Across the country, vacant lots in historic districts receive infill housing, and affordable infill housing recently emerged as a viable way to provide more affordable living solutions and bring new life to historic neighborhoods. Taking advantage of this positive trend, I analyzed seven case studies of affordable infill housing in historic districts to mine commonalities among these houses. The analysis of the design of both exterior and interior of these house led to the creation of supplemental guidelines for designing both compatible and affordable infill housing in historic districts. Specifically, I considered the following exterior and interior elements of each infill house: site and site features, form, height, proportion of street façade, window proportions and form, roof form, foundation, front entrance, porch, exterior materials, trim, square footage, number of bedrooms, number of bathrooms, number of closets, a washer and dryer, work space, and overall layout.

The examination of these criteria led to the realization of several patterns contributing to the compatibility and affordability of these houses. Most prominently, all seven houses enclose less than 1,205 square feet and sit on small lots; these two ubiquitous characteristics provide the main methods of achieving affordability within this sample. Additional commonalities surfaced that contribute to affordability in addition to the sustainability and communality of these houses. This investigation expands on the positive trend of affordable infill in historic districts and accounts for the end users of affordable housing through the provision of parameters for designing affordable infill with compatible exteriors and contemporary interiors.

PROVIDING HOME THROUGH AFFORDABLE

INFILL HOUSING IN HISTORIC

DISTRICTS

by

Catherine Claire Keane

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CHAPTER I

INTERACTIONS OF HOME AND HISTORY

> The right to housing should not be interpreted in a narrow or restricted sense, which equates it with, for example, the shelter provided by merely having a roof over one's head or views shelter exclusively as a commodity. *Rather it should be seen as the right to live somewhere in security, peace and dignity*. (General Comment No. 4 on the right to adequate housing quoted in Goley & Ozden, 2007, p. 4 emphasis mine)

As an interior designer and a historic preservationist, I believe in the power of both design and the past. I believe that the design of the spaces we live and work in impacts our everyday lives and affects us on multiple levels. Home contains daily life while simultaneously affecting its residents' identities, and all people should live in spaces that support their identities and provide security (Porteous, 1976). The historic built environment also impacts identities, both individual and communal, and maintaining physical relics of the past provides context for people's everyday lives. Historic environments each have their own sense of place and past and can facilitate the personal identification of home because "the past is integral to…identity" (Lowenthal, 1985, p. 41). Through this research, I seek to use the power of design and an understanding of the past to guide the design of affordable housing in historic districts that supports the existing character, sense of place, and community of established neighborhoods and respects the environment through sustainable design and construction.

Purpose and Justification

In this study, I link the provision of affordable housing with historic preservation by creating guidelines for the design of affordable infill housing in historic districts, following this hypothesis: historic preservation principles and practices can be used to build new structures to support historic districts and provide good resources for affordable housing (Rypkema, 2003; The National Park Service, 1976). To examine this hypothesis, I investigated the specific characteristics of seven affordable single-family infill houses constructed in historic districts to assess whether historic character and affordability can exist compatibly. New affordable houses in historic districts built to correspond with the historic fabric of the community can provide well-designed, supportive homes that celebrate the urban environment and renew the energy and vitality of neighborhoods. Additionally, new construction in historic districts allows for houses with interiors that accommodate contemporary lifestyles. Through this investigation, I provide guidelines that support the creation of homes, which consist of both physical dimensions and human interactions.

Home provides the most important personal space for an individual, and each person has the right to "gain and sustain a secure home…in which to live peacefully" (Miloon Kothari quoted in Goley & Ozden, 2007, p. 5). A house offers a place for intimate refuge; within a home, a person finds a physical and mental resting place from the universe (Bachelard, 1958). Although each person participates in multiple spaces, groups, and times, "home is perhaps the most significant of the many space-group-time complexes" to which a person belongs (Porteous, 1976, p. 386). A home provides more than a container for life's daily activities; it acts as a symbol of a person's identity (Porteous, 1976).

People have a universal right to housing that supports their sense of self and security; however, more than a billion people across the globe live in inadequate shelter (Goley & Ozden, 2007). The lack of adequate housing affects many Americans as the need for affordable housing in the United States has increased since the 1990s (U.S. Department of Housing and Urban Development, 2010). The traditionally accepted definition of affordable housing specifies people making less than 80% of the median income of an area qualify for federal assistance; however, as housing costs continue to rise, the lack of affordable housing affects households making 80-120% of the median income of some regions and cities (National Association of Home Builders, 2010). Additionally, these households rarely qualify for public assistance because they earn more than the less than 80% of median income required for financial support. Households in this category, referred to as workforce housing, include professionals such as teachers, police officers, retail clerks, and health care workers. Affordable housing needs continue to increase and change, so the design and location of affordable housing stock also needs to adapt because "as human needs change in their societal context, so must the design of shelter change" (Stewart, 1979, p. 450).

Having a sense of home involves both orientation and identification with a place, but "dwelling above all presupposes identification with the environment" (Norberg-Schultz, 1979, p. 20). Placing an affordable home within a historic district provides a sense of orientation based on established architectural patterns and identification with the history present in the built environment. Because historic neighborhoods form well-connected sub-communities that relate to their larger local contexts, they provide sites for supportive activities and approaches, particularly including affordable housing (Rypkema, 2003). Historic preservation maintains communities, each enhanced by the

accrued history physically present in these neighborhoods (See Ames & Wagner, 2009; Rypkema, 2003). Also, as concerns for the environment increase, preservation practices and principles provide sustainable options for maintaining both historic and natural resources (Elefante, 2007). Building infill affordable homes in historic districts can enhance existing historic fabric, sense of place, and community while also providing well-designed, sustainable homes at affordable prices. Additionally, infill homes combine interiors that fit contemporary lifestyles with exteriors that contribute to the historic fabric of the neighborhood. Bringing these two discussions, affordable housing and historic preservation, together through design helps achieve the goals of both by supporting historic character while providing affordable homes, enhanced by the evidence of the past that surrounds them, that support identity and security.

Connecting Affordable Housing and Historic Preservation

Although the National Trust for Historic Preservation (the National Trust) and the Advisory Council on Historic Preservation (ACHP) recognize the connection between affordable housing and historic preservation, published material on the combination of these two efforts remains deficient (72 Federal Register 31, 2007). In a 1995 policy, the ACHP provided a guide for federal agencies and State Historic Preservation Offices (SHPOs) to use when making decisions about affordable housing and historic buildings. In a 2005 review of this policy statement, the ACHP found that members of several federal agencies desired detailed guidance on applying the *Secretary of Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings* to affordable housing as well as case studies of successful integration of affordable housing and historic preservation. A National Trust publication provided guidance on

funding affordable housing projects and how to use tax credits and includes six case studies of rehabilitated historic structures used for affordable housing (Delvac, Escherich, & Hartman, n.d.). However, all but one of these cases focused on multifamily solutions and none addressed the use of infill as a means of providing affordable housing within historic contexts. While historic preservation's applicability to affordable housing has been recognized, the focus remains on rehabilitation rather than infill construction (Rypkema, 2003). Although many historic district guidelines address infill in terms of compatibility, the affordability of infill houses remains absent from these documents.

To bridge some of the shortcomings in available literature, through my thesis investigation, I provide guidelines for using preservation principles to provide affordable single-family housing. In completing this study, I add to the body of knowledge of the construction of infill housing in historic districts as a way of demonstrating the compatibility of historic preservation and affordable housing. As the question of good, affordable design has validity both inside and outside historic districts, this discussion of quality and values must begin by understanding the myriad of issues that complicate affordable housing, a topic taken up in the next chapter. Then, through considering historic preservation, sense of place, authenticity and compatibility, and historic neighborhoods, I lay out additional opportunities for stitching together these two seemingly disparate worlds.

CHAPTER II

MERGING DISCOURSES

Affordable housing and historic preservation contain complex meanings that interact, as demonstrated in this chapter. As I will show, preservation lacks clear deliniation as an undertaking and involves attention at multiple sites and scales from the near envrionment to the conurbation, from cultural context to the physical object (Huxtable, 1997). As a result of this complexity, an interdisciplinary approach to both the literature, overall organization of this research, and analysis allows for a rich and meaningful exploration, (Repko, 2008) indicates.

Above all, design – including that for affordable housing and that for historic preservation – suggests anything but a simple, linear process, and design problems do not lend themselves to facile or uni-disciplinary approaches (Buchanan, 1992). The lack of definition of design problems (Buchanan, 1992) contributes to the inherently multi-disciplinary nature of design (Mendoza, Bernasconi, & MacDonald, 2007). Bringing together the discourse surrounding affordable housing and historic preservation through design requires an exploration of not just the physical elements of the built environment but also the context and narrative processes surrounding their creation. It also involves transcending traditionally defined disciplinary boundaries and examining theories, ideas, and debate from geography, material culture, and history.

Affordable Housing

Housing involves interactions between users and their environments; social, cultural, physical, economic, and religious factors affect house forms (Stewart, 1979). Poorly designed affordable homes and misguided assumptions about those who need affordable housing continue to present issues in the United States (Friedman, 2009). As a more diverse group of people requires affordable housing, design and context must continue to improve and evolve (Rypkema, 2003). The design, construction, and location of affordable housing should account for the end users' experience and support the creation of identity.

Affordable Housing in the Twentieth Century

Housing in the early twentieth century responded to many factors, including building codes, zoning, city planning, and mass production (Stewart, 1979). Population growth, urbanization, and industrialization continued to impact cities in the early twentieth century, and both mass production and distribution played a role in the spatial forms of cities and residences. Affordable housing in the United States first became a major concern for large cities during the Industrial Revolution. As factories' needs for labor increased, they drew immigrants into the cities and urban centers. The population growth was so rapid that housing accommodations did not meet the social or spatial needs of the workers, and tenement slums grew while the wealthy constructed extravagant mansions and apartments or retreated to the suburbs. As cities became overcrowded, the elite considered the people living in affordable housing as the problem rather than the shortage of adequate affordable housing (Stewart, 1979).

Housing reformers viewed communities designed by trained planners as the solution to the lack of adequate housing. However, social reformers and city planners disagreed about the responsibilities for housing. While city planning traditionally focused on civic improvements and civic art, reformers sought to improve the morality of the poor through housing. In 1909 at the inaugural city planning conference organized by social reformers, the Committee of Congestion criticized the moral evils and health hazards caused by overcrowding and challenged planners to provide safe, sanitary, adequate housing (von Hoffman, 2009). At first, planners rejected this challenge, but over the following two decades, urban planners took on housing issues just as social reformers moved away from their previous positions. Planners began to use zoning as a tool to segregate working class or other "unwanted" populations, and planning and zoning soon benefited well-off, property owners, developers, and their allies in local government rather than the people in need of affordable housing (Jacobs, 1961).

Although housing reformers and planners attempted to provide affordable housing, neither group really understood the end users' experience of those spaces. Housing reformers of the early 1900s advocated for affordable housing as a mechanism to change the morality of residents (von Hoffman, 2009). However, the link between morality and housing in America dates back to the nineteenth century, when the "conceptual conflation between women's bodies and domestic interiors…was prevalent" and the home reflected the morality of its residents (B. Gordon, 1996, p. 281). Housing reformers used this argument to advocate for the improvement of public housing (von Hoffman, 2009). Public housing became a form of social reform, and

supporters thought that improving housing would civilize the people living in it; however, public housing did not live up to these moral demands.

The Great Depression severely impacted housing, and the strain on the existing housing stock brought about a new perspective on the influence of planning and national policy on social welfare (Stewart, 1979). After the stock market crash, construction rates fell along with the sizes of houses. In addition to slowed construction rates, slums expanded, making the urban housing shortage both quantitatively and qualitatively worse. Housing faced devastating conditions, physically and financially, and political leaders, confronted with daily foreclosures, bankrupt mortgage lenders, and frozen credit markets, called for action (von Hoffman, 2009). The Federal Government responded to this call through legislation that influenced the planning and construction of affordable housing (see Table 2.1). The Federal Housing Administration (FHA), created in 1934, made financing cheaper and easier, stimulating construction (Stewart, 1979). Hoover's Reconstruction Finance Corporation (RFC) provided loans for low-income housing groups, and Roosevelt's Public Works Administration (PWA) built low-income housing in addition to many other housing programs of Roosevelt's New Deal. In 1937, public housing advocates helped convince Congress to pass a permanent public housing program bill that created the United States Housing Authority (USHA) to fund local public housing commissions (von Hoffman, 2009). In an attempt to reduce slums, the Housing Act of 1937 mandated severe cost restrictions, minimum standards for space and amenities, and an equal number of slum units removed for every public housing unit built. However, these

requirements meant that developers carried out these projects only in blighted areas

and served to further marginalize low-income housing, which continued to be low

quality in design and environment.

Table 2.1 Select Federal Government Actions on Affordable Housing

Year	Action	Purpose
1934	Federal Housing Administration (FHA) created	Make financing cheaper and easier to stimulate construction
1937	United States Housing Authority (USHA) created	Permanent public housing program to support local public housing commissions
1937	Housing Act of 1937	Set minimum building standards for affordable housing and required that a slum unit be removed for every new unit built
1961	1961 Housing Act	Attempted to improve quality of existing housing projects by providing neighborhood amenities
1968	1968 Housing Act	Prohibited high rise public housing projects for families with children
1974	1974 Housing and Community Development Act	Created the Community Development Block Grant (CDBG) to make money available for local communities to provide affordable housing.

