

Oh The Places We'll Go
The Game of Children's Spaces

by
Emily Claire Balaban

A thesis
presented to the University of Waterloo
in fulfilment of the
thesis requirement for the degree of
Master of Architecture

Waterloo, Ontario, Canada, 2012
© Emily Claire Balaban 2012

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

Abstract

Play is inarguably an important part of human development. Through play, children as young as three years of age learn social skills and values that will form the foundation of their development in to adult life. Children can be excluded from play for many reasons. Any visible or cognitive differences in a child can cause them to be marginalized in playgroups or daycares and later in their development, at school and camps. This makes it difficult for them to experience the types of play that are so important to their healthy development.

This thesis examines the existing standards for accessible design, finding the contradictions in the information available, and exposing the gaps of information that make it impossible for designers to create truly inclusive play spaces for children. Collaboration with Camp Trillium, one of the foremost pediatric oncology camp programs in Ontario, will be a useful tool for gaining insight into the healing powers of inclusive play experiences for children. The product of this thesis will be the design of a system for creating inclusive play spaces that will allow children who have been marginalized by disabilities and illness to play freely with others.

These fully-inclusive play spaces will aim to foster a new understanding of inclusivity in children; teaching those without distinguishing differences the value of relationships with people of differing challenges, and instilling in marginalized children a sense of self that helps them develop the confidence and social ability to penetrate the boundaries that have been inflicted on them.

Acknowledgements

First I must thank my thesis committee for supporting me and guiding me through this process. Tammy Gaber, for inspiring me to do my best, helping me through the rough patches, taking me to Norway to test out my ideas, and always having the answers to my questions. Rick Haldenby, for supporting my thesis from the very first days and for always guiding me forward with a smile. John McMinn, for giving me the start that I needed and sticking with me through to the end.

Next I must thank Camp Trillium. Their support throughout this process has been invaluable to me. Without a visit to their island and their cooperation in answering my questions and providing drawings by the campers, this thesis would be incomplete.

Finally, thank you to my friends and family for supporting me in this endeavour and helping me to come this far in one piece. Dad, for teaching me to do things right the first time. Mom, for being the voice of reason in my head. Michael, for inspiring me to try something new. Benjamin, for always making me laugh. David, for teaching me something every day. And all my friends who keep me from growing up too much. Thank you.

Contents

Author's Declaration	iii
Abstract	v
Acknowledgements	vii
Table of Contents	ix
List of Images	x
Chapter 1	
Terms of Reference	3
Introduction	6
Chapter II	
Inclusivity	10
Concerning Play	20
Concerning Nature	29
Chapter III	
Development of a System	40
Testing a System	52
A System for Camp Trillium	60
Chapter IV	
Conclusion	89
Notes	90
References	98
Appendix I	
Accessibility	115
Appendix II	
Oh The Places You'll Go	142

List of Images

Chapter I

Title Page *Treehouse Design*

Adapted by author from drawing provided by Camp Trillium.

Chapter II

Title Page *Treehouse Design*

Adapted by author from drawing provided by Camp Trillium.

Figure 2.1 *High and Low Side Reach Limits*

Ramsey, Charles George., Harold Reeve. Sleeper, and Bruce Bassler. *Architectural Graphic Standards: an Abridgment of the Ninth Edition*. New York: Wiley, 2000.

Figure 2.2 *Accessible High and Low Reach*

Ruth, Linda Cain. *Design Standards for Children's Environments*. New York: McGraw-Hill, 2000. Pg 10.

Figure 2.3 *Attunement Play*

Mother and child playing. Digital image. Derbyshire Pilates. 2010. <http://www.derbyshirepilates.co.uk/pregnancy.php>.

Figure 2.4 *Body and Movement Play*

Kids jumping. Digital image. Helling Children's Center. http://www.hellingchildrenscenter.com/occupational_therapy.html.

Figure 2.5 *Object Play*

Child playing with pots and pans. Digital image. What to Expect. November 2, 2011. <http://www.whattoexpect.com/toddler/photo-gallery/decoding-toddler-behavior.aspx#/slide-5>.

Figure 2.6 *Social Play in Animals*

Dog in play position. Digital image. God Talk 101. March 14, 2011. <http://dogtalk101.blogspot.ca/2011/03/happy-dogs-wag-their-tails.html>.

Figure 2.7 *Social Play*

Two boys playing. Digital image. EHow Mom. http://www.ehow.com/info_7940718_games-play-lot-little-kids.html.

Figure 2.8 *Imaginative and Pretend Play*

Girl blowing on dandelion. Digital image. Sonoma School of Education. June 21, 2012. <http://www.sonoma.edu/education/lee/early-childhood/major.html>.

Figure 2.9 *Storytelling and Narrative Play*

Children storytelling. Digital image. Tell Your Children Your Stories. June 1, 2010. <http://enlearn.eastnoble.net/junixon2/Lists/Announcements/DispForm.aspx?ID=1>.

Figure 2.10 *Transformative and Creative Play*

Two children running with capes. Digital image. Just Kid Costumes. <http://www.justkidcostumes.com/costumes/capes>.

Figure 2.11 *Inclusive Art*

Mural Painting. Accessed December 8, 2011. <http://www.zotartz.com/Zot-Artz-Art-Event-Gallery.html>.

Figure 2.12 *Play Therapy*

Child playing doctor. Digital image. The Next Family. August 23, 2011. <http://thenextfamily.com/2011/08/two-moms-and-their-childrens-dreams-for-the-future/>.

Figure 2.13 *Basilica of St. John Lateran*

Lateran Basilica, Rome, Italy. Personal photograph by author. 2010.

Figure 2.14 *Olson Family Garden*

Luckett, Kelly. Olson Family Garden. Digital image. Greenroofs.com. 2010. <http://www.greenroofs.com/projects/pview.php?id=595>.

Figure 2.15 *Atlantic Centre for the Arts Dance Studio*

Atlantic Center for the Arts Gets a U.S. Recovery Grant. July 5, 2009. New Smyrna Beach. Accessed December 8, 2011. http://blogs.orlandosentinel.com/entertainment_arts_letter/2009/07/atlantic-center-for-the-arts-gets-a-us-recovery-grant.html.

Figure 2.16 *ACA Outdoor Work Area*

Choi, Chuck. *Jim and Alexis Pugh Sculpture Studio*. New Smyrna Beach. Accessed December 8, 2011. <http://www.atlanticcenterforthearts.org/artresprog/studios/sculpture.htm>.

Figure 2.17 *Trillium Treehouse Spiral Staircase*

2009. Fall City, Washington. In *New Treehouses of the World*. By Pete Nelson. China: Harry N. Abrams, 2009.

Figure 2.18 *Trillium Treehouse Loft*

2009. Fall City, Washington. In *New Treehouses of the World*. By Pete Nelson. China: Harry N. Abrams, 2009.

Figure 2.19 *Natural Playground Slide*

Slide built in to hill. Digital image. Earth School Concept. <http://grandview.vsb.bc.ca/Earth+School+Concept.htm>.

Chapter III

Title Page *Treehouse Design*

Adapted by author from drawing provided by Camp Trillium.

Figure 3.1 - 3.8 *Treehouse Design*

Treehouse Design. 2012. Designs by Campers at Camp Trillium Rainbow Lake, Waterford, Ontario.

Figure 3.9 - 3.13 *Palette System Test*

By author. January 2012.

Figure 3.14 *Square Post System Connectors*

By author. June 2012.

Figure 3.15 *Square Post System*

By author. June 2012.

Figure 3.16 *Round Post System Connectors*

By author. June 2012.

Figure 3.17 *Round Post System*

By author. June 2012.

Figure 3.18 *Bergen Concept Model*

Dopheide, Samantha. *Bergen Model 1*. May 2012. Cambridge, Ontario.

Figure 3.19 *Bergen Scale Model Parallel*

Dopheide, Samantha. *Bergen Model 1*. May 2012. Cambridge, Ontario.

Figure 3.20 *Bergen Scale Model Maze*

Dopheide, Samantha. *Bergen Model 1*. May 2012. Cambridge, Ontario.

Figure 3.21 - 3.26 *Bergen Prototype*

Bergen Prototype, Cambridge, Ontario. Personal photograph by author. July 2012.

Figure 3.27 *Team PLAYmakers*

Members of the team responsible for building the maze, Bergen. Personal photograph by author. May 2012.

Figure 3.28 - 3.38 *PLAY*

Final construction of PLAY, Bergen, Norway. Personal photograph by author. May 2012.

Figure 3.39 *Cancer Treatment Figure 8 Diagram*

By author. April 2012.

Figure 3.40 *Pediatric Oncology Centres & Camps Canada*

By author. April 2012.

Figure 3.41 *Pediatric Oncology Centres & Camps Ontario*

By author. April 2012.

Figure 3.42 *Development of Camp Trillium*

By author. April 2012.

Figure 3.43 *Make up of Play Blocks*

By author. June 2012.

Figure 3.44 *Sample Construction*

By author. June 2012.

Figure 3.45 *Garratts Island Context*

By author. June 2012.

Figure 3.46 *Garratts Island*

By author. June 2012.

Figure 3.47 *Garratts Island Current and Proposed*

By author. June 2012.

Figure 3.48 *Plant Hardiness Zones*

“Plant Hardiness Zones,” The Atlas of Canada, July 9, 2003, <http://atlas.nrcan.gc.ca/site/english/maps/environment/land/planhardi>.

Figure 3.49 *Wind and Sun Exposure*

“Wind and Sunshine,” The Atlas of Canada, June 19, 2003, <http://atlas.nrcan.gc.ca/site/english/maps/archives/3rdedition/environment/climate/020/>.

Figure 3.50 *Cabin Garden Diagram*

By author. November 2011.

Figure 3.51 *Camp Trillium Cabins*

Cabin area at OuR Island, Ontario. Personal photograph by author. October 2011.

Figure 3.52 *Cabin and Finger Garden*

By author. July 2012.

Figure 3.53 *Cabins and New Gardens*

By author. July 2012.

Figure 3.54 *Bluestem Grass*
<http://newhamptonprairie.pbworks.com/w/page/30802219/Little%20Bluestem>

Figure 3.55 *Hyacinth*
<http://www.tulipworld.com/hyacinths-bulbs/mixed-frAGRANT-hyacinth-super-pack.html>

Figure 3.56 *Purple Coneflower*
<http://www.gardeninglife.ca/articles/article/all-about-coneflowers/>

Figure 3.57 *Bell Peppers*
<http://drgullo.com/diet-resources/food-list/eating-by-color-yellow/>

Figure 3.58 *Carrots*
<http://www.worldcommunitycookbook.org/season/guide/carrots.html>

Figure 3.59 *Bluestem Grass*
<http://newhamptonprairie.pbworks.com/w/page/30802219/Little%20Bluestem>

Figure 3.60 *Black Eyed Susan*
<http://zhurnaly.com/cgi-bin/wiki/BlackEyedSusanBee>

Figure 3.61 *Crocus*
<http://pphotography-blog.blogspot.ca/2012/01/crocus-flower.html>

Figure 3.62 *Snow Peas*
<http://authenticselfwellness.com/2012/03/14/authentic-food-of-the-day-snow-peas/>

Figure 3.63 *Blackberries*
<http://www.ingredienttrade.com/product/blackberry/>

Figure 3.64 *Northern Lights Grass*
<http://www.provenwinners.com/plants/deschampsia/northern-lights-tufted-hairgrass-deschampsia-caespitosa>

Figure 3.65 *Daylily*
<http://www.onlyfoods.net/daylily-hemerocallis.html>

Figure 3.66 *Yarrow*
<http://pranaholistic.blogspot.ca/2010/08/yarrow-much-more-than-weed-found-in.html>

Figure 3.67 *Blueberries*
<http://cep-blogspot.blogspot.ca/2010/06/blueberries-source-anti-oxidant.html>

Figure 3.68 *Cucumber*
<http://recipehealth.net/cucumber/>

Figure 3.69 *Northern Lights Grass*
<http://www.provenwinners.com/plants/deschampsia/northern-lights-tufted-hairgrass-deschampsia-caespitosa>

Figure 3.70 *Snap Dragon*
<http://pphotography-blog.blogspot.ca/2012/01/snapdragon-flower.html>

Figure 3.71 *Aster*
<http://www.livinginseason.com/tag/aster/>

Figure 3.72 *Snap Peas*
<http://foodperson.com/2007/05/17/eat-sugar-snap-peas/>

Figure 3.73 *Raspberries*
<http://www.raspberries.us/>

Figure 3.74 *Iris*
<http://www.imagejuicy.com/images/plants/b/babiana/6/>

Figure 3.75 *Tulips*
<http://houseoftulips.blogspot.ca/2011/05/tulip-history.html>

Figure 3.76 *Beets*
<http://thegermangebhardtfamily.blogspot.ca/2011/02/red-beets-not-really-funbut.html>

Figure 3.77 *Watermelon*
<http://news.nationalgeographic.com/news/2009/08/090828-ethanol-biofuel-watermelons/>

Figure 3.78 *Onion*
http://web.extension.illinois.edu/vegguide/grow_onion.cfm

Figure 3.79 *Bluestem Grass*
<http://newhamptonprairie.pbworks.com/w/page/30802219/Little%20Bluestem>

Figure 3.80 *Monarda*
http://www.floridata.com/ref/m/mona_did.cfm

Figure 3.81 *Pansies*
<http://survivalfarm.wordpress.com/2012/02/10/pansies-spring-or-fall-planting-is-all-about-your-attitude-latitude/>

Figure 3.82 *Tomatoes*
<http://www.thegreeninja.org/six-essential-tips-for-growing-delicious-tomatoes.html>

Figure 3.83 *Strawberries*
<http://www.joyoushealth.ca/2009/06/25/strawberries-soooo-good-for-you/>

Figure 3.84 *Grass Area*
Existing grass condition on OuR Island, Ontario. Personal photograph by author. October 2011.

Figure 3.85 *Playhouse in the Grass Plan*
By author. July 2012.

Figure 3.86 *Playhouse in the Grass Section*

By author. July 2012.

Figure 3.87 *Northern Lights Grass*

<http://www.provenwinners.com/plants/deschampsia/northern-lights-tufted-hairgrass-deschampsia-caespitosa>

Figure 3.88 *Feather Reed Grass*

<http://davesgarden.com/guides/pf/botd.php?date=2007-04-09#b>

Figure 3.89 *Dogwood Bloom*

<http://www.crowders.co.uk/buy/plants/shrubs/cornus-alba-sibirica-variegata-siberian-dogwood#>

Figure 3.90 *Dogwood Winter*

<http://www.trees-online.co.uk/shrubs>

Figure 3.91 *Mockorange*

<http://forums.gardenweb.com/forums/load/cangard/msg0812065415131.html?19>

Figure 3.92 *Butterfly Bush Bloom*

<http://parkseed.com/butterfly-bush-bicolor/p/47657/>

Figure 3.93 *Butterfly Bush*

http://chezradford.blogspot.ca/2009_04_01_archive.html

Figure 3.94 *Crabapple Tree*

<http://www.flickrriver.com/photos/wiless/sets/72157617801929067/>

Figure 3.95 *Crabapple Tree Bloom*

<http://landscaping.about.com/od/floweringtrees/ig/flowering-tree-pictures/Sargent-Crab-Apple.htm>

Figure 3.96 *Pear Tree Bloom*

<http://en.wikipedia.org/wiki/Pear>

Figure 3.97 *Pear Tree*

http://www.tree-pictures.com/pear_tree_pictures.html

Figure 3.98 *Beach Area*

Existing beach condition on OuR Island, Ontario. Personal photograph by author. October 2011.

Figure 3.99 *Playhouse on the Beach Plan*

By author. July 2012.

Figure 3.100 *Playhouse on the Beach Section*

By author. July 2012.

Figure 3.101 *Bluestem Grass*

<http://newhamptonprairie.pbworks.com/w/page/30802219/Little%20Bluestem>

Figure 3.102 *Silver Fountain Grass*
<http://www.educationquizzes.com/fun-quizzes/gardening/ferns-and-grasses---ornamental-grasses/>

Figure 3.103 *Northern Lights Grass*
<http://www.provenwinners.com/plants/deschampsia/northern-lights-tufted-hairgrass-deschampsia-caespitosa>

Figure 3.104 *Viburnum Plicatum*
http://www.mauways.co.nz/product_info.php?products_id=1169&osCsid=ifvnmuqkimc70n1aa7taf9svo6

Figure 3.105 *Russian Sage*
http://www.visitsacandaga.com/garden_club/february_2009.htm

Figure 3.106 *Magnolia Tree*
<http://treepictures.net/Magnolia-Tree.html>

Figure 3.107 *Magnolia Tree Bloom*
<http://florallibrarystore.blogspot.ca/2012/05/magnolia-flowers.html>

Figure 3.108 *Marsh Area*
Existing marsh condition on OuR Island, Ontario. Personal photograph by author. October 2011.

Figure 3.109 *Playhouse in the Marsh Plan*
By author. July 2012.

Figure 3.110 *Playhouse on the Marsh Section*
By author. July 2012.

Figure 3.111 *Cotton Grass*
http://www.panoramio.com/photo_explorer#view=photo&position=539&with_photo_id=11457246&order=date_desc&user=690917

Figure 3.112 *Turtlehead Flower Bloom*
http://www.novascotiagardening.com/products.php?offset=5&cat_id=12&search_query=

Figure 3.113 *Turtlehead Flower*
<http://www.thebattery.org/plants/plantview.php?id=30>

Figure 3.114 *White Water Lily*
http://bicycle2011.com/wp-content/uploads/2011/06/white_water_lily_pad1.jpg

Figure 3.115 *Forest Area*
Existing marsh condition on OuR Island, Ontario. Personal photograph by author. October 2011.

Figure 3.116 *Playhouse in the Forest Plan*
By author. July 2012.

Figure 3.117 *Playhouse on the Forest Section*
By author. July 2012.

Figure 3.118 *Bluestem Grass*
<http://newhamptonprairie.pbworks.com/w/page/30802219/Little%20Bluestem>

Figure 3.119 *Wisteria*
<http://www.sloatgardens.com/wisteria.htm>

Figure 3.120 *Serviceberry Tree Autumn*
<http://blog.phaseonelandscapes.com/testimonials/the-splendor-of-the-serviceberry-tree/>

Figure 3.121 *Serviceberry Tree*
<http://blog.phaseonelandscapes.com/testimonials/the-splendor-of-the-serviceberry-tree/>

Figure 3.122 *Crabapple Tree*
<http://www.flickriver.com/photos/wiless/sets/72157617801929067/>

Figure 3.123 *Crabapple Tree Bloom*
<http://landscaping.about.com/od/floweringtrees/ig/flowering-tree-pictures/Sargent-Crab-Apple.htm>

Figure 3.124 *Tulip Tree Bloom*
http://www.123rf.com/photo_4544141_close-up-of-a-pink-and-magenta-tulip-tree-in-full-bloom.html

Figure 3.125 *Tulip Tree*
<http://activerain.com/blogsvie/2191323/blooming-in-charleston-sc-wordless-wednesday>

Chapter IV

Title Page *Treehouse Design*
Adapted by author from drawing provided by Camp Trillium.

Chapter V

Title Page *Treehouse Design*
Adapted by author from drawing provided by Camp Trillium.

Figure 5.1 *Sea Ranch Elevation Photo*
Corner, Donald, and Jenny Young. Sea Ranch. Accessed December 9, 2011. http://www.greatbuildings.com/cgi-bin/gbi.cgi/Sea_Ranch_Condominium.html/cid_3150571.html.

Figure 5.2 *Sea Ranch Elevation Photo*
Hursley, Timothy. *Sea Ranch*. September 2002. http://www.architecturaldigest.com/architects/100/moore_yudell/yudell_article_092002.

Figure 5.3 *Sea Ranch Aerial Photo*
Hoagland, Eros. *Utopia by the Sea*. December 12, 2008. California. http://www.nytimes.com/slideshow/2008/12/14/travel/1214-RANCH_index.html.

Figure 5.4 *Sea Ranch Living Space Photo*
Sea Ranch Residence California. Sea Ranch, California. Accessed December 10, 2011. <http://www.decodir.com/2009/11/sea-ranch-residence-california-turnbull-griffin-haesloop-architects/>.

Figure 5.5 *Sea Ranch Site Plan*
Moore, Lyndon, Turnbull, and Whitaker. *Site Plan Drawing*. 1964-1965. http://www.greatbuildings.com/cgi-bin/gbc-drawing.cgi/Sea_Ranch_Condominium.html/Sea_Ranch_Site_Plan.jpg.

Figure 5.6 *Sea Ranch Second Level Plan*
Moore, Lyndon, Turnbull, and Whitaker. *Upper Plan Drawing*. 1964-1965. http://www.greatbuildings.com/cgi-bin/gbc-drawing.cgi/Sea_Ranch_Condominium.html/Sea_Ranch_Upper_Plan.jpg.

Figure 5.7 *Haystack Mountain School Model*
Barnes, Edward Larrabee. *Haystack Mountain School of Arts and Crafts*. 1958-61. The Museum of Modern Art, Deer Isle, Maine. <http://arttattler.com/architectureinsitulandscape.html>.

Figure 5.8 *Haystack Mountain School Outdoor Space*
Moxley, Ben. 2011. Accessed December 9, 2011. <http://www.haystack-mtn.org>

Figure 5.9 *Haystack Mountain School Site Photo_spread*. Accessed December 9, 2011. <http://www.haystack-mtn.org/campus.php>.

Figure 5.10 *Atlantic Center for the Arts Dance Studio*
1997. New Smyrna Beach, Florida. Accessed December 9, 2011. <http://www.behance.net/gallery/Atlantic-Center-for-the-Arts/852760>.

Figure 5.11 *Atlantic Center for the Arts Site*
1997. New Smyrna Beach, Florida. Accessed December 9, 2011. <http://www.behance.net/gallery/Atlantic-Center-for-the-Arts/852760>.

Figure 5.12 *Atlantic Center for the Arts Music Studio*
1997. New Smyrna Beach, Florida. Accessed December 9, 2011. <http://www.behance.net/gallery/Atlantic-Center-for-the-Arts/852760>.

Figure 5.13 *Nordic Artists Center Artist Houses*
Vuoma, Laura. Artist Houses. Dal I Sunnfjord, Norway. Accessed December 9, 2011. <http://www.nkdale.no/aboutnkd.html>.

Figure 5.14 *Nordic Artists Center Artist Houses*
Vuoma, Laura. Artist Houses. Dal I Sunnfjord, Norway. Accessed December 9, 2011. <http://www.nkdale.no/aboutnkd.html>.

Figure 5.15 *Nordic Artists Center Artist Workshop NDK Workshop*. Accessed December 9, 2011. <https://www.facebook.com/photo.php?fbid=194503640572615&set=a.165086653514314.32535.107448765944770&type=3&theater>.

Figure 5.16 *Moorelands Camp Cabin Exterior*
U of T. *Moorelands Camp Cabin*.

Figure 5.17 *Moorelands Camp Cabin Plan*
U of T. *Moorelands Camp Cabin*.

"CONGRATULATIONS!

**Today is your day
You're off to GREAT PLACES!
You're off and away!**

**You have brains in your head
You have feet in your shoes**

**YOU CHOOSE
any direction
steer yourself
any direction**

You're on your own and you know what YOU know...

*Text: Dr Seuss's "Oh The Places You'll Go" (see Appendix II)
Image: Adapted from drawings provided by Camp Trillium (see List Of Images)*

Chapter I

Terms of Reference

Introduction

... and YOU are the guy who'll DECIDE where to go"

Play

“Play is the work of children. It consists of those activities performed for self-amusement that have behavioral, social, and psychomotor rewards. It is child-directed, and the rewards come from within the individual child; it is enjoyable and spontaneous.”

*Encyclopedia of Children’s Health*ⁱ

Nature

“All natural phenomena and plant and animal life as distinct from man and his creations.”

*World English Dictionary*ⁱⁱ

Health

“Health is a state of complete physical, mental, and social well-being and not merely an absence of disease or infirmity.”

*The World Health Organization*ⁱⁱⁱ

Inclusivity

“A condition where people from all walks of life, identities, and lived experiences feel a sense of belonging and can participate fully.”

Adapted from the Girl Guides of Canada^{iv}

Experiential Inclusivity

A condition where a space or series of spaces is not limiting to the type of play conducted by a child.

By Author

Physical Inclusivity

A condition where the dimensional properties of a space or series of spaces do not limit a child’s use of said space(s).

By Author


Introduction

Play is an essential part of ensuring a child's healthy development.¹ As a child grows and progresses from infancy to adolescence their needs for different types of play evolve and change with them. Through healthy play, children will be able to “learn, master experiences, express themselves, cope with anxiety, create, achieve, and develop skills”² The National Institute for Play outlines seven elemental forms of play, or “patterns of play.” Each type of play helps to nurture a specific set of skills in a developing child, which all contribute to the child achieving their highest potential. Giving a child the opportunity to experience all these types of play is highly important to their development. Historically, play has been thought to have some important therapeutic uses because of its effects on development, both as a diagnostic tool and a healing tool. Some philosophers included in this thinking pool are Plato, Friedrich Froebel, and Sigmund Freud.³ Society is starting to accept the importance of play as an element of growth, but has yet to fully accommodate children of differing abilities in to their efforts to create healthy play environments. The social and psychological skills learned through play are particularly important to children going through difficult challenges including severe illness and cognitive and physical disabilities. For this reason, healthy play experiences for children need to include a variety of activities beyond athletics that help children develop the range of social, psychological, and physical skills that they need.

Arts and nature programs are two methods of achieving healthy and inclusive play experiences that have recently been gaining momentum. The arts can be a very effective vehicle for motivating inclusivity and certain types of play. Different arts programs have been popping up across North America that aim to provide fully inclusive experiences for kids, teaching them how to express themselves, work in groups, and be proud of their abilities. Participation in

nature in the form of gardening is also a very therapeutic method of play. Taking care of another living thing and being a part of its life cycle can have great psychological benefits to anyone, but particularly to people in a more fragile state of mind, such as those living with cognitive disabilities and those facing complex issues in their lives. Given these benefits from interaction with nature, spaces that facilitate play activities should be very sensitive to their surroundings and connected to their sites. There are plenty of good examples of architecture that do this. Camps, cottages and treehouses are places that generally are designed with a playful program and a strong connection to the site and nature for both the architecture and its users.

Play spaces need to be designed carefully to facilitate all of these experiences to make a stimulating and accommodating space for children. The most successful play spaces will enable children to adapt them to their play needs. Not only should these places be able to accommodate every type of play, but they also need to be able to accommodate every type of child. Children with differing abilities and life situations all have a unique set of requirements from a play space, and the best play space will let them use it as they need while adapting to any physical limitations they may have. Given the unique needs of every child, perhaps the best play space is one that a child can create for themselves, catering to their exact needs as they see them. This thesis aims to create a system for making play spaces that allows children to experiment with environmental conditions, social settings, and connections with nature through building their own personalized play spaces.



**"Out there things can happen
And FREQUENTLY do
To people as brainy
And footsy as YOU**

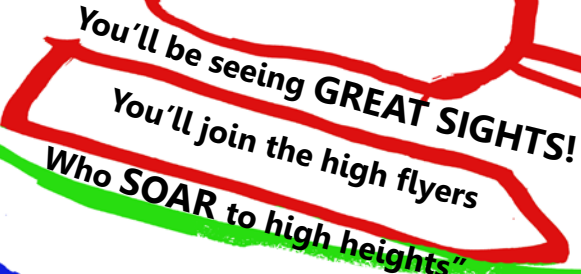
**And when things start to happen
DON'T WORRY, don't stew
Just go right along
You'll start happening too**

You'll be on your way...

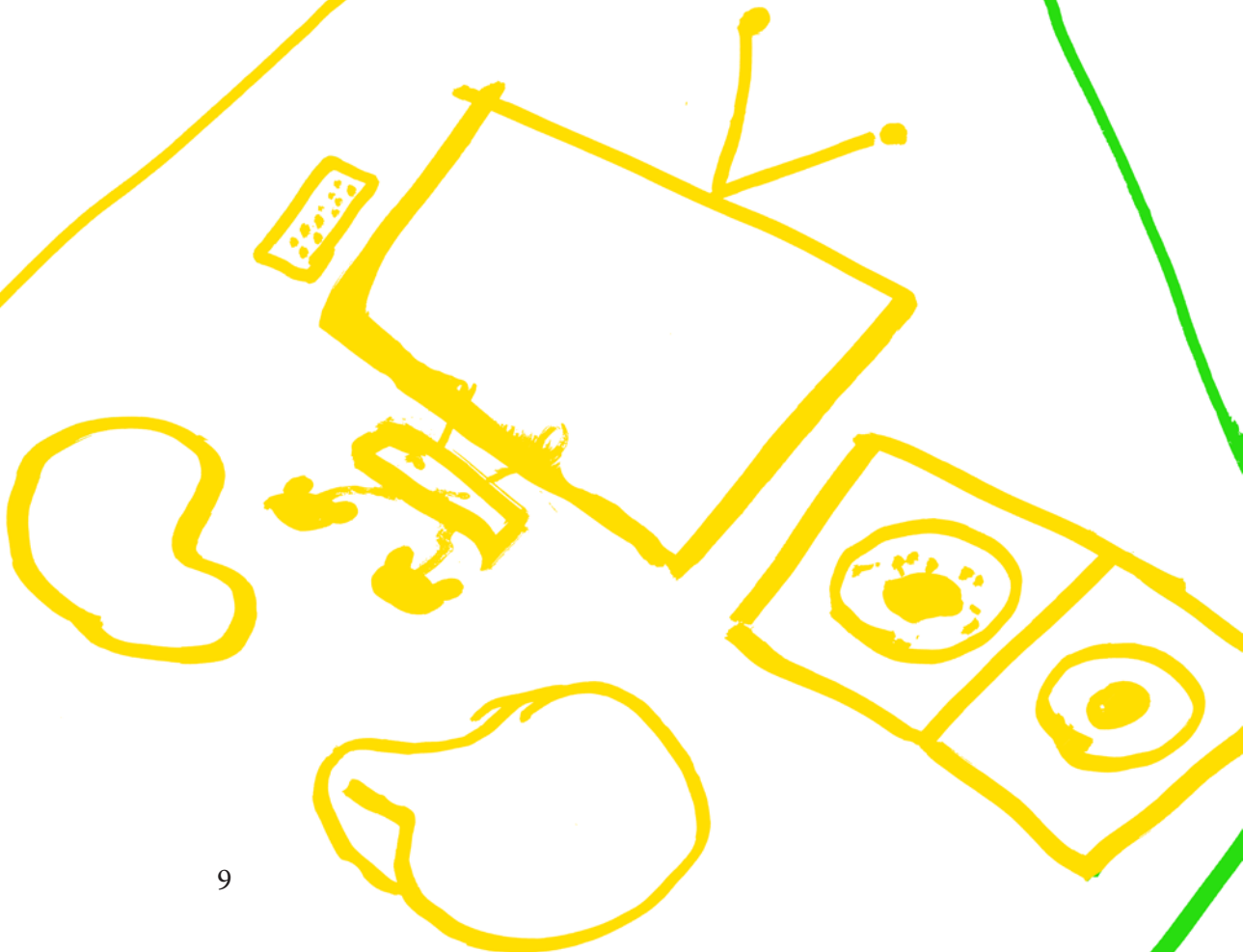
UP!

Chapter II

*Inclusivity
Concerning Play
Concerning Nature*



You'll be seeing **GREAT SIGHTS!**
You'll join the high flyers
Who **SOAR** to high heights!



Inclusivity

In working to design a system for successful play spaces for kids, a wide range of topics come in to play. Inclusivity is one of the most important and least addressed issues. A play space that limits who plays and what games can be played has failed to provide a healthy play environment for children. Children learn social values starting at the age of three,¹ and a large factor in what they learn comes from the play experiences that they have with their peers. It is therefore essential that the spaces in which children play are fully inclusive and designed such that children of all abilities can participate and learn to interact with their peers. This is why a successful system for creating play spaces needs to have complete *experiential inclusivity* and complete *physical inclusivity*.

