ABSTRACT

Title of Thesis:	ADAPTIVE PLAY: A PLACE OF HEALING & LEARNING
	Paula Fuenzalida Coronado, Masters of Architecture 2017
Thesis Directed By:	Clinical Associate Professor, James Tilghman, School of Architecture, Planning, and Preservation

For many years the disabled community has been secluded from our every day surroundings due to severe impairments and lack of adaptable environments. This is an issue that has fortunately begun to see progress in the early education systems taking place throughout the United States. In more recent years we have seen an increased involvement of school systems providing inclusion programs at the beginning stages of children's development. Unfortunately architecture has not fully embraced this issue in order to provide spaces that are mindful of this diversely unique population of children. This thesis will explore architecture as a means to provide a space for children of all disabilities, and without, to interact and learn from one another at an early age in order to create an environment of inclusion within communities.

ADAPTIVE PLAY: A PLACE OF HEALING & LEARNING

by

Paula Fuenzalida Coronado

Thesis submitted to the Faculty of the Graduate School of the
University of Maryland, College Park, in partial fulfillment
of the requirements for the degree of
Master of Architecture
2017

Advisory Committee:
Professor James Tilghman, Chair
Professor Brian Kelly
Professor Ronit Eisenbach

Dedication

I would like to dedicate this thesis to my younger brother and hero “Roro”, who has taught me to persevere through the struggles of life with never-ending happiness and love. [AADC Awareness]

Acknowledgements

Thank you,

To God, for with Him all things are possible.

To Jamie Tilghman [Thesis Chair], for all your guidance and insight throughout this year. You have pushed me to never stop sketching and I am forever grateful for that.

To Brian Kelly [Committee member], for always making each meeting so enjoyable and full of new insight.

To Ronit Eisenbach [Committee member], for your fresh perspective at each review and especially for your loving support and hugs.

To my family, for all of your love and support throughout this journey. Special thanks to my husband, Raul Coronado, for pushing me when I needed it most, and to my parents for truly being an inspiration of perseverance for this thesis. I could not have done this without all of you by my side.

Finally, thank you to my classmates for your help and inspiration. Special thanks to Karen Kim for your graphic advice and help with renderings, Nicole Akpedeye for your support, and Diane Bickel for taking notes through thesis reviews.

Table of Contents

List of Figures

List of Abbreviations

IDEA	The Federal Individuals with Disabilities Education Act of 2004.9
IEP	Individualized Education Program
ADA	American Disabilities Act

Introduction

It is difficult to understand the situations of those with disabilities when one is fully capable of doing everyday activities. The experience of these individuals and their involvement in society today is at most times disrespected and even left unacknowledged. This thesis began with a very personal experience involving children with disabilities and the inclusion difficulties they face as their families struggle to locate places of healing and learning. Having personally been a part of a family with this struggle, it is clear that this is a common issue for families around the world and that there is a greater social problem that needs to be addressed. Early intervention programs provide the resources and services for this special population at an early age, but inclusion and a sense of understanding from the community is essential to promote this sense of inclusion.

Chapter 1: What is **Disability**?

Defining Disability

Our world consists of an infinite amount of diversities that make our interactions and relationships with one another so rich. However, the diversity of disabilities has been difficult for society to learn and interact with. In 2010, 19% of the United States population included individuals with disabilities.[1] This special population has dealt with issues of social inclusion throughout many years and like with most issues, it is important to deal with the issue early on. In 2010, there were 53.9 million school-aged children (aged 5-17) in the United States civilian non-institutionalized population (people residing in the 50 states and DC who are not inmates of institutions, and who are not on active duty in the Armed Forces), of which 2.8 million were reported to have a disability. Therefore approximately 5.2% of the United States population consisted of children with disabilities. The two locations with the highest percentage of children with disabilities in metro areas include the District of Columbia with 8.4% and Puerto Rico with 9.8%.[2]

Since there are varying types and combinations of disabilities it is essential to understand what is defined as a disability. IDEA is the Federal Individuals with

[1] US Census Bureau Public Information Office. "Nearly 1 in 5 People Have a Disability in the U.S., Census Bureau Reports - Miscellaneous - Newsroom - U.S. Census Bureau." US Census Bureau Public Information Office. Accessed November 04, 2016. https://www.census.gov/newsroom/releases/archives/miscellaneous/cb12-134.html.

[2] United States. DC Action for Children. Early Intervention and Special Education in DC for Children Ages Birth to 5. By HyeSook Chung. July 7, 2013. Accessed October 18, 2016. https://www.dcactionforchildren.org/content/new-early-intervention-and-special-education-dc-children-ages-birth-5.

Disabilities Act, which specifies several definitions of disabilities terms, all of which help provide conditions that define children's specific disabilities and needs. The IDEA defines a disability as being diagnosed with, "physical or mental conditions that have a high probability of resulting in developmental delay." Some conditions include being, "evaluated as having mental retardation, a hearing impairment (including deafness), a speech or language impairment, a visual impairment (including blindness), a serious emotional disturbance, an orthopedic impairment, autism, traumatic brain injury, any other health impairment, a specific learning disability, deaf-blindness or multiple disabilities, and who, for that reason, needs special education and related services."[3]

History

The history of people with disabilities began with unfortunate circumstances as they were seen to be abnormal to society's standards. Society has also viewed the population of children almost as a minority group because of their obvious dependence on elders and lack of independence in contributing to society. There is an interesting double paradox that must be considered between valuing children's lives yet not recognizing them as individuals.[4]

Although in the Middle Ages infanticide was considered a sin by the church, rather than expose them, these children were likely to be abandoned or if fortunate

[3] United States. United States Census Bureau. School-aged Children with Disabilities in U.S. Metropolitan Statistical Areas: 2010. By Matthew W. Brault. Washington, D.C.: U.S. Dept. of Commerce, Economics and Statistics Administration, U.S. Census Bureau, 2011. 1-8.
[4] Safford, Philip L., and Elizabeth J. Safford. A History of Childhood and Disability. New York: Teachers College Press, 1996.

enough would be entrusted to the care of others. In these societies there was a fear of the "mark of the devil" which could have been a blemish, cleft palate, clubfoot, or having more or less than the usual number of fingers. Children born with abnormalities were considered changelings, or children of fairies, which were substituted with a stolen child. Then in the early 20th century, children with retardation were receiving special care, but were still considered a danger to society.[4] The extreme case during the Nazi regime revealed a gross number of extermination and infanticide because of a discriminatory ideal of the human race, which would immediately eliminate those without ideal conditions.

Many societies with persons with disabilities had been granted dignity, but the shift in Western culture from extermination to ridicule became apparent earlier on when the Romans purchased humans with physical deformities for amusement, Dwarfs kept by emperors as jesters, and "fools" as entertainment for the wealthy.[5] Today ridicule is seen in the form of jokes, related to physical and cognitive impairments, as socially acceptable. These are commonly, "expressed in colloquialisms, cartoon characterizations, and even such aberrant practices as 'dwarf tossing'."[5] Slowly society is becoming more sensitive to the situations of these people and many initiatives are being created to address the issues they face.

Fortunately, the conditions of nurture have changed, "but a child's inability to choose the circumstances of birth and upbringing has not."[5] Social conditions and demographics play a large part in the opportunities available to children with and

[5] Safford, Philip L., and Elizabeth J. Safford. A History of Childhood and Disability. New York: Teachers College Press, 1996.

without disabilities and are much more relevant to consider as they leave the school setting and into society. Involving children with disabilities more effectively inside and outside school will provide them with abundant opportunities of engagement and learning within their communities.

Current Initiatives & Programs

Several Programs in the United States have been put in place to insure the accessibility to education, transportation, and the built environment. Several standards such as the ones listed by the American Disabilities Act (ADA) have become mandatory as of 2012.

The Federal Individuals with Disabilities Education Act of 2004 (IDEA) is responsible for regulating and funding the education for children with delay and disabilities between the ages of 0 and 21. An essential part of their related programs is called Early Intervention, IDEA Part C, which "regulates and funds comprehensive, coordinated, multidisciplinary statewide systems that provide early intervention services for infants and toddlers with disabilities and developmental delays and their families."[6] These services are designed to meet the developmental needs of an infant or toddler with a disability and the needs of the family in order to appropriately assist their child's development. This is a crucial step in providing the necessary services early on in their development so that we may begin to see positive growth and learning.

In the Washington D.C. area, early intervention programs such as Strong Start provide early intervention therapy and other services for infants and toddlers with

disabilities and developmental delays and their families in agreement with IDEA Part C and District of Columbia Public Law 1-2-119, which, "mandates that infants and toddlers with disabilities and their families receive coordinated services early enough to make a difference. These services must be flexible, culturally responsive, and most importantly, meet the needs of the child and the family."[6] DC Action for Children has been a great advocate for DC's children in addressing the deteriorating conditions in DC. This non-profit organization strives to break the cycle of poverty through early interventions in the lives of the youngest children.

IDEA Part B, or Special Education, "regulates and funds free and appropriate public education for children with disabilities ages 3-21 that emphasizes specialized education and related services designed to meet their unique needs and prepare them for further education, employment and independent living."[6] Individualized Education Programs are part of IDEA Part B, which specifies the needs of children between the ages of 3-21 and what special education and related services are necessary to meet those needs. Since each child with a disability deals with unique conditions, IEP becomes an essential program for these children to have the ability to learn despite their conditions. These programs are hopefully a continuation of Early Intervention and focus on specialized services for children and older entering the school system. Integration into the school system allows children with disabilities to

[6] United States. DC Action for Children. Early Intervention and Special Education in DC for Children Ages Birth to 5. By HyeSook Chung. July 7, 2013. Accessed October 18, 2016. https://www.dcactionforchildren.org/content/new-early-intervention-and-special-education-dc-children-ages-birth-5.

become more socially involved with other children by providing the opportunity for interaction and learning between all children.

Chapter 2: What is Missing?

Programs and policies for children with disabilities have all attempted to provide equal opportunities within the public education system, but unfortunately there are still issues of segregation, inaccessibility, and sometimes unavailability of help. As described by the ARC, a DC organization begun by groups of parents of mentally disabled children, segregation of these children from classrooms is still an issue despite having the IDEA in place. Many of these students are put in self-contained classrooms or in separate schools, with few to no opportunities to participate academically and socially in a general education classroom and other activities.[7] Organizations such as DC Action for Children has found that research consistently shows that early intervention programs help reduce the need for concentrated special education once children are in school yet families of children with delays or disabilities in DC are still finding it difficult to identify and access available services and supports.[8] Although improvement of education and programs for children must be addressed, accessibility of the urban environment must also be improved to reinforce an overarching solution to inclusion in society.

Issues of accessibility within the city have also begun to be addressed. Although the ADA requires almost all building types to provide accessible built

[7] "Public Policy and Legal Advocacy." Education Issues for People with Disabilities. Accessed November 4, 2016. http://www.thearc.org/what-we-do/public-policy/policy-issues/education.

[8] United States. DC Action for Children. Early Intervention and Special Education in DC for Children Ages Birth to 5. By HyeSook Chung. July 7, 2013. Accessed October 18, 2016. https://www.dcactionforchildren.org/content/new-early-intervention-and-special-education-dc-children-ages-birth-5.

environments, the issue of accessibility has become more of a requirement rather than a social issue we can improve through design. The 2013 essay titled "The Architect and the Accessible City" by Sophia Bannert, brings attention to the incoherencies of architectural discourse with social and ethical needs of the contemporary city. The author experiences a day in the life of a wheelchair user and finds several issues with physical and social obstacles. Her insightful conclusion states that: "Egalitarianism is vital to successful accessibility for all. We need designs that are not inherently discriminatory and will facilitate security, access, equality and dignity, regardless of physical or mental ability."[9] Paired with the essay, Figure 1 shows a strong depiction of the issues faced with accessibility in society today, both physical and social.

Figure 1: The Accessible City
Source: archdaily.com

[9] Bannert, Sophia. "A Day in the Life of a Wheelchair User: Navigating Lincoln." Berkeley Prize Essay Competition. Accessed November 04, 2016. http://berkeleyprize.org/competition/essay/2013/winning-essays/bannert-essay.

As a result the question: “how can architecture address issues of inclusion in education, outside social settings, and in our cities and built environments to improve the lives of children with disabilities?” is formed. The difficulty of social integration is clearly seen in the lives of people with disabilities therefore, if early intervention programs and environments are provided early in children’s lives, inclusion could be considerably improved in their futures. It is essential to focus on improving current inclusion issues in each environment and on the needs of this special young population throughout this thesis in order to provide a responsive and impactful design solution.

Chapter 3: Where is there a Need?

Site Selection

As stated in Chapter 1, there is a large population of children with disabilities in the District of Columbia, therefore the following is a comparison between two potential sites in DC that were studied for this specific design proposal. This analysis includes an exploration of accessibility, parks/green spaces, character of the urban setting, and proximities to health and education facilities, and concentrated populations of children. This analysis also considers the relevance of these issues as they relate to the design of an inclusion-focused urban children's community center for children with and without disabilities. Figure 1 describes the concentration of the total child (under 18) population within the neighborhoods of Washington, DC, as described by US Census data collected by the DC Action for Children organization, which strives to improve the lives of DC children and families by providing research and policy leadership[10]. Figure 2 describes the specific neighborhoods selected to locate the design proposal. Since the proposed building is aimed to serve children can help serve and support the dense population within the Columbia Heights and Union Station neighborhoods in DC.

[10] "Where Resources and Well-being Vary in DC." Data Tools 2.0. Accessed October 19, 2016. http://datatools.dcactionforchildren.org.

