

The networks of concrete:

Tracing materiality in the redevelopment of Park Hill

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## Abstract

Concrete in the built environment is typically described as a static and inert presence, and as a receptacle of a creator's order. This view offers little consideration to the way we interact with the material on a daily basis. The aim of this dissertation is to provide a better understanding of how we engage with materials and unravel them in the exceptionally versatile specificity of concrete. In order to fulfil this aim I initially explore theoretically the active potential of materials. I then open the black box of concrete to trace its actions and study the daily performances in its different manifestations (such as renovation, use, experience, material and technical performance) in the redevelopment of a 1960s brutalist estate, Park Hill.

I start by revisiting the history of concrete to describe its interactions with human and non-human actors. Using the concrete in Park Hill's redevelopment as a lens, I adopt an Actor Network Theory (ANT) inspired methodology to trace the associations it forms with other entities. Assemblage theory serves to describe its complex specificity. Viewed in this way, concrete becomes neither nature nor culture, oscillating between the two. Describing the interactions of concrete I find that it becomes activated in a network, dynamically and it is continuously changing without a teleological purpose. In this network, concrete is never on its own, but continuously interfering with other actors involved in complex assemblages of the built environment. Concrete is thus exposed as an activated powerful agent, charged with the ability to instigate action and is fluidly and dynamically shaping and being shaped by this interaction.

Being active in a network with material and human actors, concrete reveals emergent properties, which are conceptualized as unexpected, non-linear and lacking in both causality and hierarchy. The purely material aspects of concrete, together with attributed meanings and the intentions of the creators, exist in a composite network of material and constructed interactions. Because it is viewed beyond constructs, it is revealed as active, and because it is intricately shaped, it is not solid and stable but vibrant, displaying many different modes of acting, interacting and even affecting those that surround it. A range of possible effects has been identified from the actions of the material that could not be constrained to the purpose it was originally ascribed to. Some pertain to the actions of concrete as an object, and some to its actions as a subject; some are material and some exist constructed in the minds of the users; they are emergent, unexpected and they all exist in a network.

Drawing inspiration from ANT and revisiting assemblage theory and concrete historiography, this dissertation aims to contribute to architectural studies, by presenting the interactions of concrete with human and non-human entities, activated in an assemblage and beyond stabilised descriptions. It also aims to contribute to studies of concrete by challenging the views of the omnipotent architect over the material and the idealised intentions of concrete in brutalism.

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## List of abbreviations

ANT	Actor Network Theory
CIAM	Congrès Internationaux d'Architecture Moderne
CQ	Concrete Quarterly
EH	English Heritage
PH	Park Hill
RIBA	Royal Institute of British Architects
STS	Science and Technology Studies
US	Urban Splash

# 1

## Introduction

In the spring of 2009 I found myself working on the final stages of the construction of a bank on a Greek island. The building occupied a small corner of the plot it was built upon, but its double storey underground car parking covered the entire site and was to be accessed by cars at ground level. To finish the exposed surface of the structural frame I needed a material that would not easily corrode and crack under the weight of the cars and so I chose a concrete screed. The structural frame was already complete beneath, and my concrete screed was proposed to protect it. I could not achieve a deep enough screed due to site constraints but also because it needed to take the weight of the cars parking at ground level. Improvising, and in an effort to solve the conundrum of achieving maximum weight versus minimum depth, I opted for a very thin layer of gravel concrete reinforced with polypropylene fibres. These structural fibres closely resemble white hair. The screed ended up looking like a woolly carpet with white fibre hair coming out of it. Not only did I not take into account the dimensions of the fibres, I had also underestimated the amount of fibres needed to support the weight of the cars.

The car park was fully usable and accessible because of my choice, and it ensured the structural durability of the frame below. However, the result was not well received by the stakeholders: neither the project manager nor the client were impressed with the furry ground surface I had created, and had the engineering team consider ways to cover it or even replace it altogether. There was not a specific structural reason for this. The stability was not in any way compromised, and the visual effect was likely to wear out over time, and once the floor became used. It was purely down to the odd and out of the ordinary appearance it had, with nothing

more specific given as a reason to justify a lengthy process of repair. There was clearly something about the surprise concrete had created that made the stakeholders involved indisposed towards it. How it had come up, and what this particular effect of concrete was, could not be addressed explicitly.



*Figure 1: Concrete on the Manchester Metrolink with fibre reinforcement coming out of its surface. Image author's own.*

For many years in my early professional life I have been almost immersed in concrete: either pouring foundations in moulds, and vibrating the liquid viscous material coming out of a pump, or mixing and testing concrete “recipes” in the manufacturing process. Every time I was using it for a project, it presented me with infinite possibilities to explore, and on many occasions, there was also an element of surprise; any time it is used by an architect or an engineer, concrete will invariably reveal something different. What comes out of the concrete mixer has already been through a process of sorting through infinite possibilities to end up in there, and once it comes back out of the mixer, it enters a domain that interacts with other entities to give infinite possibilities. These surprising and unexpected abilities of concrete are rarely discussed or appreciated, and even when they are, they are usually viewed in a negative spirit, as an occurrence in error, rather than simply another state of existence of the material.

### 1.1 Concrete described in a stable state

Typically concrete is thought of in a few specific states. Evidence of surprising capabilities such as those I discovered with the case of my screed are limited to being explored

across all disciplines that study the material, or are acknowledged as problematic states of the material. For example, when thought of as a structural component, concrete is commonly presented in a single fixed state, as a solid compact entity performing in a predetermined way, directed by an engineer. Addressed in this way, concrete is discussed as a sturdy material. Beyond its performance as a structural component that engineers are typically concerned with, it is often presented as the plastic material that enables creators to give shape to their concepts in architectural discourses, and as a cold unpopular material in popular culture.<sup>1</sup> Yet viewing it solely in one state can conceal other performances the material can encompass. For example, the view that it is solid and compact when acting as a structural component, performing in a set, predetermined way, does not account for instances where the material *does* deteriorate and *does* perform outside its intentions. When thought of in a more specific architectural history context, it is often associated by architects as the material of modernism, yet as Adrian Forty points out in his book *“Concrete and Culture”* (Forty, 2012:23), it is hardly the material that most enabled the shift to modernism in architecture, and that steel’s properties would be better fitting this description. In the view of Katie Lloyd Thomas, concrete can become *“matterized”*. It can become a paradigm of matter because it exists in a fluid and mouldable form, and regardless of the fact that it is composed of heterogeneous parts (Lloyd Thomas, 2015:273). Therefore, understanding the material in a specific solid state deprives it of descriptions that could account for other possibilities, throughout its life.

In this dissertation I will consider aspects and states of concrete that coexist in its *“life”*. To describe the material I borrow the term *“life”* from Arjun Appadurai who was the first to discuss the social trajectories of inanimate things in his 1986 book *“The Social Life of Things”* (Appadurai, 1988). For Appadurai objects are attributed meaning and value by the way they are circulated by users. The meaning of things is only that which is constructed by human attribution and this attribution is acquired by things being *“in motion”*, through their uses and

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<sup>1</sup> As will be presented in later chapters also, concrete in social media like Facebook groups and blogs is usually evidenced as a cold and harsh material, triggering negative responses.



trajectories both historically and culturally (Appadurai, 1988:17). Through this motion, things acquire for Appadurai a “*life*”. In viewing the materials as objects in motion that form relationships with other objects, I have also been inspired by the work of material culture theorist Daniel Miller who presents “*stuff*” not in isolation but in relationship with other things (Miller, 2010:51). Objects for Miller are unremarkable and peripheral, in that we are not always aware of their presence, and yet they determine our behaviour and identity. Moving closer to architectural studies, buildings as architectural objects in motion were first discussed by Stewart Brand who presented their “*life*” after they have been inhabited and as able to describe cultural, financial and historical stories in his book “*How Buildings Learn*” (Brand, 1995). Buildings are generally designed to be fixed and perform a static role, and not designed to adapt, and yet, in dealing with a building, Brand presents how one has to deal with decisions taken long before and for remote reasons.

In the way I view the material of concrete as an object in this dissertation I am considering it as being in a constant motion, a continuous interaction with other things. I have been inspired in this approach by the traditions of Appadurai, Miller and Brand (Appadurai, 1988; Brand, 1995; Miller, 2010). They view the object as having a continuous trajectory in motion and as being able to acquire and disconnect purposes, connotations and meaning throughout their life. This is in contrast with the way architectural studies typically view materials as static, and raises several questions: how is, for example, the concrete that sometimes deteriorates accounted for, if at all? How does this affect its trajectory? Why is concrete loved by some and equally hated by others, as evidenced in popular portrayals of the material and how do these opposing views fit in with discourses of modernism, or concreteness, or plasticity?

Part of thinking about concrete in a single or a limited number of states may be attributed to the social construction of the material. Its standardised consistency, which provides some constraints in its creative possibilities, ensures the material can hold safely together and perform a specific structural role. But these limitations imposed on the material,

although easily forgotten after their application, are themselves arbitrarily constructed, through creative processes of previous actors that eventually became commonplace. They were shaped into standards following a process of trial and error that can be related to factors ranging from sociolinguistic to pragmatics of material sourcing: these are conceived by the creators and can only exist as a result of human action, and not explicitly because of the structural and the chemical performance of the material. The constructed aspects of the standardization of materials as discussed by Antoine Picon (2005) and the standardization of concrete specifically by Katie Lloyd Thomas (2004), describe the way the norms are set for the material, whether that has to do with descriptions or language or the expectations of an engineer. Lloyd Thomas presents how materials become standardized and though they start with many potential ways, they stabilize to a few set descriptions. For eminent historians of concrete like Cyrille Simmonet (2001:119), Peter Collins (2004:90,221) and Adrian Forty (2012:16-39,105), whose work will be discussed in further chapters, these standards of concrete were achieved through several iterations of trial and error, but are by no means the only way. Viewing therefore the material of concrete in a stabilised mode, does not account for the potential of its unruliness.

Another reason behind this thinking about materials and objects as being stable can be found in Gilbert Simondon's *"Entretien sur la mechnologie"* where he discusses this manner of viewing objects as stabilised: For Simondon, a technical object needs to exist as a unity, as a solid object, before becoming an intermediary. Even in the first stage where culture has a role in constituting this object as an entity (i.e. how an object is assembled together is also a cultural issue, by deciding for example the use of glue or an ornament to hold it together), there is a consistent internal individuality. Regardless of the complexity of a technical object, it has to be a consistent unified entity to enter into existence (Simondon, 2009:106, 2011). Borrowing Simondon's description of technical objects, allows for objects, and by extension concrete with its million potentialities, to become stabilized and conceived as an entirety while also entering into a trajectory of interactions.

Viewing the material through the lens of critical theory or in a social construction of technology perspective, reveals limited aspects of the states the material exists in. Acknowledging that concrete can exist in a stabilised mode while interacting with other entities reveals the possibility to view it both as a material and a cultural object. In this dissertation I will attempt to challenge the dominant approach of studying concrete in architecture as culture ignoring its material aspects. Concrete is a material well positioned in the realm of culture and its social values are appreciated by architectural historians and theorists, but the material potential it offers for exploration in its different conditions should be further explored.

## 1.2 Turning to the potential of materials

In my effort to view concrete beyond its stabilised performance I will turn to descriptions of materials that acknowledge them beyond their passive and inert nature. This will enable me to move away from the material of concrete as a stable engineering or sociocultural product and investigate it as a physical presence that a subject can interact with. I will start this description of materials by questioning what they enable the designer to create. Can materials be thought as passive subjects in their interaction with architects? Can they be thought to be in a one-way relationship where the author/designer is the all-powerful?

Although it is clear how a creator uses materials to bring their vision into fruition, and architecture has been discussed as such for decades, it is limitedly explored whether and how the material has enabled the shaping of a produced outcome.<sup>i</sup> The material having a contribution to the formation of the built environment, like in the case of my screed, may seem peculiar, primarily because this ability to contribute is usually associated with a human potential to act and reflect upon the actions, and therefore with a conscious mind. Arguing for the actions of materials in themselves challenges the traditional view that they are solely serving as an inert receptacle of the designer's orders. Re-thought as such, materials can be charged with an

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<sup>i</sup> For a description of how form is influenced by the physical material of model making see DeLanda (2007); Dunn (2007, 2014); Yaneva (2009a) and by the digital object see Leach (2009a); Picon (2010).

ability to answer back to a creator, informing and co-authoring the outcome. To argue therefore for the actions of materials and describe how they can participate in shaping the built environment alongside attributed meaning, I need to look for ways of thinking about matter as active and able to have a force previously attributed only to humans.

The notion of philosophical agency is associated the capacity of a human subject to act and reflect upon its actions. Charged with self-consciousness, human actors are able to participate in actions instigated through their free will. Since humans have the ability to reflect on their actions, and willingly exercise their force to create change, they can be charged with a force, which is purely human. Frequently this human agency may involve the use of non-human components, in calculated moves and decisions based on previously acquired knowledge on the use of matter, as for example the use of a tool. The agency, however, that matter has in this case is still human as it can only be instigated by human action. The concept of non-human agency, where matter has the capacity to act disconnected from a free will, and intentionality is more difficult to describe than self-reflecting human agency. By “*non-human*”, I refer to the term initially used by Bruno Latour in *Science in Action* (1987:130) to overcome the traditional dichotomy between subject and object. In the Actor Network Theory (ANT) tradition that I will discuss further in another chapter, humans and non-humans, coexist equally as actors within a network. In contrast to the view that matter is inert, non-reactive, static, and unresponsive, the recent turn to materiality argues the ability of matter to act unintentionally, but with a contribution that comes only from itself as a non-human actor.

The introduction of new materialist thought in the humanities has steadily been gaining momentum, particularly since the publication of the “*New Materialisms*” by Diane Coole and Samantha Frost (Coole and Frost, 2010). Matter for the new materialists is moving away from transcendental notions into a destabilising presence dynamically active through speed, intensities and flows. Inspired by post-structuralist thought, and particularly by Gilles Deleuze and Felix Guattari’s work, new materialists reposition the old materialism in a realm where it

becomes dialectical with its activeness, by processes of auto-production and self-maintenance as argued by Pheng Cheah (2010:78). Matter is ascribed a vitality that for some scholars is described as vibrancy (Bennett, 2010:preface), or self constituting entity (Braidotti, 2010:201), or a destabilising agency (DeLanda, 2006:39,90-93). All of these views have in common the acknowledgement that matter has agency in engaging with itself and its surroundings.

While these developments of viewing the potential of matter, materials, objects and stuff are still on-going, they are also being brought in the realm of architectural studies. Architecture discussed through the lens of Deleuze, has been avidly been researched by Deleuzian inspired philosophers like Manuel DeLanda (2005) and Ian Buchanan (Buchanan and Lambert, 2005), architecture theorists like Andrew Ballantyne (2007) and Helene Frichôt (Frichôt and Loo, 2013) and architects like Bernard Cache (Cache and Speaks, 1995). Deleuzian terminology like the terms consistency, territorialisation and actualisation have become relevant in architecture and can offer me the potential to view concrete as an activeness in the built environment. In my effort to view concrete beyond its inertness, I will move to viewing it through a Deleuzian perspective, where it has the ability to act and actively acquire descriptions.

### 1.3 Using assemblages to describe concrete in Park Hill

#### 1.3.1 Concrete challenging architecture's views of materials

The choice of concrete for this dissertation that challenges views of architecture on the material has not been random: Understanding modes of production of concrete buildings has gained significant momentum recently. This surge gained thrust with the publication of Cyrille Simonnet's book *"Le Béton, Histoire d'un matériau: économie, technique, architecture"* in 2005 (Simonnet, 2005) and Adrian Forty's *"Concrete and Culture: A material history"* in 2012 (Forty, 2012). The revival of brutalism and its associations with the material had already triggered this renewed interest, and in the past half a decade the subject has been steadily gaining speed. The June 2015 special edition issue of the Journal of Architecture on *"The meanings of concrete"* is also indicative of this surge. The revival of concrete focuses mainly on the use of

the material on the drawing board and the intentions of the architects. While there still is a lot to be discussed on the life of the material in its initial phases (i.e. the original conception, drawing, implementation on site), this dissertation will also investigate beyond this stage of its life and will research concrete beyond the intentions of the designer and the maker, into the realm of the aftercare. In this phase of its life, concrete is traveling alongside but not necessarily connected to a creator's intentions. Rather than researching concrete as the static symbolic representation of modernity or brutalism or how it is constructed and standardized in its production, I am interested in how the material of concrete is experienced, perceived and what it does on a daily basis. This is when it becomes more alive and its actions will be evidenced, in the space where it is left to act, distanced from the wills of engineers and architects. Like in my own case of screed, when it did not act the way it was theoretically intended to and it triggered a discussion between myself, the project manager and the client that went beyond what the material was intended for, revealing an unexpected behaviour. In this dissertation, I will follow the life of concrete becoming active and displaying the potential to elude the static definitions it is ascribed. This potential will be searched from the drawing board, to the construction phase and into the period of use and aftercare of a building to reveal how concrete is understood and experienced in its every day life in multiple settings.

### 1.3.2 Shifting modalities of concrete in Park Hill

To study concrete in this multiple and changing context, I have selected to focus the research on the case of Park Hill, a brutalist estate constructed in concrete in the late 1950's that is currently undergoing a redevelopment (Lynn, 1962; Jackson, 1970; Cruickshank, 1995). Park Hill and its concrete have been through some remarkable transformations over the years. Sometimes these transformations were intended, such as the decision to maintain as much as possible of the concrete in the current redevelopment. In other occasions, such as the state of disrepair the material fell into in the 1980's were unintentional. In both cases the concrete has a story to tell about its presence on site.

Park Hill came to replace an entire neighbourhood of Victorian back-to-back housing that pre-existed Park Hill. Back-to-backs had a typology that had been notorious for the squalid conditions they created for the residents, with shared water and “*privy*” facilities and little daylight entering the living spaces. Architects Ivor Smith and Jack Lynn replaced the tight streets pre-existing in the urban grid of Park Hill, with new ones of the same names; only this time the streets were above ground. The residents from the old back-to-backs became the new residents in the estate’s apartments.

The optimism that came with the development of Park Hill and its futuristic “*Streets in the sky*”, is evident from the early days of its life. Concrete was used for the construction of the estate as the material of choice for many similar developments of its era, and at a time when material availability was recovering from the post war shortage state it had been in. The intentions of the government in the slum clearance programme were to create housing needs for the optimistic future and this coincided with the intentions of Park Hill’s architects. Smith frequently talks about the enthusiasm and confidence of their original design for the subsequent generations. Concrete at that stage was charged with the intentions of leaving the squalid past behind for a positive future. Descriptions of the estate around the time of its creation talk about either the functions of the new flats, and how different they were to the previous conditions, or descriptions of its architectural treatment. Accounts of concrete were restricted to formalist



*Figure 2: A view of Park Hill that has yet to be redeveloped. Image author’s own.*

interpretations of the estate, such as Ranyer Banham's comment in the Architectural Review of December 1961: "*plain concrete trough-beams are so immediately effective in conveying the idea of communicative continuity*", Banham AR December 1961. The same optimism is evident in the opinions of the residents: Park Hill was a modern way to live, especially when compared with the conditions of squalor they were coming from.

But the optimism did not last for long. In the 1970's the reputation of the estate started declining and in the 1980's and 1990's it became notorious for drug dealing and prostitution in the area. Increased crime rates in the area, coupled with the overwhelming lack of maintenance had left Park Hill into a state of disrepair with the concrete was remaining unmaintained and deteriorating. And while public opinion on the estate was overwhelmingly negative, English heritage took the decision to list it in 1998. With no imminent plans for refurbishment or amelioration of any sort, and with a listing decision that made difficult for any work to take place without the approval of English Heritage, the estate fell even further in disrepair until 2010. By the point when Manchester-based developers Urban Splash moved in the estate with a redevelopment plan, the concrete had been severely deteriorated.

### 1.3.3 Concrete in Park Hill through the prism of assemblage theory and ANT.

#### *The focus on Park Hill's concrete*

A great deal has been written on Park Hill since its original creation. Presentations of the estate's history have been revived with the on-going renovation, and there is a proliferation of literature emerging on Park Hill since the redevelopment began in 2010. However, this dissertation will not focus on revealing historical information about the brutalist estate. I will be going back to the original history of Park Hill, only to contextualise the presence of concrete.

Park Hill offers itself an ideal milieu where threads of concrete stories come together over a 50-year period. The redevelopment that the estate is currently undergoing, will allow me to unravel the paths of concrete, both with regards to its past life, but focusing primarily on the current transformations of the material. Contractors, developers but also users are currently on



the site of Park Hill, interacting with its material features. Whether it focuses on decisions that professionals have to take around the material, or occupiers interacting with concrete interiors, Park Hill offers an abundance of concrete manifestations to explore.

Having been on site for over 50 years, concrete has continuously been mutating and forming new relationships with other entities in Park Hill, while cutting off others. The material has been present on site in Park Hill, and in the discussions involving the estate for over 50 years now. In the cases where it is not explicitly mentioned, as I will argue later on in chapter 5, it will inform the dissertation through its absence. During its course, the material has revealed an active presence in decisions taken by historians, preservationists, users and designers. From being passive in the background it has now become an element protected for its heritage and influential in shaping the outcome, both in terms of what is produced visually, historically and structurally but also on how it is experienced.

Concrete in Park Hill has triggered a multitude of human responses, and these voices have been limitedly explored, both in Park Hill, and in the context of architectural history and theory for other architectural examples. Perceptions and experiences of the material by people within and outside the construction trade widely vary. Concrete is the subject of controversy among professionals and users. It is either “*loved*” -usually by architects- or “*hated*” -by non-



*Figure 3: A view of the redeveloped Park Hill from one of its streets in the sky. Image author's own*

architects, as portrayed in blogs and social media. The terminology “*concrete jungle*” and “*concrete monstrosity*” versus “*concrete utopia*” is commonly used in popular culture. In this array of multiplicities, and open-ended associations, concrete provides substantial reasons for selecting the particular material to look into the material's agency.

At a time when discussions of brutalism are being revived and their position in architectural history is revisited, this brutalist development is at the centre stage regarding its controversial decision to renovate (English Heritage, 1998; ‘Park Hill flats , Sheffield,’ 2010; BBC, 2011; Urban Splash, 2012; Scott, 2014). Concrete gets caught up in these discussions and becomes a crucial part of them. The old concrete meets the new concrete, both on site in Park Hill, and in the specific timing of its redevelopment: discourses of the material are changing and new technologies are replacing the old. This dissertation will not be a historical study into the origins of Park Hill, nor a description of the current renovation. I have selected Park Hill as I have found it to be an ideal location to look at the material agency of concrete in a variety of settings.

#### *Concrete in a multitude of material and immaterial entities in Park Hill*

Beyond the current revival that concrete is experiencing, it is selected as an appropriate means to demonstrate the agency of materials. The way it is constructed on site is often dictated by mundane and ordinary pragmatic reasons, coined with an element of serendipity. The creation of a concrete structure, in practical terms, is also dictated by acts not necessarily coinciding with the science of the material: it is the result of several processes, making it an interesting conglomerate on its own. Concrete in this view offers much potential for exploration: the manufacturing of cement and concrete (a highly scientific practice), the craftsmanship of the workers (an empirical process), their interaction, and the interaction of the above two with other building actors, human and non-human, create an interesting relational mix to investigate.

In Park Hill, concrete has been the central focus of the on-going redevelopment, with many of the efforts of English heritage focusing on the material. It has been interacting with other human entities on site and this is revealed by decisions taken on how to treat concrete. At

one point in the renovation process there was nothing left of the original materials in the structural frame of Park Hill, apart from concrete. The decisions surrounding the material have involved a great number of professional decisions, such as English Heritage, Urban Splash and subcontractors, but also material aspects came in the mix: availability of suitable coatings, the condition of the concrete on site that had deteriorated by human intervention and by the elements. All of these human and non-human presences have been interacting on site during recent years, and to describe the relationships they are forming with each other, they will be conceptualised in a network. The concrete has also interacted with users: original concrete in all of the flat's interiors have been left virtually intact, with only some rehabilitation treatment and with the original aggregate particles still creating rough textures in the walls of their flats. The network therefore concrete is participating in is open-ended and allows for a number of interactions between its elements to be explored.

Concrete will not be dealt as a black-box, as I will argue in the next section: I will search into the material to uncover how users and professionals engage with it, and I will immerse myself in it to explore what its creation in Park Hill has involved. This will be done both literally and metaphorically. Literally, by looking into the actual material on site, how its components have behaved, and the production methods of concrete. Metaphorically by observing the actions of professionals and users in Park Hill, both recent and past: how were coatings were selected and how did the developers decide on the concrete that was being rehabilitated? How have occupants in Park Hill been interacting with its presence in their flats? These are questions I will keep in mind while uncovering the active potential of the material and reveal its multiple states.

#### *Assemblages of concrete in Park Hill*

Assemblages, which I will present in more detail in chapter 2, will also become a framework through which concrete in Park Hill will be viewed. Primarily they offer the possibility for concrete to be described in multiple states, not necessarily in opposition, and not in an

idealised state, while all of them being valid at the same time. They offer an appropriate framework to describe concrete in a variety of settings, all coexisting and interacting with each other. Acknowledging the presence of many multiple states of the material is the first step in describing them, and assemblages offer the way for them to be acknowledged and described. Within an assemblage where concrete participates, no single setting of the material can be discarded as invalid, nor can any state claim to exist on its own or as a dominant one. Assemblages, as will be later presented, grant the potential of acknowledging all of these states as valid and as co-existing, and they can further acknowledge that the multiplicity of states can exist both in the actual and in the virtual.

Concrete in the vast building assemblage of Park Hill interacts with myriads of entities and the potential of actualisation of all interactions needs to be acknowledged. Viewing the concrete in its intricate assemblage of Park Hill allows for virtual states of the material to exist alongside actual ones. While this dissertation will focus on concrete *acting* as an assemblage, it is worth noting that it is itself an assemblage of many components: it contains within it a number of potentially contradicting actualities and virtualities with the potential of becoming. Water, cement, fine aggregate and coarse aggregates alongside cement mixers, craftsmanship and empirical knowledge all interact together to name but a few. Concrete is also still a material in the making, and its working act as an assemblage. It is shaped by a continuous process of scientific and empirical experimentation, evolving its form with innovation while also remaining highly vulnerable to corroding factors. And while maintenance products are available on the market, their availability depends on geographical, economic and even educational factors of the users, and so their use and their effect cannot be taken for granted. Although avant-garde types of concrete are constantly emerging advancing its construction, what has already been produced remains susceptible to weather and corroding pollution. So concrete becomes in effect this living object that is forming continuously, and at any time, there are myriad potential

states for the material with the possibility of being actualised. The interactions offer a multitude of possibilities to investigate, even for potentials that were not actualised.

Concrete in Park Hill is an assemblage itself heavily complicated, and properties arise from the interactions of its parts in a metaphysical way; thus, emergence in assemblages can account for this unexpectedness. The manner in which the material and immaterial parts operate together is not always straightforward and clear. The effects of concrete can sometimes be traced (for example the deterioration can be traced to the lack of maintenance) but other times they simply emerge: how were the decisions of the rehabilitating the old concrete reached, and how did concrete transform from a vehicle serving an intention into a carrier of historical heritage? The multitude of presences into the complex Park Hill mix give rise to properties for the material. Concrete in Park Hill not just serving a purpose of a structural component: its visual properties are also operating in the exposed concrete interiors. Assemblages offer the framework to present these properties through emergence.

Finally, the assemblage of Park Hill can include both material and immaterial entities, and this is another reason why assemblage theory becomes relevant. It is a collection of material components but also experiences, past memories and constructed ideas of the residents about concrete that all come into play and affect the way the building is understood. In order to gain an insight of what the multiple states of concrete may be, one has to look into the interactions with its ecologies, its networks, its environments. ,The material will in some instances, be free from transcendental ideas projected upon them, but in other instances, constructed aspects of the materials need also be recognised. I will not aim to attribute a purely material agency in the concrete, in an environmental determinist mode investigating the heroism of concrete, but neither in a socially constructed mode where the material becomes active solely through attributions of meaning. Concrete will be studied as fluctuating in the space between these two extremes of the assemblage, touching simultaneously upon both but sitting upon neither.

The aim of the dissertation will therefore be to provide a better understanding of materials in architectural studies and unravel them in the specificity of concrete as an exceptionally versatile material. In order to fulfil this aim I will initially explore theoretically the active potential of materials. I will then open the black box of concrete to trace its actions and study the daily performances in its different manifestations (such as renovation, use, experience, material and technical performance) in the specificity of Park Hill.

#### 1.4 Accounting for the variability of materials in architectural studies

In my effort to describe this variability of concrete and the daily performances of its different manifestations, I will turn for inspiration to Science and Technology Studies (STS) as a way to investigate the material in a manner that acknowledges both its non-human agency and its constructed existence. Science and Technology Studies challenge the capacity of technological objects in culture and society (Latour, 2005:94) and describe it as an intricate coexistence of an actor's conception / production / distribution / use (Akrich, 1992; Akrich and Latour, 1992; Bijker, 1997; Akrich et al., 2002a, 2002b). Actor Network Theory (ANT), which emerged as a methodology of analysing technologies within STS, allows for objects and matter to have agency as well as humans. The term *agency* within ANT is rearticulated slightly as something that triggers "*a movement, a displacement, a transformation, a translation, an enrolment*" (Latour, 2005:64) and therefore is not anymore a hierarchical power/action on behalf of a human.

ANT views this coexistence of agencies in a network where both human and non-human presences can assume identities and can interact in a continuously adapting way. Analysing an object by means of a network that can contain any actors involved in the creation, scripting, acceptance, adaptation, translation, interaction, reveals certain aspects of it that

cannot be described by the dualism of subject versus object. Yet, there exist instances when the object is indeed concretized in one description once the network of actors in which it participates, is stabilised. Perceived in this network, the presence of any actors that are not stable themselves can destabilise the network at any time when interacting (Miettinen, 1999), and materials can have an active presence in these networks. The opposing views of seeing an object purely through the dichotomy of nature versus culture are challenged by Bruno Latour (2012) who argues for the need of a dimension beyond this dipole.

In order to view materials and this agency they could be able to exhibit, one has to turn to the practices that involve them. They need to be reviewed in action, in their trajectory of transformation and translation in order to be recontextualised in a continuum of both nature and culture. A renewed interest in practice is currently on-going in architectural studies in search of ways to view actions critically. Abilities of objects, as Isabelle Doucet points out, have been taken for granted by architects, since they would always design in the hope that their buildings would enable or disable interactions and would shape conditions. However, as Doucet points out, this observation of agency was not the case of sociology, where Latour's repositioning of the object as active itself was a big statement (Doucet, 2015:16). Taking the building away from its "*Euclidean space*", as Latour and Yaneva name the idealised form of the building that typically characterises architectural theory (Latour and Yaneva, 2008), provides a new way to tackle it. In this mode there is no objective and subjective presence of a building, but rather simply a built object interacting with other presences. This view repositions the material presence of the building's form, be it in the actual physical presence on site, or in the model of its conception, or in the computer modelling tool used, acknowledging therefore its activeness.

In this mode of describing a building in the context of other presences, Isabelle Doucet identifies a turn in architectural studies, which she names the "*Practice turn in architecture*". It is the culmination of several critical theories brought into architecture paired with pragmatist philosophical traditions. In this turn of architectural theory towards critical practices the

collective efforts of many actors, rather the heroic actions of an single architect are appreciated (Doucet, 2015:15). The views of the practice turn either follow on more traditionally positioned critical theory or are inspired by Science and Technology Studies and Actor Network Theory. Bruno Latour and Alben Yaneva have propelled the interest of architecture into ANT namely with their paper “*Give me a gun and I will make all buildings move*” that dismisses the assumption that they are static objects immovable in space and time (Latour and Yaneva, 2008:80). For Latour and Yaneva, users and occupants have long been considered as operating in a subjective experience of space, beyond the geometry of a building, and yet the actual building was always thought of as a set of lines on engineering plans and 3D objects on architectural drawings. Buildings themselves, as Latour and Yaneva continue, operate on a subjective non-Euclidean realm and moving along with their human presences inhabiting them.

Interacting with an object’s “*script*”<sup>i</sup>, in the view of ANT, enables a user to reconfigure it. Alben Yaneva discusses the interaction with objects in architecture, and presents it in the realm of architecture to describe how it operates. Viewing it through the lens of ANT, Yaneva presents how it enacts the social, in ways often unappreciated, questioning what actions material objects trigger, enable and induce (Yaneva, 2009b). A contemporary building’s material action described in a ANT methodology does not cease to be an object, but still structures social action, and according to Gieryn, this is done both through human interaction with the technologies of a building and by concealing or rearticulating their script. This reconfiguration for Gieryn can be both material and discursive (Gieryn, 2002).

In this dissertation I will follow an “*entangled account*” as Isabelle Doucet (2015:20) names this approach of an assemblage description, or “*object in flight*” according to Bruno Latour and Alben Yaneva (2008:85), inspired by seemingly distant accounts of architectural and social theory. In my case, I will bring to the description of concrete its architectural

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<sup>i</sup> “*Script*” is a term used in STS and ANT literature, coined by Madeleine Akrich to describe the scenario an object needs to perform (Akrich, 1992).



historiography, rethought through Deleuze and incorporated into architecture combined with methodological inspiration from STS and ANT.

To bring the presence of materials into architectural studies through the practice turn I will investigate Park Hill as an object in time and space that is interacting with other presences. Focusing on the case of Park Hill, I will initially zoom out from the redevelopment to describe Park Hill and the material in a larger timeframe, while still interested in the pragmatics of the site. I will then focus on the material in the process of the redevelopment by conducting interviews with professionals involved in all stages of the listing and redevelopment. Instead of focusing solely on how the material performs in the creation of a building either as an active material or a passive presence, I will present it in a context where it becomes alive both onsite, while it is shaping architectural production, and in its interaction with building occupants, users, and professionals involved with the building after construction is complete. I am researching both what happens in construction, and what discussions the material is having with occupants, building caretakers, developers.

While following the renovation of Park Hill, this will not be a dissertation on renovation processes; this would require an investigation of only this specific phase of the material. I use the renovation as the initial point of tracing the material in the network. From there I move into multiple settings, where the concrete engages with dialogues with the developer Urban Splash, who have developed an intriguing attitude towards it, moving into the setting of the home where the material continues to manifest actively. I will also go back to its historical settings to describe its historical agency and look at concrete in the housing association that partly runs Park Hill, where it still continues to act. In this complex network of settings where concrete will perform different actions relative to the context and the presence of other actors, its non-human agency will be revealed. Within all the specificities concrete is located in, the agency will become visible, in different ways every time, but nevertheless active in all of the settings.

Concrete will be investigated in its entirety, existing at the same time on multiple levels, not simply in construction or use, in the past or in the present, but continuously and seamlessly. So far, discussions that have revolved around the use of concrete beyond the drawing board, have been limited to how decisions in the construction phase have demonstrated different dynamics to the decisions in an office (Calder, 2015) and to how standards are constructed in its application (Lloyd Thomas, 2004; Forty, 2012:236). Any evidence of concrete displaying the ability to become active in an on-going construction, is limited to the fields of engineering and construction management (Georg and Tryggestad, 2009; Tryggestad et al., 2010). Architecture however has a different view of the material, as an inert enabler, but this part of research is limited to the professionals engaged with it, either architects or engineers. I will attempt to zoom out further than the limited time concrete spends in the design process of a building, or while it is being shaped in the construction site. The life of concrete cannot be separated into segments, but rather be viewed operating in a complex continuum, in which decisions in the initial phases trigger discussions on concrete in its later life. These discussions cannot be conceptualised in linear time but in a dialogue of its present life with its past.

## 1.5 Contribution to existing knowledge

### 1.5.1 Contribution to material descriptions in architectural studies

In this dissertation I will present the life of concrete on a daily basis without limiting the descriptions of the material to its cultural, historical or structural aspects, but by presenting its everyday manifestations. Claiming that I will delve into the everyday of the material, might seem like a simple presentation of facts on the material that are evident, and gives the impression that there is a reality of the material that is readily available to be discovered (Highmore, 2002:1). I will use the account of the daily basis of the material as an opportunity to reveal constructed assumptions on concrete. Beyond the performances that it is theoretically designed to deliver, the daily manifestations offer the possibility to expose un-formalised expressions of the material.

Concrete will not be theorised in an ideal state, but existing in daily interaction with professionals and users.

I will draw on architectural theory that acknowledges the material in a cultural, historical or social constructivist mode, but not exclusively as a product of such. Accounts of historians of concrete that view the material through the lens of critical theory are the starting point to open up new potential threads in exploring the material: it will be studied beyond the discourses that view concrete as a projection of ideas and thoughts (Frampton and Futagawa, 1983; Frampton, 1985; Jencks, 1985; Collins, 2004), and beyond intentions of architects using it to achieve an amelioration for occupants and users (Simonnet, 2005; Forty, 2012; Calder, 2015, 2016; Harwood and Davies, 2015). Although I will be presenting certain aspects of the history of the material, I will explore issues that are not typically discussed by historians. Coming to the material from the view of a practitioner who is more aware of the everyday interactions with concrete through professional involvement and having encountered many moments when the material is very different to the descriptions it is offered in historical discussions, I will attempt to uncover daily issues that are not discussed explicitly within the framework of architectural history and critical theory. By drawing inspiration from STS and ANT (Akrich, 1992; Gieryn, 2002; Yaneva, 2013a) to understand how concrete is constructed as a technological object, I will open its black box to discover how it engages with other human and non-human entities. Discussing buildings in the context of STS and ANT is nothing new: the SAGE Handbook of Architectural Theory has an entire section on STS and architecture (Crysler et al., 2012), and several authors have taken such a stance in the past decade (Guy and Farmer, 2001; Gieryn, 2002; Yaneva, 2009a, 2013b; Guy, 2010; Buchli, 2013 to name but a few). I aim to follow this tradition and contribute to architectural studies by examining materials in architecture drawing upon STS and ANT. I am also inspired by the new materialisms in the tradition of DeLanda (2005), Frichot (2005; 2013), Ballantyne (2007), Coole and Frost (2010). Although I am not aiming to make a specific contribution to STS, ANT or the new materialisms, I am turning to

these bodies of research to describe aspects of the material not explicitly discussed in architectural theory and architectural history. In this respect, the initial contribution of the research lies in the field of architectural studies and the analysis of the everyday manifestations of concrete through the lens of ANT, STS and new materialisms.

### 1.5.2 Methodological Contribution

Resulting from the turn to STS and ANT comes a second contribution of this research, in terms of its methodological approach. Embarking on an Actor Network Theory methodology presents an alternative way of looking at architectural materials by enabling me to reposition concrete in a network of actors, both human and non-human. Once the networked reality of concrete is established, it can be described in different situations. Taking this methodological approach will lead into settings and situations where concrete manifests different types of agency. Brand (1995), Gieryn (2002), Yaneva (2009a, 2009b, 2013a), Guy, (2010), Buchli (2013), Cairns and Jacobs (2014), Doucet (2015), Heynen and Wright (2016) have all adopted similar STS and ANT methodologies in architectural studies, but my contribution lies in that I am extending this approach specifically to how we question materials, focusing on the specificity of concrete.

I am also contributing methodologically to STS and ANT methodologies by approaching the material in an informed manner. Charged with previous experience as an engineer and architect I reach the material already aware of the technical capabilities of concrete, and I employ the previous experience to read the material on site. So not only do I employ ANT that gives me a view of concrete by placing me in the middle of the networks, I also have a view previously informed stance towards the material that affects the way I view concrete. The method that I am employing allows my research to have an informed and in-the-world view of the material. Architectural scholarship methodologies are typically informed by modernist approaches, by critical theory, and in an anthropocentric mode of thinking that view the material stabilised in the background. My view however, is in the philosophical tradition that focuses on the vibrancy of

the material and the vibrancy of the object. I enter in the world and trace all the different ingredients that have not opened before and this method allows me to immerse in the networks and describe its complexity to bring to the architectural knowledge a material view that is different to architectural historiographical archival methods.

While I am not aiming to make a specific contribution to the methodologies of ANT and STS, they will be the starting point from which I will aim to explore the active potential of concrete and re-evaluate its capacities in architectural studies. Inspired by ANT that views materials as actors in a network, and its methodological sensitivities, I am entering the terrain of theory and history, traditionally chartered by theorists and historians but looking at the material in a way that can account both for its stabilized dipoles and to search for descriptions in-between. Embarking on this methodology, opens up the potential for other materials to be examined in networks and traced in various settings. Analysing this network to the extents of concrete and following the possibilities a material opens up, is a methodological contribution of the thesis.

### 1.5.3 Contribution to concrete-specific literature

A third and final contribution is aimed at the current revival of concrete and brutalism. The surge of publications of brutalism and its associations with concrete, a special issue on brutalism by the October Journal in Spring 2011 and a more recent one on concrete in the *Journal of Architecture* in June 2015, as well as a plethora of recently emerged blogs, websites and even twitter accounts on brutalism, speak of this trend. Brutalism has become a buzzword whose inspiration goes beyond architecture, into computer programming and web design. Drawing on these discussions of the material and by opening up the black box of concrete in Park Hill, I question what makes brutalism associated with concrete and what properties of the material inform brutalism's intentions. Hatherley (2011a; 2011b) Grindrod (2013), Calder (2015, 2016), Harwood and Davies (2015) all describe brutalism as a style with the pure intentions of serving and ameliorating the living conditions of the British working class. Yet in many ways, as

pointed out by Kitnick (2011), Vidler (2011), Forty (2012), the style emerged also by coincidence from practical and for not such idealised reasons. Together with this surge in the brutalism literature comes an emerging interest of renovation studies in concrete. Concrete engineers involved exclusively with its preservation, renovation and rehabilitation practices in historical settings, consist a new specialisation that emerged in the past decade. By investigating the preserved aspects of the concrete in Park Hill, I contribute to the concrete renovation literature, not in a technical manner, but in terms of the theoretical and practical issues of its implementation. Going into Park Hill to uncovering parts of the original life and contrasting them to the on-going redevelopment I am able to contribute to literature on the preservation and renovation aspects of such social housing and brutalist estates.

## 1.6 Structure of the thesis

I begin the dissertation by reviewing the literature in Chapter 2 to present the active potential of materials. The need to revisit the way we interact with materials in architecture has revealed the different modes of engagement with the built environment, and I discuss the traditional idealist thought in parallel to the new materialist thought. I investigate what has previously been visited from the perspective of other disciplines to present how matter can be thought of as acting independently of constructed meaning. Assemblage theory as described by Deleuze and Guattari is then revisited in a search of an appropriate way of incorporating different (and often opposing) modes and the possibility of using an assemblage framework to enable a both subject and object oriented thought in architecture is discussed. I will argue that using assemblage theory to consider the material entangled with the immaterial in a network of the built environment, can reveal new ways of thinking about matter in architecture.

The methodological approach in investigating the manifestations of the material on site during its construction and its afterlife is discussed in Chapter 3. My stance towards the ethnographic collection of data has significantly influenced my observations and collection of data from the estate. Being charged with experience from my previous roles as an architect and

engineer, has informed the way I investigated the concrete, and I reflect on this influence in the third chapter. I also present how I have traced the material in various directions inspired by ANT, as opposed to attributing a fixed and exclusive manner and discuss my approach for the collection of data and its analysis. Finally, I point out some of the limitations I encountered during the data collection, such as the various levels of interest by residents and the reluctance of some professionals to participate, and I discuss their effect on the type of information collected.

I then moved on in **Chapter 4** discuss how concrete is typically viewed in architectural studies. Some of the approaches view the heroic actions of the architect on concrete as the all-powerful enabler. The review of the literature will conclude by arguing that the actions of the material disconnected from the powers of the users (professionals and occupants) leaves out the possibility of these agencies co-existing in a network which will be the focus of the material in the realm of care, to view how it becomes activated in networks of material and human elements.

In empirical chapters 5, 6 and 7 the focus is almost exclusively on Park Hill: **Chapter 5** presents the historical backdrop of Park Hill and its concrete as well as some controversies that surround both the estate and its concrete., While often not explicitly present in the discussions surrounding the estate in the era of its original creation, concrete has played an influential role in its construction. I present the reasons for its selection and how it has historically failed the estate. The way its contemporary discourses present Park Hill reveals that the material is absent from the discussions, and I argue that it became present in later discussions, only after the point it began to fail. With this observation I reveal the role the material played over time.

**Chapter 6** describes the dialogues that the material enters when left on-site and enters the modality of care. I draw from ANT to describe concrete in a network of socio-material associations and I argue that it only becomes active when participating in these entanglements. The co-existence of concrete in networks of other material and immaterial components

presents the material as an activated agent, a vibrant component with the ability to instigate actions. The co-presence triggers complex discussions between material and human actors: through the data collected in Park Hill, I present how professionals interact with the material and the actions concrete instigates in its residents. My description of the abilities the material has once it is left on site, takes place beyond the actions of the designing architects, and the decisions of the engineers.

Finally, **Chapter 7** expands on the agency of the material in this network of human and non-human entities, and describes how the participation of concrete can give rise to properties that are previously unimagined I present concrete charged with historical associations, which I describe as incidental heritage, and with associations of comfort which I argue go beyond the strict definition of the term and into the visual and aesthetic associations. I reveal concrete's ability to move and shift the network and instigate the formation of these properties and present how emergent properties are instigated. The manner of interaction in this intricate grid of associations is not linear gives rise to properties of the built environment that were often unintended and surprising.

**Chapter 8** concludes by presenting the findings of the thesis and the contribution to the relevant bodies of knowledge: to the field of architectural studies by describing the material in its everyday interactions; to a body of literature that has emerged in the past 2 years and deals with descriptions of the material in architectural theory, which I coin "*studies of concrete*"; to the on-going discussions about brutalism and the revival of concrete in architecture; and finally a methodological contribution by acknowledging my role as an observer charged with previous professional experience that has enabled me to reveal the actions of concrete.



## Architecture as assemblage: towards an object oriented perspective

*“If material is a form of thinking in architecture, what constitutes material research that [...] experiments [...] with questions of authority, perception and aesthetic culture?” (Petricone, 2012:14)*

### 2.1 Introduction

The journey of questioning the agency of concrete began with an observation someone made to me several years ago about the Scottish Parliament. Having previously worked in the facilities management of the building, they commented that occupants were often finding it cold, although the thermostat readings were not always necessarily so. Their impression was that possibly the concrete in the building was impacting on their perception of comfort. There was something in the material that was effecting this perception, according to their view. It was a very interesting observation, and a quick search into the Scottish Parliament's past heating issues on the internet revealed there have been several complaints previously. There was however no unanimous view as to whether it actually was a cold building, or whether people simply perceived it as such. Some comments by members of the Scottish Parliament were dismissing claims their building was cold, and suggested that *“If anyone is feeling chilly they can wear their jacket”* (The Scotsman, 2008). What was it that made the perception of temperature

in this building controversial? If it was the thermostats, the readings and the varying taste of the occupants for environmental comfort, had the omnipresence of the material had played a part?

Since the effect of the material on the perception of comfort was a trigger for the investigation on material agency, I will commence this chapter with a brief presentation of the shifts architecture has been going through, by using the lens of comfort. This description will serve as a means of illustrating the on-going shift in thinking our relationship with the built environment. The view of an absolute fixed definition of comfort does not exist purely in the materialist sense, and the effect of constructed notions on physiological comfort are presented in the first part of this chapter, as part of a constructed experience of comfort.

I will then go on to discuss at length assemblage theory by revisiting the original texts of Deleuze and Guattari and the analysis of their work by other authors. Assemblages can provide an alternative framework of thinking about concrete, not just as a symbol in Park Hill and in the greater history of architecture, as is commonly thought, nor as a fixed and static entity. They offer three possibilities when they are introduced to the theoretical framework of this dissertation: Firstly, the manner in which properties emergence in assemblages offers a viewpoint that re-evaluates how properties of concrete come into fruition. Secondly concrete in an assemblage is allowed to operate alongside the constructed notions and with regimes of symbols, while maintaining its purely physical and material characteristics. Finally, concrete thought of in an assemblage of the built environment, can include the multiple manifestations in which it presents itself and is commonly attributed, and which this dissertation has set out to describe.

The observations on assemblages will become important in the fifth section where I will describe the common ground but also the differences between assemblages and ANT. Both are presented in his dissertation as ways of conceptualising the activeness of the material and as a framework of describing concretes relationships, however, they also present between them several differences also. I do not handle these differences as problematic in this thesis, as

I engage both of them to try to account different manifestations of the material. Because they are both based on the same ontological premise, they can both serve to describe concrete. But where one fails to provide the necessary vocabulary to illustrate the actions of concrete, I will borrow from the other. Distinguishing between the two is crucial for understanding the framework upon chapters 6 and 7 are based upon: The first one uses ANT terminology to describe concrete in a network, but the latter requires the descriptions of assemblages to argue for the emergent properties of concrete.

The presentation of materials in the sixth section aims to provide a framework in which concrete can acquire an agency not previously imagined, and form relationships with other parts of the built environment that enable it to manifest an activeness. I will revisit examples from architecture and beyond where materials present inherent powers and I will describe examples from the existing literature where they can also form themselves and shape their surroundings. These examples, although they do not necessarily pertain to concrete, they serve as manifestations of the ways materials are transformed from passive subjects to active objects and are shaping their surroundings in an active way: morphogenesis, neuroscience, material engagement, etc.

Before concluding this chapter, I present two final concepts that have implicitly informed the thesis. Affordance and affect provide another way of studying the material without allocating meaning to it. They provide the possibility of conceptualising the mental experience of the built environment as something that can exist only materially. While I am not arguing for ignoring the constructed aspects of concrete and its sociocultural context, affordance and particularly affect, enable this experience to take place in a context where it only interacts with other material presences.

## 2.2 Architecture's continuous quest for description

There is not a single, stable and certain way of thinking about buildings, and the way in which we understand our interaction with our surroundings is continuously going through a slow

and perpetual shift. Architecture is prevalent with a wide array of lines of thought and modes of understanding, all coexisting and overlapping with one other. Yet, architectural theory has predominantly favoured the use of paradigms that claim to have a single understanding of a building as previously discussed extensively by many scholars in the theory of architecture (Frampton and Moore, 2001; Guy and Farmer, 2001; Heynen and Wright, 2016:43).

Since architecture is constantly on the search of new ways to articulate its presence, it frequently uses terms from other disciplines in an effort to attribute meanings and portray ideas in buildings. This continuous quest can be attributed to two reasons: firstly, architecture is intrinsically multidisciplinary. By definition, it incorporates wide-ranging disciplines, ranging in diversity from the humanities to engineering, and from art to physics. It inevitably embodies such diversity in its descriptions, since it has to incorporate all potential interactions with the built environment. In order to address its concepts and incorporate them into a discipline that will encompass all of the above, it unsurprisingly has to engage in adopting, or “*stealing*” terms from varying disciplines. Immersed in this endless possibility, architecture is constantly in the need to rearticulate its presence through new terms. As Teresa Stoppani argues, it is inherently paradigmatic, without focus, always shifting in-between meaning and operates in both a rational and an irrational manner (Stoppani, 2015). On the one hand it tends to become highly scientified but on the other it always endeavours to account for an experience. The work of Aldo Rossi for example, who Stoppani terms as a logical rationalist, has the ability to break from the rational and delve into elements like experience and memory to be brought into architecture (Stoppani, 2015).

The second reason that places architecture in a position where it has to search for other terms to describe its existence is that in its empirical questions and enquiries we find things that we cannot name otherwise. Since it is always positioned on the cusp of multiple disciplines, describing its workings is challenging. We are often presented with the difficulty of naming something with specific terms that do not accurately describe how we conceive it at the infra-

language level. This is why, often, architectural theorists turn to philosophy or other disciplines, attempting to name configurations or relationships with terms new to architecture. Often this “*borrowing*” of ideas is awkward, when ideas and notions are borrowed without firstly being problematized into architecture. Although they have been used elsewhere to describe similar types of affiliations, when brought into the architectural discourse un-evaluated, they are frequently questionable. As will be described in a later section, the notion of assemblages is one such example that has been brought into architecture, through the interpretations of the work of Deleuze. I will however attempt to go beyond simply incorporating assemblages in architecture and will revisit the term and the potential it offers to architecture.

Identifying the motives behind the perpetual shift between paradigms reveals an important observation: The way architecture has been described until recently been thoroughly preoccupied with the need for a teleological understanding. Hélène Frichôt (Frichot, 2005), for example, in her work outlines how for centuries the purpose of architecture was to seek meaning elsewhere and she refers to Kate Nesbitt (1996) who illustrates that its concern has been with origin, essence and disciplinary limits. Frichôt argues that the product of architecture as a teleological activity is never satisfied when the discipline is viewed in such a way, and therefore we need to resort to other disciplines. This time however for Frichôt, we do not need to find new meanings to justify its actions but reveal ways in which architecture can be understood in multiple ways. The paths that architecture has been exploring so far that have not enabled it to identify a fixed purpose and subject will be discussed in the following section.