Accessibility Standards Are Not Inclusive

As designers, we rely on published Design Standards to guide us through making specialized design decisions. In particular we rely on Design Standards to tell us how to create accessible and inclusive spaces. Standards for these types of environments are essential to designers because a number of the design decisions that need to be made while creating inclusive environments are not instinctual for people without disabilities. Many standards for accessibility exist on different levels of legislature with the goal of requiring designers to provide experientially and physically inclusive play experiences. Unfortunately, within these standards there is often crucial information missing when it comes to children, making this a nearly impossible feat. This trend, although very problematic, is understandable. As we spend most of our lives as adults, it makes sense that the published and enforced standards for accessibility would focus on accommodating our adult dimensions. However, the standards for adult inclusivity are often flawed, and the

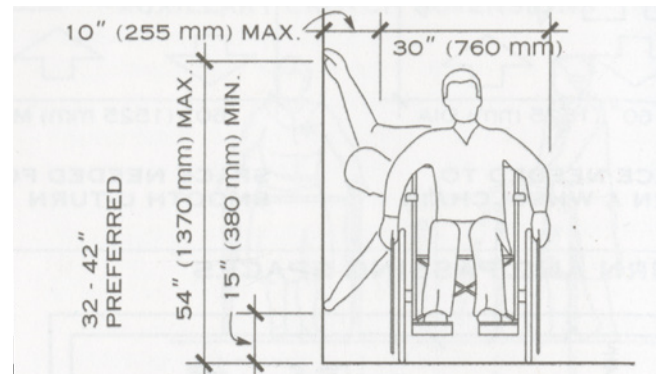


Figure 2.1 High and low reach limitations for an adult in a wheelchair. The “preferred” dimensions for an adult fit more comfortably within the range of reach possibilities for a child than the maximum and minimum possibilities.

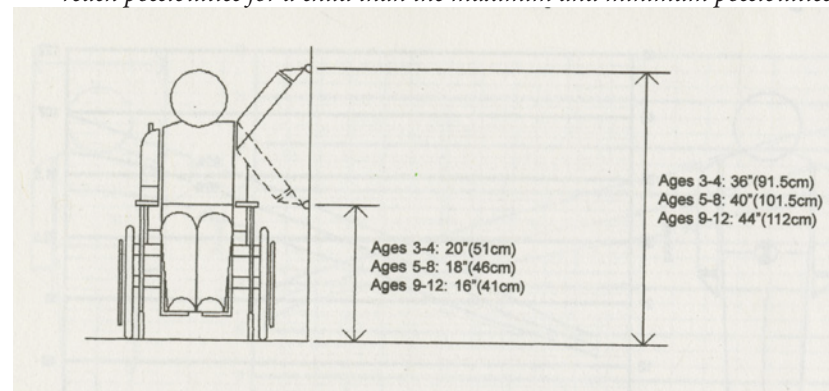


Figure 2.2 High and low reach limitations for a child in a wheelchair. For the youngest age group the low reach is 5” more limited than an adult, and the high reach is 18” more limited.

relationship between different sets of standards makes the problem complex. Within the available standards there are many contradictions, including a 5” or 110mm difference in recommended width of a door and width of a clear passage for a wheelchair. As problematic as the contradictions are, the gaps of information in the standards provided to designers is potentially even more troubling (for full analysis see *Appendix I*). The Canadian Standards Association, Ontario Building Code, and the City of Toronto Accessibility Design Guidelines all neglect to give clear design instructions as to how to achieve an inclusive space for people with sight and hearing impairments, although they do allude to strategies for making spaces more usable for these individuals, there are no clear directions as to how to go about doing so beyond some small dimensional requirements for curbs and bulkheads. Suggestions for changing materiality, colour, and acoustic qualities are made, but no information is provided about specifics for achieving this or where to find that missing information. The City of Toronto Accessibility Design Guidelines includes an entire chapter on outdoor accessible design but does not include any information about how to create connections to nature for the users, or even any recommendations to the designer to do so. The CSA, OBC and City of Toronto Accessibility Design Guidelines all omit any information about design for cognitive impairments, and for the differing dimensions between a child and an adult, with or without special needs. One of the biggest problems with this is that the dimensions for reach and sight lines for adults differ greatly from those of children. Several authors have written their own versions of standards for accessibility for children. None of these standards are required to be followed by designers, but they are available as suggested guidelines and can be found if a designer chooses to search them out.

This information tells us that our minimum standards for design need to be improved. With more coordinated and complete Design Standards to follow, designers could learn strategies for inclusivity from the beginning of their careers,

and create a foundation for a type of design that makes spaces exciting, stimulating, and usable for everyone. If we want to design successful environments specifically for children, adjusting our adult-sized standards to fit their needs is essential. And if we want to design inclusive play spaces for children, then we need to find a way to teach designers the qualitative aspects of design that can make all the difference. Architects and designers should be able to understand the concepts of inclusive design in such a way that allows them to add it to their skill set as a catalyst for innovation and imagination.

Architecture and Inclusivity

With existing design standards that are sometimes flawed, and a lack of opportunities for education in inclusive design, architects are left without a way of knowing if they have truly created an inclusive space before it is completed and in use. With an incomplete knowledge of inclusivity, is it possible that architects and designers are partially responsible for the exclusion of children with special needs that is so common in our society? Is it possible that by making exclusive spaces we have nurtured the exclusive behavior of children and adolescents? Many studies have been conducted in the twentieth century to try and gain a better understanding of how and why children and adolescents make inclusion decisions when choosing their friends and playmates. Why are children with differing abilities more often than not excluded from regular play opportunities with their peers?

Studies in Inclusivity

A study by Sylvia L. Dietrich in 2005 examined the friendships that occur between preschool-aged children with and without disabilities in an inclusive classroom environment. Of the eight children in the study, one was known to have a physical disability and three were diagnosed

with delayed development. This leaves four without any known type of disability. Of the six recorded friendship pairings that were observed, five were between a child with a disability and one without. The sixth friendship was between the child with a physical disability and a child with delayed development. Her study concluded that none of these friendships would have formed if the children had not been given the opportunity to interact. Her conclusions state that “for a friendship to develop, children must have the opportunity to meet one another.”² Not only did friendships develop in this situation, but parents from both groups of children reported changes in the child’s development. Children with disabilities were reported to have “more appropriate social interactions, more interactions with children without disabilities, higher levels of social play and more advanced play.”³ Children without disabilities were reported to have shown improvement in “social cognition, awareness of others’ needs, pro-social personal characteristics, and acceptance of human diversity.”⁴

A similar study by Craig H. Kennedy, Smita Shikla, and Dale Fryxell in 1997 examined the social relationships of intermediate school students with severe disabilities in inclusive and specialized environments. The study yielded similar results to that done by Sylvia L. Dietrich. The study focused on two groups of students with severe disabilities. The first group participated fully in general education settings, and the second group were educated in separated special education classrooms. The findings showed that while the students in the general education program did have more social contact with their peers throughout the day, the number of different peers that they had contact with and the quality of the social contact did not differ significantly between the two groups. The study did show that there is a noticeable correlation of higher levels in the students in the general education program.⁵ Their conclusions stated that there are “substantive social benefits for students with severe disabilities who participate in inclusive educational arrangements.”⁶ These include more frequent interaction

with peers without disabilities, more social contacts with peers without disabilities across a greater range of activities and settings, larger friendship networks, and more durable relationships with peers without disabilities.⁷

Another study by Karen Diamond and Huifang Tu in 2008 tried to get a clearer understanding of why children make the inclusion decisions that they do by interviewing preschool children in a classroom context. The participants included 68 children, 30 boys and 38 girls, in five different preschool classrooms. Each class included several children who were learning English and 3-4 children with identifiable disabilities, none of which required the use of a wheelchair. Interviews with the children involved describing to them different hypothetical play contexts, and then gave them the choice of a doll in a wheelchair and a doll without. 63% of children chose the doll without a wheelchair as an initial reaction to the circumstance, but approximately half of those children would change their choice to the doll with the wheelchair for contexts where the disability did not interfere with the hypothetical game or activity. Many of their explanations for this focused on sharing and enjoyment.⁸ The study suggests that the children's reasons for making specific inclusion decisions is the key to understanding the types of environments that will encourage inclusion. Children often referred to ability as a reason for choosing the doll without the wheelchair, while they brought up issues of fairness, sharing, and taking turns to explain their reasoning for choosing the doll in a wheelchair.⁹ The study states: "Our finding that many children decided to include a hypothetical child with a disability when they were given information that highlighted the ways in which the child could participate suggests that by providing information about ways to play together may be one way to support more inclusive play opportunities."¹⁰

The Consequences of Exclusivity

In 2009 Melinda Wenner wrote an important article for the *Scientific American* in which she summarizes a range of studies done to assess the effects of childhood play experiences on a person's adult life. All of them point to the same conclusion: people with limited play experiences in their childhood grow up to lead more troubled lives ranging from being convicted murderers, to being suspended from work. Of all the types of play available to a child, "free play" seems to be disappearing in modern society. Children's free play time dropped 25% between 1981 and 1997¹¹ due to parents enrolling their children in organized activities, like music lessons and organized sports, often with the intentions of helping them develop a skill that will increase their kids' chances of getting in to the right post-secondary education institutions, and sometimes with the intention of simply keeping them out of trouble. Even enrolling a child in a structured preschool or daycare program versus a play-oriented program will affect their development into adulthood. Similarly, being excluded from opportunities of free play with one's peers can have the same consequences. Free play helps a person to become socially adept, cope with stress, and build cognitive skills such as problem solving.¹² Anthony D. Pellegrini, an educational psychologist at the University of Minnesota, describes the need for children to play freely with their peers: "You don't become socially competent via teachers telling you how to behave; you learn those skills by interacting with your peers, learning what's acceptable, what's not acceptable."¹³ Children will learn to share, compromise, and respect the needs of others when they play together and have to adjust in these ways in order to keep their playmates. In 1997, a study of children living in poverty and at high risk of school failure found that by age 23, more than 30% of kids who had attended structured preschool programs had been arrested for a felony, compared to less than 10% of the kids who had attended play-oriented preschool programs. In the same group of people, their adult lives revealed that less than 7% of those who attended

play oriented preschool programs had ever been suspended from work, while over 25% of the people from the structured preschool programs had experienced suspension.¹⁴ Play also helps children to learn to deal with anxiety and stress. In 1984 a study of anxious preschoolers divided 74 children into two groups. One group was given time for free play and one group was told to sit and listen to a teacher tell them a story. After the activity periods ended, anxiety levels in the children who were allowed to play had dropped twice as much as anxiety levels in the children who had listened to the story.¹⁵ This concept of play as a stress-reliever is known in neuroscience as “social buffering.”¹⁶

One of the play environments where children develop their communication skills, arguably the most important social skill, is in pretend play. Pellegrini says that “[in pretend play with peers, children] have to communicate about something that’s not physically present, so they have to use complicated language in such a way that they can communicate to their peer what it is they’re trying to say.”¹⁷ An example provided by Wenner is that kids can’t get away with just asking “Vanilla or chocolate?” as they hand a friend an imaginary cone. They have to provide contextual clues such as “Vanilla or chocolate ice cream: which would you like?” Adults, on the other hand, fill in the blanks themselves, making things easier for kids.¹⁸ In order for children to get the play experiences they need, play needs to be seen in a different light. Somehow a stigma has developed that leads adults to think that play is an unproductive use of time, and so play becomes a limited activity for their child. David Elkind, a child development expert at Tufts University says that “Play has to be reframed and seen not as the opposite of work but rather as a compliment. Curiosity, imagination and creativity are like muscles: if you don’t use them you lose them.”¹⁹ Ultimately, play deprivation leads to poor social skills, which can have a range of consequences, including an underdeveloped ability to communicate successfully with one’s peers. Inclusive, safe play environments can create a place for children to play the way they need, and for adults

to feel comfortable allowing them to play freely with their peers.

Initiatives for Inclusivity

Summer camps have become a popular way to give children an inclusive play experience. Dr. Mike Amylon ran a pilot study through the Children's Oncology Camping Association International in the summer of 2010 to see if the camp environment has a significant enough impact on the children attending to merit running a study to measure the impact of the camp experience on young cancer patients. Inclusivity in camps for children battling disease is highly important. These children face adverse life challenges on a daily basis that can make it difficult for them to relate to their peers, and can lead to exclusive experiences. Dr. Amylon's study used questionnaires to learn about the social skills that children feel they have developed while at camp. Campers were divided into two age groups. The first is children aged 6 to 10. Their survey included fourteen questions on a four point scale asking how much the campers learned about friendship skills, family citizenship, perceived competence, independence, interest in exploration, teamwork, and responsibility. The second group was comprised of youth aged 10 to 18. The survey they answered included fourteen questions on a five point scale referring to how much their friendship skills have changed while at camp. The study showed that over 87% of the children in the younger group felt they had learned either a little or a lot about the surveyed domains, and that over 87% of the youth in the older group felt that they had improved on their friendship skills while at camp.²⁰ Increasing all of these skill sets and encouraging this type of development is especially important to children who are in a circumstance that causes them to be marginalized, like fighting a serious illness, belonging to a visible minority, or living with physical or cognitive challenges. This study showed that camps can help these children build the skills they will need to help them fight this marginalization. Many

camps exist to provide these experiences to all children. Some focus on arts, while others focus on team work, and some just want to let kids play, but they all have the same goal: to give children they type of experience that will help them to break through any barriers they may face.

Magda Mostafa, an assistant professor at the Department of Architectural Engineering in Cairo University, published a paper in 2008 outlining her study in designing spaces specifically for autism. Her work has been leading to the development of a set of guidelines that will help architects know how to design for the scope of autistic needs. Her study was conducted in two phases, a questionnaire phase followed by an intervention phase. Her questionnaire was posted online on the Families for Early Autism Treatment (FEAT) website, and was also distributed to the caregivers and teachers at the Advanced Society for Developing Skills of Special Needs children in Cairo. The participants were asked to rank architectural factors from the most influential to the least. These factors were acoustics, visual colours and patterns, lighting, texture, olfactory and spatial sequencing of functions. The results of this survey showed that acoustics and spatial sequencing were the most important factors.²¹ The intervention phase of her study involved implementing changes to a classroom environment for autistic children based on improving acoustics and spatial sequencing, and measuring the children's changes in attention span, response time, and behavioral temperament over the course of twelve weeks. To analyze the impact of acoustics there were modifications made to the children's speech and language therapy room in the form of increased sound proofing. The results showed that by the end of the study children had more than three times their original attention span, gradual decrease in response time, and improved behavioral temperament.²² To analyze the impact of spatial sequencing the classroom was reorganized in to

“stations” where different functions are carried out, with the intent being to focus the activity and remove external distractions. After twelve, the children showed a gradual increase in attention span and decrease in response time, and a general improvement in behavioral temperament.²³ Part of the spatial reorganization that was done involved the addition of an “escape space” which yielded interesting results. One child in particular who was severely autistic and had a history of removing herself from the group to provide her own sensory stimulation, in the form of sitting against a wall and banging her head against her legs stretched out in front of her, made great use of the escape space. At the beginning of the study she would spend the majority of her time within the space, but gradually she began to participate more fully in the classroom environment while constantly checking over her shoulder as if to make sure the escape space was still there. Magda Mostafa writes “It was almost as if the mere presence of the option to escape was sufficient, and her need to escape decreased.”²⁴ Studies of this type are important in finding ways to fill in the gaps in our knowledge of how to make inclusive spaces. As Magda Mostafa so appropriately says: “Environments based on careful scientific analysis will benefit not only those with special needs, but all user types, making our architecture more genuinely responsive to all our range of needs.”²⁵

Perspective

When we are children we think that excluding someone will hurt their feelings in that moment, probably because we had experienced it at one point or another. Unfortunately, we are unaware of just how deep the wounds of exclusion can go, and how far past the moment when you make the decision the wound will endure. When I think back to my childhood and the time I spent playing in the school yard or around the neighbourhood in the evenings, I can remember certain people who faced exclusion on a regular basis, some with physical limitations and others with cognitive challenges. In my neighbourhood people rarely moved away before they finished high school, so I happen to know a little bit about how these individuals grew up and what kind of people they were developing into when I last knew them. Wonderfully, most of them became integrated in to our school community. They didn't have huge circles of friends, but the ones they had were good people and the kind of friends you keep. Knowing what I know now, I can see that the schools I attended encouraged the inclusive learning environments I have been writing about. And from what I have observed, I have to say, I think they work. In my neighbourhood, people with different abilities, nationalities, traditions, and beliefs are, from what I experience, respected for who they are. People are curious to learn about those who are different than them and happy to teach others about themselves and what makes them special. With my play spaces I hope to give children experiences that will help them grow in to the kind of people that I am surrounded by when I go home: people who embrace whatever it is that makes someone special.

Concerning Play

To understand the need for *experientially inclusive* and *physically inclusive* play environments it is essential to understand the importance of play experiences on a child's healthy development. The National Institute for Play outlines seven elemental forms of play, or "patterns of play". Each type of play helps to nurture a specific set of skills in a developing child, which all contribute to the child having a healthy development experience.

Types of Play

Attunement Play is described by the National Institute for Play as "the grounding base of the state of play."²⁶ Attunement play is so named because it results in the "attunement" of the right cerebral cortex of the two playing individuals. The easiest place to see this is between a mother and her child. The pair first share eye contact, then as the child smiles and the mother smiles in response they become attuned to one another.²⁷ This type of play brings about positive feelings in the child because it makes them feel important and it meets their need for feeling as though the adult, in this case their mother, can understand their way of thinking.²⁸

Body Play and Movement enables children to learn thinking through motion. It helps to structure a child's knowledge of the world by teaching them about self-movement. Qualities such as innovation, flexibility, adaptability and resilience all stem from learning in movement. Play that is associated with exploratory body movements – jumping, rhythmic speech, locomotor and rational activity – are all done for their own pleasurable sake, and they are therefore intrinsically playful. This type of play helps to ready a child for the unexpected and the unusual.²⁹

Object Play is often seen through activities like



Figure 2.3 Attunement Play



Figure 2.4 Body and Movement Play



Figure 2.5 Object Play



Figure 2.6 Social Play as seen in an animal. This position by dogs is universally understood to be an indication of a desire to play, just like certain human signals will indicate to a peer that one is intending to play.

banging on pots and pans, skipping rocks, rolling marbles, or spinning a top. As children develop skills in manipulating objects the circuits in their brain become richer. The greater variety of objects a child plays with the more they are helping their brain develop beyond simple manipulation skills in to innovative skills. Object play has a strong correlation with well-developed problem solving skills in adults. For this reason, a lack of play with things with one's hands and fixing things by hand in one's youth can lead to underdeveloped problem solving in work settings as an adult.³⁰

Social Play helps kids to learn facial signals and body language that will let other kids know when they want to start, maintain, or end play.³¹ Social play has three subsets: play and belonging, rough and tumble play, and celebratory play. All play with other people stems from a need to be accepted, or belong. Children start this process by playing together without any conscious acknowledgement of their relationship with their playmate. Eventually their continued play develops their mutual respect for one another and a friendship is born.³² Successful social play is the key to maintaining a play relationship long enough that it can develop in to a friendship. Rough and tumble play has been shown in humans and animals to contribute to the development and maintenance of one's social awareness, cooperation, fairness and altruism. It is often viewed as a negative form of play by adults observing from outside of the game, they see children hitting, diving and wrestling and often put a stop to it. In one's youth it is more commonly seen in organized sports. Without experience in this type of play a child will not properly develop the skill of give and take that is necessary for social mastery, and children who are deprived of this type of play are often shown to have violent tendencies in their adult lives.³³ Celebratory play can be seen in animals and humans alike. People often experience it in their adult lives just as much as in their childhood. One example would be sports fans celebrating after their team has won an important game. Most forms of celebratory play rely on ritual to maintain them, like people shopping in the bustle

of the Christmas season.³⁴ Social play takes many forms, and each plays a role in developing a child's sense of how to communicate with others through body language.

Imaginative and Pretend Play is the type of play that helps children to develop their own sense of mind. Developing proper skills in understanding, trusting others and coping depends on a child experiencing pretend play.³⁵ Through pretend play a child can experiment with social roles, learn to see situations from another's point of view, and develop problem solving skills by resolving issues between imaginary characters. Their language skills are improved as they are forced to fully express themselves, or each of their imaginary characters to one another, because there are no adults present to fill in the blanks for them. Pretend play can also teach a child the power of words and language. Through pretend play with a playmate, a child uses spoken language to organize a game of re-enacting a story. This will help them to make a connection between written and spoken words, which eventually will contribute to their learning to read and write.³⁶

Storytelling and Narrative Play engages children in the process of making sense of the world, its parts, and their particular place in it. Throughout our lives there is a consistency of storytelling that helps us to better understand ourselves and others. From recounting the day's events, to hearing about their parents' upbringing, children experience storytelling in such a way that helps them to expand their personal narratives with a sense of fun as their own lives develop. Storytelling produces a sort of timeless pleasure and a sense of vicarious involvement in another's life that is most children's favourite way to learn.³⁷

Transformative and Creative Play uses fantasy to transcend the reality of a child's ordinary life. This process teaches children to create new ideas and then reshape them. Transformative and creative play brings children in to the realm of spontaneity. This type of play can be a solitary activity or can occur in groups of children of any size. The



Figure 2.7 Social Play



Figure 2.8 Imaginative and Pretend Play



Figure 2.9 Storytelling and Narrative Play



Figure 2.10 Transformative and Creative Play

creativity and innovation that this fosters will carry through to a child's adult life.³⁸

Inclusive Play Spaces

Giving a child the opportunity to experience all these types of play is highly important to their development, particularly for children in challenging life situations who will rely on these skills to pull them through to adulthood. This is why it is essential that play spaces be designed without limitations. Successful play spaces must boast *experiential inclusivity* and *physical inclusivity*. From a social point of view, the best play spaces in existence are playgrounds with a variety of spaces, materials, conditions, and apparatuses, because they are not limiting to the experience a child can have while playing. Everything is possible from competitive sports and team activities to individual contemplative play to group cooperative play. One traditional piece of playground equipment that exemplifies this is the "captain's wheel". If mounted at a height of 3'-0" or 915mm³⁹, a spinning disc is physically accessible to any child of any range of abilities who wishes to play with it. Keeping the context of the wheel ambiguous allows children to imagine any possible use for it. Something that in reality is little more than a plastic disc nailed to the inside of a simple enclosure can become anything from a steering wheel for a space ship to a spinner on a game show to the controls of a time machine. The game can be anything and it can be played by anyone.

Expanding the Program of Play

Arts programs are becoming an increasingly popular method of providing an inclusive play experience to children and adolescents of differing abilities. Arts activities such as photography, music, drawing, and drama can foster body and movement play, object play, social play, imaginative and pretend play, narrative play, and transformative play and can

give children many and varying opportunities to express their feelings, concerns, fears, and desires. A community in Muskegon, Michigan hosted “May Art Day” in 2009 and created a giant mural with a group of children with all differing abilities. Creating this piece together gave the kids a sense of accomplishment and created a sort of camaraderie between everyone who participated. The mural now hangs in the Muskegon Area Intermediate School District administration building.⁴⁰ The apparatuses used to make this day possible are similar to those made by the company Zot Artz.

Zot Artz is a company that began in 1990 and since has developed a wide range of products that enable children of varying abilities to create art. Their products are all easy to hold or push, and can be attached to a wheelchair if necessary. Zot Arts has a unique philosophy regarding the creation of their art tools: “Rather than finding ways for people with disabilities to participate in activities for non-disabled people, we create entirely new activities and projects for people with disabilities and invite those without disabilities to join in.”⁴¹ Not only do they create the tools that make it possible for anyone to create art, but Zot Artz also helps schools, museums, residential and day centres, independent living centres, and parks and recreation programs to organize inclusive art events.⁴²

Dramatic arts are another field where there has been development of inclusive play programs. Unified Theatre is a program in Hartford, Connecticut and New York City which is a “student-driven initiative that facilitates inclusion of students with disabilities through the performing arts.”⁴³ The program bases itself in middle schools and high schools and trains student leaders who can help a group of students create a successful final production that includes people of all abilities. Students take care of all aspects of the show themselves: writing, directing, acting, costumes, lighting, music, and more. Their goal is to let students work together and learn how to interact successfully in a diverse social and creative climate, or, as they put it: “let teens lead, let creativity rule and treat people with disabilities as complete and entire



Figure 2.11 Children of differing abilities all participate in creating a large art mural using tools like the Zot Artz Art Roller and Wheelchair Bridge, shown here.

equals.”⁴⁴

Play Therapy

The effects of play on the learning processes of a child are substantial, whether children are learning social, psychological or physical lessons. Because of this connection to our psyche, play can also be used as a method for providing psychotherapy to a child. Historically, different philosophers have experimented with the concept of play therapy to find where the strongest potential for this type of treatment lies. Both Plato and Friedrich Froebel in 429-347BC and 1903 respectively illustrated a hypothesis that one could analyze a person's psychological state by observing them at play.⁴⁵ Plato is said to have stated “you can learn more about a person in an hour of play than in a year of conversation.”⁴⁶ In Froebel's book *The Education of Man* he talks about the importance of the symbolism in play. He writes that “play is the highest development in childhood, for it alone is the free expression of what is in the child's soul.... Children's play is not mere sport. It is full of meaning and import.”⁴⁷ In 1921 Hermine Hug-Hellmuth, followed by her student Anna Freud, formalized the play therapy process through work in children's homes and an emphasis on the use of play to analyze a child. Their work was “revolutionary in changing attitudes about children and their problems.”⁴⁸ The work of David Levy in the 1930's took a different approach. He believed that the use of play in analyzing a child was unimportant, and developed a technique that used play to help relieve a child of the ramifications of a stressful experience from their past. This technique is known as “release therapy.” Release therapy involves first allowing the child to engage in free play to become familiar in the given play area and comfortable with their therapist. Once the therapist feels it is appropriate, they will introduce elements to the play environment that recreate the relevant troublesome event for the child. Re-enacting the event gives the child the opportunity to work through the stresses and tensions that were caused in the

original experience.⁴⁹ Most of the developments in play therapy since the 1930's have been based on the works of Hermine Hug-Hellmuth and David Levy.

Play as a Healing Tool

Although it cannot yet be proven that play has any physical effects in curing a child of an ailment, it has been established that play may be able to give a child the mental stability to help them through difficult circumstances. This is useful to children living with differing abilities, and can also be useful in healthcare settings. The Children's Hospital of Philadelphia includes varying forms of play in their pediatric healing program. The recommended play strategies are adapted based on a system of using a child's age group to identify their specific needs. Infants and children up to one year old are most concerned with developing connections to family and are fearful of separation from familiar figures and can experience anxiety from either a lack of stimulation or over stimulation. Toddlers aged 1 to 3 are seeking companionship and are most concerned with exploring their boundaries, asserting their independence and asserting ownership. Their main fears are separation from familiar figures, loss of emotional or physical control and pain. Preschool children aged 3 to 5 years enjoy playing simple games and like to be physically active. These children commonly have a fear of the unknown as well as fear of loss of body function and fear of punishment. School aged children, 6 to 11 years old, like to compete with their peers, are more critical of themselves, and have an increased awareness of their own body functions. Their thinking processes are more complicated and they are able to process cause and effect scenarios and to reason and think logically. A child this age would fear loss of bodily function, loss of control, pain, and death. Adolescents starting at 12 years of age are mainly concerned with their body image and being accepted by their peers. Their fears often include loss of body control and/or functionality, loss of independence, and invasion of



Figure 2.12 *Playing doctor with a doll or stuffed animal can help a child work through some of their fears associated with the hospital experience.*

privacy.⁵⁰

There are often limitations on the physical activity possible in a health care environment and so arts are used as a popular method of play therapy in the Children's Hospital of Philadelphia. Programs with age-appropriate creative arts therapy can encourage mastery, coping and expression of feelings in children dealing with illness or other difficult circumstances. Art therapy can be found in the form of visual arts, music, and dramatic arts. Visual arts therapy can help children to increase their awareness of themselves and others; cope with the symptoms of their illness, stress and traumatic experiences; and give them a source of joy and pride in accomplishment. Visual arts therapy can work for all age groups and can be an individual or group activity. Music therapy can involve activities such as improvisation, receptive music listening, song writing, lyric discussion, music performance, music and imagery, and learning through song. Music therapy is an activity that can be part of an ongoing evaluation of a child's psychological health and can take place in a private or group environment. Many different benefits for children come out of all kinds of art therapy. A selection of these includes facilitating positive self-esteem and positive body image, promoting a sense of independence and feelings of control, learning effective techniques to self-manage stress and anxiety, facilitating the process of acceptance, and facilitating adaptation to physical limitations.⁵¹

The strategies of play therapy used by the Children's Hospital of Philadelphia are based on both the works of Hug-Hellmuth and Levy. Play experiences are used to help children explore, process, and express their feelings about

their experience in the hospital. Observing the children at play also gives the health care providers insight in to the reactions of the child to their circumstances and allows them to adjust their interaction with the child as needed.⁵²

Perspective

Doing this research has opened my eyes to the range of play experiences that are important to a child's development, and the consequences of missing out on these experiences. Given the importance of play on a developing child's social skills and worldly understanding, the fact that the people who are often excluded from play, those with differing abilities and challenges, are the ones who need it the most seems like a cruel joke. The study of children's inclusion decisions by Karen Diamond and Huifang Tu gives me reason to suspect that there is something we can do about this condition of exclusion. If children are making inclusion decisions based on assumptions that someone who is different than them is not able to play the game at hand, then maybe making spaces that do not automatically put anyone at a disadvantage will change some of the decisions that are made. Designers and architects must learn to create fully inclusive play spaces for children, because if our profession can contribute to greater tolerance of peoples' differences then it would be a great loss for us not to take advantage of it.

Concerning Nature

Healthy childhood development and inclusive play certainly have a strong correlation. One other element of play that in recent history has lost presence in the common North American childhood experience is a connection to and interaction with nature and natural processes. In recent years this has begun to be addressed and communities are implementing activities designed to get kids up, out of the house, and playing in nature. Throughout history we can see that humans have always had some kind of instinctual knowledge that interaction with nature is part of a healthy lifestyle. One area where we can track this in architectural history is in healthcare facilities.



Figure 2.13 *An example of the type of courtyard that would have once been provided to patients being cared for in monasteries in Europe during the Middle Ages.*

Nature and Healthcare

Nature can be a powerful healing tool. Throughout history, different cultures have expressed the relationship between nature and healing through their architecture for health care. The main concerns of all these groups seem to include natural ventilation, natural daylight and view, water and sanitation, building relationship with landscaping, and self-sufficiency.⁵³

In the west, Hipocrates was the first to impress that there was a relationship between a person's health and their environment.⁵⁴ In the 5th century BC the liner stoa building type was used as a patient care setting in Athens where patients could see the temple through the portico, and experience natural ventilation and daylight. Fresh water was supplied to the building by natural springs, and latrines were provided for patients with any waste being taken off the site. This system of treatment focused on a program of communality with nature that included exercise, respite, water, vegetation, sunlight, improvements in nutrition, and immersion in the landscape.⁵⁵

In Medieval times the decline of secular city-states left a void for the catholic church to fill, and part of their domain became healthcare. This remained the practice from the 3rd to the 14th century. The church put emphasis on faith as the means to redemption and salvation, and so the belief in nature and landscape as aspects of a treatment plan was lost. In western healthcare this remained true up until the first natural spring spa/wellness retreats in the late 19th century. The conditions in monastic hospitals, which gave little or no concern to natural ventilation and daylighting, were generally deplorable, and so the hospice emerged as an alternative to the hospital. They provided care and accommodation to the sick and they dying with interaction between patients, nature and gardens. Many hospices also had the goal of being self-sufficient and so would house have their own livestock and agriculture.⁵⁶ During this time the insane asylum also developed to house social outcasts and people with mental illness. These buildings disregarded natural ventilation and light, and the only positive contribution to the development of healthcare facilities is possible their on-site food production.⁵⁷

The medieval times in the Middle East saw many hospitals built with open air courtyards. One such example is the Mansuri hospital in Cairo, built in 1284 AD. The hospital had a large courtyard in the center with inpatient rooms on three sides and a waiting room on the fourth. Patients would be brought in to the open courtyard for sunlight and fresh air. The hospital even provided a separate ward for the insane, with the rooms leading on to a separate, smaller courtyard. Care was taken with orientation and porticos to ensure that excessive sunlight was not an issue. Some hospitals even had elaborate screens around the patient rooms to provide privacy while allowing for ventilation to pass easily from exterior to interior. After the 13th century these institutions all fell into decline as the western colonizing armies built their own hospitals and infirmaries.⁵⁸

The renaissance saw a reawakening of the interests of ideals in classical antiquity, and so the therapeutic role of

the natural environment and landscape came back in to play. Asylums saw more narrow building footprints to allow for some natural ventilation and sunlight, and some even had patient rooms opening directly on to courtyards with flower gardens.⁵⁹

From 1860 through to the end of WWII the “Nightingale Movement” changed the state of overseas military hospitals. Florence Nightingale made many innovations in these spaces including fresh air circulating through a bright, and not over crowded ward. In wards of 128’ x 30’ she would allow no more than 30 patients, and each of these wards would be separated by a courtyard. One end of each ward had a connecting corridor for people and supplies, and the other end would have a terrace or screened in porch which provided an opportunity to take patients outdoors. The wards typically had large windows and were sheathed in screens if the climate would allow it.⁶⁰

In the 19th century the American resort tradition emerged in response to the failing public health conditions occurring in U.S. cities. Mineral spring resorts were successful in Virginia and Arkansas which mirrored the resorts of the 16th and 17th centuries in Europe, in cities such as Vichy, Wiesbaden, and Marienbad. The idea of a spa retreat was “based on the therapeutic use of mineral spring water for both drinking and bathing.”⁶¹ The therapeutic benefits of these places extend beyond just the water to a change of scenery, immersion in natural landscape, fresh air, sunlight, exercise, and more nutritious diet. By 1886 there were 634 spa retreats across the USA. However, by 1927 the number of these institutions had fallen to 271 as medical advancements and improvements in public health sanitation started to diminish many physicians’ beliefs in the medical uses of mineral waters.⁶²

With the development of suburban sprawl came the construction of many unsustainable suburban hospitals. From 1945-2000 hospitals were built on open land, only accessible by car, and surrounded by hundreds of parking

spaces.⁶³ Today we are realizing this mistake and some hospitals are making efforts to install patient courtyards and even roof gardens.

