The Rudimentary Wall

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A dissertation submitted to Technological University Dublin in part fulfilment of the requirements
for award of

Masters in Architecture

by

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January 2021

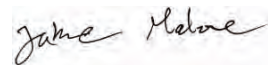Dublin School of Architecture

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Declaration:

I hereby certify that the material submitted in this dissertation toward the award of Masters in Architecture is entirely my own work and has not been submitted for assessment other than part-fulfilment of the award named above.

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Abstract:

This research through design is concerned with the historical and ontological role of walls in the articulation of our built environments. Through a design project situated in former East Berlin, it explores tactics to counter social detachment and apathy toward our contemporary urban condition and aims to reverse the perception of walls as infrastructure of limitations to infrastructure of opportunities. It is the assertion of this research that, by obscuring and expanding their conventional role to counter that of simply demarcation, this encourages active agency in the urban drama and stronger participation in the sharing and shaping of the collective experience of architecture.

The methodology will involve traditional architectural design methods coupled with exploratory writing, concentrating on the following research question: Can a broader spectrum of sociality be managed by an architecture of depth rather than division; one that embeds empathy into its walls and positions the inhabitants within a gradation of spatial condition?

Note to the Reader

This A4 document is designed to be read in two-page analogous spreads (A3), with the primary body of text on the right, and complementary but deliberately disruptive material and passages across the gutter, to the left.

"Like the novelist, the architect uses narrative, events or elements, characters or spaces, to reveal truths, and universal ideas that are more widely applicable." (Henley:2020)

Prologue introduces the theoretical framework by establishing the narrative which precedes the research question. *Reflective Interlude* momentarily breaks from the above logic and reflects on the initial design research in semester two in a continuous display before setting out the resulting research question. *Analogue*[1] then explores the subject in more depth using the lens of the research question. Again, a *Reflective Interlude* interrupts the logic with a continuous display of semester three's work ending with a written reflection. Finally, *Epilogue* presents the final design research project.

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[1] **Adjective:** Relating to or using signals or information represented by a continuously variable physical quantity such as spatial position, voltage, etc. **Noun:** A person or thing seen as comparable to another. "An interior analogue of the exterior world" (Oxford Languages)

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Prologue

Wall as Literary Protagonist

This dissertation began its inception at the site of many tales; some tragic, some triumphant. However, the one constant character in the following photo-essay (**Fig. 1**) is a wall, namely the Berlin Wall. Although these tales are not explicitly linked, photographers and protagonists alike have been repeatedly drawn to the section of wall at Sebastianstrasse.

Not captured - at least by photograph - was the tale of Siegfried Noffke and Dieter Hötger, the 'escape helpers' who in 1962 dug a 30m long tunnel beneath Sebastianstrasse and the death strip separating East and West Berlin. Paradoxically, the men were digging their way out of the encircled 'freedom' of the Western 'interior' and into the Eastern 'exterior', in order to free their trapped wives. This however, resulted in tragedy after a relative informed the Stasi of the escape plans. After weeks of tunneling, the men broke through into the cellar of a Berolina[2] 'Plattenbau' apartment block in the East, only to be greeted by armed officers.

Peter Schneider's novella *The Wall Jumper,* first published that same year, is a blend of anecdotal short stories using caricatures as instruments to illustrate the fascinating tale of two cities. The wall serves as a literary protagonist; a constant presence in the lives of Schneider's Berliners, not as a barrier but as an almost 'heterotopian'[3] mirror, as seen when the narrator describes tourists on a viewing tower taking photos of a group on the other side, being led by the same tour company. In some cases, the characters have grown oblivious to it as a physical object, while others have become inspired by its challenging nature. Kabe, perhaps the most prominent of the characters, made a total of 15 jumps from the West into the East even though he would have been entitled to use the legal checkpoints. After ignoring the calls of the Western border officials trying desperately to explain to him which side was which, he jumped into the capture of the Eastern border officials.

> The interrogators could think of no better explanation for this extraordinary reversal in direction than that Kabe had several screws loose. They sent him to the psychiatric clinic at Buch, but the doctors could find nothing wrong with him, other than a pathological desire to overcome the Wall" (Schneider:1983, p.32)

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[2] Housing cooperative who manage a large estate of Plattenbau to the east of where the wall once was. This neighbourhood, mostly housing border officials, has outlived the wall but not without the decades of tension its presence caused. This estate would be our focus area for semester 2.

[3] "...in this precise but neutral place, the observer and the observed take part in a ceaseless exchange. No gaze is stable, or rather, in the neutral furrow of the gaze ... subject and object, the spectator and the model, reverse their roles to infinity." (Foucault:2002, p. 5)

...As soon as he entered the crowded enclosure, he was confronted with regimentation. 'ALL SWIMMERS MUST TAKE A SHOWER BEFORE USING THE POOL. ALL SWIMMERS MUST USE THE FOOTBATH. ALL SWIMMERS MUST WEAR THEIR IDENTIFICATION DISKS.' (Cheever:1964)

Fig. 2. *Subject-object*, John Hejduk, 1987.

Fig. 3 *Wall House 2,* John Hejduk, 2001 (posthumous).

The wall is a neutral condition. That's why it's always painted gray. And the wall represents the same condition as the time of the hypotenuse in the Diamond Houses - it is the greatest moment of repose, and at the same time the greatest tension. It is a moment of passage. The wall heightens that sense of passage, and by the same token, its thinness heightens the sense of it being just a momentary condition... what I call the moment of the present. (Hejduk:1985)

None of Schneider's characters cross simply to defect but are drawn to its fundamentally temporal nature again and again, to quarrel with lovers, to catch a Hollywood film or just to lead multiple lives. As Jill Stoner highlighted:

> These are lines of escape that resist not simply the political limits themselves, but the mythology of those limits. Kabe turns the geometry of legislated space inside out, much in the way that Walter Benjamin, decades earlier in the same city, exposed the myth of interiority as child's play. (Stoner:2012, p. 35)

This unexplained itch to smooth striated landscapes is nowhere more evident than in John Cheever's short story, *The Swimmer,* published in 1964 and adapted to film in 1968. The protagonist, Neddy, gets the urge to seize a beautiful day in Westchester County New York, and pioneer his own way home from his neighbour's back yard by joining every other pool in between as one flowing river. Apart from the odd fence, hedge and highway, Cheever's walls are metaphorical. He spends the day avoiding getting trapped into the insular nature of back yard party conversations and their illusion of community, and instead wants to:

> … sublimate the private pools into a flowing river ... to remove from these objects their boundaries. Swimming through – that is to say entering into – a series of private properties, Neddy attempts to draw a fluid line of force, but finds himself blocked by a sequence of ossified, fortified interiors. (Stoner:2012, p.59)

The walls of architect and poet John Hejduk are another example of animating the inanimate. His mostly 'paper architecture' takes the form of 'masques'[4] as storytelling devices with the aim of anthropomorphising architecture by the linking of various personas to buildings e.g. The Weather Man who resides in the Weather Station. Architects and historians have long disputed the wonderfully absurd mind of Hejduk. Amy Bragdon Gilley explains that "…this form of architecture is a compendium of text, symbol, history, and performance, which is meant to lead the viewer and the participant to a greater comprehension of the citizen's role in the creation of community." (Gilley:2010, p. 25). However, James McGregor (2002) argues that Hejduk's work is a purely satirical critique of modernism's failure to address the individual consciousness, which instead demarcates and ritualises social roles just as the Court Masques did. Therefore, a mutual understanding can be established: that Hejduk demonstrates architecture to be a ritual event which reveals the universal expression of the human experience within it.

Hejduk's first masque, *Victims* was as an entry in the 1986 IBA competition for the former garden of Prinz Albrecht Palasi, also the site of the SS Gestapo building. Just like the photo-essay at the beginning of this dissertation, *Victims* was a direct response to its site and those who inhabited it and made it as such, highlighting the deep influence of the past in creating art of the present and future.

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[4] A genre of theatre in the 16th Century using spectacle and allegory where the spectator was simultaneously a participant. Masquerade social events involved hiding one's true identity, so as to liberate the expression of otherwise discursive identities or politics.

Left: **Fig. 4.** West Berliners peering through the wall, unknown.

Right: **Fig. 5.** East and West Berliners attending a marriage across the divide.

And it was inevitable to realise that all these expressions – the fanaticism of the tunnel diggers; the resignation of those left behind; the desperate attempts to celebrate conventional occasions, such as marriage, across the divide - were finally too applicable to architecture itself. The Berlin Wall was a very graphic demonstration of the power of architecture and some of its unpleasant consequences. Were not division, enclosure (i.e., imprisonment), and exclusion – which defined the wall's performance and explained its efficiency – the essential stratagems of any architecture? (Koolhaas:1995, p. 226)
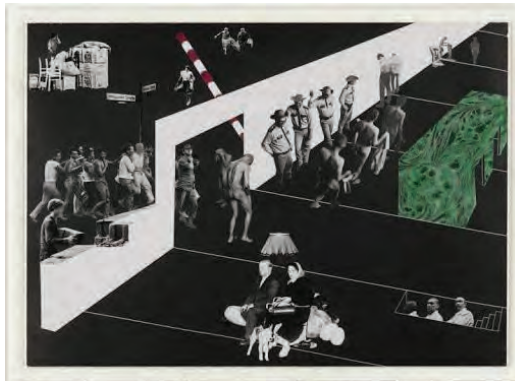
Left: **Fig. 6.** *Exodus, or the Voluntary Prisoners of Architecture,* Rem Koolhaas et al, 1972.

Right: **Fig. 7.** *Tilted Arc,* Richard Serra, 1981-1989.

Wall as Choreographer

In 1971, Rem Koolhaas while on Summer study from London's Architectural Association School of Architecture (AA), felt the impulse to visit the wall on its tenth birthday. He was shocked to find the paradoxical nature of the imprisoned and yet 'free' West, and that the wall is not a clean single entity, but a slowly evolving 'situation'. Initially, using the existing city fabric by blocking up doors and windows; then behind, a second independent concrete slabbed wall is erected. Only then is the former knocked and the final permutation, the smooth *designed* wall stood for the remaining 20 of 28 years, leaving the infamous death strip in between the two.

> Sometimes the parallel layers of the wall would separate, swallowing, for instance, a church. Sometimes the fencing would surround, like a tiger cage in a circus, a forlorn satellite of Westernness so that a nine-year-old could bicycle to school every morning. (Koolhaas:1995, p. 220)

Koolhaas goes on to describe the wall as a 'script'; an object choreographing its subjects into a game of ritualistic spectacle. "On each side, the wall had generated its own sideshows/ paraphernalia; on the Western side, a regular series of viewing platforms (early models for Hejduk's masques?) …" (Koolhaas:1995, p. 221). However, he notes that the wall only receives its ever-changing meaning by those who interact with it.

This visit would inspire Koolhaas (together with Madelon Vreisendorp, Elia Zenghelis, and Zoe Zenghelis) to form the 1972 AA thesis: *Exodus, or the Voluntary Prisoners of Architecture,* in which the space between two high walls where people voluntarily seek refuge, cuts through London's urban fabric to create a new enclave of urban culture invigorated by architectural innovation and political subversion.

Richard Serra is an artist best known for his large abstract sculptures; the substantial presence of which, forces viewers to engage with the physical qualities of the works and their sites. His work deals with the relationship between body and mass and describes how we have a sixth sense: the perception of density & weight. When asked about his *NJ-2* exhibition, he said:

> ... the piece implicates you in its space. As the piece changes, you have to change, and either hasten your stride or turn in ways you hadn't anticipated. You actually lose your sense of direction, so you don't know whether you're going north or south. Time enters into the equation of your bodily rhythm as you move through the work. It alters the time of your experience. (Serra:2016)

Serra's most controversial project was *Tilted Arc,* which was a 120ft long and 12ft high steel plate erected in Foley Federal Plaza Manhattan in 1981. Locals petitioned for its re-location but Serra insisted it was 'site-specific' and to relocate it would be to destroy it. It was deliberately counter-intuitive and succeeded in its mission to significantly redefine the experience of traversing the plaza. This calls to mind art historian Michael Fried's 1967 essay, Art and Objecthood, where he states;
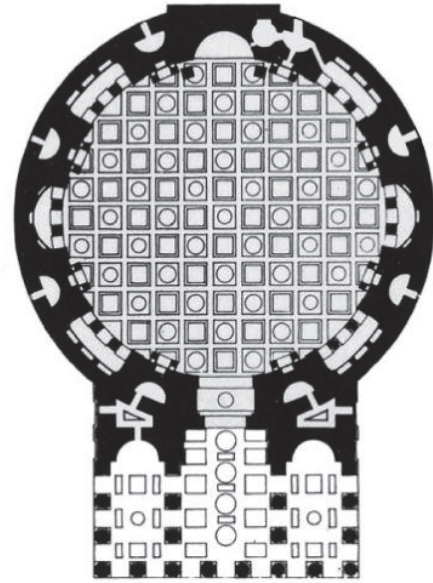
Left: Fig. 8. *The Pantheon* (floor plan), 125AD. Example of stereotomic architecture.
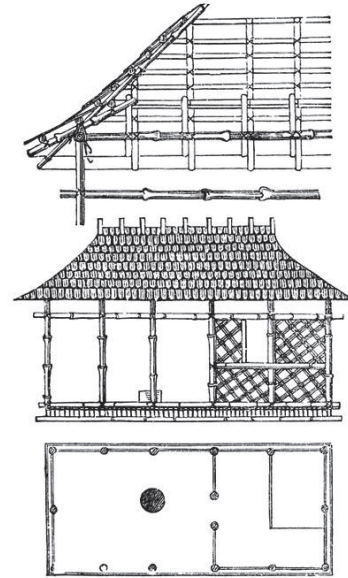
Right: Fig. 9. *The Primitive Hut,* Gottfried Semper, 1851. Example of tectonic architecture.

Left: Fig. 10. *Maison Dom-Ino*, Le Corbusier, 1914.

Right: Fig. 11. *Geodesic Dome*, Buckminster Fuller & students, 1953.

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> ...the experience of literalist art is of an object in a situation – one that, virtually by its definition, includes the beholder...literalist works of art must somehow confront the beholder – they must, one might almost say, be placed not just in his space but in his way. (Fried:1998, pp. 153-154.)

Tilted Arc would eventually be removed in 1989. Ironically, this would be the same year that the Berlin wall finally fell.

Wall as Substance

The construction of buildings (walls) up until recent history were usually governed by the available materials and the knowledge to use those materials; be that stone, earth, clay or timber. This can be defined as vernacular construction, whereby spaces to shelter, dwell and congregate receive their structural parameters directly from the materials that define them. The space of culture is therefore shaped by the logic and traditions of that culture. From ancient Egyptian and Roman architecture to Medieval and Baroque, the symbolic and functional role of their walls were combined whether by pure mass or representing the structural logic on the faces of mostly stereotomic[5] forms. (More on this in *Wall as Living Place)*

Simon Henley (2020) builds the argument, that the technological innovations that came with modernism have shifted the focus away from walls of substance and mass, and as a result we have detached our corporeal relation to architecture. Firstly, with the advancements in engineering came the steel and concrete frames to 'liberate' the facade and spatial plan, such as Le Corbusier's *Maison Dom-Ino* in 1914. Then, the objectivity of modernism concentrated on the envelope to lightly enclose the frame. Henley reminds the reader that buildings have always traditionally (vernacularly) responded to climate with perceptible character i.e., mass to stabilise both warm and cold climates, and large eaves or canopies to protect from rain and sun.

