Urban compounding: Housing what is and what could be

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Abstract
This study examines the organic transformation of the South African version of the Victorian/ Edwardian bungalow from a free-standing house into a courtyard form of building – seen as a bungalow 'compound' - as part of wider city-making processes, in a context of rapid urbanisation and continental migration. Based on architectural practice-led research, the study claims that the knowledges embedded in the adapted bungalow properties can significantly contribute to context appropriate planning of lower cost accommodation and emerging mix use. As a result, while associated with connotations of illegality and 'slum life', the study coins the bungalow compound as an 'aspirational house' in the transforming African city, an undercover game changer developing plot-by-plot on an emerging spectrum of housing *what is* and *what could be*.

Keywords: courtyard morphology, compounding aspiration, plot by plot, African urbanity

Introduction

Johannesburg 2024. Hidden behind walls of buildings made in another time and for different people, hundreds and thousands of beds accommodate Johannesburg's post-1990, transitional, multinational population, many of them in rooms on private properties with formerly freestanding bungalows from the Victorian/ Edwardian period, in the inner city belt. The rule of law treats the mainly non-formal[1] appropriation of the buildings, and more importantly, their yards (that is, the open space on the plot), as a spatial illegality. In their official accounts, the City continues to record the current multi-unit room arrangements as the former single-family houses. As a result, it identifies them as inefficient in terms of numbers of occupants – and consequently requiring replacement vis-à-vis desired densification (City of Joburg, 2016).

At the same time, the properties – if recorded 'as built[2] and as inhabited' (as in this study) – suggest a form of occupation (in terms of quantity, costs, diversity of functions and residents) that the city is actually attempting to achieve in the well-located areas with very limited amount of affordable accommodation offered by the state (Dormann, Mkhabela, 2019). They are also lucrative investments and incorporate multiple providers of other services. Mostly, but not entirely operating 'off the record', the multi scalar networks that run through these spaces have created their own 'infra-economy' of material life in the shadows (Braudel, 1981:24) as a form of the everyday that might seem challenging to administer but will nonetheless, most probably, continue to exist.

Contextually, the study focuses on changes of bungalow properties in two central neighbourhoods bordering the inner city, Yeoville and Rosettenville, established at the beginning of the 20th century, for nuclear families of a white, privileged minority. After the official abolition of Apartheid in the early 1990s, these areas have been almost completely re-populated with immense socio-cultural changes – and intensely densified. Much is assumed about the changes, and few of these are considered 'good' by the planning authorities but in

[1] Non-formal implies some form of limitation of applying " regulation" – but does not automatically see this as negative – instead, the capacity to regulate is limited. (Jenkins 2013). Nagati describes this condition as non-binary, on a "spectrum of negotiation and contestation," between not requiring but not negating formal structure (Nagati, 2016:33).
[2] As built: A key architectural instrument to document existing buildings. As-built drawings commonly show changes on-site to original construction plans using redline drawings. Measured drawings are prepared to represent the situation *as is*. Final record drawings "as-built" are typically prepared for submission to the council, incorporating the changes of the red line drawings.

fact, too little is known or understood about how these residencies are being transformed inside out (Charlton, 2019). The metanarrative of crisis and slums that Nuttall and Mbembe (2008) critiqued as dangerously one-sided still prevails here. The study's accounting suggests a grey area between official recordings and lived realities as driver to identify what appear to be misconceptions as actual potential for change.

Methodolgically, the focus turns on the properties themselves, as emerging epitomes of house lives/home spaces (Heer, 2019; Jenkins, 2013), as knowledge sources and as developing citational grounds in a field around the planning of urban accommodation in precarious contexts that is understudied. The approach considers the bungalow compound as an epistemic object (Cetina, 2001; Rheinberger, 2005; Lurry, 2021) that can manifest as a problem space across multiple themes, scales, and contexts. In doing so, the study addresses the misconception of architecture as a finished product and appropriates essential incompleteness as a device to locate relevant knowledge(s). It considers the inevitable lack of complete evidence as an opportunity to understand the documentation of these emerging dynamic 'house worlds' as readings of *what is* and *what could be*, a concept Simone and Pieterse (2017) refer to as the process of *re-description*. The study examines the bungalow compounds via a case study approach, as particularly complex category of 'as built' documentation with the aim to render the, at times, contested spaces, into valid forms of city building. Within theme and context of the conference, this working paper focuses on the transforming residential typology and its morphological connotations as forms of *urban compounding* – a process that operates on a complex spectrum of, at times self-regulated, urban change, and places itself at the intersection of architecture, urban design and planning.

