HORTON, KATE S. M.F.A. Design for Social Wellbeing: Creating a restorative urbanism model for interior environments. (2022)
Directed by Dr. Lucinda Havenhand. 60 pp.

Social wellbeing, or healthy relationships and sense of belonging in society, is an important component of mental health. To build and sustain social wellbeing people need social infrastructure, or community places and spaces where they can gather in-person to live, work, and play. Roe & McCay (2021) propose a restorative urbanism model for creating salutogenic (health-promoting) environments in public open space to support mental health and wellbeing. This studio investigation explores how this model could extend to interior environments, and specifically interior spaces that support social wellbeing. The objective is to redesign a former mill building in Greensboro, North Carolina as a “micro restorative city” that could be used as a model for restorative interior environments that promote social wellbeing. This study focuses on bumping places or transition spaces where people have positive impromptu encounters that enhance social cohesion. This paper presents conceptual designs for bumping places within the mill building and discusses concepts central to this investigation: how the principles of restorative urbanism could translate to interior environments, the characteristics of interior bumping places that promote social wellbeing, and the relationship between interiors and public outdoor space in a restorative urban environment.

DESIGNING FOR SOCIAL WELLBEING: CREATING A RESTORATIVE URBANISM MODEL FOR INTERIOR ENVIRONMENTS

by

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A Thesis

Submitted to

the Faculty of The Graduate School at

The University of North Carolina at Greensboro

in Partial Fulfillment

of the Requirements for the Degree

Master of Fine Arts

Greensboro

2022

Approved by

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LIST OF KEY CONCEPT DEFINITIONS

Community

"A social unit comprising a group of people with a shared location; interests; or other social, religious, ethnic or other backgrounds or attributes, leading to a commonality of social norms, values, customs and/or identity" (Roe & McCay, 2021, p. 90).

Conviviality

"A quality of public space that encourages human interaction and liveliness, a mingling of people in the course of their everyday lives to form transient connections that make them feel happier and part of a bigger 'whole'" (Roe & McCay, 2021, p. 90).

Mental Health

"According to the World Health Organization, mental health is a state in which an individual 'realizes his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to [their] community' (WHO, 2004). Conceived in this way, mental health encompasses the absence of mental illness and the presence of psychological wellbeing" (Roe & McCay, 2021, p. 6).

Social Capital

"The extent to which a person can leverage [their] relationships to achieve some particular aim (essentially through the reciprocity embedded in social relationships)" (Roe & McCay, 2021, p. 7.

Social Cohesion

"The overall extent to which a social group is connected and harmonious and applies more to a group than to an individual" (Roe & McCay, 2021, p. 90).

Social Infrastructure

Comprises the physical places and organizations that shape the way people interact (Klinenberg, 2018).

Social Isolation

"An objective state where a person has a low level of contact with normal social networks, including community involvement and communications with family, friends or acquaintances" (Roe & McCay, 2021, p. 90).

Social Wellbeing

Dimensions of social wellness include social integration (feeling part of society), social contribution (believing you are a vital member of society), social coherence (making sense of the world around you), social actualization (feeling hopeful about the future of society) and social acceptance (feeling good about the people around you) (Keyes, 1998, as cited in, Roe & McCay, 2021, p. 7).

CHAPTER I: INTRODUCTION

Introduction

How can we live well, together?

Before the COVID-19 pandemic, the relationship between buildings and health was not widely discussed by the general public. Now, after the global spread of an airborne illness, many more people understand how good airflow can prevent disease, and how buildings can make us sick. Planners and designers, who have long considered it best practice to leverage the built environment to promote good physical health, have responded with well-established design strategies for healthy places. Yet the pandemic has also brought to light a less appreciated phenomenon—the impact of the built environment on mental health and wellbeing. Years of social isolation and physical distancing to mitigate the spread of disease have led to renewed interest in the question of how we can live well, together.

The restrictions imposed during the COVID-19 outbreak affected much of the world's population and caused significant disruption globally. For many people, daily life changed dramatically. "For most of us, [the pandemic has been] characterized by varying degrees of uncertainty, anxiety and loss—of loved ones, of livelihoods and security, of life plans, and crucially, of the ability to interact with the world unrestricted" (Roe & McCay, 2021, p. xii). The need for social support is greatest in times like these. Quarantine, isolation, and physical distancing threatened our sense of connectedness and changed how we interact with each other in our everyday environments. In the absence of life outside our homes, we were reminded of the value of social environments—the community places and spaces where we gather in-person to live, work, and play. We have a new appreciation for the experience of being together and an increased awareness of how being apart impacts our mental health.

Social isolation increases people's risk of depression, anxiety, and suicidal thoughts (Beutel et al. 2017, as cited in, Roe & McCay, 2021, p. 91), and social isolation associated with

quarantine can trigger mental illness even in people that were previously well (Usher et al., 2020). With the mental health repercussions of the pandemic predicted to last for years, we need places and spaces where we can develop and sustain healthy relationships that make us feel connected and part of a larger whole.

The intent of this studio investigation was to explore how interior design can help people build and re-build their social wellbeing—their relationships and sense of belonging in society. Using Roe & McCay's "restorative urbanism" model as a theoretical framework, this research seeks to extend the "restorative city" design principles to interior environments.

Theoretical Framework

Jenny Roe & Layla McCay propose a new mental health urbanism, restorative urbanism, to address the challenges of living well, together. In *Restorative Cities: Urban Design for Mental Health and Wellbeing*, Roe & McCay present a framework for designing cities with mental health, wellbeing, and quality of life at the center of the design process. Roe & McCay use a systems-thinking perspective and a people-centric approach to establish salutogenic (health-promoting) design principles for the urban built environment.

Roe & McCay recognize that mental health is a complex issue influenced by a system of interacting factors. Their argument is that the relationship between the built environment and mental health is "an integral—and often overlooked—part of this system" (Roe & McCay, 2021, p. 8). Each component of the restorative city framework shown in Figure 1 addresses a system of factors in the built environment using multi-dimensional design principles.

Restorative urbanism requires strategies to not only reduce mental illness risk factors but also support psychological wellness. In this approach, the absence of mental illness does not necessarily mean the presence of mental health, and vice versa. This means that designing for good mental health requires reducing environmental stressors, such as poor-quality housing, crime, and noise, as well as actively building salutogenic environments such as parks, walkable streets and trails, and intergenerational play opportunities. At the core of restorative urbanism

are these health-promoting attributes of the built environment—the places and spaces where people gather in-person to live, work, and play.

Figure 1. The Restorative City System Framework

Note: Sourced from Roe & McCay, 2021, p. 13.

The restorative city framework is a people-centric model. It centers the human experience of the city—how people move through the urban built environment, the aesthetics of urban form, the importance of providing access to natural settings and diverse uses that support everyday activities. In comparison to many of the utopian masterplans proposed by visionary architects and planners throughout history, Roe & McCay (2021) describe their model as quieter. In their argument, the future healthy city does not require radical redesign or a futuristic vision; what is required is a humanistic approach that "puts mental health, wellness and quality of life at the forefront" of design (Roe & McCay, 2021, p. 2).

This people-centric approach is highly relevant in this moment of societal and cultural transition when many of us are reflecting on our pre-pandemic assumptions about how we want to live. The COVID-19 pandemic is ushering in a new era of humanism that demands a systems

approach to mental health and wellbeing. The purpose of this studio investigation is to better understand how interior design principles can be integrated into this system.

Topic and Questions

Restorative urbanism builds on restorative environments research, which shows how certain places help us recover from mental fatigue, stress, and the demands of everyday life. It also builds on WHO and UN global policy initiatives that place health and equity at the center of city planning (Roe & McCay, 2021, p. 9). Each component of the restorative city framework draws on scientific evidence from a variety of sciences including psychology, public health, geography, anthropology, and urban planning.

Two psychological theories currently dominate the literature on restorative environments: attention restoration theory (ART) (Kaplan and Kaplan, 1989) and stress reduction theory (SRT) (Ulrich, 1983). Both theories focus on individual-level psychological restoration and posit how the environment contributes to individual cognitive, stress, and mood recovery. ART and SRT are well cited in interior design research, and individual-level psychological restoration is at the core of the recent health and wellness trend in interior design practice.

In making the case for how restorative urbanism, Roe & McCay cite more recent evidence on how restorative environments may benefit social relationships. Hartig et al. (2013) suggest that restoration in one individual may extend to another (i.e., an environment that restores our individual attentional capacity can also make us more attentive to others). These “collective restoration” benefits can accrue between family, friends, and colleagues (Hartig et al., 2013) as well as between “consequential strangers,” or the people you may encounter more than once during your daily activities (Blau & Fingerman, 2009). Studies show that in places with robust social infrastructure, relationships grow naturally between people who have regular contact with each other in their everyday lives. Evidence suggests that social infrastructure reduces social isolation, facilitates the development of social capital, and increases social

cohesion; it is the bedrock of social wellbeing and a core attribute of urban environments designed to build and sustain mental health (Klinenberg, 2018).

The objective of this studio investigation was to redesign a former mill building as a micro restorative city that could be used as a model for promoting mental health and social wellbeing. The following research questions framed the investigation.

How can the principles of restorative urbanism translate to the design of interior environments?

How can interior environments facilitate collective restoration?

What are the characteristics of interior space that contribute to conviviality and foster place belonging?

In a restorative urban environment, what is the relationship between interior environments and public outdoor space?

CHAPTER II: EXTENDING RESTORATIVE URBANISM TO INTERIOR ENVIRONMENTS

Restorative Interior Environments for Social Wellbeing

In the restorative urbanism model, mental health is “a holistic and multi-dimensional concept that integrates three core components of hedonic wellbeing (e.g., happiness, enjoyment), eudaimonic wellbeing (e.g., purpose, meaning, fulfillment) and social wellbeing (e.g., healthy relationships, connections to others)” (Roe & McCay, 2021, p. 5). This study focuses on restorative interior environments that could support the social wellbeing component of mental health. Specifically, this investigation explores how interior space could facilitate impromptu encounters and positive social interactions between “consequential strangers” (Blau & Fingerman, 2009) that could support the psychosocial health of individuals and communities.

Bumping Places

According to Roe & McCay (2021), the spaces where people meet incidentally and have positive interactions are known as bumping places. In the context of public open space, parks, playgrounds, and walkable corridors are frequently cited examples of bumping places. These types of outdoor spaces have characteristics that could be translated into interior environments. The primary considerations for any bumping place are location and sense of conviviality. A bumping place must be located where impromptu encounters can occur and it must have a sense of conviviality that encourages people to linger and interact in positive ways. In addition, a bumping place in a restorative city must integrate design principles of the seven system components.

Location

Bumping places exist along boundaries and within transition spaces. The edges of buildings, particularly along the lower floors, provide opportunities for indoor and outdoor life to interact. Doorways and other openings are prime locations for impromptu encounters between people entering and exiting a doorway or passing by an opening. These exchange points allow

for activities inside the building to move outside, and vice versa, and these exchanges can greatly enhance the vitality of indoor and outdoor life (Gehl, 2010). Similar interactions can happen at the edges of interior spaces.

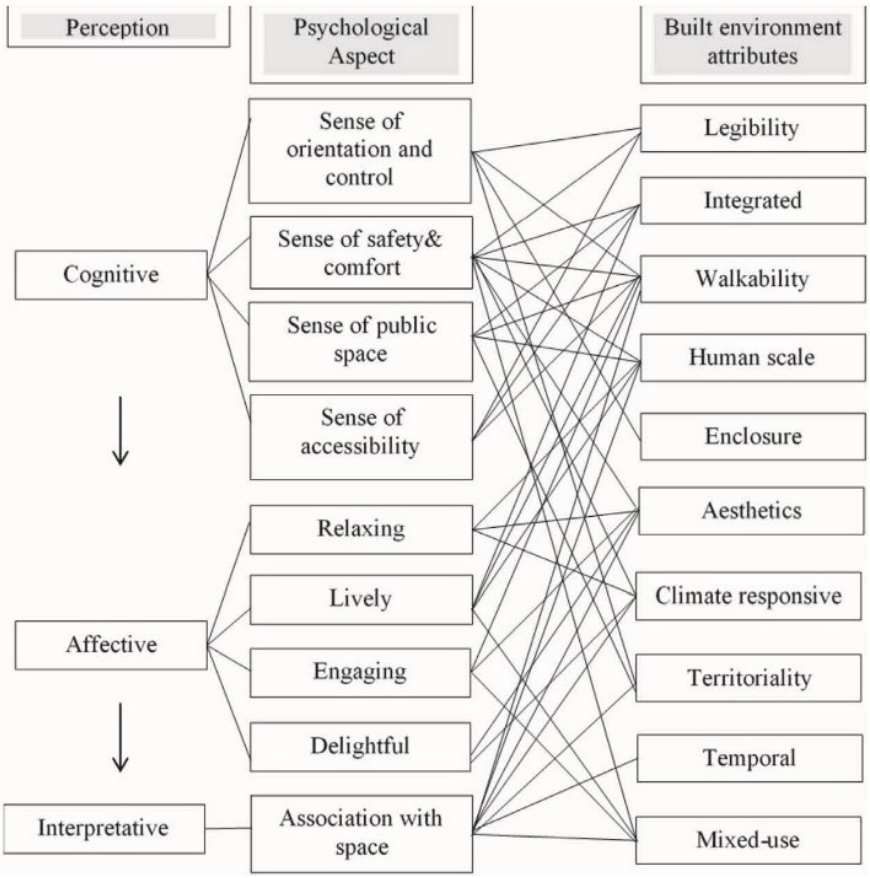
Sense of Conviviality

Conviviality is “a quality of public space that encourages human interaction and liveliness, a mingling of people in the course of their everyday lives to form transient connections that make them feel happier and part of a bigger ‘whole’” (Roe & McCay, 2021, p. 90). Studies of public open space show that people perceive and evaluate conviviality in three stages. In the cognitive stage, people become aware of information such as orientation, accessibility, safety, and comfort; in the affective stage they perceive convivial feelings such as relaxing, lively, engaging, and delightful; and in the interpretive stage, people assign a value to the experience (Thombre & Kapshe, 2021). Figure 2 identifies ten built environment attributes that influence convivial perception of public open space and shows the relationship between these attributes and the psychological aspects of convivial perception.

