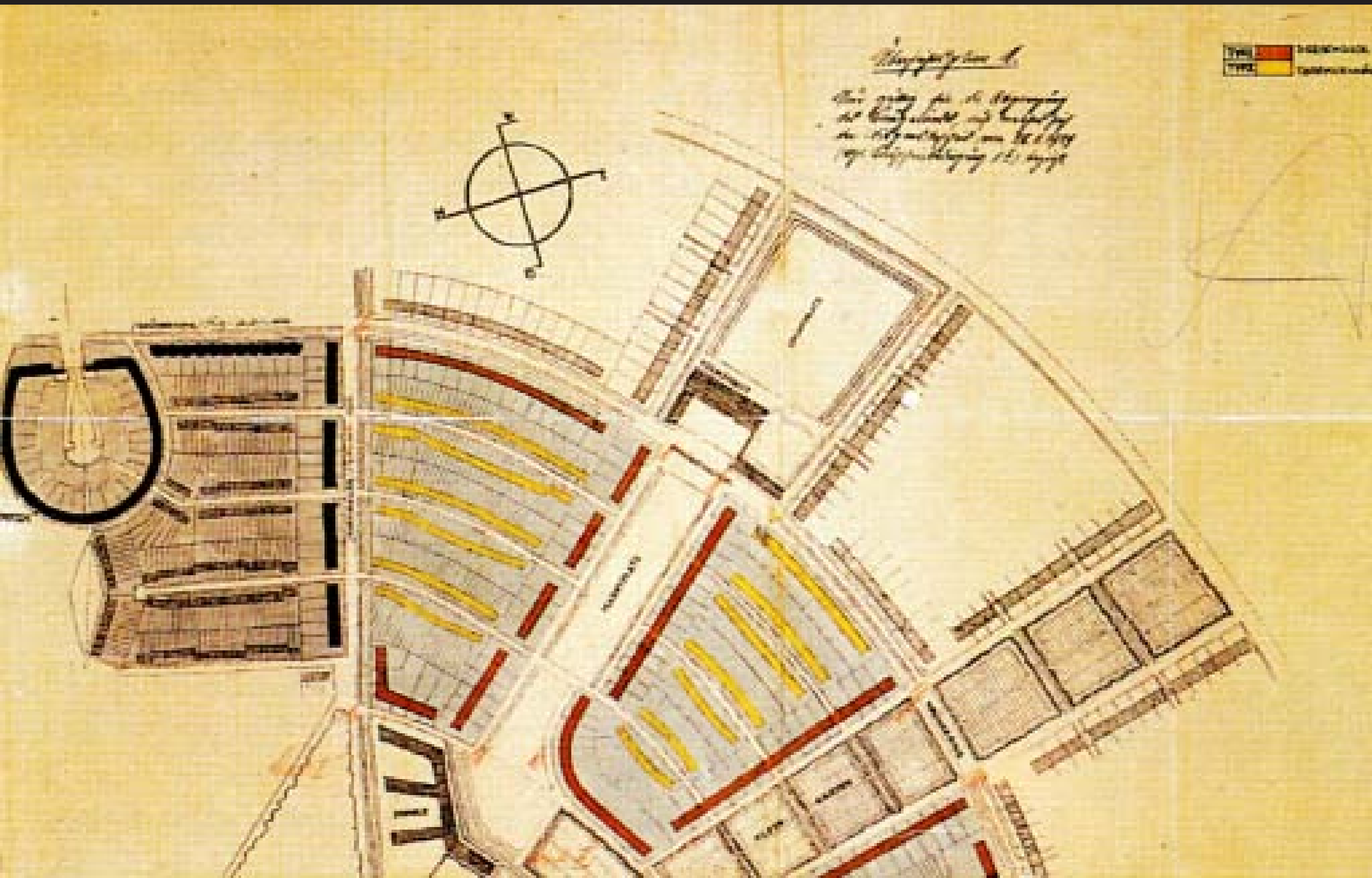

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The Paddington Terrace House: An Example of Incrementally Accommodating Change from the House to the City