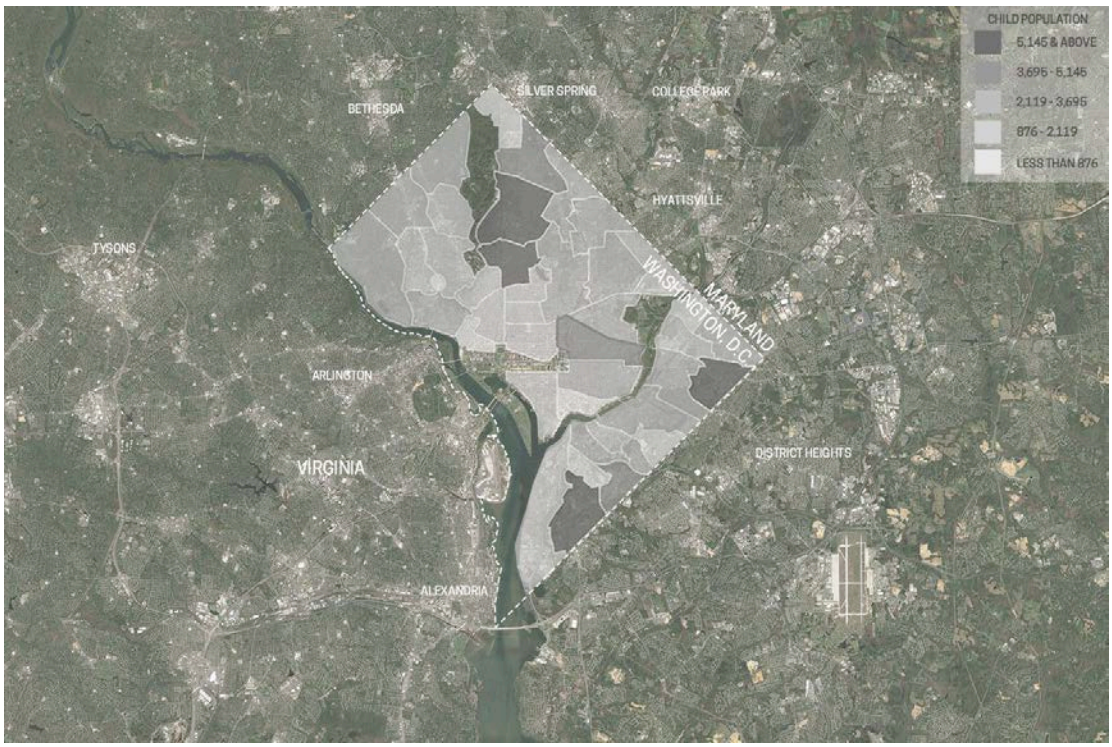

Figure 2: Child Population Concentration in DC Neighborhoods
Source: Basemap – Google Earth, Diagram – Author, Data – DC Kids Count Data Tools 2.0

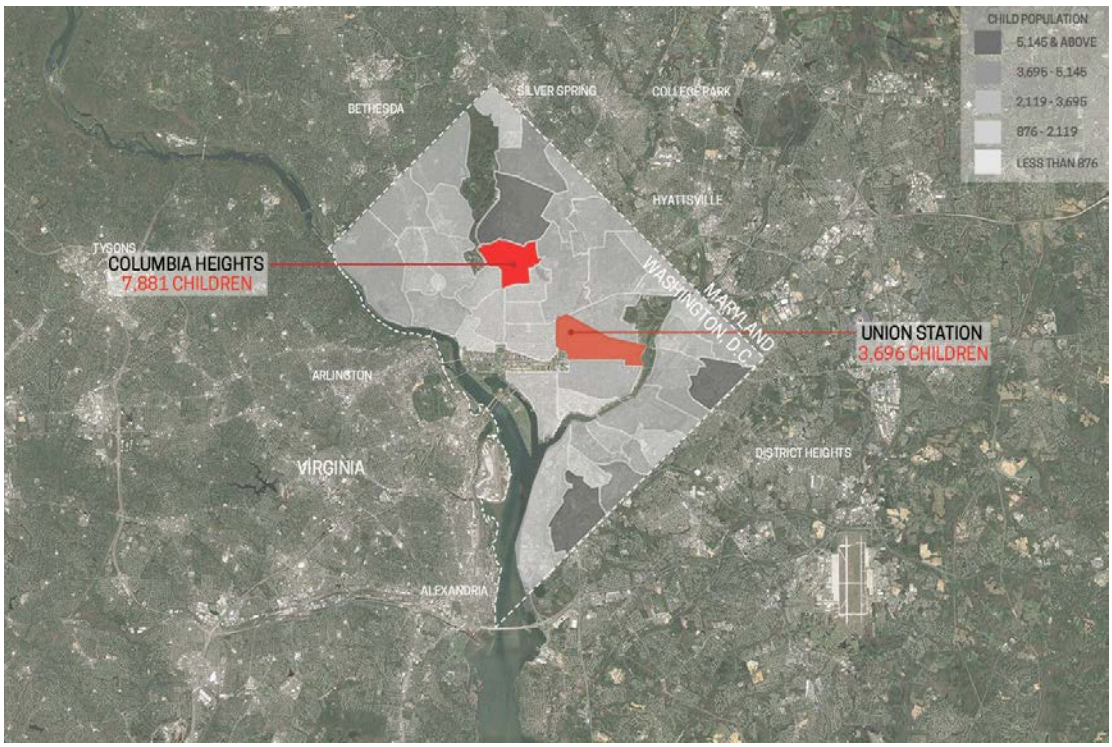

Figure 3: Concentration of Children in Columbia Heights & Union Station Neighborhoods
Source: Basemap – Google Earth, Diagram – Author, Data – DC Kids Count Data Tools 2.0

Site 1: Columbia Heights

The Columbia Heights has a seen a great deal of development throughout the years. Today it is becoming known as a growing retail and commercial center with significant amount of medium-density residential. The neighborhood's diversity goes back to the early 20th century when several African American communities began to move in because of its adjacencies to the thriving black communities of Shaw and U Street. At this time, development was beginning to increase to create an urban center and additions of larger apartment buildings. Today the neighborhood is continuing to develop and it has become a diverse center of not only people (Figure 2), but also of its buildings. Historic rowhouses and small shops are mixed with higher density apartment buildings and retail, which allows for diversity to dominate the character of this neighborhood.

This site is surrounded by a dense residential fabric surrounded by several elementary schools and only two public charter schools with special education programs embedded into the urban blocks (Figure 3 & 6). This offers young and diverse users the opportunity to interact with each other from general education schools and neighborhood settings. The site is also in close proximity to two major health institutions, National Children's Hospital and Howard University Hospital (Figure 3 & 6), and provide health and safety precautions for all children, but could more specifically assist children with severe disabilities quickly. This is a very accessible site, with three different metro stops and several nearby bus stops, all approximately 5 to 15 minute walking distances as depicted in Figure 4. As shown in Figure 5, the site sits between a diverse urban fabric, landscaped green spaces, and

medical institutions that offer opportunities to create a design that connects these urban, natural, and institutional settings.

Figure 4: Demographic Breakdown of Columbia Heights
Source: DC Kids Count Data Tools 2.0

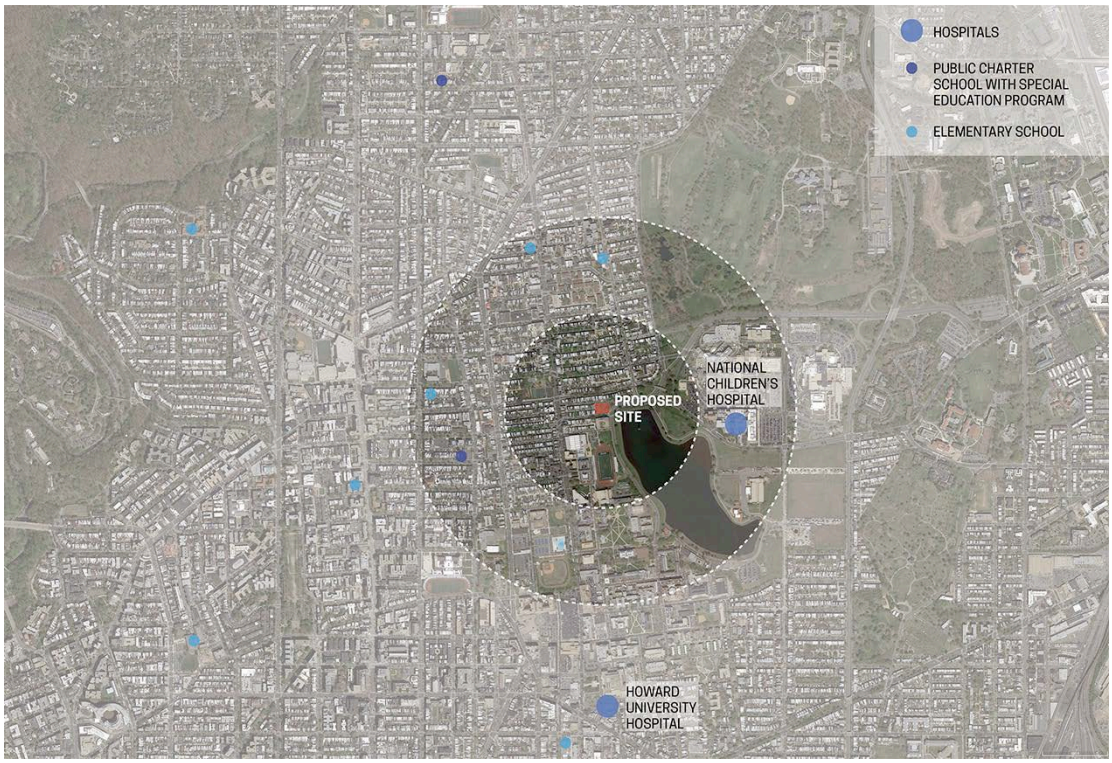

Figure 5: Proximity to Hospitals & Schools
Source: Basemap – Google Earth, Diagram – Author

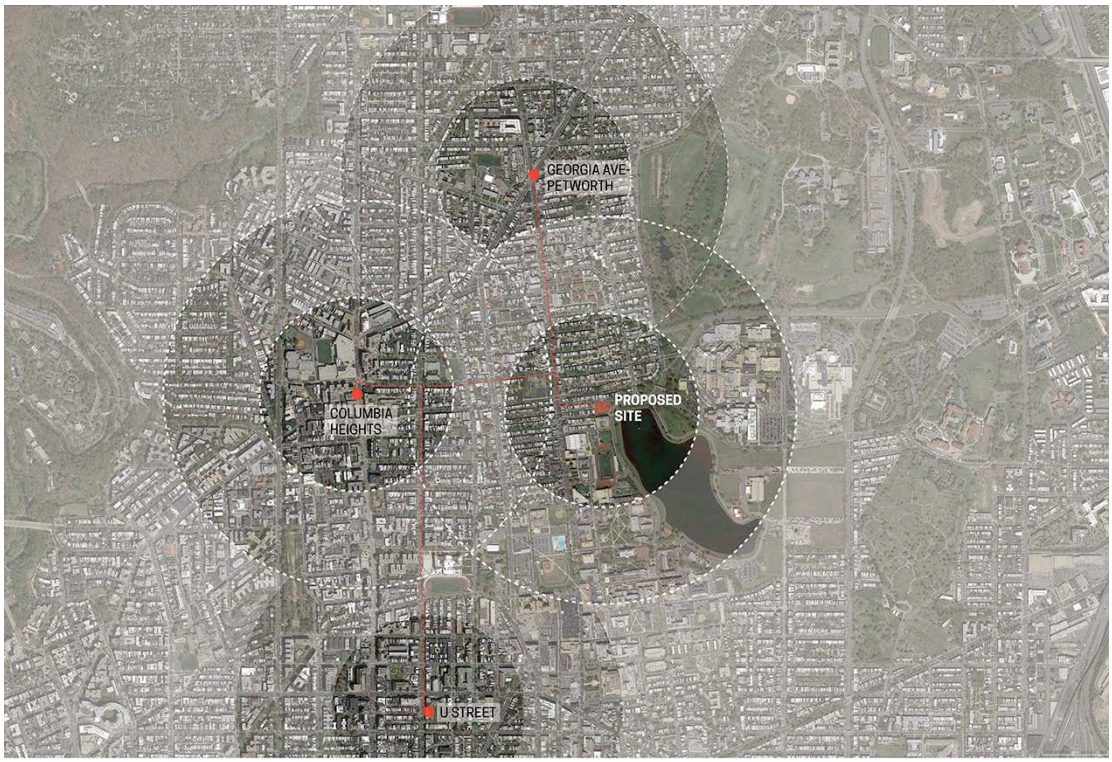

Figure 6: Accessibility to Metro Stops
Source: Basemap – Google Earth, Diagram – Author

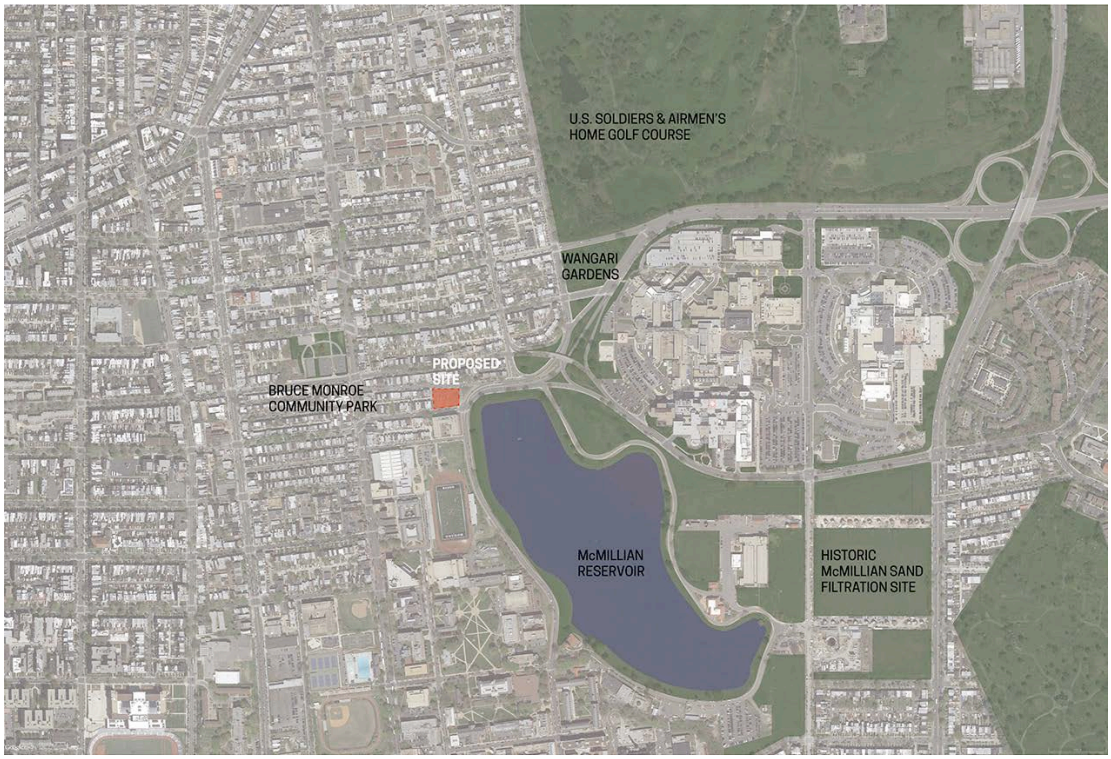

Figure 7: Mediator Between Urban, Landscape, & Institutional
Source: Basemap – Google Earth, Diagram – Author

Figure 8: Proximity to Schools & Hospitals
Source: Basemap – Google Earth, Diagram – Author

Proximities to medical facility/hospitals could potentially, as stated above, provide health services for children with more severe disabilities or in any emergency, but could also attract users in these facilities outside of their rooms. This site is also nearby multiple facilities that are both knowledgeable of and interact with people with disabilities, as shown in Figure 7. Association to a children's community center could create a unique learning environment through new interactions and relationships with professionals and other age groups with disabilities. The concentration of art programs and organizations South of the site (Figure 8) is another opportunity that could provide partnerships between a proposed community center. This center could begin to include therapeutic art workshops with children with and without disabilities that could involve teaching, learning, and displaying art with these community organizations.

Figure 9: Disabilities Involved Organizations
Source: Basemap – Google Earth, Diagram – Author

Figure 10: Potential Art Program Partners
Source: Basemap – Google Earth, Diagram – Author

Figure 11: Proposed Site at Columbia Heights
Source: Google Earth, Diagram – Author

Site 2: Union Station

The selection of the Union Station Neighborhood site was guided by its proximity to the transportation center juxtaposed by the concentration of surrounding residential neighborhoods (Figure 14). Throughout history there has been a major shift in demographics, where in 1990 there was a majority of African Americans to 2012 where there has been a more balanced concentration of White and African American populations.[11] Figure 9 shows the demographic of children, which supports this change. This is a slight difference compared to the Columbia Heights site where the majority of the child population consists of Hispanics and African Americans (Figure 9).

Proposed development of Union Station imagines H Street as a new commercial epicenter for the city, with a transportation hub being the core connector between the cities of Richmond and Baltimore (Figures 10-12). The proposed expansion and redevelopment would essentially do for Washington what Grand Central Terminal did for New York.[11] This would directly affect the proposed site as shown in Figure 17, and could potentially bring more attention to this community center as a catalyst for changing inclusion in this neighborhood.