Green Spaces in Modern Hospitals

A study done in 1995 by the Center For Health Design Inc. interviewed users of different hospital gardens and green spaces and recorded peoples' self-assessments of the effects the garden has on their emotional health. At the Alta Bates Medical Center in Berkeley, California 80% of patients and staff who use "The Roof Garden" reported that it helped them to feel calmer, more contented, more relaxed, and less stressed.⁶⁴ Similarly, at the Kaiser Permanente Medical Center in Walnut Creek, California 88% of users reported feeling more relaxed after using the "Central Garden."⁶⁵ One employee at the hospital commented on the effects of an outdoor space on the health care process saying: "I work in the operating room – no windows. The diurnal cycle is interrupted. Out here, it's open to the sky. It fits with the holistic idea of what I think healthcare is. It's not only medicine and physical treatment; you also have that part that's unique to the individual called the soul. The garden helps to revive that."⁶⁶ The results of the study lead to a series of design recommendations regarding gardens in health care facilities. These design guidelines can be applied to any green space meant to contribute to an individual's health, the most important of which include having varying degrees of enclosure and separation from the outside world, dividing the space so that there are sub-areas of varying size and levels of privacy, and making sure that the garden is easily accessible and that the paving can accommodate wheelchairs. Some specific recommendations for plantings and landscape design include providing non-invasive sensory stimuli, facilitating physical and psychological movement throughout the garden, incorporating lush colourful planting that is varied and eye catching, making use of flowering trees, shrubs and perennials that provide a sense of seasonal



Figure 2.14 *The Olson Family Garden at the St. Louis Children's Hospital*

change, using trees with foliage that moves easily in the wind creating sound and light variation, using plants and water features that attract birds and butterflies, and incorporating water features for soothing background noise, and joining all of this together with a series of meandering paths to allow for strolling and contemplation.⁶⁷

Therapeutic Horticulture

While simple exposure to nature is certainly beneficial for people in need of healing, participation in nature in the form of gardening is also a very therapeutic method of play. In fact, in gardening there is potential for body play, object play, and imaginative play. Taking care of another living thing and being a part of its survival can have great psychological benefits to anyone, but particularly to people in a more fragile state of mind, such as those living with cognitive disabilities and those facing complex issues in their lives. Gardening and farming can engage a child in nature, teach them about natural processes, and help to form their broader understanding of the parts of the world and their role in it. Using gardening and farming in a therapeutic manor is referred to as “Therapeutic Horticulture”. Therapeutic horticulture has been practiced in North America since the end of WW1, when soldiers were instructed to spend time in the garden for “healing purposes” after they returned from war.⁶⁸ The benefits of therapeutic horticulture can be emotional, physical, social and spiritual. Emotional benefits include the sense of empowerment and self-esteem that come from being in control of something, as well as a renewed sense of purpose and achievement from the responsibility of completing a task. Physically, horticultural therapy can challenge a child’s strength, balance, and hand-eye coordination. The level of physical exertion required in gardening and farming can easily be adjusted to meet the differing levels of ability of the children involved and gardens in raised planter beds ensure that children can participate in a seated position if being on the ground is not realistic for them. Social connections can be strengthened when a team

of children work together on a gardening or farming project. Often spending time working with nature can improve on an individual's spiritual well-being with the positive effects of stress relief, and elevated mood.⁶⁹

Playful Architecture in Nature

All of the benefits of access to nature and interaction with nature are too great to be ignored. Therefore, places that are well designed to accommodate all of the important and healthy aspects of play need to have a strong relationship with their site and the surrounding natural cycles. Camps, cottages, and tree houses are three building types designed specifically to enhance one's experience of a landscape at different scales by giving an individual a more intimate and interactive experience with nature. Camps generally include a series of buildings that facilitate a range of activities for a large group of people. Many camps are based in natural settings and so the architecture and activity program of the camp reflects this and is designed to highlight it for the campers. One such place is the Atlantic Centre for the Arts. ACA facilitates a program that lets artists of different genres come together and develop their skills. Different types of arts are given specific studio spaces fitted to their needs, and each space has a unique connection with the surrounding landscape depending on its program.

Cottages and treehouses are traditionally designed at a smaller scale, to be occupied by just one family, and sometimes one individual, at a time. Not only do these buildings connect the users to their surroundings, but they also create a sense of camaraderie between the users, brought on by the sense of pride and excitement that comes from this special experience that they get to share. Trillium Treehouse in Fall City, Washington, USA is a project that was started as an exercise during a five day workshop at the Northwest Treehouse School as a way of teaching tree house enthusiasts how to pick a tree and safely build a tree house within it.⁷⁰ The project, completed in June of 2009, shows a strong desire



Figure 2.15 The dance studio at ACA aligns windows with mirrors, giving dancers an experience closely linked to surrounding natural landscape as it is reflected upon them.



Figure 2.16 The sculpture studio at ACA boasts an outdoor work area linked to the interior space by three roll-up doors, and sheltered by the large roof overhang creating quite a strong blurring of indoor and outdoor space for the artists to use.



Figure 2.17 Exterior of the Trillium Treehouse



Figure 2.18 The interior of the Trillium Treehouse gives the occupant a strong connection to the surrounding forest, and creates a more intimate relationship between the occupant and the site than is achieved from outside the treehouse.

to connect its inhabitants to their surroundings. Even the name of the tree house links it back to the rare flowers that grow at the base of the supporting tree.⁷¹ The experience of being inside this tree house gives the occupants the chance to see the forest at the height of the branches. One could argue that the elevated view of the forest gives the occupant an ever better connection with the site while occupying the treehouse than while standing in the site.

A good play space will enable children to have access to nature, either through providing a view of a natural landscape, providing children with a previously unfound view of a landscape, or by providing a situation that allows a child to interact with nature. Access to experiences as simple as facilitating and observing the lifecycle of flowers, the changing colours of foliage across the seasons, moving shadows throughout the day, and learning where one can hide from sun, wind and rain in an outdoor play area all contribute to a child's better understanding of their natural surroundings and brings something special and essential to their development.

Play Spaces in Nature

Bienenstock Natural Playgrounds is a Canadian company that designs and builds playgrounds that focus on reconnecting children with nature. They work with communities to bring better play spaces to them that can bring the community together through the construction process and provide a safe and stimulating place for children to play. Part of their company manifesto states “The parks and playgrounds we create reflect the natural heritage of the site and the needs of the community through a collaborative and inclusive design process, a skilled team of installers and well-orchestrated community builds. Rolling hills, winding pathways, giant logs, boulders and large native trees and shrubs define spaces filled with art, music and nature.”⁷² Some of their playground features include activity tables with stools made of cut logs, slides fit in to the side of

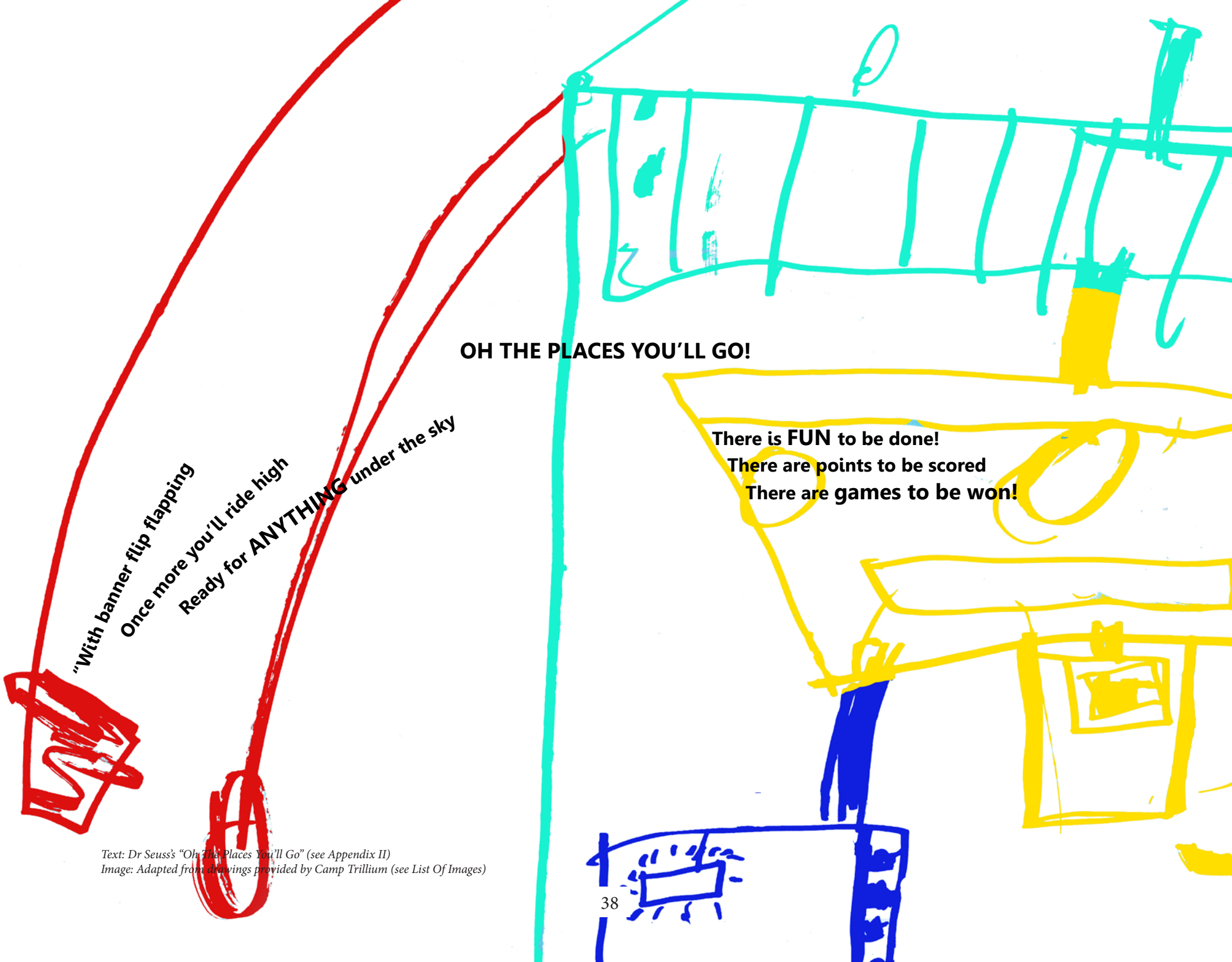
a hill, bongo drums, climbing walls, hanging xylophones, log furniture, and “wacky posts.”⁷³ Their different play equipment encourages a range of types of play for the children using it, and gives them an opportunity to do all of these things in a more natural setting as opposed to a concrete and plastic play structure.

Perspective

Interaction with nature is something that has been losing strength, even since I was a child. In the six-year range that my siblings and I occupy I have seen a noticeable difference in the amount of time spent playing outdoors and the amount of time spent playing inside in front of a screen. People in cities and suburbs are quickly losing touch with the experiences that connect us to our surroundings. Families have their gardens looked after by a landscaper, children play video games instead of climbing trees, and teenagers communicate by meeting up on Xbox Live instead of going out to play soccer or baseball. The ever-increasing popularity of cottages and camping experiences shows me that people know they are missing the link with nature that used to exist and they are trying to get it back. Unfortunately they think that they need to leave home to do it. The issues of sustainability and green living have reintroduced many people to gardening, and hopefully parents will involve their kids in these activities, but I think kids need more than that. Kids need to be shown all of the exciting things about nature – the cycles of the seasons, the movement of the sun, the growth of flowers, the falling of snow – and one way to do that is to make spaces that highlight all of these features for children, so that they can't miss it.



Figure 2.19 a built in slide by Beinenstock Natural Playgrounds gives children an interactive experience with the natural formation of a hill rather than a built structure,



OH THE PLACES YOU'LL GO!

**"With banner flip flapping
Once more you'll ride high
Ready for ANYTHING under the sky**

**There is FUN to be done!
There are points to be scored
There are games to be won!**

*Text: Dr Seuss's "Oh The Places You'll Go" (see Appendix II)
Image: Adapted from drawings provided by Camp Trillium (see List Of Images)*



And the **MAGICAL** things you can do with that ball

Will make **YOU** the winning-est winner **OF ALL!**

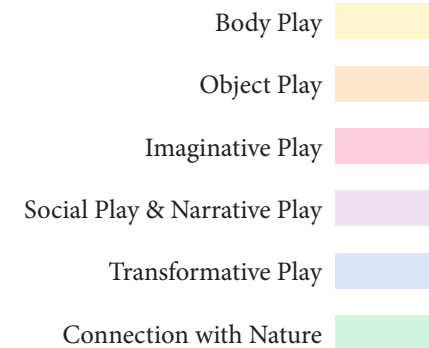
Chapter III

*Development of a System
Testing a System
A System for Camp Trillium*

Development of a System

Every child, no matter their situation, needs exposure to a healthy play environment. Based on their social, psychological, and physical circumstances each child has specific need for a unique type of play space. Each child is unique and has a special awareness of their needs as far as a social and play space goes. An adult can try and analyze a child and design something that they think fits their needs, but ultimately, the person who knows best what kind of space a child needs is that child themselves. Therefore, the best way to make a play space for children is to let them design it themselves and create what they need at that point in time for the play they are in need of. In working with Camp Trillium I have found this to be true. Camp Trillium ran an activity where they asked the children participating in a weekend camp session to design their own treehouse. The designs by the children showed that when given the opportunity they will design for themselves complex multi-zone play spaces that accommodate many of the types of play outlined by the National Institute for Play.

While catering to the social, psychological and physical needs of every child, a play space should also be designed especially for the site it is on so as to give a child using it the best connection with nature possible. It is impossible to design one play space and say that it will be perfect for every child's needs and siting conditions. The solution is to make a system of parts that can be manipulated by a child and are adaptable to any site. My design work is focused on creating such a system.



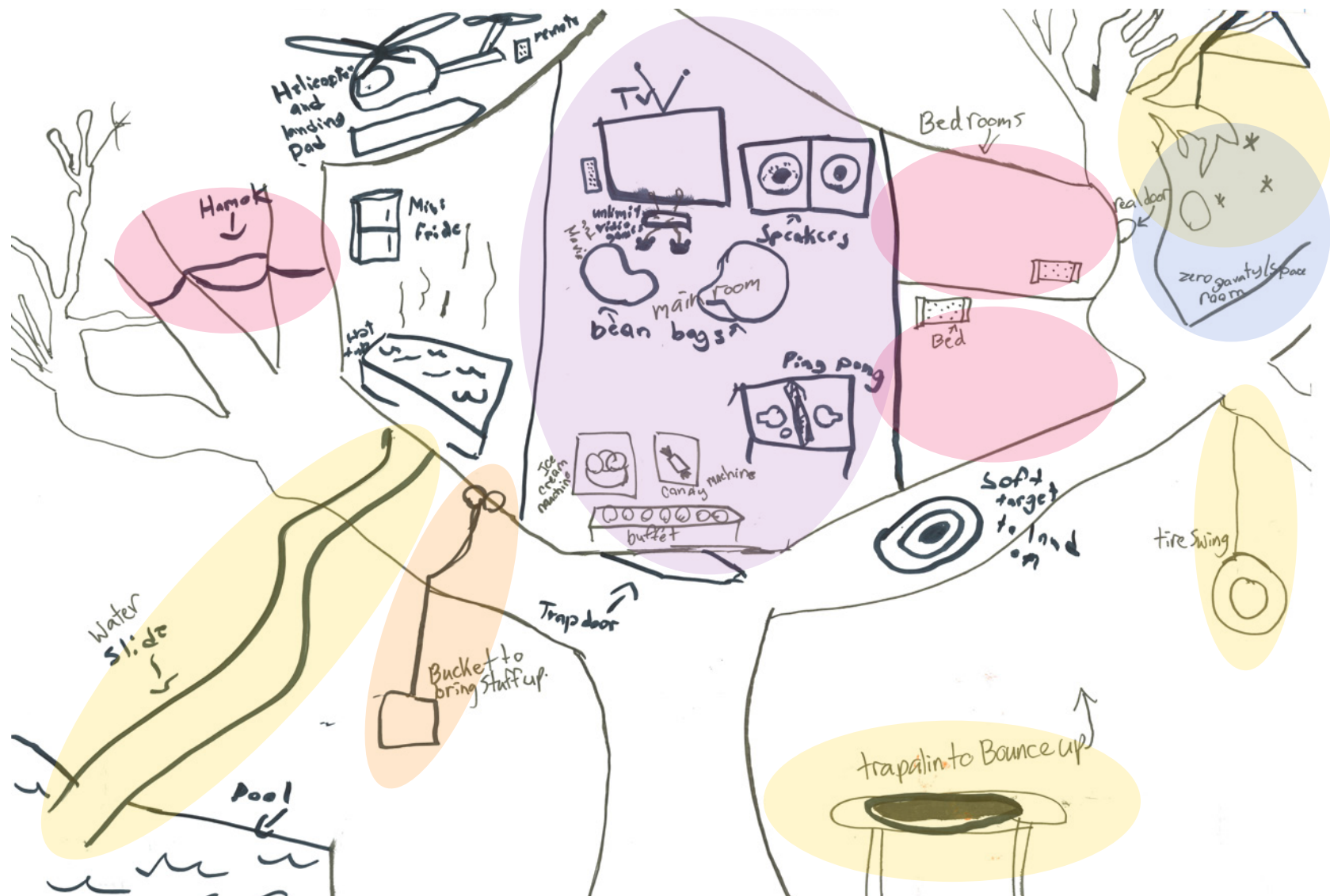


Figure 3.1 Treehouse Design by camper at Camp Trillium. This design shows many different spaces that accommodate varying types of play. The bedrooms indicate a desire for private space, as does the hammock. The game room indicates a space for groups of people to gather and play and the entry-by-trampoline shows a desire to play even before entering the treehouse. The trampoline, zero gravity room, tire swing and the water slide are places for body play, the bucket would be for object play, and the varying degrees of social spaces accommodate group play and independent play.



Figure 3.2 Treehouse Design by camper at Camp Trillium. This design shows a series of rooms that indicate a desire for a range of play experiences. By compartmentalizing activities this treehouse design leaves space for social play (in the “game room”), object play (bucket), and body play (slide leading from roof to ground). The fact that the game room is separated from the other parts of the treehouse suggests that there may be an unlabeled private space that could be used for imaginative play, and the presence of a kitchen indicates a desire for object play through cooking.

- Body Play
- Imaginative Play
- Connection with Nature



Figure 3.3 Treehouse Design by camper at Camp Trillium. In this design the tree exists within the treehouse, instead of as an exterior support system. There are multiple spaces at varying levels that are possibly meant for a range of play activities. The positioning of the platforms over the “lake or pool” suggests they may be used for diving, the slide and tire swing show a desire for body play, and the requirement of a password for entry shows a desire to control when people are admitted, allowing for both group play and individual play to take place within the treehouse at different times.

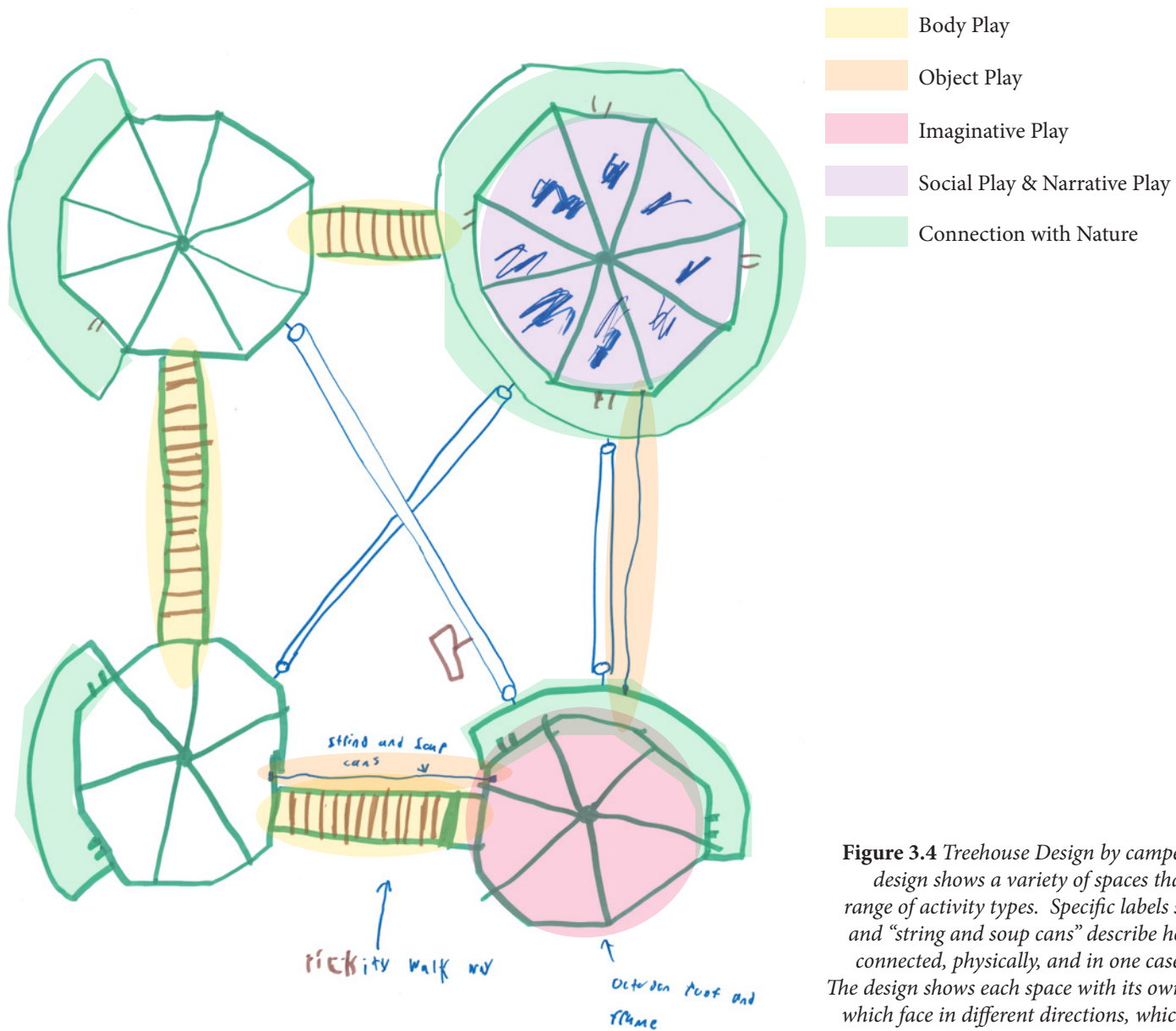


Figure 3.4 Treehouse Design by camper at Camp Trillium. This design shows a variety of spaces that are possibly meant for a range of activity types. Specific labels such as “rickity walk way” and “string and soup cans” describe how the different spaces are connected, physically, and in one case only for communication. The design shows each space with its own exterior balcony, each of which face in different directions, which would provide changing views of the natural surroundings.

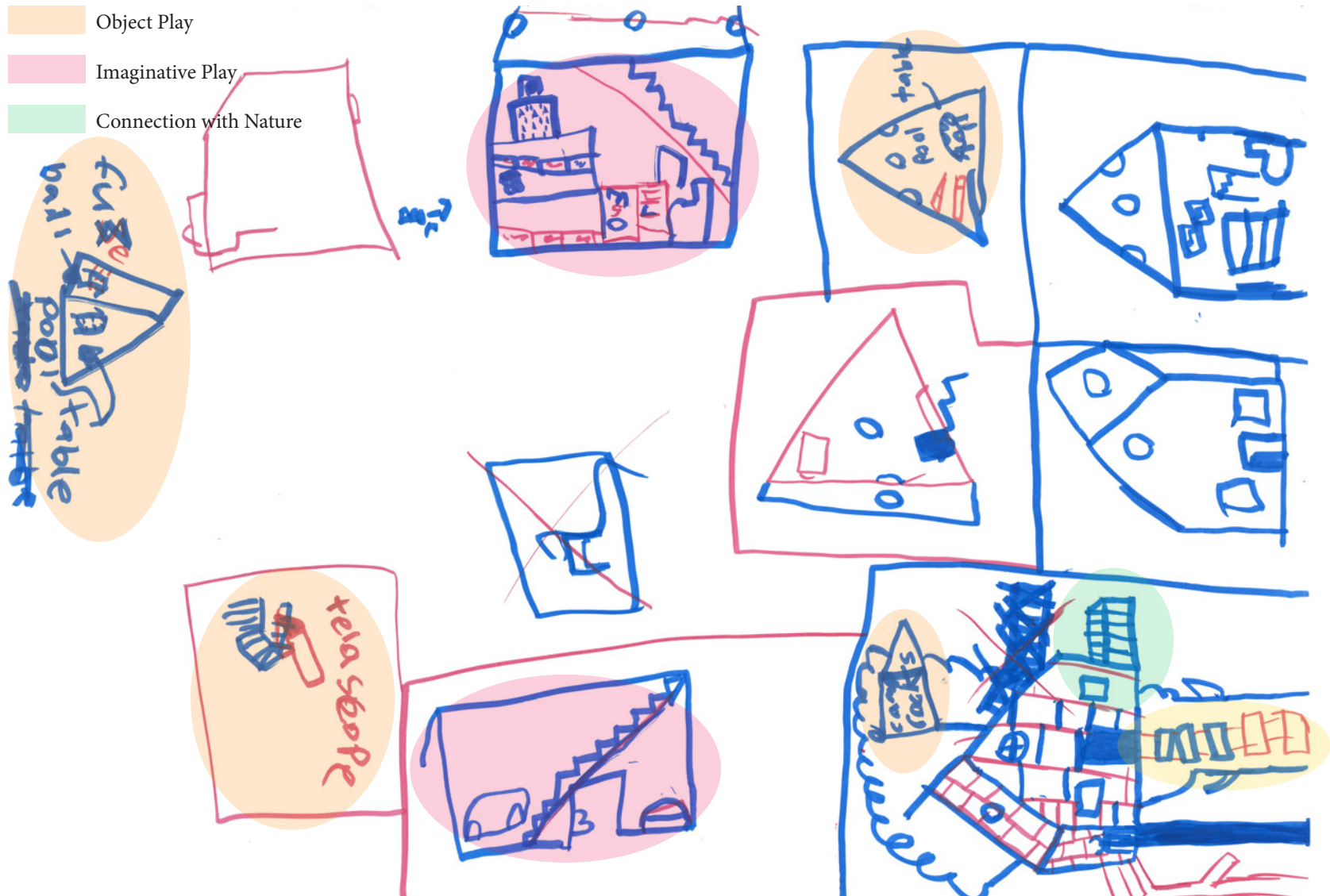


Figure 3.5 Treehouse Design by camper at Camp Trillium. This drawing shows a progression of design ideas. Different spatial concepts are explored, one popular condition being spaces under a stair case. There appears to be a game room located inside the roof of the treehouse, and possibly a more private space under the stairs that would lead up to it. The exterior view shows a ladder leading up to the entrance of the treehouse, which would be a tool for body play, and a balcony looking out over the surrounding landscape.

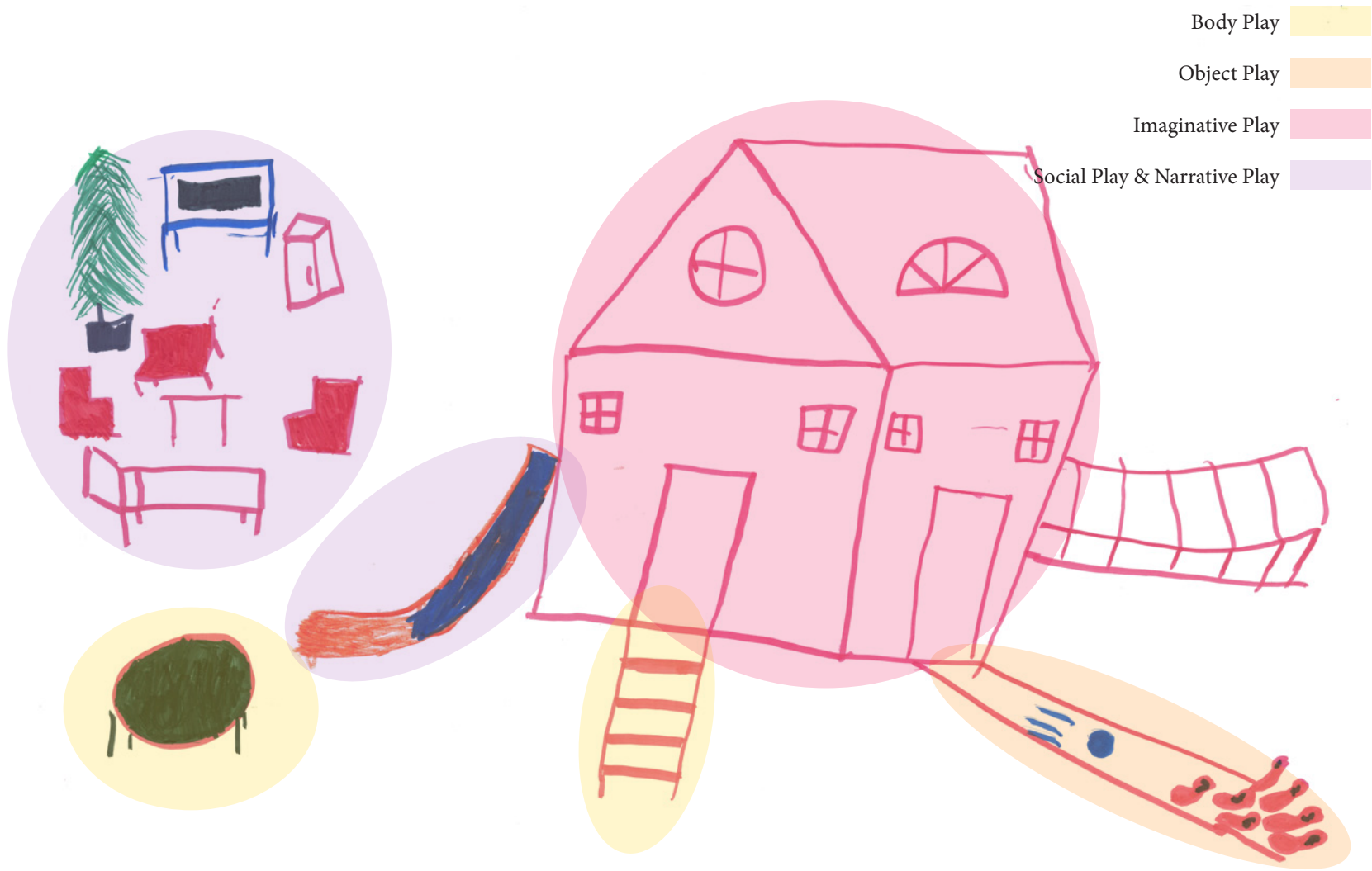


Figure 3.6 *Treehouse Design by camper at Camp Trillium. This design shows a strong preference towards group play with the variety of sports shown and the living room layout. The ladder to enter the treehouse and the trampoline are both objects for body play. The bowling alley coming out of the treehouse shows a desire to blur the boundaries between interior and exterior space, while the typical “house” typology shows a need for a separated area that provides a more private atmosphere.*

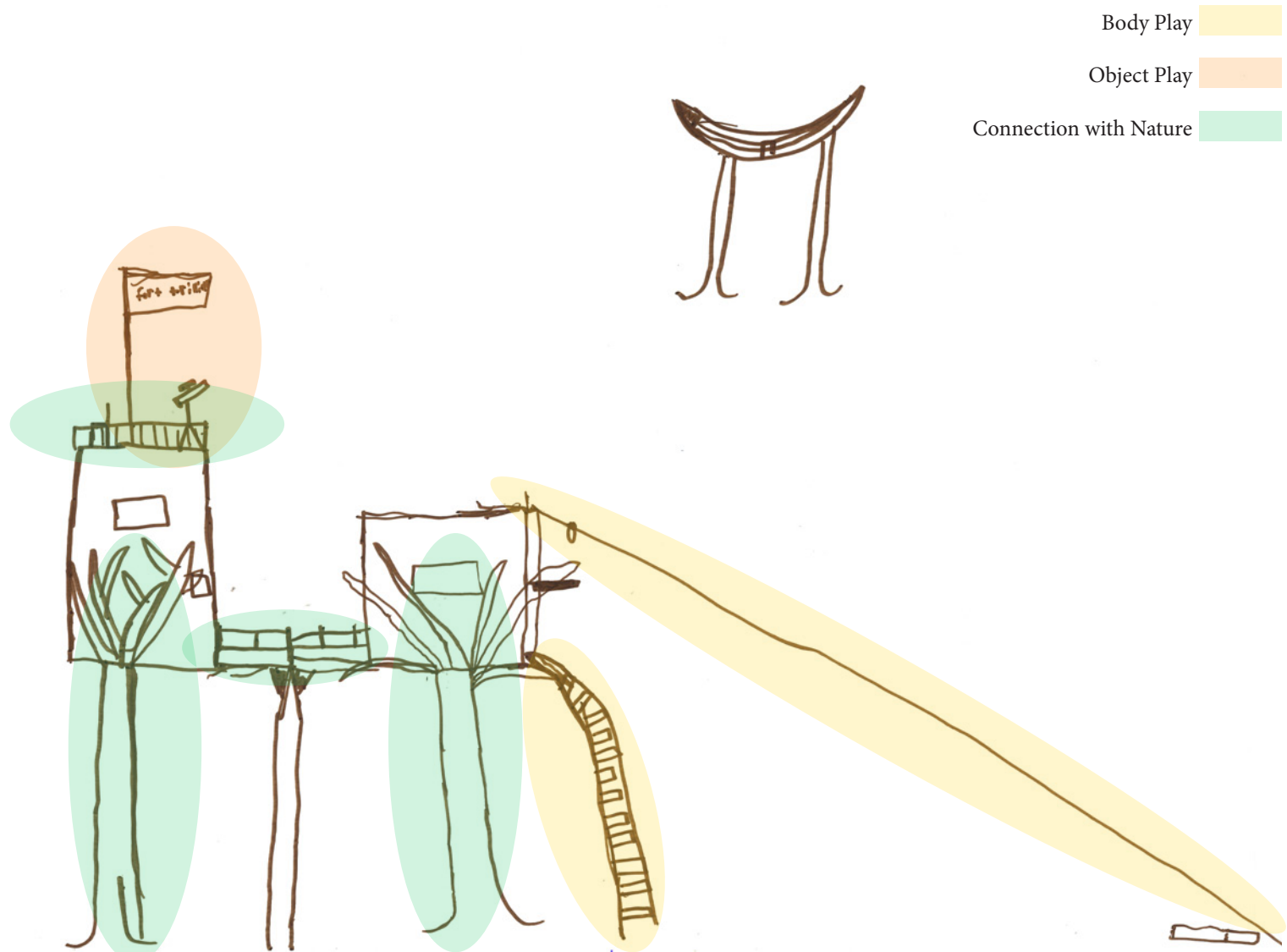


Figure 3.7 Treehouse Design by camper at Camp Trillium. This design appears to focus on connection with nature, body play, and object play. The movement from interior to exterior space as you switch rooms shows a blurring of boundaries, and the presence of the trees inside the treehouse emphasize this. The ladder and zipline are places for different types of body play, and the telescope and flag provide opportunities for object play, while the rooftop viewing platform further strengthens the theme of connecting with the natural surroundings.

