

# **Past Park Exclusive Design Methods Towards People with Disabilities**

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On my honor as a University student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments.

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## **People with Disabilities in an Exclusive Society**

It can be said that a majority of memorable experiences children have growing up revolve around social-shaping events such as playing with their peers in a communal space where they can use their imagination, experience the world around them, and feel safe while doing so. These communal spaces exist today. They are found at parks, playgrounds, or often neighborhoods. And while they vary in many degrees, all share the common purpose to serve as that communal space. Now, it would be the hope that no group of individuals be denied access to these shared quintessential adolescence experiences. Unfortunately, exclusion within these spaces exists for many groups of individuals, as a majority of playgrounds worldwide can only be used by a limited audience excluding users with various disabilities.

The term “disability” is defined by The International Classification of Functioning, Disability and Health by the World Health Organization (2020, p.3) as an “umbrella term for impairments, activity limitations, and participation restrictions.” This definition provides a broad sense of how disability can have a wide range of interpretation. Specifically, people with disabilities are often susceptible to exclusionary designs including playground designs. For instance, individuals with vision impairments often rely on touch or hearing in order to enjoy walking through a park, though appreciated amenities like tactile paving or auditory access devices are not always present (Kin Wai, 2013). As another example, people with mobility limitations may not be able to enjoy certain features of a playground if there are limited turn radii on features such as ramps (Mejeur et al, 2013).

Many playgrounds in use today are not designed inclusively. Professionals specializing in special education fields perceive accessible playgrounds as problematic in terms of carrying out the idea of inclusion (Stanton-Chapman et al, 2016). As a concept, inclusion can briefly be

described as the removal of physical, social, and cognitive barriers and encouragement of equal opportunity. Meanwhile, exclusion can be defined as the concept of barring [someone] from participation, consideration, or inclusion (Merriam-Webster, 2020). However, instances occur where there is a mixture of both inclusion and exclusion present in the design of entities like playgrounds. With combinations being difficult to fully define, it becomes vital that the design process apply certain frameworks in order to identify playground aspects that promote inclusivity or increase exclusion. I will be investigating the design practices, or lack thereof, individuals have used within the past century when addressing inclusion in the design of playgrounds. This paper will identify the ways in which playground designs have excluded individuals with disabilities.

### **Contextualizing Inclusive and Exclusive Playgrounds**

In 1996, the United States Access Board created a committee to specifically address access for play areas within the United States: the Play Areas Regulatory Negotiation Committee (Yanchulis, 2020). However, it was not until 2004 that current guidelines for play areas became integrated into the Board's ADA (Americans with Disabilities Act) and ABA (Architectural Barriers Act) Accessibility Guidelines (Yanchulis, 2020). Within those guidelines, playgrounds are required to be accessible in ways such as having accessible ramps and provide an appropriate surface beneath equipment (Falstad, 2017). Such types of standards are used to govern the accessibility of playgrounds; however, these broad standards are not completely satisfactory and often certain users remain excluded. For example, in a recent article Robert Benincasa of National Public Radio, describes the challenges and barriers 3-year-old Emmanuel Soto of Richmond, California faces while using a wheelchair in playgrounds (Benincasa, 2013). It is

discussed that Emmanuel's local playground, while labeled as ADA compliant, does not allow him to fully explore the features due to the choice of surfacing being loose fill material, therefore hindering his mobility around the space. These physical barriers, Soto's mother stated, caused Soto to lose interest in the park and have emotional distress (Benincasa, 2013).

Another example of specific exclusion in playground design is demonstrated in a study by Yantzi, Young, and McKeever, which investigates the suitability of school playgrounds for people with disabilities in the Toronto area (Yantzi et. al., 2010). It is discovered within this study through a "playability analysis" which uses an audit system developed by OPA, Ontario Park's Association, that at least four playgrounds fail to support disabilities, though meeting local accessibility guidelines.

Through meeting only basic criteria to be considered accessible, these playground examples are indicative of a lack of inclusive thinking. It is interesting to consider that while advocacy for people with disabilities in playground spaces progresses as a movement, there continues to be current practices and construction of playgrounds that lack further deliberation beyond what is legally required. Cases such as these, are exemplary of a minimal or lack of user-centered design, despite a need for it to be a common practice, especially in a playground design sphere.