### 2.3 From a positivist to a constructed built environment.

To describe this unceasing pursuit of architecture searching for paradigms I will visit comfort as an example that embodies this shift. The choice for investigating paradigm shifts through this notion is two fold: Firstly, as already mentioned it is the starting point for my interrogation into the material agency of concrete and will help develop the through process into this journey of investigation. Secondly, comfort itself is a term whose definition has been

continuously changing in a series of endeavours to identify a paradigm that could accurately describe it. The way architects, environmental scientists and sociologists have dealt with comfort, presents a wide array of approaches, with each discipline attempting to morph it in ways that it complies with the prevailing attitudes of their respective time. What we have perceived as comfort has been far from stable in time or place. *Comfort* exemplifies the shift from an initial positivist to a post-positivist paradigm, and the gradual move from approaches which tightly define and quantify a concept that is closely related to personal experience, into an effort to unpack it and open it up to endless possibilities. The initial attempts to conceptualize the notion of comfort have evolved rapidly in the previous century; hence we are now coming to understand the impossibility of framing it in an absolute way.

Other notions, pertaining to architectural experience have also been previously explored in architectural theory through a series of paradigm lenses. *Use* is one such example. It has also been approached, similarly to comfort, as a quantifiable concept, then viewed as the product of a constructed experience, before realising that it was also difficult to grasp into a tight definition because of the multiplicity of associations it formed with other entities of the built environment. The notion of “*use*” could therefore also become a vehicle in viewing paradigm shifts. But I have chosen to investigate this shift through the notion of comfort because it can encompass both the use and also many of the material aspects that are not commonly addressed in discussions of use. Use typically involves a human subject operating in an environment, whereas comfort involves an interaction with material arrangements and objects entangled in its achievement. Comfort also is interconnected with issues such as use, but also stigma, material decay and advancement. It involves all of the above, which have been addressed separately in architectural theory. Employing the notion of comfort to describe shifts in architectural thought, will aid to describe the way matter is explored in later chapters. Materials will be viewed not as passive entities but as active participants in subject object interaction. Considered in this reciprocal way, as active components of a dialogue with the user rather than a passive property simply existing

in a vacuum, comfort cannot be reduced to the simple interaction of an active subject perceiving the passive object. The changes comfort has undergone are therefore related to the passivity of matter versus a view of its activeness, which falls within the field of new materialisms that will be described later.

### 2.3.1 Environmental comfort: A positivists view

In the 1960s, while working in a laboratory in Copenhagen with a device he called "*The climate chamber*", Ole Fanger, a Professor in the Technical University of Denmark made the first attempts in quantifying the notion of human comfort. The aim of this research was to identify within a tight margin the ambient conditions at which the participants' internal body temperatures would be maintained unaltered. Aside from measuring environmental conditions, such as temperature, humidity, air flow etc., clothing and activity levels were the only two factors pertaining to personal experience identified by Fanger that were not strictly related to environmental conditions. Reading this line of thought, 40 years later, the lack of personal variants, such as age, culture, location, sex in his experiments is surprising. This exemplifies the strive for quantification regardless of personal attributes. The perfect condition for comfort was defined by temperature, humidity and ventilation; everyone was expected to conform to the rigidly and narrowly described conditions by Fanger.

Fanger's work can be criticized on three levels: firstly for considering all humans fitting one and only category. His aim was to identify a temperature, an air velocity and a relative humidity level, and his research was revolving around the average quantified person, with no considerations again for sex, metabolism, health, age etc. (Fanger, 1970; Fanger and Valbjørn, 1979; Fanger et al., 1988; Fang et al., 1998). Secondly, he can also be criticised for considering humans as passive, with subjects having had no control over the conditions; they were to be accepted as given. Not only Fanger's subjects were expected to fit the tightly defined and quantified conditions he was proposing, they were also not permitted to have any control over

them. Finally, he ignored the biological adaptation possibilities of his subjects. Fanger's approach to human subjects was based on the premise of an almost universal person, with similar biological and physical characteristics, not allowing for any organic differences, nor personal preference. This attempt for a normalization of comfort, whereby the passive human subject is expected to abide by all the premeasured conditions Fanger had quantified, has influenced a large body of research on comfort since, that considers the body as inert and the environmental conditions the only ones that can be adjusted to achieve comfortable levels (Lutzenhiser, 1993; De Dear et al., 1998; Lutzenhiser and Shove, 1999; Lin et al., 2011) Although more recent attempts view comfort as a result of biological, physical and hormonal processes, it still expected to be followed by the average person.

### 2.3.2 A constructivists view: sociocultural comfort

A second line of thought emerged almost in parallel to Fanger's work in the 70s that treats comfort as a sociocultural product. An abundance of literature exists along this stream, distancing comfort from the tendency to be understood in a positivist mode. More recent work by Michael Humphries, Fergus Nicol and of Elizabeth Shove (Humphreys, 1995; Nicol and Humphreys, 2002; Shove, 2003; Guy and Shove, 2007) defies the previous positivist tradition; they take a bold step to considering comfort a sociocultural product, a man-made construct altogether, defying the pre-existing tradition. Alongside Nicol and Shove, Humphreys does not only establish the sociocultural production of comfort; he ontologically positions it in a different realm. Comfort, in their view, is established by socio-temporal processes and instances of habit consolidated into socially acceptable practices. Shove's work discusses extensively what is acceptable practice when attempting to provision for comfort. Working in a suit for example in a bank in a hot and humid country may sound extreme but it is certainly a prerequisite in many cases. Their approach is distanced from embodied functions but accounts for nature's



functioning and the environment by considering local climate conditions as an agent shaping these practices.

### 2.3.3 Phenomenology: understanding through the senses

Understanding comfort through a phenomenological lens, would involve its description as a construct, a man-made creation that is shaping human experiences by means of the intentions of the architect, ignoring the role of the material presence that impacts our understanding of space. Viewed as a construct, phenomenology offers the necessary concepts to understand how our relationship with the environment is constructed. However, it can also offer the first step in opening up an understanding of the world thorough the lens of the material, even though is only being implicated in the way that our senses perceive it. Understood this way, phenomenology opens the possibility of matter implicated into architecture and leaves it open-ended to interpretation. While it can account for a description situated in the traditional constructivist paradigm, it leaves the possibility that the material works reciprocally with the body un-shaping its understanding.

Phenomenology in relation to the built environment, and in particular to architecture reads as a multisensory experience, interacting with our five senses and beyond. Juhani Pallasmaa, architect and theorist, provides with a description of architecture as a constructed experience in our minds and points out several ways in which it is understood. Pallasmaa, claims that understanding architecture involves all of our sense organs, rather than existing as a simply ocular experience, and that it even triggers an awareness in senses beyond the prevailing five ones (Pallasmaa, 2005:24). Gaston Bachelard acknowledging this projective behaviour in experiencing the environment with our senses attempts to describe a metaphysical parameter, "*devoted*", as he would say, "*to the domain of intimacy*". Our experience, as he puts it, is shaped by covering "*the universe with drawings we have lived. [...] Space calls for action, and before action, the imagination is at work*" (Bachelard, 1994:6).

Theorists that have described a phenomenological understanding of architecture, like Juhani Pallasmaa, Karen Franck and Bianca Lepori argue that today's architecture has become detached from a body experience.<sup>i</sup> This observation for both Frank and Lepori and for Pallasmaa, is linked to the dominant paradigm of Cartesian philosophy that is structured around the mutual exclusivity of the body and the mind by favouring vision as the only way of understanding the built environment. In turn, this creates a misconception that aesthetic comfort is only achieved through visual comfort. Understanding the mind as existing outside the body and as a superior entity, for Frank and Lepori, translates into architecture as the difference between the drawing and the conceived space to the built environment. The hunt for objectivity of the western culture leads to a neglect in architecture of the importance of subjective qualities such as colour/materials and their subsequent dismissal as uninteresting as form is because the latter relates exclusively to the body. This image of disembodied rationality is portrayed in the constructed world today<sup>ii</sup> (Franck and Lepori, 2007). As Korydon Smith comments on the work of Pallasmaa: *"Instead of experiencing our being in the world, we behold it from the outside as spectators of images projected on the surface of the retina"* (Smith, 2013:127).

According to David Harvey this ocular-centric paradigm that has been dominant in occidental culture has led to a *"vision centred interpretation of knowledge, truth and reality"* (Harvey, 1989). Pallasmaa argues the necessity for challenging this hegemony of vision that has biased the sciences and architecture. He suggests, rather thought provokingly, that today's alienation and detachment stems from this ocular-centrism governing the technological world, *"related to a [...] pathology of the senses"*. The prevalence of the ocular upon other senses that is contested from Ancient Greek philosophy and spans all the way to the present is what

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<sup>i</sup> It is interesting noting that Franck and Lepori bring into their joint work two different fields: Franck in an academic in environmental psychology and Lepori is a practicing architect, and both are concerned with an approach to architecture and psychology that puts the users first.

<sup>ii</sup> In the renaissance world view there was a distinct and orderly hierarchy in the way the senses were involved in the perception of the cosmos: the eyes were considered supreme, while touch came in last. The invention of perspective initiated a distancing of vision from the other senses stretching all the way up to modern day technological culture that has separated sight (and sound to an extent) from anything other.

according to Pallasmaa gives rise to the misconception that all matter is inert and awaiting to be perceived. This flatness and alienation worsens through weak materiality senses (Pallasmaa, 2005:22). Understanding of matter as static and passive will become a central observation in a later section of this chapter.

#### 2.3.4 Constructed taste and the subjective brain

David Hume, the 17<sup>th</sup> century Scottish philosopher, describes in his 1757 treatise “*On The Standard of Taste*” how visual experiences, and our positive or negative responses to them, should be considered as a construct (Hume and Lenz, 1965). Hume argues that humans perceive sensual experiences in a way that is individual and constructed in their own minds; in other words, he has a view of aesthetics constructed by the senses. He denies any form of mind independence when it comes to the appreciation of experiences, be they visual or pertaining to other senses, and recognizes the subjectivity of human experience in the appreciation of qualities: they cannot be right or wrong, just warranted or unwarranted, depending on what, how and who makes them. In order to achieve a normative description of experiences, they need to be discoverable and one needs to be able to describe them. Therefore for Hume, whose interest in experiences lies within their aesthetic appreciation, aesthetic judgements are subjective, unlike factual judgements that can be true or false. As such, aesthetic judgements produce felt responses of pleasure or displeasure. This means that aesthetic properties are not inherent in the objects, but projected upon them by transcendence. “*A thousand different sentiments, excited by the same object, are all right: Because no sentiment represents what is really in the object.[...] Beauty is no quality in things themselves: it exists merely in the mind which contemplates them; and each mind receives a different beauty*” (Hume and Lenz, 1965). An experience for Hume is in the mind that perceives them, and has little to do with the object itself. In this constructed manner, no values can be attributed to the material, but only to the subjectivity of the mind that understands matter in a certain way. For

Hume there is not a right or wrong way of understanding, there is only the subjectivity of the human brain.

Following in Hume's tradition, the question whether there is value in objects and matter itself as opposed to value on the experience enabled by matter, is on-going. Value empiricist philosophers present a reductionist view of aesthetics and the experience of understanding ones surroundings. Malcolm Budd argues that the value of beauty "*is identical with the value of the experience it gives us*" (Sharpe, 2000). This reduction of the value of aesthetics and beauty to the mere experience it provides leaves the role of matter completely unaccounted for. Alan Goldman also defends the experiential account of an aesthetic value; but at the same time acknowledges that matter can also play a part in the experience. Through the lens of artwork and forgeries he argues that the experience is not just the formal qualities of the matter. Arising from the formal qualities are expressive and cognitive context and imaginative broader context. Perceptual, cognitive, affective, imaginative all participate and alter the experience. For Goldman, parameters such as cognitive, cultural and historic context, and morals are aesthetic knowledge but not aesthetic qualities; they are values parasitic on the aesthetic qualities. The concepts and knowledge we bring to the experience are what affect perception (Goldman, 1995).

Further discussion on the subjectivity of the experiences and interdependence of the human brain in the interaction with the environment, is beyond of the scope of this chapter. What is evident from this brief overview is the involvement of matter, or rather mostly lack thereof, in the ways we have been thinking about our surroundings. Positivist views that have acknowledged the presence of matter, have reduced its role to its strictly physical properties, i.e. temperature and colour, while a constructivist mode of thinking, understands it as part of a sociotemporal process. Even in the case of a phenomenological view where matter is a trigger of the senses, experiencing architecture through the material, is reduced to a subjective experience related to acquired memories, sightings and perceptions, leaving out any interaction

with matter. But as I discussed in the introduction of this observation, I am attempting to move away from its perception as a passive object that awaits to be discovered by an active subject.

Keeping in line with my original aim, I will introduce matter into a regime where it can include many more ingredients, as it was demonstrated in the case of comfort: the environment, the thermal, material entities, the visual, the sensual etc. Materials will become part of a complex relationship that I will attempt to unpack in order to understand what is the role of the material and materiality can be in architecture. Actor Network Theory has already been described in the first chapter as a way of bringing together humans and non-humans to coexist both as actors in a network. In contrast to the view that matter is static and unresponsive, ANT acknowledges the ability of matter to act, both via designed human intention as well as unintentionally as a non-human actor. Further to ANT, I will also revisit assemblages to describe concrete actions. Assemblages will be presented at length in the following section.

Assemblages are also employed in the dissertation to conceptualise the relationship of materials. Borrowed from materialist philosophy, it will enable matter to be viewed not as a facilitator, but conceptualised as an intricate assembly of interacting components. It will be rethought as an entity without a fixed set of properties; something that is neither subject, nor object, but is constantly on the move and in-between. The continuous shifts that matter oscillates amongst have the capacity to constantly create and reshape environments. This perpetual movement integrates more ingredients, and assemblages can assist in understanding this complexity, moving away from symbolisms and acquired meaning, but solely through the presence materials can have in shaping it.

## 2.4 Assemblage Theory

### 2.4.1 The origins of assemblages

Adopting the ideas of Gilles Deleuze and Felix Guattari to describe architectural practices has gained momentum in the past 20 years, predominantly in conceptualising ideas,

practices and events. The implication of Deleuzian philosophy into architecture has challenged preconceptions about what architecture is, what architecture does and how architecture is implicated with the environment (Frichot, 2005). Away from idealist strands of philosophical thought, that have been prevalent in architectural thinking, Deleuze offers a way of thinking about matter as a powerful thing that actively shapes our world.

In the opening chapter to the *"A Thousand Plateaus: Capitalism and Schizophrenia"*, the example of the book demonstrates what Deleuze and Guattari define as an assemblage; material, paper, words, reader, narrator, letters and page numbers become an intricate complexity, inextricably interconnected.

*"In a book, as in all things, there are lines of articulation or segmentarity, strata and territories; but also lines of flight, movements of territorialization and destratification. Comparative rates of flow on the contrary, of acceleration and rupture. All this, lines and measurable things, constitutes an assemblage. A book is an assemblage of this kind, and as such is unattributable. [...]. One side of a machinic assemblage faces the strata, which doubtless make it a kind of organism, or signifying totality, or determination attributable to a subject; it also has a side facing a body without organs, which is continually dismantling the organism, causing asignifying particles or pure intensities to circulate"* (Deleuze and Guattari, 2008: 4).

Just like in the description of the book, the constructed environment can be viewed as such an assemblage; users, bricks, mortar, architects, foyers, door knobs and broomsticks as well as communities, functions, visual experiences and affectual triggers, but to mention a few, all become part of it. Similarly to the case of the book, where all the discrete parts can produce any number of effects, a different mode of interaction between the parts of a building assemblage will add a different reading. Incorporating an assemblage view to the built

environment can allow for a number of effects and affects to come into fruition, with the different modes of interaction of its parts.

DeLanda interprets the description of assemblages from what Deleuze and Guattari call *agencement*, The word “*agencement*” in the original French text, implies an agency already, a form of action according to Due, (2007:132) which is lost in the translation into English, as Phillips (2006) points out. The assemblage, as a number of pieces gathered into a composition, always consists of the heterogenous entities that can be both material (relating to physical tangible entities) and expressive (symbols and icons that express identity). The assemblage is described as existing in the territory formed by two axes: one is the machinic side of an assemblage and the other the axis of territorialisation and deterritorialization: “*one [...] axis defines the variable roles which an assemblage’s components may play, from a purely material role [...] to a purely expressive role*”. The other axis “*defines [the] variable processes in which these components become involved and that either stabilize the identity of an assemblage [...] or destabilize it*” (DeLanda 2006:12).

#### 2.4.2 Particularities of assemblages

The importance of assemblage theory in the context of this thesis is that it enables purely material and physical objects to coexist in the same terrain as constructed notions of expression and socially consolidated norms. By describing the way material elements interact in a way that accounts for human constructed ideas, assemblages enable us to think of a materialist ontology that can be applied to the case of acquired connotations. It is an opportunity to view both material and immaterial entities acting side by side and not in opposition. Materials become active and acquire agency in the same terrain as the ideas and signs they relate to. But the question remains: how do assemblages come into being, how do they become active and how do properties emerge in a context in which material and immaterial entities exist? Concrete, was hypothesised in the first chapter as active, so how

could this activation take place? What is it that enables it to acquire an agency in this complex terrain of entities, as hypothesised in the first chapter?

Re-visiting assemblages in the original work of Deleuze and Guattari and the descriptions of Manuel DeLanda, but also in the work of Andrew Ballantyne, Reidar Due, Graham Harman, Andrew Leach and Dorothea Olkowski, reveals some particularities of assemblages (Olkowski, 1999; DeLanda, 2005, 2006; Ballantyne, 2007; Due, 2007; Harman, 2008; Leach, 2009c; DeLanda, 2016). Firstly assemblages are unique entities, and therefore any properties that are produced from the interaction of its parts are singular: they result from an individual process, occur randomly and without any teleology- no fixed state the parts have to arrive to. Secondly, it is the dynamic differences, rather than the physical or notional differences of the diverse entities, that drive processes in an assemblage. Properties occur because of the differences rather than in spite of them. The differences are not nuisances that break from the norm, but active parts that trigger change in the assemblage. Finally, properties emerge through the interaction of the parts, but almost in a metaphysical way as unexpected effects, without a linear production of an effect.

#### *Assemblages as unique historical events*

The assemblage, according to DeLanda is a unique historical entity and occurs individually. As the result of an individual process, the origins of an assemblage can be traced back to the historical identity from which it arose (DeLanda, 2016:19). Deleuze and Guattari describe the process of individuation in the Thousand Plateaus through biological examples (see Deleuze and Guattari, 2008:54,263) and DeLanda with population thinking (DeLanda, 2016:156). Biology, therefore, is crucial to understanding how both an assemblage emerges as an individual entity, but also what mechanisms are in place that destabilise it.

Originally derived from biology, population thinking offers a way of describing how variable characteristics emerge, even in the case of analogous original conditions and how differentiation occurs within similar samples. The emergence of new characteristics in a



biological population takes place when the population of any variable replicators is coupled to a “*filter or sorting device*” (DeLanda, 2006:44). In a given gene pool - the biological replicators - , combinations are taking place through mechanisms of reproduction. But the possible combinations of reproduction, is not infinite; it is also restricted by filters. Geographical proximity, environmental and contextual characteristics but also genetic isolation are such filtering mechanisms. The impossibility for example to couple the genes of an elephant with those of a spider - are examples of such filters. In biology, to sustain the reproductive ability of a population, two reproductive entities are not sufficient. To ensure evolution and the emergence of new characteristics and properties, there is a minimum size of a reproductive community required.

Population thinking offers, according to DeLanda a way of discarding random generalisation of Aristoteleian essences. Describing any organisms as the result of a historical process of replication makes the properties that emerge for the organisms unique and individual. No characteristic can be attributed to an entire species or type; it can only relate to the singular organism in which it appears. There are no tightly defined species with properties that exist in tight brackets. Organisms do not consist a characteristic sample of a population, nor do they possess specific traits. To describe a biological organism is not necessary to describe a type of population: instead of using essences to categorise species, every entity is of a different form but has derived by historical speciation and through a historical process of individualisation. Therefore, what was previously described as an “*essence*” of a species, is now a set of characteristics sedimented through myriad individual historical processes. When a characteristic of an entity is the same as the next, it is not because there is an essence but there has been historically a continuous process that produces results with tiny differences. These differences may be imperceptible by naked eye, but still every organism is different from the next one. Even twins do not share 100% of their DNA. Therefore, the biological organism is an individual entity and the reproductive process becomes a process of individuation through

which evolution occurs. Biology names this process speciation: it is the process of limiting characteristics to a specific pool of genes that is derived historically and is not a man made category. The emergence of new characteristics is produced by a historical process of individuation and as such cannot be predetermined, but only stem from a result of genes interacting with coupling filters and sorting devices.

#### *Dynamic differences as driving forces in assemblages*

The individual and historically derived assemblage operates on a relatively stable territory, where its parts interact with each other, and with little interference from outside factors. However, this does not mean that the assemblage is always stable. In this “*intra-assemblage*” area, there are always fluctuations and destabilising forces in the territory, seeking to de-territorialise its parts (Deleuze and Guattari, 2008:356). Yet these processes of deterritorialisation are “*most often [...] immediately recuperated*” by a reterritorialisation effect that seeks to counteract the deterritorialisation actions (Ballantyne, 2007:38). Any effect in the territory that seeks to tilt the assemblage in another direction is counteracted within the territory. The question that Deleuze and Guattari raise, is what holds together the heterogenous elements, the *consistency* of an assemblage. And once this consistency is achieved and the territorialised elements of an assemblage are held together, there is a counter effect on the assemblage: at the moment the consistency of the assemblage is achieved, there is a deterritorialising action, by a part of the assemblage that has held together so much that it has become another assemblage, deterritorialised into something else. So an absolute consistency may actually be only able to find all its totalities in the infinity of all the plateaus. And yet if it is achieved in the territory of one assemblage, the question of what holds it together still remains. (Deleuze and Guattari, 2008:361). The idea of consistency existing only in one territory but in a perpetual movement, continually seeking to reterritorialise other deterritorialising actions in the assemblage is related to the body without organs (BwO). It is a body of non-organised accumulations, driven by intensities. The BwO, is not-stratified and not formed with fixed

extents. It exists in the plane of consistency, and the plane of consistency includes the totality of all the bodies without organs of an assemblage (Deleuze and Guattari, 2008:174). It is the plane of the *“uninterrupted continuum”* of the Body without organs (Deleuze and Guattari, 2008:171), where BwOs exist in a continuous flow.

Thermodynamics in physics are an example of a BwO: intensive differences in volume, temperature and/or pressure drive processes and cause other effects. To describe the operations of a BwO it is necessary first to differentiate between intensive and extensive differences. Borrowing the concepts from thermodynamics, extensive properties are divisible (e.g. area, length etc.) while intensive properties are not divisible (e.g. temperature). Changes are driven by intensive differences. In Deleuze’s own words: *“everything which happens and everything which appears is correlated with orders of differences: differences of level, temperature, pressure, tension, potential, difference of intensity”* (Deleuze, 2004:280). But although thermodynamics has a very succinct teleological aim achieving a state of perfect equilibrium, Deleuze’s differences that are driven by intensities have no such aim. The absence of a succinct aim is supported by DeLanda with far-from equilibrium thermodynamics that study systems as *“continuously transversed by a strong flow of energy or matter”* (DeLanda, 2005:82). There is no teleology to the system. The system is not directed to a single state but undergoes a continuous flow. It is this flow that sustains the differences, creating a zone of high intensities. This is the zone of possibilities, in which, according to DeLanda’s reading of Deleuze, is what defines the distinction between actual and virtual space (DeLanda, 2005).

A crucial characteristic of the BwO is that it is not divisible: it does not serve as a mere container. This is because its properties are intensive and not extensive; they cannot be confined spatially. For example, if one were to think the globe as a body without organs, there can be a divisibility- both constructed (i.e. borders which are defined by specific measurements, but also clusters of elements with the same characteristics- ie valleys, seas, oceans, lakes, mountains etc.) But these divisible properties cannot trigger effects. Only if one thinks of the

globe as a body of non-divisible intensive qualities can movement arise and new conditions can emerge. Just like in the case of a meteorological map - bodies of air cannot be divided and their intensity cannot be not physically measured and constrained, and with their different intensive properties, BwOs drive change: i.e. flows of air creating breezes or typhoons etc. The continuous flow of intensities is what drives this body without organs into a perpetual movement, not seeking to finalise a stable state of equilibrium. These, bodies of processes produce entities without essences and are continuously changing. Different intensive qualities fuel the process.

In this plan of consistency matter can be morphogenetically impregnated and as having powers within itself. It is not tied up in some reservoir of essences in a creationist way, where actions upon matter are transcendental. Instead, matter has powers immanent within it to self-form. Powers of morphogenesis are not received from somewhere, are not applied to concrete, but are contained within itself. The body without organs is capable of human expressivity-without the need for a superficial agency. For example the brain viewed as an assemblage of experiences, neurons and blood flow, has the capability to create dreams simply from the matter it is made of. The information required for the dreams to be created and experienced, are already within the brain. This capability of matter to already contain the information required to form, is immanence: the capability is within the material, not transcendent upon it.

In the plane of consistency there is a self-organising capacity without any structure, any pre organised form and without any order. This is how immanence has the capacity to be driven by intensities: therefore, immanence is not simply something within something else, but something within itself. It included all the actualised and potential possibilities, all the actualities and virtualities of an assemblage, all the singularities and events. It is the plane where *"nothing ever actually happens but everything has just happened and is about to happen"*(DeLanda, 2016:132). In the plane of consistency all possibilities can be actualised or remain virtual.

### *Emergent properties of assemblages*

An example of how assemblages of things give rise to properties can be found in the interview with Claire Parnet, where Deleuze discusses emergent properties presenting the horse, the warrior and the weapon (Deleuze, 2007:72). In this assemblage, every component is clearly defined and can also exist independently. But when the horse, the warrior and the weapon act as a unity, there are capabilities of the assemblage that emerge from the interaction of its parts. Those capabilities reveal themselves only when the assemblage is territorialised and the components interact; the effects are irreducible to just the sum of their parts.

An emergent property based on the above description, is a property of a whole that emerges from the interactions of its parts. The importance of this observation is that it halts reductionism- the effect cannot be imagined and comes as a surprise to the original properties of the individual parts. Chemistry becomes again a domain in Deleuzian thought that supports the presence of emergent properties. For example a chemical property of a molecule is very different to those of the atoms and the properties of a chemical composition are very different to the molecules of the elements it is formed by, depending on the state of the individual molecules.

But not all interactions induce properties in an assemblage. Depending on the way the parts interact, the way they are positioned in the assemblage, and the effect they have on the whole, their effects can be different. Relations in an assemblage can be of interiority, or of exteriority: Interiority relations are those that constitute the very identity of the parts (DeLanda, 2006:18) describing the parts of an interaction of an interiority relation, describes in effect the actions of the whole. Interiority relations, as DeLanda presents, do not take place in assemblages but are external to it. By contrast, exteriority relations are those where the interaction of parts can never describe the effects of an assemblage. In interiority relations a part may be detached and be made a part of another assemblage(DeLanda, 2006:12). So an

assemblage can only be one of exteriority relations, and the interactions of the interiority type, do not take place in an assemblage's territory.

When elements of an assemblage are connected by relations of exteriority with interacting components retaining their original identity, they retain the capacity to act on their own when not forming part of an assemblage. Constant interactions create emergent properties that are irreducible to the components themselves and therefore are not transcendent. When their interaction stops, the emergent properties cease to exist. These emergent properties must exist independently of the individual components. In other words, if the way in which the individual components interact changes and the properties of an assemblage changes, then these properties are not emergent.

To explain the type of non-linear interaction in assemblages that lead to the emergence of properties, DeLanda uses catalysis: taken from chemistry, catalysis is a shorter way for a chemical reaction to take place. In the words of DeLanda: "*Catalysis violates linearity since it implies that different causes can lead to one and the effect [...] and that one and the same cause may produce very different effects*" (DeLanda, 2006:20). The presence of a substance creates a form of shortcut for the chemical reaction to occur. Catalysis implies a virtuality consistent with the DeLandian interpretation of Deleuze.

The above two –emergence and exteriority - are necessary for DeLanda in order to avoid having to reduce assemblages to its parts. If one is to take this concept further in the case of concrete and comfort that this chapter began with, a building can provide a good example: It is made of heterogeneous components, some material (bricks and doors) and some immaterial (use, concepts). In order for it to be described without having to reduce to each one of the parts, relations must remain of the exteriority type. The interaction of concrete must be in such a way that it does not describe the effects of the assemblage in which it participates directly.

### 2.4.3 Thinking of concrete in the context of Assemblage Theory

Acknowledging the presence of material objects of the built environment existing in an assemblage, can have significant implications for concrete, its interactions, and the properties emerging from its presence. From the descriptions of assemblages, three observations are taken forward for the material. Firstly, assemblage theory offers for concrete to be involved in the emergence of properties and therefore describe how a structural component can also have visual affects, but also aesthetic and comfort affects. Thus, the emergence of properties of an assemblage of the built environment in which concrete participates, cannot simply be described by the relations of concrete. Its relations with users, experiences, surface treatments etc., where its interactions with other entities does not constitute an integral part of the assemblage, can be described in an emergence framework. Concrete's unintended characteristics, emerge from these interactions and never on their own. Hence, the manner in which properties emerge in assemblages, is relevant to concrete presence in the built environment.

Secondly, the assemblage enables material, but also constructed notions to exist along side. So in an assemblage, on its axis of materiality vs. expression, concrete can interact with and acquire constructed meaning. But on the same axis it can exist in its purest material state, where it is simply an object, without associations. Its material characteristics are maintained but at the same time it exists in a regime of symbols and constructions- assemblages offer the framework for concrete to exist in-between both, and become both at the same time, while never becoming absolutely the one or the other. In between, the other axis can offer moments when it can destabilize. There will be instances when a deterritorialising force will pull it in another direction, such an extreme example might be an earthquake, or a physical disaster. And unless there is a reterritorialising force to pull it back - i.e. the material capacities in this case to sustain the effect of the action, it can form part of another assemblage, that of rubble.

Finally, assemblages offer the option for concrete to exist in the multiple states I am searching for in this dissertation, and in fact enable it to exist in all of these states at the same

time. Concrete in an assemblage is charged with potential, it is not only about the interactions it forms with other parts in the assemblage that make one of its states actual, it is also in a myriad other potential interactions with the possibility of actualisation. Usually, it is perceived in a single state, stable and inert, and this indeed is one manifestation of the material, but so are also fragility, and a state of fluidity. The material exists in infinite potential. At the point it is designed on the drawing board, is entering in an interactions with formworks, aggregates, water sand admixtures, and labour, experiences, trial and error processes, and the outcome of these interactions is infinite. So not only can assemblages with their destabilising forces actualise a different state of the material, but they also include the infinite virtual states the material can exist in. these states, have the potential of becoming, but can also exist in an infinitely virtual state.

## 2.5 Actor Network Theory and Assemblage Theory

Following the descriptions of assemblages and of actor-networks of human and non-human entities in the previous sections, it becomes apparent that several similarities but also differences can be noted between the two. There is first of all a parental relationship; ANT is largely influenced by Deleuzian thought and assemblage theory but also carries links in the pragmatist tradition, post phenomenology and ethnographic methodologies. Because of this genealogy they also both occur in distinct historical moments in time. These different moments also involve their manifestation in different ways; assemblage theory is an ontological position, a description of being in the world, rather than transcending upon it; therefore, it will be contributing to my dissertation in a clearly philosophical way. ANT, on the other hand, is a reworking and a methodological mobilisation of assemblage theory by Bruno Latour.

This explains why there are some very common threads running across both ANT and assemblages. Selecting to review both in this thesis does not put them in opposition, but in a supplementary position. In my description of the relationship between concrete, its surroundings, and the properties, ANT is useful methodologically, but assemblage theory



provides a more vast area for concepts to be drawn from. As previous authors have noted, ANT and assemblages revolve around relationships that occur and around entities that change while interacting with other diverse entities (Müller, 2015; Müller and Schurr, 2016). The changes happen *because* of the relationships rather than in spite of them. Therefore, both assemblages and ANT can allow for concrete to be described in a context where it can shape and be shaped into something else other than its purely material characteristics. This commonality between them can be traced back to the genealogy of ANT, which can be partly traced to assemblages.

### 2.5.1 Relational description

With the synergy of multiple entities and heterogeneous components coming together, ANT and assemblages become relational. As Müller points out, they both discuss entities operating in an interaction or in a network, instead of an element acting on its own (Müller, 2015). They assume the presence of an entity can only initiate change in conjunction with another, and never by itself. It is the relationship that makes them activated, not the individual components themselves. This relational description is central to the way I will approach concrete, as I have already made clear from the first chapter: I will not approach the material on its own, but will recount it in an array of components with which it can create synergies. However, in the view of the ANT the relations are usually altered by something new added in the network, another component that arose at some later point, and not something pre-existing. The descriptions of sociotechnical networks illustrate the introduction of a technology, while assemblages are relying on mutations within the territory they sit upon. The assemblage that is left to mutate and relationships form from these mutations. The very production of the assemblage and its emergent properties can be the result of a historical process. The relationships of exteriority between heterogeneous elements can be changed to interiority relations altering the way properties are produced in this assemblage.

### 2.5.2 Non-reductionist descriptions

Both ANT and assemblages are non-reductionist in that none of the relationships or the properties that arise, could previously be imagined by their parts. In the assemblage and the actor network, the resulting synergies are unimagined and unexpected, and are formed without any rational reasoning, nor any linear logic. The multitude of actors involved may not individually have any of the characteristics that arise in their interactions. Their properties may, or may not have influenced the effect of an assemblage, and interactions between similar parts do not always ensure similar effects. This is particularly applicable to assemblage theory, which does not accept any form of linear logic. It argues that different parts can produce the same result, and that the interaction of the same parts can produce a different result. What this implies in the case of concrete and the way it is perceived, is that any interaction with the material will be producing different effects every time. None of the ways in which the material is perceived, can be pointed down to the individual characteristics, neither material nor immaterial.

Although actor networks are not concerned with *how* the networks appear and the processes taking place in their creation, they are concerned with *what* happens when they operate. The descriptions of sociotechnical networks present how effects are attained once the human and non-human entities meet. By describing the interactions, the effect, although non-linearly, can be described. Assemblages are not concerned with their manner of operation, but use emergence to describe the properties coming about in an almost metaphysical and non-descriptive way. While the premise of opening a black box is central to ANT, assemblages are more unpredictable: their behaviour and their mode of operations is entirely unpredictable, regardless of the level of knowledge on the parts.

### 2.5.3 Co-existence of heterogeneous components

The material presence for the actor network is essential. The interactions of the sociotechnical revolve around the coexistence of human and non-human entities, all with the

potential to act. The agency for the non-human components operates in parallel with the human ones. There is no hierarchy of agencies that components can trigger. The fact that human agency can also be intentional is irrelevant for the way the agency is produced; its intentionality does not make it a superior or inferior type of agency. Human and non-human components act in the same way, but the fact that they are different is crucial for them to operate. ANT relies on heterogeneous socio-material entities coming together to become productive, and their heterogeneity ensures the agencies of an actor network. Matter and objects are brought into social networks and becoming active with them simultaneously. There is no hierarchy in the way they come together, but all co-exist in a flat ontology. The agency can be attributed to both material and immaterial, human and non-human, without the need for justification of a rational intentionality.

Assemblages are formulated in a similar way. Entities from both axes come together to be productive and the productivity of the assemblage in the form of emergence, is ensured by these two axes. No assemblage exists without these two axes, and no assemblage is productive, unless these two axes combine heterogeneities. The heterogeneity is what makes the assemblage continuously mutate; with the diverse interactions that take place, the assemblages give rise to emergent properties. The material presence is therefore crucial in both, with the difference however being that ANT refer mostly to materials, tangible and with physical characteristics. Whether it is an object, “black-boxed” and thrown into a network or a technology whose box has been opened and the relationships of the technical components with the users are investigated, ANT objects, artefacts, technologies and materials, always have discernible characteristics. Assemblages on the other hand, can also have entities in the virtual with the potential, and matter existing in its purest form.

The way the heterogeneous parts work together differs between the two: although they both require a variety of diverse actors, ANT agency requires partnering, and the heterogeneous elements need to couple up. They need to find *allies*, as Müller names them, to

associate and interact with in order to produce an actor network (Müller, 2015:31). The relational affinity between in the coupling of the heterogeneous components, Affinities in assemblages however, can also operate purely by coexisting in the same assemblage and the effects emerge almost in a metaphysical way. Catalysis, as described previously by DeLanda, assumes that there can be third parties involved, that although their presence can influence the effect, are not directly influences in the outcome. The affinities elements form in assemblages are still relational, but in an abstract and indiscernible way. Furthermore, assemblages discern relationships of interiority vs. exteriority that produce unimagined emergent properties.

Finally, there is a distinct difference in the origin of the heterogeneous entities. Assemblages, in order to operate, always require a territory. As Jason Skeet points out in his description on the operations of an assemblage, by marking out the two axes on the assemblage, four sides are defined on which a territory can act. This is the specific environment for the assemblage to be constructed and it demarcates a clear and specific area (Skeet, 2014). ANT on the other hand is open-ended and can allow for any affinity to come into play. The open-endedness of the network becomes important in later sections as it allows me to introduce entities related to the concrete that would previously have been unimagined in the territory of an assemblage.

#### 2.5.4 Methodological rigidness of ANT vs. conceptual position of assemblages

A further very crucial difference between the two is the methodological rigidness of ANT versus the conceptual framework used to describe assemblages. ANT uses a full set of terminology and has a specific method of enquiry, albeit with some variations (Nimmo, 2011).<sup>i</sup> The terms “*black box*”, “*script*” and “*non-human*” that have already been described in the first chapter, but also “*intermediary*”, “*delegating*”, “*affordance*”, “*mediator*”, “*object*” vs. “*thing*”, refer to specific characteristics and actions in the actor-network (Yaneva, 2009b). There is a consistent set of terms that ANT employs to describe in a systematic way the infrastructure in

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<sup>i</sup> For a more detailed study of actor network methodological approaches also see Nimmo, 2016.

which technological and material achievements operate in a social context. The dominant use of ethnographic methods that ANT uses makes it more rigid methodologically. Assemblages on the other hand can employ any form of enquiry, without any indication of preference, nor an explicit tendency in the literature. Because of the fuzziness of the descriptions, and the very abstract philosophical terminology they use, assemblages also find a very wide audience and a multitude of disciplines they have an audience in; this makes their methodological approach even more open and diverse.

### 2.5.5 Synchronic actions of ANT vs diachronic actions of assemblages

The previous section of this chapter presented ways in which properties come into fruition in assemblages, as a result of a historical process of evolution. Biology offered the necessary terms to describe a property not as an essence, a fixed bracket description, but as a singular effect that has stemmed from continuous singular transformations. Properties emerge in assemblages through a historical process of individuation. Any components of the territory in which they are formed can at anytime be, or not be an activated part of the assemblage; the transformation can be continuous over time, but can also occur simultaneously. The time scale in which the assemblage forms and evolves can vary from being very large - a long historical process - to very small. ANT, however is not concerned with a historical process occurring over time and predominantly describes networks that take place synchronically. The effects do not move between layers of timescales or relate to the immediate time setting in which they occur. The absence of time scales and the ability to move between various timeframes makes assemblages more versatile in describing effects that take place over a long period of time, or effects which appear with a time lag and over various scales.

### 2.5.6 The need for both ANT and assemblages in describing concrete in Park Hill

Both assemblages and ANT will become helpful in this dissertation to describe concrete and the complex relationships it forms. In some cases, ANT will prove more helpful in describing

these relationships, as they will be occurring synchronically and in a network. In chapter 6, ANT will provide the methodological rigidity for describing the concrete and its synergies in a network, where the interactions and the elements are brought together through the intentions of the actors, even if the effects are unintentional. The way the relationships operate are discernible in a network, with the effects being simultaneous and not the result of a historical process. The ways in which effects come about, are indicated by the interaction of the components that come into play. Human and Non-human actors come together without hierarchy and couple up in a clear and intentional way, even if their effects are unexpected. ANT is also necessary when concrete is acting as an object in actual space. Partnering of concrete with other entities takes place in these networks and effects are stemming from that partnering. concrete triggers effects with its extensive properties, purely by being there and orders social relationships by means of its physical dimensions. When objects and humans operate in the sociotechnical aspects of the building, and the material is interacting with other non-human and with human actors, these relationships are conceptualised with the vocabulary of ANT.

However, in later chapters, I will need to describe the effects of concrete in an almost metaphysical way, that occurs as a result of historical evolution and through changing relationships of entities in a fixed territory. Materials in the built environment are performing in ways that have nothing to do with the original intentions they were ascribed. Exposed use of loadbearing brick or concrete for example is not employed simply for their structural properties. By participating in the built environment assemblage they are also having visual effects, aesthetic effects, and in many cases from the use of certain materials cultural and historical properties also emerge. Materials have evolved far beyond their original intention, and the evolution has taken place through a continuous historical transformation. There was not a specific moment in time when a marble column was made in the ionic order to become representative of a cultural use, and there is no fixed moment in time when concrete became the material with the potential for social transformation. Arguing that the selection of materials,

and for the purposes of this dissertation, concrete, is simply to create a structure, is a partial statement. It leaves out a multitude of performances that have emerged in the use of those materials over time.

Assemblages therefore become crucial in describing the transformation of materials over a historical process and illustrate how their properties emerge: not in a linear clear way but in a surprising and unexpected manner. Concrete will be presented as an entity that is transformed from a vehicle of structural capacities, to an element through which visual and aesthetic effects are emerging. The effects that are brought about are entirely unimagined, and are emerging in most cases through a continuous historical process, rather than a simultaneous coming together of actors. The properties emerge in an unclear, non-linear way.

Both assemblages and ANT are fruitful in describing concrete in Park Hill. The fact that both can be employed in the same domain of research to answer similar questions, demonstrates that they act as supplementary and not in opposition to each other. Where ANT fails to describe the historical process of emergence of a property, assemblages come in the description. Similarly, when assemblages fail to describe the sociotechnical interaction of the object of concrete in its network, ANT provides a repertoire of concepts and terms to map the relationships of human and non-human actors. Both ANT and assemblages describe relationships of heterogeneous elements, and both have a relational worldview: they both set a similar scene for concrete actions to take place.

## 2.6 Activated matter

The effect of the concepts mentioned in the previous sections, can be seen in the recent surge of materialist thought in academic literature. According to Diana Coole and Samantha Frost there has been an unprecedented interest in materialist ideas and concepts that acknowledge the powers of matter. A materialist philosophy is one that enables materials to be revealed as powerful, without transcendence in the way they operate. In the materialist ontology,

matter can exist independently of our minds and therefore is ontologically in opposition to idealist thought in that any transcendence of a constructed concept is ruled out. This renewed interest, that spans over a wide range of disciplines and is evident during the first decade of the 21<sup>st</sup> century, can partly be attributed to the domain opened up by the philosophy of Gilles Deleuze. Coole and Frost introduce the term “*New Materialisms*” to describe the emerging materialist related concepts (Coole and Frost, 2010). New materialisms have emerged from the same line of thought as the concepts that I described in the previous section, and although this dissertation will not use them explicitly, they offer in their different views a way of presenting matter as highly activated. This will become a critical observation in describing the activeness of concrete.

As new materialisms stem from the Deleuzian concepts that were described earlier, they can also offer a line of thought to the way concrete is described in the dissertation. Assemblages, territorialisation, actualisation and emergence mentioned previously, were found to have far reaching implications in describing concrete in Park Hill, and visiting new materialisms can further help describe the implications on the material in architecture. It is worth keeping in mind however, that the new materialisms do not constitute a unified body of thought but contain multiple and often contradicting notions within them. Concepts can be taken away from the comeback on materiality but not necessarily as a solid body of knowledge. To understand what the surge in New-materialist theories can offer to architecture, we first need to understand what has led to this surge. I will then describe what this comeback can offer to architecture.

### 2.6.1 The emergence of New Materialisms

#### *Open descriptions of assemblages*

One of the reasons why there has been an exponential increase in new materialist thought can be attributed to the open ended descriptions of Deleuze. William Conolly describes



Deleuze's philosophy as something that exists constantly in flux, in movement (Connolly, 2010:179). The philosophical descriptions of Deleuze and Guattari are open ended and leave room for associations with many disciplines. This is also evident in the way the authors themselves present their ideas. Their work is a continuous overlap of ideas from biology, geology, sociology, history and psychology to name but a few. The fact that it has such wide reaching inspirations also resonates far reaching relationships to these disciplines and therefore a wide reaching application. The philosophical descriptions of assemblages, emergent properties, lines of thought, territorialisation and deterritorialisation can therefore have such far reaching implications and has found breeding ground in disciplines from economics to management to politics, media and sociology and indeed architecture. The ideas presented in specific disciplines can also differ, not only because they will be background- specific, but also because they apply to so many different levels of actualisation. The practical application of new materialist ideas in politics will not for example be the same as the practical applications of new materialist thought in architecture. Specific disciplines will also have a different level of material implication: architecture for example will be more heavily involved with material manifestations than sociology. Therefore a degree of variation in the new materialist thought and possibly even some contradiction is to be expected.

#### *Technological advances informing materialist thought*

Materialist thought is informed by observations in sciences, and therefore the on-going surge can also be attributed to recent advances in technology. More than any other shift in prevalent modes of ontological thinking, New Materialisms is the turn that is most informed and evidenced by scientific contribution to knowledge. And since scientific thinking has been revolutionized, primarily by quantum physics in late research, the presence of matter and how it operates in the natural environment has been re-evaluated in accordance to the latest developments. Therefore, materialist ontology is being shaped by these advancements and is informed by this renewed thinking of the structure of matter (Coole and Frost, 2010:5).

The inability of idealist thought and the radicalism of the dominant discourses of the 20<sup>th</sup> century to describe phenomena related to the presence of materials, are also related to the technological advances informing materialist thought. Coole and Frost argue that post-structuralist thought has allowed for materials to be accounted in their ontological premises, and therefore there was a need to address the gap. However, this is not to say that Deleuzian thought and the new materialisms are an enemy of constructivist thought or positivism. Instead, what is on offer with new materialisms is a way of conceiving matter as having an agency without the need for a transcendental force. Matter can exist independently, but also concurrently with constructed preconceptions. Viewing the presence of materials through this lens, they can be attributed an agency that is post-human, without the need to describe them through the views of a creator. Both constructed ideas as well as purely material ones can exist in the intricate assemblages matter and concrete participate in. Transcendence is replaced by immanence: there is not a need for something greater to exercise a power, but the information for whatever arises, is already contained in the interacting parts. And this leads me to the third observation that will be the most critical for concrete in my case.

#### *Material activeness*

Viewing matter in the idealist tradition, one has to assume it is inert, unable to produce any effect on its surroundings, and therefore serving as a receptacle of orders. For example in the previous section, which saw materials described in a phenomenological regime, materials in architecture were viewed as physically obedient and loyally attentive to the orders they had been given by a creator. The architect had no role in the way a subject perceives the object. The presence of a human subject, through his constructed understanding of their surroundings is what makes an object be perceived; any variations upon perceptions of the object are dependant upon the subject. But by presenting the capacities of matter, new materialisms reveal their ability to act upon others. Activeness can manifest itself not only by means of offering a differentiated perception in each subjective case, but by powerfully participating in a

communication with the subject. New materialisms allow for biologically lifeless matter to interact in assemblages with its surroundings, something that would seem irrational in an idealist context, This observation raises the implication for materials in an architectural assemblage to gain agency.

### *Learning from the new materialisms*

The ability of materials to become active when in an assemblage is an important gain by looking into theories of new materialisms. Yet, describing human matter as a powerful acting entity and as having agency maybe difficult to describe: it is lacking a free-will component, a pre-requisite for initiating action; agency is inherent to the human realm, due to the capacity of humans to reflect upon their actions, but how can it be applied in an assemblage that includes the material? In the section that follows I will present some examples to illustrate the ability of matter to have a say and act, and how it can be attributed an inherent power both within itself and through its interaction with other entities, either human or non-human. While assemblage thinking and the emergence of properties are central to the common theme of new materialisms, these views can often be in contrast to each other.

#### 2.6.2 Materials becoming active in assemblages

Assemblage thinking becomes central to the work of Jane Bennett who introduces a power parameter in describing the role of matter in human/non-human assemblages. Bennett attributes to matter the ability to act as an *“assemblage operator”*, a term she borrows from Deleuze, giving it thus a powerful dimension that has the ability to activate the actions of an entire assemblage. In her book *“Vibrant Matter”* (2010) Bennett provides various examples on how matter is activated. Matter for her is full of vitality, able to come to life. Materials for Bennett resonate, they vibrate vitality, almost in a metaphysical way, with what she calls *“thing-power”*. For example in her case study of fat consumption, she identifies human actors (consumers, sellers, manufacturers) operating alongside non-human ones (fat itself is a non-human actor, but

also chocolates, sugar, vending machines, wrappers etc.) all existing in an assemblage. However, fat in this assemblage is what drives its operations, is what triggers effects. An emergent property of this assemblage, such as weight gain and subsequent reduced mental capacity of those consuming the fat relate to the consumption and metabolic abilities of the non-human fat. So the emergence of the assemblage can be traced all the way back to the distribution and consumption of fat. This power of fat is what she presents as assemblage operator. The operator is capable of effecting “*revolutionary transformations*” (p.42). In an assemblage it acts as a variable in an open-ended system that can cause locally a chaotic behaviour and influence greatly the produced effect.<sup>i</sup>

Another example from new materialist literature, but this time operating in a more networked reality and in the framework of ANT, is Material Engagement Theory (MET). Proposed by Sir Colin Renfrew and Lambros Malafouris, MET revolutionarily suggests another capacity of materials in an archaeological and historical context: the ability to shape the neural architecture through interaction with the properties of materials (Malafouris, 2004). In fact, MET argues that the evolutionary process in the emergence of an intelligent modern day man has been affected by this interaction with materials from the Neolithic era onwards. Malafouris uses the example of the potter on his wheel to describe the interaction of materials with the brain. The moment they touch the clay on the wheel and put their foot on the pedal, a conversation between the molecules of the material and the neurons on the tips of the potters’ fingers begins, allowing for the neurons to take shape and form according not to their individual will but letting them be shaped with the agency of matter. It is not only the potter that gives the orders to the

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<sup>i</sup> Bennett uses another example that are characteristic of the way she conceives of matter in assemblages: A blackout in North America in 2003 serves for Bennett to describe agency in human/non-human networks. The grid is described as an assemblage using Deleuze’s and Guattari’s vocabulary. What started as a few innocent voltage collapses (non/human agents), coined with increased consumer demand (human agents) and weak transmission wires (non/human agents) resulted in a collapse of the grid, leaving over 50 million in the United States and Canada without power. The blackout was a result of uneven distributions of power in an intricate network of connections between human and non-human actors (Bennett, 2010:24). Bennett argues that she introduces the idea of non-human agency in to assemblages something that previous authors have overlooked.

materials, it is the material that gives orders to the fingertips: how much pressure does he need to place on the clay, how much must the foot alter the pace of the wheel, how quick or slow must every tiny fingertip movement be and what different use must a potter put to each finger. As the piece of pottery on the wheel starts to take form, every order of the potter to the material gets a response and the potter replies back, based on previous feedback. Through this case study, Malafouris (Malafouris, 2008) presents the material in a network, rather than an assemblage, involving the material itself as a non-human acting entity, exercising power on the artists' body and brain. The effects of clay and neurons, is more easily traceable, and clay is coupled with the neurons in this small network of interactions; the powers remain on the material giving another account of their agency.

Exploring further examples from new materialisms and how they contribute to thinking of architecture as an assemblage could be further expanded, but it is beyond the scope of this chapter and beyond the purpose of identifying concepts relevant to how concrete is acting in Park Hill. Understanding matter as active is the most important observation made for new materialisms, whether they are in an assemblage or a network, materials have to power to be active, and the implications of architecture are vast.

### 2.6.3 Philosophical descriptions of material activeness

This idea of matter bearing information and capacities within it can be traced all the way back to Aristotle: his term "*entelechy*" presents matter as having an end in its self.<sup>i</sup> For Aristotle, matter has the potential to be actualised, to come into a form, from a state of potential. For example, for Aristotle a block of marble already has within it, the material required to turn into a piece of sculpture. Entelechy is the information contained in it and the process of turning it into a sculptural form. This form is the final state of *energy* as Aristotle describes in "*Generation and Corruption*" (Korudalleus, 1780:103, 129, 225-227) and in "*Physics*" (Korudalleus, 1779:326-

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<sup>i</sup> The Greek term *entelechy* (εντελεχεια) is short for "εν εαυτόν έχει τέλος» meaning that something has an end within itself.

340). In similar accounts in his descriptions of biological organisms, Aristotle found them to be composed of two inseparable substances: the purely material characteristics and the actions, the immaterial functions. Entelechy in the biological organisms was for Aristotle what made organisms come alive, was the soul within the organisms. Without entelechy, organisms would simply be reduced to their material characteristics.

The concept of entelechy was taken forward by German embryologist Hans Driesch. Jane Bennett describes his work on sea urchins: For Driesch, all the information for life to emerge pre-exists inside every cell involved in the creation of the embryos. This pre existing of information in all cells is what he calls entelechy: an "*intensive manifoldness out of which emerges the extensive manifoldness of the mature organism it*" (Bennett, 2010:62). The organism has the potential to be realized with the information contained in matter pre-existing in, it. Entelechy in Driesch's case has moved from the Aristoteleian definition: matter does no longer have the ability to move into an ideal state, and possibly with a transcendent intervention, but is now active in it self, and could morph into infinite potential without any transcendence. From a condition in which everything is moving towards a perfect state described in the Aristoteleian context, matter becomes for Driesch a driver to infinite potential and therefore is charged with capabilities.