The text is organised into seven sections. The next section introduces the house as a knowledge object as central premise of an approach. Then conceptual model of the "shaering layers of change" (Brand, 1994) are explored as visual, analytical frame to argue for a multi scalar reading of typological change from the ground up. This is followed by methods and results, and then discussed under the premise of new orders. The conclusion reflects on *urban compounding* as a process and product, of housing what is and what could be, in uncertain times.

The house as epistemic object, exclusive knowledges

The work starts from the premise that the house knows, and we as professionals don't, in many occasions. A house is a basic architectural element that is a part of people's everyday lives and also a basic unit of urban morphologies. As private property, it plays a significant role in the planning paradigm of South Africa's historical urban development. It has been argued, that domesticity is as much personal as it is politically, socio-culturally, and economically rooted and legally laid out (Chakravartty & Silva, 2013). The idea of the 'house' is a contested space in South Africa[3], as much as the land it stands on (Braun, 2015) – and indeed, therefore, in terms of its architecture. Architectural practice here (as elsewhere) has long been complicit in the production and reinforcement of social bias and discriminating spatial arrangements (Bhandar, 2018: Aureli, 2012; Weizman & Carlo, 2010). Within this system of unequal distribution of resources, the planning and design professions have inevitably assisted to "craft and spatially define asymmetry" (Aureli & Tattara, 2013).

[3] The study refers to the 'house' as a form of domesticity that was envisioned and designed as a social construction in line with a clear cultural binary. Archival and legal documents (e.g. the Report of the Johannesburg Housing Commission (Chas. Lane Sansom, Chairman, 1903), Black Housing, The Key to a Stable Black Society (The National Development and Management Foundation, South Africa, 1978) Native Housing in South Africa (Calderwood, 1952) and the Minimum Standards of Housing Accommodation for Non-Europeans) display clearly separated strategies and predictions for housing requirements of black, white or coloured people.

Institutionalized and systematically organized, the domestic geometries thus created often appear as the translation of legislation laid out in the past yet retaining some shadow validity as a blueprint in the ground. Within all of this, the City continues to ask for the application of, at times, outdated building codes and regulations, drawing on architectural tropes. Additionally, it does not seem to be able to engage with the physical structures as they are – as built – and hence to accommodate the real-life changes which these cater.

Despite this basis in a form of architectural and morphological 'blindness,' some buildings/properties have managed to help themselves in certain ways – they have learned after they have been built (Brand, 1994)[4] and make most of the opportunities for change. They have, one could say, "the capacity to aspire" (Appadurai, 2004:59; Appadurai, 2003), and their representations are, in many ways, aspirational maps. Here, the architectural structure, as built, turns into a blueprint of people's visions of how they would like to live within the choices they are privileged to make, overwriting previously set times and boundaries.

The history of their transformation can be seen to be embedded in their physical form as traces of an ongoing negotiation between economical, juridical and socio-cultural dynamics (Chakravartty & Silva, 2013). The house thus turns into a knowledge object and a source when zooming out of the wider urban morphology and a socio-economic construct of material civilization across time[5] (Braudel, 1981) – even when zooming into the anatomy of its own materiality (Brand, 1994; Duffy, 1990). Both ends of the spectrum deal with change over time as a response to context on different scales, sometimes to the extent that it becomes a new form of context – as boundaries between house and context merge, and those relations also become a rich knowledge base.

Accessing such 'inner' spatial knowledge is not easy in the areas under investigation due to a high degree of non-formal activities, with a number of them potentially deemed illegal, and a general rise in lack of safety and security. Here we encounter Braudel's' material life (1981) at eye level, " a shadowy zone often hard to see for lack of adequate […] documents," something he calls the "infra economy, the informal other half of economic activity, the world of self-sufficiency and barter of goods and services within a very small radius" (Braudel, 1981:24) People in the 'shadowy zone' are understandably cautious with whom they share what, and access to these intimate forms of knowledge is inevitably limited to some degree. This is more so when, legally, the private properties have the right to exclude. The governing structures do not seem to have resources or a feasible strategy of how to enter or, to look for, in these admittedly complex, dynamically changing territories This increases the exclusivity, and (according to market rules) the value of the embedded knowledge – and, in fact, of the properties, likewise.

Shearing layers of change and red line drawings

[4] Brand discusses the knowledge of buildings from a material perspective and deconstructs the house made of components across six shearing 'lifetime layers' of change further explored in Chapter 4.