Specific to design of playgrounds, a human-centric area of practice in its nature, considerations advocating for park users with disabilities create a unique space that provides straightforward benefits to the user group; but can also lead to the creation of long-lasting impacts on these individuals' lives as well. These types of secondary benefits can range from physical, to social, to even physiological positive impacts for the user groups. In detail, some of these benefits may be play based interactions resulting in social development for children with

Autism Spectrum Disorder, or children with mobility impairments gaining a fuller range of physical mobility through play (Grant, 2017).

### **Inclusion as a Focus for Socio-Technical Analysis**

Over one billion people in the world live their daily lives with some form of disability (WHO, 2020). That translates to over one seventh of the world living unique circumstances, experiences, and lifestyles. It also means there are over one billion individuals who will most likely at some point in their lives be affected by times where they are excluded from participating in the same opportunities that the people around them have the privilege of enjoying.

Additionally, the affected one billion can also be multiplied many times over when those who have witnessed their friends, families, or peers with disabilities be excluded in some form are included. Socio-technical topics are often centered around an encompassing idea that technological decisions will impact large populations usually on a grand scale. Furthermore, it is often the case that many times, these types of decisions can be said to impact the majority of the world population in some form either directly or indirectly. Therefore, when considering how technology in general can affect people groups on a world level, it is clear that there should then be great importance placed upon considerations made advocating with the 15% of the world population with a disability.

Further into the design realm, disability is often associated with “quick-fix” solution terms such as “accommodation” or “accessible”; however, these terms do not often provide users with disabilities satisfactory products. This frequently happens because disconnection can occur between the designer, the design methods, the design, and the users with disabilities. For example, confusion can occur in the misuse of terms between “accessibility” versus

“inclusivity”, as it is assumed by many that with accessibility, comes inclusivity. Two well written definitions distinguish between these two terms, where “accessible” is “the removal of environmental barriers” while “inclusive” is also “the removal of social barriers” (Woolley, 2013). Related, it is therefore important for the designers to often place themselves within the role of their user groups in the attempts to use logic as a form of understanding the users’ experiences (Masiulianis, 2017). In a more formal manner, a socio-technical analysis may be performed to qualify the methods in which inclusive design may be carried out. The framework that will be used to conduct such an analysis is the Universal Design framework.

As a concept, Universal Design can be described as “the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design” (Hums et al, 2016, p.40). The framework was developed in 1997 by a group of architects, product designers, engineers and environmental design researchers, among whom some themselves have disabilities (NDA, 2020).

The framework consists of seven principles which are intended to guide existing designs, the design process, and to educate both designers and consumers (NDA, 2020). The first four principles of Universal Design touch on Equitable Use, Flexible in Use, Simple and Intuitive Use, and Perceptible Information. The first principle describes the design as useful and marketable to people with diverse abilities. Meanwhile the second principle outlines how design may be flexible in accommodating a range of preferences and abilities. The third principle emphasizes the use of design to be easy to understand. And the fourth principle touches on how design should communicate necessary information to the user.



Figure 1. Seven Principles of Universal Design (Image Source: IFLA, 2020).

The last three principles of Universal Design highlight Tolerance for Error, Low Physical Effort, and Size & Space for Approach and Use as described by the National Disability Authority. The fifth principle speaks on minimizing hazards and unintended actions. Meanwhile, the sixth principle touches on how design can be used efficiently with minimum fatigue. Lastly, the seventh principle explains that design should be appropriate in terms of size and space. The theory of Universal Design is applicable particularly to inclusivity in the area of playground design methods as it describes well the guidelines in which designers may increase their knowledge of abilities inclusion.

Overall, Universal Design is one of the most prominent theories that not only consciously emphasizes proper functionality of the design, but also values aesthetics and inclusion. It purposefully distinguishes itself from being labeled simply as “compliant” or “accessible”; and instead, applies to people of all abilities. Universal Design theory acknowledges that it is a process and not a product, meaning that absolute universally designed products are not always achieved, but that is what designers should strive for when using the theory in practice.

## **Research Design**

Anticipating the ways in which designers should perceive inclusion and ensure such qualities are exemplified in their product in future settings, motivates my research question: How have past design methods for parks excluded individuals with disabilities? This question can be rotated onto a larger scale in terms of specifically inclusive design and how the concept can improve upon areas in the past where there has been a lack of inclusive presence or furthermore, the use of exclusionary practices. Universal Design served as the primary framework for forming ideas and analyzing the topic of addressing different user groups, such as people with disabilities within the design considerations of parks. The principles of Universal Design (NDA, 2020) were applied specifically in the context of case studies & case comparison.