Note: complied from von Hoffman, A. (2009). Housing and Planning: A Century of Social Reform and Local Power. *Journal of the American Planning Association*, *75*(2), 231 - 244. Stewart, K. K. (1979). Twentieth Century Housing Design from an Ecological Perspective. In G. S. Fish (Ed.), *The Story of Housing*. New York: McMillan Publishing Co.

Later in the twentieth century, urban planners began using housing as a physical

manifestation of social welfare. Planners sought to sort the functions of the city and

created high-rise apartment buildings disconnected from the more affluent parts of the

city (Jacobs, 1961). Planners assumed affordable housing residents desired green

spaces and playgrounds, but their projects resulted in isolated buildings that lacked

functions from which residents could benefit, such as grocery stores and barbershops.

Additionally, residents of apartments rarely have the opportunity for the personalization

of space that leads to a sense of security and attachment to a home (Porteous, 1976).

The end users' need for a home that supported identity and security remained absent from early affordable housing options that focused on sorting and influencing morality (Jacobs, 1961; Porteous, 1976; Stewart, 1979).

The Federal Government tried to account for affordable housing residents' experiences through a series of laws that recognized the ill effects of the disconnected high-rise housing projects (see Table 2.1). With the 1961 Housing Act, the government attempted to increase quality in existing projects by providing neighborhood facilities, stores, and commercial centers, and with the 1968 Housing Act, the government recognized the negative associations with high-rise affordable housing through prohibiting high-rise projects for families with children "unless there was no other practical alternative" (Stewart, 1979, p. 492). The 1974 Housing and Community Development Act supported this shift away from high-rise developments, and organizations began building low- and mixed-income housing in efforts to revive inner-city neighborhoods (von Hoffman, 2009).

The lack of local support and understanding and planners' attempts to sort the city's functions left affordable housing scarred. Despite social reformers and public housing advocates' triumphs at the national level, local businessmen and politicians resisted the plans to incorporate public housing in communities (von Hoffman, 2009). The high-rise apartment buildings and city slums resulted from a desire to sort the city's functions and place low-income earners all in the same place (Jacobs, 1961). This attempt to organize the city resulted in unsafe and undesirable landscapes for both residents and potential visitors.

While urban public-housing suffered from poor design and context, suburban dwelling gained popularity after the Great Depression as a result of several technological, economic, and social factors. Highway construction and increased use of the automobile spurred suburban development further from city centers (Stewart, 1979). The FHA made homeownership more affordable by insuring residential mortgages and allowing lenders to accept smaller down payments and longer loan repayment periods (25-30 years) (von Hoffman, 2009). Additionally, the standardization of the 40-hour workweek increased the appeal of suburbs (Stewart, 1979). The preference for single-family homes persisted after World War II as technologies continued to advance and family structure influenced the design of housing. However, suburban living and homeownership remained unattainable for many Americans.

The post-WWII period marked a physical change in housing in North America, as well as demographic, lifestyle, economic, and cultural changes that continue to affect residential landscapes and societal concern for affordable housing (Friedman, 2009). Before modernization, family provided education, protection, recreation, economic support, and affection, but many of these functions were transferred to outside parties after WWII (Stewart, 1979). Because the family represents an important social institution throughout history, "changes in family lifestyle have directly impacted the design of dwellings over the years" (Stewart, 1979, p. 453). The housing market targeted a homogeneous group – households composed of a working father, housewife, and children, and this demographic influenced the design of single-family, detached houses (Friedman, 2009). The idea of the family as the primary consumer of single-family homes impacted the interior layout of houses – the number of bedrooms

and bathrooms and the arrangement of the rooms themselves (Friedman, 2009).

Households that did not fit in this demographic assumingly found shelter in apartments.

While developers and builders focused on appealing to families that could afford suburban homes, they continued to ignore the needs of affordable housing residents. Jacobs recognized the lack of acknowledgment of the end user's experience of affordable housing and noted that although the private sector could meet ordinary housing needs, not all people can afford to live in privately funded housing (1961). Those unable to afford such housing, "have been turned into a statistical group with peculiar shelter requirements, like prisoners, on the basis of one statistic: their income" (Jacobs, 1961, p. 324). The system of affordable housing that existed by the 1960s was "irrelevant to the nature of the problem, irrelevant to the plain financial need of the people concerned, irrelevant to the rest of our economic system, and even irrelevant to the *meaning of home* as it has evolved otherwise in our tradition" (Jacobs, 1961, p. 325 emphasis mine). Essentially, designers and founders of affordable housing ignored the basic needs of the end users, and a system emerged to house statistics rather than people, a system still in place today.

Current Issues of Affordable Housing

The issues surrounding affordable housing have evolved since the twentieth century, and even more households find themselves in need of affordable homes because of the recent mortgage financial collapse (Hosford, 2009). Traditionally, the term "affordable housing" implied "commercially built houses that ordinary working people could afford," but today, people associate it with social programs and

government subsidies (Rybczynski, 2008, p. 16). HUD estimates that 12 million renters

and homeowners now spend more than 50% of their annual income on housing,

exceeding HUD's definition of affordability by 20% (U.S. Department of Housing and

Urban Development, 2010). Today, issues of affordability affect people making up to

120% of the median income of certain areas (National Association of Home Builders,

2010); working professionals have joined minimum-wage earners earning below 60% of

the median income as households in need of affordable housing options (Hosford,

2009). Respected and necessary professionals, such as teachers, police officers, and

nurses, find themselves misunderstood and increasingly unaccounted for in the housing

options available today (Rypkema, 2003). Most working professionals do not qualify for

public assistance, but the little funding available for affordable housing would be

stretched too thinly if made available to these working professionals. This group in

need of affordable housing calls into question the current state of affordable housing

and why earning 80 – 120% of the median income of an area still limits the housing

options for many households.

Levitt and Sons pioneered building affordable homes for the postwar market;

they took advantage of the market created by GIs coming home in need of houses and

efficiently constructed small houses on small lots that sold for only $9,000 (equal to

$82,000 in 2008) and included a flexible floor plan and innovative design solutions

(Rybczynski, 2008). A Levittown house cost just three times the average annual salary

of $3,300; using the same formula, in 2008, the national average salary was $40,500, so

an affordable house would cost around $120,000. However, according to the Census

Bureau, the median price for a new single-family home in 2008 was around $234,000.

Levitt and Sons created a model that could be built efficiently and purchased affordably, but as time passed, the "bigger is better" mentality crept into America and affordability continued to move beyond the grasp of many households.

The form of housing in general in America has changed greatly since World War II, and these changes have in turn affected affordable housing. Since 1950, the average size of a new house increased from 1,000 square feet to 2,265 square feet in 2002 and then to 2,438 in 2009 (Bernstein, 2005; Fine & Lindberg, 2002; U.S. Census Bureau, 2011). This inflation of house size across the country also escalated housing costs, making single-family houses barely affordable for a growing number of households. And while house size increased, average household size decreased: in 2000, 2.6 people occupied the average household, compared to the more than 3 per household in 1967 and 4.5 in 1915.

In addition to changes in house and household, the homeowner changed since Levittown revolutionized the American suburb in the 1940s. Now, more single people buy homes, and people living alone represent the second largest household type, while non-family households increase faster than family households (U.S. Census Bureau, 2001). Single-person and single-parent households as well as the number of seniors have increased since World War II, and with a single annual income, they need affordable options because they often do not qualify for government assistance. Single-wage earner households cannot afford the rent for a fair-market two-bedroom apartment anywhere in the United States today (U.S. Department of Housing and Urban Development, 2010). Many households no longer fit the homogeneous market to which single-family, detached housing caters, but their options remain limited.

Perpetuating the ever-increasing size of houses, zoning regulations in many areas encourage the construction of large homes on large lots because they generate more property taxes (Hosford, 2009). Additionally, in some areas, voters view growth as negative and approve restrictions on the number of houses built in an area (Rybczynski, 2008). Strict zoning laws and complex permit processes decrease growth and discourage new building, so while demand increases, construction of new houses decreases. Zoning for large lots represents a common way to control density, and these large lots mean fewer houses with higher costs that then drive up surrounding property values. This seemingly never-ending cycle of big lots and big houses makes affordable options scarcer. Building smaller houses on smaller lots provides more affordable solutions, but communities interpret that approach as unwanted density (Rybczynski, 2008).

Although public policy increasingly favors integrating affordable housing options throughout communities, local opposition remains successful in preventing the construction of affordable housing in many places (Mueller & Tighe, 2007). On local and state levels, zoning presents additional hurdles for building affordable housing in certain areas (Friedman, 2009). Community opposition in the form of the Not-In-My-Back-Yard (NIMBY) argument thwarts attempts to incorporate affordable housing on the local level. Using this argument, homeowners oppose developments for seemingly understandable reasons: increased traffic, reduced personal safety, and decreased value of homes. This sentiment influenced political leaders who take the Not-In-My-Term-Of-Office stance; despite the fact that they understand the need for affordable housing, they do not want to support it for fear of losing voters' support. NIMBY

arguments have gained momentum and many people assume that affordable housing

threatens the property values in a neighborhood. Some evidence suggests that people

use these arguments less (Friedman, 2009). In 2006, the American Planning

Association (APA) took a stance against state and local zoning regulations that

prevented the development of subsidized and low-income housing (von Hoffman, 2009,

p. 240). Zoning bylaws have been successfully challenged in court, and today planners

often incorporate the goals of housing reformers, environmentalists, and historic

preservationists in their work and understand the need to work with the local citizens

rather than against them (Friedman, 2009; von Hoffman, 2009).

The identity of affordable housing requires a re-conceptualization as the

provision of homes rather than the construction of basic shelter. Those in need of

affordable housing should have a choice about their home that enhances rather than

harms their personal identity, thus the idea of home represents an incredibly significant

aspect to this study. This discussion centers on the framework of home as an

important part of identity, "for our house is our corner of the world" (Bachelard, 1958, p.

4). Architecture serves to help people dwell within the environment, and "the basic act

of architecture is …to understand the 'vocation' of the place" (Norberg-Schultz, 1979,

p. 23). The vocation of a house involves offering protection, stability, and rest

(Bachelard, 1958). A home provides the three essential territorial satisfactions: identity,

security, and stimulation (Porteous, 1976). The home acts as a symbol of identity,

which "includes not only self-knowledge but also one's persona as recognized by one's

fellows" (Porteous, 1976, p. 384). Preservation figures prominently in this discussion as

both personal and cultural pasts influence a person's identity (Lowenthal, 1985), and

respect for and integration of history in the creation of home fosters personal and

community connections with the built environment.

Historic Preservation

Architecture exists to satisfy people's physical and psychological needs and to

shelter the activities of daily life (Norberg-Schultz, 1979). The historic built environment

served the people who conceived it, but it also continues to shelter people today.

Preservation of a building recognizes its physical ability to continue to provide a place

for people to experience. However, understanding a place calls for an awareness of

how people experience it (Steele, 1981). Preservation encompasses more than the

materials that make up the buildings; "it has to do with the way individuals, families,

and communities come together in good environments" (Moe & Wilkie, 1997, p. 240).

As time passes and functionality changes, the historic built environment accumulates

different users who associate a variety of experiences with historic places. Historic

buildings, sites, and neighborhoods have become significant places because the

people who experienced them endowed these spaces with value and meaning (Burton-

Christie, 2009, p. 6).

Historic preservation evolved over the decades and, as time passes, more

structures become valuable historic resources. The preservation field in the United

States grew from a small, elite group in the 1960s to a larger number of professionals in

the 1980s (Lowenthal, 1985). However, preservation began long before the 1960s, and

Ruskin and Viollet-le-Duc discussed its importance for European architecture and

history in the nineteenth century (Ruskin, 1849; Viollet-le-Duc, 1860). Ruskin believed

that the glory of a building resides in its age and found beauty in the ways time becomes evident on a building (1849). Viollet-le-Duc, however, found truth in restoration because it shows the building in its purest form (1860). Despite differing in their reasoning and methods, they both recognized the importance of saving historic architecture because "we require heritage with which we continually interact, one which fuses past with present" (Lowenthal, 1985, p. 410). These two voices of preservation still have strong resonance today, but because buildings in the United States, generally less than centuries old, often call for adaptive reuse to remain viable resources, preservationists usually find middle ground between picturesque ruin and exact restoration (Huxtable, 1997; Mason, 2006). A building that stands in ruin, full restoration, or somewhere in between connects us with its past and provides a physical artifact which we can interact with and learn from in the present.

Each generation shapes their own legacy by what they keep and what they destroy, and preserving historic buildings and landscapes becomes more important as history and the past play less integrated roles in our daily lives (Lowenthal, 1985). Despite its cultural value, the historic built environment often succumbs to destruction. Unfortunately, in the last three decades of the twentieth century, more than six million historic or older homes have been demolished (Rypkema, 2003). Sprawl, urban renewal, and urban disinvestment have influenced the destruction of much of the historic built environment (Jacobs, 1961; Moe & Wilkie, 1997; Rypkema, 2003). The parking lots that replace historic commercial buildings and the McMansions that replace 1920s bungalows indicate a general disregard for the past in the United States.