[5] Braudel' s (1981) material civilisation is the second layer of a triple division of economic realities. He introduces A) the market economy as "transparent, visible realities […] and easily observed" in the centre, underneath which B) a "shadowy zone often hard to see for lack of adequate […] documents" plays out "elementary basic activity that went on everywhere […] a rich zone, like a layer covering the earth […] called material life or material civilization" In lack for an appropriate word he calls it the "infra economy, the informal other half of economic activity, the world of self-sufficiency and barter of goods and services within a very small radius." The third zone C) is placed above, and even more invisible than the below, and directed by "certain groups of privileged actors' who "could manipulate exchange to their advantage and disturb the established order. In their desire to do so […] they created anomalies, 'zones of turbulence' and conducted their affairs in a very individual way, [operating] from a distance." (Braudel, 1981:23-25). At the time (15th – 18th century) it included the dealings of foreign exchange, linked to distant trade movement and complicated credit arrangements, was transnational and operated upon principles of monopoly (Braudel, 1981). In the bungalow compounds under investigation material life relates to the composite of formal and non-formal activities (and structures) that govern their everyday.

To access these exclusive knowledges, and to understand the role of the house – and what it is housing in a complex and opaque urban context - as architectural element and equally as planning paradigm, the work has developed a particular approach and proposed an analytical format of undertaking and presenting the empirical research work. It so follows Simone and Pieterse's (2017) call for re-description methodologically, by employing the professional format of red line drawings, in combination with analytical layering. The intention is to 'un-see' the house, to make way for new patterns to visually emerge. 'Un-seeing' the house is to view it as if it did not exist as a pre-classified entity through deconstructing the plot and the compound into its elements – identifying the 'small spaces' (Chattopadhyay, 2022) that make everything work in order to reach a better understanding of its workings as an emerging morphology working through **layers of change**.

The study borrows the principles of Brand and Duffy (1990, 1994) to read transformations in buildings through *shearing layers* to analyse the morphological changes – and illustrate new, evolving patterns in compound lives. The research customizes these author's terms of use, making these particular to the place of investigation. Brand's *shearing layers of change* (Brand, 1994) start from Duffy's premise that 'there is no such thing as a building' (Brand, 1994: 12). His concept looks at structures in terms of building components and their ability to adapt or change across different time spans. The term was originally coined by Duffy (1990) as a form of facility management related to costs and life span, which he separated into shell, services, scenery, and set. Brand extended Duffy's concept into six layers that have different times of change and possibilities of adaptation: site, structure, skin, services, space plan, and stuff (Fig 1).

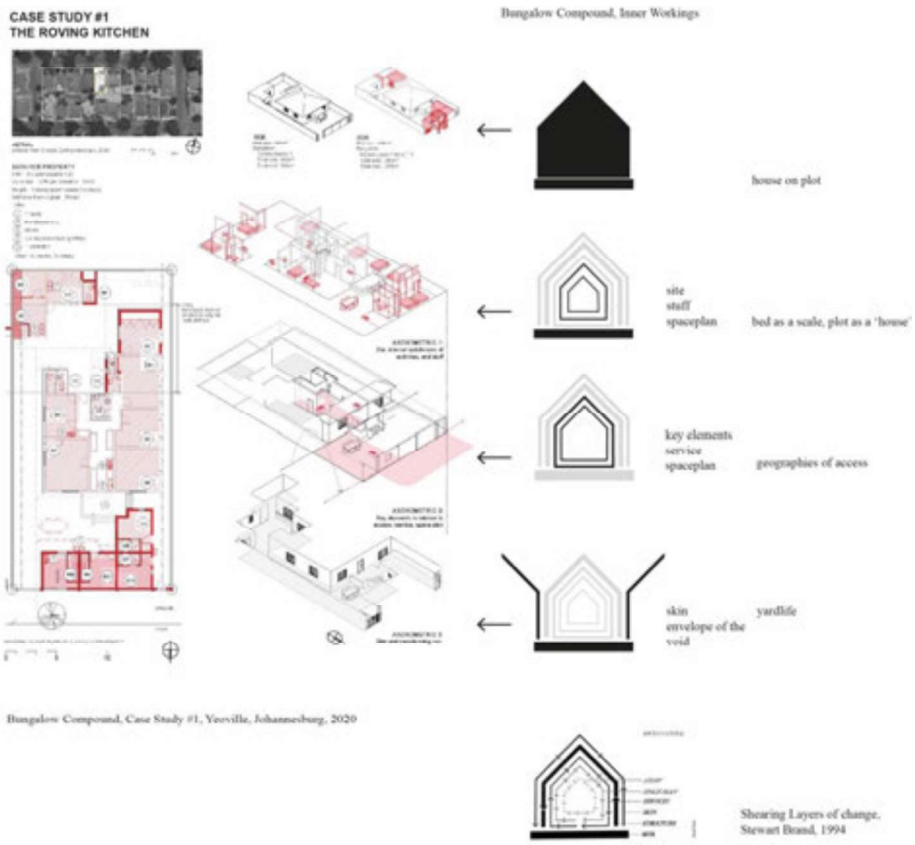

Fig 1: Bungalow compound, analytical layers, appropriated from Brand (1994) (author's own, with S de Villiers 2023)

This study is particularly interested in the role of *site* and *stuff* in the context of the bungalow compound. These two layers seem to have a particular deterministic role in Brand's set-up at each end of the timeline, one being eternal and the other one in constant change or motion. However, due to radical changes in forms of agency that are embedded in both *site* and *stuff* in the Johannesburg samples, they seem to be of high significance for what Duffy calls *use potential* (Duffy, 2009) when applied to the transforming bungalow properties.