- Body Play
- Imaginative Play
- Social Play & Narrative Play
- Connection with Nature

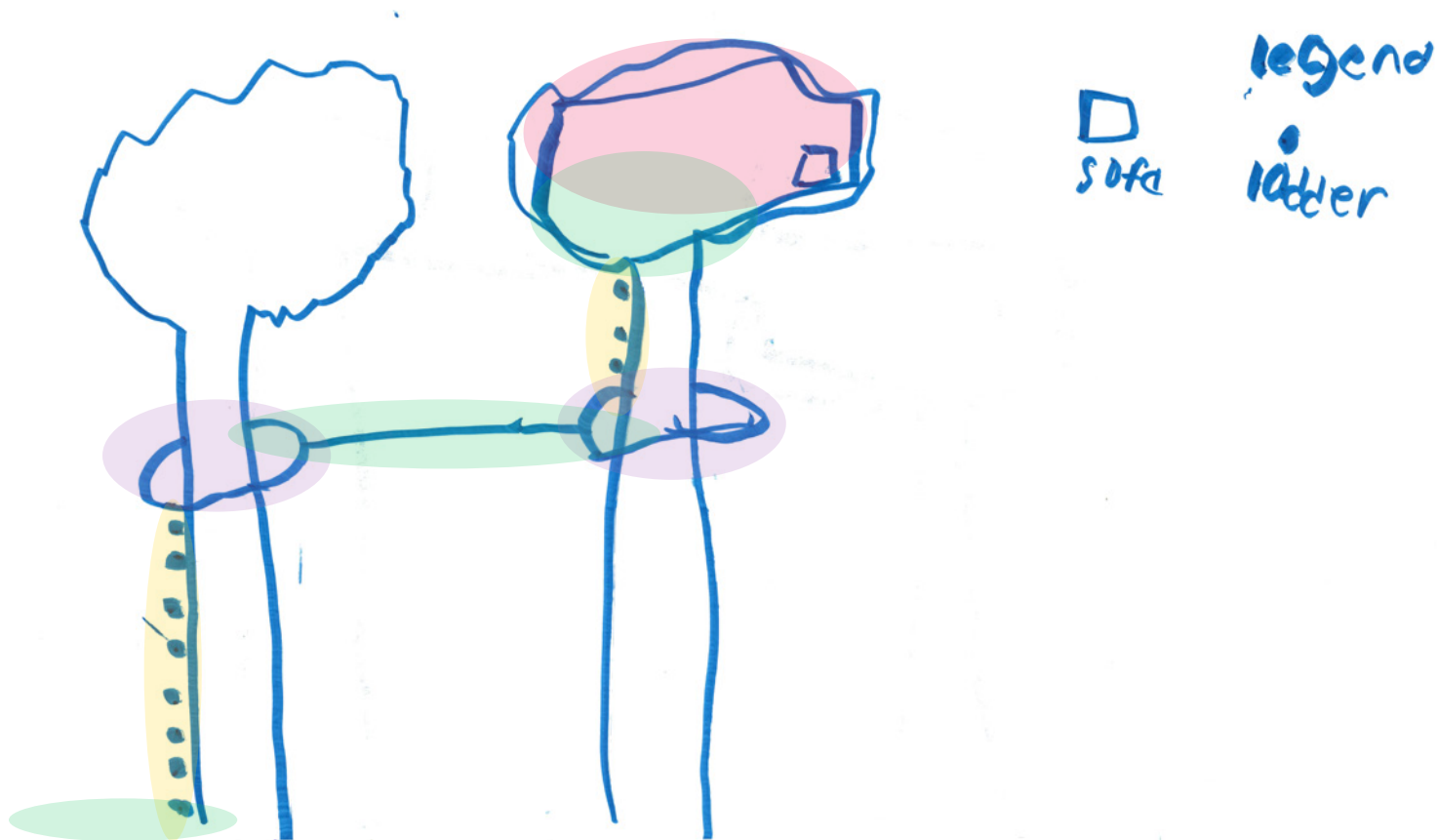


Figure 3.8 Treehouse Design by camper at Camp Trillium. Although simple, this treehouse design manages to give many clues to the types of play that may go on here. The use of ladders to change levels indicates a need for body play, and the progression of spaces across a series of trees shows a desire for a range of social settings and degrees of connection with the surroundings. The two rings around the trees could indicate two separate gathering spaces with ranging views of the surroundings, while the space within the tree may be meant as a private space, since it is the hardest to get to and has the greatest amount of enclosure.



Figure 3.9



Figure 3.10



Figure 3.11

Figure 3.9 - 3.11 Tests using full skids as a construction module in three different landscapes: Forest, Beach, and Grass

System Idea: Reclaim Reuse Rebuild

Description: This system is based on finding a building material that can be reclaimed and would be essentially free of charge to the user. The material explored in this system is pallets. Pallets are commonly available in the dimension of 4'-0" x 3'-6" or 1219mm x 1016mm. A series of explorations were done comparing the use of pallets in building playhouse structures in varying landscapes. The first set of explorations used the pallets as a whole unit and yielded some interesting spatial conditions. The second set of explorations broke down the skids in to their components and tested the possibilities of the parts. This exploration yielded significantly less interesting results.

Advantages: The pallets are an easily attainable, potentially free, recycled building material and when used as one whole part, a playhouse can be made with as little as 3 pallets, and provides endless possibilities.

Disadvantages: Pallets are heavy and ultimately a child would be unable to build a playhouse without the help of an adult.



Figure 3.12

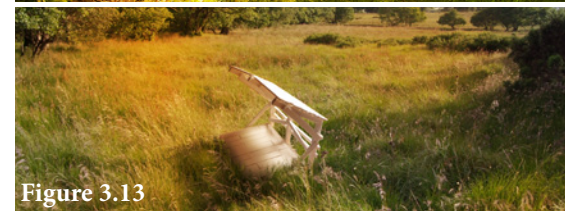


Figure 3.13

Figure 3.12 - 3.13 Tests using components of skids as a construction module in two different landscapes: Forest and Grass. Test shows that the spaces created with smaller components are less compelling than those created with full skids.

System Idea: Posts

Description: This system still harks back to the first exploration. It uses one piece of a palette, the 2x2, as a post and requires the creating of connection pieces and a simple, permanent platform to make a kit of parts that let a child piece together a framework of spaces that would then be enclosed with whatever type of covering they may choose. The system would require up to six different connector pieces that would have to be fabricated out of metal. Any child wanting one of these playhouses would start by having a platform installed. The platform has a grid of square spaces that allow for the insertion of posts wherever desired. The child would then use the connector pieces to build across and up with the posts however they choose. The system allows for anything to be built within the framework of a grid.

Advantages: The posts are reclaimed from palettes, and a child is free and able to build whatever they wish once the platform is installed. The length of the posts, 1'-8" or 510mm, makes it possible for a child in a wheelchair to build from the ground up on their own.

Disadvantages: The system is limited to the dimensions of the platform installed and the creativity of a child is limited by the grid of spaces on the platform. The connector pieces required would be created specifically for this system and would need to be purchased for a child wanting to build a playhouse.

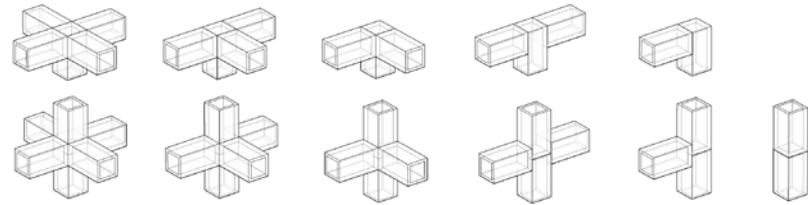


Figure 3.14 End pieces for connecting square posts

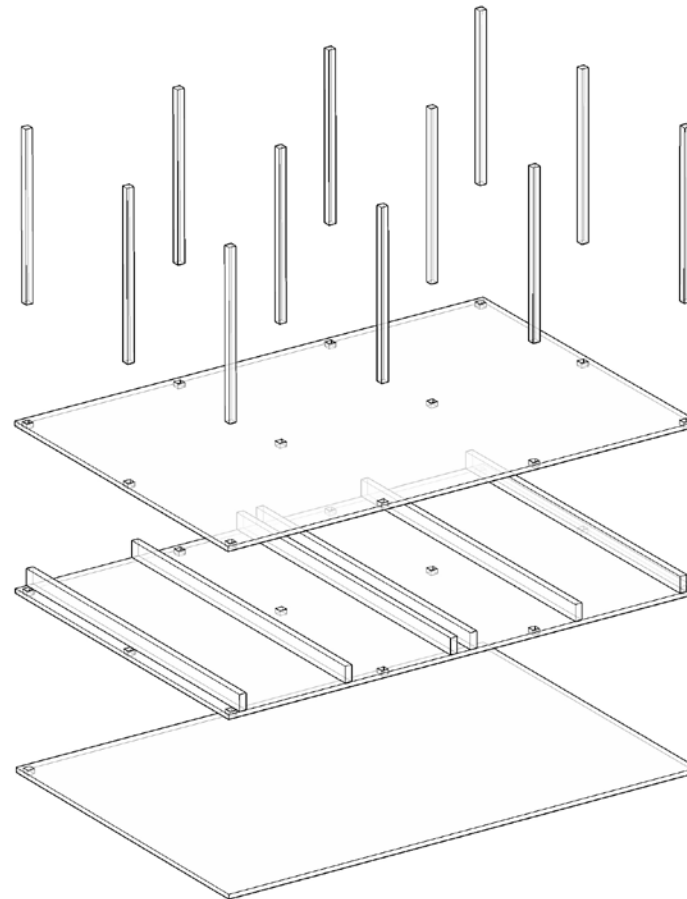


Figure 3.15 Platform construction with possible locations of posts

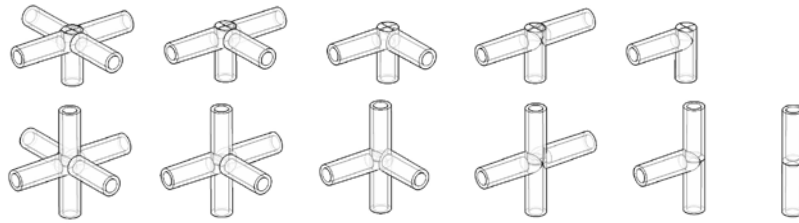


Figure 3.16 End pieces for connecting round posts

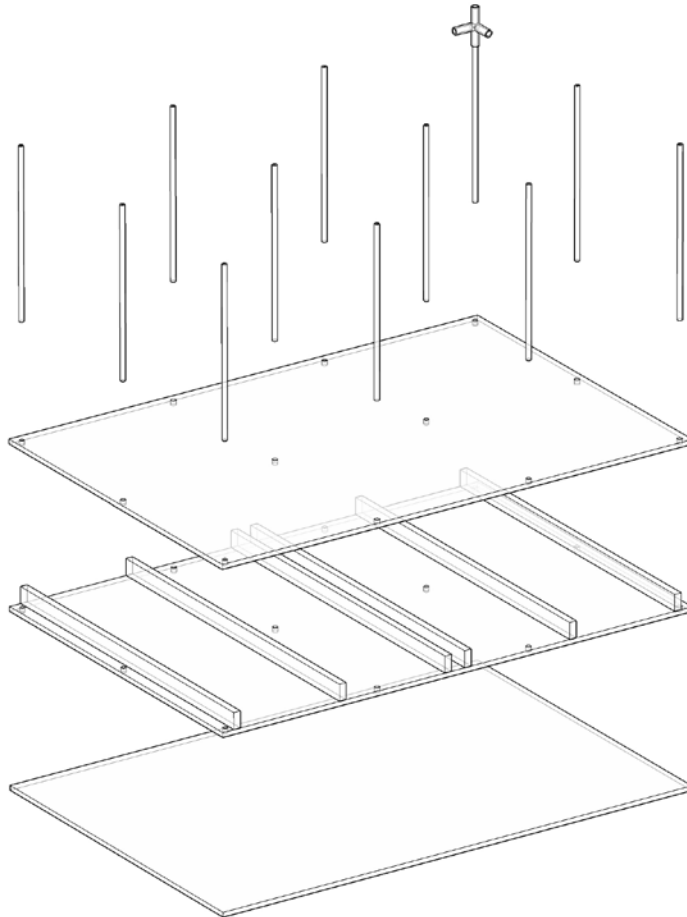


Figure 3.17 Platform construction with possible locations of posts

System Idea: Rounded Posts

Description: This system is based on the previous system, with one major change: all of the building parts are round. One of the flaws in a system that uses reclaimed wood from a pallet is that the wood is often of poor quality. This is bad for structural reasons and safety reasons. Making a system out of dowels instead of 2x2 posts from a pallet ensures uniform, reliable strength in the system and less chance of splinters. The connector pieces would be easier to fabricate since they can now be made out of 2" lengths of metal tubing welded together in the six required configurations. The system still relies on the installation of an initial platform, but it would be easier to build since the grid of spaces could simply be drilled in to a completed platform rather than needing to be built in and requiring more time consuming work.

Advantages: The posts are stronger and safer than those used in the previous system and the connector pieces and platforms would be less expensive to manufacture. The length of the posts, 2'-0" or 610mm, makes it possible for a child in a wheelchair to build from the ground up on their own.

Disadvantages: Dowels are more expensive than reclaimed wood, and the system still limits the creativity of the child with its grid structure setup.

Perspective

In testing these three systems I have found that the success of a system lies in its simplicity. Testing pallets as a building unit and their parts separately made this clear, and I fear that the number of components in the post and round post systems make it weak. I've learned that making a system that has frame and separate covering is probably not the best method. I think a system that combines structure and envelope in one unit will be most effective at letting children easily create and adjust their own play spaces.

Testing a System: Blocks and Poles

The International Wood Festival in Bergen, Norway was the perfect venue for testing out a simple building system for creating outdoor play spaces for children. The competition sponsors eighteen teams from around the world to spend a week in Bergen building a “portal” while exhibiting the properties of wood. Our project was appropriately named “PLAY” as the act of playing was present in every part of the construction and use of the portal. The team, *PLAYmakers*, worked hard to design a “portal” as required by the competition that would fit in to the site. This was proving problematic as the official site was to remain unknown until we arrived in Bergen to start building. The team decided it would be best to design a system for building, rather than a finalized sculptural element, that would allow us to adapt our play structure to whichever site we were given upon arrival. This would enable us to accommodate any local restrictions such as access for emergency vehicles, and to create a play structure that would interact well with its site conditions. Previous systems that I tested told us that some form of stacking was going to be the best way to achieve this, and so our task was to develop a way of stacking wooden modules that created a flexible play space.

Development

Our design development started with the concept of stacking pieces of wood like bricks. This type of stacking allows for spaces to be left between the modules and meant there was potential for framing views and playing with light and shadow. Stacking pieces of wood like bricks also means that it’s possible to have just one element in the system. As we worked on discovering the potential for form with this system we found a second element was needed: an end piece to allow for greater change in height. The next thing our design needed was a simple device for connecting the pieces.

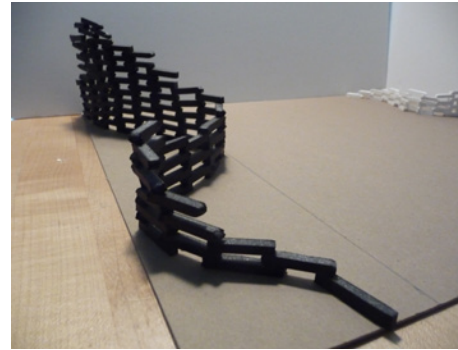


Figure 3.18 Original concept model for PLAY



Figure 3.19 Scale model of intentional structure to build in Bergen with possible configurations of two walls working beside one another.



Figure 3.29 Scale model of intentional structure to build in Bergen with possible configurations of two walls working together.

We decided to use dowels to connect pieces together. This means every piece can be identically made with holes in each end large enough to allow for a half-inch dowel to slide easily through. This way, different lengths of dowels can be put in place right from the beginning, and the rest of the structure can be slid on to the standing poles until complete. This system of connecting the pieces also means that once built, the play structure can be easily manipulated by rotating parts of the wall.

Prototype

The final system is made up of three parts: large modules, small modules, and dowels. The large modules are all identically drilled with two holes, one hole at either end, and the small modules are square, with one hole drilled in the middle. The concept is that the modules can then be slid on to the dowels and stacked however the maker sees fit. Testing this system in the workshop at the University of Waterloo School of Architecture led us to conclude that when using a $\frac{1}{2}$ " dowel we would need to drill holes of $\frac{5}{8}$ " diameter in all the modules. One of the best features of this system is that it can be built anywhere, and since anyone using the system is essentially building a wall, there is no need for a pre-constructed platform, which means there are no limitations to the shapes and spaces that a child can create when using this.

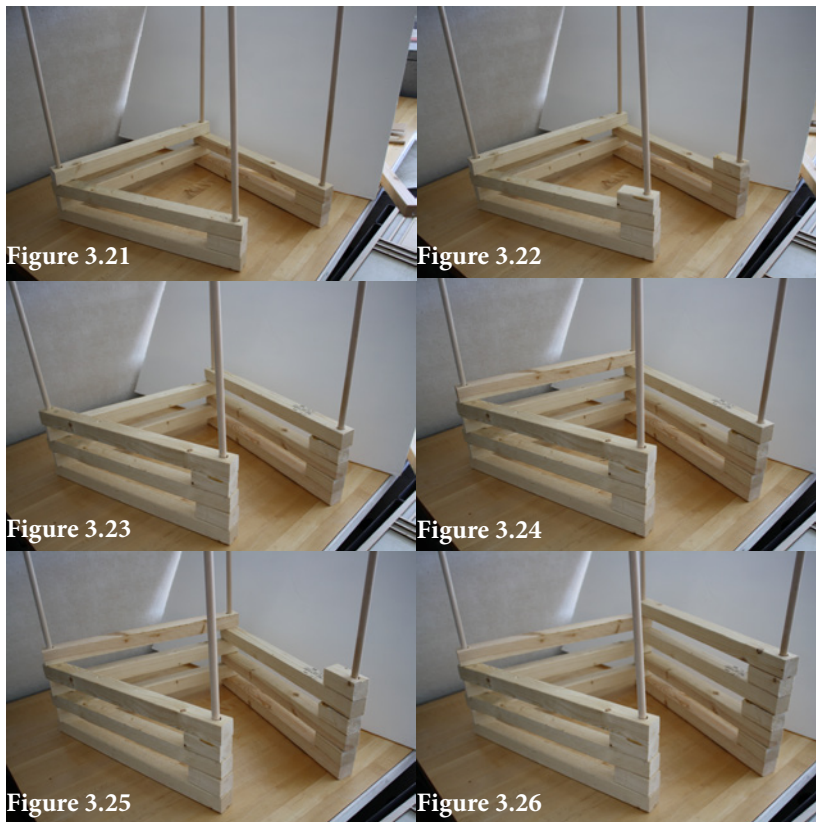


Figure 3.21

Figure 3.22

Figure 3.23

Figure 3.24

Figure 3.25

Figure 3.26

Figure 3.20 - 3.25 Full scale testing of building up the system using modular pieces and long dowels.

Installation

In Bergen we used our brick and pole play system to create a maze for children to play in. The original concept was to have the entire system be moveable, with the feature being functioning doors that would allow the maze experience to change as different children moved through and opened and closed doors as they saw fit. Unfortunately, material restrictions in Bergen removed the possibility of using dowels in our system, so our construction did not have functioning doors. Instead, we provided a dynamic maze experience that carefully guided users across the public space we were using towards a venue for the Bergen wood festival. Entrances to the maze in the form of openings and doors were strategically placed to invite people coming from all directions in to the play space.

The modules in this play system stayed true to our design. We used wooden 2x2 boards to create a collection of two lengths of pieces, 1'-6" or 457mm and 2" or 50mm. The 2" pieces were all painted orange and blue to emphasize the edges of the maze and clearly delineate the openings to users.

Construction of PLAY took five days. In the end we created a space that was used by people of all ages as a moment to stop and play with friends and family as they pass through the city during the Bergen Jazz Festival.



Figure 3.27 Team PLAYmakers (from left to right) Samantha Dopheide, Emily Balaban, Kristal O'Shea.



Figure 3.28



Figure 3.29



Figure 3.30



Figure 3.31



Figure 3.32



Figure 3.33



Figure 3.34



Figure 3.35



Figure 3.36

Figure 3.36 Doors in PLAY. Doors within the maze give players the option to deviate from the paths laid out by the walls. The construction system of poles and blocks would allow for the doors to be operable, so each player could adjust the space by opening and closing doors as they see fit.

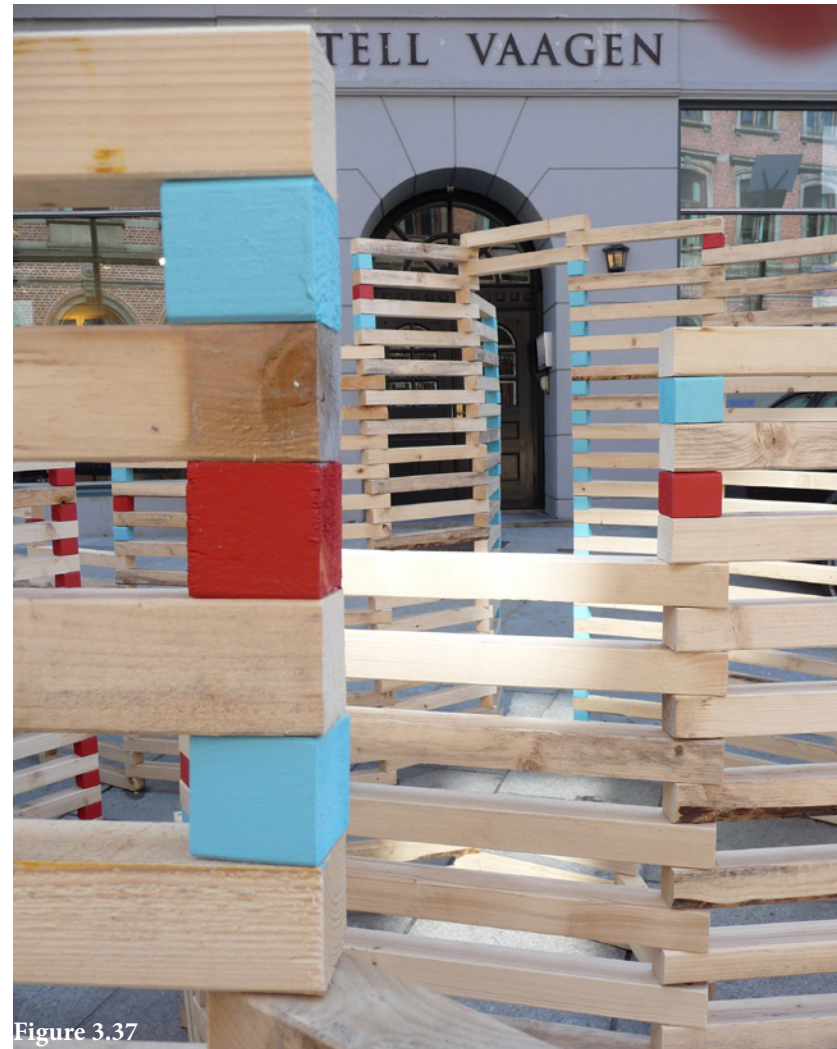


Figure 3.37

Figure 3.37 Coloured blocks in PLAY. Coloured blocks add a sense of playfulness to the structure itself and are also used as a way-finding system. Level changes in PLAY are created with alternating colour blocks, while doors in PLAY are created using only one colour of block per door. This allows people within the maze to see quickly where they will have the option of moving through a door, and where they will have to be guided by the curving walls.



Figure 3.38

Perspective

The block and pole system is definitely effective in combining structure and envelope, but it has its downfalls. The main problem is that unless it was intentional to have poles exposed above the walls, a child would have to think ahead to the heights of wall they want to create and build with the necessary lengths of poles. This limits what a child can build and limits their ability to alter it without having to start all over. A better version of this system would have the same amount of flexibility without requiring preplanning or limiting adjustments.

A System for Camp Trillium

The Special Healing Environment at Camp

Scientific advancements are forever changing the world of health care. Cures for diseases once thought fatal are being discovered every day. One of the most highly publicized conditions of our generation is cancer. In the growing field of cancer research many methods of diminishing the disease have been developed, but there is still no known cure, and many forms of cancer are still without treatment options. In the past thirty years possible treatments for cancer have begun to expand beyond the realm of the health care system to the realm of alternative natural healing scenarios including spas, retreats, and summer camps.

Camps provide children battling cancer with a positive environment that combines play, arts, and interaction with natural landscapes to augment the therapeutic potentials of all three. Children develop a network of people to support them through their battle against cancer. The psychological and physical healing achieved in these programs is invaluable to the children's recovery process. It is important that camps for children with cancer are designed to take advantage of all of the possible healing aspects of play, arts, and interactive relationships with natural landscape. The camps should provide the children with opportunities to develop social skills, learn different methods of emotional expression, and connect to nature in a way that teaches them about the cycles of the natural world. With a successful, coherent design of site and buildings, architects can ensure that, if only for a short time each year, these kids can be kids, and their recovery can be advanced by this highly enriched experience.

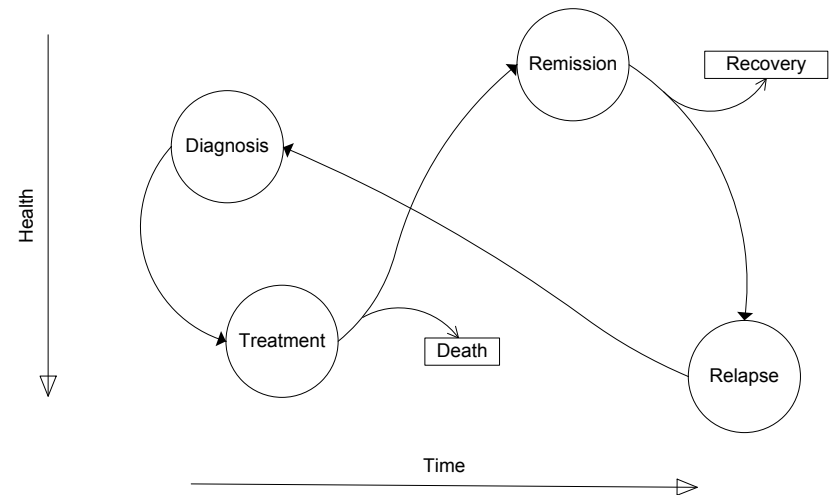


Figure 3.39 Figure Eight diagram of the cycle of cancer treatment



Figure 3.40 Location of Pediatric Oncology Centres and Children's Oncology Camps in Canada

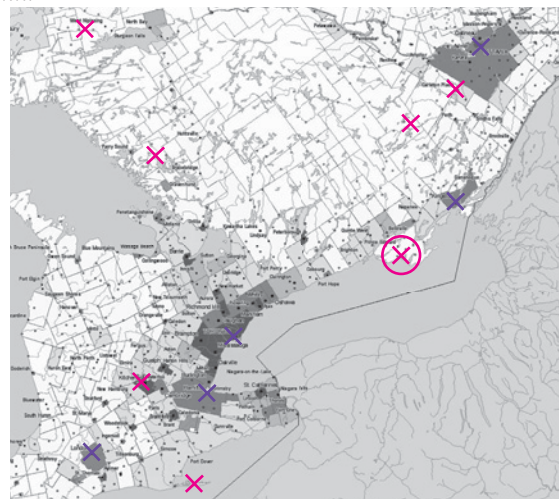


Figure 3.41 Location of Pediatric Oncology Centres and Children's Oncology Camps in Southern Ontario

Cancer Treatment Cycle

Cancer treatment follows a typical process from beginning to end. The process starts at a patient's first diagnosis. Depending on the type and severity of their cancer, the time span between diagnosis and treatment will vary. There are a variety of treatment methods, including chemotherapy, radiation, and surgery. If treatment is unsuccessful and the cancer is not removed, the patient will often succumb to their illness. If the treatment succeeds and the cancer is removed, the patient enters remission. Remission is a time period where a patient waits to see if their cancer will return. The length of time spent in remission varies in patients from months to years. If the cancer does not return, the patient has fully recovered. However, if the cancer does return then the patient has relapsed. They go through a re-diagnosis and begin the process again.

Pediatric Oncology in Canada

So what is the demand for pediatric oncology camps in Canada? How do they fit in to this treatment process?

The 2006 Canadian census shows that there are approximately 5.6 million children in Canada aged 0-14.¹ A study done by the Canadian Cancer Society and Statistics Canada in 2008 showed that approximately 0.16% of children in Canada aged 0-14 are diagnosed with cancer.² This means that there are almost 9,000 children in Canada with cancer, and a need for pediatric oncology treatment centres and pediatric oncology camps.

Cancer treatment always starts in a health care centre. In Canada there are seventeen pediatric oncology centres, five of which are located in Ontario. Health care centres are only involved in a small part of what a cancer patient goes through. After the treatment stage, cancer patients need to find a different place to engage in a healing environment for their physical and psychological challenges. In the past

thirty years, children's oncology camps have become an accepted and embraced form of secondary treatment for children with cancer. In Canada there are twelve associations of children's oncology camps recognized by the Children's Oncology Camping Association International. These twelve associations include twenty one camps across the country, eight of which are in Ontario. The cancer treatment diagram shows that camps provide a healing and supportive environment that patients need at all stages of their cancer experience, while hospitals and treatment centres are limited in their contribution in the overall process.