The entry for entelechy in the Oxford Dictionary defines the term as "*the realization of potential: the supposed vital principle that guides the development and functioning of an organism or other system or organization*". Entelechy, therefore, is the self-developing mechanism of an organism that offers the potential to develop itself into infinite potential. For Aristotle, however, in the case of the marble it also requires a human action on the material to enable it to actualize. Although the material contains an end in it self, there is an additional human *energy* required to turn the marble into the sculpture. For Aristotle, entelechy is what drives matter to an absolute perfect state, aiming towards a perfect state condition that an organism can reach. This potential of matter to be realised moves towards an ideal condition,

and not towards infinite potential. The description of entelechy in the Oxford dictionary is therefore related more closely to entelechy in Driesh's sense, and not the Aristotelean description.

Similar to entelechy, and also relating to biology is the concept of autopoiesis: In the biological sciences, closed systems<sup>i</sup> have the ability to reorganize themselves in order to ensure their propagation. For example, in the case of trauma, an organism has the potential to reorganise its cells and their functions to ensure the wound will heal. All the information for the operations that take place in healing, are already contained in the cells. The mechanisms are set into action not by a transcendent force, but by capabilities inherent to the organism. Humberto Maturana and Francisco Varela, (1980), describe the workings of an autopoietic machine, one that is not limited to singular organisms but can expand to entire ecosystems and that is organized as a network of elements that interact. By means of these interactions, the self-healing system continuously reforms the associations between the elements and continues to formulate the assemblage in which they participate.. The cells or biological systems of an autopoietic machine have the ability to self-heal and recreate its components. In cases where the living cell needs to adapt or restructure itself, the matter and information for doing so is already immanent in it. The closed system is also the mechanism responsible for its own reorganization, and the organism remains spatially a network of associations that propagate it as a whole. What autopoiesis implies philosophically is that matter has the capacity to act on its own, without an intervention from the outside. This power is immanent to the material and pre-exists its necessity to heal.

Both autopoiesis and entelechy –at least in the way it is conceptualised by Driesh and Bennett- describe the potential of matter to contain information within it and actively and self-form. Matter is activated, thus enabling the emergence of life. In both cases the emergence of

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<sup>i</sup> A closed system is a system in which the components cannot leave from a boundary. In the life sciences this translates to organisms, cells etc.

an organism or a self-healing mechanism is activated independently of the context. In the assemblage of the organism or the ecosystem, the plateau of operations remains closed, and any action to deterritorialise its parts, is countered by a reterritorialising action that brings it back to its original territory. The mechanisms that come into play operate metaphysically, and there is no clear path for the emergence of the effects. Yet, autopoiesis is slightly different conceptually in that it assumes that the organism will be contained in a closed system in itself. Entelechy on the other hand, assumes that the deterritorialised effects will lead to infinite potential. While autopoiesis endeavours to return the system into an ideal prior state of stability, entelechy is open-ended, free to myriad potentials of actualisation, making matter an omnipotent power. The possibilities which matter has in this respect, are infinite.

#### 2.6.4 Materials and their morphogenetic capacities in architecture

In this line of thought, where matter can be charged with a power to act, morphogenetics are re-described a new mode of thinking about materials in the built environment. Assigning them with the capacity to act on their own, with an immanence that stems from within them, rather than being acted upon by a superior force, has opened a new areas of possibilities in architecture. If immaterial objects have the capacity to form themselves, they can be partially or fully discharged from the mental processes and human actions imposed on the form and characteristics of a material. There is a self-forming potential inherent to the material. Architectural history and theory present several ways in which materials can be active in the morphogenetic abilities of material presences. The information stemming from materials can be related to the structural capacities and the information on structural integrity within the structure, or can be linked to the form of the material. They can also be stemming exclusively from the material, without any form of intervention, where forms emerges fro the assemblage, or they could be acting in a network of other immaterial and material things, similar to descriptions of ANT.



The use of blue foam as a model material in the Office for Metropolitan Architecture (OMA) described by Albená Yaneva (Yaneva, 2009a) is an example of the latter. Yaneva identifies how a material that is not even present in the final built form, and is exclusively used in the conceptual stages of a building, can have a great power over the final object of architecture. Being the dominant material used for model making in OMA, the blue foam is involved, albeit unintentionally and without the conscious decisions of the architects, in the decisions of building forms produced in the practice. The final form of the constructed product can be traced back to the material used for the production of the models. The way it is cut and shaped with its workability, gives rise to the shape of the building more so than the ideas projected upon it by the architect. The architects engage in discussions around the object, and the lone architect working with the foam, shaping it with a knife or cutting it in a machine engages in a kind of “*dance*” as Yaneva calls it (Yaneva, 2009a:78). With her ethnographical account of the everyday architectural production in OMA, she describes this process of continuous interaction, a process that takes place in the form of a dialogue between the material and the creator, whereby the creator has certain intentions in giving form to the materials, but the materials themselves also have a will of their own, and become active in a dialogue with the architect. Both material and architect operate in the same network and the form produced is a result of their dialogue, equally stemming from their interaction without any form of hierarchy.

Another view of the morphogenetic capabilities of materials in architecture can be found in the work of the German architect Frei Otto. Known for his tensile structures, Otto used foam bubbles to create models of tensile forms for his designs. Soap bubbles have the unique and remarkable ability to self-form in the optimum shape for an area that minimises surface tensions (Drew, 1976:10). Taking this observation from physics, Otto used it to create tensile structures with the information already pre-existing in the material: the forms produced for his designs, come directly from the material and were pre-existing in the material itself. The intervention of the architect is minimal in this situation, and the effect produced relies on the capacities of the

material. Frei Otto also famously produced a hanging model of the Sagrada Familia (Armengol, 2001:149). He used a complex mesh of string and weights turned upside down to create the intricate forms of the towers of Anton Gaudi's famous cathedral. The form of the cathedral is shaped by gravity acting on the chains representing the structure; the shape came about not only by the intentions of the creator, who selected and arranged the materials, but also by the physical characteristics of the components: the weight of the steel and the tensile traits of the string. The information for the production of this form, was contained in the materials used. In both cases, the immanent morphogenetic capacities of the liquid soap and of the steel weights and string, gave rise to the structures.

The concept of autopoiesis described in the previous section has been influential for Patrick Schumacher's explorations of the self-forming abilities in architecture. His work on autopoiesis spans from his theoretical understanding presented in his book on the "Autopoiesis" of architecture (Schumacher, 2011) to the practical exploration of form making in his work with former partner in practice Zaha Hadid. An example where autopoiesis has been implemented in an urban redevelopment project is the Kartal-Pendik proposal in the outskirts of Istanbul. Zaha Hadid architects, have redesigned a 5.5 million square meter neighborhood, relying heavily on computer simulation tools. The architects have collected a large amount of information on the area. Together with the requirements for the project, the information is input into a modelling program in the form of an algorithm. The final outcome and the proposed form is a computer-generated proposal that has emerged from the algorithm (Schumacher, 2009).<sup>i</sup> While not explicitly involving material arrangements, the resulting effect is produced by an object: a computer with its algorithm.

In all the examples presented above, the architect's work is largely influenced by the ability of matter to morph into unique shapes, unbeknownst and unexpected to the creator. Matter is charged with the ability to self-morph as a result of the interaction of many

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<sup>i</sup> For more information on software modeling of urban contexts also see Picon (2010:199)

components whose continuous interaction does not necessarily produce identical results every time. Soap, blue foam and computer modelling systems in the cases above, shift the dominant descriptions of materials in architectural theory: they no longer are an inert entity obedient to the creator. The transcendental manner of interaction of an architect with materials has been lost: the latter have become an actor in discussions with a creator. Morphogenetics in the cases described, emerge from the dialectic between the object and the creator. Materials become active participants in form creation, receiving orders from the creator but answering back through their intensive and extensive properties and feeding into a dialogue. There is not a single linear effect that emerges every time from this interaction, but there is infinite potential without a distinct linear causality.

## 2.7 Materials and their non-representational perspectives

Moving on from ways in which material agency can be described with very clear and direct ways, I will present two notions, that can be brought into the discussion of the material agency, beyond the absolute representational, where there is no sense of directionality, only the presence of matter and its effects. These two views, both offer ways that can abolish the presence of pre existing constructed notions, where the material can exhibit agency without allocated meaning, or at least in ways in which the allocated meaning is far from forming a straightforward relationship with the experienced effect of the material.

### 2.7.1 Affordance

Having already described already ways in which matter can and should be attributed with agency and an ability to initiate action and instigate the formation of conditions, affordance can offer an indirect manner of viewing the material. Originally coined in the philosophy of perception James J. Gibson (1977), it involves a presence for objects in our interaction with the environment, and the way in which matter is implicated in our readings of surroundings. In the "*Theory of Affordances*" Gibson describes the affordances of the environment as that which it offers to the animal, but referring to both to the animal and the environment; a term that implies

the “*complementarity of the animal and the environment*” (Gibson, 1977:68). Affordance, in other words, are the potentialities of interaction offered by the environment. They describe the meaning of an object, not as a constructed attribute, but as already existing in the object. For Gibson, there is no cognitive attribution to the object and no thoughts are necessary for the subject to interact with the object, there are no intermediaries. The object with its properties exists out there, waiting to be understood in the real world, and not constructed.

Affordance theory has the potential to be implicated in the understanding of the constructed environment. As previously noted by Johnathan Maier and Georges Fadel, it can work as a conceptual framework in architecture to describe relationship between form, function, users and environments (Maier et al., 2009): affordances can be used as an evaluation tool to explore initial intentions versus actual uses of artefacts, providing valuable information of past uses that can be used for future reference. Maier and Fadel (Maier et al., 2009) take forward Gibson’s assumption that object already includes the information involved in its perception. They read objects, e.g. door handles, as initiating action of behalf of the user; they also differentiate between affordances that are initiated on a personal user level and on a group level and introduce an element of desire to describe the different affordances of artefacts otherwise designed for the same purpose. However, although affordance brings to the forefront the material and the interactions with it, this mode of thinking can be decisively phenomenological. Pallasmaa, for example, also discusses the ability of objects in buildings to speak for themselves, like for example the use of handles opening the building (Pallasmaa, 2005). He mentions that the worn out texture of a building’s door handles, might create a sensation of familiarity and warmth to invite the user. Therefore although his intentions are towards a material exploration of the properties a building can afford, they shift to a human interpretation of the materials qualities that is not included in Gibson’s account.

Affordance can describe the implications of concrete’s material presence away from constructed notions, purely by means of its characteristics, yet how this can be achieved,

remains unclear. For affordance theory, the human/material interaction becomes activated with the presence of the material, but affordance still views this from the perspective of the human, relying on interpretations of the material, rather immaterial triggers. Therefore, although affordance can capture the emergent properties of concrete when interacting with a subject, the perspective is still from the human, and not from a reciprocal relationship of both subject and object.

### 2.7.2 Affect

The second concept that can dissolve pre-constructed notions and that can describe the ways concrete is implicated in the experience of the built environment, is the philosophical notion of affect. Nigel Thrift describes affect as *“the property of the active outcome of an encounter”* (Thrift, 2008:178), a definition he draws from Spinoza: the increase or decrease of the ability of mind to act either positively or negatively. For Spinoza, affect was related to, but not necessarily dependent upon, emotions.<sup>i</sup> Considering that Spinoza’s philosophy was based upon the premise that there was only one substance (in contrast to a duality of mind perception that gives superiority to human thought), only matter can be implicated in the way responses are triggered. Deleuze and Guattari carry Spinoza’s definition further to describe its implication into human perceptions with the premise that it exists in one substance only. To discard the possibility of a second transcendental substance, Deleuze describes in his book on Spinoza a primitive organism, the tick: Its sole purpose is to suck blood and is only therefore capable of only three affects: light, smell and heat. Similarly for Deleuze, humans have a set number of affects. As Elizabeth Grosz puts it, affect is the *“non-human becomings of man”*, what makes him an animal, rather than distinguish him (2008:77). One could argue that Grosz’s definition strips affect from all intentionality and attributes to it the potential for a single substance to be triggered by itself and without any transcendence.

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<sup>i</sup> In parts two and three of ethics he differentiates among three types of emotions: joy-laetitia, sadness-tristitia, desire-cupiditas.

Massumi further supports the existence of one substance by talking about affect being completely autonomous, an independent action and involuntary response of the human body. The escape of affect is what can be perceived according to Massumi as *“one’s sense of aliveness [...]. [...] the perception of this self-perception [...] that allows affect to be effectively analysed”* (Massumi, 1995:97). Emotion is *“a subjective content, the socio-linguistic quality of an experience”* defined as personal, but affect and emotion *“pertain to different orders”* according to Massumi (1995:88). So while emotions can be socio-linguistically shaped and brought to the consciousness, affect remains autonomous and subjective as a body function and response.

Nigel Thrift’s work offers more practical albeit more dystopian terms of understanding affect. It is made more visible in the urban and political realm, and offers for Thrift the potential for a *“manufactured agency”* of choice. The engineering of affect, which has *“knotted thinking, technique and affect together in various potent combinations”* (Thrift, 2004) has been used in military and socio-political situations for centuries. Affect is an area of politics architects are extending into in recent years and Thrift identifies the necessity of extending affectual studies into cities. In this domain, lots of possibilities come to mind like architecture, built environment, infrastructure, advertisement, urban greenery etc. Yet, many of these possibilities remain unexplored and the potential is vast: In Thrift’s own words: *“Given the utter ubiquity of affect as a vital element of cities, [...] you would think that the affective register would form a large part of the study of cities-but you would be wrong.”*(Thrift, 2004:57). But although he goes a long way to describe the possibilities in studying and employing affect in practice in the political realm, he does not go into any detailed examples about affect in the cities in particular, but remains within the political as a reified concept.

Affect raises some questions that are worth keeping in mind when addressing the aim of the dissertation, and trying to unravel the multiplicity of concrete: could we consider affect as an independent means of experiencing the presence of concrete in the built environment? Could

the architectural experience become disconnected from personal experiences, when describing our interaction with the material? This observation would imply that there is a concrete ecology triggering a similar autonomic response to everyone and that an affectual trigger can cause the same response to people who have a different emotional reaction to the same thing. Considering a concrete interior for example triggering a user's experience would be similar, regardless of personal background, past experiences, mental images, socio-linguistic background or emotions. Is it that everybody finds some aspect of the built environment to relate to and therefore triggering a pleasant and conscious emotional reaction, or is the environment itself that activates the same affectual response, which can then be translated into positive emotional reaction, establishing therefore a relationship between the two? Yet, if we are to assume that a materialist mode of thinking can argue for an existence of the cosmos independent of our minds, one has to accept that this interaction is shaped exclusively by matter. The role of materials in triggering an affectual response is therefore becoming critical in this view.

### 2.7.3 Affect in the context of assemblages

By examining and comparing the work of Massumi and Thrift, two issues can be argued, and both can suggest ways of describing concrete and the effects it can elicit. The first one relates to the use of the term "*autonomy*" by Massumi: if affect is cut off completely from the emotion and consciousness, it should also be autonomous of the sociolinguistic context emotion pertains to. However, this would imply that the same things can trigger an autonomic reaction of affect in everyone. For example, viewing a concrete interior can induce an autonomic reaction on the brain of the viewer, and the intensity of this reaction, Massumi would argue, is linked to affect. Yet, I would counter-argue that it is very difficult to assume the same autonomous affect on everybody. How can it therefore be deduced that a relationship between affect and emotion can be excluded? The author himself talks about the parallel running of these two but does not consider the possibility of a non-linear relationship. It could be

described as a reciprocal relationship that would be explained not by cause and effect, but in an intricately networked complexity and if Thrift's concern of an ever adaptable affect is considered, then this partly material, partly constructed assemblage becomes even more of a possibility. The affective response triggered by a concrete experience independently from the subjective emotional perception, should leave open the possibility of a different level of connection between the two non linear, operating in parallel.

Opening the possibility of a non-linear connection between affect and emotion, brings me to the second implication of affect in a possible reading of the environment through concrete. The interaction of the human with the material raises an awareness of what this relationship involves and the proprioceptual account of what is experienced is continuously constructing and altering the understanding of the material. And even further beyond the proprioceptual account, knowledge emerging in the cognitive sciences, such as environmental psychology and neuroscience will be able to revolutionize studies of affect and even formulate its relationship with emotions. The knowledge that is gathered from analysing perception, and describing interactions with the material, makes one more aware of the affectual implications. This awareness, raises the question of whether one will maintain the same affectual responses after it has been consciously or unconsciously acknowledged. This could work both ways: assuming an affectual response remains the same towards a concrete interior, would its knowledge alter the response? Or the other way around: could the knowledge of what a concrete interior elicit create an expectation for this effect to be triggered? Using the knowledge of affect could also account for a constructedness of the knowledge of the material, but in a way that it stems purely from material elements. The properties of concrete that would then be acquired, would be a result of the knowledge of the material, and affectual responses would evolve to something different when knowledge on them becomes readily available.

Incorporating affect onto our reading of the urban environment, as highlighted by Thrift, can attribute a more significant presence to matter. Extending his observation from the urban



into the narrower area of the built environment, the point of interaction of material and immaterial entities can give a conspicuous role to matter: it can become activated without any constructed meaning. An affectual reading of concrete in later chapters can therefore become a significant domain for investigation. As already mentioned, the production of affectual responses will be considered in the way materials, perceptions and the environment interact, but it will not be the main concept I will be exploring. Affect will be entangled in the material construction on the built environment, but only as an underlying concept that has motivated the research, not explicitly involved in it.

## 2.8 Discussion

This chapter started with a presentation of ideas and concepts that are shaping the way in which we understand architecture. Over time, architectural discourses have continuously argued for an absolute condition that architecture should follow and achieve, but this condition has never been able to be fixed and tightly defined. Throughout all the changes in thinking about how architecture should be and what it should do, there has never been a condition that has been able to withstand time. All the assumptions deemed as the perfect state that architecture must reach, would collapse some years later. In the case for example of Fanger who advocated that the environment would be fixed within specific environmental parameters, there have been counter opinions on the sociocultural construction of comfort. The sociocultural construction of comfort itself, was in turn later presented with views of a phenomenological effect of the built environment on comfort. Whenever there has been an attempt to fix and stabilise a state that architecture must endeavour to reach, that state has always eluded a definition.

Deleuzian thought offers a renewed way to describe these shifts of architecture. Understanding the built environment as one plateau where there are stabilising and destabilising forces, the potential of architecture becomes infinite. Whereas until recently architecture was in pursuit of a single state, the introduction of Deleuze and Guattari's has reversed this pursuit.

The multiple presentations of architecture that have been until recently faced as a nuisance, have now a way of being acknowledged as the norm. It is somewhat ironic that the condition of the ever-changing architectural definition can be now stabilised precisely by acknowledging these multiple changes.

Assemblages were then discussed, not as another way of viewing architecture, but as a vehicle for re-conceptualising the entire discipline. Three observations about the way assemblages operate will become important in later parts of the dissertation (Chapter 6). Firstly, because of the way they operate, assemblages allow for a far more entangled, complex and multi-layered understanding of architecture than the typical approaches in phenomenology, constructivism, or teleological interpretations. Secondly, they help present the emergence of properties as a metaphysical product and as the result of a historical process of interaction of heterogenous entities. Concrete viewed in an assemblage has the territory to operate alongside the constructed notions, while maintaining its purely material characteristics. Thirdly and very importantly, they allow for materials to be brought into the discussion of architecture, in a way that acknowledges their active potential. This potential is activated, not only in a network, like in the case of the blue foam in OMA, but also within the materials themselves, like in the case of Frei Otto's bubbles.

I then moved on to argue for the need of both ANT (described in the first chapter) and assemblages for the purposes of this thesis. This thesis is not going to argue for or against any single one, but will refer to both. Depending on the type of description necessary for concrete I will employ assemblages and ANT interchangeably to understand materials and their interactions. They are both ontologically positioned in the same realm: they both discuss heterogeneous entities coming together and both have a relational worldview. There are instances where ANT is required to describe in a clear methodological vocabulary the interactions of concrete with sociotechnical networks. But there are also instances when the material presents with non-linearly produced properties that assemblages are helpful in

describing. Both are brought into the discussion not in opposition, but acting as complementary to one another and in both cases the material exists in parallel with existing constructivist theories that describe architecture.

In the final section I have presented how affordance theory, as described by Gibson, and affect theory as described by Massumi and Thrift, can exist in the context of assemblages.. Affect becomes entangled in the material construction on the built environment, but was presented only as an underlying concept that has inspired the dissertation. It presents the option for concrete to be perceived beyond any sense of attributed meaning, beyond a representational realm. In this realm, there is no sense of directionality, only the presence of matter and its effects. Affect offered for concrete the option to exhibit agency without allocated meaning. Could concrete ever be conceived as existing independently of our interpretation of the environment? Could it exist in a realm where there is no interference from constructed experiences? While I have not reached a conclusion on these questions, opening them up reveals an area in-between two different type of descriptions: a materialist and a constructed one.

Concrete, starting from the next chapter, will become the lens through which I will describe human and non-human interaction, initially in the built environment and later on in Park Hill. This present chapter opened the possibility to reshape the way we describe our interactions with the object of built environment. It raised the question: *“how can we re-describe concrete viewed as part of an assemblage? And what can this re-evaluation offer to the existing knowledge on the material?”* Whether viewed as *“vibrant”* and powerful, like in the case of Bennett, or as an inextricable entity inside a complex networks of associations, as Deleuze and Guattari would place it, or as a trigger for the actualization of one of a myriad of potential conditions activated by DeLanda’s catalysis, concrete can be thoroughly rethought. I will start by challenging the dominant descriptions of concrete in architectural studies that view it as a passive, stable and singular object. I will then proceed to describe its interactions in a network

of human and non-human components using an ANT methodology, and will present its capacities as emergent from the mode of interaction with other parts of an assemblage. I will present the emergent ways of how the presence of material interacts with the built object and our understanding of the very vibrant matter that concrete is. But before I proceed in doing so, I will present in the next chapter, the tactics used for the collection of information and the analysis of the material gathered.

## How to trace concrete: a methodological approach

*“An assemblage, in its multiplicity, necessarily acts on semiotic flows, material flows, and social flows simultaneously” (Deleuze, 2007:25)*

### 3.1 Introduction

To appreciate how materials can be better understood in architectural studies, I have previously presented their active potential. From this chapter onwards I will focus on the versatility of concrete, to describe instances when the material presents itself as an activated entity in the built environment. I concluded the previous chapter by arguing the need to revisit concrete within an ANT and assemblages context to present their activeness and study it as both nature and culture, both as subject and object existing in multiple states, rather than a stabilised solid concrete object. In order to open the black box of concrete and trace its actions, I have gone out to the field and studied examples that demonstrate how concrete presents itself in its activeness. The collection of information includes observations of peoples' interaction with the material and insight gained from people dealing with concrete. However, before presenting the empirical information gathered on site, I will present in this chapter the tactics used in tracing the agency of concrete.

The conceptualization of matter as active and the solidification of concrete as a technical object in its structural nature can only serve as a theoretical context that needs further evidence

from real life examples to be supported. So to meet the aim of unravelling concrete as an exceptionally versatile material posed in the very beginning of the dissertation, I reached out to the practice of construction and employed a variety of tools to capture the malleability of concrete.

Stepping out to the field and investigating the material in its setting is necessary to address the aim of the dissertation; this is where concrete can exhibit signs of being alive and participating in the formation of the built environment and its experience. To take this step into the activeness of concrete on the site and in its everyday manifestations, one needs to think of the material being stripped off of all attribution of meaning- of all symbolism, of all constructed notions and of all linguistics, to reveal its material activeness. Yet at the same time, it has created affiliations that cannot be discarded. Assemblage theory can therefore provide an insight into how to collect information on the material by appreciating both its manifestations. Threads of concrete stories were followed to reveal what was happening in the assemblages concrete was participating in.

In the way that assemblage theory has informed the methodology of this research, lay two methodological contributions of this dissertation, which are related to each other. Firstly, using assemblage theory to describe the actions of concrete and capture its properties as emergent is a methodological contribution of the thesis. I have mobilized a variety of methods in the collection of data (archival research, visual ethnographic survey, on site observation, interviews) all of which I have used interchangeably, according to what I found necessary to follow through from my observations on the concrete. Rather than using a method or combinations of methods to follow through and collect a set amount of information, I followed traces of concrete stories in Park Hill using an overlap of methods. This overlap captures concrete's specific temporal and procedural aspects that qualitative methods used by architectural history theory at the moment are not capable of grasping. Typically used methodologies capture the material in a specific form and in a specific building, stabilised and

used in a specific building typology. However, using an actor network theory methodology to capture the variability of concrete, or concrete as vibrant matter, engages the material with many different actors on the spot. ANT allows a different take of concrete, and reveals the malleability of concrete: the different variations of the networks of concrete. For the concrete's properties to be described as emergent, there is a need to describe its associations with entities surrounding it spatially and temporally. Both the ephemeral and the diachronic situations the material has been in are necessary to describe its emerging properties as a result of a non-linear, complex and sometimes inexplicable interaction in an assemblage.

Finally, and along the lines of the methodological contribution to assemblage theory, a second contribution lies. This dissertation relies heavily on information collected by an informed researcher. It would be impossible to disconnect my reading of the estate's concrete from any previous experience of working with the material. Although not having worked as a concrete rehabilitator per se, having been previously in work situations where there was the need to conduct concrete repairs, I had an informed view of what the condition of the concrete was on site. I do not consider this to be a bias to the research, but a specific research tactic that has enabled me to capture the different states of concrete in Park Hill. Using informed observation and coupled with more conventional qualitative research techniques, such as archival research and interviews, I was able to observe the agency of concrete, its formation in an assemblage in Park Hill, and describe its emergent properties.

### 3.2 Research approach

Because my argument for concrete starts with the material existing both in constructed and material states, methodologically, the research cannot be far from the ontological premise of a materialist world view where the activeness of the material that can also exist independently from pre-constructed notions. In keeping in line with this premise, right from the initial concept stage that I described in Chapter 2, I moved away from hierarchy assuming constructions to allow for a non-directional investigation in a flat ontology. By doing so, I was presented with the

challenge of having to look for data in infinite entanglements and networks of associations where anything could be equally important or unimportant, not to mention that everything in these networks constantly fluctuated and shifted. For the presentation of my argument, Deleuzian assemblage theory (Deleuze and Guattari, 2008), DeLandian manifolds (DeLanda, 2013) and Latourian actor-network theory (Latour, 2005) have been crucial in viewing the collection of data in a manner that moves away from a focused research subject.

Inspired by traditions, of assemblage theory and ANT, I approached my research with an open view to account for entanglements and associations with the objects, without assuming the pre-existence of any assemblages and networks. My data collection has been influenced by Actor-Network Theory's ethnographical approach and I engaged with Albena Yaneva's "*Slow ethnographer*" mode of understanding (Yaneva, 2013a). Yaneva discusses the difference between a "*hasty sightseer*" and a "*slow ethnographer*" perspective in architectural research, with the first one rushing to get a simple snapshot of a building, viewing it only as a static entity, while the latter takes her time to engage in different ways of perceiving it, by walking inside it, viewing it on many occasions and at different times. Maggie MacLure (2013), suggests the need for a flattened logic to account for open-ended assemblage associations instead of seeking a static representation of hierarchical categories of data.

On-site observation was crucial to collect information: in many of the threads of the concrete stories I identified, it was the starting point. Observing the condition of the material and the changes that have been done during the redevelopment charged me with interview questions that I could follow up with participants, or with further searches into the literature about techniques and concrete performances. All the methods used during the course of the data collection were done so interchangeably. There was no hierarchy in the way I treated the sources. When a thread opened up the potential for concrete to reveal itself as active, I would follow it with any method necessary to collect that information: photographic survey, interviews,



archival research for information on past concrete and market research for the products used in the surface treatment of concrete.

The reasons for selecting concrete as the means to study material agency, were mentioned in the introduction and were multiple: the complex and intricate nature of the material, the constant formation and development in its field and the complex ways in which users receive concrete, were all considered when selecting the material to focus matter activeness on. These reasons will serve as the starting point where I will turn to for clues that will inform my search and support my arguments and hypotheses. In my initial search of information I identified several developments in concrete I could focus my search on, but one of them particularly stood out.

As already described in Chapter 1, I have found Park Hill to be an ideal lieu to study the activeness of concrete. Immersed in complexity, it is entangled with multiple controversies, both in its original construction and its renovation. I have selected it as a domain where possible powers of the concrete could be revealed by tracking its journey inside the building, As presented in the introduction chapter, the recent surge in interest in Park Hill culminating to its redevelopment, offers an ideal occasion to study the multiplicity of contexts coexisting and overlapping with each other. The concrete that has been present on site for over 50 years has now become centre stage feature, making it an ideal location to study the material actions in this complex ecology. Having served its role purely as a means to achieve an architect's vision, it is now becoming protected and its heritage is activated. It is also present in practical decisions in the renovation- its black box has been opened to reveal what other ways of understanding the material are there to be discovered. Coming out of the development as active, provides a multiplicity of settings to be traced in.

Park Hill was not the exclusive focus for data collection. I have also approached and researched historical use of concrete through literature, secondary sources and interviews with informed professionals, in multiple forms of engagement with the material: engineers, historians,

a photographer and a novelist. All of them provided interesting accounts of engagement with the material, each in their own realm. In some instances they were able to point to traces of material agency, beyond what could be identified in Park Hill. But having some focus on Park Hill enabled to acquire a complete view of this one example that has played an important role in putting my arguments forward. The case of Park Hill in its historical context is presented in the next chapter, but before proceeding to the historical presentation of the estate, I will provide an account of the methodology and the methods used for the collection of data.

### 3.3 Observing Park Hill’s concrete: employing a multitude of tactics to trace concrete.

To unravel the multiplicities of concrete in Park Hill, observation became a very important part of the collection of information. Over the period between November 2013 and December 2015 I visited Sheffield, the estate and archives 14 times to conduct observations and photograph the concrete in Park Hill. In the same period I was also visiting the Sheffield Archives and Local History Library, I was discussing with the developers and interviewing occupants in Park Hill. Over the course of data collection on Park Hill, Some of the professional’s interviews did not take place in Sheffield, but in the places of work of those involved (London, Manchester, York and Nottingham). There was not a clear-cut designated period of one method followed by a period of data collection by another method. Observations in Park Hill started in November 2013 and initially were taking place in parallel with archival research. Interviewing commenced in April 2014, once the archival data collection was over.



Figure 4: A timeline of fieldwork in Park Hill: Archival research and Interviews took place in parallel with site observations

### 3.3.1 Archival sources on Park Hill

#### *Sheffield Archives and Sheffield local Studies Archive*

My journey in Park Hill began with a parallel visit to the local archives to understand the context in which the initial construction of the development in concrete took place. Sheffield archives and Local studies library proved to be a valuable source with their vast collection of documents from the time the area was still a slum, leading up to the creation of Park Hill and its first years of use. The recent surge in interest for Park Hill, has created the need for Sheffield archives to compile a list of all files included in their archives with all relevant information. The document entitled “Sources for the Study of Park Hill and Hyde Park Flats” contains a full detailed list of archived sources from the time the flat’s construction was conceived in the 1950’s, all the way to 2010.

The mere production of this guide reflects the surge of interest Park Hill has seen in recent years. It was produced in 2010, aiming at students and researchers who wish to study the estate. It is a valuable resource for anyone interested in delving into its story, as it contains both an overview of the history that touches on multiple subjects, and a complete list of coded sources. In an overview of the topics of interest in the introduction of the guide, 11 areas are listed. Although one category refers to the “social and physical” break-downs of the fabric in the 1980’s, concrete was not explicitly mentioned in any of them, nor was there a mention of its older history.<sup>i</sup>

It starts with a 25-page presentation of the history of Park Hill that includes photographic material from the slums that existed on site previously, their demolition and the newly opened estate in the 1960’s. The guide also includes one photograph from the original phase of creation, albeit with the estate in the distance and without any discernible context. Yet

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<sup>i</sup> The introduction to the Park Hill archival sources guide lists the following categories as of interest to the estate: “Town planning and post-war redevelopment in Sheffield, public health, slum clearance and improvement schemes, housing provision, population growth and the city’s housing needs, modernist design approaches to social/communal living and the re-creation of community; civic pride and optimism in a housing project built on a scale not seen before in this country; the hey-days of the 1960s and 1970s when, according to the accounts of some former residents, the ideals underlying the scheme’s design seemed to be fulfilled. There followed the problems of the 1980s and breakdowns in both the social and physical fabric of the estates; and more recently, national recognition of the architectural importance of Park Hill, the process of renewal and the ensuing local and national debate on whether such recognition is warranted and the money on its refurbishment well spent.”

there is little information to be revealed about the concrete from the guide and the word is mentioned only three times, in the 48-page document and only in relation to the recent redevelopment.

Following the presentation of the history of the estate there are 67 sources listed of Sheffield council and committee meetings and a further 39 sources listed on council surveys and reports. The chronological breakdown of the sources listed is described in table 1 below. It is worth noting that some of the items mentioned in the guide refer exclusively to Hyde Park flats, Park Hill's sister development that was created at the same time, and these have been omitted from the research.

*Table 1: Chronological break-down of sources listed in "Sources for the study of Park Hill and Hyde Park"*

	Sheffield Council and committee meetings	Council surveys and reports
1930-1949	11	7
1950-1961	47	15
1961-1965	7	4
1966-2010	2	13

The minutes from the council's planning department meetings reveal the circumstances in which the previous inhabitants are moved from squalor to a new state of the art development. However, the information retrieved from there was of little value to my research as there was no information pertaining to the concrete used in the construction of the flats. (47 documents identified in the guide of which 38 were able to be retrieved from the archive). Of the 7 documents identified from the period 1961-1965, 6 were retrieved and from a further 2 documents identified from the period 1966-2010, 1 was retrieved. Once again, concrete is not mentioned in any of the documents. A list of all the documents identified and located in the archives is included in the referencing section.

#### *The RIBA Catalogue*

The RIBA archive has also proved a valuable resource with its British Architectural Library catalogue, accessed online. A search with the key words: "*Park Hill*", "*Sheffield*" revealed

104 relevant sources. Of those sources I was able to identify eight RIBA journals, five architectural review articles, eighteen Architects Journal articles and one Detail magazine entry. There was also photographic material listed throughout the initial phases of Park Hill's life. The information collected from that catalogue, once again, revealed evidence of Park Hill with regards to its original intentions, but in the early phases no information on concrete was retrieved. The information collected served to present the contextual aspects of Park Hill's original creation, but little evidence on the concrete.

*Table 2: Breakdown of archival material sourced in the RIBA catalogue*

	Total	By publication				By type	
		Detail	RIBA Journal	Architects' Journal	Architectural Review	Photographic	Article/book etc
<b>Until-1961</b>	12		0	1	1	5	7
<b>1961-1965</b>	4		0	1	1	2	2
<b>1966-2016</b>	80	1	2	16	3		80
<b>No date</b>	8		6			8	0
<b>Total</b>	104	1	8	18	5	15	89

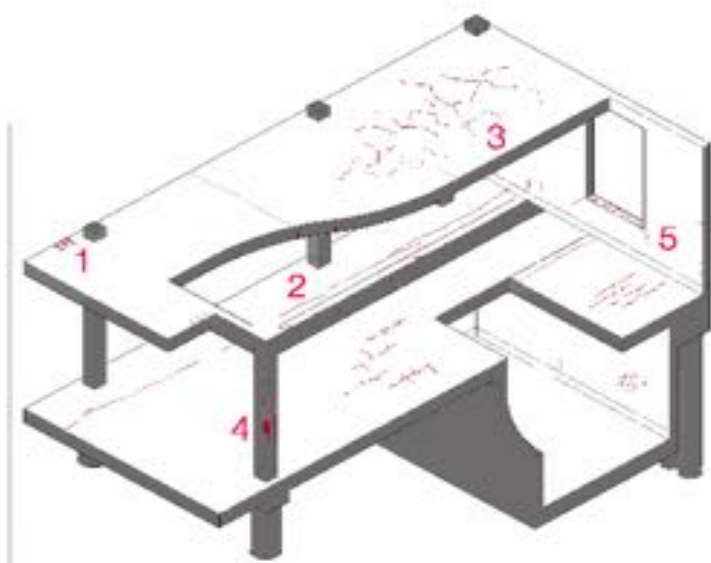
#### *Concrete quarterly*

A final publication that was researched thoroughly for information was Concrete Quarterly (CQ). It is a magazine on concrete buildings that has been continuously in publication since 1947. Over the time it has been in press, it has included buildings that have been innovative in their use of concrete. The scope of the magazine is not to include technical information on concrete details. It is simply a presentation of case studies of concrete buildings. For example, Lasdun's National theatre and Royal college of Physicians have featured in the past for their use of concrete. Yet Park Hill, that had been so important for its time, was never presented. This further adds to the observation that the presence of concrete in Park Hill was not acknowledged. Analysis of the information resented over the period 1960 to 1965 revealed that there were several flats presented, yet they were mostly high-end, sometimes coined with the term "luxury". Concrete in Park Hill, had once again failed to register. A full list of material

reviewed is included in the referencing section. outlines the publications of concrete quarterly that were investigated.

### 3.3.2 Informed site observation and visual ethnography

The collection of evidence on Park Hill's concrete on site, was largely informed by my previous experience as an architect and engineer working with the structural capabilities of the material. Having been involved in early phase of concrete construction and in rehabilitations of concrete frame buildings elsewhere, Park Hill seemed a familiar territory. I was aware of the expected performances and failures, and this provided me with an informed view of the concrete in the estate. Upon my initial visit on Park Hill's site, it was obvious that the material on the old part of the estate exhibited signs of severe visual deterioration. There were visual defects that were clearly evident, but my informed perspective also revealed structural issues with the reinforced concrete in Park Hill. The material on the redeveloped flanks, however, had, in some places been rehabilitated. It was apparent that the discrepancies of concrete in the old part of the estate had been rectified in the new part. These repairs took place both in the form of structural corrections, but also visual corrections: the material looked masked over with a coating. From that point onwards, I would conduct an investigation into the nature of the concrete failures and repairs.



*Figure 5: Areas of concrete failure noticed in Park Hill, according to the descriptions by English Heritage. Image and classifications adapted from England, 2014.*

1. Longitudinal cracks
2. Tension area (but no reinforcement corrosion)
3. Surface cracks
4. Corrosion of Reinforcement- in need of repair
5. Shrinkage cracks

My visual ethnographic observations took place in 14 visits to Park Hill. In every single visit I took photographs to document the estate and these photographs were organised in chronological way, but also typologically, according to the different performances of concrete. Based on the differences and variations revealed in the image databases, I mobilised the search on concrete. The image databases use not were mobilised using the arguments not just to illustrate the agency of concrete and the malleability of the material but also to amplify and continue some of the arguments. The visual material collected did not serve simply as a memory tool, or as an extension of the mind to remember the estate and its concrete. It also serves as qualitative data that I present in the next chapters. Throughout the research I would go back to the images, I analyse them and trace the different variations of concrete and then I mobilise in the chapters that follow in a conceptual manner. In the way that Tim Ingold puts it, the images did not necessarily stand for something, but helped me reveal something about the material(Ingold, 2010). The images were a vehicle to explore also these variations of concrete. In this sense they became more than illustrations, not just extensions of memory and what I have seen, but also analytic data- they bring a different layer of qualitative data.

Being already familiar from previous professional experience with such concrete failures, I knew by observation what issues lay behind the failed concrete on the un-renovated flanks and the types of repair that some of the failures in the redeveloped flanks had been through. To further this investigation, I began a photographic survey from the failed concrete and the building's repairs. Once I started collecting photographic evidence, I observed that the visual discrepancies fell widely into the following categories, and the images in my databased were organised in this way:

- Spalling on non-structural components (mainly on Balustrades )
- Visual inconsistencies
- Edges of concrete missing (due to spalling but on structural components)
- Repaired (Possibly because of spalling)
- Thin cracks

In categorising the types of visual discrepancies I used the guide by English Heritage (England, 2012:79) Those categories summarised the visual inconsistencies of the materials on site and some of them had further structural implications. These observations, apart from being a finding in themselves, have also informed the further research and the interviews I undertook later into the estate.

The most challenging part of researching Park Hill has not been the sourcing of information on the estate: there is an abundance of literature to describe the estate. Identifying relevant information on the concrete of the building has been the real challenge. While it has certainly been there - at least physically - in the estate, its presence in the literature is an entirely different matter. This observation will become important in chapter 5 to argue for the absence of concrete in the initial discussions of the estate. As this research was aiming to focus on the redevelopment, once I had gone through the collection of the archival material and particularly



Figure 6: Categorisation according to defect type. All images are the author's own.



of the period up to its original completion, I shifted the focus to the field, to conduct observations and discuss with participants.

### 3.3.3 Interviews

My group of interview participants consisted of two types: Those involved in a strictly professional capacity with Park Hill and those involved as users of the estate. The professional group is easy to define as it consisted of architects, engineers, contractors etc. involved in the redevelopment. Users, however, are more difficult to define. Some were living or have lived in Park Hill and can be referred to as occupants. There were also many who do not live inside the development, but experience it on a daily basis in a non-professional capacity. Users in this respect can be the users of the city of Sheffield. The majority of cases coincides with residents of Park Hill, but I did not leave out participants who were aware of traces of the material since they also occupy a concrete regulated environment. The author of *“Concretopia: A journey around the rebuilding of post-war Britain”* is one such example: out of personal interest he has visited numerous times and has researched extensively the estate’s past. Although not strictly an occupant, a user can also be someone who experiences it on a daily basis such as a Sheffield resident passing through it every day.

#### *Professionals and informed participants*

My search on site commenced with identifying suitable actors that had participated in the renovation of concrete in Park Hill, and there were several of them involved. Urban Splash is a Manchester-based developer that had previous experience of working with listed buildings, as Park Hill was. Starting with the chairman and senior manager, I took advantage of a snowballing effect (Marshall, 1998; Polkinghorne, 2005) to recruit participants. I was introduced to professionals that had participated in its redesign, its on-site creation, involved in its listing and managed its facilities before and after the renovation. I spoke to three senior architects involved in the new design of Park Hill, three on-site professionals, an English Heritage representative

that was involved in the listing decision and oversaw the work and two members of the facilities management team. The search from there on moved to informed professionals who have a level of expertise in concrete and of which some were indirectly involved with Park Hill.

### *Residents*

In order to minimize ethical risk during data accumulation, any contact with the residents initially took place through the residents' association of Park Hill. After being introduced to the management team, I was able to participate in one of their residents' meetings, where I was allocated 30 minutes to speak to the residents collectively. The management was reluctant to offer more time with residents. The demand from students, journalists, researchers and members of the public to investigate, has been overwhelming in recent years for Park Hill, and hence the management, which is interested in protecting the residents, was reluctant to allow interested parties to approach them. Yet, this may not necessarily be the opinion of the residents. Surprisingly, following the initial group discussion I quickly received two more phone calls from residents, offering to be interviewed in private. They were both interested in discussing in further detail the particulars of living in Park Hill and answer specific questions on living with the concrete. One of them, in the initial contact she made with me, also sent me an image of her concrete walls.

Following those two interviews with the residents, I established further contact with residents and interviewed a further three participants. Once the "*snowballing effect*" kicked in once again, there was an abundance of residents to interview. The type of residents I could approach were the ones that I was introduced to by the initial two contacts I had met at the residents' association, and all had a very positive view of the development. Yet they all discussed the views of other residents that are very sceptical of Park Hill and its concrete, that were not at all eager to participate in an interview and discuss their experience of concrete. Furthermore, the point when new information stopped being produced was reached at a very early stage with the residents of a positive outlook. This is not uncommon in qualitative research:

data saturation is the point where the data collected begins to be repetitive. From very early on, the codes identifiable in the residents' interviews were repeating themselves.

### *Interviewing methods*

Open interviews were used to interview all participants. As coined by Hammersley and Atkinson (1989), to contrast with closed ones that have a fixed number of unchangeable questions and are quantitative in nature, open interviews were selected to allow for a more

*Table 3: Interview Participants*

Organization			Position	Appointment	Duration
Developers	1	Participant 1	Senior Stakeholder Urban Splash	29 April 2014	35 min
	2	Participant 2	On-site Senior Construction Manager Sheffield	17 June 2014	70 min
	3	Participant 3	Site Manager	17 June 2014	70 min
Architects	4	Participant 4	Senior Architect	24 July 2014	45 min
	5	Participant 5	Architect	05 Nov 2014	55 min
	6	Participant 6	Senior Architect	28 July 2014	50 min
Other	7	Participant 7	Resident services co-ordinator	21 May 2014	20 min
	8	Participant 8	Resident services manager	21 May 2014	70 min
	9	Participant 9	English Heritage stakeholder	17 June 2014	110 min
	10	Participant 10	Guardian Photographer	25 July 2014	45 min
	11	Participant 11	Author Concretopia	28 May 2014	75 min
	12	Participant 12	Former resident	24 July 2014	35 min
	13	Participant 13	Junior Engineer	12 Dec 2014	25min
	14	Participant 14	Civil Engineer/ specialised in concrete recovery	12 Dec 2014	45min
	15	Participant 15	Concrete Expert, Partner at RSH+P	28 July 2014	75 min
	16	Participant 16	Urban Splash marketing-showroom	13 Nov 2015	18 min
Residents	17	Occupant 1	Park Hill	6 June 2014	20 mins
	18	Occupant 2	Park Hill	3 July 2014	25 mins
	19	Occupant 3	Park Hill	21 May 2014	30 mins
	20	Occupant 4	Park Hill	21 May 2014	30 mins
	21	Occupant 5	Park Hill	21 May 2014	30mins
	22	Occupant 6	Park Hill	21 May 2014	30 mins
	23	Occupant 7	Flaine, Marcel Breuer	29 April 2014	35 mins
	24	Occupant 8	Peabody, Boston, Josep Lluís Sert	28 July 2014	75 mins

open-ended description by the participants. Since the methodology chosen was to trace the material to paths that were unaccounted for, the method should allow for participants to be able to reveal new information and this type of open-ended responses was deemed an appropriate tool. A list of questions was compiled prior to each interview. The appendix has three sample interview questions: one used for residents, one for participants involved with the development

professionally and one for other users. These served as a guideline but was by no means restrictive of the direction the interview could take.

Apart from the residents' interview questions that remained almost unchanged for every interview with this particular type of participant, the questionnaires were adapted every time according to the participant. Every professional I spoke to had a different involvement in Park Hill, and the questionnaire was thus changing to adapt to retrieve new information every time. The questions comprised of three types: opening questions that would serve to start the discussion on a topic, clarifying questions in case the participant was not clear on how to answer, and questions that could be further asked in case the participant was eager to further discuss the topic. The interviews would in some cases deviate from the questions posed, with new possibilities opened up during the discussions. Even on the two occasions (participants 7 and 10) that the interviews deviated from the structure, there was still some form of organization in the way they were conducted: as Braun and Clarke (2013) argue, there is always some type of structure, even in unstructured interviews, the interviewer asks questions and the interviewee responds.

Karen O'Reilly (2012:106), argues that every interview conducted also involves participant observation elements. In the duration of an interview, it is inevitable that the interviewer observes the interviewee, particularly if the interview is conducted in an environment related to the research subject. In the interviews that were conducted with residents inside their flats, this was certainly the case. Before all interviews, I would explore the apartment and observe the space, and the occupant always initiated this. They would offer to show their living spaces, and in two cases provided a detailed description of their furniture they had chosen to have. This initiative also reflects their eagerness to show off their newly acquired homes and their enthusiasm for the participation in a research project that recognizes the historical importance of their abodes. Generally, the ones that were enthusiastic about their dwellings and had not had any issues with the concrete, were most likely to volunteer to an interview and

inevitably, the actions of participants who have a more positive outlook for the concrete were observed. Their actions, mostly when it came to furniture arrangements in their flats with regards to the concrete walls, suddenly became important, although such data was not intended to be collected originally. The mode of engagement of residents was therefore more loudly spoken by their actions in their apartments, rather than the information they presented in the interviews.

### *Interview analysis*

Once all interviews were transcribed and collated, they were analysed by coding in categories. My first attempt in coding was using HyperResearch, a qualitative and mixed methods software analysis tool. It was employed to identify common threads in the data collected and enable me to code more efficiently and systematically. However, after using it for a first attempt in coding, I was presented with a limitation: the specificities of the software, would not allow me to insert over a predetermined number of subcategories of a code, thus limiting the way I could organize the data. After I had stopped using it I observed a second limitation. Coding using a software would keep me from getting more “*intimate*” with my data, and once I started organising it manually, I became more familiar with my interviewees responses and more possibilities of codes and sub-codes were revealed to me. HyperResearch, according to its creators is intended as a codifying tool that does not replace the mental process required to analyse such data, and the limitation the software posed was counterproductive to my analysis.

## 3.4 Reflections on data collection and analysis

On the 6th of June 2014 I was visiting Park Hill for yet another discussion with one of the residents there. One of the residents, who I will call Catherine, showed me around her house, discussed with me for over an hour about her story with Park Hill: how she had come to know it, fall in love with it and move there. She was enthusiastic about her decision and

mentioned several times how eager she was to make this place work once again, just like the way it functioned in the 60's. She was escorting me to the main entrance on my way out when we ran into another resident. She casually introduced me to him, told him I was researching Park Hill's concrete, and asked him whether he would speak to me. The man nodded in what seemed in agreement, so I started presenting my research in Park Hill. After about a minute of explaining to him what I do I passed on the conversation to him. Staring in my eyes helplessly for a few seconds, he started talking an incomprehensible language. *"This is the issue we have"* Catherine mumbled, *"How can we make this work? This will only work if everybody wants to make it work. But we can't communicate here."*

This brief occurrence on a Thursday morning in Park Hill is typical of the issues encountered during the collection of data, particularly in approaching the residents. As already mentioned previously, not all residents responded enthusiastically to the interview call. In this respect, it is fair to say that the ones interviewed were the ones more likely to be enthusiastic with their flats and therefore spoke more positively. This could be attributed to two issues: firstly, the ethics limitation on making contact via the residents' association meant that only those actively engaged with the community of the development would be given the opportunity to respond, and they would also be the ones likely to be responsible and actively look after the estate. My observation after participating in the residents' association meeting was that only one person was an old resident of Park Hill and a council tenant. All others were private owners, and therefore likely to have bought a house which they found attractive in the first instance, at least enough so to spend a minimum of a hundred thousand pounds on buying them. By extent, the way in which these residents engaged with the concrete in their flats would be in a positive manner. According to Catherine, the man we met did not fit this category.

Secondly, this can also be attributed to an effect that a snowballing type of approach in data collection can have. The approach of respondents through other participants can limit the type of reactions retrieved (Beauchemin and González-Ferrer, 2011). Indeed, the fact that all the

residents approached, all came either from participation or from being friends with other neighbours that participated in the association meetings, indicates that they would be most likely of the same attitude of being interested in their developments. Not having interviewed residents with negative responses to the concrete in their flat, does not mean that there were no residents discontented with living in a development of exposed interiors. My experience and observation of the estate shows evidence far from that: there are indications that there are inhabitants of Park Hill not fond of their dwellings. But the fact that responses were limited to those who were satisfied is not a major limitation of the study considering the initial purpose of the research: attributing agency to concrete, does not necessarily change it with a positive or negative sign; it simply serves to reflect its presence, without talking any particular side.

Although respondents with negative views were not interviewed, this does not mean their views were not captured by the research. I did not interview them directly, but the residents' association management team provided descriptions of their actions that reveal their views. Accounts of residents covering their concrete walls, or complaining about the temperatures in their flats, tracking the surface temperatures of their walls and complaining about their unfinished walls were all mentioned by managers and fellow residents. Although the interaction of concrete with those residents was not traced through their own words, they were traced through their actions, thus making up for the account of the different views that was present in the interview sample. The means of retrieving the information was different, but the tracing was as revealing.

Another issue that I was concerned with since the beginning of the research was that of saturation: at what point does the data I have collected for the completion of the research can provide a useful and meaningful input to the arguments I was trying to make. To my surprise, quite quickly the responses began being repetitive. While in the case of the residents this can be attributed to the snowballing method of approaching residents, I observed that this was also the case with the professionals involved with the redesign and the reconstruction. There are

differentiated opinions whether data saturation can be counterproductive for research: Corbin and Strauss (1990), Dey (1999) and O'Reilly and Parker, (2012), for example, claim that after a certain point the emergence of new categories may stop, but analysis might still be able to produce new information. Others, like Mason (2010) and Guest, Bunce and Johnson (Guest et al., 2006), claim that saturation in social sciences can come as early as 4 to 6 interviews and continuing to retrieve data can be counterproductive for a study, as it has nothing new to offer. It is then left to the research to cut out data as appropriate in order to shape his analysis more effectively. According to Mason (2010), saturation is a possible way of understanding when the increase of a sample is unlikely to yield any significant changes to the codes that will be analysed.