> This progression arguably reached its conceptual apotheosis in Buckminster Fuller's proposal for a geodesic dome over midtown Manhattan (1968) which reduced the construction of "wall" and "roof" to a single membrane. Graphically and geometrically, the architect's goal had hypothesized that there need only be a line separating inside and out. (Henley:2020)

The resulting glass box architecture presents the façade as a technological device rather than being derived from culture. The energy intensive technology systems needed to regulate the now unprotected internal environments, further detaches our perceptibility while making for a regression in sustainable design. This led to a return to the wall but one that rejects substance and inert environmental performance; being instead a "series of lines that perform discrete technological

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[5] "from the Greek word *stereos*, solid, and *tomia*, cut, introduces an idea of construction which is not conceived as the assemblage and juxtaposition of elements typical of the common tectonic procedure, but rather as the gradual removal of matter from an existing shape." (Cacciatore:2014, pp. 19-20)
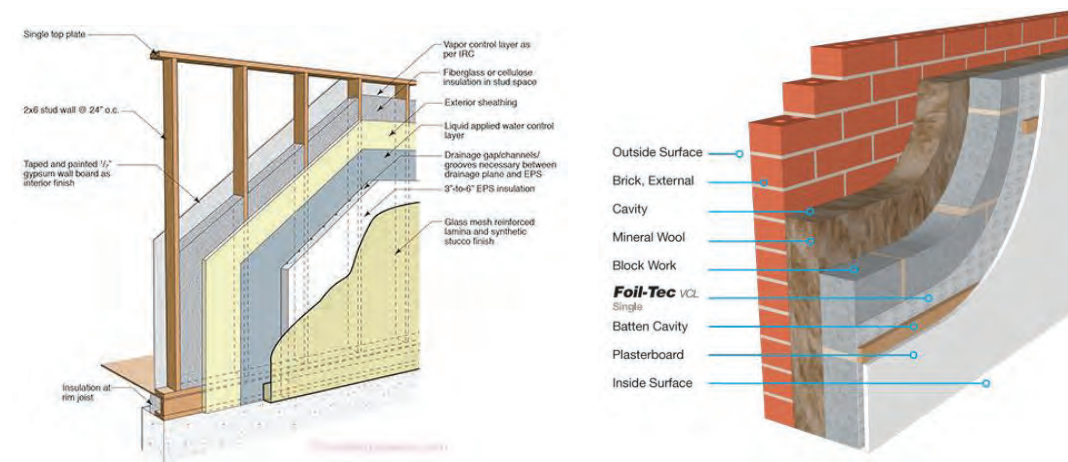
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Fig. 12-13. Conventional wall build-ups: complex collection of imperceptible layers performing discrete roles.

It is in the liminal space of a building's façade - arguably the most public, most physical realm - where our experience of bodily life is most acute. Indeed, the corporeal experience of architecture begins at the threshold of the façade, and for this reason, I am interested in the edges of buildings, both as fabric and as spaces in and of themselves. How can façades - that create shelter and temper our internal environment - help us attend to the natural world as opposed to demarcating a space apart from it? (Henley:2020)

Beyond the more or less two-dimensional plastic values that are traditionally associated to the façade, this fringe can be seen as a spatial entity within which the possibilities to live at a different scale are simultaneously recognized and explored. (Mateus:2017)

roles. The reasoning that underpins these abstract elements has been separated from the sensible and perceptible aspects of a building." (Henley:2020)

Philosopher Martin Heidegger's seminal essay, *Building, Dwelling, Thinking* (1954) was published in his book *Poetry, Language, Thought* in 1971. He traces the verb *to build* (bauen) to the mutual Old English and High German word 'buan': *to dwell,* which in turn originally meant *to be.*

> What then does ich bin mean? The old word bauen, to which the bin belongs, answers: ich bin, du bist [meaning]: I dwell, you dwell. The way in which you are and I am, the manner in which we humans are on the earth, is Buan, dwelling. To be a human being means to be on the earth as a mortal. It means to dwell. ... We do not dwell because we have built, but we build and have built because we dwell, that is, because we are dwellers. (Heidegger:2001, pp. 148-149)

Heidegger elucidates that this original meaning - the inherent condition and necessity of being grounded with a sense of place - has been lost in modernity, leading to "Man's homelessness". Building for the sake of building ignores the fundamental concern for dwelling, resulting in impersonal architecture. Like Hejduk's subtle critique of modernism's failure to situate the individual consciousness, Henley points out that this shift is antithetical to Heidegger's version of dwelling, leaving anthropology out in the cold.

But Henley skips perhaps the most significant protagonist in the shift from wall to frame. In 1851, Gottfried Semper published his book: *The Four Elements of Architecture*. It is here, where the strict separation of structure and enclosure is first promulgated. Like Heidegger, Semper explores the etymology (again in German) for true meaning as he derives the word for wall: 'Wand' from 'Gewand' (garment/vestment) and 'winden' (to wind/coil). Therefore, he places wall within the 'textile' element of architecture (although tectonic by nature), distinct from 'ceramics', 'tectonics' (purely timber in Semper's understanding) and 'stereotomy'. The wall is therefore not to be used as load bearing, but as lining/surface; without which the internal realm would be undefined. What's more interesting is that there is a second word for wall in German: 'Mauer', which in Semper's understanding equates to the load bearing layer, concealed by the attached 'Wand'. However, in today's terms 'Wand' and 'Hauswand' are used in the context of buildings and their creation of interior space, while 'Mauer' refers to a stand-alone object and its division of exterior space e.g., *Die Berliner Mauer* (The Berlin Wall).

> This tectonic/stereotomic distinction was reinforced in German by that language's differentiation between two classes of wall; between die Wand, indicating a screen-like partition such as we find in wattle and daub infill construction, and die Mauer, signifying massive fortification. (Frampton:1995, p. 5)

While Semper's distinction of the structural and lining layers of the wall may have led to modernism's momentary banishing of them in favour of the frame, it did inspire a more Heideggerian undercurrent: The 'unattached lining'. (More on this in *Wall as Living Place).*
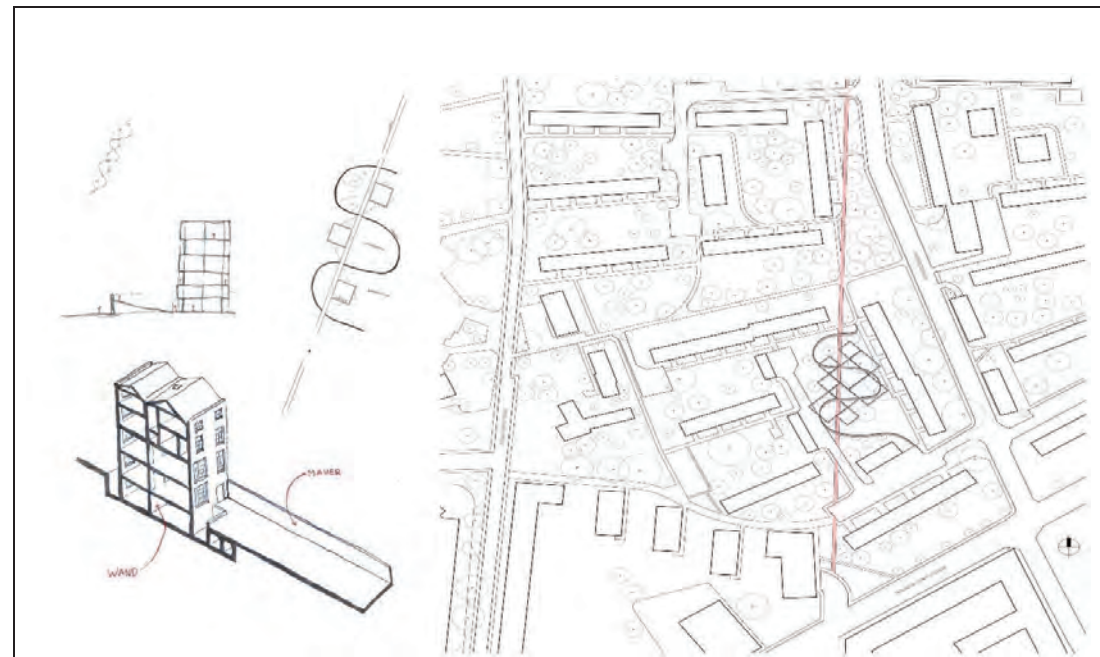
Reflective Interlude

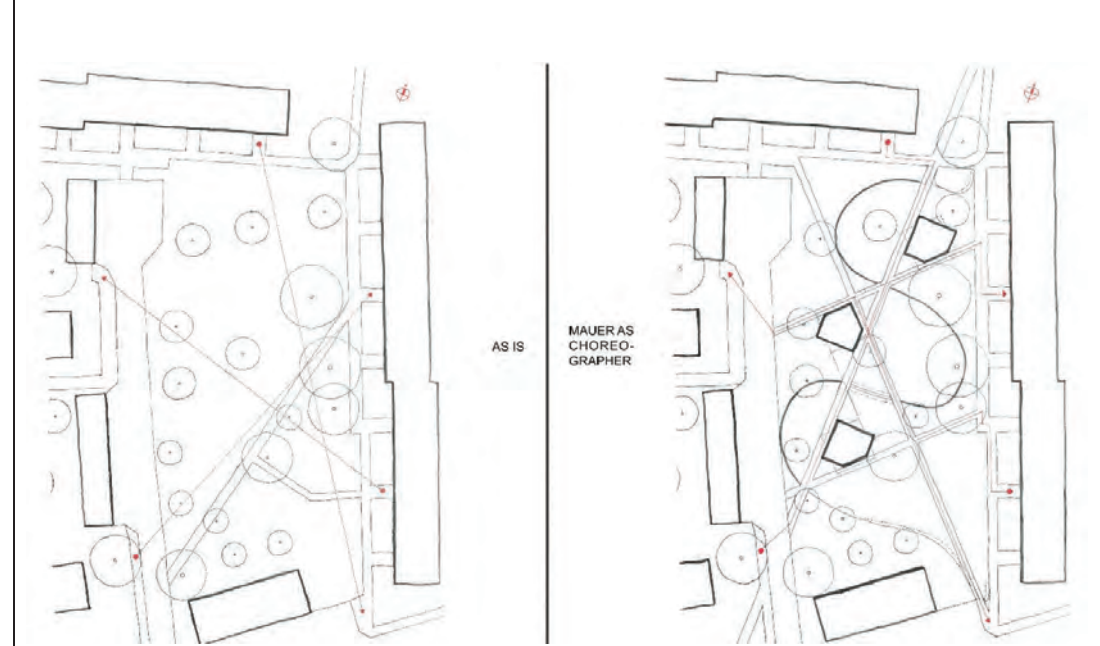**Fig. 14.1.** *Early Site Strategy Sketches. Wand vs. Mauer.*
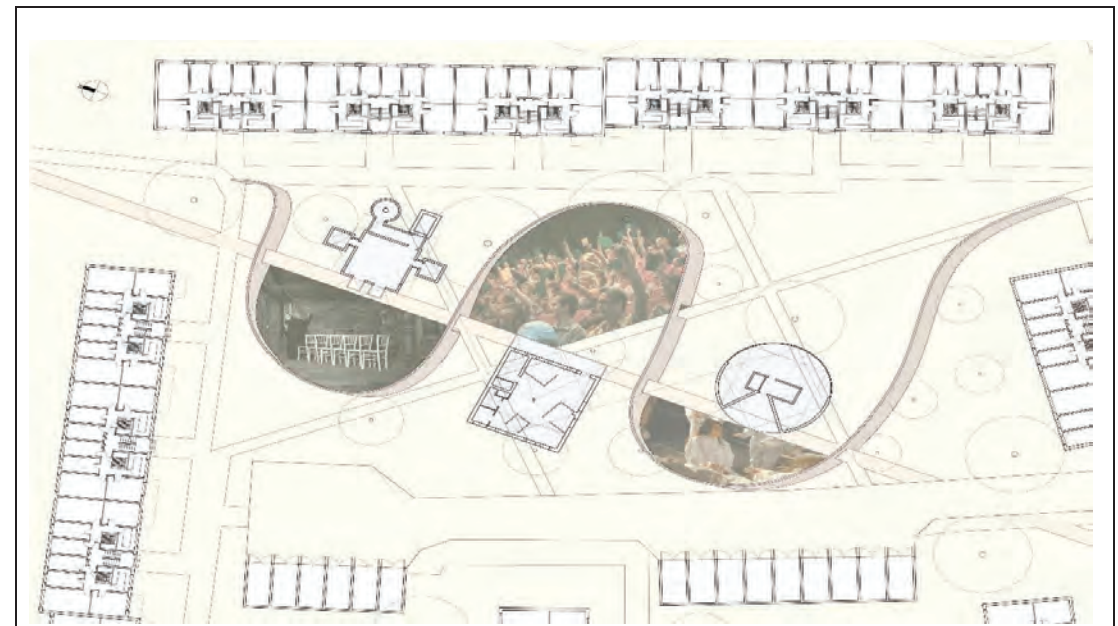

Fig. 14.2. *Plan of Controlled Freedoms.*
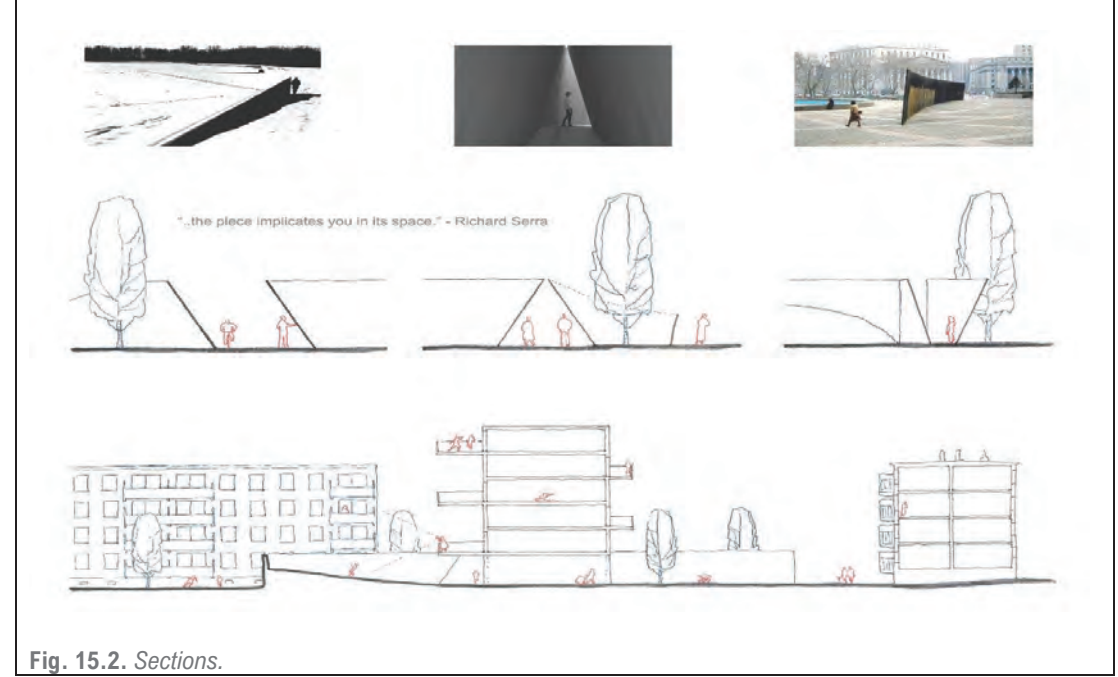