However, preservationists understand that "merely to know about the past is not enough; what is needed is the sense of intimacy, the intensely familiar interaction with antiquity" (Lowenthal, 1985, p. 378).   Historic structures offer places to gain an intimate understanding of the past in our everyday lives. The historic built environment does not always exist in pristine form as museums or tourist attractions; it provides a variety of everyday places that shape our lives: homes, schools, coffee shops, offices, and restaurants. The loss of historic buildings does not mean the elimination of these everyday places from our lives, but it does mean that rather than interacting with history on an informal level day to day, we find ourselves more disconnected from the past. Preserving the historic built environment involves maintaining the places that impact our daily lives while connecting us with the past.

Sense of Place

The meanings of a place consist of what it collects (Norberg-Schultz, 1979); historic structures, sites, and landscapes hold significance because of the history, character, and experiences that have accrued there. A place must be understood in its concrete form, informed by experience, and understood as meaningful to identity and significance (Burton-Christie, 2009). A place includes a specific landscape, social activities, and personal and shared meanings, and historic structures also offer places with physical evidence of their history (Anderson, 1997). Place and space both have physical location, but a space becomes a place through human experience (Tuan, 1977). The historic built environment provides places in which past, present, and future users can create their own meanings and develop a sense of place based on their own

experiences. The preservation of a historic structure does more than maintain its physicality; it allows it to continue to provide a place for people to enjoy.

Sense of place has, in some ways, lost its original meaning, which comes from the Latin term *genius loci*, the idea that each locality possesses a unique quality because of the guardianship of a supernatural spirit (Jackson, 1994). Modern culture denies this spiritual or divine presence, but people still recognize that certain places support well being better than others. A sense of place results from "a complex mixture of physical, social, and personal factors," and high-quality places have evidence of their history and identity (Steele, 1981, p. 205). The complex meanings embodied in historic places, sometimes difficult to define, contribute to personal and shared sense of place. Analysis of a structure involves looking at its space, the three-dimensional aspect of a place, as well as its character, the atmosphere of a place (Norberg-Schultz, 1979). Although the original character of a historic property cannot always be saved (Summerson, 1949), it can evolve as new users endow the space with new meanings and character (Norberg-Schultz, 1979). Allowing this evolution of historic character can, in many ways, preserve the sense of place present there because "to protect and conserve the genius loci in fact means to concretize its essences in ever new historical contexts" (NS 18). The complex meanings embodied in historic places are sometimes difficult to define but contribute to both personal and shared sense of place. Along with the physical form, these complex meanings and associations contribute to the identity of historic preservation.

Authenticity

Each historic site, building, and landscape embodies a distinct character and identity, acquired through human experience. Significance and authenticity represent important issues about the identity of the historic built environment, and the difficulty of establishing significance or authenticity causes debate among preservationists (Anderson, 1997; Baer, 1998; Fitch, 1990; S. C. Gordon, 1997; Huxtable, 1997; Lowenthal, 1985; Summerson, 1949; The National Park Service, 1976). Authenticity means genuine, and preserving a building's identity authentically has troubled preservationists for years (Tschundi-Madsen, 1985). Ruskin and Viollet-le-Duc differed in their considerations of authenticity; Ruskin valued patina while Viollet-le-Duc preferred the purity of the original structure. Despite its challenges, authenticity remains an essential consideration for preservationists to respect the identity of historic structures and places.

Traditionally, preservationists evaluate authenticity based on the physical historic fabric, but this approach "ignores a diverse range of subjective meanings that may, in fact, be immensely important to stakeholders" (Wells, 2010, p. 36). Because of this narrow approach to authenticity, many preservations believe that authenticity and significance need to be redefined in order to go beyond the physical attributes of a building (Anderson, 1997; S. C. Gordon, 1997; Huxtable, 1997; Mason, 2006; Wells, 2010). The buildings and landscapes cultures consider significant change over time as generations' perspectives and values change, evident in the kinds of properties considered valuable now compared to the properties preservationists valued a few decades ago (S. C. Gordon, 1997; Anderson, 1997). About 30 years ago,

preservationists believe properties worth saving had been lived in by important people, served as the location of a historically significant event, or represented work designed by a prominent person; however the preservation community increasingly recognizes common, vernacular, and recently constructed properties as significant. Although others have accused preservationists of focusing on the buildings themselves without understanding the cultural meanings embodied in a place, a growing number of preservationists recognize that properties may contain multiple values.

A values-centered approach to preservation allows for a greater understanding of what holds historical significance and suggests that a place may embody several relevant meanings (Mason, 2006). Wells refers to this approach as constructed authenticity and suggests that it involves defining authenticity through culturally or socially accepted ideas and meanings associated with a place (2010). Applying a holistic approach to preservation of historic sites leads to acknowledgement and inclusion of a greater range of stakeholders by accounting for multiple values, based on comprehensive knowledge about a site's cultural, social, and architectural aspects. Gaining an understanding the culture behind the architecture we preserve represents an important step as we strive to know the identity of the building beyond its physicality because it stands a symbol of its culture (Viollet-le-Duc, 1860).

Beyond fabric-based and constructed authenticity, phenomenological authenticity focuses on individuals' experiences of historic places and provides the base for both physical- and values-centered approaches (Wells, 2010, p. 37). Phenomenologists attempt to understand the emotional response to a place, and "accept that the emotional bond with a place has a phenomenological basis," and that

"historical authenticity resides in individuals' life experiences" (Wells, 2010, p. 38). This layered understanding of authenticity calls for preservation that accounts for memories and ideas within the physical preservation of a place and challenges preservationists to communicate with the public in order to understand the places that hold significance and meaning. Using social, cultural, and experiential values leads to a more holistic approach to historic significance and authenticity. Although the meanings of a place may change, "buildings and landscapes that elicit this continuity with the past encourage the belief that the present and future are meaningfully linked to the history of a place" (Kellert, 2008, p. 12). The continuity that exists in the historic built environment allows users to associate their own values with a place while also providing a sense of history and identity for the culture.

Historic Neighborhoods

Of the everyday places historic buildings offer, home might be the most influential and personal place with which a person identifies (Porteous, 1976). Historic neighborhoods (and the buildings, spaces, and interiors within them) embody several meanings and values (Mason, 2006), and the physical space of a home becomes a place with several meanings and values for its residents (Porteous, 1976; Sopher, 1979). Historic districts offer spaces that can become valuable places for affordable homes and their residents.

Historic neighborhoods provide well-connected communities, offering supportive neighborhoods and providing home to many Americans (Rypkema, 2003). Despite the common perception that inner-ring suburbs, older neighborhoods built

closer to city centers, remain homogenous communities, they actually exhibit a wide range of residents, differentiated by class, race, and ethnicity (Hanlon, 2009). Historic neighborhoods provide homes to millions of Americans and often contain racial, economic, and social diversity as a result of the variety of quality, scale, and conditions often found in historic neighborhoods (Rypkema, 2003). When compared to newer neighborhoods, historic neighborhoods provide many benefits: more than 60% of older neighborhoods feature an elementary school compared to less than 40% of new neighborhoods; historic neighborhoods, often within one mile of shopping centers take advantage of public transportation available in 60% of historic neighborhoods in contrast to only 25% of new housing. Because historic neighborhoods form well-connected sub-communities that relate to larger contexts and include a diverse range of residents, they can provide the sites for supportive activities and approaches, particularly including affordable housing (Rypkema, 2003).

Despite the many positive attributes historic neighborhoods possess, many remain threatened by a wide range of issues. An interesting dichotomy exists throughout the country: many historic neighborhoods suffer from economic decline while others suffer from economic wealth. Both of these extremes threaten the historic fabric and character that remains in older neighborhoods, but vastly different solutions and resources are needed to maintain the physical and cultural context of historic forms that provide homes to many Americans.

In a study of 1,742 inner-ring suburbs, defined as contiguous census places adjacent to a city center where more than half of the housing stock dates before 1969, almost half showed signs of vulnerability (Hanlon, 2009). Studies demonstrate that

suburbs built between the 1940s and 50s have a lower social status than other

suburbs. These post-war suburbs have become home to many minority groups as a

result of discrimination in the market and a lack of affordable housing. More recently,

many immigrants made inner-ring suburbs their home because these neighborhoods

often possess the most affordable housing options as inner-city neighborhoods

become gentrified and high-end suburbs continue to develop on the outer fringe of

metropolitan areas. The influx of immigrants in these neighborhoods has contributed to

the diversity of the residents living in older and historic neighborhoods; however, many

inner-ring suburb residents struggle to properly maintain historic resources.

Additionally, deindustrialization threatens many working-class, inner-ring suburbs; with

the labor market shifting, many older industrial suburbs have become vulnerable to

decline. These older suburbs continue to provide links to history and homes to many,

but the lack of economic resources may mean the deterioration of the historic forms

that remain.

     Despite the economic woes many older neighborhoods face, others suffer from

a wealth of resources and a lack of respect and understanding of the values of historic

houses. Despite the perception that middle-class households continually shift

outwards, the existence of a number of middle- and upper-class inner-ring suburbs

suggests that many wealthier families choose to live in older houses closer to city

centers (Hanlon, 2009). However, many of these suburbs may experience what the

National Trust calls "the Teardown Trend" (Fine & Lindberg, 2002). "Teardown" refers

to the practice of demolishing a historic house and replacing it with a much larger new

house. Variations of this trend exist, including: demolishing large estates to subdivide

to accommodate two or more new houses or demolishing multiple smaller homes to make way for a new, large house. Teardowns threaten the architectural heritage as well as the communal qualities that make historic neighborhoods appealing places to live. The new, oversized houses not only disrupt the historic character of the community but also reduce the economic and social diversity present there by threatening affordable options, or starter homes, that allow young families a chance at homeownership. Many historic neighborhood residents and preservationists worry that these neighborhoods will transform from mixed-income communities to homogeneous, upper-class enclaves.

Preserving historic neighborhoods involves saving diverse communities that connect people to history on a daily basis. Many Americans continue to follow suburbia outward for privacy, mobility, security, and ownership but often face isolation, congestion, raising crime, and overwhelming costs, and many find themselves in neighborhoods that do not function as communities (Moe & Wilkie, 1997). Historic neighborhoods and inner-ring suburbs developed to encourage community offer an alternative that people choose for different reasons: affordability, proximity to jobs, historic character. Preserving the history and character of historic neighborhoods strengthens partnerships among residents as well as the connections between the past, present, and future (Moe & Wilkie, 1997). Building new, affordable homes in these well-connected communities – both with the larger context and with history – provides a way to continue the preservation of historic character by allowing it to impact the design of infill houses.

Affordable Housing in Historic Districts

In a historic neighborhood, community and personal identification with a place intersect - a sense of place can be embedded in the context of the house as well as the home itself. The personal creation of home involves understanding that place as unique while also placing it within "a code of local signatures," implying communication with a larger social group (Sopher, 1979, p. 138). A sense of home and place relates to a house's physical structure and the human relationships it supports, and connections to its physical environment and social relationships also foster a sense of place. A skilled designer can cultivate personal identification with a sensitively designed house in historic neighborhood.

Providing adequate affordable housing requires new construction (Rypkema, 2003), with historic preservation principles and practices applied to the construction of new affordable homes in historic neighborhoods. Developers offer an affordable option by reducing expenses through construction of infill houses because existing infrastructure means residents can capitalize on public transportation systems already in place. Additionally, many historic neighborhoods already possess connections to local commerce, reducing the need for new shopping centers. "Well-designed infill housing can help revitalize a neighborhood" by attracting new residents, widening the tax base, promoting safety and walkability, and encouraging diversity through providing a variety of housing types for a broader range of incomes (Friedman, 2009, p. 211). Designing a house to reflect and connect with the existing environment leads to a sense of social unity and acceptance among new and current residents.

New affordable houses in historic districts not only provide a site for harmony, they also contain interiors catered to twenty-first century lifestyles. Open floor plans offer contemporary approaches to organizing the public spaces, eliminating the need for walls separating each space, therefore, providing for the same activities while requiring fewer materials and helping small houses seem larger and less cramped (Gauer, 2004). Although having only one bathroom in a home represented a common design strategy until the late twentieth century, most contemporary families demand at least two bathrooms in their homes (Rybczynski, 2008). Additionally, people expect more storage space as well as an easily accessible washer and dryer (Rybczynski, 2008; See:Susanka, 2001). As computers become fixtures in our everyday lives, new homes often include workspaces for computers (Susanka, 2001). Traditionally functional workspace, kitchens now buzz as hubs of activity. As families often gather and socialize in kitchens, designers must now accommodate this spatial use through central placement, appropriate square footage, and thoughtful layout. Grouping like activities and functions, such as kitchen, laundry, and bathrooms, offers another way to maximize space and minimize costs by reducing plumbing materials. New houses in historic districts provide a unique opportunity to accommodate contemporary lifestyles on the interior while complementing historic character on the exterior.

Compatible Infill. Compatible infill in historic districts offers a win-win solution to empty lots and an increasing need for affordable housing. Sensitive infill designs respect existing pedestrian-friendly features, scale, building height, width, and setback, and lot coverage. By respecting these features, designers can successfully introduce new architectural styles and innovative designs in a historic neighborhood.