I explored the design methodologies used in the recent past of playground design within the context of the United States. In the process of gathering evidence to explore this topic of past design strategies for parks, particular methods were utilized for data collection. These methods were secondary sources including the use of previous literature, policy documents, and agency reports. Previous literature served the purpose of providing a basis of what information regarding inclusive design considerations there have been in past scenarios for creating design methods of parks. I used literature investigating specific cases of playgrounds that exist in the U.S. Local policy documents also served as a useful data source, especially in providing research context and considering what narratives about addressing disabilities exist within different jurisdictions and governmental powers. Similarly, agency reports provided useful data related to past and current actions being taken to address inclusivity by different entities.

Once appropriate evidence was collected, the evidence was analyzed through the use of case studies and case comparison. The methods of case studies and case comparison were



performed as analyzing methods in the context of attempting to identify instances in design method scenarios where similar definitions of what inclusive design means were used in practices, as well as drawing patterns based on similar and dissimilar scenarios where designers would have had to have taken a position on how they view inclusive design. To explain, these types of instances are where actions either took an inclusive route, an exclusive route, or somewhere in the middle. The three case studies are used to determine the particular ways in which playgrounds have excluded individuals with disabilities.

## **Results**

The majority of playgrounds constructed within the past two to three decades have not purposefully designed their playgrounds to exclude certain demographics or have had malicious motivations. However, their design methods chosen frequently lead to unintended exclusionary designs which often affect people with disabilities. Even with the consideration for all abilities in mind, it can also be the case where accessible design is not sufficient enough to eliminate exclusion altogether. Through investigating playgrounds geographically located across the United States, an adequate analysis can be conducted to compare and identify the common ways individuals with disabilities are excluded in the playground setting. Therefore, the analysis will not attempt to find purposeful exclusion, but identify inclusion gaps which can then be correlated to exclusionary elements. It is evident that through these case studies, past design methods for parks have excluded individuals with disabilities frequently through physical barriers within the park's design, as well as through goal setting and desired use of the park in the initial design phase, and disconnection between designer, client, and consumer.

### *Case Comparison*

Within all three cases of playgrounds there are instances where inclusivity could be improved upon. However, there are clear trends between levels of inclusivity and chosen design methods for each park. Most commonly exclusion within the parks begin at the initial design phase such as the case with Neptune Park. This park was designed under the intentions of serving as a “destination park” which ultimately led to growing gaps in inclusivity throughout the remainder of the design process. Meanwhile, Imagination Playground though with quasi-inclusive intentions in mind, ultimately stagnated in holistically integrating inclusion into the playground design because it became solely preoccupied by the concept of flexible use. Lastly while not perfect, in comparison, Martin’s Park is a sufficient model case where inclusive design in the initial design process led to repercussive inclusive design later on throughout the park design process.

### *Neptune Park Saratoga Springs, UT*

Opening back in 2012, Neptune Park has become a popular playground located south of Salt Lake City in Saratoga Springs, Utah. Since its grand opening the playground has attracted not only local visitors but has garnered world-wide fame majorly due to its acclaimed 30- foot-tall climbing pyramid playground attraction (Day, 2015). Besides the large pyramid play structure other features include more typical swings, seesaws, as well as nearby soccer fields and basketball courts (Holmes, 2018). Hired to work alongside the local Parks and Recreation department, J-U-B Landscape Architects were put in charge of designing a playscape that would not only “accommodate [city youth recreation] programs, but would also establish a recognized, central gathering spot for the community” (Holmes, 2012). Within the designs it is clearly

outlined that the main goal of Neptune Park was to create a “destination” park (Day, 2015), and to use the playground specifically to “put [the park] on the map of destination parks within Utah and throughout the region” (Day, 2015); as a result, it is viewed as a success by many reports in that regard. One report describes the park as “an amazing park and one that you will keep coming back to” (Utah Outdoor, 2021), and another touts the park as “boldly [sending] the signal that playground fun is making a comeback” (Fidel, 2012). Such statements bring about the conversation of how inclusion fits within the park’s “successful” model.

