Camp Adventure

USER BASED RESEARCH AND APPLICATION IN DESIGN

CAMP ADVENTURE; USER BASED RESEACH AND APPLICATION IN DESIGN

by

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A REPORT

submitted in partial fulfillment of the requirements for the degree

MASTER OF LANDSCAPE ARCHITECTURE

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KANSAS STATE UNIVERSITY
Manhattan, Kansas

2010

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Abstract

Camp Adventure, a summer camp for the physically disabled, has obtained a site for the future Camp Adventure Conference and Retreat Center at Perry Lake, Ozawkie, Kansas. The camp serves youth and adults with cerebral palsy and spina bifida. Past rental facilities have been far from adequate for the camp's basic needs of accessibility and has led the camp to seek a specially designed permanent home. As a counselor for 9 years, I have experienced firsthand the barriers and frustrations with inadequate facilities. Seeking to find solutions to the camp's specific needs, I found William H. Whyte's research methods and environmental psychology studies fitting to discover human preference and experiential qualities.

To understand the best methods of adaptation, a series of user based research methods have been conducted to gather user input. The campers understand, from daily experience, what it takes to make an element or activity accessible, and their guidance will inform the design of select program elements. User input is not only being gathered from the camp, but from educational sources at Kansas State University, practicing professionals at Ochsner Hare and Hare, and local government representatives. Collaboratively molding the site's existing form, the campers accessibility needs, and a complex program has created an exciting and challenging project. The program consists of 24 elements and activities, many of which are not traditionally handicap friendly. In-depth design studies and application of the user input has created the form and experience of seven program elements.

This book contains literature and precedent studies, user based research results, the master plan for the entire site, and design details of seven program elements. It is to be used by Camp Adventure as a guide to implementation of the camp design. It is the path for Camp Adventure to achieve their dream: a barrier free, fully accessible, adventure; Camp Adventure.

Camp Adventure

User Based Research & Application in Design

A master's Project & Report by. Amanda White

Acknowledgements

To my parents, thank you for without your moral and financial support, as I would have never made it this far in my academic career. Thank you for always believing in my ability no matter how wild the dream.

To Travis, thank you for sticking with me through this ride. All the nights I've been missing and second hand stress you've endured was all for something great. The sanity I do have left and the dreams I have ahead are much credited to you.

To Ochsner Hare & Hare, thank you for believing in me and my talents. You have truly helped to shape who I am as a designer and as an individual, especially Ken Boone, Shannon Gordon, and Diane Binckley. My success is reflective of your mentoring.

None of this could have been possible without the help of my professors during this project and all the years prior. A special thank you to Tim Keane, for enduring all of my questions each day and my often overwhelming ambition. And finally a special thank you to Stephanie Rolley. You introduced me to the world of environmental psychology, forever changing my perspective on the world and what design could be.

Lastly, this book is dedicated to the campers of Camp Adventure. Each and everyone of you are one of the most beautiful people I know in this world. Your acceptance and love could right all of the wrongs in the world. You deserve a place specially made for you. I can only hope this helps you in your journey to that dream.

Abstract

Camp Adventure, a summer camp for the physically disabled, has obtained a site for the future Camp Adventure Conference and Retreat Center at Perry Lake, Ozawkie, Kansas. The camp serves youth and adults with cerebral palsy and spina bifida. Past rental facilities have been far from adequate for the camp's basic needs of accessibility and has led the camp to seek a specially designed permanent home. As a counselor for 9 years, I have experienced firsthand the barriers and frustrations with inadequate facilities. Seeking to find solutions to the camp's specific needs, I found William H. Whyte's research methods and environmental psychology studies fitting to discover human preference and experiential qualities.

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The Project

The Project chapter is to describe the client, Camp Adventure, and their particular dilemma. Thoroughly explaining the camp's issues, frames the argument for the methods by which I approached the solution. The thesis succienctly describes the approach to the solution and the result expected.

Camp Adventure

All information in this section was collected from Camp Adventure, Inc.

Camp Adventure is a non-profit, non-denominational Christian summer camp for physically disabled youth and adults. The camp is a week long adventure aimed at the capabilities of the disabled campers. In 1973, Ann Sadler, a parent of a child with Spina bifida founded Camp Adventure. Ann and her husband wanted a camp where their child could attend and do summer camp activities like other children. No camps for children with spina bifida existed in Kansas at the time. So together, Ann and her husband founded the first summer camp in Kansas to serve youth and adults with spina bifida, Camp Adventure. The camp later began accepting campers of all physical disabilities.

"For one week, Camp Adventure makes me feel like everyone else who is not disabled. It is my home away from home. It is a place where everyone like me can forget they have limitations from their disabilities, and have fun doing things they thought they would never be able to do in their lives."

Camp Operations

Youth and adults of all ages and physical disabilities come to Camp Adventure for a week to be "normal". One camper describes the camp's effect on her life: "For one week, Camp Adventure makes me feel like everyone else who is not disabled. It is my home away from home. It is a place where everyone like me can forget they have limitations from their disabilities, and have fun doing things they thought they would never be able to do in their lives. In short, Camp Adventure is a wonderful place, and we all would be lost with out it." Michelle, veteran camper (Camp Adventure, Inc.)