Achieving compatibility presents a complex issue for new design in historic

neighborhoods but represents an important consideration for maintaining the existing

sense of place. *The Secretary of Interior Standards for Rehabilitation* outline a strategy

for compatibility where the new work differs from the old, but relates successfully in

terms of massing, materials, features, size, scale and proportion (Ames & Wagner,

2009). Motifs, such as the proportions and decoration of windows, doors, and roofs

compose the character of each group of buildings (Norberg-Schultz, 1979). The

dominant, character-defining elements of a place, if respected in new structures, brings

manifestation of new contexts (Norberg-Schultz, 1979). A designer's job involves

visualizing the sense of place that already exists (Norberg-Schultz, 1979), and infill

housing in historic neighborhoods should reflect the spirit and history of its environment

embedded within its historic structures and neighborhoods.

New construction in historic districts often requires design review by a historic

preservation commission to ensure that the addition to the landscape does not disrupt

the character of the neighborhood (Ames & Wagner, 2009; Gorski, 2009). Local

communities often have design standards and guidelines to protect the historic fabric of

historic districts. Historic district guidelines provide a tool for reviewing proposed

changes in historic districts, in addition to including educational information, specific

guidelines, and illustrations for the local community to use for rehabilitation and new

construction (Leimenstoll, 2009). Because an affordable home in a historic district

might undergo design review, the quality of its design and its materials results in more

appropriate buildings than one without undergoing a design review process. Scholars

suggest respectful infill construction with regards to the current use and location

(Friedman, 2009, p. 210). In the case of infill construction, appropriate design relates to the historic fabric of the district without resorting to simple imitation of the existing building stock. The *Secretary of Interior Standards for Rehabilitation* provide three important considerations for new construction: characteristics of the property, differentiating new from old, and compatibility with the existing fabric in terms of materials, features, size, scale and proportion, and massing (Gorski, 2009). The *Standards* represent one of many guides for new construction and but not the only resource for design review.

In addition to the *Secretary of Interior's Standards for Rehabilitation, the Design Criteria for New Buildings in Historic Savannah* provided a guide for new construction that many historic districts have adopted or used as a base for their guidelines (Eric Hill and Associates & Muldower & Patterson Associates, Inc., 1983). The influential considerations included: construct new buildings with a similar scale and height of the existing buildings; consider façade and window proportions and rhythm; use materials, textures, colors, architectural details, and roof shape that relate to the existing structures; incorporate cohesive landscaping and site features; relate the fenestration and details to the historic structures. Since the publication of these guidelines, many historic district commissions adapted them for districts in their communities. Perhaps because of the teardown trend in many districts, some guidelines now include explicit rules for lot coverage to prevent oversized infill (Fine & Lindberg, 2002). *The Raleigh Historic District Design Guidelines* suggest compatibility of new construction with surrounding buildings through setback, orientation, spacing, and distance from

adjacent buildings and should respect the character-defining features of the site, such as trees and significant views (Leimenstoll, 2001).

Friedman developed the *Le Village Guidelines* for infill design at two sites: 1) general requirements of the housing type to address form and style and 2) technical requirements of architectural elements such as windows, cladding, and landscaping (Friedman, 2009, p. 217; Friedman, Lin, & Krawitz, 2002). Similar to the *Raleigh Historic Guidelines*, Friedman emphasized the use of the same setback for new buildings as the common setback throughout the neighborhood. The implementation of these guidelines reduced the building of arbitrary forms, and infill corresponded to existing scale of lots and house size through varying the massing of façades and building to the same scale. Additionally, Friedman suggested designing a compatible infill house helps gain support and lower opposition in the community.

In addition to providing guidance on rehabilitation and new construction, the *Historic District Guidelines for Davidson, North Carolina* connect sustainability with preservation by "adopting an accepting and encouraging tone toward sustainability and including examples of and references to sustainable practices" (Leimenstoll, 2009, p. 39). Davidson's guidelines support sustainable infill and site development in addition to encouraging walkability and the use of permeable paving materials. The guidelines offer sustainable guidance for roofs, exterior wall material, and window repair over replacement. They also address energy issues in a sustainable manner and include how to incorporate new energy saving features. These guidelines acknowledge the close connection between sustainability and preservation and provide a resource for Davidson residents as well as other historic districts.

Sustainable Approaches. Preservation allows for future generations to experience

and learn from the historic built environment, and it teaches people to value not only the

past but also the future (Elefante, 2007). In a similar light, sustainability involves leaving

adequate resources for future generations while still meeting the needs of the present

(Parrot & Emmel, 2001). Sustainable preservation practices allow for future

generations' enjoyment and use of the historic built environment as well as the natural

one. Our actions that respect the future generations positively impact them (Lowenthal,

1985; McDonough & Braungart, 2002; Ruskin, 1849). This awareness of future

generations present in preservation applies to the principles of sustainability, which

postulate that we should provide for the present without negatively impacting the future

(Kibert, 2005). Preservation and sustainability call for stewardship of our current

resources in order to respect future users' experiences of the natural and built

environments.

Sustainable design philosophy "seeks to maximize the quality of the built

environment, while minimizing or eliminating negative impact to the natural

environment" (McLennan, 2004, p. 4). It provides an approach to design, not a stylistic

or aesthetic application and, therefore, can be applied to any style or type of building.

Sustainable design involves respect for natural systems and life cycles as well as

people, and it implies the intention to find the best solutions that balance environment,

aesthetics, costs, and other traditional architectural concerns (McLennan, 2004).

The elements of sustainable design methodology include understanding the

climate and place, reducing loads (system requirements), using alternative energy

sources, and employing the most efficient technology possible (McLennan, 2004).

Buildings that evolve from and connect with nature celebrate nature by making it visible in the design (Kibert, 2005). Similar to preservation, place influences sustainable design solutions because each location has its own distinctive characteristics and resources. The six principles of sustainable design provide further guidance for designers in creating sustainable buildings and products (See Table 2.2).

Table 2.2 The Six Principles of Sustainable Design

Principle	Meaning
Respect for the wisdom of natural systems	Use nature as a model for all designs because true sustainability requires communities and built environments to emulate natural systems
Respect for people	Create healthy habitats for people as well as the rest of the natural world.
Respect for place	Honor the differences between places
Respect for the cycle of life	Create products and buildings with life cycles that are appropriate for their use
Respect for energy and natural systems	Use natural resources sensitively; they are finite and should be respected
Respect for process	Collaborate and employ interdisciplinary communication, holistic thinking, life-long learning, and continual improvement, allowing for time to make good decisions, and rewarding innovation

Note: From: McLennan, J. F. (2004). *The Philosophy of Sustainable Design*. Kansas City, Missouri: Ecotone LLC.

Three main forces drive sustainable building: increasing destruction of ecosystems, changing of biogeochemical cycles, and population and consumption growth (Kibert, 2005). The Industrial Revolution led to a dangerous cradle to grave cycle in which man-made products have detrimental effects on the environment (McDonough & Braungart, 2002). Current construction methods disregard the natural environment, and, "rather than being designed around a natural and cultural landscape,

most urban areas simply grow…eradicating the living environment in the process"

(McDonough & Braungart, 2002, p. 33). The urban environment consumes 40% of

energy resources, 30% of natural resources, and 25% of freshwater and generates one

third of air and water pollutants and 25% of solid waste (Kellert, 2005). As the demand

for natural resources increases, these resources face shortages and higher prices, and

in the US, the building industry (production, manufacture, and construction) accounts

for six billion tons of waste each year. The construction industry accounts for about

eight percent of the US gross domestic product but uses 40% of raw materials, and an

estimated 90% of all raw materials used in buildings and infrastructure and urban

planning and development has led to the reliance on the automobile.

Because the automobile increased mobility, people moved away from cities,

creating sprawl and increasing dependence on the car (Owen, 2009). Sustainable living

involves more than designing in response to nature; it calls for smaller lifestyles that

require fewer resources. Smaller homes in established, dense neighborhoods lead to a

sustainable lifestyle that depends on the automobile and fossil fuels less. Historic and

older neighborhoods, often connected to jobs, shopping, and public transportation,

provide residents with connections to place, community, and history and a more

sustainable alternative than sprawl. When it comes to building a new single-family

house more sustainably,

> the best strategy…is to build it on a small lot in an already dense neighborhood
> (which increases embodied efficiency), to build it smaller (which consumes fewer
> resources during construction, requires less energy forever, and discourages
> accumulation of unnecessary possessions), to caulk and insulate it more
> thoroughly, especially under the roof (which helps keep the heat on the correct
> side of the building envelope in all seasons), and to go easy on the air
> conditioning and the inefficient appliances (Owen, 2009, p. 236).

Additionally, building smaller in an established neighborhood reduces construction costs and ongoing operating expenses, making infill housing not only sustainable but also more affordable than a new house in a new suburb. Although Elefante claimed "the greenest building is one that is already built" (2007, p. 26), new construction in historic districts can respect the conservation of both history and ecology through sustainable design practices. The ideals of sustainability, preservation, and affordability can come together in an infill house in a historic neighborhood that provides a supportive, connected home.

Historic preservation principles and practices, applied to the design of affordable single family homes, support the creation of a sense of place, the inclusion of families in a neighborhood community, and the environment and healthy living. Through conscientious design and location within historic neighborhoods, designers, architects, builders, and developers of affordable housing can be stewards of the past through historic preservation, the present by encouraging sense of place and community, and the future through sustainable practices.

Integrating Affordable Housing and Historic Preservation

Because this study brings together two separate areas of study, affordable housing and historic preservation, an interdisciplinary approach to research in addition to the literature review suggests a better understanding and ultimate integration of these two areas (Repko, 2008). I borrow values-centered historic preservation approaches to assess current examples and propose guidelines for new, affordable houses (Mason, 2006). This values-centered approach allows for a greater understanding of what holds historic significance and suggests that a place may embody several relevant meanings.

My approach to analyzing new, affordable construction in historic districts thus involves an understanding that several meanings can exist in a historic landscape and that new construction can relate to the past that surrounds it without imitating it.

To accomplish a cohesive approach for this multi-disciplinary project, I take a constructivist approach to this study because I do not seek fact but, rather, to create knowledge about the complex phenomena of affordable housing and historic preservation (Schwandt, 1994). Thus, I use houses as evidence and tools to create knowledge because they represent purposeful human acts (Prown, 2001). My epistemological approach, further informed by understanding the sense of place – the continuities between past and present evident in the physical landscape (Anderson, 1997; Lowenthal, 1985) – indicates that the home stands as an important physical space for each individual (Bachelard, 1958; Porteous, 1976; Sopher, 1979). Endowed with value (Burton-Christie, 2009), both home and historic places possess varying importance for different individuals.

Applying the principles of historic preservation to affordable housing, an issue plagued with a complicated past in this country (Friedman, 2009; Jacobs, 1961; Stewart, 1979), calls for approaches that acknowledge complexities and allow for integration. For this research, I employ a qualitative methodology because the issues I explore involve subjective judgments of the design and fit of affordable houses within historic districts (Leedy & Ormrod, 2010). In qualitative research, "the researcher is an instrument" and believes in her "ability to interpret and make sense of what he or she sees" (Leedy & Ormrod, 2010, p. 135). Using a qualitative approach allows me to be an instrument of my research by interpreting current examples of affordable housing in historic districts. Through qualitative interpretation, I gained new insights regarding the creation and

provision of affordable housing in historic districts, develop new guidelines for future infill

affordable homes in historic districts, and discovered issues that exist in the current

stock of infill affordable housing in historic districts (Leedy & Ormrod, 2010). I did not

seek to define or discover truth through my research but, rather, to provide an approach

that acknowledges history and context without disrupting it.   In the next chapter, I lay out

the specific methodology that brought this rich approach to fruition.

CHAPTER III

EVALUATING MATERIAL EVIDENCE

In order to create guidelines for designing affordable infill housing in historic

districts, I selected case studies from a purposeful sampling of affordable housing in

historic districts (Gray, Mills, & Airasian, 2008), actively used as material evidence

(Prown, 2001). For this research, I performed seven case studies for comparison within

the sample, proposing generalizations about how future compatible and affordable

houses should be constructed (Leedy & Ormrod, 2010). I obtained case studies

through the National Alliance of Preservation Commissions (NAPC) listserv, networking

at conferences, and contacting architects involved in affordable housing. Though I

identified several possibilities through these contacts, but only seven qualified for

inclusion in the study.

Requirements for Inclusion

To qualify for the study, I limited examples to single-family houses built in a

locally designated or National Register historic district with photographs and floor plans

available. Additionally, affordability represented an important requirement for inclusion.

In each case study, relevant information included: a copy of the National Register or

local historic district nomination; photographs of the exterior of the infill affordable

house; floor plans; and photographs of the exteriors of other houses and structures in

the district. Because I did not have access to all of the examples and their locales, I

obtained via Google, contacts, and/or historic district nominations. I selected case

studies as part of larger infill developments, so rather than assessing all of the houses

constructed for these neighborhoods, I selected only those sited adjacent to at least

one historic house to better understand its relationship to the historic character of the

neighborhood.