Looking at a comparison of the locations of pediatric oncology treatment centres and children's oncology camps across Canada shows that most provinces make an effort to provide treatment centres close to big cities for easier access to the majority of families, while camps are often situated out of town, in nature.

Camp environments are one of the best opportunities for creating a holistic healing environment by combining play, arts, and nature. The Children's Oncology Camping Association International identifies three camps in Ontario for kids with cancer; Camp Trillium, Camp Oochigeas, and Camp Quality Canada.³

Special considerations need to be made to ensure that the experience at every children's oncology camp is fully inclusive. These camps must provide an environment that ensures that children who have developed any physical disability as a result of their cancer or treatment are not excluded from any camp activities. The program of the camp should facilitate as many different types of play as possible in order to give the campers experiences that will help them develop and strengthen a range of social skills and that will aid them in their battle against cancer. Most camp programs are good about expanding the range of activities beyond athletics to include arts and nature programs, giving children experiences that are therapeutic for their recovery. Successful architecture in a camp environment will be designed carefully

to facilitate all of these experiences and make the most of the resources available on the site.

Camp Trillium

Camp Trillium is one of the three associations of children's oncology camps currently in operation in Ontario. Garratt's Island is the only permanent home of Camp Trillium, which has become one of Ontario's most successful camps for child cancer patients, and was the first children's oncology camp in Canada. Camp Trillium was started in 1984. The first camp session was held in London, Ontario and involved 28 campers. Since then, Camp Trillium has expanded to two sites; one rented space on Rainbow Lake in Waterford, and one island that they own, Garratt's Island. Camp Trillium's current set-up provides the camp experience to over 2000 children every year.

Garratt's Island is located in Prince Edward County, Ontario. The island is surrounded by West Lake, separated from Lake Ontario by a natural causeway to the south, which happens to be the Sandbanks National Park. The camp's proximity to this protected area of land is one of its many special features. Sandbanks National Park is the southernmost area of protected land in Canada. The camp's proximity to this area allows them guaranteed access to a natural space to include their camp program, and gives the campers the opportunity to have day trips to the park included in their camp experience.

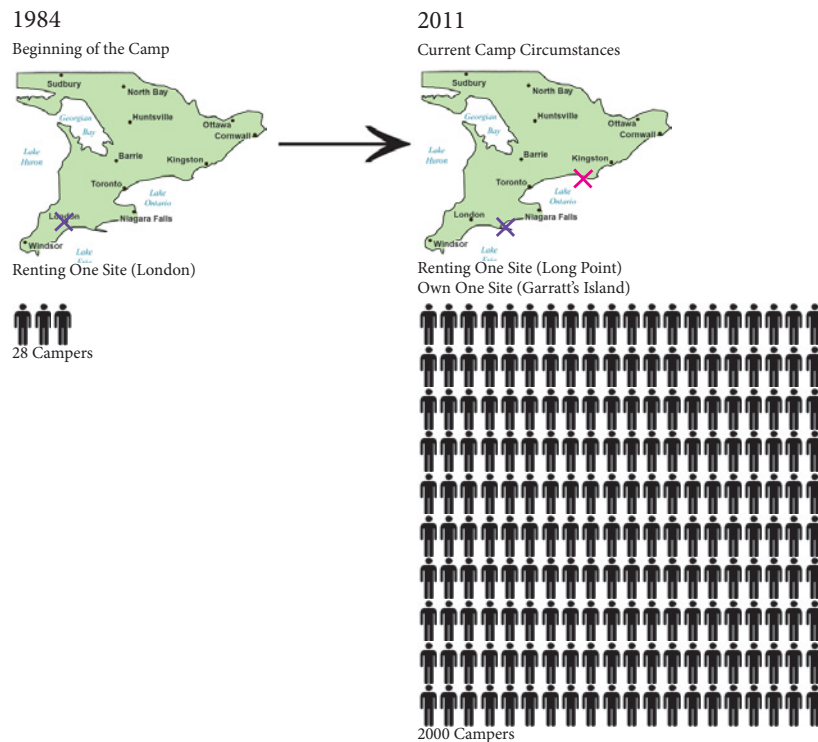


Figure 3.42 The growth of Camp Trillium from 1984-2011

System Idea: Play Blocks

The system of parts designed for use at Camp Trillium is a development of the system designed for use in Bergen that specifically addresses the needs of the children at Camp Trillium. This system requires only two elements: a long module and a short module. These modules are blocks with bits of dowels attached to the bottom, and holes drilled part way in to the top. This allows for the blocks to be stacked without the need for a separate pole element, and it allows for a child to create as they build and not have to think ahead to the height they wish to reach. The elimination of the pole also removes any difficulty that a child may have had in reaching the top of a pole to slide another block in to the system.

The blocks are all made up of three layers of 3/4" plywood cut at a width of 3" (75mm). There are two lengths of blocks, the same as used in Bergen, 1'-6" (457mm) and 2" (50mm). The blocks are widened to 3" to add stability to any play space they are used to build. Of the three layers of plywood, two are drilled similarly to the first set of blocks. The top layer is drilled with 5/8" holes, and the bottom layer is drilled with 9/16" holes. All three layers of the block are laminated together, and then 1 1/2" lengths of 1/2" diameter dowels are inserted in to the bottom holes in the block and glued in place. The differing sizes of the holes ensure that the dowels are snugly attached to the bottom of the blocks, but will slide easily in and out of the top of the blocks. Maintaining the dowel pieces as part of the system allows for the play spaces to be completely adjustable after they are built just as they were when the dowel ran through the entire height of the system.

The system can be built anywhere, and without a preliminary platform. One challenge of using this system is that building at the lowest levels may present some difficulties for children in a wheelchair. There are a few simple solutions to this problem. One solution is to have someone build the wall up ten rows, bringing the height of the wall to 1'-10"

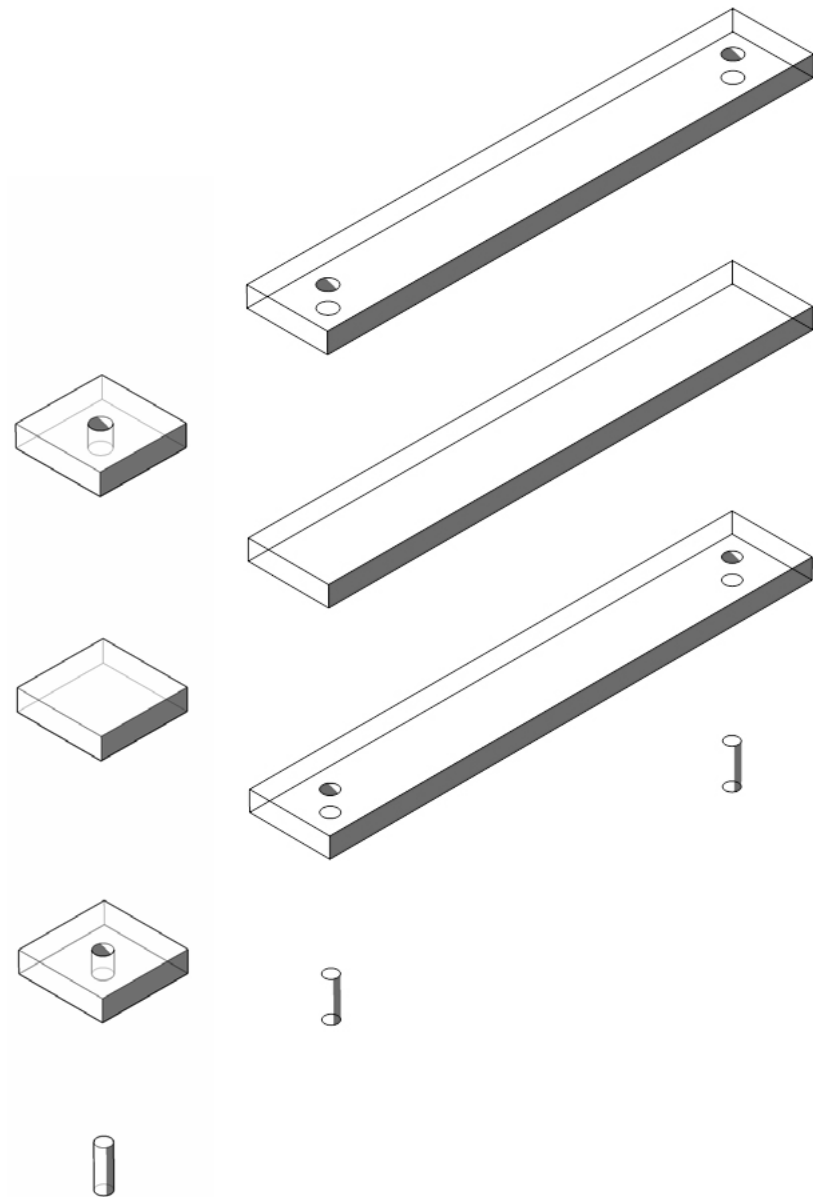


Figure 3.43 Layers of the Play Blocks

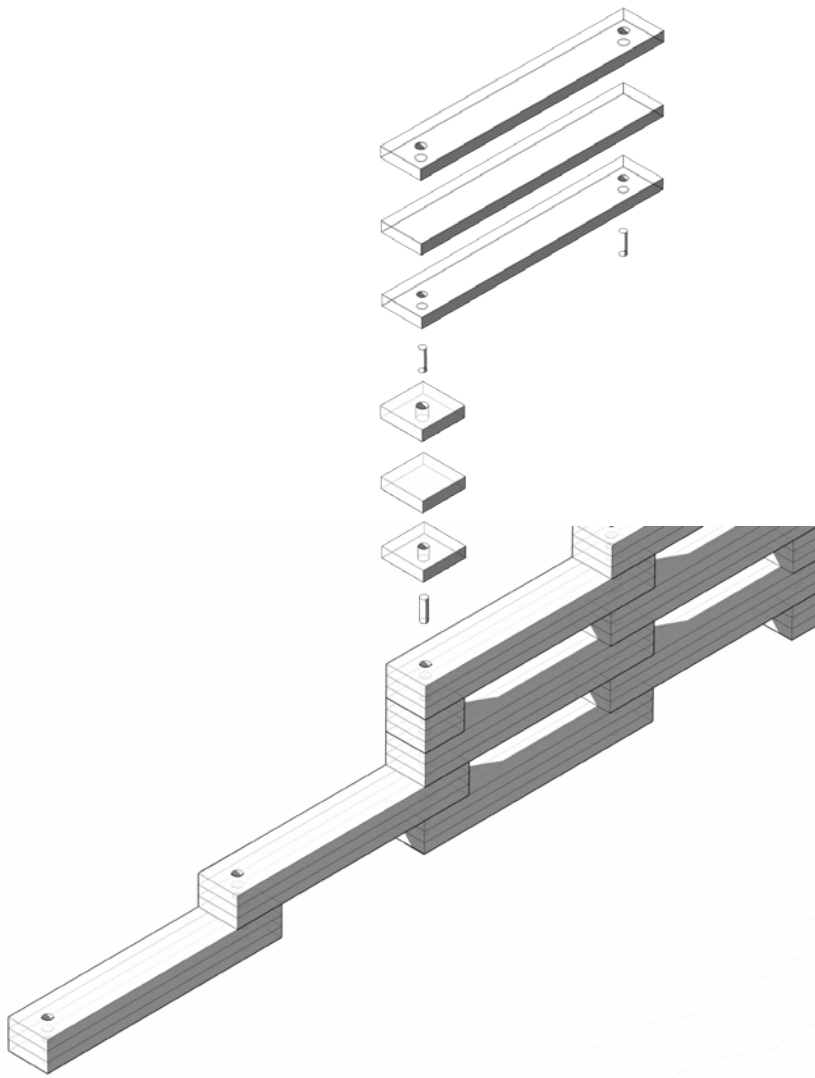


Figure 3.44 Possible end condition of a wall created with the Play Blocks

(560mm), which is well within the low reach for a child in a wheelchair. The child would then be able to adjust the positioning of the wall as they desire, and keep adding height. This solution encourages group work and inclusivity, two of the life skills learned through play that this system is trying to bring to children. Another solution would be to have a child sit on the ground while building the first ten rows of their playhouse. This gives a child the opportunity to spend time outside of their chair while enjoying a play experience.

Play Blocks for Camp Trillium

Camp Trillium is a camp for children and adolescents who have survived cancer, are currently battling cancer, or have a sibling who has been diagnosed with cancer. These children have a unique set of physical, psychological, and social needs. A child whose life is affected by cancer goes to camp to find a supportive, inclusive environment where they can make friends, form social connections with people who understand their situation, and be exposed to social experiences they may miss while going through the cancer treatment process. At camp they find an opportunity to learn new skills, challenge themselves physically and intellectually, and develop their social support system. Play Blocks is a successful system for making play spaces for these children that meets their physical, psychological, and social needs.

Physically, the blocks can be used without much exertion, and provide a whole body experience while being used to build. The blocks are easy to grip and lift, and can slide together and be rotated with minimal force. This means that a play space created with this system can be easily manipulated by any child at the camp, including those who are recently finished or still undergoing cancer treatment and may have a lowered level of body strength. Building with the play blocks can require the campers to push, pull, bend over, and stand on their toes. Each summer at OuR Island there are about two children in wheelchairs. The Play Blocks system can be used by a child in a wheelchair by building

up the wall to meet their low-reach limit. This can be done by someone working with the child in the wheelchair or by having the child sit on the ground. Building a structure with the Play Blocks will challenge these children's perceptions of what is possible to create, both from a sitting and a standing position. Having a physical, inhabitable manifestation of their work gives the campers an opportunity to reflect on what they have achieved.

Psychologically, the Play Blocks give campers an experience where they can feel a sense of accomplishment and pride as they watch their structure contribute positively to camp life. Play blocks would be a successful addition to the range of activities available at Camp Trillium that provide a goal-oriented, and results-producing experience.

The Play Blocks system also fulfills the campers' social needs. Campers at Camp Trillium need opportunities for active social engagement, usually found in group activities, and opportunities for quiet contemplative time, either alone or with a friend. Play Blocks can be used as a group activity or an individual activity. The experience of working in a group to build a playhouse helps the campers to develop skills in teamwork, leadership, and cooperation. Any camper could also work alone to build a private space, giving them an opportunity for contemplative and imaginative play.

Camp Trillium "OuR Island"

The final element of this design is providing the ideal spaces for the children at Camp Trillium to build their playhouses. Camp Trillium's home on Garratt's Island is a popular children's oncology camp program in Ontario. This camp's program stands out above others because of its "family camp" sessions throughout the year that bring together entire families affected by cancer and offer parents and siblings the same healing experience as the regular camp session provides each summer.



Figure 3.45 Garratts Island in West Lake 1:100,000



Figure 3.46 Areas of Garratts Island in use

Figure 3.47 Garratts Island 1:2000
Current and Proposed Uses



The Garratt's Island program is known to the Camp Trillium staff and campers as "OuR Island" in tribute to two families who helped to purchase the island for the camp; Oddfellow and Rebekah.

OuR Island is comprised of a series of buildings on the west side of the island, water access for swimming, canoeing and kayaking on the north side of the island, activity areas in the centre of the island, and an out-tripping site on the east side of the island. The buildings on OuR Island are simple, modest, and practical for the camp's function. They have five cabins, four "pods", two activity centres, a mess hall, and an arts and crafts cabin, along with administrative buildings. Camp Trillium's program is only missing one thing, a link to nature for the campers beyond just being in it.

The Nature of "OuR Island"

Given that the island only sits up to 100m above sea level,⁴ it's not surprising to find that the island is mostly made up of lake matter, specifically lacustrine mud and sand. The surrounding area is made up of a combination of glacial deposits and till blanket.⁵ This base seems to give the area a fairly accommodating environment for growing plants. This can be confirmed by examining the island's plant hardiness zone, which is found to be in the category standard of "5b", quite mild and accommodating. Garratt's Island also experiences very clear sun and wind conditions. The wind on Garratt's Island is predominantly westward. In the winter, wind tends to blow between N60°W and N140°W, and in the summer winds are either blowing N60°W or N30°E.⁷ The sun exposure on OuR Island is some of the highest possible in Canada. The island experiences between 2000 and 2200 hours per year of bright sunshine, and between 45% and 50% of bright sunshine during its daylight hours.⁸

OuR Island falls in to the mixed plains ecological zone. Within this classification the island's zone has a possibility of a range of 8 to 11 land cover types including 21

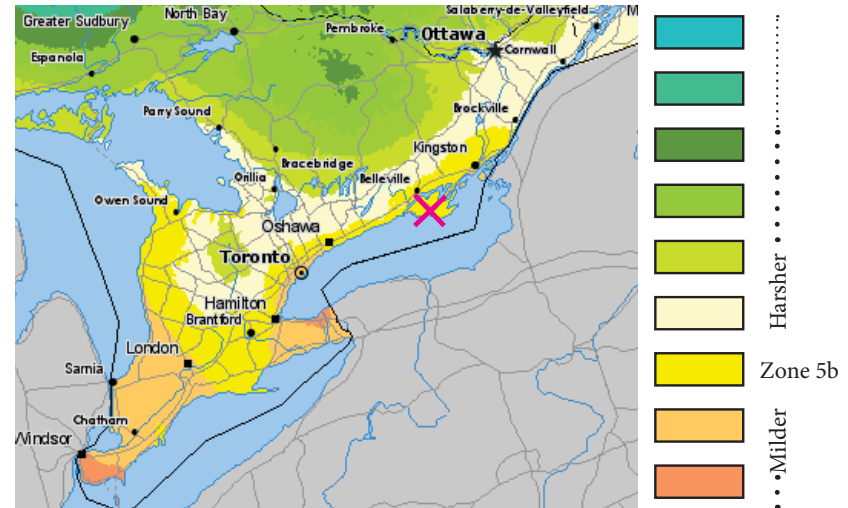


Figure 3.48 Plant Hardiness Zones

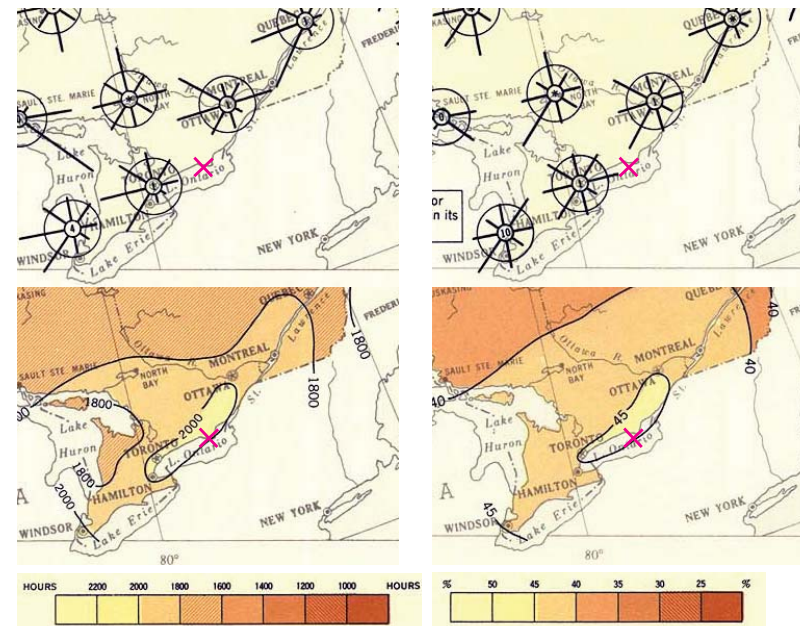


Figure 3.49 Wind Direction and Sun Exposure

to 30 rare species of plants. My ground truthing efforts on Garratt's Island have revealed that there are four land cover types on and around the island. These include forest, lawn, tall grass, and marsh. The different ground cover types are a surprisingly accurate cross section of the ground cover types across Canada. While certain ecological zones are definitely unrepresented, arctic being one, installations in the different zones of the island will be able to give an understanding of the possibilities for the installation of this playhouse system across Canada. The camp's buildings are largely located in lawn spaces, while the activity areas take place mostly in the forest, and circulation routes pass through the tall grass areas. The island's program generally avoids the marsh areas.

Design for Camp Trillium

Improving the camp program by reconnecting the campers with the variety of land cover types on the island could be easily done by strategically placing new sites for playhouses on the island with specialized new planting to enrich the surrounding growth conditions. These playhouses would give opportunities for different kinds of play by the campers, as well as create connections back to nature. Initiating a gardening program at Camp Trillium OuR Island is another way of improving the program to better the connection with nature and natural cycles. A program where each cabin could be responsible for their own garden could be used to cultivate camaraderie between cabin mates. The gardens associated with each cabin would give them all a unique set of vegetables, fruits, and flowers to be used in cooking and decoration at the camp. This use of therapeutic horticulture would certainly foster pride and a sense of accomplishment in the campers.

Having a wider variety of plants growing on the island will improve the sensory experience of the campers at their cabins where they will grow special fruits, vegetables and flowers, and surrounding the new sites for their playhouses.

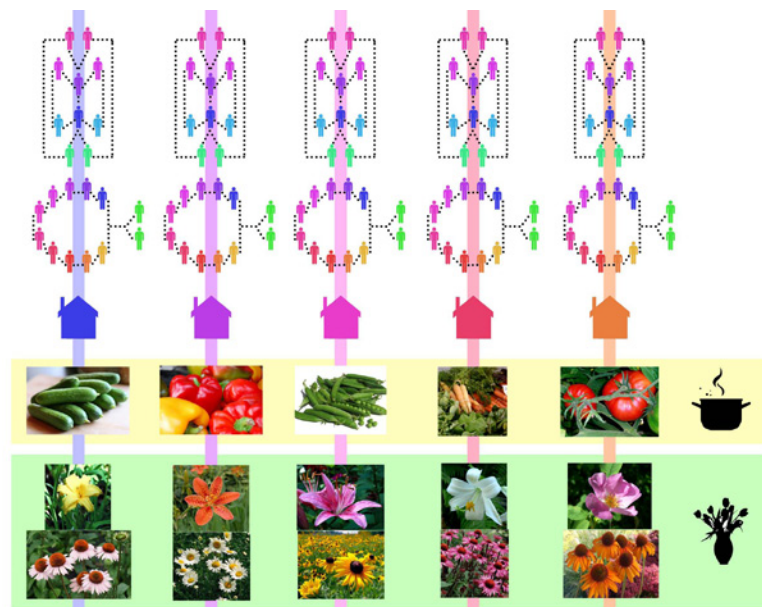


Figure 3.50 Groups of people in each cabin contributing to agriculture and flower gardens



Figure 3.51 Existing condition of cabin area at Camp Trillium OuR Island

Each cabin will be equipped with raised planter bed called a “finger garden” because of its unique shape. The gardens for each cabin are designed specially to be accessible to all the campers. This requires the dimensions to reflect the possible arm reach and manouevering space requirements of a wheelchair. These include:

- Clear space of min 2500mm between a cabin and its garden
- Min. Width of 1500mm between “fingers” of the garden for easy manouering
- Max. Depth of 1000mm of each “finger” to accommodate a reach of 500mm in to the garden beds from each side of one “finger”
- Max. Depth of 500mm along the spine to accommodate a reach of 500mm in to the garden bed from inside the garden
- Height of 500mm for easy reach from a sitting position of anyone over 3 years of age

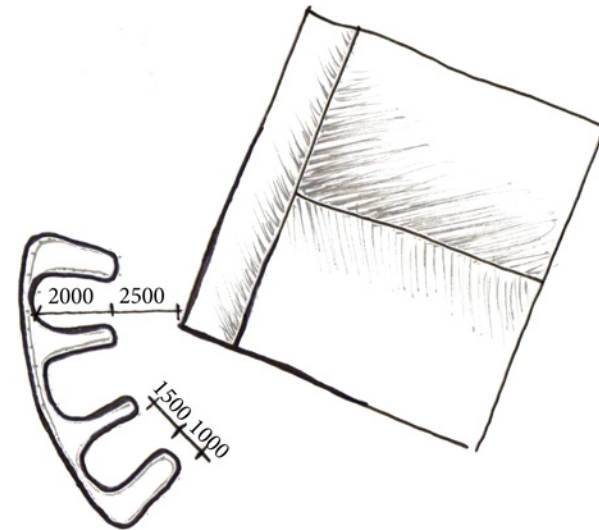


Figure 3.52 Finger Garden and Cabin 1:250

Each garden will have a unique set of plants including a variety of edible and non-edible plants, and one at each cabin that will attract wildlife such as butterflies.



Figure 3.53 Cabins and New Finger Gardens 1:500

Finger Gardens for Cabins

The first installation site is the cabins. Each cabin will have one “finger garden” assigned to it.

Finger Gardens are raised planter beds with narrow lengths radiating out from a joining spine such that the entire garden space is accessible to a person in a wheelchair. The open spaces between each “finger” are 1500mm wide, enough space for someone in a wheelchair to turn around and enough space so that there can be a chair and a standing person within the same space. Each “finger” is 1000mm wide, which allows for a 500mm reach from either side, accommodating the possible reach of a person sitting in a wheelchair. The planter beds are all raised to a height of 500mm which should allow for easy reach for all.

Each cabin is assigned one finger garden, along with one garden for the administration cabin. The pods are located across the path from a series of disconnected finger gardens. There are enough planter beds that each pod will be responsible for two.

Each garden will have a unique set of plants growing in it. These may include grasses, flowers, vegetables or fruits. The produce from each garden will be used in the camp’s cooking and the flowers grown are safe to use for crafts and decoration. Many of the flowers will attract butterflies, bees, and humming birds, bringing a new type of life to the cabin area.



Figure 3.54 Figure 3.55 Figure 3.56 Figure 3.57 Figure 3.58

Figure 3.54 - 3.58 Plants for Finger Garden #1. (From left to right) Bluestem Grass, Hyacinth, Coneflower (attracts butterflies), Bell Peppers, Carrots.



Figure 3.59 Figure 3.60 Figure 3.61 Figure 3.62 Figure 3.63

Figure 3.59 - 3.63 Plants for Finger Garden #4. (From left to right) Bluestem Grass, Black Eyed Susan (attracts butterflies), Crocus, Snow Peas, Blackberries.



Figure 3.64 Figure 3.65 Figure 3.66 Figure 3.67 Figure 3.68

Figure 3.64 - 3.68 Plants for Finger Garden #2. (From left to right) Northern Lights Grass, Daylily, Yarrow (attracts butterflies), Blueberries, Cucumber.



Figure 3.69 Figure 3.70 Figure 3.71 Figure 3.72 Figure 3.73

Figure 3.69 - 3.73 Plants for Finger Garden #5. (From left to right) Northern Lights Grass, Snapdragon (attracts butterflies), Aster, Snap Peas, Raspberries.

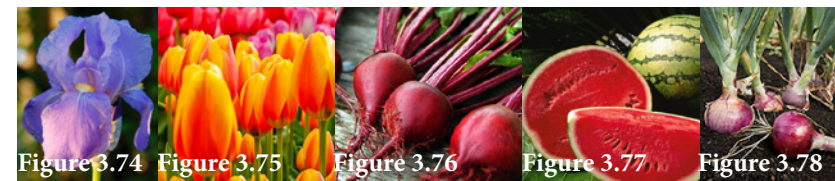


Figure 3.74 Figure 3.75 Figure 3.76 Figure 3.77 Figure 3.78

Figure 3.74 - 3.78 Plants for Finger Garden #3. (From left to right) Iris (attracts butterflies), Tulip, Beets, Watermelon, Onion.



Figure 3.79 Figure 3.80 Figure 3.81 Figure 3.82 Figure 3.83

Figure 3.79 - 3.83 Plants for Finger Garden #6. (From left to right) Bluestem Grass, Monarda (attracts humming birds), Pansies, Tomatoes, Strawberries. .



Figure 3.84 Existing condition of grass area at Camp Trillium O'Rourke Island

This path through the grass landscape will provide three separate open areas for campers to build their own playhouses using the playblocks. The spaces closest to the ends of the path will allow for slightly smaller playhouses than the open space at the middle of the path. The undulating form of the path will give the campers a unique experience of changing shadows throughout the day.

The entrances to the path are flanked by colourful flowering trees that will draw the campers' attention and invite them in to the space. Grasses and shrubs with unique colours and scents will accent the journey along the path. The addition of these new plants will give campers new experiences of the changing seasons.

Playhouses in this area will be able to be built directly on the ground. Campers may have to learn to accommodate for changing elevations in the landscape to make their playhouses stable. Opportunities exist for campers to make playhouses that will separate them from the grass landscape or playhouses that will frame new views looking outward from the path. Campers may weave grass to create a covering for a playhouse



Figure 3.85 Plan of New Grass Playhouse Area 1:250

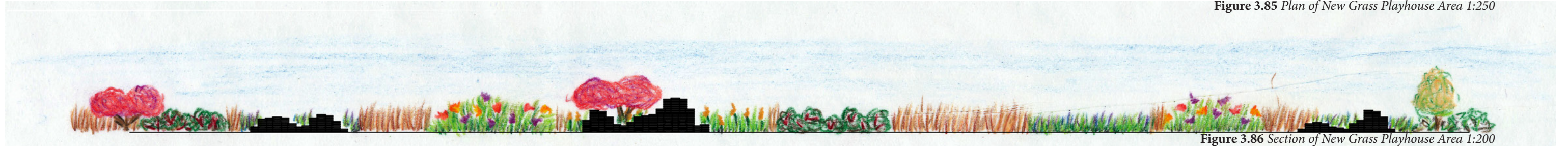


Figure 3.86 Section of New Grass Playhouse Area 1:200

Playhouses in the Grass

The tall grass regions of the island are currently a place for passing through. This playhouse location will create a reason to pause in this type of landscape and observe the natural patterns, textures, and rhythms that make it unique.

The new plantings in this area will bring new textures and colour to the area. Heightening the sensory experience of this pathway will draw the camper in and give them a reason to pause and explore. Trees, grasses and shrubs will come together to make this playhouse space stimulating and fun.

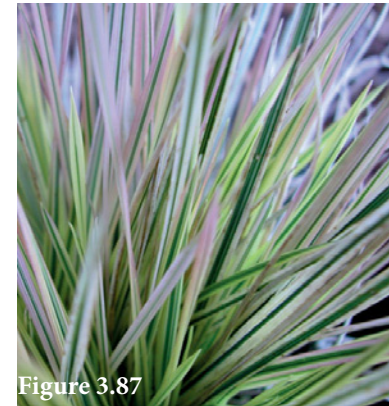


Figure 3.87

Northern Lights Grass will add variety in colour



Figure 3.88

Feather Reed Grass will add variety in texture and height



Figure 3.89

Dogwood Shrub will provide interesting leaves and berries in the summer, and flaming red texture in the fall and winter



Figure 3.91

Mockorange will add a flowered shrub component while contributing the scent of oranges to the air



Figure 3.92

Butterfly Bush will add a variety of colours to the playhouse space and attract butterflies



Figure 3.94



Figure 3.95

Crabapple Trees will bring a raised flowering component to the area that marks the entrances to the space, and a bed of colourful petals when they fall.

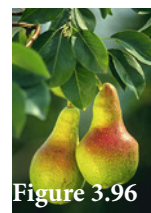


Figure 3.96

Pear Trees will bring a white flowering component to the space that also bears fruit for the campers to enjoy while in their playhouses.



Figure 3.97



Figure 3.98 Existing condition of beach area at Camp Trillium OuR Island

The new playhouse area at the beach will give the campers the chance to learn about creating a flexible space for bettering their swimming experience. Their playhouse may need to account for the movement of the sun through the sky or blocking the wind when they come out of the water.

The entrance to the beach area will have some new colourful grass planted at the end of the existing boardwalk, and that same grass will flank the entrance to the playhouse area. New colourful grasses and shrubs surrounding the space will sway in the wind, and the more sturdy flowering shrubs and trees will add a variety of colours and textures to the experience.

Playhouses in this area will be able to be built directly on the ground. Campers may have to make a space that can provide a private area for changing, or a more open area for a group to gather. This playhouse could also be used as an apparatus for hanging towels to dry or warm in the sun while campers are swimming, and campers may even choose to use their towels as a method for providing a covering for the playhouse.



