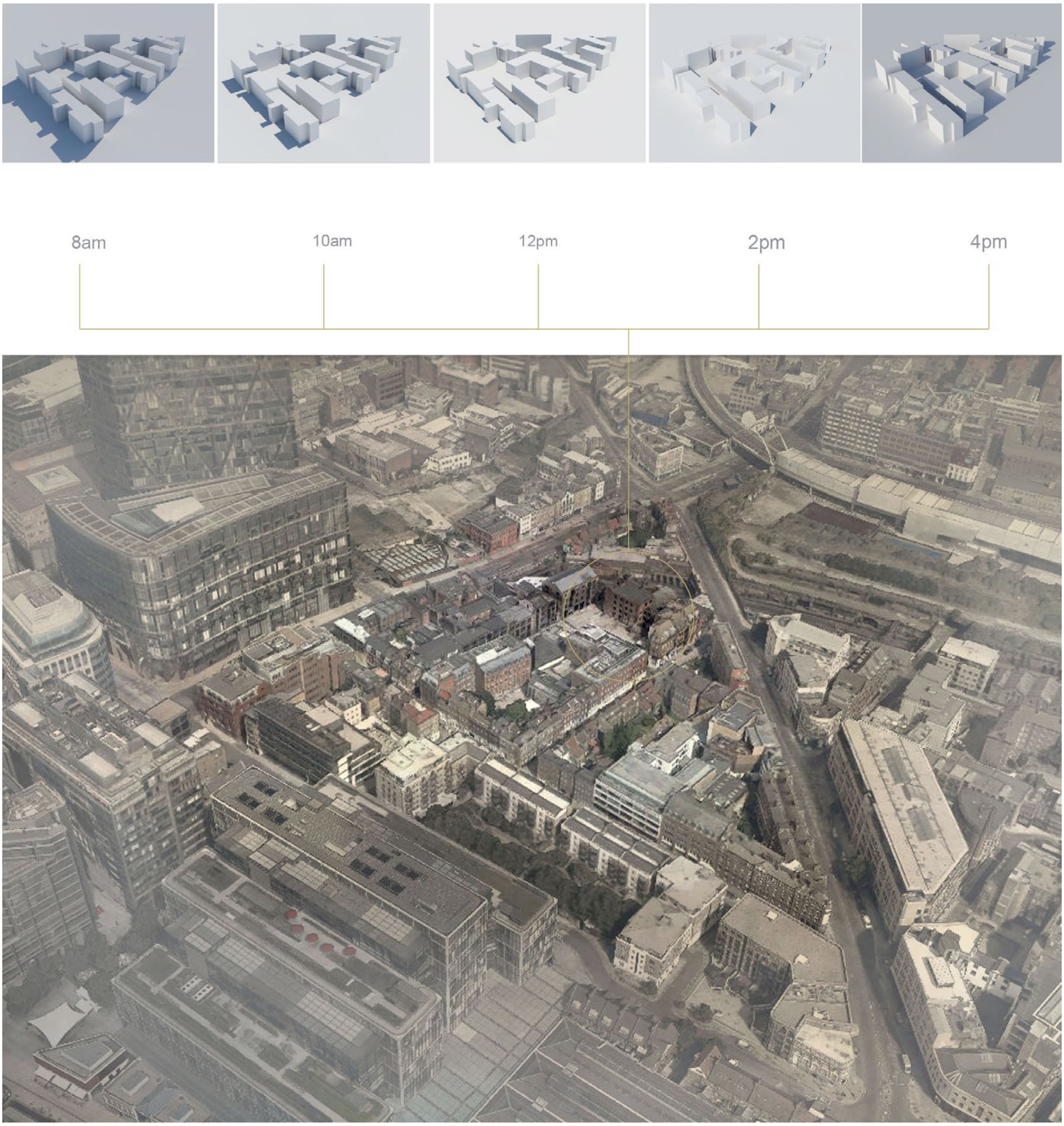



*Fig 6.26. Yellow and plum brick placement on site. Also showing locations of stone sills noticeable throughout the Norton Folgate area.*




## DAYLIGHT ON SITE

*Fig 6.27. Study into the daylighting conditions on the site. The render series at the top shows light + shadow spaces acting on the site throughout the day at two hour intervals.*

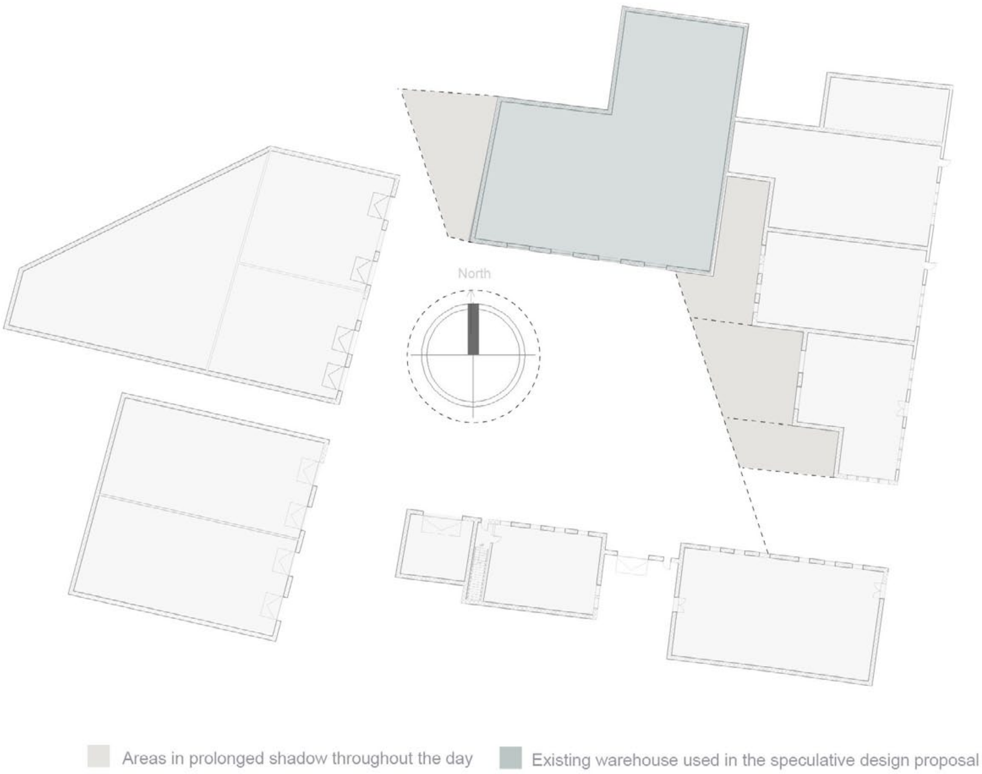



*Fig 6.28. Following on from the previous study, this map shows the areas of the site which are in prolonged periods of shade throughout the day*


## SITE EXPOSURE

*Fig 6.29. Diagram showing window placement and areas of exposure within the public site.*

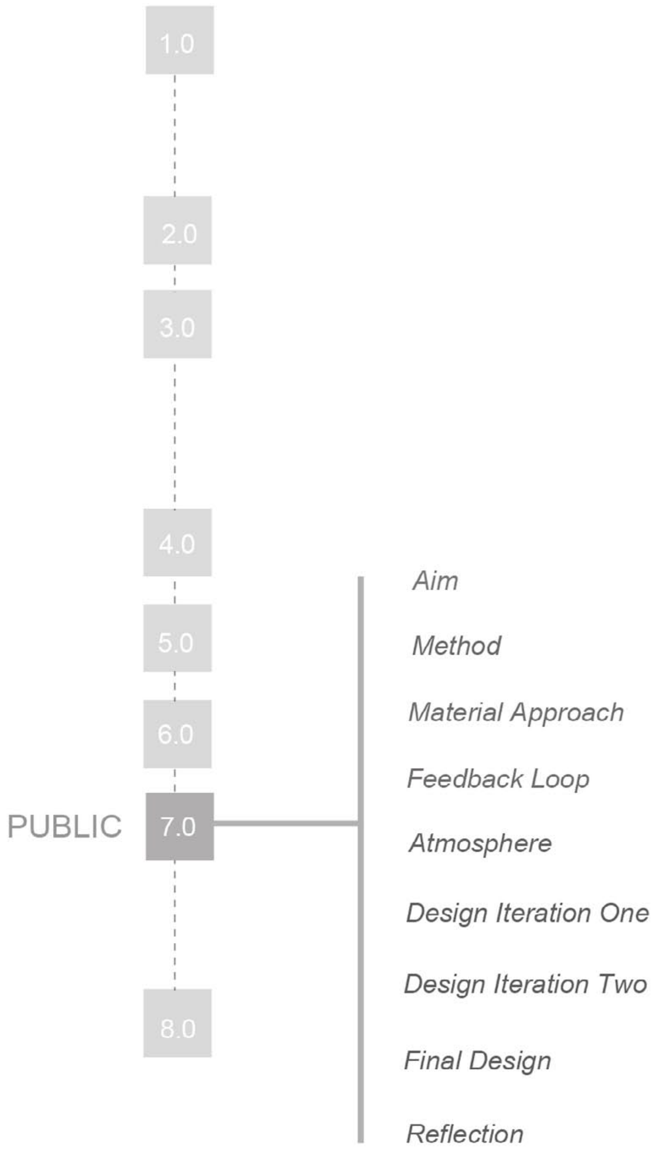

HERITAGE LISTED BUILDINGS

*Fig 6.30. Map showing the location of heitage listed buildings and pavements within the Norton Folgate site.*

*Fig 6.31. Historic image of the Norton Folgate site*

## SITE APPROACH

The historical intensity of the Norton Folgate site situates it within a sensitive construction context. The significance of the heritage site has been recently highlight following the endorsement of a large scale redevelopment within the area, threatening to demolish over 70% of the heritage buildings on site (Bickersteth, 2016. Web). Speculative design at the public scale therefore sought to propose an alternative site approach. Rather than demolishing the existing buildings, the design research utilizes the existing historic fabric as part of a new design, employing gaps between existing structures to extend the new designs and using interior interventions to reinvigorate the site.


1.0
2.0
3.0
4.0
5.0
6.0
PUBLIC
7.0
8.0
Aim
Method
Material Approach
Feedback Loop
Atmosphere
Design Iteration One
Design Iteration Two
Final Design
Reflection

# 7

# PUBLIC SCALE

## INTRODUCTION

Design through research at the public scale resulted in a speculative art gallery proposal for the Norton Folgate site. The design approach was directed by three reflective considerations; the need to better understand site conditions, establish a digital presence within the design process and create a material focussed design narrative. The following chapter discusses how these considerations were addressed and implemented. An explanation of the method and material approach highlights progressive shifts in process towards exploring the proposition and reflecting on it. Subsequent sections regarding the iterative development and program implementation seek to establish the architectural direction of the project, including the role of material narrative and the dynamic progression of material agency. Following the final design presentation, the work is ultimately evaluated and reflected upon.

## AIM

The aim of the public enquiry was to design a speculative art gallery through a material based design process that productively engaged both analogue and digital testing methods. Within this framework, the enquiry sought to address and further amplify the atmospheric qualities of the proposed design by focussing on a material agency activated in, and through, site, user and program.

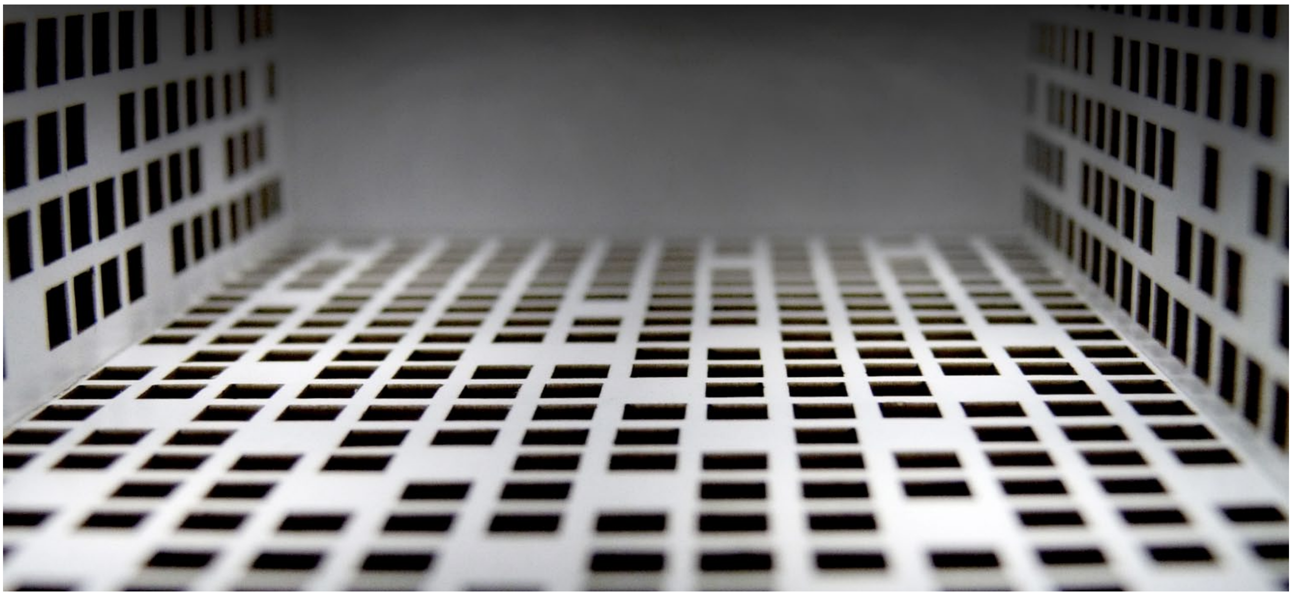


*Fig 7.01. Cardboard perforation model from the public enquiry*

## METHOD

The first step of the public scale enquiry was to formulate an appropriate feedback loop between analogue and digital methods. Digital and analogue iterations instead worked collaboratively to progress the design led research, rather than the previous analogue focus. Digital tools were employed which had the capacity to engage with materiality through a computerized lens. This was largely achieved through digital experiments in the Grasshopper plug in. Material images from the earlier experiments were computerized through image sampling tools in Grasshopper, noting changes in grain, texture and atmosphere. Graph mapping tools within the program allowed for the material surfaces to be manipulated three dimensionally, which were then rendered through 3DS Max and compared to photographs of the original models. Digital scenarios were reconstructed through analogue means and subsequently photographed, mirroring the modes of enquiry at installation and domestic scale.

The decision to shift to brick materiality prompted a responsive change in the digital approach to the enquiry. Rather than working directly from images derived from analogue processes, there was a shift towards modelling brick walls and using parametric tools to manipulate the geometry through variable components. Changes in scale, spacing and uniformity challenged the traditional applications of brick. Digital tools were also utilized to test the dispersal capacity of bricks over a number of curved and folded surfaces. Analogue methods continued to recreate the digital iterations and test them atmospherically, changing light and material surfaces to better understand the relationship between the two. Keeping in mind Zumthor's encouragement to "think dialectically", exploring contrasting elements became a way of better maintaining a strong aesthetic language throughout analogue and digital modes. A specific narrative was not employed for the design, however the gallery program was refined once a stronger sense of the material environment had been established.

*Fig 7.02.(Left). Public process diagram showing movements between analogue and digital testing methods*

WEEK ONE

Combining **Natural + Artificial Materials**

INSTALLATION

Recreating **Material Surfaces**

'Unmaking' **Material Models**

**Light + Material** Analysis

ANALOGUE

Drawing **Material Interpretations**

Photogtaphing **Material Surfaces**

**2D + 3D Surface** Mapping

DOMESTIC

Creating **2D Textures**

Applying **2D Textures to 3D Models**

INTRODUCTION OF FEEDBACK LOOP

Increasing **Material Scale**

Decreasing **Material Scale**

**Light + Material** Analysis

**Parametric Spacing** Experiments

**Parametric Perforation** Experiments

PUBLIC

**Light + Perforated Material** Analysis

**Light + Material Thickness** Analysis

DIGITAL

**Digital Transparency** Experiments

**Material Interface** Models

**2D Material** Placement Planning

**3D Material** Placement Planning

**Tectonic** Model Making

**Light** Testing

**Digital Model** Making

**Digital** Rendering

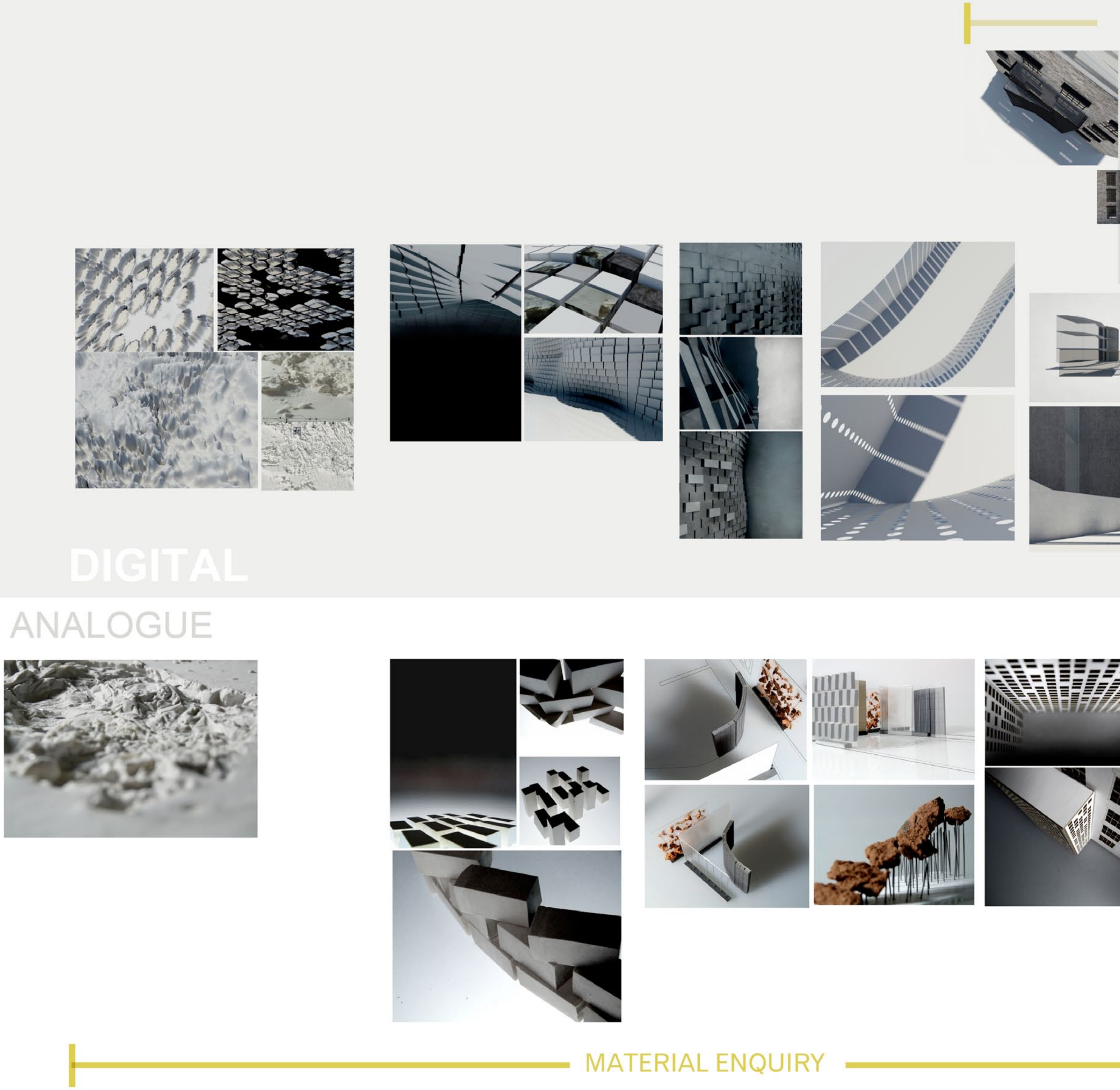
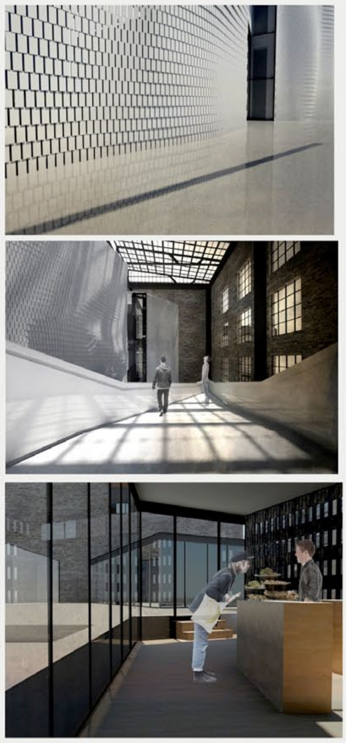


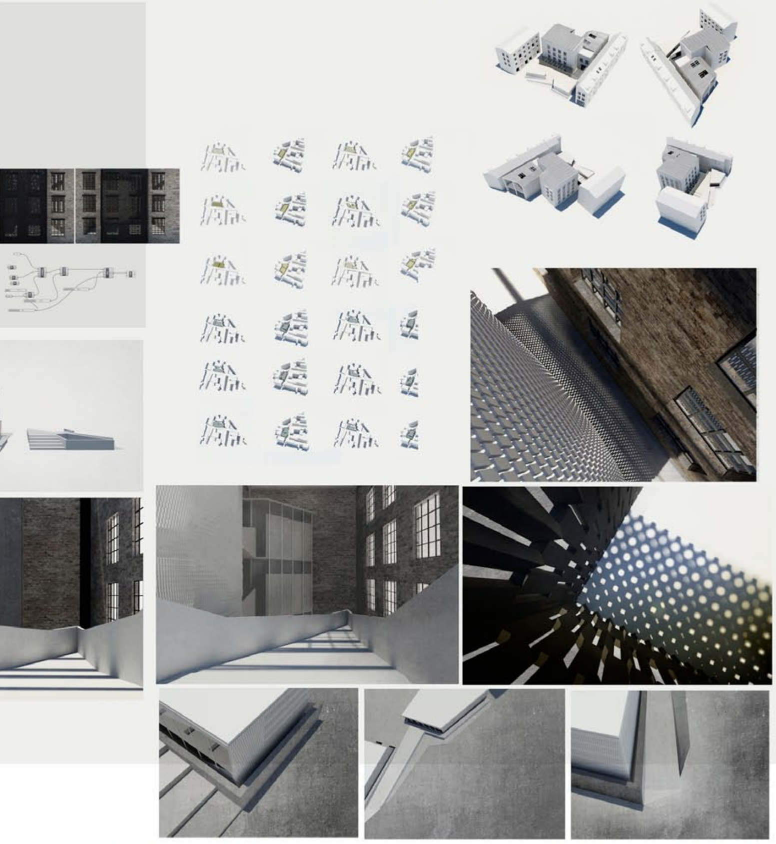


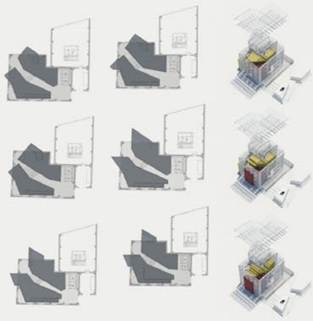

*Fig 7.03. Overall public process showing development from material enquiry through to final design*

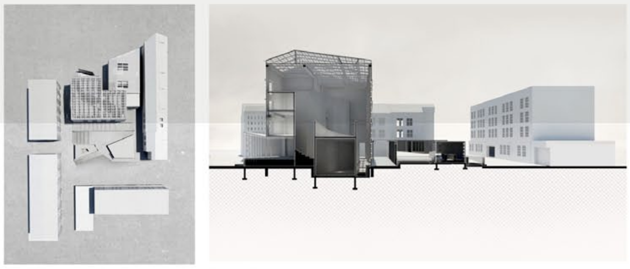
## FINAL DESIGN

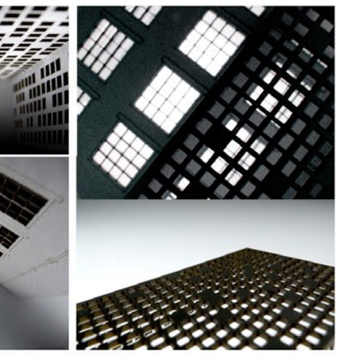


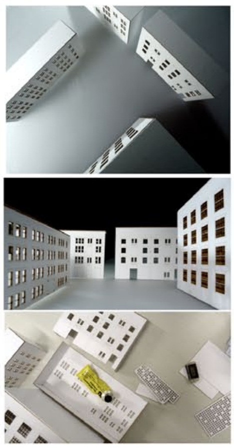
## DESIGN ITERATION ONE

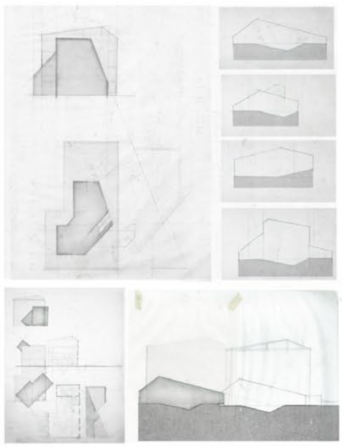












## DESIGN ITERATION TWO

# MATERIAL ENQUIRY

*Implementing the Digital Feedback Loop*

# MATERIAL APPROACH

The feedback loop prompted a shift in the material approach to one that weighted digital and analogue methods equally. It was important that within this approach structure, materiality remained in an authoritative role. Gramazio & Kohler were used as a digital precedent when undergoing initial experiments in parametric brick design. Their strategic design methods resulting in the formulation of 1:1 scale models made their work beneficial in progressing understandings regarding the isolation of digital processes and the subsequent contextual relationships which form (Gramazio & Kohler 160). Due to the brevity of the process, scale models were completed at 1:10 scale, providing the analogue input necessary to better understand the digital developments. Material agency was therefore explored through both analogue and digital means. Analogue methods became an opportunity to explore the affective capacity of each material as these qualities were less evident within digital manipulations.

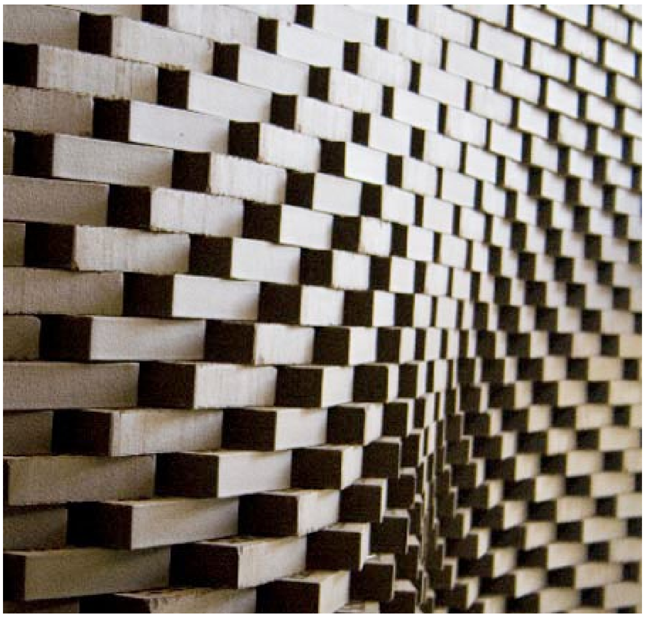


*Fig 7.04. Pike Loop by Gramazio & Kohler*

| Materials on Site | Material Models |
| --- | --- |
| Brick + Mortar | Brick Fragments + Plaster<br>Wire Mesh + Plaster Filling<br>Wire Mesh + Drafting Film |
| Stucco | Plaster |
| Glass | Drafting Film<br>PET Sheet<br>Acrylic |
| Stone | Stone<br>Corrugated Cardboard |
| Timber | Sawn Wood<br>Wood Veneer<br>Balsa Wood |
| **Additional Materials** | |
| Digital Surface Recreations | White Cardboard |

*Fig 7.05. Summary of materials used within the material enquiry at public scale with respect to the site materials which they ultimately represented*

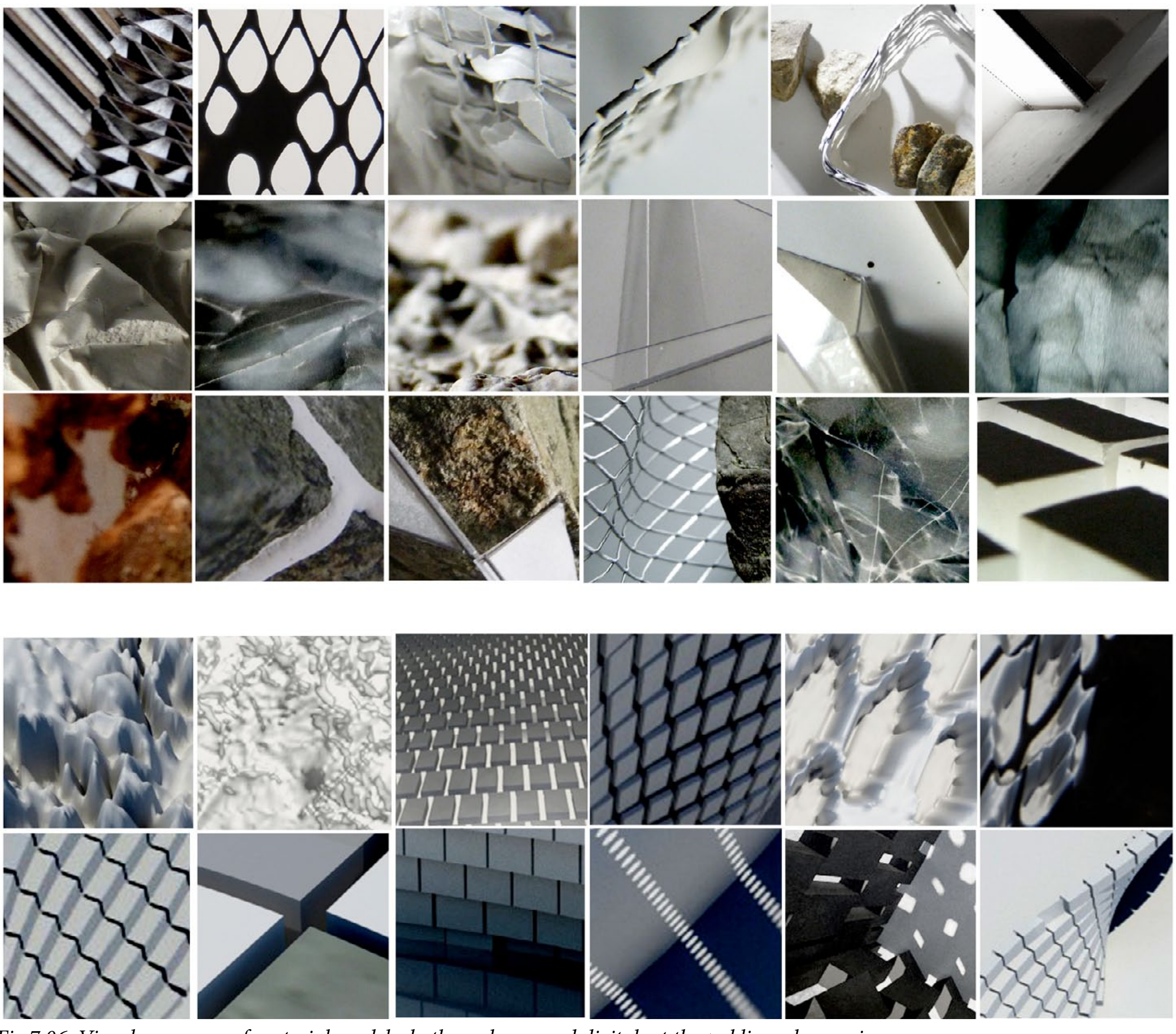


*Fig 7.06. Visual summary of material models, both analogue and digital, at the public scale enquiry*

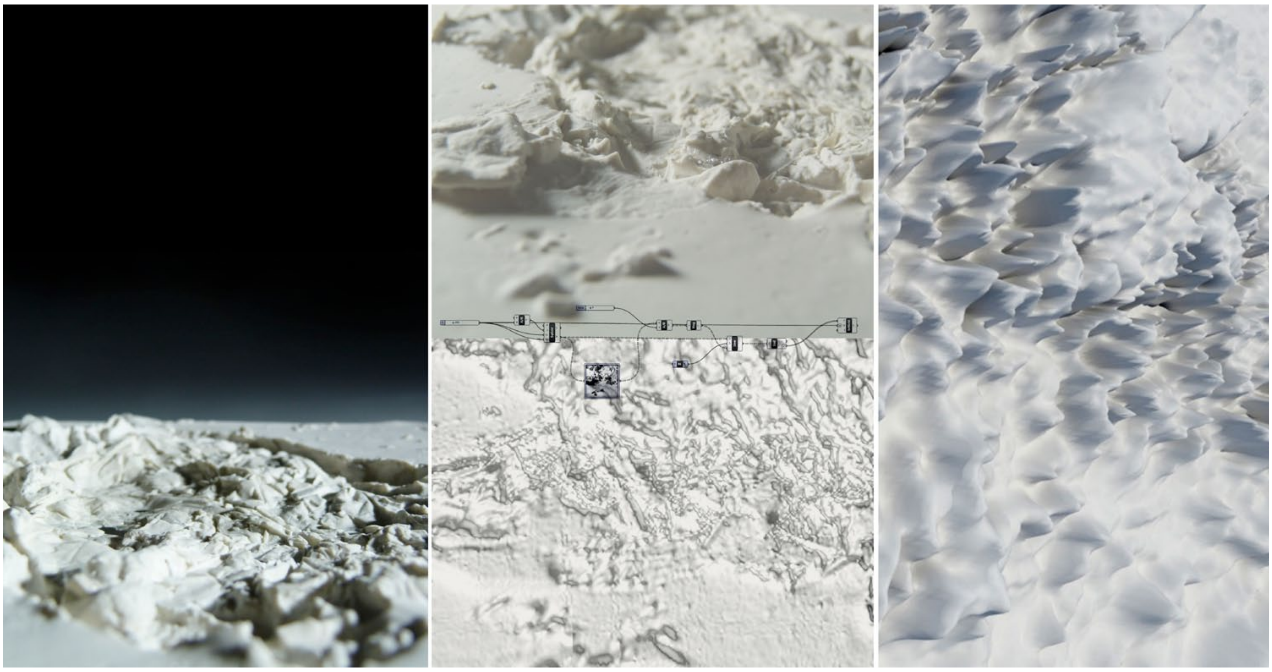



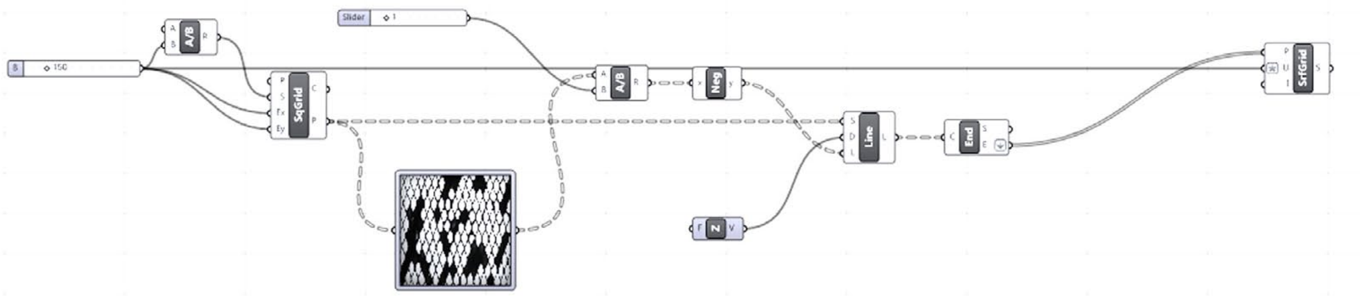
*Fig 7.08. Image showing transition from analgue to digital material testing*

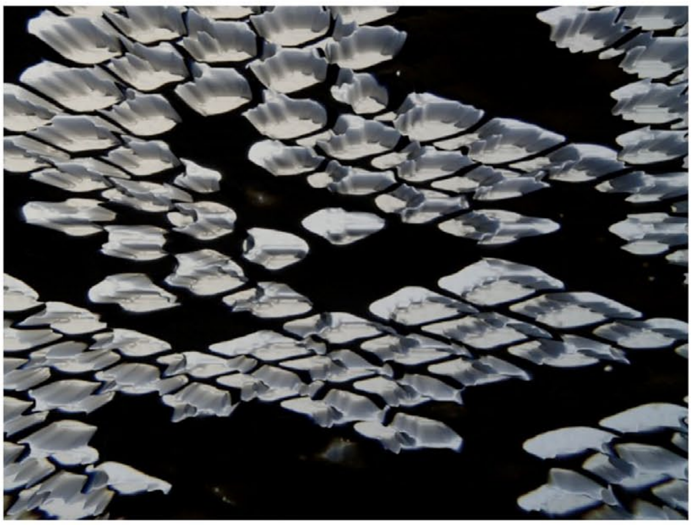
# FEEDBACK LOOP

It was evident that digital methods of testing were relevant in order to productively engage and enhance the practical testing methods as part of an integrated feedback process. Having introduced them purely as a representational tool in the domestic process, their role in the public scale enquiry needed to be better incorporated to the testing framework. Analogue testing enabled a more realistic atmospheric experience, while computation methods allowed geometries to be manipulated through an endless variety of scales. A hybrid method of testing was therefore considered appropriate for this scale and a feedback loop was introduced in order to make each digital and analogue iteration stage as productive to the next as possible. For every analogue action there was a digital reaction and vice versa. Each iteration was evaluated in terms of its observed outcome and its subsequent potential in future iterations through the contrasting methods.



*Fig 7.07. (Left). Digital material render*



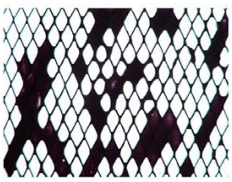
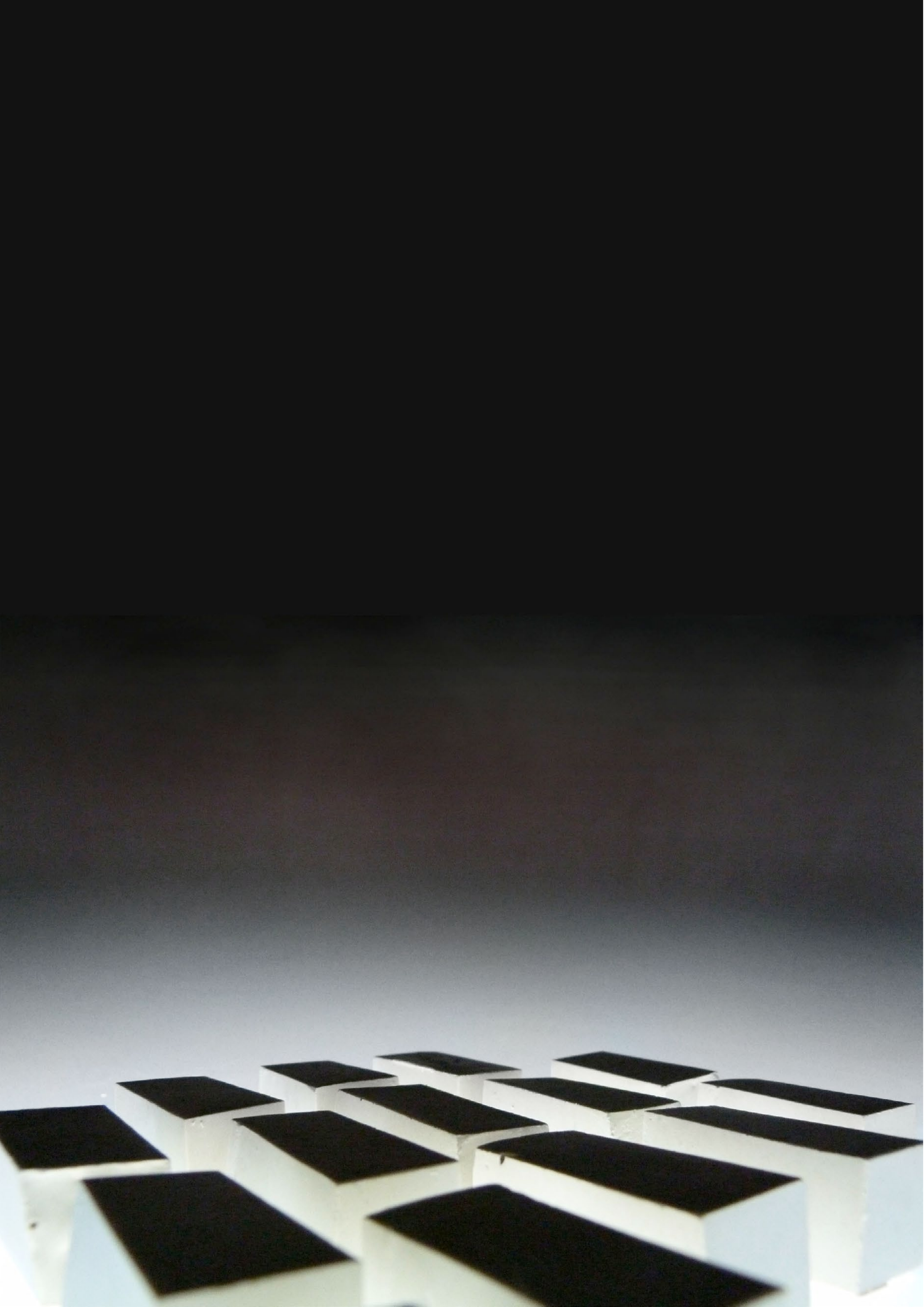


*Fig 7.09. Image showing iterations using the image sampler tool in grasshopper*



*Fig 7.10. (Right). Comparison of digital render using the image sampler against original plaster model from the domestic enquiry*


Slider
1
200
A/B
SqGrid
A/B
Neg
Line
End
SrfGrid
Z



## ATMOSPHERE

Considerations of atmosphere were situated within Anderson's understandings of "affective atmospheres", whereby a correlation between materials and atmosphere was firmly established and maintained through analogue testing. Within this relational agency, the 'affective atmospheres' exist in a way which "surrounds and envelopes something particular" (Anderson, 2014. 139). The design process was therefore tasked with composing this consuming sense of atmosphere. Two design themes were established to connect material iterations to atmospheric experience; contrast and the subsequent use of a gradient between both materials and programs. The historic stock brick perimeter was contrasted with parametric white brick interior surfaces, and the permanence of the main gallery space was contrasted with a transient 'pop up' gallery space towards the South end of the site. Material manipulations involving light, spacing and perforated surfaces sought to further amplify the relationships between user, site and matter.