The bungalow plot is the unit of analysis taken as the base across an amended version of Brand's shearing layers (Brand, 1994). The "layers" analysis permits the addressing of the gap that "will inevitably occur between developing requirements and the residual long-lasting building shell" (Duffy & Hutton, 2005:40, 1998) – and the "[interesting] absence of fit, that is 'slack'" (Duffy & Hutton, 2005:39, 1998) – as multiple versions of potential and aspiration have been materialised across time.

The empirical part of the study interrogates the material footprint of selected properties across three registers.

- As a **series of spatial patterns** translating social, economic and legal (political) values and related regulations over time.
- As **a transforming building type** with architectural elements transforming in the context and circumstances, reversing an understanding of solid and void/individual and shared spaces.
- As a composite of the above through different **figurings and forms of occupation**, measured in programme, density and infrastructure.

The bungalow compound's changing layout and organisational structure describe the basic shift from the house on the plot to the plot as a compound house and **merge interiority with exteriority,** and the architectural type with urban morphology, by shifting from prescribed functionality to sequences of previously defined elements such as walls, rooms and corridors. The bungalow compound anatomy is then represented in three layers:

- **stuff** on **site**, looking at the **emerging space** plan through domestic practice,
- **services, space plan and key built elements** to interrogate the role of 'small spaces,' and the repurposing of the initial double life of *served* and *serving,*
- **skin** and **boundary wall** as the envelope of **the void,** to explore the form and significance of the emerging void, the courtyard.

The foundation method of the empirical work was initially randomly sampled, that turned purposive on a 'plot by plot' basis[6], unpacking and mirroring the transformation practices of the bungalow properties themselves. This method mimics a practice of city-making termed "plotting urbanism" (Karaman *et al*., 2020), which describes a process of urban development that works incrementally, from property to property, in rapidly urbanising cities in the Global South and beyond. The concept permits us to deal with overlapping forms of formal and non-formal urban growth through repeated and similar incremental building activities on private properties in low-income, highly dynamic neighbourhoods, such as in this study. The above authors use this term to describe how forms of ownership vary, how preferred typologies are linked to the commodification of existing houses, how change is a response to the speculative land market (supply on demand) plus landlords, and how tenants often have social relationships that are governed by physical proximity (Karaman *et al*., 2020).

The Making of the Catalogue, Comparing Unfinished Objects

In order to be able to illustrate the selected bungalow compounds as exploratory 'samples' in a systematic way, on the plot, as part of a block, and along a street in one of the neighbourhoods under investigation, the initial medium that allowed the bungalow's enourmous reach and multiplication – the pattern book – is revisited as a trope to develop an alternative (research) catalogue of properties. A layout template was developed, to capture relevant and available information – as much as the lack thereof (reminding the reader that "lack of" is important as discussed previously). Within its comparative set up, the catalogue of the case study properties is as organic as the changing layout of each plot, and the information collected is as temporary as it differs from sample to sample. While the analysis shows that there are clear patterns in the original layouts, appearances, and materialities – as much as there are in the amendments made over time – it also shows inconsistent, incomplete, and (at the time of thesis submission), already partly outdated data, at least in parts. The study takes

[6] The bungalow compounds were investigated on site from 2018 to 2020.

advantage of this condition and interprets the incongruence of forms and figures as layouts of *aspiration*. The research refers to those as *plot holes.* In fiction, a plot **hole** or plot error is a gap or inconsistency in a storyline that goes against the flow of logic established by the **story's** plot. Such inconsistencies include things as illogical, unlikely or impossible events and statements or events that contradict earlier events in the storyline (Dormann *et al*., 2020). In real life, such narratives challenge our assumptions. This is because in any situation, although we might not understand what happened – yet it did happen – this probably made sense to someone for some reason.