The reality is that because inclusion is not the main focus of the project, there consequently are gaps where unintentional exclusion is present. An obvious example of such gaps is that through the heavy reliance on climbing park equipment such as the play pyramid, certain people with different disabilities are automatically excluded from play. Additionally, though a seemingly safe, financially attainable option, the presence of mulch as the playground surfacing material



Figure 2. Neptune Park (Image Source: KSL , 2012)

discounts individuals with mobility disabilities from traversing the playground. Physical barriers proposed in design such as these cause explicit instances of exclusive design, however, it also can be considered that another source of exclusion in design methods actually lies with a lacking consideration for people with disabilities in the process of goal setting, which takes place in the initial design phase. By prioritizing the main goal of the park to be used as a “destination park”, the design ultimately sidelines other objectives of the park. To elaborate, specific to Saratoga Springs’ Parks and Recreation Department and Planning Department, it is clearly outlined with the master plan for future park improvements that it is the primary desire of surveyed families and young children to have more playgrounds above all other proposed amenities (Saratoga Springs City, 2011). This evidence indicates that the city would like to serve all families and

young children as best as it can, however, varying interpretation of who makes up those families demographics-wise remains an unknown element. The results of varying interpretation from both the designer and the client (the local jurisdiction), become the gaps in inclusion the park experiences today.

*Imagination Playground, New York, NY*

Presently located in Manhattan, New York, Imagination Playground is an engaging space that allows for children to freely use their imaginations. As described by New York City's Department of Parks and Recreation, Imagination playground is "an interactive, transformable space that prompts children to manipulate their environment and create a play space of their own with [loose parts]" (nycgovparks.org, 2021). It is at this playground that children can utilize the "playground set" containing loose parts such as cubes, bricks, cogs, curves, and cylinders, to fit together and create their own structures to play with (Kaboom, 2021). Emphasizing the concepts of encouraging children to utilize their imagination and unstructured play, architect David Rockwell was inspired by watching his own children play to create a system that could support ideas of communication, teamwork, and creativity (Kaboom, 2021). The playground's design consists of three core elements which are providing a manipulable environment that allows children to create, loose parts which allow for flexible use, and play associates who maintain a safe play environment (Kaboom, 2021).



Figure 3. Imagination Playground (Image Source: Kaboom, 2021)

This type of design is considered a modern innovation and challenges the necessity for traditional, permanent playgrounds and its flexibility has led to much of the playground's success. However, although achieving success in terms of providing elements for fostering creativity and communication, elements that aid in creating an inclusive atmosphere could be further emphasized. For example, the founding concept of loose parts poses as exemplary demonstration of the idea of flexible use. It is clear the designers desire to utilize the idea of flexible use, but by providing limited to no instruction and lacking diversity in physical attributes of color, shapes, and textures, this playground provides many people with disabilities a lackluster experience or no experience at all. Additionally, the loose equipment is a low safety standard and presents another example of physical exclusion. Although the play associates may seem a simple

solution to this idea, it cannot be guaranteed to users that innate physical risks associated with the equipment are eliminated. By focusing singularly on the idea of flexible use within the design, the innovation has become limited in its capacity to serve its users in other ways such as being safe, desirable, and perceptible.

### *Martin's Park, Boston, MA*

Martin's Park is the latest of additions to the Boston Harbor area's public spaces. With the grand opening taking place the summer of 2019, the playground's creation was motivated by the city's desire to provide a new public space all individuals would be able to use and also serve as a dedication park for Martin Richard, the youngest victim in the Boston Marathon Bombings (ABC30, 2019). A modern playground, Martin's Park's design features various structures, levels of engagement, and layouts. With over thirty features, engagement can truly vary from facilitating teamwork, engaging sensory elements, and even improving mobility skills or experiencing aspects of nature. Such elements are directly correlated with the playground intentionally basing its design around the ideas of "inclusive design". Specifically, the playground's design focuses on five distinct areas of inclusion as shown in Park Design Presentation which was presented at a local community meeting during the fall of 2016 (Boston Parks, 2016). Within this design presentation, park designers from the Boston Parks and Recreation Department alongside Michael Van Valkenburgh Associates, describe the plans for inclusion to be categorized social/emotional inclusion, physical inclusion, sensory inclusion, cognitive inclusion, and communication inclusion (Boston Parks, 2016). These five categories were then each defined and followed by an inclusion scorecard self-assessment.



Figure 4. Martin's Park, Inclusion Scorecard (Image Source: Boston.Gov, 2016)



Within this assessment each feature and attraction from the playground was identified and scored based on which of the five criteria it met. For example, the Wooden Play Ship feature according to their scorecard meets all five criteria by not only providing “2 accessible levels”, but also tying in “the park’s marine context [thematically]”, and serving as an “interactive stage for dramatic and imaginative play and discovery” (Boston Parks, 2016). It is evident that throughout the park there are certain elements which only meet several of the five inclusive play criteria while others meet all five. And while this is true of physical barriers, according to the ideas of inclusive design, this is not necessarily viewed as design failure or instances of inclusion gaps because inclusive design is addressed in the initial design phase. To explain, the concept of inclusive play design does not discount the idea that existing areas could become even more inclusive with improvements; however, it does strive for total inclusion in the design phase, but is understood by its ideals that completely inclusive physical design is difficult to attain. As a result of inclusion taking place within that initial design phase, it is viewed that the design methods for Martin’s Park succeed to emulate inclusive design standards for people with disabilities.