Finally, the reluctance of certain professionals to participate in the study is worth mentioning. Because Park Hill has been surrounded in controversy makes it difficult to gather information from some interviewed professionals who are reluctant to discuss. This was particularly the case with two of the actors, where it was evident that they were very carefully calculating every word throughout the interview, and one of them asking me to omit specific parts of the transcript afterwards. This observation, however can only serve as a further argument to the complex associations the material has brought on site. Although as data it has been inadmissible to the study, it reflects the type of relationships of actor networks concrete participates in.

In further visits to Park Hill I encountered in a further two visits the gentleman that did not speak English of the occurrence above, who I have nicknamed Alan since, I encountered on the streets in the sky during another two visits. He was roaming the estate enjoying the views, and on one occasion I saw him trying to communicate with an Urban Splash representative, in an agitated but friendly manner. Perhaps Catherine had assumed wrong, he might not be that disinterested in his abode after all.



## Concrete in its historical setting: a complexity in the making

*“The engineer’s aesthetic and architecture- two things that march together and follow one from the other” (Le Corbusier, 2007:13)*

### 4.1 Introduction

Walking along Rue Franklin, a typical Parisian street with little traffic, one can easily fail to notice one of the most important buildings of the 20th century blending in harmoniously with its surroundings on street level. But glancing upwards, the apartment building at number 25, is seen to break the rules that its surrounding neighbours set. Initially, it breaks the typology of all the other buildings on the street by forming a hollow enclave on the façade; this regressed front surface then shapes a balcony on the first floor, unique for the pattern of all its adjacent residential blocks. When viewed carefully, 25 Rue Franklin makes a bold statement in contrast to the existing street of Haussmannian period block; it is clearly standing out, making a statement structurally, expressively, historically. And in this instance, this statement is enabled by the different material used: ferro-concrete (Frampton and Futagawa, 1983:116; Norwich, 2001:228; Collins, 2004:178).

The building at 25 Rue Franklin is a building characteristic of the early steps it’s architect, August Perret was taking in the early 20th century that led to establishing reinforced concrete as the material that would shape the century to come. The legible recess of the plan layout that

can be read from the façade, makes it stand out from the neighbouring properties. Structurally, these details are achieved with the intervention of the newly discovered at that time ferro-concrete. Rue Franklin also reveals a high level of decorative ornaments. Most of the external surfaces are decorated in embossed leafy patterns. And while the colour of the patterns blend in harmoniously with the context, they are in fact made from a different material altogether. The leafy patterns are not carved out of stone, the building material omnipresent on the street, but they seem to be coming out of a mold<sup>i</sup> (Frampton and Futagawa, 1983:116; Frampton, 1985; Collins, 2004).



*Figure 7: Auguste Perret, Rue Franklin, Paris, 1904; the recessed façade makes the building stand out from the adjacent properties*

The properties of the material have enabled the unique for its time structure to stand in its present form. The combination of the compressive properties of concrete coupled with the tensile abilities of structural steel, protect the recessed structure from the effects of torsion that would in the case of a different material inhibit the production of the said layout. But the importance of the material from the said structure do no rest there: Perret acquired the structural material with its plasticity capabilities in the case of 25 Rue Franklin and re-conditioned it to push the layout formation of the Parisian apartments into new territory. In doing

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<sup>i</sup> Part of this description relies on my own viewing of the building.

so, he also pushed its ornamental capacities, by identifying the potential to imitate past forms efficiently.

The journey of concrete in this transformation is described and critically appraised in this chapter. In the context of modernism, concrete was identified as a material of structural but also social transformation. In the context of brutalism its potential also turned to the aesthetic and the attribution of meaning to the material. In these parts of the journey of concrete, the material is historically presented as stabilised and idealised for the issues it was coming to address. Very recently, we are coming to understand these stabilised descriptions of the material as different to the way it is experienced.

By presenting Hennebique's attempts I will demonstrate how the formation of a typical concrete structure frames similar to those used until today, was stabilised by trial and error processes; the coincidental choice of the word brutalism has attached to the material negative connotations; and through the work of Barnabas Calder on Denys Lasdun that reveals the tactics employed by the architect to convince the clients for its use, I dismiss the role of the all powerful architect. The chapter concludes by arguing that concrete may be temporarily thought as stabilised in descriptions of a specific time, but this stabilisation is only momentary. Participating as described in the previous chapter in an assemblage, and through its interaction with other entities, it destabilises again into a different condition.

## 4.2 Reading concrete in the context of modernism

Le Corbusier, Perret's best-known apprentice, saw beyond the ability of the material to simply reshape building forms and expressively mould facades. Le Corbusier and his contemporaries envisioned through the material a socioeconomic reformation. The striking presence of this impressive 1904 building may have now faded with time, but it has influenced future generations of architects and left an indelible mark on the history of concrete. For Le Corbusier, concrete was a means for space to become manifest in the way he envisaged; it enabled him to develop ideas on the contemporary city through the use of the material. His

early works demonstrate an exploration of the technical capabilities: since the early 1920s he had been designing vertical living, combined office and apartment blocks, roof top airports that would make up his city of the future (Frampton, 1985; Collins, 2004). It had, however, only been a design for a city for the select few, with a centrepiece of high-rise structures to be used only by the rich aristocrats who could afford a car and a plane. Concrete underwent extensive experimenting before it could become the material of modernism. Once its properties and technical performance were established, Le Corbusier was able to see in it the material of the future, suitable to make houses “*machines to live in*” (Frampton, 1985; Le Corbusier, 2007).

Starting with the first CIAM in 1925 and particularly after the Athens Congress in 1933, suitably themed “*Functionalism*”, the intention to experiment with the functional capabilities of the material was evident. Aligned with CIAM’s ideas on future cities of uniformity and standardization, these functional affordances of the material were explored through the technical performance of concrete and this was the line of experimentation almost exclusively explored before the Second War. It was a city that according to Le Corbusier would revolutionize urban life and would bring man closer to nature in a well-ordered environment. All structures were raised on a pilotis to allow free movement, to maximize green spaces, and to let air flow freely for the high-rise structures and to eradicate the tuberculosis virus that had claimed millions of lives in previous decades. The city was afforded by concrete and steel. Whether the impetus was the ability to create acceptable living conditions for all, quickly and efficiently, or an egalitarian city with amenities for everyone, or housing for the convenience of an exclusive elite, the technical abilities of concrete remained paramount.

The discourses on the purity of Le Corbusier’s intention behind the use of concrete are on-going amongst architectural historians. It is worth however pointing out Adrian Forty’s observation that concrete may have been modern out of coincidence, or possibly by the practices of the concrete industry in the first part of the century (Forty, 2012:101). Concrete has been attributed for decades the role of transforming modern architecture and the material of

modernity. This view, according to Forty argues that this is far from true- he views that steel would be best suited for this role. If concrete was to be redefined as a material able to take shapes and forms, as had been used for centuries before it was introduced to modernity, the entire argument would fail. This misconception of associating the material with modernity, according to Forty, has been reinforced by the cement. The attribute of a “*modern*” material is so well embedded for Forty that the question is not whether or not concrete is a modern material; rather it becomes whether it could ever detach itself from the associations of modernity (Forty, 2012:15).

These associations of modernity, however, can move beyond the context of Modernist architecture. Dell Upton, for example, argues that contrary to Forty’s statement, concrete *did* produce a modernity albeit of a different type; one that moves beyond the typical discourse of modernism. Drawing from the examples of the American South’s African-American cemeteries, where makeshift tombstones were used, often out of concrete, Upton argues that the way in which the material has been handled and used, make aware a different process of modernity. The material reveals an innovativeness: the cheap and easy way to use it is often disguised by “*view of poverty*”. Enabling an alternative use for the impoverished African American community, it produces is a far more complex modernity to the one modernism advocated for (Upton, 2015). Whether concrete is a material of modernity, is a broad and on-going discussion, but what is worth noting, as previously pointed out by Forty is that concrete is fluid, slipping through definitions. The attribution of a label does little to confine its behaviour.

#### 4.3 Concrete becoming a stabilized technical object

Before concrete could enter this trajectory and acquire attributed meaning through its motion, it had to become stabilized. As already mentioned in Chapter 1, Gilbert Simondon argues that technical objects have to exist firstly as a unity before entering a trajectory of associations and acting as intermediaries. Regardless of the complexity of a technical object, it has to be a consistent unified entity to enter into existence. Internal coherence and stability are

crucial for the existence of any technical object (Simondon, 2009; 2011). The stabilised state, I argued in Chapter 1, plays a role in the dominant description of concrete in a single condition. And this stabilization has taken place through a long process, random at times and at instances calculated, and influenced by both human and material actions. This stabilisation is also what makes for the distinction between materials and matter in this dissertation. Starting this interaction with a large environment, as concrete forms associations, it narrows down and stabilises, becoming more solid with the more associations it forms in its trajectory.

The journey of concrete in this stabilisation can be traced several thousand years in the past. The earliest known natural formation dates back to the Miocene era, over 12 million years ago, and is the result of pure coincidence: limestone and shale oil spontaneously combusted and the creation cement compounds were naturally deposited. Man-made samples of cement-based use have been found that date back to 3000BC China and 1200 BC Greece, but it was the Romans that took the material forward, once again triggered by chance. The precise details of the re-discovery of concrete by the Roman's talk of a purely coincidental event, following the eruption of Mount Etna in 396 AD and the spontaneous contact of the pozzolanic ashes with water. Roman experimentation by trial and error propelled the material into an engineering marvel; traces of horsehair have been found that were acting as tensile reinforcement and reports of horse blood used as an anti-frost admixture have been found (Jain and Kothari, 2012). The technical expertise the Romans developed on concrete following a period of prime remained dormant for centuries until its revival in the later part of the 1800's. Around that time, early concrete structures like the Palais Ideal (1879-1912) and Steiner's Goetheanum (1924) experimented with the use of concrete predominantly exploring its plastic capacities.

Initial attempts at construction in concrete could hardly be described as scientific, and buildings came to stand mostly as a result of trial and error, rather than a systematized process. The production of this composite material was the result of an intention that materialised through a complex give and take between aleatory presences of materials, which coincidentally

found themselves in the same mix, properties that engineers and architects were trying to achieve, and the pragmatic issues faced at construction sites. Hennebique was the first “*Bureau*” to explore construction systems of concrete in the late 19<sup>th</sup> century (Cusack, 1984; Forty, 2012:21; Hellebois et al., 2013). Its founder, Francois Hennebique patented a technique that was able to address two major issues that preoccupy the engineers to this day: firstly he identified an early ability of concrete to reduce the cost of steel construction. He observed that concrete used together with steel would significantly reduce the amount of the later required, thus significantly reducing the cost. Secondly, by introducing steel, Hennebique reduced the dead load when compared to that of a structure constructed exclusively on concrete (Cusack, 1984). Both relied on the fact that the bars used in concrete were much thinner than those used in typical steel structures.

A typical characteristic of the Hennebique concrete is that the reinforcement bars are bent at a shallow angle. Quite possibly without Hennebique’s knowledge, this system enhances the shear resistance of horizontal elements: beams and slabs. Their approach to the calculation of concrete beams was rather peculiar according to concrete engineers Gerald Muller and George Rankin (Muller and Rankin, 1991). Hennebique’s trial and error calculations have assumed the design load would be shared in half by steel and concrete. Although Hennebique had possibly identified that concrete is best at taking the compressive forces, instead of calculating the tensile forces for the steel they would assume tensile and compressive forces were equally shared. This might explain why Hennebique rose the reinforcement in the slabs and beams at the point of connections with columns and vertical elements. Practically, this meant for the steel in the truss that it moved from the area of tension into the area of compression. Whether this effect was acting negatively on the material is in question (Muller and Rankin, 1991). While it might appear as an innocuous observation, the difference in calculating tensile loads in the concrete of Hennebique reveals an assumption made about the material: Hennebique were treating the material acting as one, solid entity. The way however in which

engineers today assume reinforced concrete to work as is by identifying the area of tension and compression, and calculating the tensile properties of steel separately. In contrast to Hennebique, which would estimate total loads and then split in half, contemporary engineering splits the areas of tension and compression to calculate the acting forces on the material differently. The material behaviour does not change with the different assumptions on calculation. It behaves in a particular way, whether it is seen as two parts or one split in half.

Assuming that the forces are taken by the entire slab and beam, and calculating tensile and compressive forces for both materials, as Hennebique had been doing, assumes that reinforced concrete is all one entity and becomes the point in time where the material is thought of as a stabilised entity (figure 8). The properties achieved by reinforced concrete, the infinite potential of random components to come together in myriad different ways, are stabilised at the moment the material came into being. Although the technology has significantly changed, the techniques are similar. One thing however remains certain, regardless of how the material is conceptualised: that once the material had managed to achieve desired technical abilities, it was stabilised.

The structural principles of construction in concrete, to this day, remain based on the Hennebique system. The science of concrete stability has undergone limited transformation since the built manifestations of Le Corbusier's theories. Photos from the original construction of Unité d'Habitation in Marseilles, reveal the steel mechanisms secretly at work inside the material and show that not much has changed since. On a technical level, the type of structural thinking is virtually identical to today's buildings. The advancements since then relate either to a more standardized approach in the way concrete is manufactured and put in place or to advanced chemistry and admixtures used mainly to facilitate the construction process rather than improve the built quality: retardants, accelerators, pumping aids and bonding admixtures have significantly eased construction. The principle of transferring tensile forces to the rebar is still applicable on concrete structures to this day, albeit existing in a very scientificated manner,



in contrast to the initial trial and error period. In fact, when Muller and Rankin, revisited the Hennebique concrete construction system in the 90s, they argued for the possibility that as a system it was in fact superior in the way it performed, due to the curvature of the reinforcement in the concrete. Concrete has indeed undergone a very systematic process of scientification and is still being researched for the potential it can offer for the future (Petricone, 2012). The principles, however, introduced by Hennebique have undergone limited change. The principles of transferring tensile loads to the rebar are still applicable to the concrete structures to this day.

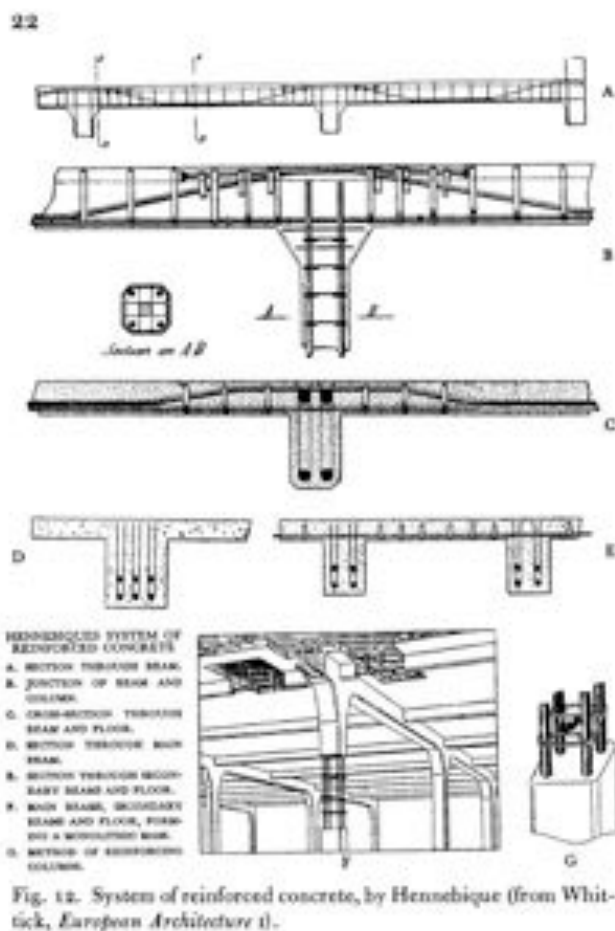


Figure 8: The Hennebique System. Image taken from [arch.mcgill.edu.ca](http://arch.mcgill.edu.ca)

Hennebique was neither an architecture and engineering firm, nor a contractor as the founder himself declared: it was selling the license to use their technical expertise, images of buildings, either in photographic form or drawn on paper. Francois Hennebique himself would

often confess that his formula ultimately adds up to “*plain cooking*” (Forty, 2012:20). Considering that 20% of the market at the turn of the century was controlled by Hennebique, it is astonishing to think that up to 1/5 of the entire world’s reinforced concrete buildings (Forty, 2012:21), were created out of this random mixture of coincidentally combined ingredients put together by a non-professional contractor.

The capacity of concrete to expose an industrial process had started as an obsession for Le Corbusier who, eager to demonstrate how the building was truly a machine, revealed the technique of the wooden framework onto its surface. Peter and Alison Smithson took this even further by attempting to portray even scratches of technique on the surface in a style they termed Brutalism; yet this time, the gesture was used to make an argument on how the aesthetic was formed by the process, rather demonstrate the engineering marvels of the modern age. Instead, Le Corbusier envisaged the abilities of reinforced concrete to alter the standards of construction. In his argument of the plan, he presents the forms achieved by the rediscovered use of concrete as the new aesthetic of the engineer: “*Reinforced concrete has brought about a revolution in the aesthetics of construction*” (Le Corbusier, 2007:63). He sees the technical capabilities of the material go hand in hand with the aesthetics it produced. These technical abilities gave the opportunity for a very specific type of form to be produced in this new method of construction. In the years that followed *Unité* there was a change in the way concrete would be handled, not as a means of technology but as a visual means.

#### 4.4 Meaning constructed in concrete

The intertwining of the material’s aesthetic begins only once the material of reinforced concrete has been stabilised in a technical performance. At that point, the weaving of the technical properties with the produced aesthetic and cultural associations can be induced by constructed connotations and affiliations to particular notions. The standardization of a material in a form inevitably also has material origins. The shape for example of beams and columns, also relate to the material properties of concrete. But as Antoine Picon points out, the very way

in which we understand materials and their properties, is culturally constructed at social and cultural levels, in contrast to structures that are technological constructs. To identify properties within materials, like for example defining durability, or strength, requires a cultural standardization process through experiments (Picon, 2005). This process applies particularly to the case of concrete and is what has made reinforced concrete to move away from being thought of as a technological form of structure, to being a material. Typically, investigations into the origin and development of concrete, instead of focusing on the types of buildings and structures produced by construction, explore the construction history of technological, social and cultural factors investigated in the construction history. i.e. in the case of Hennebique, thinking of concrete as a highly technical practice, whose structures lack the creativity of architectural masterpieces like the ones Auguste Perret was producing (Picon, 2005). In concrete's recent 120 year history, however, the material demonstrates instances when it triggers cultural, aesthetic and notional associations: while technologically it was being investigated to push its capabilities, it was also becoming associated with on-going historical and social changes. One such case is the style of brutalism.

In the Architectural Review of December 1955, Reyner Peter Banham published an article entitled "*The New-Brutalism*" that marked a new era for concrete: the newly emerging "style" Banham was calling for had, according to the author, established itself as a current thought in Britain and went against the contemporary culture that was viewing modernism stripped of its ideals, as a purely stylistic gesture (Banham, 2011). Brutalism attempted to revive those modernist ideals. Banham would consider buildings that were away from the principles of the original CIAM group, not worthy of the title "*New Brutalist*". And although he identified several buildings that could fit within the "*The New Brutalist*" stylistically, they would all fail to meet its ideals. By ideals, Banham is referring not to social or moral ones, but his ideology about how materials should be used. Reyner Peter Banham, together with Peter and Alison Smithson, George Kandylis, Aldo van Eyck and others had formed Team X, a group of 10

architects that proclaimed the revival of modernist ideals which by then had degenerated into a style (Frampton, 1985:271). Apart from the School in Hunstanton, erected in 1953 by the Smithsons, possibly no other building would pass the “*Brutalism*” test. All potential candidates - Banham identifies only the Unité d’ Habitation, Mies van der Rohe’s Lakeshore apartments in Chicago and Louis Kahn’s Yale Art Centre as such- are eventually dismissed for treating materials excessively, with insufficient “*Je-m’en-foutism*”, as he calls it, or “*architecture in its brutality*” (Banham, 2011). Materials for Banham were to be used “*as found*”.

For an essay so critical of CIAM’s degeneration and deviation of their original ideals, it is surprising that Banham shows no consideration of the social principles of Team X. The new style served merely as another way of looking into technology and its reproductive capabilities for construction as architecture by keeping the properties of the materials intact (Kitnick, 2011). In the case of concrete, this would translate to exposing the technical abilities of the material. Concrete structures in this newly emerged “*style*” of brutalism, however, seemed to elude a fixed definition. For Reyner Banham and his famous December 1955 article in the *Architectural Review* the style of brutalism is summarized as: “1, Formal legibility of plan; 2, clear exhibition of structure; and 3, valuation of materials for their inherent qualities “*as found*” (Banham, 2011:354-61). This definition is what provided Banham with the conundrum to identify suitable buildings, and resulted in having nothing to show for it other than Hunstanton. It is almost as if he created a new style to fit the work of his friends and colleagues the Smithsons, but in doing so he failed to accommodate any other building. His manifesto describing brutalism as a response to the modern movement and his criticism of existing modernist ideas, all rely on this single building. Manufacturing of a style around one building excluded possibilities for all others (Vidler, 2011).

The ideals that rely purely on the material use and not on social values is further reflected in another observation of the Hunstanton. All the architectural photographs of its time portray a building with absolutely no signs of use: the lack of furniture, of people and even of

services makes the building seem to the viewer as an object of art, rather than a used space. Claire Zimmermann discussed the use of photography by Nigel Henderson for the Smithsons as a means to read the building's architecture, almost in a self-explanatory way (Zimmerman, 2012). Had this building been designed to carry social and cultural ideals, it would have been depicted as such. But this was a building manifesting a particular method of construction and a manifesto on the use materials, and in fact so obsessively so, that users were left out of its depictions. Figure 9 presents a sample of Hunstanton photographed bare, without any users on its premises.



*Figure 9: The School in Hunstanton, architects Peter and Alison Smithson. Image taken from RIBA Picture Library reference AP523/74.*

As a style, brutalism became largely associated in the years to come with two elements: concrete, and in the UK, social housing. In Britain, this association was particularly rapid and intense and unfortunately when the latter came to collapse, concrete followed shortly after. Martin Pawley argues that the beginning of the end for this type of housing for the UK was marked by the 1968 disaster in Ronan point that will be described in more detail in Chapter 5. As Pawley remarks, this was a failure of a specialized Danish modular system to withstand an explosion due to ill fitted gas pipes, and yet, it has come to represent an overall failure of the sector (Pawley, 1998:45; Forty, 2012:160). The irony is that Ronan Point came to be associated with every type of social housing of a grand scale, regardless of the type of construction used.

And along with modular construction, concrete, also a widely used means of social housing development, became associated with failure. The collapse of one social housing development, not in concrete, created negative correlations with the material that were difficult to dismiss once they had formed.

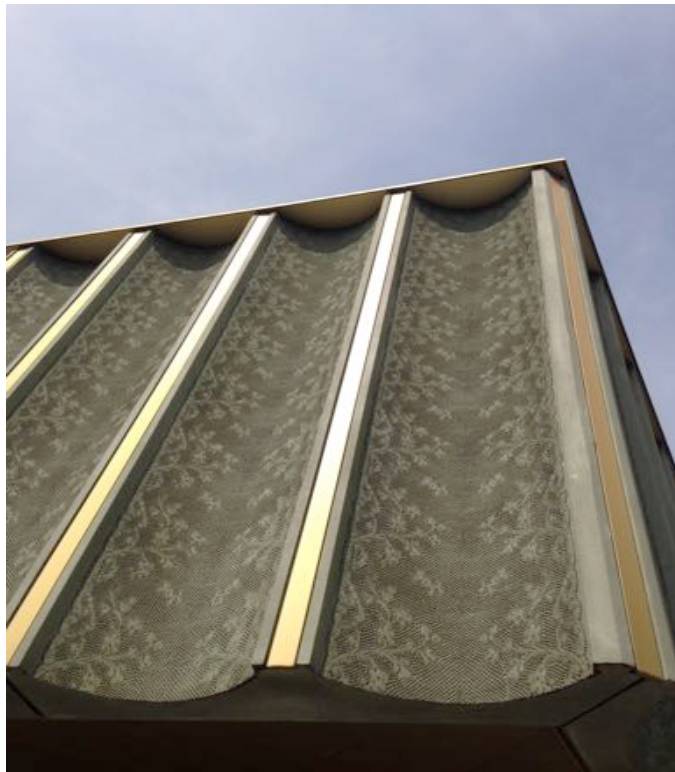
In contrast to Martin Pawley, who sees that negative connotations start with Ronan point, George Baird, places that moment in time as the point at which the material was charged with dissipative cultural powers, and that moment in time coincides with Robert Venturi's "*Learning from Las Vegas*". In the foreword for Pina Petricone's book, "*Concrete ideas*", Baird raises the question of how a material like concrete, that started off so optimistic, was passed on to the public as a material in decline (Petricone, 2012:11). But the question of the process, of what happened in between, what coincidences and conjunctures, with which mechanisms at play brought about this change, remains unanswered. For Dell Upton, attributing to architecture a purely symbolic function leaves out "*embodied and empathic meanings essential to architecture's symbolism*" (Upton, 2003). In this respect, the "*Heroic and original*" buildings of Venturi and Scott Brown, become more than mere accumulations of symbolic meanings.

Moving beyond questions of how concrete shapes cultural and aesthetic connotations, Pina Petricone investigates how the new methods and techniques of concrete construction, and most notably nanotechnologies that enable smooth finishes, alter the constructed perceptions of the public and shift the negative opinions that surround it (Petricone, 2012:14). Petricone questions the potential for future concrete technologies to make aesthetic appreciation sway in its favour, but this assumption is based on the premise that perceptions about the material are entirely constructed. Absent from this problematization of what can shape an appreciation of the material are the physical properties that seem unconnected from the technical, the visual and the aesthetic properties of the material.

The presentation of the future potential of concrete by Petricone can also offer a further argument for the invalidation of a teleological purpose of concrete. Stephen Cairns and Jane

Jacob's discussion of the decline and death of the material (Cairns and Jacobs, 2014) can be counter argued and/or supplemented with the presentation Petricone's presentation of cutting edge concrete technologies and the potential. The death of matter which Cairns and Jacobs present as an inevitability can be rethought of as a mere possibility. Concrete for example as a self-healing material greatly expands its lifespan and the production of recycled concrete using aggregate smashed from derelict concrete structures redefines the material in a terrain of infinite possibility and potential, eradicating any sense of teleology, even that which acknowledges in a pessimistic way the end of the material after a given point in time.

*Figure 10: The lace embossed concrete facade of the Nottingham Contemporary by architects Caruso St. John. Image author's own.*



The connotations made with concrete and the meaning it is attributed, can differ from its everyday perceptions, as Stephen Parnell (2015) observes. He discusses meaning in concrete that is constructed, but also identifies instances when connotations are ignoring obvious associations that can be formed. Why, in one such case he wonders, is Sheffield still called the “steel city” when the built environment is predominantly concrete? And if the city's past might be able to provide an answer in this case, one has to ask, why has the material resisted the original connotations of optimism and future progress from the 60's onwards, whereas negative

connotations, particularly related to the decline of social housing have readily been picked up so easily (Parnell, 2015)? In a similar manner, Nottingham is an example of a city offering an everyday experience with a different type of material connotations in concrete, as discussed by Christopher Matthews (2015). It is a city that lends itself particularly well for the production of concrete, primarily due to the rich geological history that stores rich deposits of aggregate, and houses Caruso St. Johns museum, a building completed in 2009 (figure 10), of exposed concrete marked with Nottingham lace pattern, a material typical of the city, replicated in a locally sourced material (Matthews, 2015). The critical regionalist view of imprinting the local culture into the façade of a building is described, in a more material oriented way by the architect Guja Dogg Hauksdóttir, presenting its use in the modernist architecture of Iceland, where it pertains to the local landscape both for the material properties (resistance to harsh weather) and resemblance to the local vernacular volcanic stone construction (Hauksdóttir, 2015). All these approaches attempt to relate the location to the meaning concrete is becoming charged with.

A review of the ways concrete is understood over time has revealed multiple ways in which meaning is attributed to the material. This meaning is far from stable: it is continuously changing in time and place. What was once considered a material for the enhancement of the future became a symbol of decline, and how within similar words associated with the material, such as in the case of modernism, what exactly those associations were remains vague. In the following section I will describe how part of this arbitrarily constructed meaning is also related to the semantics of words used for concrete and its associations.

#### 4.5 Concrete and New Brutalism

Debates on the architectural history and theory of brutalism have gained momentum in recent years. But although the original style of brutalism had little to do with the material, it has become exclusively associated with concrete. Banham in his essay does not describe it as such, yet in its on-going debates, brutalism is considered to be the extensive use of concrete. So



much so that objects are now coming to be associated with brutalisms, and in fact objects whose aesthetic have nothing in common with the art brut of Paolozzi. The exact manner in which concrete becomes associated with the style, is a puzzling question and one that could be interesting to address, but is beyond the scope of this dissertation. What is worth however noting is how important words become when they are associated with the material. This association is in fact in many ways random. Concrete in its presentation in contemporary culture, as demonstrated for example by blog posts (for example: Scott, 2014; Geddes, 2015) is also often associated with the terms like monstrosity and jungle, but the exact manner in which these associations are formed are vague. What impact has the affinity of concrete to brutalism had on the material?<sup>i</sup>

The very etymological history of the term brutalism, and its association with concrete is one such instance as described by Antony Vidler (2011). The story of the origin of the word brutalism and the apparent mystery surrounding the author is indicative of the controversies it incorporates. In the “*New-Brutalism*” article published in December 1955, Reyner Banham is adamant that the term was originally conceived by Peter and Alison Smithson although does he traces the origins to Eduardo Paolozzi and Jean Dubbuet and his art brut. He mentions that it was first used publicly to describe a small project for a house in Soho, and as an alternative to “*the warehouse style*” a term that had been used previously. He specifically attributes it to: “*Alison Smithson first claimed the words in public as her own in a description of a project for a small house in Soho [...], designed before the phrase existed*” (Banham, 2011). But according to Antony Vidler, there was also evidence by Sigfried Giedion and George Kandylis to suggest that it was in fact a combination of Peter Smithson’s nickname “Brutus” and Alison’s Smithson’s first name, hence the word “*Brutalism*”. Later on, in the sixties, Banham changed his original account and stated that it had come from Guy Oddie who was working with the Smithsons on their house in the summer of 1954. This is however contradicting Peter Smithson

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<sup>i</sup> A simple Google search of “concrete monstrosity” returns 20,800 accurate hits and “concrete jungle” returns 535,000 accurate hits, demonstrating the common use of the expressions.

who had first published a text using the term a year earlier. Yet Vidler points out that in the architectural literature there is persistent belief that the term originated from a Swedish magazine “*Bygg-Mastaren*” that had used the term “*Ny-Brutalism*” in Sweden by Hans Asplund previously to describe the bare aesthetics of a house and this comment was shared with three English architects. The Swedish journal *Bygg- Mastaren* had published in 1950 a special issue on the work of Gunnar Asplund and the English summary, translated the term *Ny-brutalism* to *Neo-brutalist* (Vidler, 2011). According to this prevalent theory, they had brought the term in the early fifties and the picked up and spread quickly.

A term so debated for its origin, eventually became associated with a style. Whatever the exact origin of the term, the ambiguity surrounding its etymology speaks for the random event of its creation. Assuming that “*brut*” was purposefully acquired with negative connotations would not withstand. The connotations that have associated concrete with the brutality were not constructed intentionally, as Banham attempted intentionally to create a style, but were later imprinted with associations that had to do with it’s use. Associations with the semantic are not the only way to infer meaning into the concrete. Kahn for example used it as a solid monolithic structure in the Bangladeshi assembly to associate it with a monumental effect, in contrast to a modernist representation of a lightweight structure (James-Chakraborty, 2014). Interest in brutalism, and by association concrete, is witnessing a revival in recent years. There is a surge in publications into the material by historians, architects, and anthropologists that offer diverse accounts and modes of understanding concrete, some of them revealing more pragmatic reasons for its use, and they will be discussed in the following section.

#### 4.6 Concrete everyday decisions in the architecture of Denys Lasdun

The British architect Denys Lasdun, well known for the use of concrete, is one such example that is thought to have used the material for reasons beyond its associations of modernity. Architecture historian Barnabas Calder argues that Lasdun does not use concrete

by default, for being the material that architects of his time are using. For his work, the material lends a set of mouldable properties that enable him to be creative in his explorations. It is an ideal medium to pursue his artistic freedoms and it is there to enable him. Neither had his choice have anything to do with cost or other pragmatic reasons: he had many more options available far more cost effective, but he has chosen to work in concrete for most part of his career, and certainly from the 60s onwards. It is more related to Lasdun's perception of the architect than anything else, which attributes to the professional an all powerful role: the architect's to impose his powerful will on the clients, engineers and building materials. All are in place to enable him to fulfil his vision. Calder views the role of the architect as a heroic persona, a creative genius who has the ability to act on matter, but also over other professionals involved (Calder, 2015).

This is not to say that Calder does not acknowledge the networked reality of architectural practices, and the effect of the everyday pragmatics of construction on a building, as described initially by Albena Yaneva (2009a) and later by Kjell Tryggestad, Susse Georg (Georg and Tryggestad, 2009; Tryggestad et al., 2010), Libby Schweber and Chris Harty (2010). But reading architectural production as the culmination of creativity, conflicts and everyday interaction of professionals would be difficult through Lasdun in particular. Although many architectural practices of his time were expanding and thus making architectural production a collective and in some cases anonymous process, Lasdun was a strong opponent of the idea of a collectively produced building, to the point where he was willing to let skillsets out of his projects in order to gain more freedom in the exploration of the architectural potential. This was a "*price*", as Calder mentions, Lasdun was "*willing to pay*". Giving the example of a competition design that was never constructed, the architect must have relied heavily on the engineers for the exploration of the structural potential of concrete. He claims that were it to be constructed, the engineer's contribution would be an engineering achievement as well as an architectural one, drawing similarities with the Sydney opera house and Jon Utzon's design that also made Arup

stand out for the remarkable structural capabilities. These capabilities were also what made Lasdun favour concrete.

Where Kenneth Frampton has found Lasdun's inking to concrete to be a de facto decision by the architect (Frampton, 1985), Calder's exploration of Lasdun's archive reveals that this is far from it: although his early use suggests he was fond of the material, he also was suggesting that its use is "a *mistake*" because to laypeople it often resembled unfinished. Although Calder is restrained by the fact Lasdun was viewing the role of the architect as the all powerful, he is more interested in the everyday interaction of Lasdun with the material in his projects. Discussing projects in concrete like Christ's college and National Theatre, Calder claims Lasdun was in a constant battle with enemies, clients (i.e. council) and public perceptions. Instances where Lasdun deliberately concealed the use of concrete also reveal the reluctance of clients to the material. Preferring to handle discussions on the materials himself, rather than leaving them up to his team, he would speak in vagueness, avoiding to give a definite answer all together. The decisiveness of Lasdun to use concrete was such that he was finding ways of getting the clients to agree without full awareness of what they were getting into, almost luring clients into exposed concrete- or as himself used to call it: "*the Great art of architecture is concealing the art of architecture*" (Calder, 2015). Lasdun, even once he had his name established in architectural circles, was still facing difficulties imposing his choice of concrete. Calder's more recent work on Brutalism and its associations with concrete questions the use of the particular material for a means of social amelioration and presents it also as the playground of a group of well educated architects blowing the budget of the welfare state, providing a different account to the well-intended experiment that often comes with brutalist narrative. Barnabas Calder's work on the use of concrete by Denis Lasdun is concerned to a large extent with the role of the architect: he discusses the decisions to use concrete through the everyday reality of Lasdun's architectural practice, and engagement with stakeholders and clients. This account of concrete use opens up the potential of the material being active in the

way it engages with professionals, yet Calder only presents it through the direct involvement of the powerful architect. It is a dichotomy that presents clients almost as an uninformed subject willing to disobey the informed architects decisions, and the passive material is taking up the creator's orders, similar to descriptions of concrete in architectural historiography. This activeness of concrete in engaging with professional decisions will be explored further in empirical Chapters 6 and 7.

## 4.7 Discussion

Having discussed instances of concrete use in the history of the material, events where the material has come together through the heroic actions of the architect versus the chance encounters of matter, are revealed. Concrete for Forty has slipped definitions (Forty, 2012) and for Calder it offers to the heroic architect the potential to apply his powers on the material (Calder, 2015). In ways already described in chapter 2, the material presents instances where an activeness is triggered. In a similar manner, the accounts of Calder and Forty open up moments when the material becomes active. The impact of the material with its exuberance, can therefore slip the intentions of the creator. Viewed in this way, concrete shifted significantly in its life: initially it was a material of the technical, with its properties being of concern only for the engineers whereas architects were involved with its ornamentation (for example the Hennebique patent which was not concerned with aesthetics, while Perret also used it as an ornament), then onto a material producing, or "*affording*" through its properties a particular aesthetic for architects, who can harness its technicalities for the creation of a new "*style*", and then further ahead to a material that can afford a revolutionary change in the lives of people, a means of instigating social reform. Through this journey, assisted by the architect, concrete becomes the shaper, the instigator of change.

In the description of the life of the actual material, three phases become distinct. Before it is assembled, there are myriad physical entities that may come together and potentially interact. The possibilities of what will come together and how they will be joined with concrete,

are infinite. The manners in which the components come together are not dependent on a particular event, or tied between them in a linear way. They occur spontaneously, and through the random interaction of material and immaterial entities. Potential combinations of elements charged with contingency, give rise to the material in an arbitrary, non-linear way. There are materials commonly used in the production of concrete, but also others that are added by chance or experimentation: water, pozzolanic products, rubble, sand and lime, all exist in a state of infinite potential in the realm of myriad actualizations.

At some point in time, an quasi-arbitrary selection of elements comes together. This is the instant when the material of concrete is stabilized. The entities that comprise it have all found a place in the assemblage that concrete is, and this gives the material its particular technical performance. At that moment, the material exists as an entity capable of solving a series of predetermined technical tasks. It is the point where it exists with a consistent internal individuality, where all potential of material actualizations have temporarily stopped, and have not yet entered in a dialogue with the subject. Inspired by Simondon, I have argued that the consistency of the unified object in this moment is a necessary condition for concrete to engage in the dialogue that follows in the final stage of interacting with human and non-human agencies.

Before concluding, I will go back briefly to the concrete structure of 25 Rue Franklin, or to the board marked surfaces of Lasdun's National Theatre. There are specific structural and chemical properties that enable them to hold their form, mystified for the average passer-by. At the moment the concrete is assembled on site, it leaves back all the dialogues of Lasdun with the clients and the controversies of his practice, or Perret's intentions. The solidified object of reinforced concrete, is at that moment, and for that moment only, a unified entity. The infinite numbers of components with infinite potential origins, all come together to stabilize in an object, albeit for an instant only, for concrete to appear as solid. During this state, concrete remains paused. Beyond that instant it leaves its solidified state, this condition of being thought of as stable, and begins an interaction with actors surrounding it. Once this dialogue has begun,

concrete becomes destabilized again and re-enters a state of fluidity, oscillating amongst being a mediator of structural, aesthetic, social, cultural and potentially other assumed connections. Its million potentialities become stabilized for an instant when it is conceived as an entirety, only to slide back again into a constantly fluctuating formation.

From the dynamic emergence of the material out of myriad potentialities, concrete enters an instant static state before slipping back to infinite potential. But this point is crucial for its ability to acquire shifting roles beyond the static state that it enters. It is the point it becomes structural, allowing it from there on to become political, become cultural, become aesthetic and endless other possibilities, in its never ending interactions with humans and non-human objects and subjects. This conceptualises concrete as acting in three phases, three modes in its existence. In the first one, concrete is in the domain of infinite fluidity, infinite potentiality. At the moment it is assembled, it enters a second state, where, it exists in a stabilized mode. In this structurally solidified state, concrete although stabilized, leaves open-ended associations that enables it to be dragged beyond and enter discussions that allow it to be viewed in other ways than technical.

Affordance, presented in the previous chapter, can assist in describing the relationship between the material and the user. It is a way of mediating between the object and the subject, without the need for translation and describe an affinity between the material properties and the way it is perceived. The precise point in time when the solid and stabilized object of concrete slips back into fluidity and continuous morphing, is when affordance becomes crucial. At that moment concrete is read, understood or perceived by the human subject without any cognitive attribution, but purely for how it speaks on its own. Without mediators, and without the need for translation and attribution with a particular meaning or style, the concrete re-enters on its own a condition where it is in its most material state, away from any assignment, any description and any transcendental notion. Beyond this phase, it re-enters a realm of infinite potential, this time not potential of actualization of a material object, but of morphing into other roles and acquiring

other performances. There, performances are acquired through the interaction with the human and other non-human elements. This is when it moves out of the solidified state of the technical object, and into the day to day interactions with subjects and objects, becoming and un-becoming a material charged with social, aesthetic, visual and infinite other roles. This is the stage which later chapters will place particular focus on. The dissertation will explore what happens beyond the stage where it was stabilised, and visit the everyday interactions of concrete to search how they trigger properties that are previously unimagined for the materials involved.

Following the previous description of the associations the material of concrete forms with other entities, can support the choice for investigating material agency through its lens. Concrete is neither object nor subject in these descriptions. Nor can the associations it forms be dismissed, but neither can the technicalities of the material object, and the material properties be ignored either. The assemblage that was described in an earlier chapters, is an appropriate way of describing this type of constant interaction of material properties and social type of functions and instantiations. The specificity of the material is not grasped by describing only the material aspect of it, or only about those in charge of it, or the meanings attributed to it. It is neither nature nor culture, neither geological formations coming together, nor a set of symbols. And in order to understand the way all of these practices come together, assemblage becomes a means of description. We cannot describe concrete as this thing that stays static forever, once the building is complete. It is not there in the building fabric to be forgotten, and neither is it totally a social construct that is entirely redefined in the mind of social actors. The assemblage describes this multiple specificity that cannot be described in a material culture or a symbolic culture, but as a hybrid, a composite. Assemblage is the description that makes this multiple nature possible. With the assemblage, it instantaneously exists in a semblance of manners, continuously moving between them. The various formations it has been morphing into, albeit in unstable manner, are evidence of the powers it has inherently. The specificity of



concrete and the complexity of the material can serve as an example to describe the active role of matter in architecture. The question that arises at this point is how are these shifts triggered? What happens in the life of the material that instigates a change in its role, its perception and in its performance? This is the question that empirical Chapters 5, 6 and 7 will aim to address by investigating how the material agitates the everyday with its interaction with human actors.

## The rise and fall of concrete in Park Hill

*“Things are not just formed matter, they are transductions with many conditions of possibility and their own forms of intentionality”* (Graham and Thrift, 2007)

### 5.1 Introduction

On the edge of Sheffield City centre, lies a concrete fort, dominating the landscape. Park Hill, an estate of council housing, greets the visitors of Sheffield with its imposing concrete omnipresence hanging over the train station. For years, Park Hill has been a symbol during post-war Britain. In the late 50s it was considered a symbol of modern values, and Team X's aspiration for an inclusive society, with higher living standards for everyone. In the age of the space race, it symbolized the dream that became a reality. Rapidly declining in the 70s it was seen as a symbol of the decline of social housing; in the 80s of the harshness of the Northern Great British cities and the banality of life of the working class. Park Hill is now a Grade II\* listed building by English Heritage, undergoing a major redevelopment and described by residents as “Yuppieville”.

For 50 years Park Hill has continuously been a receptacle of meaning, a symbol of ideas or social conditions. Architects and users alike have projected onto it their ideas, their intentions and their beliefs. But the view from this angle leaves out the importance of Park Hill's material

presence on the landscape. And based on my encounters with Park Hill on site and in the archival and library material researched, concrete must have been important: The on-going renovation has stripped the building of every other material aspect leaving only the concrete in place. Concrete as a material in Park Hill has been speaking from the moment of its creation, initially only quietly, hiding behind immaterial presences. More recently its voice has become louder; it has answered back to them: its on-site implementation and the memories of the users tell a different story. I, therefore, found it find surprising that concrete is absent from the discussions on the project and embarked on a process of understanding why.

The social, visual and technical performances of concrete are articulating different stories throughout the history of Park Hill. What led to the decline of the development, its later recognition and its listing for its historical importance, but also the decisions surrounding the current renovation which has chosen to neglect all other elements of the listing report and focus exclusively on the material, are all investigated through the lens of concrete. Concrete etches its own story in Park Hill, quite different to the stories that architects, engineers, and planners would have intended it to narrate. It has continuously shifted between identities and meanings, between absence and presence.

The aim of this chapter is to discuss Park Hill precisely through this presence and absence of concrete. It is an attempt to paint the picture of the backdrop of the estate, which has undergone a significant transformation over a relatively short period of time, but by doing so the description of concrete of Park Hill has become important. Every section of it describes the context of Park Hill in a particular period and presents information that is essential to understand the estate and its entourage in that particular era, even if some of this information is unrelated to concrete. The prevalent modes of thinking that became important during each phase Park Hill has lived through are presented, and their interaction with the estate are discussed all along its timespan. The presentation of the historical contextualization of Park Hill serves to understand its position in time, not only refrained by the narrow definition of context as

the physical boundary defining the surroundings of the estate, but a conceptual background, a fluid set of ideas and intentions, trends and ways of thinking.

In this chapter, the ideas of the presence (and absence) of concrete are charged with multiple meanings. Although from the completion of the building the material has always been present physically and visually on the estate, there have been phases in its life that have not acknowledged the existence of the material on the site. The role of concrete in Park Hill is absent from its descriptions in the publications of its time. The estate begins to form associations with the material, only when the material is acquiring negative connotations and becomes associated with stages of its life when Park Hill is in deterioration. That is the point when it proclaims its presence in the imagination of its residents and its users. It is understood and perceived as part of the estate, in a way that was previously unappreciated.

## 5.2 Park Hill's past and present story

The interaction of Park Hill with its contemporary currents will be described in this section. The context within which Park Hill has been created, has operated, and been associated with, is presented. It takes form in the many elements of transformations that took place all through the estate's life span, focusing on key periods as the culmination of events and paradigms shaping it. The distinct temporal contextualization of the estate that is presented provides the necessary account of a historical backdrop. The periods discussed serve not as historical review of perspectives in the story of Park Hill, but as a means of informed description of moments of the building when concurrent events at certain moments of the estate have triggered instants of redefining concrete in Park Hill.

Yet, although some of the material presented here is not related directly to the concrete, the material is never away from the development. One of the ways context can be described in the case of Park Hill, is indeed through the material, through its physical presence and its notional absence. For concrete describes a story of the context of Park Hill even when it is absent from its descriptions in the on-going discussions about the estate. In many cases, it is

this very absence that also depicts the performance of the material. Concrete has always been physically present in Park Hill. Exposed for everyone to see, feel, touch and sense. Yet the presence was not always felt. For many years it was its absence that was most surprising. Absence not from the building, nor from the estate and the site, but absence from the discourses that Park Hill was initiating and the controversies it was participating in.

### 5.2.1 Leaving the past behind (pre-1963)

The Second World War had devastating effects on the lives of Sheffield's inhabitants, making them immensely difficult as well as of those of the citizens from across the country. Rationing of food and materials was prevalent, and coexisting with an urgent need to rebuild Britain. Amongst the struggles the population was facing were the squalor conditions that a large percentage of Britons were living in. Across the UK, the need for renewal of the national housing stock was urgent and needed to take place on a grand national scale.

The Park Hill area in Sheffield in particular was just another example of the poor living conditions of the time and was occupied by Victorian back-to-back terraces. Figure 11 depicts a typical arrangement and section of the back-to-back typology. They are a type of terraced housing that shared a back party wall. It was the typical working-class housing of the time, which, because of its typology, created poor living conditions for the residents. It typically consisted of a single room on each of the three floors, with no installations for running water or toilet. The room on the ground floor was usually used as a communal and cooking area. They usually were placed in a formation that created a courtyard between them. In this small courtyard were the communal WC facilities and a communal water pipe. The lighting in the houses was also very poor. Not only was there a single window, with a blind wall at the back, they were also so close between them that any light could hardly penetrate. But although these conditions may appear very hard, it is generally thought that people living in these neighbourhoods had developed a very strong sense of communeship.

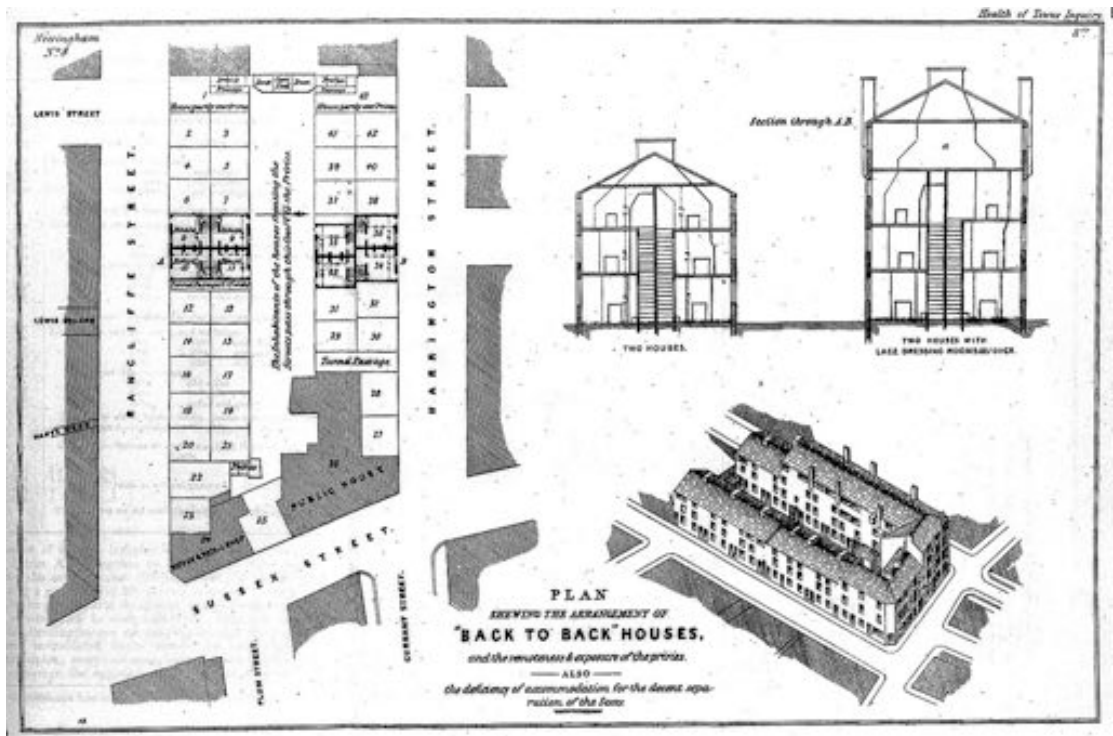


Figure 11.: Typical section of Victorian back-to-back housing. Image taken from commons.wikimedia.com

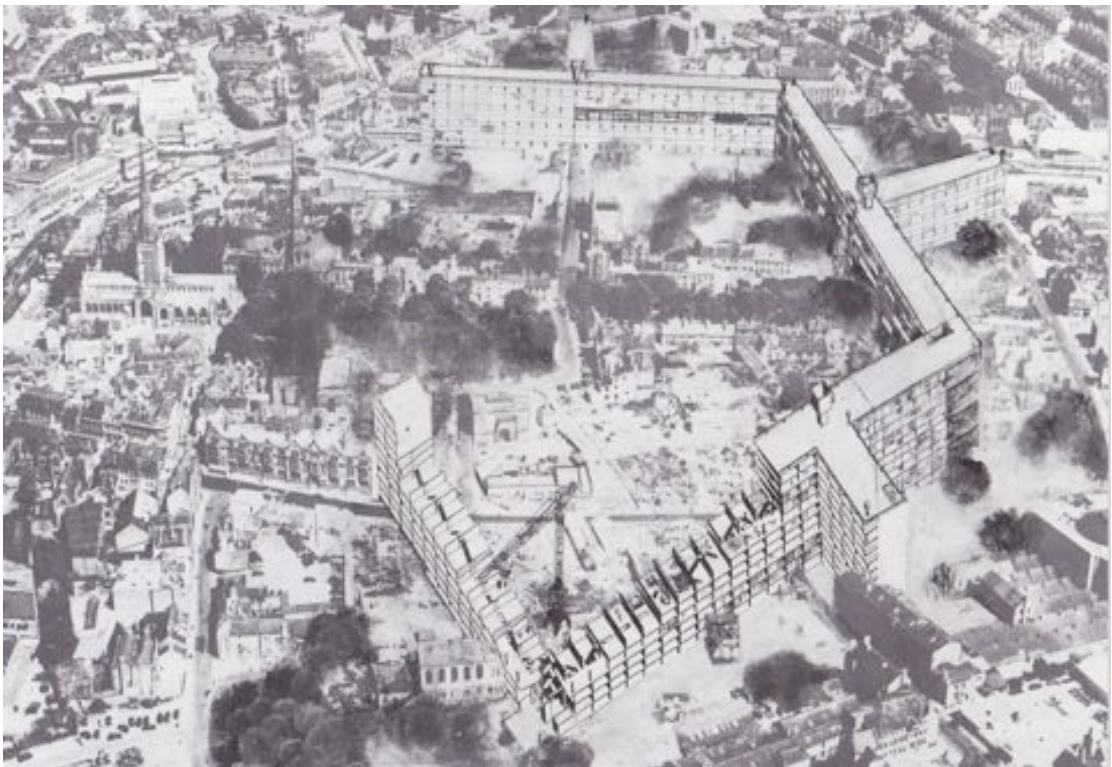
Park Hill estate was designed in 1957 by architects Ivor Smith and Jack Lynn and was proposing a way of overcoming the problems of living in back to back terraces. It was infused with an optimism that would leave behind the rough conditions of the past. Not only did Le Corbusier's Unité d' Habitation inspiration in Marseilles serve as a source of inspiration for the design, the entire modernist idea of a vertical city was celebrated in the design: it was implemented in the development in a way that the "streets in the sky" became a distinctive feature of the development - streets on floor levels wide enough for a milk van to circulate on them. The recreation of the communal spirit of old neighbourhoods in the new development was driving the design and the intention was to maintain the layout of the back-to-back streets, by replicating them in the sky. The architects maintained even some of the street names that existed in the area prior to the estate. They kept the street layout as it was in the plan and simply tilted the map, to recreate everything in vertical. The streets were therefore roughly maintained of a similar outline and those residents that had previously lived there, could move

back into their streets, with the same neighbours, keeping the same social relationships and structures even after moving.