*Fig 7.11. (Left). 'Analogue bricks' using light manipulations to draw out atmospheric qualities*

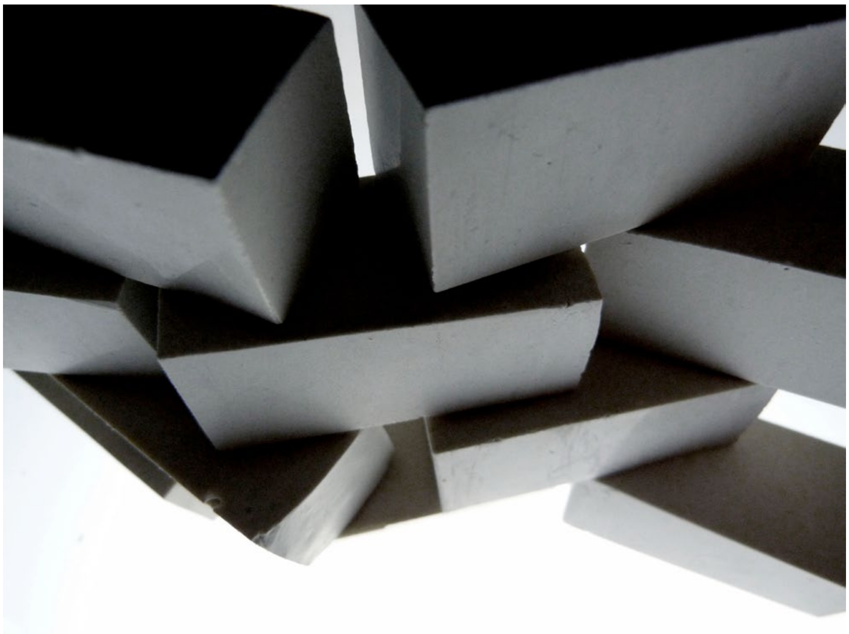


*Fig 7.12. 'Analogue bricks' recreating digital outcomes*

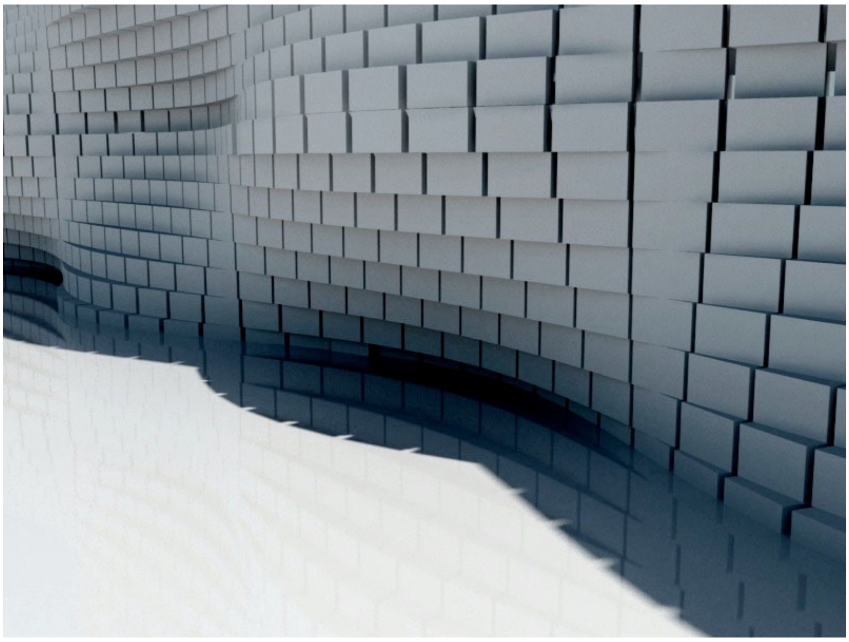


*Fig 7.13. Parametric brick structure formed in Rhino through the Grasshopper plug-in*



*Fig 7.14. (Right). Parametric brick structure formed in Rhino through the Grasshopper*

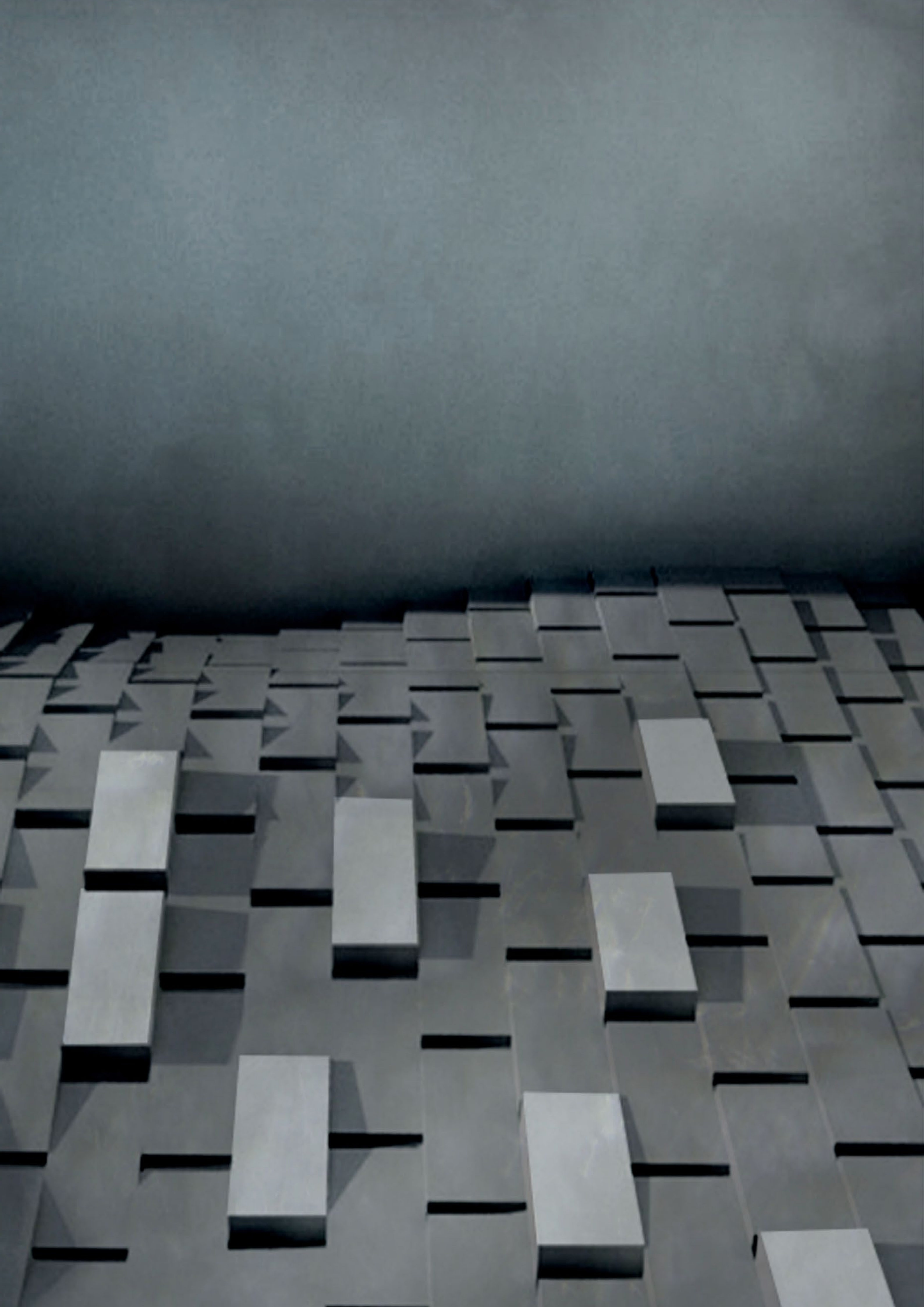


*Fig 7.15. Using analogue material photographs as rendering textures in 3DS Max*

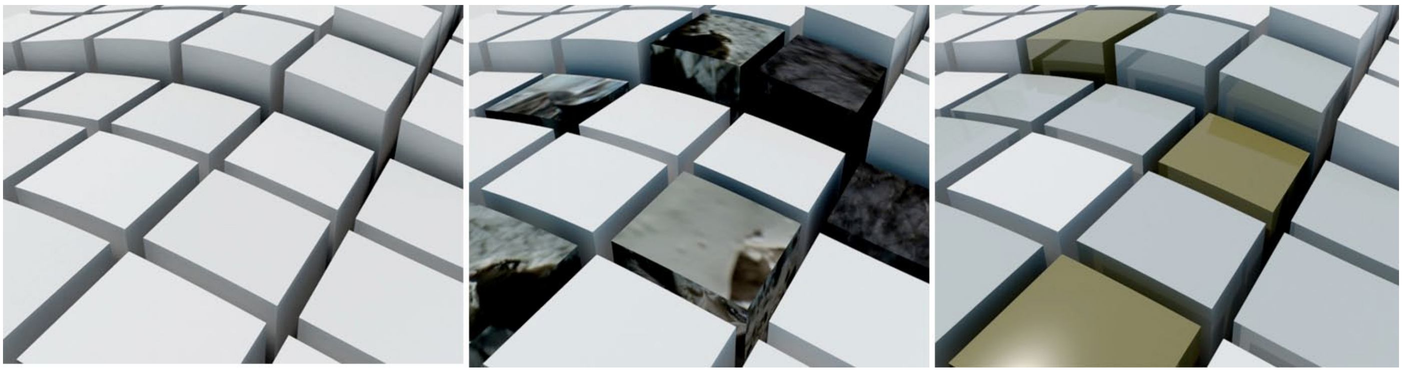


*Fig 7.16. 3DS Exploring material application processes in 3DS Max*

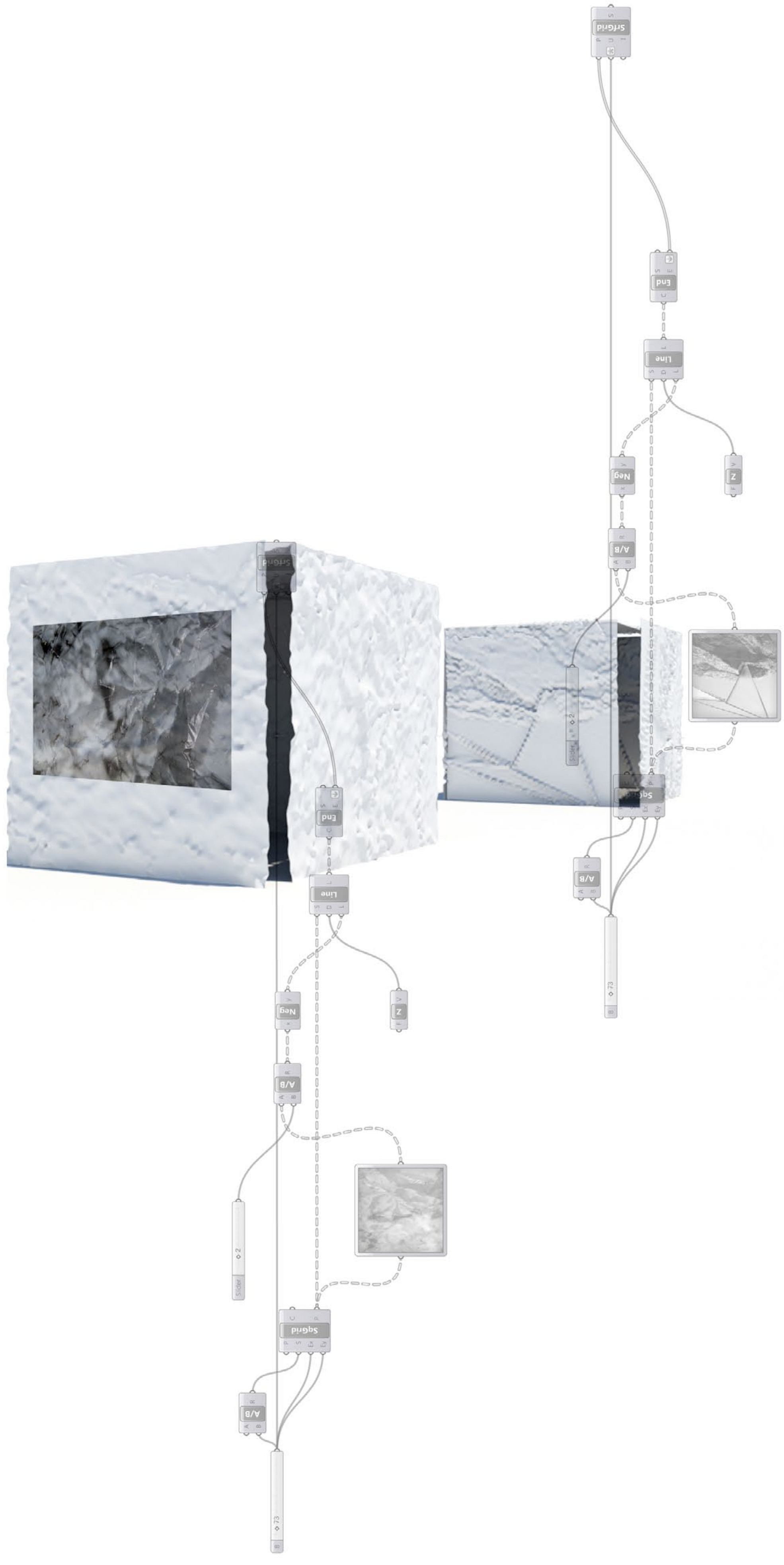
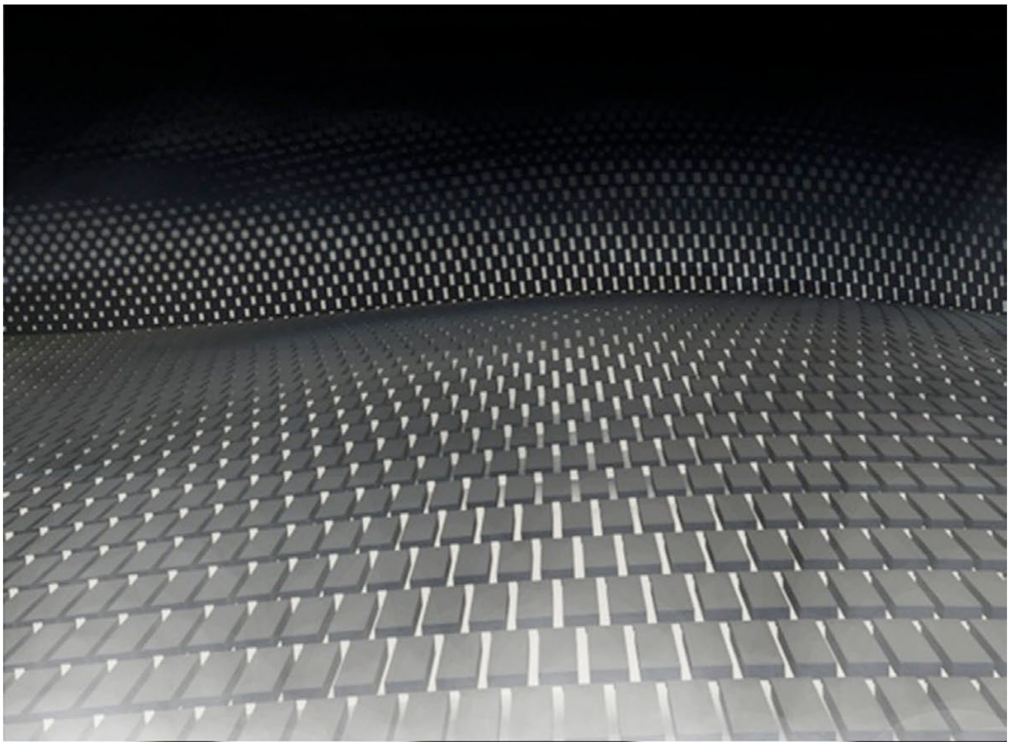


*Fig 7.17. Grasshopper sequences used to recreate surface photographs from the installation enquiry*



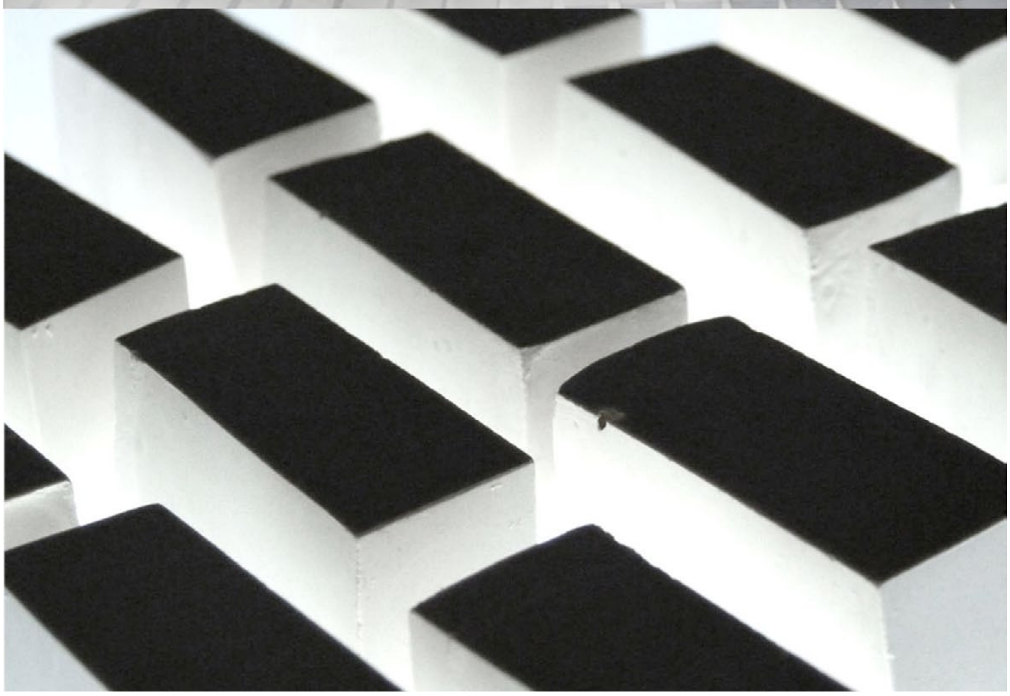
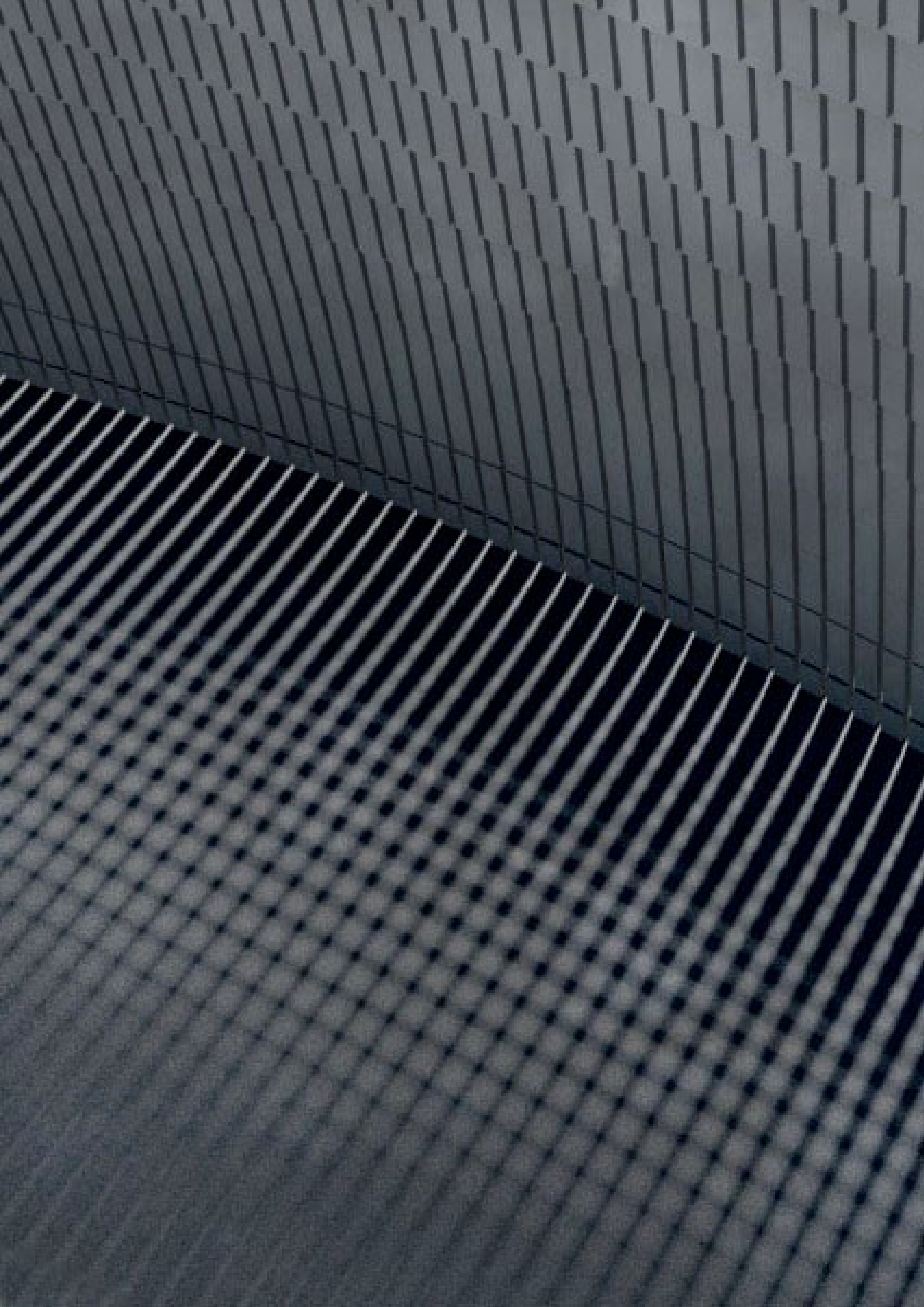


*Fig 7.18. Comparison image between analogue and digital brick models*



*Fig 7.19. 3DS Max render of a parametric brick wall designed in Rhino through Grasshopper*



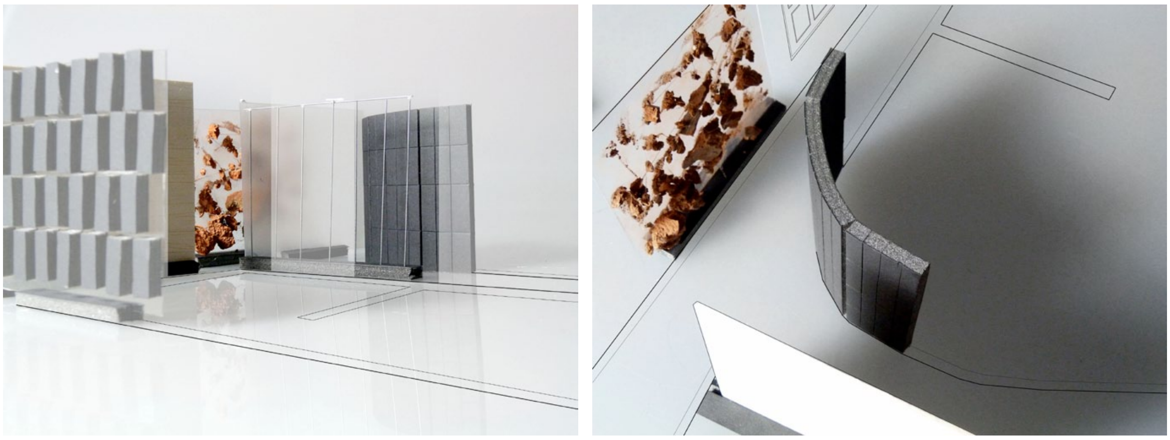


*Fig 7.20. Recreating analogue versions of wall surfaces created in Rhino + Grasshopper.*

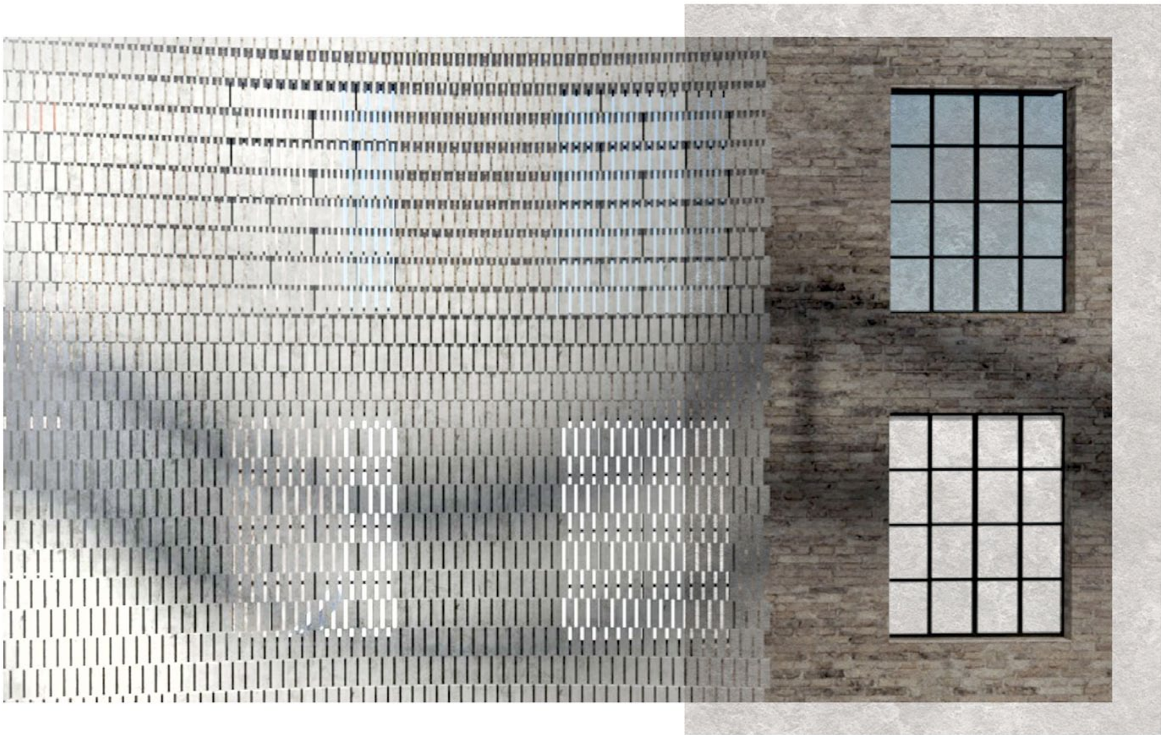
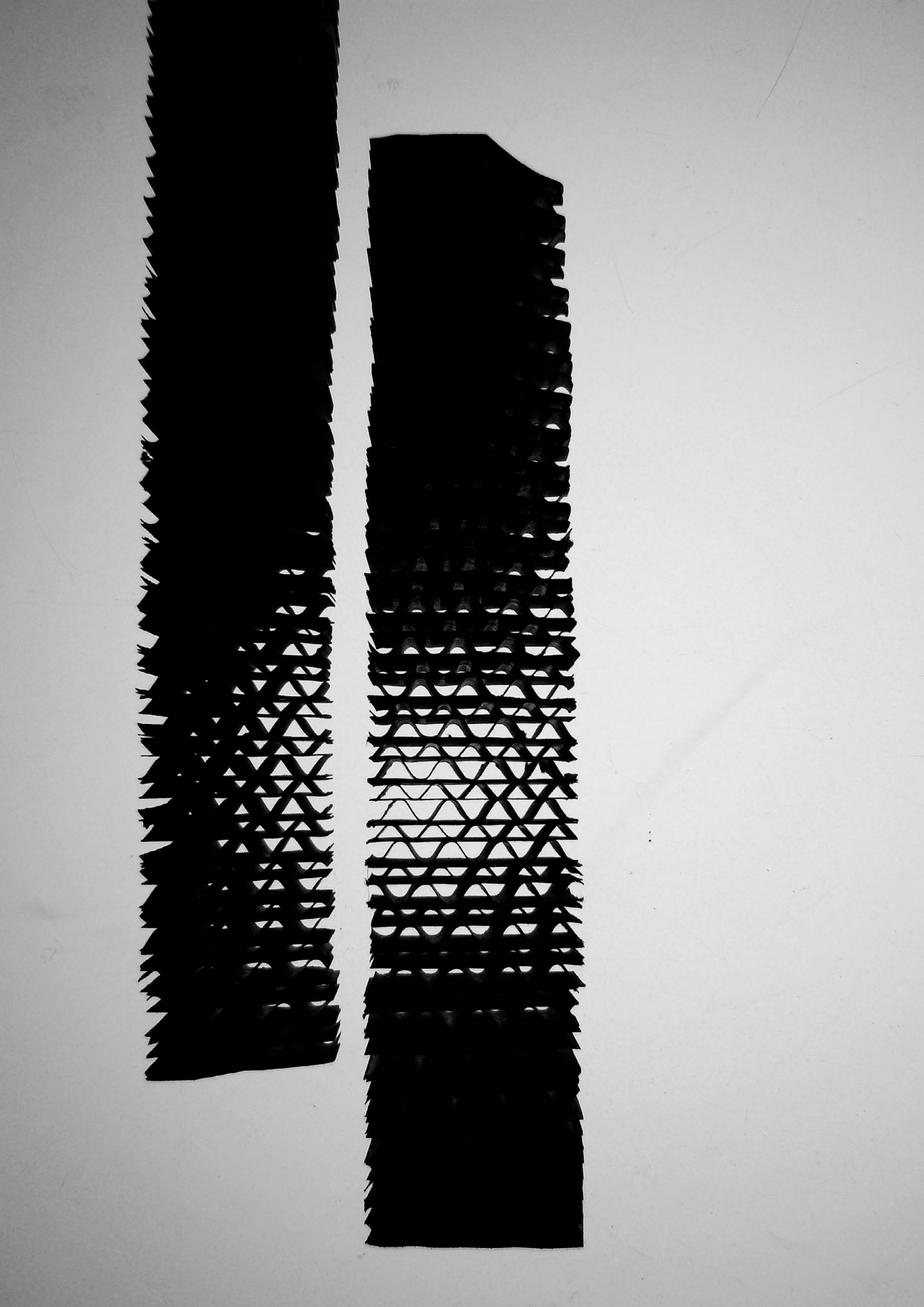
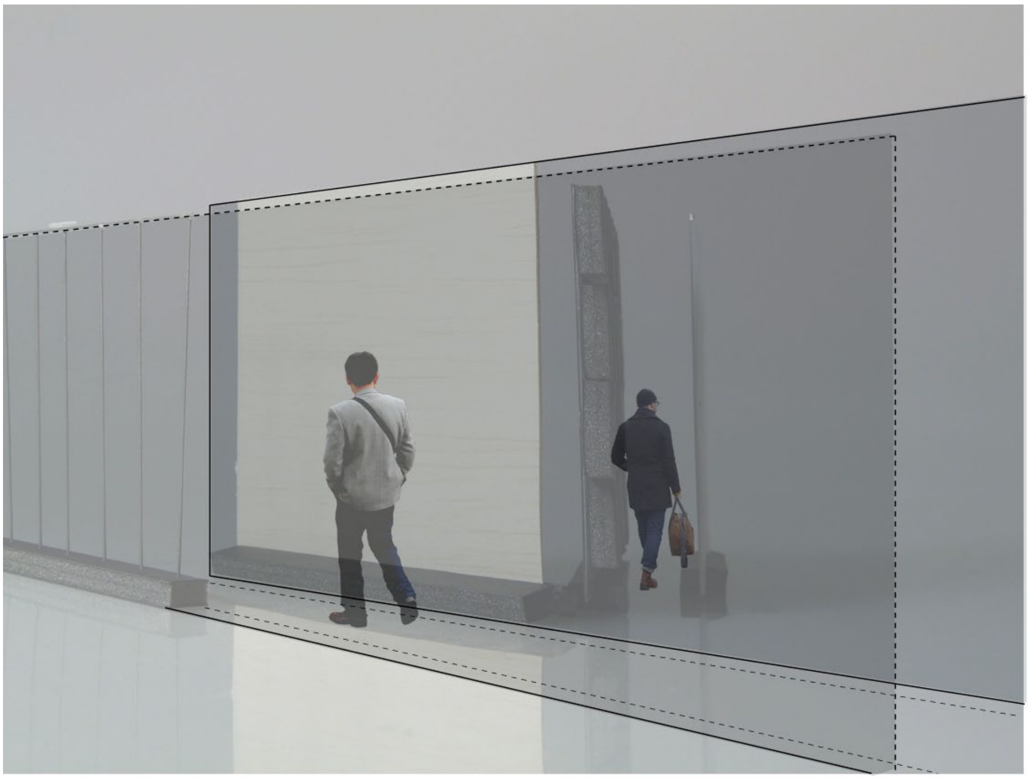


*Fig 7.21. Render showing contrast between new parametric and existing stock brick walls*



*Fig 7.22. Corrugated card model laser cut to create curved surfaces similar to those created in Rhino through Grasshopper*





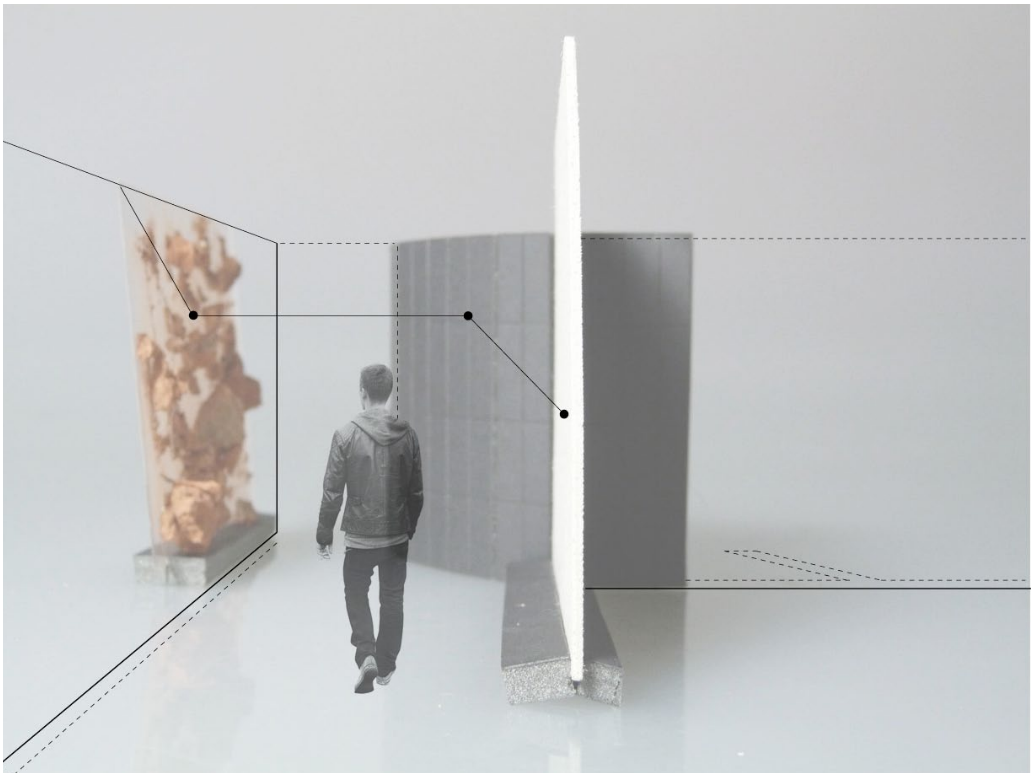


*Fig 7.23 and 7.24. Analogue surface models highlighting important material relationships between the body, material and site*

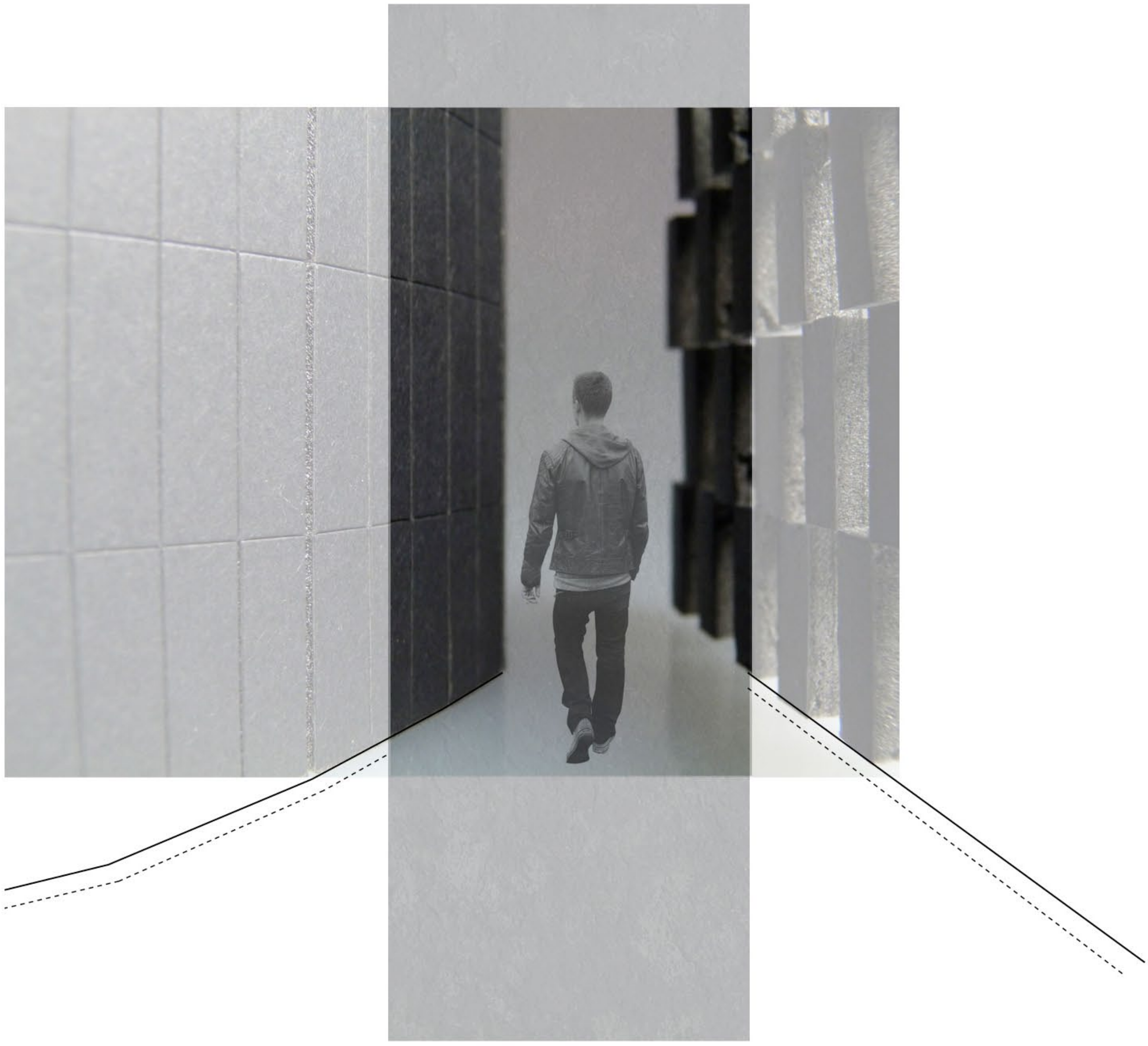


*Fig 7.25. Analogue surface models highlighting important material relationships with the body.*