## **Discussion**

Playgrounds are complex spaces that can often serve as beneficial to many groups of individuals; however, it is often the reality that many playgrounds have no consideration for playground inclusion or have limited notes of it. Therefore, when it is the objective of serving a broad range of people groups including people with disabilities, it is important to consider where inclusive concepts should be implemented in the design process itself. Connecting to the principles of Universal Design these cases exemplify the importance of design for inclusive

design particularly in consideration for individuals with disabilities. As the framework presents seven different principles: equitable use, flexibility in use, simple and intuitive use, perception information, tolerance for error, low physical effort, size & space for approach & use, it becomes clear how design methods tend to slack in integrating inclusive design particularly during the initial design phase. Within the three playgrounds' reporting, when there is a lack of addressing inclusion in their designs it is present by noticing a lack of at least one of Universal Design's aforementioned seven principles.

It is important to also mention the ways this research is limited and several caveats that exist outside of this analysis. First, in terms of understanding the scope of playgrounds within the United States, the ways in which playgrounds are exclusive go vastly beyond the scope of this paper, and research is limited to analyzing how specifically people with disabilities are excluded through playground design. The research does not consider the important yet broad externalities that most certainly play key roles in determining people with disabilities' experiences at playgrounds such as socio-economic considerations, backgrounds, political barriers, social barriers, or emotional barriers. Moreover, in order to keep the analysis narrowly focused, this particular research investigates a scope revolving around playground cases solely within the U.S., as adding in international cases would prove useful yet largely complicated due to variation between national policies, socio-economic differences, and cultural perceptions of parks. Additionally, the three case studies do not completely serve as an accurate representation of the entire United States, and more realistically serve as stripped samples of playground design within the country.

Within the future, it would serve as a useful method to conduct analyses on more case studies in order to increase both the sample size, expand the conclusions drawn, and potentially

find new areas of exclusive playground design practice. This could be conducted by finding case studies of interest that lie in new geographic regions of the United States. Additionally, it could potentially be useful to analyze cases outside of the US in order to determine how much of a role politics, economics, and culture play within playgrounds designed within the country.

For personal advancement in my engineering practices, this research will serve as specific discussion and commentary on the importance in determining and deciding how to proceed in the design process. Particular to my Capstone Project, this emphasizes the data collected in my team's project which looks to present our client with demographic user group playground preferences as well as determine the main objectives that should be used in decision making for selection of playground elements such as surfacing materials.

## **Conclusion**

This research serves as a useful reference in determining how engineers must carefully determine, define, and outline their project goals and objectives. The ideas of Universal Design in a playground design sphere should set a precedent of the ways in which engineers should consider all project objectives rotating from a small-scale societal scenario represented by playgrounds into a broader life situation. The findings of this research indicate that exclusion in playgrounds exists and inclusive design practices playground designers currently use can be improved upon. As seen in the cases discussed, these instances often occur in aspects of the project such as choice of equipment and materials for the playground, park layout and themes, and initial design goal setting. Specifically, engineers, architects, and other designers should take this knowledge into consideration for future designs and harness inclusive design practices such as Universal Design in their technical decisions. It is critical that these individuals show serious

consideration to acknowledge how their design methods can affect people with disabilities. These methods can significantly impact user groups in a variety of ways; therefore, designers must determine how they can adapt their design models toward a more inclusive future.