The *plot holes,* figuratively speaking, consequently place the outcome of research on the spectrum between the **forensic** and the **imaginary**. The work thus proposes consideration of potential intersections of the forensic and the imaginary as readings of, at times, diverging and shifting **aspirations** (Appadurai, 1986; Appadurai, 2003; Appadurai,2004). Aspiration looks at the properties as commodities with social lives whose multiple value is determined "by a judgement made about them by subjects" (Appadurai, 1986:3). This means personal interests in the compounds determine their transformation – and their divergent futures. Aspiration is also considered an ability to do something or take action regarding something and relates to the context required to enable these actions. Common aspirations, or re-occurring plot holes, may indicate a trend that is relevant for future urban development, and currently overlooked in the larger narrative.

While the bungalow compounds have been investigated on a case-by-case basis, the research is further interested in what the properties do as a collection. The study considers the sum of what happened in any individual bungalow compound as a basis for the configuration of emerging typicalities as a developing urban register. 'Typicality' (as opposed to typology) encompasses experiences and local practices that are linked to a particular – typical – spatial configuration that hold morphological connotations (Dovey & King, 2011). Following the most common distinctions in typological classifications that have been based on use (programme) and/ or morphology (layout) of the architectural object (Forty, 2000), the *compound typicalities* are based on what happens on **and** with the properties, e.g. as mixed use places of accommodation and business, as neighbourhood networks, as investments on the property market, as infrastructural objects.

They are thus approached as performative and relational forms of temporary categorisation, in a spatial and regulative context. The following section is a transition between methods and findings, or maybe in itself a comment on the finding of methods in contexts under development, in order to outline the emerging typicalities and their various scales, It begins with an assessment of multiple interests, that have resulted in infinite variations of transformation, to conclude with the need to reconfigure existing categories when dealing with cultures of conversion.

Emerging Typicalities: Compound Interests: Multiplying value

Compound interest is commonly understood as a form of long-term (slow) yet exponentially growing financial investment, where interest gathers interest in addition to the principal capital. It describes a multiplication of the principal investment through the accumulation of interest as a most effective principle of exponentially added value to capital.

Architecture, as a practice that designs space to accommodate people and their everyday activities, can frame forms of life and determine values of space, people and their interests as manifested in daily practices – through layout, materialities, sizing, and access to views, and light, services among other things. Like property or real estate, it is also an investment that can gain or lose value over time (see Fig.18 for the transactional history of the case studies). As real estate, property is generally considered an investment with slow but steady returns and low volatility, according to a popular online platform (The Investopedia Team *et al*., 2022), at least in areas of relative political stability.

This study draws an (admittedly blunt) parallel here to the compounding of architectural interests and attempts to translate the principles of financial investment (monetary compound interest) in the context of small-scale owners/landlords of bungalow compounds in the selected focus areas in Johannesburg. While compound interest is a calculable relationship between time and money, the study of existing bungalow plots as DIY development adds 'space' as the third critical factor in the perpetual negotiation of property value – with intended profit figures being often pushed upwards through the highest feasible density at the lowest cost in the shortest turnaround.

To achieve this, the post-1994 bungalow landlords of Yeoville and Rosettenville are compounding the capital output of their properties through **subdivision** (of space) and **multiplication** (of people and use): broadly speaking, the transformation of the one-family house into multiple households organized in rooms, additions of rooms along the boundary walls, the absorption of supplementary programmes, and the **activation of the yard** as productive void, in between space and **outdoor rooms.**
Compounding here is thus also used to mean 'adding to' increasing of" as well as the process of combining more than two different elements. The added value thus could commonly be understood as the accommodation of additional uses and increased densities resulting in more rental income and more relatively affordable places to stay in prime urban locations. Compounded interest, however, also included the need to absorb vehicles, keep up maintenance of the street and its sidewalk, and expand infrastructure and services such as water, electricity and waste removal at the most basic. The growth and value of the single property can be influenced by – as much as it is a contribution to – the neighbourhood's overall condition, its accessibility, cleanliness, safety and security. The plot compounding process is such an urban-level project.

The analogies of compound interests suggested here in the bungalow context are plural and complex, as they are operating with different measures, and this study follows the intersection of the juridical, economic, and ethical as extracted knowledge layers of the physical blueprint. If the traditional economic understanding of compound interest lies in the multiplication of financial value, the bungalow compounds are dealing with division as another form of multiplication, through a number of measures: use, households, income, space per person, forms of business, as well as practices of sharing – resources, relations, space. Plans for contemporary forms of life appear inconsistent in different degrees and configurations. Yet it convinces (some) through its persistent and resistant performance via the organic transformation from the free-standing, single-family house to a rooming courtyard arrangement: that is, urban compounding.