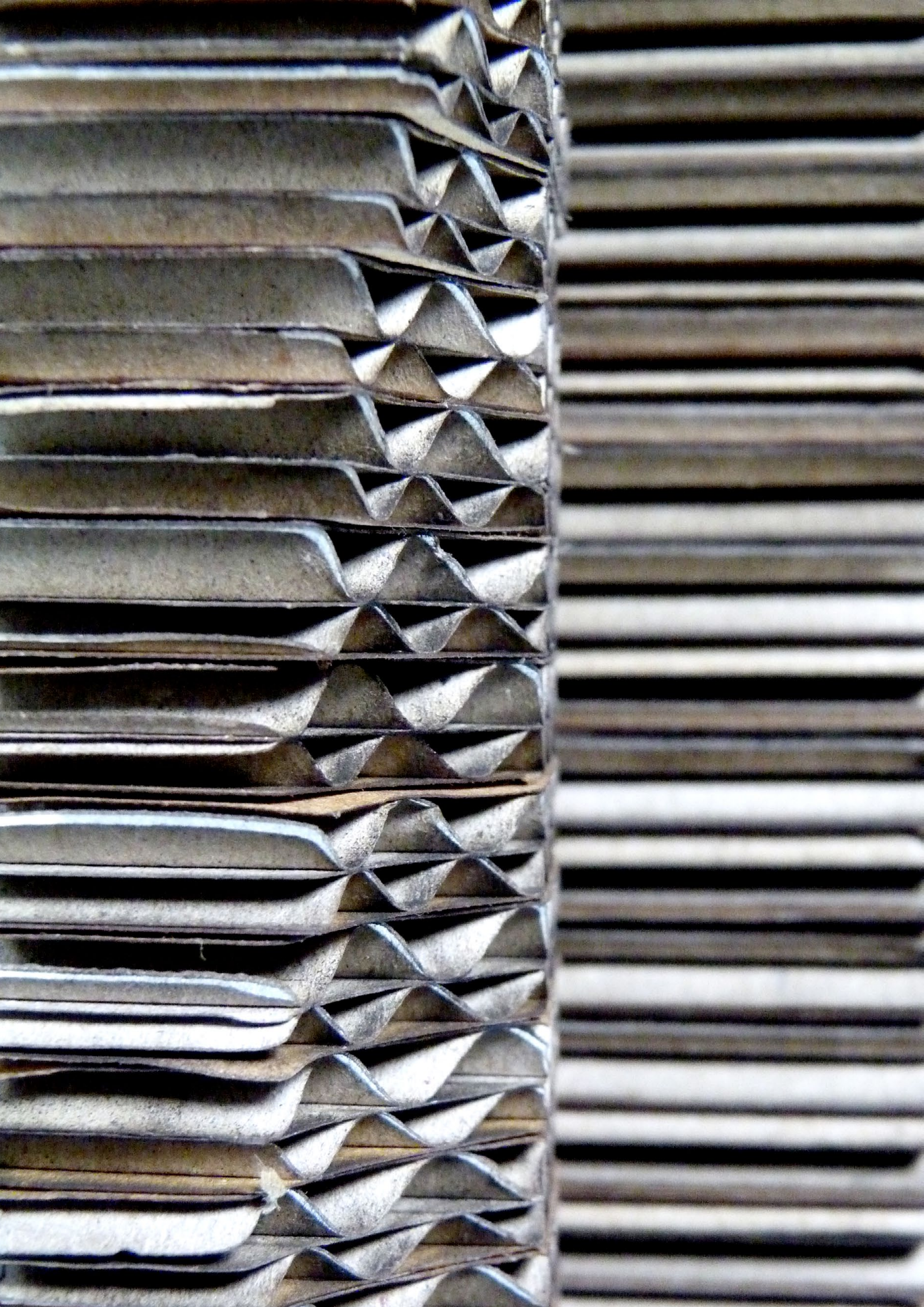



*Fig 7.26. Image series showing translation of digital model to analogue*



*Fig 7.27. Corrugated card model*

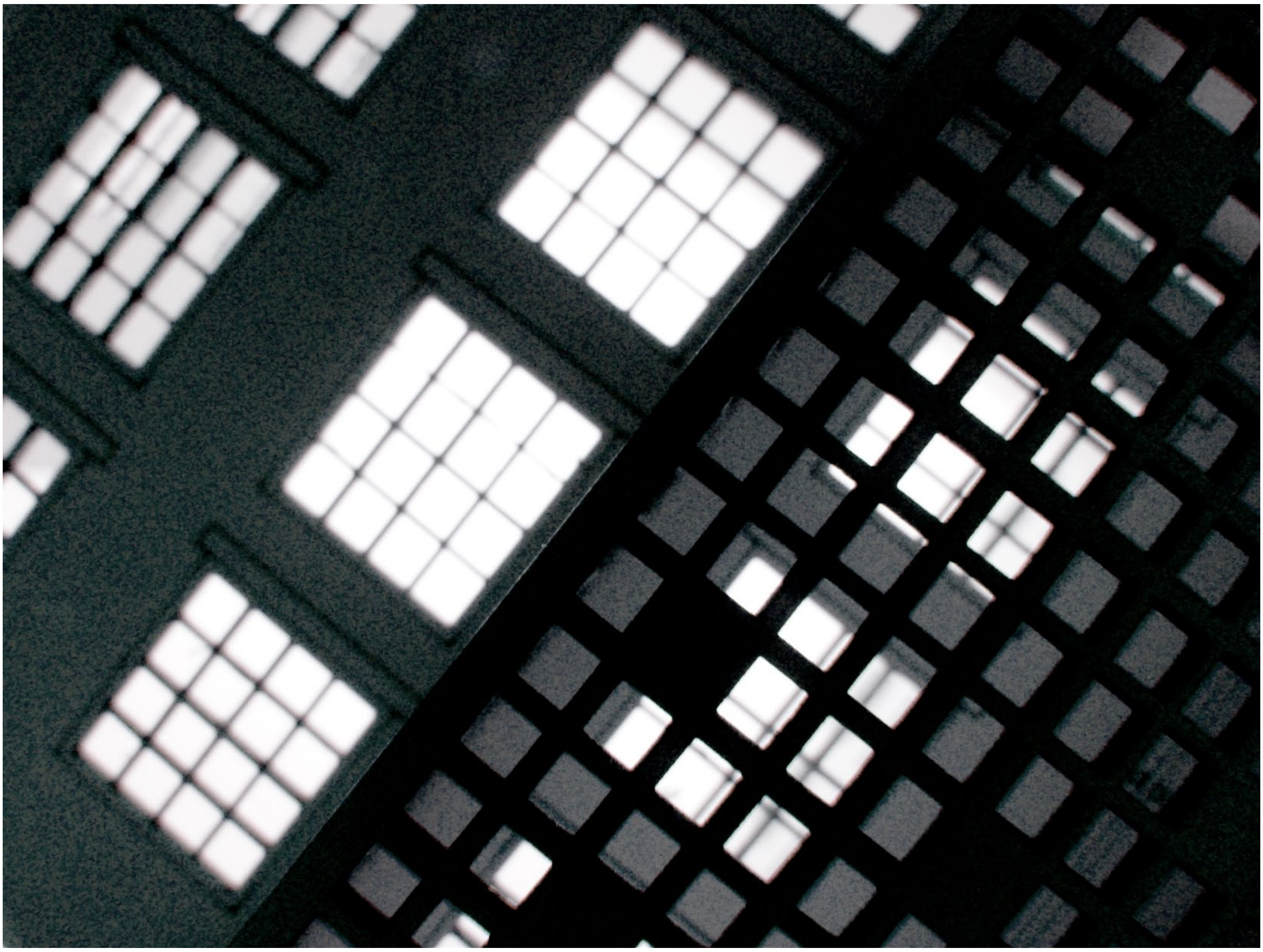
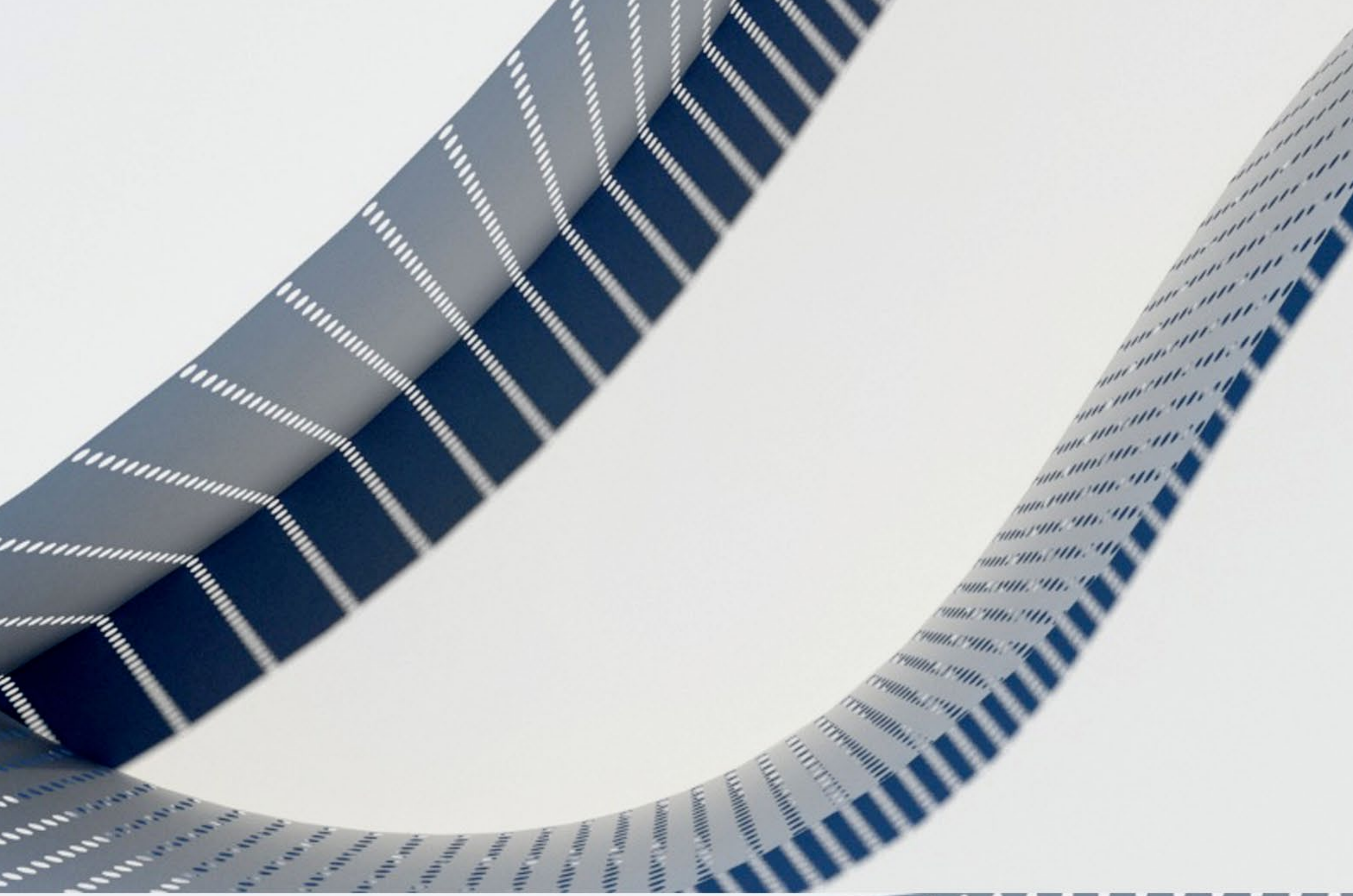
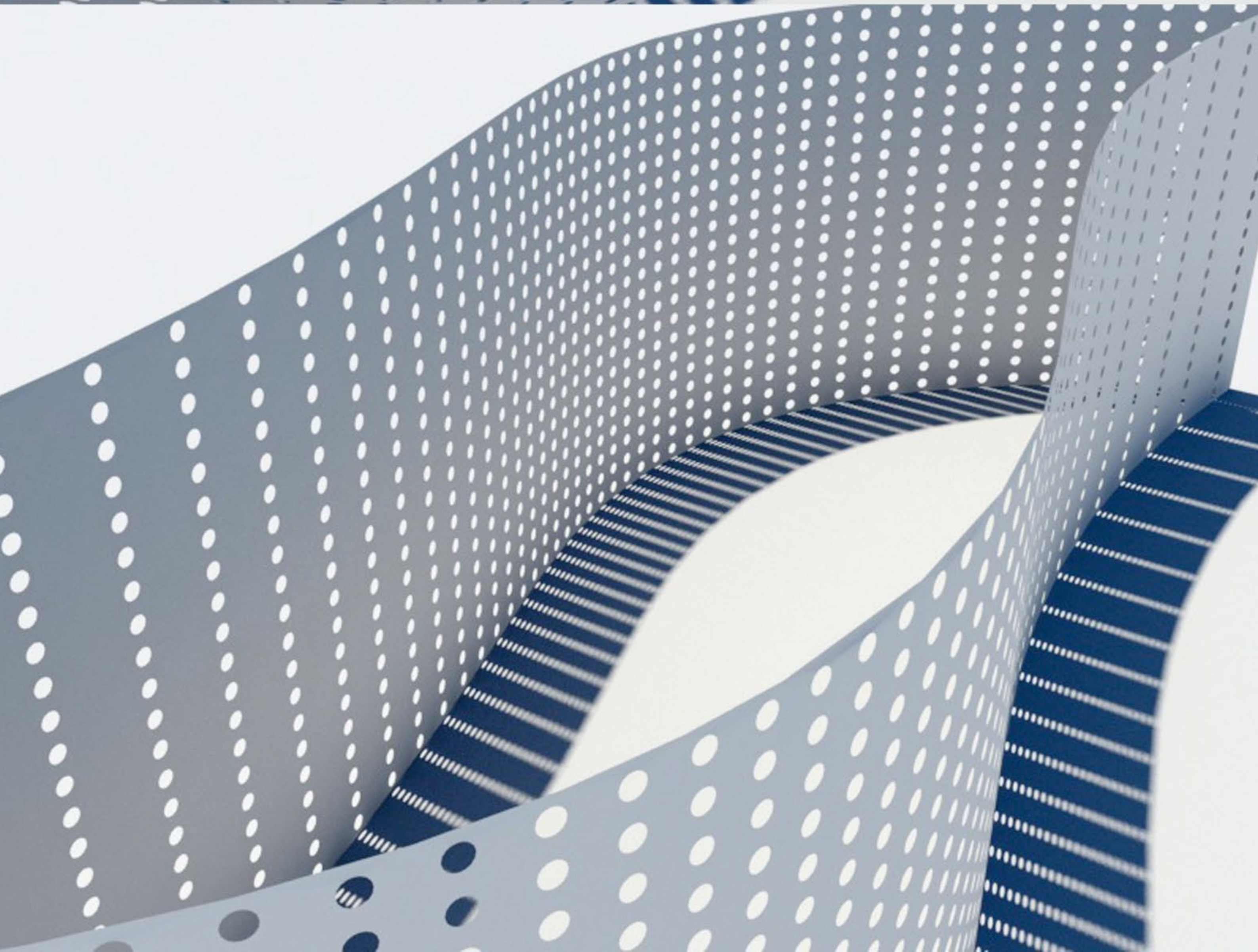


*Fig 7.28. Laser cut perforation model tested against existing facade structure of the warehouse*



*Fig 7.29. (Left). Digital perforations created in Grasshopper*





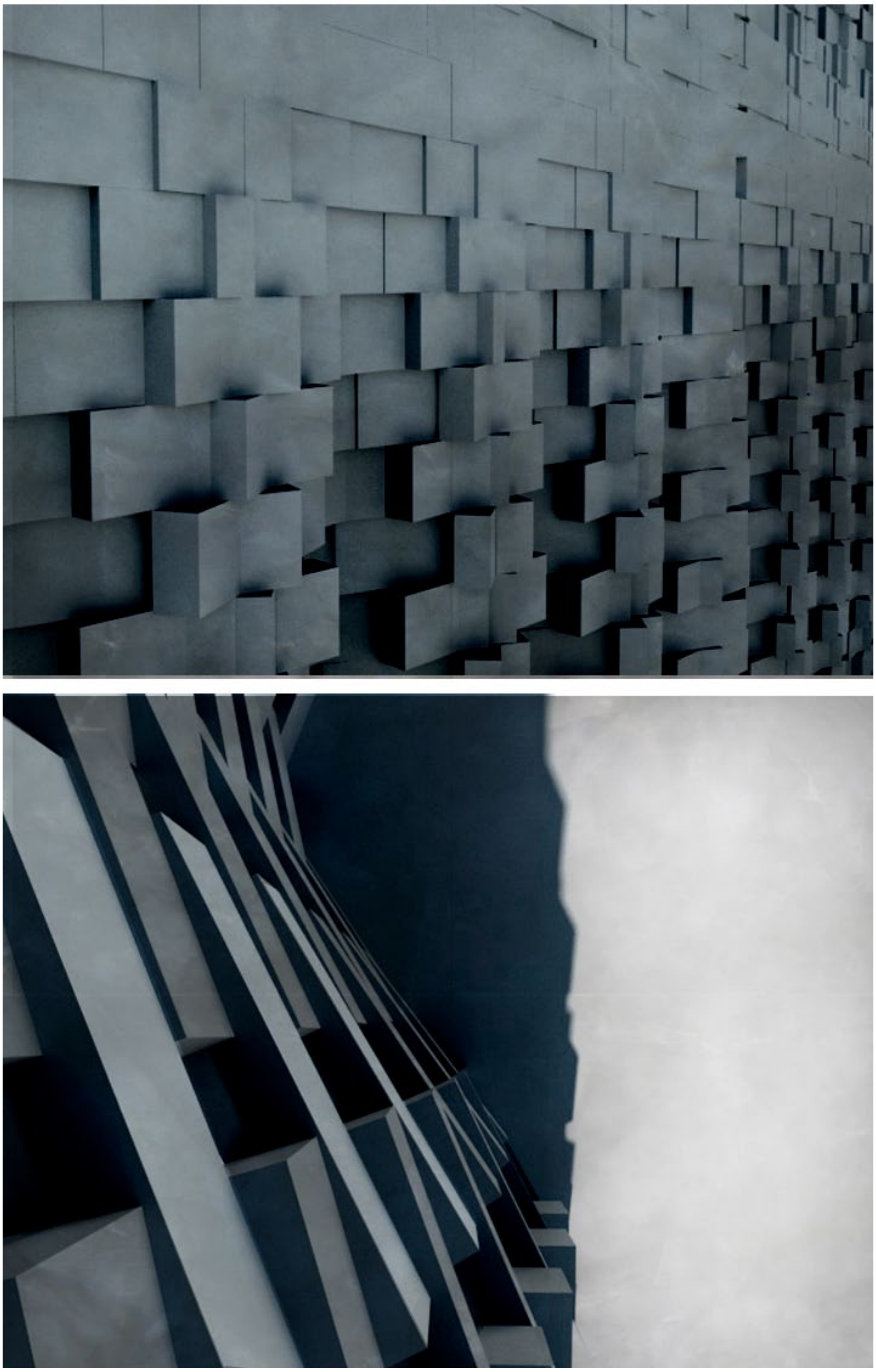


*Fig 7.30. Parametric brick walls with atmospheric light conditions*



*Fig 7.31. (Left). Parametric brick model rendered through 3DS Max daylighting system to allow for appropriate light ma-*

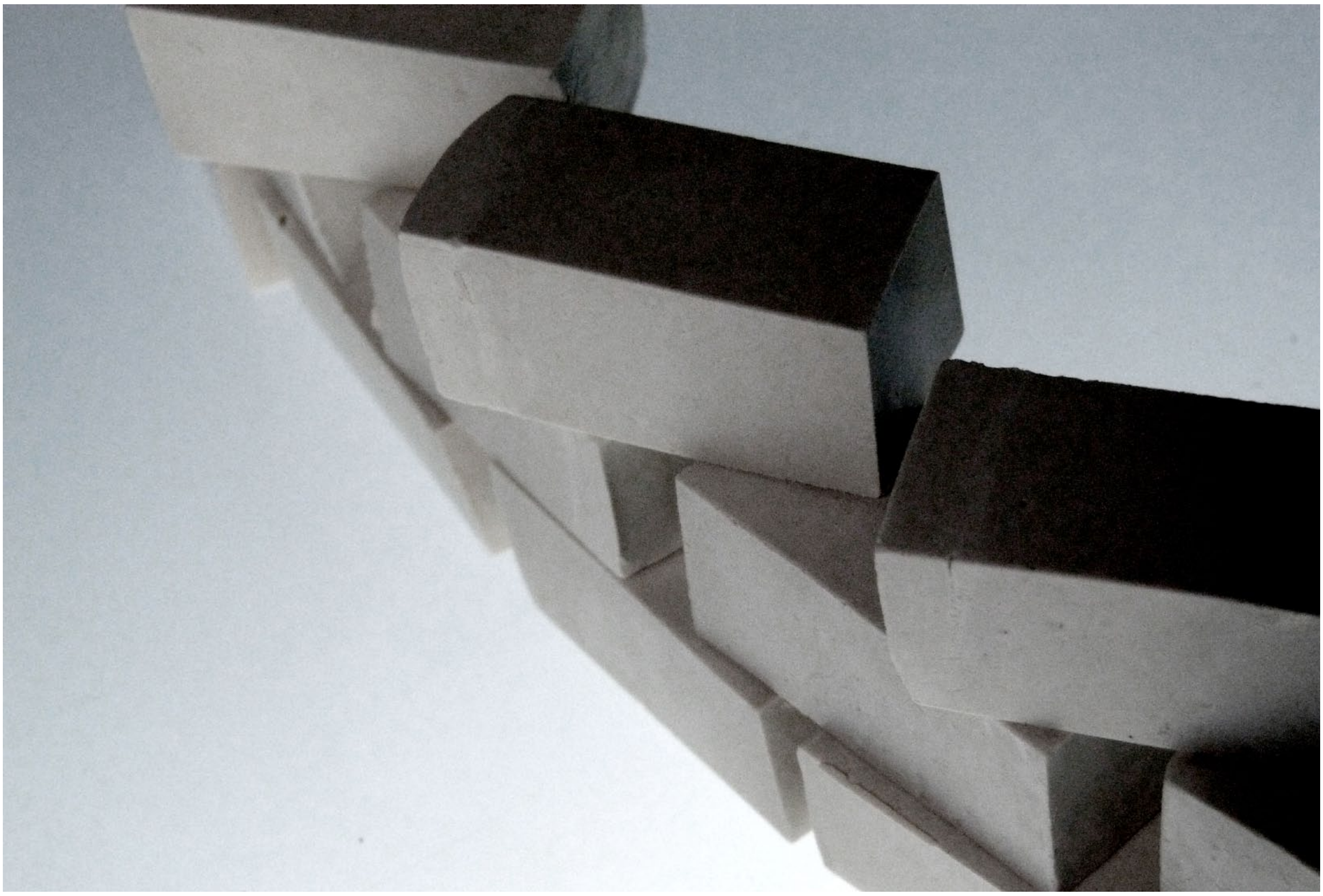


*Fig. 7.32. 'Analogue' bricks testing spacing and shadow*


*Fig. 7.33. Red brick and stone fragments used as model bases*

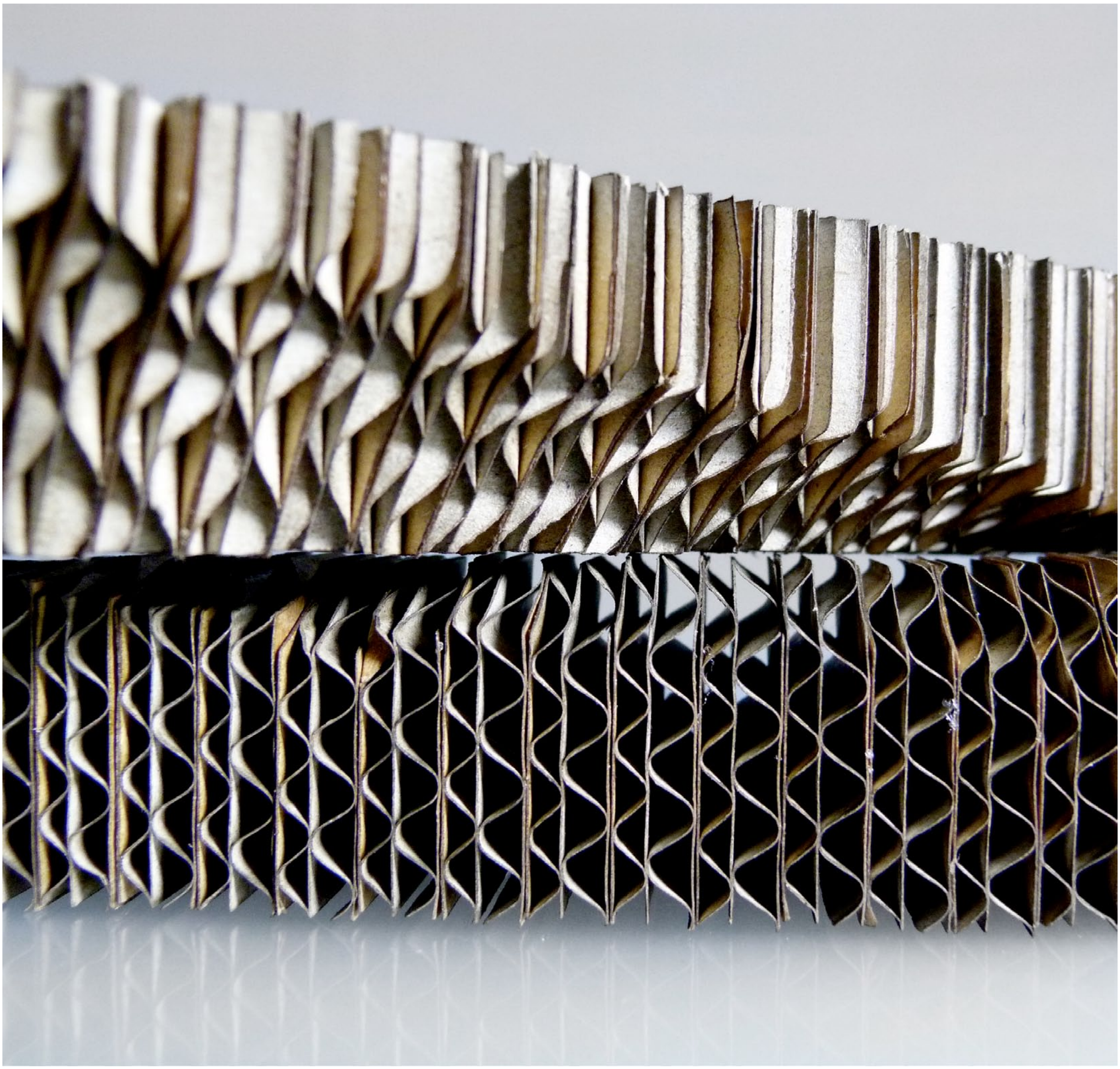


*Fig 7.34. Corrugated card model after curved laser cutting*

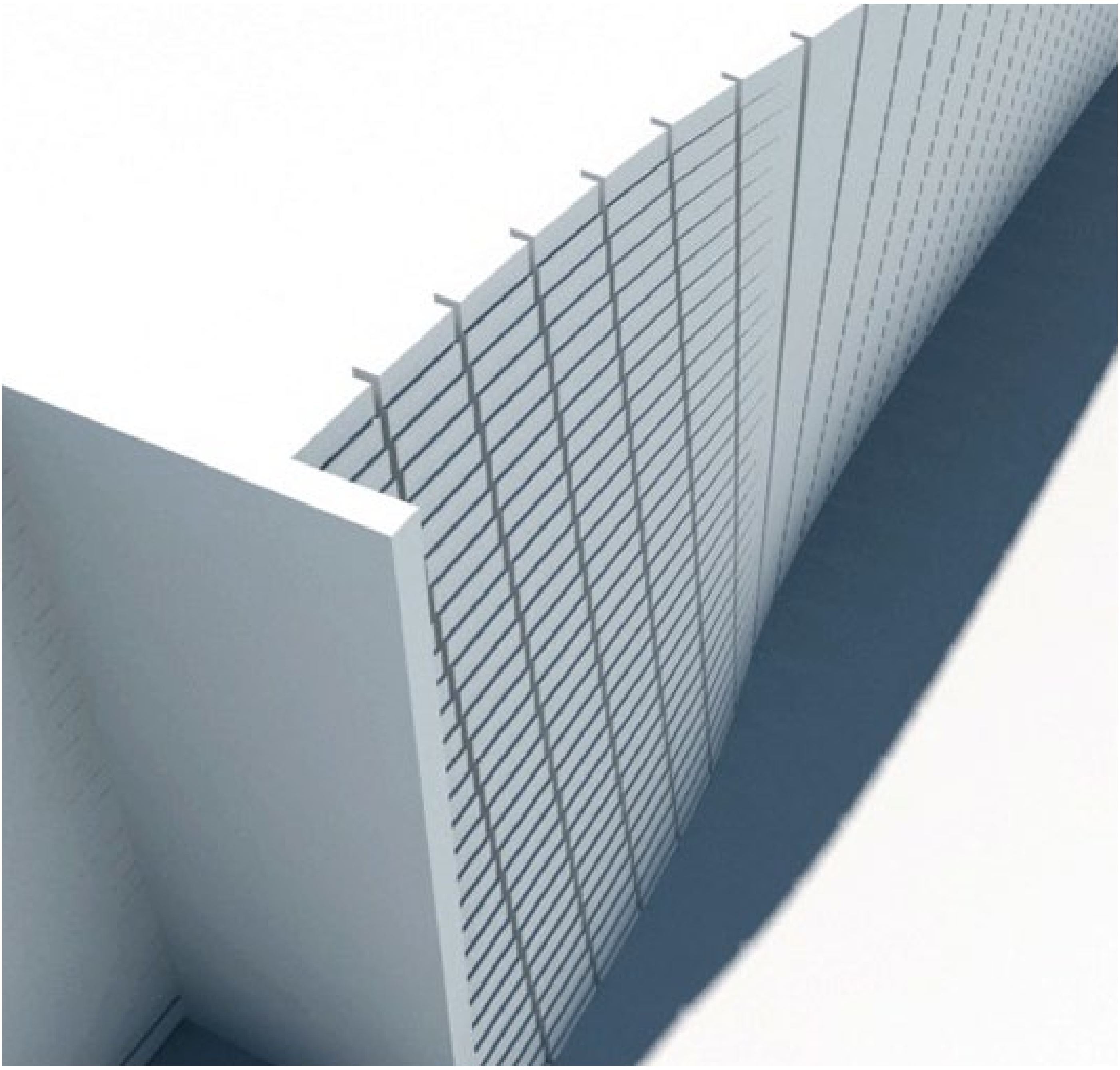


*Fig 7.35. Parametric brick wall formulated in Rhino using the Grasshopper plug-in*

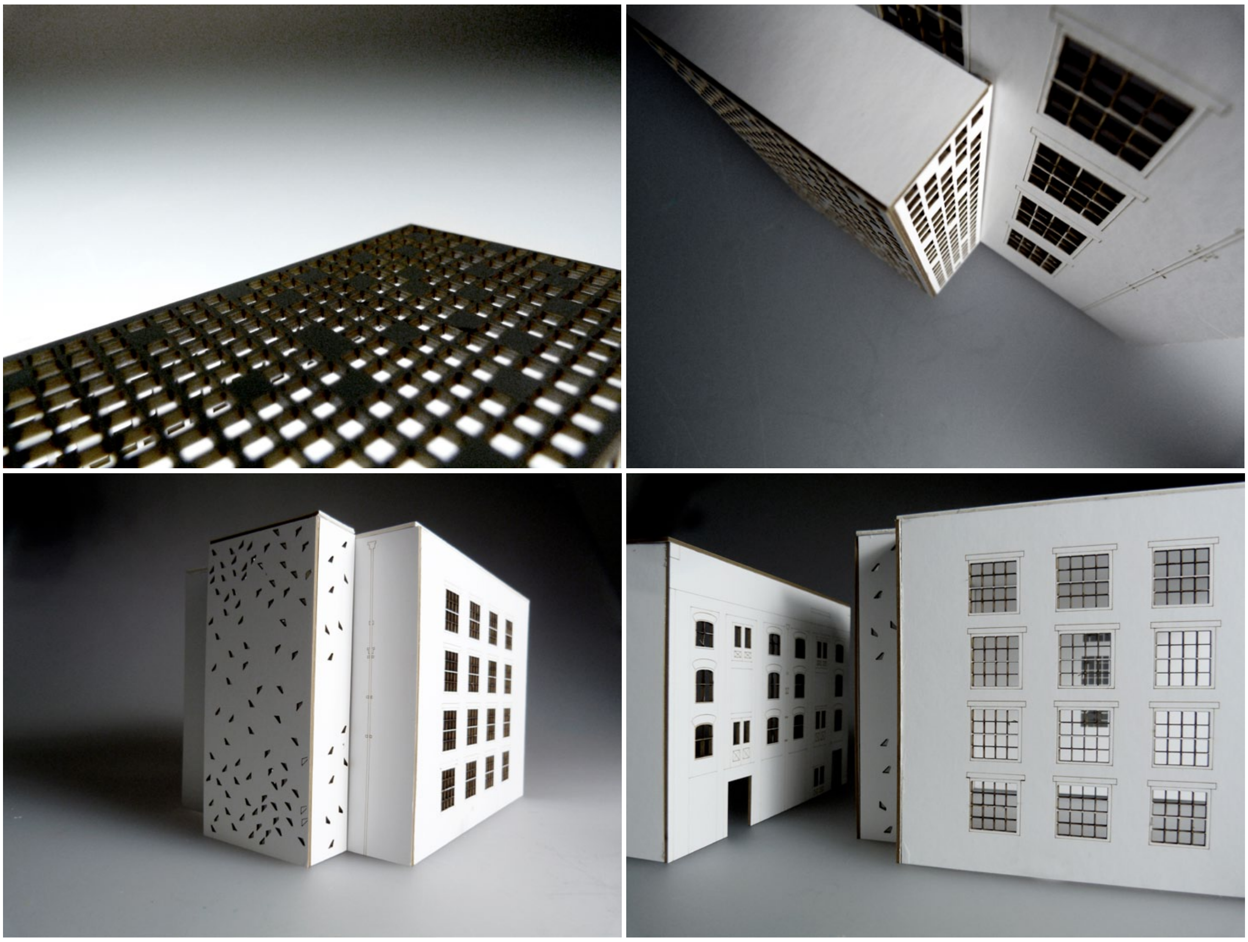
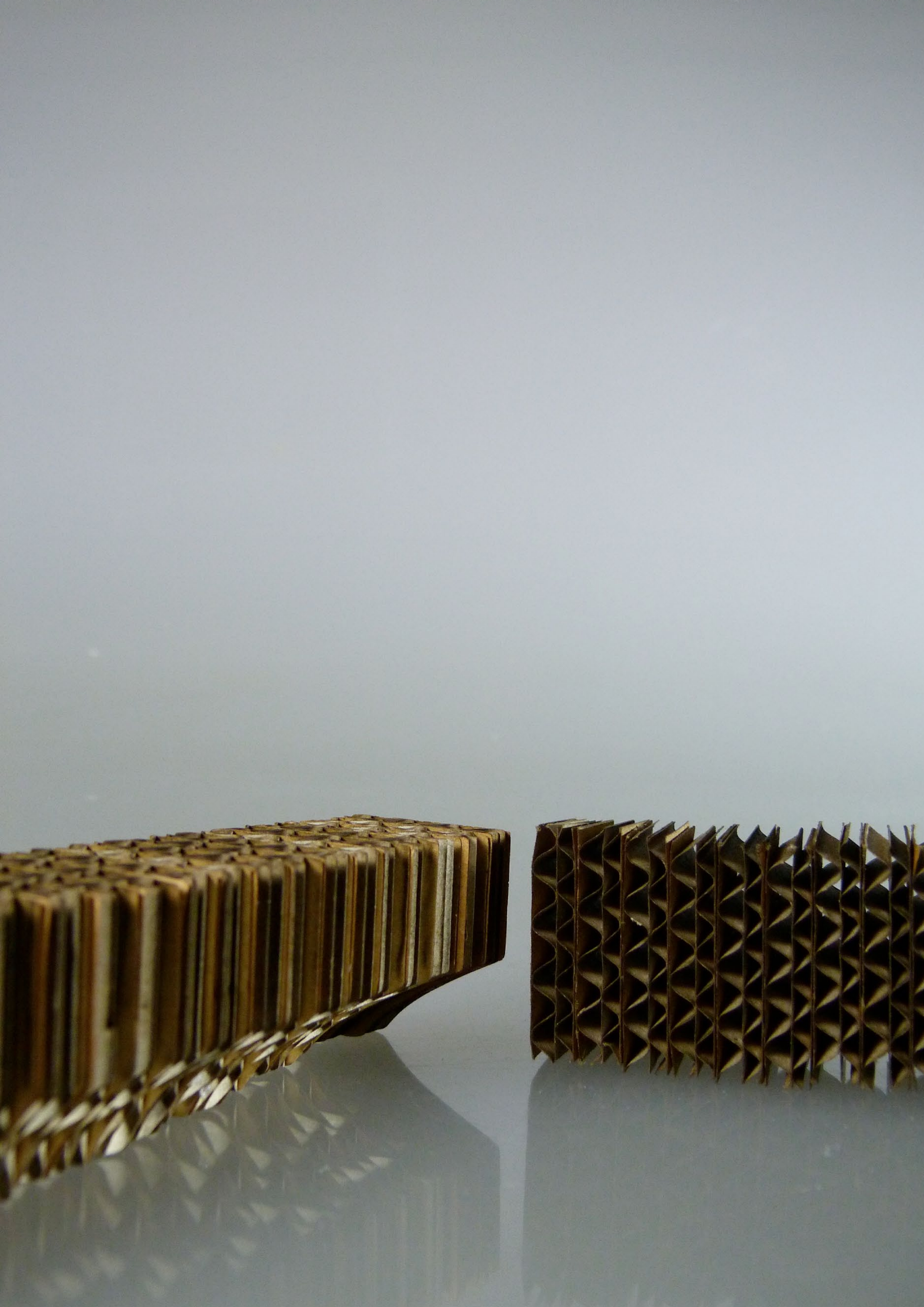


*Fig 7.36. Model series testing perforations against existing site structures*



*Fig 7.37. (Right). Corrugated card model challenging digital pattern making and uniform alignment*