Fig. 15.1. *Emancipation of the Spectator.*

Fig. 15.2. *Sections.*

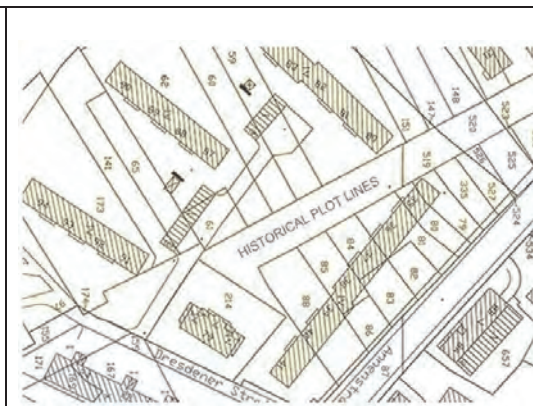**Fig. 16.1.** *Site Strategy two: Existing.*

Fig. 16.2. *Site Strategy two: Historical Plot Lines.*

Fig. 16.3. *Site Strategy two: Public Thoroughfare.*

Fig. 16.4. *Site Strategy two: Separation Distance.*

Fig. 16.5. *Site Strategy two: Four Blocks.*

Fig. 16.6. *Hemp-Lime Research.*
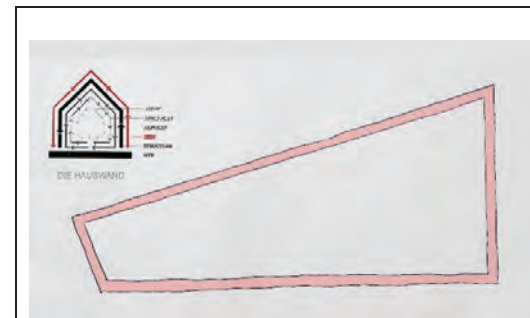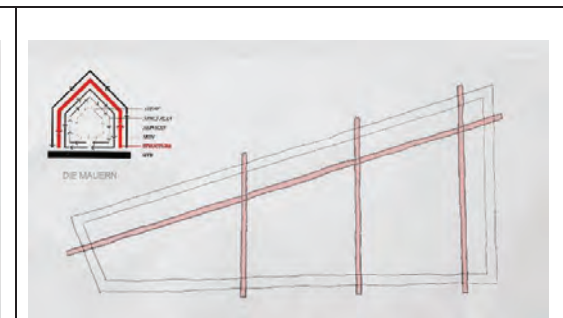

Fig. 17.1. *Structural Strategy: Die Hauswand.*

Fig. 17.2. *Structural Strategy: Die Mauern.*
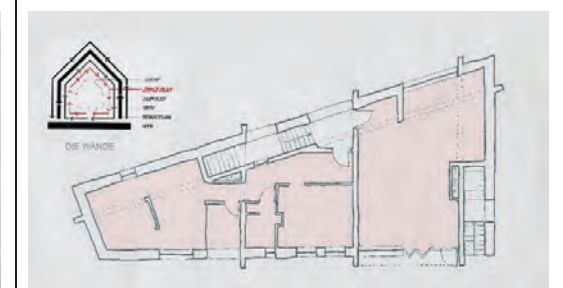

Fig. 17.3. *Structural Strategy: Die Platten.*
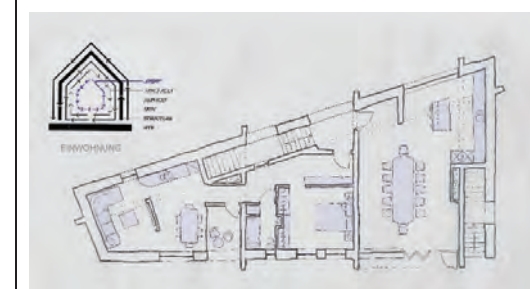

Fig. 17.4. *Structural Strategy: Die Wände.*

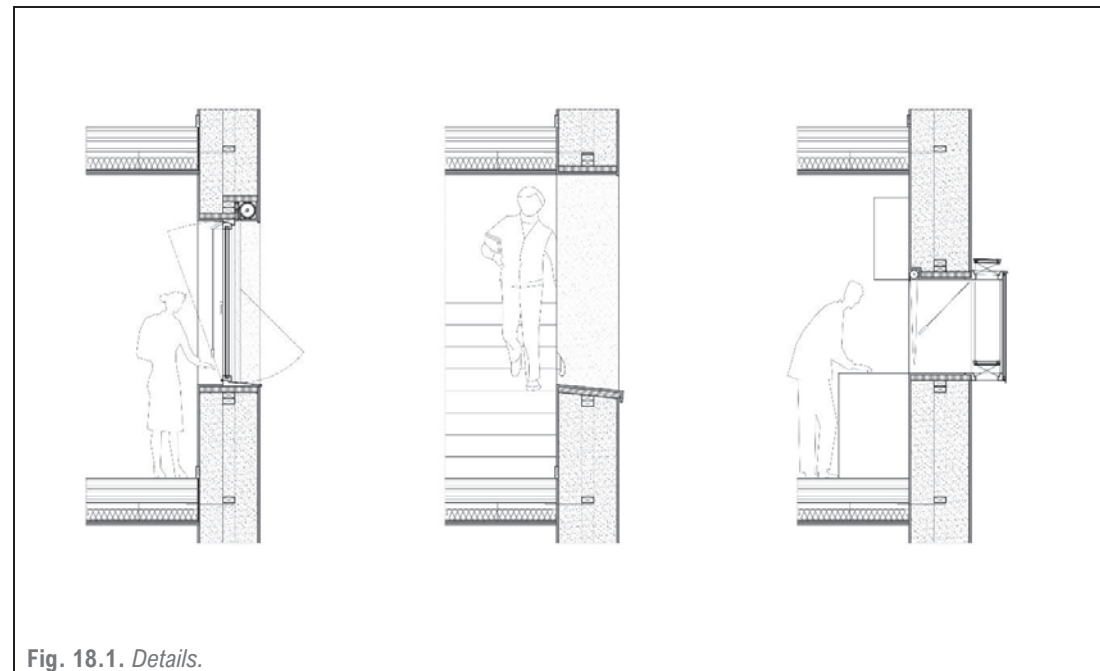**Fig. 17.5.** *Structural Strategy: Einwohnung.*

Fig. 17.6. *CLT Research.*
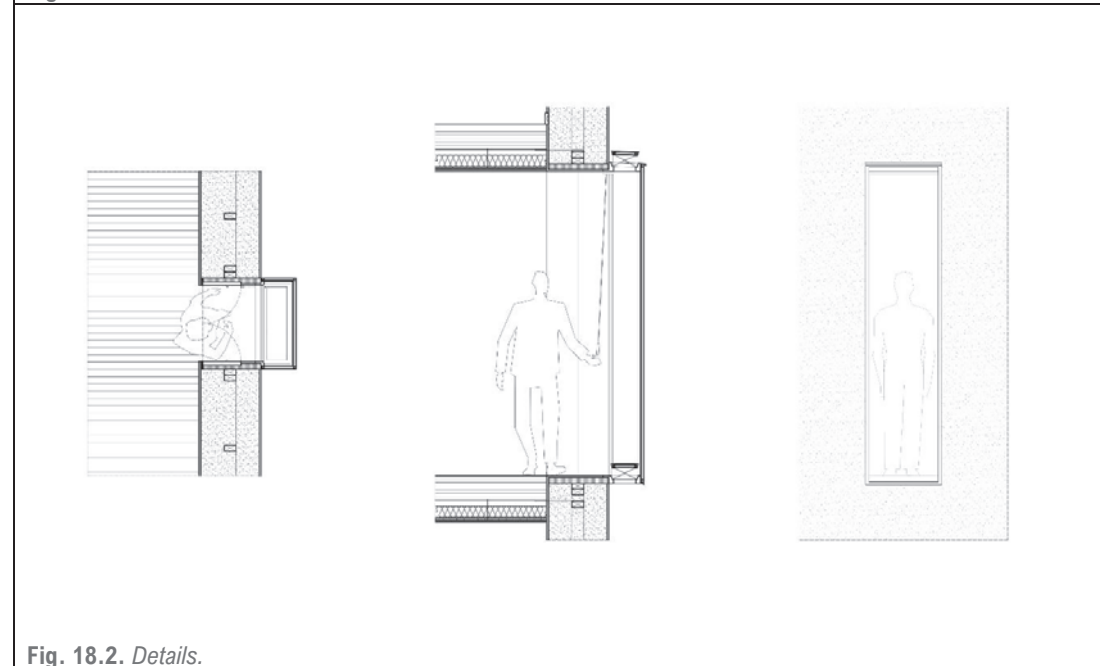
Fig. 18.1. *Details.*

Fig. 18.2. *Details.*

After our visit to Berlin in January, the aim of semester two was to test ideas through 'primer' projects and proposals, allowing the site and context to speak through them but then returning the design back to the site in a 'double loop' effect to further understand what our resulting thesis would be, come semester three. It should be noted, that only the most pertinent selection of this work has been included. As always, many other rabbit holes were fruitlessly pursued.

In **Fig. 14.1.,** I began by applying a version of Bernard Tschumi's *Points, Lines*[6] method to one of the many dead enclaves between the Plattenbau[7]. The particular space I chose lay on the ghost of what was once a prominent 19th Century street: Dresdener Strasse, immortalised on the tracings of pre-bombed Luisenstadt's plot lines. Reinstating this 'Linie' as a welcoming route for the 'flâneur'[8] to traverse the otherwise insular Berolina estate, I then swapped 'Points' and 'Surfaces' for 'Wand' and 'Mauer' to further define the space for event. The curving Mauer is constantly re-positioning the flâneur as they dive from interiority to exteriority, much like the swimmer. Three 'Objekte' made of 'wände' act as viewing platforms; but are themselves also viewed from the resulting proscenium created by the Mauer.

Fig. 14.2. explores the Mauer as choreographer, but it gives as much as it takes. I rightly received caution for the implementation of something imposing; "perhaps too sensitive on the memory of Berliners". On reflection however, **Fig. 15.1**. and **Fig. 15.2** deal with the potentially grounding effect that this presence offers. As with Serra's work, you take stock of the object before you and experience the changing relationship you have with it, with others and with your surroundings in general as you pass through. You are in that moment, an actor and not merely a spectator of architecture.

After effectively testing the use of walls on the site in a very literal sense as a primer project, it was time to address the site more appropriately. **Fig. 16.** redraws the historical plot lines and proposes four blocks of housing along the resurrected street, sunken between two walls reminiscent of *Exodus or the Voluntary Prisoners of Architecture,* transgressed however by both underpasses and overpasses. To achieve walls of substance and stereotomic mass, and to accentuate the objecthood of these blocks, I investigated a sustainable alternative to concrete: Hemp-Lime.

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[6] Parc de la Vilette, Paris, 1987. Tschumi's focus on the duality of 'space' and event' formed part of the work in semester one. More on this in *Wall as Living Place.*

[7] These long and slender 'inhabited walls/maueren' of housing are in some cases nearly 300m long and serve as the only bounding edges to a neighbourhood otherwise devoid of bounding edges since the wall came down. They deliberately ignore the street pattern, with large swathes of 'antispace' between them.

[8] French for *Street wanderer, aimlessly observing.* Walter Benjamin in the first half of the 20th century, deployed the term as a literary protagonist, wandering and observing the damaging effects of modernity.
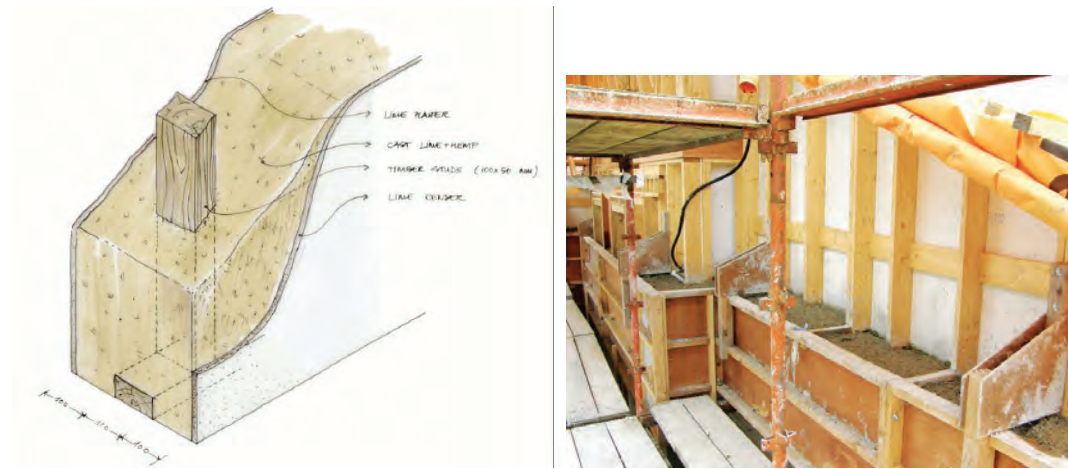
Fig. 19-20. Hemp-lime being cast onto a timber frame.

As hemp lime is a natural product, performance can vary slightly, but commercial hemp lime wall systems tend to achieve: • dry density: 270–330 kg/m3 • thermal conductivity: 0.07–0.09 W/mK (typical U-value at 300 mm = 0.21 W/m2 K) • compressive strength: 0.1–0.2 N/mm2. (BRE:2011)

Inputting a thermal conductivity value of 0.075 W/mK across a depth of 500mm of solid hemp-lime with 15mm lime-render on both faces returns a U-value of 0.14 W/m2 K. According to Florentin et al (2017), a negative value of embodied carbon (EC) for hemp-lime has been reported in multiple studies, ranging between –0.3 and –1kgCO2/kg. This is attributed to the fact that hemp sequesters carbon while as a crop and further as it cures in construction. (p. 294)

To achieve a similar finish and U-value using concrete, one would end up with 50mm deeper wall overall - 220mm of fair-face or textured concrete, 300mm of cellular glass insulation and 60mm of fibreboard. Example: *Diener & Diener, Steinenvorstadt mixed residential and commercial development, Basel (CH), 1995.* The combined EC of this system is markedly worse with values of 0.185 kgCO2/kg, 1.86 kgCO2/kg and 0.37 kgCO2/kg respectively. (ICE:2011)

It should be noted however, that this latter option is structurally integral while the hemp-lime calculations do not take into account the need for complementary structure i.e.. Added cement or an independent frame.