This site is also surrounded by a dense residential fabric and several elementary schools; all of which have a direct connection and relationship with recreation centers (Figure 16). This could potentially be a conflict with the

[11] Pearlstein Steven Pearlstein, Steven. "Reimagining Union Station." Washington Post. Accessed November 04, 2016. http://www.washingtonpost.com/sf/business/2014/09/12/reimagining-union-station-2/.

community center since there are several of these facilities that provide recreation and activities for children within this community. This could also be an opportunity to provide another type of program, whether it is specialized recreation or art workshops to create a community hub of inclusion along this new axis of redevelopment and community.

An essential relationship from the proposed site is to iconic and influential special education facilities, Gallaudet University for Deaf Students and Michael Graves' design for St. Coletta of Greater Washington for special education and autistic children. Both of which could be potential collaborators to this community center (Figure 13). Connections to the Mall and the city's green spaces through its well defined urban grid can also be made stronger at the node connection created at the proposed site as shown in Figure 15. A community center could bring residents and children in this neighborhood together to create a learning environment of inclusion with the help of nearby special education professionals and students. Proposed redevelopment can also bring new amenities and potential partnerships and relationships within the community, which could bring many of the issues of disability inclusion to the public eye.

Figure 12: Demographic Breakdown of Union Station
Source: DC Kids Count Data Tools 2.0

Figure 13: Diverse Ages of Building Use around Union Station
Source: The Washington Post: Reimagining Union Station

Figure 14: Proposed Development around Union Station
Source: The Washington Post: Reimagining Union Station

Figure 15: Before & After Rendering of Union Station
Source: The Washington Post: Reimagining Union Station

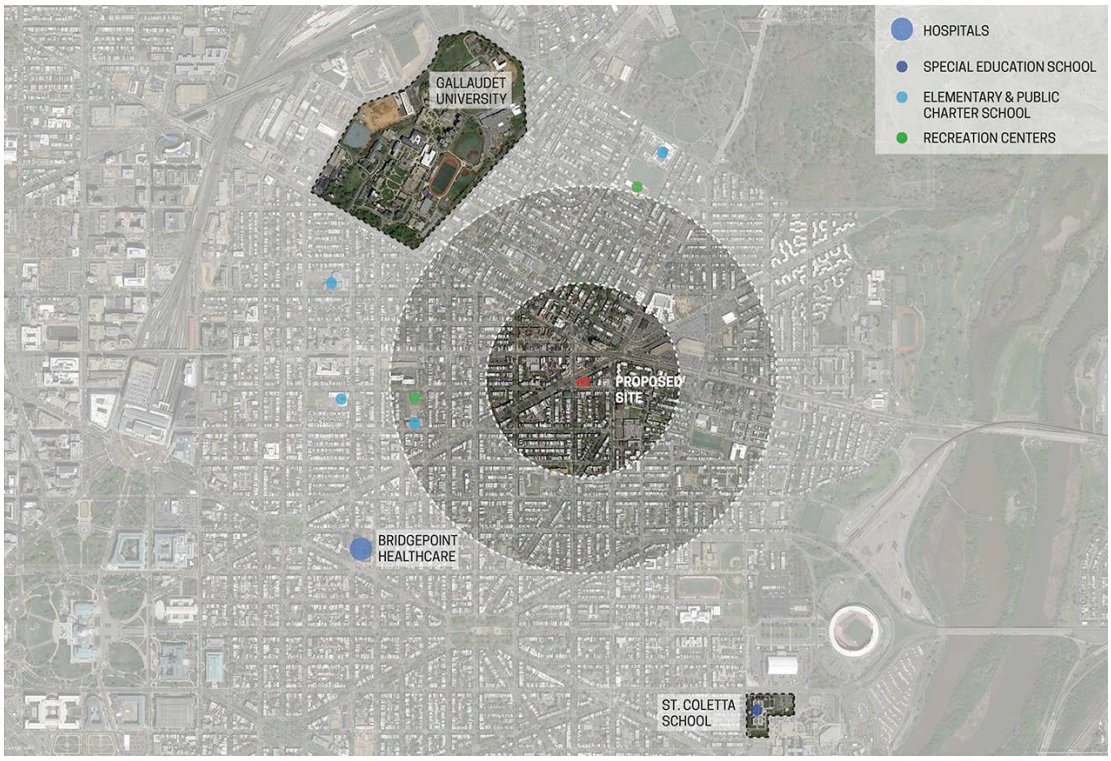

Figure 16: Proximity to Schools & Medical Center
Source: Basemap – Google Earth, Diagram – Author

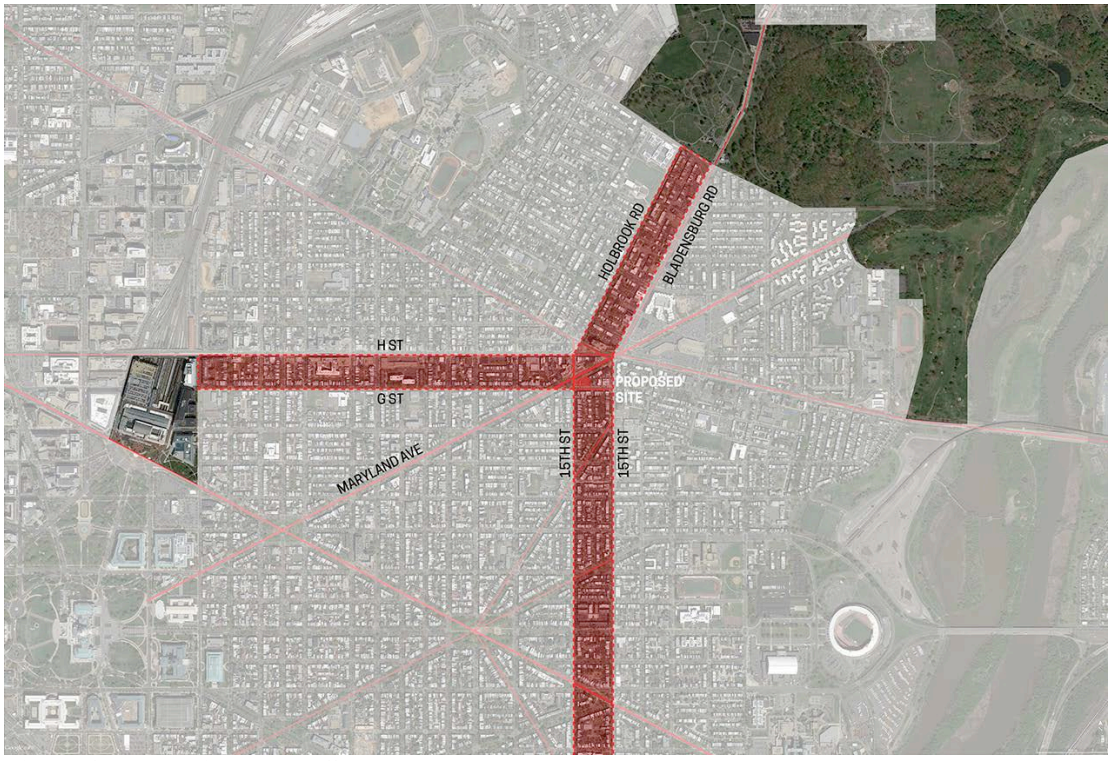

Figure 17: Potential Urban Connectors
Source: Basemap – Google Earth, Diagram – Author

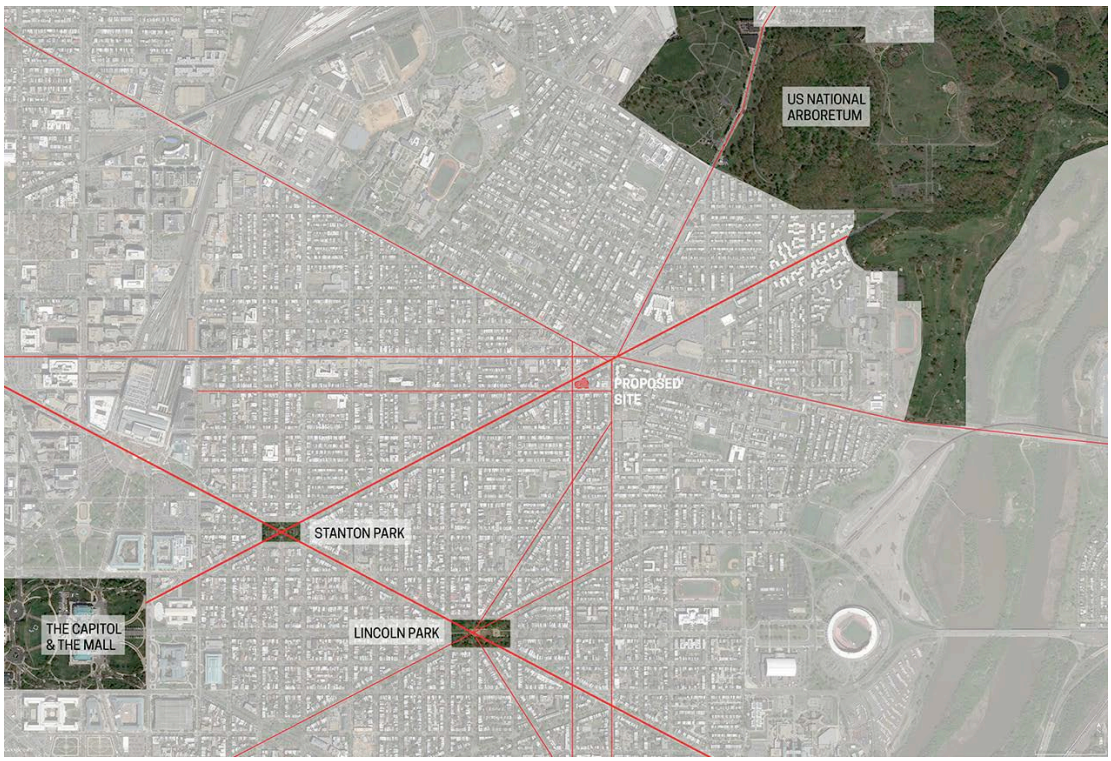

Figure 18: Connections to Green Spaces/Parks
Source: Basemap – Google Earth, Diagram – Author

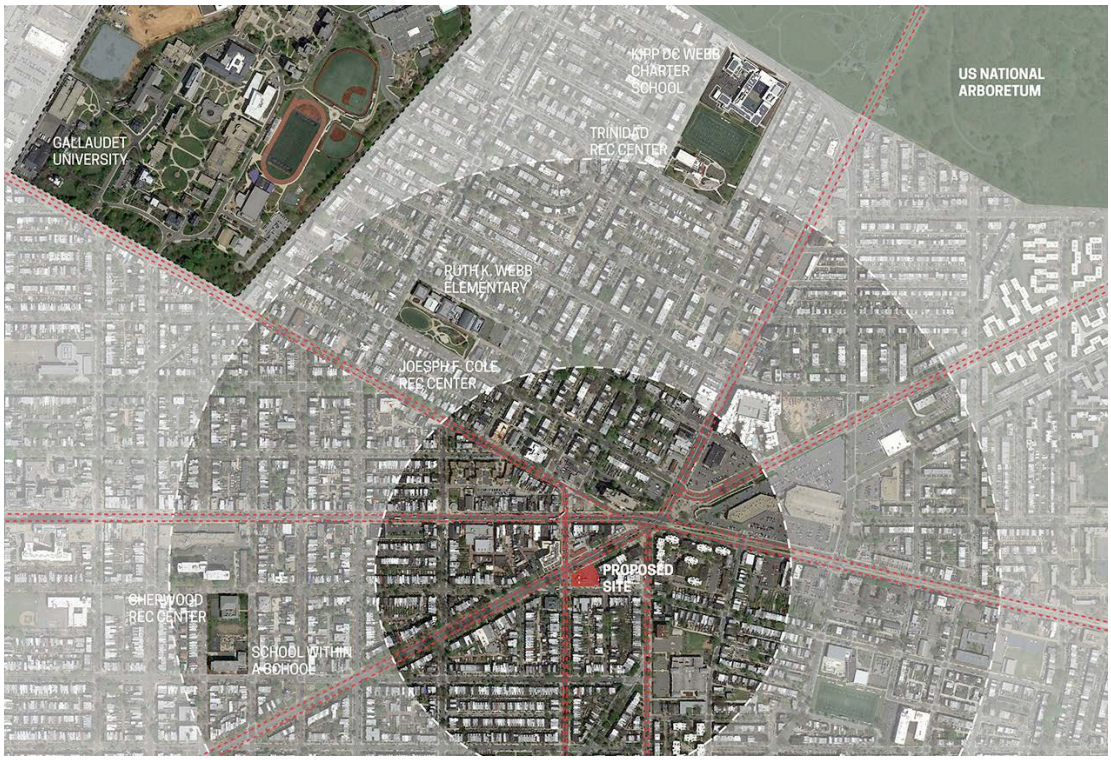

Figure 19: Potential Users and School to Rec Center Relationships
Source: Basemap – Google Earth, Diagram – Author

Figure 20: Future Retail/Commercial Redevelopment in Relation to Site
Source: Basemap – Google Earth, Diagram – Author

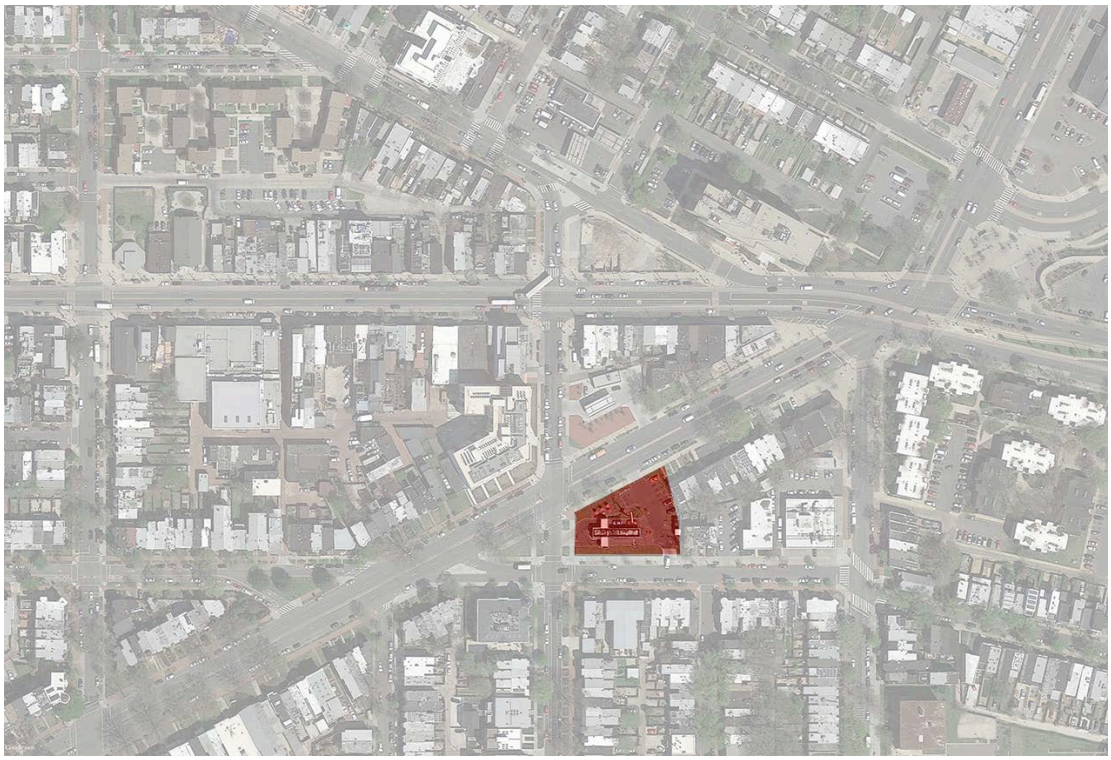

Figure 21: Proposed Site at Union Station
Source: Basemap – Google Earth, Diagram – Author

Opportunity

The Columbia Heights and Trinidad sites both present a great amount of opportunities for a site, and potential center, that engages communities of children and disabilities. Based on the analysis of accessibility, urban connections, and, most importantly, surrounding potential partnerships at the educational, medical, and community levels, the Columbia Heights (Howard University) site was selected for further analysis and development. This analysis can be seen in Figure 19. There is an overall high level of potential community, medical, and mixed urban and residential development in this site, but lacks special education centers or centers with people with disabilities, where the Trinidad site has both Gallaudet University North of the site and St. Coletta School South of the site. This presents a greater need for the design proposal to engage the community of children in the Columbia Heights neighborhood.