Neither was the idea of naming them "*streets in the sky*" new. Le Corbusier referred to the street level as "*rue*", an idea going back to his original concepts of the Ville Radieuse with typologies that would allow the socialising of the inhabitants on a floor level, and replicate the social conditions of the ground. But Ivor Smith and Jack Lynn, took this idea even further: because the morphological characteristics of the site allowed them to master the landscape's dramatic incline, they were able to link those levels to the ground and allow the entry of a vehicle on the "*street level*". The incline of the hill is such, that at some point all levels, but the uppermost, reach the ground. So they took Le Corbusier's ideas a step further, to more accurately recreate the street. This was no real street of course with circulation traffic, but the milk float was regularly circulating the street to distribute milk to all flats certainly served as a reminder of the role of such wide corridors. This was probably more of a symbolic gesture, not one that served a necessity for Park Hill since there were ample facilities for the catering of the estate on the site anyway. But it certainly was a symbol of the recreation of the street level at the sky level.

Ivor Smith and Jack Lynn, at the time when they were designing Park Hill, were young architects, working for Sheffield city council, this had been their first project straight out of university. Their biggest source of inspiration came from the Smithsons. Peter and Alison Smithson had participated in the Golden Lane competition a few years earlier in 1953 but had come second to the actualized proposal. In that scheme, the Smithsons proposed what they titled "*the streets in the air*" (Figure 12). The design of the competition entry bears many similarities to Park Hill: it was to be built at a site of dereliction from the war and slum areas, it had the Unité d'Habitation as a very strong influence, but most importantly it proposed the idea of the streets in the air in a series or elongated tall structures, interconnected with bridges linking the streets and ensuring the unstoppable flow of the linear connection. Both the Golden

Lane entry by the Smithsons and Park Hill have similar looking layouts that resemble brain synapses in their elongated spread.



*Figure 12: Golden Lane Design, Competition entry, by Peter and Alison Smithson (1951). Taken from Frampton (1985).*

Following a relatively short period of construction, that began in 1959, the leader of the opposition Hugh Gaitskell, Labour MP and Leader of the opposition, inaugurated Park Hill on Friday 16th of June, 1961, in a festive atmosphere. At the point Park Hill opened its doors, the crowded back to backs, lack of sewage, squalor, cholera, typhoid and crammed conditions, seemed a thing of the past for the inhabitants of Park Hill that moved back to the estate. The under construction concrete frame that was dominating the Sheffield landscape for three preceding years, was now clad in coloured brick panels. New residents here moving here have only good times to look ahead to. The war is over and the future looked promising. Surely nothing could go wrong with this?



## Optimism

In my search for information on the estate and discussing with participants that were aware of the contemporary currents affecting Park Hill during its creation, the positive atmosphere of the time stood out. The era in which Park Hill was inspired and created, was infused with an optimism that is difficult to grasp today when one looks at the estate. Park Hill was looking to the future, because as was described in the previous section, it was so radically different to what it had come to replace, and it had the intention and the capacity to drastically change the lives of all those inhabiting it. It was looking forward because it was coming from a distressed past, and it was promising to change what had preceded.

This optimism that the contemporary era infused in the design of Park Hill was described as recently as 2010 by one of the original architects, Ivor Smith, a key stakeholder of Urban Splash, during their meetings on the renovation of Park Hill. Ivor Smith was trying to infuse the same optimism in the new developers, as he had experienced it 50 years ago. He recalled their discussions when I interviewed him:

*“I asked him [Ivor Smith] questions about what is different now [2010] from when you were working and [...] he said [...] when he was working he had come out of WWII, and actually the space race was on, technology was changing people’s lives, computers were being invented the jet set age was coming, people were going to the Moon and there were lots of things happening and everybody’s life was getting better and there was a huge optimism. And there was this view that architecture was going to improve the quality of lives, and architecture could in particular make lives better. I think this sort of thing epitomized Park Hill and we have sort of lost this now in architecture; I mean no one talks in those sort of terms any more. [...] Nobody actually talks about making great spaces that people will really enjoy living in and I think that saying is quite important about it” (Interview with key stakeholder, Urban Splash, 29/04/2014)*

The simultaneous optimism paired with the scarcity of the 50s is not just an observation of Ivor Smith and his work on Park Hill. Peter Smithson in a published interview with Peter Carolin in 1997 talked of the scarcity of materials and the attitude towards them in the early 1950's. The innovative nature of the Hunstanton design was precisely a result of that scarcity. Hunstanton was designed in the late 1940's "a *period of continuing rationing, shortage of building materials*". The intentions of the Smithsons, who did all the structural calculations themselves in the design stage, were to use all materials assembled in a way that will serve a structural purpose as well. The window frames for example, also double up as a means of stiffening the structure, and so did the infill brick panels (Smithson and Carolin, 1997).

Simon Smithson, the son of Peter and Alison Smithson, also recalled the memories he had of his father and what the practice building during that time entailed. He provided an account of what he thinks it meant for his father to design during that period:

*"[for the Smithsons] I think that that's a very specific reflection of a time of austerity that it was just miraculous. To have any materials to build in, I suspect, I think that's what my father would have said, **almost in exactly those words**. I understand there was delayed construction because they could not get steel so I think just the idea that on the one hand, you didn't have many materials to work with and the second that in theory everybody believed you had a lot of work to do because you had to build new schools, you had to build new hospitals and so on."* (Interview with Simon Smithson, 28/07/2014, emphasis mine)

During the post-war period, simultaneously there was both an immanent optimism together with a stressful condition, where demands were great and resources were few. This was an oxymoron felt by people of the time: there was both this feeling that things could only get better, but the means to achieve them with, were scarce. The need for crafty solutions and improvisation to make use of resources, particularly in the field of construction seemed great,

but so was the optimism of the ideas prevalent at that time. As much as materials were rationed and their use had to be limited, as great was the need to build.

*Re-articulation of a new condition*

In his recent publication, Ivor Smith, one of Park Hill original architects, describes the conditions that existed on the Hill and the lives of the residents prior to the erection of the estate: the proportion of inhabitants living in the area was approximately 400 people per acre in back to back terraced houses. Yet, as Ivor Smith observes, it was surprisingly neighbourly. Despite the terrible living conditions, the residents had a strong feeling of community spirit and were proud of their streets. They were happy living in the area and could have gone on living there (Smith, 2014:201). The clearance program that Park Hill was to participate in, was what later changed their lives; yet, regardless of the amelioration of the conditions they were going to go through, by means of modern construction and amenities, Ivor Smith and Jack Lynn were eager to re-create the community spirit they had encountered on the hills.

When reading into the archival material or the interviews by the first Park Hill residents, one thing clearly stands out: they all discuss it in relation to its past. In the BBC documentary on the estate a young boy describes his different life: “*modern*”, “*not squashed together, just put together*” he says, comparing it to the previous back to back estate. Another lady, in her rollers, is heard saying: “*it’s like being in ‘eaven up ‘ere because we’ve always been poor people*”. The difference the estate makes on the lives of the area’s inhabitants was drastic, compared to its past (‘Park Hill flats, Sheffield,’ 2010). They compare it to living in squalor, to overcrowded conditions and no running water. Park Hill is not making an impact simply on its own: it is the relationship with its troubled past, and the associations of the residents’ of quality living conditions with a different “*class*” that make the impact. The moment it opened, it became a new condition in relation to its past. It was at that moment that a way of living for the residents was articulated.

This association of the previous condition with the new has no direct consideration for the material, for it is nowhere to be seen. It is there, but faded and latent in the background. The conditions Park Hill was able to achieve and the changes it was making in the lives of residents', were enabled, albeit in part only, by concrete. This is evident in the accounts of witnesses, but also comes out from the review of the publications of the era. This case study, immersed in complexity and surrounded with controversy has potentially embodied shifts in the way comfort is understood in relation to concrete. It is also a structure dominating the urban landscape of Sheffield and surrounded by controversies in its construction and renovation. It is therefore proposed as a suitable case to illustrate the agency of concrete by tracking its journey inside the building with a focus on the renovation.

#### 5.2.2 Lived reality and decline (1964-1998)

The initial enthusiasm for the new development did not last long. There is no particular point in time when Park Hill stopped fulfilling its purpose, but from 1968 onwards, the estate gradually fell into a period of decline. Physical deterioration was gradually eroding the estate, but most importantly the perceptions of the public to Park Hill was weakening the condition the estate. The physical deterioration with the notional deterioration occur reciprocally: the more the opinions and perceptions of the residents for the estate become worse, the more they are likely to allow it to deteriorate physically. Disregard for the estate meant that the materiality was left to weather, while the performance of the materials was not gradually left to weaken to the point where their initial purpose wouldn't be met. Peter and Alison Smithson could not imagine that anyone in Robin Hood Gardens would not take care of their flat (Interview with participant 15, Concrete expert, Partner at RSH+P, 28/07/2014). But they were coming from a troubled background, where people would value their possessions differently (Smithson and Carolin, 1997). Out of disrespect for the estate and the council houses, the residents were caring less for their properties by the day, and the more they weathered, the more their disrespect grew, impacting on their material decline, and ultimately in this case on that of Park Hill in its entirety.



*Figure 13: The collapse of Ronan Point. Image taken from Geograph.org.uk*

There was no point in time when deterioration began and the material stopped functioning, as had been the case with other estates. The collapse of Ronan Point, for instance, an event that marked British social housing irreversibly was a pure material failure, depicted after its explosion in figure 13. In May 1968, following a gas explosion on the 18th floor of the estate caused the collapse of an entire section of the building. This type of material failure was instant and spectacular. That was not the case in Park Hill where the material deterioration was slow. Yet, the associations Park Hill had with this type of estates were strong. Although Ronan Point uses an entirely different system of construction, its collapse was associated with perils of the social housing and subsequently bringing about failure of its purpose. The associations Park Hill had formed with these types of estates, have influenced its decline and that was not the only victim. Many plans for high-rise buildings were subsequently abandoned following the fall of Ronan Point (McGinty, 1974). The collapse of Ronan Point, for example, although not in any way related technically to Park Hill, does mark a point in the history of social housing, when the decline was emerging.

The events surrounding the collapse of Ronan Point are discussed by Martin Pawley in *Terminal Architecture* (Pawley, 1998:47). He presents a big sense of disappointment for the

public towards pre-fabricated construction and social housing but also presents the moving of Erno Goldfinger in Trellick tower, which coincidentally took place in the same month. The excitement of the famous architect about living on the top floor and making friends with the neighbours is presented in the very same issue of the Architects Journal. So, on the one hand, there was the disappointment of the general public of the collapse of an estate, and on the other, there was an enthusiasm of architects about high-rise living and the communities it enabled.

The collapse of Ronan Point came to be associated for Pawley with many other failed performances of the high-rise buildings. Such an incident was described a few years later when a young mother had to give birth on the 21<sup>st</sup> floor of her high-rise apartment because she could not come downstairs to go to the hospital. Another few years later, it was described in the press when another estate, the Freemason Estate, in the vicinity of Ronan point, which had become notorious for its neglect and disrepair, to the point of a wasteland. When fire safety standards were being implemented in the 1980's, Ronan Point flats were inspected and found to be inadequate, due to the fact that their construction was so flawed that it left gaps in-between floors of flats, making them hazardous (Pawley, 1998:54). Bit by bit, the connotational relations social housing was forming with failings of the materials in estates, were tarnishing Park Hill not directly but by association.

### 5.2.3 Discovery (1998-2010)

Following several decades of deterioration and neglect, Park Hill had acquired a bad reputation for prostitution, theft and drug dealing which were rife in the development. The estate's streets, difficult to access by police and with many hiding corners in the labyrinth of corridors they form, were making it the perfect hiding place for crime to take place. The local press of the 90s has publications voicing the opinions and concerns of the public consisting mostly of negative views. While these voices were being raised in the 90s about the state of the estate, and a potential demolition was rumoured, English Heritage stepped in. In 1998, in a

move surrounded with controversy the “*Streets in the sky*” were listed together with the entire concrete structure as Grade II\*, making it the largest listed building in Europe.<sup>1</sup> This move was not just radical because of the type of building it involved -there had been previous listings of buildings contemporary to Park Hill- but because of the massive size. 991 flats were included in the original construction, and the estate covered an area of almost 0.1 square km. (measured on Google maps).

Yet the English Heritage had good arguments to support their controversial move. While the practical implementation of redevelopment activities that the move from English Heritage involved, and will be investigated in a later chapter, it is of interest to investigate what informed the decisions for the preservation of the concrete only, rather than the whole building. In the original report by English Heritage the rationale of the listing is mentioned clearly:

*“Park Hill is of international importance. It is the first built manifestation of a widespread theoretical interest in external access decks as a way of building high without the problems of isolation and expense encountered with point blocks. Sheffield and the London County Council had the only major local authority departments designing imaginative and successful public housing in the 1950s, and this is Sheffield's flagship. The decks were conceived as a way of recreating the community spirit of traditional slum streets, with the benefit of vehicular segregation; sociologists have regularly studied Park Hill ever since it opened, and is one of the most successful of its type. The deck system was uniquely appropriate here because the steeply sloping site allowed all but the uppermost deck to reach ground level, and the impact of the long, flat-topped structure rising above the city centre makes for one of Sheffield's most impressive landmarks. The result was Britain's first completed scheme of post-war slum clearance and the most ambitious inner-city development of its time” (English Heritage, 1998).*

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<sup>1</sup> This is a common rumor about Park Hill, and has been replicated in a variety of media representations, such as BBC documentaries and journal articles, yet Owen Hatherley, the author and researcher on the politics of Social Housing, denies this, claiming this title is rightfully owned by the Barbican.

The reasons behind the listing are clear: the historical importance and its social impact have placed it on their list, indeed not just as a Grade II, as most buildings of its era and 92 % of the total buildings in England, but as a Grade II\*, placing it in the category of national importance. Unfortunately, following the listing, several more years passed before the actual move to redevelop. To smooth the roughness of the urban landscape and confront crime in the area, English Heritage moved forward to initiating the renovation of Park Hill and the regeneration of the area in partnership with Urban Splash. In early 2013, a small section of the renovated Park Hill opened its doors to new residents.

A snapshot of the every day reality in Park Hill, after the listing was in place and while the neglect and disrepair gained momentum, is the "*Clare Middleton, will u marry me?*" graffiti. Drawn on one of the highest level bridges of Park Hill, it was a marriage proposal of a young man to his fellow resident Claire Middleton. The location was chosen so that it would be visible from the city centre. The couple had been on a date in Sheffield, on an evening in April in 2001, and he was hoping to attract her attention on the way back. The author has carelessly has etched the names across the bridge in an effort to marry the girl of his dreams, disrespectful of the already listed building (BBC, 2011). At the same time, it was already known that the building was due to be renovated, so the council paid no consideration to the estate either.

This peak into a moment of the life of Park Hill has attracted nationwide attention. In the recent renovation that was taking care of cleaning the concrete, the designers decided to keep the graffiti. It has been a focal point of the renovation because one of the designers' intentions was to use it as an attractor for people (Interview with participant 4, Senior Architect, 24/06/2014). The architects intended, once the entire revamp of the building is over, to create underneath it an area with restaurants and bars. Instead of carefully cleaning it, they have chosen to further accentuate it with neon lighting that now makes it visible even further away from the city centre of Sheffield. (Interview with participant 5, Architect, 24/06/2014).



#### 5.2.4 Revival (2010- the remaining future)

Urban Splash have chosen to maintain concrete in most of their interiors, making it an eminent and central feature of every apartment. Exposed concrete features are ubiquitous in Park Hill. Following advice from the English Heritage, what is even more surprising is that on the exterior, where they had a very specific responsibility to maintain the material, almost fluorescent bright colours were used for the aluminium panelling. Applying the “*squint test*”<sup>i</sup> to the façade, causes the concrete to fade in the background. The colourful façade fades out the past and infuses a new image in the development, subsequently causing the concrete to fade back.

An interesting observation about concrete in Park Hill at this revival phase is the tenancy agreement between all residents and their housing association is clear: no changes are to be made to the concrete interiors. (Interview with participant 8, Facilities Manager, 21/05/2014). The same clauses apply to residents who have purchased their flats. Chapter 6 discusses the way concrete is projected as an image of Park Hill and how are the residents treating the material. Some have attempted to cover it, not bearing to look at it- others have kept their walls and rooms completely clear to bring out the “*concreteness*”.

Meanwhile, Park Hill has integrated itself with the urban grid of Sheffield, so much that it is now an irremovable component of its landscape: its interiors are recreated in museums, its frame getting sketched on collectible mugs and plates (People will always need plates, 2013), depicted in Sheffield restaurant menus and used on movie posters (Pulp, 2014). Park Hill is possibly the first building of its type that is being represented as a symbol of its city. This is an ironic observation if one is to think that the intentions of the original architects would hardly have been to create a symbolic building.

The most important achievement of Park Hill in the realm of architectural design is its shortlisting in 2013 for the prestigious RIBA Stirling Prize. Alongside another five buildings (of

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<sup>i</sup> The visual effect produced by squinting one’s eyes, a common empirical tool for architects.

which four were new constructions and only one other was a renovation of a 12<sup>th</sup> century castle) Park Hill's redevelopment competed for the highly coveted prize. The results may have been disappointing for the architects involved in the renovation, but the importance of being shortlisted for such an eminent award in architecture, should not be ignored. For a building tarnished with the reputation of a brutalist council estate, rife with drug dealing, it was a remarkable achievement for Park Hill.

Yet there is a period in the later life of Park Hill, when the shift has very quickly occurred from the heritage of the building to the heritage of the concrete. This period did not last long, and yet it is difficult to pin it down to a date. In the late 2000s, concrete appears to have become an idolized feature that has to be treated with respect; the attitude of English Heritage (EH) in the maintenance and renovation of Park Hill appear to revolve predominantly around this. This is both evident to the visitor by going into any of the flats in Park Hill, but also just by walking around. The EH has focused almost exclusively on this, despite the rationalization of the listing of the historical structure as nationally important because of several features, almost all of which had nothing to do with concrete.



Figure 14: Park Hill inspired mug graphics. Image taken from [peoplewillalwaysneedplates.co.uk](http://peoplewillalwaysneedplates.co.uk)

Figure 15: Park Hill as the background of Pulp fictions movie. Image taken from [pulpthemovie.co.uk](http://pulpthemovie.co.uk)

The development that was once compared to "living in heaven" in a BBC documentary by an elderly resident, (Dyckhoff and Nixon, 2009) has become the epitome of a fascination with

concrete, a concept that will be discussed further in Chapter 7. Objects depicted in figures 14 and 15 testify to the revival of Park Hill in contemporary culture and the fascination with the estate. The role of the material has been crucial in ensuring this. This brief overview of life in Park Hill and the absence and presence of concrete presents us with an interesting observation. Concrete went from being totally unattributed in the early stages, to being of utmost significance in recent years.

### 5.3 Concrete absence: reading Park Hill through the material

The role of the material in understanding the context of Park Hill is double: on the one hand, there is the physical presence of the material: concrete is felt and perceived all across the estate. The visual influence of this imposing structure on the urban landscape of Sheffield is loud, and the estate clearly leaves its mark on it. But on the other hand, there is an absence of appreciation of the material on a notional level. Concrete has been a receptacle of a creator's intention to give shape to a condition by means of the material he has chosen, in this case, concrete. And yet the participation of the material in achieving this change is not appreciated as such, at least not consistently. Concrete in Park Hill has continuously fluctuated between being perceived and being notionally absent.

#### 5.3.1 Absence through performance

Prevalent in the reading of the estate is the dichotomy between absence and presence. Concrete in its early life in Park Hill, as was previously mentioned, is remarkably absent in the discussions of the estate, in the understanding the development of architectural and construction discourses of the time, but also in the perception of the material by the residents and users. It is not absent because it is not physically or visually present, but it is absent because it is not performing as intended. It is performing its role, but when it is performing as it should, we don't perceive it as a presence.

Material objects being ignored when performing as they should, but appreciated when they stop fulfilling their intended purpose, is a well-known argument in the field of Science and Technology Studies. Nigel Thrift and Stephen Graham describe the failure of things not as the failure of matter, but as the “*failure as a normal condition of their existence*” (Graham and Thrift, 2007:5). When the material fails, and in this instance, it is the performance of concrete that deteriorates and ceases to perform its original structural, visual and social role, it is when the objects lose their intended scope and thus become more apparent. Material failure should be an expected feature of the design of any complex building assemblage of components, and yet it is often neglected and overlooked. The true nature of concrete that is susceptible to corrosion and deterioration is revealed clearly at the point of breakdown.

The actions of concrete in this context also sit in parallel with the arguments of Paul Verbeek on the computer function that Thrift and Graham also refer to. Verbeek argues that the material function of the computer is lurking in the background. It is there to serve a purpose that is not perceived, as long as that purpose is served adequately (Verbeek and Kockelkoren, 1998). One can go on forever without appreciating the role of the computer, provided it performs adequately. But at the moment the material fails, it becomes apparent, through its failure. When the computer is working on Microsoft Word, for example, the role of the machine is irrelevant to the task. The limitations of the functions it performs become apparent only when it crashes. We go about writing a word documents, but only when the computer stops operating do we become aware of its material presence- when it works according to its script we notice the material aspects the least. It does perform a role, and as long as it performs it as it should, it is not making its presence felt. The moment the computer fails, is the moment the material presence is felt. After this point of time, the computer becomes failed material, making its physical presence understood.

What Verbeek describes as the role of the computer, and Thrift and Graham as a failure of things, is very similar to what has taken place in Park Hill: while concrete is performing in the

background, it is not being perceived. Concrete served its purpose adequately, as long as it was being used as a vehicle to attaining certain desired social conditions. Its structural properties were also performing adequately, and so its material presence could fade in the background. And yet It has always stood there, but it was not being experienced. Once the failings of the material began, whether they were visual, structural or social, the material made its presence felt. It was not a means of achieving a condition anymore but had become a failure in fulfilling its role. And this is the point when it made itself present.

The importance of concrete in Park Hill could have been identified previously, but was not. At the time of its construction, the role of concrete as the means of change was not celebrated in contemporary publications and was not given prominence or was substantially acknowledged. The technical capabilities that were tested and pushed at the construction stages and enabled the floating milk van to circulate were not making the presence of the concrete felt, as long as the material was performing. The material remained in the background while the technical expectations were fulfilled. The visual properties of concrete were also performing, for several years after its construction. Although it is difficult to identify the exact moment in time that the concrete started weathering so badly that it became noticeable, we can say with confidence that its visual properties became noticeable only after the material deteriorated. Up to the date that its limitations became apparent, the visual properties of concrete were concealed in the background, only to reveal themselves through its failure. In the few first years, of Park Hill, when the presence of concrete fit in with the people's and architects ideas of how life in Park hill should be, no major concerns were raised. Once the concrete started changing colour with the harsh Sheffield weather and with the iron ore pollution, and later on when it started falling apart, people began complaining about the material. The images of children playing safely in the concrete landscape of Park Hill in the 1960s gradually devolve into images of neglect and despair, portrayed in documentaries and media.

### 5.3.2 Absence from discourses

The absence of concrete during the period it was performing as intended, was only one aspect of the concrete's absence. There is also the absence of concrete from the on-going discourses about the role of the material in architecture, construction and the technological advancements of its time. Considering the omnipresence of concrete, a somewhat surprising finding in the course of this research, or rather, lack of finding, was the absence of any reference to Park Hill in its contemporary publications on concrete.

*Concrete Quarterly* for example, the journal showcasing iconic concrete structures of its time. This is not a technical publication, so it is not for showcasing the technological achievements and advancements of concrete. It serves to celebrate its use by presenting high profile concrete buildings. The fact that Park Hill is celebrated elsewhere, but not in *Concrete Quarterly* cannot be considered a coincidence. Park Hill was never intended as an icon. The use of concrete can be traced in the 5 years of the publications (1959-1963) that identify how concrete was depicted and why Park Hill did not fit in this journal. Park Hill is presented in the architectural and engineering literature of the 60s but not in CQ. In *Architectural Review*, the *Architects Journal* and *Architecture and Design*, it is depicted as a promising futuristic development. It has a prominent existence at least on one occasion in each of these big magazines in the beginning of the 60s, but there is little mention on the concrete. Not surprisingly, therefore, in *Concrete Quarterly* is hardly mentioned. Looking at other materials featured in *Concrete Quarterly* includes important architectural creations of the same era, but on the rare occasions it presents housing, there are insignificant observations on the transformation abilities it entails (For an example see Cambell, 1960:35). Social housing is also mentioned alongside private developments, labelled "*luxury*", or "*high-end*" (Cambell, 1961). Concrete, therefore, although it is present in Park Hill, it is also remarkably absent. Its presence and the role it serves is not acknowledged, it is not celebrated and not presented at all, in the initial stages of Park Hill's celebrated existence.

### 5.3.3 Absence and roughness

Finally, concrete is absent in the imaginary of the residents, until later it is life. What is also interesting to observe, is that its roughness would be expected to make the material more prominent and perceived in Park Hill. Roughness would make it stand out. In Unité d'Habitation, Park Hill's precursor, the attitude to concrete is entirely different. The fact that it is made of concrete is celebrated: its textures, are deliberately made to look rough, to emphasise the plasticity of the material, whereas in Park Hill, the concrete's roughness is not making an impact. Le Corbusier made deliberate attempts to use the appropriate boards that would make it look coarse, deliberately making it look unintentionally rough. In Park Hill, its roughness is circumstantial. Despite the fact that concrete was used in exactly the same way in terms of construction technology, with the formwork being constructed on site and the concrete being mixed on site and both deployed this roughness of the material, in the case of Unité d'Habitation it was delivered as an intentional architectural statement, while in the other case is was simply coincidental.

In this case, absence is associated with the lack of intentionality. It was not considered as a factor in the decisions of the architects and the contractors. Concrete is ignored, although it is physically present, its presence is not attributed in the intentions of the building. The dichotomy of absence and presence reveals itself in several manifestations: in ignoring the role of the material when it is performing its technological role, in being ignored in discussions of the material and the role it performs in Park Hill, in being invisible regardless of its rough nature. And just when it is least expected, it is acknowledged as an important historical feature during the renovation, when it is least expected, gaining prominence in the renovation. This absence and presence of concrete is discussed through the lens of the agency of the material in the two chapters that will follow.

#### 5.3.4 Present in the renovation approach and visually absent again

The revival of Park Hill, as will also be discussed in later chapters in more detail, has given a significant amount of attention to the concrete. It has been preserved as intact as possible by the new developers, and in the cases where it has undergone some change, this is clearly indicated on the material; the old and the new are clearly demarcated. The revival of Park Hill is an issue still widely debated. But one of the critiques it has received is the use of colour. In a discussion with Adrian Forty in November 2013, he made the observation that the new colour scheme is so bright, that it makes the frame of concrete fade in the background. It stands out so much, that it is difficult to realise the background material. This is an observation that can reveal either a coincidence on the part of the developers, or a cunning intentionality. It is unclear if this is a deliberate attempt on the architects' behalf, or whether it came about by coincidence. Yet, the brightness of the anodised aluminium panels on the new facades of Park Hill, are almost making the concrete disappear in the background. At least on the exterior, concrete seems to fade into the background becoming once again absent.

#### 5.3.5 Park Hill as a ruin, the ruin as a form of use

Following the listing, Park Hill entered into a new phase, where the fall into a state of obsolescence was inevitable. There were rumours of an eminent renovation, which acted counterproductively for any repair work in the estate. During the most part of a decade, it remained there unable to move, and gradually falling further into neglect, and disrepair. The way out of this situation, was for the renovation to commence and for the repair work that would mend the estate's disrepair to take place. The deteriorating condition of the concrete, will be discussed in a later chapter, but it is important to note that the role of the material in this situation of neglect was crucial because of its weakening of its structural and visual performance.



Stephen Graham and Nigel Thrift have identified this immovability of buildings that makes them fall into a state of disrepair, a state where a building remains in place, with no functional damage that would interfere with its potential function, but through lack of use, obduracy unavoidably enters it into a condition of obsolescence. As Stephens Cairns and Jane Jacobs note in *Buildings must die*, the ruin is situated in between “*its wholeness*” and a state of “*complete dissolution*” (Cairns and Jacobs, 2014:170). It is waiting to either re-acquire its original –or any kind of- use, or collapse in its entirety. In Park Hill, this is obduracy is accentuated, due to the estate’s size. It is difficult to enable its participation in any type of dialogue with the urban fabric and with its surroundings.

This “*obduracy in obsolescence*”, as Cairns and Jacobs name it, that Park Hill has fallen into, coincides with the recent interest in ruin lust. Cairns and Jacobs, discuss the current obsession with ruination. There is a surge of publications on ruins, signalling a wide interest in on-going discourses. Park Hill is this time on the verge of participating in current discourses in the context of ruination, by having entered in a state of disrepair. Cairns and Jacobs situate this interest “*in the context of modernity*” where “*the ruin, and states of ruination have particular hold*” (Cairns and Jacobs, 2014:167). Obsolescence, although different to ruination in that it does not necessarily require nature’s forces to occur and can therefore happen much sooner than what is typically thought of as a ruin, is a new type of ruin, that is increasingly appearing around the world.

Ironically, the original intention of employing concrete, was to use it as a non-decaying, everlasting entity. The development was designed in concrete to help it stay in place and perform its functional role for a very long period, and certainly the architects did not have in mind that it would remain as a decaying material. Their intentions in using it were to ensure the continuation of the social condition they were creating, looking into the optimistic future they were imagining. Ironically, concrete has proved anything but an everlasting material; its structural and physical deterioration in the years that followed sped up its abandoned condition.

Even before its listing, because of its condition, concrete was playing a part in the on-going debate in the 90s that oscillated between listing and demolition.

If one is to adopt the view that there is a life in buildings, then one ought to acknowledge there is also a death. Yet there are instances where buildings do carry on, even after their physical death, a demolition. Firstly, building materials are often recycled as reusable and move on to further construction. The use of spolia in architectural conservation studies, i.e. the reuse of older building elements in more recent structures, is a frequent occurrence.<sup>i</sup> Secondly, there is also a question of what the demolition leaves behind, once the rubble is cleared. What stays has already been shaped by what pre-existed. A relational account of a building needs to acknowledge the continuation into the life of what remains, from what has previously been.

For the architects redesigning and the developers renovating Park Hill, the contemporary obsession with ruination and the condition of the estate, serve as an inspiration for the new redesign and are only the starting point. Park Hill is obsolete in that it has lost the function that was originally designed for. The initial intentions of architects, the council and the planners for the have been lost with that. But a different form of function has emerged: the ruin acquires a different form of operating, where obsolescence almost becomes a form of use. The way Park Hill has been removed from this ruination process and from a state of neglect and disrepair is by removing all the elements it is composed of, except its frame. Reducing it to the absolutely minimum bare structure has ensured that there will be no more ruination in the building. Yet this raises the question whether the ruination has been reversed with the stripping action, or whether it has actually made the building move into its most ruinous form; it can also be argued that it has made the ruination accelerate its dissolution.

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<sup>i</sup> *The Hagia Sophia for example has columns from the temples of Artemis in Ephesus, the Delian Apollo, the Athena of Athens and the Cybele of Cyzicus (Saradi, 1997).*

## 5.4 Multiple levels of interaction with concrete

Reading Park Hill, through the periods it has been alive and active, reveals many stages in its life, often contradictory, and certainly diverse. These stages do not only relate to the moment in time they are identified in. The time in which Park Hill has operated has been influential on the way it has acted. And beyond the typical relationship between the historical workings and their effect on the life of the estate, there is a reciprocal discussion on a level beyond the small local proximity that Park Hill is taking part in. There, is on the one hand, the input of the historical conditions that involve the estate and run concurrently with the life of the estate. But on the other hand, there is an interaction of the estate on a larger scale, where it feeds back into current and on-going architectural discourses. It has not only acted on the small vicinity but has moved beyond to a greater area of impact, leaving a mark on a much larger scale. These different places of action of the historical context and the actions of Park Hill are not simply contradicting and overlapping; they are intertwined and infinite. Two of these levels of interaction of concrete with other presences in Park Hill, that are easily identifiable, time and scale, are described in this section.

The presence of the material in this overlapping and exchanged discussion has been crucial. It has moved from being an enabler and a means of achieving an intention, to acquiring a new life of its own, being able to shape new conditions. It has been the means of transformation in the creation, the symbol of decline in its lived experience and the focus of interest in the revival. It has moved from being a discrete and virtually absent, entity, to a virtually omnipresent material. It has changed expected roles and identities, either by intentional moves, or unintentional coincidences. It has shifted from a local presence, influenced from the greater discourses on modern architecture and the welfare state while confined in the location of the Hill, to being acknowledged as a building of global importance, with historical features that are being preserved, and on-going influence in conservation practices and discussions.

### 5.4.1 Time

The previous sections described the time span of Park Hill's life. What was happening historically in relation to the estate was presented, and through this it is not difficult to see that temporalities in Park Hill overlap. There is not a clearly demarcated moment when optimism begins, no clearly demarcated period of decline and there is certainly no clear moment of rediscovery and revival. Through these periods, concrete went from being discretely quiet, to loudly present. The periods often presented themselves as moments of the culmination of its lived experience, its preceding lived reality. The optimism of the 50's and 60's gave way to the neglect of the 70's and 80's. Viewing Park Hill through the lens of concrete reveals these instances of transformation during different stages of its life.

But looking at the life in Park Hill as a straight line, especially when the look is taking place through the eyes of the concrete, would be wrong. These periods of varying understanding about the abilities of the material in Park Hill not only are they blurred, but they also overlap and feed into each other. The optimism of the original development feeds into the enthusiasm for the renovation, and the beauty of raw materials that was once thought to be making a building stand out, is reactivated again in the present (figure 16). Park Hill's interaction of the material with time has been far from linear. It has been a twirling overlapping of concepts, users, and ideas.

### 5.4.2 Scale

An additional layer in the multiplicity of concrete is scale, which in fact adds not one more but rather multiple layers of conceptual scale: the interaction of concrete in Park Hill with other entities, physically and conceptually distant to the estate, can be read in varying scales. The estate has intertwined with elements sometimes on a very micro scale, with only the very close local proximity, i.e. the local Sheffield station, but sometimes of a much greater scale, of "*national importance*" as English Heritage chose to describe it in their listing. Other levels of

small scale interaction can include the dialogue occupants engage with concrete in their flat, their responses to the exposed listed interiors, as opposed to their depiction in international publications.

On a smaller scale, the interaction occurs with the individual, but this can quickly move up to a national or international scale. The various participants that interact with concrete in Park Hill can also move up into scale: the decisions taken by the professional is applied on a very small scale, making considerations for the single user, but can have long-reaching implications on the greater scale, and how concrete is portrayed in the international publications. On the other hand, the influence of current discourses on construction is working on a larger scale down to the level of a single building.



*Figure 16: The deteriorating original contrasts the vibrant renovated part of Park Hill. Image taken from [geography.org.uk](http://geography.org.uk)*

## 5.5 Discussion

The main material that Park Hill was created out of, concrete, was everywhere from the very start of its life. At the moment the structural frame went up, the material began to dominate the landscape. This is an observation that is difficult to ignore: Park Hill was promising the future, through the use of a material. This was in line with the tradition of Le Corbusier, who was

celebrating the presence of concrete in buildings such as the Unité d'Habitation, where the board marking and the roughness of the concrete was deliberately made to look untreated. In Park Hill, not only is concrete not acknowledged, it is remarkably absent.

The estate's creation and life, its history, its architects' intentions and decisions on the construction, and the lives of those inhabiting it become clear only when the backdrop is presented, revealing the important role the estate had to fulfil. This complex network of diverse entities interacting in various time and spatial scales is crucial in attributing the material with intentionality and will be explored further in the next chapter. Thinking of Park Hill as a presence entangled with its spatial, social and historical context creates a condition in which it is impossible to disconnect the role of the material. It has been present in the physical landscape but absent from the discourses; present in the visual landscape of the estate but absent in the residents' imaginary. It has been present in its failure and absent while performing its role. Concrete in Park Hill has oscillated between presence and absence in the physical, notional, cultural and social realm. It has remained silent through its presence on the site, but absent from on-going discourses. It has performed quietly and failed loudly.

The structural performance in the early years was crucial in achieving the intentions of the architects, and the associations of concrete in the context of social housing in the later stages of its life are influential in understanding its decline. The recent revival of brutalism and the obsession with all things concrete is also influential in understanding the expectations of the architects, while the deterioration state and the living expectations of contemporary life explain why Sheffield residents were opposed to its upkeep and renovation. Interactions on a spatial level, the move between scales it has affected and has had an effect upon, in the notional realm and the social conditions, compose this hide and seek game of the material in Park Hill.

In the chapters that will follow, there is no clear demarcation between the grand scale to the smallest. The use of concrete and its powers is investigated on multiple levels simultaneously. Assemblage theory described in Chapter 2 and further applied in Chapter 7, is

helpful in dealing with the issue of scale. In Park Hill, the individual reading of concrete, meets the portrayal of concrete on a national scale. The same ontological framework will be used in the descriptions of the interaction of concrete with users of the estate, triggering in each case a personal response. All these responses brought together are going through processes of segmentation and sedimentation and begin to interact with the collective. Each personalized response to the material, interaction with concrete in the form of a dialogue is mapped as an intricate network of interactions.

Separating Park Hill from this networked context in which it participates, is not possible. The way concrete becomes active in the context it is entangled in is described and argued for in Chapter 6. Concrete is neither participating in these intricate networks as a mere presence nor through its absence. The prevalent understanding of concrete as passive and inert material that it acted upon by architects, developers, and users, to achieve the conditions they intend, is challenged. Through its involvement in this network of associations, it is revealed as an active and powerful material that has the capacity to act and impact on the decisions of professionals and the conditions and the lives of those surrounding it.

## The everyday life of concrete: experiences and performances

*“Concrete in the “purely natural cycle of growth and decay” resolutely resists incorporation into ideas of age value, and refuses to offer a legible surface effect” (Cairns and Jacobs, 2014:74)*

### 6.1 Introduction

Having previously discussed literature on the activeness of matter, I have already described how it has been addressed in architecture, predominantly in the areas of morphogenetics, form and model making. The examples presented revolve around materials affecting the outcome of the form, mainly however at the design level. In this chapter I will describe how matter can also exhibit agency in architecture beyond the drawing board: while it is implemented in construction, and after it has been physically placed on-site. Concrete in construction and further, will not be examined in isolation to its surroundings, but will be investigated in a plethora of contextual parameters of the built environment. The ways of engaging in conversation with the human actors it revolves around will be described. Whether it informs decisions professionals take in their workplace, whether it shapes the visual outcome contrary to the intentions of architects, or impacts the way residents interact with their interiors, I will argue that concrete has the capacity to trigger behaviours, responses and attitudes and ultimately participate actively in decision-making.



Working with concrete or living inside it, the material engages in a dialogue with the human, where the material informs the professional and the user, and the human in turn answers back to the material. To describe the material as active, the term “agency” is employed, a term that can account for a position within a materialist and a subject-oriented framework. The material is not disconnected from the social relations, that surround it, nor from the cultural context. It sits well within these, but not as a passive, inert component of the built environment. Instead, positioned in this context, and through its interactions, it acquires power capabilities. The use of the term agency allows for concrete to be thought of as active, but not disconnected from its subjective properties with which it is charged.

Many of the terms used in this chapter will anthropomorphize the material to present its activeness. For example, the term “*behaviours of concrete*” is extensively used, not in the traditional sense where the behaviour is an inextricable part of human agency, but along the engineering terminology that often associates the material with an autonomous power, a “*behaviour*” which is dictated by the material coming from itself. Engineers often anthropomorphize the material and talk of its tensile and compressive properties. Along with this line of thinking I will also use “*behaviour*” not as a psychology-oriented term, but as an engineering term, associating the material with the ability to act in its own manner.

The arguments presented below are presenting empirical data collected by interviewing construction professionals involved with the reconstruction of Park Hill, caretakers who work in the development, and current residents. The focus is on the ongoing renovation of the development, but I will also look at ways in which the old parts were appropriated and how they have impacted the renovation. Focusing primarily on the life and reconstruction of the building after the original creation is over, allows the material to be viewed in the environment it was designed for, moving away from human intentions to exhibit its capacity to act as an agent. It is now acting with only remnants/traces of the human agency with which it was originally designed and intended. Its material powers are visible in the way it interacts with users and

professional actors, defying the original human intentions and acquiring a life of its own.

My discussion of concrete does not lie strictly within a material determinist way, where only materials properties act, casting aside any projection of human intentions. Rather, it sits in between the two extremes of viewing the built environment; both alongside a cultural determinist framework, where only human intentions are powerful and the material culture patterns have no effect, and alongside material determinism, where only material properties act. In the space in between these two extremities, there is scope for the material to be viewed as active, but acquiring this agency only in a network of human and non—human actors.

## 6.2 Deteriorated concrete

The redevelopment of Park Hill, a building of this size and with a listed status, inevitably involved a series of complex considerations and decisions to be taken on board. There is an intricate network of strands that need to be followed, all of which pose implications on the potential refurbishment activities. These intricate threads include the historical presence of features that have been listed and the need to be considered for their importance, entangled in the potential limitations the material presence of other features pose, together with the intentions of the developers to recreate a sustainable and viable financially housing estate.

Certain decisions on the reconstruction of Park Hill were shaped by the behaviour of concrete used originally in the development in the late 1950s and early 1960s. Those behaviours that the material revealed to the professionals and the users has impacted the way they have interacted with it and has shaped the way the renovation has moved forward. The decisions surrounding the latter are not defined solely on grounds of preservation, historical importance and representation of an era, but are predominantly dictated by the behaviours of concrete in the meanwhile. The way in which the past concrete's technical properties impact on the decision to maintain or undo parts of the structure in the present, and how with its previous life it has informed present day decisions is examined. This argument is based on two

properties of the concrete that revealed themselves after the original construction was complete, much to the surprise and dismay of the architects: spalling concrete that would come flying off the structure, and extreme weathering of concrete leaving marks of the past on the façade.

### 6.2.1 Spalling concrete

Walking in the old, as yet un-redeveloped parts of Park Hill can be an eerie experience: when one looks up, large chunks of concrete, missing from the structure are visible. One can only assume that these large blocks of concrete came off at one point flying off the building. The thought of walking through an open area where concrete might come flying off the wall from a 13 storey building is unsettling. Figure 17a and b testify to the rough condition the concrete in Park Hill is in.



Figure 17 a and b: Spalling on the balustrades and the horizontal structural beams. Image author's own.

The problem of the spalling concrete was first noticed in the late 1970s and peaked in the mid 1980's, just as the buildings notoriety was at its peak. One of the caretakers that started working in Park Hill in 1997 mentioned in his interview that spalling was a recurring phenomenon at the time he assumed employment, already 40 years after the original construction was complete. The scary feeling of walking in spalling Park Hill is felt even today, still posing a threat, although the occurrences are much rarer. Large blocks of concrete missing from the nonstructural concrete balustrades are visible by the naked eye to the visitor of Park Hill. In my discussion with the

former caretaker he observed what it was like to be in a spalling environment:

*"[Back in the 90s] ...people used to bring me blocks of concrete spalled off the building and saying that it had either nearly hit them or their child was nearly hit, literally leaving bare the reinforcement on the concrete edge. People would say how lucky they were they weren't hit!"* (Interview with *participant 8*, Resident Services Manager, 21/05/2014)



*Figure 18 Spalling on a column at "street in the sky" level Image author's own.*

The concrete randomly falling off the building was unsettling the users and interfering with their day-to-day activities in Park Hill. Spalling concrete, aside from being an interesting, albeit dangerous, observation of the material properties of concrete, also raises a question of predictability: Could it have been predicted and prevented by architects, engineers and construction professionals? To question the predictability of this behaviour of concrete, one has to question what triggered this behaviour of the concrete and what steps have been taken to rectify the problem. The roots of this problem can be traced all the way back to the original

construction, the techniques and the properties of the material used, which were revealed to the users after the first residents moved in.



*Figure 19 Core drills, taken from Park Hill slabs. Image used under permission of a participant.*

Related to the spalling is the technique used in the late 1950's and early 1960's original construction. Concrete was being mixed on site, the standard technique used back in the day. At that time, there were no ways of ensuring absolute accuracy on site and many times the end product differed between batches significantly. This meant that it was not produced in a standardized concrete production unit, which would have been the standard way of constructing it today. This practically also meant that the workforce of that time would not ensure there was sufficient cover for the concrete of a high quality, and in areas where the cover had to be low, its quality was not substantial.

The core drills extracted from Park Hill by the developers in 2010, before the redevelopment begun are the most recent evidence for the composition inconsistencies of the

original construction (figure 19). They show an enormous variation to the quality of the concrete, in the consistency of the concrete, its elasticity and aggregate composition, all different in places. The Site manager of the on-going redevelopment also testified to the large-scale inconsistencies of the original construction. In his interview in May 2014 he mentioned that: *“Close-up every column every beam is different, [...] visually, from a distance makes it uniform, but up close you can read every grain, read every shutter-mark”* (Interview with participant 3, Site manager, 17/06/2014). The issues of variability and lack of standardization of the original development that influenced the present day spalling, was raised by several professionals.

Another issue affecting the spalling situation in Park Hill are the properties of the concrete the workers had to work with, which would have been much poorer in the 50s and 60s. There were no products to ensure the workability of the material and its viscosity. The time concrete required to set would also have been much longer and the impact of the weather conditions upon it would have an influence on the material. All these problems builders face in construction have been identified much later; compounds are now used that allow craftsmen to work with concrete in varying conditions and different qualities, which would not have been available in the 60s. The modern techniques ensure a variety of issues encountered in low cover situations: they include workability and faster setting compounds. This observation was made by two of the managers of the redevelopment of Park Hill. The Senior Construction Manager revealed that:

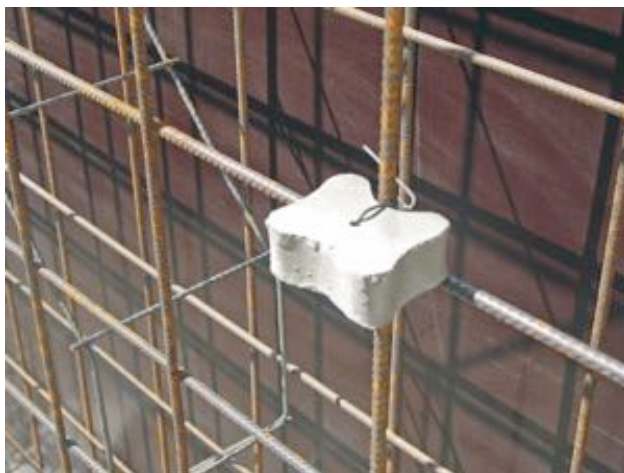
*“...in the 60s they wouldn't have had the technology that we have now to do this type of repairs. With the new compounds, you are able to work in thinner layers, and get a nice finish on it whereas with concrete itself you have got to have a minimum depth of 100 mm, to be able to work the material, so in this instance we can work materials probably up to 20mm.”* (Interview with participant 2, On-site Senior Construction Manager, 17/05/2014)

And along the same lines the Site Manager commented on the new available technologies of today that:

*“With the different products we can go from heavy structural ones which are going on to 20mm, and go up to 150mm, and even thinner coats, where you can go down to 2 to 3 mm, where you can put what we call a furring coat on, where you put just a very thin layer just to give it that little bit of extra cover on the Rebar.”*

(Interview with participant 3, Site Manager, 17/05/2014)

A final way in which the material impacts on the spall is the way the steel bars were covered upon construction. When concrete was poured onto the formwork, the steel bars would move inside upon the impact of the pour. A slight movement of a few millimetres was enough to reduce the cover amount, necessary to keep the rebar in place. Nowadays the engineers and the onsite workers keep these properties of the concrete into consideration. They use a bracket called a spacer, such as those presented in figures 20 and 21, to lift the rebar from the rebar from the formwork and keep the necessary distance for the cover, to ensure a minimum of 50 mm, and usually even more is required. Instead, in some areas of the old concrete, the engineers found as little as 8mm. The Senior Construction Manager commented on this quite clearly: *“One other problem with the decay of the concrete was that there was not enough cover on the steel. So that where you would be looking normally for 50 mm of steel cover, some places we only have 10mm”*. To which a Site worker enthusiastically jumped in: *“Or even 8mm!”* (Interview with participant 2, Senior Construction Manager, 17/05/2014).



*Figure 20: Spacers on a reinforced concrete vertical wall to keep the rebar in place. Image taken from maxfrank.co.uk*



Figure 21: Different types of spacers for different rebar thicknesses. Image taken from [astraspacers.com](http://astraspacers.com)

So the question raised above, whether the original stakeholders could have predicted the spalling situation that would come about by the methods they were using, can be reconfigured: can they be attributed to human error, since the original architects and construction workers were probably oblivious to how the concrete could behave in these situations? To address this, one has to go back to the roots of the problem and identify exactly what went wrong. This will help answer whether it was a result of human error that could have been prevented. In the case of Park Hill, the unpredicted properties that the material was revealing to the users were terrifying to the residents and threatening their sense of security.

The problem it had created was twofold: firstly it was a structural problem, as it was later verified with the hammer test, a method of testing the density of concrete in structural elements that will be described in a later section. Figures 22 and 23 show a deteriorated edge of a structural concrete component, a beam and a column respectively. Certainly not something that would imminently threaten the integrity of the building, but one that if left untreated, could cause problems in the longer term. However, the prospect of a deteriorating building was not so harrowing for the users. In fact the majority of the spalled concrete came from features that did not perform a structural purpose. The biggest spalling problems were apparent in the concrete balustrades, a functional and visual feature. The reason for their extended damage is



simple and obvious: the balustrades have the thinnest dimensions and would therefore be the most difficult case to keep the distance from the rebar at a sufficient level.



*Figure 22: Spalling on the edge of a beam in Park Hill*



*Figure 23: Typical repaired concrete with matching colour and texture to the old concrete*



*Figure 24: The Carpenter Centre for the Visual arts by Le Corbusier. Image author's own.*

Spalling issues can affect every building made of concrete and are very common. News broke in January 2015 of Zaha Hadid's Library and Learning Centre at the Vienna University of Economics and Business spalling off an 80kgr chunk of concrete off its façade, shocking



*Figure 25: Peabody Terrace and the spalling concrete louvres on the building. Image by Brunner/Cott, taken from metropolismag.com (Moss, 2012)*

architects and engineers alike (Ferro, 2015). Spalling concrete from buildings is not rare and Park Hill is definitely not the only concrete building of the previous century that has faced such problems. Nor is it the only iconic building to suffer such damage. David Wild has pointed out that this phenomenon is something encountered even in the construction of many high profile architectural gems of the previous century, including some by Le Corbusier, most notably in La Tourette and the Carpenter Centre in figure 25 (Wild, 2005) , the latter having been refurbished in the early 1990s, only 30 years after its original creation (Dixon, 1994).

The source of such problems was also raised by a participant who had previously resided in the Peabody residence Hall in the campus of Harvard University, Boston. In an interview with a former resident of the Peabody by architect Josep Lluís Sert in the 60s, they described the spalling of the concrete fins (figure 25).

*"[has] got some concrete fins which are in vertical expression, this is very thin the typical rule of thumb is that you would have 15 mm of coverage between reinforcing and the face of concrete and they didn't. So they all split so actually they have taken them off and I think they have replaced them with extruded aluminum replicated the same way but with a different material". (Interview with participant 23, 28/06/14)*

This view reveals a dialogue between the material and the professionals. The original construction has spoken back to the human actors involved with the project, and the professionals have had to react to it by investigating its properties further, and taking extra actions to ensure its safety. The original intentions of Josep Lluís Sert have been hindered by the behaviour of the material that acted differently than expected.