Hemp, one of the strongest natural fibres, is a fast-growing crop with a potential for three harvests per annum. Taking the waste product of various industries using hemp, the 'shiv' of the plant is essentially a carbon sink when used as a bio aggregate in construction. Lime binder has been used in construction for thousands of years such as in the Pantheon and is inherently breathable with potential for bio composites. The invention of Portland cement in 1824 has since largely replaced the use of lime due to enhanced structural properties and curing speed but with it, the environmental cost of increased embodied carbon; total carbon emitted during extraction, manufacturing, transporting and use in construction.

The marriage of hemp and lime therefore, results in a substance which can be cast in the same process as concrete but while further absorbing carbon as it cures. Data from Lime Technology Ltd in the UK proposes that 50 Kg of CO2 can be locked up per 1 M2 of hemp-lime walling. It's also naturally thermal and sound insulating, breathable, naturally regulates moisture (hygroscopic) and acts as thermal mass. A thickness of 500mm achieves Passivhaus U-values of 0.14 (The WISE Building Wales, 2010) while performing the various other environmental roles of a conventional wall, but as one homogenous substance. **Fig. 18**. shows the interaction of inhabitants at various moments with the brute reality of the external hemp-lime wall. Its external lining is equal to its internal.

However, without added cement it can only hold its own weight. Learning from Semper, this led me to use it as the 'Hauswand'; the perimeter but non load-bearing walls of the blocks. Using a structural skeleton made of cross laminated timber (CLT) plates as vertical 'Mauren' and horizontal 'Platten', also takes advantage of being a homogenous and carbon sequestering material. (**Fig. 17.**)

The rudimentary Wall is cast with the capacity for acting both the protagonist and antagonist in any urban drama. By default, Wall inevitably plays the noble defender of privatisation; perpetual delineator of us and them, mine and yours, East and West. Despite our most optimistic projections of virtual Wall's character, reality Wall performs the last laugh as social choreographer. The architect, seeing him/herself as the casting agent of such plays, often attempts to give Wall a benign presence. However, Wall has its own ontology which, unless conceived for an empathetic urbanism, will only resort to that default role. (exploratory writing)

'Before I built a wall I'd ask to know

What I was walling in or walling out,

And to whom I was like to give offense.

Something there is that doesn't love a wall,

That wants it down.' (Frost:1914)

Research Question & Methodology

As seen in the photo-essay at the beginning of this dissertation and in *The Wall Jumper,* walls have a gravitational force, not for their divisive nature but for their ambiguous zones of negotiation and mediation. When transgressed, boundaries offer us multiple realms experienced simultaneously. As noted by Heidegger (1971), 'a boundary is not that at which something stops but, as the Greeks recognised, the boundary is that from which something begins its presencing'. (p. 155) (More on this in *Wall as Mediator.)*

> Boundaries present themselves to us as the edge of things, as the spatial and temporal limit between the here and there, in and out, present and future. The boundary in all its manifest forms – wall, façade, gate, fence, river, shore, window – appears as a discrete separation between alternate sides of its magical divide … (Borden & Rendell:2000, p. 221)

Both the situational power of walls and the masquerade quality afforded to us by transgressing them, presents walls as the foci for 'dwelling' with the opportunity to live at different scales. "Having come to distrust the hastily adopted identity that both states offer him, he feels at home only on the border." (Schneider:1983, p.23). Therefore:

This research through design is concerned with how, in the wake of the Modern movement, neo-humanist[9] empathy has lost out to a technological culture antithetical to the Heideggerian 'dwelling'. Through a development of semester two's collective housing project situated in former East Berlin, it explores tactics to counter social detachment and apathy toward our contemporary built environments, such as interrogating the ontological role of the wall and applying a resulting gradation of spatial condition.

To reverse the perception of walls as infrastructure of limitations to infrastructure of opportunities, it is the assertion of this research that, by obscuring and expanding their conventional role to counter that of simply demarcation, this encourages active agency in the urban drama and stronger participation in the sharing and shaping of the collective experience of architecture. This then culminates in the following research question: Can a broader spectrum of sociality be managed by an architecture of depth rather than division; one that embeds empathy into its walls and positions the inhabitants within a gradation of spatial condition?

To investigate this question, my methodology involved traditional architectural design methods while continuing my exploratory writing. Researching through literature expands the lens while drawing reigns it back in. Therefore, it is necessary to constantly close the loop between writing and drawing; knowledge gained from writing feeds the drawings while knowledge gained from drawing feeds the writing.

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[9] Less anthropocentric humanism expanded to not only include all varieties of human cultural expressions, but ecologically related concerns in the animal and plant world, and even the spiritually related inanimate world.
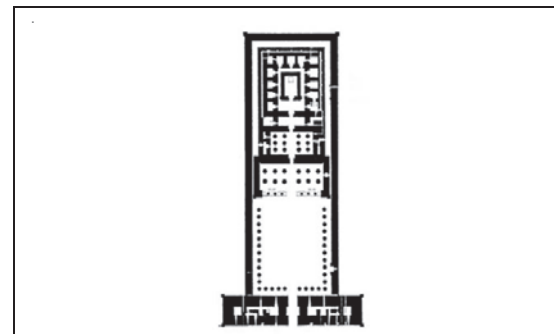
Fig. 21.1. *Temple of Horus,* Edfu. 3000BC.

Fig. 21.2. *August's Mausoleum,* Rome. 1ˢᵗ C.
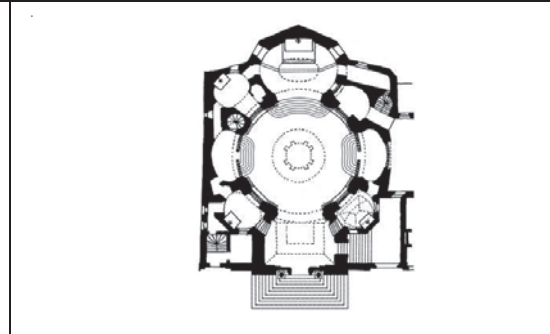
Fig. 21.3. *Dover Castle,* 11ᵗʰ C.

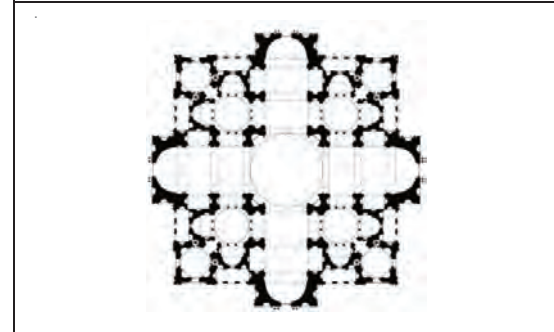**Fig. 21.4.** *St. Marie de la Visitation,* Paris. 1634.

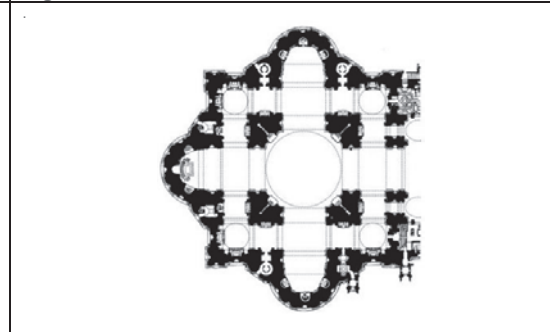**Fig. 21.5.** *St. Peter's Basilica,* Rome. 1506. Bramante

Fig. 21.6. *St. Peter's Basilica,* Rome. 1546. Michel.

"This formal idea is the same in both plans for Saint Peter's, but Michelangelo, the sculptor, treats the whole as a solid plastic block, while Bramante, the architect, designs a fabric of woven voids, where space triumphs over mass." (Peterson & Littenberg:2018, p. 6)

Right: Fig. 21.7. Venturi's 'linings' sketch.
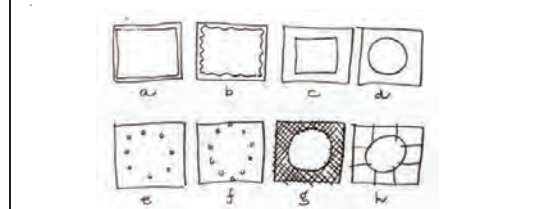
Analogue

Wall as Living Place

My rethinking of walls in semester two tested various ideas and asked various questions about their role. However, they did not directly result in the design of particularly ideal dwelling space or achieve embedded empathy for that matter. To do this in semester three, I would look back to when the origin of architecture was brought back to the wall, and the combination of multiple responsibilities resulted in meaningful mass; where structure, function, expression, lining and environment coalesced into perceptible thickness.

> It is for this reason that, after Alberti, the facade would become the most complex part of the building, so much so that it can accommodate and represent all the problems posed by the resolution of the entire construction. So conceived, the facade thus became the result of the confluence of an array of opposed, inner and outer, stresses, that are expressed through the wall's physical support. (Cacciatore:2014, pp. 23-24)

Francesco Cacciatore (2014) describes how Leon Battista Alberti revitalised the Roman tradition of the superposition of both tectonic and stereotomic construction, by expressing tectonic elements such as columns as carved projections from the wall as pilasters. This led to an increasingly invasive experimentalism in Renaissance and Baroque walls, eventually culminating in the discovery of occupiable space within the walls themselves. However, as seen in the plans in **Fig. 21.**, occupying the boundary walls of architecture had already been a recurring motif.

Robert Venturi refers to the wall as "the point of change between the meeting of interior and exterior forces of use and space" (Venturi, 2007, p. 86). He focused in on the concept of 'poché'[10] in for example St. Peter's Basilica in Rome, where the mass of the wall was used to mediate the vast change in scales of the interior space of the church to the exterior urban context. Venturi goes on to present the idea of 'linings' where the internal lining of the wall may deliberately contradict the external lining, thereby creating poché (**Fig. 21.7**). Whereas, in other cases this separation may manifest into an 'unattached lining', whereby the inner skin becomes detached from the exterior wall and creates an occupiable space between them such as private circulation, thereby producing habitable or 'open poché'. Without realising, I had achieved an unattached lining of sorts in semester two, where the circulation of the blocks was contained between the Hauswand and the Maueren.

> With Kahn the wall, as the building's boundary ceased to be a passive consequence of the enclosing function or the main place for the mere transmission of purely constructive or representational aspects and became the most dense and meaningful instance in the spatial experience. (Cacciatore:2014, p. 33)

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[10] The French word for pocket is '*poché*'. It is the term used for the areas of wall (black in plan) that are shaped to define the composition of rooms. Carving out occupiable space within these areas of wall would create 'habitable poché', delivering on the true meaning of 'pockets'.
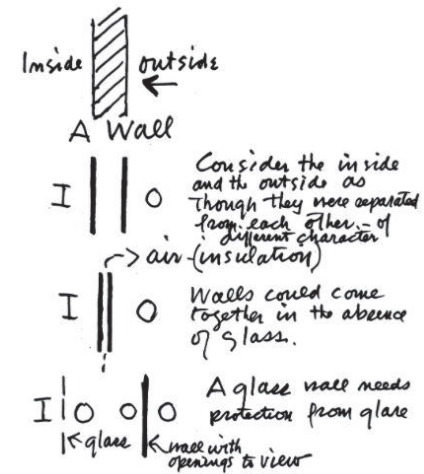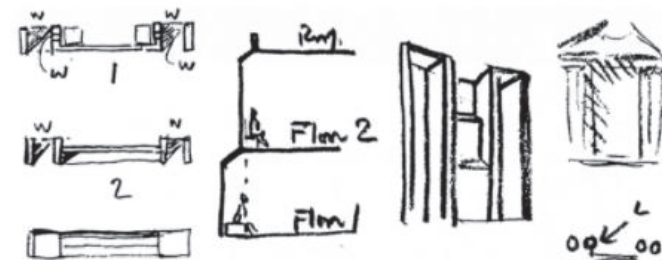
Left: Fig. 22. *Wall Sketches,* Louis Kahn.
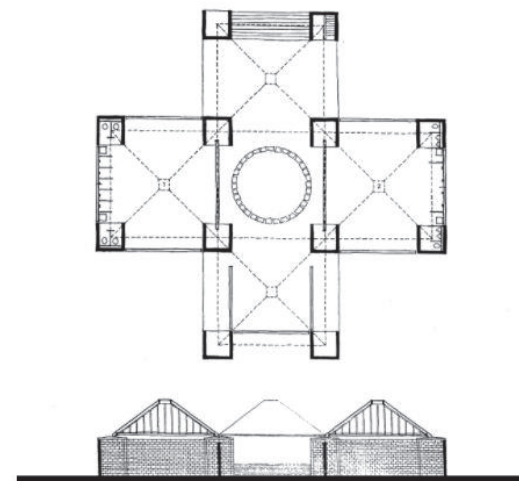
Right: Fig. 23. *Trenton Bath House,* Louis Kahn, 1955. Plan & Section.

The Scottish Castle. Thick, thick walls. Little opening to the enemy. Splayed inwardly to the occupant. A place to read, a place to sew ... Places for the bed, for the stair ... Sunlight. Fairy tale. (Kahn:1973)

Left: Fig. 24. *Phillips Exeter Library,* Louis Kahn, 1972. Reading area. Note the interplanar window assembly.

Right: Fig. 25. *Wall sketches,* Louis Kahn.

Louis I. Kahn was a modernist architect who over the course of his career, formulated an original vocabulary which at times departed from the modernist pursuit of tectonic lightness and instead brought the traditions of stereotomic depth inspired by his trips to Egypt, Greece, Italy and Britain into modern applications. His career is a clear example of the iterative process of design research in practice, as very easily identifiable motifs can be traced from primitive realisations to later, more resolved works. His obsession with 'inhabiting the wall' began with inhabiting structural elements themselves.

> But the column feels strong not inside - the column itself - but outside the column. And more and more the column wants to feel its strength outside and it leaves a hollow inside, more and more, and it becomes conscious of the hollow. And if you magnify this thought the column gets bigger and bigger and the periphery gets thinner and thinner and inside is ... a court. (Kahn:1967)

Although not his most celebrated work, Kahn himself identifies *The Trenton Bath House* project as a pivotal moment in his exploration for a new architectural vocabulary. Having already coined the famous distinction between 'servant and served' spaces, he adopted his recurring centripetal plan and used the hollow functional columns as interstitial vestibules to the periphery of the main spaces, subtly delineating the passage between them or housing ancillary facilities.