Each camper has an individual counselor for one-on-one attention and care. Camper to staff ratio is 1:2, when including senior staff such as camp directors, program staff, yearbook staff, cooks, camp moms and dads, pastors, and many more volunteers. All staff members volunteer and are of all ages. The staff considers themselves the campers "arms and legs" making seemingly impossible or difficult activities reality with minimal assistance. Campers receive medical releases, so all medical and daily care assistance is provided by counselors and designated health care staff.

The key for success at this camp is adaptation. Adaptations beyond ADA (American's with Disabilities Act) requirements take very little science, are typically common sense, and require patience and creative thinking for solutions. Adaptations make many non-traditionally accessible activities possible for the campers. Such activities include swimming, boating, baseball, nature trips, bowling, outdoor camping, horseback riding and many other indoor activities. Many classes

are offered at camp including computers, campfire cooking, crafts, bible study, yearbook, karate, boccia and nature. Campers also have the opportunity and are encouraged to take leadership roles. Michelle, a camper with spina bifida, trained for her certificate as an official Turbo Kick Instructor through the support of Camp Adventure. She began teaching her modified Turbo Kick class to fellow campers at camp this year. “Our overall goal is to instill a sense of self worth, independence and capability in each and every person that comes to Camp Adventure whether camper, staff or volunteer” (Camp Adventure Inc.)

Behind the Scenes

Camp Adventure is run by a voluntary 15-member Board of Directors. The Board of Directors plans the week of camp and all activities pertaining to, plan fundraisers for camp expenses, and organizes weekend retreats and celebrations. The Board is currently planning the future Camp Adventure Conference and Retreat Center, the camps permanent home and a rental facility to other non-profit organizations.

The actual cost of camp is $1,050 per camper. However, campers are asked to donate only $500 of the cost or participate in fundraisers or “campers hips” to pay their portion. The camp finds funding and donations to cover the remaining costs. In recent years, camp facilities rental prices have been on the rise. The dilemmas of the rising cost of camp and camp facilities and campers ability to pay the donation or obtain a “campership” are having adverse effects on camper’s attendance. Because of the cost of facilities and limitations on space, the camp has had to turn away several camper applications.

Past rental camp facilities were not fully ADA compliant, and resulted in barriers or complications to general camp operations and activities. Camp Adventure must adapt rented facilities to meet campers needs (i.e. ramps, restroom accessibility) each year. Funding for these adaptations is pulling money out of funds that could be aiding camper attendance costs.

Figure 1.3. Campers fishing. (Camp Adventure)

Figure 1.4. Joe Newton, a camper. (Camp Adventure)

Figure 1.5. Lena, a camper, enjoys the dance. (Camp Adventure, Inc.)

Dilemma

I was approached by Camp Adventure, Inc to assist in the design of their new Summer Camp, Conference and Retreat Center. I have volunteered as a counselor at the camp for nine years, experiencing firsthand the lack of accessibility in local camp facilities. The camp has bounced around three different camp facilities, all of which fail to truly meet ADA requirements, and all are increasing rent each year, costing the campers and the organization more. Camp Adventure, Inc has received a long term lease from the Army Corps of Engineers for a tract of 125 acres at Perry Lake, in Ozawkie, Kansas. This site is also known as Old Town North Park, formerly a RV and camping site. Camp Adventure has commissioned Kaster Architects of Overland Park, Kansas for the main facility structure. Camp Adventure, with camper input, has compiled a list of program activities and amenity features to be included in the site. Many of these activities are not traditionally handicap-friendly, therefore needing special attention and study.

Is our translation of ADA standards, which are intended to make things easier for the disabled, effective in creating a normal environment for the disabled?

After camp this year, I thought critically about the problems with the camp experience. An incident came to mind, which unfortunately is not the first. One day, we were attempting to transfer a camper and the counselors were having difficulties maneuvering in the space allowed. As the camper saw the issue and the frustration the counselors were experiencing, she began to cry, feeling responsible and a burden. This camp is for her; for her to feel normal; to be rid of difficulties and complications. The camp compiles activities, a plan for accessible measures, and a group of people with positive minds and compassionate hearts. Yet the facilities always seem to be the speed bump to the success of the camp. Doors are too narrow, sidewalks are cracked and shifted, slopes are too steep, and rooms are too small. In short, the facilities are not truly conducive to the functioning of these special campers. I began to refer to my interest and studies in environmental psychology and William H. Whyte's studies with building codes and how inappropriate they could be in relation to human preference. ADA was written to protect the rights of all disabled. Yet, to this special group, the codes, often implemented at minimum, do not truly meet their specific needs. Then an excellent question was posed to me. Is our translation of ADA standards, which are intended to make things easier for the disabled, effective in creating a normal environment for the disabled?

Beyond the design of the camp, I want to better understand the experience that I have the opportunity to create for the campers. The goal is to research the simple experiential qualities and quality of life that help make them feel normal and to avoid abnormal situations.

Thesis

Through a comprehensive set of human-based research methods, the camp design can be informed in terms that will address the needs and desires of the camp's specific users. The camp master plan will be reflective of the camper's desires and needs of a camp experience. The design development of seven program elements will be the best fit design for the specific users and will expand beyond ADA requirements.

Through a comprehensive set of human-based research methods...the camp master plan will be reflective of the camper's desires and needs of a camp experience.