I. Introduction

As a reaction to the strict functionalism of modern architecture, a number of social housing failures and an increasing awareness of the environmental impact of buildings, architects and academics in the second half of the 20th century took on the issue of how to design housing that could accommodate change over time. Two distinct approaches developed. “Flexible” housing allows users to readily move or transform spaces at will through the use of moving partitions or more permanent alterations. This method was systematized through the open building concept of support structures and in-fill (Habraken et al., 1976). On the other extreme, “adaptable” housing does not undergo any significant physical change over time but is designed to accommodate a number of uses through its initial design, dimension and organization. This approach is best summarized in the concept of the ambiguous, “multifunctioning” or multi-purpose room (Venturi, 1966). Some researchers analyzed existing housing considered flexible or adaptable, much built speculatively in the late 19th century, looking for design attributes or spatial characteristics that could explain how they could be continuously inhabited for over a century (Rabeneck et al., 1974, Moudon 1986). Recently, the social, economic and environmental advantages of flexible and adaptable housing have been well documented along with a wide range of case studies (Kendal et al., 2000, Schneider et al., 2007). This paper builds on this discourse by documenting a method of incremental change in row housing that has the ability to meet both current and future needs of inhabitants, neighborhoods and cities.

Incremental changes include the ability to renovate, alter and extend existing spaces for new uses, services and technologies or the addition of entirely new spaces to an existing building. Incremental change encourages both flexibility and adaptability as neither alone can adequately incorporate a wide range of needed variations. A systematic analysis of design and construction is required not in terms of how things are built but in terms of how they can be transformed after they are built if incremental change is to play a significant role in housing (Griffin, 2011). The dimension of spaces as well as how they are accessed both relate directly to how housing could be used, reused and altered over time (Chow, 2002). This approach also requires analyzing exterior spaces and the relationship of houses to one another. Structuring incremental change across lot lines ensures that each house can be transformed without sacrificing the quality of existing spaces, those of the house being altered or those of a neighboring house, or impeding any transformations a neighboring house might undergo. Consequently, accommodating change must be studied not just at the scale of the house but the block and neighborhood as well.

Specifically, this paper documents incremental change in the terrace houses of the Paddington neighborhood, one of the first suburbs of Sydney, Australia. In general, terrace, terraced or row housing offers a more sustainable and viable alternative to the development of single-family detached houses prominent in North America and Australia (Wiegelman, 2006). By removing the underutilized side yards between the typical contemporary detached houses, row houses can increase density. By sharing walls with neighboring houses, row houses reduce the amount of energy required to heat and cool (Jung, 2006). At the same time, row houses still provide many of the amenities prospective inhabitants seek in a single family detached house. These include ownership of the property and building, garages, backyards, adequate privacy, and multiple stories. In contrast to multi-story, multi-unit housing, they allow for significant external additions outside the original building envelop as well as internal transformations (Friedman, 2002). Furthermore, the row houses in Paddington have been continuously inhabited for over 100 years during which time the demographics have changed drastically. From new arrivals from England at the turn of the century to European immigrants after World War I and II to artists and students during the 60s and 70s to urban professionals, the terrace houses have accommodated a variety of occupants, new technologies and uses. Consequently, Paddington and the terrace houses there offer an ideal case study to examine the design and construction of housing that accommodates incremental change.

II. Sources and Methods

Through a detailed survey of the neighborhood using field research, aerial photographs, planning documents and floor plans, this paper documents the development and transformations of the Paddington terrace houses. The field research in Australia was conducted over three weeks in 2004 and consisted of documenting over twenty terrace houses, collecting planning documents and maps and a literature review at local libraries. Aerial photographs were used to verify additions and dimensions.

In order to study a wider range of terrace houses, this paper relies on house plans and photographs generated for real estate agents when a house is sold. This documentation was collected from a range of real estate websites in 2005, 2008 and 2012. While the plans come from a variety of sources, these plans were checked against field measurements, planning documents and aerial photographs where possible and found to be accurate. Representing the full geographic extents of the neighborhood, a database of 108 terrace houses was generated representing 3.5% of the 3,064 two or more story terrace houses identified in the 2006 census (Australian Bureau of Statistics, 2008). Houses that were atypical, including one-story houses and those without a balcony or veranda, were excluded from this study. The database itself is quite large and not reproducible for this paper, but it includes a wide range of statistics about each house including the overall width, stair configuration, number of rooms and bathrooms, and types of additions or alterations. This robust database highlights several key trends with respect to width, stair location, and incremental transformations discussed throughout the paper.