Figure 3.99 Plan of New Beach Playhouse Area 1:250

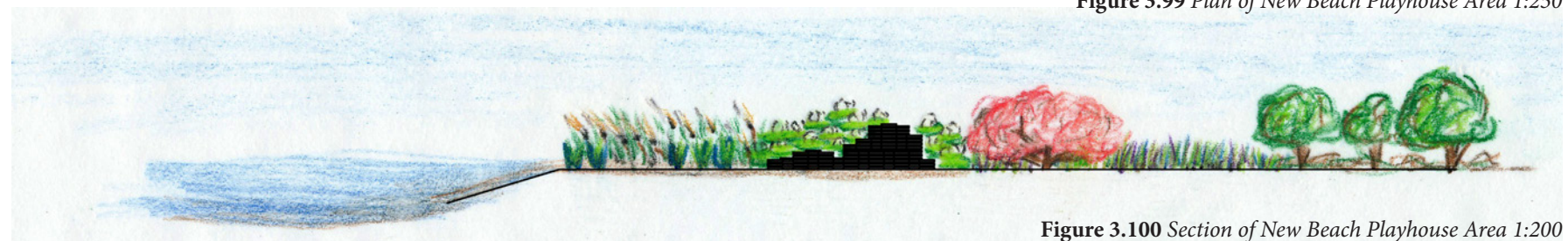


Figure 3.100 Section of New Beach Playhouse Area 1:200

Playhouse by the Beach

As campers emerge from the forest they will be faced with a new option: swimming or building! A playhouse area by the beach gives campers the opportunity to build something that may help them understand the environment better, using it to dry their towels, or to shelter them from wind.

The new plantings in this area will create a buffer zone between the beach and the forest that stimulates campers with a range of grasses, shrubs and trees. This will create an interest for the space which will make it more welcoming.



Figure 3.101

Bluestem Grass will frame the entrance to the beach from the existing boardwalk and the entrance to the new playhouse area.



Figure 3.102

Silver Fountain Grass adds a new texture to the area and plays in the wind, emphasizing its direction for the campers.



Figure 3.103

Northern Lights Grass will surround the back of the playhouse area and add a colourful accent to the space.



Figure 3.104

Viburnum Plicatum adds a unique geometry to the space and will help to shield the playhouse area from winds coming off the water while adding a floral element to the space.



Figure 3.105

Russian Sage is a nice colourful way to bring campers in to the area and add a sense of fun to the experience.



Figure 3.106



Figure 3.107

Magnolia Trees will bring a raised flowering component to the area that frames the back of the space and adds a bed of fallen petals to the playhouse area.



Figure 3.108 Existing condition of marsh area at Camp Trillium OuR Island

The new playhouse area in the marsh will be a truly unique space for Camp Trillium. This playhouse area takes the form of a dock connected back to the main land by a new boardwalk passing through the grass landscape and some forest before connecting to an existing boardwalk.

This playspace will have new unique flowers and grasses for the campers to interact with. When they first cross the threshold from grass landscape to marsh there will be a burst of colour provided by new flowering plants, followed by unique texture provided by grasses and finally flowers and plants off the end of the dock will draw the campers attention out to the surrounding marsh and attract special marsh wildlife.

Playhouses in this space will be able to be built on the final dock platform. This platform will have a raised edge preventing any Play Blocks from sliding off into the marsh. Campers may choose to build spaces that frame certain views of the camp or give them a private place in a remote location to retreat to.



Figure 3.109 Plan of New Marsh Playhouse Area 1:250



Figure 3.110 Section of New Marsh Playhouse Area 1:200

Playhouse in the Marsh

Marsh landscapes are full of unique plant and animal life that should be available for exploration by the campers. A playhouse area floating on the marsh brings the campers in to this unique landscape and gives them a chance to experience the natural surrounding in a new way.

The new plants in the marsh area will bring colour and textural variety to the experience. The marsh playspace will be connected via boardwalk to the existing path through the forest and grass landscapes and will end in a dock-like structure that can support a playhouse.



Figure 3.111

Cotton Grass will bring a new texture to the marsh experience. Planted close to the boardwalk leading to the final platform, the campers will be able to touch it and observe it moving in the wind.



Figure 3.112

Turtlehead Flowers will be part of the experience as soon as the campers cross the threshold from grass landscape in to marsh. This colourful flower will bring a vibrant element to the area and add a sense of fun to the marsh.



Figure 3.113



Figure 3.114

Water Lilies will be added surrounding the final playhouse platform. The contrast between the lily pads and the flowers will add visual interest to the area, and hopefully there will be frogs who are happy to use them and show off for the campers.



Figure 3.115 Existing condition of forest area at Camp Trillium OuR Island

This set of spaces for building playhouses gives the campers the experience of building their own treehouse-like getaways. The series of ramps are dimensioned to accommodate children of all abilities. The first set of ramps leading to the largest platform are all at a slope of 1:16, and the ramps leading from the largest platform to the final platform are at a slope of 1:20. The pentagonal landing shape allows for easy change in direction and safe ascent and decent through the system. The platforms rest at the heights of 1.4m, 2.5m, and 3.5m successively. The rise through space will give the campers a new experience of the forest landscape.

Colourful grasses are used to highlight special moments at ground level including the entrance to the system and the moment where the new path passes under the structure. Colourful and flowering trees provide elements of interest and encourage moments of pause at the playhouse areas.

Playhouses in this area may take the form of smaller private spaces on the first and last platform while the middle platform may be used to create spaces where larger groups can gather. Campers may choose to frame new views of the forest found when they climb to new heights.



Figure 3.116 Plan of New Forest Playhouse Area 1:250



Figure 3.117 Section of New Forest Playhouse Area 1:250

Playhouses in the Forest

The forest landscape on the island currently hosts the high ropes, low ropes, archery, and camping activities. The only experience missing from their program is that of occupying the treetops. The playhouse area in the forest will support the use of playhouses as treehouses.

The playhouse space in the forest will take the form of a series of raised platform connected by ramps. The ramps are sloped at 1:16 to the first platform, and 1:20 after that to make the journey easy for all users. A new path through the forest passes under the largest platform to give another viewpoint of the playspace for the campers.



Figure 3.118

Bluestem Grass will highlight the entrance to the playspace, and the part of the new pathway passing under the platforms.



Figure 3.119

Wisteria will climb the playhouse structure. It is focused on the final platform as a sort of reward for getting to the end.



Figure 3.120

Serviceberry Trees will add a floral element to the area in the spring and summer, and a colourful element in the fall. campers will experience this tree at the first two platforms and have a unique top-down view of its seasonal changes.



Figure 3.121



Figure 3.122



Figure 3.123

Crabapple Trees will bring a flowering component to the area that marks the first platform and gives it a sense of destination when glimpsed from the entrance to the space.



Figure 3.124

Tulip Tree will bring a vibrant floral element to the largest platform, and its fallen petals will give a special experience to those passing under the platform.



Figure 3.125

Play Blocks on Different Sites

The new sites for building with Play Blocks at Camp Trillium are opportunities for expanding the activities in the camp program with cumulative and iterative building experiences. At each site the campers can leave their playhouse creations to be adjusted and added to by future campers. Based on the different sizes of the sites for using Play Blocks, we can determine what kinds of play experiences would be best suited for the Play Blocks to contribute to the camp program. The two smaller sites, the beach and the marsh, lend themselves to being home to short term iterative building experiences where the campers build and rebuild structures for specific purposes. The two larger sites, the grass and the forest, lend themselves to facilitating a long term cumulative building experience where campers can add to developing structures and watch them grow over a span of years.

A short term, iterative experience would last the length of one camp session. These playhouses would be intended to serve a specific purpose for each site. Campers attending each session would build the structure that is needed and use it throughout the week. After the camp session is completed, the staff at Camp Trillium would disassemble each playhouse and leave the Play Blocks on the site, ready for the next group of campers to use.

The beach playhouse would function as a space for changing in to swimsuits, hanging towels to dry, and learning about water safety and ecosystems. Given these needs, the playhouse on the beach would need to be built to have moving components that allow the playhouse to transform from a group gathering space in to smaller private spaces. Campers would gather before swimming and learn about water safety and the natural habitats and cycles found in a lake. Next they would be given time to manipulate the playhouse in to a configuration that provides spaces for changing in to swim suits. Towels can be used as privacy screens and the campers could leave their towels hanging on the playhouse to

warm in the sun while they are in the water. While they are swimming, campers will have the opportunity to observe the natural phenomena they had just learned about, enhancing their experience of nature and their understanding of their surroundings. After swimming campers would dry off with their towels and then use the playhouse again to change in to dry clothes. This cycle of manipulating the playhouse would continue throughout the camp session, and the playhouse would undoubtedly transform as the campers find new ways to adjust it to meet their needs.

The marsh playhouse would serve as a place to sit while fishing, or as private hide away for two friends. As each camper used this site throughout the week they would build their own small structure. This could potentially be a place for sitting or an enclosure that provides privacy. As different campers come to the site they would use the existing small built elements for their own purpose, possibly relocating a seat, or repositioning a wall. It would also be an option for them to disassemble some of the existing structures and create their own original from the pieces. In the camp program campers could be given time before a fishing activity to create their own perch, or counsellors could bring campers to this space and build a private area for talking with individuals or small groups that is removed from the busy camp environment. While using these spaces campers would be connected with the calm, secluded landscape of the marsh. Fishing and having quiet time in the marsh exposes the campers to the sounds of the wildlife in this habitat and the unique plants that can only be found in this part of the island.

A long term, cumulative building experience with the Play Blocks at Camp Trillium could last for a number of years. These playhouses would give returning campers an opportunity to observe the camp program growing and changing through time, while contributing their own piece of a playhouse each year they visit. At the beginning of each camp session staff at Camp Trillium would bring some new Play Blocks to each site. As campers come through the

camp they will use these pieces and some that they bring for themselves to add to the existing playhouse and observe the effects that their contribution has on the growing structure. Once a playhouse gets too big for its site it will need to be disassembled. This could be a fun activity for campers at the end of a summer, or could be done by the Camp Trillium staff whenever they see fit. The unused pieces would then be put in storage and brought out gradually over the next few years as the playhouses are rebuilt.

The new winding path through the grass landscape leaves three open spaces where groups of campers can create playhouses for dramatic arts and group games, or more quiet activities like reading, creative writing, and visual arts. The Camp Trillium program would need to allow each group of campers coming through the site time to create the space they need for their activity. Some may choose to try and shade themselves from the sun, some may choose to create a series of connected spaces, and some may choose to frame outward views of the grass landscape. Each group's addition to the playhouses would leave their mark on the landscape for future campers to find.

The proposed treehouse-like structure for the forest landscape includes three open platforms. The first platform lends itself to more energetic small group activities with its minimal removal from the busy camp path. These could include dramatic arts, music, and group games. The last platform lends itself to more private small group activities with its extreme vertical separation from the camp. These could include activities such as creative writing, visual arts, poetry, and photography as it gives a unique birds-eye view of the camp. The middle platform of the forest play space is the largest, and could be used for gatherings of large camp groups. Each time any size group of campers goes up the treehouse they could bring a few Play Blocks with them, and as the treehouse is used, its playhouse structure will grow and become a visual marker of the camp's history. This treehouse experience could also be used as a potential site for overnight camping. During agreeable weather the campers could use

the Play Blocks and tarps to create a tent-like structure for sleeping in.

The different play experiences possible with the Play Blocks across OuR Island create an opportunity for the Camp Trillium program to become a more inclusive experience by offering each child an enhanced relationship with the island and other campers.

Perspective

Camp Trillium is a wonderful and inspiring place. Developing a system that can be used by the children at the camp to build playhouses taught me about inclusivity and health and the importance of experiencing a full childhood. This final system has its problems, as does anything, but it also addresses many of the issues of inclusivity, play, nature and health in a way that I feel successfully gives the children at Camp Trillium full play experience. The Play Blocks system allows children full freedom to build whatever kind of play space they need and adjust it as they see fit. The system is easy to understand and safe to use. Children can learn about nature by building a space that will shade them from the sun or wind, and experiencing the moving shadows over the course of a day contributes to their understanding of the passing of time. The system also allows for the potential for a child to add a “roof” by simply throwing a sheet over the entire structure. Overall, the possibilities are endless and children of all abilities are free to explore them.

Testing the Play Blocks system in the different landscape types at Camp Trillium OuR Island gave me an opportunity to explore how this system may be used by children across Canada. The four landscape types present on the island give a fairly rich cross section of the landscape types found in Canada. This leads me to believe that if a system like this is safe and effective at Camp Trillium then there is no reason that it could not also be adapted for use by children anywhere in the country who wish to build their own playhouse.

Play Blocks for All

While the Play Blocks system may fulfill the needs of Camp Trillium's campers, it is not a universally-usable system in its current state. Children of some types of challenges, mainly sight and cognitive, would benefit from a modified version of the system that is better suited to their abilities.

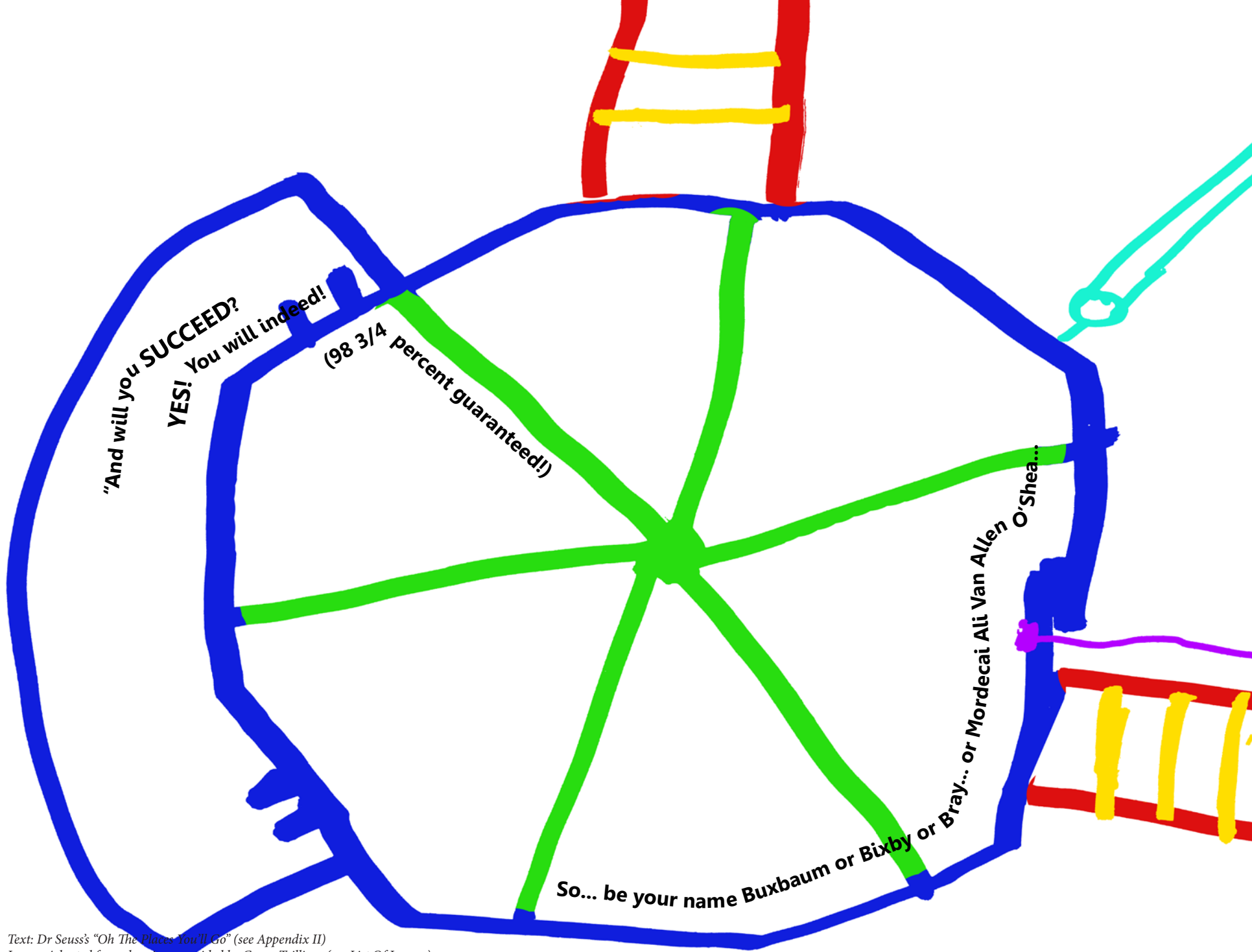
If the Play Blocks system were to be adapted for children with sight challenges it would need to find a way of incorporating texture. Each block could be textured on either end with different patterns, possibly one of rounded bumps and one of indented lines, to enable a child with vision limitations to feel quickly and easily when the blocks are in a staggered position and when they are in a stacked position by lining up opposing textures. For example, if a block were to have a rounded texture on the right end and a linear texture on the left end, then a blind child could feel their way through positioning the right end of one block over the left end of another as the system is meant to do. Colour could also be incorporated in to this modification, making one end dark and the other light would help a child with limited vision to see contrast between the left and right side of each Play Block more easily.

An adaptation of this system for a child with cognitive challenges would require a change in materiality and some dimensional modifications. The key with making the Play Blocks system successful for this group of children is to make it easier to assemble so as not to cause frustration; easier to manipulate so as to accommodate their quick change in mood and consequent change in spatial needs; and softer so as to minimize the potential for them to cause injury to themselves. Dimensionally, the blocks would need to have larger pegs and holes. This would mean that the joints are looser, but it would ultimately make a playhouse easier to assemble and would allow for a child to rotate portions of a playhouse wall without much effort. The materiality of the blocks would need to be changed from wood to some sort of durable foam. With this modification, a child could bump in

to a wall of Play Blocks or even throw a Play Block without causing serious harm to themselves or other children around them.

Children with certain physical limitations may also require a modified version of the Play Blocks system. Any child without full use of both hands would need the blocks to be lighter and have larger connection details. A successful Play Block for them would be similar to the block described for children with cognitive challenges, made of a light material and with larger pegs and holes.

The uncomplicated nature of the Play Blocks system means that it can be easily adapted for any child's unique set of needs. The repetitive components allow for easy mass production of any variation on the system, and the straight forward connection detail means that almost any cosmetic change can be made to the blocks without affecting their functionality.



**"And will you SUCCEED?
YES! You will indeed!"**

(98 3/4 percent guaranteed!)

So... be your name Buxbaum or Bixby or Bray... or Mordecai Ali Van Allen O'Shea...

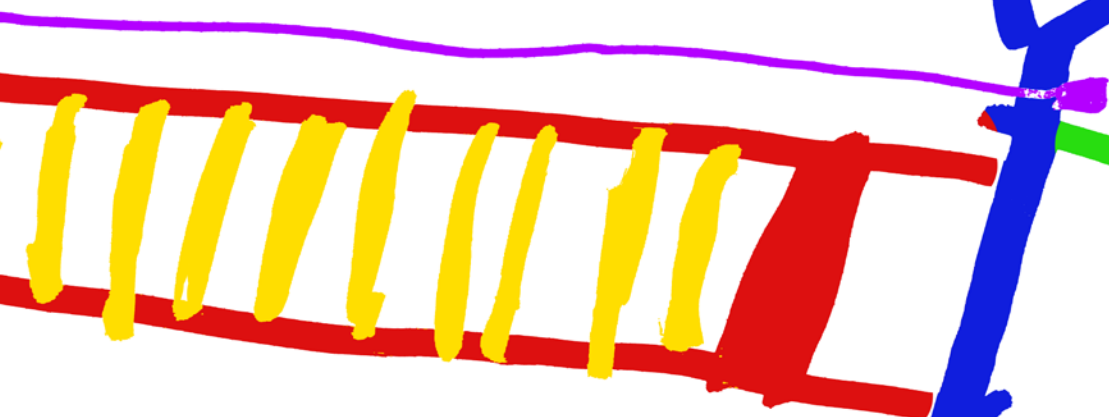
*Text: Dr Seuss's "Oh The Places You'll Go" (see Appendix II)
Image: Adapted from drawings provided by Camp Trillium (see List Of Images)*

You're off to **GREAT PLACES!** Today is **YOUR DAY!** Your mountain is waiting

Chapter IV

Conclusion
End Notes

So... Get on **YOUR WAY!**"



Conclusion

Inclusivity is an aspect of design that is often seen as inconvenient, probably because it is complex. In all of the design experiences I have had up until this point inclusivity is one element that is frequently overlooked. Trying to find out how to make a space fully inclusive is difficult. There are many different sets of standards and often the information that is available has hiccups or missing parts. Before now I had always thought that just following the first set of guidelines I could find was good enough, that making a hallway and a door wide enough for a wheelchair made a space acceptable, but now I know that I was wrong. People have very specific needs, and to try and meet those needs by trusting in the minimum requirements in a set of standards was foolish.

Through writing this thesis I have learned that the best kind of space is one that is catered to its user, not one that can be passed on to as many people as possible. I have learned that children are wise and should not be discounted from the design process. And I believe that when it comes to spaces for children, they are the best architects for their needs.

I hope that this thesis will be part of the development of a new attitude towards design. An attitude that focuses on making spaces that truly meet the user's needs, not just spaces that are aesthetically striking. I know now that the best spaces will always be complimentary to their users and bring out the best in the people who need them.

Notes

Chapter I

- i. “Play - Stages, Definition, Description, Common Problems,” *Encyclopedia of Children’s Health: Infancy Through Adolescence*, <http://www.healthofchildren.com/P/Play.html>.
- ii. Nature. Dictionary.com. *Collins English Dictionary - Complete & Unabridged 10th Edition*. HarperCollins Publishers. <http://dictionary.reference.com/browse/nature> (accessed: July 30, 2012).
- iii. *World Health Organization*, Cong. Doc., June/July 1946, 1, <http://www.who.int/governance/eb/constitution/en/>.
- iv. “Inclusivity in Canadian Guiding.” Girl Guides of Canada. <http://forms.girlguides.ca/GuiderResources/Shared%20Documents/Inclusivity%20in%20Guiding/ggc-inclusivity-in-canadian-guiding.pdf>.
1. “Children’s Needs and Helping Kids Cope,” Children’s Hospital of Philadelphia, 1996-1012, Your Child’s Changing Needs, <http://www.chop.edu/service/child-life-education-and-creative-arts-therapy/childrens-needs-and-helping-kids-cope/>.
2. “Children’s Needs and Helping Kids Cope,” Children’s Hospital of Philadelphia, 1996-1012, Your Child’s Changing Needs, <http://www.chop.edu/service/child-life-education-and-creative-arts-therapy/childrens-needs-and-helping-kids-cope/>.

Chapter IV

3. “Play Therapy,” Wikipedia, the Free Encyclopedia, History, accessed December 08, 2011, http://en.wikipedia.org/wiki/Play_therapy.

Chapter II

1. “Children’s Needs and Helping Kids Cope,” The Children’s Hospital of Philadelphia, 1996-2012, Toddler (1-3 years), <http://www.chop.edu/service/child-life-education-and-creative-arts-therapy/childrens-needs-and-helping-kids-cope/>.
2. Sylvia L. Dietrich, “A Look at Friendships between Preschool-aged Children with and without Disabilities in Two Inclusive Classrooms,” *Journal of Early Childhood Research* 3, no. 2 (2005), doi:10.1177/1476718X05053933. (Hereafter cited as *Sylvia L. Dietrich*)
3. Sylvia L. Dietrich
4. Sylvia L. Dietrich
5. Craig H. Kennedy, Smita Shikla, and Dale Fryxell, “Comparing the Effects of Educational Placement on the Social Relationships of Intermediate School Students with Severe Disabilities | Exceptional Children | Find Articles,” Find Articles | News Articles, Magazine Back Issues & Reference Articles on All Topics, Fall 1997, accessed October 2011, http://findarticles.com/p/articles/mi_hb3130/is_n1_v64/ai_n28690720/. (Hereafter cited as *Kennedy, Shikla, and Fryxell*)
6. Kennedy, Shikla, and Fryxall

7. Kennedy, Shikla, and Fryxall

8. Karen Diamond and Huifang Tu, "Relations between Classroom Context, Physical Disability and Preschool Children's Inclusion Decisions," *Journal of Applied Developmental Psychology* 30, no. 2 (November 6, 2008), doi:10.1016/j.appdev.2008.10.008. (Hereafter cited as *Diamond and Tu*)

9. Diamond and Tu

10. Diamond and Tu

11. Melinda Wenner, "The Serious Need for Play," *Scientific American*, January 28, 2009, <http://www.scientificamerican.com/article.cfm?id=the-serious-need-for-play>. (Hereafter cited as *Melinda Wenner*)

12. Melinda Wenner

13. Melinda Wenner

14. Melinda Wenner

15. Melinda Wenner

16. Melinda Wenner

17. Melinda Wenner

18. Melinda Wenner

19. Melinda Wenner

20. Amylon, Dr. Mike. "The First COCA-I Research Project Is a Great Success!" Children's Oncology Camping Association International. Accessed September 21, 2011. <http://www.cocai.org/index.php/component/content/article/1-latest-news/425-coca-i-pilot-research-study>.

21. Magda Mostafa, "Architecture for Autism: Concepts of Design Intervention for the Autistic User," *International Journal for Architectural Research* 2, no. 1 (March 2008): pg. 193. (Hereafter cited as *Magda Mostafa*)

22. Magda Mostafa: pg. # 198-199.

23. Magda Mostafa: pg. # 199-200.

24. Magda Mostafa: pg. # 201.

25. Magda Mostafa: pg. # 206.

26. "Institute for Play The Patterns of Play." National Institute For Play. 2009. Accessed December 07, 2011. http://nifplay.org/states_play.html. (Hereafter cited as *National Institute for Play*)

27. "Attunement," The National Institute for Play, 2009, <http://www.nifplay.org/attunement.html>.

28. William Hambleton Bishop, "Play Therapy Explained | How to Use Play Therapy | Attuning to Your Child | How and Why It Works," Thoughts from a Therapist, June 29, 2011, <http://www.thoughtsfromatherapist.com/2011/06/29/play-therapy-explained-play-therapy/>.
29. National Institute for Play
30. National Institute for Play
31. National Institute for Play
32. "Subsets for Social Play," The National Institute for Play, 2009, Play and Belonging, http://www.nifplay.org/social_play_subsets.html#belonging.
33. "Subsets for Social Play," The National Institute for Play, 2009, Rough and Tumble Play, http://www.nifplay.org/social_play_subsets.html#rough.
34. "Subsets for Social Play," The National Institute for Play, 2009, Celebratory Play, http://www.nifplay.org/social_play_subsets.html#celebratory.
35. National Institute for Play
36. "The Importance of Pretend Play," Scholastic, Social and Emotional Skills, Language Skills, Thinking Skills, <http://www.scholastic.com/resources/article/the-importance-of-pretend-play>.
37. National Institute for Play
38. National Institute for Play
39. Linda Cain. Ruth, *Design Standards for Children's Environments* (New York: McGraw-Hill, 2000), pg. 10.
40. Lynn Moore, "Wesley Students Participate in Wheelchair Art as Part of a May Art Day Celebration | MLive.com," Michigan Local News, Breaking News, Sports & Weather - MLive.com, May 31, 2009, http://www.mlive.com/news/muskegon/index.ssf/2009/05/wesley_students_participate_in.html.
41. "Zot Artz | History and Mission," Zot Artz | Artz for All, accessed September 21, 2011, <http://www.zotartz.com/Zot-Artz-mission.html>. (Hereafter cited as *Zot Artz*)
42. Zot Artz
43. Unified Theatre: Spotlight on Ability, About Us, <http://www.unifiedtheater.org/#/about/>. (Hereafter cited as *Unified Theatre*)
44. Unified Theatre
45. "Play Therapy," Wikipedia, the Free Encyclopedia, History, accessed December 08, 2011, http://en.wikipedia.org/wiki/Play_therapy.

46. "Play Therapy," Child Wisdom, 2001-2009, <http://www.childwisdom.org/playtherapy/>.
47. Friedrich Fröbel and W. N. Hailmann, *The Education of Man*, (New York: D. Appleton and, 1887).
48. Garry L. Landreth, *Play Therapy: The Art of the Relationship* (New York: Routledge, 2012), pg. 28 and 31. (Hereafter cited as *Garry L. Landreth*)
49. Garry L. Landreth
50. "Children's Needs and Helping Kids Cope," Children's Hospital of Philadelphia, 1996-1012, Your Child's Changing Needs, <http://www.chop.edu/service/child-life-education-and-creative-arts-therapy/childrens-needs-and-helping-kids-cope/>.
51. "Creative Arts Therapies at The Children's Hospital of Philadelphia," Children's Hospital of Philadelphia, 1996-2012, <http://www.chop.edu/service/child-life-education-and-creative-arts-therapy/programs/goals-and-benefits-of-art-and-music-therapy.html>.
- 52."Play and Recreation," Children's Hospital of Philadelphia, 1996-2012, <http://www.chop.edu/service/child-life-education-and-creative-arts-therapy/childrens-needs-and-helping-kids-cope/importance-of-play-and-recreation-during-hospitalization.html>.
53. Stephen F. Verderber, *Innovations in Hospital Architecture* (London: Routledge, 2010), pg. 9-10. (Hereafter cited as *Stephen F. Verderber*)
54. Stephen F. Verderber, pg. 10-11.
55. Stephen F. Verderber, pg. 11-13.
56. Stephen F. Verderber, pg. 17-18.
57. Stephen F. Verderber, pg. 18-19.
58. Stephen F. Verderber, pg. 19.
59. Stephen F. Verderber, pg. 20.
60. Stephen F. Verderber, pg. 20-21.
61. Stephen F. Verderber, pg. 28.
62. Stephen F. Verderber, pg. 29.
63. Stephen F. Verderber, pg. 38.

64. Clare Cooper. Marcus and Marni Barnes, *Gardens in Healthcare Facilities: Uses, Therapeutic Benefits, and Design Recommendations* (Martinez, CA: Center for Health Design, 1995), pg. 34. (Hereafter cited as *Cooper, Barnes, and Barnes*)

65. Cooper, Barnes, and Barnes, pg. 41

66. Cooper, Barnes, and Barnes, pg. 45

67. Cooper, Barnes, and Barnes, pg. 61

68. Therapeutic Horticulture website

69. Therapeutic Horticulture Website

70. "Treehouse Workshop," Nelson Treehouse and Supply, 2012-2013, <http://www.nelsontreehousesupply.com/treehouse-workshop.html>.

71. *Trillium Treehouse*, perf. Peter Nelson, YouTube, June 05, 2009, <http://www.youtube.com/watch?v=CYHiuOWpp-4>.

72. "Bienenstock Bringing Nature To Life," Bienenstock Natural Playgrounds Consulting and Green Spaces, <http://www.naturalplaygrounds.ca/>.

73. "Products," Natures Instruments, <http://www.naturesinstruments.com/page.aspx?menu=53>.

Chapter III

1. "Age and Sex, for Canada, Provinces and Territories," Census of Canada, October 6, 2012, <http://www12.statcan.ca/census-recensement/2006/dp-pd/hlt/97-551/pages/page.cfm?Lang=E>.

2. Canadian Cancer Society/National Cancer Institute of Canada: Canadian Cancer Statistics 2008, Toronto, Canada, 2008. April 2008, ISSN 0835-2976

3. "COCA-I Camps By State," Children's Oncology Camping Association International, Canada Ontario, http://www.cocai.org/index.php?option=com_comprofiler.

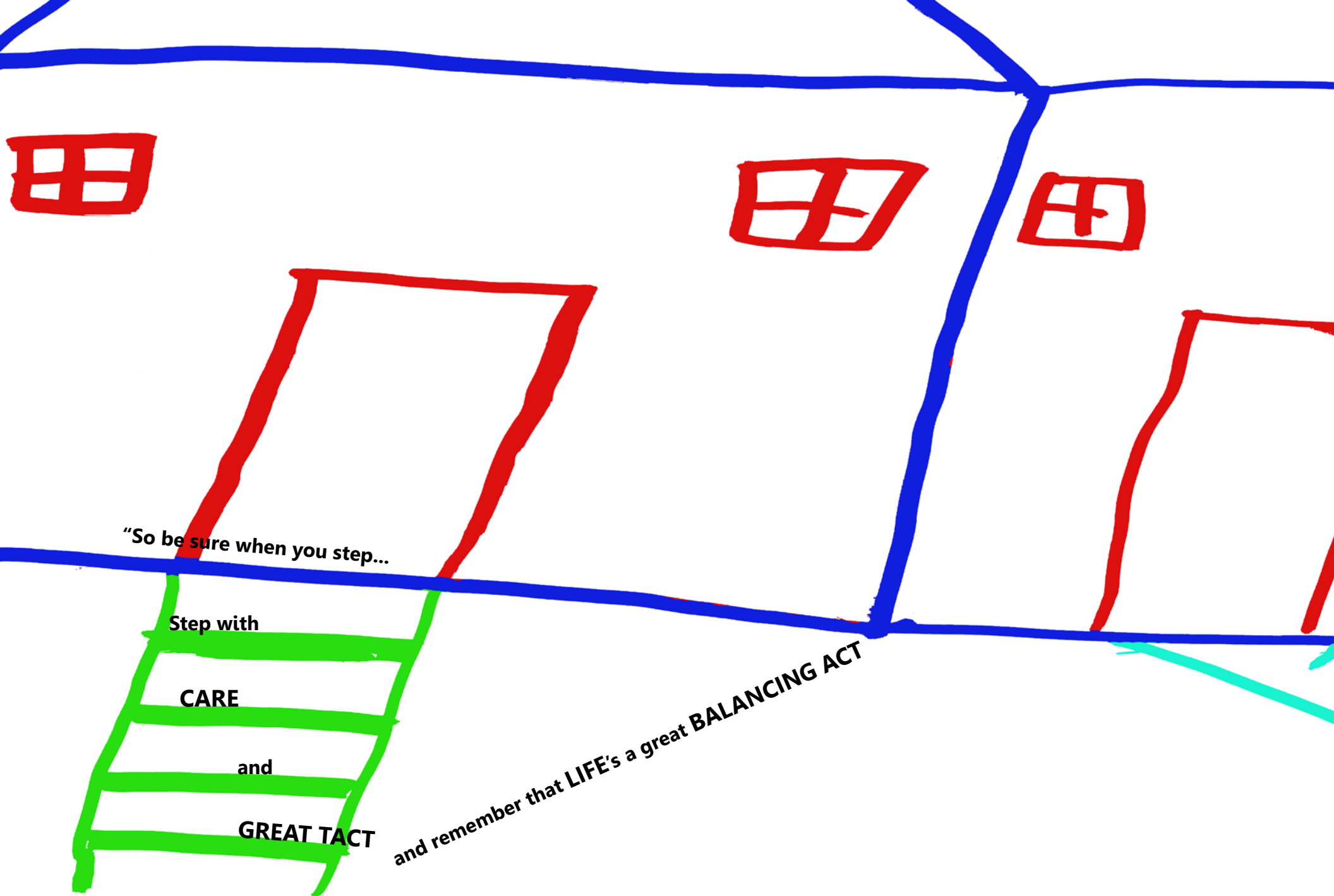
4. "Relief," The Atlas of Canada, October 29, 2003, <http://atlas.nrcan.gc.ca/site/english/maps/environment/land/relief>.