Restorative City System Components

In addition to location and sense of conviviality, this study considers the restorative city system components as integral to interior bumping places. Roe & McCay (2021) assert that the seven components of the restorative city framework are interdependent and cannot be applied discretely. The authors emphasize that any designer seeking to implement restorative urbanism should incorporate elements of each component into the planning and design of any place. Therefore, wherever feasible and appropriate, the design principles of the seven components are integrated into the bumping place schemes presented in this design proposal.

Figure 2. Built Environment Attributes and Psychological Aspects of Perception



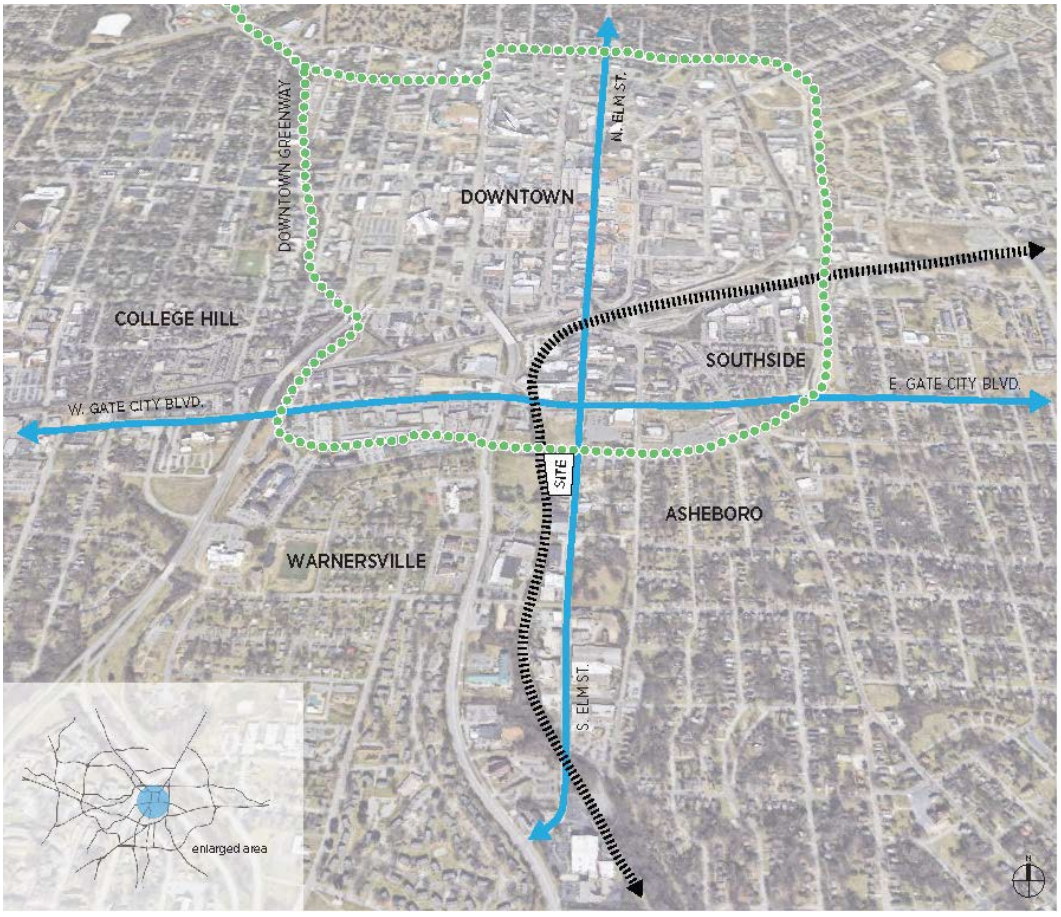
Note: Sourced from Thombre & Kapshe, 2021, p. 951.

CHAPTER III: PROJECT OVERVIEW

Approach to Existing Building

The selected site is the former North State Milling Co. property located in Greensboro, North Carolina at 816 South Elm Street. Figure 3 shows the location of the site on an aerial image of surrounding area. The property is bounded by South Elm Street to the east, the railroad to the west, and the Downtown Greenway to the north. It is on the southern edge of the City's central business district, two blocks south of Gate City Boulevard, the major artery that separates Downtown from South Greensboro.

Figure 3. Site Location



Note: Original graphic produced using Google Maps aerial image of Greensboro, North Carolina.

To test how the restorative urbanism model could be extended to interior environments, this study assumes the building exists in its found state circa 2006, prior to its purchase by the current owner. The photographs in Figures 4 and 5 were taken between the closing of the mill (around 1998) and the sale of the building (around 2008).

Figure 4. Existing Building View West

Note: Sourced from Stevenson, 2005.

Figure 5. Existing Building View Southwest

Note: Untitled photograph of 816 South Elm Street.

Adaptive Reuse

This project will propose the adaptive reuse of the existing building, meaning the proposed design will comprehensively alter the building while conserving the existing structure. Adaptive reuse differs from other building conservation methods such as preservation, restoration, or renovation. In adaptive reuse, the intent is not to maintain the found state of the building (preservation) or return it to its original state (restoration), but to renew the building by changing its function.

The adaptive reuse approach allows for alterations to the building itself, such as changes to the circulation route or spatial organization; it also allows for areas of demolition and additions to the structure (Brooker & Stone, 2004, p. 11). *Adaptive reuse goes beyond updating the structure; it is a process that creates a balance between the existing building and its new use*. This process is commonly known as adaptive reuse in the United States, but it is sometimes referred to as remodeling, reworking, repurposing, adaptation, or creative reuse.

Sustainability

Reusing existing sites usually reduces the need for new infrastructure (roads, utilities, and other services), which preserves undeveloped land and saves on construction costs. In densely developed areas like Greensboro's city center, reusing existing sites also limits urban sprawl. In the case of the Daily Bread Flour mill building, reusing this site could increase the diversity of services in the immediate area, which would promote walkability and transportation efficiency.

Cultural Value

The mill building site is a local icon and the original building, which dates to 1912, represents a building type common in the Greensboro area. "Industrial buildings and factories like the ones found [in the South Elm Street Redevelopment Area] led the way in innovative building design and technology around the turn of the 20th century, and industrial buildings were very important in the development of Modern Architecture" (City of Greensboro, 2006, p. 13).

Since the 2006 master plan, several similar buildings have been demolished, leaving the mill building as one of few remaining of its type in the area. Adapting the site while conserving the existing structure could contribute to the regeneration of the area.

Site Study

In the early stages of the design process, the programming requirements of the proposed functions were examined to ensure compatibility between the existing building and the new uses. Using the Brooker & Stone (2004) “re-reading” method, this process considered important factors such as form and structure, history and function, and context and environment. This analysis considered, for example, solar orientation and daylighting, room sizes and spatial qualities, and the hierarchy of public/private space.

Form and Structure

The structure existing today is a 34,662 gross square feet (24,350 gross square feet occupied) Type V-B building. The original building, a four-story masonry and heavy timber structure, dates to 1912. After its construction, at least three additions were completed at unknown dates. The photograph in Figure 6, which shows the 1912-built structure, was taken before 1919 when the Sanborn Fire Insurance map indicates the addition of a storehouse on the south side of the original building. Figures 7 shows how the site evolved between 1919 and 1950 as documented on the Sanborn Fire Insurance maps.

The original building can be categorized as late nineteenth century “regular mill construction” as described by Reyner Banham (1986). These buildings were constructed of heavy timber, which burned slowly in the event of a fire, and brick, which provided good thermal insulation. Multi-story mills had a flat or low-pitched roof concealed by a parapet. Banham (1986) posits that these roof designs could have been motivated by economics as well as aesthetic or stylistic preferences. In contrast to steeply pitched shed roofs, flat or low-pitched roofs allowed for sufficient headroom and maximized usable floor space on the attic story (Banham, 1986, p. 39). The cupola or raised hallway on top of the structure is typical of a gravity

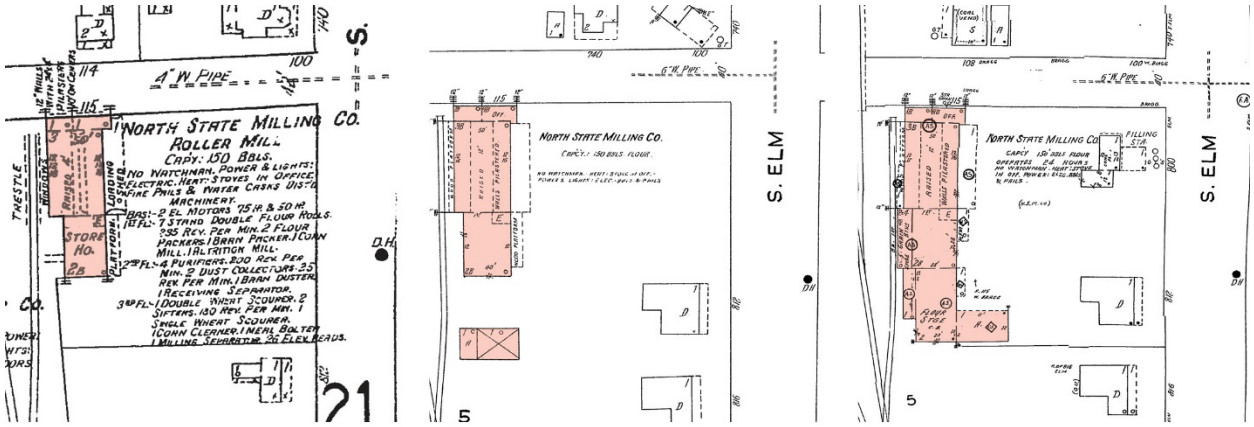
fed grain mill. It is called the headhouse because it housed the head driver of the vertical conveyor system that directed the grain into the bins (LaChuisa, 2013).

“Regular mills” were typically long, thin buildings. This form allowed for optimal power distribution and adequate lighting at individual workstations (Banham, 1986, p. 42). In the days before electric lighting, inadequate daylighting was the major defect of the regular mill. As the building type evolved, architects modified the typical solid external wall pierced by windows to create “a system of separate brick columns, connected by thinner membranes of brickwork containing windows that went almost from pier to pier” (Banham, 1986, p. 43). Reducing the thickness of the wall surrounding the window openings and increasing the aperture size allowed for more evenly distributed, less tunneled daylight.

Figure 6. North State Milling Co. Building c. 1912

Note: Untitled photograph of the original structure.

Figure 7. Sanborn Fire Insurance Maps, 1919-1950



Note: Original graphic comprises three map excerpts sourced from the *Sanborn Fire Insurance Map from Greensboro, Guilford County, North Carolina*. The excerpts were sourced, left to right, from (1919), (1925), and (1925-Dec. 1950).

Like other grain mills at the time, the interior of the 1912-built structure was likely occupied entirely by grain bins and equipment. The presence of the brick piers on the wall separating the four-story and two-story structures at the north end of the building suggests that the two-story structure was an addition, likely to create office space. The rectangular wooden grain bins inside the building were constructed using a method that first appeared in the 1870s: the cribbed bin, “whose rectangular walling was built up of layers of large planks laid flat and then spiked together, layer by layer, with massive nails” (Banham, 1986, p. 115). This method represents an early solution for storing grain in multi-story structures. When stored in bulk, grain behaves like a solid at times and like a liquid at others. The cribbed bin construction “was rigid enough to resist not only bursting pressure, but also its reverse, the sudden vacuums that could develop if the grain began to flow suddenly while being emptied under gravity through ports at the bottom of the bin” (Banham, 1986, p. 115). Although cylindrical steel storage tanks appeared in the 1860s and were common by the end of the nineteenth century, steel

construction was adopted slowly. Banham (1986) posits four reasons for resistance to the new method:

> "…the comparatively high cost of the material and the specialized skills required to fabricate it (riveting boilerplate is a very different matter from spiking planks together); rust and corrosion; steel's poor performance as a thermal insulator; and lastly the geometrical problems of packing circular bins into a rectangular building without leaving a lot of wasteful and awkwardly shaped spaces between them" (p. 117).

These reasons could explain why a building constructed in 1912 used an outdated method of building grain bins; and since the Sanborn Fire Insurance Maps (1925-Dec. 1950) indicate that the second set of wooden bins were built around the time of the Great Depression and the Second World War, when steel would have been in short supply, the builders may have reverted to the older method for economic reasons.

The original North State Milling Co. building—its heavy timber and brick structure, low-pitched roof with parapet, headhouse, and wooden cribbed bins—represents a historical building type that is worth conserving for its cultural value. "Regular mill construction" evolved into the concrete industrial buildings that inspired the European modernists and the International Style. As Banham (1986) argues, the innovations in this building type show how architects responded to changing market demands and rapidly advancing technology (p. 53). The original structure is an artifact of American building art from the early part of an era that had a powerful influence on the rest of the world.