Table 3.1. Brief Description of Case Studies

Location	District	Developer	Architect/ Contractor	District Description	Photo
544 SW B Street, Corvallis, OR	Avery Helm Historic District (National Register)	Benton Habitat for Humanity	unknown	1850s – 1929; Craftsman, Queen Anne, and vernacular version of Gothic Revival	
603 E. Martin Street, Raleigh, NC	East-Raleigh South Park Historic District (National Register)	Habitat for Humanity of Wake County	TightLines Designs	1900 – 1940; largest historically black neighborhood in Raleigh; Shotguns and Triple As make up 1/3 of the district	
403 E. Queen Street, Edenton, NC	Edenton Cotton Mill Village Historic District (National Register and local historic district)	Preservation North Carolina	Ramsay Leimenstoll	1899 – 1923; over 70 small vernacular cottages with little variation among them	

406 S. John St Goldsboro NC	Goldsboro Historic District (local district)	Self Help	TightLines Designs	1840 – 1930; Queen Anne, Second Empire, Italianate, Colonial Revival, bungalows, and cottages	
1142 Ash St, Macon, GA	The Macon Historic District (National Register)	Historic Macon Foundation	Clifford Whitby	1823 – 1942; shotguns and cottages as well as Greek Revival, Italianate, Queen Anne, Victorian, and Craftsman	
1442 N. Cherry St, Winston-Salem, NC	North Cherry Street Historic District (National Register)	Habitat for Humanity of Forsyth County	unknown	Craftsman Bungalows; cottages	
63 Bogard St, Charleston SC	Old City District (local district)	The Humanities Foundation	Stephen Russell	1700 – 1941; Charleston "single house" with gables facing the street;	

Problem Statement and Research Steps

In order to supplement existing design guidelines for compatible infill with

principles for designing affordable housing in historic districts, I studied existing design

guidelines for infill in historic districts, located examples of single-family infill affordable houses built in historic districts, and pinpointed both positive and negative attributes of current infill affordable houses in historic districts. To answer these questions, I took several steps:

1. Review current design guidelines for infill construction in historic districts.

2. Obtain examples of infill affordable housing completed in historic districts.

3. Based on photos of the exterior, describe the case studies in terms of exterior features: site, form, height, proportion of street façade, window proportions and form, roof form, front entrance, porch, and exterior materials.

4. Describe the floor plan in terms of interior features: square footage, number of bedrooms, number and location of bathrooms, number of closets, kitchen size and layout, amenities, workspace, and overall layout.

5. Using the criteria listed for the description phase of the exterior, visually analyze how the infill properties maintain the character of the historic district.

6. Using the criteria listed for the description phase of the interior, visually analyze how the interiors address contemporary lifestyles.

7. Analyze how the houses achieve affordability through design: square footage, space planning, architectural detailing, sustainable features, and materials.

8. Identify patterns present in the sample that relate to maintaining historic character and achieving affordability.

9. Synthesize the information I gather from analysis of the case studies and provide suggestions for designing infill that achieves both compatibility and affordability.

Analysis

The analysis consisted of the three phases of description, deduction, and

speculation based on Prown's steps for analyzing a material object and also relate to

the data analysis phases supplied by Leedy and Ormrod (Leedy & Ormrod, 2010;

Prown, 2001). In the description phase, I assessed the examples first in terms of the

physical dimensions, material, and articulation of both the exterior and interior. In the

deduction phase, I analyzed the relationship between the infill housing and its historic

context. I also assessed how the interiors support contemporary lifestyles and how the

designs maintain affordability and sustainability. In the speculation phase, I

hypothesized which commonalities the examples share that could lead to an

establishment of principles for designing affordable housing in historic districts.

Description Phase

The description phase included documentation and organization of the available

information for each case study. I used photographs of the houses' exteriors and

surrounding community and floor plans to describe the houses. For each case study, I

keyed a map (taken from Google Maps) with the available exterior photographs of both

the infill house and surrounding historic architecture to help gain a better understanding

of the new house in its historic context. Based on the review of design guidelines, I

described the following exterior aspects of the case studies in detail: site and site

features, form, height, proportion of street façade, window proportions and form, roof

form, foundation, front entrance, porch, exterior materials, and trim (See: (Ames &

Wagner, 2009; Eric Hill and Associates & Muldower & Patterson Associates, Inc., 1983;

Friedman et al., 2002; Leimenstoll, 2001, 2009). I described the interiors in terms of:

square footage, number of bedrooms, number and location of bathrooms, number of

closets, a washer and dryer, work space, and overall layout. I also noted any

sustainable features such as mature trees or extended eaves that provide shade. Refer

to Appendix A for an example of the site analysis map and matrix for one case study.

Deduction Phase

I visually analyzed the selected examples' architectural character and how they

maintain the sense of place of their historic districts, support contemporary lifestyles,

and achieve affordability. I used the criteria set forth in the previous section to assess

case studies and how well they correspond with the character of the district by

comparing the exteriors to the surrounding historic houses. I considered how the infill

houses maintained the historic character of the district and the overall rhythm of the

street. With the floor plans, I to assessed how well the interiors provide for

contemporary lifestyles based on these attributes: at least two bathrooms, larger

closets, larger kitchens for socializing and eating, an indoor washer and dryer,

workspace, and more open public space (See: Rybczynski, 2008; Sullivan, 2007). I

then used my descriptions and deductions to indicate which criteria contribute to how

the houses achieve affordability through design choices, such as size, architectural

details, and material. I also looked for sustainable features in the deduction phase

because building responsibly also means houses that are more affordable in the long

run (Friedman, 2001).

Speculation Phase

The speculation phase consisted of the identification of patterns present in the examples of infill affordable housing in historic districts that relate to maintaining historic character and achieving affordability. I identified commonalities among the examples that support sense of place, community, affordability, and sustainability. Spacing and proximity to other houses and architectural features such as front porches encourage interaction among residents and neighbors and support the neighborhood community. Houses that maintain the historic fabric of the neighborhood support its existing sense of place that results from the architectural character and history that the historic houses embody.

Synthesis

Following the analysis of my case studies, the synthesis phase of my thesis investigation involved formulating principles based on the evidence gathered for the design of affordable housing in historic districts. The patterns and commonalities identified in the speculation phase of the analysis set the groundwork in developing guidelines for the building of new affordable houses in historic districts that also support a sense of place, community, and sustainability. In the next chapter, I show the analytical processes of evaluation and reflection within the case studies. In addition, I project design guidelines drawn from within this research. By bringing to bear the theoretical foundations within the literature review of the previous chapter and the methodological approaches described within this one, I weave together an approach for affordable housing within historic preservation.

CHAPTER IV

IF WALLS COULD TALK

Using the research process outlined in the previous chapter, I analyzed seven case studies of affordable houses with Prown's three steps – description, deduction, and speculation – to assess compatibility and affordability of design elements and overall configuration of the exterior. I measured the accommodation of contemporary lifestyles in each case study interior based on a number of design elements and space arrangement. From a holistic consideration of these criteria, I discerned a few major patterns with several important suggestions for future infill in the form of guidelines. Above all, the small size of both the houses and their lots embodies the most consistent and prevalent method of achieving affordability in this sample. Inconsistent façade proportions, resulting from incompatible form, roof pitch, and/or foundation height, represent the overarching issue within the sample and greatly affected the compatibility of several of the case studies. Sensitively applying trim to the house and carefully selecting and applying exterior materials emerged as ways to save on construction costs while maintaining compatibility. Though only tentative gestures towards sustainability surfaced in this examination, all of the case study properties contained community-focused patterns. Similarly, all of the houses accommodated twenty-first century lifestyle practices through the inclusion of more than one bathroom, adequate closet space, and a second entry. All but one lacked the provision of workspace for a computer, an increasingly important component of daily life. Several missed the

opportunity for more efficient design through grouping similar spaces and leaving

public spaces open to one another. Reflecting the exterior/interior dichotomy born out

of my research, with separate expectations for homeowner and contractor, the

guidelines disclose a way to honor both the past and present in designing compatible

affordable housing to address modern convenience.

Key Factors

In the context of this research, the basic circumstances of construction – the

party or parties responsible for construction and the selection of the site emerged as

key factors for the predominantly successful infill houses under scrutiny. Non-profit

organizations developed and/or built five of the seven case studies, and Habitat for

Humanity built three of those five. These five case studies seemingly achieved

affordability through the involvement of non-profit organizations with a vested interest in

affordable housing; however, additional patterns of affordability emerged, as discussed

later in this chapter. Similarly, in the instance of the other two developments, both had

a historic preservation organization involved in some capacity. The Historic Macon

Foundation developed several infill houses for the Macon Historic District and hired a

contractor to complete the building of the houses; the 611-square-foot house included

in this study sold for $62,900, a price well under the median house price of $111,200 in

Georgia in 2000 (Historic Macon, 2011; "Historical Census of Housing Tables - Home

Values," 2004). In Edenton, NC, Preservation North Carolina (PNC) hired Ramsay

Leimenstoll Architect to design five infill houses. PNC sold the vacant lots to buyers

with the stipulation they build one of the two prototype designs completed by Ramsay

Leimenstoll. This unique arrangement ensured compatibility with the small vernacular

mill village cottages. Despite the fact that a non-profit organization was involved in all

seven case studies, these latter two emphasize that affordability can be attained

through efficient design and selecting a district and site that can receive a small house

– not just as a result of involvement of the non-profit.

Although no profile of an ideal historic district for infill affordable housing

emerged in this investigation, the case studies' districts do have some attributes in

common. Six of the seven of the districts include a fairly diverse building stock, ranging

in architectural style, house size, lot size and/or years of significance. The variety

present in these districts allowed some flexibility in the overall form, size, and character

of the infill houses. Because the Edenton Mill Village Historic District lacks architectural

variety, PNC understood that designing a compatible infill would present issues for this

unique coastal mill village and hired an architect with preservation experience to design

the houses, one of which was included in this study. The presence of diversity, then,

aids the possibility of compatible construction; districts with very rigid, well-defined

architectural character may prove more challenging sites for affordable housing.

Beyond these overarching concerns, a specific site analysis plays an important

role in gaining a thorough comprehension of how to achieve compatibility in a district,

and this step should not be overlooked for the building of an affordable house. Based

on this analysis, I believe that almost all of the case studies could have benefited from

more up-front analysis of the streets on which they sit. At the same time, this process

may have been cut short or held less importance in an effort to achieve affordability.

However, close consideration of the historic resources that immediately surround the

site rather than the entire district offers a timesaving approach to a site analysis. Striking a balance between affordability and compatibility calls for spending a little extra time learning the site and could yield even better results than those already achieved in this sample.

Achieving Affordability

Several positive patterns emerged from the comparison of the case studies and offer valuable suggestions for designing not only affordable and compatible but also more sustainable and community-focused infill housing. Two attributes true for all seven case studies represent the overarching principles of achieving affordability: small houses on small lots. All of these houses have less than 1,205 square feet and averaged about 1,068 (See Table 4.1). The smallest house, located in Macon, GA, encloses 611 square feet, including a single bedroom, one main dining/living room, and a kitchen and bath between these two larger spaces. While the interior arrangement varies, as discussed later, all houses contain provision for essential needs within a small footprint. These small homes do not look out of place in comparison to their neighbors because they all sit near houses of a similar scale. All of the one-story infill houses stand next to one-story or one-and-a-half-story historic houses, and the two-story schemes sit adjacent to comparable structures, reinforcing the importance of choosing a district and site that can receive a modest house.

Table 4.1. Square Footage of Case Studies

Case Study	Avery Helm	East-Raleigh	Edenton	Goldsboro	Macon	N. Cherry St.	Old City District
Square Feet	1166	1128	1186	1096	611	1205	1088

In addition to efficient square footage, the houses all sit on relatively small lots. Even in historic districts that contain large houses, the case for four case studies, these smaller structures take form on streets with smaller houses and lot-sizes. In the Old City District in Charleston, SC and the Avery Helm Historic District in Corvallis, OR, the developers divided larger lots to accommodate the smaller houses, resulting in increased density and greater affordability. Interestingly, the two two-story houses in the sample occupy these sub-divided lots. In order to fit multiple houses (11 in Charleston, SC, and three in Corvallis, OR), the footprints needed to be fairly small, making two stories necessary to accommodate the essential interior public and private spaces. Also, in all the case studies, developers followed the setback and spacing between houses, sometimes with slight variation, a factor not necessarily correlated with zoning restriction nor with personal choice.

While several additional patterns for keeping construction costs low contribute to affordability, building small houses on small lots represents the main methods used in achieving both up-front and long-term affordability. Smaller houses require fewer materials, saving up-front construction costs, and also have less space to heat and cool, lowering energy bills. Also, because land costs account for a significant portion of house prices, building on small lots cuts down on expenses, and subdividing the land

to increase density further increase affordability. Clearly house and lot size greatly contribute to affordability.

The exterior materiality of the houses represents a moderate method of achieving affordability. No specific cladding material surfaced as a commonality, but the pattern of lapboard siding does provide a suggestion about less expensive siding materials. Vinyl, wood, and fiber-cement boards represent three cladding materials used for these houses and three different price points, all affordable choices. The cost of material plus installation for vinyl averages $6.50 per square foot; for wood, $8.00 per square foot; and for fiber-cement, $9.00 per square foot (Chiras, 2009). Traditionally, locally historic districts prohibit the use of vinyl and other substitute siding, especially for historic houses, but two houses, clad in vinyl, demonstrate a historically incompatible material but with a compatible rhythm. Fiber-cement siding covers two of the houses; this material choice may reflect fiber-cement's durability and resistance to fire, rot, and insects (Chiras, 2009). Although wood siding provides a less expensive material, only one of the seven case studies features this compatible material. Information on the specific materials of the other two houses was unavailable to me, but both indicate "lap siding" in the drawings.