After major commissions such as the *Yale Art Gallery* and *Richards Medical Centre*, Kahn would go on to receive many international commissions such as the *National Assembly Building* and *Suhrawardy National Hospital* in Dhaka, where to mediate the climatic intensities of heat and light, he would wrap a 'duplicating wall' or 'ruin' around the building, creating a monumental portico within the thickness of the combined perimeter walls. The 18th Century architect Claude Nicolas Ledoux, often philosophised the significance of porticoes as

> … a space of transition where the individual could regain his social being and the crowd gradually break down into its individual parts … only a device that could enfold and subsume without destroying individuality, that could act as a foil and a structure for the sharp and intense effects of elements imbued with character (and perhaps even a sublimity) of their own, could act as the public and general frame for bringing together private and particular elements. (Vidler:2011, pp. 43-44)

However, it is the 'folded wall' and play of interplanar window assemblies where Kahn really imbues Heidegger's definition of dwelling. He admits, that on a flying visit to some British medieval castles after being in London, he was inspired by the defensive and yet humanistic qualities within their walls. His folded wall motif not only generates 'virtual thickness' but depending on which lining the window plane is fixed, creates either a sun shading loggia or a window seat.

> In this way, they acquire the character of actual places made available for minimal, daily gestures still filled with a deep human meaning. The need to find a place where daily life objects could be stored without requiring too much space, the simple possibility of sitting down or the idea of having a privileged station from where to look at the surrounding landscape make these boundary places all but accessory and rather, in a definition used by Kahn himself, deeply necessary. (Cacciatore:2014, p. 75)

That night I dreamt of being inside the tower, somewhere near the top, in the square, central space looking out. The dream then however took a strange, surreal turn, as dreams are wont to do. Like Alice eating cake in Wonderland, I experienced a sudden scale distortion, and my body grew to fill the volume of the building, my eyes looking out through the two windows of the south facade, and my hands forced out into the two small side rooms on either side of the tower, palms pressing against the small windows. The building became a costume, a mask through which I saw the city, forced by the architecture into a posture of supplication …. then I woke up. (Slinger:2013)

Left: Fig. 26. *OUT*, Judith Hopf, 2018. Video still.

Right: Fig. 27. *Advertisements for Architecture*, Bernard Tschumi, 1976-1977.

In the case of the dwelling, the significance of the threshold lies in its capacity to associate the inhabitant with, and disassociate it from, the city; and the way in which it might establish common ground between neighbors, and within an urban quarter, all of which depend on the sensible qualities of these external environments. Something that is recognizably civilized, communal, perhaps egalitarian, at least associative, and yet its humanity dignifies the individual whom encounters this architecture. (Henley:2020)

When thinking of these "places made available" by the stereotomic carving out or 'excavation' of space within the wall, Heidegger's (1971) definition of space comes to mind: "Raum means a place cleared or freed for settlement and lodging. A space is something that has been made room for ... namely within a boundary..." (p. 155). If architecture is the 'cohabitation' of space and event (Tschumi:1994) and the "product of, and inter-relation between, things, spaces, individuals and ideas" (Borden & Rendell:2000, p. 225), then these intramural moments are the most intimate of corporeal interactions between building and inhabitant.

Just as Semper and Heidegger did, I will look to language for clues and traces for enhanced meaning. The etymology of 'inhabitation' begins with the Latin origin word of 'habitare' - to dwell or reside. Taking a shorter stem of 'habere' - to have or consist of, and then 'habitus' - state of being, condition or appearance, Old French takes the word 'habit' - conduct, dress and attire. Middle English and Modern French simplify this to 'clothing' while Modern English reverts to Latin somewhat and gives us the most familiar translation of 'acquired modes of behavior'. The only preserved relation to clothing we have today in English is a nun or monk's 'habit'. However, as noted earlier by Semper, the German word 'Gewand' - the root of 'wall', literally means 'garment' or 'vestment'. Would this all suggest that by dwelling, we are really wearing the fabric of our built environments?...

Wall as Mediator

I have so far, began revealing the significance of walls in mediating between the external and internal realm, but what then about their exclusively internal instances? Robin Evans (1997) expresses that the wall should be used not only as a divider or a 'boundary' but actually as a careful tool in the articulation of spatial zones. "If anything is described by an architectural plan, it is the nature of human relationships, since its elements - walls, doors, windows and stairs are employed to divide and then selectively re-unite inhabited space" (p. 56).

But Borden (2001) reminds us of when ulterior motives are deployed. Before reading the next passage, your attention is briefly brought to the recently enacted legislation in Ireland whereby the sale of alcohol is cordoned off in supermarkets by easily entered 'gates'.

> What the Broadgate gates do is less prevent the horizontal movement of the body and more challenge the self-perception of the visitor, at the moment they pass through the gate, as to whether they are allowed on to the site. … but to provoke in their own mind, as they momentarily pass through the thickness of the edge, the questions, "Should I be here, and now? Do I have the right of passage?" (Borden:2001, p.14)

Dougal Sheridan's primary research on the appropriation of space by the squatting subcultures of 1990's Berlin, confirms that in the vacuum of territorial instincts we are all, deep down, 'Wall Jumpers' with the mentality of 'The Swimmer'. Without explicit territorial codification, the inhabitants are arguably more in tune with each other and equally, their appropriated built environments.
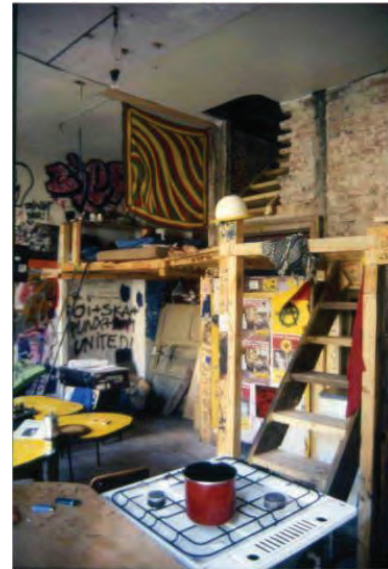
Private/Public Spatial Graduation

Individual Spaces	Bedrooms, Studies/Work spaces
Group Spaces	Kitchen, Eating, Social, Bathrooms, Toilets
Group Shared Spaces	Bathrooms, Laundries, TV room, Children's space
Complex (Used by all groups)	Computer/Photocopying room, Library, Workshops, Darkroom, Band rehearsal
Semi- public	*Unter Druck* theatre group, Latin American resource group

You will ask me what Hejduk intended with such impractically small rooms. "Well," I'll pontificate, "the whole apartment oscillates between spaces that seem too big and too small." I'll say that we only become conscious of space when it is either too big (a cathedral, a palace) or it is too small (a railway cabin, a prison cell). For most of us, lived space happens in the midground and, as such, washes over us quietly. Anonymously...The luxury Hejduk offers is a radical rethinking of the plan of a house or an apartment. Its received principles of sense. He forces you to inhabit through invention. (Basar:2014)

The most beautiful thing perhaps, is that freedom and determinism can peacefully coexist. (Metzinger:2009)
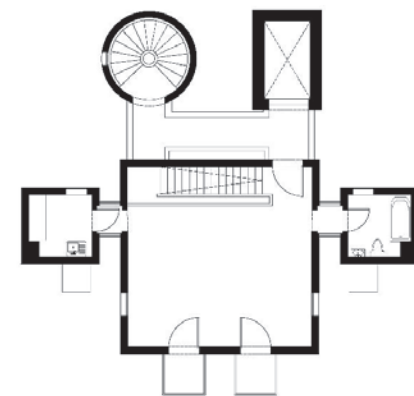
Top Left: Fig. 28. *Besetzte Haus,* literally the 'Occupied House'. Berlin. **Top Right: Fig. 29.** Besetzte Haus territorial depth analysis, Sheridan, 2007. **Bottom Left: Fig. 30.** *Kreuzberg Tower,* John Hejduk. 1988.

The absence of internal locks, potentially something 'architectonically insignificant', has an enormous effect on the space of these buildings. The resulting fluidity being equivalent to the de-institutionalisation of space where suddenly human judgement, tact, trust and communication must accomplish the job usually done by the physical division of space... The application of locks to individual's rooms within the building is usually regarded as an indication of the disintegration of the community. (Sheridan:2007, pp. 116-117)

Another way to look at depth in architecture in this context is "territorial depth", being "measured by the number of boundary crossings (…) needed to move from the outer space to the innermost territory" (Habraken:1998, p. 137). As primordial wall jumpers, we therefore thrive with walls as more indeterminate spatial mediators along a sequential 'depth', rather than deterministic static delineators.

But what exactly are walls mediating spatially? If inhabiting the fringe of buildings is corporeal dwelling, then inhabiting the complementary centripetal realm is spiritual dwelling. When discussing the open roof at the centre of Kahn's Trenton Bath House, Cacciatore (2014) illustrates that this "makes this central space a sort of metaphor of the spaces that surround it, a place that appears to connect sky and earth, gods and mortals, to use a Heideggerian expression." (p. 57).

But more appropriately, and when there is no opportunity for symbolic roof openings, this liberated central space could be viewed as 'unscripted' or indeterminate. If the fringe contains more individualised intramural 'events', then this is balanced by a more collective and unmediated 'space'. In Tschumi's terms then, the inhabitants receive their actions by what is signed into the intramural zone, while the centripetal space receives its meaning from the unscripted actions of its inhabitants.

> Collective experience is programmed not functionally but anthropologically into the plan, in the composition of that plan, whereas here common experience is constructed in the fabric, and in the manner in which that plan is realized materially, and that is most evident in the perimeter walls of a building. Collective experience - congregational spaces and associated plan types - structures both intentional and unintentional communities. (Henley:2020)

Hejduk's Kreuzberg Tower built in 1988, is arguably five distinct towers. Two semi-public towers house the spiral stairs and lift cores to the rear of the large central tower containing the main living spaces of each duplex apartment, while two smaller towers containing ancillary spaces measuring only six square meters, adjoin it on either side by transparent bridges. This results in a large bedroom, large living room with a "his and hers" balcony, and four small functional spaces such as bathroom, kitchen, laundry and reading room. Residents are reported to feel that menial tasks such as laundry are thus "conveniently detached from the rest of the building". (Akcan:2018, p. 365)

Reflective Interlude

Fig. 31.1. *Inhabiting the Skin 1.*

"A place to read, a place to sew ... Places for the bed, for the star ... Sunlight. Fairy tale"

Fig. 31.2. *Inhabiting the Skin 2.*

Fig. 32.1. *Mehr als Wohnen,* Duplex Architekten, 2015.
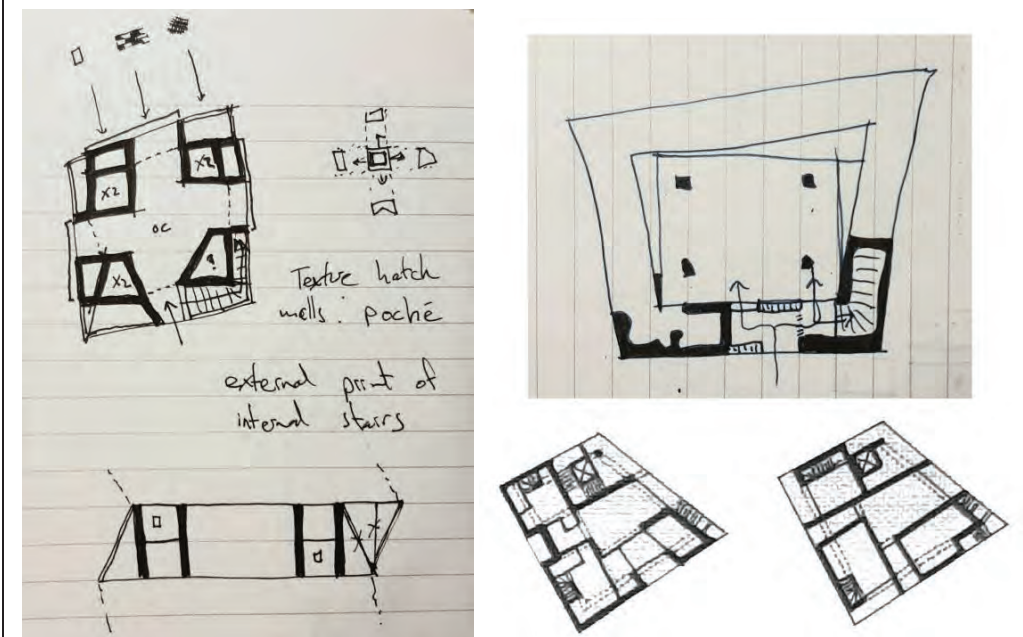
Fig. 32.2. *Initial sketches.*

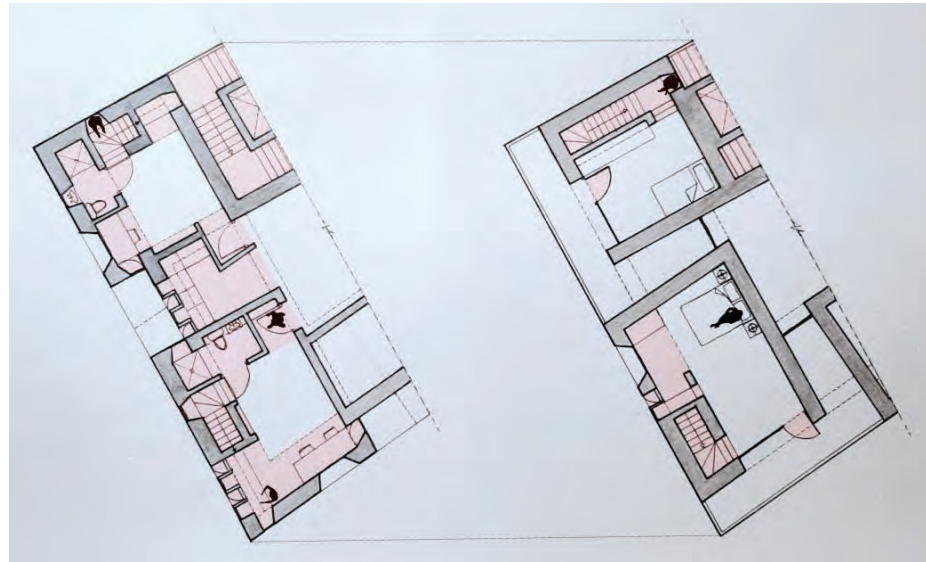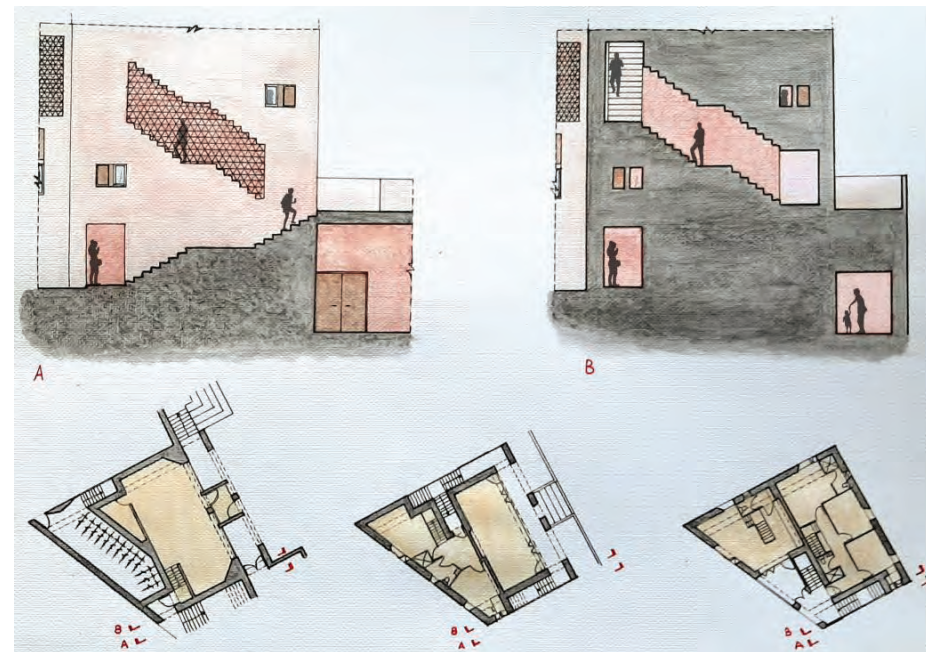**Fig. 33.1.** *Scripted Space.*