History and Function

North State Milling Co. was founded in 1912 and manufactured plain and self-rising corn meal and flour, hen scratch, bran, and feed for livestock. The products distributed from the mill included Daily Bread Flour and Joy Brand Corn Meal. The mill was operational for more than 80 years and closed around 1998. Today the mill is recognized by the Daily Bread Flour signage remaining on the facade. The son of a former salesman recalls another visual associated with

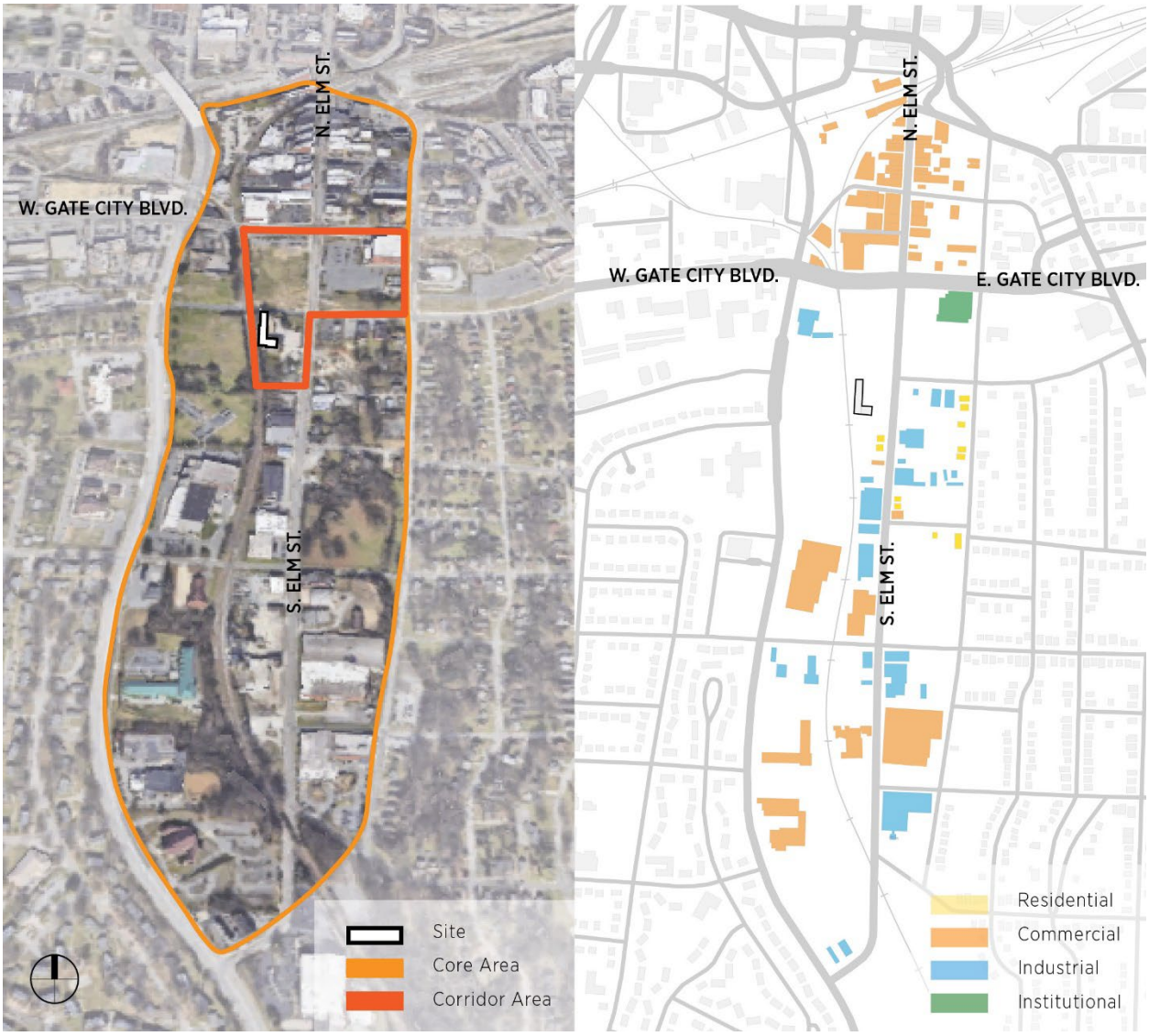
the mill—a fleet of red and white delivery trucks that served much of central North Carolina (*North State Milling Company*, n.d.).

Context and Environment

City of Greensboro. Greensboro is, historically, a mill town and manufacturing center. In the mid-twentieth century, the City was home to the world's largest denim maker (Cone Mills), the country's leader in manufacturing overalls (Burlington Industries), and the world leader in Rayon weaving (Burlington Industries) (North Carolina State Historic Preservation Office, 2009). Vick's VapoRub was invented in Greensboro around the turn of the twentieth century. Today, manufacturing and insurance sales are dominant influences on the local economy.

South Elm Street Redevelopment Area. The North State Milling Co. site is central to a post-industrial area that the City has planned to redevelop for more than 20 years. In 2006 the City published a master plan to redevelop 10 acres of land on South Elm Street (identified as the "Core Area") as well as a concurrent study of 75 acres surrounding the Core (identified as the "Corridor Area"). The boundaries of these two areas and the current land uses within these boundaries are shown in Figure 8. As indicated in Figure 8, the Daily Bread Flour mill building anchors the southwest corner of the Core Area.

Figure 8: South Elm Street Redevelopment Area

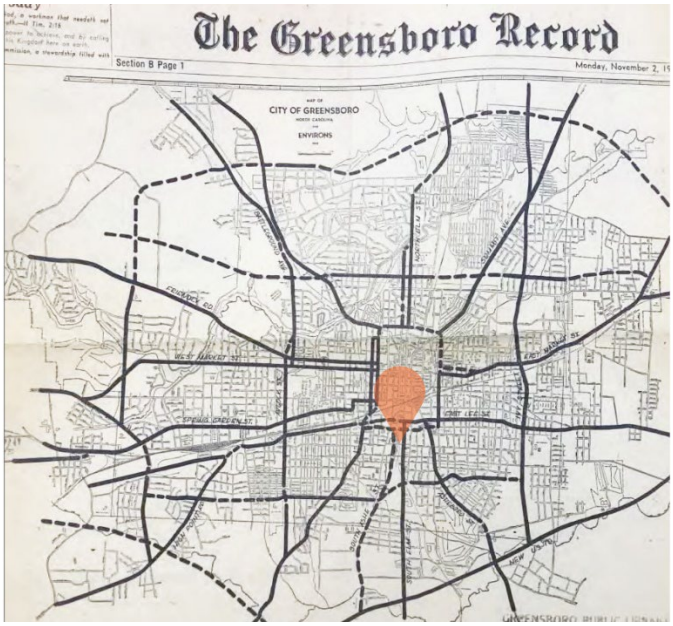


Note: Original graphic produced using Google Maps aerial image of Greensboro, North Carolina. The boundaries indicated reference the South Elm Street Redevelopment Plan (2006).

The residential neighborhoods within and alongside the Corridor Area have been shaped by extensive urban renewal and transportation projects. The development of regional arteries such as Eugene Street and Gate City Boulevard separated South Greensboro from the downtown area to serve the suburbs and outlying commercial areas. Babcock's 1954 transportation plan (Figure 9) was proposed in response to high traffic in the downtown area.

This plan provided a series of loops and radial connectors to connect the western suburbs with the industries north of downtown while bypassing the central business district. Included in the plan was a proposal to widen Bragg Street (adjacent to the Daily Bread Flour site) and make it a one-way artery to the west. The red map marker in Figure 9 shows the approximate location of the mill site. This proposal is no longer in the City's transportation plan.

Figure 9. The Babcock Plan

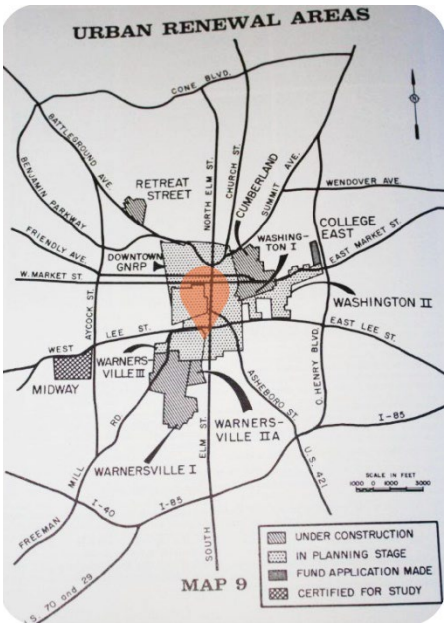


Note: Original graphic produced using image of the Babcock Plan as presented in the *Greensboro Record* on November 2, 1953. Image sourced from Willis et al., 2018, p.15

West of the Core Area, Warnersville, the City's first planned African American community, was designated a redlined neighborhood in the 1930s (*Warnersville, North Carolina*, n.d.) and subsequently identified as a blighted area (Figure 10). In the 1950s and 1960s, the City used federal funding allocated to blighted areas to demolish Warnersville. The once-thriving mixed-use area of businesses, community gathering spaces, and homes was replaced by light industrial businesses, public housing projects, and some single-family residential units. The red map marker in Figure 10 shows the approximate location of the mill site. The Core Area was

developed by businesses that depended on large, flat sites and proximity to the railroad, and later by automobile repair facilities, service stations, warehouses, and light industrial uses.

Figure 10. Urban Renewal Areas



Note: Original graphic produced using image of urban renewal areas identified by The City of Greensboro Redevelopment Commission after it was established in 1951. Image sourced from North Carolina State Historic Preservation Office, 2009, p. 9.

Proposed Function

A micro restorative city requires mixed land use, a critical pro-social design factor cited in conviviality research as well as restorative urbanism and many other urban design guidelines. Providing a mix of uses near homes and offices increases walkability, and when people can accomplish their daily tasks by walking, streets become prime spaces for convivial activities such as people watching, meeting friends, and having impromptu encounters. Mixed uses attract people of different backgrounds and interests and enhance opportunities for meeting neighbors, exchanging views, and building social cohesion (Roe & McCay, 2021; Thombre & Kapshe, 2021; Gehl, 2010). A mix of uses can activate a site at different times of day, making the site feel well used, familiar, and safe.

The proposed function for this site is a food incubator that could support local food entrepreneurs, offer teaching and learning opportunities to the community, and provide access to nutritious foods. This choice was inspired by the function of the original building as well as agricultural history of the neighboring Warnersville community and the inherent potential of the site. This concept allows for a mix of uses. Different food incubators have commercial kitchens, event spaces, coworking spaces, and other spaces that support people endeavoring to start new businesses. This former mill building site offers the opportunity to expand this concept to include a market, several retail food locations, and tenant office spaces. This mix of uses would ensure the site remains in regular use, activate it at different times of day, and bring different groups of people together for a range of convivial activities.

CHAPTER IV: CONCEPT DEVELOPMENT

A Micro Restorative City

Restorative urbanism provided a theoretical framework to conceptualize the site on a macro and micro scale. While the focus of the study was the bumping places, the investigation began by evaluating the entire site and identifying opportunities to integrate the seven system components. This was important for two reasons. First, to establish a mix of uses, and second, to identify and further develop the bumping places. To design the spaces where people transition from one zone to another it was critical to have a conceptual level understanding of the activities in each zone and the types of people those activities might attract.