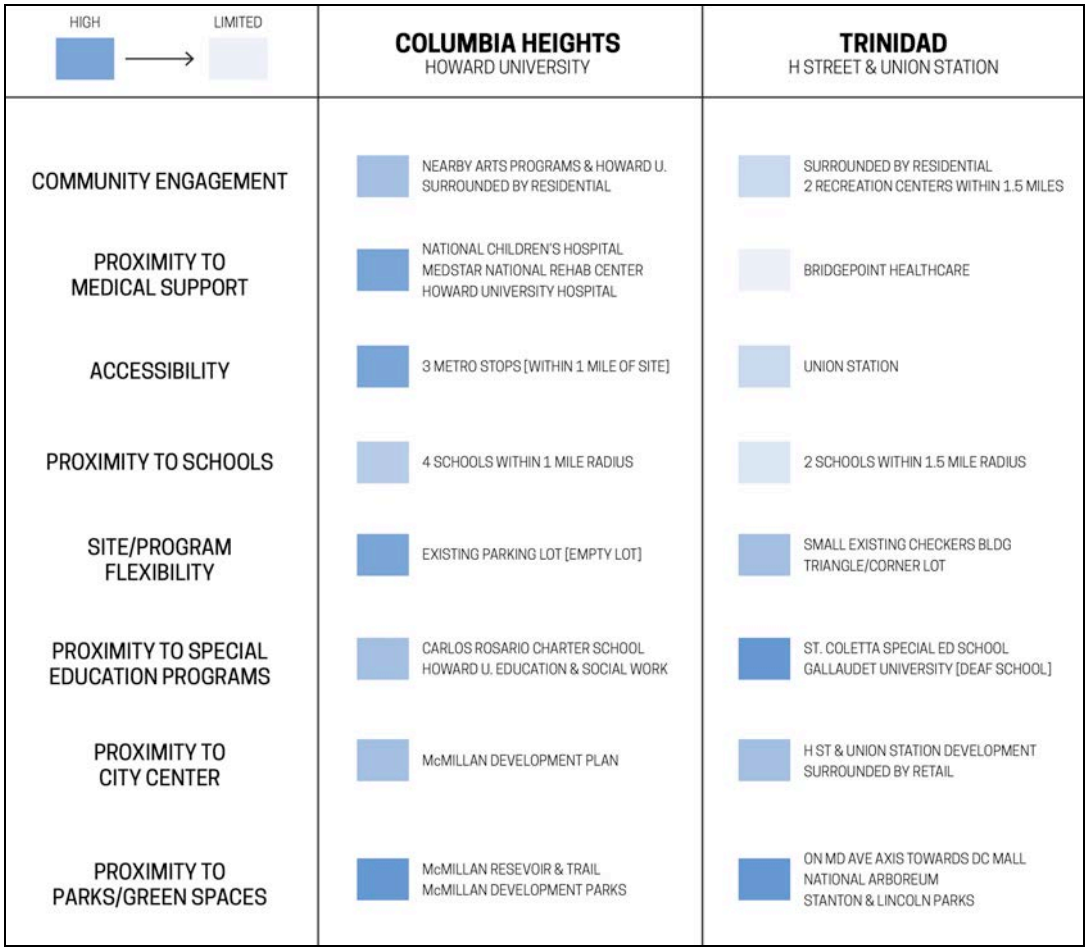

Figure 22: **Site Scorecard**
Source: Author

Chapter 4: Unique Conditions

Types of Disabilities

There are multiple disabilities that affect people throughout the world. Each person is uniquely affected. With different variations and even severities of symptoms, it makes it difficult to define a person's condition in simple terms. As discussed about in the first chapter, disability can be defined as having a physical or mental condition that results in developmental delays. In the case of this research, it will be important to consider specific disabilities in order to address specific needs and potential architectural solutions. Looking at the information collected by the US Census Bureau in 2010 on Figure 20, it is clear that cognitive disabilities are common in US metro areas.[12] Force4 Architects provides an example of this analysis and selection for a design competition that addresses the disability populations they wanted to provide a universal solution for in threshold designs. The diagram shown on Figure 21, demonstrates several conditions and the needs and potential solutions associated with each one with the ultimate goal of universal design.

Learning environments for children are treated with special care due to their young and active conditions. The same environments for children with disabilities also require an additional set of considerations to ensure their comfort and effectiveness in learning environments. Kaplan Early Learning Company has created

[12] United States. United States Census Bureau. School-aged Children with Disabilities in U.S. Metropolitan Statistical Areas: 2010. By Matthew W. Brault. Washington, D.C.: U.S. Dept. of Commerce, Economics and Statistics Administration, U.S. Census Bureau, 2011. 1-8.

several educational programs that consider the unique needs of each child. Kaplan suggests, “Children with a learning disability, speech or language disorder, hearing or visual impairment, physical disability, autism spectrum disorder (ASD), attention deficit hyperactivity disorder (ADHD), or other type of impairment may need special accommodations or modifications in the classroom.”[13] Figure 25 demonstrates the types of learning conditions that will ensure an effective and comfortable environment for each disability and the similarities between some of these conditions. It is essential to understand these conditions throughout this thesis in order to ensure the center includes these efficient and inclusive learning environments.

[13] "Adapting Classroom Environments for Young Children with Special Needs." Adapt Classroom Environments for Special Needs Children | Kaplan Early Learning Company. Accessed April 10, 2017. https://www.kaplanco.com/ii/classroom-environment-special-needs.

Figure 23: Concentration of Disability Types in Children in the United States
Source: US Census Bureau, 2010 Survey

Figure 24: Accessible Everyday: Disability Conditions/Needs Matrix
Source: Force4 Architects

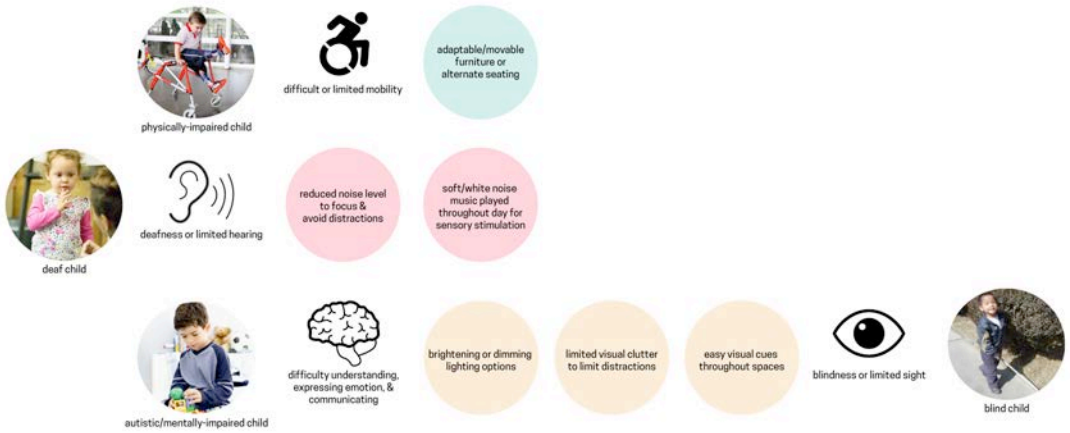

Figure 25: Special/Efficient Learning Conditions for Children With Disabilities
Source: Diagram – Author, Information – www.kaplanco.com

Potential Partners and Users

The location of this site in the DC neighborhood of Columbia Heights allows for a diverse community of people to begin important conversations. Howard University/Hospital and National Children's Hospital are major institutions that are located near the site, which could provide professional, educational, and medical assistance for the users of this building and therefore be a part of the healing process. Therapists and aides/assistants are also closely involved in the healing processes of children; therapists exclusively during therapy sessions and aides/assistants assist individual children throughout the school day.

Local non-profit organizations such as DC Kids Count and DC Action for Children could also be involved within this center to offer insight on early intervention programs and their development in the future. The site is also located within the Howard University campus and provides students from the School of Nursing & Health, School of Social Work, School of Education, and School of Medicine the opportunity to learn and understand the needs and conditions of these children and improve upon in their professions.

Since these children require specialized types of teaching techniques special education teachers and other early education professionals would ensure an effective environment of learning for all children. Close groups such as family members, friends, and even neighbors are encouraged to enter this center to support these children. Although this group of users is providing support and bringing these children into the center, their involvement also spreads the awareness of this special population's needs within the community.

Figure 26: User Analysis and Relationships
Source: Author

Chapter 5: Precedent Analysis

The following analysis explores a range of projects that engage focused design for children, people with disabilities, or both. This research will provide a better understanding of design that is mindful and innovative in creating spaces for both children and those with disabilities. While these projects each have a distinctive scale and context, this analysis explores the similarities and differences in program in order to provide the necessary tools in a healing and learning environment for this unique population of children and children with disabilities.

St. Coletta School, Michael Graves (2006)

St. Coletta opened the St. Coletta Special Education Public Charter School in Washington, D.C. in September 2006. The 99,000 square foot school was designed by Michael Graves to serve students with intellectual disabilities, autism, and secondary disabilities.[14] The special education school serves students from Washington, D.C., Virginia, and Maryland and vary from three to twenty-two years of age. These students must be diagnosed with intellectual disabilities, autism or multiple disabilities and have minimum of 24.5 hours of special education services on their IEP. Many students may also have secondary disabling conditions such as speech language disorders, vision or hearing impairments, orthopedic impairments, health impairments, and behavior disorders.[14] The programs the school provides include a variety of therapies such as: hydrotherapy, assistive technology, music and

[14] "St. Coletta of Greater Washington." St. Coletta of Greater Washington - About the School Program. Accessed December 10, 2016. http://www.stcoletta.org/index.php?page=school-program-2.

art therapy, parent training, and several others, as shown in Figure 20. The school's philosophy focuses on, "the importance on building on and celebrating individual strengths," all of which aim to give students the opportunity to receive a high school certificate upon graduation.[14]

An important issue St. Coletta aimed to solve from the beginning of its inception is the struggle of finding an education system that works for children with disabilities, "in a city that seemed insensitive to the needs of the children." As a result, the colorful, simple-formed building seen today demonstrates the people it serves, as it is a fun, playful, and inviting building inside and out (Figure 21).[15] The central atrium plays with color and light enhanced by arched ceilings and multiple skylights[16], shown in the left image on Figure 22. This playful arrangement of light, color, and form is continued throughout the building seen in the right image on Figure 22. The arrangements of spaces within the building, particularly the classrooms, are distinctively formed along the central atrium, shown in Figure 23. The five classrooms house students according to age, ranging from age three to twenty-two, and are considered "houses" rather than classrooms to play on the concept that the building's distinctive forms resemble the D.C. neighborhood townhouse. The ideas of St. Coletta School not only provide an architectural model for special education, but

---

[15] Sveiven, Megan. "AD Classics: St. Coletta School / Michael Graves." ArchDaily. November 15, 2010. Accessed December 10, 2016. http://www.archdaily.com/88771/ad-classics-st-coletta-school-michael-graves.

[16] "St. Coletta of Greater Washington." Michael Graves Architecture & Design. Accessed December 10, 2016. http://michaelgraves.com/portfolio/st-coletta-school/.

also demonstrate a strong understanding of the D.C. context, while playfully creating a space for these special children.

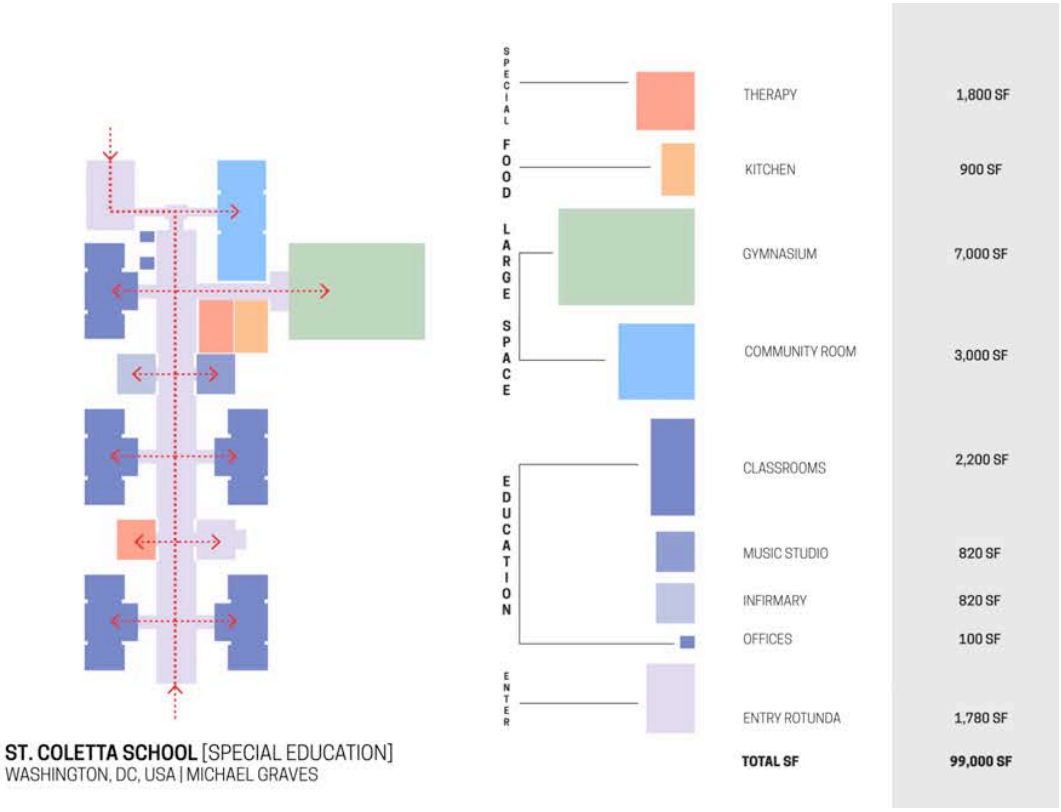

Figure 27: St. Coletta Program Analysis
Source: Author

Figure 28: St. Coletta Front Elevation
Source: www.michaelgraves.com/portfolio/st-coletta-school

Figure 29: St. Coletta Central Atrium (left) and Meeting Room (right)
Source: www.michaelgraves.com/portfolio/st-coletta-school

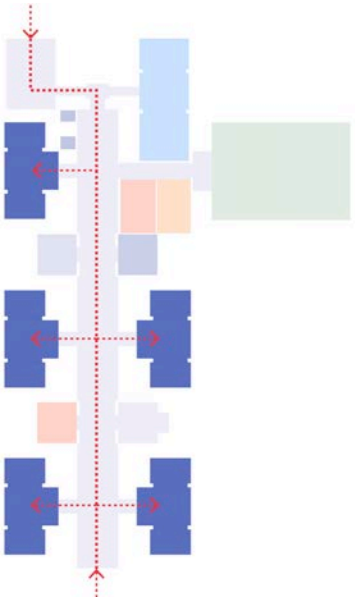

Figure 30: Central atrium connection to "houses" classrooms
Source: www.michaelgraves.com/portfolio/st-coletta-school

Disabilities Organization House, Force4 Architects, 2012

Force4 Architects and Cubo worked together to design the Disabilities Organization House, which aimed to be, and is now considered to be, "The World's Most Accessible Office Building" that brings 20 of Denmark's disabled people's associations together.[17] The building's powerful design strategy focuses on the principles of "equal access" by designing the building to be fully accessible and used equally by all users. This allows the design solutions to, "support and encourage all users to be as self-reliant as possible."[17] Although the building is designed for users with disabilities, Force4 Architects, states that it was crucial to design for everyone, regardless of the disability, to be able to, "work and move freely around the building without difficulty, and without feeling different."[18]

Since the building does house several individuals with a variety of disabilities that might require special accessibility needs, the progression from the exterior to the interior is also well designed with special parking spaces and an easy drop-off area, as shown in the site plan on Figure 24. Small details throughout the building also help users navigate throughout the different spaces inside, such as lower elevator buttons for wheelchair users to press with their feet or foot rests and buttons on railings that correspond with which level the user is on, shown on Figure 25. Since this building

[17] "House of Disable People's Organization / Cubo Force4." ArchDaily. April 12, 2014. Accessed December 10, 2016. http://www.archdaily.com/495736/house-of-disable-people-s-organization-cubo-force4.