Figure 2.1. Yellow maple leaf divider. (Adapted from Morguefile.com)

Figure 2.2. Camper photo opt montage. (Adapted from CampAdventureinc.com)

The Foundation

The Foundation chapter is to set the stage for methods and design considerations. A brief overview of the medical conditions will give context to the user's specific needs The literature reviews provide a strong argument for the user based research methods approach and process. The precedent study illustrates a similar camp and camp programs approach and considerations to their camp activities. Together, the three sections give footing and basic understanding to the adaptations needed and the argument for the need of such facilities for this group.

Medical Conditions

This section is a brief summary of the two diseases, Cerebral palsy and Spina bifida, their associated impairments, and the adaptive methods and equipment needed by those affected. For more detailed information, Appendix D presents a full discussion on the medical issues associated with cerebral palsy and spina bifida.

Cerebral Palsy

Information gathered from sources:

Dormans, John P, and Louis Pellegrino. Caring for Children with Cerebral Palsy: A Teambased Approach. 1st ed. Baltimore: Brookes Publishing Company, 1998. Print.

Hardy, James C.. Cerebral Palsy (Remediation of Communication Disorders Series). 1st ed. Englewood Cliffs, New Jersey: Prentice-Hall, 1983.Print.

"Cerebral means 'brain-centered'; Palsy means 'lack of muscle control'. "

Cerebral palsy is a birth related brain injury. There are several theories to the reason of defect. The most accepted theory is that there is a lack of oxygen to the brain during some period of fetal or infancy stage. Cerebral means "brain-centered"; Palsy means "lack of muscle control". Cerebral palsy is a motor impairment syndrome, meaning persons affected have a significant problem controlling their movement and posture. The disease is not progressive, meaning it doesn't get worse over time, and it is incurable.

Classifications of Cerebral Palsy

Cerebral Palsy is often classified by physiological type. This refers to the portion of the brain that is affected, in turn controlling the muscle contractions and how the muscles are affected. (Table 2.1, Figure 2.3). A few terms are included to give definition to common forms of the how the muscle tone is involved. Spasticity is when a muscle has a deep resistance to stretch, similar to a stretched rubber band. It takes much pressure to manipulate the stretched band. Athetois is when a muscle has involuntary writhing movements. For example, a person with athetois reaches for a cup, their arm may take a round-a-bout path to get to the cup. It is difficult for this person to take a direct path to an object. Ataxia refers to a muscles trouble with balance and control. People with ataxia often can walk, but they have a wide-based, unsteady gait. They also

often overshoot when reaching for objects.

Cerebral Palsy is often classified by geographic distribution type. This is determined by the limbs affected. (Table 2.2, Figure 2.3) Again, a few terms have been included to give reference to common diagnoses. Diplegia is when both sides of the body are affected and the legs are typically more implicated than the arms. Hemiplegia is when the arm and leg of one side of the body is affected. Quadriplegia, or total body cerebral palsy, is when all limbs are significantly affected. The person's entire musculoskeletal system is abnormal in relation to their muscle tone and movement.

Associated Impairments

Nearly 40% of people with cerebral palsy have some visual abnormality or impairment. Many people with cerebral palsy are affected with some form of hearing loss. Those with cerebral palsy often have issues with somatosensory deficits, or the awareness of where limbs may be in space. Seizures or epilepsy are common among those with cerebral palsy. Many have hip dislocations, muscular contractions, and scoliosis as well.

Developmental Disorders

Cognitive impairments, mental retardation, and learning disabilities are common with cerebral palsy. Nearly 75% of children with cerebral palsy are diagnosed with some

Physiological Type	Description
Spasticity	Velocity-dependent resistance to stretch, clasp-knife response, increased deep tendon reflexes
Athetosis	Involuntary writhing movements, often with chorea (i.e.involuntary jerky movements)
Rigidity	"Lead-pipe" hypertonia, fluncuating tone, prominent primitive reflexes
Ataxia	Problems with balance and controlling position of body in space
Hypotonia	Low muscle tone, normal or increased deep tendon reflexes
Mixed	Evidence of two or more physiological types

Table 2.1. Cerebral palsy classification by physiological type. (Adapted from Dormans 1988, 9)

Distribution Type	Description
Hemiplegia	Arm and leg on same side involved, arm usually more than leg
Monoplegia	One limb, usually arm affected (a variant of hemiplegia
Diplegia	Both sides of body involved, legs more than arms
Quadriplegia	Both sides of body involved, both legs and arms significantly affected
Triplegia	Both sides of body involved, but only one limb (usually arm) relatively spared
Double hemiplegia	Both sides of body involved, but one side is more than other; arms usually more affected

Table 2.2. Cerebral palsy classification by distribution type. (Adapted from Dormans 1988, 9)