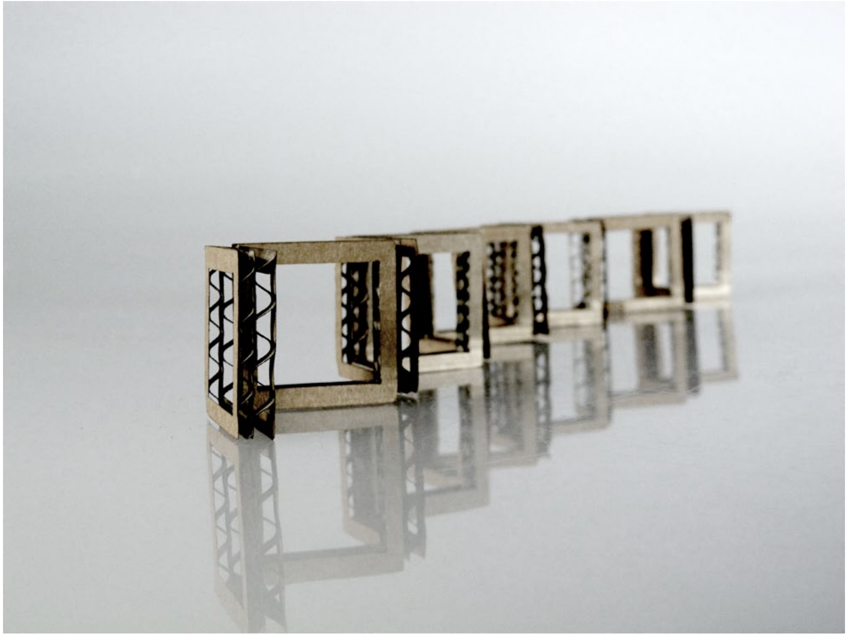


*Fig 7.38. Corrugated card model*

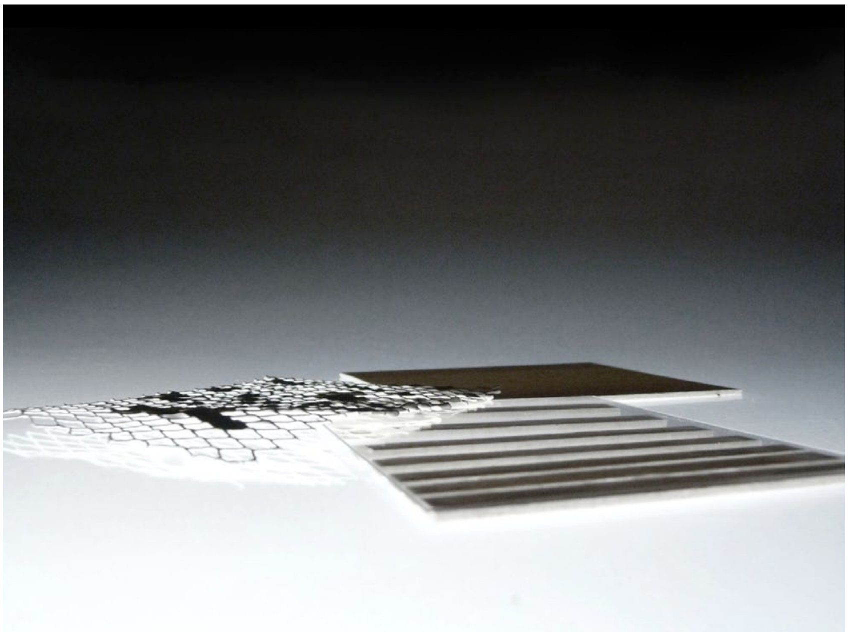


*Fig 7.39. Analogue surfaces*

*Fig 7.40. Red brick experiment*

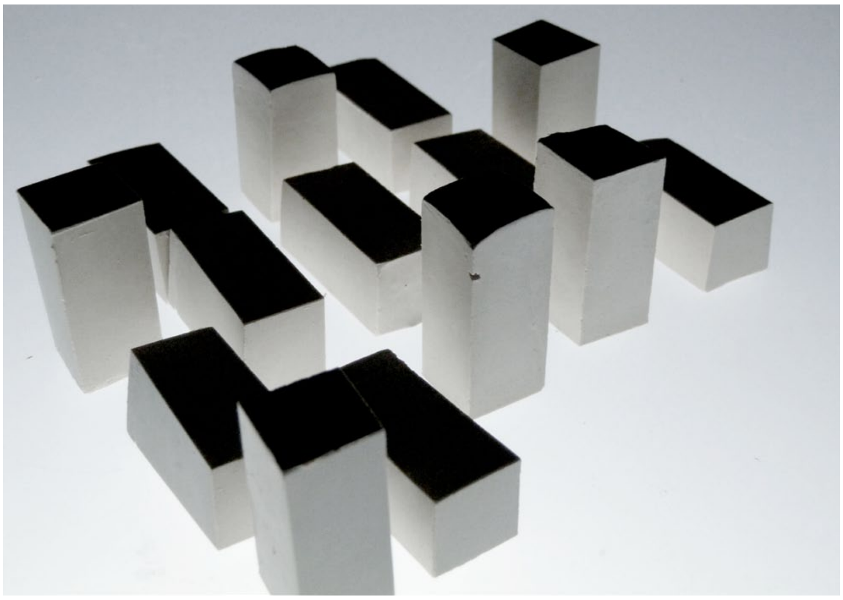


*Fig 7.41. Analogue brick lighting experiment for atmospheric testing*

# DESIGN ITERATION ONE

*Presented at August Review*

*Fig 7.42. Digital massing iterations responding to light conditions, pedestrian access and vehicular access*

## SITE

*The public site is located along Fleur de Lis Street, at the Blossom Street intersection.  Detailed below*

*Fig 7.43. Photograph of the public scale site*

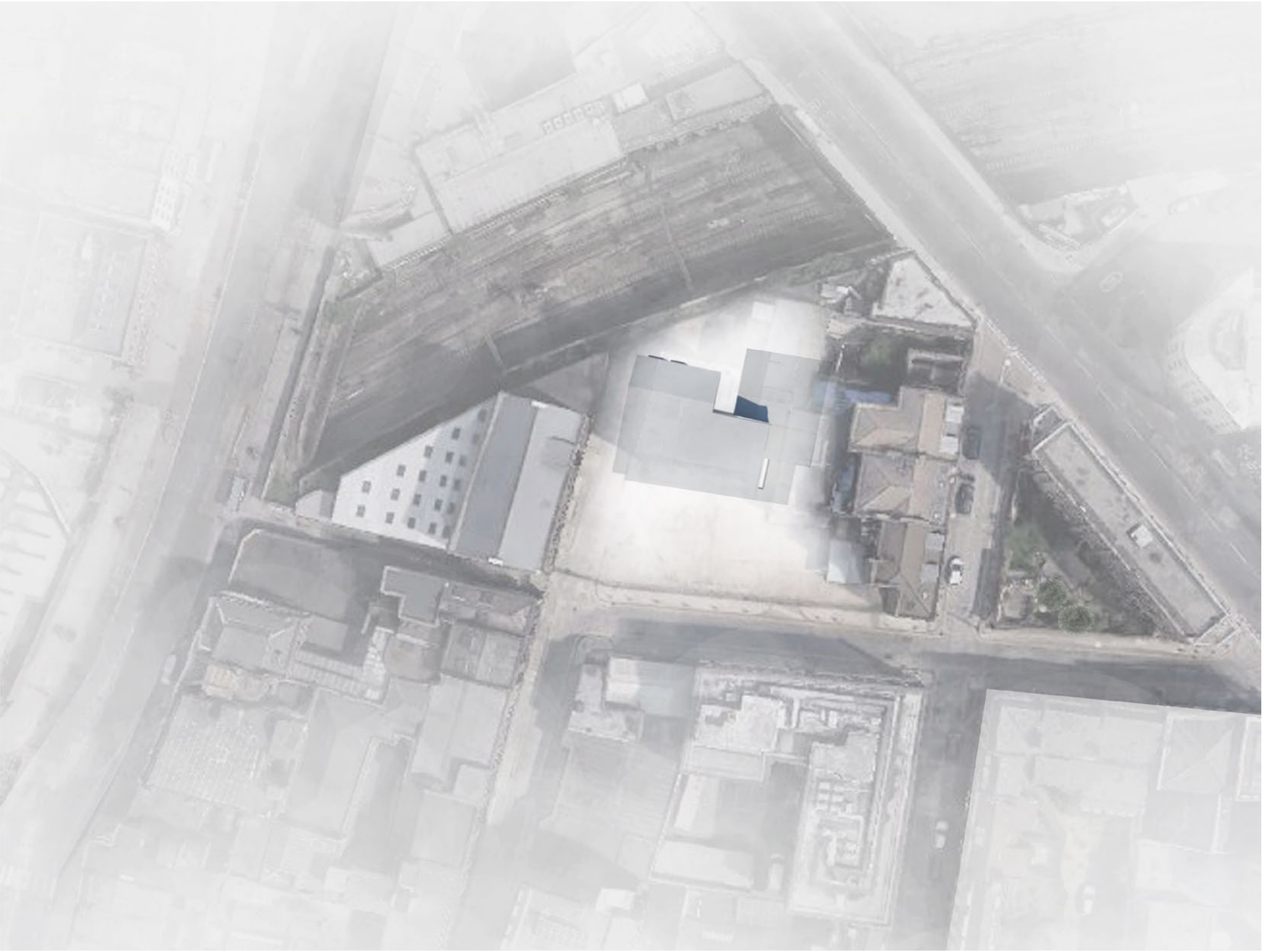


*Fig 7.44. Image showing existing warehouse structure on the site*

## PROGRAM

Resier and Umemoto's statement that "Program is unthinkable without some intersection with matter" (Reiser & Umemoto, 2006. 68) encouraged programmatic considerations to be left until later stages of the design process once the material enquiries had begun to outline an architectural outcome. In keeping with the research question that had been driving the design process, atmospheric experience and material approach were refined before setting a functional basis for the project. The gallery, the pop up gallery and studio, as a mixed program, enable a way to implement contrast which reflects the contextual nature of the site and the material environment which had been established through iterative testing.


*Fig 7.45. Laser cut site model*

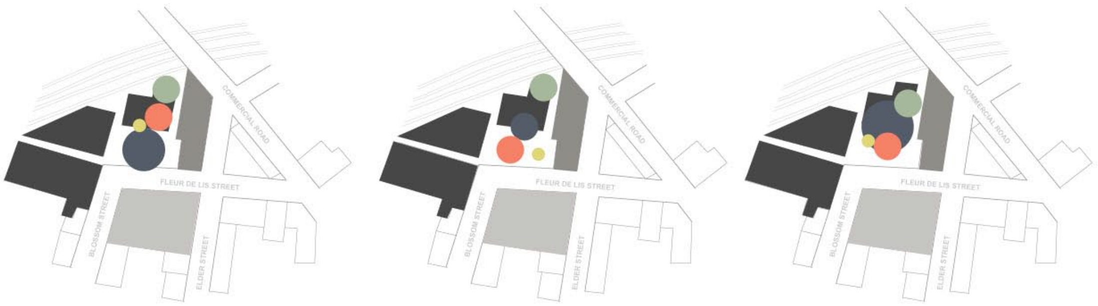


*Fig 7.46. Diagram showing programmatic dispersal on site*

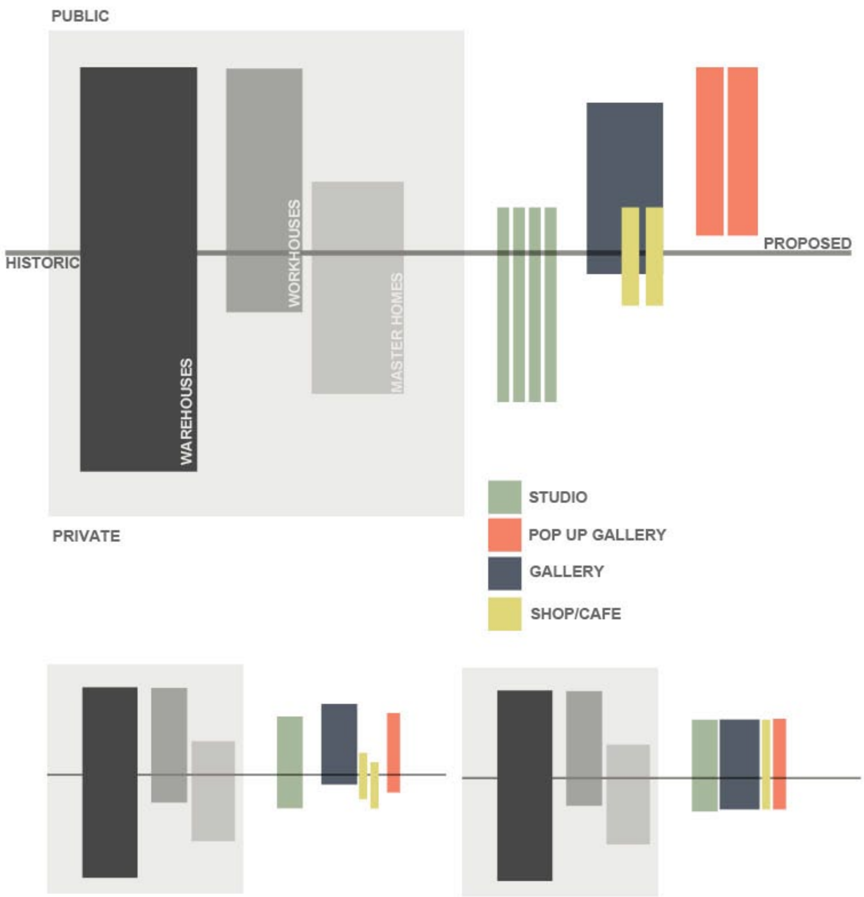



*Fig 7.48. Diagram showing programmatic exploration in relation to historic use of the site and size of resulting functional demands.*

## Implementing Contrast

*The use of contrasting elements within the design was a response to Peter Zumthor's advice to always **'think dialectically'** (Zumthor, 2000.17) in order to activate architectural atmospheres.*

### Contrasting Interior + Exterior Conditions

Using existing walls to create a 'material boundary' from which the material gradient extends from.

Interior and exterior experience building in contast through a programmatic shift from permanent to more transient use.

### Contrasting Main Gallery 'Halves'

Two gallery halves designed to house different art forms.

Circulation encouraged between contrasting materials and forms, making resulting atmospheric changes to be as pronounced as possible.

### Lighting Contrasts

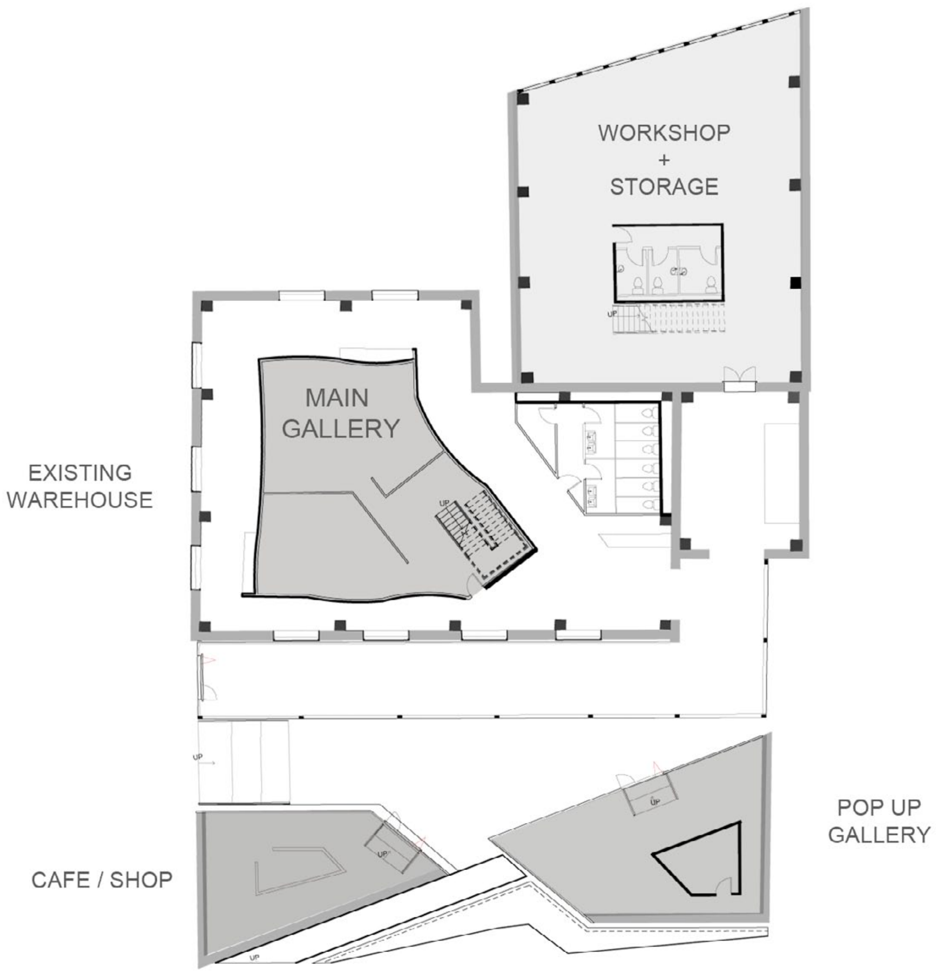
Throughout both contrasting conditions, a varied approach to lighting ensured the amplification of atmosphere throughout the shifting environments.

Material perforations, translucency and daylight filtering techniques were employed to create the desired lighting conditions.

### Contrasting Elements Explored

| | | | | | |
|---|---|---|---|---|---|
| Porous | Solid | Tiled | Seamless | Light | Dark |
| Textured | Smooth | Linear | Curved | Elevated | Sunken |

PLAN DEVELOPMENT



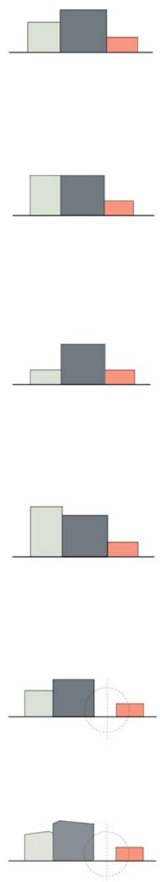



*Fig 7.50. Initial floorplan iteration. The main gallery was contained within the existing warehouse, although later extended outwards following review feedback. The workshop structure, cafe/shop and pop up gallery are all new structures.*



*Fig 7.49. (left). Diagram showing how contrast was incorporated into the design through both program and materiality*

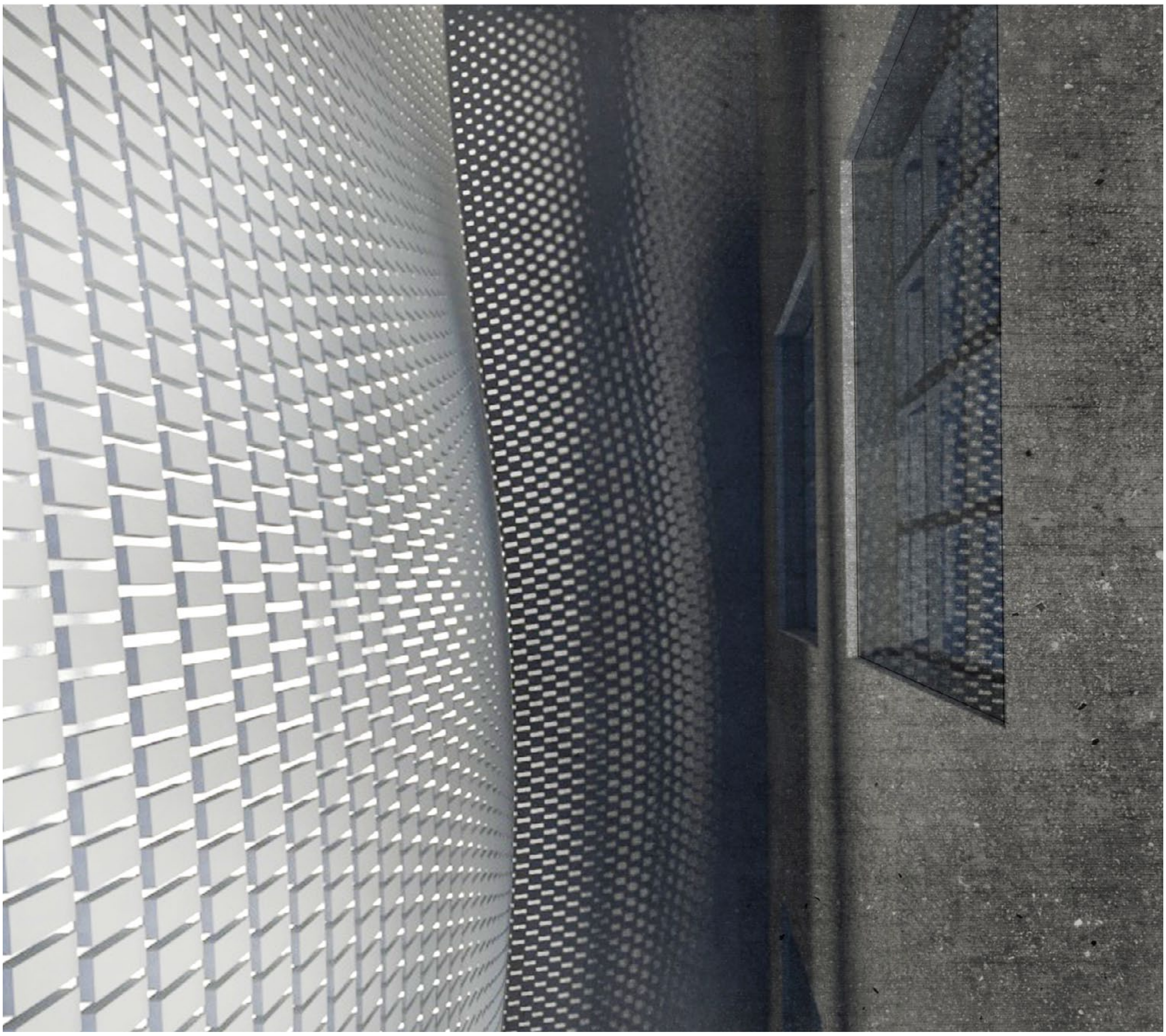


*Fig 7.51. Parametric wall against existing warehouse facade*

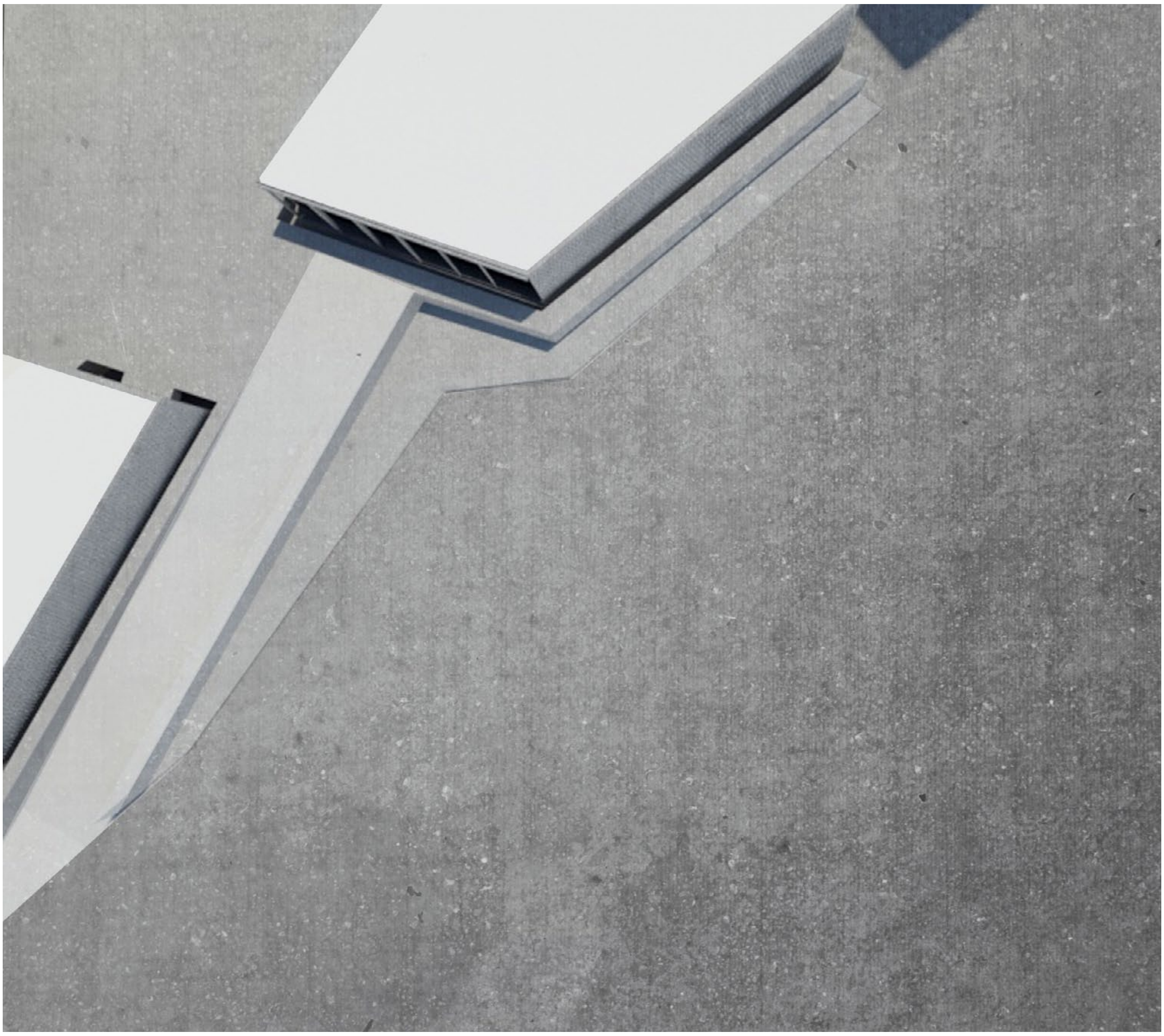


*Fig 7.52. Mixed media image of cafe/shop and pop up gallery area, raised from existing pavement.*

## IMPLEMENTING PARAMETRIC METHODS

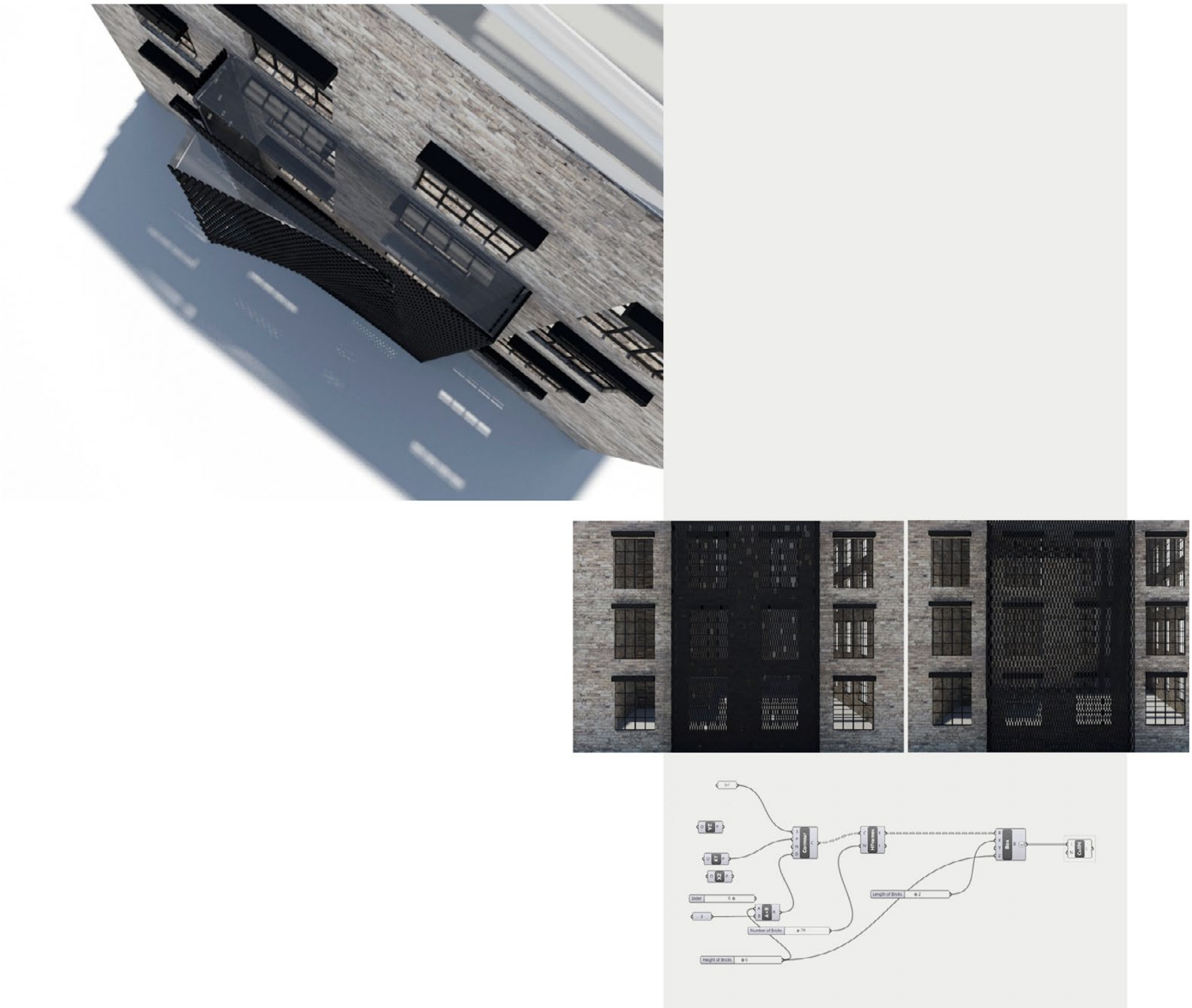


*Fig 7.53. Parametric iterations of 'new' brick walls*

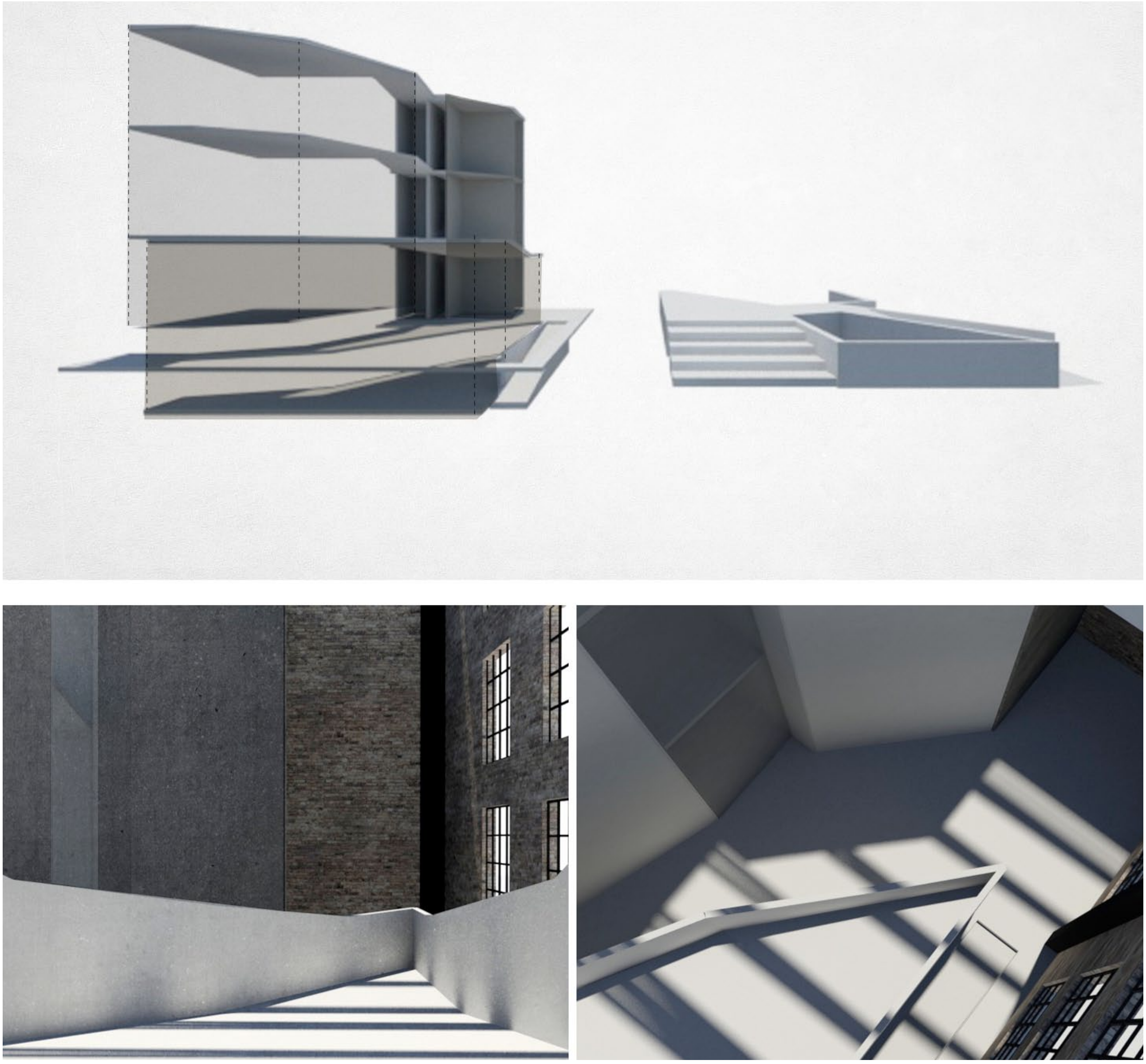
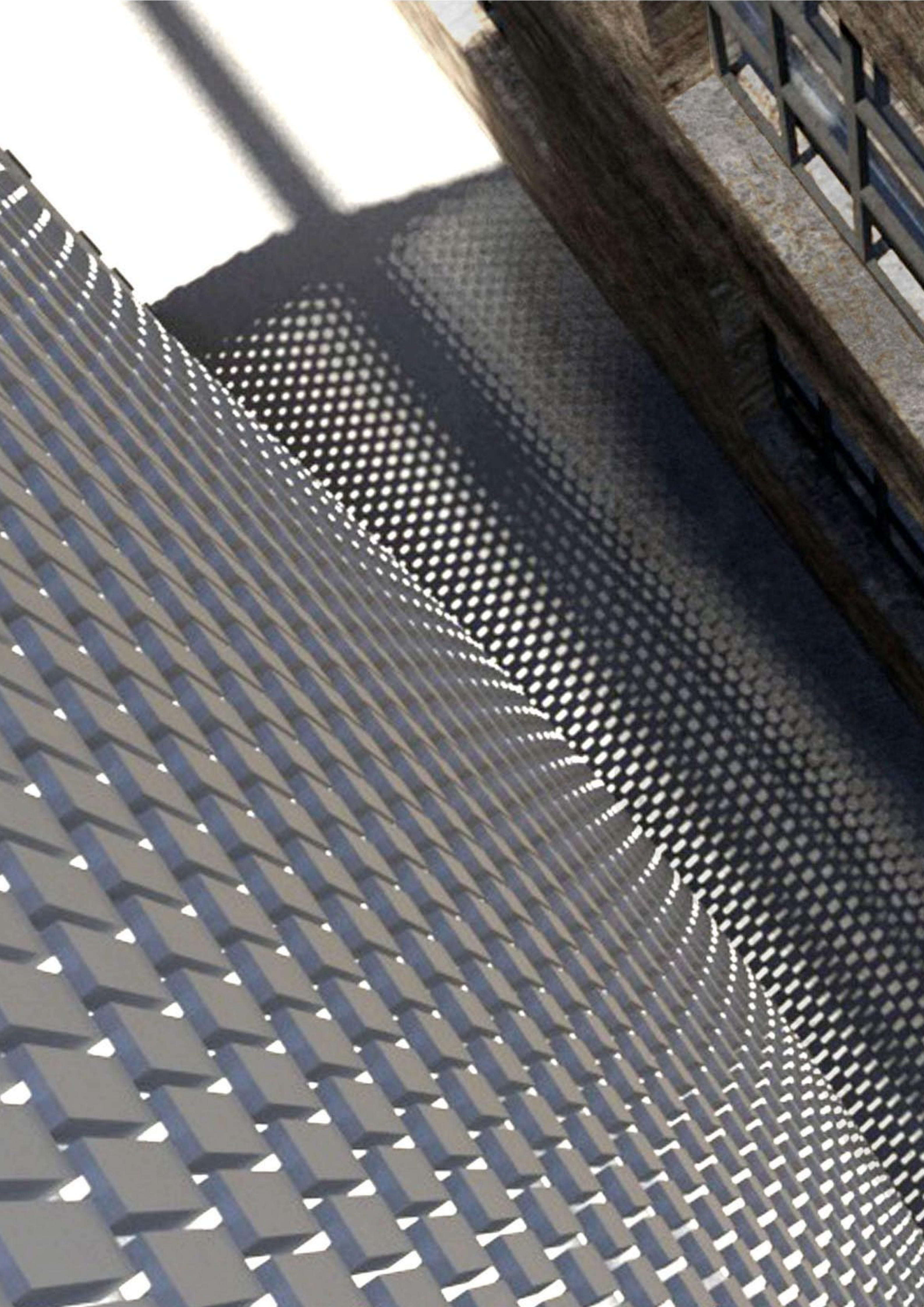


*Fig 7.54. Digital iterations of concept sketches*



## DEVELOPING PROGRAM

Parallel to the site context and the resulting tensions between old and new materiality runs the need to address the contextual relationships within the program. An art gallery programme was developed in response to both the historic and present day uses of the site. The atmospherically charged position of the research question challenged the architectural expectations of gallery space as a 'blank canvas'. While the majority of gallery spaces favour the use of the 'white cube' when displaying art works, Brain O'Doherty questions the role of more complex design environments in which to display gallery objects. Within this premise, he questions how this effects the art and further affects the "viewing subject" (O'Doherty, 1986. 7). He explains that the popular guideline that "the outside must not come in" parallels the rigidity of gallery design practice to that of religious buildings (O'Doherty, 1986. 8). This alienating environment encourages the artworks are to appear "untouched by time and its vicissitudes" which detracts from their sensory potential. Drawing from O'Doherty, this research question, in conjunction with the art gallery program, fuses in an environment which seeks to amplify the materiality of the gallery, thus forming an evocative backdrop for exhibiting art works.