The exterior cladding for five of the seven case studies maintained the lapped siding exposure (the dimension of the exposed face of the board) and rhythm present on their historic neighbors. The two houses that failed to echo the established rhythm of the historic districts are clad in fiber cement lapboards (See Appendices D and E). Both of these houses have boards with exposure far wider than traditional lapped siding, an issue that could have been avoided by decreasing the exposed face.

However, this approach would require a cutting down the stock board width, and the resulting extra cost might be the reason for the wide exposure.

The materiality of the roof also contributes to affordability, and builders deployed asphalt shingles for all but one of the structures. In order to realize compatibility, the house in Edenton has a standing-seam metal roof and a standing-seam metal roof covers the porch on the house in Charleston. While asphalt shingles appear on the same street, some of the houses still have standing-seam roofs, so the metal roof on the porch provided a way to respect historic character while using this more expensive material sparingly. As with trim and details, part of choosing compatible and affordable materials involves siting affordable infill houses in districts where these less expensive options remain appropriate gestures.

Another less-drastic way these case studies achieved affordability lies in the inclusion of specialty surface materials and select trim. Two of the houses have wood shingle siding in gable ends, and although some of the other houses would benefit from the gained visual interest of shingle cladding in gable ends, none suffered because of the absence of it.   All have corner boards and similar dimensions for window trim, maintaining some of the character-defining architectural details present in the districts. While gable vents and windows generally presented no compatibility issues, one house lacked a gable vent where it would have been fitting and one had an incompatible gable vent. Skirt boards surround three houses, but only one lacks this detail where it would have been appropriate. None of the houses have brackets or other ornamental details. While minimizing trim did contribute to achieving affordability, the lack of architectural ornamentation, in most cases, did not detract from the compatibility of the infill houses.

An important connection lies in the fact that these fairly plain houses did not look out of place next to their historic neighbors because they sit on streets or in districts with vernacular forms or simpler architectural styles. All of these patterns, in sum, suggest that affordable compatibility may be easier to achieve in districts that contain modest historic houses.

Sustainable Features

The small house size common for the entire sample represents not only an affordable but also a more sustainable approach to residential construction because construction requires fewer materials and less space exists to heat and cool. In addition to this important commonality, a few patterns became evident that also contribute to sustainability. The lots for four of the seven case studies contained mature trees to provide shade and help keep the houses cooler in the summer. Two of the three that lacked mature trees had at least one small tree planted on the lot. In the Old City District in Charleston, the houses sit so closely to one another that very little room exists for the planting of trees, explaining their absence. The porches also provide some heat-relief in the summer months through shading. The house in the Macon Historic District has extended eaves, which also help keep the house cooler in the summer months; however, this gesture did sacrifice some of the house's compatibility. Although these attributes represent fairly passive sustainable features, they do contribute to more environmentally friendly houses that also maintain a level of affordability.

Returning to a consideration of materials, the two houses with fiber cement

board siding missed the mark in achieving correct exposure, but they do have a more

sustainable material then their vinyl-clad counter-parts. Composed of sand, cement,

cellulose fibers, and water and made by laminating thin layers together, fiber cement

offers a very durable material with a lifespan longer than many siding options (Bynum &

Rubino, 1999), in contrast to vinyl, a petroleum-based material, which threatens the

environment. Fiber cement survives longer than products like vinyl before ending up in

the landfill (Bynum & Rubino, 1999; Chiras, 2009). Using fiber cement or wood siding

and installing it with a complimentary exposure presents more sustainable approaches

to cladding affordable infill housing.

Adding another dimension of sustainability to this study, the house in the North

Cherry Street Historic district gained Energy Star Certification for New Homes. This

certification requires that the new house be 20-30% more efficient than standard new

homes. Several improvements contribute to higher energy efficiency, including

effective insulation systems, high-performance windows, tight construction and ducts,

efficient heating and cooling equipment, and Energy Star qualified lighting and

appliances ("How New Homes Earn Energy Star," n.d.). This higher level of efficiency

may have cost more up-front but makes this house more affordable in the long run for

the residents. While some minor strides towards sustainability took place in some of

the case studies, this Energy Star Certified house represents a more sustainable model

for infill affordable housing. Without question, affordable infill houses should attain

higher levels of sustainability than demonstrated in this sample, and the fact remains

that sustainability and affordability go hand-in-hand because increasing energy

efficiency decreases energy costs, and choosing less-harmful materials means healthier residents.

Connecting with Community

In addition to sustainability and affordability, this analysis revealed several important elements that help connect all of the new houses with their already established communities. All seven case studies feature front porches and sidewalks that connect the house with a public sidewalk. Front porches, common attributes of historic houses, allow for more interaction with neighbors by providing usable public and semi-public outdoor space. While front porches are less common for more contemporary houses overall, front porches adorn all of these new houses in the sample. With a depth of at least six feet, these livable spaces providing enough room to enjoy the outdoor and to link with a long tradition of porch-sitting and socialization (Dolan, 2002). This extension of livable space provides usable space, a valuable asset for these small houses, and does not require heating or cooling, conserving costs. The house in Edenton, NC also extends livable outdoor space to a back deck, providing even more square footage beyond the small interior. Linking the front porches with the public sidewalks adds another dimension of community to these houses by connecting them with the neighborhood thoroughfares, an element of sustainability in terms of community connections and relationships. Both of these measures signify the importance of incorporating the new with the old and provide opportunities for new residents to meet existing residents in the district and thus dwell compatibly together.

Providing an access point from the parking area to the interior public space adds another dimension of connectivity to these houses. Six of the seven have secondary entries that provide access to the interior from the driveway.   Of those six, the second entry leads to the kitchen in three of them. One leads into a mudroom and another into the dining space. The 611 square-foot house in the Macon Historic District has a second entry on a back deck near the driveway, but it leads into the only bedroom, an awkward place for entry if the residents are carrying groceries or expecting visitors. These secondary entries provide continent access-points from the parking areas and serve as less formal links than more formal the front doors between the exterior with the interior.

In addition to these community traits, two of the case studies include another community component. The infill communities in the Old City District and Avery Helm Historic District, both the result of subdividing larger lots, opened the possibility for a small park in addition to multiple houses in each development. The City of Charleston donated the land for the Peecksen's Court development in the Old City District. In addition to the eleven houses built on the land, a small park sits between two of the houses. It functions as a community space for the eleven houses in the development, but cannot be seen from the street, indicating it provides outdoor space for only Peecksen's Court residents. In the Avery Helm Historic District, a public park sits directly in front of the infill house and looks like a front yard when viewed from the main street. This more public park seemingly aims to serve all the residents of the surrounding area. Both parks fulfill two needs; they act as community space as well as outdoor space that both developments lack because of the small yards that result from

the increased density. These open spaces, along with usable front porches and connecting sidewalks, contribute to successfully integrated infill houses that participate with their greater communities. They demonstrate a pattern for development of affordable houses within the context of historic districts. Together with sustainable features, material choices, and overall lot and house size, these factors represent positive aspects of the case study structures in the context of historic neighborhoods.

Common Issues

In addition to the several positive patterns already discussed, this analysis also produced some common problem areas in the sample. Despite the positive community-engagement aspect of the front porches, some of the case studies missed the mark of compatibility. Three of the seven have incompatible porch forms, and five houses' porch roofs do not reflect the historic character present in the neighborhoods. Additionally, two have concrete porch floors rather than more historically-appropriate and compatible wood decking. All of the houses feature rectilinear columns on the front porches, and four have rectilinear railings; these simple details may represent an effort to convey contemporary design. However, the boxed columns on two of the case studies' porches contrast with the common turned posts in both districts. While the front porches contribute to the community and add to the curb-appeal of these houses, considering the surrounding fabric of neighboring houses remains important for their design.

House form, street façade proportion, and roof form and pitch denote larger issues than those of the front porches, and these major concerns affect and relate to

one another. The overall shape and style of the houses in both the East-Raleigh South Park Historic District (See Appendix B) and the Goldsboro Historic District (See Appendix D) do not complement their historic neighbors. While in most cases, the infill houses represent simplified versions of forms common in the district, these two case studies barely relate to the historic houses in the district. Both of these houses came from TightLines Designs, a firm that sells house plans online, and these two houses have the most complex house forms in the sample despite the fact they both sit next to relatively modest historic resources. Considering the success of five houses with simple forms, these last two suggest that complexity does not necessarily equate with compatibility.

Additionally, the proportions and roofs of both of these two case studies do not compatibly fit in with neighboring structures; however, these issues plague more than just two of the houses. Six of the seven houses have inconsistent overall proportions of the street façade, and a few different issues may contribute to this perplexing problem. For example, the house in the Goldsboro Historic District has a narrower façade than its neighbors, and the porch extends beyond the house on one side, perhaps to compensate for this disproportionate front elevation. However, the overall form in combination with the porch makes it incompatible with its neighbors. The house in the Old City District in Charleston, SC has ungainly proportions because it lacks the side porch common on the Charleston-Single House; however, the proportions of the house match those common on the street when considering the main house without the side porch (See Appendix G). With foundations taller than the historic houses, two houses

include inappropriate foundation heights that also contribute to inconsistent

proportions.

Table 4.2. Comparison of Compatibility of Form, Proportion, Roof Form, and Pitch among the Case Studies

Case Study	Form		Proportion		Roof Pitch		Roof Form		Foundation Height	
Avery Helm	two-story simplified bungalow	Y	almost as wide as it is tall	N	low	N	hip	Y	very low	Y
East-Raleigh	"L" shape cottage	N	one and a half times as wide as it is tall	N	fairly low	N	hip with gable extensions	N	about three feet	Y
Edenton	vernacular cottage	Y	twice as wide as it is tall	Y	fairly steep	Y	gable parallel with the street	Y	about two feet	Y
Goldsboro	small cottage with a front porch that projects beyond the house	N	one and a half times as wide as it is tall	N	fairly steep	Y	gable perpendicular to street with gable parallel to street over porch	N	about three feet – too tall	N
Macon	shotgun	Y	as tall as it is wide	N	low	N	gable perpendicular to street	Y	about four feet	Y
N. Cherry St	simplified bungalow	Y	twice as wide as it is tall	N	low	N	gable perpendicular to street	N	about three feet – too tall	N
Old City District	Charleston Single House without side porch	Y	twice as tall as it is wide	N	fairly steep	Y	gable perpendicular to street	Y	very low	Y

Note: Y indicates compatibility and N indicates incompatibility.

The roof pitch also affects the overall proportion and presented some

incompatibility within the sample. Four case studies have pitches lower than their

neighbors, perhaps partially explained by Habitat for Humanity's approach to lower roof pitches to accommodate a means for protecting unskilled workers during construction and thus lowering liability (unnamed staff member, 2010). Alternatively, decreasing the pitch may represent an effort to cut costs because lower roofs require less material.

In addition to roof pitch, roof form also presented issues for three of the case studies. The two houses with incompatible forms also have inappropriate roof forms. The house in Raleigh has a hipped-roof with gable extensions on a street populated by Triple-A houses with a gable parallel to the street and a gable perpendicular street projecting from the middle of the roof. The house in the North Cherry Street district has a simple gabled roof, but it lacks the complexity achieved by dormers and separate porch roofs that is common throughout the district (See Appendix F).

The lack of continuity in form, proportion, and roofs greatly affects the overall success of these houses in complementing the surrounding historic fabric. However, these deficiencies provide valuable examples to learn from for future affordable infill housing. Based on the analysis of common issues in the sample, future projects may find more success by simplifying a form that contributes to the character of the district. Selecting a character-defining form to work with also leads to compatible roof form. Roof pitch and foundation heights should be such that the overall proportions of the infill house remain complementary of the historic proportions present. These shortcomings also demonstrate the importance of careful consideration of the existing fabric and how a new house can sit among historic resources without disrupting the existing district character and rhythm present.

Accommodating People

The interior floor plans vary greatly despite the fairly similar sizes in the sample, and these differences led to diverse approaches to accommodating contemporary needs. Overall, these floor plans fit current lifestyles but to varying degrees, and the analysis of them produced some areas where improvements could be made. Three bedrooms, two bathrooms, space for a washer and dryer, sufficient storage space, and a secondary entry represent, discussed previously, common patterns that address present-day lifestyles in most of the case studies. Future infill designs can improve on the examples by grouping similar spaces, providing workspace, and utilizing an open plan.

Table 4.3. Categories of Contemporary Lifestyle

Case Study	Bedrooms	Bathrooms	Washer Dryer	Storage Space	Work Space
Avery Helm	3	1	closet	6 closets	No
East-Raleigh	3	2	closet	8 (2 in master)	No
Edenton	2	2	closet	7 closets (walk-in master)	Yes
Goldsboro	3	2	closet	6 (walk-in master)	No
Macon	1	1	small laundry room	3 (2 in bedroom) closets	No
N. Cherry St.	3	2	closet	5 small	No
Old City District	3	2	stacking	5 closets	No

Today, people in need of affordable housing include single-person households, such as young professionals and elderly people, and couples with no children, but this

sample seems to be geared more towards families or multiple-person households. Five

of the houses include three bedrooms; one provided a single bedroom and the other

had two. Additionally, all but two of the plans indicated a master bedroom, larger than

the other bedrooms with direct access to a bathroom. Even though almost all of the

houses contained three bedrooms, the presence of one- and two-bedroom houses in

the study suggests the acknowledgment of the need for affordable houses for small

households in addition to families.