[18] "Danske handicaporganisationers hus." Force4. Accessed December 10, 2016. http://force4.dk/projects/dansk-handicap-organisationer/.

provides space for 20 associations, it was essential for the design to allow people to easily navigate throughout the building, but to also bring them all together. The central courtyard provides a visual connection between all levels and allows users to navigate around the courtyard on all levels, where organizations and spaces are colored uniquely (Figure 26). Figure 27, shows a rendering that also demonstrates the connection between nature, architecture, and the resulting rich environment created for this special population to work and interact with each other.

Figure 31: Disabilities Organizations House Site Plan
Source: http://www.archdaily.com/495736/house-of-disable-people-s-organization-cubo-force4

Figure 32: Elevator Low Buttons (left) and Railing Button Indicators (right)
Source: http://www.archdaily.com/495736/house-of-disable-people-s-organization-cubo-force4

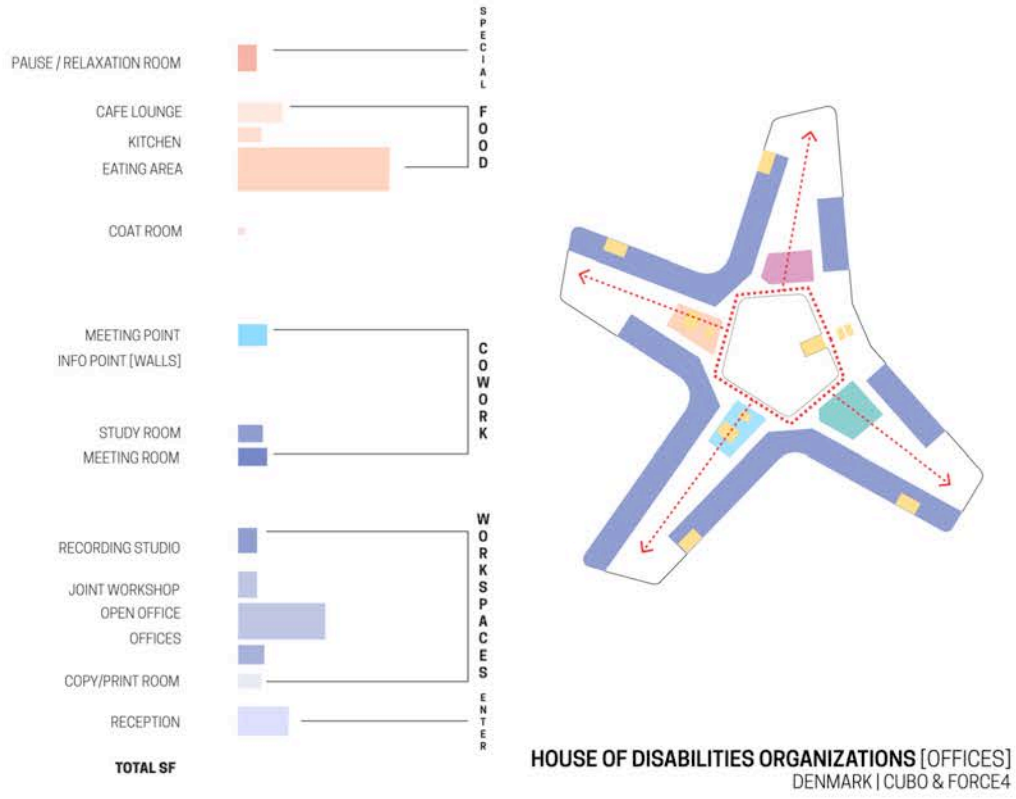

Figure 33: House of Disabilities Organizations Program & Parti
Source: Author

Figure 34: House of Disabilities Organizations Exterior Rendering
Source: Force4 Architects

Family Box, Crossboundaries Architects (2011)

Crossboundaries Architects designed what they call a "Family Box" in Beijing, China in 2011 that, "functions as both an indoor playground and a kindergarten for children…while accommodating their parents' needs."[19] Placed at the outer corner of a park, its simple, rectilinear form allows it to stand out from its natural surroundings yet mysteriously conceals the program of the building, which can be seen in Figure 28. Crossboundaries Architects also designed for its users, therefore different size and heights between adult and child spaces inspire distinctions between spaces where either or both users interact (Figure 29).

The specialty play spaces created for children in this building push in and out of the central circulation path, which create a playful environment of block-like spaces to navigate through. Offices and administration spaces are placed in a corner of the building and are accessed almost immediately from the entrance of the

[19] "Family Box / Crossboundaries." ArchDaily. July 31, 2013. Accessed December 10, 2016. http://www.archdaily.com/408150/family-box-crossboundaries-architects.

building. The distinction between the character of the circulation for adults versus that of children offers a clear route for the users of this building.

Figure 35: Night Exterior of Family Box - Crossboundaries
Source: Archdaily.com

Figure 36: Child and Adult Viewpoints in Family Box - Crossboundaries
Source: Archdaily.com

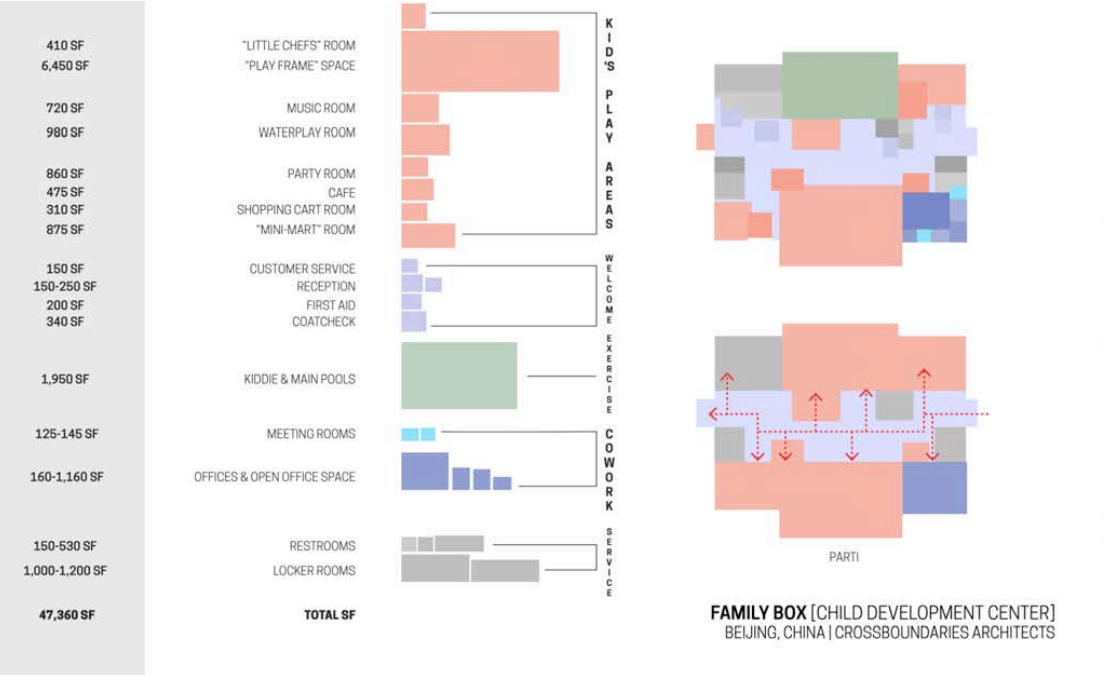

Figure 37: Program in Family Box - Crossboundaries
Source: Author

Family Box, Sako Architects

Sako Architects designed another Family Box in Beijing, China as an early childhood education center. This design was developed from a concept of colorful trees, which is abstracted in a playful way in the forms seen in the building's interior spaces for children, as seen in figure 30. The child development program was added to the upper second level of an existing structure and only expresses the playful nature of the children's specialty spaces on the interior, as shown in Figure 30. Offices and other support spaces form rectilinear spaces while the children navigate through a variety of curvilinear spaces (Figure 31), each with different colors and sizes to create a playful path through spaces.

Figure 38: Interior Spaces – Sako Architects
Source: Archdaily.com

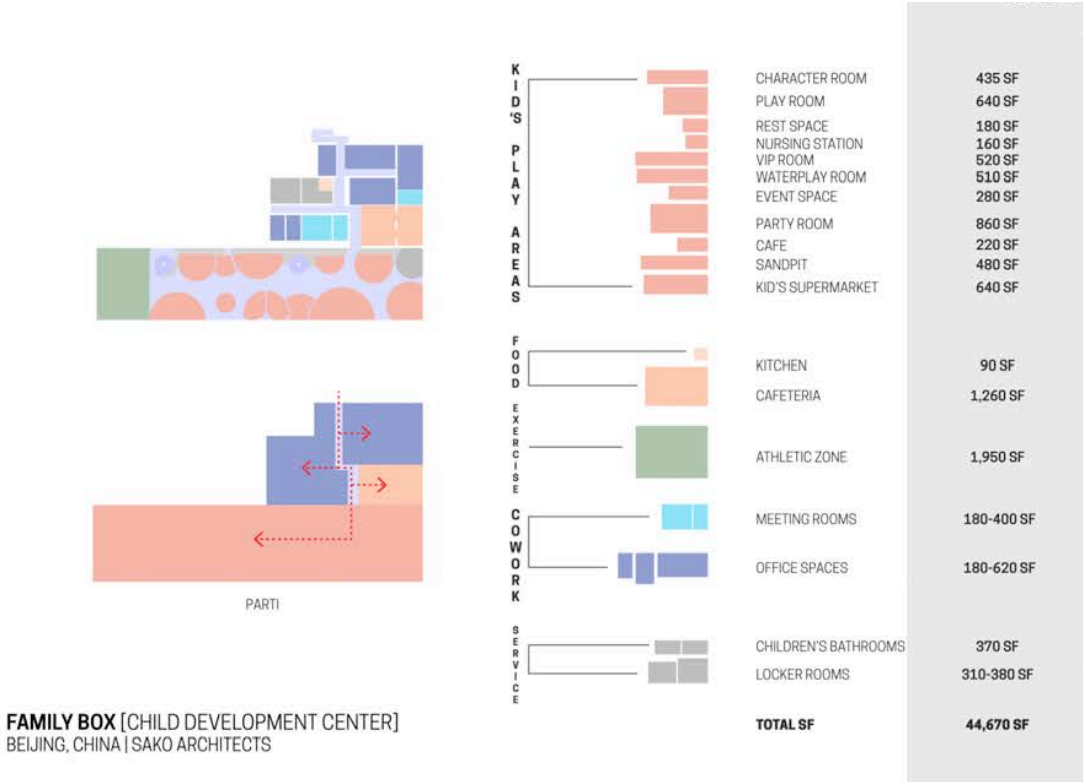

Figure 39: Program in Family Box – Sako Architects
Source: Author

Chapter 6: Design Strategy

Program Development

The precedent program analysis describes specific program spaces needed to support the population of people with disabilities and of young children (Figure 40). Commonalities between each precedent were found as shown highlighted in Figure 41, and were used to begin an analysis of program pieces for the proposed center (Figure 42). Each program piece is included in order to emphasize this essential idea of play – adaptive play for all children to learn and be healed in an inclusive environment.