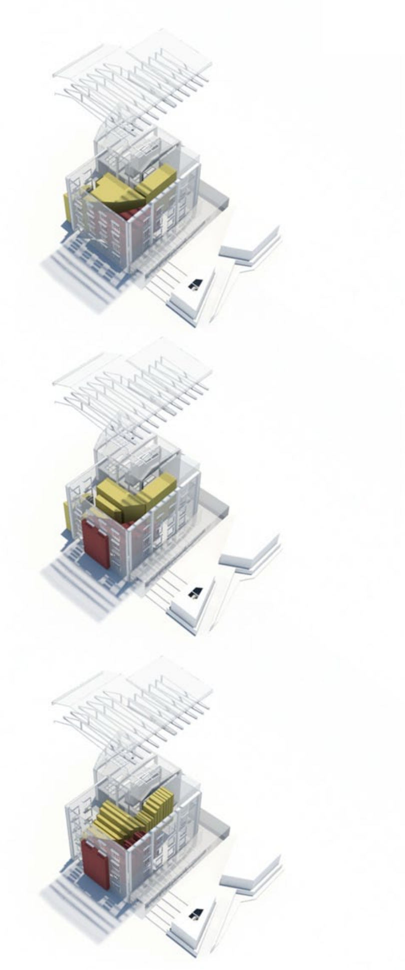


*Fig 7.55. Iterative developments in programme dispersal and hierarchy within existing warehouse.*

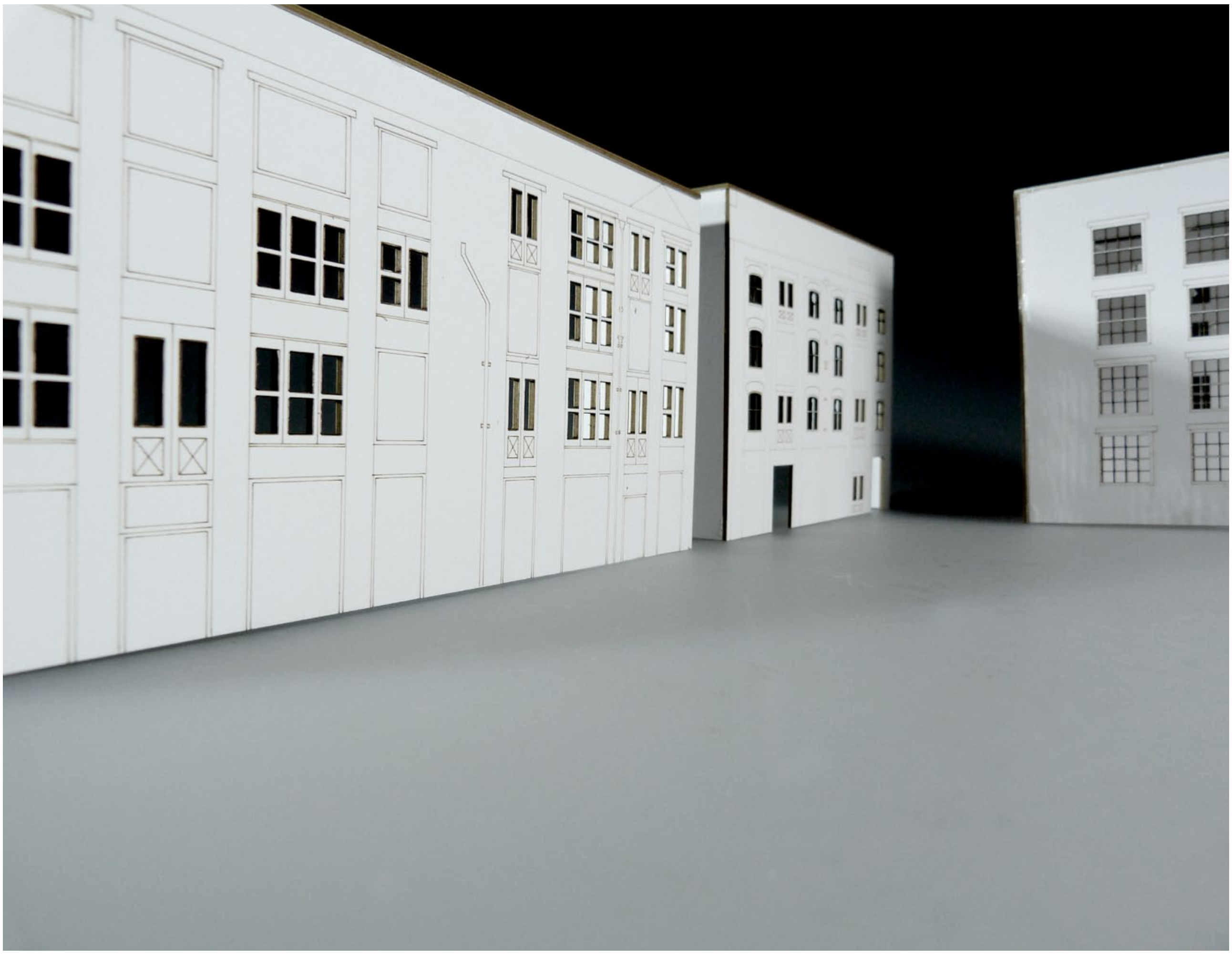
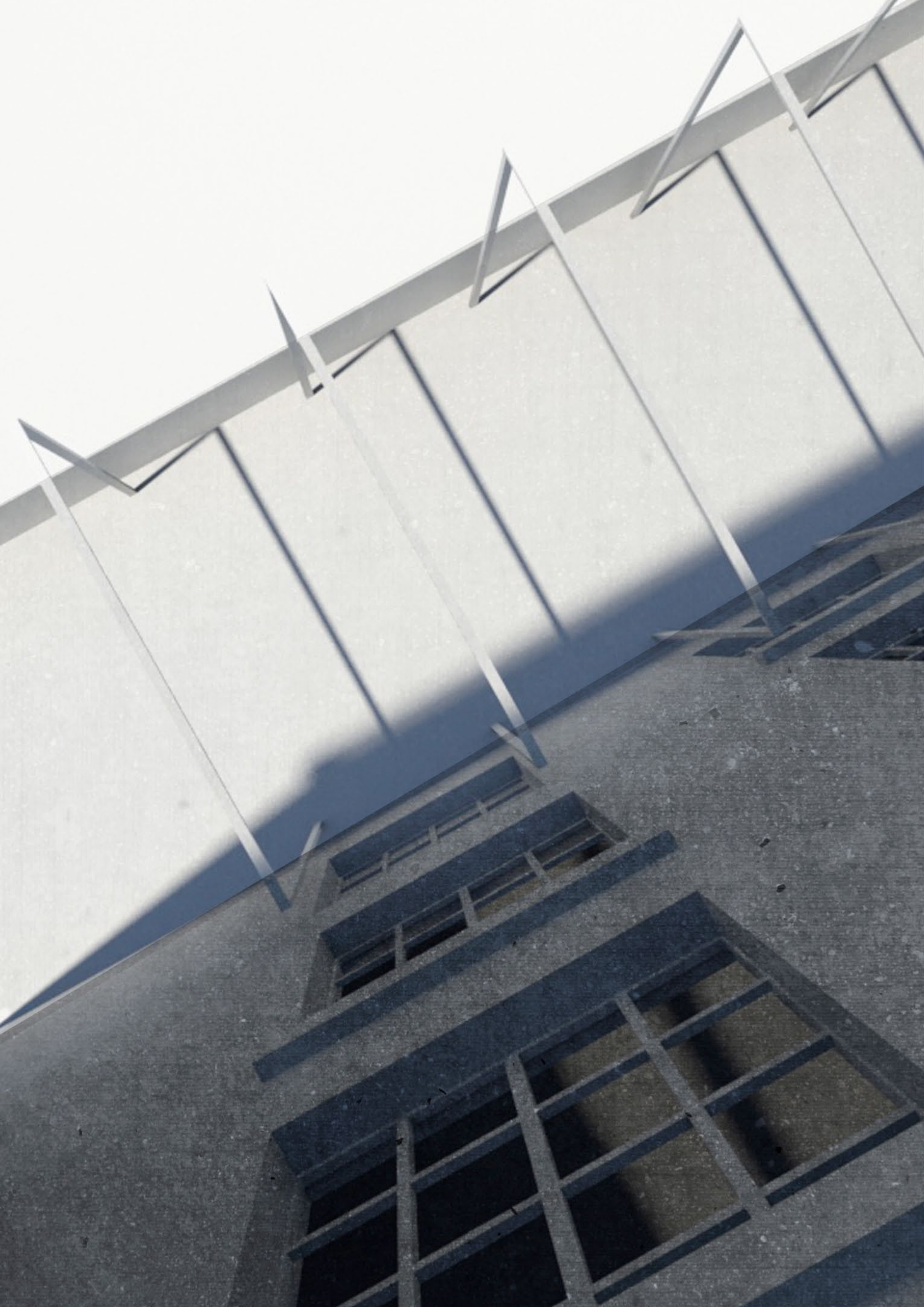


*Fig 7.56. Site model image of surrounding buildings*



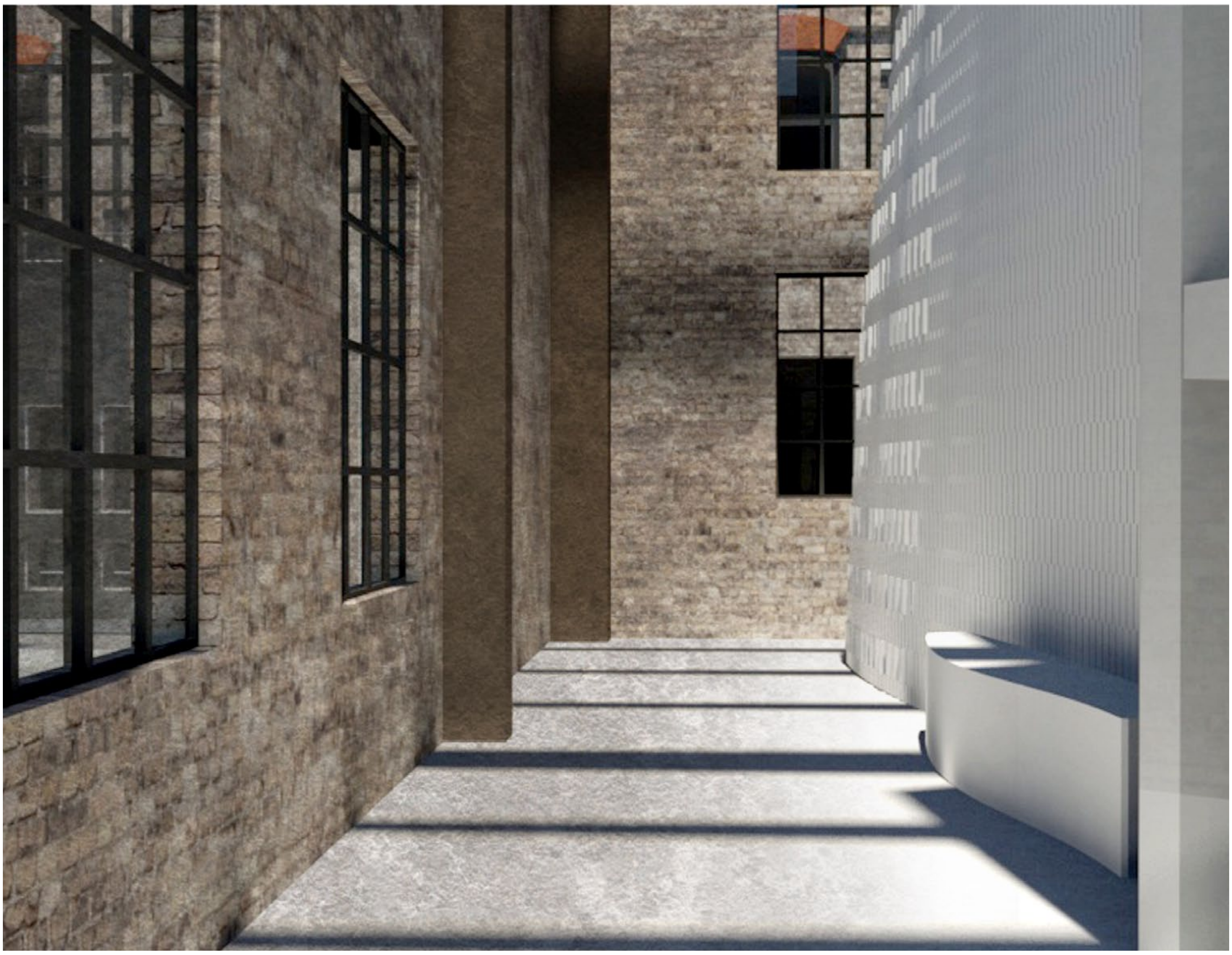


*Fig 7.58. Render of contemplation space between the parametric main gallery walls and the existing stock brick walls.*



*Fig 7.57. (Left). Entrance corridor to main gallery*

ITERATION ONE

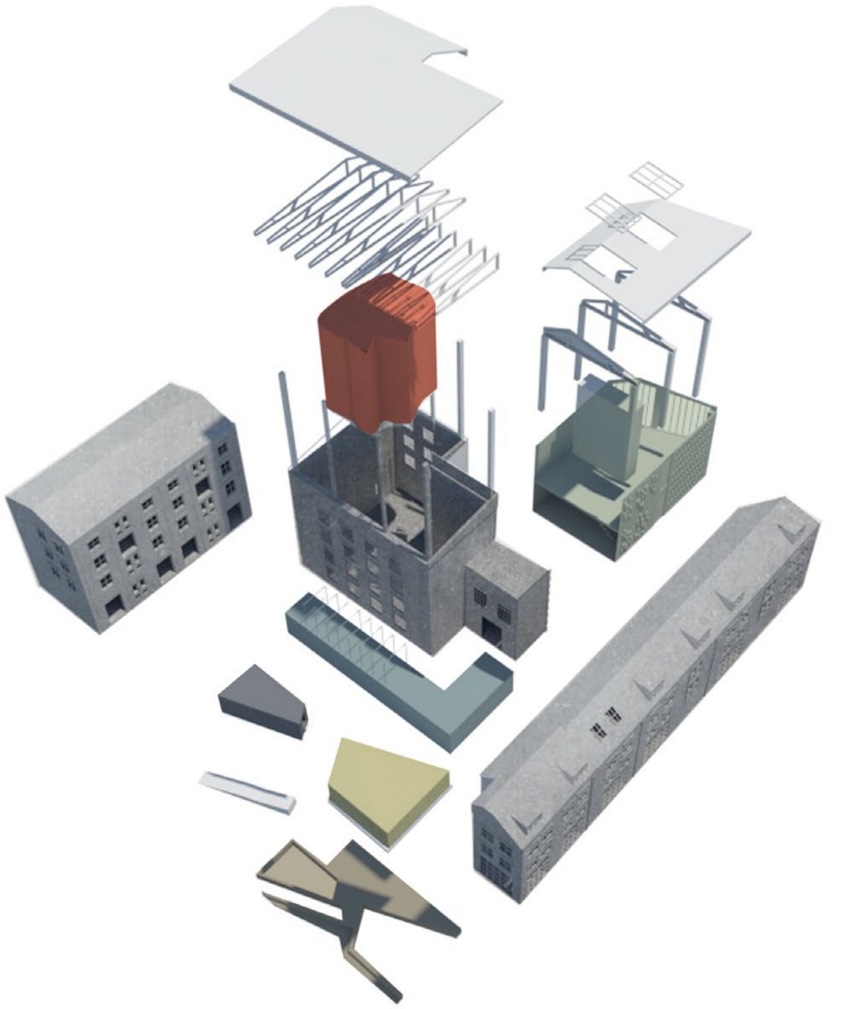


*Fig 7.58. Exploded axonometric image of the speculative design elements*

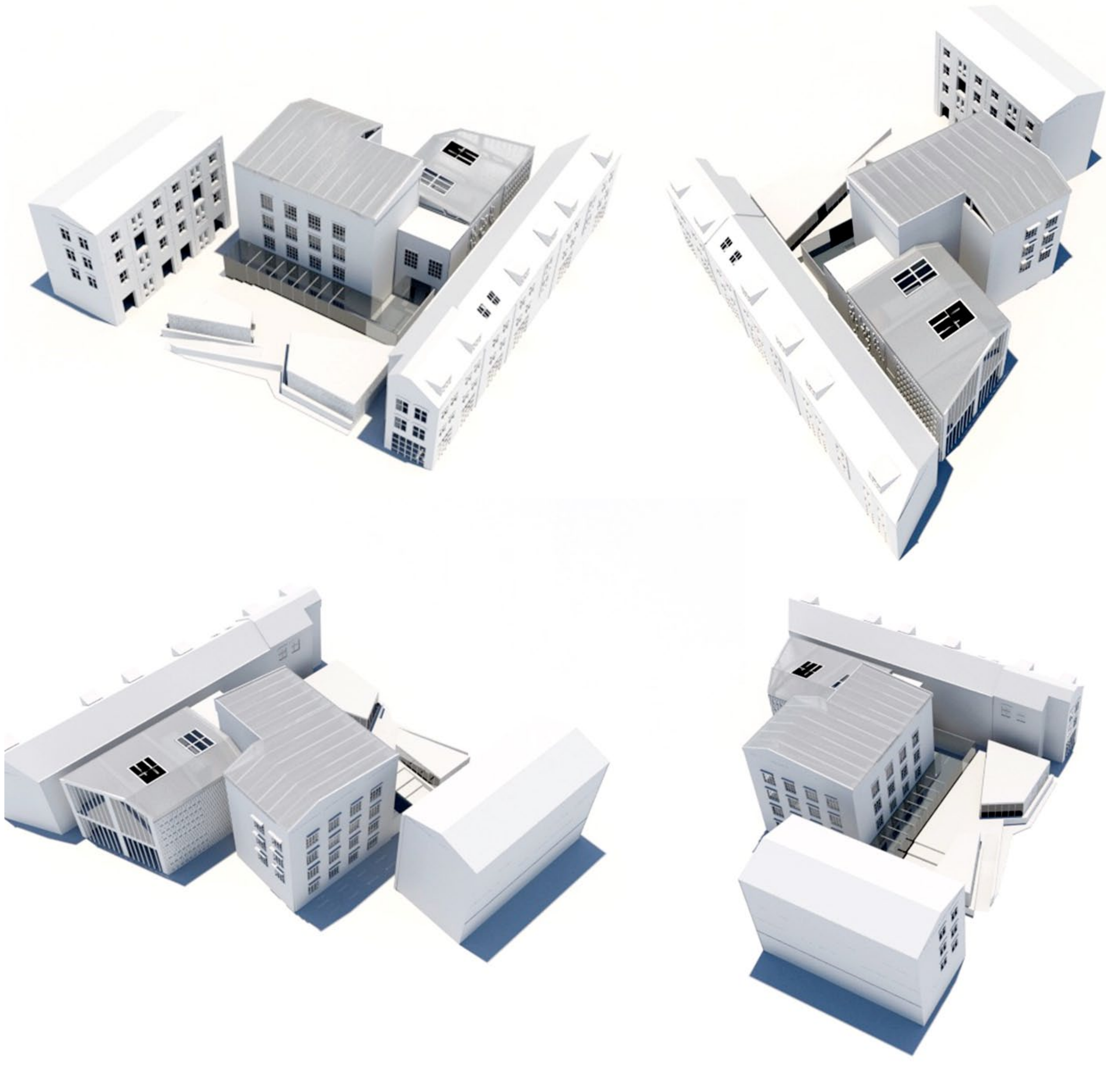
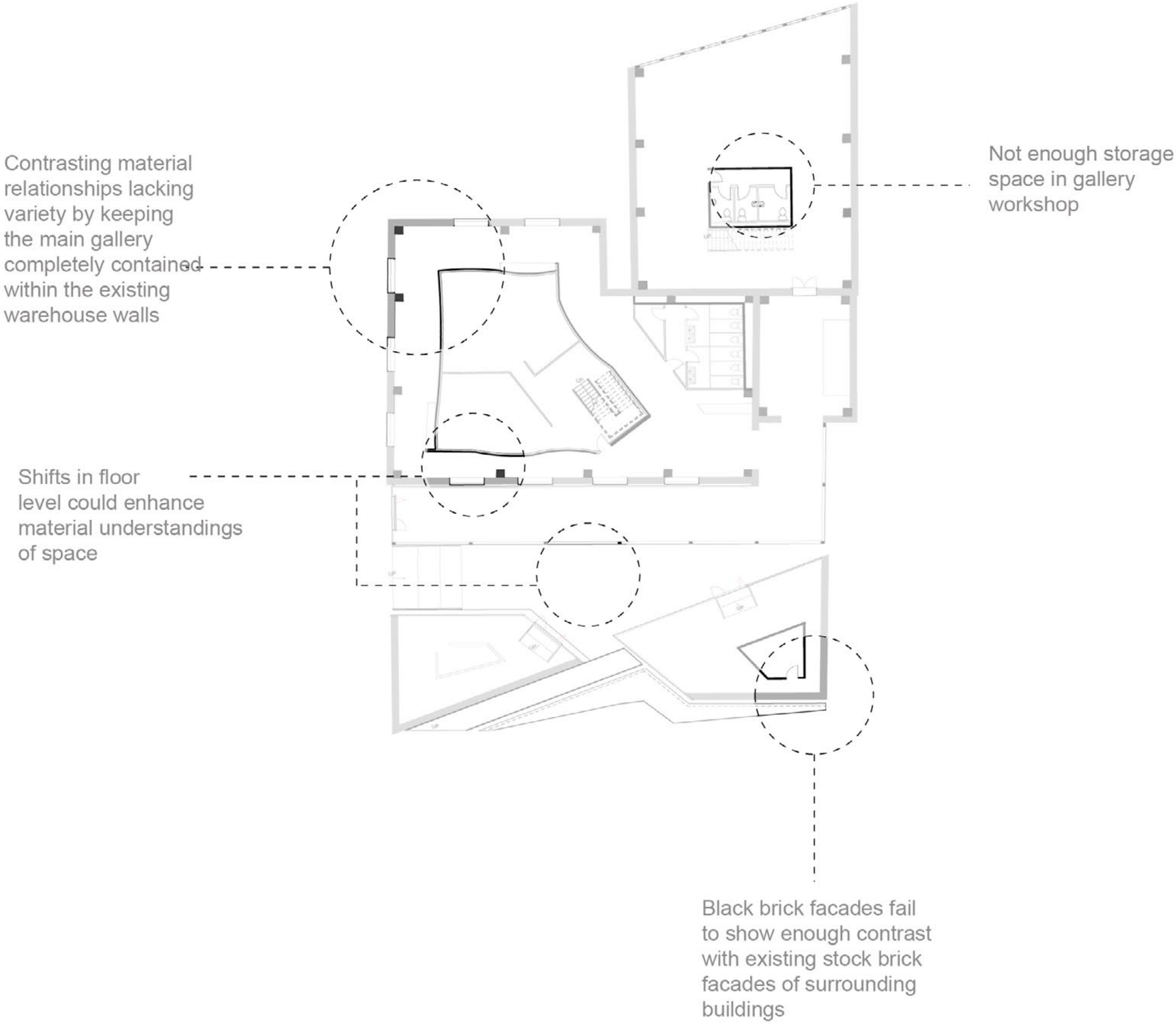


*Fig 7.59. Tectonic renders of design iteration one.*
*The exterior wall penetrations allow for daylight to be drawn into each gallery space, so that it is not entirely lost within the old to new boundary. When discussing the Tate's Switch House design, Manon states that "The permeability of the street level north-south passage not only allows for a more fluid circulation inside, it also connects the museum to its surroundings" (Manon, 2016. 60). Circulation and further 'contemplation space' similarly became a primary consideration throughout the gallery development.*

*Fig 7.60. Concept render of elevated landscape with pop up gallery and cafe/shop structures*

PROBLEM IDENTIFICATION



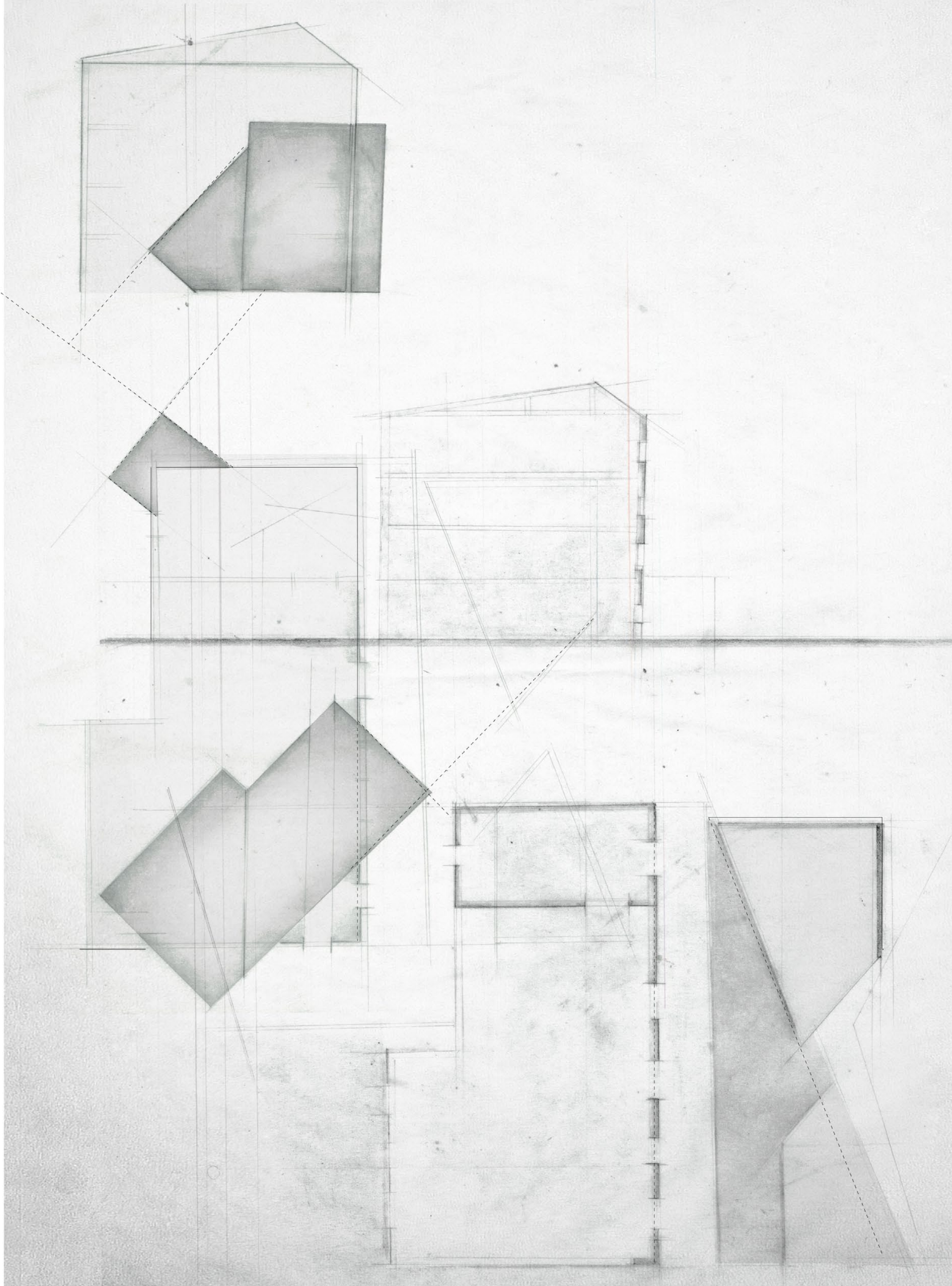

TRANSITION TO ITERATION TWO

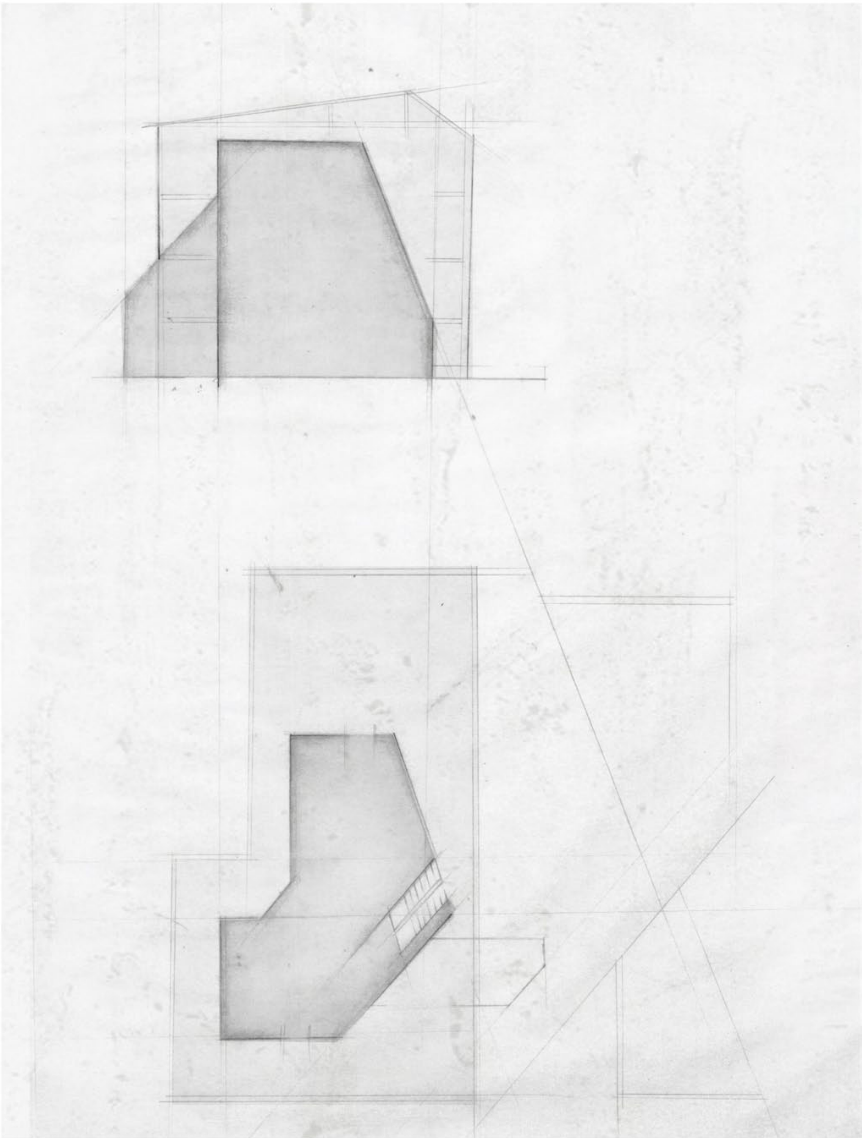
*Fig 7.61. Diagram showing reflective outcome of iteration one, highlighting the resulting shifts in design development when moving to design iteration two. The implementation of these changes has been detailed in the following section.*

# DESIGN ITERATION TWO

*Presented at the November Review*

*Fig 7.60. Digital iterations of main gallery extrusion through existing warehouse wall*





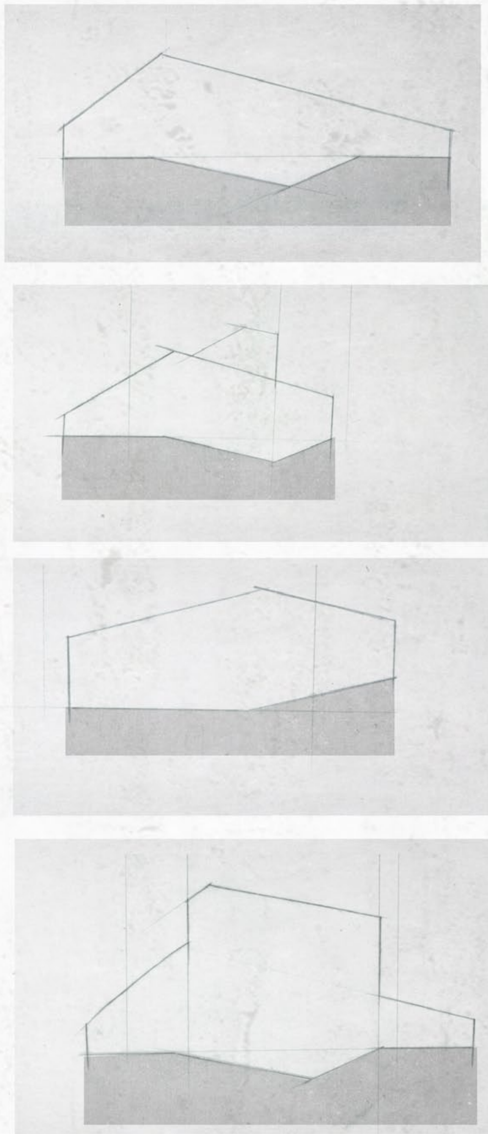


*Fig 7.62. Hand drawn iterations of gallery extrusion and placement within the existing warehouse*



*Fig 7.61. (Left). Hand drawings of plan and section gallery iterations*

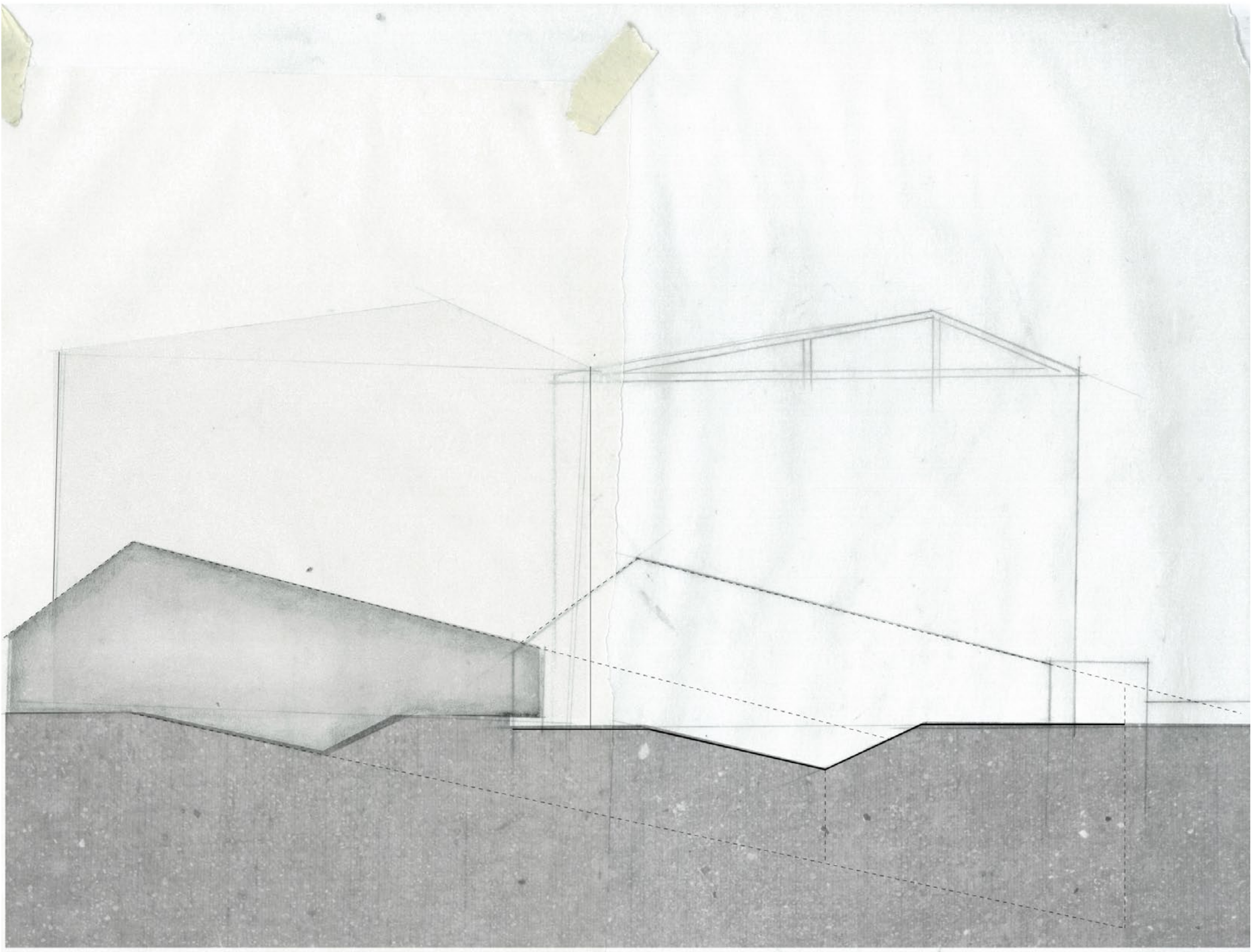
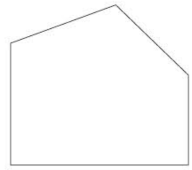


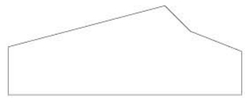
*Fig 7.63. Proposed changes in floor level within the gallery space to enhance material exposure*

DEVELOING TWO GALLERY HALVES

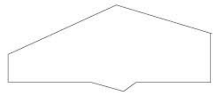
*Fig 7.64. (Right). Digital section iterations regarding the contrasting 'halves' of the gallery*



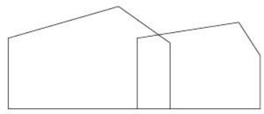
Volume too high



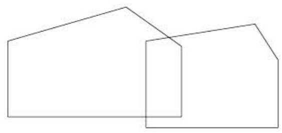
Geometry elongated



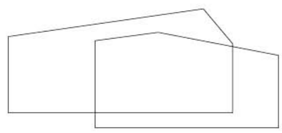
Intervention into ground plane



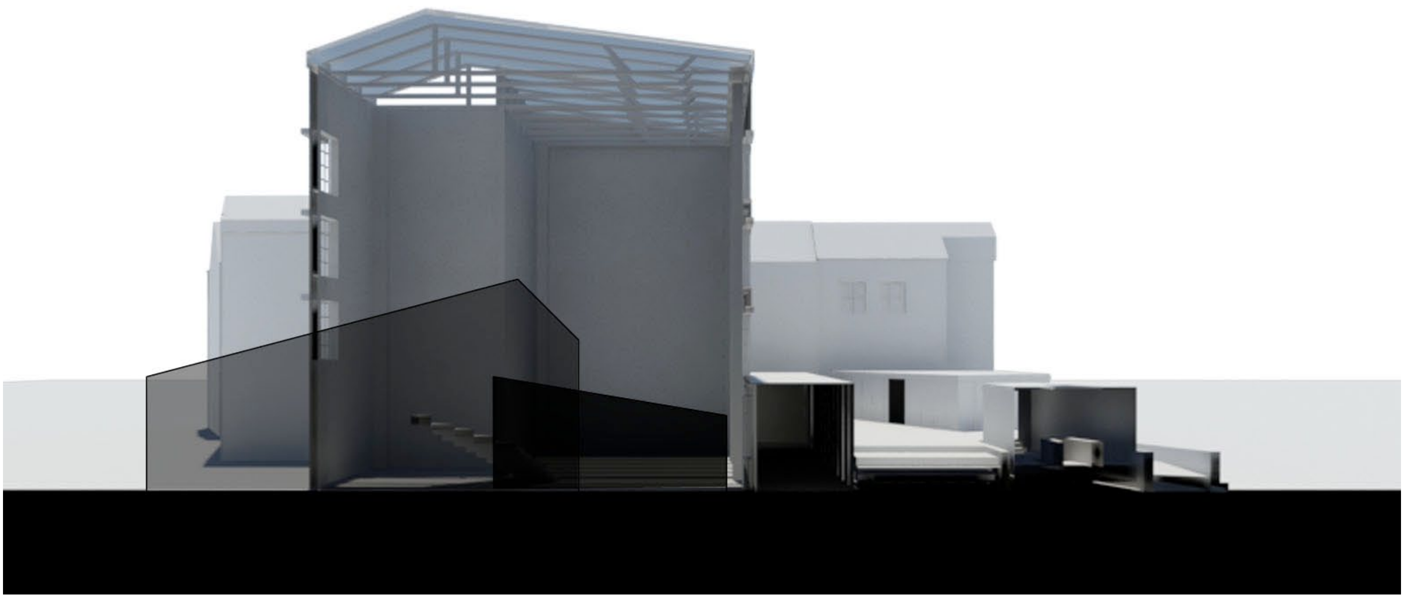
Two elements for two material experiences

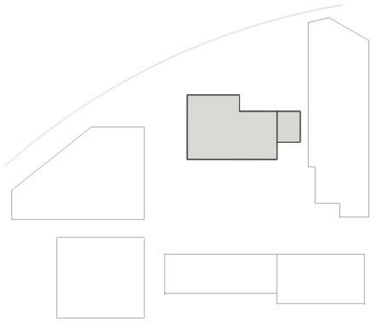


Contrasting base level



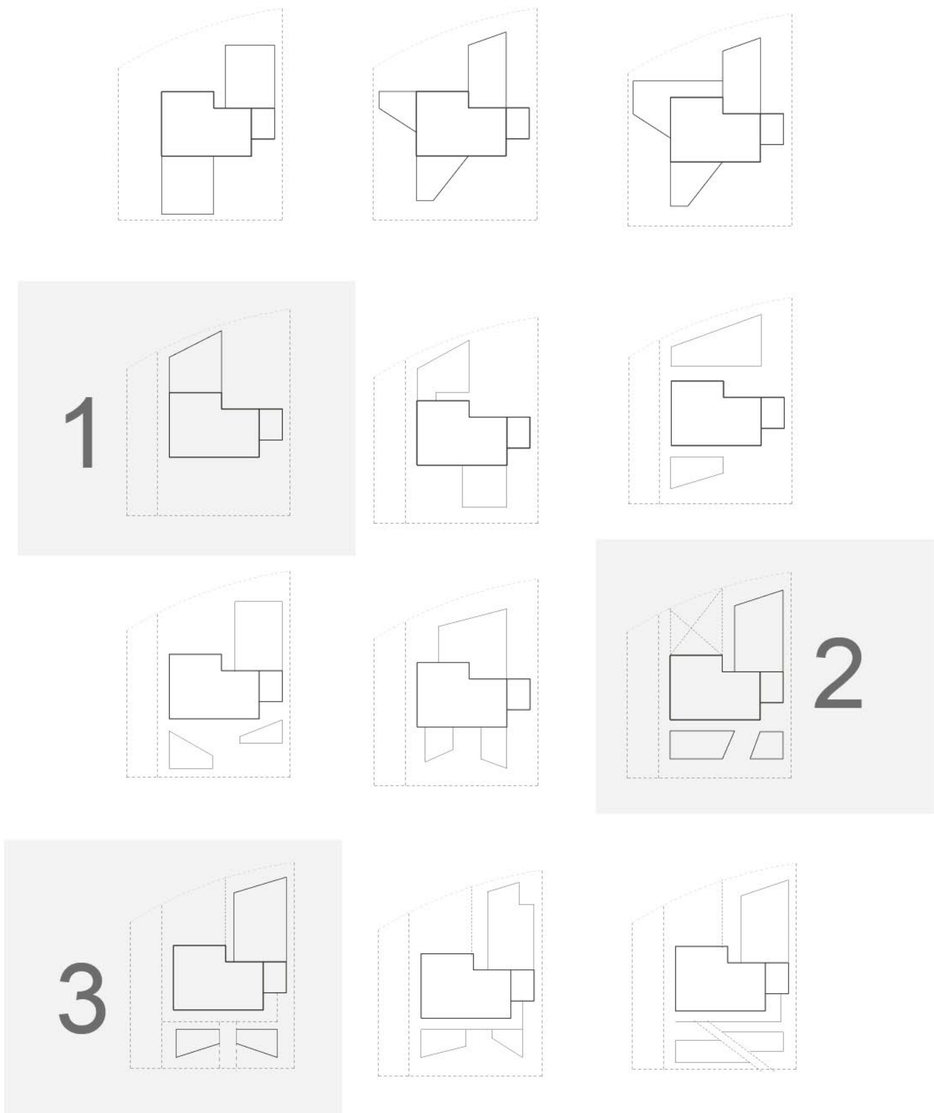
Reintroduction of elongated geometry

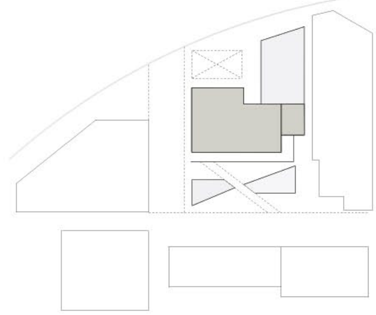


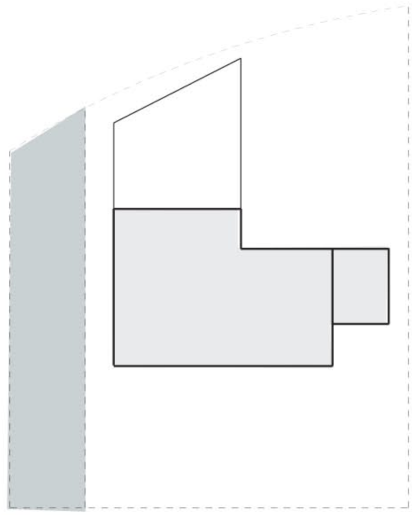


## PLAN ITERATIONS

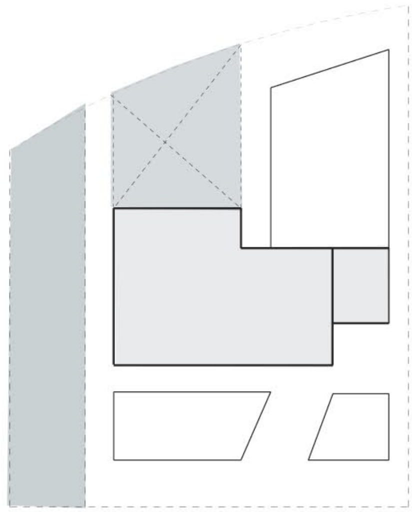
*Fig 7.65. Progressive iteration series in response to accessibility, programme requirements and site conditions. The most important iterative developments have been highlighted (1, 2 and 3) and explained in Fig. 7. 66 (Right).*