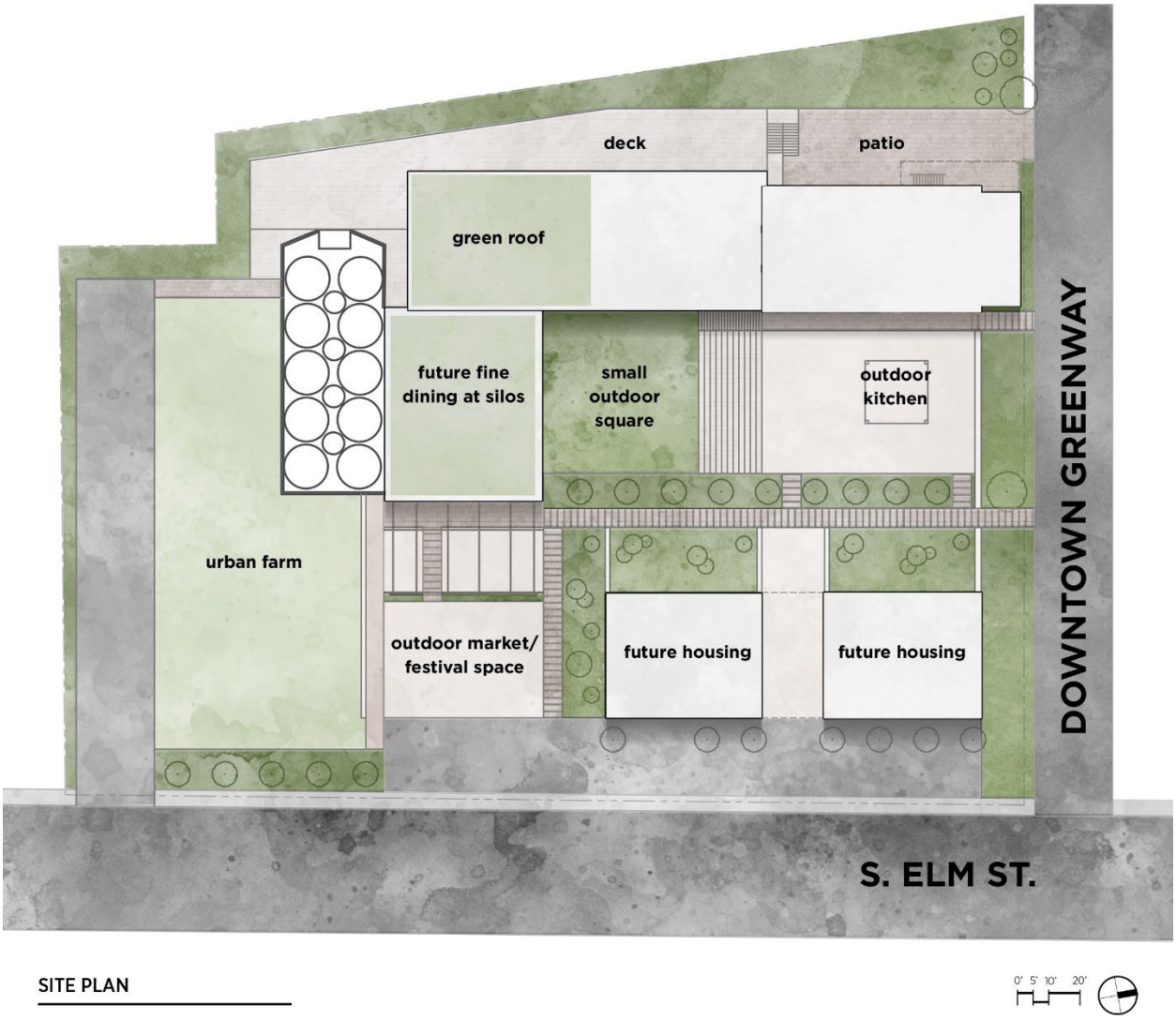
Site Planning and Design

The site area totals approximately 68,320 gross square feet, with the building and the silos occupying approximately 14,000 gross square feet at the ground level. The site is zoned within the Downtown Design Overlay which means there is no off-street parking required for this property. This allows ample space to develop the site with a mix of uses to complement the building program and support the micro restorative city concept. The major opportunities identified involve creating better connections between the building and the exterior site and activating the building at the street level.

Interior Space Planning and Program

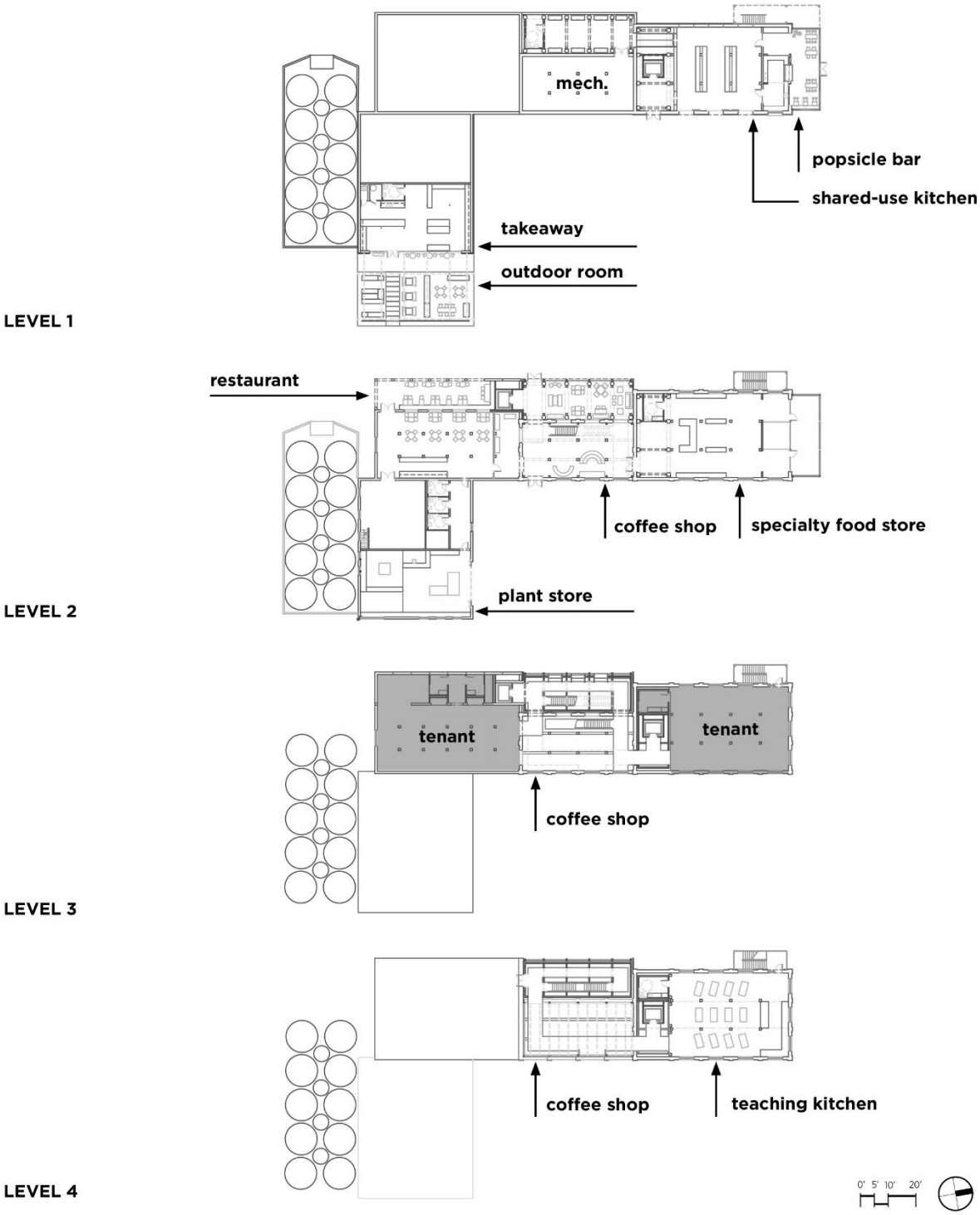
The building program includes a shared-use commercial kitchen, three retail food locations, a restaurant, a teaching kitchen, two tenant office spaces, an atrium space, and a green roof. A future fine dining restaurant is intended for the existing silos. Also planned for the site is an outdoor kitchen and an urban farm as well as future new construction housing.

Figure 11. Conceptual Site Plan



Note: Original graphic.

Figure 12. Overall Floor Plans



Note: Original graphic.

CHAPTER V: CONCEPTUAL DESIGN

Restorative Interior Bumping Places

The conceptual development process led to the identification of three primary bumping places: the retail location at the Downtown Greenway, the retail location at South Elm Street, and the central “connector” space that includes the main stair. The conceptual designs developed for each of these areas are presented on the following pages using furniture plans and conceptual renderings keyed to the restorative city system components integrated in each area. Existing and proposed floor plans and sections are included in Appendix B.

Popsicle Bar at the Downtown Greenway

The proposal for this bumping place is to transform the existing north façade of the building by opening it to the Downtown Greenway at the ground level and providing food that would attract people onto the site and into the space. The existing two-story structure, which was an addition to the original building, would be demolished and replaced by a new two-story structure of the same scale. The existing site would be excavated to the basement level on the west and east sides of the building to create two usable outdoor spaces flanking the popsicle bar at the level of the Greenway. The interior space offers views and access to the shared-use kitchen through a set of glass doors, and an opening in the overhead plane creates sightlines to the specialty food store on the second level. The second level of the addition is a balcony that offers views of the Downtown Greenway and the city center beyond.

Location

As shown in Figure 12, the popsicle bar is located at the northern edge of the site, less than five feet from the property line and the Downtown Greenway. Its proximity to this walkable and bikeable corridor makes this an ideal location for a retail storefront. The new structure creates a permeable façade and a ground level entrance that would provide a transition from the urban space of the Greenway to the interior space of the mill building. The takeaway window

facing the small outdoor square creates a secondary exchange point and opportunity for different groups of people to interact.

Sense of Conviviality

The new structure enhances the legibility and walkability of the site and creates integrated space adjacent to a small outdoor square. It provides access to the building in a location where people naturally look for an entrance. This façade is closest to the street and the roof of the original structure is the highest in the complex, so people read this as the main building. The new entrance is located directly below the iconic Daily Bread Flour mill signage that makes the building a landmark that is visible from Gate City Boulevard and South Elm Street. Whereas there as currently multiple entrances located at some distance from the street, the new entrance provides easy access to people walking and biking on the Greenway.

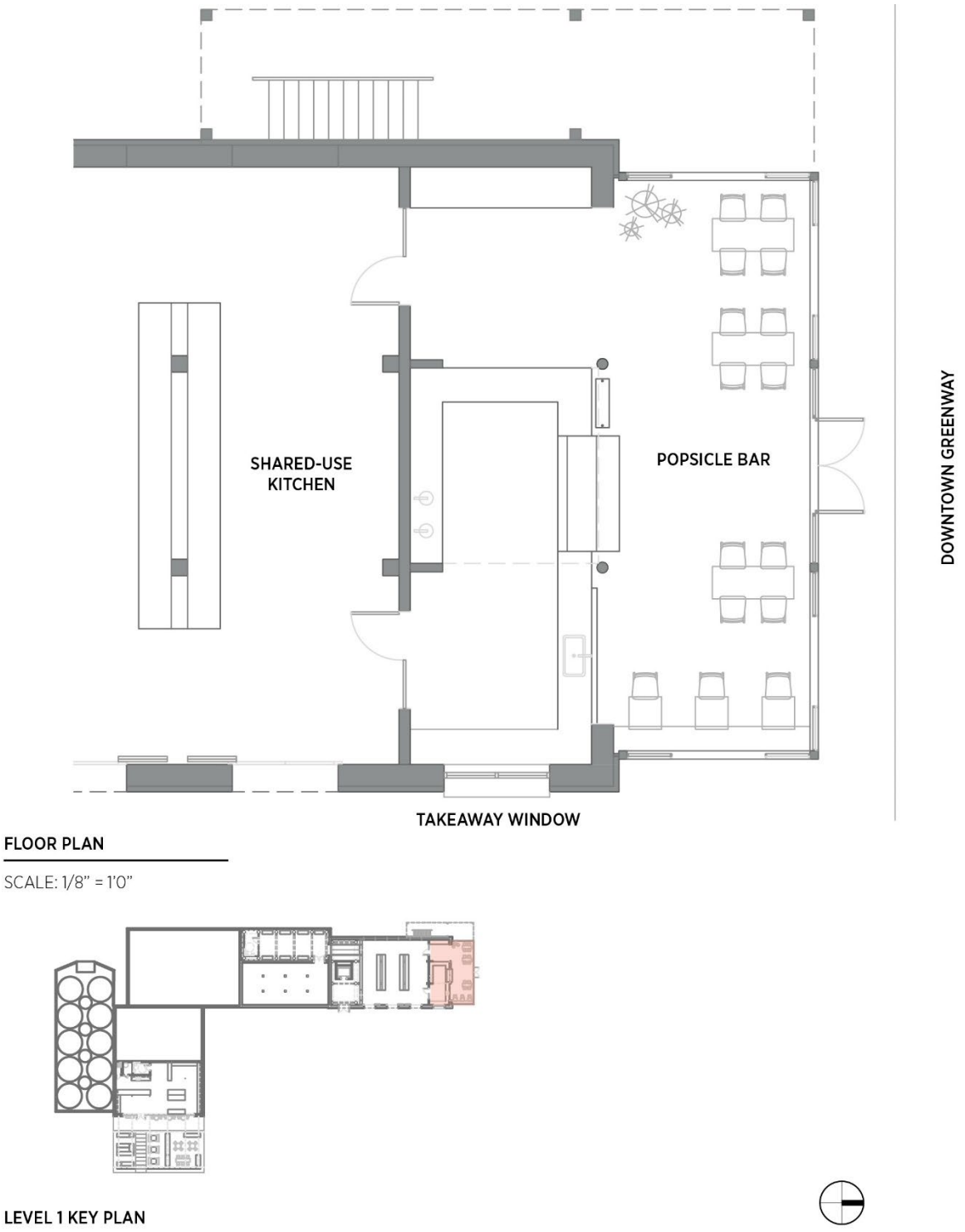
The design of the façade uses the elements and principles of design to add visual interest in harmony with the existing proportion, order, and symmetry of the existing building. The popsicle bar creates an exciting space at eye level that gives the building human scale. Although the façade is transparent and has operable windows, the space is enclosed to provide a sense of comfort and safety. The scale of the space is also relatively small which encourages social interaction.

The function of this space would attract people for many hours of the day, from early afternoon to late in the evening. Its proximity to a mix of uses would encourage people to stay, meet friends, and watch others. Over time, with consistent use, regular visitors would build a sense of territoriality, or sense of control and awareness that would make them feel secure and comfortable in this place.

Restorative City System Components

Figures 13 and 14 illustrate the design principles integrated into the design of the popsicle bar.

Figure 13. Floor Plan: Popsicle Bar at Downtown Greenway



Note: Original graphic.