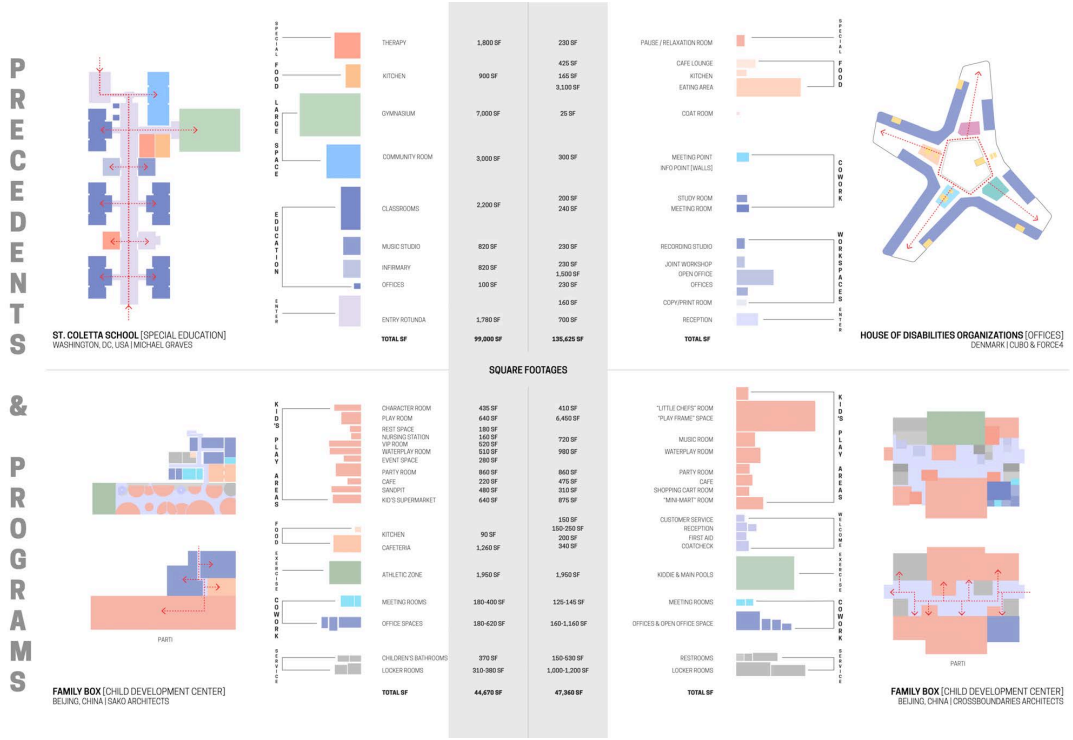

Figure 40: Precedent Program Analysis
Source: Author

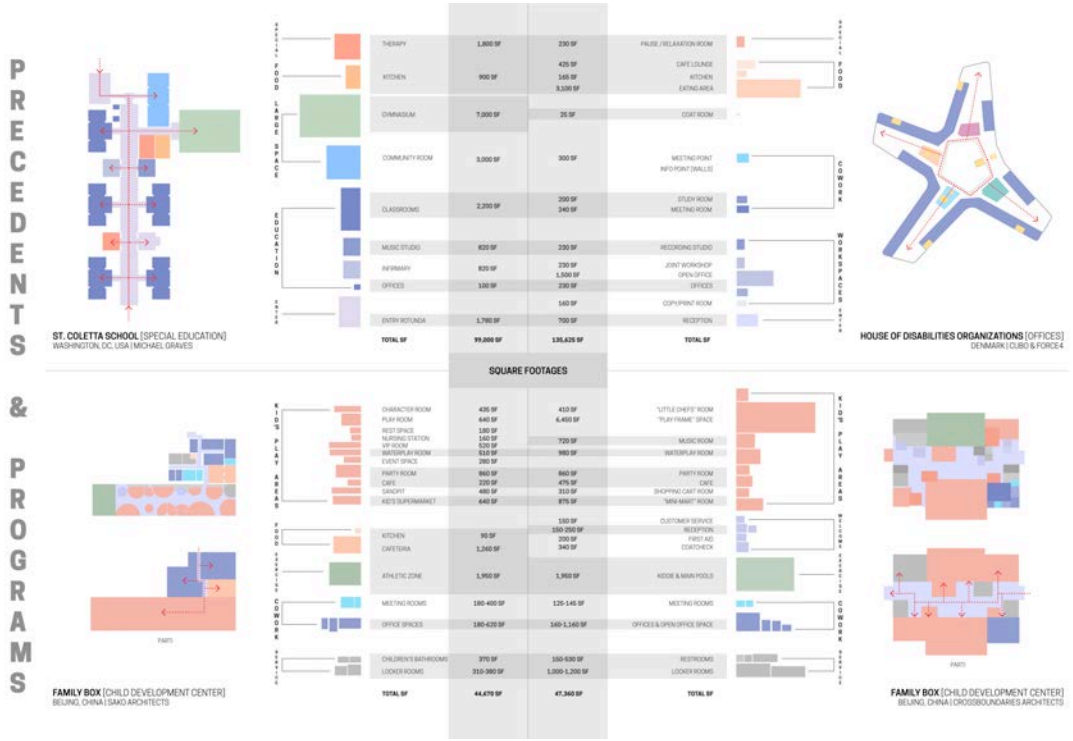

Figure 41: Precedent Program Similarities Highlighted
Source: Author

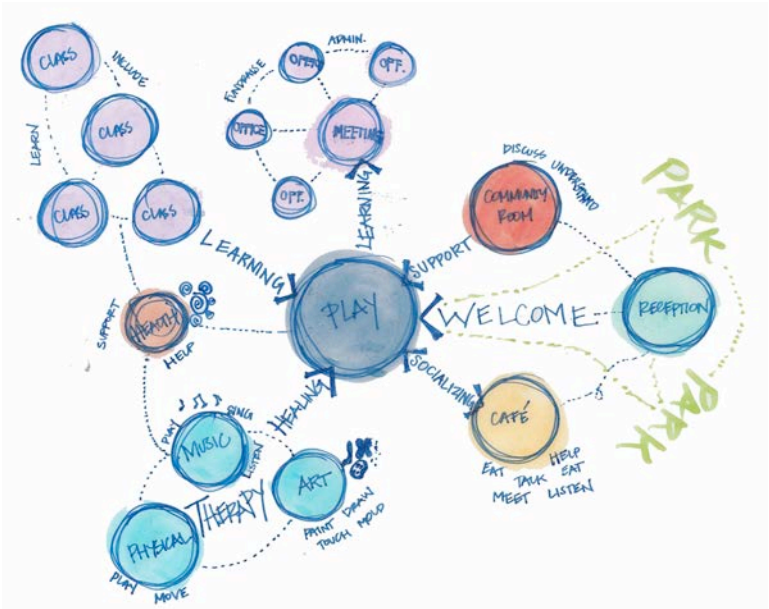

Figure 42: Adaptive Play Program Selection
Source: Author

		lobby	1,000 sf	observation room	467 sf				
		community room	1,200 sf	physical therapy	1,344 sf	classrooms	2,894 sf	classrooms	3,748 sf
		meeting rooms	1,126 sf	art therapy	1,777 sf	nap rooms	2,270 sf	nap rooms	2,737 sf
art gallery	7,840 sf	open offices	4,295 sf	sensory room	1,200 sf	quiet room	467 sf	quiet room	467 sf
parking	7,560 sf	circulation	5,318 sf	health room	889 sf	bathrooms	229 sf	bathrooms	229 sf
mechanical	937 sf	bathrooms	208 sf	storage	229 sf	office	325 sf	office	325 sf
circulation	713 sf	kitchen	180 sf	office	553 sf	office	228 sf	office	228 sf
bathrooms	462 sf	cafe	950 sf	circulation	7,870 sf	circulation	3,700 sf	circulation	3,700 sf
TOTAL	17,512 SF	TOTAL	14,277 SF	TOTAL	14,329 SF	TOTAL	10,113 SF	TOTAL	11,434 SF

Figure 43: Final Program Square Footages
Source: Author

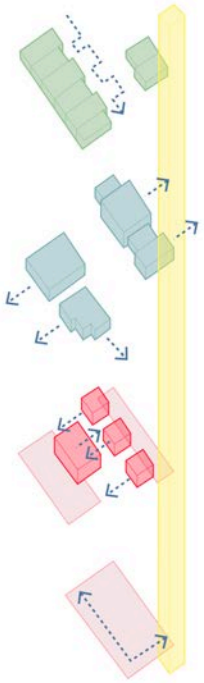

Figure 44: Vertical Relationship to Program Spaces
Source: Author

Chapter 7: Site Analysis

Existing Site Conditions

The current condition of the site is a campus parking lot for students at Howard University. The site is located between a residential zone, is included in the campus plan across a student dormitory building, and begins to respond to the edge of the McMillan Reservoir (Figure 43, 44, 45). The relationship between neighborhood, education, and nature provide the site with the opportunity to engage this diverse community.

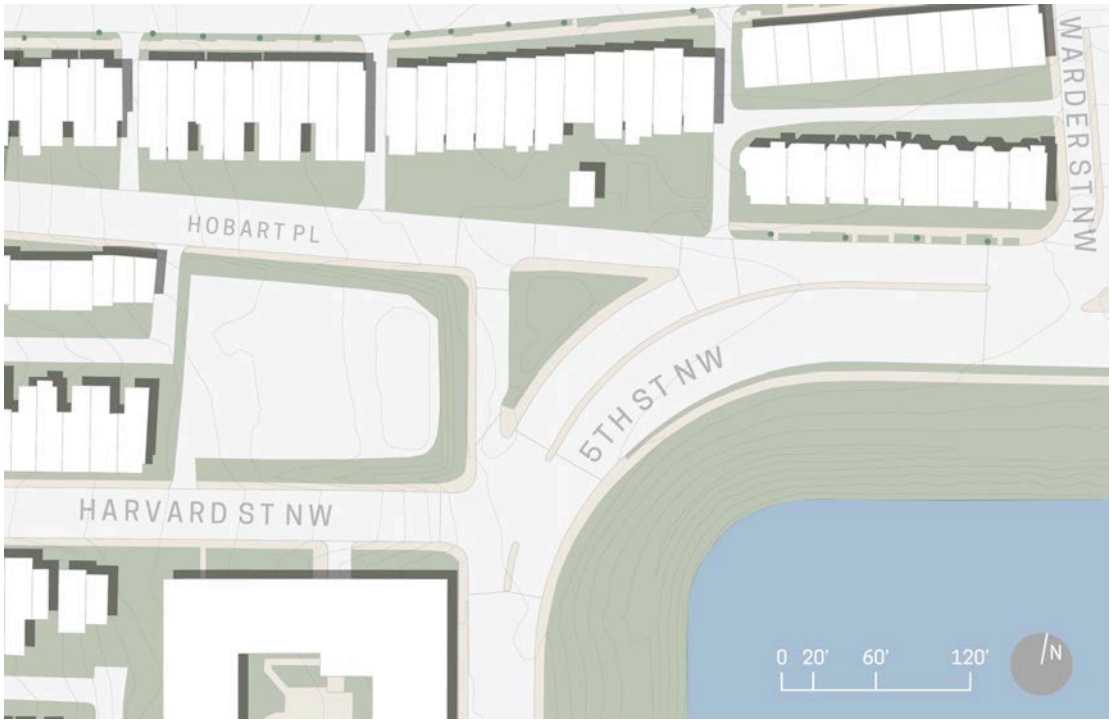

Figure 45: Existing Site Plan
Source: Author

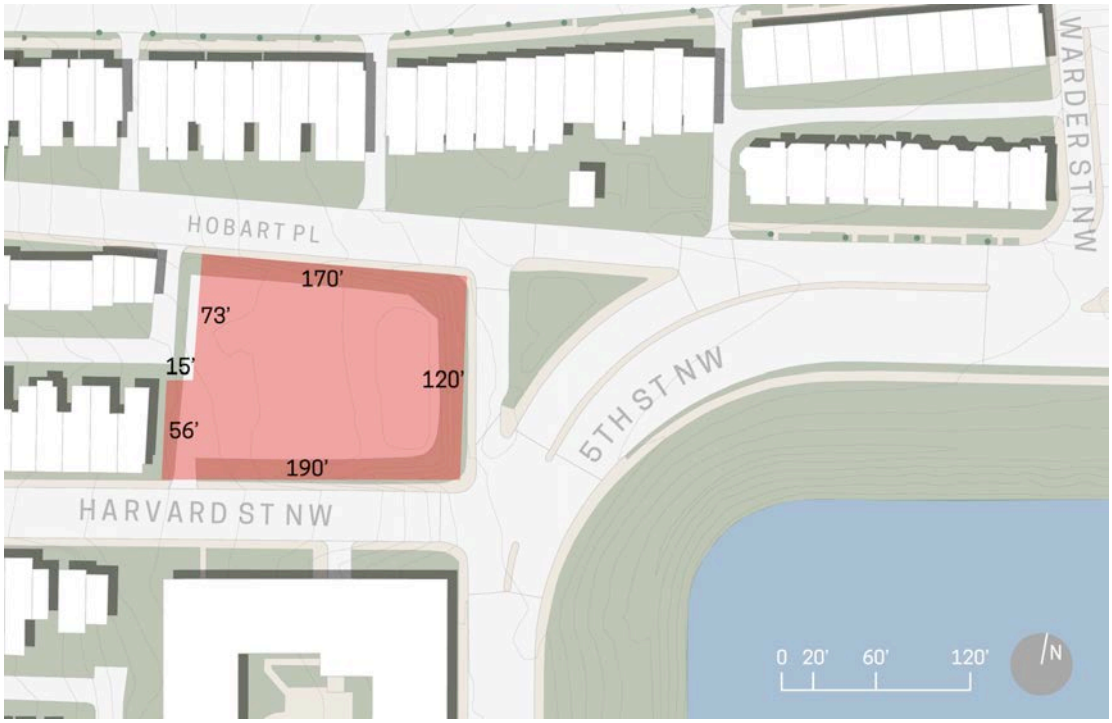

Figure 46: Property Lines & Site Dimensions
Source: Diagram – Author, Information – DC Zoning

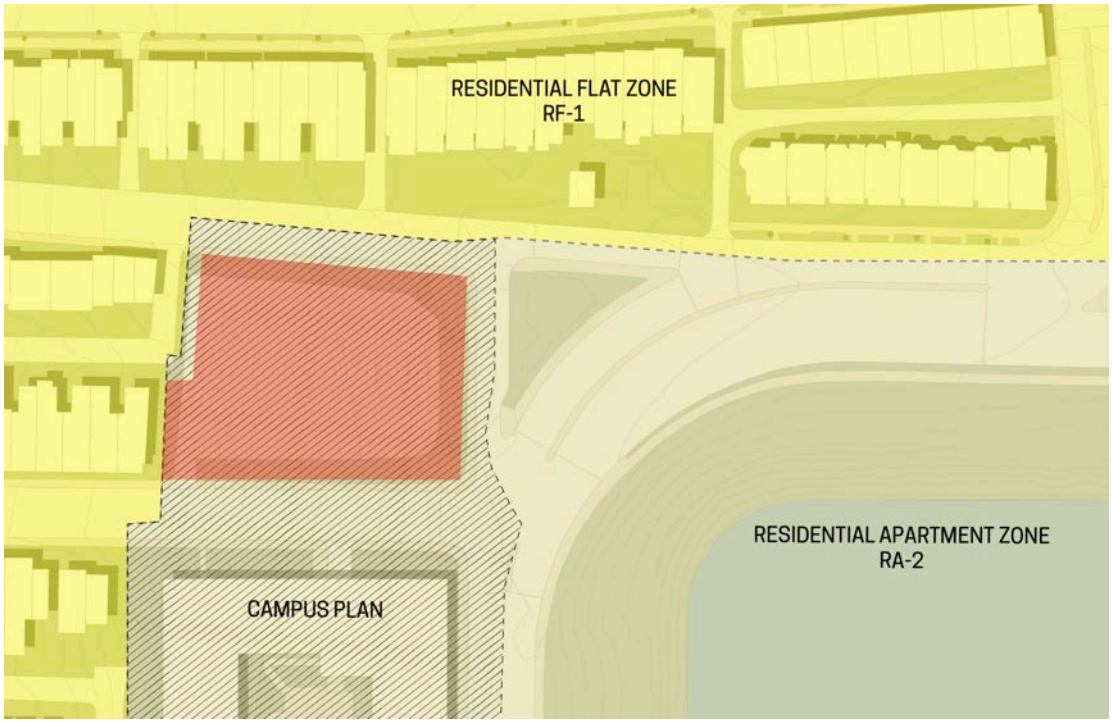

Figure 47: DC Zoning
Source: Diagram – Author, Information – DC Zoning

Constraints & Opportunities

The biggest opportunity and constraint in this site is its drastic topography change of about 12 feet from the West side of the site down towards 5th Street and the reservoir. Although the change is significant, it provides the potential for underground and raised levels to sit within the site. A raised level along 5th Street could provide better views out towards the more natural landscape of the McMillan Reservoir and could emphasize the activity occurring in this center.

The townhouses within the neighborhood also create a strong rhythm that can be continued through the site in order to inform the shape of spaces within the potential building. The curvilinear street formed by the edge of the reservoir landscape offers a break in the rectilinear rhythm of the townhouses and begin to introduce a potential curved element within the site.