The sum of the single property descriptions presented through the fieldwork is a provisional catalogue of realities, as much as a collection of temporary possibilities. The implicit uncertainty of this phrasing is considered appropriate here as a retainable (urban) quality,

referring back to Lury's notion of incompleteness (2021) and the process of re-description (Simone, Pieterse, 2017). The 'as built' representations are analyses of the spatial configurations of people's everyday lives in an African metropolis, layering visuals that are the product of complex economic transactions, cultural practices, legalities, political 'plotting' and imaginaries. They **reveal** the multiple pieces of knowledge (or parts thereof) that are embedded in the ongoing transformation of bungalow properties. Their visual reconstruction is based on the finding of material 'things' in particular arrangements on each plot. In the attempt to account for their meaning and purpose in context, these relations are illustrated through compound anatomies across three sets of appropriated *shearing layers*. The fieldwork sample illustrations are complemented by single plot descriptions that portray their 'behaviour' in detail through the lens of legalities, forms of aspiration and values, and evolving geometries.

These self-centred objects have extended themselves to the property's boundary line as a network of layers and, ultimately, a system of spaces, integrating (or confronting) lived experience and local practice with institutional/regulatory frameworks. While the 'Victorian' life of other days is still shining through cracks in remaining pressed ceilings and air bricks, the current versions of the bungalow properties share more qualities with the complex compound composites of Ghana and Nigeria than with their original lookalikes in Carshalton, Surrey (Philips, 1926:60). In general, Johannesburg's 'verandah house' (Hindson, 1987) has blended with its yard and its extensions into an ever more "unsettling hybrid structure" (Chakravartty & Ferreira, 2012) – or rather, many variations of these, including doubtless imports for the wider African region.The subsequent section looks at **different aspects of compounding** of the series of case studies and goes on to conclude with a summary of tendencies as overall findings. One case study #1 is subsequently presented as an illustration of the detailed catalogue.

Before and After Physic
'Before and after' illustrations have been used to merge information from council plans and current satellite imagery, both sourced from the CoJ as hard copies and online, on site recordings, as well as information from other publicly available information visible in computer programmes such as Google Earth, Google Maps and Apple Maps. Overall, these drawings show a significant increase in coverage of built form with a 'before' ratio of circa 1:2 (built : unbuilt) as a common proportion on a 495 plot, but the 'after' ratio averages approximately as 1:1 (built : unbuilt) and is, in some cases, more often a relation of 3:2 (built : unbuilt).

Compounding Density, Rooms and People
The density calculations of the bungalow compounds propose to use the single room as a dwelling unit, whether inside or outside the original house. This proposition is based on the recordings of everyday practices across the case studies and the areas under investigation at large. The average number of dwelling unit rooms on the properties lies around 11 to 12, with slightly more of these within the house – a constant of six. The calculation of the amount of people per property is based on a usual standard of two, sometimes three people, per room across the sample. It is also the usual occupancy per room that was found on adverts, repeated in verbal rental, or booking agreements, and supported by real life documentation on site.
As a relative measure, space (floor area) is often set in relation to occupation (demographic / number of people), with varying cultural and geographic understandings of what constitutes a dense urban area (Jenkins & Mottelson, 2020).

A key measure, internationally, is also the house or dwelling unit and its occupants – sometimes defined as households. The bungalow compound negotiates density measurements around a spectrum of variables with one constant: the built structure in the centre of the property, numerous rooms inside and additional rooms outside. In the current bungalow compound context, little is established about how to measure or even define what is a 'household'. Numerous non-typical household compositions have been recorded across the single case study series in Yeoville and Rosettenville, as is often the case in African urban areas (Jenkins, 2013). In average this is an increase of population per plot of 400 to 500% in relation to the original planning. While this sounds like a drastic change - which it indeed is – one must not forget that the inner city suburbs under investigation were kept at an extremely low density as white middle class residential areas, compared to international urban standards.

Compounding Programme

The activities on the case study properties are multiple and mostly mixed. All but two properties have a dominant residential component, that is either short– or long-term rental, or the owner and/or their household resides on the property (or a mixture thereof). The other two non-residential properties offer parallel services only, both educational, to children and women. One property is also a place of (commercially oriented) worship. Overall, only 8% of the properties are solely used as they started off – as a private residence for one family. More importantly, approximately 90% of the properties are income generating, in one way or another, and most rent out rooms on the property for that purpose, and these cover from 10-100% of the available usable built space. However, approximately 50% of the case studies offer additional programmes in addition to any form of dwelling and accommodation.
This change and variety in programme alerts to the biggest change in the properties being an economic one: the **switch** from what can more easily be described as **owner use value to owner exchange value**. In the large majority (92%) of the case studies the purchase serves **income (rental) generation in the everyday use,** as opposed to its original purpose as a **family home**. All the while, nearly all (94%) of the 'exchange value' properties still offer the use value of a home to residents (albeit more and usually unrelated tenants). In one-third of the cases, the owners share the property with tenants who run businesses or live on the premises. However, two-thirds of these properties are purely income generating by offering residential accommodation of different sorts – and other options to conduct business.
Financial profit as a driver for ownership of these transformed bungalow/urban compounds moves one part of the compounded aspirations into the field of **transactions**. It feeds into the basic unit of 'rooms as (urban) currency,'[7] from a commercial, or monetary, and a socio-cultural[8] perspective.