The number of bedrooms desired by contemporary homeowners varies, but

almost all expect more than one bathroom in their homes. All but two of the case

studies provide two full baths. The smallest house features only one full bath and one

bedroom, so the lack of a second bath makes sense in this house, most likely intended

for a single person or couple. The house in the Avery Helm Historic District also has

only one bathroom, which sits on the second floor. The need for a staircase probably

made it difficult to fit a second bathroom on the first story of the house. Overall, most

contemporary households benefit from having two bathrooms at their disposal, so this

attribute should continue for future infill houses.

In addition to two bathrooms, present-day homeowners expect space for a

washer and dryer. All of the plans include space for these amenities, and only one

indicates the need for a stacking washer and dryer, thus meeting present-day

expectations. With space for a full laundry room allocated for only one of the houses,

the closet space for the washer and dryer does provide some additional (and usually

much-needed) storage, which represents another important component of

contemporary lifestyles.

Despite the limited square footage of these houses, most of them contain a good amount of storage space. All of the houses include a closet in each bedroom and at least one additional closet. Two of the houses feature a walk-in closet in the master bedroom, and two have two closets in the master. The presence of ample storage in the master bedrooms, a contemporary trend in most new suburban homes, only shows up in four of these small houses. Three lacked pantry space, but six included a closet that could serve as a linen closet. Overall, most of the plans had a fair amount of storage space, an important attribute of contemporary houses.

The only missing component of current daily life in all but one of the houses was workspace. Because the computer plays an increasingly integrated roll in twenty-first century lives, most people expect space for a desk or built-in work surface; however, only one of the floor plans indicate such a space. Space is so limited in these plans that finding a place for even a small desk proves nearly impossible. Today, many people work from home and would benefit from having a space dedicated to deskwork, and many households include children who need a place to complete homework. Creating an alcove with as little as five or six linear feet or extending a counter surface a few feet does not require enough square footage to jeopardize affordability, but providing this small amount of space better accommodates contemporary daily life.

For the most part, these case studies have the attributes of twenty-first century houses but lack grouped plumbed spaces and open floor plans. Although the number of bathrooms satisfies current needs, their locations within the houses often present a missed opportunity for more affordable designs. Grouping plumbed spaces minimizes the amount of pipe needed and offers a more efficient way to design the interiors.

Although five of the seven case studies' plumbed spaces are relatively close together, only two of them successfully employ this efficient method of space planning. In three, a bathroom and kitchen or kitchen and laundry share a wall but the other plumbed spaces sit in different areas of the house. While this method of designing a house does not represent an essential way of achieving affordability or fit with contemporary lifestyles, it does present an additional way to save on up-front construction costs and should be considered when designing a small, efficient house.

Overall, the lack of open floor plans represents another missed opportunity for more efficient and contemporary design. Opening up the public areas helps small spaces seem larger and cuts down on the materials needed by eliminating walls separating every room. As discussed in Chapter II, open public spaces also better accommodate contemporary lifestyles. The kitchen has become the hub of many twenty-first-century households, but only a few of the houses acknowledge this primary roll of the kitchen. The house in Avery Helm and the one in Peecksen's Court in Charleston have kitchens that open completely to a living/dining space. The houses in Edenton, Goldsboro, and Macon have partially open plans in which public spaces are somewhat separated by walls but have large openings between them rather than hallways and doors. Planning public spaces that closely relate and open up to one another eliminates the amount of materials needed, creates larger spaces within a small footprint, and allows the users the freedom to define the spaces as they see fit.

These cases studies demonstrate different approaches to affordable infill design, but when considered together, several patterns emerge that led to suggestions for future infill. The guidelines synthesize this analysis and provide suggestions for

choosing an appropriate district, creating affordable, compatible exteriors, and

designing efficient interiors that support contemporary life. The guidelines supplement

existing parameters for building new houses in historic districts by adding suggestions

about achieving affordability. These affordable guidelines do not provide specific

solutions for every district but can serve as a starting point for the design of affordable

infill housing.

Guidelines for Designing Compatible, Affordable Infill

1. Select districts that include small lots that can accommodate modest homes.

    a. Maintain the setback and spacing of the district.

2. Perform a detailed site analysis to provide an understanding of how to achieve

    compatibility.

    a. Concentrate on the immediate surroundings of the site that directly

        impact the affordable infill house.

    b. Note lot size, setback, spacing, form, proportions, roof form, foundation

        height, entrances, porches, windows, materials, and architectural details.

    c. If feasible, site the house to optimize southern exposure for passive solar

        heating and cooling.

3. Build small.

    a. Keep the heated space to less than 1,200 square feet.

    b. To achieve greater sustainability, use energy-efficient construction

        methods, including effective insulation systems, high-performance

windows, tight construction and ducts, efficient heating and cooling
equipment, and Energy Star qualified lighting and appliances.

4. Simplify a traditional house form that appears close to the chosen site.

    a. Employ a roof form and pitch common in the district.

        i. Extend the roof overhang in hot climates for a sustainable
        approach to keeping the house cooler in warm weather.

    b. Build the foundation high enough to be compatible with the existing
    houses.

5. Respect existing street façade proportions by maintaining a compatible roof
pitch and foundation height.

6. Include an appropriate front façade.

    a. In districts where front porches are common, include a suitable front
    porch.

        i. Construct the porch using methods and materials that
        compliment existing fabric.

        ii. Trim the porch with rectilinear columns and railings with
        appropriate dimensions.

        iii. Connect the front porch with a public sidewalk.

    b. In districts where front porches are not common, provide a consistent
    front entry.

7. Affix lap siding with correct board exposure. Maintain the pattern and
dimension of lap siding in the district.

       a. In districts where lap siding is not common, use a material consistent with the historic materials.

8. Cover the roof with asphalt shingles, or a more appropriate material depending on the commonalities of the district.

9. Install windows with appropriate proportions and spacing in comparison to the historic houses.

       a. Use operable windows to allow for passive cooling in warm weather.

       b. Align windows and doors to maximize air flow in the summer.

10. Trim the house simply but adequately to compliment existing houses

       a. Use appropriately dimensioned trim.

       b. Attach corner and skirt boards and include appropriate gable vents in districts where they are common.

11. Leave existing mature, healthy trees unscathed in order to maintain shading of the house in summer months.

       a. Add native deciduous trees where possible to provide shade in the summer and solar gain in the winter.

       b. Add native plantings where possible.

12. Use permeable surfaces for driveways.

13. Provide a rain barrel for water re-use when appropriate.

Guidelines for Interior Layout of Affordable Infill

1. Utilize an open plan for the public spaces.

2. Include one to three bedrooms, depending on the desired user-type.

3. Provide up to two full bathrooms for houses with two or more bedrooms.

    a. Install a gray water reclamation system to conserve water.

4. Equip a space for washer and dryer.

5. Group plumbed spaces.

6. Supply adequate storage: at least one closet in each bedroom, a linen closet,

    and a pantry.

7. Provide a second entry with easy access from car to public space.

8. Create a work surface or provide space for a desk.

CHAPTER V

NO PLACE LIKE HOME

Although the designers of the case studies maintain the character of their historic neighborhoods to varying degrees, the buildings bring new life to historic districts through the provision of affordable homes. The designers of these small houses also provide a more sustainable living solution than developing unused land for large homes that require extensive infrastructure construction. They sit among physical relics of the past while supporting contemporary lifestyles through the layout of their interiors. These homes provide supportive places to live that connect their residents to an established community as well as history. In addition to supplemental guidelines for designing affordable infill, the analysis discussed in the previous chapter also led to the realization of attributes of this study, challenges in the research process, and implications for future research.

In this investigation, I considered affordability in terms of design decisions, suggesting that building affordable housing involves more than adequate financing. This study demonstrated that sensitively designing efficient houses presents a fundamental method of keeping expenses low without sacrificing contemporary amenities. This comprehensive examination goes beyond monetary definitions to find that achieving affordability results from several converging criteria, especially house and lot size in addition to materiality and architectural detailing.

This study's consideration of the interiors of infill houses adds another dimension to typical historic district guidelines, which traditionally focus on front façades and site features. By analyzing the interior layout of these houses, I included additional methods of achieving affordability in addition to taking the users into account for this investigation, a practice absent from affordable housing in the past, as discussed in Chapter II. Home represents a personal space that impacts the identities of the people who live within it, and interpreting the interior of these houses led to an understanding of how they might function as homes.

Challenges in the Research Process

Because this sample included infill examples located well beyond Greensboro, NC, where I conducted the analysis, I traveled to only two of the seven sites and found the description and deduction phases easier to complete for those two houses. I took photographs and notes while on site and later keyed the maps and assessed their compatibility; my physical experience of these case studies and their surroundings led to a more holistic understanding of how each fit into its respective historic district. Undertaking that process personally proved much more effective than using the photographs people took for me because, having not been to the site, I then used Google Street View to find the location of the image and then keyed the map accordingly. While that process did lead to accurately keyed maps and complete analysis, it lengthened the amount of time needed to fully understand and accurately assess the case studies. Seeing all of the houses in person may have made the initial

phases of this study more thorough; however, I am confident that the phases and

methods of analysis I utilized produced sound results.

In a similar light, I could not experience the interior of any of the houses, so floor

plans acted as my primary source of information about the interiors. The opportunity to

go inside these houses may have contributed to a better understanding of how the

spaces function. Additionally, the materials and finishes of the interior were not

available to me; having access to the materiality of the interiors may have added more

information about achieving affordability and accommodating contemporary life on the

interior of infill houses.

Implications for Future Research

Although affordable infill housing in historic districts presents a growing trend in

many communities, locating specific examples with the necessary information available

proved difficult. In addition to my inability to physically visit all of the houses and their

interiors, having more case studies to add to this study may have produced stronger

patterns or more thorough guidelines. Moreover, sustainability represented an

important focus of this study, but the analysis revealed fewer patterns than expected

for considerations of the natural environment. In light of these challenges, future

studies on affordable infill housing in historic districts would benefit from attaining a

larger sample that includes larger strides towards sustainability.

While the methods employed for this study fit the intended outcomes, a few

additional methods may have contributed to a more complete understanding of the

houses. Interviews with the people involved in the designing, planning, and developing

of these case studies may have led to more comprehensive guidelines on choosing a

location, designing the houses, and achieving affordability. Interviewing residents of

these houses may have also provided a deeper understanding of how these houses

function and how well the interiors suit everyday life in the twenty-first century.

Despite varying degrees of affordability, compatibility, and sustainability, all of

these case studies represent a positive trend: small houses that respect the history that

surrounds them while honoring current lifestyles. Past and present come together in

the design of these houses; their exteriors reflect the history that surrounds them and

reveal twenty-first-century living solutions on their interiors. These houses positively

impact historic districts by filling empty lots or replacing run-down houses and their

residents by offering affordable homes that physically connect with the well-established

communities in which they are located. While these houses do not all represent ideal

manifestations of compatibility and sustainability, they achieve the most important

consideration of this study: providing affordable homes in historic neighborhoods.

REFERENCES

Ames, D., & Wagner, R. (Eds.). (2009). *Design & Historic Preservation: the Challenge of Compatibility*. Newark: University of Delaware Press.

Anderson, B. (1997). The Importance of Cultural Meaning in Defining and Preserving Sense of Place. In M. Tomlan (Ed.), *Preservation of What, for Whom?: A Critical Look at Historical Significance* (pp. 126-124). Ithaca, NY: National Council for Historic Preservation.

Bachelard, G. (1958). *The Poetics of Space*. (M. Jolas, Tran.). Boston: Beacon Press.

Baer, W. (1998). The Impact of 'Historical Significance' on the Future. In M. Tolman (Ed.), *Preservation of What, for Whom? : a Critical Look at Historical Significance* (pp. 73-83). Ithaca, NY: National Council for Historic Preservation.

Bernstein, F. A. (2005, October 2). Are McMansions Going Out of Style? *New York Times*, 1.

Buchanan, R. (1992). Wicked Problems in Design Thinking. *Design Issues*, *8*(2), 5-21.

Burton-Christie, D. (2009). Place-Making as Contemplative Practice. *Anglican Theological Review*, *91*(3), 347-371.

Bynum, R. T., & Rubino, D. L. (1999). *Handbook of Alternative Materials in Residential Construction*. Washington, DC: McGraw-Hill.

Chiras, D. (2009, July). Don't Paint Your House for 25 Years! *Mother Earth News*, (234), 92-95.

Delvac, W. F., Escherich, S., & Hartman, B. (n.d.). Affordable Housing through Historic Preservation: A Case Study to Combining the Tax Credits. U.S. Department of

Interior, National Park Service, preservation Assistance, and the National Trust

for Historic Preservation, Department of Public Policy.

Dolan, M. (2002). *The American Porch: An Informal History of an Informal Place*.

Guilford, CT: The Lyons Press.

Elefante, C. (2007). The Greenest Building is...One that is Already Built. *Forum Journal*,

(Spring), 27-38.

Eric Hill and Associates, N., & Muldower & Patterson Associates, Inc., E. H. (1983).

Design Criteria for New Buildings in Historic Savannah. In *Readings in Historic*

Preservation. New Brunswick, New Jersey: Rutgers - The State University of

New Jersey.

72 Federal Register 31. (2007). Final Advisory Council on Historic Preservation Policy

Statement on Affordable Housing and Historic Preservation, 7387 - 7389.

Fine, A. S., & Lindberg, J. (2002). *Protecting America's Historic Neighborhoods: Taming*

the Teardown Trend. The National Trust for Historic Preservation.