## References

- ABC30. (2019, June 16). 'Martin's Park' Opens, named after Boston Marathon Bombings youngest victim. Retrieved March 14, 2021, from <https://abc30.com/boston-marathon-bombing-victim-martin-richard-victims-park-honors/5349020/>
- Benincasa, R. (2013, August 28). New accessible playground rules may not go far enough. <https://www.npr.org/2013/08/28/214831473/new-accessible-playground-rules-may-not-go-far-enough>
- Boston Parks and Recreation Department; Michael Van Valkenburgh Associates. (2016, October 20). Martin's Park Meeting No. 3 Presentation. Retrieved March 14, 2021, from [https://www.boston.gov/sites/default/files/embed/file/2018-01/martins\\_park\\_mtg3presentation.pdf](https://www.boston.gov/sites/default/files/embed/file/2018-01/martins_park_mtg3presentation.pdf)
- Day, D. (2015, February 11). Saratoga springs Neptune PARK: J-U-B Engineers. Retrieved March 14, 2021, from <https://web.jub.com/project/saratoga-springs-neptune-park/>
- Falstad, H. (2017, January 03). ADA Compliance for Playgrounds -. Retrieved November 03, 2020, from <http://accessadvocates.com/ada-compliance-for-playgrounds/>
- Fidel, S. (2012, April 24). 30-Foot play pyramid, 1 of 3 in the world, comes to Saratoga Springs. Retrieved March 14, 2021, from <https://www.ksl.com/article/20131420/30-foot-play-pyramid-1-of-3-in-the-world-comes-to-saratoga-springs>

- Grant, R. (2017). "Implementing Directive Play-Based Interventions" in Play-Based Interventions for Autism Spectrum Disorder and Other Developmental Disabilities (7-10). <https://doi-org.proxy01.its.virginia.edu/10.4324/9781315657295>
- Holmes, D. (2012, September 15). Neptune Park: Saratoga SPRINGS USA: J-U-B Engineers. Retrieved March 14, 2021, from <https://worldlandscapearchitect.com/neptune-park-saratoga-springs-usa-j-u-b-engineers/#.YEzvsWhKhPY>
- Hums, M. A., Schmidt, S. H., Novak, A., & Wolff, E. A. (2016). Universal Design: Moving the Americans With Disabilities Act From Access to Inclusion. *Journal of Legal Aspects of Sport*, 26(1), 36 - 51.
- IFLA Library Buildings & Equipment Section. (2017, October 13). Universal Design for Library Buildings. Retrieved November 03, 2020, from <https://iflalbes.wordpress.com/2017/10/13/universal-design-for-library-buildings/>
- Kaboom. (2021, January 05). Imagination playground™. Retrieved March 14, 2021, from <https://kaboom.org/creative-play/imagination-playground>
- Kin Wai Michael Siu (2013, October 14). Accessible park environments and facilities for the visually impaired. *Facilities*, 31(13/14), 590 - 609.
- Masiulonis, K., Cummins, E. (Eds.). (2017). *How to Grow a Playspace*. London: Routledge, <https://doi-org.proxy01.its.virginia.edu/10.4324/9781315695198>
- Mejeur, M., Schmitt, G., and Wolcott, H. 2013. "A Systematic Review of the Best Practices for Playground Inclusion." *Pediatrics*, January.

Merriam-Webster. (2020). Exclude. Retrieved November 03, 2020, from <https://www.merriam-webster.com/dictionary/exclude>

NDA. (2020). The 7 Principles. Retrieved November 03, 2020, from <http://universaldesign.ie/What-is-Universal-Design/The-7-Principles/>

Yantz, i N., Young, N., & Mckeever, P. (2010) The suitability of school playgrounds for physically disabled children, *Children's Geographies*, 8:1, 65-78, DOI:10.1080/14733281003650984

Nycgovparks.org. (2021). Imagination playground. Retrieved March 14, 2021, from <https://www.nycgovparks.org/parks/imagination-playground>

Saratoga Springs City. (2011). Marina Park Master Plan. Retrieved March 14, 2021, from <https://www.saratogaspringscity.com/DocumentCenter/View/142/Marina-Park-Master-Plan>

Stanton-Chapman, T. L., & Schmidt, E. L. (2016). Special Education Professionals' Perceptions Toward Accessible Playgrounds. *Research & Practice for Persons with Severe Disabilities*, 41(2), 90 - 100. Utah Outdoor Activities. (2021). Neptune Park Saratoga Springs utah. Retrieved March 14, 2021, from <https://www.utahoutdooractivities.com/neptunepark.html>

Woolley, H. (2013). Now Being Social: The Barrier of Designing Outdoor Play Spaces for Disabled Children. *Children & Society*, 27(6), 448 - 458.

World Health Organization. (2020a). Classifications of Disability. Retrieved November 02, 2020, from <https://www.who.int/classifications/icf/icfbeginnersguide.pdf?ua=1>

World Health Organization. (2020b). Disability and health. Retrieved November 03, 2020, from <https://www.who.int/news-room/fact-sheets/detail/disability-and-health>

Yanchulis, D. (2020). Home. Retrieved November 03, 2020, from <https://www.access-board.gov/guidelines-and-standards/recreation-facilities/background>