Figure 26: The 17 original vertical elements on the balustrades were replaced by 16 in the redevelopment, in order to account for the increase in size. Image courtesy of Urban Splash

### 6.2.2 In need of repair

The problems that spalling had been causing in Park Hill were multifaceted. An obvious one described above was the danger of flying concrete chunks on the site, making Park Hill an unsafe place, scary to walk in and raising its notoriety amongst the surrounding residents of Sheffield. These problems however, were mainly caused by the concrete on the balustrades, because of their small thickness as described before. Their occurrence on other elements of concrete with a structural role was not as frequent and as obvious. The response of the new developers on this issue was a simple one that very quickly fixed the issue: they decided to remove the concrete balustrade entirely, and replace them with modern, ready-made, factory fabricated ones, replicating the exact style of the original ones, but manufactured with modern standards to avoid the previous problems (figure 26). All the original concrete was stripped from

the balustrades. By doing so, they were also able to address the current building regulations for stairs and balustrades, for which the previous ones were spaced slightly too wide (figure 27). The new ones also have one small but significant change from the original ones- the top rail is in wood. Urban Splash in their Park Hill advertising brochure felt the need to justify their decision: *“it seemed like a more human thing to do, a nicer texture, a better feel to rest your elbow whilst you watch the world pass below”* (Urban Splash, 2012). This limited quote, however, provides little explanation to why the concrete of the balustrade did not have to be preserved and why only the top rail would be in another material.

The balustrades in Park Hill were the least of the contractor’s worries. The concrete behaviour that made the redevelopers work most difficult was the spalling on the actual loadbearing concrete frame. The state of the existing structural elements (which was decided along the way



*Figure 27: The original balustrades in Park Hill were too wide to comply with current regulations. Image author's own.*



*Figure 28: Spalling on a structural elements, revealing the rebar underneath. Image author's own.*



that it would have to be preserved with as little alterations to the original as possible) was posing a more serious threat to the building (figure 28). In places where the concrete had fallen off, it had revealed the rebar, and leaving it exposed would pose a threat to the long-term integrity of the structural frame. To complicate matters even further, even in parts of the frame where the rebar was not exposed, the engineers identified that the weathering elements had reached it regardless, because of the damage already occurred to the existing concrete.

For this reason, the first activity that took place in Park Hill, before any of the reconstruction could begin, was the assessment of its structural integrity by Hammer testing of the renovated flanks. The Schmidt hammer test measures the compressive properties of concrete. Exactly as its name reveals, a metal head hits the concrete to give a reading on the elasticity of the material directly beneath. The more elastic the surface is, the most rebound it will trigger on the hammer. In many cases, while the concrete might visually appear sound, it can be hollow behind, making the steel prone to rust. The type of sound the hammer makes, also reveals the amount of cover to the rebar. This amount is crucial to the time the steel has left



*Figure 29: The edges on the columns after they have been repaired.. Image author's own.*

before it corrodes. If it is a very small amount, penetration of the elements through the concrete pores are likely to get to the steel very soon and spall the concrete off. So even if the concrete appears intact and the rebar remains unrevealed in place, it could only be a matter of months before its cover blows off.

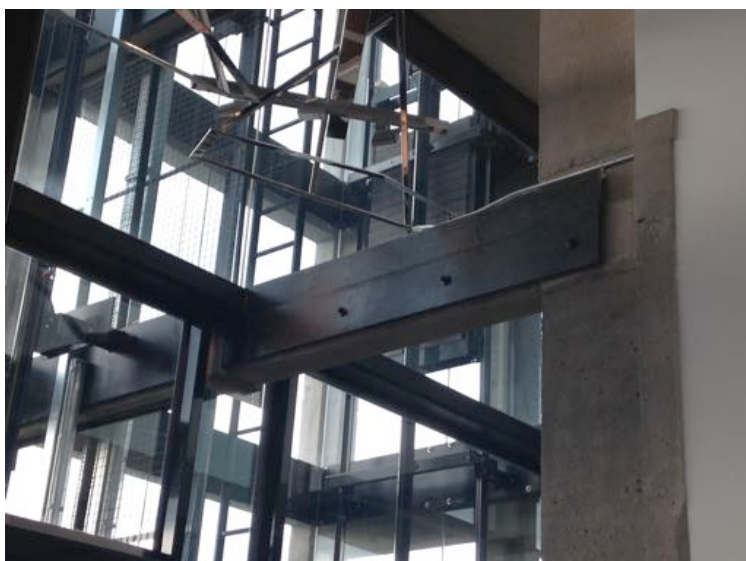
The testing on site revealed 400 areas of concrete just on the one flank of Park Hill that needed repairing, in order to ensure the structural integrity of the entire concrete frame and that concrete would remain in place in the years to come (figures 29 and 30). Tackling spalling concrete, both on the structural elements and on the balustrades, certainly was the biggest problem the renovators of Park Hill had to face. In the words of one of the site workers:

*"I would say that the worst area [we had to deal with] was the low cover, and a lot of that was actually near the roof level, when we had to uncover the rebar and send it back, and with concrete it was extremely, extremely hard. It is not limestone chipping, it was pebbles, and due to that we reverted from standard [normally they chip the concrete off by breaking it with mass breakers] we reverted to Hydro demolition which is high pressure water" (Interview with participant 3, Site Manager, 21/05/2014).*



*Figure 30: Exposed reinforcement during the period of the renovation. Courtesy of Urban Splash.*

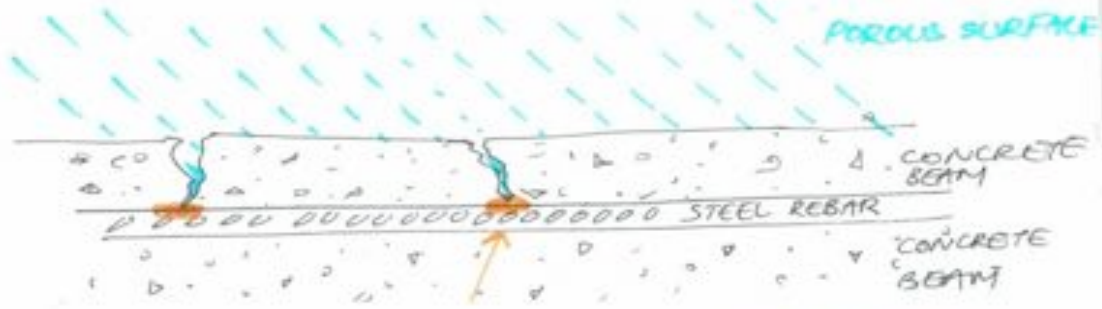
The above description talks however of only of the first aspect of the repaired concrete, the revealing of the rebar on the face of the concrete, and the difficulty reaching it. This deterioration of the concrete, which started off as the result of the previously unexperimented properties builders had to deal with, were passed down to the steel which then passed them on back to the concrete: the low cover meant that the elements could get to the steel, and the steel would rust and expand, causing the concrete to spall. Figure 32 demonstrates the process with which the concrete deteriorates. In the case of the concrete balustrades, the issues were primarily related to the threat posed to the users' security, while in the case of the structural elements, the properties of the concrete, were causing a structural issue, that once it was tamed, it transformed into a visual issue. In Park Hill, concrete revealed behaviour upon the building that was not accounted for originally, and has altered and reconfigured the planned role it was supposed to perform. Architects expected a particular performance affected by the building upon its residents, its users and the general context upon which it sat. But the material properties of concrete revealed after the material had left the drawing board contributed to the different life and unexpected performance of Park Hill concrete. This behaviour of the building that was not accounted for originally, and has altered and reconfigured the planned role it was supposed to perform.



*Figure 31: Several elements were removed from the structural frame (beams) and were replaced by steel components. Image author's own.*

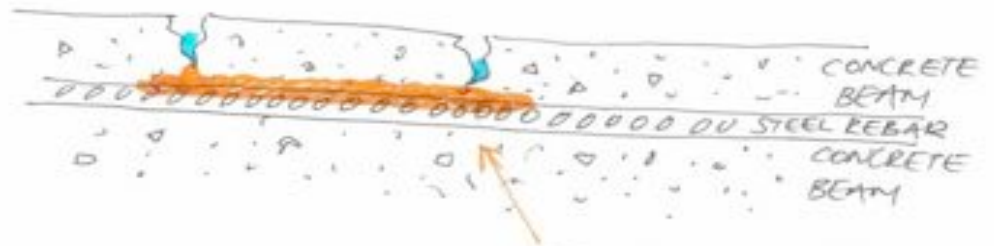
STAGE 1.

① THE ELEMENTS PENETRATE THE POROUS SURFACE



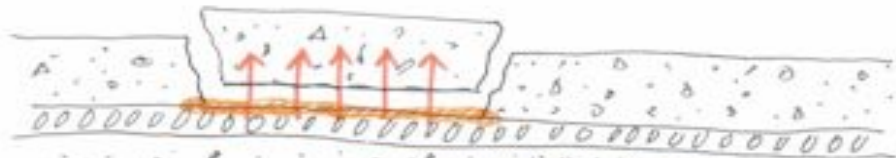
② CORROSION OF STEEL REBARS BEGINS.

STAGE 2.



③ CORROSION OF STEEL REBARS EXPANDS INSIDE BEAM

STAGE 3



④ CONCRETE IS EVENTUALLY SPALLED OFF THE BEAM LEAVING THE REBAR EXPOSED TO FURTHER CORRODE

Figure 32: How concrete spalls, Image author's own.



### 6.3 Existing concrete hinders interventions

The previous section dealt with the way concrete in Park Hill has intervened with the repairs. It has addressed the limitations to the level of intervention in the renovation phase due solely to the material's technical characteristics. In this respect, the material has opened up a dialogue with the professional actor that the latter has had to answer back to, making the built product both a result of the architect's desire and informed by the material also.

Beyond the purely technical characteristics of concrete, a dialogue opens up with the form of the material, the mass and the spaces whose creation it has enabled in the past. This second type of limitation that the material places upon the intentions of the architects has to do with the way they have had to deal with the internal residential plans and the public circulation areas. The creation of a particular type of space, has also been the result of the technical properties of concrete, so in effect, their origin is similar to those described in the section above. Yet, I am including them in a different section, because the interaction with the concrete occurs indirectly through space, not directly through the technicalities of the actual material.

Structurally, the frame was restraining because of the impossibility of removing certain beams and having to work around them to create the type of spaces they wanted. Removal of a concrete beam is a very intricate procedure: it requires fine cutting of the replaced column or part of the slab, and the replacing with steel of similar attributes i.e. weight and compressive strength to substitute the part that is replaced. The entrance of Park Hill concierge is the only part of Park Hill where they have replaced concrete elements to create features of their liking. They have been replaced with steel elements in their entirety. So the structural properties of the concrete (high compressive and low tensile strength) have made it difficult to replace the features the architects would have wanted, making the decision partly a product of the physical properties.

### 6.3.1 Master planning and façade arrangements

The capacity of the material to influence decision-making through its properties was evident from the original moment of creation of Park Hill in the post-war period. Asked about concrete and the creation of the kind of spaces that Park Hill housed, one of the redevelopment architects was adamant on the agency of the material at the time of its original creation:

*“It was a very useful material because at that time architects could achieve certain forms with it that they would not necessarily be able to get to. If you look at Unité and the forms on the roof garden, some of those would have been quite difficult to achieve quickly with other materials. So I think that is probably why architects liked concrete”* (Interview with participant 4, Senior Architect, 24/06/2014)

## THE 10 COMMANDMENTS



Figure 33: The Ten Commandments. Image courtesy of Urban Splash.

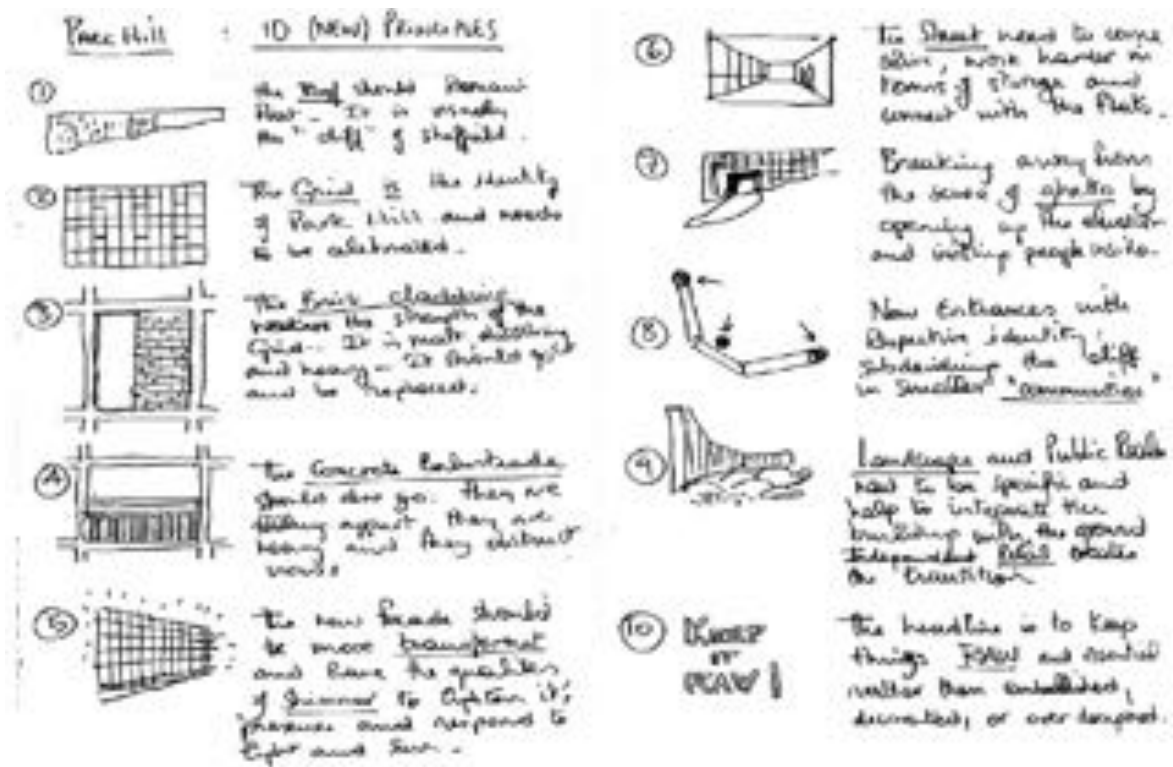


Figure 34: The 10 Principles. Image courtesy of Urban Splash.

Once the building was listed and the developers were appointed to proceed with its renovation, they were faced with a huge, monolithic, immobile concrete frame. Their efforts to create a new, usable plan, and readapt the old flats to the necessities of modern life, had to revolve around the presence of the structural frame of the building. Any decisions that had to be taken were dictated by the structural properties of concrete, combined with the immovability of the frame.

The first limitation the concrete was imposing with its volume was the influence of the master planning. One of the architects described the challenges of working around the concrete mass: "the building felt like a fortress almost, you could not really penetrate it." (Interview with participant 4, Senior Architect, 24/06/2014). Because of the immovability of the concrete mass, certain decisions had to be taken because of it, rather in conjunction with it, although this had been far from the original intention of the redevelopers.

The Ten Commandments and the 10 Principles shown in figures 34 and 34 respectively were compiled by the design team at the onset of the renovation, They addressed the

beginning the necessity of replacing the heavy and impenetrable elements of the building with light and transparent ones, in more than one of the issues they had identified in Park Hill as problematic: the sense of community was to be addressed with opening up the elevation, and the façade had to become transparent, according to these rules. But all these changes were subject to the presence of the concrete.



*Figure 35: The concrete frame creates a repetitive rhythm on the Facade, that has moved to the redevelopment from the original design of Park Hill. Image author's own.*



*Figure 36: The repetitive rhythm of the old Park Hill that has transferred onto the redevelopment. Image author's own.*

The external façade design would also be limited by the presence of concrete. The architects made mention of a rhythm on the façade that should not be lost, and had an impact on the external aesthetic. This was pointed out by one of the architects of the design team: *“because you can obviously see the rhythm of the grid, the concrete balustrades are very important, the ratio of the balconies and the other openings and the repeated grid of the module”* (Interview with participant 4, Senior Architect, 24/06/2014). The repetitive façade pattern in the concrete frame largely informed the visual outcome of the redevelopment, even before any considerations for the design had taken place (figures 35 and 36). Park Hill was left with the concreteness of Park Hill's rhythm right from the onset of the redevelopment.

### 6.3.2 H-cores

The biggest impact of the concrete was on the internal arrangements of the flats. One of the most difficult concrete features the developers had to work their way around of was the retaining of the inner H cores. Not only were they immobile and absolutely necessary to the structural integrity of the building, the developers decided to *“keep it raw”* as they claimed (Interview with participant 4, Senior Architect, 24/06/2014), because they felt it would fit with the decision of English Heritage to preserve the concrete. Not that this was a prerequisite. Possibly the reason behind its keeping is purely the fact they have used exposed concrete in their other developments and felt they wanted to keep in line with their corporate image. Yet the concrete in the H cores was of a very different image. In all their previous developments, Urban Splash have been using polished exposed concrete, smooth finished in high-end apartments. This was different. Park Hill concrete, as already mentioned exhibits an enormous variation. And yet, to keep it in line with the original decision reached mutually by English Heritage and developers, the decision was made to not only keep it, but keep it intact to preserve every single detailing and nook it embedded within it; the conduit boxes have become part of the concrete, the metal cable casings have become part of the concrete, and the little wooden chunks where the window casing were screwed upon, have become part of the concrete.

The initial intentions of the architects were to completely reconfigure the plans and create a completely new layout for Park Hill.

*“We actually tested several scenarios.[...]. At one stage we had a completely different scheme where we had five apartments per cluster.”* (Interview with participant 4, Senior Architect, 24/06/2014)

In describing how the plans progressed from the first thoughts to the final built project, concrete invariably is brought up as a major role player. Two major limitations have been identified in the course of the fieldwork: the first was the presence of the H-core in the plans, which made efforts to solve the Park Hill plan perplexing:

*“you can wrap the apartments around differently [referring to the H-cores] and you can configure these entrances; it is a three dimensional puzzle as well”* (Interview with participant 5, Architect, 28/06/2014)

Creating a new plan around the old structural elements of the frame was a puzzling and complicated procedure: *“five apartments per cluster[...] was a radical change, because we had more circulation and it was more complicated.”* (Interview with participant 5, Architect, 28/06/2014). When the architects were asked about the limitations because of the structural frame the reply reveals the influence of the concrete:

*“...definitely it does limit what you can do. There are also lots of technical issues about the slabs and what you can do and what you can't do.”* (Interview with participant 4, Senior Architect, 24/06/2014)

The designers struggled with the layouts for several months and went through a series of different proposals, before coming back to the original design and deciding it was best to keep close to it. They even at some point considered removing columns to create various plan layouts, unifying apartments to create larger family homes with three or more bedrooms. But the final design produced was very close to the original flats layout, due to the limitations posed by the structural elements.



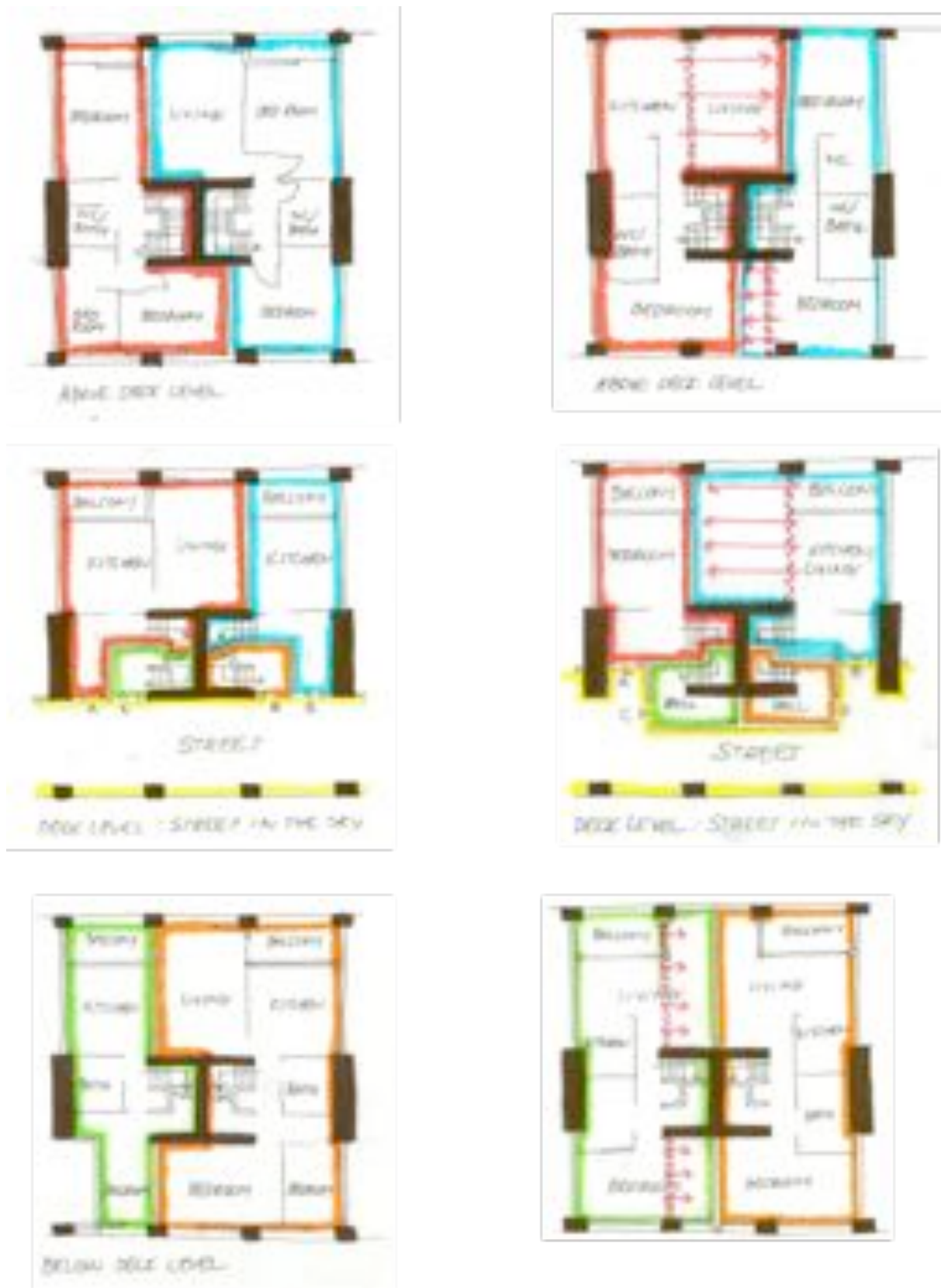


Figure 37: Internal changes in the flats' arrangements, redrawn from original plans and marketing material plans by Urban splash. Redrawn from original plans (AR, 1961)

The figure on the previous page (figure 37) illustrates the minimal changes that have been done to the flats. This is the typical plan of the arrangements around an H-core unit. The differences are only internal moving of partition walls. Although the first action of the workers on site was to strip down the structural concrete frame of any internal partitions, the designers rebuilt everything internally with very subtle changes to the original plans. On the street level, only a wall was moved internally, and on the upper and lower deck levels two internal walls were moved compared to the original plans. The fixed arrangement of the H-core that had to remain in place and the necessity to retain circulation areas around this core restricted any major alterations. This was not for lack of effort or ability on the architects' behalf. If this were the case they would not have produced 5 flat arrangements in their proposed drawings. The reason was that the internal arrangement was optimized, when the initial plan remained unaltered, or with little alterations.



*Figure 38: The H-cores in exposed concrete after the renovation*

The fact that the changes internally were purely within the same plan is reflected by what the initial intentions of the developers were. The original H-cores did not only remain intact in their outline but their exposed concrete also (figure 38). A key stakeholder of Urban Splash revealed the original intentions:



*“what we did was that we removed a wall to make them more open plan because they used to have separate living rooms and kitchens but we wanted to make them open the plan so we’ve opened them as much as we can. Also, we got the though views so that when the doors were open you could view from the one window to the of the window and you could see both ways all the way through.”* (Interview with participant 1, Senior Stakeholder Urban Splash, 29/04/2014)

The changes desired by the developer were to do with altering layouts within the same plan. Although the redevelopment involved the original frame being stripped bare of any internal partitions (figure 39), in the redeveloped plan, virtually the same layout was retained and very small interior changes were made, contrary to initial intentions. After much elaboration on the plans, the final ones ended up not looking much different to the original 1960’s drawings:

*“It just evolved over the project we tested the difference ways the building could work. It was quite nice but we kept that original arrangement.”* (Interview with participant 4, Senior Architect, 24/06/2014)

Of course, residents’ needs have changed today. One resident has commented on how she would actually have preferred the layout to be different, with the creation of more three-bedroom properties for which in her opinion there was a greater market. She claimed that all the



*Figure 39: Park Hill stripped bare to the structural frame. Image courtesy of Urban Splash.*

3 bedroomed apartments (only one on every street level, in a corner location due to the limitations of the layout) were, according to Urban Splash, the first to sell. Yet it seems the developers were not able to address this requirement of the market, because of the limitations imposed on them but the concrete.

### 6.3.3 Service risers

A further limitation came from the service risers. Concrete did not allow changes to the structure, and it would have been very difficult to create new holes to service, so the interiors of the flats had to be kept in the same places. This means in practical terms that the old kitchens and bathrooms would have to be in the same location as where the previous ones had been (figure 39). The concrete structure and the difficulty of moving and removing and adding new service risers, would not allow significant changes to the location of the services, and the plans testify to the level the intervention has taken place. As one of the architects described it:

*“there was a constructability consideration in these service risers which distribute all of the pipes, waste pipes, electrical pipes throughout the building. It is much easier if you have one riser that feet and a problem like this and you stick to the original layout. Changing does become very complex and also very expensive.”* (Interview with participant 4, Associate architect, 24/06/2014)

Once concrete had acquired such a conspicuous role in the re-development of Park Hill, it became so powerful at the expense of other features. The all-important street in the sky, whose initial existence is what kept the building alive and saved it from demolition, had to be eliminated to make space because of the immovability of concrete. In the next section I will argue that the loss of the street in the sky was accidental, and its presence gave rise to the concrete, but the concrete in return, claimed disproportionately greater importance, casting it aside. This is another type of dialogue that concrete has opened up, not with a human actor in this case, but with an idea, the idea of streets in the sky, that will be discussed in the next section.



Figure 40: There has been no change in the locations of the service risers (areas in pink) from the 1960's. The slab could not take any additional openings and the positions of the kitchens and bathrooms had to be near the original locations. Diagrams redrawn from original plans.



Figure 41: Spalling on a column to beam connection before rehabilitation. Image author's own

## 6.4 Concrete and the implementation of the listing report

The controversial decision of listing Park Hill dividing residents in Sheffield presented in Chapter 5 also accounts for the role concrete has had in this decision. The way English Heritage approached the development and the consideration that was given to concrete can argue for the agency of concrete. The presence of a building of this size in concrete worked both for it and against it: against it because having a building of this size in deteriorating concrete, adjacent to a vibrant city centre, was deemed an eyesore by the locals. But also for it because making away with such a huge structure could also create more problems than those it was trying to solve. Ultimately, the omnipresence of concrete that had dragged its reputation to the ground also became what saved it from destruction.

### 6.4.1 Reading into the listing by English Heritage

The decision of maintaining the exposed concrete interiors in the redevelopment of Park Hill, within the limits of its listing was reached by EH following extensive discussions and several site visits with the developers. The developers already had a high level of expertise working with the material. Besides, using bare materials in their interiors was part of their signature style that they had previously become known by. Timber Wharf, completed in 2002, the project that established Urban Splash in the UK residential scene, extensively featured interiors of concrete. As a key stakeholder of Urban Splash described on the rationale of Timber Wharf: “we decided

*to actually use concrete and to use it bare but spend a little bit more money to get the concrete done really well rather than use the money we saved in plastering it all up” (Interview with participant 1, Senior Stakeholder Urban Splash, 29/04/2014)*

Urban Splash had previously used it for a combination of technical and visual reasons and they had already experimented the use of the material. They therefore had the know-how to implement it in Park Hill. Yet it is interesting to note that many of those working on site, believe that the maintenance of the concrete was a decision dictated by English heritage and the listing report of Park Hill. Onsite there was confusion amongst those working with regards to where the decision came from.

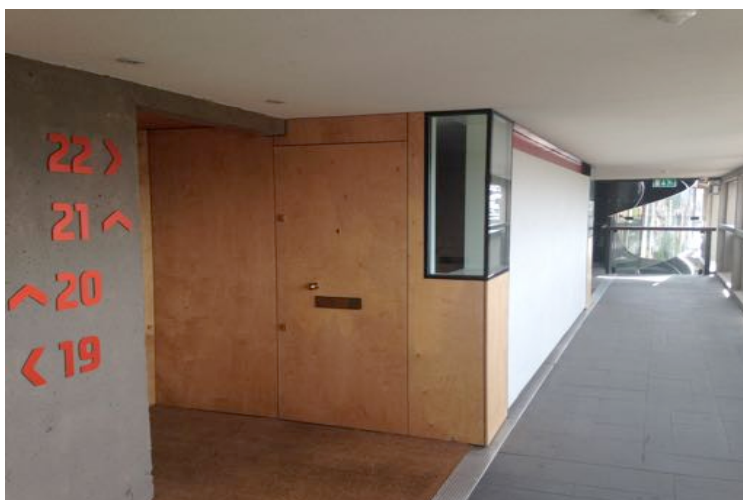
#### 6.4.2 Influences of the listing on the redevelopment

Since the time of its original construction, Park Hill stood as a huge monolithic mega block, overshadowing the city of Sheffield, an imposing figure in the city. This was one of the arguments posed by those against its listing, its visual staining of the beautiful city of Sheffield. For the public it was just too ugly, too big, and therefore difficult to hide. Possibly the first thing one still encounters when arriving into Sheffield by train, is the South flank: difficult to miss because of its size. Once it had been listed by English Heritage, it was attacked for being the

*Figure 42: The milk float in the streets in the sky.  
Snapshot taken from BBC (2004)*



largest listed structure in Europe, a claim still made by Wikipedia. Similar comments are still commonplace by the opponents of Park Hill in blogs, news comments and BBC documentary sites. Clearly the visual was a primary influence against the listing. Yet this size that everyone opposed to, may have also worked in favour to the listing. To even consider going down the demolition path, which would have been possible only before the English Heritage report sealed its legacy, would imply that a very big operation would be required. In fact, one of the arguments used by those in favour of its retaining were that it was a sustainable option, and the unsustainability of tearing it down. In defending the listing on grounds of sustainability, the chairman of Urban Splash mentioned: *"The real sustainability for me is that there are buildings now which are being demolished for third time in a lifetime and actually for me the real sustainability is about a building that would last for a very-very long time."* (Interview with participant 1, Senior Stakeholder Urban Splash, 29/04/2014). It is unclear however what the implications of a possible demolition would have been. What would a demolition involve in terms of resources, cost and implications for the city and Sheffield city council? In contrast to architecture historians of brutalism such as Elaine Harwood (Harwood and Davies, 2015) and Barnabas Calder (2015, 2016) who would argue the importance of the material listed lay in its potential to shape a new living condition for the residents, the concrete here has revealed to be impacting on the development of a very practical aspect: it is there solid, massive, and although



*Figure 43: The streets in the sky have been "eaten in" by clusters of entrances. This has reduced the dimensions of the "Streets in the sky". Image author's own*

imperfect, it influences a decision by its mass.

#### 6.4.3 The streets in the sky in the listing report

The listing entry description is a brief document, outlining features of Park Hill that have made it significant, and worthy to secure its continuing presence in the Sheffield skyline by the demolishers. It is only 963 words in size and almost like a bullet point list. What is interesting in the report is to find out what makes concrete so important. In the entire document, the word “brick” is mentioned just three times, the word “concrete” seven, and the word “timber” a surprising 16 times. Yet the approach of everyone involved in the reconstruction was that concrete is what is central in Park Hill. The construction photos reveal just how important concrete was. What has made the material aspect so important in the development is the listing report itself, which, while it does not specifically focus on the concrete, it describes extensively the environment it afforded in the manner that typical historical accounts of its architecture would describe.



*Figure 44: The streets in the sky have been redeveloped into narrower paths, of insufficient width to be accessed by the traditional "milk float" visible in photographs of the past. Image author's own*

The extent to which the existing layout of the concrete was compromising to the original intentions of the architects is evident also in the treatment of the streets in the sky. It is worth considering that this was a listed building with the report arguments focusing on the uniqueness of the *streets in the sky*, as a manifestation of the architectural intentions of its time. Figure 42, a snapshot from a BBC documentary on Park Hill shows the milk float roaming the



“streets in the sky” and it is evident that vehicular access was ensuring continuity with the ground streets. Yet when it came to producing a new plan for the flats, the biggest difference from the old layouts, is the narrowing of the street. The entrances to the flats “eat into” the street, narrowing it down and depriving it of its streetly nature. They do not look or feel like streets anymore, since the traditional milk floats, or any vehicle for that matter, cannot circulate and they have lost their linearity on the one side (figure 43 and 44). So the feature that was according to the listing report the most important feature to be retained in Park Hill, is the one that has been most significantly altered, in terms of the layout. Surprisingly, a senior actor in the renovations, when asked about the streets in the sky, dismissed them as not important (Interview with participant 3, Site Manager, 17/06/2014).



*Figure 45: The bare structural frame of concrete was revealed during the reconstruction. Image courtesy of Urban Splash*

Another aspect of the listing was that the report is very clear about its rationale: it is listed because of the historical importance of the streets in the sky, because it is an exemplary case of the type of architectural thinking of that point in time, that is manifest in the Streets in the sky. But the way the redevelopment has been treating the existing structure is very distant from the listing scope. The streets in the sky are not kept intact, but rather the properties are expanding, eating into the streets in the sky, and what becomes important in the new Park Hill is only the material: concrete. What happened that has made the concrete so important? The



prominence that concrete acquires onsite is remarkable, and in fact so much that one of the sub-contractors in describing what his treatment of the development should be, he was certain that it was all about the concrete:

*“... they wanted to return the building, and return the concrete structure. So as far as the building is concerned, for them it's the concrete structure, nothing else.”*

(Interview with participant 3, Site Manager, 17/06/2014)

This is certainly the impression the development gives to the visitor also. The frame has been left bare. It raises the question whether the stripping down to the original empty frame is the result of this misconception of the contractors (figure 45)? Or was it because of the instructions they had were specifically so? One of the architects doesn't seem to think that the attainment of a social condition is what drove the use of concrete by Ivor Smith and Jack Lynn: *“Because it was easy, because it was readily available to him”* (Interview with participant 4, Senior Architect, 24/07/2014). So possibly the design of Park Hill in concrete was not only because of the properties it afforded, but also dictated by practical reasons such as availability to the original, architects.

## 6.5 Concrete shaping the everyday lives of residents

In addition to the previously described discussions the material was engaging in with professional actors, concrete also opened up conversations with the users, by means of its visual properties. The redevelopment of Park Hill has revealed a significant amount of exposed concrete in its interiors for reasons that have previously been described in different sections and pertain to the mass of the material, removing or replacing concrete. Much of the material that was left visible to the occupants is located inside the flats in the form of beams, columns and circulation risers. The H cores, as the architects in charge call the elements enabling circulation inside the flat, were kept virtually intact by the designers in order to: *“put a twist on it, make it modern”*. (Interview with participant 3, Senior Construction Manager 17/06/14)

These H cores, are also a prominent feature in the flats' interiors, in addition to being the support walls of the circulation stairs. The steps and the wall are all structural elements of the building frame, and removing them was most certainly impossible for practical reasons. The exposed surfaces have been retouched with simply a clear coating, leaving the original texture bare, but the steps have been covered in wood and a wooden railing has been added for security reasons and compliance with building regulations. Revealing such a large amount of concrete interiors to the user triggered a variety of responses in its implementation. Speaking to the occupants has revealed various responses to the exposed concrete interiors, usually in the extreme ends. Occupants of the flats have responded with either an aversion or an attraction to their concrete interiors. For some it has been turned into a central feature of their dwelling while others have opted to covering it, in order to hide it. This type of behaviour is not new: occupying concrete interiors in other brutalist buildings is known to have triggered similar effects.

#### 6.5.1 Living in concrete

The Ski resort in Flaine in the French Alps is also a large concrete structure listed with the French Historical Monuments Survey. The French geophysicist Eric Boissonnas discovered the suitability of the site as a ski piste in the 50s and in 1965 he commissioned Hungarian born architect Marcel Breuer, already famous through his involvement with the Bauhaus to design the resort. Boissonnas, was an avid enthusiast for contemporary architecture; his Connecticut home, albeit in exposed brick, had been designed and built some 10 years earlier by Philip Johnson.

Flaine, is not simply a building but, like Park Hill, an entire community, built in a secluded location in the Alps, rather than in close proximity to a city centre. It was constructed from scratch in three phases: Flaine I, II and III, with the first part completed in December of 1968. The vision of Boissonnas for Flaine was clear: to design a resort with primary view to “*aesthetics*” and environmental respect and with the entrepreneurial intentions coming second (Boissonnas, 1994). Part of Marcel Breuer’s response to this requirement was to involve large

exposed concrete surfaces on the walls of the lobby and the apartments. One of the current residents of Flaine described it in his interview as: *“...the Southbank on ice, it is in brutal concrete.”* (Interview with participant 21, Flaine apartment owner, 29/04/2014). What comes as an immediate observation from this comment, is the associations the material forms with historical buildings. It interacts with preconceived connotations, and many of its associations are charging the material with a negative notion, even before one can picture it.

Although Breuer was enthusiastic about designing a building in concrete, reception of the exposed use of the material was not taken for granted. Boissonnas would write to Breuer a year before the first phase of the development opened that if:

*“The concrete game is to be played, our advertisers wish to receive a collection of photos illustrating a selection of your creations;[...to] use them for demonstrations and lectures to selected public opinion shapers”* (Letter to Marcel Breuer, Breuer Archive, dated 3rd of August 1967, accessed online)

Boissonnas was not convinced of the use of concrete and was looking for ways to shift public perceptions. These perceptions of the material, acquired through associations and channels of influence, outline the complex presence in complicated networks. The original intentions of the architects designing for the users’ *“aesthetics”*, were overseen by many of the occupants that later moved in. As one of the owners of a ski apartment, revealed, many of the residents have gone into their brutalist 1960’s apartments and have deliberately hidden it, either with timber, or painted over it (figures 46-47). As he described the actions of some residents, they have responded to the concrete interiors by: *“taking their flats and covering them with timber and they have hidden the concrete. The concrete is quite beautiful. If you go to any modern chalet, they are just built now of concrete but they then put up materials in front of the concrete to hide it.* (Interview with participant 21, Flaine apartment owner, 29/04/2014).

Correspondence between Breuer and his associates reveal that Boissonnas had raised questions on the saleability of the project because of the exposed concrete, Breuer’s

associates were hinting that he would be more likely to accept it depending on his mood. Communication between members of the Breuer personnel, which had to travel between New York, Paris and South America at a time when travelling and communication was very different, was done other by telegrams or post. On 26<sup>th</sup> of January 1973, Mario Jossa, an associate in the office of Marcel Breuer working at the time on the second phase of Flaine, wrote to Robert Gatje, supervisor: “...we will succeed at selling the exterior concrete wall [...] as Eric Boissonnas is in good spirits these days” (Letter to Robert Gatje, Breuer Archive, dated 26<sup>th</sup> of January 1973, accessed online). Considering this particular communication was sent by mail, we cannot be sure when it was received, and whether the good spirits of Boissonnas’s spirits still remained. Flaine, also now protected by the French Historical Buildings Survey, evidences the reluctance of even the principal stakeholder to go ahead with the concrete interiors, but who eventually gave into the architect’s suggestions. Good spirits, long distance telegrams and availability of the material all come into play in this mix of components that eventually has the concrete surfaces of Flaine exposed. This observation is similar to Calder’s description of Lasdun and his ways of convincing his clients on the use of concrete. Sometimes with reluctance and sometimes in favour, the use of exposed concrete can also come down to depend on the good spirits and mood of the clients.

### 6.5.2 Breaking regulations to avoid concrete

Breuer never intended for his Flaine interiors to be covered, and it is difficult to know what his thoughts would have been on the recent alterations of his exposed concrete interiors. Reacting to the material can be a resident’s way of re-appropriating space in a personal way to make it his or her own. Using the existing materials to create a comfortable condition for the residents is a recurring theme. During a discussion with an Urban Splash associate, extensively experienced in renovating interior spaces in Victorian houses, he mentioned a frequent encounter in renovations:

*“At one stage everybody having brick would have it covered up with plaster or wood have it covered up with carpets. I know that now what you do now if you go to a Victorian house, the first thing you do is to peel off the plaster to reveal the brick and peel off the carpets to reveal the wood.”* (Interview with participant 1, Senior Stakeholder Urban Splash, 29/04/2014)

A similar manner of re-appropriating space is observed in Park Hill. Residents have reacted to the material, either by covering it or by making it stand out. But Park Hill, being a listed Building, has a no alterations policy to the concrete. This means that social and private



*Figure 46 (above left and right): Original photo from the hotel interior in Flaine. Image taken from Flaine.com*

*(above right): Recent photo of the interior, some columns have been painted over. Image taken from Booking.com*

*Figure 47 (below): Original photo from the hotel interior in Flaine. Image taken from Flaine.com*



tenants alike cannot make any irreversible changes to the concrete. They cannot significantly alter the exposed walls, so plastering and painting over them is not permitted. This issue has proved to be controversial with the residents.

On an evening in May 2014 I attended the resident's association meeting. The meeting's chair allocated five minutes for me to present to the residents. As I was explaining to them what I was interested in investigating in Park Hill, I made mention of their response to exposed concrete walls. Almost immediately, two residents broke into my talk and spoke simultaneously: "*We are not allowed!*". They later spoke to me in private and described to me their views. They both had wanted to plaster, or "*at least*" paint over them. Their residency contract however was very clear on that: they could not do anything to the walls. Both of them were social tenants and one of them had moved to a newly refurbished flat, after living in the original Park Hill for almost 30 years. In his previous flat, he said, there was no exposed concrete: "*why is there so much concrete [now]?*", he was wondering.

On a different meeting with one of the current caretakers of Park Hill, I found out that Great Places were also asked by another of the social rented tenants if they could paint over it. Their response was firm: considering the clause in the contract that prohibits him from impacting on the concrete he was denied to do so. The tenant then got back to the association suggesting that he put plasterboard over, which was again denied because of the damage it would cause to the wall when placed. A mutual agreement was in the end reached: he was told he can place a piece of hardwood to cover the wall, this would ensure minimal damage, and the resident settled with that (Interview with participant 7, Resident services coordinator, 21/05/2014).

That particular request turned out to be the first of many. The maintenance team have received similar queries on the interior concrete by some of the tenants:

*"We were often asked the question is can we plaster the walls and of course the answer is no. You cannot plaster them. It is one of the terms of the lease. You can*

*put a picture up on the wall if you like but you can't plaster the walls you can't cover them.* " (Interview with participant 8, Resident services manager, 21/05/2014)

Yet this was not the reaction to concrete by all the residents. For some, the response was completely to a different direction. In the resident's association meeting, the views of private residents were different. A girl in her late 20's was commenting: "*My grandparents [previous residents of the old Park Hill] think it is hideous. I don't see why, I have kept it as it is.[...] I have not done anything to it. But I have put some paintings up on the wall.*" (Interview with occupant 4, 21/05/2014)

This interesting dialogue the material enters with the user is not restricted to simple covering of a wall. This is the reaction only by those who want to obliterate the material, and hide it behind something else. The responses of those who are in favour of concrete have engaged into a continuous dialogue with the material. They shape and alter, or maintain and preserve their homes affected by the presence of the material. Concrete has affected decisions to decorate and has altered furniture arrangements. Some have gone as far as claiming that the concrete has affected their decision to buy or rent in the building, making concrete the attractor to the building rather the deterrent and this will be revisited in the next section.

There is also another level of reading into this dialogue: concrete is interacting with the preconceptions of English Heritage about its importance, the policies of the developers put in place to visually comply with the company's corporate identity, and the previous associations of the material in the minds of the owners, or their parents and grandparents. These subjectivities of man-made associations through past experiences, entangle with the physical presence of the material, where occupant's actions are triggered making the users act upon the material, also described below.

### 6.5.3 Concrete as an attractor

Two of the residents I spoke to in private were very enthusiastic about having bought a flat in there. Emily and Anna both came to Park Hill partly because of how their flats looked in

their interiors. Emily, a retired lady in her 60's, sounded excited on the phone about the prospect of talking to an architect about her flat. She held out an *"open invitation"* as she said, to all architects, or anybody who wants to see Park Hill, to show them how it *"works"*. A well educated pensioner, well read in arts and architecture and an avid enthusiast of modernism, she initially rented a flat in early 2014 on Long Henry Row, before buying an apartment on Norwich street six months later. Park Hill for her was the home she had been looking for a long time: *"I'd never found anywhere else I ever wanted to live because I had a very nice house, a well-built 1930s house that was five minutes from the sea. [...] I came here because I really liked it!"* (Interview with Park Hill resident 1, 06/06/2014)

Emily had previously lived most of her adult life in a seaside resort in the South of England when she decided to downsize. But when she informed her children of her decision to buy in Park Hill, she was not greeted with much enthusiasm:

*"They all had a concern about me living here. They all came to see the show flat the previous August but I had the sensation that I was the only one who liked it!"*  
(Interview with Park Hill resident 1, 06/06/2014)

The past associations her children had with the material, were different to hers and Emily was feeling that this enthusiasm she had was only because Park Hill was linked to her interests in art and architecture. It is interesting noting that the age variation of those who were favourable or not to the concrete walls, seems to bear no correlation at all. One would expect the younger generation to be in favour, and yet, this was clearly not the case. Her enthusiasm was similar when I discussed with her the omnipresence of concrete. Her response to the internal concrete features was immediately enthusiastic:

*Interviewer: "What did you think of the concrete interiors?"*

*Emily: "I loved it, I walked in and I loved it."* (Interview with Park Hill resident 1, 06/06/2014)



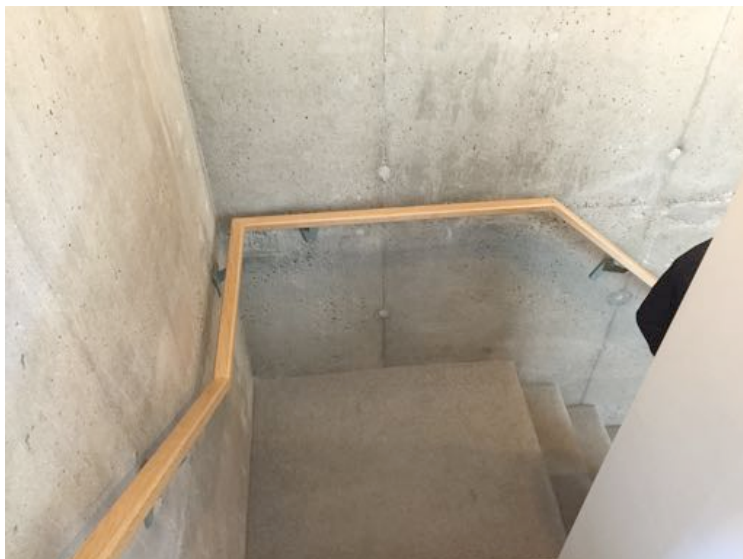
Anna, also an owner in Park Hill, is an academic in her early 30s, and sounded equally attracted to the concrete when she decided to move in.

Interviewer: *“Would you say that concrete affected your decision to move?”*

Anna: *“It was certainly really nice to have interiors that were made up, they were all ready and I didn’t have to do anything with them straight away, [...]they didn’t need lots of work on my part, and also it is quite different, I quite like the idea of living somewhere that is a little bit quirky and unusual, and I think that the concrete fits that category.”* (Interview with Park Hill resident 2, 13/06/2014)

In both their cases, the material is the attractor rather the deterrent. Instead of the residents reacting to it negatively by covering it up, they let the material lure them into decisions, in some cases as big as buying a property.

In the most recent visit to Park Hill, the marketing suite for the second flank of the renovation had just opened its doors to the public. To my surprise, all the bedrooms and stairs area in the new showroom were covered in thick carpets (figure 48). Something I had not seen previously in other flats, nor in the previous marketing suite. I questioned the sales representative on it; *“We decided to use carpets this time”*, he said, *“at least on the top floor to make it feel warmer”* (Participant 16, Park Hill Sales Representative, 13/11/2015). In the discussion it became apparent that to conceal the cold feeling of visitors, Urban Splash decided to use carpets. They had to make way for a different material.



*Figure 48: The carpet on the stairs of the marketing suite. Image author’s own*

The attitudes towards concrete can go both ways. In the case of the buyers, some chose their furniture because of the concrete, others want to cover it, while others still, find it too cold. Far from triggering one distinct reaction, concrete can activate different responses to different people. And although in some cases the responses might seem to apply to a large number of users, it is certainly not an absolute manner, and there are exceptions to the standard responses. There is not a fixed way, but multiple ways, and this multiplicity is triggered also by the multiplicity of the experience users are charged with. Yet, like in the case of the “cold”, when there is a repetitive occurrence, there is something in common for these occurrences, and whether it is a material or constructed trigger, it remains unclear.

#### 6.5.4 Concrete as a decorator

In both cases, those who were attracted and those who were deterred, the presence of concrete has affected the way they have used and decorated the flat. It has impacted on decisions related to their furniture, their style, size and location. In some cases the furniture was positioned as to conceal the walls and minimize the visual impact of the concrete, in others the concrete was treated as the holy grail of the apartment that had to be brought out by positioning the appropriate furniture in particular locations. Others have talked of decisions to keep or throw out furniture from previous places they have stayed, or decisions on new furniture bought because of the concrete. The way Emily for example has furnished the space was largely influenced by the presence of concrete. When I asked her how the material impacted her decisions on the interiors of the house she replied:

*“I have not decorated, I have not touched anything. Because I liked it as it is. That hook was already in the wall. I have got loads of pictures and I have not put them up, not sure I want to put them up”* (Interview with Park Hill resident 2, 13/06/2014)

It also has an effect of how they showcase familiar items and memorabilia as the same resident pointed out: *“not sure I want to put them up but when I look at my pictures I kind of think, “hmmm, I like my pictures as well”, so I think I have got a kind of war going on* (Interview

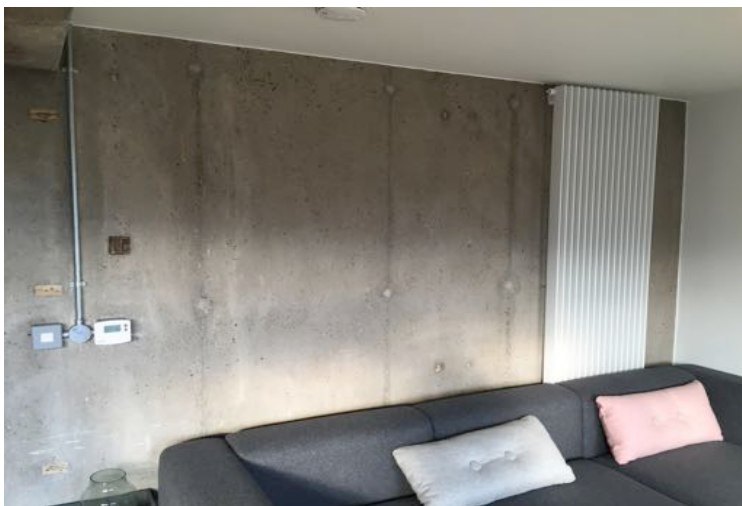
with Park Hill resident 2, 13/06/2014). The concrete influence went as far as affecting her decision to put her family's photos on the walls.

Another resident commented on the fact that the presence of concrete made her throw out a large amount of her belongings, to make the concrete stand out better in her apartment although she was not as successful at throwing out as much as she originally intended:

*"[Concrete] has reflected what I have decided to buy and what furniture I have kept and what I haven't kept. So for example I just don't think it would work at all to try to put a floral wallpaper, or chintzy style of furniture. So when I came I had that sofa (she points at a sofa) Which came from my mother's house, and then I bought that chair (points to a 50's style chair) deliberately because I thought that it matches the style"* (Interview with Park Hill resident 2, 13/06/2014)

Among the private landlords, there was also some confusion over what can be preserved, and what not, and what level of interventions can the concrete walls have. Some were aware that they could not alter the concrete while others had heard about it and most did not know the exact terms (figure 49). Yet, a lot of this confusion seems to be because many of the private tenants are happy to preserve the concrete as it was:

*"I was told by the sales rep that you were able to do what you liked with the interior, and that there was no regulation, although since then, I have been told that the person who runs the management company, she thinks there may be some clause*



*Figure 49: The living room of a Park Hill flat. The only wall decoration is the marks on the concrete.*

*in the lease. I am not bothered anyway, I have no plans to change the concrete, but as I understand it when something is grade I listed, that you have to leave the interiors and if it is Grade II listed you can change them so I think... I don't know, but I don't have any plans to change it, I like it."* (Interview with Park Hill resident 2, 13/06/2014)

If a comparison could be drawn with Flaine, Park Hill poses one significant difference. The original intention of the Ski resort was to be designed as bare and exposed. In Park Hill however this was decided upon the redevelopment and has little to do with the original architects intentions. What informed the decision in each of these cases remains different, and the exposed effect has been brought about by the random interaction of elements that are not necessarily related to structural or aesthetic issues, but rather, perceptions mixed with random occurrences in the life of the construction.