5. "Surficial Materials," The Atlas of Canada, October 29, 2003, <http://atlas.nrcan.gc.ca/site/english/maps/environment/land/surficialmaterials>.

6. "Plant Hardiness Zones," The Atlas of Canada, July 9, 2003, <http://atlas.nrcan.gc.ca/site/english/maps/environment/land/planthardi>.

7. "Wind and Sunshine," The Atlas of Canada, June 19, 2003, section goes here, <http://atlas.nrcan.gc.ca/site/english/maps/archives/3rdedition/environment/climate/020/>.

8. “Wind and Sunshine,” The Atlas of Canada, June 19, 2003, section goes here, <http://atlas.nrcan.gc.ca/site/english/maps/archives/3rdedition/environment/climate/020/>.

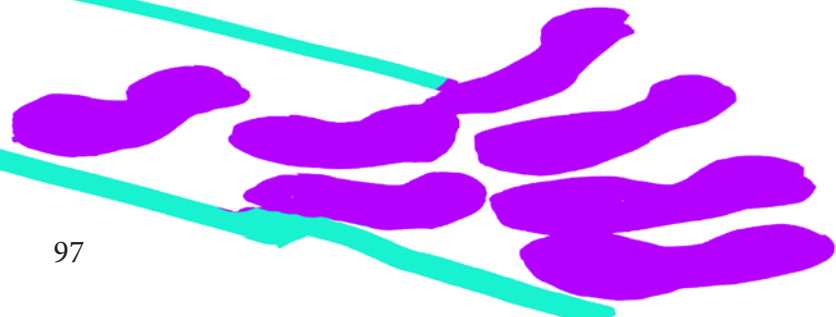


*Text: Dr Seuss's "Oh The Places You'll Go" (see Appendix II)
Image: Adapted from drawings provided by Camp Trillium (see List Of Images)*



Just never forget to be dexterous and deft and never mix up your

RIGHT
foot with your
LEFT"



Inclusivity and Development

Books

Fischer, Joachim, and Philipp Meuser. *Accessible Architecture: Age and Disability-friendly Planning and Building in the 21st Century*. Berlin: DOM, 2009.

Precedents for well designed accessible architecture. Examples of an outdoor chair lift, a ramp feature in a private home, sliding doors for accessibility, ramp slopes, and kitchen heights.

Imrie, Robert, and Peter Hall. *Inclusive Design: Designing and Developing Accessible Environments*. New York: Spon Press, 2001.

Social implications and conclusions on inclusive design. Further reading suggestions.

Moore, Robin C., Susan M. Goltsman, and Daniel S. Iacofano. *Play for All Guidelines: Planning, Design, and Management of Outdoor Play Settings for All Children : Workbook*. Berkeley, CA: MIG Communications, 1987.

Standards and environmental considerations to be made when designing fully inclusive play spaces for children.

Nellist, Ivan. *Planning Buildings for Handicapped Children*. London: Crosby Lockwood, 1970.

Patterns, colours, textures, and spatial qualities for children.

Sandhu, Jim Singh. *Environmental Design for Handicapped Children*. Farnborough, Hants.: Saxon House, 1976.

Conditions to consider when designing for handicapped children. Helpful information on colour and size of spaces (pages 75 and 121).

Studies

Amylon, Dr. Mike. "The First COCA-I Research Project Is a Great Success!" Children's Oncology Camping Association International. Accessed September 21, 2011. <http://www.cocai.org/index.php/component/content/article/1-latest-news/425-coca-i-pilot-research-study>.

A preliminary study to determine the relevance of a study examining the social impacts of the camp environment on children battling cancer. The final study will prove that what goes on at camp is an important part of the healing process for their campers. This preliminary study showed that children who experienced camp felt more comfortable in social situations and developed friendship skills that helped them outside of the camp environment.

Diamond, Karen, and Huifang Tu. "Relations between Classroom Context, Physical Disability and Preschool Children's Inclusion Decisions." *Journal of Applied Developmental Psychology* 30, no. 2 (November 6, 2008): 75-81. doi:10.1016/j.appdev.2008.10.008.

"Results suggest that attending to issues of equity and fairness and providing appropriate adaptations that allow all children to participate may be valuable strategies for supporting interactions among young children with a range of different abilities in the same preschool classroom."

Dietrich, S. L. "A Look at Friendships between Preschool-aged Children with and without Disabilities in Two Inclusive Classrooms." *Journal of Early Childhood Research* 3, no. 2 (2005): 193-215. doi:10.1177/1476718X05053933.

"Parents of children without disabilities have listed positive effects from placement in integrated settings accruing to their children, including changes in social cognition, awareness of others' needs, pro-social personal characteristics, and acceptance of human diversity." "For a friendship to develop, children must have the opportunity to meet one another." "The fact these friendships developed provides credence to the argument educators should continue to create and maintain inclusive environments."

Kennedy, Craig H., Smita Shikla, and Dale Fryxell. "Comparing the Effects of Educational Placement on the Social Relationships of Intermediate School Students with Severe Disabilities | Exceptional Children | Find Articles." Find Articles | News Articles, Magazine Back Issues & Reference Articles on All Topics. Fall 1997. Accessed October 1, 2011. http://findarticles.com/p/articles/mi_hb3130/is_n1_v64/ai_n28690720/?tag=mantle_skin;content.

A study showing the results of inclusive school environments on the social development of students with and without severe disabilities. Findings show that students in the inclusive study environment group had significantly higher levels of contact with their peers each day. Therefore, there are significant social benefits for students with severe disabilities who are able to participate in an inclusive educational environment.

Mostafa, Magda. "Architecture for Autism: Concepts of Design Intervention for the Autistic User." *International Journal for Architectural Research* 2, no. 1 (March 2008): 189-211.

A study in to the different architectural features in spaces that have an impact on autistic children. Findings show that acoustics and spatial sequencing have the highest impact on children with autism. The study continues with investigations in to acoustic and spatial sequencing strategies that make spaces more successful, with an analysis of a child's improvement concerning attention span, response time, and behavioral temperment.

Play and Development

Books

Fröbel, Friedrich, and W. N. Hailmann. *The Education of Man*, New York: D. Appleton and, 1887.

The importance of play on a child's development, and the serious need for it in their young lives.

Landreth, Garry L. *Play Therapy: The Art of the Relationship*. New York: Routledge, 2012.

History of play therapy and development over time.

Articles

Hawes, Alex. "Jungle Gyms: The Evolution of Animal Play - National Zoo| FONZ." *Welcome to the National Zoo| FONZ Website - National Zoo| FONZ*. January/February 1996. Accessed December 07, 2011. <http://nationalzoo.si.edu/Publications/ZooGoer/1996/1/junglegyms.cfm>.

Most animals play to learn life skills. Specific examples of different types of play by different animals.

Tierney, John. "Can a Playground Be Too Safe?" *The New York Times*, July 18, 2011. http://www.nytimes.com/2011/07/19/science/19tierney.html?_r=2&src=dayp.

Debate on whether the new features and standards being imposed on playground design are actually beneficial to the children using them.

Wenner, Melinda. "The Serious Need for Play." *Scientific American*, January 28, 2009. <http://www.scientificamerican.com/article.cfm?id=the-serious-need-for-play>.

Play is essential for people to develop necessary social skills. References work by Stuart Brown, Anthony D. Pellegrini, Jaak Panksepp, and David Elkind.

Wolfberg, Pamela. "Inclusive Outdoor Play - The Importance of Children's Playgrounds - Landscape Structures." *Playground Equipment & Park Playgrounds - Landscape Structures Inc*. Accessed October 1, 2011. <http://www.playlsi.com/Explore-Products/Universally-Accessible-Playgrounds/Resources/Article-PlayAPortaltoNewWorlds/Pages/Article-PlayAPortaltoNewWorlds.aspx>.

Children need playgrounds in order to be exposed to important social encounters that will help their development. Playgrounds therefore need to be fully inclusive to give all children the opportunity to develop these skills.

Websites

“Child Life Play Program at The Cancer Center | The Children’s Hospital of Philadelphia.” The Children’s Hospital of Philadelphia | The Children’s Hospital of Philadelphia. Accessed December 08, 2011. <http://www.chop.edu/service/oncology/resources-for-families-of-children-with-cancer/child-life-play-program-at-the-cancer-center.html>.

Description of the program in place at the Children’s Hospital of Philadelphia in which play is used as a therapeutic tool for helping children who are battling cancer, and the importance of extending that care to their siblings.

Hambleton Bishop, William. “Play Therapy Explained | How to Use Play Therapy | Attuning to Your Child | How and Why It Works.” Thoughts from a Therapist. June 29, 2011. <http://www.thoughtsfromatherapist.com/2011/06/29/play-therapy-explained-play-therapy/>.

“Institute for Play The Patterns of Play.” National Institute For Play. 2009. Accessed December 07, 2011. http://nifplay.org/states_play.html.

The seven types of play and how they contribute to a child’s development. Attunement Play, Body Play and Movement, Object Play, Social Play, Imaginative and Pretend Play, Storytelling-Narrative Play, Transformative-Integrative and Creative Play.

“Play Therapy.” Child Wisdom. 2001-2009. <http://www.childwisdom.org/playtherapy/>.

Play therapy for parents to do with their children.

“Play Therapy.” Wikipedia, the Free Encyclopedia. Accessed December 08, 2011. http://en.wikipedia.org/wiki/Play_therapy.

A general overview of the concept of play therapy, its history, the main players, and its development over time.

Taylor, Kerara. “Bright Ideas: A Citywide Play Circuit.” Play Today: Stories to Outrage You, Ideas to Inspire You, and Photos of Playgrounds of Playgrounds to Make You Go, “Oooh.” June 4, 2010. http://kaboom.org/blog/bright_ideas_citywide_play_circuit.

Examples of elements of play being worked in to the urban design of major cities in Europe and Asia.

“The Importance of Pretend Play,” Scholastic, Social and Emotional Skills, Language Skills, Thinking Skills, <http://www.scholastic.com/resources/article/the-importance-of-pretend-play>.

Playspaces for Children

Books

Alamo, Marta Rojas Del. *Design for Fun: Playgrounds*. Barcelona: Links International, 2004.

Playground precedent studies.

Bengtsson, Arvid. *Environmental Planning for Children's Play*. New York: Praeger, 1970.

Examples of creative slides. Favourite example is a slide coming from an imitation dormer window (page 202).

Day, Christopher, and Anita Midbjer. *Environment and Children: Passive Lessons from the Everyday Environment*. Amsterdam: Architectural, 2007.

Descriptions of the different types of play children practice throughout their development, and the kinds of spaces that facilitate this play.

Dudek, Mark. *Children's Spaces*. Amsterdam: Elsevier, 2005.

How to make spaces for children. Most precedent material is of schools.

Esbensen, Steen. *Play Spaces for Preschoolers*. [Ottawa?]: Canada Mortgage and Housing Corporation, 1997.

Factors to consider when designing play spaces for young children including size, location, organization, safety issues, and landscape issues.

Lefavre, Liane, and George Hall. *Ground-up City: Play as a Design Tool*. Rotterdam: 010 Publishers, 2007.

Using play as a design tool and objective for urban planning.

McGrath, Molly Wade., and Norman McGrath. *Children's Spaces: 50 Architects & Designers Create Environments for the Young*. New York: Morrow, 1978.

Designs of secret club houses by children, for children.

Ruth, Linda Cain. *Design Standards for Children's Environments*. New York: McGraw-Hill, 2000.

Design standards and dimensions specifically for children. Information about zones for play equipment, maneuvering space, transfer space for children from wheel chair to play structure, ramps, appropriate plants for exposure to children, outdoor accessible equipment, and other useful reference material.

Arts and Healing

Books

Kaye, Charles, and Tony Blee. *The Arts in Health Care: a Palette of Possibilities*. London: J. Kingsley Publishers, 1997.

How the arts can contribute to the healing process.

Websites

“Adolescent Play, Coping Support and Preparation | The Children’s Hospital of Philadelphia.” The Children’s Hospital of Philadelphia | The Children’s Hospital of Philadelphia. Accessed December 08, 2011. <http://www.chop.edu/service/child-life-education-and-creative-arts-therapy/childrens-needs-by-age/adolescent.html>.

How to accommodate for the needs of different ages of children when planning therapeutic play and arts activities.

“Child Life, Education and Creative Arts Therapy | The Children’s Hospital of Philadelphia.” The Children’s Hospital of Philadelphia | The Children’s Hospital of Philadelphia. Accessed December 08, 2011. <http://www.chop.edu/service/child-life-education-and-creative-arts-therapy/>.

Description of the combination of programs available at the Children’s Hospital of Philadelphia for helping kids cope with illness.

“Goals and Benefits of Art and Music Therapy | The Children’s Hospital of Philadelphia.” The Children’s Hospital of Philadelphia | The Children’s Hospital of Philadelphia. Accessed December 08, 2011. <http://www.chop.edu/service/child-life-education-and-creative-arts-therapy/programs/goals-and-benefits-of-art-and-music-therapy.html>.

Detailed description of the types of arts therapy available to children at the Children’s Hospital of Philadelphia and the goals of each program in relation to helping the child.

Moore, Lynn. “Wesley Students Participate in Wheelchair Art as Part of a May Art Day Celebration | MLive.com.” Michigan Local News, Breaking News, Sports & Weather - MLive.com. May 31, 2009. Accessed December 07, 2011. http://www.mlive.com/news/muskegon/index.ssf/2009/05/wesley_students_participate_in.html.

Fully-inclusive painting day gives kids a refreshed outlook on life. One child was even helping to push his own wheelchair, something he usually avoids. The art equipment used is provided by Zot Artz.

Unified Theatre: Spotlight on Ability. <http://www.unifiedtheater.org/#/about/>.

Organization for getting kids of all abilities involved in the dramatic arts. Used to teach leadership skills and co-operation between children of differing abilities.

“Zot Artz | History and Mission.” Zot Artz | Artz for All. Accessed September 21, 2011. <http://www.zotartz.com/Zot-Artz-mission.html>.

A company devoted to creating art equipment that can be used by all children with and without disabilities.

Nature and Healing

Books

Barnes, Marni, and Clare Cooper. Marcus. *Healing Gardens: Therapeutic Benefits and Design Recommendations*. New York, NY [u.a.: Wiley, 1999.

History of the use of gardens in healing environments. Specific design considerations for healing gardens for children. Recommended references.

Marcus, Clare Cooper., and Marni Barnes. *Gardens in Healthcare Facilities: Uses, Therapeutic Benefits, and Design Recommendations*. Martinez, CA: Center for Health Design, 1995.

History of the presence of outdoor gardens in health care settings. Studies showing patients responses to different plant types and outdoor spatial conditions.

Verderber, Stephen F. *Innovations in Hospital Architecture*. London: Routledge, 2010.

The history of the role of nature in healing.

Websites

Taylor, Dr. Aimee. “Horticulture in Health: A Brief History.” Horticultural Therapy, Dr Aimee Taylor - TherapeuticHorticulture, Health, Gardening, Vancouver. 2005. <http://www.horticulturaltherapist.com/research.html>.

A short description of the recorded instances of horticultural therapy in the past.

Taylor, Dr. Aimee. “Therapeutic Horticulture.” Horticultural Therapy, Dr Aimee Taylor - TherapeuticHorticulture, Health, Gardening, Vancouver. 2008. <http://www.horticulturaltherapist.com/index.html>.

Description of the benefits of Therapeutic Horticultural and the types of therapeutic horticulture available.

Environments for Healing

Books

Dilani, Alan. *Design & Health: the Therapeutic Benefits of Design*. Stockholm: Svenskbyggjtjänst, 2001.

Methods of health care design that can actually aid in the healing process.

Hay, Louise L. *Heal Your Body: the Mental Causes for Physical Illness and the Metaphysical Way to Overcome Them*. Carlsbad, CA: Hay House, 2008.

Phrases to heal ailments. Cancer “I lovingly forgive and release all of the past. I choose to fill my world with joy. I love and approve of myself.”

Building in Natural Landscapes

Books

Laurens, Alain, Daniel Dufour, Ghislain André, and Vincent Thfoin. *Treehouse Living: 50 Innovative Tree House Designs*. New York: Abrams, 2007.

Methods of framing around trees, building with cables to allow for thinner structural members, trap doors, spiral staircases, towers, and lifts. Beautiful drawing style.

Laurens, Alain. *Exceptional Treehouses*. New York: Abrams, 2009.

Examples of well designed tree houses for very specific programmatic needs. Many good precedents for how to connect back to the landscape.

Nelson, Peter. *New Treehouses of the World*. New York: Abrams, 2009.

Amazing tree houses from around the world. Some helpful examples of specific building features; trap doors and lifts.

Websites

“Bienenstock Bringing Nature To Life.” Bienenstock Natural Playgrounds Consulting and Green Spaces. <http://www.naturalplaygrounds.ca/>.

Company in Ontario that designs and builds natural playgrounds.

“Products.” Natures Instruments. <http://www.naturesinstruments.com/page.aspx?menu=53>.

Company that supplies different play structures and accessories to be used in natural playgrounds.

“Treehouse Workshop.” Nelson Treehouse and Supply. 2012-2013. <http://www.nelsontreehousesupply.com/treehouse-workshop.html>.

Program that includes teaching people how to pick a good tree for a treehouse, how to make safe rigging while building a treehouse, and includes building the main platform for a new treehouse during your stay.

Trillium Treehouse. Performed by Peter Nelson. YouTube. June 05, 2009. <http://www.youtube.com/watch?v=CYHiuOWpp-4>.

Video of Peter Nelson describing the Trillium Treehouse, how it came to be, and some of the qualities that make it unique.

Statistics for Design

Websites

“Age and Sex, for Canada, Provinces and Territories,” Census of Canada, October 6, 2012, <http://www12.statcan.ca/census-recensement/2006/dp-pd/hlt/97-551/pages/page.cfm?Lang=E>.

Canadian Cancer Society/National Cancer Institute of Canada: Canadian Cancer Statistics 2008, Toronto, Canada, 2008. April 2008, ISSN 0835-2976

“COCA-I Camps By State,” Children’s Oncology Camping Association International, Canada Ontario, http://www.cocai.org/index.php?option=com_comprofiler.

“Plant Hardiness Zones,” The Atlas of Canada, July 9, 2003, <http://atlas.nrcan.gc.ca/site/english/maps/environment/land/planthardi>.

“Relief,” The Atlas of Canada, October 29, 2003, <http://atlas.nrcan.gc.ca/site/english/maps/environment/land/relief>.

“Surficial Materials,” The Atlas of Canada, October 29, 2003, <http://atlas.nrcan.gc.ca/site/english/maps/environment/land/surficialmaterials>.

“Wind and Sunshine,” The Atlas of Canada, June 19, 2003, section goes here, <http://atlas.nrcan.gc.ca/site/english/maps/archives/3rdedition/environment/climate/020/>.

Architectural Precedents

Siting Strategies

Sea Ranch
by Charles Moore, Donlyn Lyndon, William Turnbull,
Richard Whitaker

Multiple private spaces have relationships to one another and also specific opportunities for connecting with the surrounding landscape condition. (See *Figure 2.1 - 2.6*)



Figure 5.1 SR Elevation Photo



Figure 5.2 SR Elevation Photo



Figure 5.3 SR Aerial Site Photo



Figure 5.4 SR Living Space

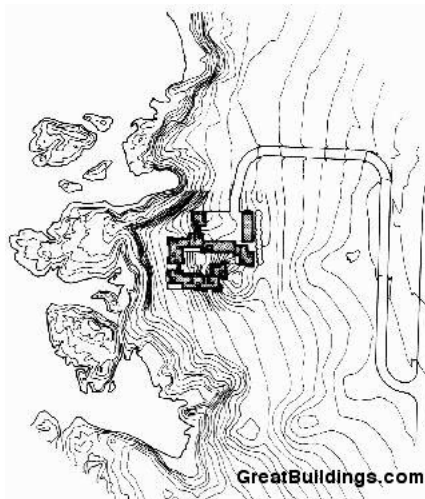


Figure 5.5 SR Site Plan

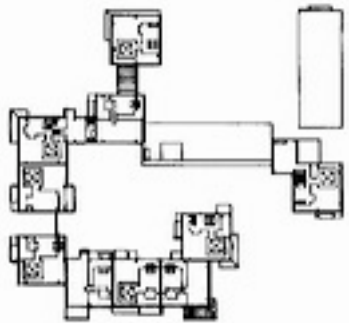


Figure 5.6 SR Second Level Plan

Haystack Mountain School
by Edward Larabee Barnes

A spine and ribs strategy of coherently relating a group of buildings to one another. (See *Figure 2.7-2.9*)



Figure 5.7 HMS Site Model



Figure 5.8 HMS Outdoor Group Space



Figure 5.9 HMS Site Photo



Figure 5.10 ACA Dance Studio



Figure 5.11 ACA Site Photo



Figure 5.12 ACA Music Studio

Blurring the Boundary of Indoor/Outdoor Space

Atlantic Center for the Arts
by Maryann Thompson Architects

The quality of light changes as the relationship of indoor space to outdoor space changes. A feeling of enclosure is created in outdoor spaces by overhead trellises. The material palette of the architecture reflects the material palette of the surrounding natural landscape. (See *Figure 2.10-2.12*)

Nordic Artists Center

Large portions of glazed wall with material palettes that reflect that surrounding landscape blur the boundary between indoor space and outdoor space successfully, even in the winter months. (See *Figure 2.13-2.15*)



Figure 5.13 NAC Artist Houses Exterior



Figure 5.14 NAC Artist Houses Interior



Figure 5.15 NAC Workshop



Figure 5.16 MC Cabin Exterior

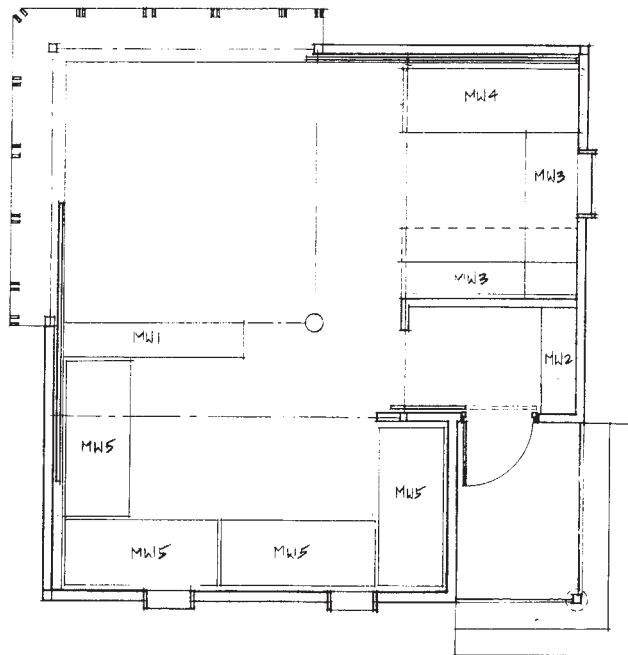


Figure 5.17 MC Cabin Plan

Facilitating a Variety of Social Interactions

Moorelands Camp Cabins
by U of T

The design of the cabins allows for three types of social interaction to occur. The bunk bed area is the most private and intimate space, possibly for interactions between pairs of people or a place for personal contemplation. The gathering space in the cabin accommodates the campers and counsellors, while the corner steps of the cabin, all oriented towards a central fire pit on the site plan, allow for large groups of campers (multiple cabins at a time) to gather and share an experience. (See *Figure 2.16* and *Figure 2.17*)

Appendix I

Accessibility

Existing Standards

This thesis originated in a critical analysis of existing Design Standards established by different levels of government and proposals by several experts. The analysis was broken in to seven categories: dimensional information, design for access to nature, design for children, design for cognitive disabilities, design for hearing disabilities, design for illness, and design for sight disabilities. The following chart is the result of my analysis. Each of the seven categories is colour coded, and the sources with information pertaining specifically to design for children are highlighted throughout the chart.

This chart shows the problems with the information that is available to designers. Most of the information outside of the initial dimensional standards is not present in the standards that we rely on for guidance (found in the first three columns). Design requirements for sight and hearing disabilities are briefly covered in the Ontario Building Code, but design for children, cognitive disabilities and illness are not addressed. Along with this missing information, there is such a range in dimensional requirements that it is difficult for a designer to know which ones to use.

If designers were to have access to the information presented in this chart in a learning environment, either while in school or by participating in specialized courses during their careers, it would provide us with a basic knowledge of how qualitative factors can greatly sway a user's experience of the spaces we create. We could then move forward in our careers with a greater awareness of how our design decisions affect the people in our buildings, and the potential impact on society.

Comparison of Standards

Standard/Source	CSA	OBC 3.8	City of Toronto Accessibility Design Guidelines 2004	Basics Barrier-Free Planning	Design Standards for Children's Environments	Architectural Graphic Standards	Play for All Guidelines	The Source Book	Four Architectural Movement Studies
Clear Space - Between Obstacles	3' (920)	3' 7" (1100)	min 5' (1525) for 2 way traffic		2' 6"x4' (760x1230) for front approach to an element with 4' dimension perpendicular to element		5'		3'0" (914)
Clear Space - Roll Under Wheelchair		6' 6" (1980)					3' 2" (965)		
Space for 2 Wheelchairs	4' 11" (1500)		5' 6" (1675) 3' 11" (1200)	5' 11" - 6' 7" (1800- 2000)		5' (1525)	6' (1823)	5'0" (1525)	
Space for 1 Wheelchair			wheelchair and walk	2'11" (900)	5' (1520)	3' (915)			
Space for Adult+Child				3' 7" (1100)					
Space for Mother with Pram				2' 7" (800)					
Space for person with crutches	3' (920)			3' 4" (1000)		2' 6" (762)	3' (914)		
Space for person with Cane			3' 4" (1000) (1500- 1650w x 2030h)	2' 7" (800)		person+8" both sides			
Space for person with Walker				2' 7" (800)		2' (610)			
Wheelchair Distance of one arm thrust							1' 6" (457)		
Door Width	2' 7" (810)	2' 9" (850)	3' (915)			2' 8" (815)			
Door Height				6' 10" (2100)			6' 8"		
Door - Swing - Clear Space Push Side	3' 11"x3' 11" (1200x1200)	11" x door width (300 x door width)	3' 11" x 3' 11" (1200x1200)	w+ 1' 7" (500)x 3' 11" (1200)		3' 8"x4' (1120x1220)			
Door - Swing - Clear Space Pull Side	4' 11"x4' 11" (1500x1500)	1' 11" x door width max 4' 11" (600 x door width max 1500)	1' 11" + door width x 4' 11" (600+door x 1500)	4' 11"x4' 11" (1500x1500)		4' 1"x5' (1260x1525)			
Door - Pocket - Clear Space Front	3' 11"x2' 11" (1200x900)			1' 7" (500)+w+ 1' 7" (500)x 3' 11" (1200)		2' 8"x4' (815x 1220)			
Door - Pocket - Clear Space Behind				6' 2" (1900) x 3' 11" (1200)		2' 8"x4' (815x 1220)			
Door - Button - Distance from door frame or end of door in open position		1' 11" (600)		4' 11" (1500)					1150w with 1200 clear space after turn on both sides
Clear Space - 90 Degree Turn	4' 11" (1500)	3' 11" diameter (1200)	4' 11" (1500)	6' 10"x6' 10" (2100x2100)		5'x5' (1525x1525)			
Clear Space - Pivot Turn	4' 11" (1500)	3' 11" diameter (1200)	4' 11" (1500)	6' 10"x6' 10" (2100x2100)	5'x5' (1500x1500)	5'x6' 6" (1525x1965)	5' 4" diameter		2150x1800
Clear Space - Around an Obstacle	obstacle 1200 or more space shall be 920. Obstacle less than 1200 space shall be 1100.		3' 7" (1100)			3' (915) for 1200 or bigger. 3' 6" (1065) for less than 1200			
Ramp - Slope 20' Length	1:15 (with 600mm rise between landings)	max 1:12	1:12 (1:15 preferred) bridge 1:20	6% 1:16		1:12	5% easy, 6.25% accessible, 8.35% difficult		1:16
Ramp - Slope 10' Length	1:20	max 1:12	same as above			1:12	1:12		1:10
Ramp - Cross Slope	1:50		1:50		1:48	1:50	1% -2%		
Ramp - Width	3' (920)	2' 11" (900)	3' 4", 3' 7" (1015- 1100)	3' 11" (1200)	3' (910)	3' (915)			
Ramp - Hand rail - Projection Beyond	11" (300)	11" (300)	11" (300)	11" (300)		1' (305)			
Ramp - Rest Platform Distance Between	29' 6" (9000)	29' 6" (9000)	29' 6" (9000)	19' 7" (6000)	16' (4877)	2' 6" (762)	30' (9150)		
Ramp - Rest Platform Width	width of ramp	width of ramp	width of ramp			5' (1524)			
Ramp - Rest Platform Length	4'11" (1500)	5' 6" (1670)	5' 6" (1670)	4' 11" (1500)		5' (1524)			
Ramp - Beginning and End	4'11"x4'11" (1500x1500)	5' 6" x 5' 6" (1670x1670)	5' 6" x 5' 6" (1670x1670)						
Ramp or Sloped Path - Curb	3" (75)	2" (50)	6" (150)	1" (30)			2" (50.8)		

Building Without Barriers	Planning Buildings for Handicapped Children	Gardens in Health Care Facilities	Construction and Design Manual: Accessible Architecture	Places for Preschoolers	It's Not all Swings and Roundabouts	Case Study - San Francisco General hospital - "The Comfort Garden" (Gardens in Health Care Facilities)	Case Study - Alta Bates Medical Center Berkeley - "The Roof Garden" (Gardens in Health Care Facilities)	Case Study - Kaiser Permanente Walnut Creek - "Central Garden" (Gardens in Health Care Facilities)	Dr. Stephen Fine - Director Hollows Camp & Research Chair for the Ontario Camp Association	Jen Wolfenden - Director of Nursing at Camp Trillium
		Make entrances and width of pathway wide enough to easily pass a wheelchair through								
			5'10" (1800)		6' 7" (2000)					
			2' 11" (900)							
	2' 9" (850)		2'11" (900)							
			4' 11"x4' 11" (1500x1500)							
			4' 11"x4' 11" (1500x1500)							
				6%					1:12	
				0					1:12	
			3' 11" (1200)							
			11" (300)							
30' (9150) and at direction changes			19' 7" (6000) match ramp							32' 10" (10000) and at beginning and end
			4' 11" (1500)							5' 11" (1800)
			4' 11"x4' 11" (1500x1500)							