Figure 14. Conceptual Rendering: Popsicle Bar at Downtown Greenway, Exterior

KEY: Restorative City System Components

- G2 Front porch
- B1 Street stormwater drainage systems that transform streets into mini-waterways
- S2 Smells appropriate to the location, particularly pleasant food smells
- S3 Fine-grain storefronts, natural features, buildings with visually clear purpose and other structures of visual interest
- S4 Textural variation
- N1 Provide fine-grain, permeable facades
- N2 Physical infrastructure that facilitates social interaction
- A1 Frontages are open to the street, accessible for all and welcoming
- A3 Connect to green space corridors
- A4 Illuminate at night to encourage walking
- I1 Potential subdivisions of public spaces to encourage use by different groups
- I3 Natural surveillance
- I4 Facilities to meet the needs of diverse groups.

G GREEN B BLUE S SENSORY N NEIGHBOURLY A ACTIVE P PLAYABLE I INCLUSIVE

Note: Original graphic.

See Appendix A for full descriptions of the design principles in the image key.

Figure 15. Conceptual Rendering: Popsicle Bar at Downtown Greenway, Interior

KEY: Restorative City System Components

- S1 Happy sounds of people
- S2 Smells appropriate to the location, particularly pleasant food smells
- S3 Fine-grain storefronts, natural features, buildings with visually clear purpose and other structures of visual interest
- S4 Textural variation
- S6 Design markets to incorporate bumping places and opportunities for social interaction
- I4 Facilities to meet the needs of diverse groups.

G GREEN B BLUE S SENSORY N NEIGHBOURLY A ACTIVE P PLAYABLE I INCLUSIVE

Note: Original graphic.

See Appendix A for full descriptions of the design principles in the image key.

Takeaway Restaurant and Outdoor Room at South Elm Street

Like the popsicle bar at the Downtown Greenway, the proposal for this bumping place is to create a permeable façade that provides access to the building at the ground level. The existing site would be excavated to the basement level and the existing openings would be replaced by a storefront. An existing stair would provide staff with access to the kitchen shared with the restaurant on the second level.

Location

As shown in Figure 16, this restaurant and outdoor room are located at the transition from South Elm Street to the site. The façade faces South Elm Street however it is set back more than ninety feet from the street. Extending the interior environment to the outdoors with a pergola decreases this distance by roughly thirty feet to attract people onto the site from South Elm Street. The outdoor room creates a zone central to the restaurant, the urban farm, and small outdoor square.

Sense of Conviviality

The renovated façade enhances the legibility of the site and creates integrated space at the intersection of the circulation path to the urban farm and the small outdoor square. It provides an entrance that is more visible from and closer to South Elm Street than the existing entrances on the east façade. The new pergola creates a distinctive form that enhances the identity of the site without competing with the historic qualities of the original structure.

Like the addition at the Greenway, the design of this façade uses the elements and principles of design to add visual interest in harmony with the existing proportion, order, and symmetry of the existing building. The new pergola aligns with the existing structural grid of the interior space which enhances the sense that the outdoor room is an extension of the interior. The restaurant and outdoor room create exciting spaces at eye level that gives the building human scale. The pergola makes the outdoor space a semi-enclosed space that provides a

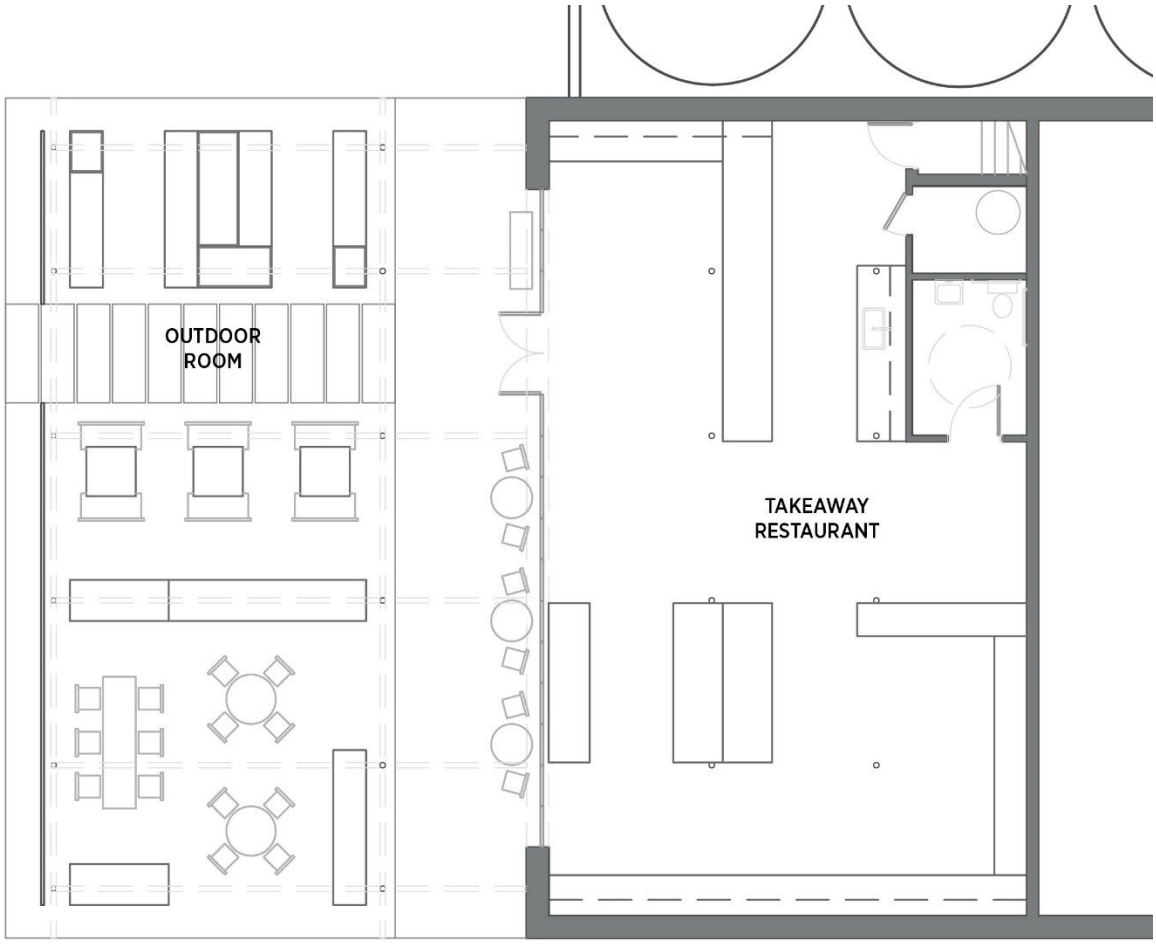
level of psychological comfort and safety. The scale of both spaces is also relatively small which encourages social interaction.

The function of this space would attract people for many hours of the day, from breakfast to lunch and dinner. This would complement the conviviality of the popsicle bar and provide an equally active space at the opposite corner of the site. Like the popsicle bar, its proximity to a mix of uses would encourage people to linger, and the adjacency to the “third space” of the urban farm offers an opportunity for different groups of people to interact. Over time, with consistent use, regular visitors would build a sense of territoriality, or sense of control and awareness that would make them feel secure and comfortable in this place.

Restorative City System Components

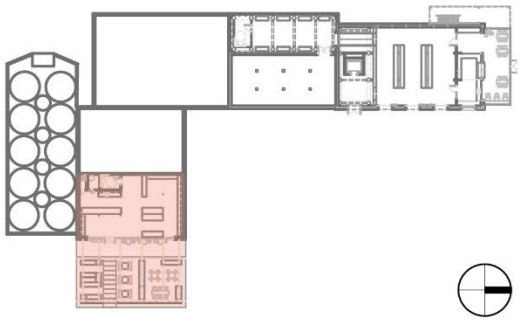
Figure 17 illustrates the design principles integrated into the design of the popsicle bar.

Figure 16. Floor Plan: Takeaway Restaurant and Outdoor Room at South Elm Street



FLOOR PLAN

SCALE: 1/8" = 1'0"



LEVEL 1 KEY PLAN

Note: Original graphic.

Figure 17. Conceptual Rendering: Outdoor Room at South Elm Street

Note: Original graphic.

See Appendix A for full descriptions of the design principles in the image key.

Coffee Shop at Atrium "Connector" and Main Stair

The existing "connector" space is the former storehouse that was an early addition to the original structure. The subsequent additions of the grain bins to the west and new structure to the south made this space central to the complex and limited the amount of daylight the interior space receives. It is a natural location for a bumping place, but it requires modifications to draw people into and through space. The proposal is to remove the existing roof on the two-story structure and insert a new three-story volume with a glass roof to create a daylit atrium that unifies the former storehouse with the adjacent grain bins. A new main staircase would be inserted into this volume and connect to the second level office spaces and third level teaching kitchen and green roof. The space would function as a coffee shop with a kiosk and lounge on the ground level as well as smaller bumping places on the second and third levels.

Location

As shown in Figure 18 (level three) and Figure 20 (level four), this space is located at the heart of the site. It is accessible by the main entrance on the east façade and the west entrance off the back deck as well as the specialty food store, second-level restaurant, third-level office spaces, and fourth-level teaching kitchen and green roof. It holds the most potential for bringing together diverse groups of people who attracted to the mix of uses on the site.

Sense of Conviviality

The proposed "connector" design would increase the legibility of the site by consolidating multiple entrances to a single access point on the east facade. The form of the new volume resolves an awkward geometry in relationship to the original structure, and the additional height signals its importance in the hierarchy of space. The design language echoes the additions at the Greenway and at South Elm Street which brings unity to the building complex. The new spatial organization and circulation path creates an integrated space with direct connections to almost every indoor and outdoor space on the site.

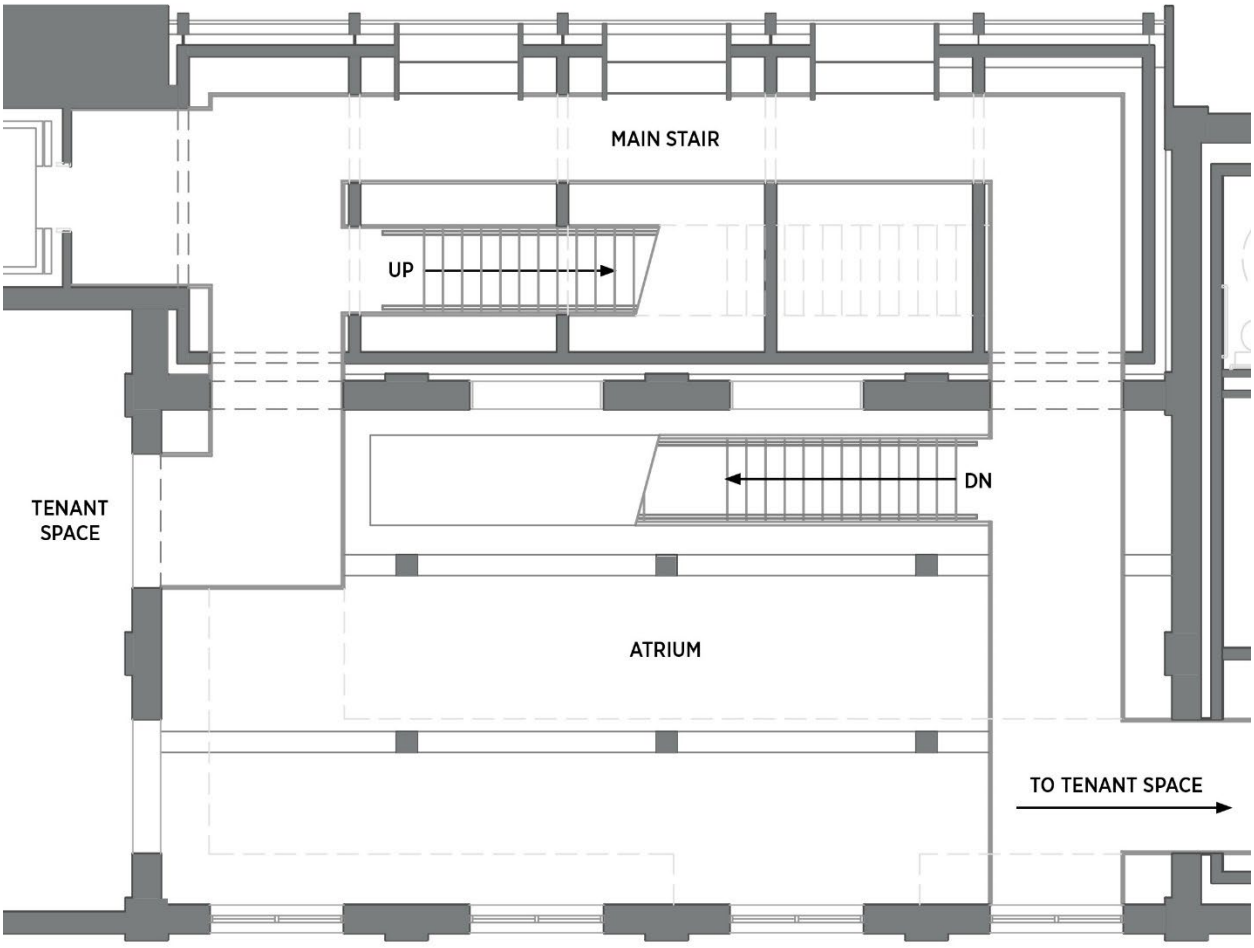
The main stair is an “event,” visible at the entrance, that encourages people to explore the space. Its form and circulation path create visual interest and a sense of mystery. Looking up from the ground floor, people would be able to infer that the stair connects to bridges that span the atrium on the third and fourth levels. However, the second and third flights of the stair are concealed, which encourages people to explore to better understand the connection. The simple steel-clad form and the way it circulates into and out of the grain bins references the mechanical equipment once housed in the building. The circulation path allows people to experience the exposed structures and existing materials of the former storehouse and grain bins. New natural materials complement the existing finishes without detracting from their historic character. A series of small-scale social spaces—a second-level lounge, third-level niches, and fourth-level observation space—provide for interaction with different groups of people at different scales and energy levels.