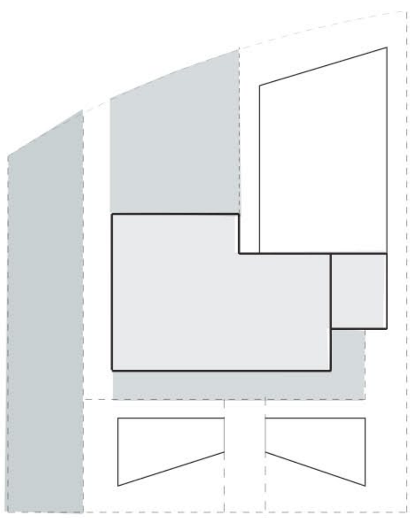





1 Introduction of boundary for vehicle access to the North end of the site



2 Introduction of boundary for loading zone



3 Introduction of boundary for localized gallery access

Development of two small structures at South end of site to limit warehouse obstruction and encourage public activity between buildings

## POSITIONING OF CONTRASTING SURFACES

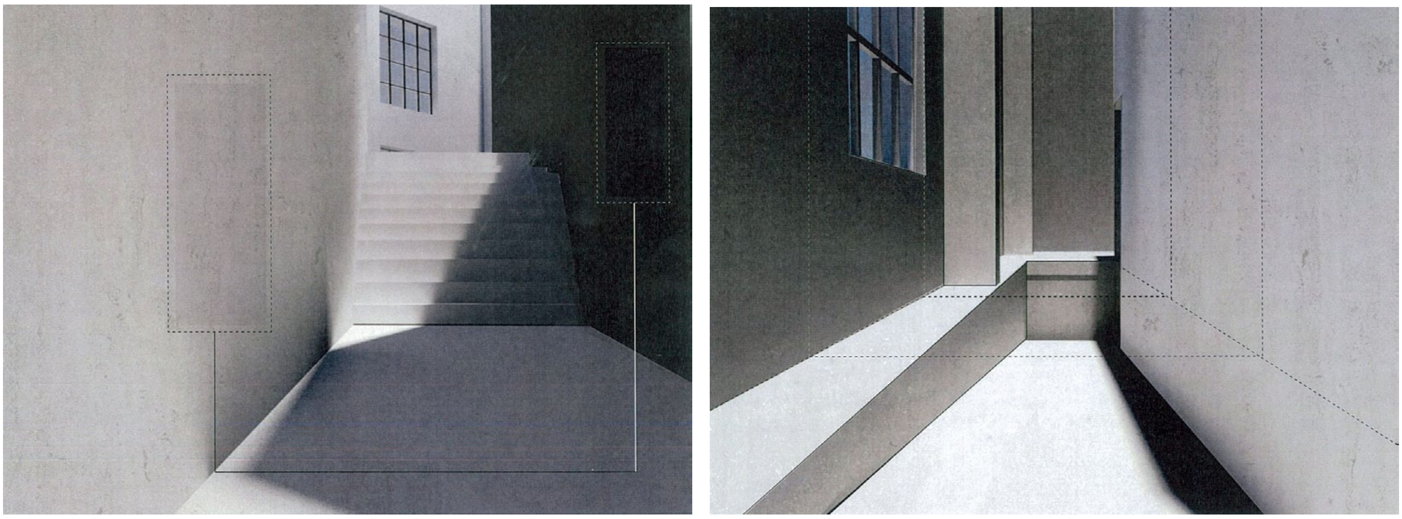


*Fig 7.67. Setting up material contrast in the main gallery and encouraging circulation between different material environments.*

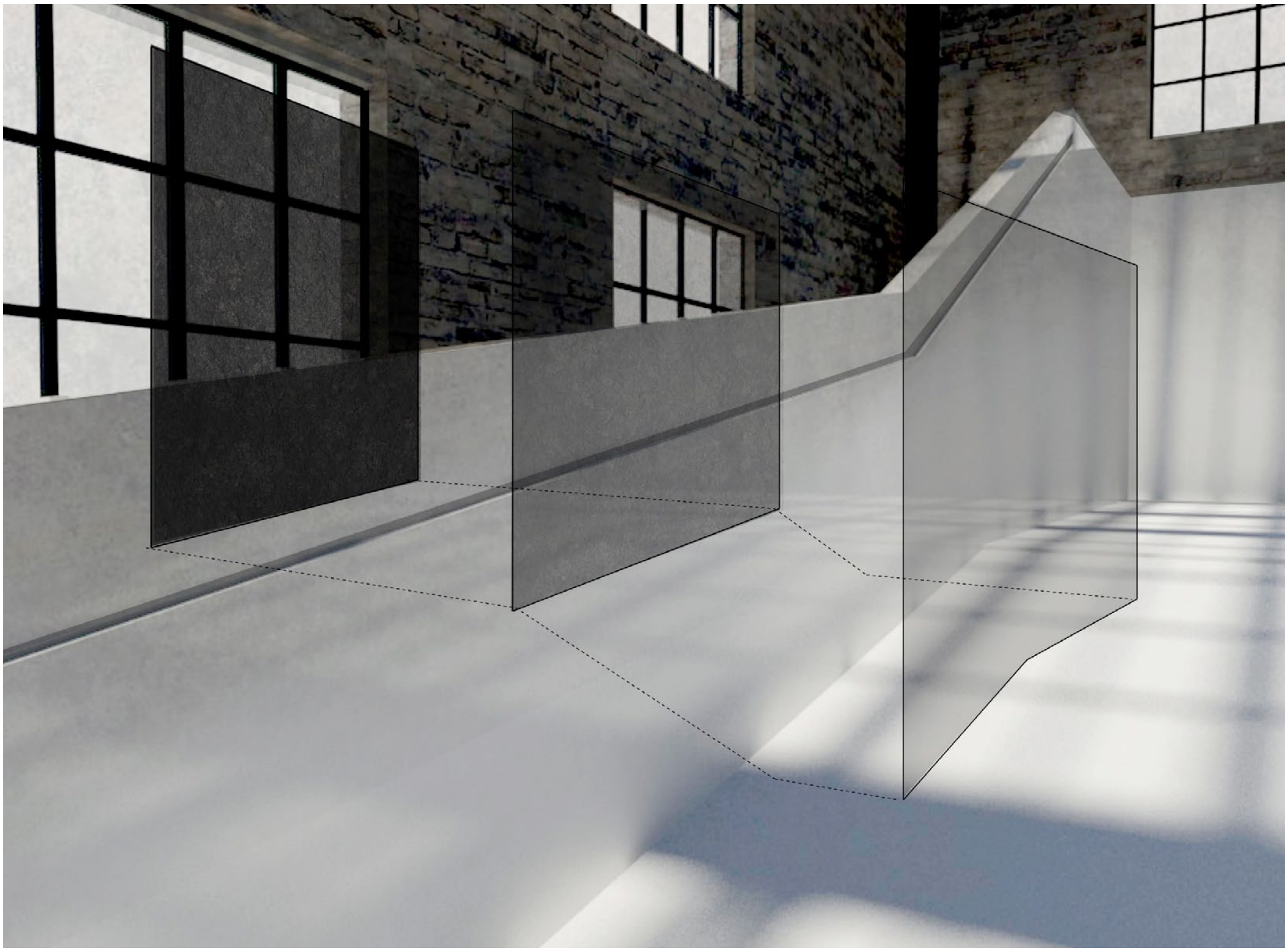


*Fig 7.68. Diagram showing the 'material gradient' between old and new materiality*

## CONTRAST THROUGH MATERIAL INTERFACES

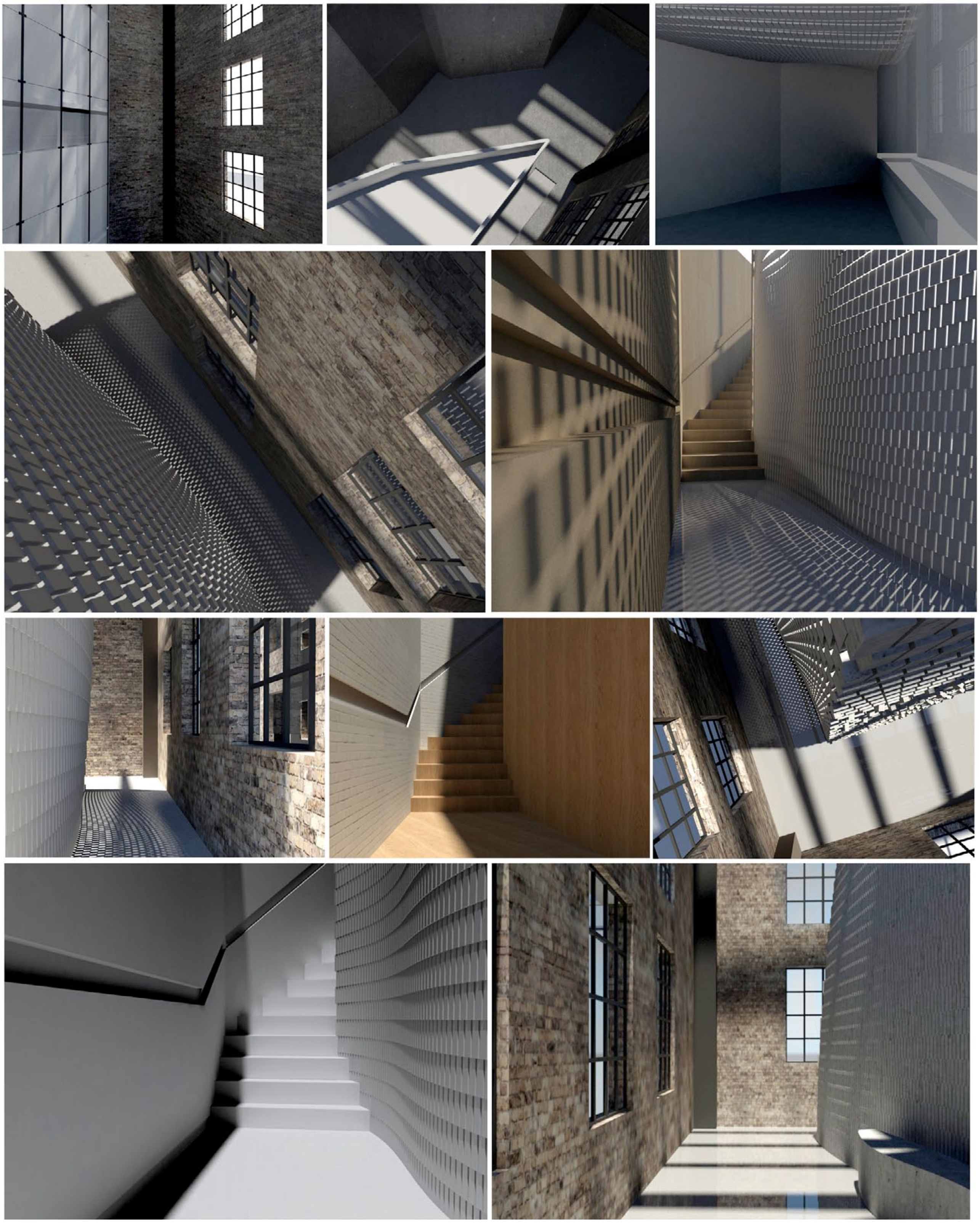


*Fig 7.69. Digital iterations of the gallery space. Iterations shifting to emphasize material contrasts*

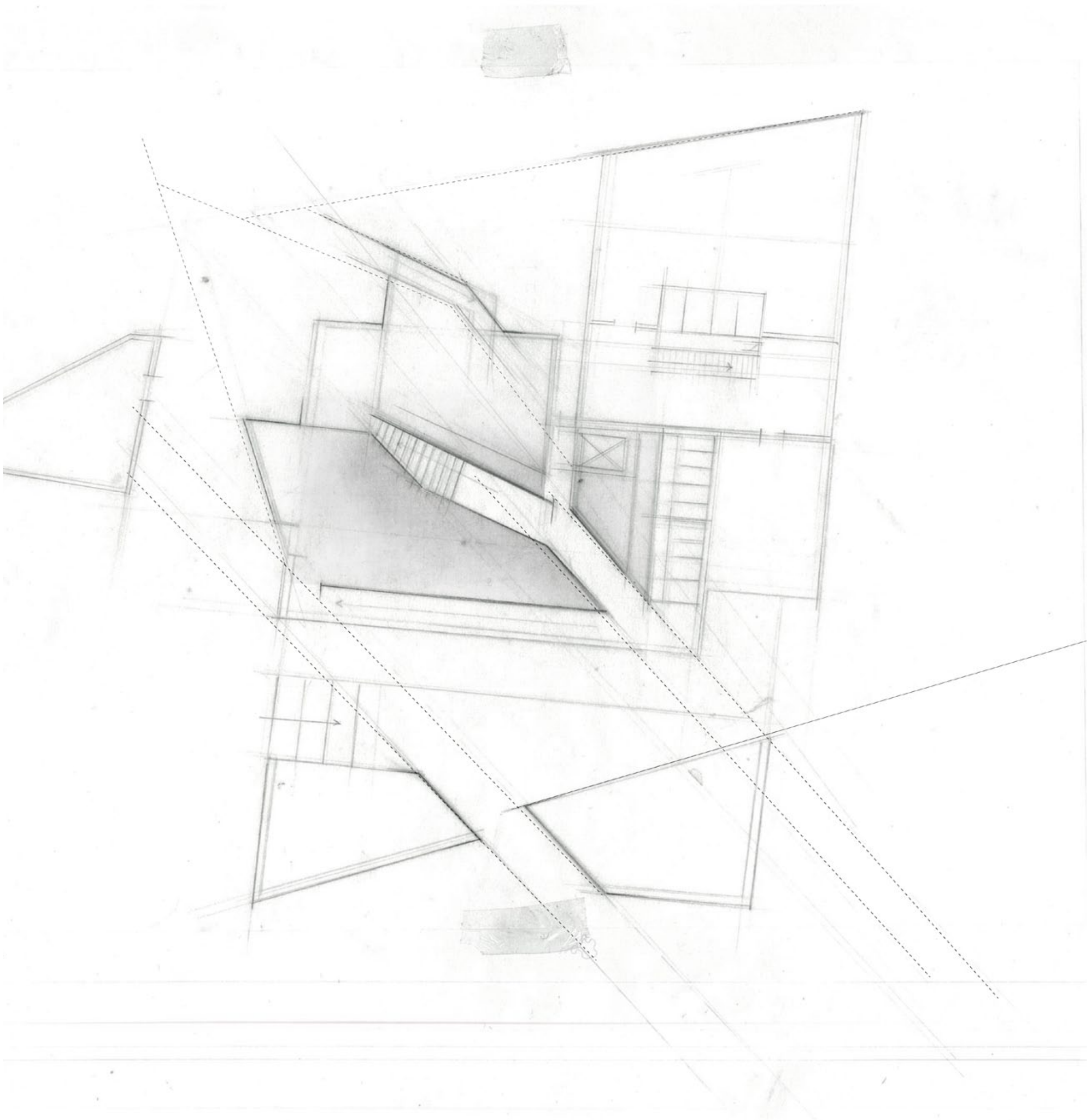


*Fig 7.70. Sketch of floor plan iteration*

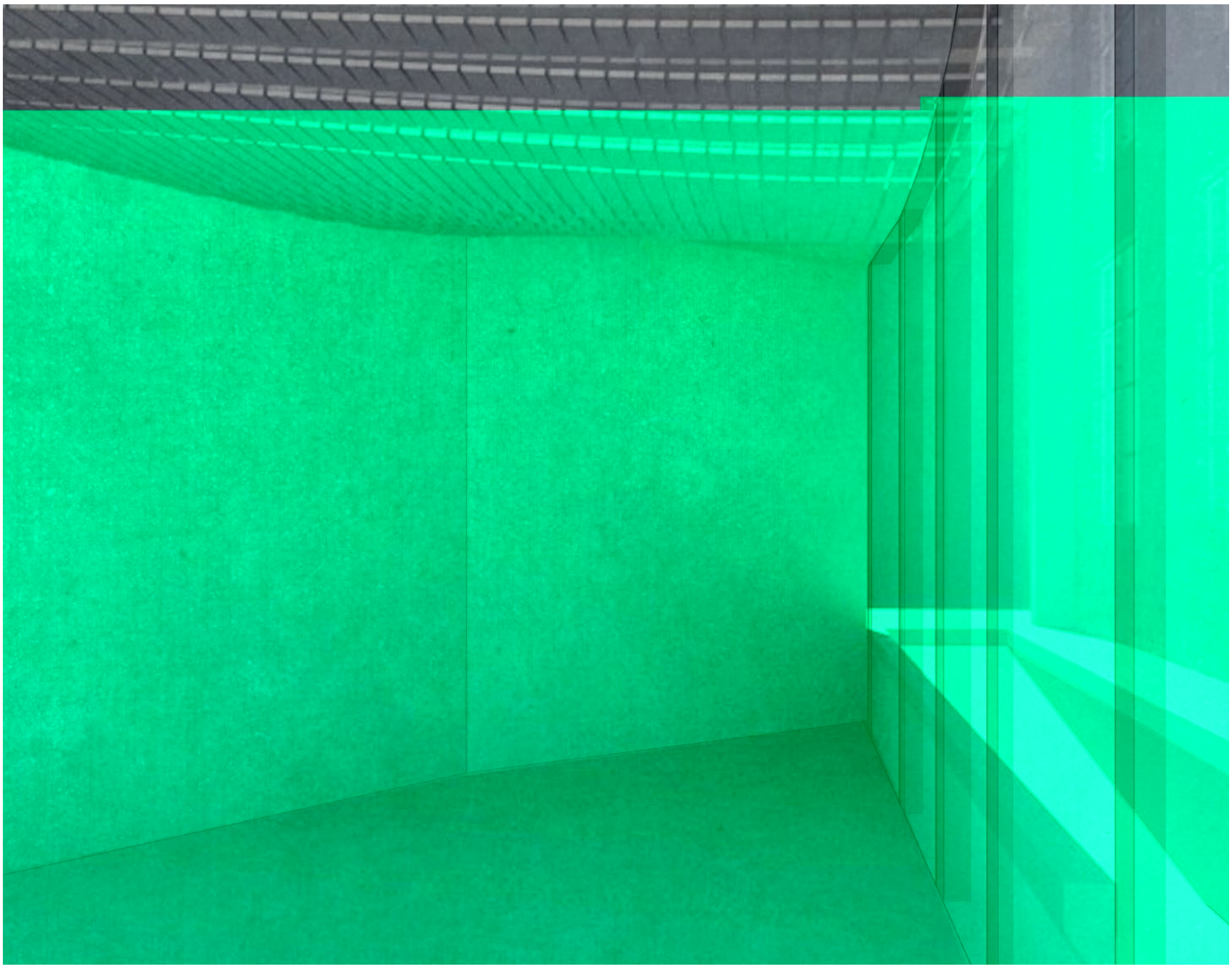


*Fig 7.71. Digital experiments involving parametric ceiling structures, using brick geometry*

COMBINING PROGRAM AND MATERIAL CONTRAST

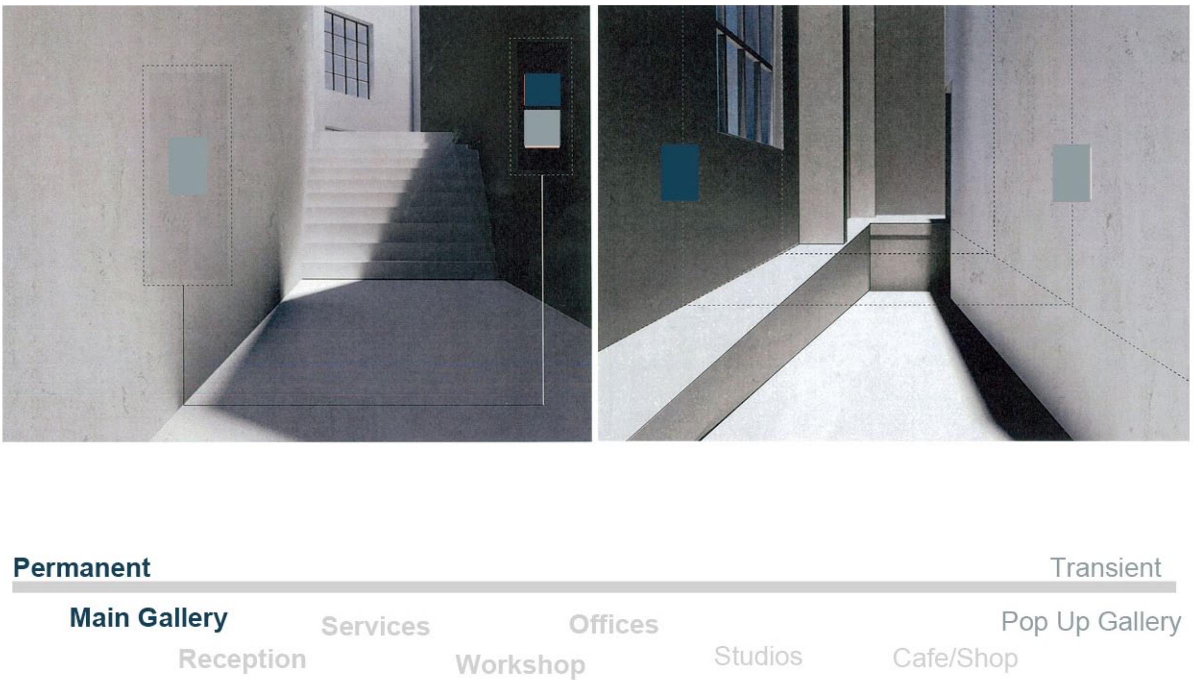



*Fig 7.72. Diagram showing the placement of contrasting programme elements*

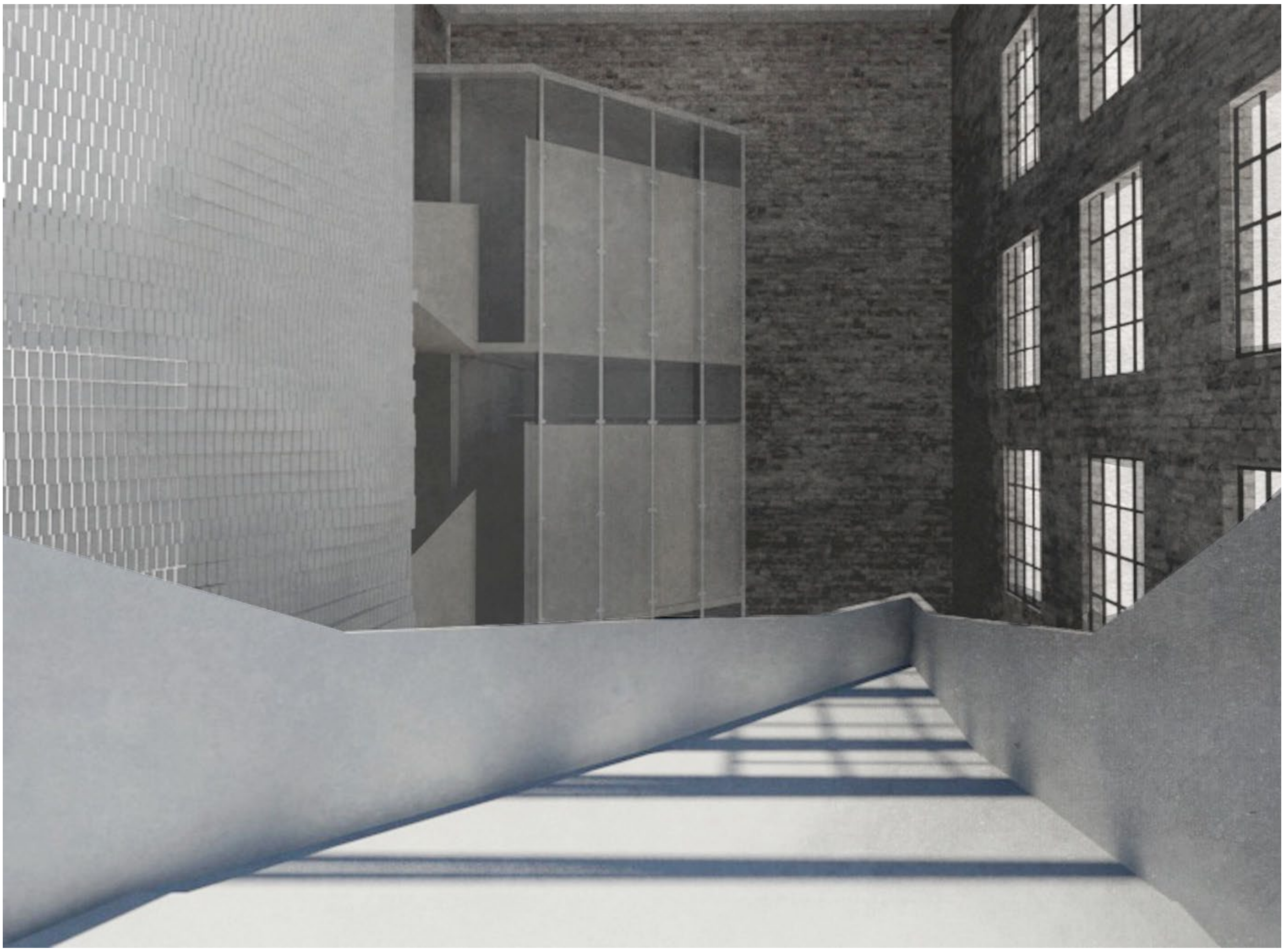


*Fig 7.73. View from a viewing platform within the main gallery, highlighting shifts in surrounding materiality*

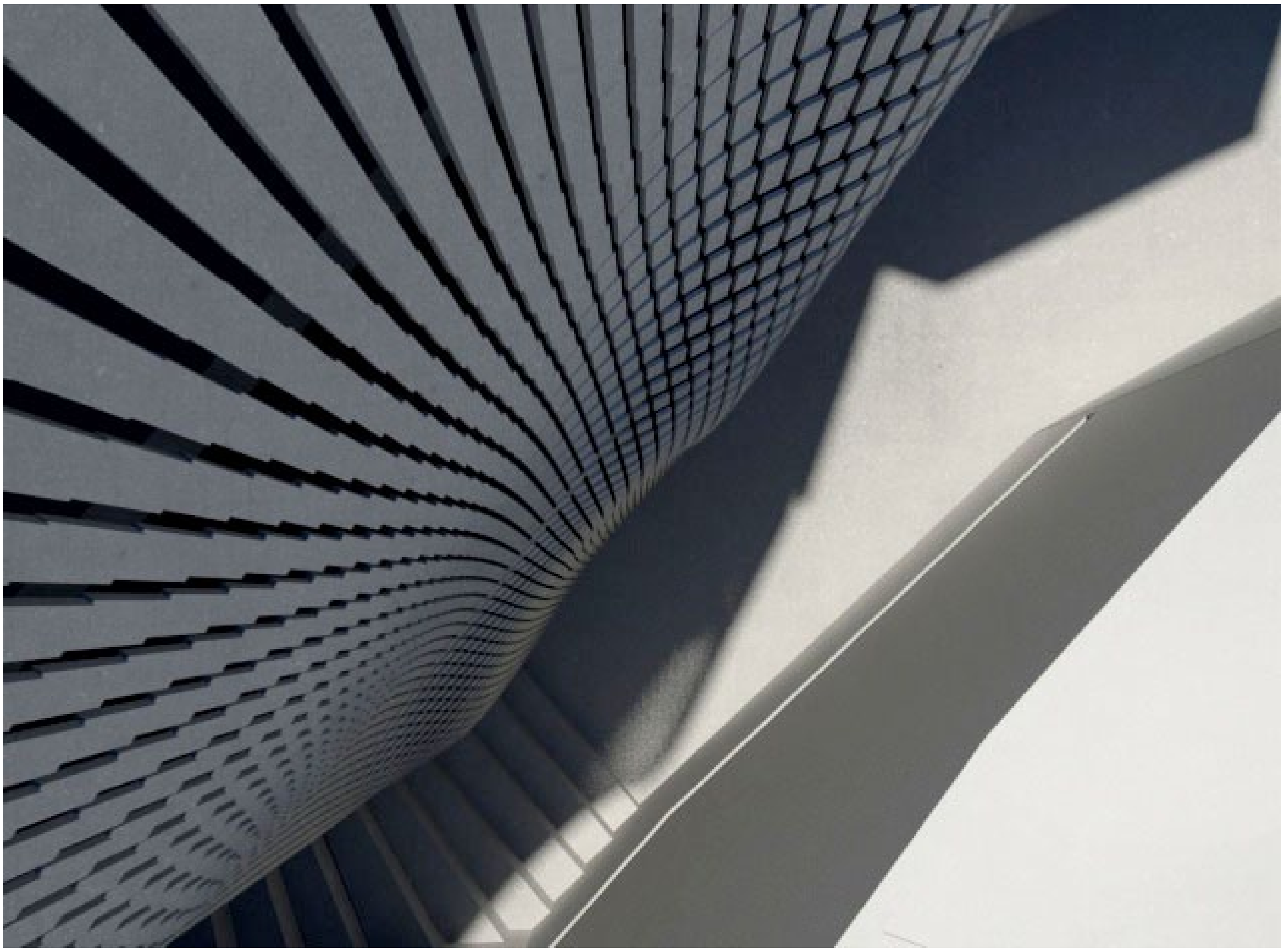


*Fig 7.74. Parametric gallery wall*

# FINAL DESIGN

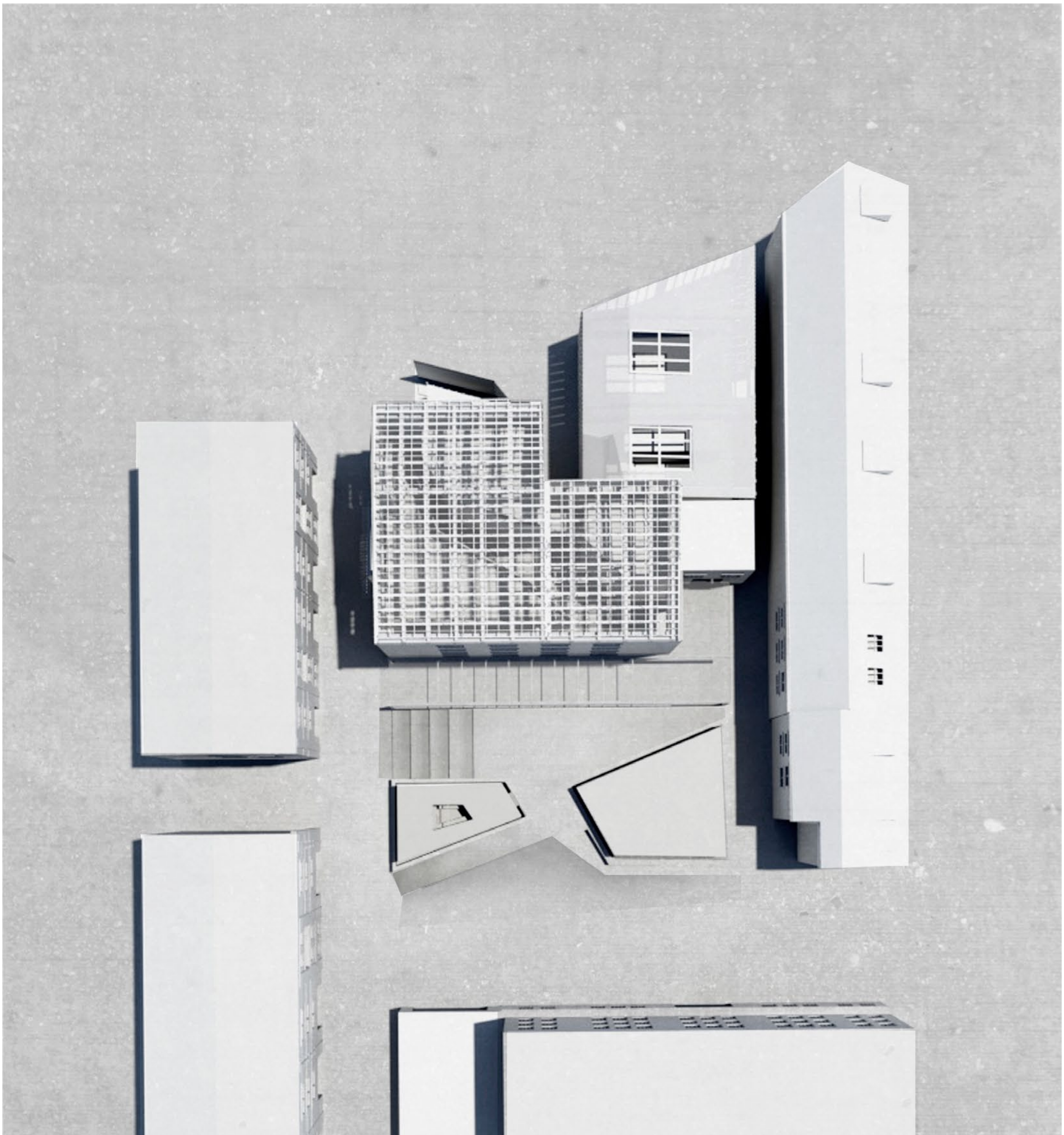


*Fig 7.75. Site plan of final gallery design at Norton Folgate. Feedback from the August review bought about the need to reasses treatment of interface areas and junctions between existing and new materiality. The main change arose within the main gallery space, which was iterated to formulate more meaningful boundaries between the existing structure and the speculative intervention.*

*Fig 7.76. Render overlooking the raised landscape area containing the cafe/shop and pop up gallery*

*Fig 7.77. Contextual render of the speculative design within the wider site*


*Fig 7.78. Material junction within the main gallery space*

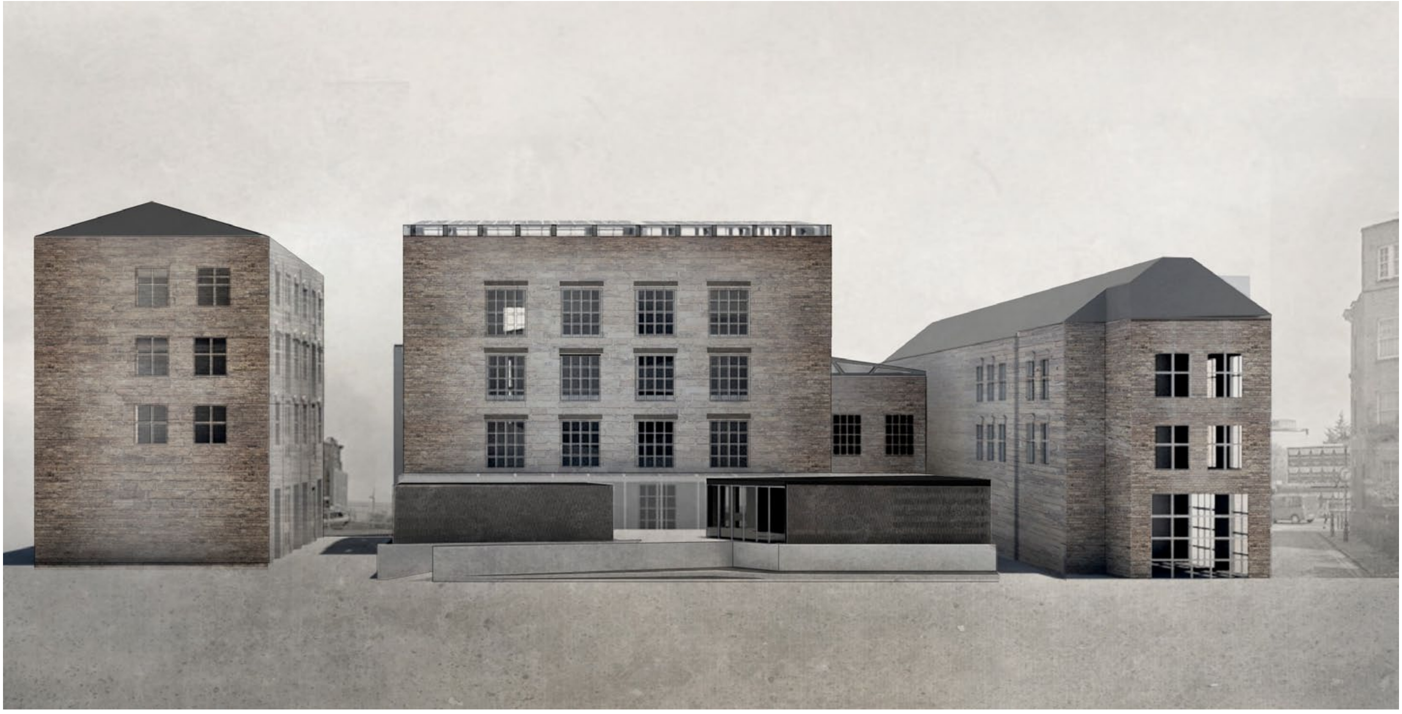
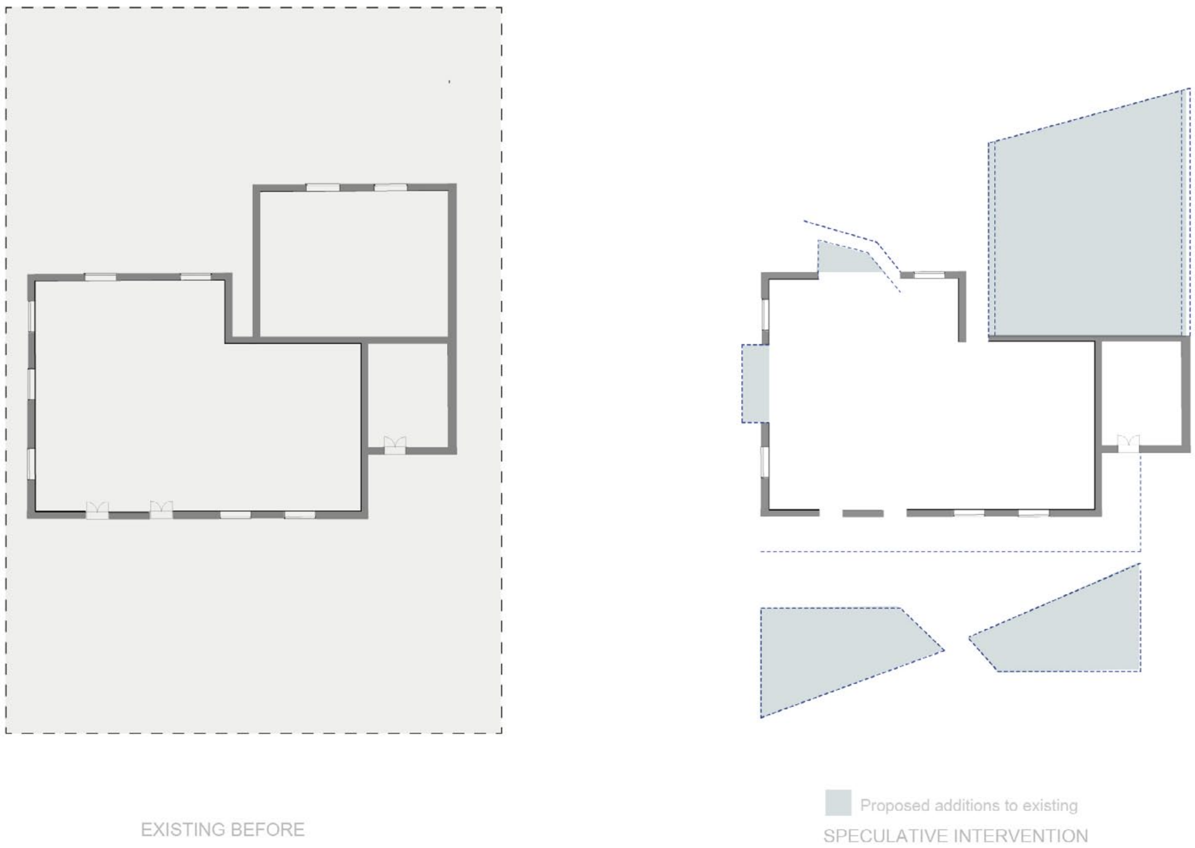


*Fig 7.79. South facing elevation*

*Fig 7.80. North facing elevation*




POSITION OF OLD vs NEW FORMS

*Fig 7.81. Diagram showing existing and new structures within the speculative design*