Standard/Source	CSA	OBC 3.8	City of Toronto Accessibility Design Guidelines 2004	Basics Barrier-Free Planning	Design Standards for Children's Environments	Architectural Graphic Standards	Play for All Guidelines	The Source Book	Four Architectural Movement Studies
Ramp - Colour	Contrast adjacent surfaces (S)			Avoid shades of blue (may cause disorientation)					
Ramp - Texture	Contrast adjacent surfaces (S)								
Lift - Clear Space Within	5' 7"x4' 6" (1725x1370)	follow CSA	comply with CSA	3' 7"x4' 7" (1100x1400)		5' 7"x4' 3" (730x1291)			
Lift - Door	2' 11" (910)	follow CSA	3' (915)	2' 11" (900)		3' (915)			
Lift - Clear Space in Front		follow CSA	comply with CSA	4' 11"x4' 11" (1500x1500)					
Finish - Ground - Outdoor - Material			firm, level, non slip. shall have contrasting colours. For boardwalks, planks shall be perpendicular to direction of travel and have max 6mm gap	non slip, anti static, ease of care, ease of cleaning, resistance to damp, degree of sound absorption, degree of light reflection, avoid blue	firm, stable, slip resistant. With 9" (230) compressed depth, critical height of woodchips is 10' (3000) double shredded bark mulch 7' (2100)			Slip Resistant	
Finish - Ground - Outdoor - Texture		path way shall have 1100mm wide surface of a different texture than surrounding area	shall have a different texture than surroundings.					Even, Continuous	
Finish - Ground - Indoor - Material	firm, skip resistant	stable, firm, slip resistant	signage should be on the opening side of doors	non slip, anti static, ease of care, ease of cleaning, resistance to damp, degree of sound absorption, degree of light reflection, avoid blue					
Finish - Ground - Indoor - Texture									
Finish - Wall				strong, durable (withstand damage from wheelchairs), load bearing capacity that allows for gripping and lifting apparatus, easy to clean					
Gathering Space							Keep all elements of the play area clearly visible (H)		
Seating - Design	Clear foot space 1' 6" D x 2' 2" H (480x680)				Seat at appropriate height for transfer by a child in a wheel chair 11"-2' (280-610)				

Building Without Barriers	Planning Buildings for Handicapped Children	Gardens in Health Care Facilities	Construction and Design Manual: Accessible Architecture	Places for Preschoolers	It's Not all Swings and Roundabouts	Case Study - San Francisco General hospital - "The Comfort Garden" (Gardens in Health Care Facilities)	Case Study - Alta Bates Medical Center Berkeley - "The Roof Garden" (Gardens in Health Care Facilities)	Case Study - Kaiser Permanente Walnut Creek - "Central Garden" (Gardens in Health Care Facilities)	Dr. Stephen Fine - Director Hollows Camp & Research Chair for the Ontario Camp Association	Jen Wolfenden - Director of Nursing at Camp Trillium
			3' 7" x4' 7" (1100x1400)							
			2' 11" (900)							
			4' 11"x4' 11" (1500x1500)							
			easy wheelchair travel without vibration		durable, easy to install, slip resistant, impact reducing, colourful					
	Smooth enough to accommodate wheelchairs		cross slope not larger than 2%, length slope not larger than 3%		paving slabs should have a corrugated finish with flush joints					
			slip resistant, low glare, wheelchair accessible, firm, not attract static charge		firm, non slip					
			designed to take the fittings required for plumbing, carrying, supporting, and lifting equipment							
	Seating arranged for social interaction... near to the entrance into the garden space adds convenience									
	Fixed seating with backs for sitting in comfort is important for users who may be physically weak. Increase seating options available (possibly moveable) so that users can meet their particular need.									
	Should be pleasant to									

Standard/Source	CSA	OBC 3.8	City of Toronto Accessibility Design Guidelines 2004	Basics Barrier-Free Planning	Design Standards for Children's Environments	Architectural Graphic Standards	Play for All Guidelines	The Source Book	Four Architectural Movement Studies
Reach - Wheelchair - High	3' 11" (1200)	4' (1200)	4' 6" (1370)	4' 7" (1400)	Age 2-5: 3' (910) Age 5-12: 3' 6" (1020)	4' (1200)			
Reach - Wheelchair - Low	1' 2" (380)	2' 11" (900)	1' 6" (460)	1' 4" (400)	Age 2-5: 1' 8" (510) Age 5-12: 1' 6" (460)	1' 3" (380)			
Reach - Wheelchair - Front	1' 7" (500)		1' 8" (510) side	1' 11" (600)		2' 1" (635)			
Reach - Wheelchair - Controls	1' 4"-3' 11" (400-1200)			2' 9" (850)		5'-4" (380-1220)			
Colour Contrast - Good	Light on Dark		contrast of aprox 70% light reflectance should be provided on signage. Bright highly contrasting tones. Colours on the warm end of the spectrum are easier to distinguish	Light on Dark					
Colour Contrast - Bad			avoid contrasting cool colours (ex blue/grey)	Green/Red, Yellow/Blue			Bold patterns or colours may be disorienting over a continuous surface		
Texture - Contrast									
Window - Operation Handle	1' 4"-3' 11" (400-1200)			Mounted as low as possible on window, not centrally not at eye level for person in a chair (4' 1" (1250)) bars up to 2' (850) can be seen through from sitting in a chair					
Window - Mullions			do not block view for person in a wheelchair between 3' 6"- 3' 11" (1070-1200)						
Window - Parapet - Height			2' 5" (760) max	1' 11" (600)					
Window - Opening Style				Horizontal (does not cause extra obstacles in a space and easy to operate)					
Hand Rails - Diameter	(30-40)	(30-40)	(30-50)	(30-45)	(24-39)	(32-49)	(32-38)		
Hand Rails - Height	2' 7"-3' (800-920)	2' 10" -3' 2" (865-965)	(865-915) with 150mm curb OR (915) min for wheelchair users AND (865-965) on ramps	2' 9" (850) for wheelchair users	1' 10"-3' 2" (560-965) for age 2-5: 1' 10"-2' 2" (560-660) Between raised play zones: 1' 8"-2' 4" (510-710)		1' and 2'		
Wheelchair - Guide Plates - Height				4" - 6" (100-150)					
Balcony - Parapet Height				1' 11" (600)					
					"The diameter of a protrusion should not increase in the direction away from the surrounding surface toward the				

Building Without Barriers	Planning Buildings for Handicapped Children	Gardens in Health Care Facilities	Construction and Design Manual: Accessible Architecture	Places for Preschoolers	It's Not all Swings and Roundabouts	Case Study - San Francisco General hospital - "The Comfort Garden" (Gardens in Health Care Facilities)	Case Study - Alta Bates Medical Center Berkeley - "The Roof Garden" (Gardens in Health Care Facilities)	Case Study - Kaiser Permanente Walnut Creek - "Central Garden" (Gardens in Health Care Facilities)	Dr. Stephen Fine - Director Hollows Camp & Research Chair for the Ontario Camp Association	Jen Wolfenden - Director of Nursing at Camp Trillium
			4' 7" (1400)							
			1' 4" (400)							
			(30-45)							
			2' 9" (850)							
			4" (100)							

Standard/Source	CSA	OBC 3.8	City of Toronto Accessibility Design Guidelines 2004	Basics Barrier-Free Planning	Design Standards for Children's Environments	Architectural Graphic Standards	Play for All Guidelines	The Source Book	Four Architectural Movement Studies
Access to Nature - User's comments on hospital gardens									
Plant Species									
Nature Creating Physical Feeling Changes									
Nature for Relaxation									
Nature as a Mood Changer									
Trees, Plants and Flowers									

Building Without Barriers	Planning Buildings for Handicapped Children	Gardens in Health Care Facilities	Construction and Design Manual: Accessible Architecture	Places for Preschoolers	It's Not all Swings and Roundabouts	Case Study - San Francisco General hospital - "The Comfort Garden" (Gardens in Health Care Facilities)	Case Study - Alta Bates Medical Center Berkeley - "The Roof Garden" (Gardens in Health Care Facilities)	Case Study - Kaiser Permanente Walnut Creek - "Central Garden" (Gardens in Health Care Facilities)	Dr. Stephen Fine - Director Hollows Camp & Research Chair for the Ontario Camp Association	Jen Wolfenden - Director of Nursing at Camp Trillium
		"Flowering trees, shrubs, and perennials provide a sense of seasonal change that reinforces one's awareness of life's rhythms and cycles."			"by using native and naturalised species, and those associated with a particular landscape, not exotics, it is possible to reduce the maintenance, produce hardy growth, and increase the number and range of visiting wildlife from insects to birds and mammals."	"...well-loved oasis that brings joy, contentment, and peace to visitors and outpatients..."	"The fact that many of our respondents used the words "more productive", or implied such an outcome, is an indication that such outdoor spaces are not merely "cosmetic extras" but should be intrinsic components of every working environment."	"The trees, the birds, the squirrels, children playing - all remind people that 'life goes on'."		
		"Plant species that attract butterflies call attention to the ephemeral, serving as a gentle reminder of the preciousness of life."			"Wild-life' sites are particularly useful as part of school playgrounds, as a learning tool, giving children the opportunity to understand and respect the delicate balances of the 'natural world'."			88% of people use the garden for relaxing. 84% for walking through. 82% for talking.		
		95% of users reported that they "feel different" after visiting the garden			"planting needs to regenerate quickly and benefit from random pruning!"					
		78% of users report feeling "more relaxed, less stressed, calmer, contented"				68%of respondents report feeling calmer, contented, sleepy, more relaxed, and less stressed.	80% of users report feeling calmer, more contented, more relaxed, less stressed.	86% of users report feeling calmer, more relaxed		
		25% of users reported feeling "refreshed, rejuvenated, stronger"				28% report feeling better, more positive, pleased.	33% feel refreshed and stronger. 22% feel better and more positive	24% of users report feeling stronger and refreshed		
		69% of visitors feel trees and plants are useful in helping to achieve a mood change. 94% of people who use the garden use it for relaxation			"Children love the element of surprise in their play, so little flowers that have to be searched for, brightly coloured blooms, strange smells, etc., are all useful"	94% of people like aesthetic attractiveness and design of the garden best, 74% of people like the flowers, plants and trees, and 60% like the privacy, quiet, and comfort found in the garden	67% of people say that flowers and colours help them to achieve a change of mood	82% of users say they like the trees, plants and flowers best. 72% the aesthetic attractiveness and design. 54% serenity, quiet, and escape. 86% Say that trees and plants help them to achieve a mood change.		

Standard/Source	CSA	OBC 3.8	City of Toronto Accessibility Design Guidelines 2004	Basics Barrier-Free Planning	Design Standards for Children's Environments	Architectural Graphic Standards	Play for All Guidelines	The Source Book	Four Architectural Movement Studies
Use of sound and tactile Elements in Natural Settings									
How Often do People use Natural Spaces?									
Swings - Seat Height					Age 1-2: 2' (610) Ages 3-5: 1' (305) Ages 5+: 1' 4" (410) for wheelchair transfer: 11"-2' (280-610)		Accessible swings should have back and side support or an indentation for the child to sit in (ex tire swing)		
Swings - Distance Between					at 60" above ground minimum distance of 2' (610)				
Swings - Distance in Front and Behind					Equal to height of pivot		2x height of swing beam		
Swings - Support System Info									
Slides - Height					should be less than critical height of ground material				
Slides - Enclosure					flat open chute should have sides 4" (100) tall				
Slides - Slope					Average no more than 30 degrees, with no one portion being more than 50 degrees				
Sand - Table or Box - Curb				consider the use of raised boxes					
Climber - Height							5' 4" (1626)		
Hardware Protrusion							no object should protrude a distance greater than its diameter		
Design for Children				Design for children's different physical and psychological perceptions of the adult world					

Building Without Barriers	Planning Buildings for Handicapped Children	Gardens in Health Care Facilities	Construction and Design Manual: Accessible Architecture	Places for Preschoolers	It's Not all Swings and Roundabouts	Case Study - San Francisco General hospital - "The Comfort Garden" (Gardens in Health Care Facilities)	Case Study - Alta Bates Medical Center Berkeley - "The Roof Garden" (Gardens in Health Care Facilities)	Case Study - Kaiser Permanente Walnut Creek - "Central Garden" (Gardens in Health Care Facilities)	Dr. Stephen Fine - Director Hollows Camp & Research Chair for the Ontario Camp Association	Jen Wolfenden - Director of Nursing at Camp Trillium
		58% of visitors feel features involving auditory, olfactory, and tactile sensations are useful in helping to achieve a mood change						60% of users report features involving auditory, olfactory or tactile sensations helpful in attaining mood change		
		30% of people use the garden several times per day. 27% of people use the garden occasionally. 18% of people use the garden every day (of 143 people)								
1' 1" (350)										
11' 10" (3600) 5' 11" (1800)										
Maximum 2 swings on one horizontal frame										
open free standing maximum 6' 6" (2000) should be mounted on an embankment or mound										
6'-1' (150-300)										
design for dwarfism										

Standard/Source	CSA	OBC 3.8	City of Toronto Accessibility Design Guidelines 2004	Basics Barrier-Free Planning	Design Standards for Children's Environments	Architectural Graphic Standards	Play for All Guidelines	The Source Book	Four Architectural Movement Studies
			"public parks, parkettes and playgrounds should be designed to be used by people with varying abilities/disabilities and with universal access principals in mind"				"Children with disabilities often have limited opportunities for large group experiences. Environments which allow the experience of solitude as well as group activity can help children develop social skills and positive self identities."		
							"Nonthematic equipment is more adaptable for informal as well as programmed activity (PLAE, 1981-87)		
							"By providing a variety of spatial settings - private, semiprivate, and public - the stage is set for a spectrum of personal and social experiences that together can contribute to full child development. (AEC, 1980)		

Building Without Barriers	Planning Buildings for Handicapped Children	Gardens in Health Care Facilities	Construction and Design Manual: Accessible Architecture	Places for Preschoolers	It's Not all Swings and Roundabouts	Case Study - San Francisco General hospital - "The Comfort Garden" (Gardens in Health Care Facilities)	Case Study - Alta Bates Medical Center Berkeley - "The Roof Garden" (Gardens in Health Care Facilities)	Case Study - Kaiser Permanente Walnut Creek - "Central Garden" (Gardens in Health Care Facilities)	Dr. Stephen Fine - Director Hollows Camp & Research Chair for the Ontario Camp Association	Jen Wolfenden - Director of Nursing at Camp Trillium
			reach and sight lines are restricted - pay attention to heights required (window sills, furniture)						Summer camps, as well as year-round outdoor education centres, offer kids what is currently lacking in our education system	
									Research has identified the ideal learning environment as one that provides optimal challenges and emotional stimulation within a context of both independence and inter-dependence	
					"Children love the element of surprise in their play, so little flowers that have to be searched for, brightly coloured blooms, strange smells, etc., are all useful"				The high levels of situational and personal interest that develop at camp often result in a positive approach to future learning that can extend throughout one's life	
					"Some of the planting should be changeable, i.e. deciduous, so that the children can watch the seasons."				Green spaces actually have the capacity to improve attention and allow for better intellectual focus. This has important implications for the psychological and physical well-being of our children.	

Standard/Source	CSA	OBC 3.8	City of Toronto Accessibility Design Guidelines 2004	Basics Barrier-Free Planning	Design Standards for Children's Environments	Architectural Graphic Standards	Play for All Guidelines	The Source Book	Four Architectural Movement Studies
Design for Cognitive Disabilities									
Limitation	Difficulty participating in social environments								
Problems	<p>"Those affected cannot participate in society on their own, and need clearly structured living conditions."</p> <p>Safely retain children</p>								

Building Without Barriers	Planning Buildings for Handicapped Children	Gardens in Health Care Facilities	Construction and Design Manual: Accessible Architecture	Places for Preschoolers	It's Not all Swings and Roundabouts	Case Study - San Francisco General hospital - "The Comfort Garden" (Gardens in Health Care Facilities)	Case Study - Alta Bates Medical Center Berkeley - "The Roof Garden" (Gardens in Health Care Facilities)	Case Study - Kaiser Permanente Walnut Creek - "Central Garden" (Gardens in Health Care Facilities)	Dr. Stephen Fine - Director Hollows Camp & Research Chair for the Ontario Camp Association	Jen Wolfenden - Director of Nursing at Camp Trillium
<p>kids need to interact with their peers and adult mentors in order to develop social skill sets that will allow them to be successful and productive members of society... Accredited summer camps have a long established and proven reputation as safe havens for kids and young people to live and learn together in a supervised community environment.</p>										
<p>The classroom setting unquestionably has its worth. However, it is nevertheless limited by walls and desks and predicable lesson patterns... There is a genuine need for students and their teachers to regularly convene beyond the classroom. Camp is one occasion where this type of learning interaction can take place each summer.</p>										
Physical illness leading to emotional vulnerability										
"People who are not well sometimes tend to be emotionally vulnerable and sometimes intellectually impaired"										

Standard/Source	CSA	OBC 3.8	City of Toronto Accessibility Design Guidelines 2004	Basics Barrier-Free Planning	Design Standards for Children's Environments	Architectural Graphic Standards	Play for All Guidelines	The Source Book	Four Architectural Movement Studies
Solutions				"To aid memory, dementia patients' surroundings should be made up of simple, easily recognizable elements, with visually simple and easily navigable rooms, rather than large atria and intricate constructions."			carefully designed enclosed settings for children and their care givers		
				Sensitivity to exterior environment			For children who are severely impaired, watching, or "vicarious play", may become the major form of interaction		
				"Problems with dysfunctional temperature and pain perception caused by cognitive or sensory impairment often create an inability to regulate body temperature"					
				Burn, cutting			provide places to sit and observe in the middle of the action		
				"Exclude burn risks ... sharp edges and hard surfaces and other hazards should also be excluded as far as possible, as they are dangerous to anyone					

Building Without Barriers	Planning Buildings for Handicapped Children	Gardens in Health Care Facilities	Construction and Design Manual: Accessible Architecture	Places for Preschoolers	It's Not all Swings and Roundabouts	Case Study - San Francisco General hospital - "The Comfort Garden" (Gardens in Health Care Facilities)	Case Study - Alta Bates Medical Center Berkeley - "The Roof Garden" (Gardens in Health Care Facilities)	Case Study - Kaiser Permanente Walnut Creek - "Central Garden" (Gardens in Health Care Facilities)	Dr. Stephen Fine - Director Hollows Camp & Research Chair for the Ontario Camp Association	Jen Wolfenden - Director of Nursing at Camp Trillium
		"Design for a sense of security, serenity, and safety - with defined seating areas, easily readable pathways, and clear designations..."								
		"Trees whose foliage moves easily, even in a slight breeze, draw the user's attention to patterns of colour, shadows, light, and movement. This was described by interviewees as a soothing and meditative experience."								
		"Features to attract birds - such as a fountain or birdbath, a bird feeder, trees appropriate for roosting or nesting - stimulate the senses and help lift people's spirits."								
		"...sound can create a psychological screen (white noise) that serves the restoration process. A water feature can provide this pleasing and soothing sound."								
		"Where there is a view, make sure that some seating faces that direction to facilitate psychological								

Standard/Source	CSA	OBC 3.8	City of Toronto Accessibility Design Guidelines 2004	Basics Barrier-Free Planning	Design Standards for Children's Environments	Architectural Graphic Standards	Play for All Guidelines	The Source Book	Four Architectural Movement Studies
Design for Hearing Disabilities		Signals shall have a visual component		missing auditory signals, possible challenges with balance					
Hazards				bright, no shadows					
Light									
Orientation			be sure not to have any devices located such that they will interfere with signals from hearing devices	equalize diverse sound conditions with soundproofing (low reverberation and sound dampening systems)					
Acoustics			make sure occasional noise is not unduly amplified	use warning lights along with auditory signals					
Signals									
Design for Illness									
Problem									
Risks									
Therapies									

Building Without Barriers	Planning Buildings for Handicapped Children	Gardens in Health Care Facilities	Construction and Design Manual: Accessible Architecture	Places for Preschoolers	It's Not all Swings and Roundabouts	Case Study - San Francisco General hospital - "The Comfort Garden" (Gardens in Health Care Facilities)	Case Study - Alta Bates Medical Center Berkeley - "The Roof Garden" (Gardens in Health Care Facilities)	Case Study - Kaiser Permanente Walnut Creek - "Central Garden" (Gardens in Health Care Facilities)	Dr. Stephen Fine - Director Hollows Camp & Research Chair for the Ontario Camp Association	Jen Wolfenden - Director of Nursing at Camp Trillium
		"Porviding one or more eye-catching and unique features by which people will identify a garden - such as a sculpture, wind chimes, an aviary, a fish pond - serves to anchor memories of the garden and the restoration achieved there."								
			bright, glare-free, and without shadows (to make lip reading easier)							
			provide for sound insulation against increased noise levels from outside							
			consistent throughout the space							
			supplement acoustic signals (bell, phone) with visual signals (flashing indicator)							
		General physical illness								Cancer
		"[People with physical illness] are acutely aware of their physical comfort"								normal path of growing as a family altered by the diagnosis...which has made priorities of childhood have to shift more vulnerable to germs, to bruising and bleeding, to brittle bones
		"design with particular awareness of issues of mobility and microclimate"								camp accommodates and provides support and education

Standard/Source	CSA	OBC 3.8	City of Toronto Accessibility Design Guidelines 2004	Basics Barrier-Free Planning	Design Standards for Children's Environments	Architectural Graphic Standards	Play for All Guidelines	The Source Book Four Architectural Movement Studies
Benefits Design for Sight Disabilities								

Building Without Barriers	Planning Buildings for Handicapped Children	Gardens in Health Care Facilities	Construction and Design Manual: Accessible Architecture	Places for Preschoolers	It's Not all Swings and Roundabouts	Case Study - San Francisco General hospital - "The Comfort Garden" (Gardens in Health Care Facilities)	Case Study - Alta Bates Medical Center Berkeley - "The Roof Garden" (Gardens in Health Care Facilities)	Case Study - Kaiser Permanente Walnut Creek - "Central Garden" (Gardens in Health Care Facilities)	Dr. Stephen Fine - Director Hollows Camp & Research Chair for the Ontario Camp Association	Jen Wolfenden - Director of Nursing at Camp Trillium
		" provide sensory stimuli that is noninvasive in character to draw our attention away from the initial feeling state to an external focus."								
		"facilitate physical and psychological movement with pathways and/or vistas through to a variety of types of spaces, thereby assisting a shift in perspective."								
		"create areas for safe seclusion as well as social interaction to help think and work through issues"								
		"appropriate plant selection... is one of the essential elements of a therapeutic garden environment, as dying and unhealthy plants have a negative psychological impact on those observing them."								
		"contrast and harmony in texture, form, colour, and arrangement of plant materials provide a variety that holds the attention and helps to draw focus away from ourselves."								
		"adjustable [shading] allows people to control the amount of sun or shade, so important to those who feel unwell or are taking certain medications."								
										getting along with your group, trying new things, challenge by choice, being closer to nature

Standard/Source	CSA	OBC 3.8	City of Toronto Accessibility Design Guidelines 2004	Basics Barrier-Free Planning	Design Standards for Children's Environments	Architectural Graphic Standards	Play for All Guidelines	The Source Book	Four Architectural Movement Studies
Hazards			curb ramps should be finished at the lower edge with a cane detectable rounded edge	props, projecting parts of buildings, changes in ground level					
Light			evenly lit working surfaces and circulation spaces. Use quality of light as close to full spectrum as possible	avoid shadows, bright, no glare					
Colours		consider the use of raised planting beds, fragrant plantings, and braille signage	contrasting colour and different textured materials.	used to mark danger spots - Light on Dark works, green on red, or yellow on blue will not, they look like indistinguishable shades of grey to someone who is colour blind			Warnings should be reinforced by contrast in lighting value (light/dark)		
Orientation			ramps 5' (1525) wide	Any dangers to upper body must be marked at floor height. odour marking (by strong smelling plants) can help one get oriented					
Glazing									
Acoustics									
Signals		Signals shall have an auditory component	consider the use of raised planting beds, fragrant plantings, and braille signage Baseboards should be highly contrasted (70%) from walls and floors in monochromatic	Tactile elements set in to the paving, Guidance lines on walls or floors in			warning textures should be 1/16 to 1/8" high and start 36" before a hazard is encountered		

Building Without Barriers	Planning Buildings for Handicapped Children	Gardens in Health Care Facilities	Construction and Design Manual: Accessible Architecture	Places for Preschoolers	It's Not all Swings and Roundabouts	Case Study - San Francisco General hospital - "The Comfort Garden" (Gardens in Health Care Facilities)	Case Study - Alta Bates Medical Center Berkeley - "The Roof Garden" (Gardens in Health Care Facilities)	Case Study - Kaiser Permanente Walnut Creek - "Central Garden" (Gardens in Health Care Facilities)	Dr. Stephen Fine - Director Hollows Camp & Research Chair for the Ontario Camp Association	Jen Wolfenden - Director of Nursing at Camp Trillium
			steps, thresholds, edges							
			rooms should be bright, glare-free, and without shadows							
			contrasting colours of the same tone should be used to signify important changes in surroundings							
			provide tactile options and "sensory islands" (ex. Plants and flowers)							
			use shatter-proof glass							
			consistent throughout the space							
			Relate optical with acoustic signals							
			smooth, easy to clean wall surfaces to create							

Sources

In Order of Appearance in Chart

- Barrier-free Design*. Rexdale, Ont.: Canadian Standards Association, 1990.
- Ontario Building Code, 1990 - Containing the Building Code Act and O.Reg.413*. 1990.
- City of Toronto Accessibility Design Guidelines*. Toronto: Diversity Management and Community Engagement, Strategic and Corporate Policy / Healthy City Office, Chief Administrator's Office, 2004.
- Skiba, Isabella, and Rahel Züger. *Basics Barrier-free Planning*. Basel: Birkhäuser, 2009.
- Ruth, Linda Cain. *Design Standards for Children's Environments*. New York: McGraw-Hill, 2000.
- Ramsey, Charles George., Harold Reeve. Sleeper, and Bruce Bassler. *Architectural Graphic Standards: an Abridgment of the Ninth Edition*. New York: Wiley, 2000.
- Moore, Robin C., Susan M. Goltsman, and Daniel S. Iacofano. *Play for All Guidelines: Planning, Design, and Management of Outdoor Play Settings for All Children : Workbook*. Berkeley, CA: MIG Communications, 1987.
- Kelly, Carol, and Ken Snell. *The Source Book: Architectural Guidelines for Barrier-free Design*. Toronto, Ont.: Barrier-Free Design Centre, 1987.
- Walter, Felix. *Four Architectural Movement Studies for the Wheelchair and Ambulant Disabled*. London: (346 Kensington High St., W.14), Disabled Living Foundation, 1971.
- Harkness, Sarah P., and James N. Groom. *Building without Barriers for the Disabled*. New York: Whitney Library of Design, 1976.
- Nellist, Ivan. *Planning Buildings for Handicapped Children*. London: Crosby Lockwood, 1970.
- Marcus, Clare Cooper., and Marni Barnes. *Gardens in Healthcare Facilities: Uses, Therapeutic Benefits, and Design Recommendations*. Martinez, CA: Center for Health Design, 1995.
- Meuser, Philipp, and Joachim Fischer. *Construction and Design Manual: Accessible Architecture*. Berlin: DOM, 2009.
- Esbensen, Steen. *Play Spaces for Preschoolers*. [Ottawa?]: Canada Mortgage and Housing Corporation, 1997.
- Martin, Rosy. *It's Not All Swings and Roundabouts: Making Better Play Spaces for the Under-sevens*. London: Women's Design Service, 1989.

Cooper Marcus, Clare. "San Francisco General Hospital: The Comfort Garden." In *Gardens in Healthcare Facilities: Uses, Therapeutic Benefits, and Design Recommendations*, by Marni Barnes, 23-29. Wayne Ruga, AIA, IIDA, 1995.

Cooper Marcus, Clare. "Case Study: Alta Bates Medical Center, Berkeley, California: The Roof Garden." In *Gardens in Healthcare Facilities: Uses, Therapeutic Benefits, and Design Recommendations*, by Marni Barnes, 31-38. Wayne Ruga, AIA, IIDA, 1995.

Cooper Marcus, Clare. "Case Study: Kaiser Permanente Medical Center, Walnut Creek, California: Central Garden." In *Gardens in Healthcare Facilities: Uses, Therapeutic Benefits, and Design Recommendations*, by Marni Barnes, 39-45. Wayne Ruga, AIA, IIDA, 1995.

Fine, Stephen. "Camp is a Place for Learning." Ontario Camps Association. <http://www.ontariocamps.ca/parents/articles/learning.html>.

Wolfenden, Jen. "RE: Camp Research." E-mail message to author. November 28, 2011

Appendix II

Oh The Places You'll Go - Dr. Seuss

Oh The Places You'll Go

By: Dr. Seuss

Seuss. Oh, the Places You'll Go! New York: Random House, 1990.

Congratulations!
Today is your day.
You're off to Great Places!
You're off and away!

You have brains in your head.
You have feet in your shoes
You can steer yourself
any direction you choose.
You're on your own. And you know what you know.
And YOU are the guy who'll decide where to go.

You'll look up and down streets. Look 'em over with care.
About some you will say, "I don't choose to go there."
With your head full of brains and your shoes full of feet,
you're too smart to go down any not-so-good street.

And you may not find any
you'll want to go down.
In that case, of course,
you'll head straight out of town.

It's opener there
in the wide open air.

Out there things can happen
and frequently do
to people as brainy
and footsy as you.

And when things start to happen,
don't worry. Don't stew.
Just go right along.
You'll start happening too.

OH!
THE PLACES YOU'LL GO!

You'll be on your way up!
You'll be seeing great sights!
You'll join the high fliers
who soar to high heights.

You won't lag behind, because you'll have the speed.
You'll pass the whole gang and you'll soon take the lead.
Wherever you fly, you'll be the best of the best.
Wherever you go, you will top all the rest.

Except when you don't
Because, sometimes, you won't.

I'm sorry to say so
but, sadly, it's true
and Hang-ups
can happen to you.

You can get all hung up
in a prickle-ly perch.
And your gang will fly on.
You'll be left in a Lurch.

You'll come down from the Lurch
with an unpleasant bump.
And the chances are, then,
that you'll be in a Slump.

And when you're in a Slump,
you're not in for much fun.
Un-slumping yourself
is not easily done.

You will come to a place where the streets are not marked.
Some windows are lighted. But mostly they're darked.
A place you could sprain both your elbow and chin!
Do you dare to stay out? Do you dare to go in?
How much can you lose? How much can you win?

And IF you go in, should you turn left or right...
or right-and-three-quarters? Or, maybe, not quite?
Or go around back and sneak in from behind?
Simple it's not, I'm afraid you will find,
for a mind-maker-upper to make up his mind.

You can get so confused
that you'll start in to race
down long wiggled roads at a break-necking pace
and grind on for miles across weirdish wild space,
headed, I fear, toward a most useless place.
The Waiting Place...

...for people just waiting.
Waiting for a train to go
or a bus to come, or a plane to go
or the mail to come, or the rain to go
or the phone to ring, or the snow to snow
or waiting around for a Yes or a No
or waiting for their hair to grow.
Everyone is just waiting.

Waiting for the fish to bite
or waiting for wind to fly a kite
or waiting around for Friday night
or waiting, perhaps, for their Uncle Jake
or a pot to boil, or a Better Break
or a string of pearls, or a pair of pants
or a wig with curls, or Another Chance.
Everyone is just waiting.

NO!
That's not for you!

Somehow you'll escape
all that waiting and staying.
You'll find the bright places
where Boom Bands are playing.

With banner flip-flapping,
once more you'll ride high!
Ready for anything under the sky.
Ready because you're that kind of a guy!

Oh, the places you'll go! There is fun to be done!
There are points to be scored, there are games to be won.
And the magical things you can do with that ball
will make you the winning-est winner of all.
Fame! You'll be famous as famous can be,
with the whole wide world watching you win on TV.

Except when they don't.
Because, sometimes, they won't.

I'm afraid that some times
you'll play lonely games too.
Games you can't win
'cause you'll play against you.

All Alone!
Whether you like it or not,
Alone will be something
you'll be quite a lot.

And when you're alone, there's a very good chance
you'll meet things that scare you right out of your pants.
There are some, down the road between hither and yon,
that can scare you so much you won't want to go on.

But on you will go
though the weather be foul
On you will go
though your enemies prow
On you will go
though the Hakken-Kraks howl
Onward up many
a frightening creek,
though your arms may get sore
and your sneakers may leak.

On and on you will hike
and I know you'll hike far
and face up to your problems
whatever they are.

You'll get mixed up, of course,
as you already know.
You'll get mixed up
with many strange birds as you go.
So be sure when you step.
Step with care and great tact
and remember that Life's
a Great Balancing Act.
Just never forget to be dexterous and deft.
And never mix up your right foot with your left.

And will you succeed?
Yes! You will, indeed!
(98 and 3 / 4 percent guaranteed.)

KID, YOU'LL MOVE MOUNTAINS!

So...
be your name Buxbaum or Bixby or Bray
or Mordecai Ali Van Allen O'Shea,
you're off to Great Places!
Today is your day!
Your mountain is waiting.
So...get on your way!