III. Paddington Terrace House

The history of the Paddington neighborhood and terrace houses is well documented by Kelly (1978), and only a brief summary of relevant details will be offered here. As one of the first suburbs of Sydney, Paddington started as housing for craftsmen, stonemasons and carpenters, working on the nearby Victoria Barracks during the 1830s. The craftsmen built their own houses out of local sandstone based on 19th century, Georgian, English working class terrace houses of the type documented by Muthesius (1982). These houses had flat, unadorned façades, placed along the sidewalk edge. As the climate of Sydney is radically different than that of England, the English terraced house typology was quickly adapted by adding a balcony and verandah to the front of each house, providing shade and an exterior space connected to the main living and bedroom above (Figure 1). At the same time, the terrace houses were set back ten to twenty feet from the sidewalk to provide a front garden.

Built before electricity, the two to three story terrace houses are only two rooms deep with at least 3m (10ft) ceilings to allow for daylighting and ventilation. The houses were organized with a formal parlor facing the street and a room for dining or living opening onto the backyard. The upper floor mirrored the lower with two bedrooms spanning the width of the lot. If a terrace house was more than two rooms deep, the third room, typically a scullery with a bedroom above, would not be the full width of the lot, leaving a three to five foot gap from the bearing wall for the middle room to have a window (Figure 2). Occasionally, the scullery and water closet would be a separate structure sited three to ten feet away from the house itself. Similar to the addition of a third room, the scullery would not span the full width of the lot, and the water closet attached to the rear of the scullery would be narrower, extending the house along one of the two party walls and thinning as it progressed deeper in the lot (Figure 4). In some cases, the water closet was a separate shed built along the rear property along alleys designed for hauling “night-soil.” Housing four to six people on average, these five to six room terrace houses made up about 80 percent of the housing built in Paddington between 1870 and 1890 (Kelly 1978).

Today, the Paddington terrace houses used in this study range from four to eleven rooms including anywhere from two to five bedrooms. In 2006, the average household size across all of Paddington is 2.0 people with 1.1 people per bedroom (Australian Bureau of Statistics, 2008). Total floor areas ranges from under 50 square meters (roughly 540 square feet) to over 200 square meters (2,150 square feet). The average terrace house is seven rooms including three bedrooms. In addition to these spaces, there are an average of two bathrooms. Only nine percent of the houses in this study have a habitable basement, and most of these are on steeply sloped sites where rear yard is a full story below the entry level.

Dimension

The majority of the terrace houses were built speculatively. Land speculators would buy property, typically from the ranchers who owned the rolling hills around Victoria Barracks, and divide it first into lots with 60-foot wide frontages to proposed streets. As some speculators believed they could make more profit by selling more lots, they divided their parcels into dimensions as narrow as 3 meters (10 feet) and typically 24-36m (80 to 120ft) in depth. Instead of reselling the smaller lots and allowing individuals to build their own house, developers would build a series of terrace houses to rent or sell. A recent study of three large blocks in Paddington noted that terrace houses were primarily built in groups of two to six houses (Watanabe et al., 2007).

Of the houses analyzed for this study, the width between bearing walls of the terrace houses ranged from 2.8m to 6.6m (9ft to 22ft) with an average width of 4.3m (14 ft). The distribution of widths has two distinct peaks at 4.0m (13ft) and 4.4m (14.5ft). These two widths alone make up 40 percent of the houses in this study and supports Kelly’s assertion that the average lot width in Paddington is approximately 4.6m (15ft) or a 60-foot frontage divided into four lots with bearing walls measuring a minimum of 23 cm (9 in). Over 90 percent of the terrace houses are less than 5.5m (18ft) wide and nearly a quarter are less than 4.0m (13ft) wide. Due to these narrow widths, the density of Paddington terrace houses ranges between roughly 35 to 47 dwelling units per hectare (14 to 19 dwelling units per acre) depending on the width of houses in a given area. The average density of Paddington including apartment buildings and open spaces is 34 dwelling units per hectare (Australian Bureau of Statistics, 2008). This level density has been identified as critical in providing housing that supports walking, public transportation, commercial enterprise and other social, environmental and economic benefits while maintaining individual ownership of land and buildings (Bennet, 2011).