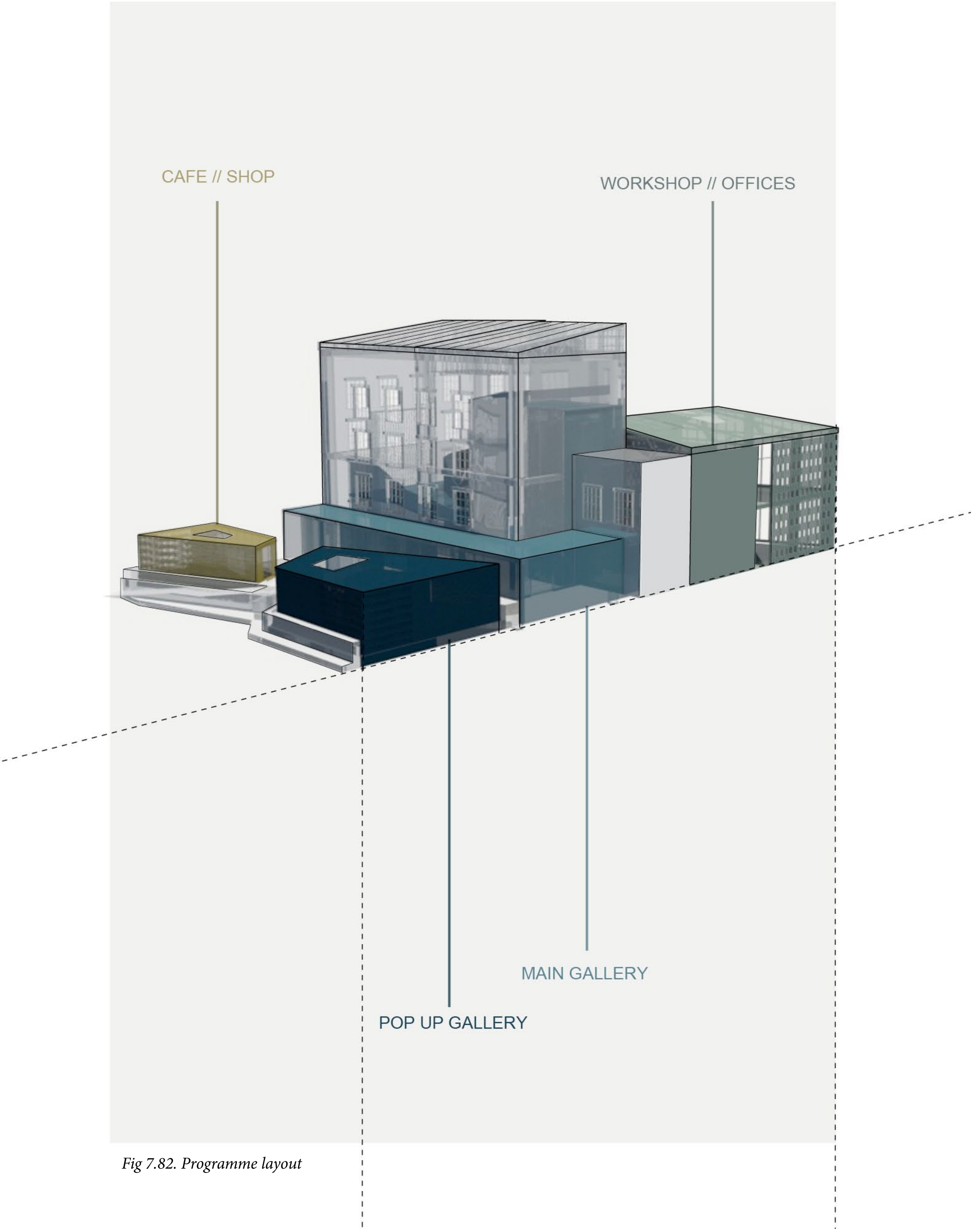



*Fig 7.82. Programme layout*

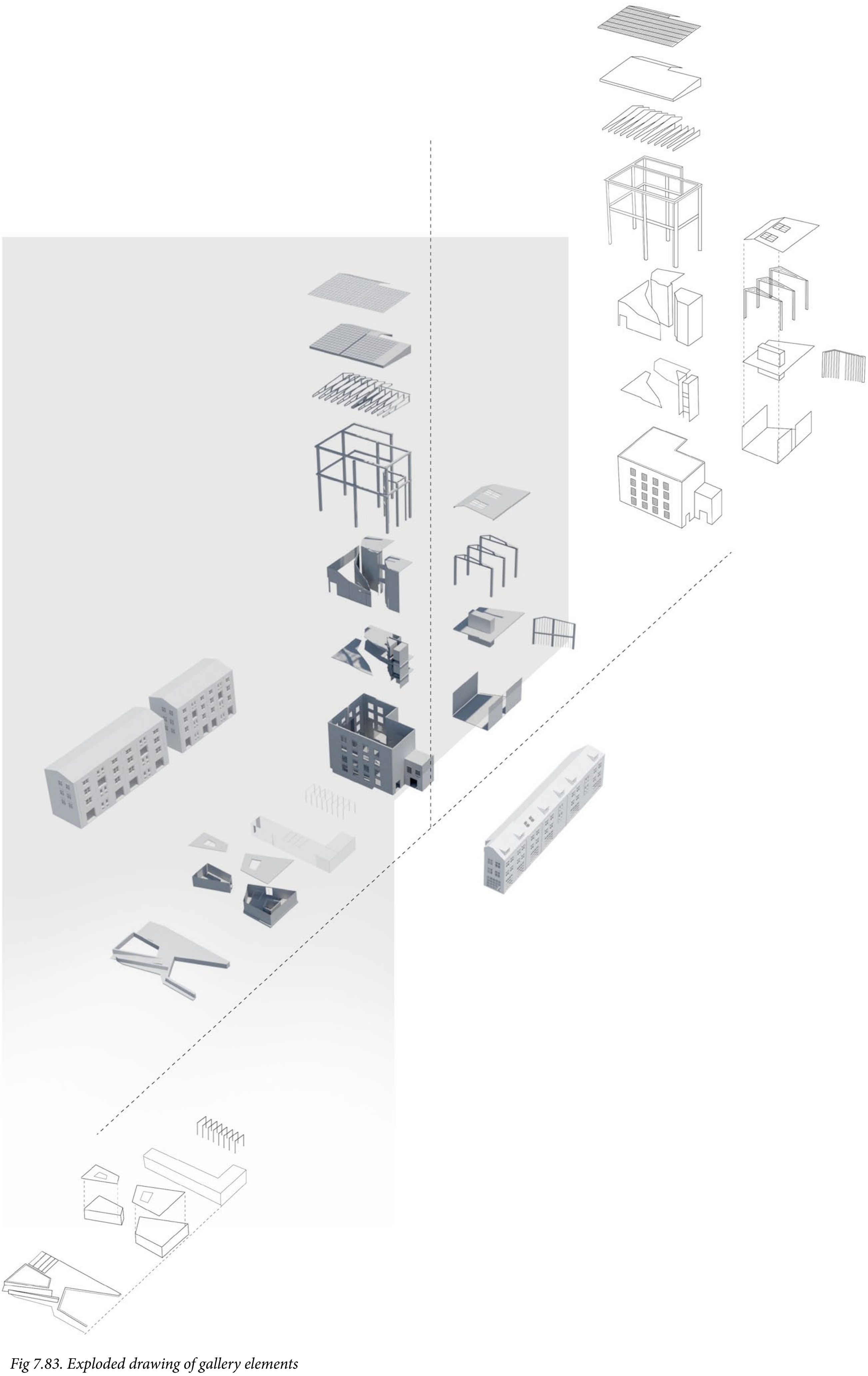


*Fig 7.83. Exploded drawing of gallery elements*

## THE GALLERY DESIGN

The speculative gallery design seeks to strengthen the connection between user and site through a series of catalytic material interventions. The creation of contrasting materials and spaces throughout the design aim to further act as experiential markers which allude to contextual displacements in time and function within the site. The main gallery sits within the Victorian warehouse, with two small structures protruding through the North and West warehouse façade walls. A North facing extension to the Warehouse accommodates the necessary gallery service spaces including storage, studio space, workshop areas and administration offices. In front of the Warehouse, an elevated concrete landscape area surrounds the smaller café and pop up gallery buildings. The design proposal does not change or demolish any of the existing heritage listed buildings on site.

White parametric brick walls have been incorporated into the Warehouse interior, creating the most heavily contrasting material to the existing brick, and subsequently atmospheric, environment. Translucent polycarbonate, rough concrete, steel and polished white concrete form the material gradient within the Warehouse, linking the parametric surfaces to the historic façade. The exterior buildings are composed predominantly of black brick and transparent glazing with perforations, rotations and extrusions to the brick surfaces. The exterior experience seeks to generate a more transient embodied experience, with the elevated concrete landscaping acting as an experiential displacement tool. Entry into the elevated space transitions users into the transient aspect of the program and this is reflected in the increasingly transparent materiality. To further enhance the experience, the buildings situated within the landscape area have been sunken into the concrete landscape and are separated by a small gap between ground plane and building structure. This design feature seeks to emphasize ideas of time separation, functional change and contrasting material presence. In this way, the materials grow in transparency as they move away from the existing masonry walls in the same way that the program becomes more transient. To intensify the material atmosphere as much as possible, the levels within the building vary as a way of highlighting the intended material changes and resulting atmospheric shifts.

*Fig 7.84. Light conditions within the cafe/ shop which have been created through the use of a perforated black brick facade*

OVERAL DESIGN TECTONIC

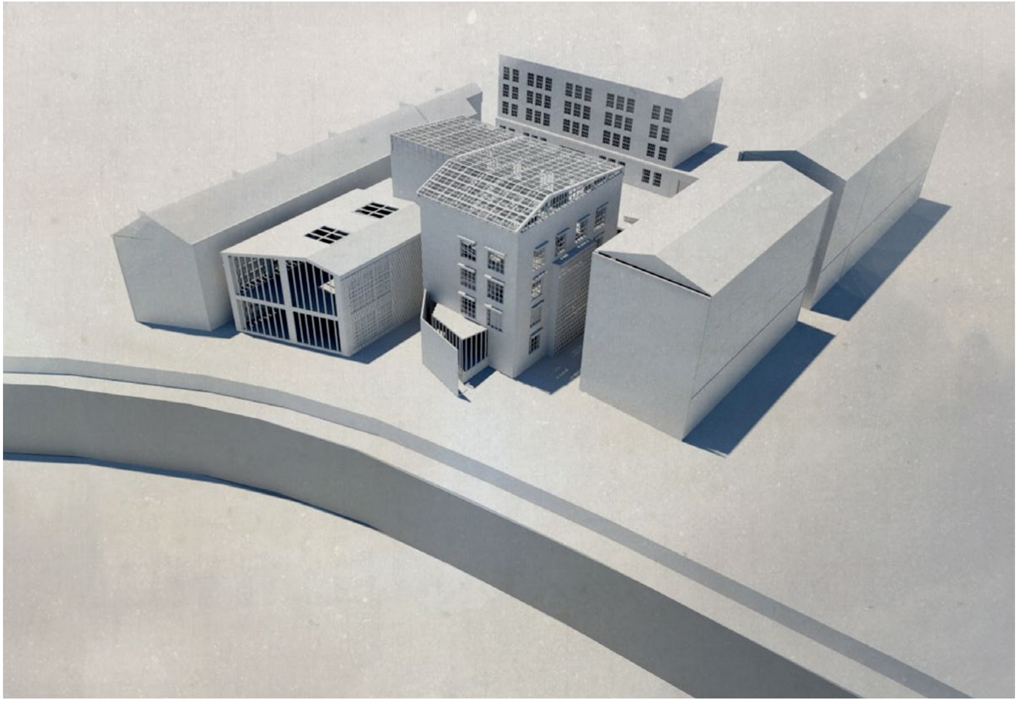


*Fig 7.85. Tectonic site overview*

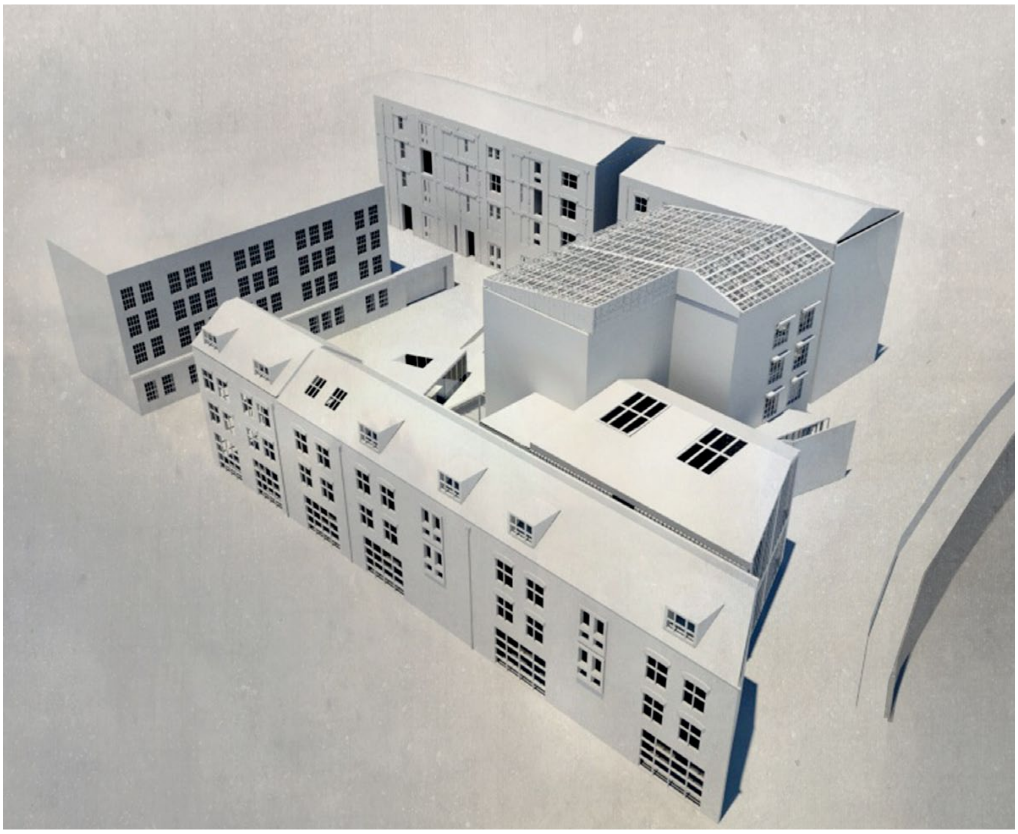


*Fig 7.86. Tectonic site overview*

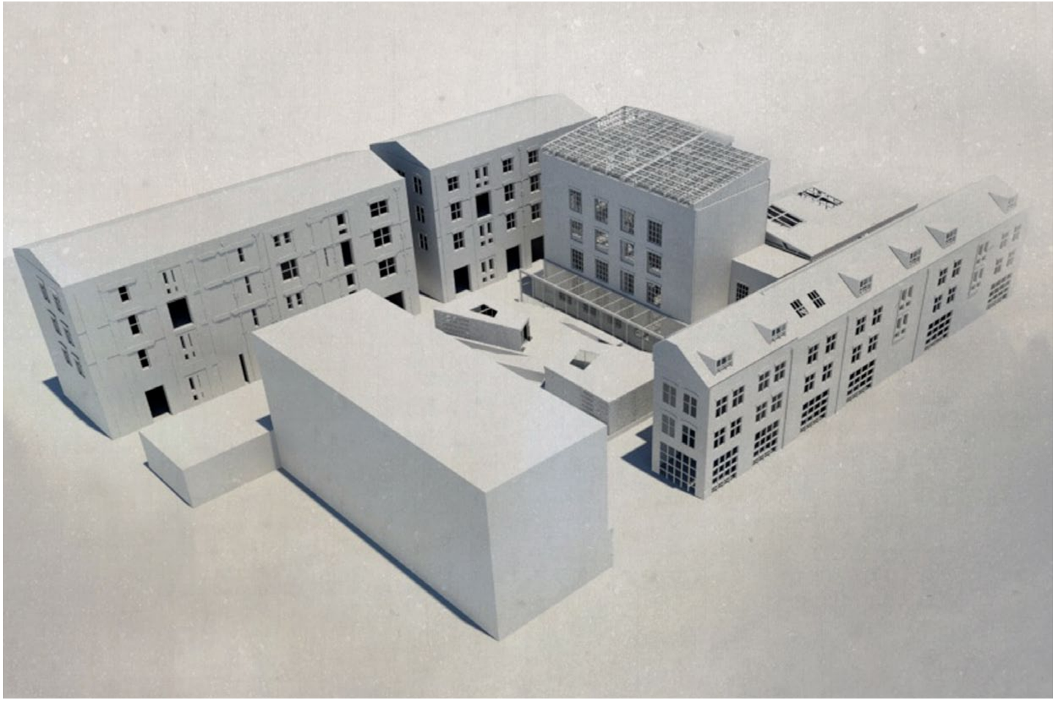


*Fig 7.87. Tectonic site overview*

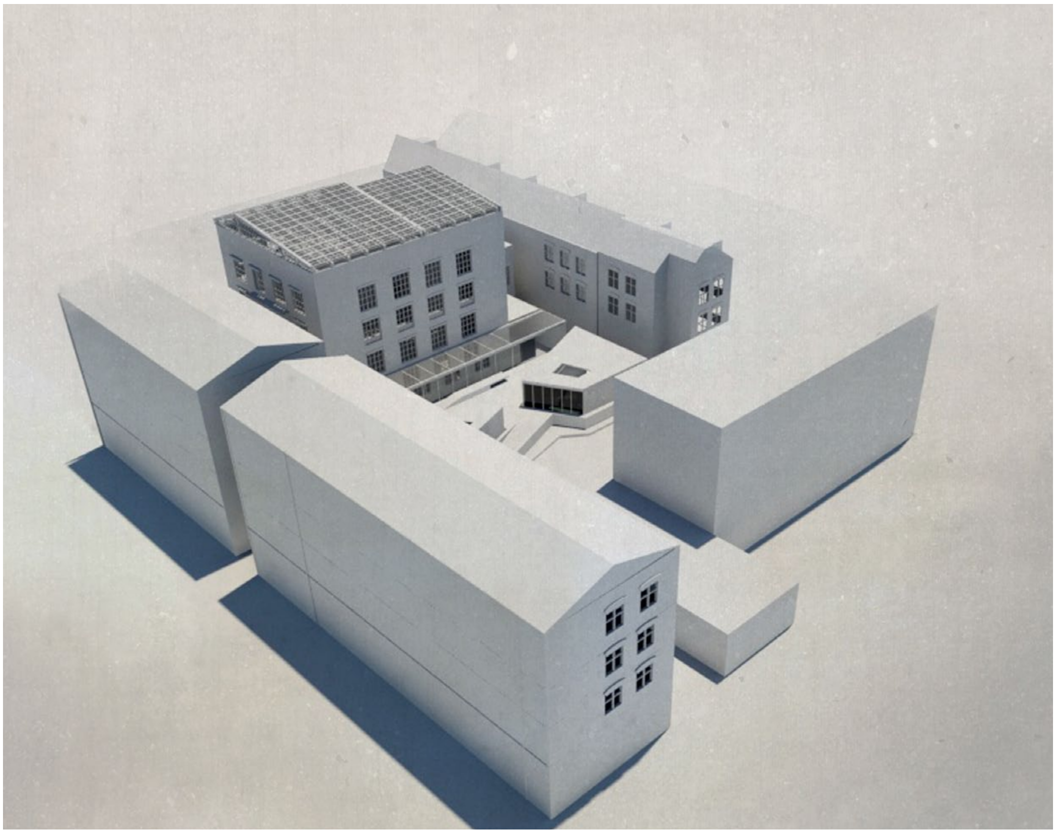


*Fig 7.88. Tectonic site overview*

*Fig 7.89. Entrance corridor with raised landscaping area to the right of the walkway*

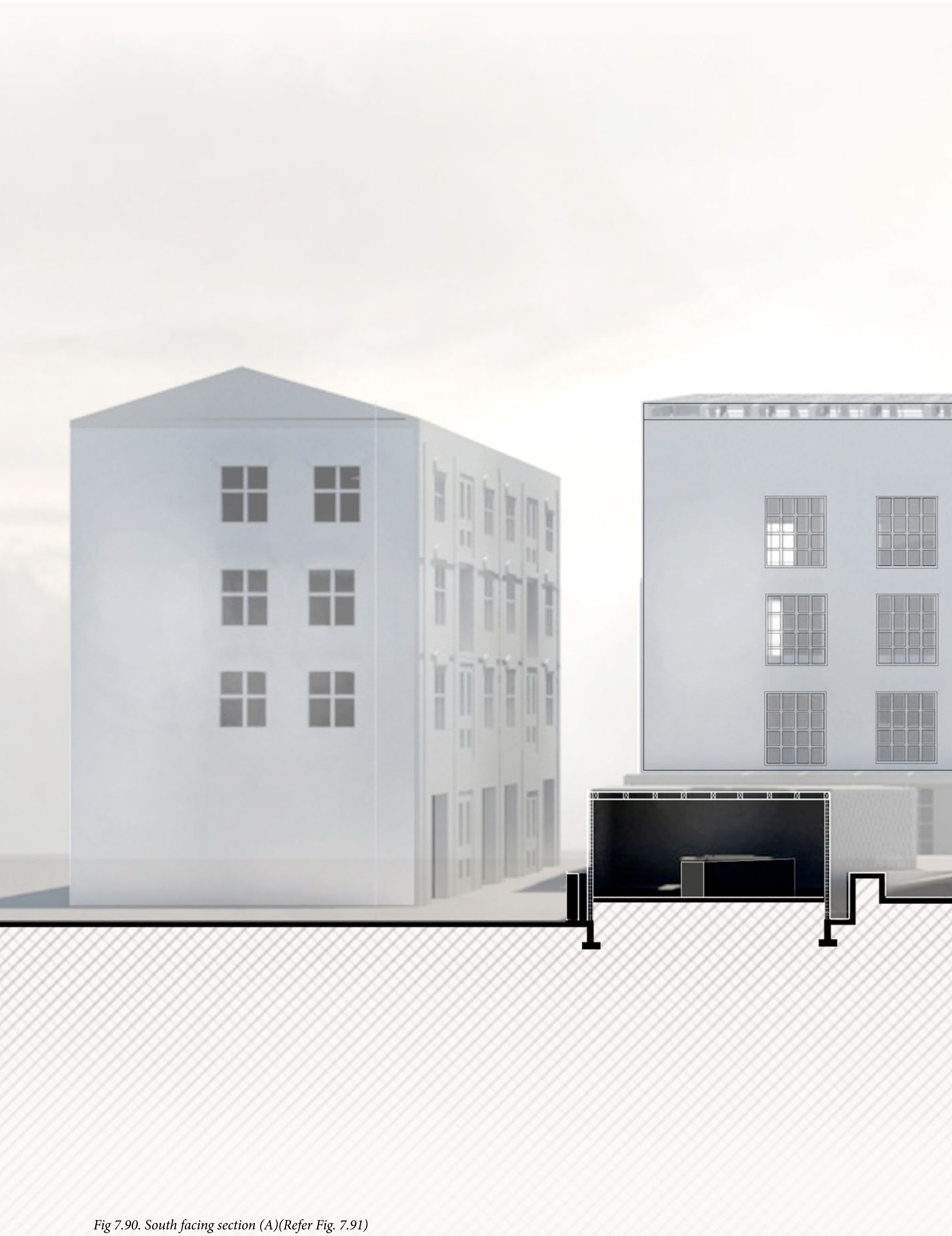


*Fig 7.90. South facing section (A)(Refer Fig. 7.91)*

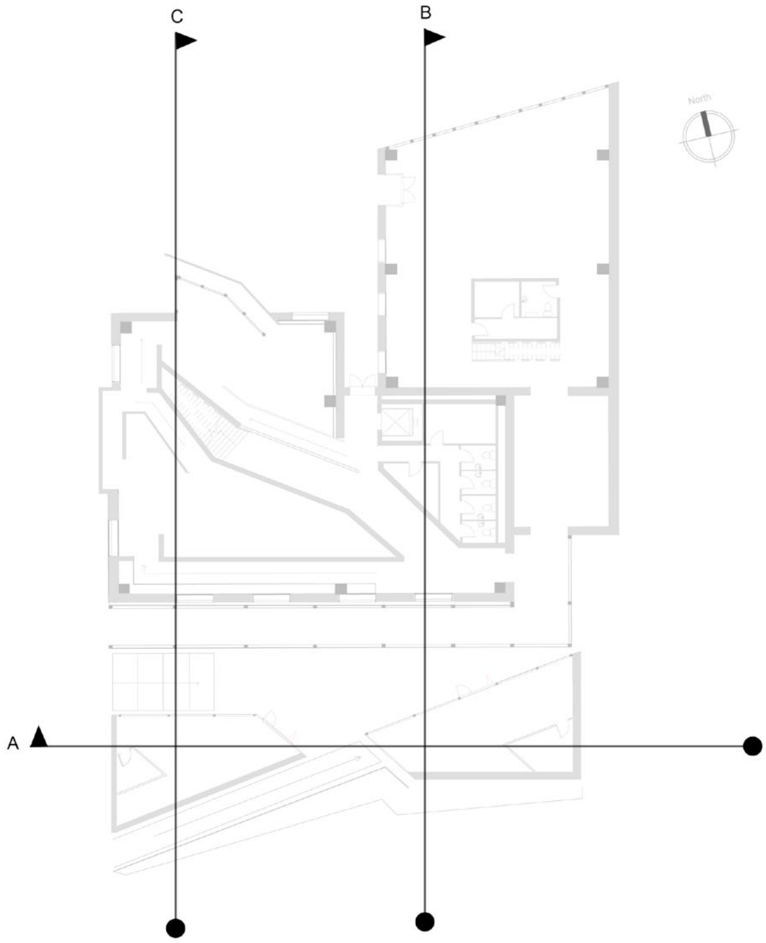
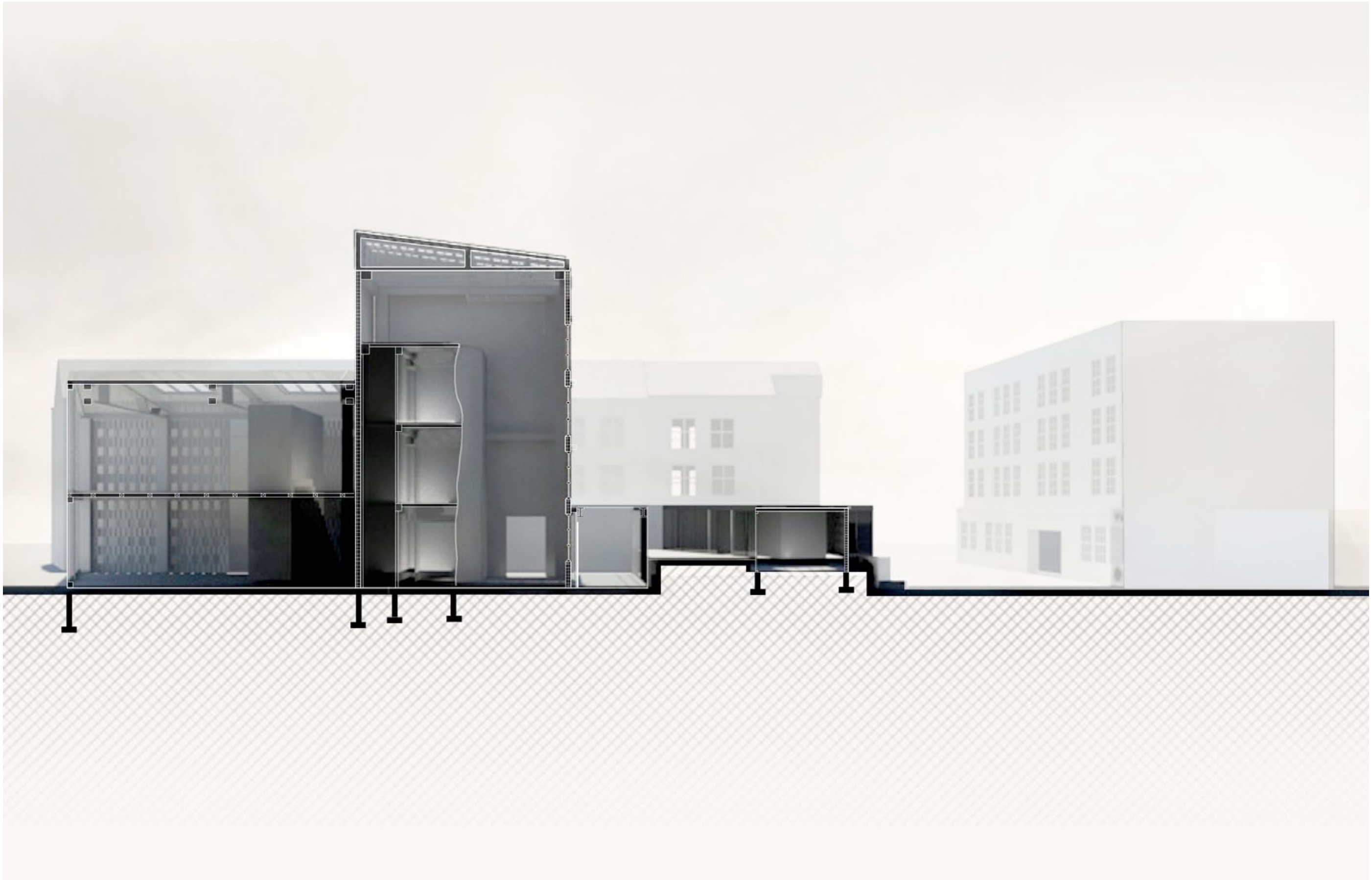



*Fig 7.91. Section placement*



DESIGN CONSIDERATIONS

*Fig 7.92. East facing Section (B). Filtered light enters the warehouse building through the windows and translucent roof. The material interventions within the warehouse space therefore deal with the directing and diffusing of this light source. This treatment relied heavily on viewpoint framing as a way of creating the desired experience. The interior boundaries provided a more controlled platform from which to address artificial lighting within the gallery spaces and reduce direct light for preservation purposes where needed.*

*Fig 7.92. Viewing platform on top of the main gallery*

## MATERIAL GRADIENT

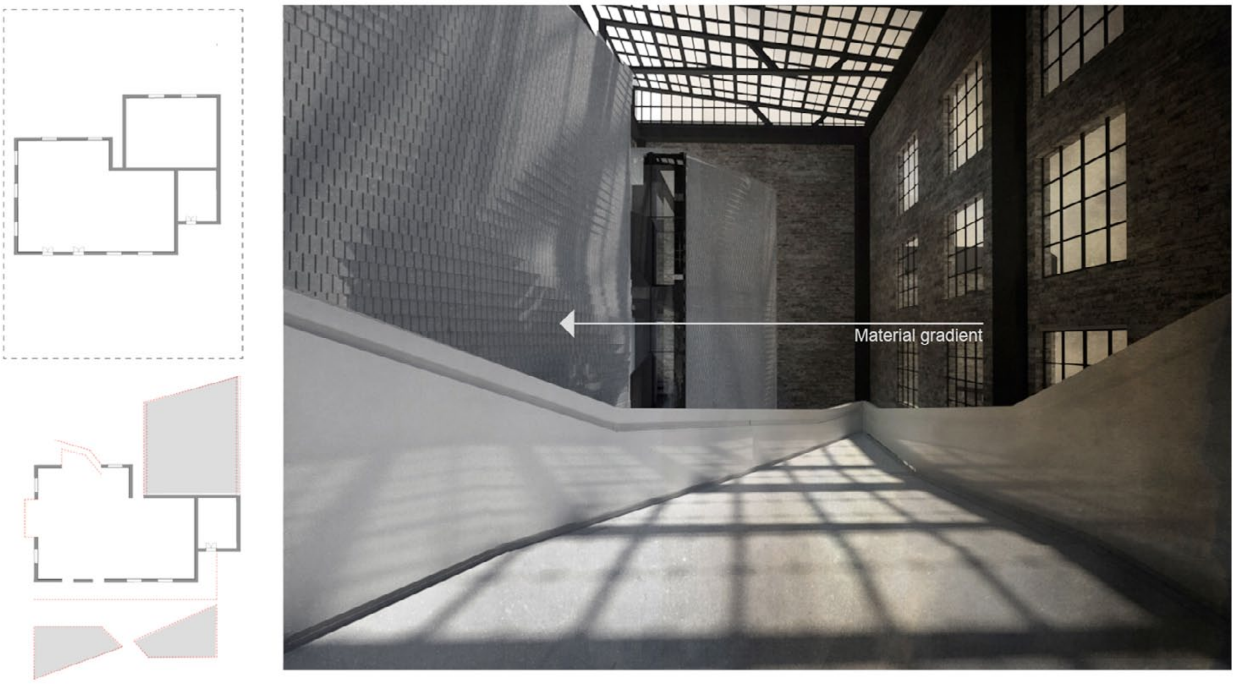
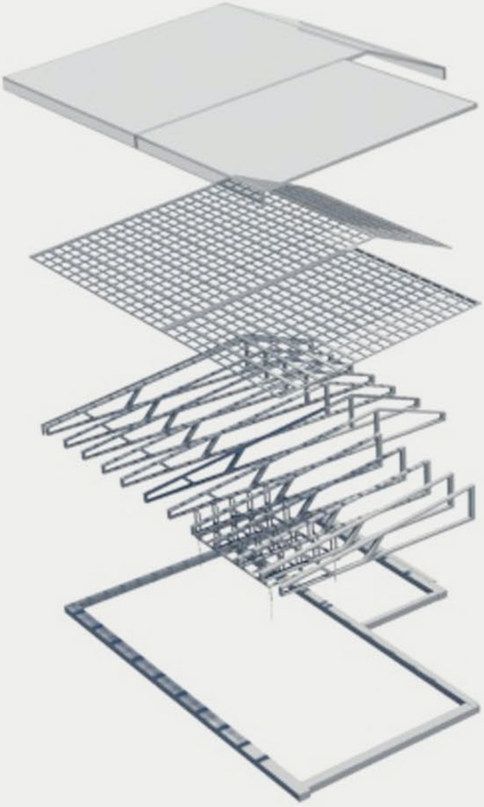
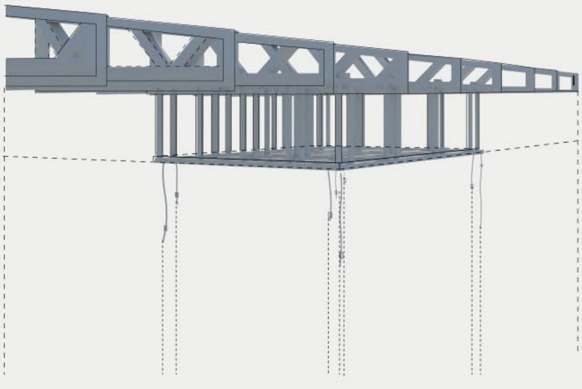



*Fig 7.93. Diagram showing how the final gallery design is situated within the existing gallery. Central image shows how the material gradient operates*

## HANGING INSTALLATIONS

*Fig 7.94. (Right) The main gallery is composed of two contrasting halves, one extending three stories high and one only extending two stories, with the second level operating as a viewing platform with an open ceiling. Consequentially, there was a vast expanse of open space which needed addressing as to ensure it wasn't wasted. A structure for hanging installations was therefore designed in order to create an engaging function for the open space. The image shows the devised roof structure from which installations can hang from*





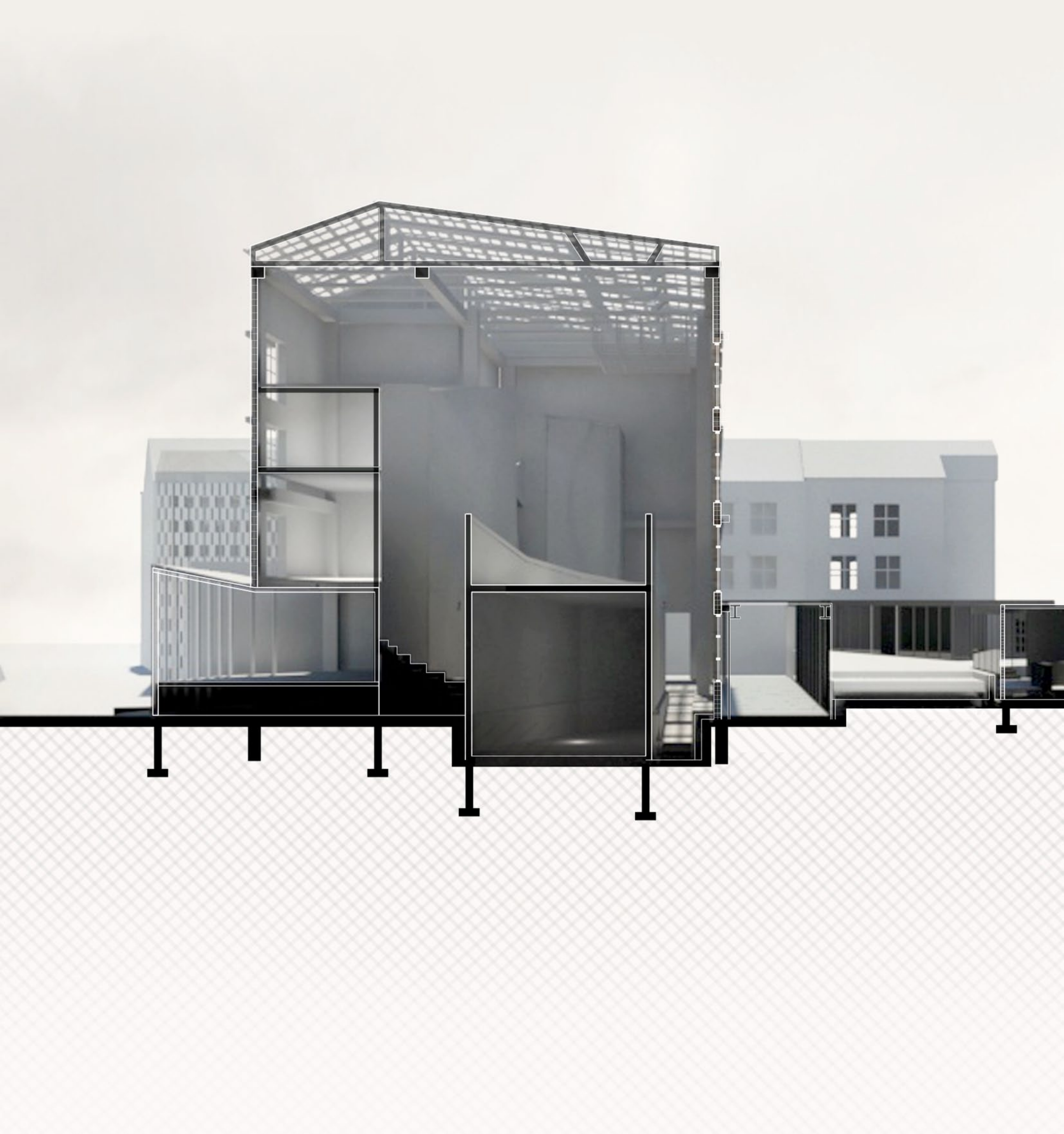
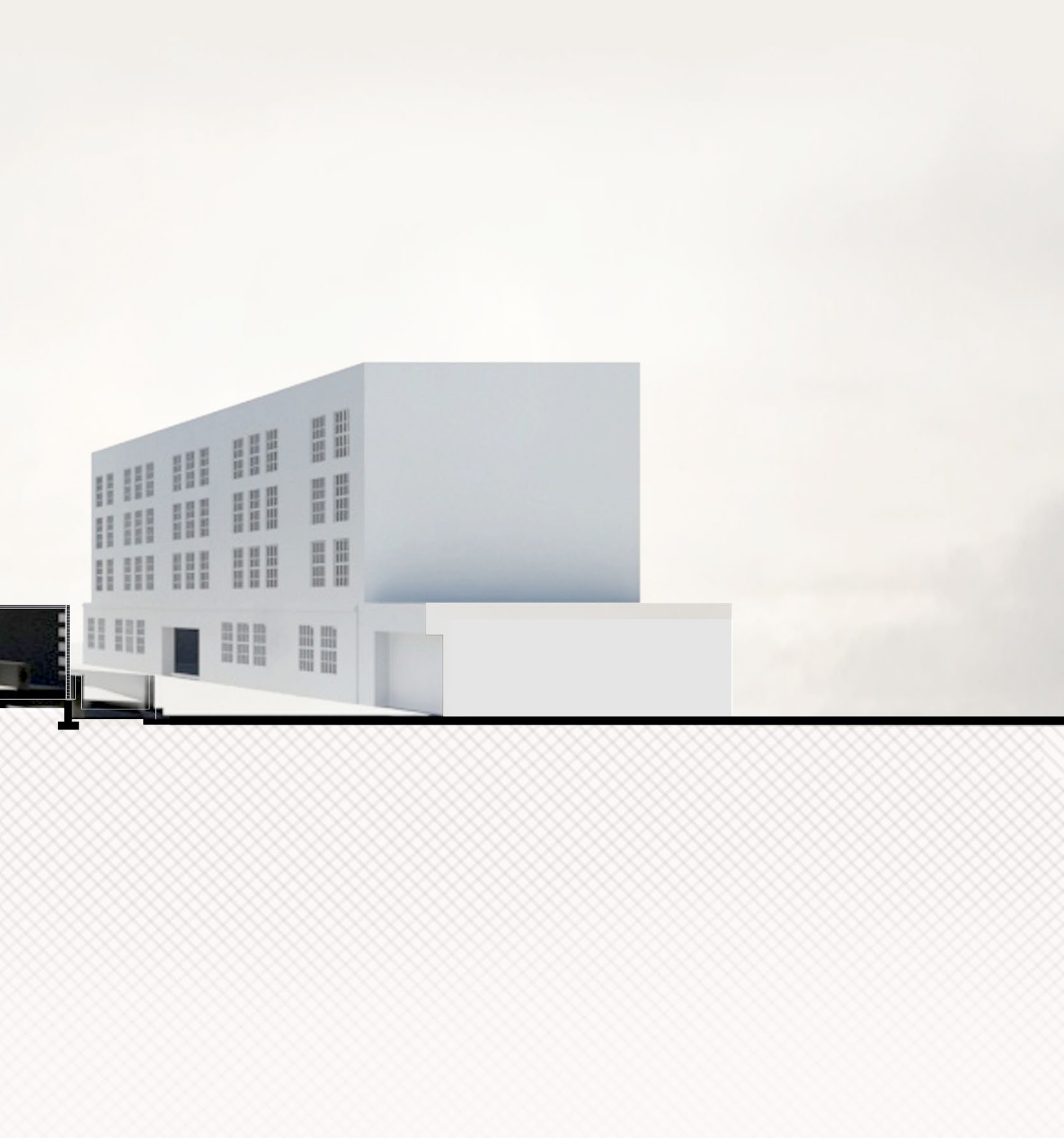