Fitch, J. M. (1990). *Historic Preservation: Curatorial Management of the Built*

Environment. Charlottesville, VA: University Press of Virginia.

Friedman, A. (2001). *The Grow Home*. Montreal, Canada: McGill-Queen's University

Press.

Friedman, A. (2009). *Homes Within Reach: A Guide to the Planning, Design, and*

Construction of Affordable Homes and Communities. Hoboken, NJ: John Wiley

& Sons.

Friedman, A., Lin, Q., & Krawitz, D. (2002). The Development Process of Urban and

Architectural Guidelines for the Rehabilitation of an Inner-city Neighborhood: Le

Village, Cornwall, Ontario, Canada. *Journal of Urban Design*, *7*(1), 5-34.

Gauer, J. (2004). *The New American Dream Living Well in Small Homes*. New York, NY: Monacelli Press, Inc.

Goley, C., & Ozden, M. (2007). The Right to Housing: A fundamental Human Right Affirmed by the United Nations and Recognized in Regional Treaties and Numerous National Constitutions. Human Rights Programme of the Europe-Third World Centre (CETIM).

Gordon, B. (1996). Women's Domestic Body: The Conceptual Conflation of Women and Interiors in the Industrial Age. *Winterthur Portfolio*, *31*(4), 281-301.

Gordon, S. C. (1997). Historical Significance in an Entertainment Oriented Society. In M. Tolman (Ed.), *Preservation of What, for Whom?: A Critical Look at Historical Significance* (pp. 49-58). Ithaca, NY: National Council for Historic Preservation.

Gorski, E. (2009). *Regulating New Construction Projects in Historic Districts*. The National Trust for Historic Preservation.

Gray, L., Mills, G. E., & Airasian, P. (2008). *Educational Research: Competencies for Analysis and Applications* (Ninth.). Upper Saddle River, NJ and Columbus, OH: Prentice-Hall, Inc.

Hanlon, B. (2009). A Typology of Inner-Ring Suburbs: Class, Race, and Ethnicity in U.S. Suburbia. *City & Community*, *8*(3), 221 - 246.

Historic Macon. (2011). Historic Macon's Real Estate Listings. Retrieved March 15, 2011, from http://www.historicmacon.org/historic-preservation/properties-for-sale

Historical Census of Housing Tables - Home Values. (2004, December 2). . Retrieved

March 15, 2011, from

http://www.census.gov/hhes/www/housing/census/historic/values.html

von Hoffman, A. (2009). Housing and Planning: A Century of Social Reform and Local

Power. *Journal of the American Planning Association*, *75*(2), 231 - 244.

Hosford, C. (2009, November). Workforce Housing. *Multi-Housing News*, *44*(11), 38-39.

How New Homes Earn Energy Star. (n.d.). . Retrieved March 11, 2011, from

http://www.energystar.gov/index.cfm?c=new_homes.nh_verification_process

Huxtable, A. L. (1997). *The Unreal America: Architecture and Illusion*. New York, NY:

The New Press.

Jackson, J. B. (1994). *A Sense of Place, A Sense of Time*. New Haven and London: Yale

University Press.

Jacobs, J. (1961). *The Death and Life of Great American Cities*. New York: Random

House, Inc.

Kellert, S. R. (2005). *Building for Life: Deisgning and Understanding the Human-Nature

Connection*. Washington, DC: Island Press.

Kellert, S. R. (2008). Restorative Environmental and Biophilic Design. In S. R. Kellert, J.

H. Heerwagen, & M. L. Mador (Eds.), *Biophilic Design* (pp. 3-19). Hoboken, NJ:

John Wiley & Sons.

Kibert, C. (2005). *Sustainable Construction*. Hoboken, NJ: John Wiley & Sons.

Leedy, P. D., & Ormrod, J. E. (2010). *Practical Research: Planning and Design* (9th ed.).

Columbus, Ohio: Allyn & Bacon.

Leimenstoll, J. R. (2001). Design Guidelines for Raleigh Historic Districts. Raleigh

Historic Districts Commission.

Leimenstoll, J. R. (2009). Going Green: Applying a Sustainability Lens to Historic District

    Guidelines. *Forum Journal*, (Spring), 38-43.

Lowenthal, D. (1985). *The Past is a Foreign Country*. Cambridge: Cambridge University

    Press.

Mason, R. (2006). Theoretical and Practical Arguments for Values-Centered

    Preservation. *CRM Journal*, *3*(2).

McDonough, W., & Braungart, M. (2002). *Cradle to Cradle*. New York: North Point

    Press.

McLennan, J. F. (2004). *The Philosophy of Sustainable Design*. Kansas City, Missouri:

    Ecotone LLC.

Mendoza, H. R., Bernasconi, C., & MacDonald, N. M. (2007). Creating New Identities in

    Design Education. *International Journal of Art & Design Education*, *26*(3), 308-

    313.

Moe, R., & Wilkie, C. (1997). *Changing Places: Building Community in the Age of*

    Sprawl. New York, NY: Henry Holt & Company.

Mueller, E. J., & Tighe, R. J. (2007). Making the Case for Affordable Housing with Health

    and Education Outcomes. *Journal of Planning Literature*, *21*(371), 371-385.

National Association of Home Builders. (2010). About Defining Housing Affordability.

    Retrieved September 13, 2010, from

    http://www.nahb.org/generic.aspx?sectionID=1013&genericContentID=93314

Norberg-Schultz, C. (1979). *Genius Loci: Towards a Phenomenology of Architecture*.

    London: Academy Editions.

Owen, D. (2009). *Green Metropolis: Why Living Smaller, Living Closer, and Driving Less*

Are the Keys to Sustainability. New York: Riverhead Books.

Parrot, K., & Emmel, J. M. (2001). Sustainability in Housing: A Curriculum Case Study. *Journal of Family Consumer Sciences*, *93*(5), 31-41.

Porteous, J. D. (1976). Home: The Territorial Core. *Geographical Review*, *66*(4), 383-390.

Prown, J. (2001). *Art as Evidence*. New Haven and London: Yale University Press.

Repko, A. F. (2008). *Interdisciplinary Research*. Los Angeles: Sage Publications, Inc.

Ruskin, J. (1849). The Lamp of Memory. In *The Seven Lamps of Architecture*.

Rybczynski, W. (2008). Why Can't We Build an Affordable House? *The Wilson Quarterly*, *32*(3), 16-19.

Rypkema, D. D. (2003). Historic Preservation and Affordable Housing: The Missed Connection. *Forum Journal*, 4-19.

Schwandt, T. A. (1994). Constructivist, Interpretivist Approach to Human Inquiry. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of Qualitative Research* (pp. 118-137). Thosand Oaks, London, and New Dehli: SAGE Publications.

Sopher, D. E. (1979). The Landscape of Home: Myth, Experience, Social Meaning. In D. Meinig (Ed.), *The Interpretation of Ordinary Landscapes* (pp. 129 -149). New York and Oxford: Oxford University Press.

Steele, F. (1981). *The Sense of Place*. Boston, Mass.: CBI Publishing Company, Inc.

Stewart, K. K. (1979). Twentieth Century Housing Design from an Ecological Perspective. In G. S. Fish (Ed.), *The Story of Housing*. New York: McMillan Publishing Co.

Sullivan, J. (2007). Affordable by Design. *Builder*, *30*(9), 134-136;138-141.

Summerson, J. (1949). *Heavenly Mansions: and Other Essays on Architecture*. New
York: W.W. Norton & Company, Inc.

Susanka, S. (2001). *The Not So Big House*. Newton, CT: Taunton Press.

The National Park Service. (1976). The Secretary of the Interior's Standards for
Rehabilitation & Illustrated Guidelines for Rehabilitating Historic Buildings-
Standards. Retrieved March 11, 2010, from
http://www.nps.gov/hps/TPS/tax/rhb/stand.htm

Tschundi-Madsen, S. (1985). Principles in Practice. *APT Bulletin*, *17*(3 & 4), 13-19.

Tuan, Y. (1977). *Sense of Place: the Perspective of Experience*. Minneapolis: University
of Minnesota Press.

U.S. Census Bureau (Ed.). (2001, September). Households and Families: 2000.
Retrieved from http://www.census.gov/prod/2001pubs/c2kbr01-8.pdf

U.S. Census Bureau. (2011, February 24). Characteristics of New Housing Index.
Retrieved March 27, 2011, from http://www.census.gov/const/www/charindex.html

U.S. Department of Housing and Urban Development. (2010, January 13). Affordable
Housing - CPD - HUD. *Homes & Communities*. Retrieved January 29, 2010,
from http://www.hud.gov/offices/cpd/affordablehousing/

unnamed staff member. (2010, June 20). Habitat for Humanity of Wake County Historic
Infill Houses.

Viollet-le-Duc. (1860). Excerpts of Lecture x. In *Discourses on Architecture* (pp. 463-
487).

Wells, J. (2010). Authenticity in More than One Dimension: Reevaluating a Core Premise
in Historic Preservation. *Forum Journal*, *24*(3), 36-40.

	Infill Exterior	Compatibility	Comments
Site			
Lot Size	small	no	the infill lots appear smaller - possibly to make room for four houses and a park on a small parcel of land
House footprint	smaller than most of the historic homes nearby	yes	
Driveway	at the rear of the lot	no	most houses have side driveways, but because this lot is small, the back of the lot is really the only place for the drive
Parking	driveway	yes	parking in driveways or on the street
Front Yard	actually lot has a very small front year, but the park in front of the house makes it look like the house a large front yard, which seems fairly common in the neighborhood	yes	
Back Yard	small but similar to the historic lots	yes	
Setback	front is set in line with the side of the nearest historic house	yes	
Orientation	faces B Ave, inconsistent	no	
Distance from adjacent buildings	further from other infill than typical and about the same distance to the historic house at its east side	no	
Typography	fairly flat	yes	
Mature Trees	mature trees on side and rear of lot	yes	
Plantings	low plants and small trees near front of the house	yes	
Sidewalk	sidewalk from public sidewalk to front porch	yes	
Site Features	adjacent to park	n/a	
Views	maintains views	yes	
Form	simplified two-story bungalow	yes	
Height	2 stories	yes	
Proportion of Street Façade	almost as wide as it is tall	no	seems squat
Windows			
Type	double-hung	yes	
Subdivision	1 over 1	yes	

Proportion	vertical	yes	
Orientation	4 on front façade	yes	
Spacing	one double openings and two single openings on front façade	yes	
Size	similar to historic neighbors, which all vary slightly	yes	
Foundation			
Type	concrete slab	no	
Height	about I foot high	no	seems shorter than historic houses
Material	concrete	yes	there are a few stucco/cement foundations, a few that are covered by clapboards, and a few brick - because of the wide variety, I think this material is compatible
Color	gray? (not visible in pictures)	yes	
Roof			
Roof Form	hip	no	gables seem more popular but there are a couple hipped roofs in the surrounding area
Pitch	Lower than surrounding roofs	yes	its wide span exaggerates its lower pitch
Overhang	similar depth to historic houses, which have wider overhangs because most are craftsman style	yes	
Roof Material	asphalt shingle	yes	
Roof Color	dark gray	yes	
Front Entrance			
Placement	on the right side of the house	yes	
Material	insulated steel door with glazing	yes	
Color	white	yes	
Orientation	front façade facing B Ave	yes	doors common on front and side facades in this neighborhood
Subdivision	one with glazing	?	hard to see the doors of these houses because they sit further from the street
Size	single opening, looks standard size	yes	
Porch			
Placement	front porch spanning the front façade	no	partial front porches seem more common
Roof Form	low-pitched hip	no	gables seem more common

Construction/ Materials	can't see	can't see	
Depth	6 feet	yes	seems consistent/slightly deeper than others in the neighborhood/ provides usable space
Columns	square	yes	
Railing	half wall covered in clapboards	yes	
Siding			
Material	clapboards	yes	
Color	gray	yes	
Trim			
Color	white	yes	
Material	wood	yes	
Corner boards	yes	no	only one house in my pics has corner boards
Window Surrounds	white, consistent size with historic houses	yes	
Brackets	none	yes	
Gable Vent	none	yes	variety of different gable vents
Skirt Board	none? (can't see pictures)	yes	
	Infill Interior	**Contemporary Lifestyle**	
Square Feet	1166	n/a	
Bedrooms	3	n/a	
Bathrooms	1	no	
Closets	6	yes	although the closets are small, they are in each bedroom and there is a pantry/utility closet under the stairs, a linen closet outside bathroom, and a coat closet near the front entry
Secondary Entrance	entrance at rear of the house into kitchen, near rear driveway	yes	
Kitchen	"L" shape, eat-in, open to living room	yes	
Workspace	no space designated for workspace	no	
Amenities	washer and dryer in kitchen	yes	
Arrangement of Public Spaces	open plan kitchen/dining is open to living	yes	
Grouping	plumbed spaces are grouped near the far, right corner of the house	n/a	

| indicates sustainable feature |
| indicates affordable feature |
| indicates both affordable and sustainable feature |
| indicates feature that supports community/neighborhood |

Appendix B. SITE ANALYSIS OF THE EAST-RALEIGH SOUTH PARK

HISTORIC DISTRICT

National Register Photo of 603/601 E. Martin St.

Appendix C. SITE ANALYSIS OF THE EDENTON COTTON

MILL VILLAGE HISTORIC DISTRICT