Compounding Scales

Stuff and Internal Subdivisions : The most common objects that move in and out of the bungalow plots are **beds**, double and queen size, to accommodate more than one person if needed. They dominate the internal layout of the properties and are a vital possession of the tenants. They are also the main income generation measure of the landlords, when number of beds equals number of rentable rooms. While bed spaces change at times rather fast, with moving tenants, they are then replaced with copies of the same, hence, somehow constant.

Key elements: The key elements of the bungalow compound form part of a "**geography of small spaces**" (Chattopadhyay, 2022) that participated in the production of the "colour line"

[7] Currency being understood as a standardized medium of exchange that indicates (monetary) value.
[8] David Graeber speaks of forms of 'social currency' and 'human economy' at the intersection of exchanging material goods, services and transforming social relationships (Graeber, 2012).

(Chattopadhyay, 2022) with **political and cultural connotations** beyond served and serving spaces concerning people, across all the scales of plot, block, and city. This role of material parts (the verandah, the stoep, the corridor, the boundary wall) and infrastructural components (the stove and the water tap) has been included in the fieldwork and analysis from a contextual methodological and typological perspective. The drawn analysis has looked at such elements in relation to access, services, and space plan. The resulting figures are complex and, nearly in every case, highly individual, overlaid by information of socio-cultural and economic practices on the plot.

- The **verandah** as part of the entrance sequence has been **closed,** in full or partially, in one-third of the case studies. This happened mostly before 1990 and was often linked to the extension of the room bordering it or making space for a garage, for example.
- The **corridor** has remained unchanged on most properties and is the element that permits the **subdivision** of the house into rooms as single units. It is the **lifeline for internal adaptations**, and at the same time, provides **room for flexibility**, that is, the set-up of different physical arrangements (Rabeneck, et al., 1974; Schneider & Till, 2005). The circulation space is centrally positioned (Fig. 29) and slightly larger in size to allow for a smooth transition to an **internal service spine** or a series of bathrooms and kitchens. This setup also enables the rooms of the freestanding single-family house to become independent entities as units that can be accessed from the outside.
- The **boundary wall** has been undergoing the biggest transformation over time, as visualised in the 'before and after' drawings, and places itelsef at the intersection of planniong, urban design and architecture. From a simple demarcation of land as 'one's own,' as requested per original deeds, and providing some privacy, it has extended in height and depth. It is now a three-dimensional structure with different thicknesses that are in parts inhabited or activated with other programmed activities. The extruded boundary wall turns into the compound version of double (sided) skin has two outsides, and deals through a public service programme (like an eatery) with the sidewalk and also the internal courtyard.

Forms of Flexibility and Adaptability: New Typicalities, Complex Structures

The study suggests that the empirical findings, as a catalogue of possibilities, hold relevant concepts of development in the making. As 'life after on (or in) what was before' they deal with appropriation and adaptation as knowledge from the ground, imaginaries tested in the everyday – that in turn might be worthy of being appropriated in the architecture of future planning and urban accommodation, in these areas or similar applicable contexts.

What has been introduced in this study as forms of flexibility and adaptability that exceed the house as an 'object' and transcend the old social-spatial hierarchies on the plot to create alternative ways of arranging and sharing spaces. This profiles the bungalow compounds as architectures that "compounded" challenge the city in terms of its restructuring. The properties' operations are addressing new forms of production and institutional orders through modes of cultural and physical appropriation and often share wider economic interests. The question of type enters the realm of urban morphology, as a developmental strategy on private properties that is only very partially orchestrated by the public sector.

The analytical drawings recorded transformation from inside out beginning with *"stuff on site makes space plan."* The findings suggest that the *site* can behave as ephemeral as buildings, when the outline of the plot turns into the circumference of the 'house.' At the same time, the

same property line remains inviolate as a legal entity. The convulsion of slow = persistence of site, and fast = change of space plan and arrangement of stuff, collides at the boundary and so changes its nature as a building element, from primarily excluding to potentially accommodating. *Stuff*, **on the other hand,** can retain a status of permanence and serve as an evaluating device. While keeping its ability to move, it is simultaneously turned into a constant of the transforming bungalow properties. The bed, as the smallest common denominator, operates as the basic compound scale for measuring room sizes 130, densities, and financial profitability. It is also the valuable possession of every single proprietor and the centrepiece in each room called home.