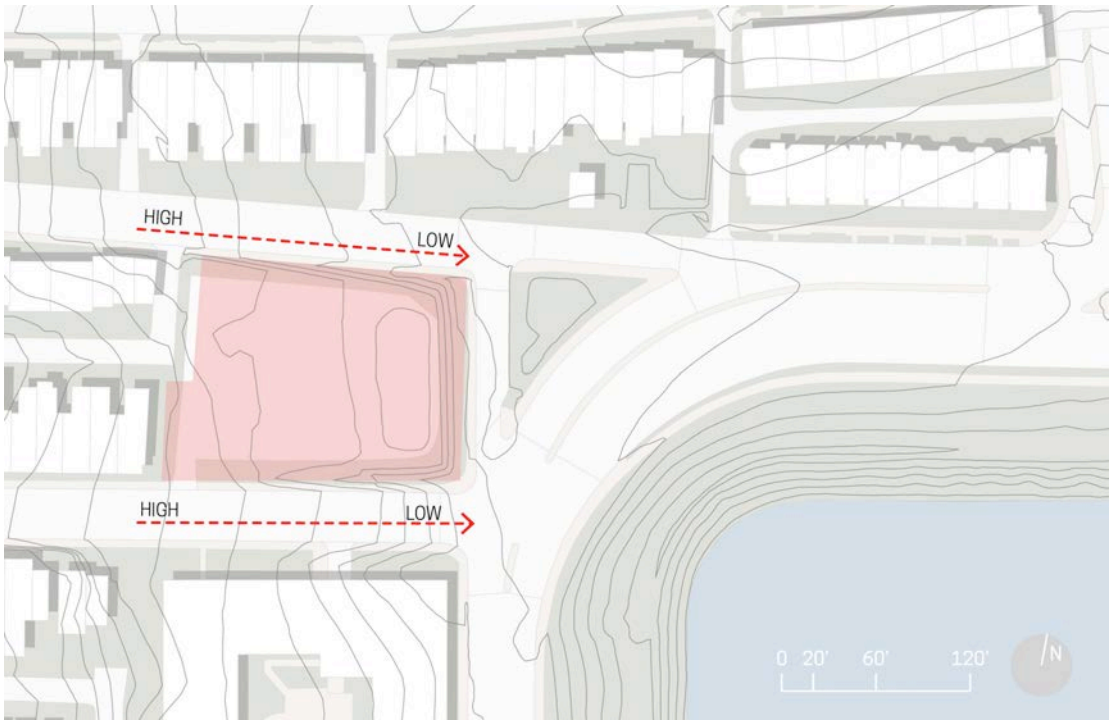

Figure 48: Existing Topography
Source: Diagram – Author, Information – GIS

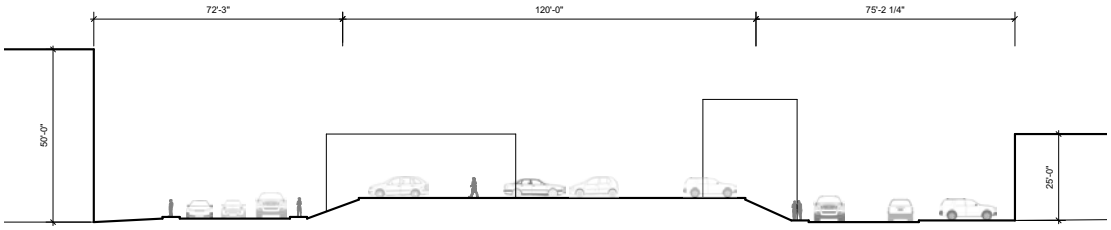

Figure 49: Existing Site Section through Harvard Street and Hobart Place
Source: Author

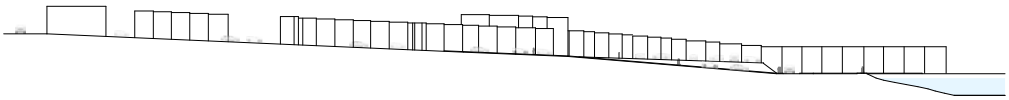

Figure 50: Existing Site Section through Harvard Street from Georgia Ave to Reservoir
Source: Author

Figure 51: Site Elevation Photo Collage
Source: Author

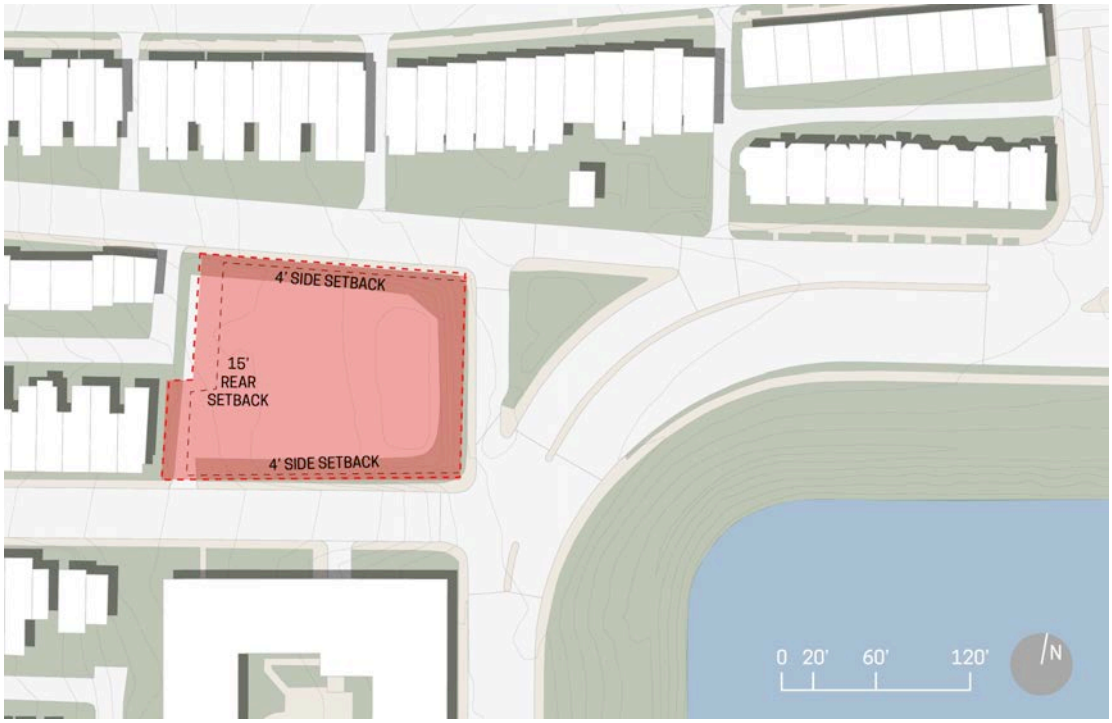

Figure 52: DC Zoning Setbacks
Source: Diagram – Author, Information – DC Zoning

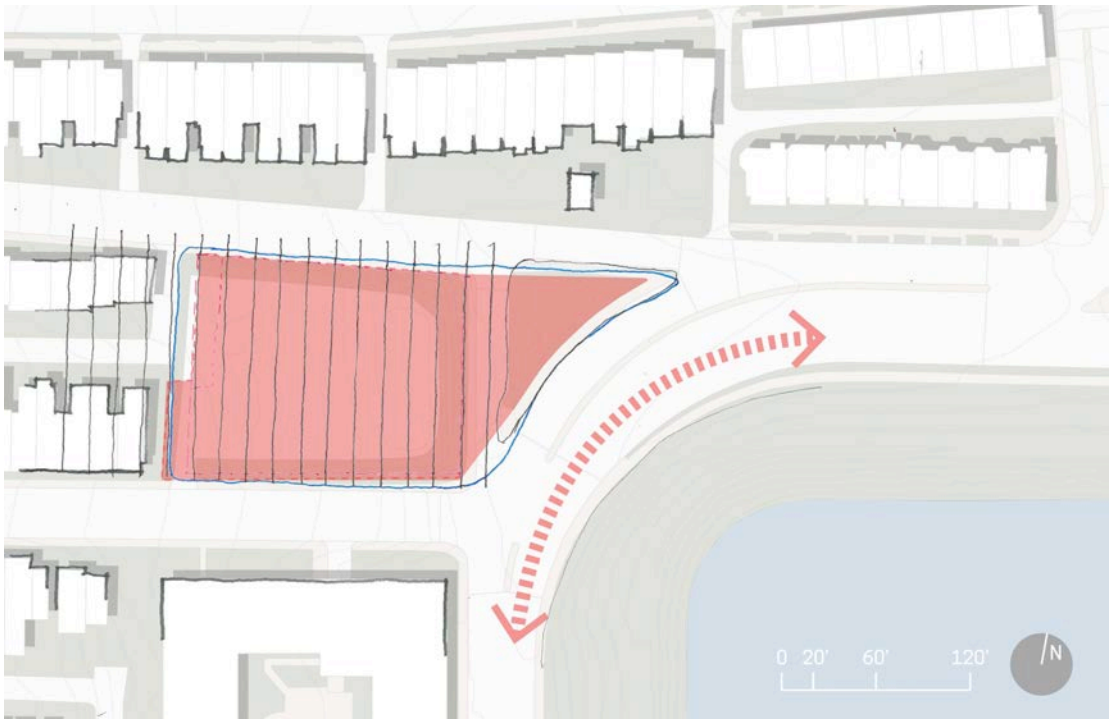

Figure 53: Opportunities & Influences in Form
Source: Diagram – Author, Information – DC Zoning

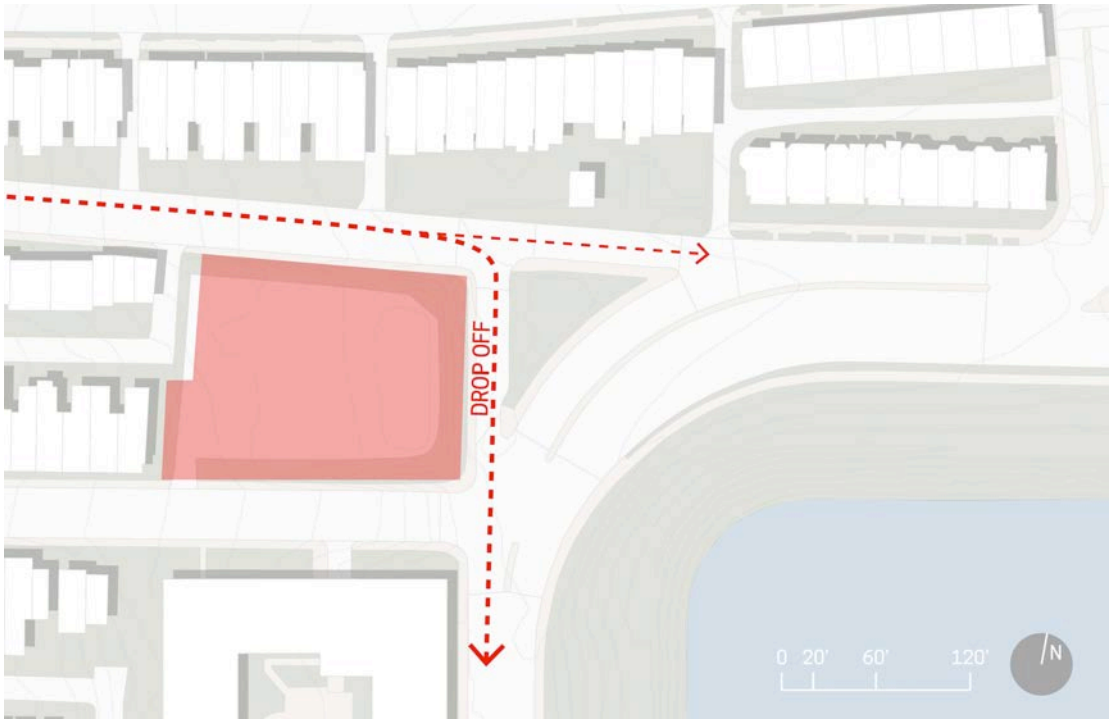

Figure 54: Potential Drop-Off & Pick-Up Paths
Source: Diagram – Author

Chapter 8: Design Proposal

Conceptual Design Strategies

The design objective of this thesis is to provide an environment for children with disabilities to engage with other children, the community, and allowing others to interact and understand the needs of this special population.

The site analysis informed the placement of the building based on its closeness to essential and potential resources for this center. The relationship with the McMillan Reservoir and the steep topography allowed the placement of the building to overlook the landscape and stand out as a center within this community.

The accessibility of this building is also essential to allow these special users and the community to easily enter the center. Since the site has a drastic change in topography from Hobart Place and Harvard Street down to 5th Street, drop-off and pick-up areas were placed perpendicular to Hobart Place and Harvard Street to allow for easier merging into 5th Street.

The program analysis of different special education facilities, childhood development centers, and preschools also helped inform the configuration of the building. The character of the neighborhood townhouses began to inform the shape of the spaces inside the building in order to create a playful environment that responds to and reaches out to this community.

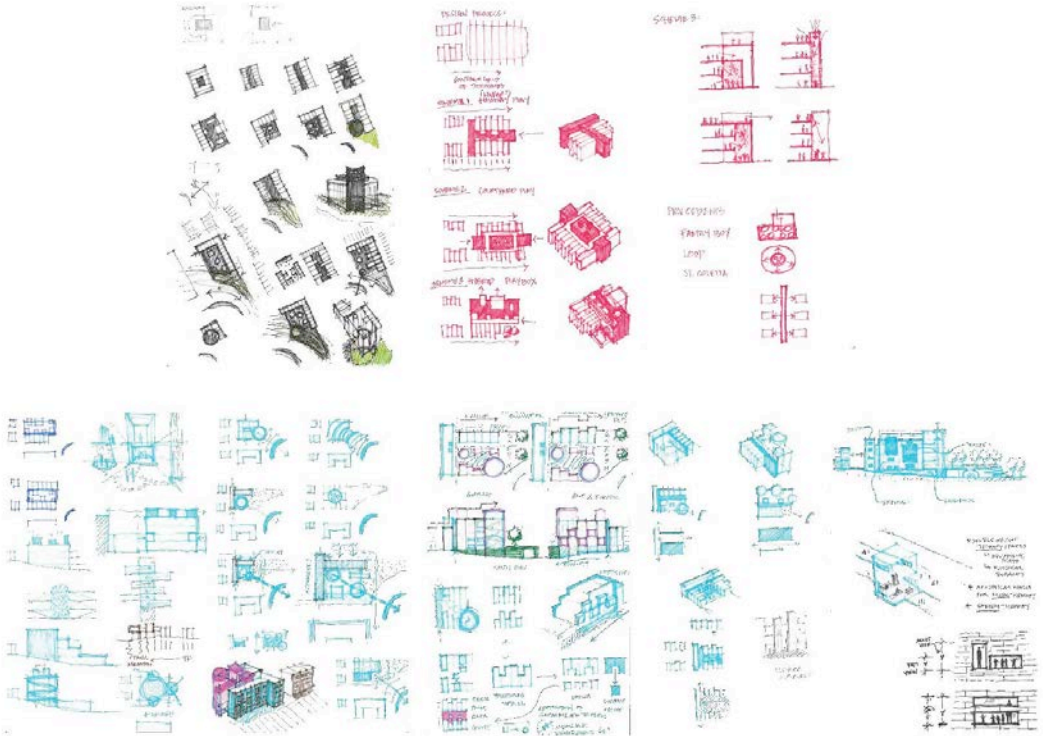

Figure 55: Parti Sketches
Source: Author

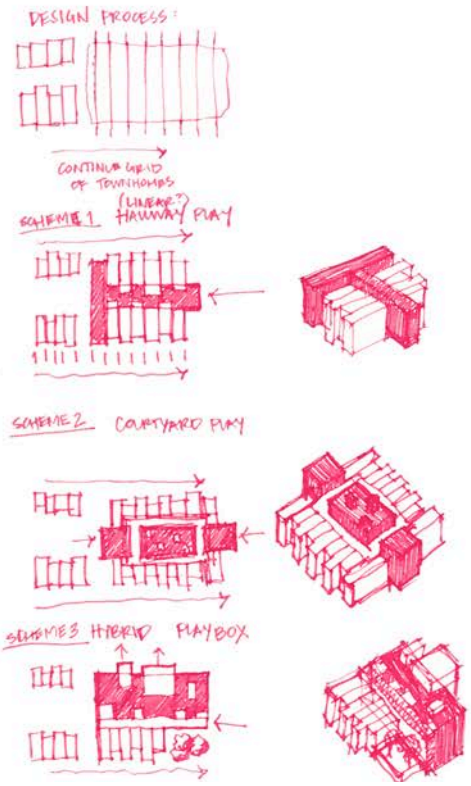

Figure 56: Concept Sketches
Source: Author

Final Design

In order to foster a sense of community, healing, and learning in this urban environment, each level of this center aims to provide a unique experience of inclusion as shown in Figure 57. Essentially, "Scheme 1" was pushed forward to create a central community atrium with program spaces that push in and out of the building. This allowed for continuity in form that has a relationship with the homes in the community.