Construction

Despite the range of widths discussed in the previous section, the floor plans and construction of most Paddington terrace houses are remarkably similar. The construction of the terrace houses is critical in understanding how change can be accommodated incrementally. Load bearing party walls of brick built upon sandstone foundations run parallel to one another along lot lines. In most cases, these walls extended past the roof and enclosure to provide fire protection and emphasize the boundaries of each individual house. Floor and roof joists run between these bearing walls. As the spans were usually less than 20 feet, no interior load bearing walls or columns were needed. Therefore, the front and rear facades as well as all interior walls are non-loading bearing. Figure 5 highlights the hierarchy of how a typical terrace house can be transformed overtime with more permanent elements, bearing walls and floors, in black and non-loading bearing elements in grey. This assembly allows for a range of transformations within the interior as well as extensions and additions to both front and rear of the terrace houses. Consequently, indoor plumbing was easily incorporated, allowing for the addition of bathrooms and kitchens. One of the more typical alterations is the removal of the wall between the former parlor and dinning/living space to shift from Victorian patterns of living with isolated rooms to open-plan living spaces. This transformation is documented in one-quarter of the terrace houses in this study. This particular alteration is potentially limited as the lateral stability of a row is compromised if too many houses remove this wall, and the municipal council has now enacted codes regulating removal of this wall. The assembly also lends itself to the often-steep topography of Paddington as individual houses did not have share the same foundation and could “slip” vertically between the load-bearing walls that clearly divided them.

Incremental Transformations and Additions

Despite the relatively small size of the Paddington terrace houses, they have accommodated a wide range of incremental changes over the past 120 years. While these may at first glance seem random (Watanabe et al., 2007), many of the transformations and additions are influenced by the width and stair type more than any other factor. In terms of adaptable transformations that require only the repurposing of existing spaces, the four main rooms of the house – the parlor at the front, the informal living and dining room at the rear and two bedrooms upstairs – remain relatively unaltered in most terrace houses today with exception of adding closets. The dimension of these spaces and how they are accessed has left enough ambiguity to meet the needs and life-styles of several generations of inhabitants. Through the additions of dormers and stairs, the originally unutilized space in the gabled roof has been turned into an extra bedroom in over one-third of the houses in this study. This transformation is seen primarily in the terrace houses with stairs parallel to the bearing walls, 70 percent of all attic conversions, as these are more readily transformed into a three-story staircase than those running perpendicular.

The primary additions to the Padding terrace houses occur in the rear where the original scullery is transformed into a modernized kitchen and additional living space. There are three primary types of additions that include (1) extending the full width of the terrace house only on the ground floor with potentially a stepped addition above, (2) extending the full width of the terrace house but creating a small, narrow courtyard between the original house and the addition, or (3) a stepped addition extending the original house deeper into the rear yard. Narrower houses typically extend the full width of the house while wider houses use courtyards (Figure 6). The stepped addition likely has less to do with the width of the house and more to do with the stair orientation. Defining the width of the original rear extension, the perpendicular, switchback stair associated with houses 4.2-4.4m (14ft) wide acts a template for future additions and makes a courtyard scheme less viable. Figure 4 highlights how a single terrace house has been transformed from its original as built condition through subtractions and additions to its current state.

The four to six-foot depth of the verandahs offers the opportunities to use these spaces as exterior porches, enclose the upper balcony as a separate space off the main bedroom, or extend the ground floor parlor to edge of the balcony. Herman Hertzberger (1991) would argue continuing the bearing wall past the enclosure and edge of the verandah, enclosing it on three sides, offers an incentive to transform the space. There are a few streets where these spaces have been enclosed or extended on the ground floor space to make commercial storefronts (Figure 3). However, the local council declared Paddington a heritage conservation area in 1995. If an individual wishes to renovate or make any alterations to a terrace house, they must restore the front façade to its original appearance, removing any extensions or additions. This is reflected both in relative lack of houses in this study with an enclosed balcony, only six total and all of which are in need of remodeling, and that the boundary of the historic district is made visible with often radically transformed façades on the other side of the street.