*Fig 7.95. East facing section (C)*



## CONTRASTING MATERIAL PLACEMENT

*Fig 7.96. Material contrasts within the gallery*



*Fig 7.97. (Right). Images of the elevated landscape area and the material gradient it forms with the site*

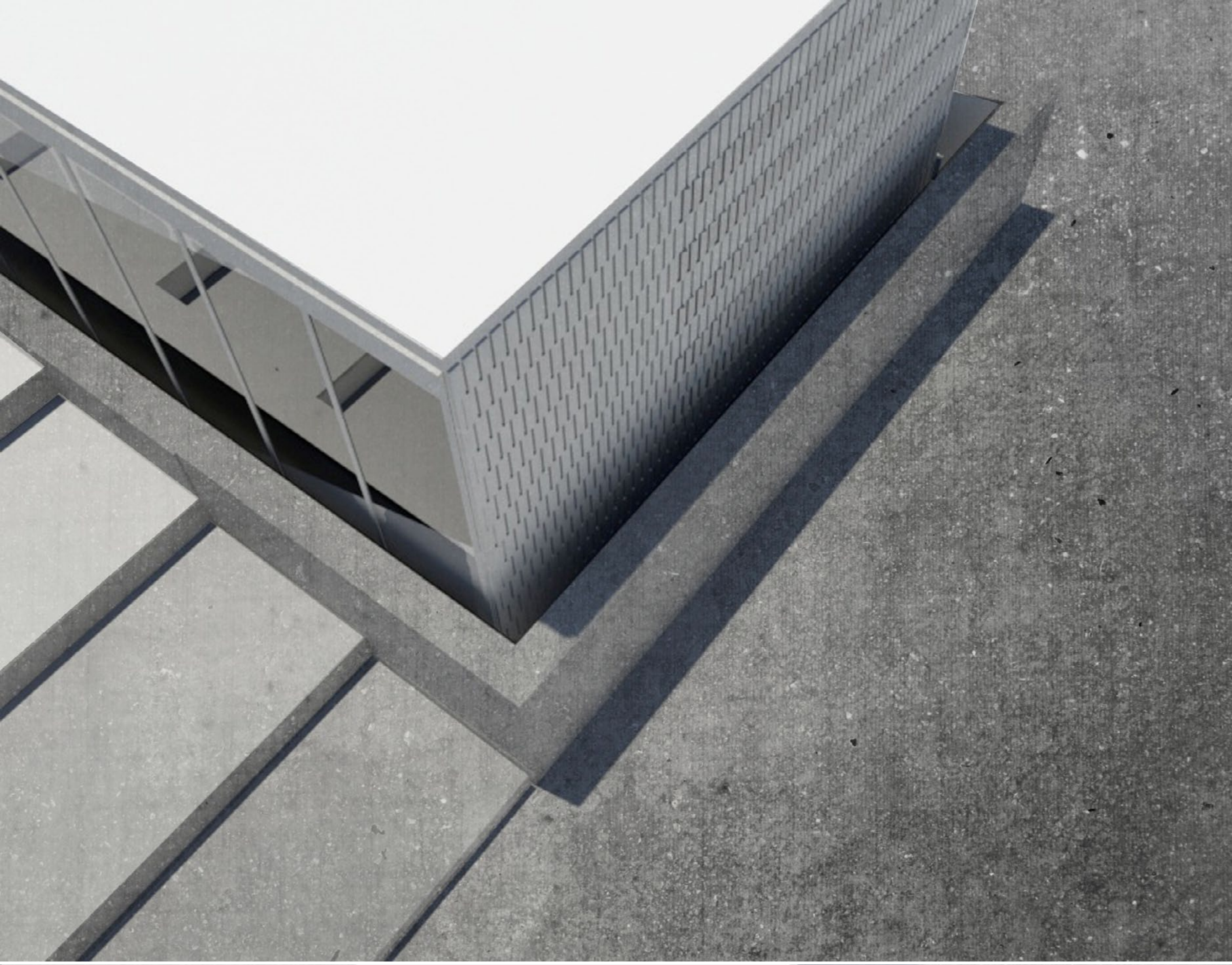
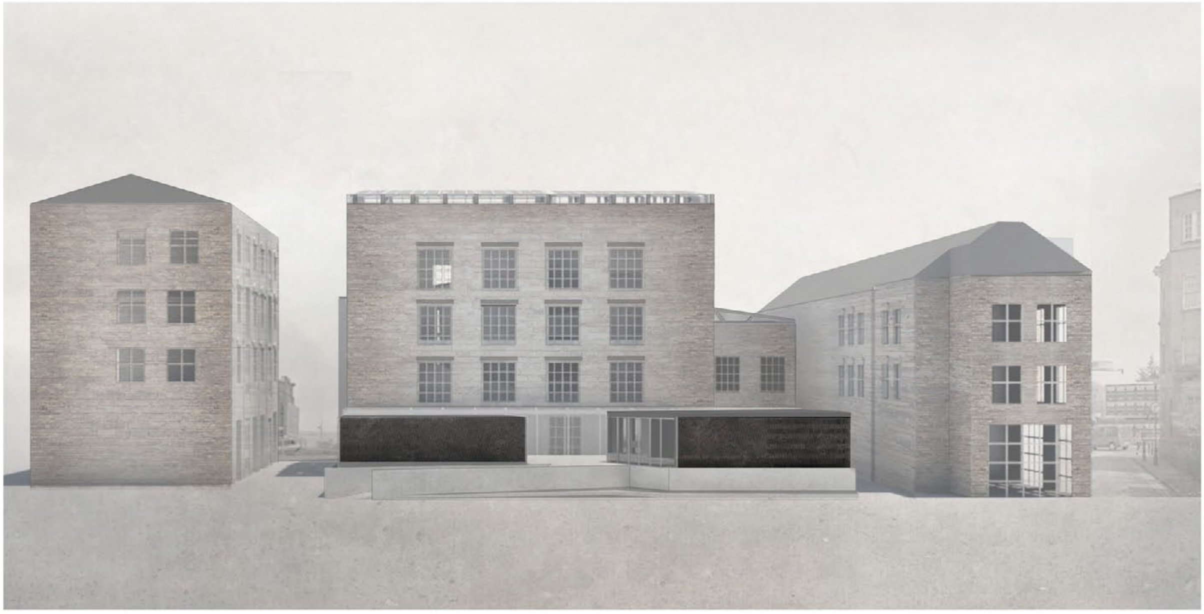


*Fig 7.98. Interior render of the cafe / shop.*

*Fig 7.99. Render of the elevated landscape*

PERFORATION OF BRICK FACADES



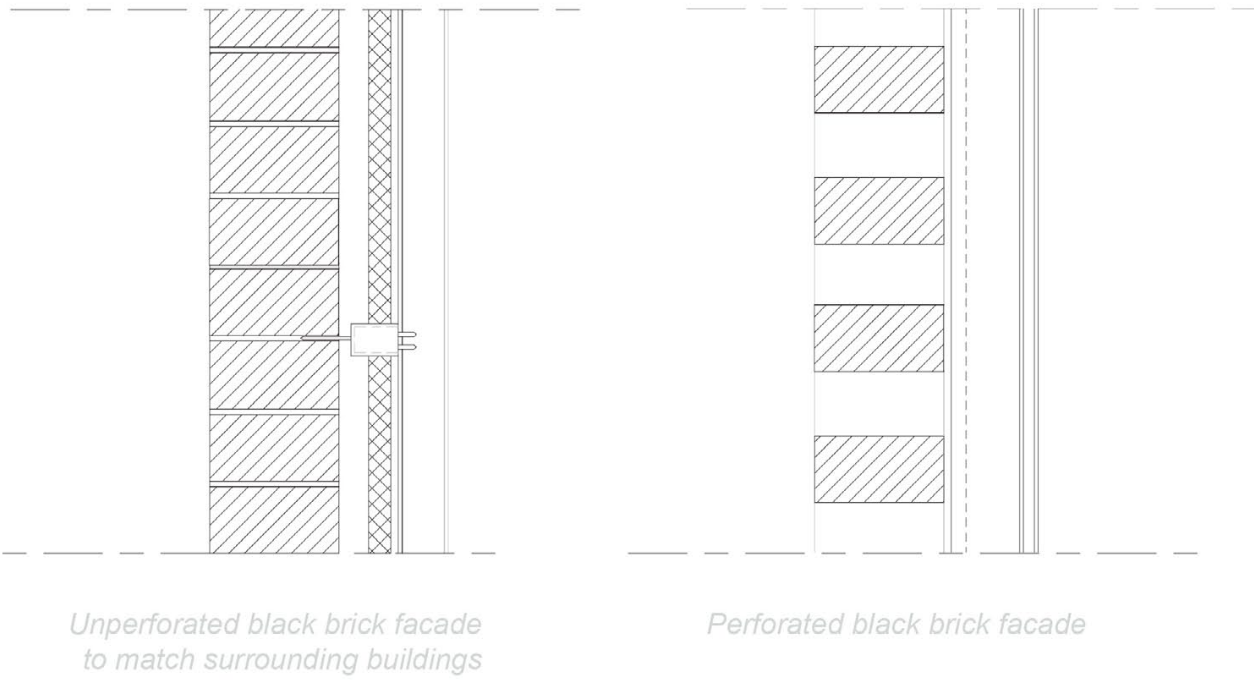



*Fig 7.100. Diagram showing placement of perforated black brick facades within the design*

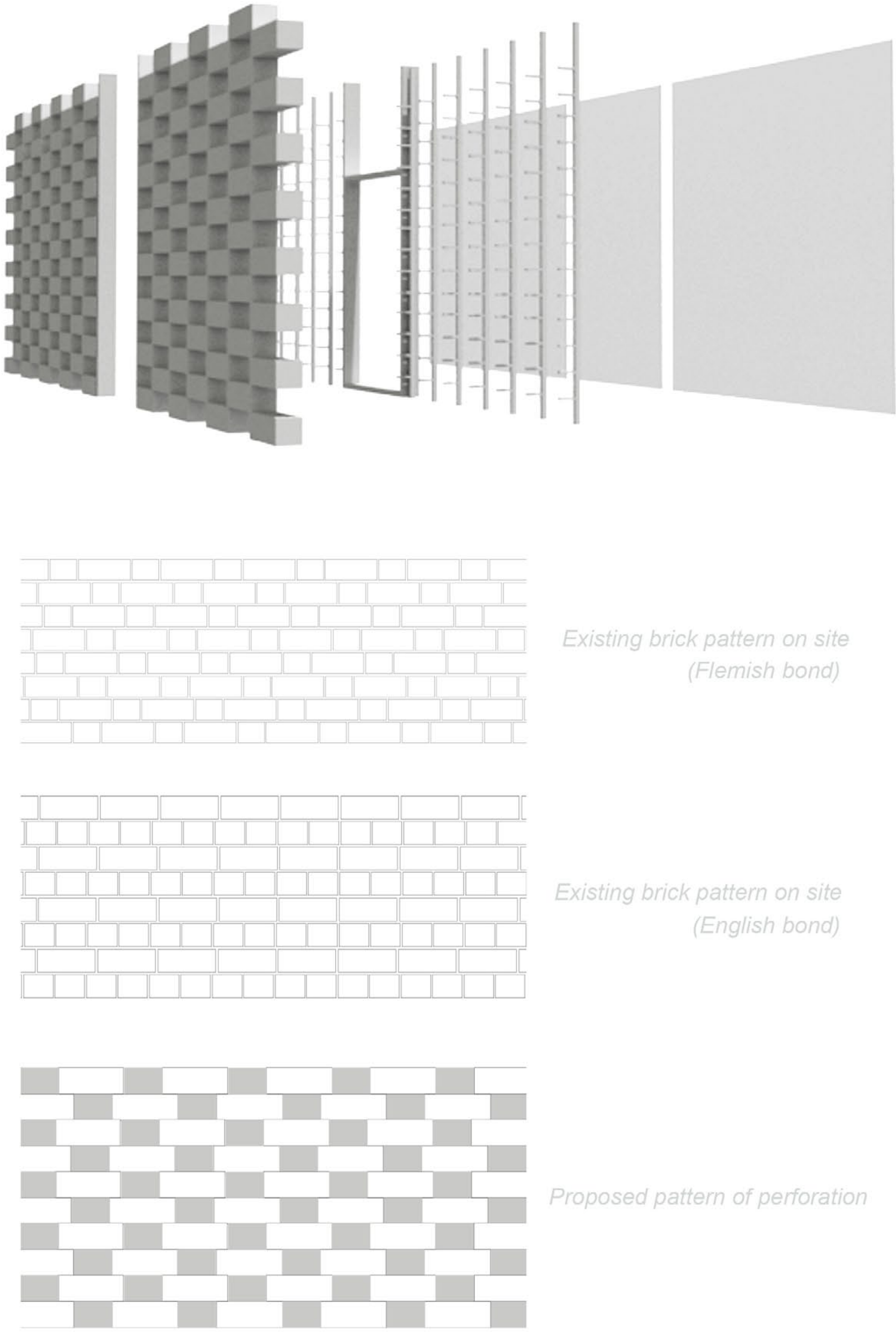



*Fig 7.101. Explanation of perforation patterns and where they were derived from*

*Fig 7.102. Walkway into main gallery*

*Fig 7.103. View from inside the pop up gallery*

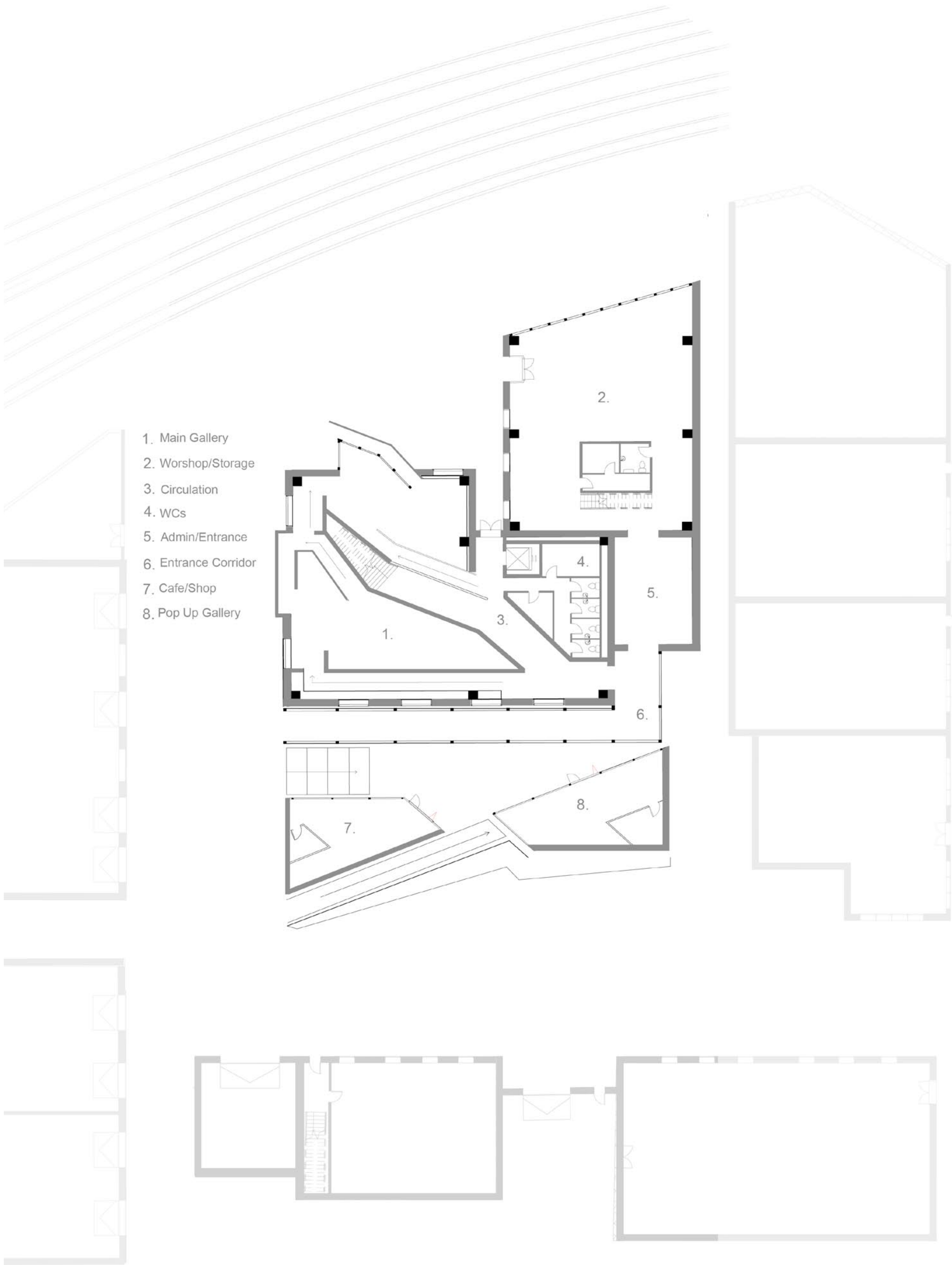



*Fig 7.104. Plan of the speculative gallery design*

*Fig. 7.105. North view of the gallery and studio space at night*

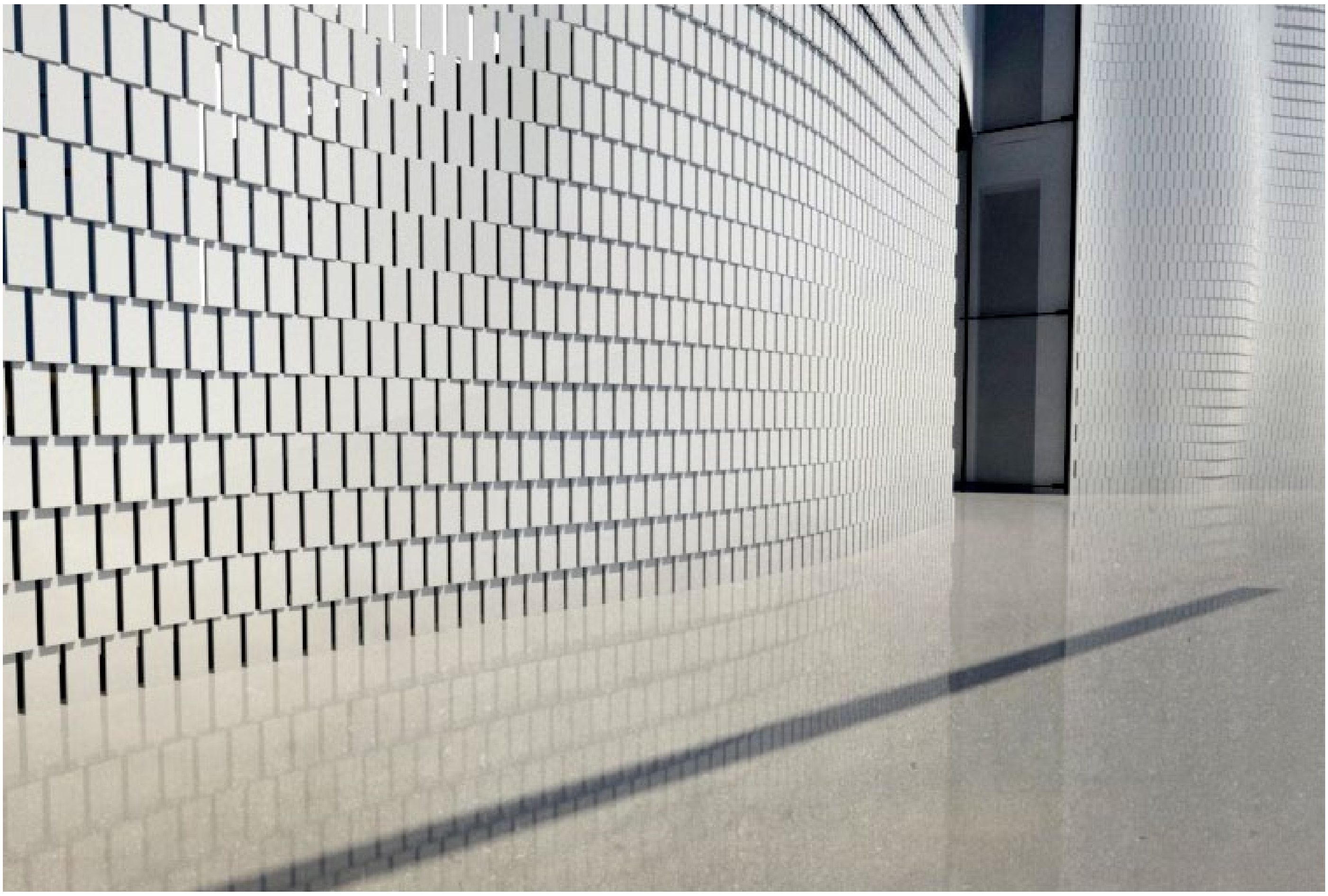


*Fig. 7.106. Parametric gallery wall junction with floor*

MATERIAL JUNCTIONS

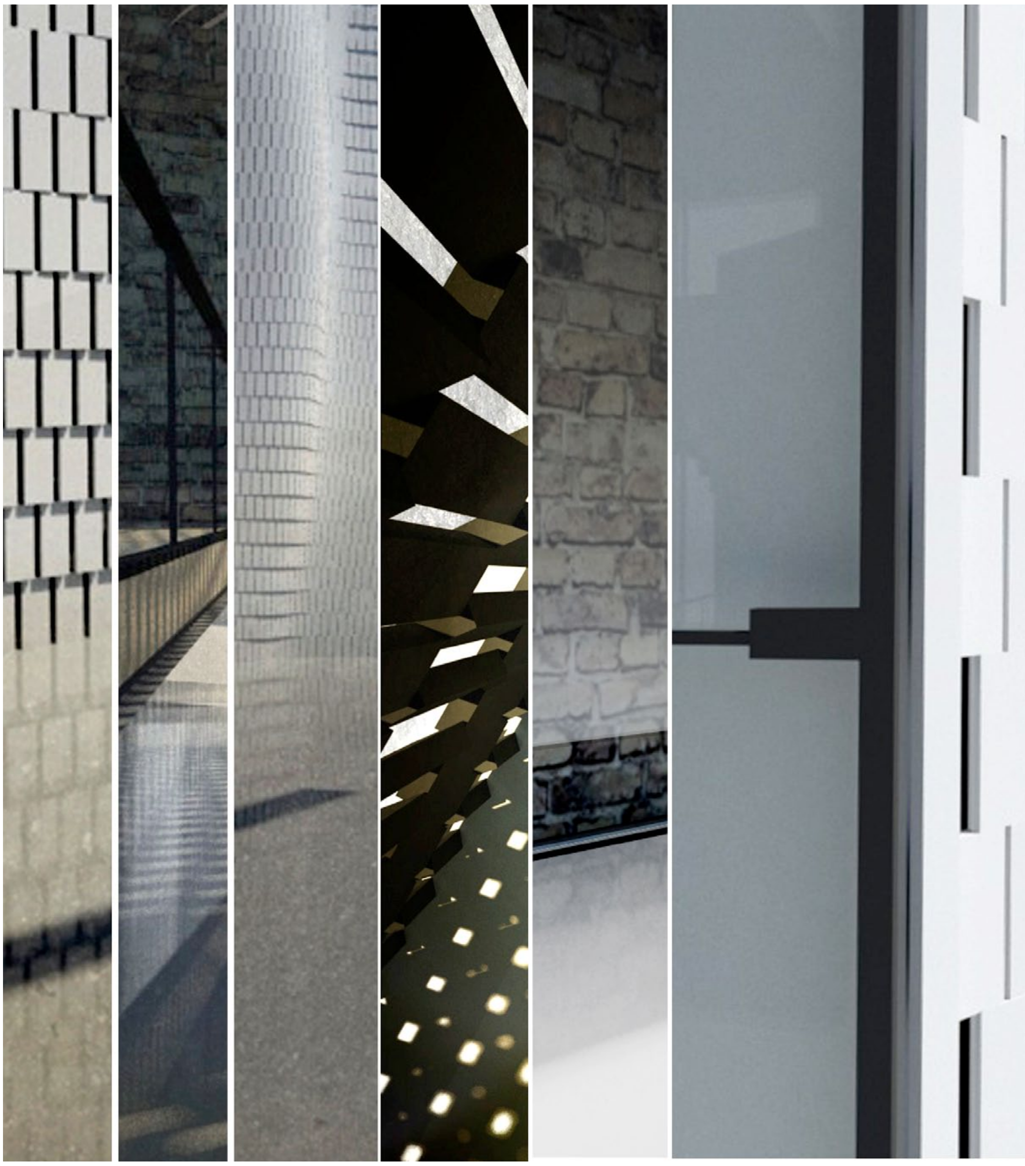


*Fig. 7.108. Material junctions and contrasts throughout the speculative design*

*Fig. 7.107. (Left). Interior render of gallery*

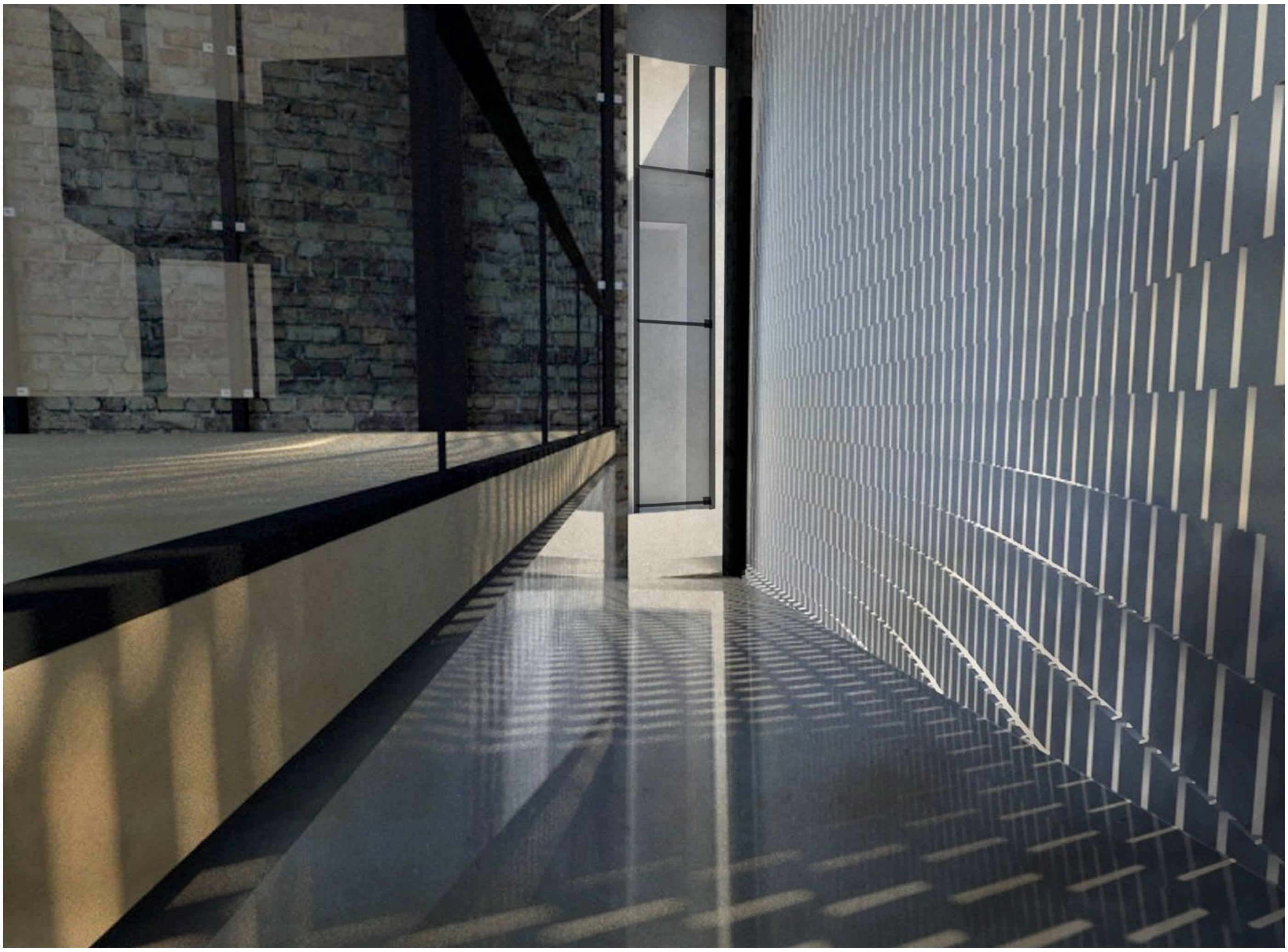


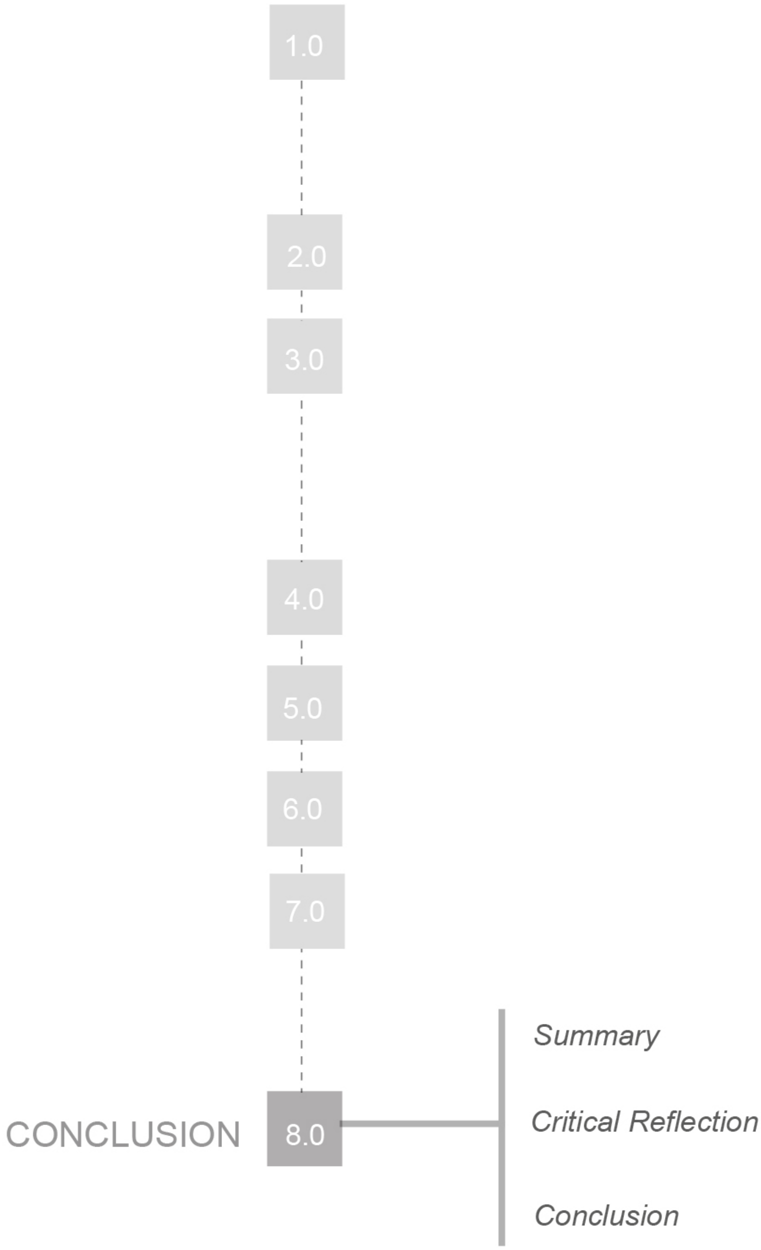
*Fig. 7.109. Shadow conditions within gallery entrance space*

*Fig. 7.110. Wall to glass junction*


*Fig. 7.111. Design overview*

## REFLECTION

The primary aim for the public scale process was to establish a stronger and more productive relationship between analogue and digital methods to amplify the material agency of the building. This ultimately culminated in the use of parametric brick forms both within and surrounding the historic brick warehouse. While the insertion of a parametric environment seems a stark contrast to the contextual materiality, the iterative processes which inevitably led to the final design showed that design concepts did emerge from material enquiries, rather than develop independently from them. Having established a tactile understanding of masonry in the early stages of the research, parametric developments regarding the size, position and shape of the material elements could be made without losing sight of the associated atmospheric outcomes. Furthermore, the digital aspect of the design provided the level of contrast which was needed to successfully create the atmosphere and sense of contextual understanding that was wanted. Implementing a feedback tool for both small and large scale iterations ensured that the continuous 'making and reflecting' methodology established at the start of the project was successfully adhered to. Design decisions regarding scale, ground level, surface proximity and lighting ensured that the embodied experience was taken into account throughout the design development.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CONCLUSION
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Summary
Critical Reflection
Conclusion

# 8

# CONCLUSION

## SUMMARY

The research proposition was answered through 'design for research' and 'design through research'. The literary context provided a framework through which the research question was theoretically explored. This framework encouraged the use of both analogue and digital design methods, which culminated in the consistent use of a feedback loop throughout all iterative developments. The research question was approached through three scales; an installation, domestic and public scale intervention. At the installation scale, parameters were set for the research question with a focus on defining the relationship between materiality and atmosphere. Throughout the domestic development, the inhabiting body was introduced more forcefully into the design exploration which was explored at a larger scale throughout the public development. Ongoing material enquiries guided the design led research process through making, digitalizing and photographing. Light manipulations including perforations, translucent incorporations and spacing variations provided the predominant means of amplifying the atmospheric output of each material enquiry. The subsequent atmospheric experience was therefore amplified by giving agency to materiality and strengthening the dialogue between human and non-human elements.

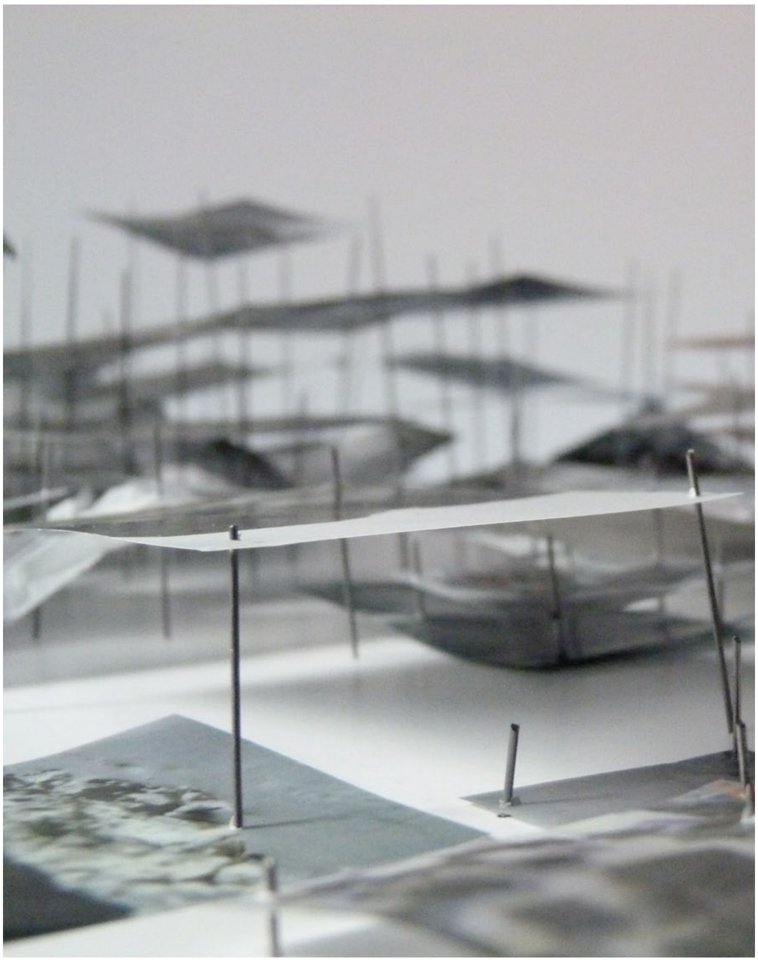

*Fig 8.01. Concept model for the installation*

*Fig 8.02 November review set up*

## CRITICAL REFLECTION

This design research has brought about a number of challenges and discoveries, with the most prominent challenge being the need to establish a digital presence within a predominantly analogue mode of material testing. After initially ruling out parametric methods as being counterproductive to the progression of the investigation, ongoing feedback and research highlighted the potential to formulate a valuable relationship between digital and analogue material expression. While the digital element transitioned into a productive iterative tool following the introduction of the feedback loop, there was a consistent challenge in maintaining the atmospherically charged language obtained throughout the installation enquiry when the project shifted to the domestic scale. At this scale, the design lacked atmosphere when the material exploration was directly translated, without feedback, between the digital and the material. The more tactile nature of early investigation methods ensured a strong relationship between the body and the materials, resulting in a deeper understanding of both the tangible and intangible material qualities.

The perception of affect as an intangible component of space places it within a fluctuating and delocalized field. (Anderson, 2009. 77). How to express or design for affect, because it is so ephemeral, did prove a hindrance to the design exploration. The presentation of physical models during reviews allowed for a sensory engagement with the explored materiality. The coldness of the stone and its softened edges, compared to the temperate transparency of the printed drafting film became critical factors in the analysis of material properties. It further became evident that the reviewers responded to the material models, in particular for the domestic scale, more favourably. The inevitable adjustment to using purely digital representations at the domestic scale prompted a need to establish an atmospheric language in which to convey the observed material properties. This development was further supported by review feedback which critiqued the decreased sense of atmosphere within digital images compared to the material photographs. Drawn and digitally produced overlays formed the basis of the atmospheric language, seeking to both depict the affective qualities and also provide a coherency to the design images. A further step of the project would have been to intensify this language and develop a more hierarchal method for its use.

A further problem within the research arose over the contextual grounding of the project. Photographs from a site visit and 3D models of the surrounding site were used to convey as much information as possible, however the existing site atmosphere was equally important in conveying the final design. Given the focus on light and its ensuing atmospheric qualities, the natural light conditions of the site and of London's noted 'yellow light' were incorporated into the design images as much as possible. There remained however a contextual lagging, particularly towards the later stages of development.

By using progressive scaling up as a design method, and further employing numerous iterations for each phase, the overall design process was able to shift towards the most successful iterative developments and consequently depart from the more idle moments in the process. This structure aided in the mediation of design challenges throughout. The assimilation of digital methods within the design process ultimately grew in success when moving up in scale. By the public scale enquiry, parametric tools were employed in a way which incorporated material qualities as digital foundations, allowing component size and surface formation to be informed by the practical material enquiries.



*Fig 8.03. (Right). Main staircase of the gallery showing light conditions of the contrasting halves*

# CONCLUSION

This research thesis investigated the agential capacity of materials to amplify atmospheric experience. The variety of methods used to test and iterate the materials allowed for multiple modes of material agency to be explored. Scaling, as a method, further reiterated the ability of materials to generate a force on architectural form and atmosphere through the production of a range of speculative designs. The combination of analogue and digital testing gave rise to material agency through routine, transformative and non-reflexive action, encouraging 'autonomous' development through the models and by harnessing affective conditions "via exchanges between the visible present and the starkly absent" (Jones & Cloke, 2008. 81). This thesis concludes that materials have an ability to exert force on the design process when they are engaged in a responsive feedback loop which acknowledges the transformative capacity of both 'human' and 'nonhuman' elements. The dynamic nature of scaling as a design method supported these findings by encouraging progressive dialogue between material matter and design process. Developing materials, and further architectural conditions in such a manner, amplifies atmospheric experience through a strengthened dialogue between user, matter and site.



*Fig 8.04. (Left). Material model at installation scale*

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