Fig. 33.2. *Intramural zone.*

Fig. 34.1. *1st Floor.*

Fig. 34.2. *2nd Floor.*

Fig. 35.1. *Section A.*
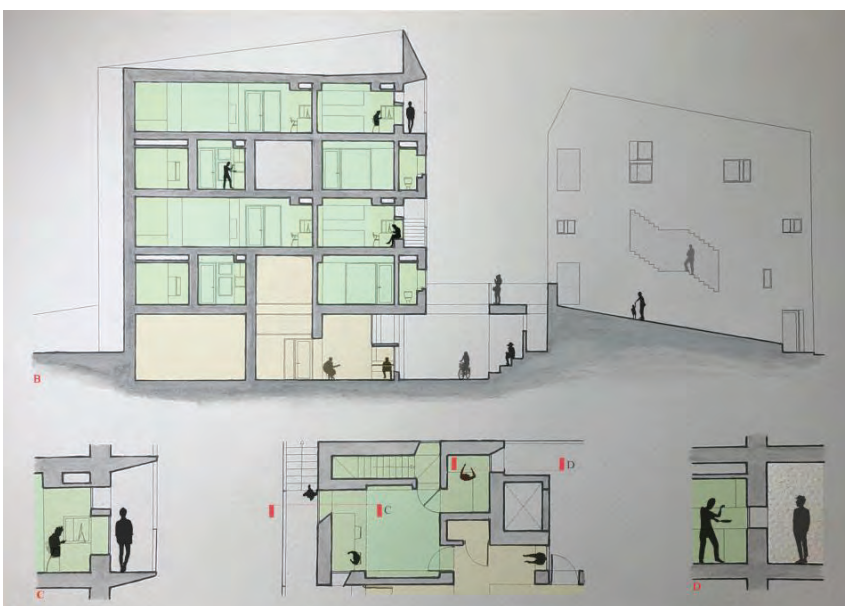
Fig. 35.2. *Section B.*
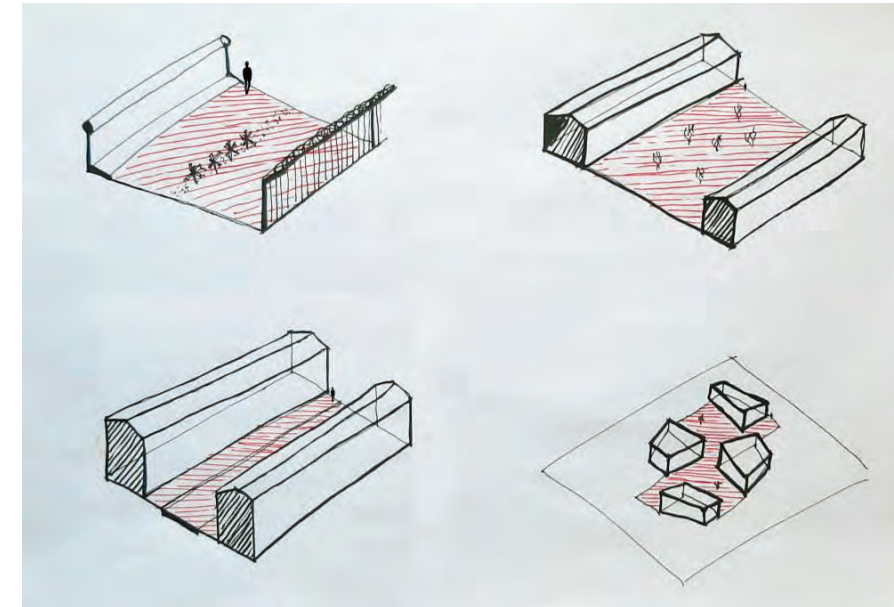
Fig. 36.1. *Space Between 1.*
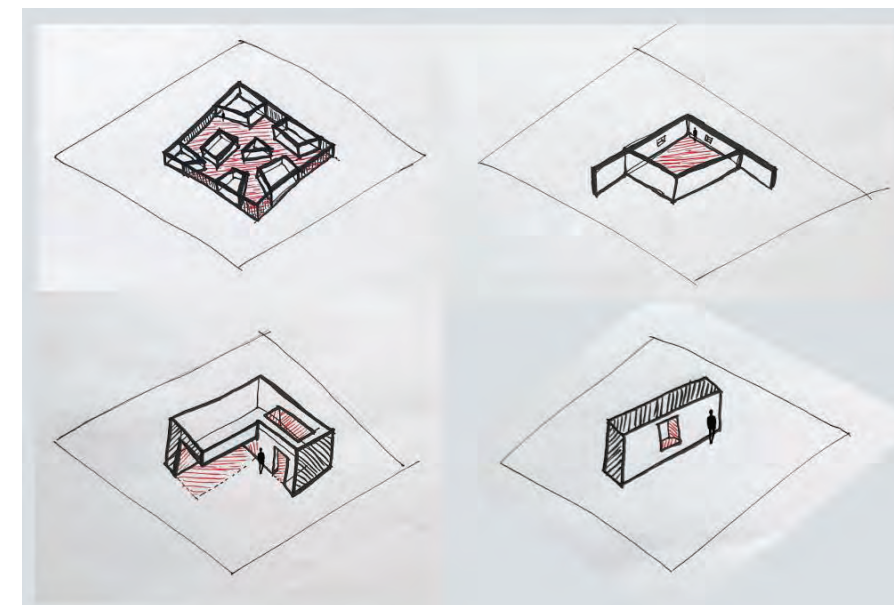
Fig. 36.2. *Space Between 2.*
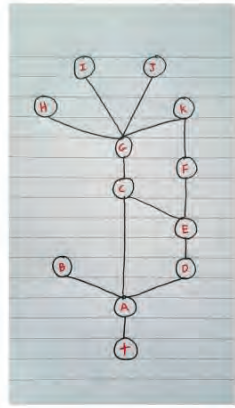
Hillier 'Space Syntex' method
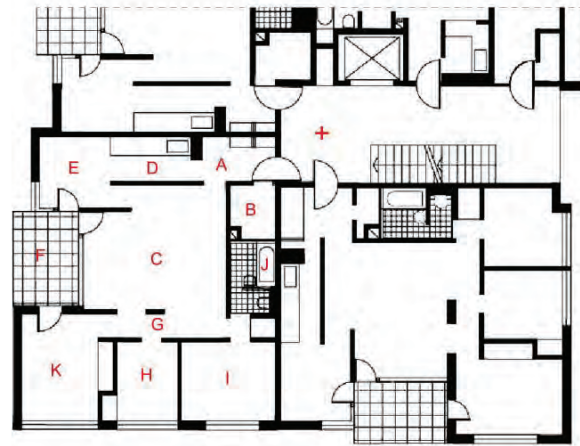
Fig. 37.1. *Hansaviertel Interbau*. Hillier's method.

Collective

Sequential Gap/ Buffer Zone

Individual

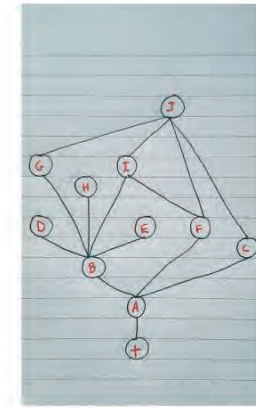Explicit Territorial Codification

Scheerlinck 'Territorial Depth' method
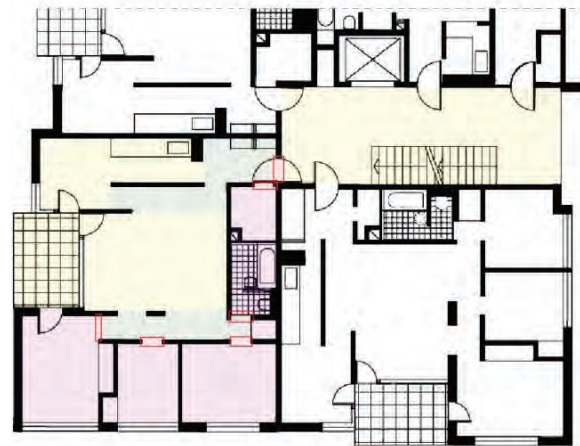
Fig. 37.2. *Hansaviertel Interbau*. Scheerlinck's method.
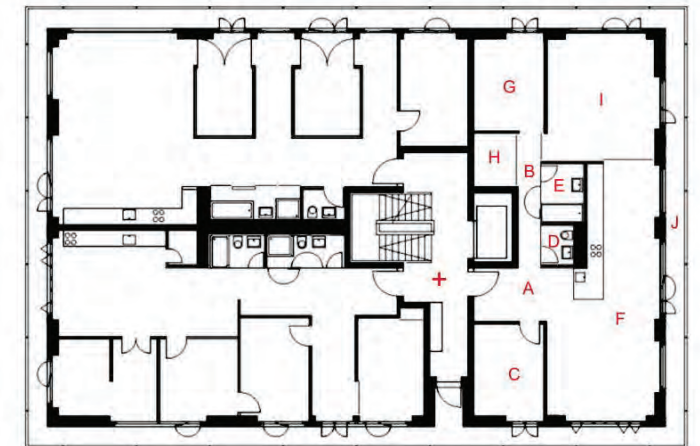
Hillier 'Space Syntax' method

Fig. 38.1. *R50 Cohousing*. Hillier's method.

Collective

Sequential Gap/ Buffer Zone

Individual

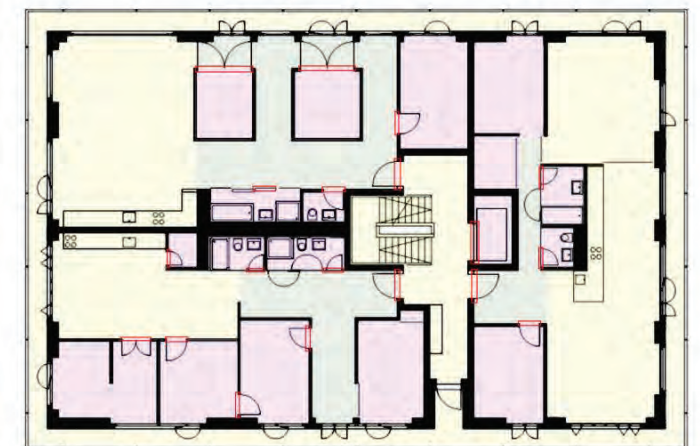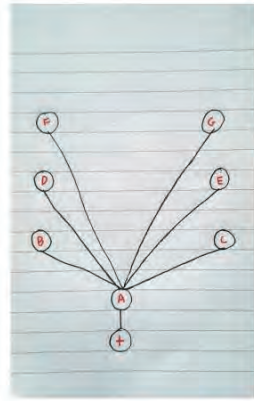Explicit Territorial Codification

Scheerlinck 'Territorial Depth' method

Fig. 38.2. *R50 Cohousing*. Scheerlinck's method.
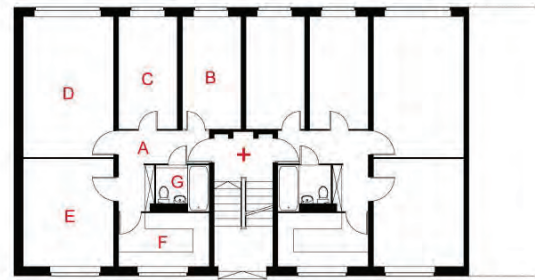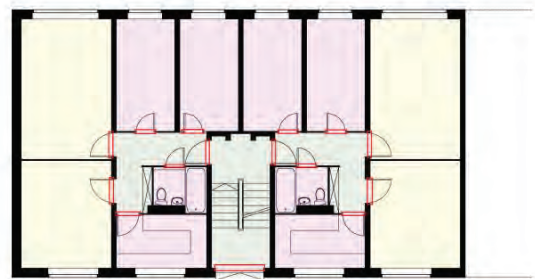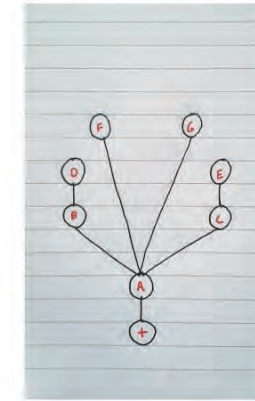
Hillier 'Space Syntax' method

Fig. 39.1. *Berolina Plattenbau*. Hillier's method.

Collective

Sequential Gap/ Buffer Zone

Individual

Explicit Territorial Codification

Scheerlinck 'Territorial Depth' method

Fig. 39.2. *Berolina Plattenbau*. Scheerlinck's method.
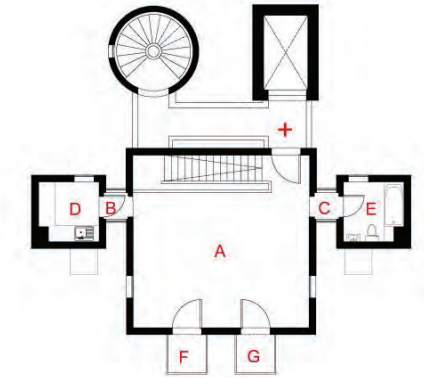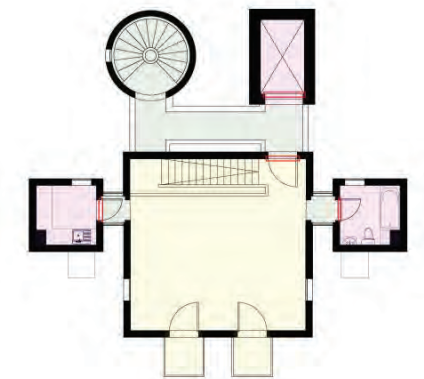
47

Hillier 'Space Syntax' method

Fig. 40.1. *Kreuzberg Tower*. Hillier's method.