IV. Block and Neighborhood Scale

Structuring incremental change across lot lines ensures that each house can be transformed in the same way without sacrificing the quality of existing spaces, those of the house being altered or those of a neighboring house, or impeding any transformations a neighboring house might undergo. In the Paddington terrace houses, the positions of the original sculleries along one of the bearing walls, the “growth” or addition wall, offers a shared understanding of how subsequent additions and extensions could be structured. Looking at the larger urban fabric of Paddington, it is clear that additions have been made along these

walls. Two neighboring terraces can share the same addition wall creating mirror image plans or use different walls where each house has the same plan and windows from the additions look onto the blank, back side of the neighboring addition wall.

While there are many similarities between the Paddington terrace houses and English workers' terraced houses from the same time period, one key difference was the additions of alleys in Paddington to address sanitation needs. Ranging from 2.5 to 5.5m (8 to 18ft), the alleys now provide automobiles and pedestrians access to the rear of almost every lot. Nearly half of the houses in this study have either a garage or parking spot off an alley. Where garages cannot be added due to topography, many streets are generous enough in width to allow for cars to park perpendicular to the direction of traffic and the alleys themselves can provide parking. Currently, only three houses in the study have accessory dwelling units accessed by the alleys, but as the need for housing in Paddington increases the rear portion of the lots offer opportunities to continue accommodating change.

VI. Conclusions

While there will continue to be accidental flexibility and adaptability within housing, we cannot rely on it. The ability to accommodate change must be anticipated, structured and intentionally integrated. Incremental change in housing has the potential to accommodate unforeseen shifts in demographics, new technologies and different lifestyles. As a result, the natural and economic resources invested in these buildings will not be wasted. At the same time, incremental change allows a major portion of the built environment to endure while allowing for individuals to interact in significant and meaningful ways to define and maintain a sense of place. The Paddington neighborhood has accommodated a wide variety of inhabitants, new technologies, new forms of transportation and new uses through a shared understanding of how to transform the houses. This paper has argued the design of the terrace houses on all levels, from the individual house to the neighborhood, contribute to the longevity of this housing stock. In particular, this paper has highlighted the role dimension, construction and access play in the ability for row housing to accommodate change.

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VII. Legenda

All photos by author. All graphics by author with assistance from Brian O'Reilly.

Figure 1. Paddington terrace houses, front elevation.

Figure 2. Paddington terrace houses, highlighting stepped rear extensions.

Figure 3. Terrace houses converted into storefronts by infilling the verandah on Williams Street, Paddington.

Figure 4. Plans of 6 Alma Street, Paddington highlighting the location and type of incremental changes it has undergone.

Figure 5. Exploded isometric showing the construction of 90 Liverpool Street, Paddington with non-load bearing elements in light grey.

Figure 6. The percentage of a given addition type versus the interior width of a terrace house. This graph demonstrates the relationship between house width and the type of addition deployed.

figure 1

figure 2

figure 3

figure 4

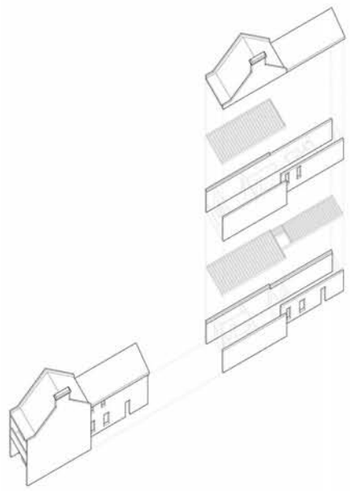

figure 5

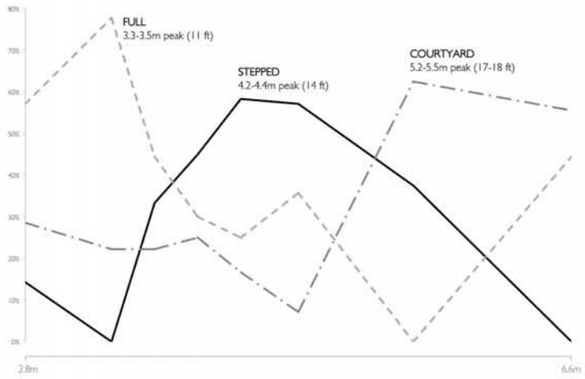

figure 6