Dissolving Existing Incongruences: Guiding New Orders

The study started from empirical engagement with the properties studied in context, on a plot-by-plot basis, on a random selection with two defined areas of urban interest. The initially inductive aspect of the research made use of the knowledge embedded in the buildings, the spaces between them, and their transformation. The aim was to understand more about the social, economic and juridical entanglements of 'the house' over time, as accommodation of private lives, and as part of the city. While it has been hard not to notice, the change of the freestanding family home to a multi-unit compound / courtyard arrangement has remained somehow elusive, and unregistered. It seemed important to provide 'proof of life' of their existence 'as built'. As a prerequisite to argue for the legitimacy of the undocumented, and to underline their worthiness, the study developed drawings of the properties with nearly forensic detail, and analytical layers to represent the emerging typological change. As the subsequent more deductive case studies and their history have shown, these recordings deal, on multiple scales, with complex dynamics of recognition (Povinelli, 2011). The findings have shown that the bungalow compounds now are in a deficit of authorative approval – but potentially raw material as samples of popular production, and 1:1 visualizations of aspirations for an updated version of emerging patterns of urban life. This means, from the perspective of design research, there is empirical evidence of the knowledge embedded in the bungalow transformations as a valid contribution to the discourse around the design of urban accommodation provision and a conceptual understanding of the value of the urban compound as a transforming type – but normative references that could apply in a potential process of implementation are missing. The implications here may be to turn to what Carl calls the "topography of praxis" (Carl, 2011). He describes it as "the structure of involvement with people and things that comprise urban praxis" (Carl, 2011), or typicalities, as embedded within constituencies – the particular culture of a place as the basis for bottom-up guidance as opposed to standard generalizations implemented from 'above.' In the case of the bungalow compounds in Yeoville and Rosettenville (and similar places like these two areas), this could result in taking advantage of the density of ownership and start working plot by plot on guiding the diversity as embedded quality, and the transformation processes as forms of low-cost built environment efficiency- as the basis for maintaining and improving.

Such a "guidance" process would imply some form of technical/legal involvement to manage overall and assist in improving the product, directing the discussion towards a professional vacuum (gap) that has been detected in the study. The involvement of the professionals that usually prepare the making of built structures and sign off on them, responsible for their safe and adequate performance – such as architects and engineers – seem notably absent in the world of transforming bungalows. As are the city regulators and their service providers. The profession as a technical provider and city council as a regulating entity appear to lack the capacity to deal with either the administration of 'life on the ground' in the way both

institutions have been doing it, 'traditionally' – or change the format of engagement from prescriptive to proscriptive (Tipple, 2000).

Unexpected Collaborations

The study of the transformed bungalow in the context of urban densification comes at a time when its existence faces major challenges but also explicit opportunities. In the light of manifestations of both urban management and housing crisis in the inner city (Zack et al., 2010), there is a high demand for affordable accommodation, yet little knowledge about space-sharing practices on private properties (Charlton, 2019). The mere recognition of the 'bungalow compound' as a unit in official documentation could support the understanding of their potential within the urban context. But is this enough? Or how would we get there? What does a process of recognition entail that actually works in practice and not only on paper? We should recall that we are dealing with an "unsettling hybrid structure […] a juridical-economic-moral entity that, as *property*, has material (as asset), political (as dominium), and symbolic (as shelter) value" (Chakravartty & Silva, 2013:2). In the case of the bungalow compound, this is a 'house' that currently works in the shadows – and not too badly for the many involved in its manoeuvres.

In coming close to an ending, the question that hovers over this work – as in the life of 'the house' – is: what needs to be done? The research has identified what has been termed compound *doings* as the main drivers for compound operations. As some sort of hypothetical question turning recommendation, what about considering the compound *doings* not solely as drivers for **wha**t happens within the transformation of the properties but equally as ways to deal with these in a more appropriate, supportive way – from a professional, from an institutional, and from a knowledge perspective. This thesis potentially leads to some form of "knowledge transfer" – from the bungalow/compounds and their actors – to the professionals, regulators, financiers, and urban modellers. This could then, in turn, modify the action of these so-called "higher order" entities engaging with the emerging and positive values identified, while mitigating the negative – making all of this more visible.
The curation of knowledges that are embedded in the transforming bungalow compounds addresses the need for the *merging* of disciplines and working in inter-disciplinary or trans-disciplinary ways. Architecture, planning, and urban design are all shifting practices that have not found their role in areas under investigation or similar neighbourhoods. Their active involvement is an exception rather than the norm.

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