Collective

Sequential Gap/ Buffer Zone

Individual

Explicit Territorial Codification

Scheerlinck 'Territorial Depth' method

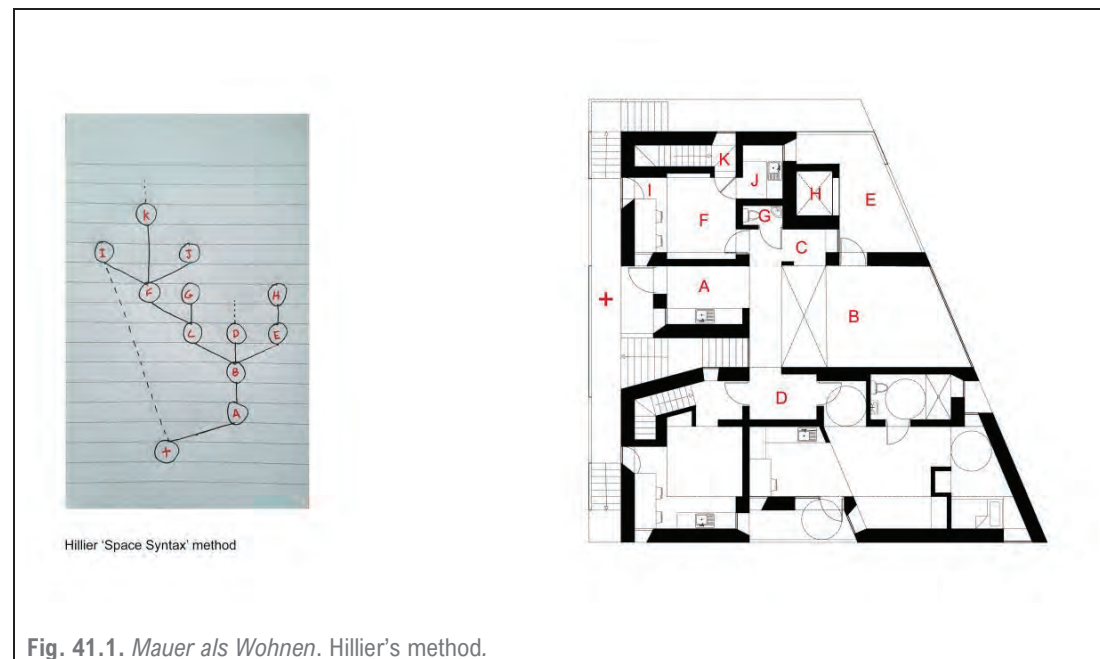**Fig. 40.2.** *Kreuzberg Tower*. Scheerlinck's method.

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Hillier 'Space Syntax' method

Fig. 41.1. *Mauer als Wohnen*. Hillier's method.

Collective

Sequential Gap/ Buffer Zone

Individual

Explicit Territorial Codification

Scheerlinck 'Territorial Depth' method
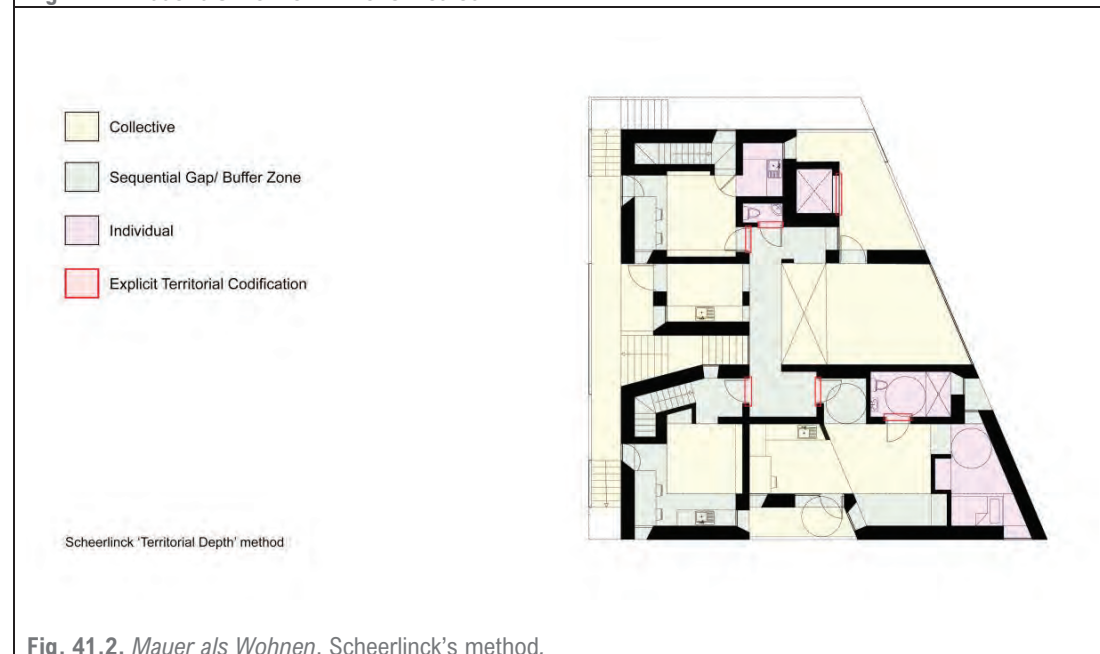
Fig. 41.2. *Mauer als Wohnen*. Scheerlinck's method.

With the critical distance afforded by the Summer break, the shortcomings of semester two's findings became increasingly apparent. The lack of focus on the dwelling scale coupled with the refined research question concentrating on the 'wall as living place', led me to investigate ways in which people inhabit the skin of buildings and how this in return is expressed on the exterior (**Fig. 31.1**). Again, ignoring plan and using watercolour I designed three situations where inhabitants interact with the depth of the external wall using Kahn's method of interplanar window assemblies (**Fig. 31.2**).

Fig. 32.1. is a floor plan from Duplex Architekten's *Mehr als Wohnen* (More than Living) cohousing scheme in Zurich. Note the private dwelling spaces appear like independent houses contained within the overall shape of the structure, with shared communal space flowing in between. If 'space' is bounded and measurable and 'anti-space' is unbounded and ineffable (Peterson & Littenberg:2018), then the communal space with its floor to ceiling glazing on multiple faces of the building is in fact anti-space, designed for communality to counterbalance the space of individuality. **Fig. 32.2.** were the initial sketch ideas to develop a revised configuration of the four blocks inspired from the above and the concept of layers and depth through walls, rather than spaces being dictated by structure as was the case before.

I did the drawings in **Fig. 33.** in order to better understand the intramural zone and how it relates to the individual living units. The second section is literally taken through the perimeter wall to reveal what moments are carved out of its mass. Applying a semi-public external realm wrapping the building, allows the circulation not to be static but to become a device for setting up temporal relationships managed through the architecture. This also affords a more concealed surface for window placement, making the overall form and elevation more pure and subtle.

The plans in **Fig. 34.** describe how every two floors is one cluster with two, two-floor units and two single-floor units, with a shared communal space between them. The sections in **Fig. 35.** illustrate how the wall is the giver and taker of intimacy, managing the balance of privacy and proximity through its fundamental depth with openings designed to mediate the intensity along thresholds. Vignettes are further used to demonstrate some of these choreographed moments which positions inhabitants in space.

At this point, I realised that my research was as much about the space between walls as the walls themselves; the underlying concept was analogous across all scales: From the space within the Berlin wall; between the Plattenbau; between the street fronts; between the blocks; between the units in the blocks; within the units themselves; the poche space within the perimeter mass; and finally, the space between the exterior and interior linings of the wall. (**Fig. 36.**)

The idealised modernist belief of physical determinism is turned on its head, revealing those conditions in which space can be the result of action rather than the cause of behaviour. (Stoner:2012, p. 16)

Indeterminacy provides a space for the self-determination of the occupant and allows them a less mediated and more direct relationship with the specific qualities of a space. (Sheridan:2012, pp. 202-203)

Taking a break from the methodology of research 'through' design, I was decided to explore territorial depth rather than literal depth, via research 'into' design. So, I took five buildings from Berlin including my own which I aptly named *Mauer als Wohnen* (Wall as Living), and I passed them through two methods of analysis. First, was Alvar Aalto's Interbau scheme *Hansaviertel,* through the lens of Bill Hillier's (1996) *Space Syntax* analysis. As seen in **Fig. 37.**, the plan is quite centripetal with multiple orientations and routes, making the spatial sequence less linear. Kris Scheerlinck's (2011) method identifies the significance of buffer zones between spaces acting as porticoes with the benefit of territorial overlap.

Next in **Fig. 38.**, is the R50 Cohousing which we had the privilege of visiting on our trip. Hillier's method uncovers a rich spatial depth with multiple readings where each unit finishes at the shared perimeter balcony. It's worth noting that each unit was tailored to each family so lots of unique elements to the plan. To contrast, I looked at a Berolina Plattenbau unit which is very standardised and modular in its plan with a very linear spatial experience. There is also lots of 'explicit territorial codification' which Scheerlinck attributes to a static and closed interpretation of space (**Fig. 39.**).

Analysing John Hejduk's Kreuzberg Tower through Hillier's method returns a similar result as the previous case and yet this spatial experience is radically more complex. The buffer zone bridges literally separate daily routines from the indeterminate central volume (**Fig. 40.**), Finally in **Fig. 41.**, I discovered my own scheme to be quite linear but with similar buffer zones as Aalto's between collective and individual spaces. The walls themselves are so deep that I've deemed them buffer zones also. However, Scheerlincks' method exposes that the binary definitions of collective and individual may not suffice for cohousing schemes. Therefore, a broader spectrum of sociality is required along with the blurring and expansion of the conventional role of walls.

Epilogue

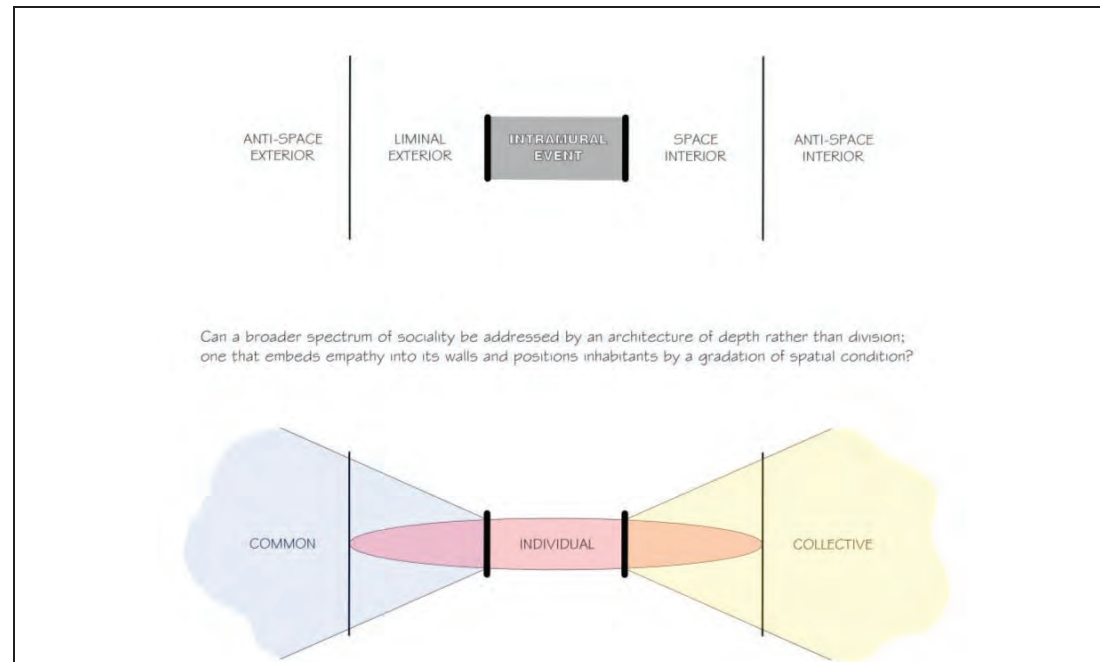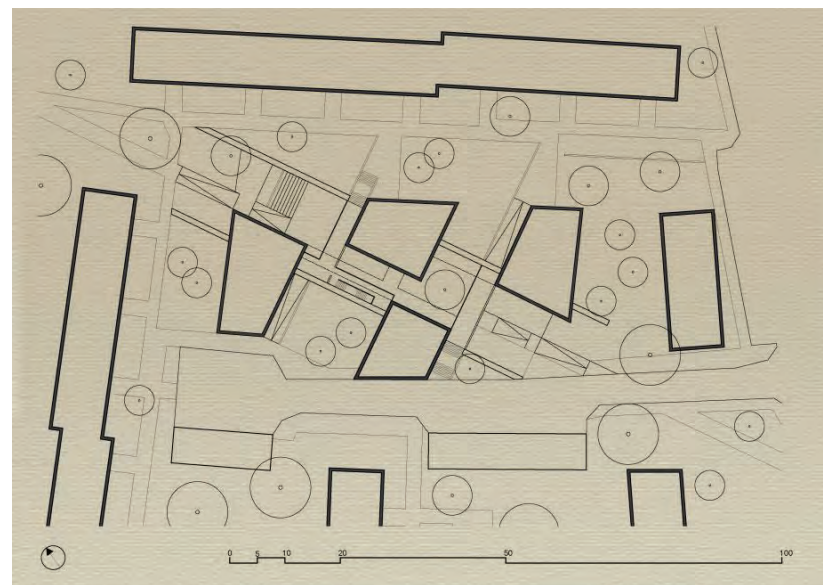*Semester 3 Final Design Research Project*

ANTI-SPACE EXTERIOR | LIMINAL EXTERIOR | INTRAMURAL EVENT | SPACE INTERIOR | ANTI-SPACE INTERIOR

Can a broader spectrum of sociality be addressed by an architecture of depth rather than division; one that embeds empathy into its walls and positions inhabitants by a gradation of spatial condition?