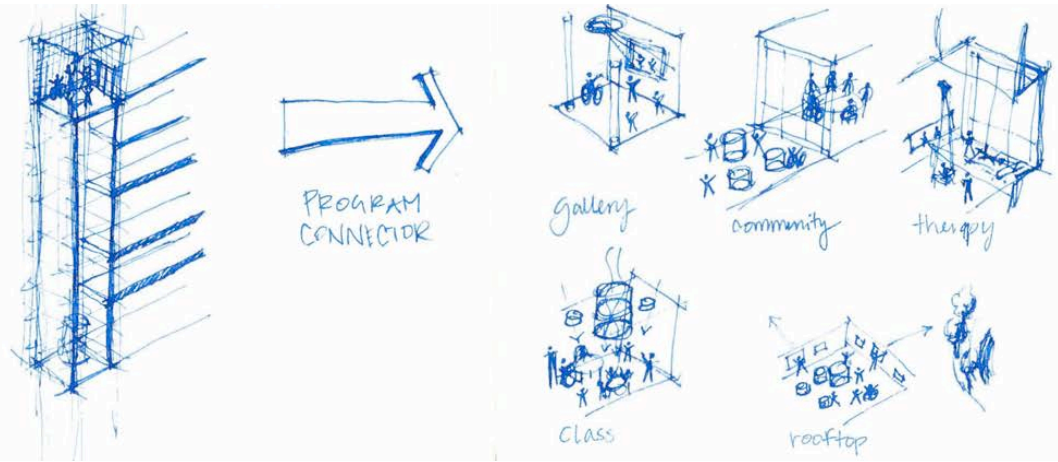

Figure 57: Vertical Relationship of Program
Source: Author

"Gallery Play"

At the ground level of the building, children will be dropped off and picked up in a covered space underneath the overlook above. There is also available parking for those who are staying in the building throughout the day and are commuting from further distances. Pedestrians along Hobart Place, North of the building, also have an entrance that leads them directly next to the large elevator tower and into the kid's gallery space. Pedestrians also have the option of going up a ramping system, East of the site that takes them up to the Community Overlook.

Entering this underground level could take visitors, students, or staff directly to the elevator and to another level, but also allows them to experience a space filled with children's artwork completed in the above art therapy room or artwork in collaboration with local DC art programs located near the site; as explored earlier in this thesis. By providing a space for children to display their own work they are able to become a part of this DC community by sharing a piece of them with others.

The open gallery space is defined by the color red along the walls holding children's art pieces and is also painted on columns creating a continuous rhythm along the gallery for children to move along the space with ease. Skylights with colorful glass poke through the ceiling of the gallery on axis with the drop-off and pick-up entrance to create a playful indicator that moves children and others through the gallery.

Figure 58: Ground Floor Plan
Source: Author

Figure 59: Approach from Reservoir
Source: Author

Figure 60: Proposed Harvard Street Elevation
Source: Author

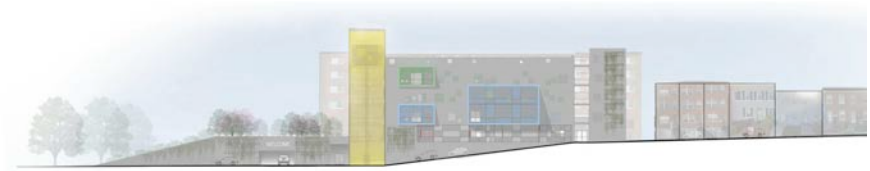

Figure 61: Proposed Hobart Place Elevation
Source: Author

Figure 62: Kid's Gallery
Source: Author

"Community Play"

As a pedestrian moving from the Eastern side of this site, a ramping system leads people in the neighborhood up on the Community Overlook where nature meets the building. The accessibility to the Overlook provides a space that engages the community with the activity occurring in this building and an amenity that offers users of this center a transition from nature to building, reservoir to overlook to center. This elevated Overlook not only allows natural views out toward the McMillan Reservoir, but also avoids the busy and potentially dangerous car traffic at the street level of 5th Street and Harvard Street.

Another optional pedestrian entrance into the building occurs on this second level along Harvard Street where the topography is much higher. Along the Southwest end of the building, pedestrians may enter through into a lobby space and

can move into the atrium space where the different levels of the building are exposed. Skylights that were exposed in the kid's gallery ceilings are now exposed on the atrium floor and create a sequence of skylights that lead towards the exterior overlook or to the grand elevator.

This level includes open office space on the North and South sides of the building in order to house non-profit organizations and support groups that would aide the healing and learning activities in this center. Meeting rooms and a large community room are formed as blocks that push into the community atrium space and provide space for these organizations and the community to begin essential conversations about these children's needs.

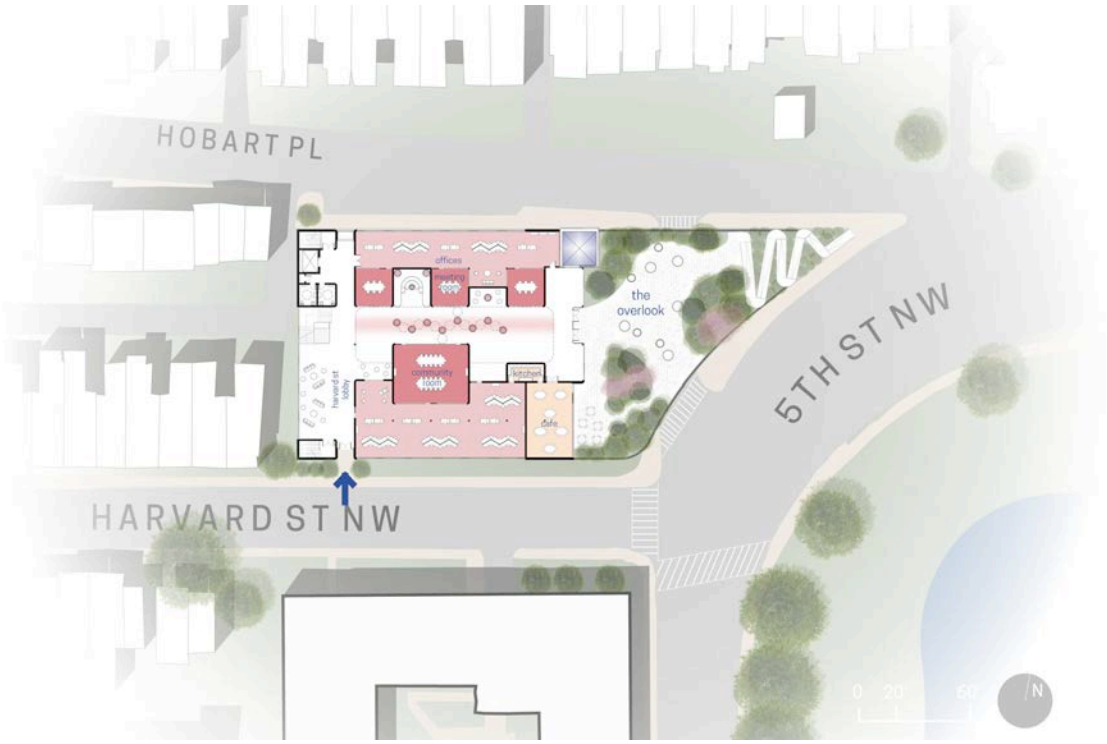

Figure 63: Second Floor Plan – Community Level
Source: Author

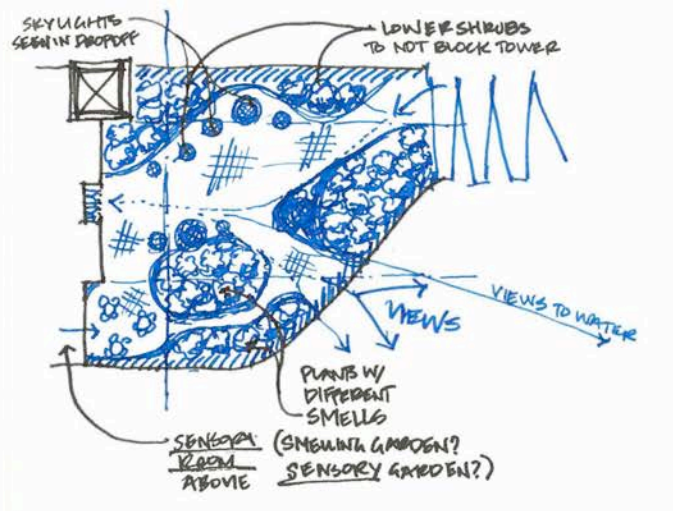

Figure 64: Process Sketch of Overlook Design
Source: Author

Figure 65: Community Overlook looking toward Reservoir
Source: Author

Figure 66: Community Atrium
Source: Author

"Therapy Play"

The third level of this building focuses on providing the supports and services for children with disabilities and for others to learn and be involved in these activities. Two administrative offices are located along the Western side of the building for professionals, while each therapy space acts as a block that pushes into and outside of the building. The therapy "blocks" push out into the community serving as a metaphor for pushing this activity to be known within this community – spreading awareness.

The physical therapy room is double-height in order to allow therapy equipment to fit into the space comfortably and has an adjacent observation room for university students, professionals, and family to learn and understand the healing

process. The health room provides space for assistance in any accidents or medical necessities to take place as commonly seen in educational facilities. An art therapy room gives art programs around the site to become involved in this center and become a part of a healing process for these children. A sensory room is also included on this floor to provide space for children, especially those with autism, to explore their senses. The space pushes into the noise of Harvard Street in the South and into the natural smells and activities occurring in the overlook on the East.

Figure 67: Third Floor Plan – Therapy Level
Source: Author

Figure 68: Therapy Hall
Source: Author

Figure 69: Double-height Therapy Room
Source: Author

“Class Play”

The fourth and fifth floors house environments of learning. Classrooms are paired with nap rooms and push in and out of the hall and the facade in order to imitate the nature of the townhouses surrounding the site. These classrooms aim to hold small groups of children for more focused teaching, but to also offer environments of inclusion. Children with and without disabilities will share these learning spaces and experiences in these spaces. Quiet rooms are also provided on both floors for students to easily access these spaces when feeling frustrated or overwhelmed with their surroundings. Skylights with colorful glass are introduced again into the ceilings of the 5th floor classrooms, which allow students to enjoy natural lighting.

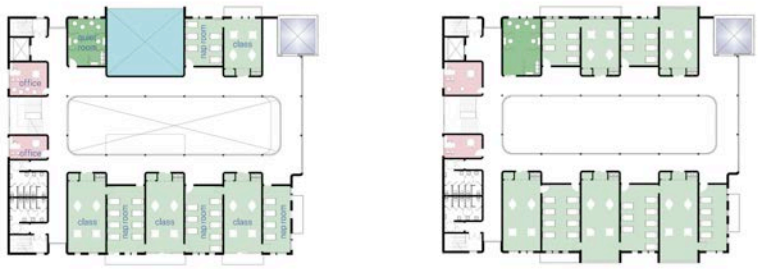

Figure 70: Fourth & Fifth Floor Plans – Classroom Levels
Source: Author

Figure 71: Integrated Classroom
Source: Author

"Rooftop Play"

The rooftop playground offers an outdoor recess play space for students above the noise and traffic of the street and continues to offer views out toward the reservoir. Windows placed along the border are located at a lower eye level to emphasize the eye level of a child and provide views out toward the neighborhood. Skylights are also brought to this level and push below into classroom spaces to provide colorful and natural lighting.

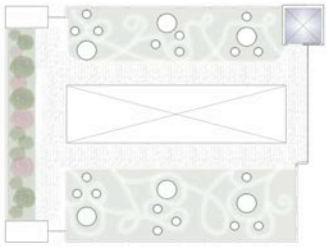

Figure 72: Rooftop Plan
Source: Author

Figure 73: Rooftop Playground
Source: Author

Chapter 9: Conclusion

The exclusion of people with disabilities in our society has begun affect the lives of this special population and their chances of being a part of any community. Changes in the education system have introduced programs that include children with disabilities into a regular classroom, but environments with this idea of inclusion have not been created. Early intervention programs have also allowed children with disabilities and their families find resources for their circumstances. In order to encourage this push towards inclusion, there must be a response from our built environment that can facilitate and provide the supports and services from a young age. Involvement from the community is also essential in order to promote awareness and understanding of this diverse and special population of children. Although this thesis has aimed to create an environment of inclusion within the community of Columbia Heights, it seeks to become a catalyst for change in society – starting with children.

Figure 74: Final Presentation Boards
Source: Author

Bibliography

"Adapting Classroom Environments for Young Children with Special Needs." Adapt Classroom Environments for Special Needs Children | Kaplan Early Learning Company. Accessed April 10, 2017. https://www.kaplanco.com/ii/classroom-environment-special-needs.

Bannert, Sophia. "A Day in the Life of a Wheelchair User: Navigating Lincoln." Berkeley Prize Essay Competition. Accessed November 4, 2016. http://berkeleyprize.org/competition/essay/2013/winning-essays/bannert-essay.

"Danske handicaporganisationers hus." Force4. Accessed December 10, 2016. http://force4.dk/projects/dansk-handicap-organisationer/.

"Family Box / Crossboundaries." ArchDaily. July 31, 2013. Accessed December 10, 2016. http://www.archdaily.com/408150/family-box-crossboundaries-architects.

"House of Disable People's Organization / Cubo Force4." ArchDaily. April 12, 2014. Accessed December 10, 2016. http://www.archdaily.com/495736/house-of-disable-people-s-organization-cubo-force4.

Pearlstein Steven Pearlstein, Steven. "Reimagining Union Station." Washington Post. Accessed November 4, 2016. http://www.washingtonpost.com/sf/business/2014/09/12/reimagining-union-station-2/.

"Public Policy and Legal Advocacy." Education Issues for People with Disabilities. Accessed November 4, 2016. http://www.thearc.org/what-we-do/public-policy/policy-issues/education.

Safford, Philip L., and Elizabeth J. Safford. A History of Childhood and Disability. New York: Teachers College Press, 1996.

"St. Coletta of Greater Washington." Michael Graves Architecture & Design. Accessed December 10, 2016. http://michaelgraves.com/portfolio/st-coletta-school/.

"St. Coletta of Greater Washington." St. Coletta of Greater Washington - About the School Program. Accessed December 10, 2016. http://www.stcoletta.org/index.php?page=school-program-2.

"Strong Start DC Early Intervention Program (DC EIP) | Osse." Accessed October 30, 2016. http://osse.dc.gov/service/strong-start-dc-early-intervention-program-dc-eip.

Sveiven, Megan. "AD Classics: St. Coletta School / Michael Graves." ArchDaily. November 15, 2010. Accessed December 10, 2016. http://www.archdaily.com/88771/ad-classics-st-coletta-school-michael-graves.

US Census Bureau Public Information Office. "Nearly 1 in 5 People Have a Disability in the U.S., Census Bureau Reports - Miscellaneous - Newsroom - U.S. Census Bureau." US Census Bureau Public Information Office. Accessed November 4, 2016. https://www.census.gov/newsroom/releases/archives/miscellaneous/cb12-134.html.

United States. DC Action for Children. Early Intervention and Special Education in DC for Children Ages Birth to 5. By HyeSook Chung. July 7, 2013. Accessed October 18, 2016. https://www.dcactionforchildren.org/content/new-early-intervention-and-special-education-dc-children-ages-birth-5.

Wang, Shaoqiang. 2011. Play: Indoor & Outdoor. Berkeley, CA: Gingko Press.

"Where Resources and Well-being Vary in DC." Data Tools 2.0. Accessed October 19, 2016. http://datatools.dcactionforchildren.org.