## 6.6 Discussion

Concrete in this section has been described as having the capacity to agitate everyday activity for those inhabiting it, experiencing it or working with it. Examining concrete through the lens of the professionals and the occupants has revealed how professionals decide on concrete, how their decisions are informed back by the material, and how residents interact with it in their exposed interiors. Through this lens, the agency the material has on those interacting with it on a day-to-day basis has been revealed. The interaction occurs on both of the two levels of interaction discussed: the professional and the occupant. Chronologically, they both enter the network of concrete after it has left the original intentions of the architect, designer or developer. They are involved with the material in the stages that follow the non-tangible conceptual state of the building, into the everyday manifestation of the building.

Involving the material into a dialogue with the human and non-human actors it revolves around, implies the necessity to consider it in between the two extremities, drawing from both a materialist ontology, but also moving away from it to understand the constructed effect on the

material. It incorporates instances where the material is left to act without human intervention, like in the case of spalling concrete where it becomes involved with steel and water revealing its material acting powers, only to attract human intervention later on and be treated with human intentions exercising power over matter. In the case of the residents however, in their interactions with it, they bring into this intricate mix their past experiences and their preconceived notions about its use and its historic associations. I will conclude this chapter with some observations on the material by describing the oscillation of concrete between human and non-human agency.

#### 6.6.1 Concrete becomes active only in a network

Concrete is involved in a grid of associations, where the network of interactions are not clear cut; the material is intricately intertwined with all the other parameters that it is impossible to be removed. The professionals' decisions, instigated by their desires and the occupants' interactions, informed by the material, come together to manifest the agency of the concrete, alongside the agency of other non-human elements. Disconnecting the impact of context from this intricate mix of associated parameters is impossible. Participation of the material in this network of associations is traced in a similar manner to the work of Jane Bennett, as thing-power materialism. A position of material determinist nature, would argue that the material is all-powerful, and everything rises and ends from the material and because of it. In Bennett's view, the material is attributed with a "*thing power*" that is activated in an assemblage.

Concrete could not have been thought of as part of a network exclusively in the material realm, where the agency is acquired purely thorough the associations with other material objects. These assemblages of things, do not, in the view of Object Oriented Ontology, involve immaterial objects. But in the case of Park Hill, concrete is not purely about matter forming associations with other matter. For Bennett, objects are part of assemblages of associations that can involve constructed, not purely materialist entities. The material viewed in this way in Park Hill, becomes associated with other material components, but is also never completely

disconnected from its semiotics; to refer back to Bennett, there is an irreducibility of a thing's involvement with human subjectivity. The elements that come together make the material active and trigger a chain of events that put it into motion. On its own, concrete is indeed passive and inert. But in reality, concrete is never on its own. It never exists in a disconnected state, neither at the conceptual stage, when potentials of actualization are still fluid, nor indeed when it leaves the drawing board and enters chronologically the actual, in a physical manifestation. It is always within a context, within an assemblage, within a network. One cannot think of concrete as a lone, stable material, disconnected from steel, water and oxidization, nor as a neutral object, untied of any semiotic associations. It is always participating in an intricate grid of associations, connected to other elements in an ecology of things. Its dissipative nature, causes it to act in a disruptive way, and makes it speak back to us in the way it does. This network, the context and the interactions that it involves, is what activates the material as a powerful parameter in this assemblage of the built environment.

#### 6.6.2 Concrete dynamically shaping and being shaped

The agency derived from the interaction of concrete with other elements, other actualities and virtualities revolving in an assemblage of associations, is dynamic. Because of its interactive nature, these associations never cease to exist. There are always new associations with new elements shaping this assemblage of Park Hill, and other elements that disconnect from it. The open-ended associations assist the concrete to continuously shape and morph the assemblage in different ways, and these interactions are infinite. The agency that is therefore stemming from the interaction is never static. To fully understand the active nature of the material, one needs to connect it to other elements. In the case of Park Hill, this agency is activated through the everyday experience and interaction with the building. Processes of daily maintenance, repair, everyday interactions with interiors, are all continuously making the concrete active and the materials become powerful in these associations and processes of daily maintenance and repair.

Concrete through its spalling, the result of interactions with other material elements, reveals a fragility, a brittleness, which is in turn responded to by the contractors, only to discover that some users interact differently with their interior material and the material speaks differently to them. Concrete has continuously had these instances where it has acted with an element of surprise, precisely because these associations it forms are dynamic. There are infinite number of associations concrete forms and infinite disassociations it cuts off. This makes it impossible to have an end. Even at the point where the physical presence of Park Hill might cease to exist, it will still be forming associations in subjective ways in the minds of users and practitioners elsewhere. So while it is distant physically, it will remain in proximity on a subjective level. Objective and subjective proximity oscillate incessantly in intricate grid of associations.

### 6.6.3 Concrete activated without a teleological purpose

In the grid of associations concrete has already been described in, it interacts in a network of human and non-human entities. These entities and their associations come together randomly and unintentionally. Because there is no intention in the way they come together and the associations they form, there is also no fixed direction in this network and by extent no teleological purpose. There is no predetermined state the material is working towards achieving through its associations and there is not a single state that the building is working towards achieving. Both material and building are moving without a purpose or a direction. There is not absolute condition to be achieved but continuous shifting and changing in this network of associations.

The way in which concrete in Park Hill interacts as an agent with all the actors revolving around it shows a distinct lack of causality. There is not one specific way it interacts with actors and does not bring about a certain, pre-determined effect. Rather, what it produces is an indirect effect upon which concrete exerts power in a non-specific, unclear way. This absence of a linear, structured way the material becomes active is discussed in more detail in the next

section. The options it reveals are open ended and are also dependent upon the context in which it acts. Therefore, the role of the environment is also important in the way concrete interacts with other agents, all of which become active participants in the shaping the experience of the environment of exposed concrete.

The story of the Park Hill concrete is far from a straightforward one, where an architects intention came into fruition by mastering the material. Nor is it a tale of concrete mastering the development and behaving actively in an autonomous way. It has been proved to be a continuous dialogue of humans, users and the material. Open-ended, with infinite potentials for actualization, moving infinitely without fixed purpose or direction, without a clearly mastered intention; the material can keep on shaping and shifting for as long as it still stands. And when it will no more stand, it will keep on shaping and shifting through its connotational associations.



## The surprises of concrete: emergent properties

*“If Ferro-concrete becomes a building material do not rest until a new style is found for it. For the style is created by the material, the subject, the time, and the man”.* (Rasmussen, 1959:169)

### 7.1 Introduction

The previous chapter argued for the agency of concrete in drawing actors into dialogues with the material, dialogues that are taking place between human and non-human actors in the post-drawing-board stage. Concrete was described as a powerful agent that triggers professionals and users’ responses, making them react to the materials properties. Concrete is altering, skewing, or even negating the professionals’ or the residents’ desires through its physical properties and material presence on site. The material, I argued, acquires this agency through the interaction of its properties with human actors in an intricate network. Residents with past experiences and professionals with ambitious projects in their minds, meet the material presence of inert matter in an intricate way of interactions and charge concrete with a powerful agency.

This chapter will carry forward this agency that concrete becomes charged with when existing in networks of human and non-human actors of the built environment. Taking forward the agency of concrete from the previous section, I will argue that through it, the material gives

rise to emergent properties of the network upon which it acts. The network concrete was initiating and participating in, in the previous section, will be seen in this chapter as giving rise to new properties of the built environment, with an ability to move and shift the network and instigate the formation of these properties. The manner of interaction in this intricate grid of associations is not linear but complex and can give rise to properties of the built environment that were often unintended and surprising.

Because there is a distinct lack of linear causality in this network of actions of concrete, the concept of Deleuzian emergence I discussed in section 2.4.2 becomes important in this chapter. This enables concrete to be viewed as a triggering agent that has power within an assemblage, but is not the direct cause of the emergent properties it triggers. Conceptualizing this network in a framework of emergence, where the effects produced are different to the sum of the aspects involved, enables the material to become charged with visual, and cultural properties, it moves from being a structural component, to a facilitator of ageing and comfort in the built environment. These emergent properties reach far beyond the ones a built product had upon its original conception, and in its intended use.

I will therefore move beyond subject-object oriented agency, since the material becomes active by interacting both with itself and with other non-human agents. Where there is human interaction involved, it has moved beyond the intentional agency, into a realm of non-human and unintentional agencies. There are instances where the synergy of the network involves a human action, but this is beyond a purposeful behaviour where there is a distinct goal. While the human agency is still present, it is only unintentional.

The examples I use to describe the emergence of new properties, are predominantly stemming from the fieldwork on Park Hill, but also include historical cases featuring widely in the architecture literature. Some of the properties discussed in this chapter, such as comfort, have been previously addressed in the literature and have been observed by historians of

architecture almost at the same time as their creation; yet, they have not been discussed previously through the lens of material agency within an emergence framework.

## 7.2 From structural to emergent visual properties

The visual effect the exposed material produces in Park Hill is one of the properties stemming from the interaction of the agency of concrete with other components of the built environment. Through the manipulation of concrete, the material answers back to the creators intentions, by creating a visual outcome that often comes as an unintended and as an unexpected surprise. The use of timber board marking projected onto concrete produces a visual effect that has triggered discussions, not just relating to the discussed estate, but many icons dominating its co-current architectural discourses.

### 7.2.1 Board marking: regimented ideas applied with unregimented techniques

Looking up from Sheffield city centre to view Park Hill from a distance, the estate appears a uniform and seamless creation, a solid monolithic mega block. However, upon close inspection, it reveals itself as not so smooth as it is initially perceived. Close up, the original, old phase of Park Hill reveals itself to the visitor as lacking uniformity. There are construction-related inconsistencies on the concrete that are not evident in the other building components, such as brickwork. Every part of the old concrete construction of Park Hill has a different look, and the biggest contributor to this effect is board marking.

In traditional concrete construction, formwork is used to create the mold where concrete in its fluid form will be poured in before it sets. Once the concrete sets and the formwork is removed, the texture of the surface of the resulting structure will be left with a negative print of the mold. Nowadays, formwork has evolved, and there are wide options about the look of the surface the end product will achieve. Metal, plastic and rubber are commonly used today to achieve a variety of desired surface textures. But in the 50s there was only the option of timber.

Timber board marking is extensively used in Modernist architecture, so much that it is

often associated with the work of Le Corbusier in particular. It leaves a very distinct mark on the moldable surface of the concrete, by exposing the texture of the timber planks onto the material. Just like many other exposed concrete structural frames of its time, Park Hill has visible marks of timber on some surfaces horizontal, on others vertical, and in some areas of the concrete frame, very wide polished planks seem to have been used because there is little timber marking on the surface. Were a development of this size to be built from scratch nowadays, components of concrete would be extensively standardized. The structural dimensions, the production and delivery of the material, the formwork and their assembly, a large number of construction components would have to be uniformly designed and mass produced, both for timescale and efficiency, as well as integrity and quality control issues. Yet, in the late 50s, building in a standardized manner was not an option. Most building elements, including concrete, were bespoke, created onsite individually, as a uniquely produced entity.

This is not to say that it was conceived this way: Park Hill is uniform in theory. On the drawing board, the layouts of the apartments are identical and the structural detailing and dimensions of Park Hill appear uniform. There were only so many types of flat layouts that were designed, and they all conformed to a preset plan, regardless of floor, orientation or location in the building. Its structural calculations for the beams and columns would have been likewise; in theory; there is no difference from one column to the next. Lack of standardized techniques are only part of the reason why it was impossible to achieve a uniform production. There were other, more practical reasons that affected the outcome.

The construction personnel that has been working on site in the redevelopment of Park Hill has not been oblivious to the fact this is a historically charged building, and have worked under the auspices of Ivor Smith, one of the estates' two original architects. Since this frustrating omnipresence of varying visual effects of the concrete was perplexing the contractors, someone questioned Mr. Smith when they were fortunate enough to meet him, about the way the building was managed during construction:

*“when I asked him where did you start first, he said “we did everything all at once”, so you think of the amount of supervision needed for the amount of manpower, and the delivery of so much steel and concrete on the site at once”*

(Interview with participant 4, Site Manager, 17/05/2014)

This practically meant that the needs for resources to arrive all on site would have been enormous. It is also difficult to know the exact material availability for the construction to begin, but it would surely involve vast amounts of materials and arriving on site most probably from more than one source. In terms of human resources, a project of this scale required a large number of technical forces, with varying degrees of skilled knowledge. It is not therefore unsurprising that with varying materials arriving from more than one source and wide ranging technical skills, the results would be skewed across the entire development. From column to column, and beam to beam, what stands out is the different board marking.

The example of the board marking is a very clear instance where a structural and technical issue became the visual norm in the construction of Park Hill. Board marking used purposefully to serve a visual purpose is widely documented in modern architecture. But the visual effect is one that came about in the effort to tame the structural properties of concrete. It is a supplementary use in a way that was unforeseen. Modernists made full use of this new property of the material, starting with Le Corbusier and the use of Betón Brut. This observation of the visual properties on concrete becoming important was initiated with a radical change in the way we use materials in architecture in the 50's and the emergence of brutalism. A more pragmatist snapshot of the ongoing debate in the 60s, is described in the next section.

### 7.2.2 Surface treatment: taming the visual properties

The way board marking is used by architects was an ongoing debate in construction for the better part of the 60s: is exposed concrete acceptable? And if so what should it look like? A small snapshot of the discussions among architects at the time is found in Concrete Quarterly, in the winter issue of 1964. Concrete Quarterly was a leading publication of concrete

advancements of its time, read by architects worldwide. Betty Cambell, editor of the journal at the time, wrote about this debate in the editorial of the issue on the occasion of a workshop entitled: *"The surface treatment of in situ concrete"*. One of the presenters in the workshop Mr Allford, A.R.I.B.A. was skeptical about using exposed concrete as is, and was arguing for the need to cover it with something else.

Discussing this view in her editorial, Betty Cambell was taking a softer stance, by countering that: *"...it is the material that counts; no subsequent tooling will mask defects. The material which means not only the mix, but the placing, the compaction, the treatment of the form face, the release agent and the care given to sticking the form and curing; it involves too the architects detailing of his building, never forgetting that old-fashioned detailing is not so old hat- that smooth concrete needs and deserves this kind of consideration"* (Cambell, 1964)

What is interesting in this debate from the 60s is the appreciation of the visual properties the material brings out by means of its structural properties. There is a deep understanding of the agencies of the material, its ability to serve purposes beyond a mere frame element. When Cambell discusses that: *"Where concrete is exposed concrete, it should look like concrete"*, there is an obvious attempt to theorize the visual properties of concrete. Yet they are not seen as properties that are inherent to the material. Rather, they are more related to the ability of the architect to manipulate the material and give rise to properties himself. The many latter attempts to tame the visual properties of concrete testify to that. But ultimately the material was answering back to the architects and the developers.

### 7.2.3 On-going construction: a utopia in the making

Another instance, where concrete properties became visual, is the impact it made on the urban landscape in the cities that were being radically changed. Rebuilding the Great British cities in the 60s was not an activity that took place over night. The transformation of towns like Croydon or indeed Sheffield is often mistakenly thought of as disconnected from the construction process and the on-going work that would inconvenience the citizens

and impact on the urban landscape. When we think of construction we tend to think of the built product, once all the engineers and subcontractors with their big trucks have disappeared from sight. We forget about what has happened in-between, when it was there in the urban fabric, acquiring bones and flesh, but not quite ready yet.

The construction of buildings, particularly on the grand scale that was taking place in the 60s when simultaneously a large number was constructed, would certainly have created a great deal of distraction to the citizens, and the urban landscape would have been dominated by the presence of half built projects, closed roads and the omnipresence of trucks and bulldozers. The presence of concrete during that time was dominant.

John Grindrod is the author of *“Concretopia”*, a book discussing life in the concrete estates from the 60s onwards. He has travelled across Britain to meet residents of social housing estates and has researched what it was like living in one at the time. His view however, is not one that viewed buildings as static. His intentions from the start of his research were to include the radical changes in the country’s building stock in the 50s, not only as an end product, but also within the context of transformation and change. Having grown up in a social estate himself in the rapidly growing Croydon in the 70s, he had a good awareness of how things were looking at times when construction was booming in cities. In his interview he presented his thoughts and his writing about life around that time:

*“I wanted to get an idea of the people I spoke to of what it was like to live through the moment when everything was being built, rather than when it was finished. You have a perspective of the things when they are finished and they are static but of course at the time they kept changing.”* (Interview with participant 11, Author of *“Concretopia”*, 28/05/2014)

This idea of buildings as static versus the buildings thought as active and ever changing is a theme discussed in architectural theory. As Albená Yaneva and Bruno Latour

observe for architecture: *“a building project resembles much more a complex ecology than it does a static object in Euclidian space”* (Latour and Yaneva, 2008). There is not a fixed moment in time when the building exists in an idealized state and what we consider as a complete, finished and stable built object does not exist in the real world.



*Figure 50: Park Hill in the late 50s. The Victorian back-to-back terraces were not replaced with a modern estate overnight, but there was a long period of omnipresent construction in the area. Image taken from [geography.org.uk](http://geography.org.uk)*

Grindrod wanted to include the everyday reality of living in an area where everything was changing, and what it meant to live on a site of virtually constant building, where concrete was everywhere.

*“I didn’t want to look just at the big names, big architects and what their project was and then, hey presto! The buildings were built, because actually that’s not how it happens”* (Interview with participant 11, Author of *“Concretopia”*, 28/05/14)

It is interesting that John Grindrod, purely through his personal experiences of social housing architecture, identifies that the buildings of this time involve far beyond the built description and the architects names. He has included stories of the people that have lived there, and has also addressed the disruption in the lives of the surrounding residents. He describes how residents felt at the time:

*“And people had to go through these enormous periods around to building the shops and they would be the very last thing in them, so actually there would be no social amenities for them and finally when they got done there*



*would be somewhere to buy a newspaper and food, I think that is the sort of stuff that would have to get built first” (Interview with participant 11, Author of “Concretopia”, 28/05/14)*

The duration of a concrete frame construction is a deciding factor in this respect and the visual incompleteness also relates to the processing of materials and complicated construction processes (figure 50).

*“I find fascinating the fact that people had to put up with this, and they did and they were willing to, even in real luxury areas, stuff like the Barbican, you know the surrounding buildings were surrounded by building works even a decade later, and they were still building 15 years later. It must have been horrendous!” (Interview with participant 11, Author of “Concretopia”, 28/05/14)*

I have previously discussed that on the drawing board, a building at the moment of its conception has a million potentials for actualizations, and always interacts with a network of parameters, continuously shifting and changing roles and purposes. Yet, there is also another transformation that the building inflicts on other elements of the network it participates in: the transformation inflicted on the surrounding landscape. In this network of agencies, the visual transformation of the surrounding area is the result of the construction properties of concrete, which require a large amount of formwork and labor. In Park Hill the area went over a period of time interrupting the lives of the residents, visually and functionally and left a strong mark on the urban landscape of Sheffield, even before it was built.



*Figure 51: The repaired concrete in Park Hill is clearly visible: where there has been a repair, a neatly cut square area of the material has been removed and has been replaced by a fresh material, different in texture. Image author’s own.*

#### 7.2.4 Repairs on concrete

In the previous chapter, I described how concrete is spalling in Park Hill, as the result of many years of weather exposure and properties of the materials. The repairs are necessary in the ongoing redevelopment to fulfill structural requirements: they enforce the material already present and keep the weather elements from getting to the steel reinforcement. Their technical role is determined before any consideration is given to their site application. Yet, their visual appearance once they are complete has become of a central focus and has gained equal if not more importance in the decisions of the building repairers. The final instance in this chapter where the structural demands are transformed into visual properties involves the repairs on the concrete of Park Hill, by its new developers in the renovation phase (figures 51 and 52).



*Figure 52: Dents and marks on the concrete of Park Hill in places where the concrete has been rehabilitated. Image author's own*

Because of the listing of the building with English Heritage, every decision that could affect the visual outcome and could conflict with the historical importance of the estate, had to be authorized by the architects of the institution. In the previous section I discussed this switch from the structural importance of the repairs to the visual importance of the repairs. The attitude of English Heritage towards the concrete was a preservational one: maintain as much of the old as possible, and where necessary, clearly delineate the new material so as not to leave any doubts whether something is old or new. Every intervention on the concrete had to achieve a very specific visual purpose: to look as closely as possible to the original concrete when looked at from a distance, but enough so that it could still be easily be identified



*Figure 53: The detail where concrete has been repaired is clearly marked with a square and stands out when seen up close as slightly differently coloured. As the viewing distance increases it becomes harder to differentiate between the repaired and the original concrete. Image author's own.*

when looking at the structure close up.

English Heritage were heavily involved in the choice of materials for the repairs, and their intentions were far from structural: the visual outcome was of great importance in their suggestions. The repairs, as described in Chapter 6, were made initially by replacing existing damaged concrete, with a new mix, and then painting over it. The intended attitude was to make any cover to the existing concrete as transparent as possible, so as not to alter the visual outcome significantly from the intentions of the original architect of the 60's. Yet the decision was finally taken for the replaced concrete to be made by polymer reinforced concrete, not traditional aggregate concrete. The chosen material had one major advantage, to the traditional choice: much less quantity was required for the repairs. This seems an important advantage when it comes to sustainability and efficiency. But for English Heritage there was a more important one:

*“to carry out repairs using a traditional aggregate cement concrete would have required quite a lot more cutting out in order to form the repairs.[...] So I suppose on the one side using the polymer modified concrete, meant the repairs would be smaller, and that was actually*

*cheaper but it also meant that more of the historic would actually survive. So you could say that it was good from that point of view. That was part of the reason that I eventually agreed to repaint with an anti-carbonation coating on the concrete.”* (Interview with participant 9, English Heritage Senior Architect, 25/05/2014)

Both during the initial choice stage, and throughout the repair phase, the choice of concrete was far from purely a structural one. English Heritage also highlights cost and historical importance. Regarding the repair phase, the senior architect that spoke for the organization described how decisions were reached and what their intentions were in the treatment of exposed concrete. The matching process to achieve the visual outcome envisioned by English Heritage, was a long process, guided by the visual, not the structural outcome of the repairs. They involved many trials on elements of concrete in Park Hill, testing various products and their combinations, to decide on the most acceptable one in terms of visual properties.

*“We did spend a lot of time trying to investigate ways of trying to repair it without changing the colour of the concrete to insure that any coatings applied on the concrete were transparent, that you could see through it.”*  
(Interview with participant 9, English Heritage Senior Architect, 25/05/2014)

However, because the polymer modified concrete was the most efficient choice for the amount of historical concrete that could be preserved, the architect decided to go ahead with its use and opt for an anti-carbonation agent that would then subsequently mimic the historic concrete.

*“Obviously because we had been matching the concrete accurately the colour should be matched pretty well so that actually the repairs would sit nicely within it. But as the polymer modified concrete was very different in colour to the historic concrete, putting anti-carbonation coating*

*over the whole thing which was itself coloured to match the historic concrete as closely as possible seemed a sensible thing to do, seemed to blend the whole thing, so from a distance is the extent of repairs is less obvious.”*

(Interview with participant 9, English Heritage Senior Architect, 25/05/2014)

Achieving a uniform look from a distance was a purely visual decision. The developers could not afford to have a building looking like a patchwork from a distance, even more so after the bad press publicity the building had received in the previous years. Park Hill to the inhabitants of Sheffield had to look a uniform and smooth renovation, sleek enough to be lived in again. But this instance, the observation exemplifies also the emergence of another set of properties that became important in Park Hill which is discussed in the next session: historical properties.

### 7.3 Incidental heritage: cultural and social emergence

#### 7.3.1 Historical emergence: preservation considerations in the repaired concrete

A crucial question in Park Hill that requires to be addressed is the decisions that drove the preservation. What made concrete become such a prominent feature in a building where concrete was only the enabler, the vehicle to ameliorate the social conditions? The initial intentions of Park Hill were never about the concrete. They were only about the changes that a building of concrete could facilitate. Concrete was the best means available at a time when rationing and was in place and competing with the need for urgent housing as observed by Park Hill's original architect himself (Smith, 2008).

In its original construction, the choice of concrete was not about the material itself. Of course, it could have been created in any other material that fit the purpose. The high rise would have been achieved with steel also, a typical Sheffield material. The material selection was purely coincidental and the absence of concrete from the literature described in Chapter 5 testifies to this. The high-rise typology was the requirement, and concrete was at the time

the means of achieving it. The way concrete interacted with other agencies of its time, war, rationing, prevalent paradigms in post war housing, lead to concrete being used. The material choice emerged through the circumstances of Park Hill's time. It *happened* to be concrete; partly because it was more readily available to steel and partly because it was the next best material to use at that time for an estate of that scale. It was the best option for the architects because of a combination of reasons, and least because of a love for it. However, English Heritage and the new developers in Park Hill, have treated concrete with the utmost respect and one could even say worship. This is why this type of heritage , can be described as incidental (figure 53). Alongside the material, several other components that were interacting with it became also important, material and immaterial, and their agencies give rise to historical and cultural properties, as I will describe below.

*Structural becoming historical: from Ancient Greece to Inigo Jones' St. Pauls, Covent Garden*

Before modernism, architecture was preoccupied with the use of symbolism and attribution of meaning, being far from open and free. The ability to be creative and leaving a mark on architecture, was constrained by the strict rules that applied to design. The Classical orders are the quintessence of symbolism and constructed meaning in architecture: each order symbolizes a human form and/or a use for the building in which it was built. Modernist Architecture is the first attempt to move beyond that inherent symbolism. John Summerson, the architectural historian, discusses the genealogy of the classical orders from Ancient Greece to modernism in the *Classical Language of Architecture*. Summerson (Summerson, 1963), himself an avid enthusiast of the modern movement, produced for the BBC six radio programs in the 60's, which he then summarized in his 6-chapter book. It was a commonly known secret at the time that Summerson's intentions were to convey to the public his enthusiasm of modern architecture, at a time when it was most hated and towards a public that were mostly traditional minded. He discussed in his programs the genealogy of architecture that begins with the Greek temple and is encountered still in

modernism. In order to argue for modernism as a style, he has to go back to the origins to rhythm and order (Summerson, 1963:40). Yet in doing so he exemplifies something more than this: the almost linear continuation between Neoclassicism and Modernism. The attribution of symbolism in architecture is therefore carried into modernism.

This tendency of architecture to progress linearly had begun even earlier on. In his 1753 essay on architecture, Marc-Antoine Laugier argued for the necessity of returning to the purest forms of columns, entablatures and pediments, because these were the most elementary segments of architecture produced in nature. He was identifying the origins of the orders in nature, and describing the primitive hut as the starting point of the ancient Greek temple. Nature in his view must be imitated as closely as possible, because the origin of the column is in the tree barks (hence the necessity for the vertical tapering), the entablature is the *“the pieces of wood which rest horizontally on the vertical posts to form a ceiling”*, and the pediment is derived from the triangular shape revealed when placing branches against each other at roof level (Laugier, 1977:12-13).

*“Never has a principle been more fertile in effect. From now on it is easy to distinguish between the parts that are essential to the composition of an architectural Order and those, which have been introduced by necessity or have been added by caprice. The parts that are essential are the cause of beauty, the parts introduced by necessity cause every license, the parts added by caprice cause every fault.”*(Laugier, 1977:12)

Laugier’s primitive hut, is a demonstration of how practical elements have turned into pure visual aesthetics. What was once constructed simply out of necessity and lack of other options eventually became a language, used by all architects. The origins of this language, the driving force behind it are the structural properties of wood that enabled the formation of the hut.

*“Let us never lose sight of our little rustic hut. I can only see columns, a*

*ceiling or entablature and a pointed roof forming at both ends what is called a pediment. So far there is no vault, still less an arch, no pedestals, no attic, not even a door or a window. I therefore come to this conclusion: in an architectural Order only the column, the entablature and the pediment may form an essential part of its composition. If each of these parts is suitably placed and suitably formed, nothing else need be added to make the work perfect” (Laugier, 1977:13)*

Another famous example John Summerson discusses in his “*Classical Language of architecture*”, is that of Inigo Jones, St. Pauls Church in Covent Garden (Summerson, 1963:38). Recreated in stone, is an absolute representation of what would have been a wooden roof of an ancient Greek temple. The plates, the collars, the beams and the rafters are perfectly recreated on the roof of the church, creating in effect a new style, an aesthetic feature of what was once a purely structural gesture.

Similarly, the in way that concrete has been used from modernism onwards, with the applications of Le Corbusier's domino house typology, there is a structural rhythm acquired in the concrete. The typical concrete structure of the 1920s onwards, has a very distinctive typology that give to its structure a sense of rhythm and repetition. This repetitive rhythm is what has made Park Hill's recreation relate to its historical past. What has remained from the original Park Hill is the rhythm of the concrete frame. From a distance this is what looks as uniform and consistent throughout. The infill panels change in colour, the various flanks of the development change in height as one moves along the site, but the rhythm of concrete remains the same, consistently throughout the entire Park Hill.

The visual properties of concrete were not intentional by architects. Brutalists, which argued for the beauty of materials as found, had no intention to use concrete as a visual means. But ultimately, through its many repetitions, concrete developed a new language, a pattern a rhythm that became visual. The connotations it carried with its use in the 50s



and 60s, ultimately made it into a historical fetish for English Heritage as described in the next section.

### *Fascinated with concrete*

The practice of maintaining as much of the original concrete in Park Hill, has turned into an obsession of the material, and lead to the fascination with concrete in Park Hill. Everything that was positioned on top of the concrete was to be removed, to reveal the material, which has become a type of holy grail in Park Hill, as the utmost preserved entity. And for this preservation to give as much emphasis as possible on the historical aspect of concrete it had to make sure no other elements of concrete, apart from the small repaired patches, were to be placed in Park Hill. A key stakeholder of Urban Splash, has spoken about the material used:

*“It is all original we didn't put any concrete in only repairs so all the concrete we got there is original, [...] I think it may have been plastered on top so we have removed the plaster from it.”* (Interview with participant 1, Senior Stakeholder Urban Splash, 29/04/2014)

He was in fact suggesting that there is not enough concrete that reveals the true nature of Park Hill's structure, similar to the way one would treat a Victorian building:

*“I mean there is remarkably little concrete I think because it is a concrete building, because of the nature of it, because of how you put everything in. It is covered up with plaster and decoration but again I think it was like when we look at an old Victorian mill we will expose as much of the brickwork and the timber as you can”* (Interview with participant 1, Senior Stakeholder Urban Splash, 29/04/2014)

This parallel gains importance when viewed within the context of Urban Splash: they are a developer specializing in renovating old Victorian buildings. Their attitude to the preservation of concrete in Park Hill can be understood better when viewed in that context, where the original material becomes of historical significance. Years of experience

in Victorian Warehouses in Manchester, where the original structural elements are kept intact, and the brick is exposed to the fullest, is Urban Splash's area of expertise. Two observations can be made on the views of Urban Splash. Firstly the brickwork in many of the Victorian warehouses they have developed was intended exposed, so the original material is of different historical importance. Secondly both Park Hill and Victorian warehouses, although differently purposed, they were designed with little consideration for visual aesthetics. The first had a social purpose and the latter a functional one.

This obsession with the material and maintaining as much as possible of the original, does not stop at the physical presence of the material, but goes as far as exposing its flaws:

*"the mentality [...] was that [...] if we repaired cracks or fissures that you could see, but there would be a reassurance that it was not to the detriment of the building."* (Interview with participant 6, Senior Architect, 28/07/14)

The inconsistencies that characterize the exposed concrete surface had to be maintained as such, when there was no structural need for repair. The honesty of the material is what makes it important in Park Hill. The repairs that are made to the concrete are only the basic ones needed, and everything else stems from there:

*"There is a parallel to it [making the concrete seem more attractive] and the fact that we really could not deny the fact that the frame was there, and that we did not want to include it, or render it, we didn't want to make it appear like a wedding cake or something like that, we wanted to be quite honest with it and say that this is the concrete frame, we had to make certain repairs to it in order for it to work and you can see where those repairs are but the whole thing as a whole is brought up to a new level and revitalised from there."* (Interview with participant 6, Senior Architect, 28/07/2014)

This is also evident in the words of the director of Urban Splash, and some of the

Senior designers involved in the reconstruction:

*“it’s not everybody’s cup of tea, but then it’s my view that actually if you don’t like concrete you are not gonna be looking up to buy in Park Hill in the first place [...]. The people that are going to come and look at it are probably going to be into concrete so lets do something about it, lets celebrate it rather than hide it.”* (Interview with participant 1, Senior Stakeholder Urban Splash, 29/04/2014)



*Figure 54: The walls of Park Hill are covered in visual inconsistencies that have deliberately been maintained. Image author’s own.*



*Figure 55: Visual inconsistencies resulting from elements that have been removed. Image author’s own*

The prominence of colours in Park Hill in the way the refurbishment wall panels have been treated is almost making the concrete fade in the background. When an architect from the office of Egret West was questioned on whether the prominence of colours in the renovated Park Hill was intentional, his reply was:

*“The colours are really a reference to the original building. What you are*

*referring to was not intentional, if that is the case. We always wanted the grid to be the primary thing that stands out. If you noticed the way that we put these panels, it almost feels as if one colour is sliding behind the concrete, that is what we wanted to achieve. I think maybe we could have toned them down a bit, it just needed a bit of a kick, that's why we chose such a bright colours.”* (Interview with participant 4, Senior Architect, 24/07/2014)

Through the decision to recreate the brick paneling shades, the dull shades of the concrete have faded away in the background. Concrete has been sanctified through the actions of the professionals involved in its renovations. It has become the Holy Grail of the renovation, which has to be preserved and maintained at any cost, and with every effort. The object, which was purely a means in the original intentions of the architects, has become the intention of the estate.

#### *Embedded in concrete*

The preservation of concrete to the greatest extent possible, has also meant that many elements, trapped in the concrete of Park Hill have also been maintained. Concrete, due to its properties has the ability to retain within it anything that is encased in its formwork. For this purpose it is common in construction to place matter inside the formwork, that will be useful once the concrete sets. This ability of concrete can work both as an advantage and as a disadvantage to the construction process. On the one hand, if something is set inside, it is difficult to remove. Concrete therefore in this case provides the advantage of securing the element inside (figure 54). However, once the fluid concrete has been poured and set in the formwork, it remains encased; difficult to be removed. This is problematic when something needs to be positioned inside the concrete. With most other

materials, even with brick, hiding something inside (e.g. cables, suspension elements etc.) is possible, even after the construction of that particular element has been completed. But in the case of concrete, most structural and functional elements that need to pass through it or function within it, are placed before it sets, and remain there. This creates a collection of embedded elements in Park Hill's exposed concrete walls (figure 55 and 56). This is another form of incidental heritage, where the elements that were encountered remained in the wall and given prominence, not because of their actual historical importance, not because they were of particular merit in the original design (figure 57), or because they had something unique, but simply because they happened to be embedded in the concrete that in turn happened to be maintained.



*Figure 56: The embedded conduit casings next to the new electrics on a resident's exposed wall. Image author's own.*

### 7.3.2 Maintenance

The final instance of concrete and its relations becoming incidentally charged with historical and cultural significance is the lack of maintenance that has characterized Park Hill. The habit of perceiving concrete as a static in time and fixed entity is also revealed on the

way maintenance is perceived, or rather not perceived in considering the life span of a building. The aging of exposed concrete surfaces on many of the postwar developments in Britain and across the world reveals itself as dirty and neglected, because of the lack of treatment after construction. This issue of the poor maintenance affecting the experience and ultimately influencing the deterioration of the estate, I will present through the case of one of the best-known council estates of the similar period as Park Hill, Robin Hood Gardens in London's Tower Hamlets.

One of the things that has made this type of estates special from an architect's point of view, that I have already mentioned numerous times, is that the architect that designed them always endeavored to create a condition better than the previous one. To quote Alison Smithson, the problem that these estates then ran into was that "*there was no collective memory of those previous conditions*" (Johnson, 1970). However the future conditions that were about to come were difficult to be imagined by the architects. How could they foresee the future and what was coming ahead? They were designing for a future that they thought was going to happen, or they wanted to happen, and the future turned out to be something different. Simon Smithson, son of Peter and Alison Smithson, is also an expert in concrete, both through his family's heritage and through his own work as a partner at the office of Richard Rogers. In his defense of Robin Hood Gardens and the optimistic decisions in the original creation, he mentioned in his interview:

*"I don't think you could have anticipated the East End social fragmentation of the families, where the nuclear families kind of imploded. I don't think you could have anticipated people dealing drugs and bringing their violence into that. So yes there is an element of naivety, but I don't think anyone could anticipate what happened. It is very easy to be critical in hindsight"* (Interview with participant 15, Concrete expert, Partner at RSH+P, 28/07/2014)

Yet in discussing the presence of concrete he did attribute part of the decline to its presence. He mentioned how at the time concrete was considered “*maintenance free*” by those using it: “*I think it’s a misnomer that concrete was maintenance free, all things need maintenance all things have to be maintained*” (Interview with participant 15, Concrete expert, Partner at RSH+P, 28/07/2014). There is something that went wrong, but that in his view it is not related to the design of the estate: “*judging by how well Park Hill is has survived its regeneration or refit I can’t believe there was anything substantially wrong with Robin Hood*” (Interview with participant 15, Concrete expert, Partner at RSH+P, 28/07/2014).

In my discussion with Simon Smithson on his vast experience of working with the material, presented me with the example of Robin Hood Gardens to describe how he thinks concrete is often mistakenly related to poor maintenance. This is an example very close to Park Hill, in terms of its era, material, aesthetic, function and ideological drive behind it, so it serves as a close comparison. On the deteriorating state of the iconic building he mentioned:

*“Like most buildings of that period with no maintenance, the way it was set up was that, like any concrete structure, everybody thinks is the capital cost about the building, but they never think of the maintenance cost and in particular in the UK you never put enough time into managing these estates, so that they were safe and so on, because nobody ever had the money. I think this is a classic case: if you don’t do anything to a building for 50 years, then you are going to run into trouble, I don’t care what the building is made of.”* (Interview with participant 15, Concrete expert, Partner at RSH+P, 28/07/14)

Yet by no means was he of the attitude that everything has to be restored back into the original condition in these estates of concrete. He acknowledges the importance of acquired features on the concrete and how they are attributed a historical/cultural importance:

*“I think you have to let buildings have their own lives. You cannot restore everything back to its original condition in these cases.”* (Interview with participant 15, Concrete expert, Partner at RSH+P, 28/07/14)

What Simon Smithson's view reveals is that the effect of the material acted both through its properties, for example the staining and weathering are purely material effects, but also in a constructed manner, through the “*misnomer*” that a “*maintenance-free*” material would be able to replace the previously known forms of construction. He also mentioned other material aspects, through the constructed solid forms of the estate: noise transmission and the inflexibility of the structure to future adaptation, in a very similar manner described in Chapter 6. For Park Hill, social and cultural properties are then emerging by the play of material and constructed effects of the use of concrete. The interaction of concrete with the other presences is what gives rise to new emergent characteristics of the material.



*Figure 57: Visual inconsistencies and lack of maintenance of the concrete are visible in the landscaping concrete from the early life of the development. Snapshot taken from BBC (2004)*

As Stephen Cairns and Jane Jacobs present in “*Buildings must die*”, the decay in the visual performance of concrete (Cairns and Jacobs, 2014:74) does not signify a structural issue, but it does raise the question of the patina. What

should be considered as part of the heritage of the building, as patina and therefore something that needs to be preserved, and what is classed as mere dirt? I would argue that Urban Splash take in Park Hill this “*patina*” definition very far. Nearly everything is to be celebrated in the concrete: the dirt, the imperfections and the cracks, as long as they pose no threat to structural stability. In a similar manner to how Le Corbusier was celebrating board marking inconsistencies in the Unité d’ Habitation, the redevelopment of Park Hill is now celebrating the



decay.

On the subject of buildings and continuously changing and shifting, Simon Smithson also made an observation about another very iconic Concrete London building.

*“it is the same as the National Theatre, there is bits of it that I don't agree with and I know that Dennis Lasdun didn't like some bits of it. But, I think you have to accept that buildings are going to change”* (Interview with participant 15, Concrete expert, Partner at RSH+P, 28/07/14)

The theme of maintenance is recurring, interestingly, in my interviews with many of the professionals I spoke to from the renovation of Park Hill. They made similar observations on the necessity to maintain concrete buildings, contrary to the popular understanding of buildings as standing unresponsive to time. The director of Urban Splash pointed that:

*“There are some very fundamental things that make it an interesting building that was tarnished through maintenance and reputation.”* (Interview with participant 1, Senior Stakeholder Urban Splash, 29/04/2014)

While other professionals, involved more hands-on with the on-site reality of Park Hill also noted that:

*“the concrete will age because of the type that it is, and concrete still has exposed aggregate , so it will naturally age with the algae , and fumes of cars, [...] like any structure no matter whether it's concrete or steel you need to maintain it . If you have a steel building or a steel bridge you need to maintain it, you need to keep on top of it, to look after it. The concrete is no different. A bit like the window cleaners today”* (Interview with participant 2, on-site Senior construction engineer, 17/05/2014)

The existing concrete has dictated decisions relating to the visual outcome in Park Hill. These visual properties in Park Hill stemmed from the fascination for concrete where everything had to be kept intact and preserved as it was found. This however has created almost a new

style, a deteriorating and severely weathered look for Park Hill which now overwhelms the development Figures 58 and 59 present some of the maintenance issues that appear in the landscaping in Park Hill in its early years of its life.



*Figures 58-59: Visual inconsistencies between the old and the fresh concrete have been brought about by the fascination of the material. Image author's own.*

Everywhere one looks, Park Hill appears rough, something that is a result on the one hand of the way concrete was constructed in the 50s and the preservations, and on the other on the deteriorating state while every minute detail is kept in this material (figure 59). Concrete interfering with the elements, algae, moisture, radiation etc., gives rise to aesthetic and historical properties.

#### 7.4 Comfort as an emergent property of concrete

I have previously argued in the second chapter of the thesis that to assume the experience of a comfortable built environment is manifest solely through the attainment of steady environmental conditions is like claiming that the sole purpose of a building is to provide shelter. I discussed work of other authors on how buildings serve a variety of

purposes and operate on multiple levels: social, cultural, visual, social, political. All of these building functions relate to different comfort needs the building has to address. I also discussed what has been perceived as a comfortable condition, a notion that has been mutating continuously to include varying concepts and definitions. The work of Deleuze, I argued, can provide with a tool to describe how these mutations are taking place. In this section I will describe how concrete has evolved and at instances participated in shaping varying experiences of comfort.



*Figure 60: Structurally innocuous cracks that remain visible in the columns. All the original ones on the soffits have been covered. Image author's own.*

#### 7.4.1 Concrete soffits

When the architects originally designed the interiors, they had intended for the concrete soffits to be left exposed. Their intention was a purely aesthetic one, and it projected their ideas about how a building representative of the firm's identity had to appear. Yet, the initial presence of the concrete slabs fulfills a purely structural role. In this role, slabs often form very thin cracks, not more than a couple of mm wide as seen in figure 60. Park Hill was no exception. These fine cracks in the concrete have to do with the way concrete is produced and performs on site. In no way does it affect the structural stability of the slab; it does not perform a structural role. Yet in the case of Park Hill, when the developers saw the fine cracks in the concrete, they were concerned that it might impact on

the potential buyers. They were aware that their presence was innocuous to the building and posed no threat whatsoever.

*“We discussed leaving the soffits for weeks and weeks and weeks, because we wanted really to keep as much concrete as possible exposed. But it had very thin cracks in some of the concrete. Which were not structural cracks, just from regular movement of the way the concrete behaves cracks form in it.”* (Interview with participant 6, Senior Designer, 24/07/2014)

The architects decided it could make the residents feel uneasy if the cracks on their ceilings were visible. This led to the decision to cover the concrete soffits in plaster and white paint, to create a smoother finish.

*“[...] the client was really concerned that this would be making the people nervous about buying a flat in Park if they had a crack on their ceiling, even though there was nothing wrong with it. So they made us cover all the soffits.”* (Interview with participant 6, Senior Designer, 24/07/2014)

The structural features of concrete have been reterritorialized in to an element of uncertainty and discomfort. Comfort therefore becomes a manifestation of the emergent properties of concrete. The experience the material affords, in relation to a comfortable built environment has attracted and rejected meaning, perceptions and ideas continuously over its time. It has not always had them imposed upon itself; sometimes they stemmed from within it. There are therefore myriad possibilities in how the material can shape comfort, never operating in a clear direct way but endlessly intertwined. It is the ability of the material to serve multiple purposes and morph into different roles that influences the behaviour of the building towards comfort or non-comfort. Comfort is informing a decision, on the visual properties of the redevelopment and it is present in the discourse of the residents and developers.

#### 7.4.2 Actions of interior concrete

The behaviour of users in Park Hill, in the way I presented in the previous chapter, has formed relationships of exteriority with the exposed concrete interiors that do not alter the nature of the assemblage of Park Hill. The behavior of the residents inside their apartments, their modes of interaction with the material as I will talk about briefly in the next section, are interacting with the assemblage. This mode of interaction significantly alters the nature of the assemblage. This is evident in Park Hill in both the residents' and the professionals' interaction with the existing concrete. Starting with the residents, the new apartment owners are not allowed to touch their exposed concrete walls, according to clauses in their contracts, not even put a nail up to hang a picture. The way residents have decided to make the apartments their own reveals instances of comfort, revealed though their discourse.

Karen is a young lecturer at a local University, has chosen to make the concrete walls of her apartment a prominent feature, making no effort to hide them. Alen, however, a refugee from Kosovo, in his 60s who was temporarily offered a flat in Park Hill by the council, has asked the housing association to acquire permission to cover his concrete interior with a plaster board. Another resident, that has refused to participate in the study for obvious reasons, has covered them in wallpaper, much to the dismay of the people who run the place. The way each user interacts with his interior is unique and for myriad reasons, it can take infinite manifestations. For Karen, the exposed concrete reminds her of her summers in the south of France. The French grands ensembles come with many pleasant memories for her.

*"It never had bare concrete in the original design, so the concrete is not the original plan, it is just something that the new architects have made, which is really interesting, the way they have used it. But actually when I moved in, one of the removal men said to me " Have they left your flat unfinished?" They just did not get the design of it at all, and I was like going..."Oh, that is part of the design", but to him the idea that you would*

*have a bare concrete wall was quite weird, he just thought they had been sloppy with the finish, and they were a bad developer, or something like that.”* (Interview with Occupant 3, 21/05/2014)

In the case of the professionals, the fact that concrete has shifted in its performances is the best example of this continuous transformation in itself. Through the interaction of the material with other actors, human and non-human, concrete has shifted into new emergent characteristics. The requirement of a structural performance has already been fulfilled once the building first opened its doors. Now, interior concrete has a very different performance. This newly acquired role is initially visual. The looks of the interior must be maintained throughout and this is a requirement by the contractors and the architects who believe that the building “*portrays*” that style of their company. But it is also a historico-cultural role: is preserved, not by English Heritage, who were not involved with the interior of the apartments, but by the regulations issued by the Housing association that run the place. So concrete has acquired a whole new purpose in this case: from a structural component, it has been reterritorialized into a visual and cultural component, expressive of the historical importance of Park Hill and Urban Splash corporate profile. The new characteristics of concrete have emerged from the way the material has interacted with other actors in Park Hill.

## 7.5 Discussion

Although we tend to think of concrete as a lone object, in reality it is never on its own, as I established in Chapter 6. It is always in a network of actors, continuously interfering with other agencies and acquiring agencies of its own. In this chapter I discussed instances of actions of concrete in this network of other entities that give rise to properties coming as emergent, external to other actors and appearing without clear relation to what was pre-existing in the network. Both material entities and human actors, all are involved in this emergence. To describe this emergence of properties I will conclude this chapter by

initially describing their characteristics; I will then go back to the Deleuzian framework that was introduced in Chapter 2, to describe how this emergence takes place. I will start by conceptualizing their mode of interaction as unexpected, non-linear, non-causal and lacking hierarchy.

### 7.5.1 Property descriptions

#### *Lack of intentionality*

Firstly, the actions of concrete in this network appear as unintentional. This is exemplified in the case of visual emergent properties that were discussed in section 7.2: whether it was board marking or the disruption to the urban landscape caused by the on-going construction, it is clear that there was never an intention from the designers and architects to produce these effects. Instead, architects were surprised with the ability of concrete to acquire new properties and have in response endeavoured to harness them, make them obey to their orders, only to be faced with another unexpected behaviour of concrete. These unexpected behaviours of concrete have been not been stemming from an autonomous function of the material, but from its interaction with other entities, as presented previously in chapter 2.4.1. They can thus be deemed to include both object oriented agencies and subject-oriented agencies. Through the way concrete has formed relationships with other components of the built assemblage, has been surprising, with an array of stemming properties, previously unimagined, and completely unintentional.

In the case of board marking, the other agencies included timber frames, in the case of surface treatment it included the harsh northern weather and in the case of on-going construction, bulldozers. There are infinite elements that concrete can interact with and produce unexpected behaviour. This unintentional agency is only not intended for initially. Once it has performed several repetitions of its presence, it ceases being a surprise to the designers and ultimately becomes intentional. The architect can become aware of the

emergence of such properties only after they have been formed through the interaction of concrete with other components. At that point, one can stop viewing them as a surprise, and start evaluating them as intentional. Knowing how concrete is going to behave, and how properties will emerge in its interaction is only possible, if the elements it interacts with are known. Yet, because there is always a varying number of components that interact, concrete is likely to produce another set of unexpected properties, after it has been applied past the drawing board.

#### *Lack of linear causality*

In the section on the surface treatment of concrete, the debates of architects on harnessing the ability of concrete to acquire visual properties with appropriate treatment was described. This is a good example of what characterizes this emergence of properties. Concrete has not directly produced the effects described. It has been a participating agent that has the ability to move and shift the network in previously unimagined ways. In this network, there are architects, material, modernist ideologies and chemical reactions, all wading in a network, where other times the surface treatment is necessary, while other times, with other architects, ideologies and material properties, the surface treatment is absent. The interactions the material forms with other elements are not therefore linear and do not produce specific and predetermined effects. Rather, the manner of interaction in this intricate grid of associations is complex and difficult to conceptualize in an absolute way. We cannot draw a particular set of manners of interactions; no direct relationships between components that produce linearly or vectorally defined effects. The effects that are produced with this interaction of human and non-human agencies are best thought of as cut off from the elements that have produced them.

This lack of path, the absence of a clearly delineated way of properties arising, is typical in all the examples described above. The examples provided are only a few samples of emergent properties that may come about of the material interaction with other



agencies. They are by no means exhaustive, but they exemplify the emergent way the properties come into fruition. There is no clear reason, but many agencies interacting that bring the properties about. These assemblages are far greater than the sum of its parts, and the element of surprise I argued for above, is also coming from this non-linear emergence.

### *Continuously changing*

The lack of a linear causality discussed above, also involves a continuous transformation. Because the elements that interact are infinite, and the assemblage in an open-ended grid of associations, the elements it acquires in its path, and other that it leaves behind, are continuously changing. There are infinite potential elements to the assemblage, infinite potential combinations, and infinite ways in which it can take, and because the combinations are continuously changing, the assemblage and its emergent properties are also constantly shifting.

### 7.5.2 Property emergence

In the final part of this chapter I want to conclude by describing how these emergent properties are coming into fruition: what happens in these assemblages of the built environment that make concrete acquire properties beyond the original intended ones it is charged with? Concrete in Park Hill has moved well beyond the initial structural role the material has. Through the examples given above, concrete has shifted from a structural component, to a historical, a visual, a cultural and a comfort element. This emergence of its properties is brought about through its interactions with other agencies. To describe just how these properties become emergent in the case of concrete, one has to look back to Deleuze and the framework he offers for conceptualizing emergent properties.

### *Instances of deterritorialization*

Deleuze on his book on Kafka gives the description of the mouth, which has been deterritorialized from an instrument of food consumption and ingestion to an agent of language and communication (Deleuze and Guattari, 1986:20). Section 2.4.2 saw the deterritorialisation potential in assemblages: the teeth, served to grind food, and the tongue to assist in the consumption. The way teeth, oral cavity and tongue interacted with the food, make the food easier to be consumed and digested subsequently by the stomach. But the role of these elements changed with the emergence of language. Teeth and tongue became means of articulation of consonants, and the shape of the oral cavity assists with the articulation of vowels. Their role has been deterritorialized from means of food consumption and ingestion, to vehicles of language articulation. Concrete, in a very similar way, has been deterritorialized from a structural means that had a very specific role in the building assemblage, into a visual and aesthetic feature. The role of concrete initially was purely a structural one, shifting eventually into other roles. This did not happen overnight. Just like in the case of the mouth where the development of language was a long and slow process and took place over several thousands of years. Concrete again, in the past 150 years has gradually attained these properties, has very slowly but steadily been reterritorialized into a means of achieving other properties, beyond its purely structural ones.

The examples of concrete being deterritorialized into agents other than those it was initially serving has been described in the previous sections of this chapter. Architectural History is rife with such instances of deterritorialization of structural components, beginning with the ancient Greek temple: the frieze is the product of the timber frame and the marble triglyph, the ending of the timber beam, as described by Laugier (1753) and his primitive hut and Inigo Jones' St. Paul of Covent Garden was presented as just another skillful replication of this observation.