COMMON | INDIVIDUAL | COLLECTIVE

Fig. 42.1. *Spectrum of Sociality 1.*

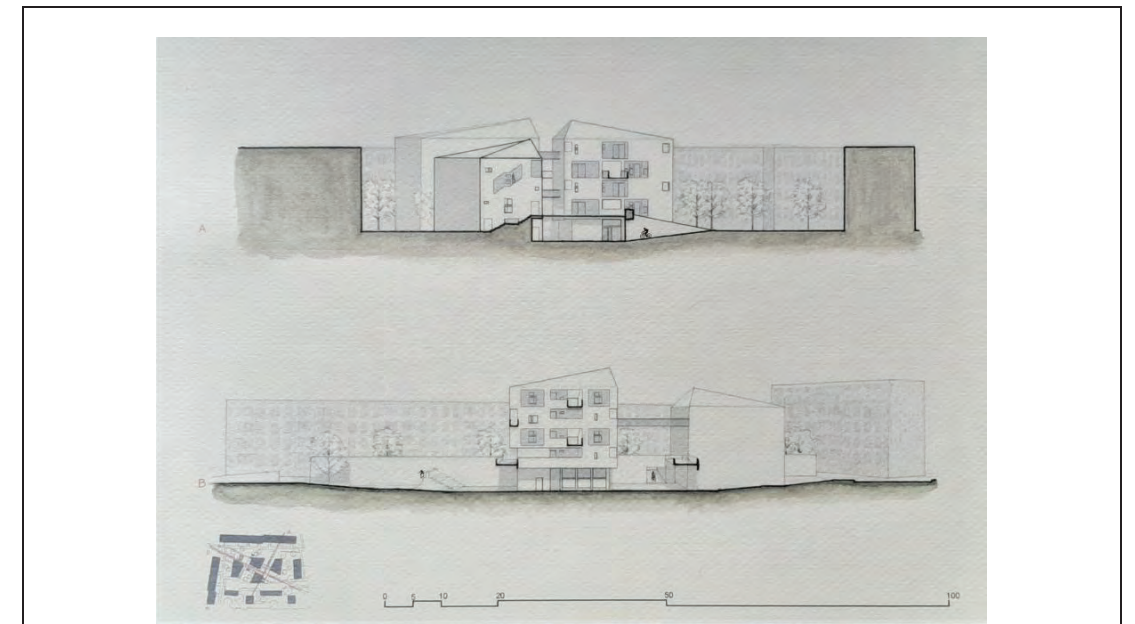**Fig. 42.2.** *Site Plan.*

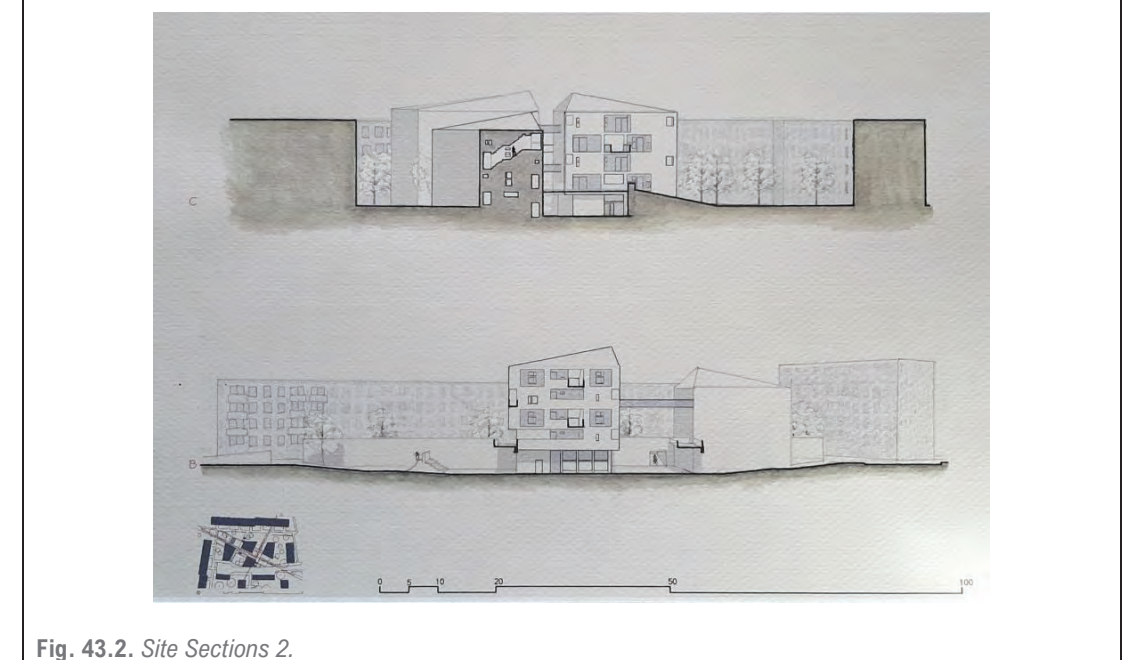**Fig. 43.1.** *Site Sections 1.*
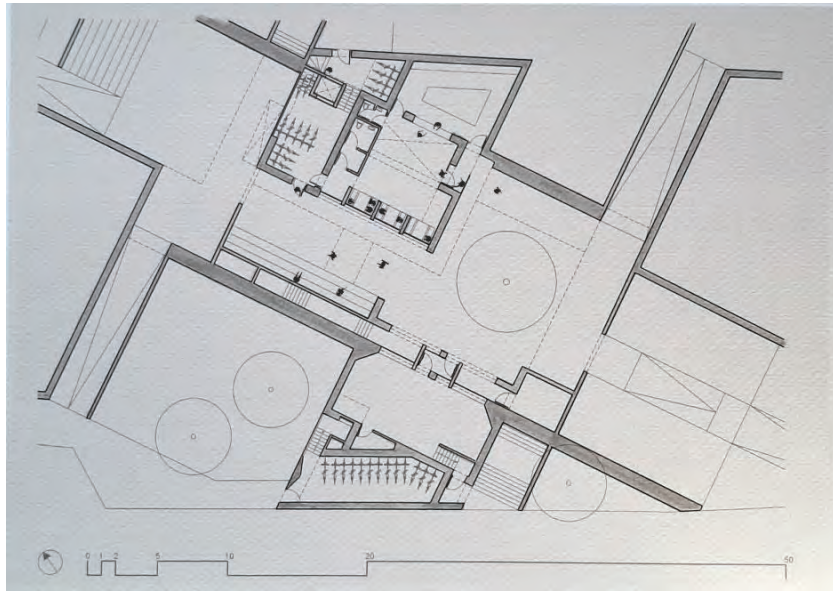

Fig. 43.2. *Site Sections 2.*

Fig. 44.1. *Ground Floor* – Option spaces for residents to add value to street.

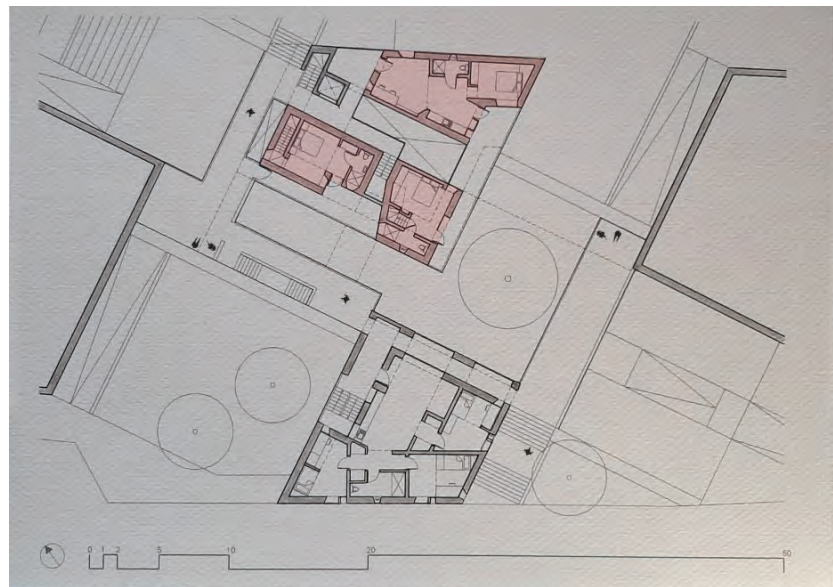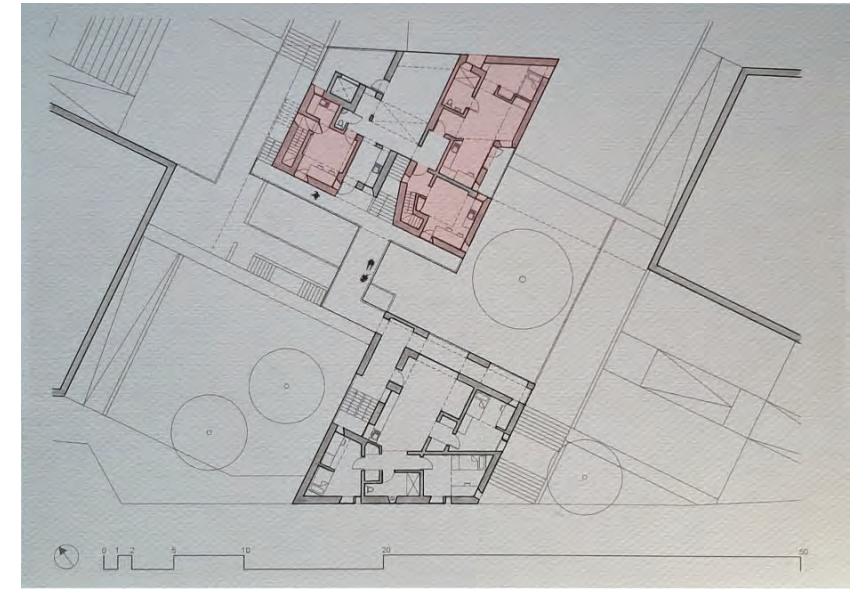**Fig. 44.2.** *First Floor* – units within cluster.

Fig. 45.1. *Second Floor* – units within cluster.
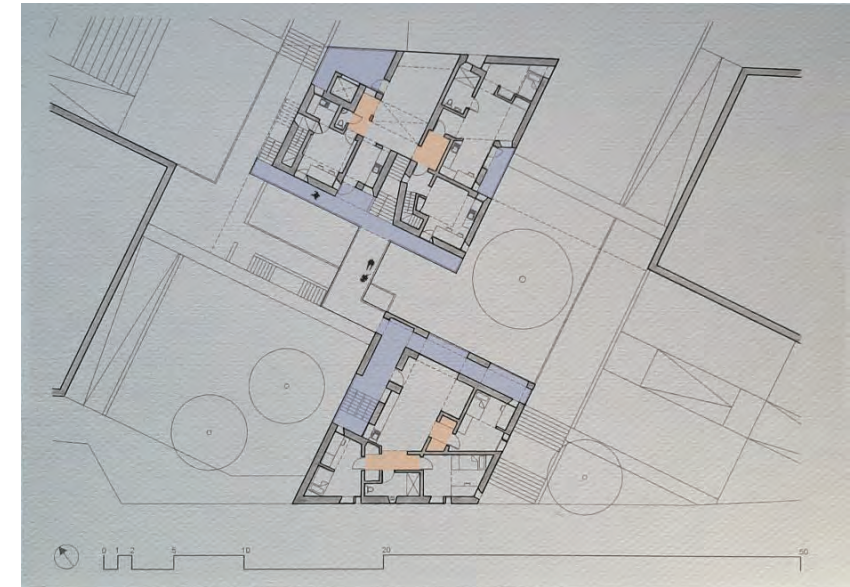

Fig. 45.2. *Second Floor* – Liminal vs Interstitial zones.
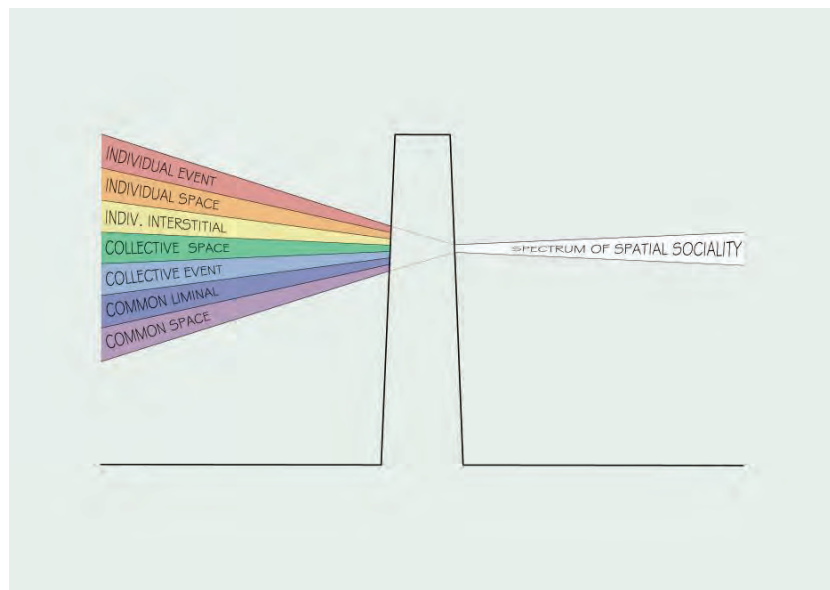
Fig. 46.1. *Spectrum of Sociality 2.*

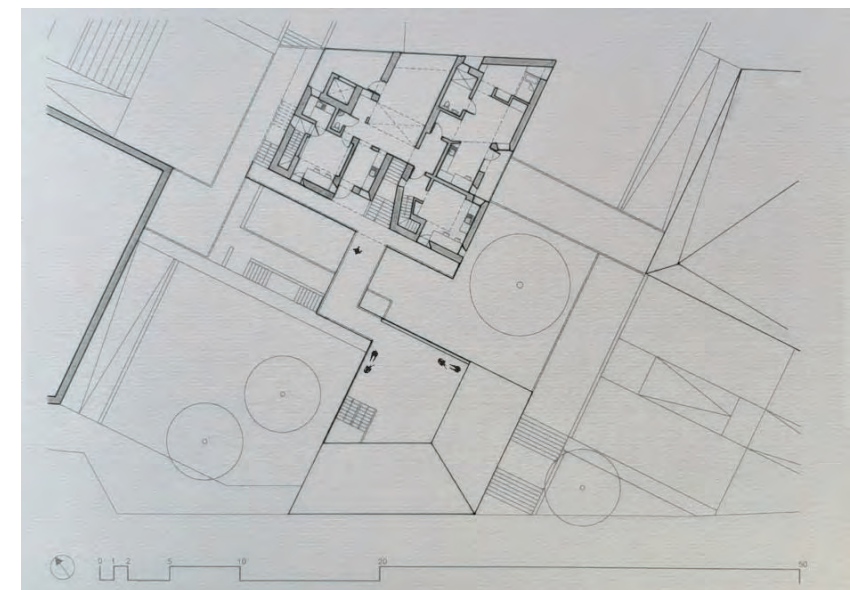**Fig. 46.2.** *Third Floor* – Full spectrum collapsed into plan.

Fig. 47.1. *Fourth Floor* – Roof Terrace.

Fig. 47.2. *Section A* – Collective space vs collective event.

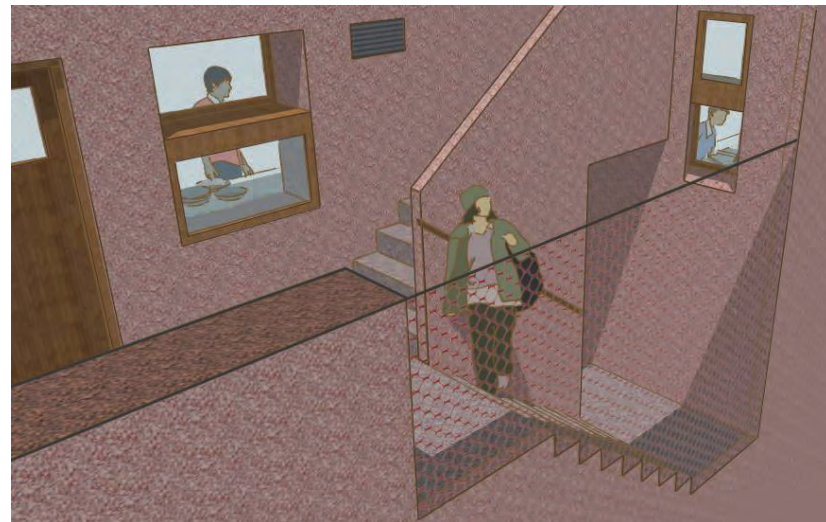**Fig. 48.1.** *Section B* – Liminal zone vs Individual event.

Fig. 48.2. *Privacy vs. Proximity* - Temporal Relationships in the Liminal zone.

Appendix

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