Like the two other bumping places presented in this study, the function of this space would attract people for many hours of the day. Together, these spaces activate the central zone as well as the opposite corners of the L-shaped existing structure. Although levels of conviviality would vary at each location, the intent is to create spaces that would encourage a consistent level of activity throughout the day.

Restorative City System Components

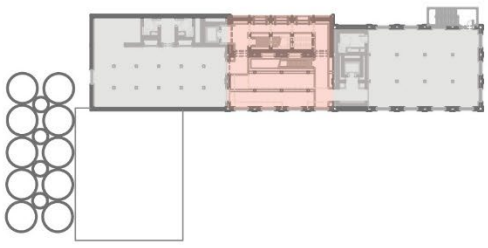
Figures 19 illustrates the design principles integrated into the main stair at level three, and Figure 21 illustrates the atrium at level four.

Figure 18. Floor Plan: Main Stair at Atrium, Level Three



FLOOR PLAN

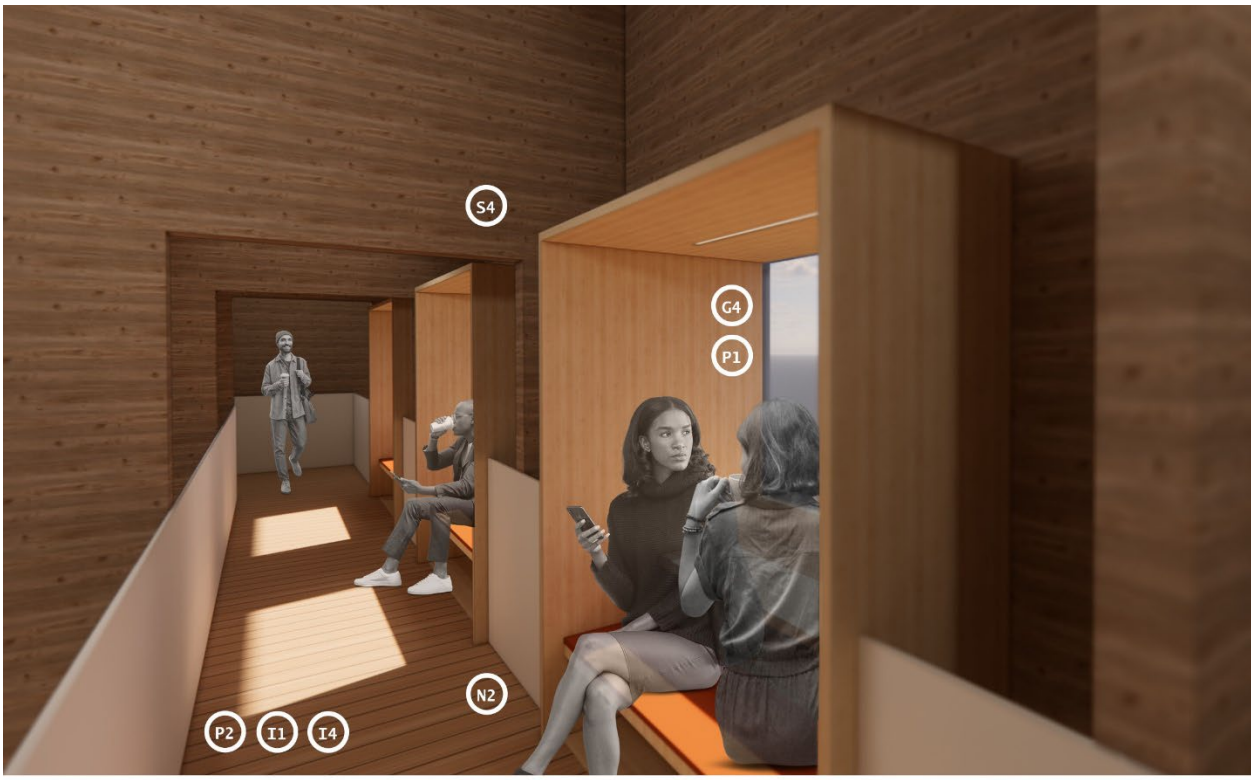
SCALE: 1/8" = 1'0"



LEVEL 3 KEY PLAN

Note: Original graphic.

Figure 19. Seating Niches at Main Stair through Grain Bins, Level Three



KEY: Restorative City System Components

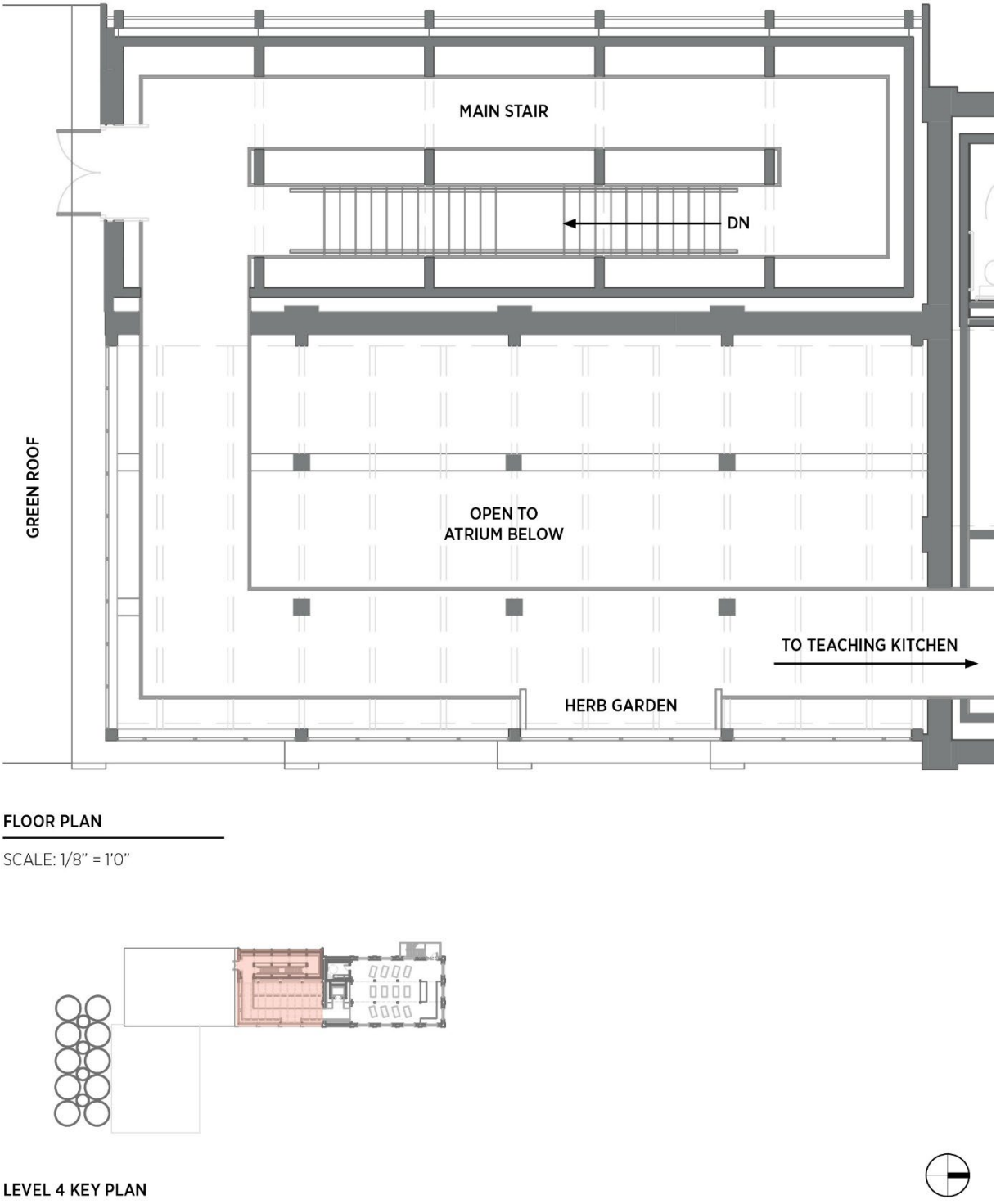
- G4 Views of green space from workplace
- S4 Textural variation
- N2 Physical infrastructure that facilitates social interaction
- P1 Design contemplative spaces for 'daydreaming'
- P2 Design labyrinths, mazes and murals to engage curiosity
- I1 Potential subdivisions of public spaces to encourage use by different groups
- I2 Enhance wayfinding
- I4 Facilities to meet the needs of diverse groups.

G GREEN B BLUE S SENSORY N NEIGHBOURLY A ACTIVE P PLAYABLE I INCLUSIVE

Note: Original graphic.

See Appendix A for full descriptions of the design principles in the image key.

Figure 20. Floor Plan: Bridge at Atrium, Level Four



Note: Original graphic.

Figure 21. Bridge at Atrium, Level Four

KEY: Restorative City System Components

- G1 Internal atria/courtyards with natural features
- G4 Views of green space from workplace
- S2 Smells appropriate to the location, particularly pleasant food smells
- S3 Fine-grain storefronts, natural features, buildings with visually clear purpose and other structures of visual interest
- S4 Textural variation
- A2 Design stairways as "events," open and visible at entryways
- P1 Design contemplative spaces for 'daydreaming'
- P2 Design labyrinths, mazes and murals to engage curiosity
- I1 Potential subdivisions of public spaces to encourage use by different groups
- I2 Enhance wayfinding
- I4 Facilities to meet the needs of diverse groups.

G GREEN B BLUE S SENSORY N NEIGHBOURLY A ACTIVE P PLAYABLE I INCLUSIVE

Note: Original graphic.

See Appendix A for full descriptions of the design principles in the image key.

CHAPTER VI: CONCLUSION

Discussion

General Findings

Extending the restorative urbanism model to interior environments requires supplementing the framework with guidelines and principles specific to the interior design discipline. While Roe & McCay (2021) provide design principles for each of the seven system components, the recommendations are intentionally broad. The authors consider their audience to be “anyone who wants to better understand how to create places…that support wellbeing” (Roe & McCay, 2021, p. 14) and they leave room in the framework for adaptation and expansion. In addition, except for the Sensory City and Active City, each of the component principles are organized by city scale and neighborhood scale, and do not expand to the scale of a site, a building, or an interior space. It is therefore reasonable for any designer who wishes to apply the framework to seek discipline-specific recommendations that align with the guiding principles of restorative urbanism.

While the restorative city framework identifies built environment attributes that contribute to restorative urbanism, there are few visual examples to illustrate the concepts. This again, leaves room for interpretation. The work of urban designer Jan Gehl, cited by Roe & McCay, proved a useful companion to Restorative Cities in this studio investigation. Gehl, Roe & McCay share a people-centric approach the centers the human experience of the city. *Cities for People* (Gehl, 2010) was especially helpful in understanding through visual examples how people respond to urban form and interact with each other in urban environments. Gehl’s focus on human scale assisted in translating urban design concepts to interior environments where human scale is always a primary concern.

Although the principles are broad, many of the recommendations do translate directly to interiors. Several of the principles are considered best practice across the design disciplines,

and the smaller scale tactics (e.g., stairways as “events” and seating that encourages socialization) are particularly relevant to interiors. The Sensory City design principles address human factors (how humans experience space through their senses) as well as the elements and principles of design that are foundational to any interior design practice. In other words, in the hands of a skilled designer, any interior space could meet certain requirements of a restorative city, however, the level of integration is highly dependent on the project site as well as the project team.

Certain restorative urbanism principles could be applicable within the context of a building design project but would be outside the scope of an interior designer. For example, an interior designer could orient an interior space toward a view and emphasize the view, but the architect would be responsible for locating exterior openings to create the view. In the case of this theoretical studio investigation, I made design choices regarding the building façade, roof, and structure that would require consultation with architects and engineers on a professional project. It is worth noting that I made these choices to optimize the site as a micro-restorative city, and that for any restorative urbanism project to be successful, it would require alignment between each member of the project team, from the city officials and the owner to the consultant team and, perhaps most importantly, to the community members. Roe & McCay (2021) recognize this and encourage designers use inclusive methods for engaging the community at every stage of the planning and design process (p. 181).

Site-Specific Findings

In translating the restorative urbanism design principles to the Daily Bread Flour mill site, I found that certain aspects of the existing site made it suitable for a micro restorative city. Its sizeable square footage and its location directly adjacent to the Downtown Greenway are perhaps the most advantageous qualities. In addition to the nearly 25,000 square feet of interior space, the site offers more than 50,000 square feet of usable outdoor space. This offers ample opportunity to integrate salutogenic elements such as front gardens, water features, and

intergenerational play opportunities that are more appropriate for outdoor rather than indoor space. It also allows for the possibility of new construction housing which would greatly enhance the site as a micro restorative city by ensuring its regular use and enhancing its social vitality.

The site's direct connection to a walkable and bikeable corridor with street trees and good lighting addresses many principles of the Green, Active, and Inclusive City system components. It also enhances the possibilities for creating bumping places on this site. If the Downtown Greenway is well used and people regularly pass by the Daily Bread Flour mill, those people would be naturally drawn to new attractions on the site. The proposed new retail locations could easily become part of their daily routines—places where they could stop for coffee, a meal, or a popsicle, or shop for specialty food items. Over time, as they become more familiar with the site, people could spend time in the small outdoor square, volunteer at the urban farm, take a class at the teaching kitchen, or rent the shared-use kitchen. These activities would ideally lead to positive social interactions where people exchange views, forge bonds, and enhance social cohesion in their community.

While there are inherent benefits in the size and location of the site, the building orientation and existing structure present challenges to implementing a micro restorative city. The building orientation and form, an L-shaped structure facing directly north, with four-story silos to the south, is not ideal for a convivial climate. People gravitate to sunny spaces, and although the farm on the south side of the property would receive full sun throughout the day, the existing building and silos cast afternoon shadows on the open space central to the site. This would affect how people respond to the proposed outdoor square and perhaps limit its use in the afternoon hours. In addition, there are few existing openings on the south side of the building, and this greatly limits the amount of daylight that illuminates the interior space. This site condition had considerable influence on the design decisions at each of the bumping places proposed in this study. It was a driving factor in proposing a glass-roofed atrium that would create a daylit "connector" central to the building. It also influenced the choice to provide an

outdoor room adjacent to the farm where people could enjoy the southern exposure. In addition, the takeaway window for the popsicle bar is purposefully located adjacent the outdoor square which would receive more direct sunlight than the north facing interior space.

The historic value of the existing building also presented benefits and challenges to this exploration. People are drawn to historic structures for a variety of reasons. The Daily Bread Flour mill can be appreciated as an artifact of American building art and an icon of the local community. Buildings like these also represent a way of life that no longer exists. At the height of the industrial age mills were the economic and social centers of their neighborhoods, and the North State Milling Co. would have supported residents living in homes that have since been demolished. This history lends the building qualities that make it an attractive destination for social functions. At the same time, the structure limits the types of spaces that can be created within the building. The complex is segmented into four sections that each have relatively small floor areas compared to other industrial buildings. For example, the original structure is three bays wide and five bays deep, and each bay is roughly twelve feet, six inches by thirteen feet. These spaces have an intimate scale for a public space. They can support small businesses and offices, but they are not well suited for the large assembly spaces that can be integrated into other former industrial buildings.

The influence of these site conditions on the design illustrates the relationship between outdoor space and interior environments in the restorative urbanism model. A convivial interior space that attracts people and encourages them to linger can enhance the vitality of street life and vice versa. The spaces are interrelated and yet, as this study demonstrates, the existing site conditions can increase or limit the potential of the interior environment.

The proposed building function also determines how well a project can integrate restorative urbanism principles. Since this was a theoretical investigation, I was able to choose a mix of uses that offered opportunities to integrate the restorative city system components. If

this were a professional project, the owner could ultimately determine a function that offers less opportunities than a food incubator.

Opportunities for Future Research

As noted by Roe & McCay (2021) “collective restoration,” or the idea that restoration in one individual could extend to another, is an emerging research focus that has not been empirically studied outside the context of vacations (p. 12). More research is needed to understand how collective restoration benefits accrue and the role of the built environment. Conviviality, and the qualities of interior space that contribute to conviviality, is another topic that requires further research. An extension of this study could focus more deeply on translating the Thombre & Kapshe (2021) framework to interior environments and expanding upon convivial aesthetics in interior spaces.

Reflection

There were a few themes in the responses to my oral examination that provoked further thought. There is an opportunity to expand upon this studio project by creating additional renderings to show how the design could shape human interaction in a variety of use cases. For example, several renderings of the outdoor room could be created to show how different groups of people might occupy and interact in the space, and how those interactions could be shaped by the selection and arrangement of furniture. Another set of renderings could show an event in one of the retail spaces to visualize how the design implements the restorative city principle of creating flexible settings for community activities. This speaks to visualization methods, and the question of which methods are most effective for a study that focuses on the human experience of interior space, both for the designer in their exploration process and for the person responding to the design proposal. The perspective views shown in this document were intentionally chosen to frame what Roe & McCay (2021) describe as the “episodic” moments in daily life that shape the human experience of a city. They are positioned at eye level and cropped to communicate human scale—the views that people experience in a single moment

rather than the expansive scenes that digital 3D modeling can show. This method could be further explored, and I would encourage designers seeking to create salutogenic spaces using a humanistic approach to consider their design process as a method of exploring the human experience of space.

In my personal experience of developing a humanistic approach to design, the choice of building site had a positive influence. I found great inspiration in the history of the building—in imagining its previous use and the way of life it represents—and the process of renewing a building by changing its function aligned in many ways with the philosophy of restorative urbanism. To me this reinforces the argument made by Roe & McCay (2021) that designing a healthy city does not require a radical vision but rather a “quieter” approach that centers human experience. The adaptive reuse approach and the “rereading method” (Brooker & Stone, 2004) gave me a framework for thoroughly evaluating the site and understanding how its previous use could inform the application of restorative urbanism design principles. I would encourage other designers using this model consider the cultural significance of existing sites as a valuable source of inspiration. I think that despite the limitations of the structure, working with a building with a previous life enhanced my ability to implement a people-centric approach that puts mental health, wellbeing, and quality of life at the forefront of the design process.

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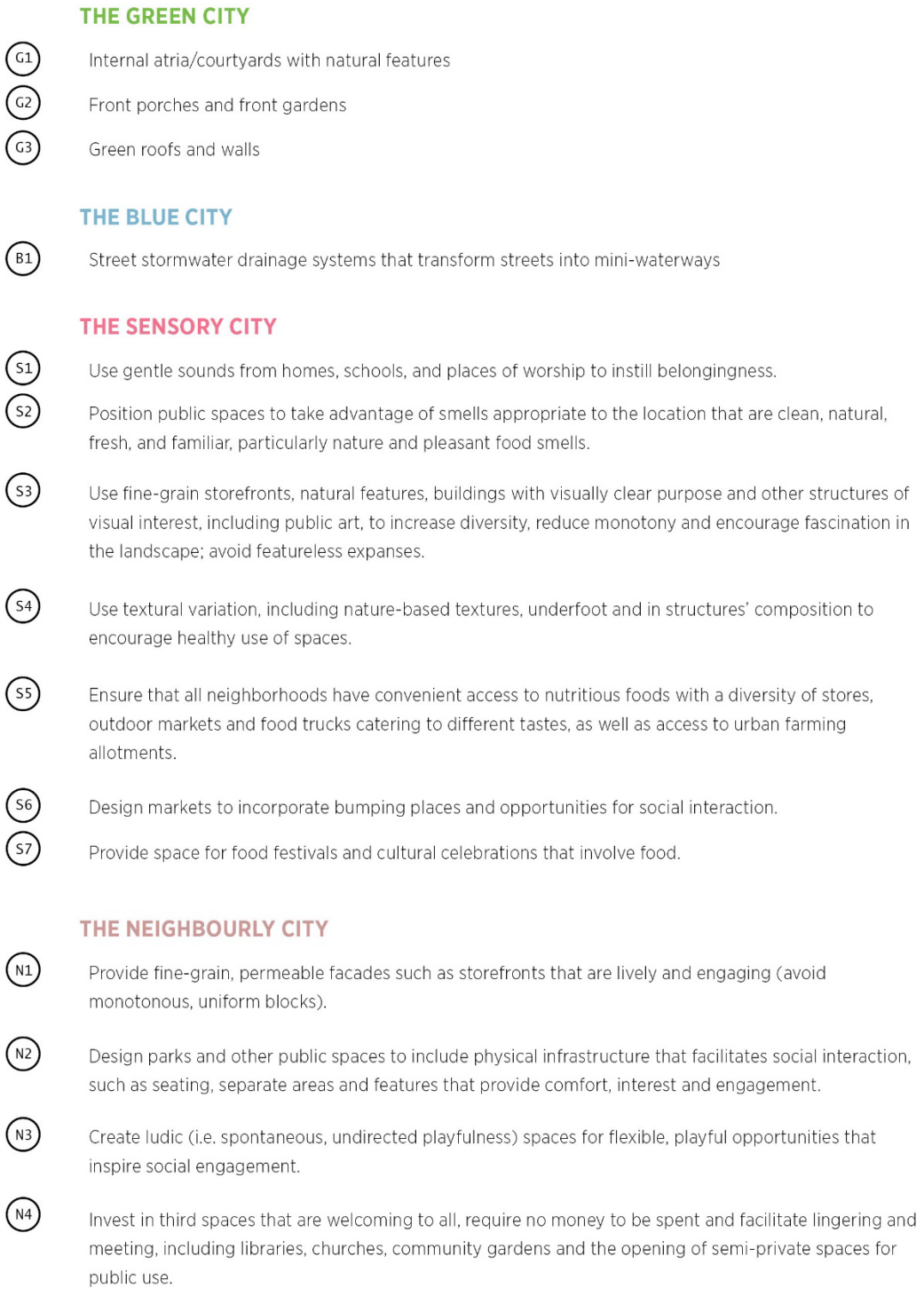
APPENDIX A: RESTORATIVE URBANISM DESIGN PRINCIPLES

The figures in this appendix include expanded image keys with full descriptions of the design principles keyed to the conceptual designs presented in this paper. This is not the comprehensive list of principles established by Roe & McCay (2021) but rather the select principles integrated in the proposed designs.

Figure A22. Image Key: Restorative Urbanism Design Principles



Note: Sourced from Roe & McCay, 2021.

Figure A23. Image Key: Restorative Urbanism Design Principles *Continued*

Note: Sourced from Roe & McCay, 2021.

Figure B24. Conceptual Site Plan

Figure B25. Overall Floor Plans

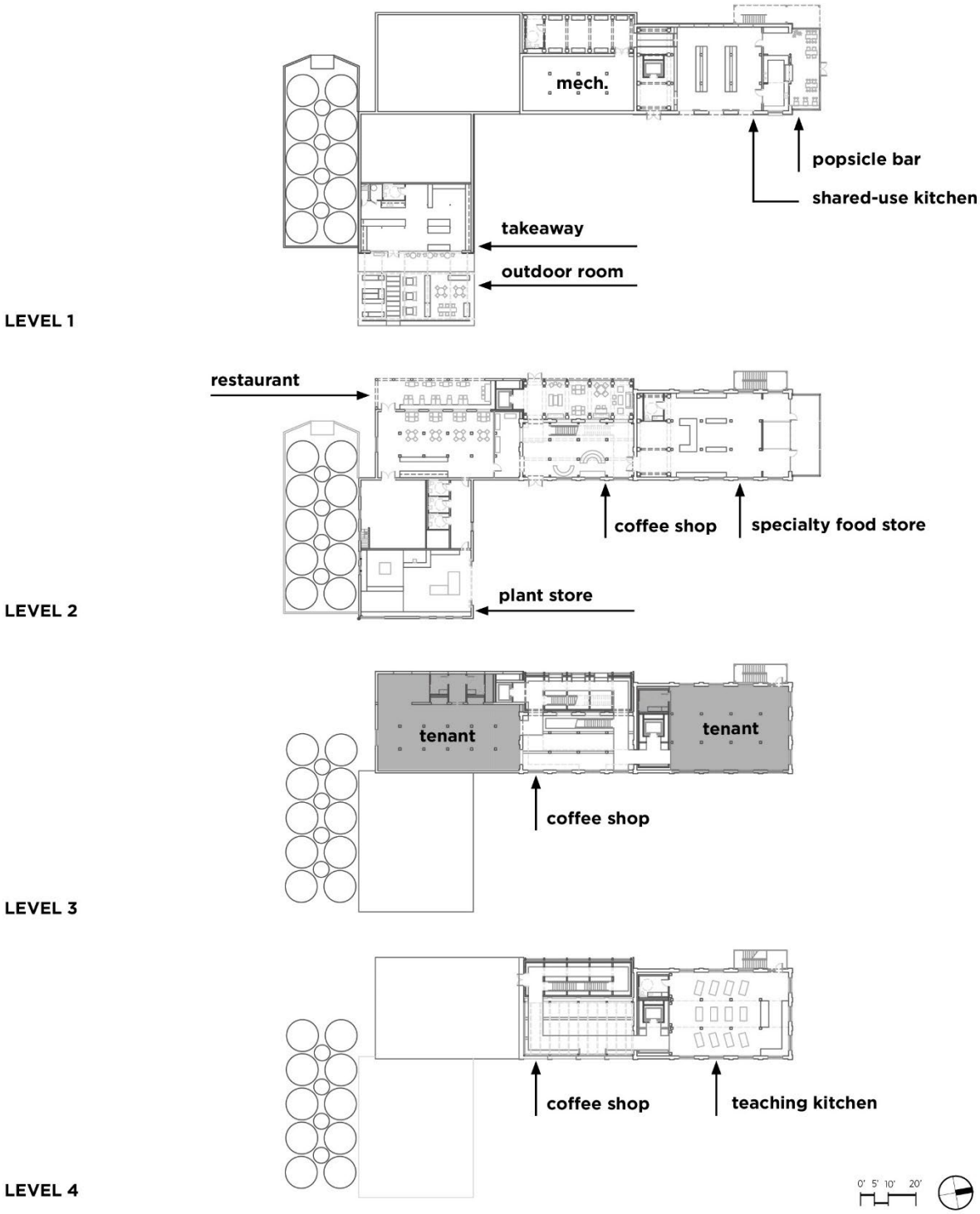


Figure B26. Floor Plan and Section: Popsicle Bar

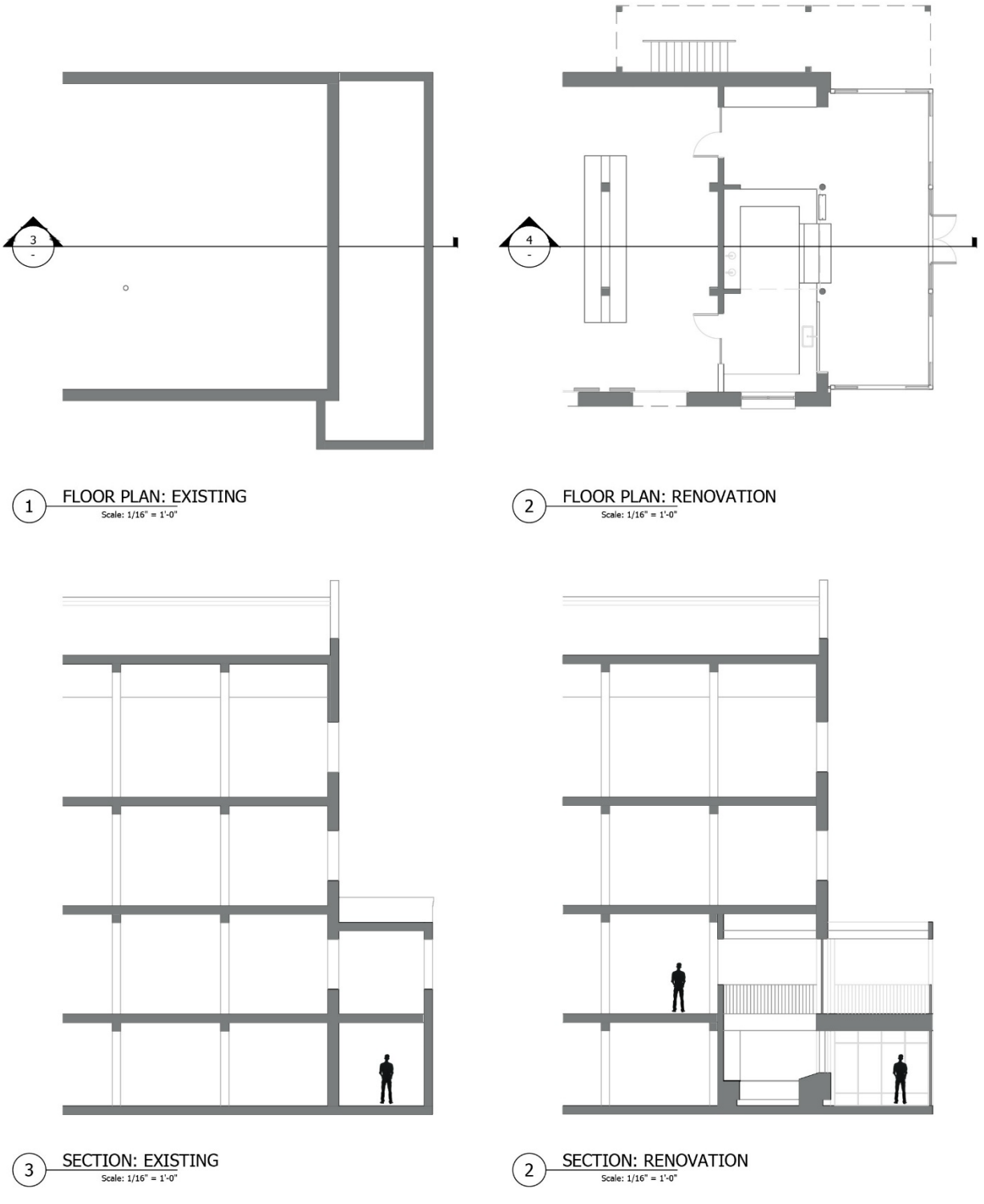
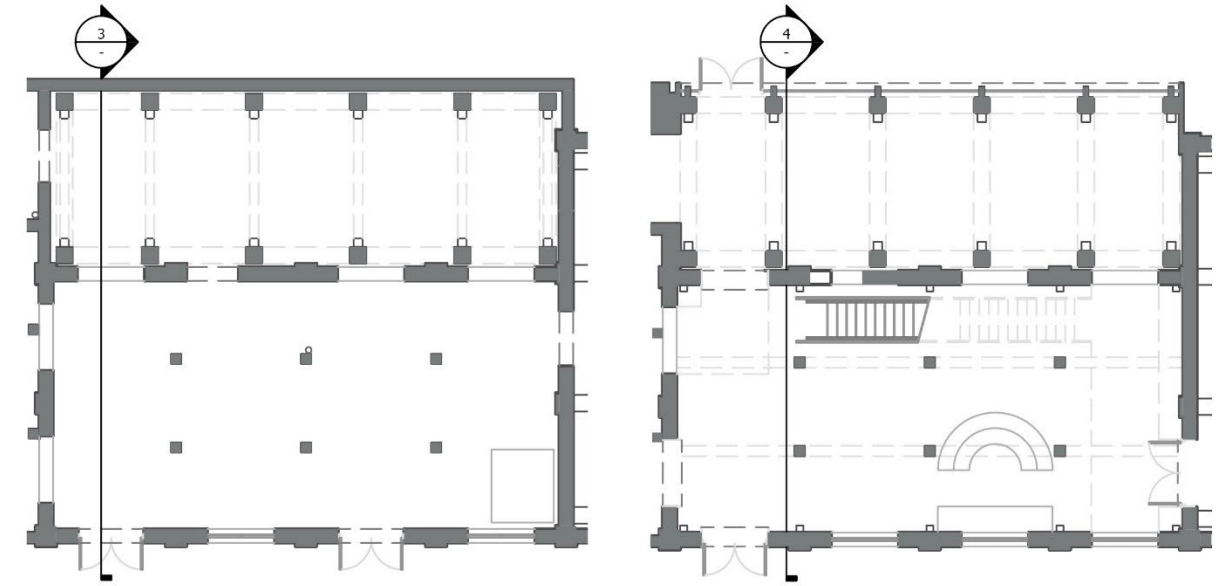


Figure B27. Conceptual Rendering: Popsicle Bar, Exterior

Figure B28. Conceptual Rendering: Popsicle Bar, Interior

Figure B29. Plan and Section: Atrium "Connector" and Main Stair



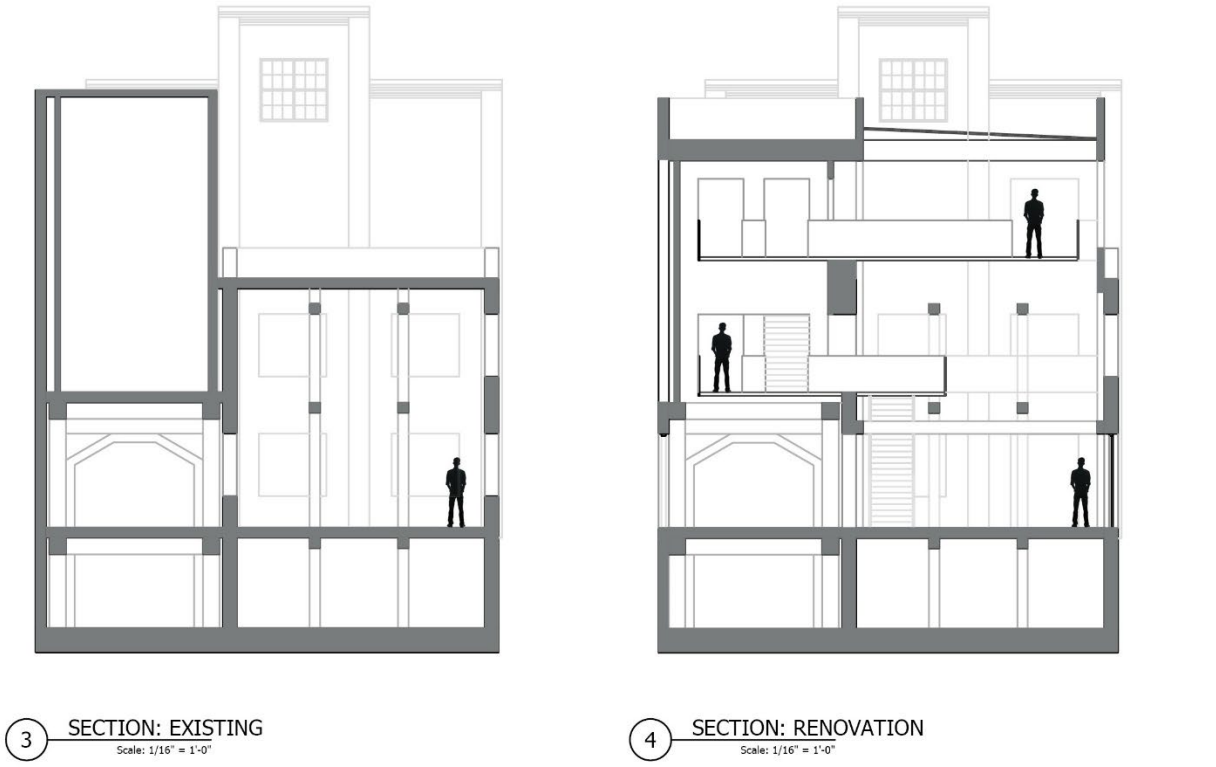


Figure B30. Conceptual Rendering: Niches at Main Stair, Level Three

Figure B31. Bridge at Atrium "Connector," Level Four

Figure B32. Plan and Section: Outdoor Room

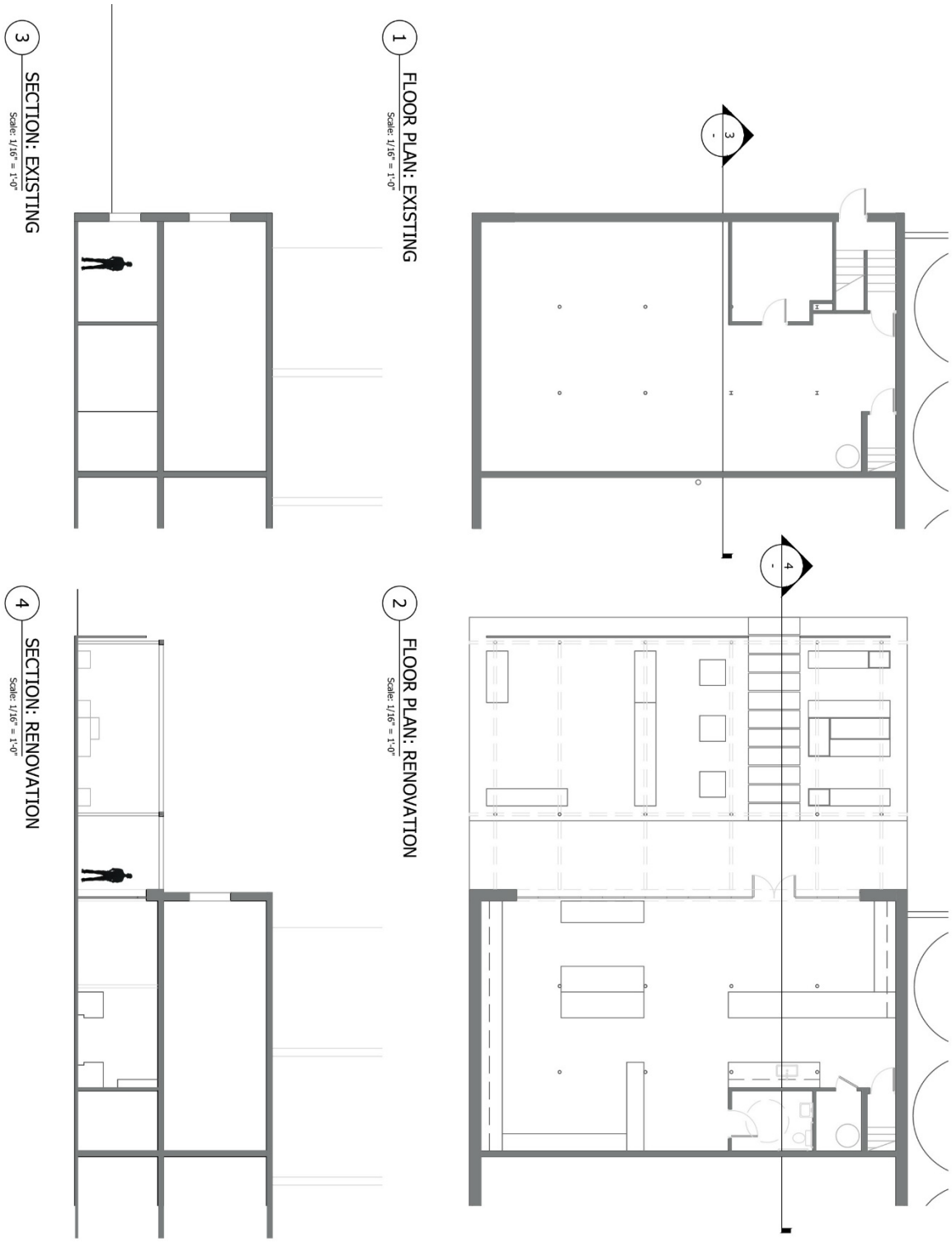


Figure B33. Conceptual Rendering: Outdoor Room