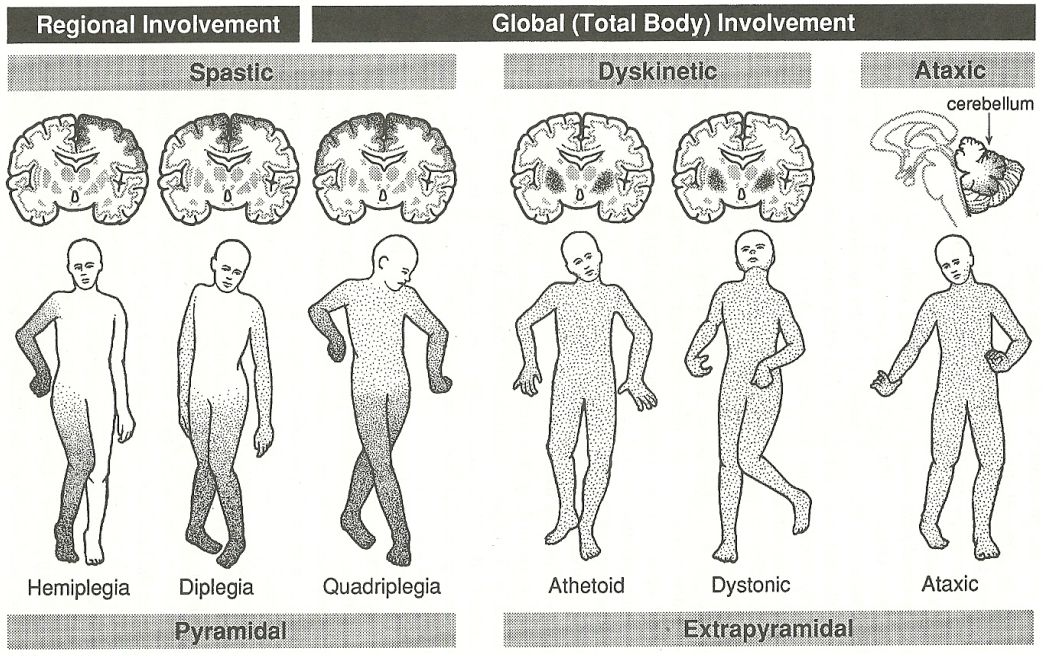

Figure 2.3. Cerebral palsy classification by physiological, distribution, and neurological substrate. (Dormans 1988, 12)

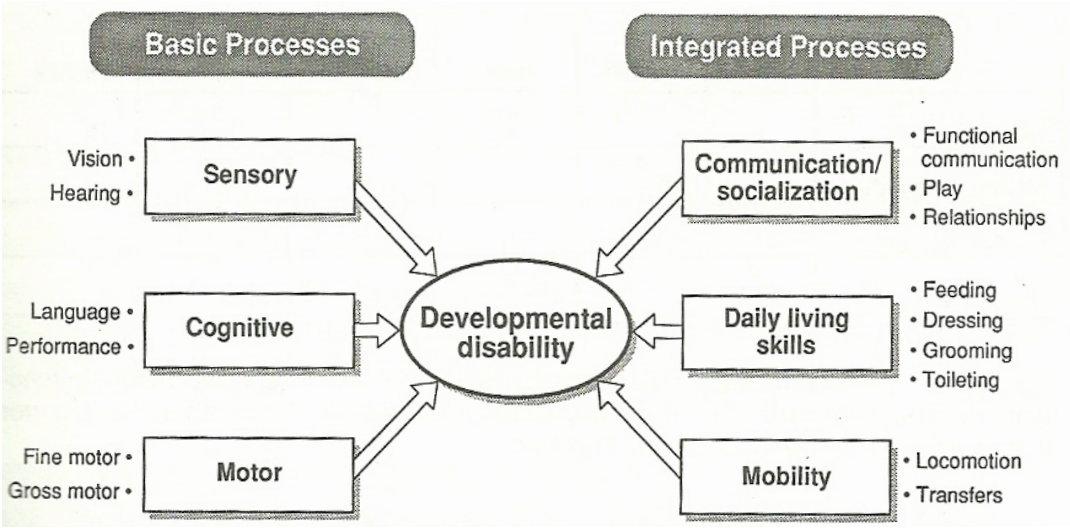

Figure 2.4. Function domains that characterize a development disability. (Dormans 1988, 33)

	Sensory	Cognitive	Motor	Commu-nication	Daily living skills	Mobility
Cerebral Palsy			✓			✓
Mental Retardation		✓			✓	
Autism		✓		✓		
Deafness	✓			✓		

Table 2.3. Development profile across functional domains. (Dormans 1988, 34)

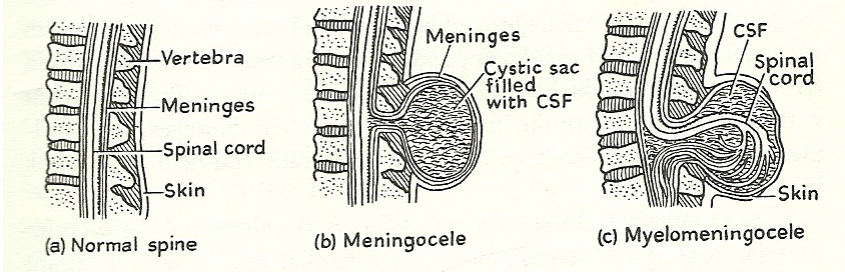

Figure 2.5. Diagram of section through spine or meningocele or myelomeningocele conditions. (Anderson 1977, 13)

level of mental retardation or a learning disability. Cerebral palsy is often compared to mental retardation, autism, learning and language disorders, and attention disorders when looking at the development in human behavior over a life cycle. (Table 2.3) Developmental disability is determined by the behavioral and functional characteristics of the child. Functional characteristics are composed of basic processes and integrated processes. (Figure 2.4) The basic processes, sensory functions, cognitive processes, and motor functions, can be considered the person's ability to function simply as a person. The integrated processes, socialization, daily living skills, and mobility skills, is a person's ability to live within mainstream society.

Spina bifida

Information gathered from sources:

Anderson, Elizabeth M., and Bernie Spain. The Child with Spina Bifida. New York: Routledge, 1977.Print.

Rowley-Kelly, Fern L.. Teaching the Student With Spina Bifida. Baltimore: Brookes Publishing Company, 1992. Print.

Spina bifida is a developmental defect of the spinal column during the fetal stages. The

spinal vertebra fails to fuse together, paralyzing the person from the point of failure and down. A gap in the spinal column is created, and the spinal cord or the surrounding membrane may protrude out. (Figure 2.5) In some cases, a cyst-like sac forms on the back. (Figure 2.6) The extent of paralysis is directly correlated to the geographic location within the spine of the point of injury. From that point and down, the body and limbs are paralyzed. (Figure 2.7)

There are two classifications of spina bifida: spina bifida occulta (the spinal cord and membrane does not protrude out and there is little external evidence) and spina bifida cystica (when the spinal cord and membrane does protrude out forming a "cyst-like" sac). Spina bifida occulta is rather common and has very little affect on a persons spinal cord or nerves. Spina bifida cystica is much more complicated. Because the spinal cord and membrane tissue is exposed, the nerve functions are highly susceptible to injury and infection. In some cases, there is even permanent, irreversible neurological damage. The sac must be surgically removed in order to protect the nerves, and place the spinal cord and membrane tissues back into the spinal cavity, to protect it from any further injury or infection.

Hydrocephalus

Cerebral spinal fluid is a fluid that bathes and protects nerve cells in the brain. In a child with spina bifida, the fluid builds up and will cause what is called hydrocephalus. Hydrocephalus can cause enlargement of the skull, pressure, and severe migraines. If hydrocephalus progresses a person may need a shunting procedure. An artificial shunt is implanted to take the excess fluid away from the brain to an area of the body that can absorb it, often the abdomen.

Limb and Joint Deformities and Sensation Loss

Individual limbs may become deformed due to an imbalance of muscle due to a lack of nerve supply. Hips, knees, and feet are often deformed due to a lack of mobility, again related to the nerve supply shortage and paralysis. Those with spina bifida experience a lack of sensation in the affected part of the body. The nerve supply is damaged or lacking with the affected portion, and when a child touches something hot or sharp with that limb, the nervous system doesn't send the message to the brain that it is being sensitized. Pressure also becomes an issue with the lack of sensation. If too much pressure is applied, blood will cease from circulating and oxygen to the tissue is cut off. For example, when we sit in one position for too long, our nerves tell our brain and we shift positions to relieve the pressure. However, those with spina bifida do not get that message, and if the pressure is extended for too long, the tissue will begin to deteriorate.

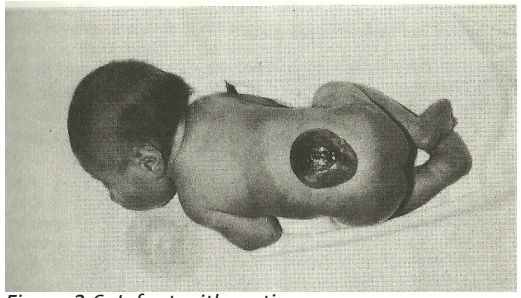

Figure 2.6. Infant with cystic sac. (Anderson 1977, 15)

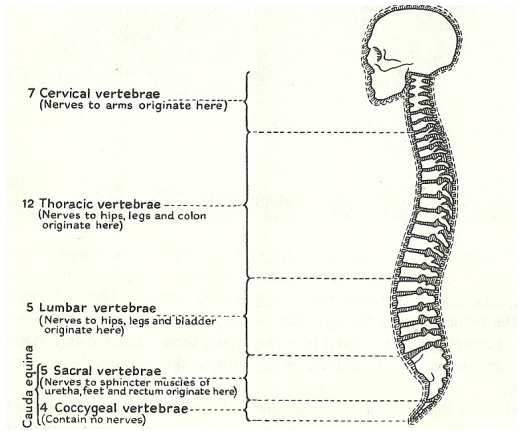

Figure 2.7. Vertebrae associated with paralysis diagram. (Anderson 1977, 16)

Surgery is needed to remove the dead tissue.

Incontinence of urine and fecaes is also another issue. Again, the lack of nerve supply fails to control the bladder and sphincter muscles. This is treated by several different practices: manual expression, use of urinary appliances, and urinary diversion surgeries. Many use a catheter and collection bags to address the issue. Another approach is an ureterostomy or ileostomy, or the practice of bringing a portion of the intestine to the surface of the skin and connecting to a spout and collection bag. Both are at risk of infection and have social implications as well.

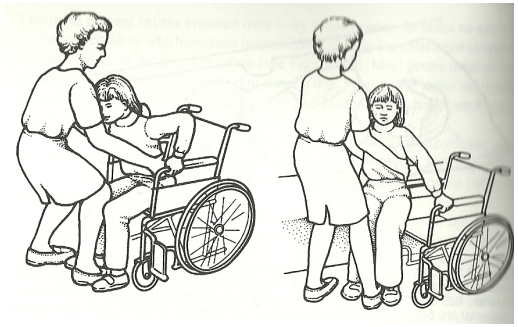

Figure 2.8. Stand-pivot transfer. (Dormans 1988, 208)

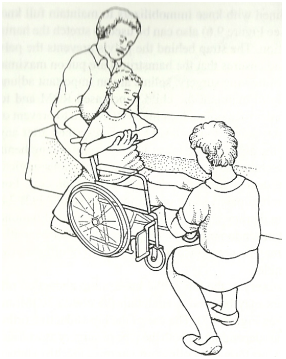

Figure 2.9. Two person transfer. (Dormans 1988, 209)

Adaptive Methods

Transfers

A transfer is when an immobile person is manually relocated from one position to another. This can be done in two different methods. The first is a standing-pivot transfer. (Figure 2.8) In some cases, campers can do or assist with their transfers with the aid of either equipment for stability or a person to provide stability. This depends on the muscle tone a camper has. For those more paralyzed, a two-man transfer is required. (Figure 2.9) This is when two people assist, one holding under the legs and the other holding under the arms, transfers the full body from one position to another.

Equipment

Walkers provide support by use of light metal frames. Anterior walkers are those you push in front of you, much like the typical walker we associate with today. The posterior walker (Figure 2.10) is pulled behind the body and promotes an extended trunk and more upright posture.

There are two main types of crutches: axillary and forearm. Axillary crutches (Figure 2.11) are the typically known crutches with support under the arms with pads, and a weight bearing handle to grip with the hands. The forearm crutches (Figure 2.12) have a cuff that fits around the forearm and a handle to support weight. Quad canes (Figure 2.13) provide a little more support than the crutches. There is a horizontal handle with a large base, supported by four short legs. This provides more balance and is often the transition from a walker to crutches.

Wheelchairs come in various sizes and shapes, and are equipped with several functions. Manual wheelchairs (Figure 2.14) are often used when the individual can maneuver the wheels themselves. Power wheelchairs (Figure 2.15) are often used for those who do not have the strength to maneuver a manual chair, but has cognitive understanding to operate a power chair. Power chairs have several controls for speed, acceleration, turning speed, and tilt options. The tilt allows for the body to reposition easily and distribute weight more evenly. These features are controlled by use of a joystick, usually located somewhere along the armrest. Power chairs also have a gel or lead acid battery that supplies the power to the motor. Batteries must be recharged often, and must be charged in a safe location for safety concerns. These batteries do come with safety concerns as they can blow up or leak acid.

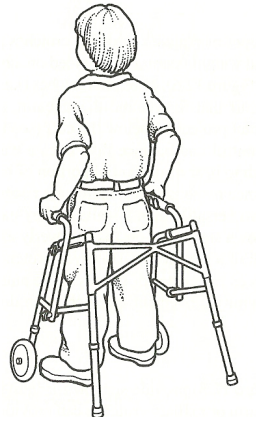

Figure 2.10. Posterior walker. (Anderson 1977, 315)

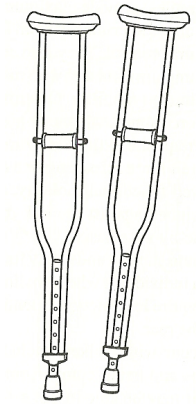

Figure 2.11. Axillary crutches. (Anderson 1977, 316)

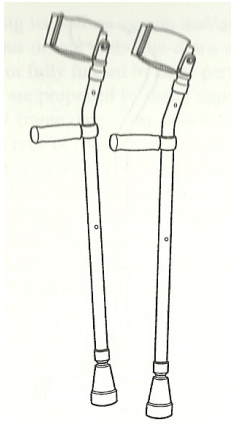

Figure 2.12. Forearm crutches. (Anderson 1977, 317)

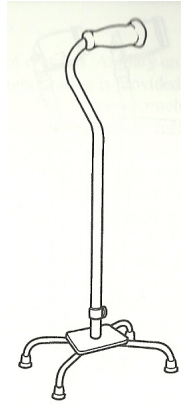

Figure 2.13. Quad cane. (Anderson 1977, 318)

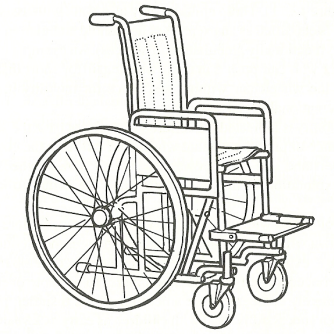

Figure 2.14. Manual wheelchair. (Anderson 1977, 319)

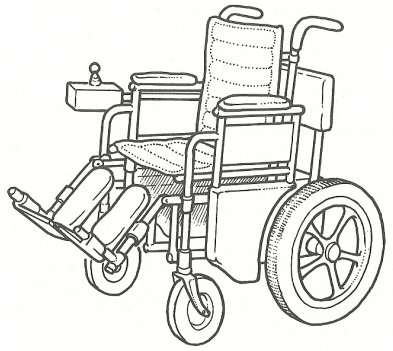

Figure 2.15. Power wheelchair. (Anderson 1977, 321)

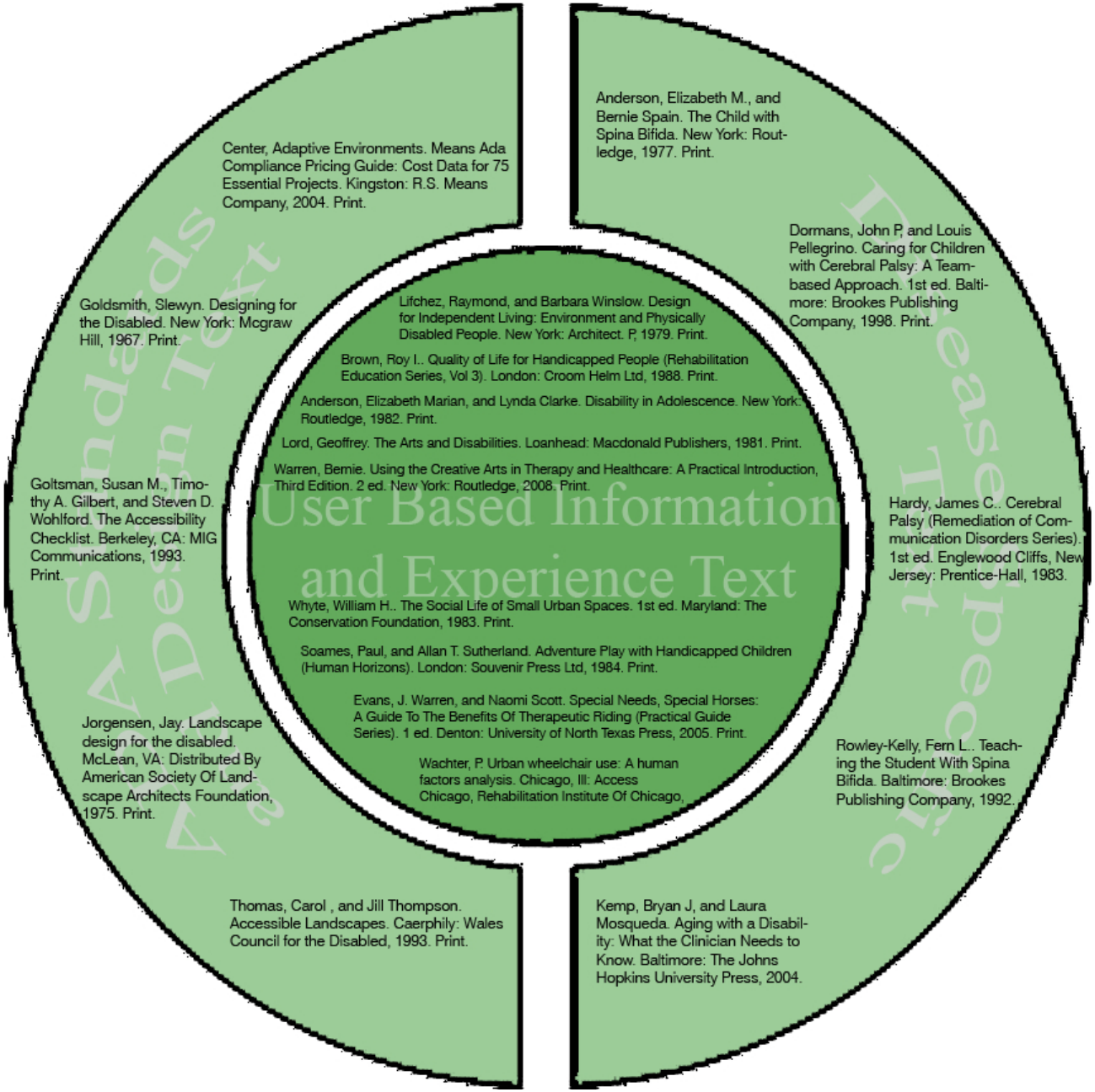

Figure 2.16. Literature map. (Amanda White)

Literature Review

When looking at the literature that would guide the project, I noticed there were three separate categories: ADA standards and design text, disease specific text, and experiential text. I started off collecting the standards and design text as well as the books on cerebral palsy and spina bifida, or the disease specific text. I began to notice that perhaps the problems with designing for the disabled, was perhaps that the two categories weren't being connected in reality. Both the standards and the disease text were running parallel, but in the built environment, they were possibly missing each other. So I began referring to those designers and leaders in "people spaces": William H. Whyte, Clare Marcus Cooper, and Project for Public Spaces. Through searching those sources and researching key terms involving experience and programs for the disabled, I was led to the center circle of the literature map (Figure 2.16):: User based research information and user experience text. The following reviews were pulled from the most influential of these texts and the theories found are the basis for design. All of the following texts assured me that getting user input and studying their specific needs would result in a design truly for the special group of users of the camp. The literature map demonstrates graphically how I came to understand the relationships of the texts consulted.

"Quality of life can be viewed as the discrepancy between a person's achieved and their unmet needs and desires. The larger the gap between what people have and what they need and want, the poorer the quality of life"

Quality of Life

Source: Brown, Roy. Ed. Quality of Life for Handicapped People (Rehabilitation Education Series, Vol 3). London: Croom Helm Ltd, 1988. Print.

"Quality of life can be viewed as the discrepancy between a person's achieved and their unmet needs and desires. The larger the gap between what people have and what they need and want, the poorer the quality of life" quoted by Macfarlane (Brown 1988, 111-112).