### *Relations of exteriority*

A further way in which properties become emergent, is through relations of exteriority. DeLanda describes these relationships in assemblages where immaterial things are entangled with elements that are normally thought of as human constructs. As previously described in section 2.4.2, the relationships they form with each other should be external to the assemblage. In the case where they are internal, the assemblage properties are not altered, in other words their mode of interaction produced no effect. But in the case where the properties are of the exteriority type, the assemblage tilts to other properties also, and more properties are becoming emergent.

The way concrete interacts with other agencies in Park Hill is twofold. With steel components, formwork and anticorrosion agents, it forms relations of interiority. The fact that it has stood there for 50 years testifies to that. These types of relationships have enabled it to stand and impose its presence in the Sheffield skyline and over the city centre for all this time. But in the case of the H-cores, interacting with users, Urban Splash corporate identity, and the historical connotations that English Heritage had charged them with, they give rise to visual, historical and comfort connotations. Furthermore, to keep true to their ideas about the importance of concrete, they were keeping the concrete of the H cores exposed. Maintaining the concrete structural frame, has led to the material forming relationships of exteriority with other actors of Park Hill, and in this case structural actors. But then the designers had of course to put the structural integrity above all and the interaction of concrete with other structural components, and that was interior to the assemblage. The behaviour of users in Park Hill has also formed relationships of exteriority with the exposed concrete interiors that do not alter the nature of the assemblage of Park Hill. The behaviour of the residents inside their apartments, their modes of interaction with the material, are interacting with the assemblage, but their mode of interaction remains of the exteriority type relation.

### *Myriad potentials for actualization*

There is not a single path that relations follow to achieve a predetermined state of a property that is fixed in time. The possibilities are endless for the potential interactions, and they are therefore continuous. Never seeking to be finalized, these interactions continuously give rise to new emergent properties. Every time another agency is introduced into the assemblage, many new thousands of potential ways of interactions are opened up, which in turn will give rise to more emergent properties. So the shifting and changing of the assemblage is continuous and endless. There is not a fixed determined state the assemblage is trying to reach, but myriad potential endless states that all may or may not come into fruition.

In these endless potentials that make the assemblage not static but ever changing there is a distinct lack of hierarchy. There is not right or wrong, better or worse way. There are only potentials, all equably attainable, or not attainable, but in no case can there be a hierarchy of supremacy of one over the other. Every potential shift is different, but in a non-discriminatory way. But it is not only the interactions of elements that are continuously shifting in previously unimagined ways, towards non-linear paths and modes of interactions. The properties are also continuously changing, in new ways, in undetermined ways. What becomes important at any time, or in any place, is also continuously shifting and changing, making a predetermined, intentional linear path impossible to conceive and be to directed in a desired way.

## Conclusions

Tracing the concrete in Park Hill has revealed aspects of the material previously unimagined. Through the journey of its tracing, I have made several observations on its activeness. The dissertation began with the aim of providing a better understanding of materials in architectural studies and unravelling them in the specificity of concrete as an exceptionally versatile material.

To achieve this, I initially explored theoretically the active potential of materials. In Chapter 2, I conceptualized matter in a mode where it can exhibit its powerful potential to act. Contrasting with the predominant views of architecture to deal with matter as passive and inert, one could describe it as having an agency. This non-human action that I presented through the literature, challenges the traditional views of philosophical agency associated with a human capacity to act. I then revisited the notion of assemblages as initially described by Gilles Deleuze and Felix Guattari and later by Manuel DeLanda, Jane Bennett and Graham Harman, to describe how the built object can be thought of as an assemblage of components. I concluded Chapter 2 by presenting the notions of affordance and affect as ways of experiencing architecture beyond linear and expected representational ways. They can provide a mode of thinking of material actions instigated independently of the actions of an object.

In the fourth chapter I revisited the historiographical literature on concrete, and described on-going discussions of the material, predominantly viewing it as a static presence. The renewed interest in concrete that was presented, has also sparked a surge in publications,

many of them focusing on brutalism and the social intentions of the style. But through this recent surge in the literature of concrete, there were moments when the material, through accounts of other authors, was suggested as active, beyond the intentions it is expected to serve. Although it is not explicitly described as such, it can demonstrate the ability to instigate actions. The third chapter concluded that there is further potential for investigating the actions of concrete in the everyday realm of architecture. Indeed, there are instances when in the same scenario the material was revealed as active at certain instants and static and inert at others, fluctuating with changes in its context and properties.

I then stepped into the specificity of concrete in Park Hill in empirical Chapters 5, 6 and 7 to study its daily performances and manifestations. In Chapter 5, I presented elements of the original 1960s Park Hill and its revival in the current redevelopment alongside a parallel revival of brutalist architecture. I argued that the way the material has participated in its contemporary discourses goes hand in hand to the rise and fall of the development. By tracing concrete in Park Hill and other estates in concrete, I have presented in Chapter 6 its capacity to agitate everyday activity for those experiencing it, inhabiting it, or working with it. This action is not occurring autonomously for the material but in the realm of the assemblage it is affiliated with. Both Chapters 6 and 7 described these complex relationships and what stems from the co-existence of concrete in networks of other material and immaterial components. With its involvement in these networks, it presents itself as an activated powerful agent, a vibrant component with the ability to instigate actions and properties. It has triggered complex discussions between material and human actors, and given rise to emergent properties through their co-existence; visual, aesthetic and comfort were conditions presented as springing from this interaction. Much like the nature of interaction they stem from, these conditions are fluid and undefined by boundaries themselves. They therefore also exist in a continuum of properties, oscillating among social, cultural, aesthetic, comfort and visual, and the list is not exhaustive. The properties they elicit, much like the assemblage they are an indirect outcome of, are fluid

and dynamically shaped by this interaction and span across an array of unlimited ways of perceiving of the built environment.

## 8.1 Contribution of the findings to existing bodies of knowledge

### 8.1.1 Contribution to architectural studies

The initial and most significant findings contribute to architectural studies by challenging the way we look at concrete in three ways: Firstly, I have described concrete in its interactions with human and non-human entities. Secondly, I have described this interaction by revisiting the notion of assemblages, to argue that it becomes activated in the network and exists in an assemblage. Finally, because it interacts with these entities in a network and because it is activated in this network, it constantly stabilises and destabilises over time.

#### *Concrete interacting with human and non-human entities*

In Chapter 5, concrete was established as a presence that manifests itself differently in various historical contexts. I have repositioned, in Chapter 6, the autonomous or with limited interaction state in which it is described in, in a network. In this network concrete has the capacity to be acted upon, but also act. The dialogue the material participates in involves human and non-human actors and oscillates from a materially deterministic mode of engagement to a constructed mode. In a seemingly non-human interaction like in the case where it starts spalling off a building (section 6.2.1), it becomes active with minimal human input. When residents either become fascinated by it or despise it (section 6.5), constructed past experiences (section 6.5.1) and visual qualities (section 6.5.2) can play a part. In this respect it is activated in an almost exclusively human realm. Yet it is never exclusively in the one or other domain, but always lying in the area in-between, simultaneously involving human and non-human actors. The interaction of concrete with these actors, as was presented in Chapter 6, is never static and stable, and does not acquire equilibrium, as demonstrated in section 6.3; the new plan of the redevelopment of Park Hill was adapted in section 6.3.1 as a result of both the

stabilising material forces of the H-cores (section 6.3.2) and service risers (section 6.3.3) as well as the intentions of the developers. Contrary to a material deterministic view that would imply the material performing independently without human interaction but also contrary to a simple interaction where material presence would be invisible, concrete is shaping and being shaped through its participation in an ecology of entities.

This finding has been inspired by the Science and Technology Studies and Actor Network Theory to inform our thinking about materials in architectural studies. Isabelle Doucet (2015), who identifies a “*criticality from within*” turn in architecture looking at practical aspects, and Albená Yaneva (2013b), that describes buildings amidst a network of political, scientific and technical controversies served as inspiration to this research. This finding sits alongside anthropological studies in architecture that critically discuss materiality through the lens of culture (Buchli, 2013) and material culture that views objects as cultural products of social relations (Upton, 2008). My contribution lies in the way architectural studies present materials to interact with other human and non-human aspects of the built environment. I have searched for the material properties and introduced material interactions in the specificity of concrete, which inform the relations and assist in dialogues with professionals, users, occupants, and the material.

#### *Concrete activated in an assemblage*

Assemblages were brought into the description of concrete to describe it as a material of many components with infinite potential to be shaped. But assemblages also allowed concrete to be understood in this complexity of interactions that is frequently neglected. The engagement of the material with multiple settings involving multiple actors simultaneously is what activates it in this networked reality. In the realm of the user and the occupant (section 6.5), concrete influences actions in their lives like decisions to buy apartments and choices of furniture. In the realm of the urban it influences decisions on the renovation (sections 6.4.2 and 7.2.3) and in the realm of the developer it shapes the design of the flats (section 6.3). In all of



the contexts I described concrete, it was activated together with its context and the material properties. The assemblage includes the context, the material and its properties; it is the continuous interaction of all the above and cannot be reduced into context or material. All coexist simultaneously, interacting and reconfiguring each other. Concrete therefore in these multiple ecologies in which it participates, widens the network in which they exist. Everything in this network is interconnected, and continuously acquiring entities, while letting at other times others go. Viewing human interactions and the material in a network where concrete becomes activated, is a finding of the study.

Views of buildings beyond static and in a Euclidean state, but as "*objects in flight*", did not explicitly discuss materials as part of their networked descriptions. This is why I turned to the new materialisms, as they can provide a framework to read the built environment through the "*actions*" of materials. The work that has emerged previously from this amalgamation of architecture with materialist thought still has to address the human–non-human interaction in the built environment with a clear focus on materials. For example, Helène Frichôt (2013) has theorized the biotechnological paradigm in architecture raising questions as to what is ultimately human and non-human; Manuel DeLanda's work revolves primarily around self-organization concepts and the new materialisms and the processes applicable to an understanding of an urbanity (DeLanda, 2005; Leach, 2009c); Neil Leach discusses the material scripting and digital fabrication possibilities, affected also by the understanding of the potential of matter in this effect (Leach, 2009a, 2009b, 2014). My thesis offers another view of materialist understanding by going back to the physicality of concrete viewing it as a mixture of tangible material components. Using the case of concrete I have presented the possibility of re-evaluating the presence of matter in architecture, not as a manmade construct but as an unintentional agent. The multiple realities of the material revealed concrete both as a construct and as an active physical presence. Concrete presents itself as stripped down from human intentions in a

materialist way, but at the same time still interacting with human interventions and constructed experiences.

*Concrete beyond a stabilised and solid description*

Concrete in its descriptions in architectural studies literature is commonly reduced to a few particular features. In Chapter 4 I presented how in engineering, it is depicted as solid, passive and “concrete”, how it is attributed an inertia in historical and architectural theory accounts, and how meaning and intentions of architects are projected onto the material. Later, in the fifth and sixth chapters, I discussed how popular perceptions view it as a negatively constructed notion, associated with “*monstrosity*”, and “*jungle*” but these associations are either coincidentally constructed, or speculative (sections 4.5 and 6.4). I described this stabilisation of concrete in limitedly perceived states by borrowing the term from Simondon (section 4.3). Through a continuous process of thinking and rethinking of the material in this constructed mode, these features have been interpreted and ultimately reduced to only a few: a means of projecting certain meaning and a solidified passive entity. While the black box of the materiality of concrete remains unopened, concrete has remained a stable, and solid entity.

However, when I visited the material in many of its settings, it revealed itself as anything but solid: in a construction setting it was influencing decisions with its physical properties (sections 6.3 and 7.2); in the context of renovation it was shaping the layout of the apartments (section 6.3.1); in the experience of the estate spalling not only did it display a physical manifestation of concrete to act, but it also influenced the perceptions of the occupants (section 6.2). The material nature of concrete also influenced the constructed ideas of residents. Similarly, with its maintenance (section 7.3.2) and weathering, the physical neglect (a human action or lack thereof) created a material effect, a non-human, unintended and unimagined outcome, and this in turn constructed a human perception. The spalling state is just another condition (section 6.2.1), as is the weathered concrete. Neither of them should be ignored because of the problems they create and both should be appreciated as instances occurring in the material

together with its interactions with different settings. They are simply another state the material manifests itself in, and these various states emerge from such an interaction.

Concrete presents continuously different manifestations, when experienced both as a physical and as a constructed object. This experience relates to both physical properties (i.e. colour, spalling, strong compressive strength) as well as the constructed experience of the perceiver through personal experiences (section 6.5.2). Because they vary so infinitely, the material appears to present a different aspect ever time. As it was active in its networks, there were instances where an emergent change came through concrete. For example, in Chapter 7, I described concrete as a vehicle of emergent comfort (or lack thereof) and of emergent safety, both through the lens of the occupants. The emergent properties that concrete emanates, result from its positioning in multiple settings and through its participation in coexisting networks. When these networks tend to be stabilized, material properties were solidified making the material of concrete understood in a single state. However, networks continue to fluctuate, and from them, properties can further emerge. This is what enables the material to be revealed in states previously unaccounted for.

There are occasions when building materials in stabilised states are challenged in the literature. Yaneva (2013b:19), for example, questions whether glass can exist only in a transparent brittle state and Cairns and Jacobs (2014) present material deterioration, decay and death of buildings as an inevitability. Lloyd Thomas argues that concrete is "*mattered*", serving as a paradigm for matter because of the fluidity of its shape, perceived in a similar manner to the way Simondon perceives clay: raw, fluid matter (Lloyd Thomas, 2015). My contribution lies alongside these accounts. The solid descriptions of concrete were stripped to uncover other states in which it manifests itself, and I have further contributed by describing these states as the emergent result of an interaction, a finding that sits in the field of architectural and studies of concrete.

### 8.1.2 Contribution to methodology

Following the presentation of the theoretical context in which concrete exists, I have questioned how could such a complex material be studied. Viewing concrete as a black box, only allows for a limited exploration of “*how*” and “*why*” it can trigger effects. To argue that it is constantly changing and on the move, I opened up the material characteristics of concrete to investigate the interaction of their physicality with the cultural, social and constructed connotations it carries. In describing the renovation decisions (section 6.3), I introduced the structural and visual properties of the material and the emergent comfort and safety properties from material actions. In the case of soffit cracks (Section 7.4), I described them through the structural behaviours of concrete triggering a human effect. I have been tracing the various networks concrete participates in, collecting information from varied sources, combining archival material with interviews and observations of the material and the participants. The network in which concrete has been revealed in, is precisely revealed as such because of the methodology. Without ignoring architectural theory methodologies, I allowed the tracing of the material to lead the search for information. To do so, I opened the solid impermeable façade of concrete to explore what happened within this fluid material.

Material culture often perceives the object in a single setting of space and time. The study of the object in this respect is the relationship between humans and objects, either irrespective of context, or by only acknowledging one aspect of the context. This is most evident in non-representational accounts of object descriptions, e.g. affect. In the occasions where the object is understood in relation to its context, it is viewed narrowly so, and strongly related to aspects of the consumption or commodification of the object (Appadurai, 1988) and in social interactions (Miller, 2008; 2010). The potential the setting offers to the interaction of the human with the non-human, is brought into the discussion more evidently in ANT accounts, when the black boxes are opened and the object participates in the same networks as human constructions; the object exists in a realm of the mediation of the two (Latour, 1987, 2005;

Akrich, 1992; Akrich et al., 2002a; Yaneva, 2009b; Doucet, 2015). Tracing it in different contexts I have revealed multiple aspects that can be read through the material, specifically because I have traced it in multiple contexts. The contribution lies in that I have implemented this methodology specifically in the study of materials in architecture and this opens up the possibility for materials to be further read in multiple contexts, to allow for other modes of existence to be uncovered. The vibrancy of concrete reconfigures how we can approach material research in architecture differently, by appreciating the different modes of concrete.

### 8.1.3 Contributions to studies of concrete

Appreciating the different modalities of concrete in Park Hill and the range of networks it has participated in, specifically informs studies of concrete in two ways: Firstly I challenge the view that architects are the omnipotent architect by uncovering the everyday interactions of professionals with the material and the agency concrete has in this interaction. Secondly, I question the idealised social intentions concrete is charged with in descriptions of brutalism.

#### *Challenging the all-powerful architect*

Views of concrete that present the material coming together through the actions of a single heroic architect have predominantly preoccupied architectural historians like Calder, Collins and Forty, as I have presented in the third and in the fifth chapter.

Barnabas Calder offers to the heroic architect the potential to apply his or her powers on the material (Calder, 2015) and yet Adrian Forty has identified moments when it has slipped intentions and definitions. My description discovered moments when the material became active, and the impact of the material with its exuberance, has avoided the intentions of the creator like the plan design (section 6.3), or has worked in tandem with his/her desires in the listing decision (section 6.4). I also discussed concrete not as a technical object, but with its emergent properties being of concern for the engineers and architects involved with its ornamentation. The Hennebique approach presented in Chapter 4 was not concerned with aesthetics (Cusack,

1984); yet, this construction method in the case of Park Hill (section 7.3.1) stabilised the concrete frame into creating a particular aesthetic. Over time, architects have harnessed its technicalities for the creation of a new “*style*”. Laugier’s primitive hut was presented as the example of a form stabilised into a structure. Katie Lloyd Thomas (2004) described how the characteristics of materials, are constructed through specification, yet, I argue that concrete participates in its use and everyday interaction with actors, influencing decisions and actions. Revealing the mode of emergence of these properties makes the material presence more prominent.

### *Challenging the idealised use of concrete*

Because I have challenged the powers of the architect over the material, this opens up the possibility to challenge the associations architects portray upon the material. Concrete use in the brutalist estates of the sixties is charged with the intentions to bring about an idealised social change, even if this change did not last. By moving away from accounts of architecture as a projection of an idea and concept, concrete is not anymore the surface on which we project intentions. Neither is it solely a realm of social values, political decisions and cultural factors, as critical theory would present. I am challenging the associations of concrete with pure intentions and the idealised condition it was meant to generate.

While the use of the material as a means to the architect’s creativity is not dismissed, the importance of its everyday interaction is also brought into the discussion. My thesis has presented the material both when it was charged with human input and designers intentions but also when it was given space to actively influence and participate in networks. The spalling, beyond its physical manifestation, also takes part in questioning the purpose of the presence of concrete; it alters the perceptions and the experiences of the occupants and the passers by, and creates constructed experiences that are then attributed with negative connotations.

Describing the material properties more in line with a materialist world-view chronologically coincides with the renewed interest in brutalism. Indeed brutalist discussion

revolves around the socialist ideas it was originally intended to represent. For the new enthusiasts, the style is always related to the presence of the material and itself is not to be admired for the mere beauty of it. John Grindrod author of “*Concretopia*”, as I discussed in section 7.2.3 deliberately coins the material with a “*utopia*” as a representative of the social dimensions of the style (Grindrod, 2013). Owen Hatherley has argued both on the aesthetics of the concrete but also on the ethical associations it carries from its original intentions and has consistently expressed this view in books and newspaper articles (Hatherley, 2011) while Harwood associates brutalism with the post war optimism (Harwood and Davies, 2015). As I have already discussed from the first chapter, the surge of relevant publications is overwhelming in recent years, with more recently, the release of Barnabas Calder of “*Raw concrete: the beauty of Brutalism*” (Calder, 2016). For Calder, the effect of concrete lies both in the potential to ameliorate the lives of residents and as the playground of a group of well-educated architects blowing the budget of the welfare state. Providing two different accounts that rely on human intentions raises the question of what has made concrete the vehicle of such experimentation, and to answer this, unpacking the material properties is essential.

Moving away from accounts of objects presented through their biography, or by being the creation of an author, “*things*” can tell multiple stories of themselves and of the people they interact with. These stories of the objects do not end with the creation, by closing the black boxes. There is no moment in time when the objects become absolutely stabilized, but because of the continuous changing of their setting they are continuously producing more narratives.

## 8.2 Contribution to contemporary debates and professional discussions: possible further research

Having tackled concrete with a greater emphasis on the everyday interaction in networks, I suggest that employing a view where the material exists in between constructed assumptions *and* materialist world views, has the potential to open new paths for the brutalist discourse to be explored. With descriptions and discussions of brutalism which are very much

en vogue again, one could wonder whether they could perhaps more closely be studied more to bring something to the discussion. There is clearly a revival not only on brutalist discourse but also on modernist heritage to which concrete contributes. These debates focus extensively on whether we like the brutalist estates or not and whether concrete is in fashion or not. Could they be becoming too polarised and too reductive? My study shows different reasons why we should appreciate concrete. We could more closely consider questions not directly related to style: Why did brutalism become associated with concrete, why was it described as such and used the same examples of brutalism? The school in Huntstanton by the Smithsons, the epitome of the style of brutalism according to Banham, was hardly made out of concrete. Just how did the material come about to be used? How did the material establish itself beyond the mere social change it involved? How important was this social change that concrete was meant to trigger and how it was it perceived by the users? What material aspects of concrete influence its effect? Having already touched on some of these questions in my research, they could be further explored giving the material a stronger presence in a brutalist sociohistorical context that can bring about unexpected results. There are more routes to consider in revisiting the heritage status and the legacy of these estates. The way we discuss brutalism is it not too much about style? My study gives a different appreciation of brutalism to that depicted in the popular press.

### *Epilogue*

By following the thread of the material, the stories it describes to everyone interacting with it, using it, occupying it, experiencing it, I was able to reveal the agency of concrete in different situations. Materials are able this way to acquire an eminent presence, to demonstrate their abilities. Using this method informed by pragmatism and without ignoring critical theory views of the material as projection of social distinctions and social voices and context, I would suggest that materials in architecture should be studied in this way, to account for the



multifaceted nature, acting both as objects and subjects as, both material and a product of discourse, both as nature and culture.

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## Archival Material - from the Sheffield City Archives and Local Studies

		Date	Document type	Wording	Details
1	Council and committee meetings 1930-1948	1930s -1950s	Estates Committee,	Index references to housing, clearance schemes/areas, orders, Compulsory Purchase Orders, demolition of property, contracts, unsanitary areas/premises, progress reports, Medical Officer of Health Official Representations regarding demolition. Remit from 1950s transferred to Housing Committee	(Sheffield Archives: CA-MIN)
2		December 1957 – May 1959	Housing Committee,	Park Hill index references include Compulsory Purchase Orders, appointment of consultant engineers, closure of roads and other rights of way, demolition of properties, electrical services, garages, Garchey refuse disposal system, heating and hot water, laundry facilities, licensed premises, meeting room accommodation, open spaces, planning consent, public inquiries, public's inspection of the flats, shopping precinct, shops, tenders, the laying of the foundation stone at Park Hill (Part 1).	(Sheffield Archives: CA-HOU/2/7)
3		8th January 1930	Motion regarding housing in Sheffield and Council instruction,	Motion regarding housing in Sheffield and Council instruction,	(Sheffield Archives: CA-MIN/68, pp. 184-5);
4		17th September 1930	Estate Committee's response,	Estate Committee's response, including overview of obligations under Housing Acts of 1925 and 1930.	(Sheffield Archives: CA-MIN/68, pp.849-853)
5		26th September 1934	Estates Committee Special Meeting	Deputation including Lord Mayor and City Architect visited London 19th July 1934 to inspect buildings on the Flat System erected under Housing Acts 1923, 1924 and 1930. Deputation also visited Liverpool, 2nd August 1934 for the same purpose.	(Sheffield Archives: CA-MIN/72, pp. 880-881)
6		18th April 1934	Estates Committee,	Adoption of report by Housing Sub- Committee of 12th April 1934 recommending clearance under Housing Act 1930 of area in and around Bernard Street, Duke Street, Bard Street and School Lane, including Compulsory Purchase Orders and demolition "for the purpose of securing a cleared area of convenient shape and dimensions...reasonably necessary for the satisfactory development or use of the cleared area..."	(Sheffield Archives: CA-MIN/72, pp. 459-460)
7		29th November 1933	Estates Committee.	Official Representation to the Lord Mayor, Aldermen and citizens of the City of Sheffield [regarding demolition in the Duke Street area] by John Rennie, Medical Officer of Health,	(Sheffield Archives: CA-MIN/72, p. 137)
8		17th April 1935	Estates Committee	. Resolution: Chairman and City Architect authorised to visit Paris for the purpose of inspecting a system of refuse disposal installed in certain modern flats in the city.	(Sheffield Archives: CAMIN/ 73, p. 575)
9	Council and committee meetings 1949-1961	28th April 1949	Housing Committee (Special)	Considered in principle the question of erecting multi-storey flats with lifts. Schemes in the London area to be inspected, and information gathered on flat developments in Scandinavia.	(Sheffield Archives: CA-MIN/86, p. 899)
10		18th May 1949	Housing Committee	Visit to Denmark and Sweden to inspect multi-storey flats in Copenhagen and Stockholm to obtain information on this type of housing development. Deputation, including Chair of Town Planning Committee, Town Clerk, City Architect and Planning Officer, to visit 27th June – 2nd July 1949.	(Sheffield Archives: CA-MIN/87, p.20)

11	17th August 1954	Housing Committee (Development Sub-Committee)	Resolved that authorisation be given to a visit to selected towns and cities in Western Europe for the purpose of inspecting post-war developments in the erection of multi-storey flats and studying the designs and methods of construction employed in relation to that type of development. Aldermen Gascoigne and Turner, Councillor Lambert, City Architect and the General Manager of the Public Works Department to attend.	(Sheffield Archives: CAMIN/ 92, p. 192)
12	15th February 1955	Housing Committee	. Compulsory Purchase Order recommended under Section 74 Housing Act 1936 and Acquisition of Land (Authorisation Procedure) Act 1946, for provision of housing accommodation in the vicinity of Duke Street, Anson Street, Duke Street Lane, Norwich Street, Long Henry Street, Rhodes Street, Talbot Street, Stafford Street, Talbot Lane, Lord Street, Hague Lane, South Street, Bungay Street, Bungay Lane, Granville Lane, Turner Hill, Granville Street and Gilbert Street.	(Sheffield Archives: CA-MIN/92, p. 580)
13	15th March 1955	Housing Committee (Special)	Report submitted from Deputation of Housing Committee relating to their visit to certain European	
14	Sep-54	Countries	Countries in September 1954 for the purpose of studying multi-storey housing development in those countries. Also submitted a report by the City Architect, City Treasurer and Messrs. Cyril Sweett and Partners, Chartered Quantity Surveyors, upon proposals for the redevelopment of the Park Hill area (Part 1). Proposals approved. Housing Committee recommends that gas made available in order that tenants may have a choice between electricity and gas cooking facilities.	(Sheffield Archives: CA-MIN/92, p. 627)
15	15th March 1955	Housing Committee	Site clearance (Part 1). Bounded by Anson Street, Duke Street Lane, Long Henry Street and South Street, including rehousing of occupiers of 38 temporary bungalows and 45 other dwellings in the area. Recommends an Order to extinguish certain public rights of way along streets and parts of streets: Lord Street, Gilbert Street, Hague Lane and Long Henry Street; also to close parts of Anson Street, Gilbert Street, Duke Street Lane, Lord Street, Norwich Street and Long Henry Street.	(Sheffield Archives: CA-MIN/92, p. 628)
16	15th March 1955	Housing Committee (Development Sub-Committee)	Recommends a public exhibition in the Town Hall Reception Room of plans, drawings and photographs relating to the Park Hill redevelopment.	(Sheffield Archives: CA-MIN/92, p. 632)
17	20th May 1955	Housing Committee (Development Sub-Committee)	Leases agreed for use as licensed premises on Duke Street (shopping centre), South Street (North, South), Duke Street (South) with Brampton Brewery Company Limited, Duncan Gilmour and Company Limited, Hope and Anchor Breweries Limited, William Stones Limited.	(Sheffield Archives: CA-MIN/93, p. 35)
18	24th June 1955	Housing Committee (General Sub-Committee)	William Holford, Professor of Town Planning at University College London refers to the Park Hill project as a "notable a forward-looking redevelopment scheme which should receive every encouragement" (on a B.B.C. Third Programme broadcast 'Is Town Planning Possible?')	(Sheffield Archives: CA-MIN/93, p. 121)
19	21st July 1955	Housing Committee (General Sub-Committee)	Compulsory Purchase Order (31,835 square yards) under provisions of Section 74 Housing Act 1936 and Acquisition of Land (Authorisation Procedure) Act 1946.	(Sheffield Archives: CA-MIN/93, p. 184)

20	10th August 1955	Housing Committee.	Approves and adopts the Slum Clearance and Redevelopment Programme report for the city, relating to the Corporation's housing programme and provision of new dwellings, to be presented to the City Council. Report recommends the redevelopment of Park Hill, Netherthorpe, Woodside Lane and Burngreave (in that order) in the form of multi-storey flats, maisonettes and terraced houses.	(Sheffield Archives: CA-MIN/93, p. 215)
21	19th August 1955	Housing Committee.	Heating and hot water installation at Park Hill redevelopment area,	(Sheffield Archives: CA-HOU/1/1, p. 5)
22	18th November 1955	Housing Development Sub-Committee	Cost of installation of central heating and hot water systems in Part 1 of the Park Hill redevelopment scheme agreed as £99,413,15s,0d.	(Sheffield Archives: CAMIN/ 93, p. 415)
23	23rd February 1956	Housing Committee (General Sub-Committee)	Slum Clearance programme – recommends first year to include Park Hill (Part 1), 85 properties cleared; stage 2, 389 properties cleared (271 to be re-housed).	(Sheffield Archives: CA-MIN/93, p. 644)
24	23rd February 1956	Housing Committee (General Sub-Committee)	Selection of building contractors: tenders for the construction of 976 dwellings and other building works in connection with Part 1 of the Park Hill redevelopment include John Laing and Son Limited, George Wimpey and Company Limited, M. J. Gleeson Limited and Henry Boot and Sons Limited.	(Sheffield Archives: CA-MIN/93, p. 645)
25	23rd February 1956	Housing Committee	Town Clerk reports that planning permission for Part 1 has been granted from the Ministry of Housing and Local Government.	(Sheffield Archives: CA-MIN/93, p. 646)
26	19th June 1956	Housing Committee (Development Sub-Committee)	Reported that the Ministry of Housing and Local Government had granted planning permission regarding the development of land in Part 2 of the Park Hill Redevelopment Area.	(Sheffield Archives: CA-MIN/94, p. 116)
27	5th November 1956	Housing Committee (Development Sub-Committee)	Authority to be given to the Public Works Department to erect 990 dwellings and other buildings, estimated cost £2,158,587. Some objections, favouring the tender of John Laing and Son Limited (£2,358,818,6s 8d). Rejected 7 to 5.	(Sheffield Archives: CA-MIN/94, p. 446)
28		Council Motion (amendment)	Council Motion (amendment) that the acts and proceedings of the Housing Committee 5th November 1956 regarding the authority given to the Public Works Department to erect 990 dwellings in Area 1 of the Park Hill Redevelopment Scheme are not confirmed, and should therefore be referred back for further consideration. Amendment rejected 57 to 25, 7th November 1956.	(Sheffield Archives: CA-MIN/94, p. 414)
29	20th November 1956	Housing Committee (Development Sub-Committee)	Park Hill (Part 2), Compulsory Purchase Orders on land in the vicinity of Maltravers Road, St. John's Road, Chancel Street, Wybourn Road, Manor Oaks Road, Park Hill Lane, Hampton Street, Blagden Street, Dacre Street, Bernard Lane, Simonite Lane, Rough Bank, Weigh Lane, Staniforth Lane, Bernard Street, Long Steps, Snow Hill and Cricket Inn Road.	(Sheffield Archives: CA-MIN/94, p. 450)
30	15th January 1957	Housing Committee (Development Sub-Committee)	Consent to loan £2,338,712 for the erection of 990 dwellings and other buildings in the Park Hill Redevelopment Scheme.	(Sheffield Archives: CAMIN/ 94, p. 571)
31	21st June 1957	Housing Committee	Regarding leases of shops to be erected within the Park Hill development	(Sheffield Archives: CA-MIN/95, p. 102)
32	16th July 1957	Housing Committee (Development Sub-Committee)	Resolved that the Garchey system of refuse disposal in 994 dwellings be installed by Matthew Hall and Company Limited at a cost of £80,327,6/0.	(Sheffield Archives: CA-MIN/95, p. 217)
33	8th January 1958	Council	Council 8th January 1958. Compulsory Purchase Order submitted relating to 119,258 square yards in	(Sheffield Archives: CA-MIN/95, p. 588)



the Park Hill area.

34	18th February 1958	Housing Committee (Development Sub-Committee)	. Report, plans and model submitted by the City Architect, illustrating preliminary proposals for the layout and development of Part 2, to be approved.	(Sheffield Archives: CA-MIN/95, p. 697)
35	25th April 1958	Committee	Committee recommends a foundation stone be laid in the form of a paving slab in a paved area adjoining the new shopping precinct, to commemorate the start of Part 1 of the Park Hill Area Redevelopment Scheme. Aldermen Gascoigne and Turner to be invited to perform the formal ceremony of laying the stone on	(Sheffield Archives: CA-MIN/95, p. 697)
36		Deemed planning consent for Part 2 of the Park Hill scheme.	Close streets or parts thereof: Bernard Lane, Blagden Street, Dacre Street, Simonite Lane, Weigh Lane, Bevis Street, Rough Bank, Staniforth Lane, steps leading from Staniforth Lane to Bernard Street, Park Hill Lane, St. John's Road, St. John's Walk, Bigod Street, Rubens Street, Rubens Place, Chancel Street, footpath between Park Hill Lane and Weigh Lane, parts of Hampton Street, Manor Oaks Road, Wybourn Road.	(Sheffield Archives: CA-MIN/95, p. 698)
37	9th May 1958	Housing Committee (General Sub-Committee)	Messrs. Cyril Sweett and Partners, London, Quantity Surveyors, and Messrs. Ove Arup and Partners, London, Consulting Engineers, to be appointed for work on Part 2 of the Park Hill Redevelopment Area.	(Sheffield Archives: CA-MIN/96, pp. 86-87)
38		Park Hill Lane,	land at, Compulsory Purchase Orders	(Sheffield Archives: CAMIN/96, pp. 379, 551)
39	17th February 1959	Housing Committee (Development Sub-Committee)	Tender of W. J. Simms, Sons and Cooke Limited, Nottingham, (£556,750) to be accepted for 152 dwellings, 170 garages and one public house on sites within Part 2 (Stage 1) of the Park Hill Redevelopment Scheme. Additional £4,900 for the provision of cookers and water service; estimated £5000 for landscaping by the Parks Department.	(Sheffield Archives: CA-MIN/96, p. 842)
40	17th March 1959	Housing Committee (Development Sub-Committee)	Resolved that members of the Housing Committee visit London April 1959 to inspect selected multi-storey flat schemes, to help formulate proposals for the provision of social, recreational and general amenities for future residents of Park Hill (Part 1).	(Sheffield Archives: CA-MIN/96, p. 940)
41	17th July 1959	Housing Management Committee.	Park Hill (Part 1) to comprise four blocks (North, South, East, West). Each floor to be given a distinctive name, using names of streets in the area which are to be closed (add Row), e.g. Gilbert, Hague, Long Henry, Stafford.	(Sheffield Archives: CAHMC/ 1/1)
42	17th July 1959	Housing Management Committee,	Designation of postal addresses for Part 1 of the Park Hill development.	(Sheffield Archives: CAHMC/ 2/1, p. 16)
43	22nd October 1959	Housing Development Committee.	reports that a number of flats in Park Hill (Part 1) will shortly be available for occupation by tenants.	
44		Balustrades,	Balustrades, sometimes pierced, sometimes solid; roof paved with soil areas for plants. Ideal for mothers with very young children and for old people, pleasurable to walk about within by reason of its own layout and the fascinating views from it.	(Sheffield Archives: CA-HDC/2/1)
45	1959	Housing Management Committee	. Joint report by City Architect and Housing Manager on amenities and management at Park Hill (Part 1) [1959].	(Sheffield Archives: CA-HMC/2/1, p. 54 (9pp.))

46		[1959/1960]	Housing Management Committee,	'Park Hill – Part 1: Sociological Report' compiled by the Housing Department, giving an account of the experiences of the department, and of the general reactions of tenants following the first lettings of flats within the Park Hill estate.	(Sheffield Archives: CA-HMC/2/1, pp. 94-100)
47	Council and committee meetings 1962-1966	13th September 1962	Housing Management Committee	Housing Manager submits a report on a sample Social Survey (questionnaire) carried out at Park Hill (Part 1) between August 1961 and March 1962 by the resident Assistant Estate Manager. This includes a statistical analysis of residents' responses to questions about accommodation, storage, noise, the Residents' Association, laundry, pedestrian routes, lifts, shops and other amenities, the Garchey refuse disposal system, heating and hot water, children and play, design and rents. Its Foreword states that "from the results of the work done...it is manifestly true to say that Park Hill eminently justifies the forward looking vision of the Corporation when finally giving approval to the Scheme."	(Sheffield Archives: CA-HMC/2/1, p. 384 and pp. 388-400)
48		20th September 1962	Housing Development Committee.	Park Hill Scheme winning an Award for Good Design,	(Sheffield Archives: CA-HDC/1/1, p. 10)
49		23rd May 1963	Housing Development Committee	Royal Institute of British Architects' award for Park Hill (buildings completed within Sheffield and South Yorkshire, 1959-1961 inclusive). Awards to the City Architect and General Manager of Public Works. The Corporation to receive a replica of the bronze medal award, and a commemorative tablet to be fixed at a point within Park Hill.	(Sheffield Archives: CA-MIN/101, p. 13)
50		24th October 1963	Housing Development Committee	Additional 9 penthouse flats at £2000 each agreed for Park Hill (Part 2 Stage 2).	(Sheffield Archives: CA-MIN/101)
51		11th March 1965	Housing Management Committee,	Installation of automatic controls for the central heating system at Park Hill.	(Sheffield Archives: CA- HMC/2/2, p. 266)
52		7th July 1965	Housing Development Committee progress report	1169 dwellings completed (Park Hill Part 2 Stage 2).	(Sheffield Archives: CA- MIN/103, p. 50)
53	Council and committee meetings 1966-2011	1982-1983	Housing Committee.	Children's play areas at Park Hill estate, 1982-1983. (Sheffield Archives: CA-HOU/2/23) Housing Committee. Park Hill environmental works, phase 2, 1991.	(Sheffield Archives: CA-HOU/2/59)
54		(Sheffield 1996)	Sheffield City Council,	Housing Department, 'Park Hill: Open Day'	(Sheffield Local Studies Library: MP 3221 S)
55		(Sheffield 1999)	Sheffield City Council,	'Park Hill Streets in the Sky: Heritage Open Day' [leaflet]	(Sheffield Local Studies Library: MP 3474 S)
56		(Sheffield 1999)	Sheffield City Council,	Housing and Direct Services. 'Park Hill: Streets in the Sky' [leaflet]	(Sheffield Local Studies Library: MP 3398 S)
57		[Sheffield 2002]	Sheffield City Council,	Housing and Direct Services. Housing brochure for Park Hill flats	(Sheffield Local Studies Library: MP 3451 S)
58		(April 2004)	Sheffield City Council, '	Park Hill: Development Brief'	ç

## Archival Material from Concrete Quarterly

Issue no.	Quarter	Year
25	Summer	1955
26	Autumn	1955
27	Winter	1955
28	Spring	1956
29	Summer	1956
30	Autumn	1956
31	Winter	1956
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36	Spring	1958
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38	Autumn	1958
39	Winter	1958
40	Spring	1959
41	Summer	1959
42	Autumn	1959
43	Winter	1959
44	Spring	1960
45	Summer	1960
46	Autumn	1960
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48	Spring	1961
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50	Autumn	1961
51	Winter	1961
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56	Spring	1963
57	Summer	1963
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61	Summer	1964
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64	Spring	1965
65	Summer	1965

66	Autumn	1965
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Table 1- Type A Interview questionnaire – Professional actors

Overarching question	Additional Questions	Clarifying Questions
<b>Introduction</b>		
To go back before you were involved with Park Hill in your professional capacity, were you familiar with it?	What were your thoughts on the development before you embarked on the renovation?	
<b>CONSERVATION (current discourses)</b>		
How did you decide what to preserve in Park Hill?	Once the building was listed, what possibilities were you offered regarding the preservation of the building?	How did you reach the decision to maintain the concrete frame?
What was the aim of the preservation?	What was your opinion on this type of preservation?	Was the history of the building and its association with brutalism or its reminding of Unite involved in the decision on how to maintain the concrete?
Which aspects of Park Hill did you want to preserve?	Was the conservation a temporal snapshot of a particular era? Did you want to maintain only the initial features?	How do these compete with maintaining a contemporary image?
How was the project received in the press?		Did this affect the way you envisaged what you wanted to produce? Did it alter any decisions you made after you embarked on the project?
What was your part in deciding the conservation aspects?	Was it a joint decision? Were different opinions voiced?	Did you encounter difficulties implementing your choices on the type of preservation you were going for?
How did you choose the technical aspects of the preservation?	What was the motivation for using this particular technique? Did the primary aim of conservation compete with the practicalities of practice?	Does the technique leave a mark on the material? Did you have other traces that you chose to delete?
How did you source contractors, particularly in relation to concrete?	Were they decided solely by yourself, or did you have to consult with other parties?	Did you consider proximity criteria and financial criteria, or their experience in other projects? How would a different choice have brought a different outcome?
<b>DESIGN DECISIONS AND CONSTRUCTION POLITICS (professional actors)</b>		
What did you want to achieve with your decisions on concrete? Did they compete with opinions other actors had?	How did your initial intentions coincide with the final outcome? What were the reasons for this change?	

What conflicts between actors did you encounter? (Particularly relating to concrete)	Who did they involve and what was the outcome? How did you cooperate? What was the purpose of this conflict? Ideological? Financial? Cultural?	What was the impact of these conflicts on the produced building? How different and in which ways did it produce a different outcome as to that originally planned? Did the changes alter Park Hill functionally or visually?
What was the primary aim you wanted to achieve with your design?	When redesigning the plans, what criteria shaped the rearranging of flats?	A comfortable experience for the user? Bringing out the aesthetic features? Keeping costs down? Did you consider views, proximity to lifts, and ease of circulation?
Was the idea of the “ <i>Streets in the Sky</i> ” important in the design?	Did it affect things you choice to maintain/ get rid of etc? Why did you narrow the streets in the sky?	How was the extra space incorporated in the flats?
Color scheme. How did you decide on it?	What informed your decision? Who was involved in this decision? Did you look at Past photos? How about other developments of that time?	Were you interested recreating the original feel with a contemporary touch?
What influenced the decision to create interiors with exposed concrete?	What was the rationale behind creating additional exposed concrete interiors in the redevelopment?	Did you want things done differently, e.g. maintaining some of the grime of the original development like you did with the will you marry me graffiti?
What is the image you had in mind when you embarked on the Park Hill project?	When you were designing the original drawings, what ideas did you have about making it an attractive place for people (Inhabitants, Sheffielders)?	How does it coincide with what you have achieved and in what ways is it different?
What were your roles in the project?	Were they strictly defined? Were your roles altered during the course of the project?	This applies to both in terms of your practice role and your personal role. What dictated this change?
<b>ENGAGEMENT WITH PUBLIC (Collective memory)</b>		
Did you speak to residents when you first came in?	How did the public receive you? Did you have to officially meet with the public on many occasions?	Did they talk to you about past experiences of living in Park Hill?
Do you know what the public expectations were for the renovation?	How did they envisage it?	Was this incorporated in the design and how?
Was it part of the strategy to engage with the public?	Strategy to engage with local residents/ local media etc?	

How did former residents and Sheffielders opinions affect your decisions?		What is the input of this on the design?
<b>PROPINQUITY</b>		
What requirements did you have regarding number of properties, required flats and occupation density, layout etc?	How flexible were these requirements?	Would you have done things differently?
What requirements did you have regarding the visual aesthetics?	How flexible were these requirements?	Would you have done things differently?
<b>SUSTAINABILITY</b>		
Did you consider employing sustainable techniques?	Did you consider BREEAM?	Why did you not go down that way?
Did you consider what Sustainable choice would do for the publicity?	Did you have any reactions (by professionals involved or local residents etc) challenging your decision?	
DO you consider it sustainable?	Would you have difficulties bringing in a sustainable scheme into an existing concrete frame?	Not just referring to emissions and BREEAM ratings but also on a community level.
<b>GENEALOGY (ontological relation)</b>		
<i>"Will u marry me?"</i>		
You have chosen to create interiors featuring exposed concrete elements. What influenced this decision?	Your marketing brochures exhibit this to a great extent, do you feel this is a material associated with the target group you were aiming at? Did you want things done differently, eg maintaining some of the grime of the original development like you did with the will you marry me graffiti?	
<b>Conclusion of interview</b>		
Small definitions: Brutalism, streets in the sky, conservation, social housing, concrete, comfort.	Other actors within or outside Urban Splash	
What was your experience overall of the endeavor?		



Table 2- Type B Interview questionnaire - Residents

Overarching question	Additional Questions	Clarifying Questions
When did you move into Park Hill	How long have you been here?	Continuously?
Where did you move here from?	The old Park Hill? From Sheffield area?	From other city?
Was it your choice to come here?	Did you come because you liked it or because there was no other option?	Did you get the flat you wanted or was it given to you?
Do you prefer it to elsewhere?	Given the chance would you go elsewhere?	
You are a private tenant? Or a council tenant?		
What was your perception of Park Hill before you moved in?	Did you have a past relationship with it?	Lived in it, had friends, mugged there etc?
Do you remember it being built?	Did you watch it as it progressed/ or uninterested?	
When you saw it or moved in, did it look like a construction site?	Was there building materials everywhere?	Were there any unfinished parts? Closed off areas? What was the state of the concrete?
The concrete in your interiors/ what do you think?	Did you know they would be like this before you came in?	Before you had agreed to move in?
Would you say it affected your decision to move in?	Do you think it has a strong influence?	
Have you covered them in any way?	Would you change them were you given the opportunity?	Do you know people that have made changes?
Feeling of Homeliness?	Do you use materials that are "warmer"? In order to make up for the "cold" feeling?	Has it affected the way you have decorated?
What do you think of the no change policy for the walls? did you know it before you moved in?	How important is this policy on your decision to take the flat?	Have you used ornaments, etc? or plants?
In the internal walls, do you know what changes have been made in the construction phase?	Can you tell where things have been repaired? Or treated? Or remained as they are?	Can you tell of the marks of the walls what was there before?
Does the concrete have problems with staining in kitchens/bathrooms because of condensation?	Do you clean it? Do you treat it?	Does it tend to change colour with use? Is it too early?
OVERALL: Do you think concrete is an important feature of the flat? Of the development?	Do you think it could have been given more prominence? Or less prominence?	Can you think of such a way?
Have you been close with other residents?	What kind of relationship do you have?	Do you share activities? Have tea or whatever?

Have people been enjoying it?	Major problems etc?	What was their reaction to moving here?
Do you have any interesting stories?	Do you have a memory of the concrete in Park Hill? Eg a construction/redecoration story etc	
Do you know about Streets in the sky?	About Brutalism, architecture, the architects?	Do you know the importance of concrete in Park Hill?
What do your friend think of Park Hill	Do you have a story?	Do they say things like concrete monstrosity, jungle etc?
Overall, do you like Park Hill?	Do you like the concrete in Park Hill?	Is Park Hill part of your identity?

Table 3- Type C Interviews with informed members of the public (for John Grindrod-estate resident and author of Concretopia)

Overarching question	Additional Questions	Clarifying Questions
Personal Story and your experience living in an estate	Memories of materiality/playing/leaning against concrete etc	Concrete was ubiquitous? What kind of relationship did you have?
When did you move in?	Where did you move here from?	From other city?
The book is called concretopia, why?	Why concrete for title? Concrete= negative vs Utopia= positive?	Where you aware of the associations it carries?
You repeatedly mention the construction phase of the high rises. Either through people describing them or through photos. Do you think the construction phase of the concrete was important for the people?	How has it influenced you think? How important in the memories, visions of future etc?	
What was the importance of the high rise?	What is implied by " <i>posh end of the development?</i> " any concrete there? ( Gorbals? p. 115)	Is there a differently defined high end?
Do you remember it being built?	Did you watch it as it progressed/ or uninterested?	Was there building materials everywhere? Were there any unfinished parts? Closed off areas? What was the state of the concrete?
The book starts and ends with riots in Sheffield and Croydon.	Importance of riots in the narrative?	Do you see them as a result? Are they associated?
Role of English Heritage?	Delisting eg buildings to be able to change windows.	Do you know people that have made changes?
Homes mislabeled as slums to bring them down.	What is the importance of notational associations? What was the role of the words used in your opinion?	Cruddas Park- p. 230 was renamed because of stigma+ Park Hill as slang for deprived areas.
Use of the words monstrosity, jungle	Were people associating them with where you lived, researched etc?	
Would you say you have a pragmatist or a romantic perspective on the use of concrete?	How can you visualize their future?	Can you tell me about the shooting incident?
Your approach is different to Hanley	Recent history vs positive memory	
Did you look into concrete quarterly or Architectural review?	Difference between exposed vs covered, internal vs external, luxury vs social housing etc.	Can you think of such a way?
Do you think concrete was an important actor?	How would you comment its development?	Describe concrete, brutalism, streets in the sky

## Participant Information Sheet

### *Reading comfort through the material agency of concrete*

You are being invited to take part in a research study [as part of a postgraduate student project leading to a PhD]. Before you decide it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. Please ask if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part. Thank you for reading this.

#### **Who will conduct the research?**

*The research will be conducted by myself, Athena Moustaka with the approval of my supervisors Prof. Simon Guy and Dr. Isabelle Doucet from the Manchester Architecture Research Centre in the University of Manchester.*

#### **Title of the Research**

*The title of the research is: "Reading comfort through the material agency of concrete".*

#### **What is the aim of the research?**

*The research aims at describing the relationship between the use of concrete in the built environment and peoples' perception of comfort, and how this relationship has evolved over time. For this purpose it will trace the use of concrete throughout various stages of the construction of Park Hill.*

#### **Why have I been chosen?**

*You have been chosen to participate in this project because of your involvement in the reconstruction of Park Hill and are therefore in a good position to offer insight into this topic and to comment on your experience. Other participants in this research will have likewise been involved in the construction and rehabilitation of Park Hill in a professional capacity.*

#### **What would I be asked to do if I took part?**

*Should you wish to participate, an interview will be conducted at either your office or a meeting room in your work premises, or in a similar space in the University of Manchester. The interview is expected to last between 60 to 90 minutes. In it you will be asked a series of questions related to your professional role in Park Hill, the decisions you took as a professional, and information surrounding your experience of the project and in particular the use of concrete.*

#### **What happens to the data collected?**

*Subject to your approval the interview will be recorded and you will be provided with a transcribed copy. Once transcription is complete the original audio recording will be destroyed, no longer than three months from the original recording. All of the research data will be stored in the University of Manchester in hard copy form for no more than three years after the interview date, or until the completion of the research project.*

#### **How is confidentiality maintained?**

*In case you require your name not to be disclosed in the research, you can advise the researcher at any time.*

**What happens if I do not want to take part or if I change my mind?**

*It is up to you to decide whether or not to take part. If you do decide to take part you will be given this information sheet to keep and be asked to sign a consent form.*

*Please also note that you can decide to stop the interview at any point and you need not answer any questions that you do not wish to. If you decide to take part you are still free to withdraw at any time up to a week following the interview without giving a reason. If you withdraw from the study all data will be withdrawn and destroyed.*

**Will I be paid for participating in the research?**

*Unfortunately you will not be compensated for your time and interview.*

**Where will the research be conducted?**

*The interview will be conducted at a time and place of your choice, either your office or a meeting room in your work premises, or in a similar space in the University of Manchester.*

**Will the outcomes of the research be published?**

*Findings will be published in writing in relevant academic journals and research publications, conference presentations and a PhD thesis.*

*As part of the presentation of results, your own words may be used in text form.*

**Who has reviewed the research project?**

*The project has been reviewed by the University of Manchester Research Ethics Committee and has gained approval on 24/10/2013.*

**Contact for further information**

*Should you have any questions or require further information please contact the PhD researcher for details:*

*Athena Moustaka, PhD Researcher e-mail: [athena.moustaka@manchester.ac.uk](mailto:athena.moustaka@manchester.ac.uk)*

*MARC (Manchester Architecture Research Centre), School of Environment and Development, Desk 10, PhD Quad A, Arthur Lewis Building, Oxford Road, M13 9PL*

**What if something goes wrong?**

*Should you wish to make a formal complaint about the conduct of the research please contact the Head of the Research Office, Christie Building, University of Manchester, Oxford Road, Manchester, M13 9PL.*

**Consent Form**

*Reading comfort through the material agency of concrete*

If you are happy to participate please complete and sign the consent form below.

Please initial box.

1. I confirm that I have read the attached information sheet on the above project and have had the opportunity to consider the information and ask questions and had these answered satisfactorily.	
2. I understand that my participation in the study is voluntary and that I am free to withdraw at any time without giving a reason and without detriment to any treatment/service.	
3. I understand that the interviews will be audio-recorded and I agree to the use of quotes in published material	

I agree to take part in the above project.

\_\_\_\_\_  
Name of participant

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Name of person taking  
consent

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature