

ABSTRACT

Title of Thesis: ACHIEVING INDEPENDENCE: HOUSING
FOR ADULTS ON THE AUTISM SPECTRUM

 Marcus James Tsouvalos, Master of Architecture
2017

Thesis Directed By: Professor Steven Hurtt, Architecture

Living independently is one of the major milestones which represents one's passage to adulthood. Many people may take this step for granted and assume it is an inevitable part of life, but for many adults with Autism Spectrum Disorder this is not the case. 80% of adults with ASD live with their parents where they will continue to rely on their care. This situation has many challenges, but a detrimental one for the individual with ASD is fewer opportunities to form relationships outside of the family (find source). Living independently in a supported housing development can provide this population the opportunity for more social interaction while receiving supports needed for everyday living. This thesis will investigate the option of creating highly specialized spaces geared toward offering individuals with ASD more independent living within their community.

ACHIEVING INDEPENDENCE: HOUSING FOR ADULTS ON THE AUTISM
SPECTRUM

by

Marcus James Tsouvalos

Thesis submitted to the Faculty of the Graduate School of the
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Advisory Committee:

Professor Steven Hurtt, Chair

Professor Brian Kelly, Coordinator

Professor Michele Lamprakos, Committee Member 3

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Dedication

I would like to thank my thesis committee for helping me through this year long process. A special thanks to my family for supporting me through six years of my architectural education.

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Chapter 1: An Introduction to the Autism Spectrum

What is the Autism Spectrum?

Autism spectrum disorder (ASD) is a range of developmental disorders often characterized by challenges with social skills, repetitive behaviors, speech and nonverbal communication¹. This disorder is extremely unique in that there is no one type of autism but a “spectrum” of symptoms, levels of disability, and skills. It is often said that when you meet a person with autism you have met “one” person with autism because every case comes with its own set of unique challenges and abilities.

The spectrum which is often referred to as an umbrella has three main categories for classification: Asperger syndrome, autism disorder, and pervasive developmental disorder not otherwise specified, see figure 1.

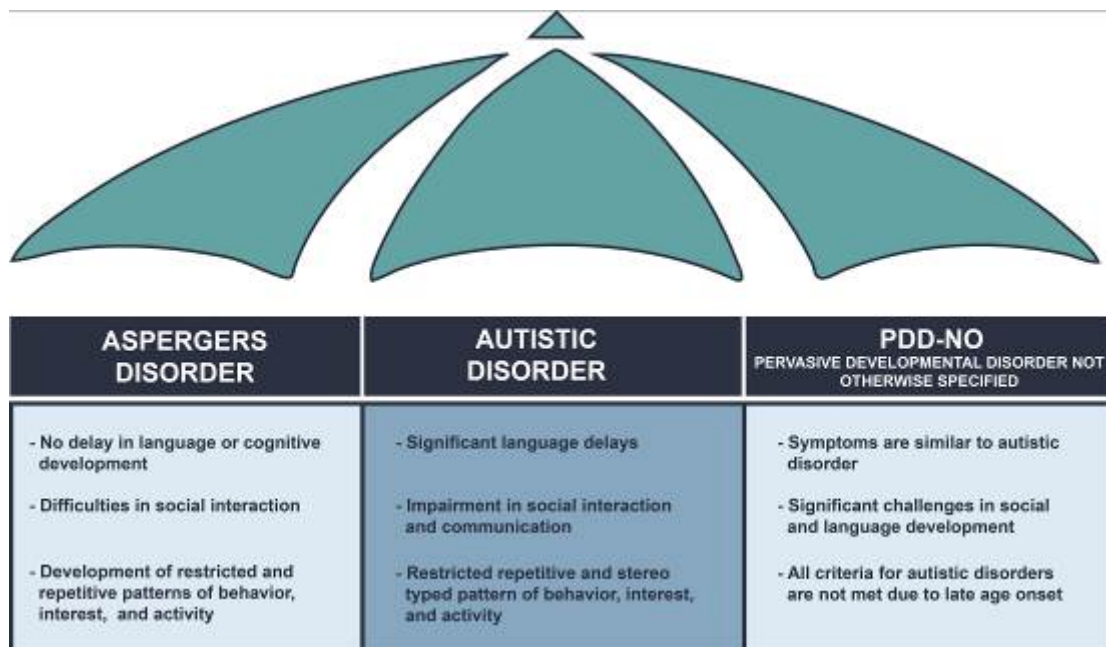


Figure 1 | the Autism Spectrum

¹ “What is Autism?” Autism Speaks. Accessed April 17, 2017, <https://www.autismspeaks.org/what-autism>.

Each of these categories is then further classified by a degree of severity, see figure 2.

SEVERITY LEVEL FOR ASD	SOCIAL COMMUNICATION	RESTRICTED INTERESTS AND REPETITIVE BEHAVIOR
Level 1 Requiring support	Without supports in place, deficits in social Difficulty initiating social interactions and demonstrates clear examples of atypical or unsuccessful response to social overtures of others May appear to have decreased interest in social interactions	Rituals and repetitive cause significant interference with functioning in one or more contexts Resists attempts by others to interrupt rituals and repetitive behaviors or to be
Level 2 Requiring substantial support	Marked deficits in verbal and nonverbal social communication skills Social impairments Limited initiation of social interactions and reduced or abnormal response to social overtures from others	Rituals and repetitive behaviors and/or preoccupations or fixated interests appear frequently enough to be obvious to the casual observer and interfere with Distress or frustration is apparent when rituals and repetitive behaviors are interrupted Difficult to redirect from fixated interest
Level 3 Requiring very substantial support	Severe deficits in verbal and nonverbal social communication skills cause severe impairments in functioning Very limited initiation of social interactions and minimal response to social overtures form others	Preoccupations, fixated rituals, and/or repetitive behaviors markedly interfere with functioning in all spheres Marked distress when rituals or routines are interrupted Very difficult to redirect from fixated interest or returns to it quickly

Figure 2 | ASD Levels of Severity

Both the main categories and severity level guidelines are outlined in the Diagnostic and Statistical Manual of Mental Disorders. The DSM-IV is the latest version provided by the American Psychiatric Association. It is important to note that an individual with ASD will not possess all the characteristics of one category or severity level, but will often have a combination traits.

Symptoms and Behaviors

Understanding the core symptoms and related health concerns that are often associated with the autism spectrum will be crucial in defining the challenges and design solutions for the thesis project. Figure 3 illustrates social deficits, language

impairment, and repetitive behavior as the three core symptoms associated with autism spectrum disorder.

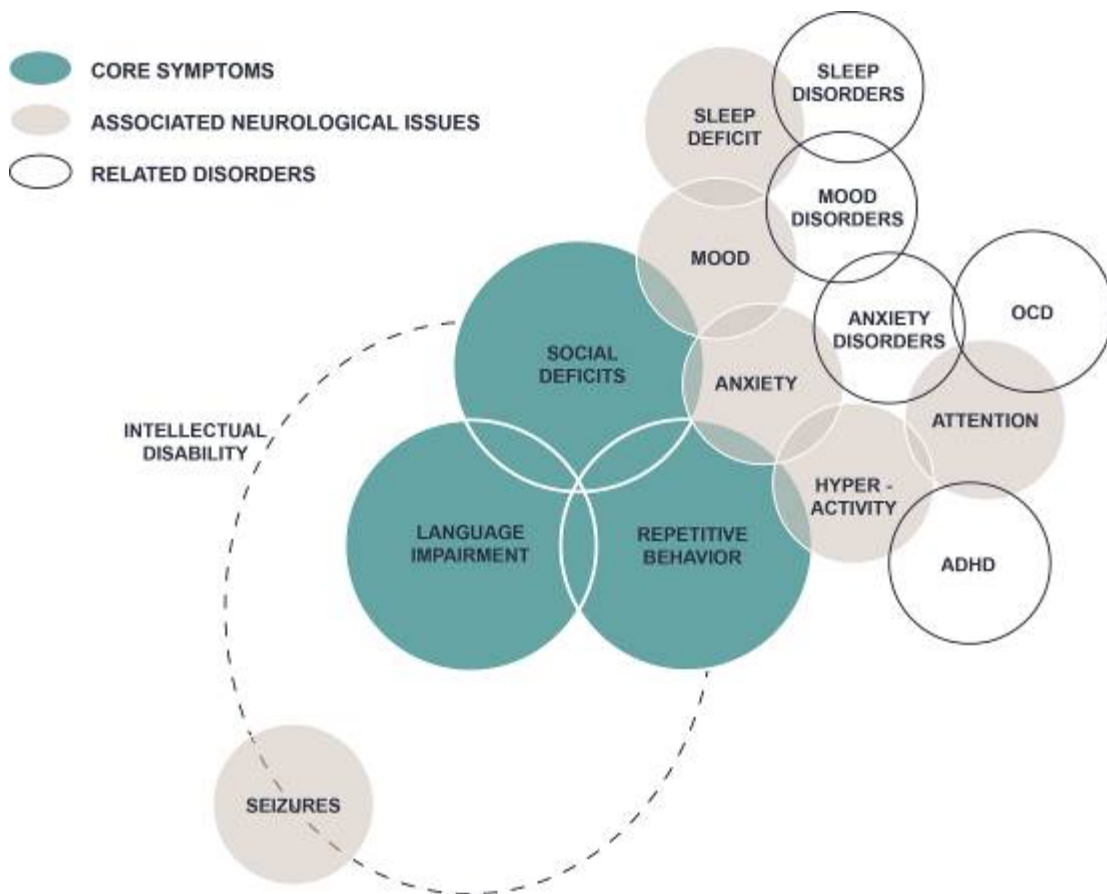


Figure 3 | ASD Core Symptoms

Social deficits are behaviors that directly impact the social interactions between an individual with ASD and a neuro-typical individual. Difficulty using nonverbal behaviors to regulate social interactions that include trouble looking into someone's eyes, few or unusual facial expressions, and unusual intonations in speech and voice quality is one part². The failure to develop age appropriate peer relationships, relationships limited to the immediate family circle, and difficulty

² Ozonoff, Sally, Dawson, Geraldine, and McPartland, James, *A Parent's Guide to Asperger Syndrome & High Functioning Autism: How to Meet the Challenges and Help Your Child Thrive* (New York, New York: The Guilford Press, 2002), 27.

interacting in group settings are another major component in the social deficit category³.

Language impairments can be characterized into four key symptoms. The first being a delay or the total lack of development in language. The second is difficulty holding conversations; knowing when to start, continue, and end a conversation appropriately, the conventional back and forth dialogue, failure to respond to questions, and difficulty speaking about topics that do not directly hold interest. Repetitive and unusual language is the third and includes characteristics like repeating what others say, repeating lines from videos, books or commercials, and an overly formal pedantic style of speaking. Finally play that is not appropriate for developmental level⁴.

Repetitive behaviors encompasses interests that are narrow in focus and overly intense other point of excluding other topics⁵. This leads to difficulty letting go in situations, but also excellent memory for details of special interests. Some of the more visual cues that are evident because of repetitive behaviors include the flapping of the hands when excited, spinning and rocking for periods of time, and pacing⁶. These behaviors are known as stimming and often utilized by the individual as a calming or coping mechanism in stressful situations.

³ Ozonoff, Sally, Dawson, Geraldine, and McPartland, James, *A Parent's Guide to Asperger Syndrome & High Functioning Autism*, 27

⁴ Murray, Stuart, *Autism* (New York, New York: Routledge Taylor and Francis Group, 2012), 17.

⁵ Ozonoff, Sally, Dawson, Geraldine, and McPartland, James, *A Parent's Guide to Asperger Syndrome & High Functioning Autism*, 27

⁶ Ozonoff, Sally, Dawson, Geraldine, and McPartland, James, *A Parent's Guide to Asperger Syndrome & High Functioning Autism*, 28

Chapter 2: Woodberry, Baltimore | Site

Locating the Site

The thesis emphasizes the integration of the autism community and the neuro-typical community on two scales of the project: the building scale and the urban scale. Three critical points guided the selection of the project site location. The site has access to public transportation, an existing community, and surrounded by institutional support. The site chosen for the independent living residence is in Baltimore city, Maryland, see figure 4.



Figure 4 | Locating Baltimore City

Baltimore city serves as an ideal location because it offers several support programs that contribute to the research and care of Autism. Placing the residential building in

an urban context can cause challenges and benefits for the residents in terms of safety, sensory stimulation, and ability to be independent. With this in mind a closer examination of north Baltimore was conducted, see figure 5.



Figure 5 | Locating North Baltimore

North Baltimore provides the urban context that will enable the resident's easy access to the city without being in the downtown area of Baltimore. Figure 6 provides a satellite view of north Baltimore's existing conditions.



Figure 6 | North Baltimore

Druid Hill Park is one of the most distinguishing features in North Baltimore and is surrounded by small neighborhoods that vary in size, socio-economics, and individual community cultures, see figure 7. The majority of the neighborhoods have a mixture of small single family homes, duplexes, and rowhomes creating unique



Figure 7 | North Baltimore Neighborhoods, image by author

communities with strong cultural heritage. The Woodberry-Hampden communities were seen as site that would offer the most opportunity to further explore the thesis. There are several major road ways that run through North Baltimore and connect the city to the greater Baltimore area. Figure 8 shows a selection of these circulation paths. The Jones Falls Expressway also known as I-83 is one of the major interstates that connect the city to the county and to surrounding cities. I-83 roughly follows the path of the Jones Falls stream and snakes through the middle of the north Baltimore bisecting the city in two. Falls road to the East of I-83 and Reisterstown road to the west are two roads that predate the interstate and historically connected the surrounding counties to the city. Druid Park Drive and Clipper Park Drive are two roads that run through the proposed site of Woodberry.



Figure 8 | Major roads, image by author

North Baltimore has several institutions that provide support or have the potential in playing a role in the support of autism. The Woodberry neighborhood provides the most benefit for an integrated community that will be able to support the residential project. The Itineris Foundation, which is committed to helping provide opportunities for individuals with Autism Spectrum Disorder (ASD) to participate meaningfully in all aspects of adult life⁷, recently located to the Woodberry neighborhood to further their growth as a support program for individuals with Autism Spectrum Disorder. The Kennedy Krieger center for Autism and the Kennedy Krieger High School Green Spring campus, which is an internationally recognized institution dedicated to improving the lives of children and young adults with pediatric developmental disabilities and disorders of the brain, spinal cord and musculoskeletal system, through patient care, special education, research, and professional training, is also located in Woodberry. Woodberry is centrally located to Loyola, Johns Hopkins, and Coppin State Universities which have the potential for creating programs that help support the proposed community of this thesis. Figure 9 illustrates the important institutions in the Woodberry-Hampden area.

⁷ “Itineris Mission Statement,” accessed December 18, 2016, <http://itineris.maki.groovecommerce.com/story/historymissionvision/>

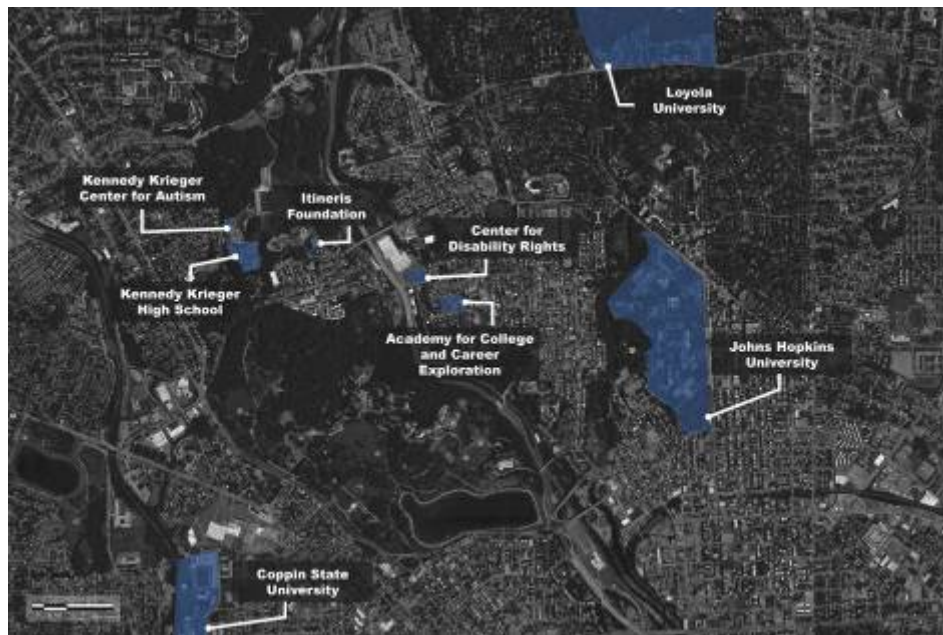


Figure 9 | North Baltimore important institutions, image by author

Woodberry also meets the need to be within a 10 minute walking distance of public transportation, specifically the light rail system. Many of the residents of the project will not be able to drive and depend on public transportation and Maryland State provided transportation to get around. The rail line follows the path of I-83 and connects Hunt valley in Baltimore County with downtown Baltimore. The Itineris Foundation teaches their clients how to use the light rail and uses it to travel throughout Baltimore when going on field trips. Figure 10 demonstrates the walking radius and compatibility with Woodberry. The specific site for the project is shown in figure 8 and is located on axis with the Woodberry light rail stop.

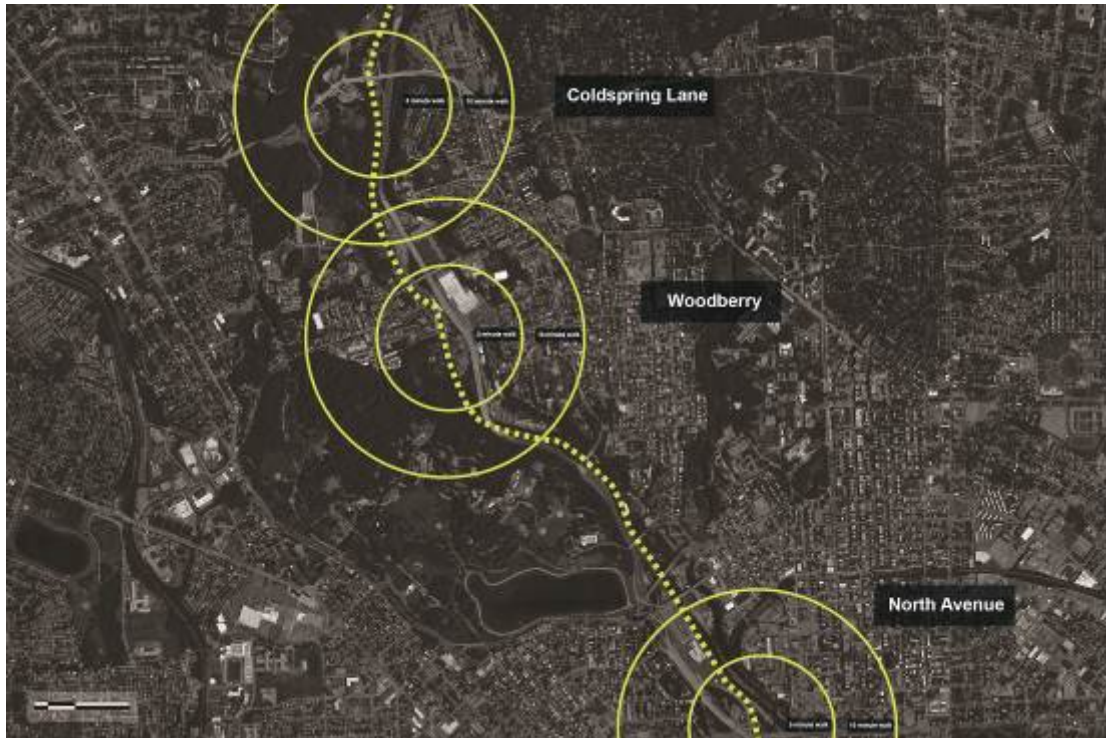


Figure 10 | Baltimore Light Rail, image by author

The Woodberry Neighborhood

Woodberry Baltimore developed as a mill race along the Jones Falls stream in the mid-18th century when the city of Baltimore became a critical point of export⁸. Prior to this the Woodberry area was not considered a part of the Baltimore city limits. The neighborhood has gone through several transitions that follow Baltimore's role as an international port. Beginning with wheat production, then progressing to cotton, and in the mid-19th century a shift to industrial manufacturing. Woodberry is now in a state of revitalization with the development of harmonious residential and commercial projects. The figure ground of the Woodberry site figure 11, reinforces the historical background that the area used to be a company town centered on the mill and manufacturing production. A relatively small community a

⁸ Mark Chalkley, *Hampden-Woodberry* (Charleston: Arcadia Publishers, 2006), 9.

majority of the housing and building occur right around the large manufacturing buildings next to the Jones falls.

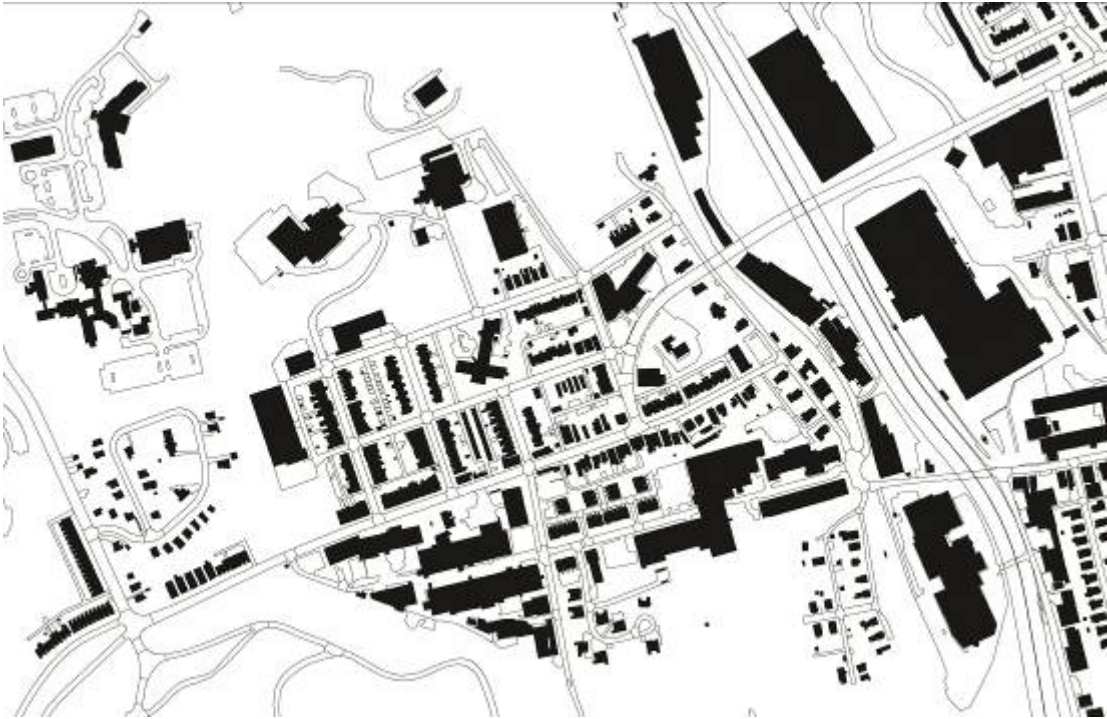


Figure 11 | Existing Figure Ground, image by author

The proposed site, figure 12 is located on the former WME. Hooper and Sons industrial manufacturing site. Currently the site comprises of 5 properties with a total of 667,000 square feet. The shape of the site is a triangle with the northern edge measuring 1,334 feet, the eastern edge 1,000 feet, and the southwestern edge 1,504 feet. Two larger buildings are located on the site one of which may be used as an adaptive re-use project. The rest of the buildings on the site are smaller warehouse support type buildings with small windows that do not offer any value restoration and will be torn down for the development of the project.

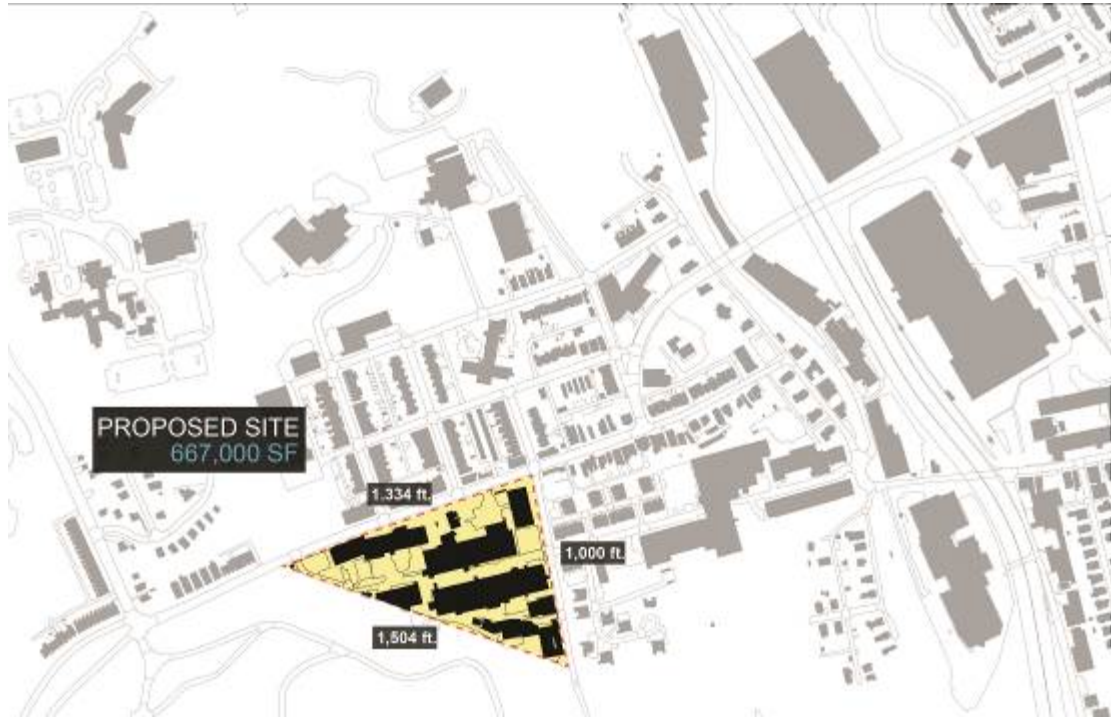


Figure 12 | Proposed site, image by author

The Site is in between the 5 minute and 10 minute walking radius of the Woodberry light rail stop as shown in figure 13. The majority of the Woodberry neighborhood is within the walking radius proving how small a community is while at the same time reinforcing the design concept of creating an integrated community that will support the thesis project.

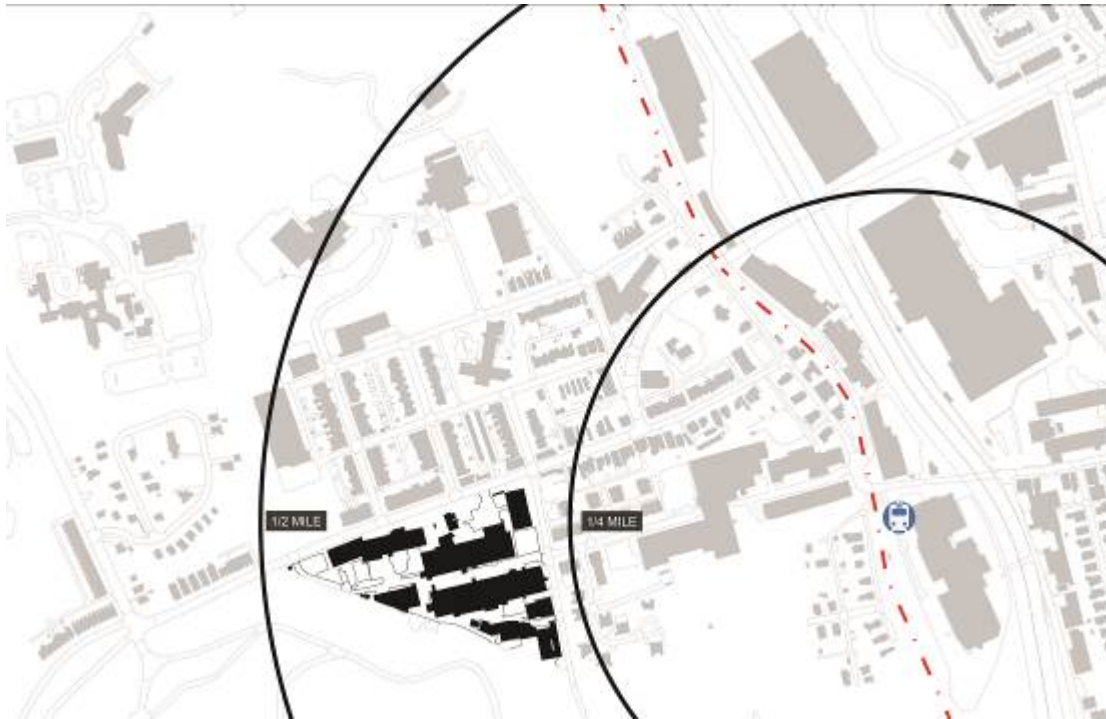


Figure 13 | Proposed site as transit oriented development, image by author

Clipper park drive and Druid Park Drive are two of the main corridors on the site currently. Druid Park Drive is the thorough fare intended for vehicular traffic whereas Clipper Park Drive is meant for pedestrian and light traffic circulation.

Figure 14 shows the walking path taken form the site down Clipper Park Drive to the Light Rail. Distinguishing these to promenade streets will be a crucial element in the urban design aspect of the project. Reinforcing the existing building typologies and implanting new programs a critical locations will make both streets easily recognizable.

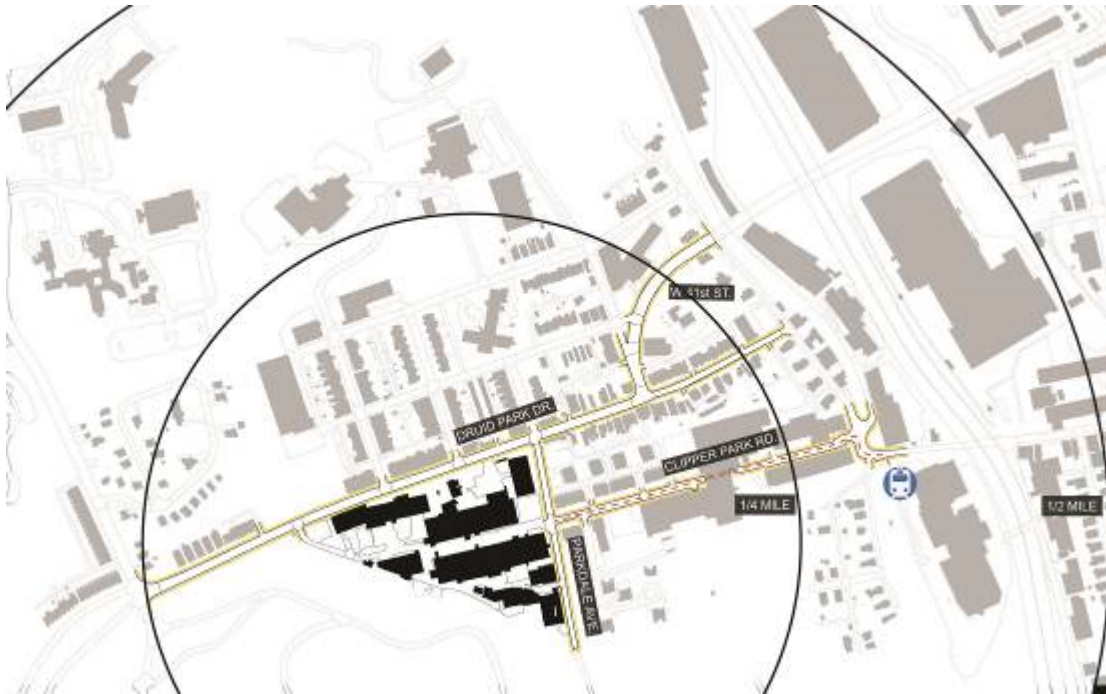


Figure 14 | Major vehicular and pedestrian corridors, image by author

Woodberry has varied building types ranging from large industrial building, single family residences, rowhomes, office buildings, and commercial retail, figure 15. The proposed site is currently zoned as an M-2-1 light industrial site. This thesis proposes a change in zoning to O-R-2 the same as the Clipper mill project located to the east of the site occupying a majority of Clipper Park Drive. With a change in zoning for the site a series of commercial office and retail programs can be inserted into the site providing jobs for the residents of the project and creating a diverse economic neighborhood for the current residents. This project will act as an extension of the Clipper mill project and further the economic and social diversity of the neighborhood.



Figure 15 | Varied building types for an integrated community, image by author

The proposed site is located near a series of institutions that have particular significance to the project. The Kennedy Krieger center for autism and high school (Green spring campus) is located in the northwest corner of the Woodberry neighborhood. The Itineris foundation is located to the north of the site and the Maryland center for disability rights is located to the right in Hampden. All three of these institutions at present act as separate entities within the community. One aspect of creating an integrated community would be the inclusion of these programs and encouraging them to work together. As Itineris grows this connection becomes even more feasible and realistic because many of the services that are provided to school aged individuals (Kennedy Krieger high) end at the age of 21 and the services proved by Itineris and similar agencies become just as crucial. Figure 16 documents these institutions in relation to the proposed site.

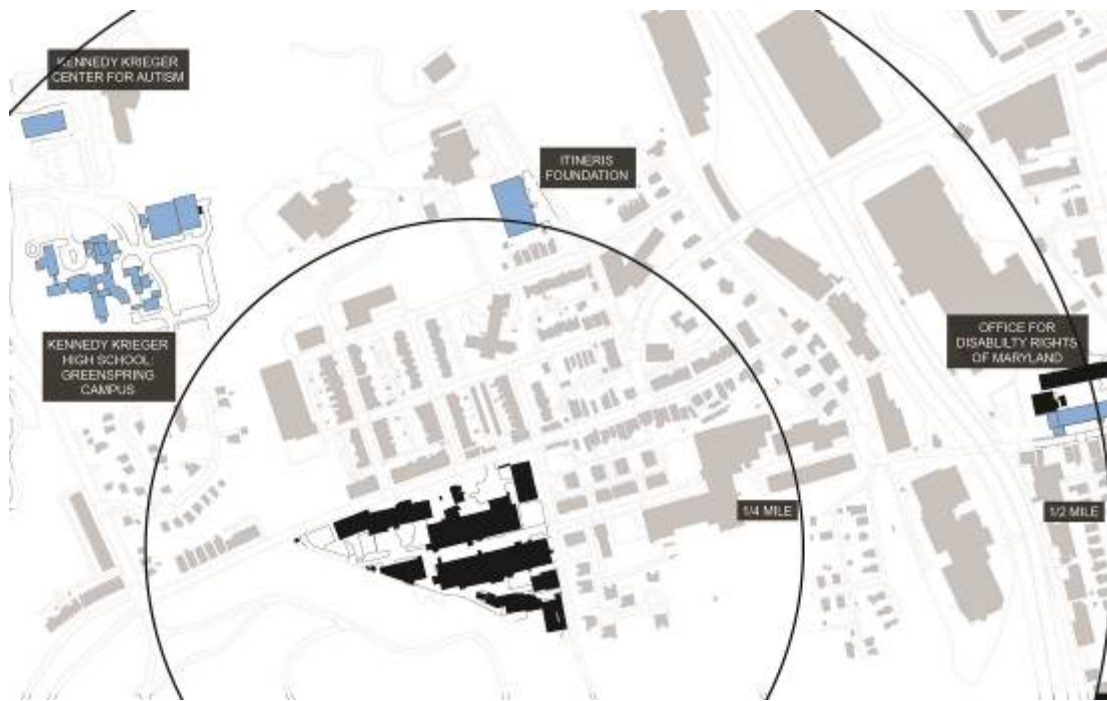


Figure 16 | Local support institutions, image by author

Woodberry is secluded by its geographical location and direct association with Druid Hill Park. Figure 17 depicts the tree canopy of the area and indicates heavy tree cover on the northern portion of the park. There is also heavy tree cover surrounding the entire neighborhood, the canopy is linking the Woodberry Park and Jones falls trail. The proposed site sits in between two hills further creating a sheltered community, see figure 18. Figure 19 depicts this same condition in a section axon, this provides design potential for a proposed park entrance to Druid Hill Park similar to Meridian park in Washington, D.C. or the Spanish steps in Rome. While the proposed site sits in between two hills it is still located at a highpoint compared to the rest of Clipper Park Drive as seen in figure 20. Figures 19-22 further illustrates the topographic challenges and opportunities for designing the site. The section in figure 22 is taken through the assembly apartments and the art studios in the Clipper mill complex, this will be a part of the main pedestrian promenade. The section cut of figure 19 is taken on the proposed site showing the relation of the

current industrial manufacturing building which had potential for conversion to a newer ware house structure that has little implication to the site.



Figure 17 | Tree canopy, image by author



Figure 18 | Site topography

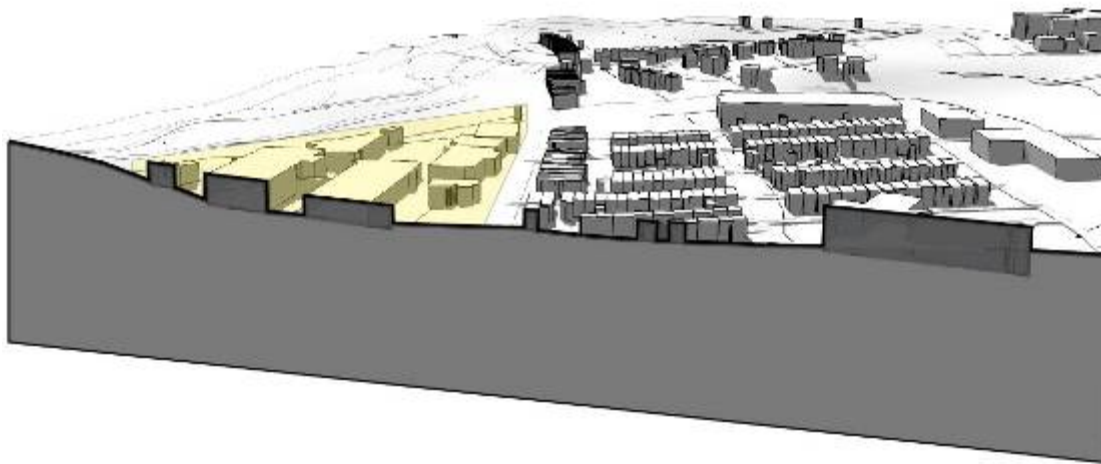


Figure 19 | Site section image by author



Figure 20 | Section through Clipper Park Drive image by author



Figure 21 | Section through Clipper Mill Development image by author

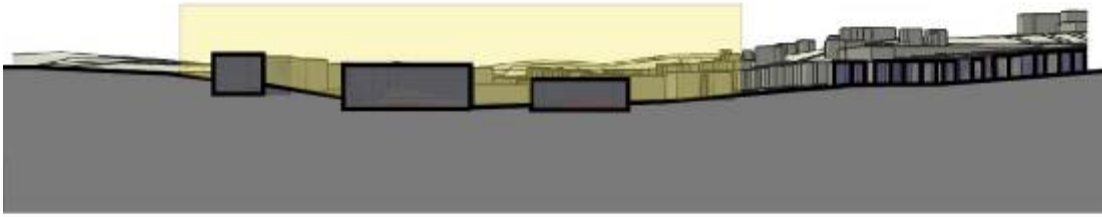


Figure 22 | Section through proposed site image by author

Schematic Urban Studies

One of the major goals of the thesis project is to create an integration between communities on the scale of the building and the surrounding urban design. To design a mitigation of building scales the clearly defined site boundaries must be blurred to create a seamless transition. Continuing the surrounding street grid into the site is one of these options. Continuing the building type along these streets enforces the transition and completes the building fabric. Figure 23 shows an aerial view of the proposed site conditions.



Figure 23 | Aerial of the Site image by google

The following proposals are a series of initial urban design schemes that address the above mentioned site analysis. The first scheme depicted in figure 24 explores the potential of preserving the main manufacturing building on the W.M.E Hooper and Sons site. Continuing the language of preservation the thesis project would occur in the industrial building with the rest of the site becoming an extension of the existing community and the addition of two larger scale commercial buildings.

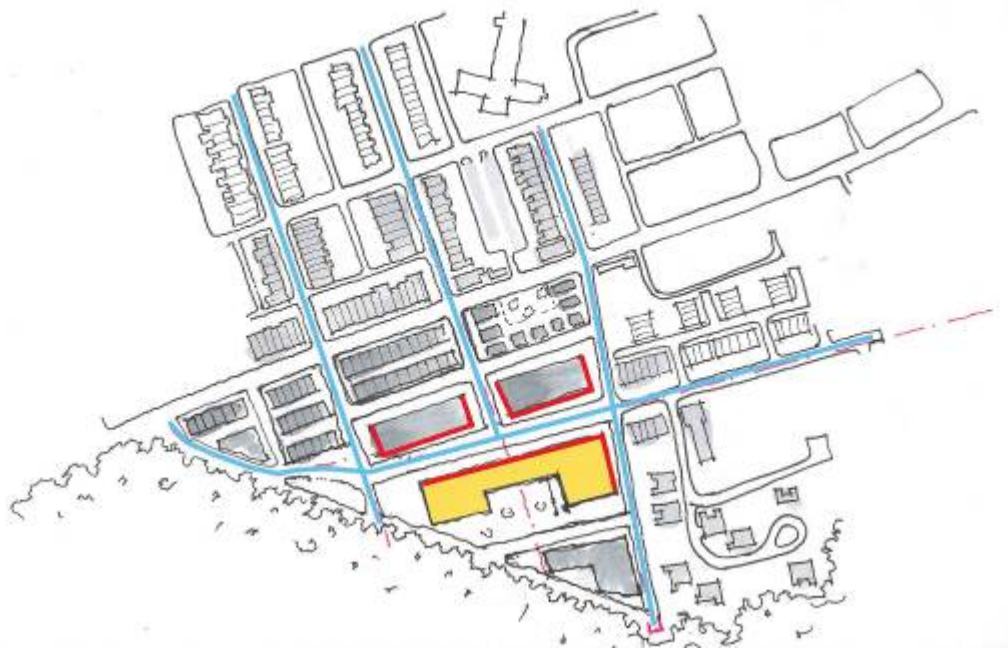


Figure 24 | Preservation scheme image by author

This second scheme creates a new entrance to Druid Hill Park, see figure 25. The parks edge acts as a barrier to the community and is not inviting, which is atypical to an Olmsted Park. Using meridian Park in Washington DC as reference this scheme proposes a new entrance into Druid Hill Park that addresses the severe topographic change. This new park entrance gives all of the residents of Woodberry

an added amenity and a direct connection rather than a barrier edge condition which is the current condition.

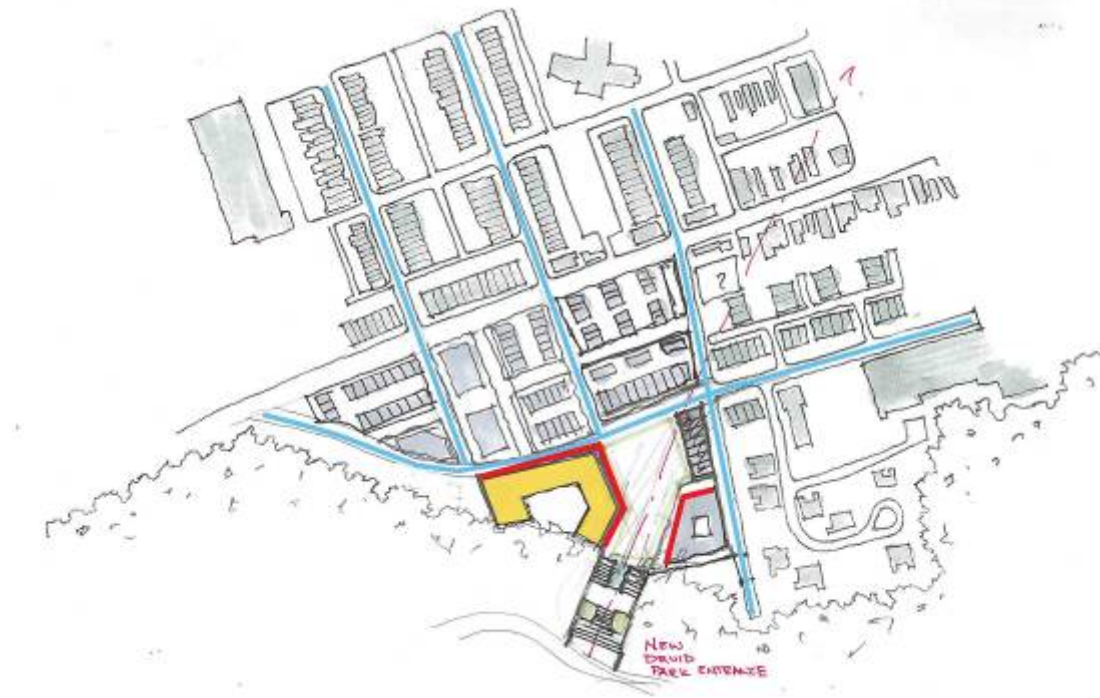


Figure 25 | new Park Entrance Scheme image by author

The scheme depicted in figure 26 investigates the possibilities of sectioning off a portion of the site for larger scale building that will house the office and commercial retail while the rest of the site is weaved back into to the surrounding neighborhood. The scheme centers the thesis project in the middle of the commercial area making it the focal point of the site. There is also the inclusion of more single family houses that are located to the west of the site facing the park. These are envisioned as a series of higher end homes that will provide a more socio-economic diverse community. Figure 27 is a variation of this idea providing a zone of retail, placing the thesis site to the west of the commercial district, and developing a series of higher end homes along the parks edge.

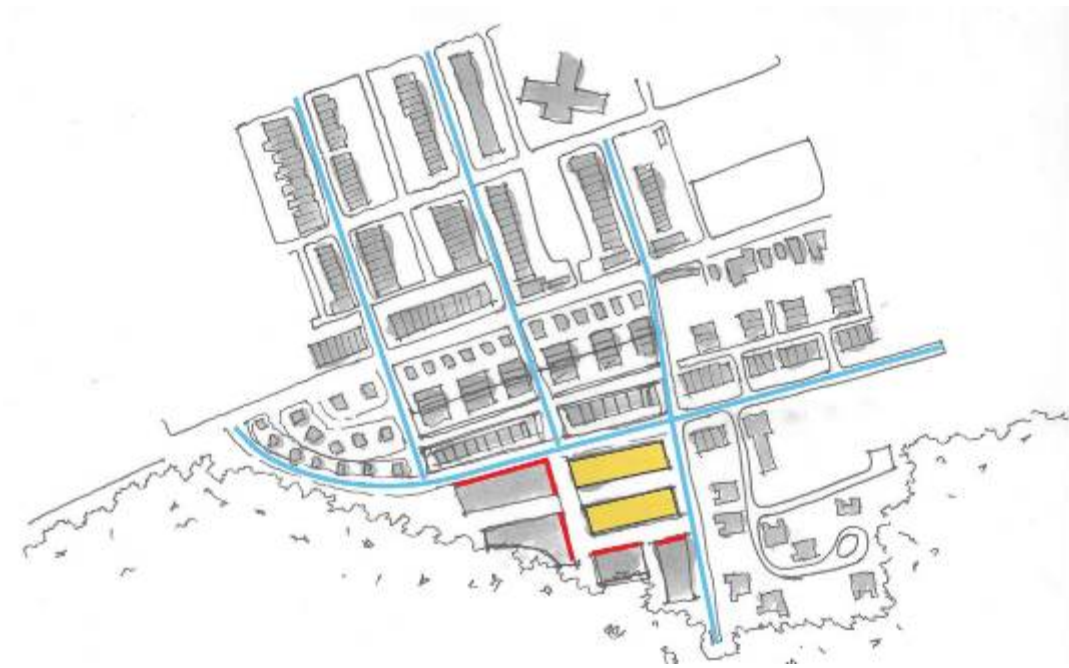


Figure 26 | Commercial center with suburban housing image by author

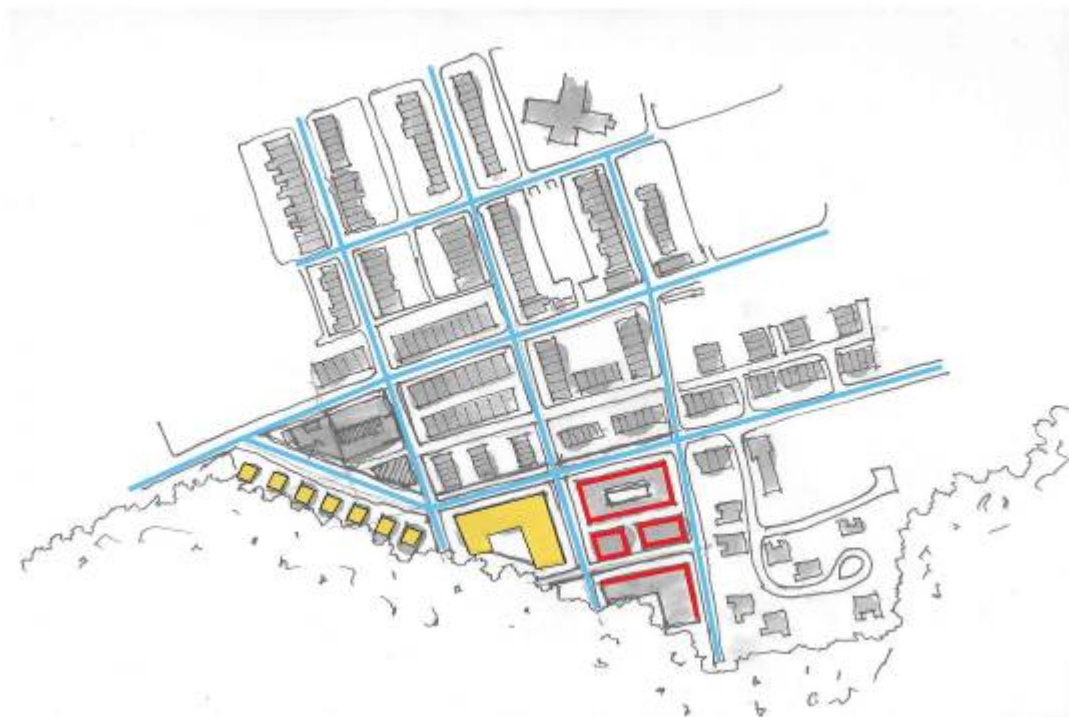


Figure 27 | Parkside Housing image by author

The courtyard scheme in figure 28 is creating a series of courtyard for the residential project as well as within the commercial retail zone. Giving the residences the main connection to the park a series of transition zones are created from the street front to the parks edge.

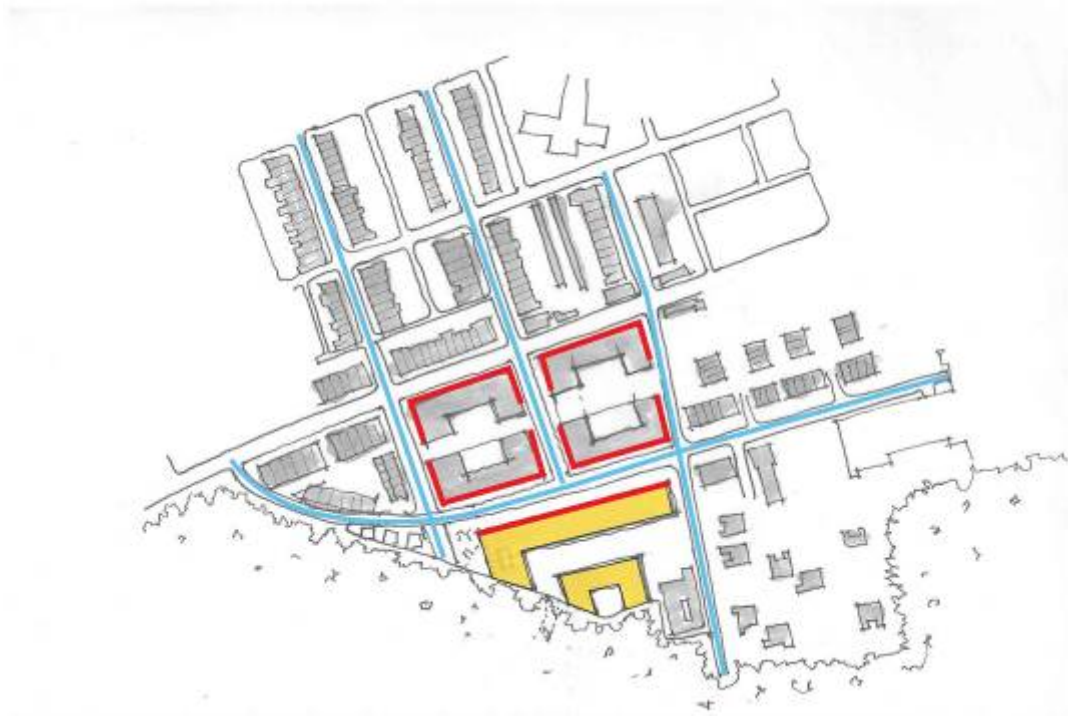


Figure 28 | Courtyard scheme image by author

The final scheme while radical for the area seeks to create more of a presence for the community. The radial configuration allows for a combination of commercial retail, rowhome, and large scale residential types to occupy the same space. The scheme also creates a promenade for a park entrance that would resemble the Spanish stairs of Rome. This scheme has also led to the investigation of English townhomes along parks that more effectively utilize the green edge, figure 29.

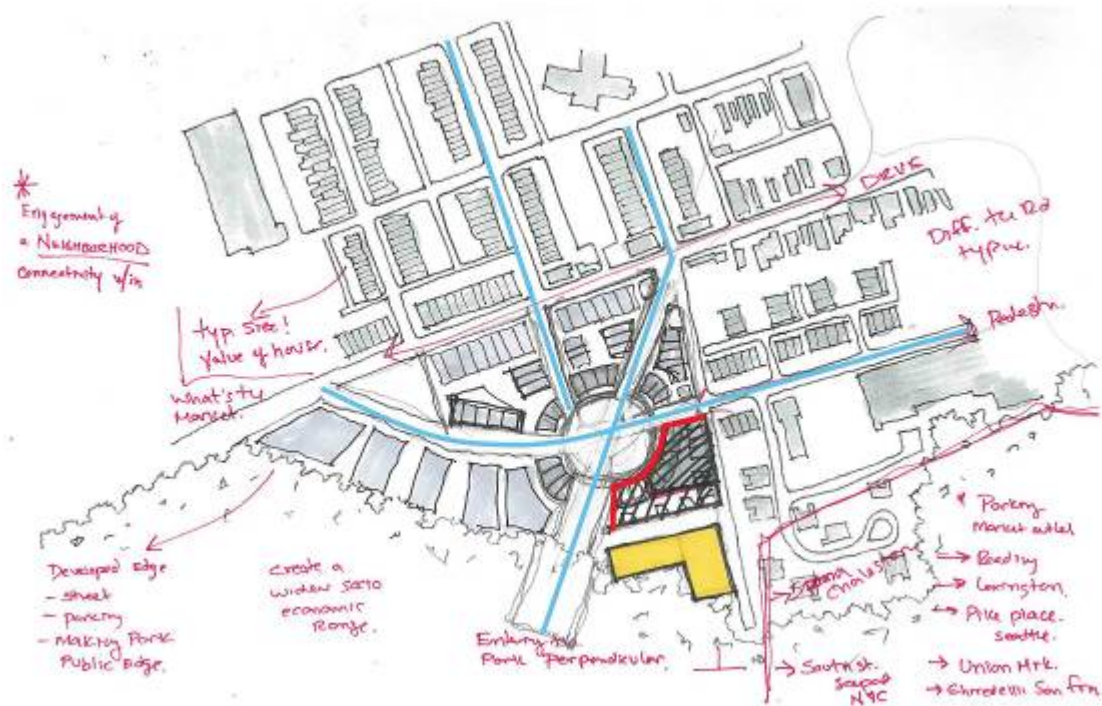


Figure 29 | Radial plan image by author

In all of these schemes the residential project is tending to be located at the southern portion of the site relatively centered. Most of the schemes have an open courtyard facing the Park giving an enclosed and private green space to the residents of the project. It is important that the community's street grid is pushed through the site creating natural connections to the park. Retaining the existing community is also crucial, maintaining the current building fabric will also be important in the development of the site.

Chapter 2: Precedence Analysis

Overview / Criteria for Analysis

Independent living residences for individuals with ASD is very limited and fairly new in terms of built projects. The following case studies include one project that has been completed in Sonoma California called Sweetwater Spectrum for adults with autism, a co-housing project in Nanterre France which focuses on creating a social diverse living environment for its residents, and a conceptual residential project in Copenhagen for children with Autism. Based on the program analysis and the understanding of the sensory challenges that exist with these individuals these projects address programmatic adjacencies, zones of sensory stimulation, connection to green spaces, and organization of residential building types. Two of the three are within an urban context providing analysis for integration into an existing urban community and the third addresses a transition from the built to the natural environment. Through the analysis of these projects a fuller understanding of the housing concerns will be achieved when designing. Figure 30 shows the three projects being analyzed.



Figure 30 | Case studies

Sweetwater Spectrum / Sonoma, California

Architect: Leddy Maytum Stacy Architects

Year Built: 2013

Location: Sonoma, California

Number of Residents:16

Context: Urban

Area: 2.8 acre

The idea for the Sweetwater Spectrum Community was conceived in 2009 by a group of families⁹. Serving as a national model for autism housing, Sweetwater spectrum is a high quality housing option for adults with autism that focuses on creating a life of purpose and dignity for its residents¹⁰. A group of four 3,250 square foot homes are situated on a 2.8 acre property. The home has common spaces, laundry facilities, bedrooms with private bathrooms, and spaces for the support staff the property also has a 3,300 square foot community center, therapy pool, an urban farm, and orchard, and a green house¹¹. Sweet water spectrum is 4 blocks from the Sonoma town center and has access to public transportation.



Figure 31 | Sweetwater Spectrum image by Tim Griffith

⁹ “Sweetwater Spectrum Community,” Arch Dailey, accessed December 18, 2016, <http://www.archdaily.com/446972/sweetwater-spectrum-community-lms-architects>

¹⁰ Arch Dailey, “Sweetwater Spectrum Community.”

¹¹ Arch Dailey, “Sweetwater Spectrum Community.”

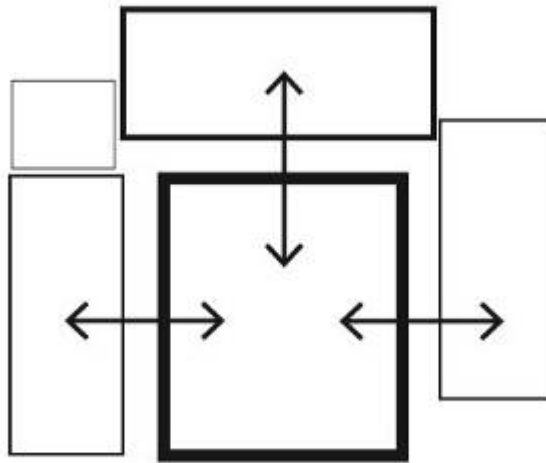


Figure 32 | Parti of Sweetwater spectrum image by author

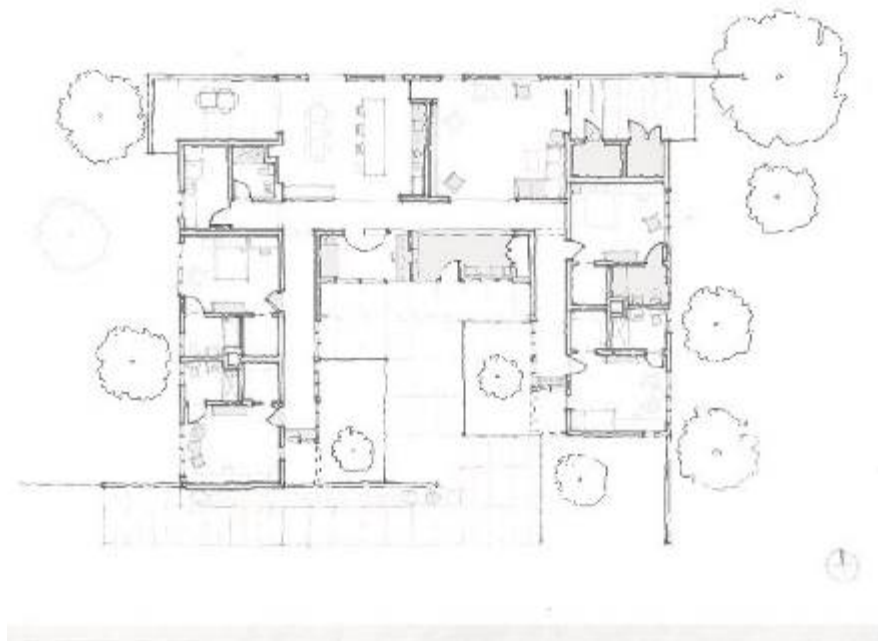


Figure 33 | Typical Floor Plan image by author

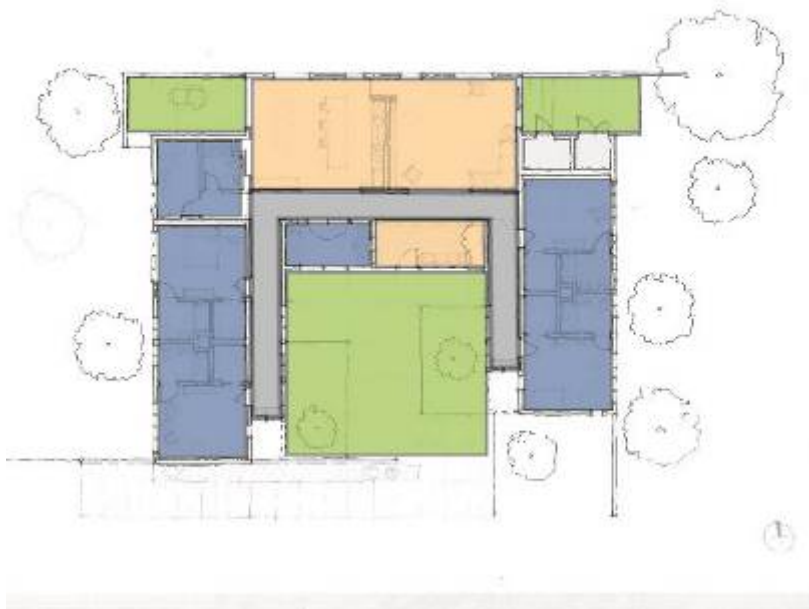


Figure 35 | Sensory Zones image by author

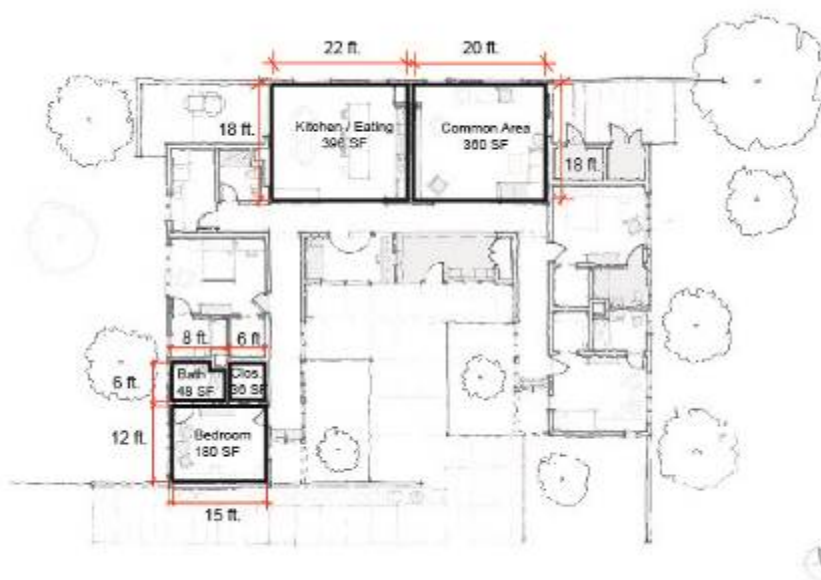


Figure 34 | Program elements image by author

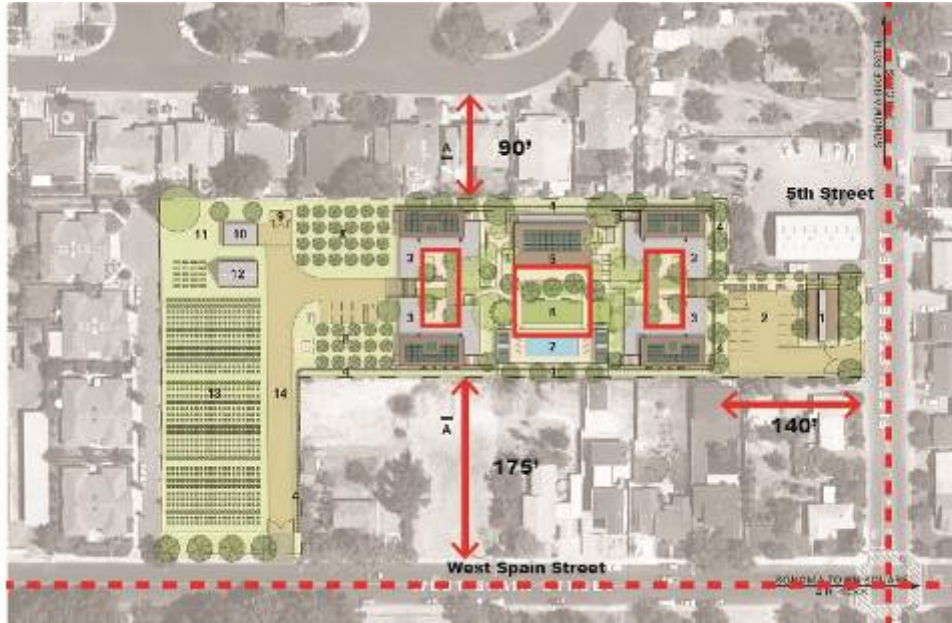


Figure 36 | Site conditions, set back from street edge, image by author



Figure 37 | Site condition relation to surrounding buildings image by author

Nanterre Co-Housing / Nanterre, France

Architect: MaO architects, Tectone

Year Built: 2015

Location: Nanterre, France

Number of Residents: 15 families

Context: Urban

Area: 1,700 SF

The goal for this co participatory housing project is to create a greater spatial quality for the inhabitants of the project. While not designed specifically for individuals with autism the Nanterre project implores techniques of a social experiment not common to the area by offering a different type of living¹². There are several programmatic adjacencies and shared spaces that are similar to the spatial quality that will be achieved with this thesis' program. Located at a zone where there is a shift in building typologies the co- housing project acts as a mediator addressing each type with varying story's, 2 story's facing the single family houses and 4 story's at the location of the mixed development zone. The ground floor is where many of the shared amenities are located: community garden, DIY workshop, Kitchen, laundry, flex meeting space. These spaces are meant to facilitate interaction between the residents of the project.

¹² "Nanterre Co-housing / MaO architects + Tectone," Arch Dailey, accessed December 18, 2016, <http://www.archdaily.com/779035/nanterre-co-housing-mao-architectes-plus-tectone>



Figure 39 | Nanterre image by Arnaud Schelstraute

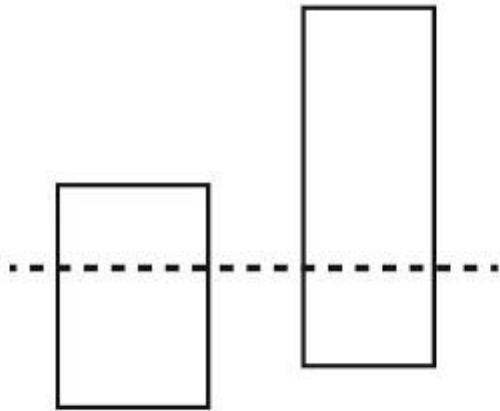


Figure 38 | Parti Diagram image by author

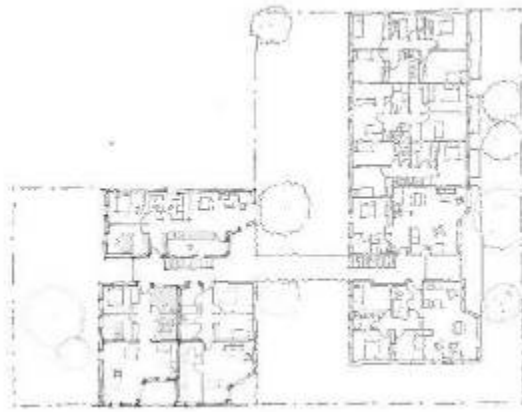


Figure 40 | Typical floor plan image by author



Figure 41 | Program elements image by author



Figure 42 | Sensory zones image by author

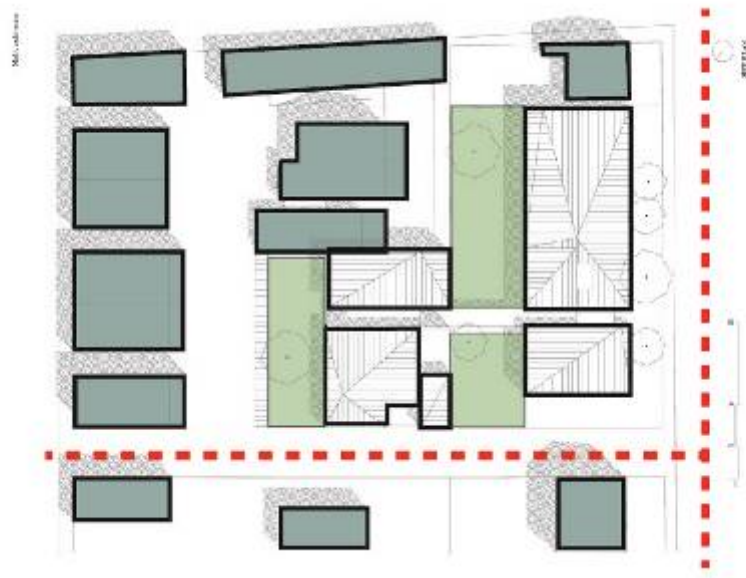


Figure 43 | Site conditions image by author

Conceptual Home for Children with Autism / Hareskoven, Copenhagen

Architect: CREO Arkitekter / JAJA architects	Year Built: Conceptual
Location: Hareskoven, Copenhagen	Number of Residents: 18 children
Context: Rural	Area: 16,147 SF

A conceptual project designed for children (1-18) near the Hareskoven forest. The jury for the competition commented, “The proposal creates an inviting and intimate atmosphere that makes it feel like home... It fulfills all our aspirations in creating a model of future homes for children with special needs”¹³. The building utilizes the orientation of the existing building that shields the residents from the street and fronts the residential units towards the natural environment, the Hareskoven woods. The design strategy of the project was to soften the transitional edge between the built and natural environments. A two-level building, the upper level serves as the entry point and street-facing element and the lower levels are mainly living units and communal spaces. All of the private living units have bathrooms and are connected by a common area lit by natural sunlight via a skylight. All of these spaces front the garden and surrounding woods giving the residential portion of the project a very tranquil quality.

¹³ “Creo Arkitekter and JAJA to Design Home for Children with Autism near Copenhagen,” Arch Daily, accessed December 18, 2016, <http://www.archdaily.com/784811/creo-and-jaja-to-design-home-for-children-with-autism-near-copenhagen>



Figure 45 | Coppenhagen Conceptual home image by CREO arkitekter

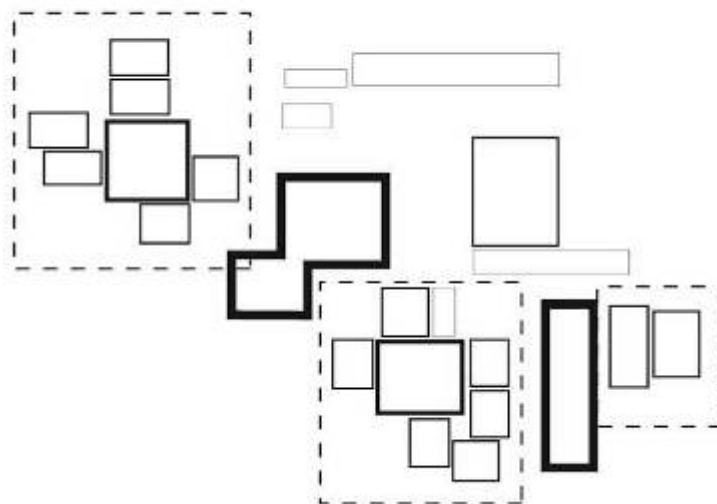


Figure 44 | Parti diagram image by author

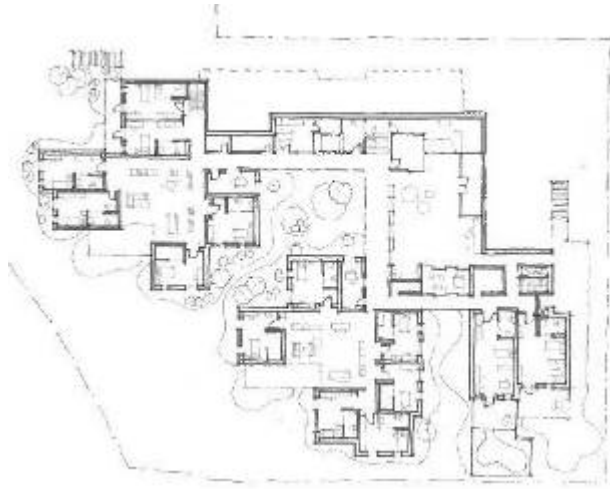


Figure 47 | Typical floor plan image by author



Figure 48 | Sensory zones image by author



Figure 46 | Program elements image by author



Figure 49 | Site plan image by author

Chapter 3: Program

Overview

This project is focused on creating an environment both on the macro and micro scale that will support independent living for individuals with Autism Spectrum Disorder. In addition to creating living spaces that enhance the daily lives for individuals, a series of community program elements will be placed strategically in association with the residential component to foster integration within the community. A unique aspect that begins to diverge from the typical housing model for individuals on the spectrum is the inclusion of neuro typical residents. The ratio of these two demographics is subject to more intense investigation.

Program Objectives

- What are the appropriate connections?
- What are the sensory challenges?
- Interaction with the community
- Basic Program Elements

Connectivity within the residential unit

The built environment can be confusing and sometimes unbearable for individual on the spectrum¹⁴. Understanding the needs and spatial awareness concerns is critical in designing an environment that will be comfortable and make the user feel safe in their home. These challenges are caused from the way in which a person processes information, specifically central coherence (Cognitive Styles: Instructional Design, find credible source). Central coherence is the ability for a person to combine elements together into the meaningful whole, which for neuro-typical people happens rapidly, allowing them to make quick decisions, see figure 50. For individuals with ASD this process is fragmented, *figure 51* with a strong tendency to over focus on details¹⁵ leading to a much longer time for the total comprehension of a space and situation.



Figure 50 | Central Coherence total picture image by author

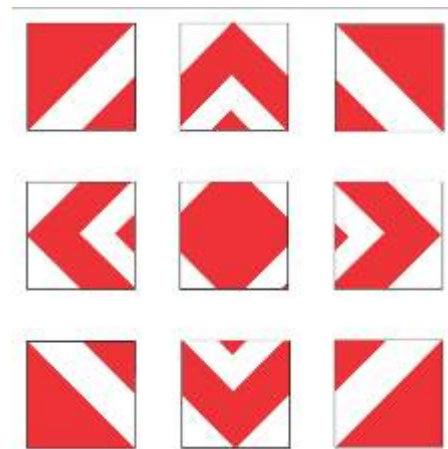


Figure 51 | Central coherence fragmented picture image by author

¹⁴ “Context independent living,” Architecture for autism, accessed December 19, 2016, <http://architecture-for-autism.org/>

¹⁵ “Central coherence,” Architecture for autism, accessed December 19, 2016, <http://architecture-for-autism.org/>

In terms of space making the individual units should be organized into clear and distinct zones that emphasize specific functional uses of the space. This will prevent disorientation and limit the number of challenges the resident must face. For example *figure 52* depicts a sample program for the one bedroom unit and separates specific program elements into private, public, and semi-public spaces.

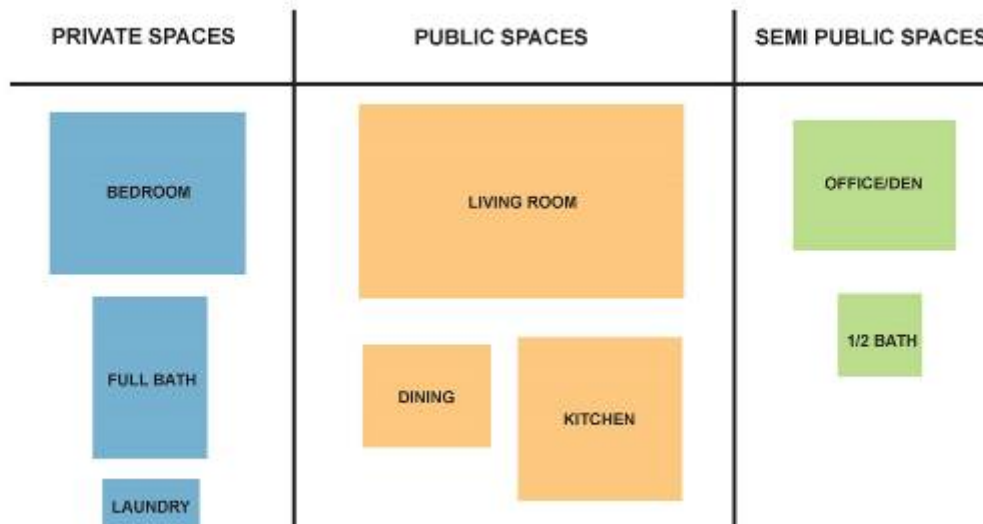


Figure 52 | organization of spaces public / private image by author

Within this organization the program elements were also grouped in terms of what activities need to be within the same proximity. The laundry room is grouped with the bedroom and bathroom because these are the spaces that will be used for dressing and undressing. The dining area will have a direct relation to the kitchen, but will still be a separate and defined space. *Figure 53*, demonstrates how the living room can act as a centering element for the unit versus, a linear approach with a hall as the centering piece figure 54.

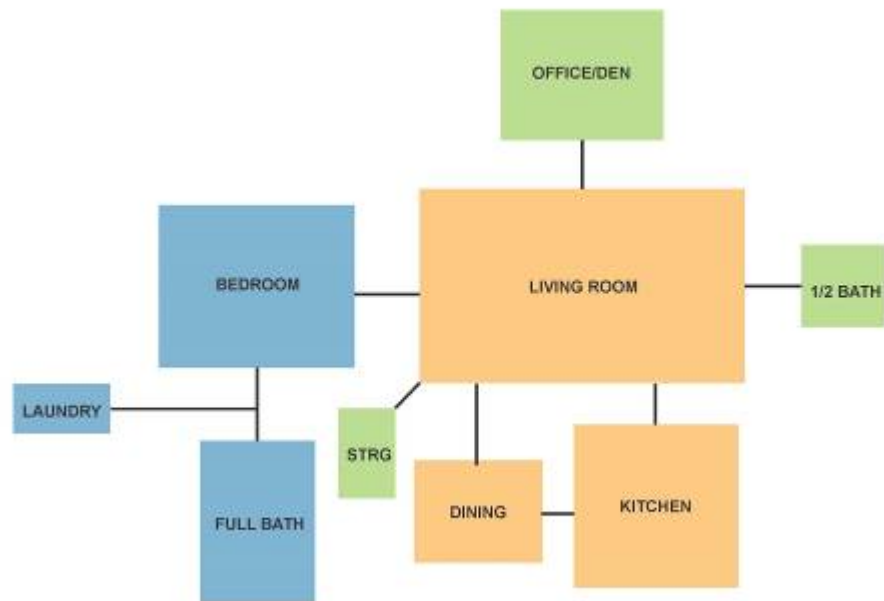


Figure 53 | Central organization image by author

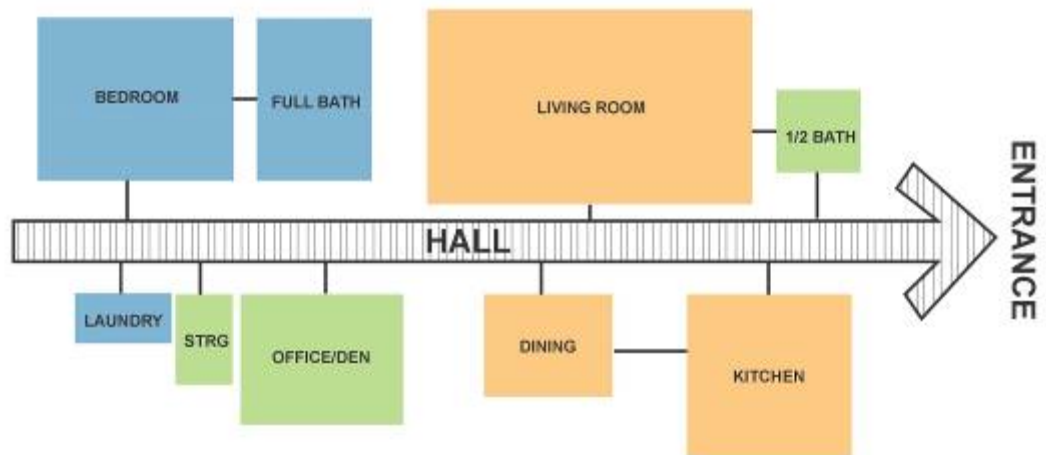


Figure 54 | Linear organization image by author

Creating these zones will assist in the resident with ASD to manage the residence, maintain a clear overview of their environment and become self-reliant with minimal assistance¹⁶.

Zoning of the home also begins to divide spaces into levels of sensory sensitivity. The public spaces will have higher levels of interaction with noise, light, sound, and people, especially in the living units with one or more resident's *figure 55*.

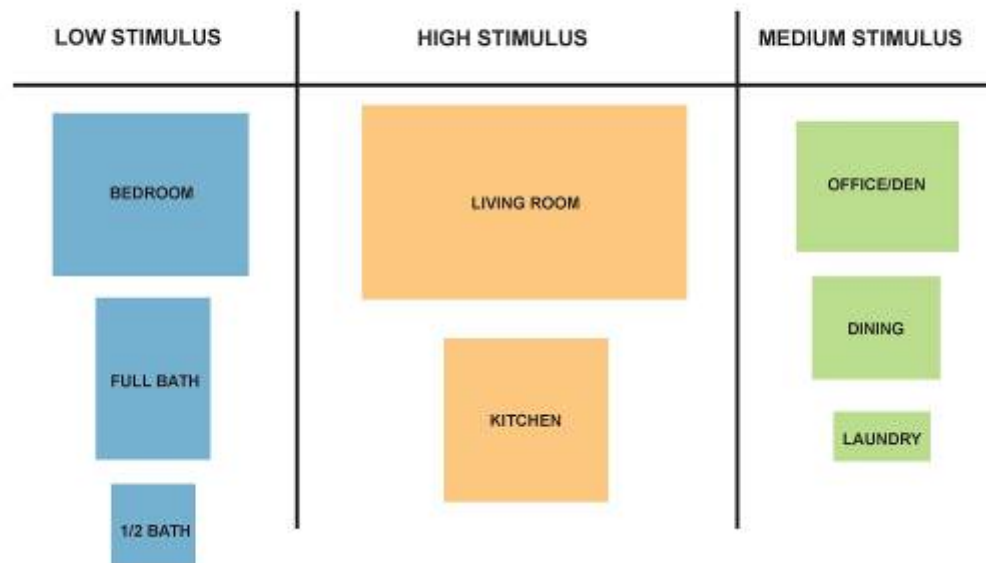


Figure 55 | Spaces organized by sensory level image by author

In order to separate these spaces transition zones are needed and can be in the form of hallways or other program elements that act as buffers between the two spaces *figure 56*. A visual and tactile distinction between these spaces can occur as well.

¹⁶ "Context living independently," Architecture for autism



Figure 56 | Transition zones between program spaces image by author

An example of these can be seen in non-carpeted areas that have an immediate difference from carpeted areas in terms of the feeling beneath your feet, the color, and even the sound of walking on the surface. Therefore, it will be beneficial to place carpet in areas where distinct changes in functional use occur; the living room, the bedroom, and the office space.

Sensory Challenges

Individuals with ASD perceive the world in a very different way. Experiences are often dulled or emphasized to an extreme that can make daily life a challenge. When there is a sensory overload and processing information becomes too much, this is called hypersensitivity. Hyposensitivity is the opposite, when not enough information is perceived and the body becomes disconnected from its surrounding environment.

Sensory sensitivities can have major implications when it comes to the built environment. The perception of sound, light, and tactile elements are the most affected senses in an architectural spaces. Manipulating and creating spaces that

properly address these challenges will facilitate a supported independence within the residential unit and within the community.

Acoustics

Marga Mostafa, an Egyptian architect and one of the leading researchers on architecture for autism conducted a poll that concluded acoustics and sound ranked as the number one priority in design¹⁷. The design challenge with sound encompasses a wide range of areas. A sensitivity to sound coming from outside sources will be the first area of focus. An individual may be hypersensitive to certain pitches of sound, oversaturation, and unexpected bursts which cause extreme discomfort. Limiting the sources of sound through soundproofing the walls and ceiling are measures that must be taken. As mentioned earlier carpeting in high sensory areas absorbs sound, preventing reverberation. Even with noise from the street and surrounding residential units, sounds from within the residence can occur especially when living with more than one person. This is why it is important to have separate spaces for residents to retreat to when they are feeling overwhelmed. These spaces can be the individual's bedroom, den, or office space.

While sound can be a great discomfort it can also be a coping mechanism and source of pleasure. This section will address concerns about sound created by an individual and the impact on the neighbors. A fascination with a particular sound that comes from the tapping or shaking of an object can become quite loud and often repetitive. When individuals become overstimulated or are in a state of extreme concentration they may tap their feet on the ground, rock back and forth and hum, or pace. These are soothing techniques, known as stimming that are found among a

¹⁷ "Sound," Architecture for Autism,

wide variety of people, not just individuals with ASD. Talking in a loud voice is another common symptom for many high functioning individuals and could cause problems when living with others and in a community.

These challenges can be addressed in several ways. Sound proofing the walls and ceilings of units will prevent the overstimulation by sound from outside sources and it will prevent sound caused by the individual with ASD from intruding on surrounding residents. Specifying sound absorbing finishes and creating a spatial arrangement that puts louder program elements like the living room in the center allowing for additional buffer zones.

Tactile

The material choices of interior spaces can take two approaches that of the hyper-textual, which prefers smooth and soft materials; and the hypo-textual that receives stimulation from rough surfaces (M. Mostafa, housing adaption for adults with Autism Spectrum Disorder). When thinking about the design of spaces it is good to understand that it is easier to add elements to a space than take away. Many of the spaces will need to be tailored for the individual user. A series of intimate spaces accomplishes a sense of enclosure and assists the user maintain a central coherence.

Community space within the main building

Within the main building there will be a series of spaces that are designed to bring all the residents together as a community. The following spaces will be designed so that the sensory sensitivities of the residents with ASD will be addressed. The reading room and game room will be two of the main spaces where residents

with ASD and neuro-typical residents will be able to interact. Being able to share common interest and learn new ones will be the main focus of these two specific areas. The multi-purpose and media spaces, while still seen as environments where interaction can occur will be more defined as more rentable spaces for the residents where planned activities can occur.

The community amenity spaces can be used as centering elements on each of the residential floors, this will ensure that proper utilization of the space is achieved. The location of these spaces will also assist in the spatial zoning of the residential floors. Much like the individual living units the building will be zoned into activity spaces that will help orient individuals and create a stable routine within in the building. Figure 57 depicts two initial possibilities for the placement of the amenity space.

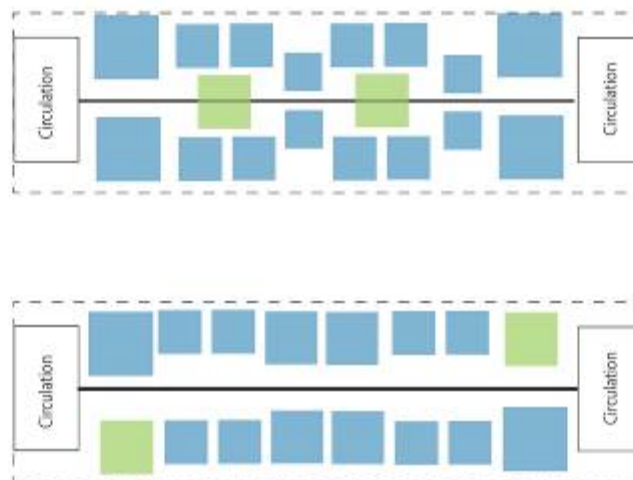


Figure 57 | location of communal spaces image by author

Community spaces outside of the main building

In order to create a sense of community and ensure that the residential building does not get disconnected from the surrounding city, a series of strategic program elements will be placed in and around the housing project to engage and contribute to the surrounding neighborhood. One of the most crucial pieces of program that will achieve this goal will be a mid-sized grocery store tailored for the urban dweller. Acting as a critical node within the community the grocery store will ensure people will always be coming to the area. A community center to the YMCA that will have community meeting spaces, a fitness facility, and basketball courts will be the second piece of program to invigorate the site. Finally a series of small retail and restaurants will complete the new community. It is the intention that these new program elements will be supported by a series of community events held outside of the areas in the public space.

Program Summary

One Bedroom	SF/Room	Stimulus Level	# of Rooms	Total SF
bedroom	120 SF	low	1	120 SF
kitchen	100 SF	high	1	100 SF
dining area	80 SF	medium	1	80 SF
living room	200 SF	high	1	200 SF
office/den	80 SF	medium	1	80 SF
full bath	70 SF	low	1	70 SF
half bath	40 SF	low	1	40 SF
laundry	18 SF	medium	1	18 SF
				645 SF
Two Bedroom	SF/Room	Stimulus Level	# of Rooms	Total SF
bedroom	120 SF	low	2	240 SF
kitchen	100 SF	high	1	100 SF
dining area	80 SF	medium	1	80 SF
living room	200 SF	high	1	200 SF
office/den	80 SF	medium	1	80 SF
full bath	70 SF	low	2	140 SF
half bath	40 SF	low	1	40 SF
laundry	18 SF	medium	1	18 SF
				998 SF
Three Bedroom	SF/Room	Stimulus Level	# of Rooms	Total SF
bedroom	120 SF	low	3	360 SF
kitchen	100 SF	high	1	100 SF
dining area	80 SF	medium	1	80 SF
living room	200 SF	high	1	200 SF
office/den	80 SF	medium	1	80 SF
full bath	70 SF	low	3	210 SF
half bath	40 SF	low	1	40 SF
laundry	18 SF	medium	1	18 SF
				1088 SF
Amentities	SF/Room	Stimulus Level	# of Rooms	Total SF
Lobby	2000 SF	high	1	2000 SF
Multi-purpose room	1000 SF	high	1	1000 SF
Reading room	800 SF	medium	1	800 SF
Game Room	500 SF	high	1	500 SF
Media Room	500 SF	medium	1	500 SF
				5888 SF
Community	SF/Room	Stimulus Level	# of Rooms	Total SF
Grocery Store	30000 SF	high		3000 SF
Rec Center	20000 SF	high		2000 SF
Community gathering space	12600 SF	high		12600 SF
Restaurant	1000-5000 SF	high		5000 SF
Retail	600-1000 SF	high		1000 SF
				236000 SF

Program Description:

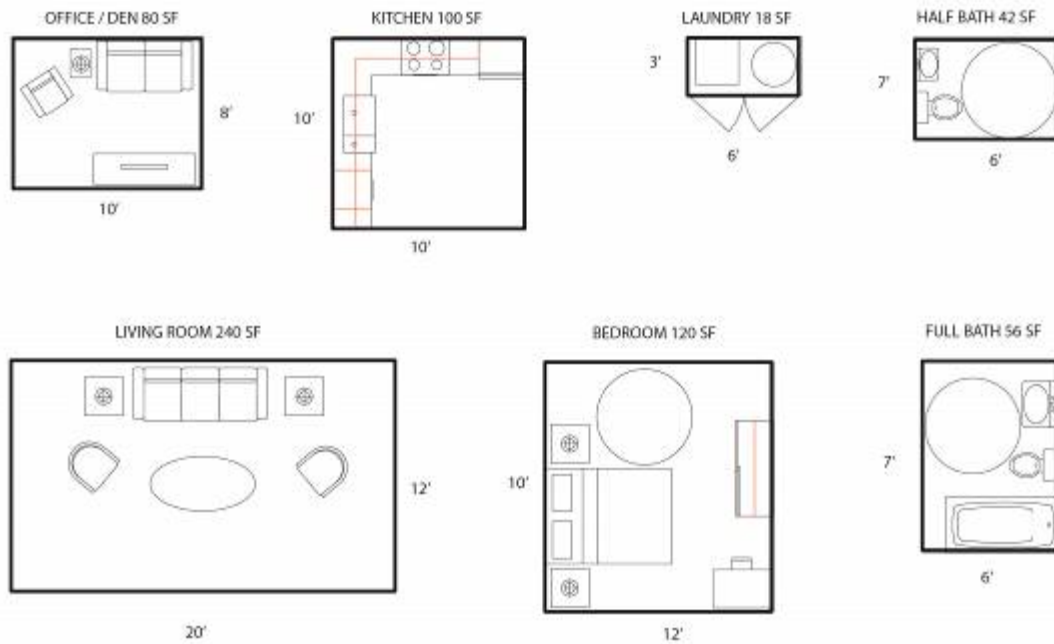


Figure 58 | Residential unit program elements image by author

Main Building

150,000 sq. ft.

The main building will house four floors of residential program with commercial and retail program elements on the ground floor. All levels of independence will be represented in this building. Fully independent, supported independence, and full time care units will be available. Community spaces will be strategically placed throughout the building to ensure community interaction and engagement for all of its residents. The commercial and retail spaces will be chosen based on their benefit to the new community in which they will be serving. The size of the building was based off of the surrounding mill building types. The current length will be 442'' with a width of 101'.



Figure 59 | Hooper Building

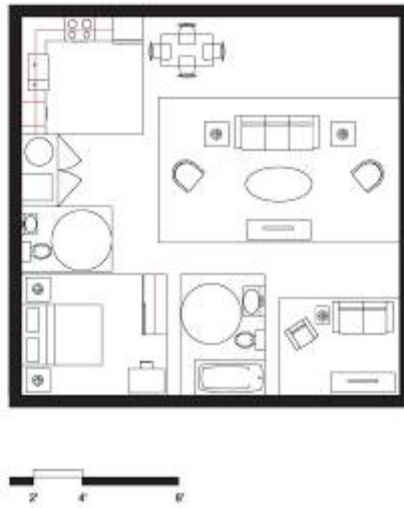
Residential Spaces

There will be a total of 76 units in the Main building. The units will be a collection of one bedroom, two bedroom, and three bedroom living options. The main building will house 124 residents.

One Bedroom

982 sq.ft.

The one bedroom units will comprise half of the available units. A series of open floor plans and plans that create more intimate spaces within the unit will ensure that the needs of both the individuals with ASD and neuro-typical individuals are met. There will approximately be 44 one bedroom units in the housing project.



Bedroom

120 sq. ft.

The 12' x 10' space is able to accommodate a queen sized bed with 2 night tables and lamps. A closet that measures 2' x 12' will also be included in the room.

Full Bathroom

54 sq. ft.

The full bathroom is a 7' x 10' space that contains a 60" x 30" bathtub/shower, a standard size W.C., and a wash basin with counter top. The full bath will also include custom cabinetry that will provide storage for linens and give a place for a hamper to collect dirty clothes.

Laundry / Mechanical

18 sq.ft.

Stacked washer and dryer, 27" x 30" x 80", mechanical unit, and water heater

Half Bathroom***40 sq. ft.***

The half bath should be placed away from the bedrooms and located in the more public area. This bathroom will be for guests and visitors and will provide handicap access.

Living Room***240 sq. ft.***

12' x 20' space. Limiting the amount of distractions (hypersensitivity) within the space and including at least 2 walls without windows or doors to create enclosure.

This space will become the center location of the living unit. A large sofa, end chairs, coffee table, and television will be the main elements within the space.

Office / Den***80 sq. ft.***

The den and office will provide an intimate space that can be for a more quiet environment. In the one bedroom units this space will be a work area with a desk, giving a distinct zone for certain tasks to be performed.

Kitchen***100 sq. ft.***

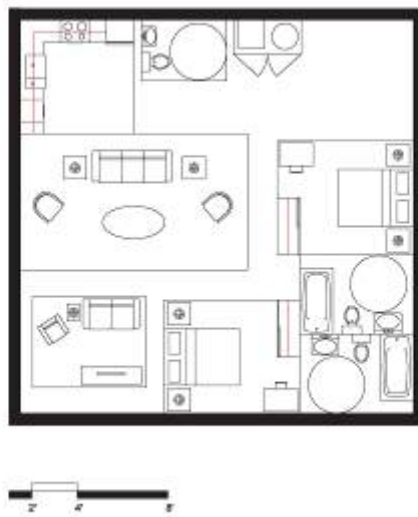
The kitchen will provide full cooking capabilities with counter space and accessible cabinetry. When enough counter space is not possible a small island counter top will be provided.

Dining Space***80 sq. ft.***

A separate space from the kitchen will be provided for eating meals. The dining area will allow for a four person table. A clear distinction of the space should be made from the kitchen and the living room, this can either be with a change in material or a partition.

Two Bedroom***1,200 sq. ft.***

The two bedroom unit represents ¼ of the units in the building. A series of more open floor plans and plans that create more intimate spaces within the unit will ensure that the needs of both the individuals with ASD and neuro-typical individuals are met. There will approximately be 16 two bedroom units in the housing project.



Bedroom (2)

150 sq. ft.

The 15' x 10' space is able to accommodate a queen sized bed with 2 night tables and lamps. A closet that measure 2' x 12' will also be included in the room.

Full Bathroom (2)

70 sq. ft.

The full bathroom is a 7' x 10' space that contains a 60" x 30" bathtub/shower, a standard size W.C., and a wash basin with counter top. The full bath will also include custom cabinetry that will provide storage for linens and give a place for a hamper to collect dirty clothes.

Laundry / Mechanical

18 sq.ft.

Stacked washer and dryer, 27" x 30" x 80" , mechanical unit, and water heater

Half Bathroom***40 sq. ft.***

The half bath should be placed away from the bedrooms and located in the more public area. This bathroom will be for guests and visitors and will provide handicap access.

Living Room***240 sq. ft.***

12' x 20' space. Limiting the amount of distractions (hypersensitivity) within the space and including at least 2 walls without windows or doors to create enclosure.

This space will become the center location of the living unit. A large sofa, end chairs, coffee table, and television will be the main elements within the space.

Office / Den***120 sq. ft.***

The den and office will provide an intimate space that can provide a quieter environment. In the one bedroom this space will be a work area with a desk, giving a distinct zone for certain tasks to be performed.

Kitchen***100 sq. ft.***

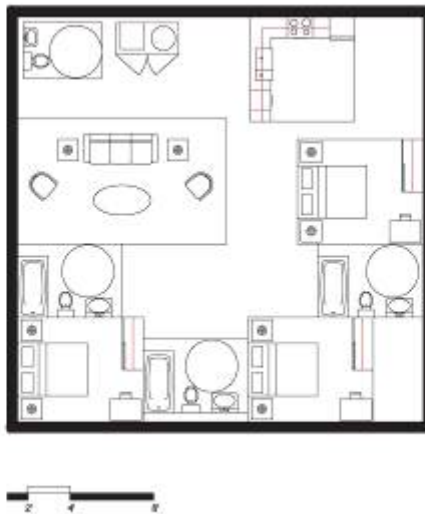
The kitchen will provide full cooking capabilities with counter space and accessible cabinetry. When enough counter space is not possible a small island counter top will be provided.

Dining Space***80 sq. ft.***

A separate space from the kitchen will be provided for eating meals. The dining area will allow for a four person table. A clear distinction of the space should be made between the kitchen and the living room. This can either be created with a change in material or a partition.

Three Bedroom***1,500 sq. ft.***

The three bedroom unit represents ¼ of the units in the building. A series of more open floor plans and plans that create more intimate spaces within the unit will ensure that the needs of both the individuals with ASD and neuro-typical individuals are met. There will approximatley be 16 three bedroom units in the hosuing project.



Bedroom (3)

150 sq. ft.

The 15' x 10' space is able to accommodate a queen sized bed with 2 night tables and lamps. A closet that measure 2' x 12' will also be included in the room.

Full Bathroom (3)

70 sq. ft.

The full bathroom is a 7' x 10' space that contains a 60" x 30" bathtub/shower, a standard size W.C., and a wash basin with counter top. The full bath will also include custom cabinetry that will provide storage for linens and give a place for a hamper to collect dirty clothes.

Laundry / Mechanical

18 sq.ft.

Stacked washer and dryer, 27" x 30" x 80" , mechanical unit, and water heater

Half Bathroom***40 sq. ft.***

The half bath should be placed away from the bedrooms and located in the more public area. This bathroom will be for guests and visitors and will provide handicap access.

Living Room***240 sq. ft.***

12' x 20' space. Limiting the amount of distractions (hypersensitivity) within the space and including at least 2 walls without windows or doors to create enclosure.

This space will become the center location of the living unit. A large sofa, end chairs, coffee table, and television will be the main elements within the space.

Office / Den***120 sq. ft.***

The den and office will provide an intimate space that can provide a more quiet environment. In the one bedroom this space will be a work area with a desk, giving a distinct zone for certain tasks to be performed.

Kitchen***100 sq. ft.***

The kitchen will provide full cooking capabilities with counter space and accessible cabinetry. When enough counter space is not possible a small island counter top will be provided.

Dining Space***80 sq. ft.***

A separate space from the kitchen will be provided for eating meals. The dining area will allow for a four person table. A clear distinction of the space should be made between the kitchen and the living room. This can either be created with a change in material or a partition.

Community Space within the Main Building

Within the main building there will be a series of spaces that are designed to bring all the residents together as a community. These are spaces to which all residents will have access.

Lobby

5,000 sq. ft.

The entry point for the apartments, the lobby will include a security/welcome desk. Sitting areas will also be provided. Directly connected to the lobby will be the elevator lobby and mail room.

Multi-purpose Room

1,500 sq. ft.

The multi-purpose room will act as a flex space for the apartment building. This space can be reserved by residents for parties or can be used as a communal gathering area.

Reading Room

400 sq. ft.

The reading room will be a communal space available to residents where they will be able to read periodicals, newspapers, and books. A collection of lounge chairs and sofas are arranged in a way so that either intimate or more public spaces are available.

Game Room

500 sq. ft.

The game room will be a gathering place for the residents of the building. Pool tables, foosball, and poker tables, are potential amenities in the space. A small collection of high top tables and lounge seating will populate the space. The game room will be able to hold 20-40 people.

Media Room

500 sq. ft.

The media room will provide a small movie theater-like aesthetic. A large projector and screen will be the main elements in the space, which will be able to seat 20 people.

Service Space

Trash / Recycling ***500 sq. ft.***

The service space will contain enough space for two separate containers and truck access. A loading dock will also be located in this space.

Mail Room ***100 sq. ft.***

The mail room will serve the 140 residents in the building. This room will be located on the first floor off of the main lobby.

Elevator Lobby ***50 sq. ft.***

Directly connected to the main lobby.

Community Spaces outside the Main Building

The following program elements will be strategically placed to create a sense of community and ensure that the residential building does not get disconnected from the surrounding city.

Grocery Store ***30,000 sq. ft.***

Smaller than the typical grocery store this program element will house a stream lined selection of goods. Located on the ground floor of the main residential building, the grocery store is to act as a node within the surrounding community activating the surrounding site.

Community Center ***20,000 sq. ft.***

The community center will be similar to a YMCA that provides community gathering

spaces, a fitness facility, and basketball courts. This center will act as a safe place outside of the residential building for individuals with ASD to interact with community members in a controlled environment.

Restaurant

1,000 – 5,000 sq. ft.

A series of small restaurants will also provide another community dynamic to the site. These businesses will also provide healthy food options for the residents that find it difficult to cook on a daily basis.

Retail

600-1,000 sq. ft.

Local business looking for startup locations.

Chapter 4: Design

The thesis project addresses two design problems that support and foster the residents with autism and the surrounding community. Designing a safe community that creates a sense of place and is able to provide job opportunities, volunteer opportunities and opportunities of community engagement will not only benefit the resident with ASD but also the surrounding community of Woodberry which is lowly declining. The fixture of the urban design proposal will be the restoration and conversion of an old manufacturing building initially built for the production of sail cloth into an inclusive residence where ASD individuals will live alongside there neuro-typical peers.



Figure 60 | Proposed Urban Design, image by author

Urban Design Proposal

The WM E. Hooper and Sons Co. manufacturing site is currently disconnected from the rest of the Woodberry neighborhood. The urban design proposal not only will strengthen the community by providing a more diverse building typology and spur economic growth, but it will also directly support the resident of the inclusive housing project occurring in the Hooper building by creating a walkable community where every day amenities can be easily accessed. The first step in this process is reconnecting the site back into the neighborhoods existing street grid. The extensions of Keystone Ave. and Malden Ave. to the south and converting the existing private road of clipper park into a public access will create four new block where preservation and new construction can occur, see figure 61.



Figure 61 | Site Parti, reconnecting the street grid, image by author

There are an infinite amount of possibilities in which the proposed street grid could be formed and the types of buildings that would occupy the new blocks. Each iteration would bring a certain and unique character to the neighborhood. A collection of site iterations can be located in the appendix. In a comparative analysis of the existing street grid and the proposed street grid in figure 62 the disconnected nature of the site is evident.



Figure 62 | Existing and Proposed street grid, image by author

The proposed street grid created 4 zones for preservation and new construction projects that would reinforce the inclusive housing project and the community. In order to maximize the site a process of selective removal had to occur. Of the eight storage and utility buildings located on the site four were selected to remain with modifications that would reinforce the urban design proposal, figure 63. The extensive vetting process was widely based on if the building would be able to be adaptively reused in a positive manner that would reinforce the new independent community.



Figure 63 | Selective Removal, image by author

Diversifying the building typology was the next step in integrating the site back into the community. By creating a mix of small retail spaces, offices, and new residential buildings the site was transformed into a dynamic location for the entire community. The comparison of the existing and proposed site typologies in figure 64 exemplifies this claim.



Figure 64 | Existing and Proposed Site Building Typology, image by author

In order to keep the integrity of the sites history the design decisions made were meant to enhance the existing structure and esthetic of the buildings. For example the warehouse building directly adjacent from the Hooper Building was cut in half to allow for a small commercial retail street and entry plaza into the main residential building. Figure 65 shows the existing facade and the proposed façade of the market building.

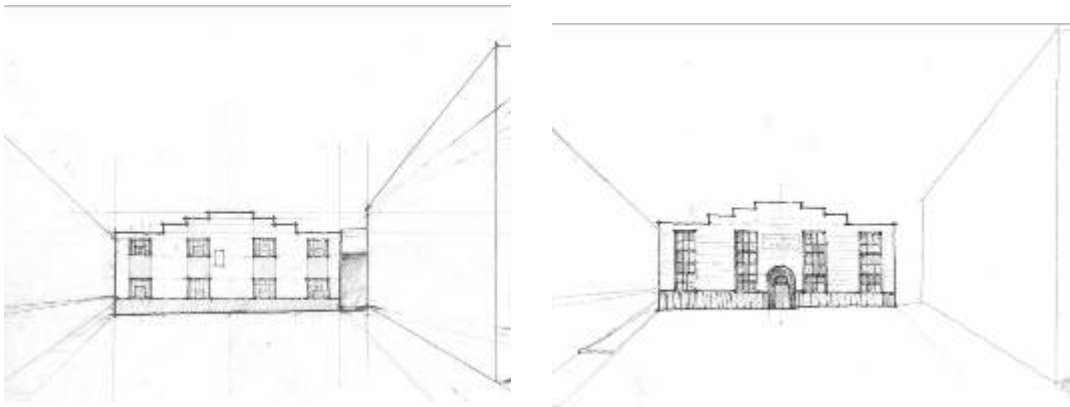


Figure 65 | Existing and proposed Market Building Façade, image by author

By adding a series of single family homes, creating a commercial retail street and creating a series of public gathering plazas that can be utilized by the entire community the site has been transformed into a community amenity that will benefit the autistic resident and the neuro-typical resident. The comparison of the existing site and its proposal in figure 66 demonstrates diagrammatically how the WM E. Hooper and Sons Co. manufacturing site has been opened up to the community.

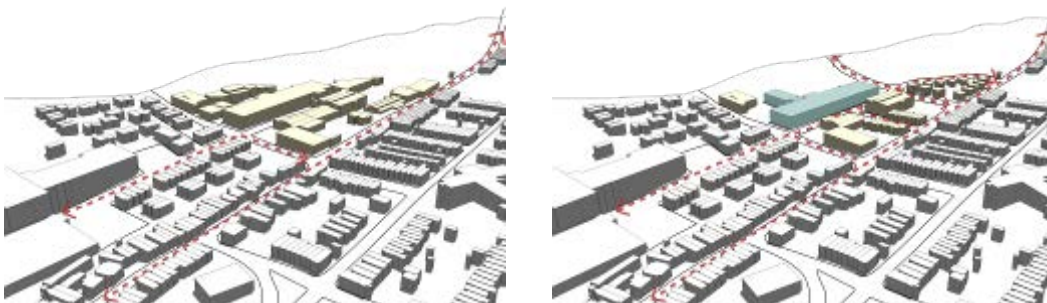


Figure 66 | existing vs proposed site, image by author

Existing Building Documentation

The thesis will be using the main manufacturing building on the site for the inclusive housing project. Figure 67 shows the location and the existing conditions of the buildings with site photos. Built in 1902, the building was initially used for the manufacturing of sail cloth and later canvas for the army during WWII.

Existing Building Images



Figure 67 | Existing building conditions of the Hooper Building, image by author

The building is 442'-6" in length and 101'-0" in width see figure 68. Constructed using heavy timber and masonry walls the building has a total of 162, 8 inch wood columns placed 8 feet on center, figure 69. A total of 4 floors with 16'-4" floor to floor heights, the building stands at 64'-9 1/4", figure 70. Currently the building is divided by gypsum wall board to create office space for small companies. Of the four floors only levels two and three are occupied. It is important to note that

with no central air or heating the building does feel the effects of the seasons through the exterior masonry walls.

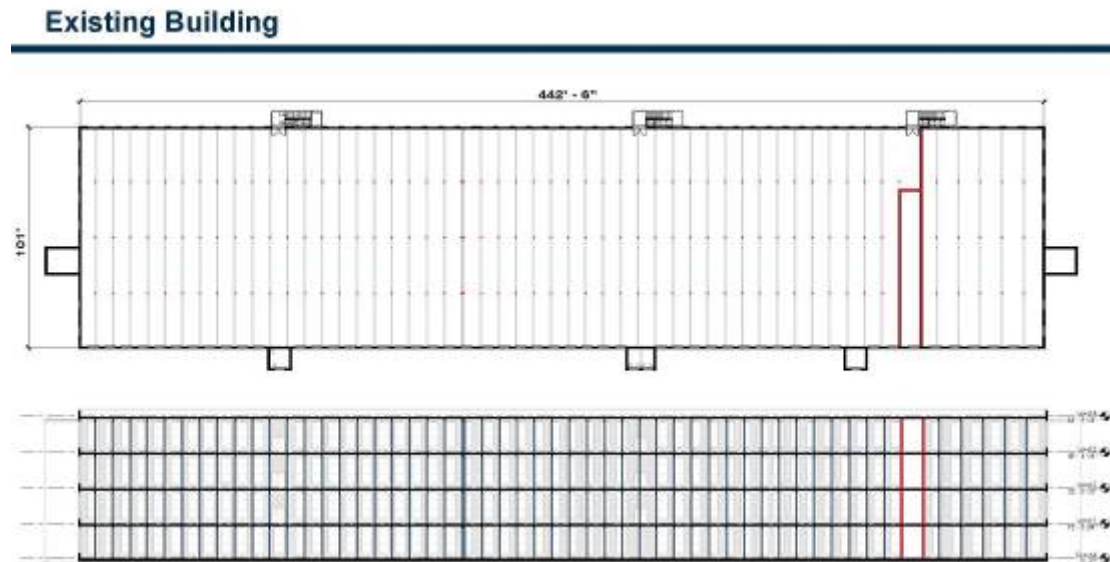


Figure 68 | Existing building dimensions, image by author

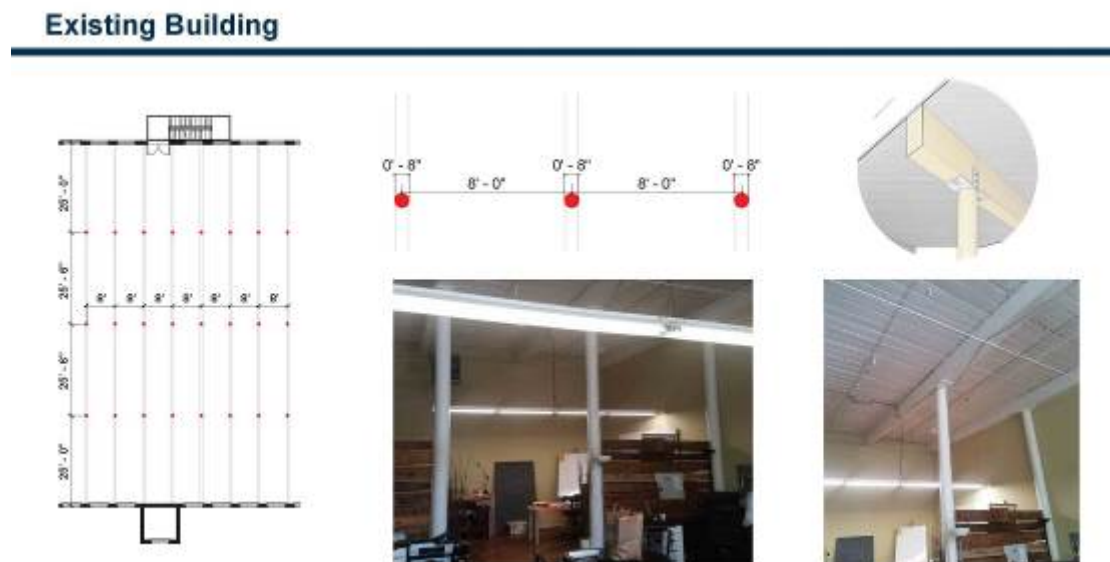


Figure 69 | Existing column detail, image by author

Existing Building

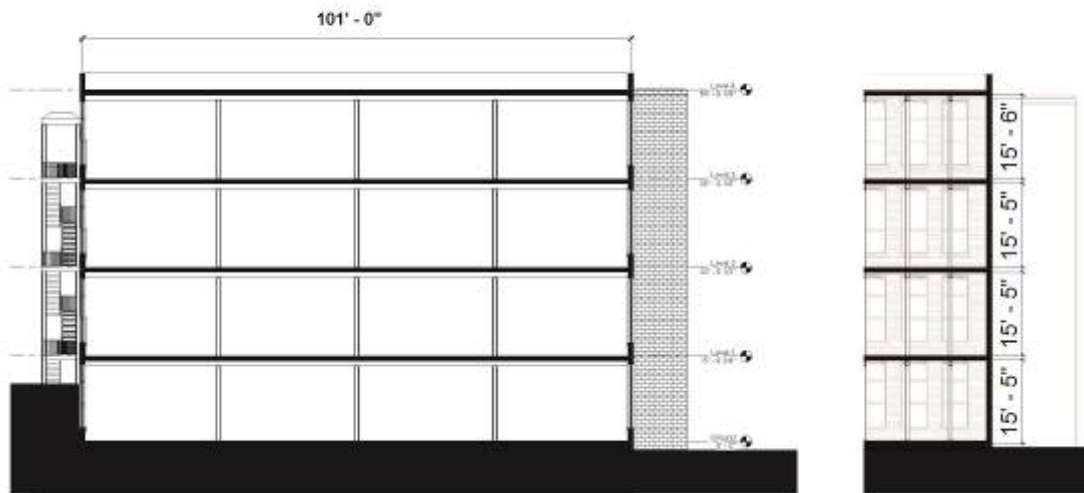


Figure 70 | Existing building height and section, image by author

The building poses several challenges when it comes to being able to transform it into a residential property. The first of these challenges comes from the column grid of the building. The structure was never coordinated with the window placement of the building creating awkward intersection of the two as seen in figure 71. Because of the misalignment, the placement of walls within the building will need to be altered to ensure that each living space receives the required number of windows. Currently the building has 3 generations of windows ranging from the original to two different types of replacements. One of the design decisions will be replacing all windows with more thermally responsive windows that aesthetically resemble the original, see appendix for window and entry studies. The new windows will also reinforce the repetitive nature of the front façade as it will be acting as a back drop for the community gathering spaces created in the urban design proposal.

Existing Building | Interior



Figure 71 | Structure and window conflict, image by author

The second major challenge of the existing building is mitigating the dimensions of the building that were designed for the manufacturing of sail cloth for livable residential units that will respond to the needs of individuals with ASD. In order to achieve this, the implementation of the courtyard was used to investigate double and single loaded corridor schemes, iterations can be found in the appendix.

Hooper Residence Design

The Hooper building will have two main program elements. The first being the primary objective of the thesis in creating inclusive residential units individuals with ASD and their neuro-typical peers. The residential components will be located in the existing Hooper building as well as in the Parkdale wing addition. The second component will be including a series of work studios located on the east wing of the Hooper building and on the ground floor of the Parkdale wing that businesses can rent. All of the businesses that become tenants of the project will become a part of a

work training program where they will help train the residents with ASD with general workplace skills. The breakdown of these spaces and locations is depicted in figure 72.

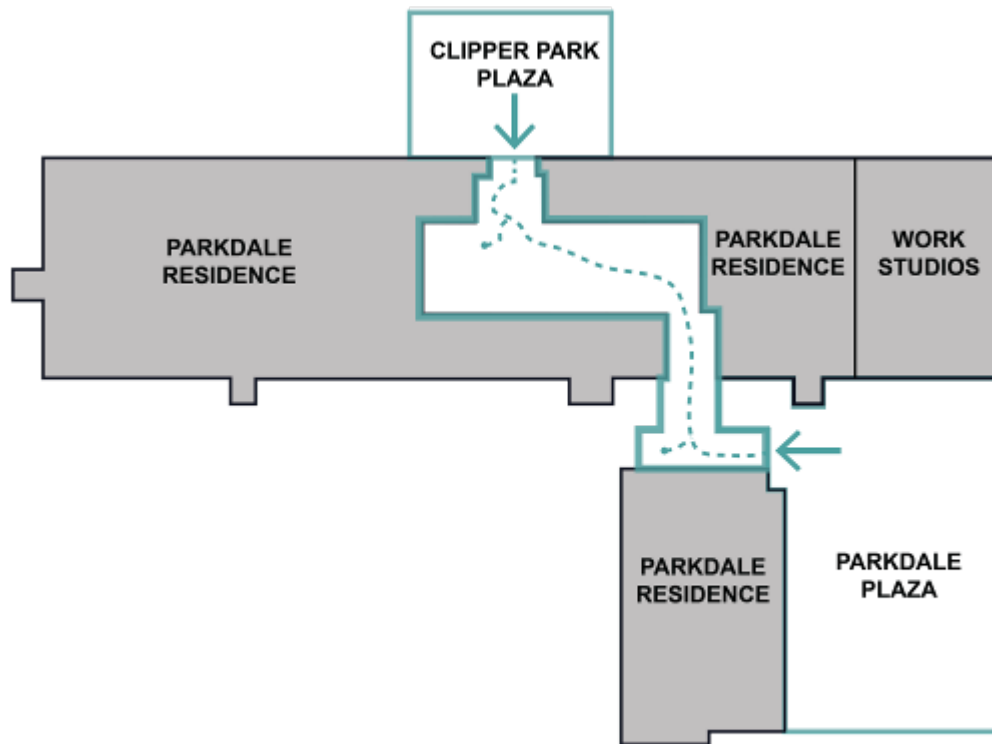


Figure 72 | program spaces

The thesis project will have a total number of 64 units with 107 people living in the building. In order to determine the appropriate and fair number of units that would be allotted for individuals with autism intensive research was conducted into inclusionary and affordable housing where 30 percent of units are typically set aside for residents. The thesis project had set aside 40 percent of its entire units for individuals with ASD. This means 26 units will be for individuals on the spectrum and 43 of the residents will have ASD, figure 73.

The Total Number of Residents

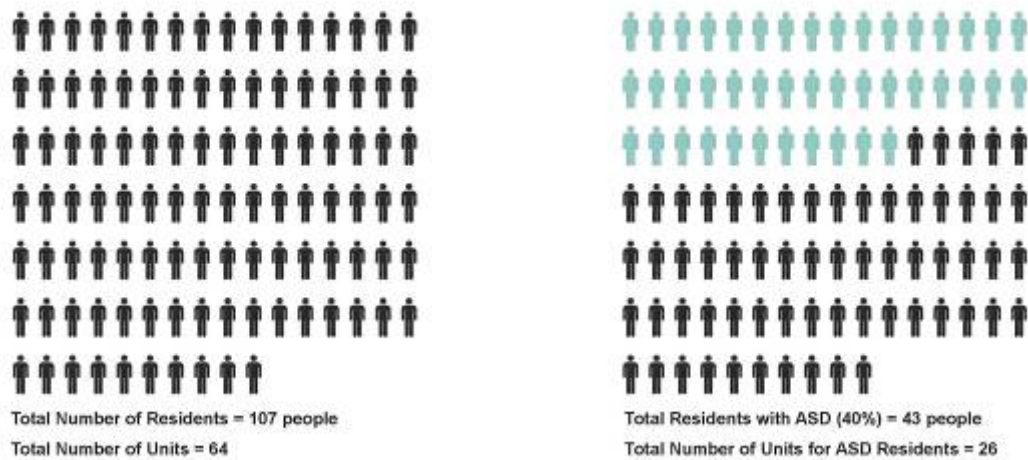


Figure 73 | total number of residents, image by author

One of the key components of the project is its inclusionary objective of residents with ASD living alongside their neuro-typical peers. In order to better understand this concept figure 74 describes four residents, three are on the spectrum and range in ability level and there is one example of a potential neuro-typical resident. Richard is 30 years old with high functioning autism and is ready to experience more independent living. He qualifies for residential supports and will rely on coaches to help him with shopping for groceries, travel to volunteer work, or doctor appointments. He will be able to take pride in being able to have his own space for day-to-day living in the community. Claire is 34 and has Autism. She works part-time and receives financial support from her parents and she is ready to try independent living. Claire is looking for a two bedroom apartment that she can share with her friend from her adult service agency who receives residential support services. Both residents may require assistance from life coaches in the beginning.

Jake is a college student who is studying special education at a local college. As a neuro-typical resident he would gain a better understanding of individuals with ASD by living in a one-bedroom residence in the same building with them. Jake may possible work part-time as the front desk representative. Laura is a resident with high functioning autism and strong social skills, she would like to volunteer as a hall representative. She would be responsible for distributing information which would be of interest to all residents such as notice of scheduled maintenance, and social activities for the building or hall in the common areas.



Figure 74 | the inclusive residents, image by author

The courtyard concept of The Hooper building achieved two major design challenges in the thesis project. It first enabled for the building to be adapted into livable residential units and second it provided secure outdoor space for the ASD resident. The three courtyards in the residential portion of the building and the one atrium in the work studio act as center elements within the building with major

community amenity space and entry points directly connected to them. Figure 75 depicts the central entry diagram concept that the building is conceived around.



Figure 75 | Entry sequence, image by author

The main entry point to the Hooper building is located off of Clipper Park Road at the termination point of the commercial retail street. The plaza space created from the bisected warehouse building directly adjacent from the Hooper building celebrates a portion of the front façade by exhibiting what it will look like straight on rather than from the oblique. The second entry point is located off of Parkdale Avenue and serves as the access point for the residents who will be picked up by alternative modes of mobility. The glass connection between the Hooper building and the new Parkdale wing is the perfect location for the resident to safely wait in a sheltered space for their rides.

The second challenge that the courtyard solved was the mitigation of the original manufacturing dimensions of 442 feet and six inches in length and 101 feet in width and making them suitable for livable residential units. The column grid was

spaced so that there was roughly 25 feet from the exterior walls and each row of columns. Placing the residential units in between the exterior wall and a row of columns enabled the units to have a depth of 23 feet and four inches. Placing the columns in the corridor offset 2 inches from the wall giving the corridor a total width of 4 feet and 10 inches, the corridor has become a rhythmically soothing space only being interrupted by the entrance into a unit. Figure 76 shows diagrammatically how the space is broken up allowing for a central courtyard width of 40 feet 4 inches. The image in figure 76 shows how this would aesthetically look with all corridors overlooking a centrally spaced courtyard.

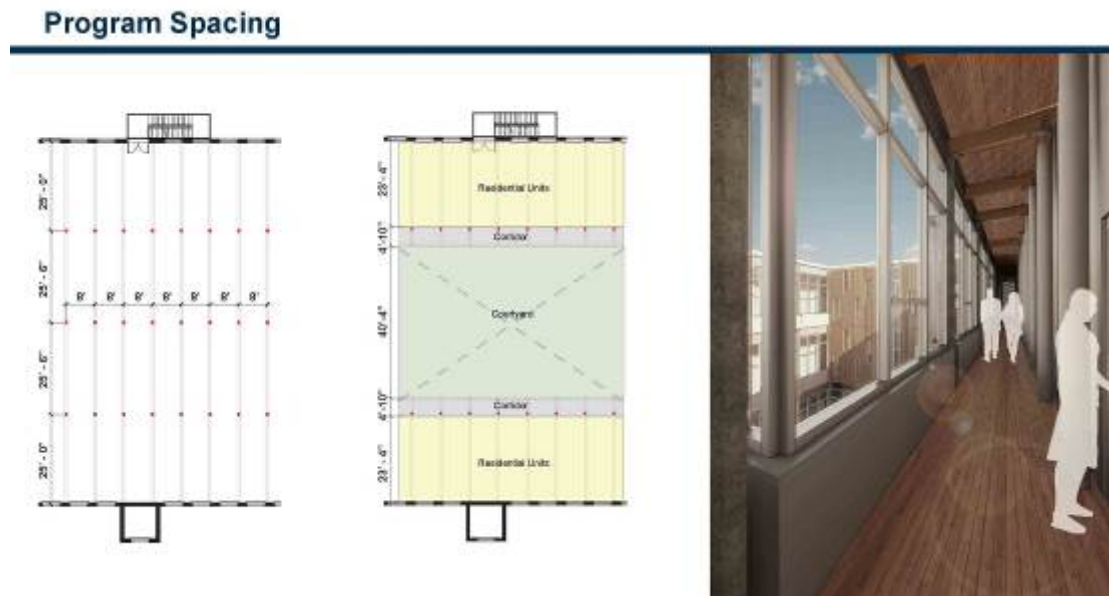


Figure 76 | Courtyard diagram

In order to create the series of four courtyards in both the residential and work studios a new structural system must be proposed to support the loads of the building. When placing the courtyards in the center of the building a large quantity of the

existing columns will need to be removed. To continue the language of preservation the thesis has proposed to purposefully reuse the removed columns on the perimeter edge of the courtyards to aide in the structural support. The location of the reclaimed columns will be celebrated by positioning them so that they will stick into the courtyard and encased in glazing, figure 77. In order to understand this visually figure 78 shows the existing and proposed conditions of the courtyard placement and transversely how the reclaimed columns bring homage to the removed structure and rhythm from the center of the building.

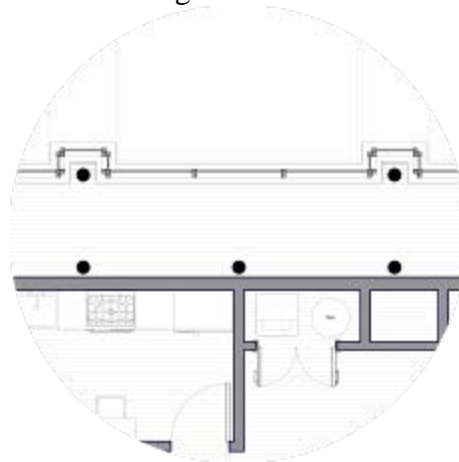


Figure 77 | reclaimed column location, image by author

Courtyard Insertion



Existing interior with proposed courtyard location



Proposed courtyard with removed structure overlay

Figure 78 | Existing and proposed conditions with courtyard, image by author

The spatial sequence and organization of the spaces was a critical element within the design process. With the courtyards acting as the central element of the building all of the major community gathering spaces and community amenity spaces are located around these central nodes. The entry level of the building can also be referred to as the amenity level of the program because it has the fitness center, reading room, media room, and club and game room spaces that are all designed for the interaction between the residents, figure 79. The entry level is also the point in which residents from the Parkdale wing can cross over into the Hooper building.



Figure 79 | entry level, image by author

The plan layouts of the typical floor plans in figure 80 and 81 depict the arrangement of units and their corresponding mezzanine levels. Each level has three scales of social gathering spaces ranging from open, closed, to intimate spaces to allow for choice of interaction for the residents with ASD.

Level Three | Typical Plan



Figure 80 | typical floor plan

Level Three Mezzanine | Typical Plan



Figure 81 | typical mezzanine level

The community spaces are an incredibly important aspect of the design as they act as mediators for the two different population living in the building. These spaces that also include the courtyards also act directional pieces in the layout of the building and informs the users as to where they are and where to locate their unit.

Figures 82-83 depict the major public spaces. Figure 82 shows the club and game room and the main elevator entry overlooking the central courtyard. Figure 83 shows the balcony off of the elevator lobby that is located on floors two and three and the open gathering space for residents at the center point of the building.



Figure 82 | community gathering spaces, image by author



Figure 83 | Courtyard balcony and open community space

Of the total sixty four units there are a total of twenty nine one bedroom units, twenty seven two bedroom units, and eight three bedroom units. The design of the units was heavily based on the separation of stimulus zones described in the program chapter. Taking into consideration as well the spatial organization of the space that clearly describes the intended use if the space. For example instead of having open concept floor plans for the living areas the kitchen had to be enclosed to that the noises and smells could be contained in one space. The enclosure of all the spaces also aides in the residents in understanding the intended purpose of the spaces; the kitchen is for cooking, the dining area is for eating, the living room is for recreational use, and the bedroom is for sleeping. The designation of activity for such spaces will help the residents create a daily routine that will help in their organization and up keep of their apartment. Figure 84-88 shows the collection diagrammatic representation of the different types of the units.



Figure 84 | Hooper building one bedroom unit, image by author

One Bedroom Unit | Parkdale Wing



Figure 85 | Parkdale building one bedroom unit

Two Bedroom Unit | The Hooper Building



Figure 86 | Hooper building two bedroom unit, image by author



Figure 87 | Parkdale building two bedroom unit, image by author



Figure 88 | Hooper building three bedroom unit, image by author

In order to understand the quality of the spaces and the aesthetic nature of some of the living spaces are depicted in figures 89-92. When it came to designing

the quality of the spaces the use of subtle and warm colors were used to create calming environments for the residents.

Living Room



Figure 89 | typical living room looking towards the mezzanine level, image by the author

Living Room from the Mezzanine



Figure 90 | view from the mezzanine looking onto the living room space, image by the author

Bedroom



Figure 91 | typical bedroom, image by author

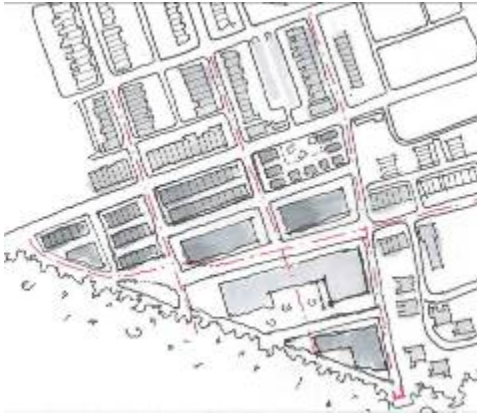
Parkdale Balcony



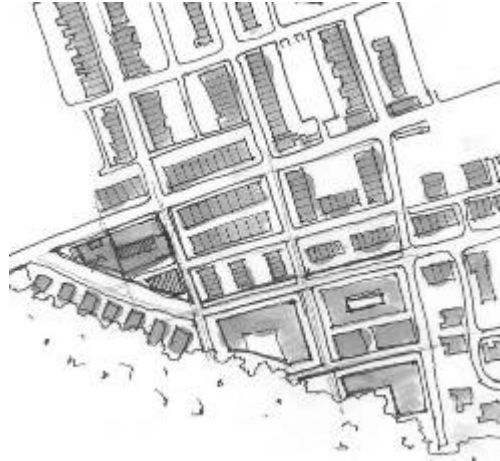
Figure 92 | Parkdale balcony view to Druid Hill Park, image by author

Appendices

Urban Design Iterations:



Site iteration A



Site iteration B



Site iteration C



Site iteration D



Site iteration E



Site iteration F



Site iteration G



Site Iteration H



Site iteration I



Site iteration J



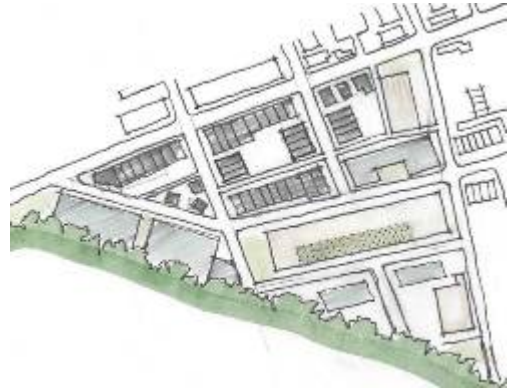
Site iteration K



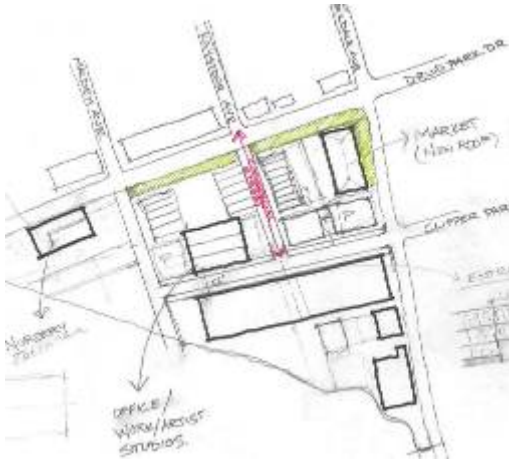
Site iteration L



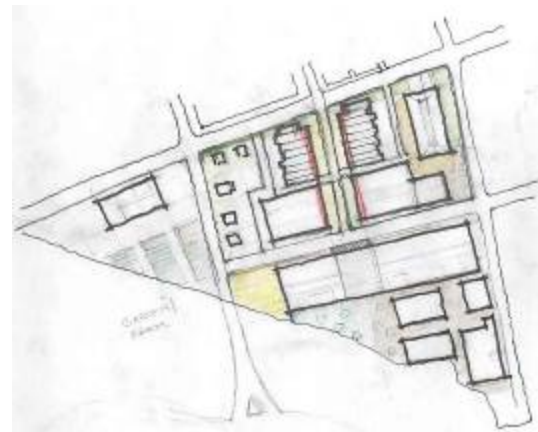
Site iteration M



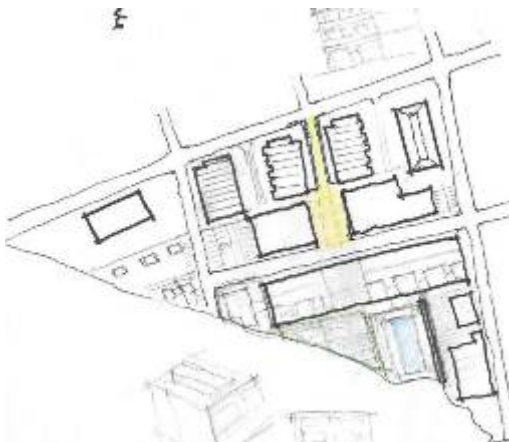
Site iteration N



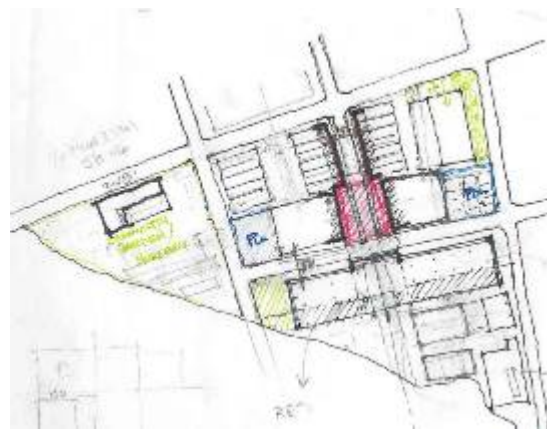
Site iteration O



Site iteration P

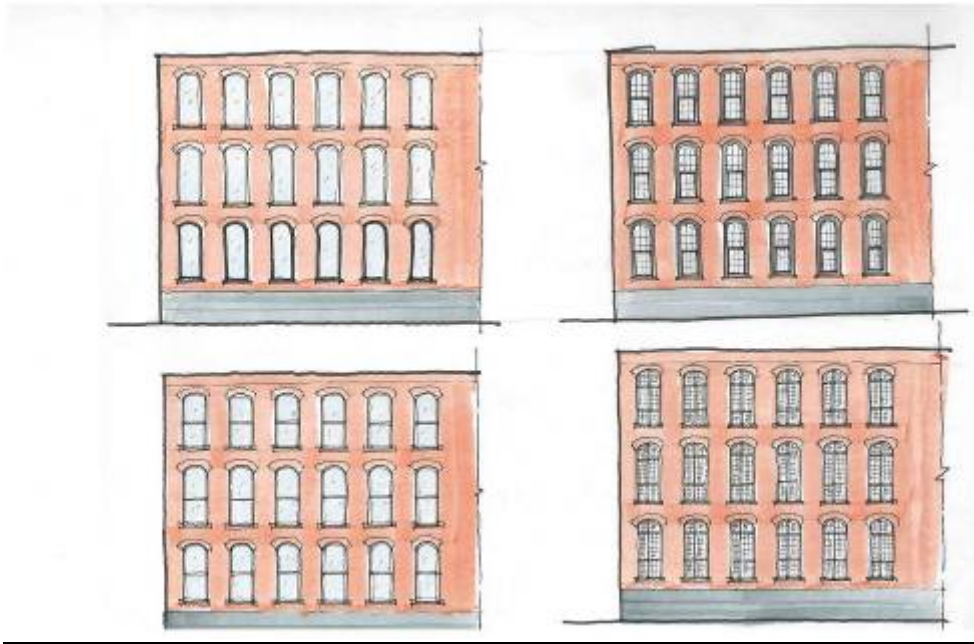


Site Iteration Q



Site iteration R

Window and Entry Studies



Window studies



Entry studies

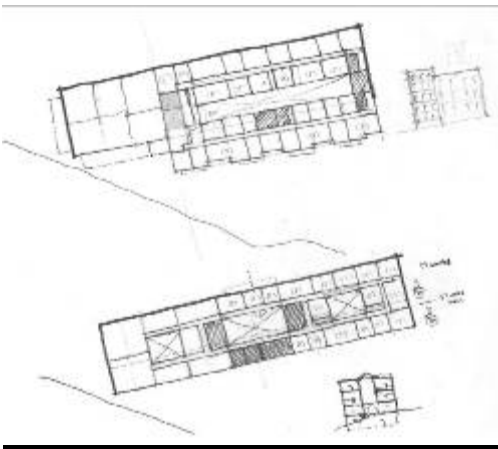
Iterations of the Courtyard



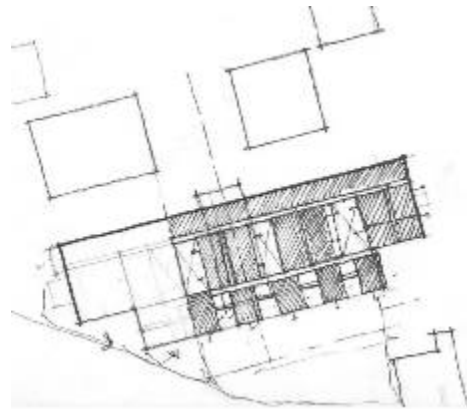
Courtyard study A



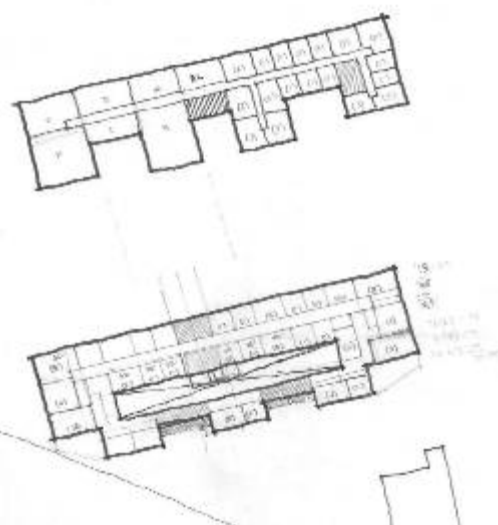
Courtyard study B



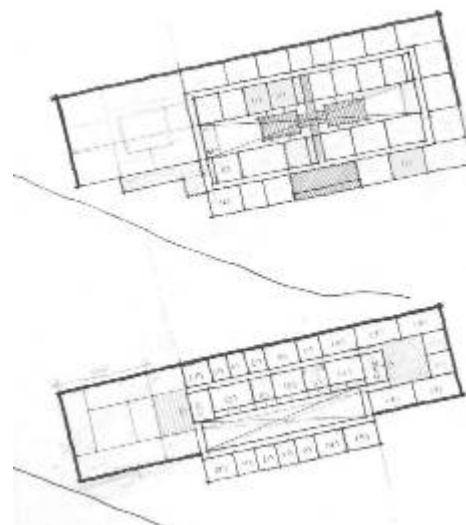
Courtyard study C



Courtyard study D



Courtyard study E



Courtyard study F

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