Quality of life is a concept with major implications; in one sense it is a logical extension of "normalization". Quality of life is complex and very dynamic. Each individual has different wishes and perceptions of personal fulfillment, adding complexity to generalize for community design. It includes aspects of external behavior, personal perception and descriptors of the environment. "The views that the individual has about him or herself, the enjoyment that an individual experiences, and the problems that he/she faces makes up this quality" (Brown 1988, 1). Studies have found that it is psychological, social, educational, and allied processes that underlie how an

"...a global concept that constantly changing and evolving regarding age, economy, local attitudes, political climate, and professional skills as well as several other factors."

individual feels about their self. Looking at how these processes are shaping that view is essential to providing a healthy quality of life for the disabled person.

This process of understanding the factors of quality of life must be taken in a team approach to obtain the most concise understanding from all involved in the person's life. Input from the individual, and the individual's representatives, whether parents or guardians should shape the users needs and desires. The disabled person's quality of life is also affected by what the local community, friends, neighbors, and relatives have to say and the role they play in the user's life. Quality of life is highly graded on the individual's experience with an environment, including the prosthetic devices or other means of overcoming their handicap. Noting this experience, is important as without the knowledge and input from a disabled person, little can be said about their quality of life. We cannot merely make assumptions, and Brown argues for user input as the basis for understanding and improving quality of life. Studies have been done to gather personal input on quality of life. One study used diaries and interviews to allow people to report their personal opinions on their quality of life and experiences. The book is full of studies done on several aspects contributing to the disabled person's quality of life. When looking at quality of life, you must understand that it is not a static quality. It is a global concept that constantly changing and evolving regarding age, economy, local attitudes, political climate, and professional skills as well as several other factors.

"Chapter Eight: Environmental Design for Disabled Person" in Quality of Life of Handicapped People was a very informative piece written by Roy Ferguson. Architecture, as a discipline, has not traditionally been overly concerned with behavioral considerations. In reverse, the field of psychology has not traditionally been concerned with the physical aspects of the environment. This has changed within the last half century as environmental psychology has found a niche in the design and psychology worlds. It spans the two areas and addresses the reciprocal relationships between humans and their environment.

The built environment should not merely reflect the principles of construction and aesthetics, but also meet the behavior and psychological needs of its users. Environmental psychology studies have shown the relationship of lighting and work performance, the effect of having windows and fresh air in the office and worker satisfaction, and the arrangement of furniture to foster a better social interaction. These are just a few studies done, but environmental psychology has proven that special attention to user's actions and preference can truly inform the designer for a better space. The increased awareness of the importance of these relationships between design and behavior has resulted in a response of better fitted designs, especially in that of primary

environments. For the disabled, those primary spaces are homes or residential centers, and schools.

Ferguson placed specific emphasis on the difference of terms, disability and handicap. They are often used interchangeably but are quite distinct. Ferguson notes disability as "the loss or reduction of functional ability" and handicap is "the disadvantage or restriction of activity caused by disability" (Ferguson in Brown ed. 1988, 165). And then he quoted a friend of his that really puts these terms into reference.

"My body makes me disabled, but the environment makes me handicapped" (Brown 1988, 165).

To begin a design process to ensure a positive quality of life is to develop goals and objectives in relation to the specific users. This is "achieve the greatest congruence between the needs and preferences of the users and the design features…" (Ferguson in Brown ed. 1988, 167). The best way to bridge this gap between the needs of the people and the built environment, is to bring those who design the environments and those who use them together to solve the design issues. I could not agree more with this statement and it fully supports my thesis. Clare Cooper Marcus once said "The problem is not that designers are lacking for creative ideas, but rather that they are frequently hampered by not having the time to search out appropriate people based research…. research based recommendations cannot substitute for public participation." This chapter is a clear argument for Cooper's call for designers to conduct forms of public participation for user input. Designers often assume several things when user input is not gathered. Ferguson quotes Carver and Rodda "it is part of our environmental inheritance that the 'normal' environment has been designed in the main by the 'normal' man for the 'normal' man" (Ferguson in Brown ed. 1988, 167). This supports that clearly much of the world has been designed for the able body and few considerations are made for the disabled. ADA has made large strides but is often found minimal to specific groups and Camp Adventure's exposure to existing camp facilities have proven that enforcement of ADA codes are far short of complete. Ferguson states that involvement of the users in the design process is "necessary" to avoid the tendency to design for the 'normal'. Developing design criteria directly linked to the developmental and functional needs of the disabled help to increase the positive relationship between the environment and its specific users.

Public attitude towards the disabled population tend to be negative, either considering them of inferior or superior status. This is shown in the designs of institutional environments. The buildings are very large, and were designed for efficiency, not comfort. They are often isolated

"My body makes me disabled, but the environment makes me handicapped"

"…is not that designers are lacking for creative ideas, but rather that they are frequently hampered by not having the time to search out appropriate people based research…. research based recommendations cannot substitute for public participation."

"Self-concept is broadly defined as 'a person's perception of self which is formed through experiences with and interpretations of one's environment and is greatly influenced by others'."

from the community. They are intended to be residential facilities, but often lack the qualities and characteristics of a home. Winston Churchill once stated "We shape our buildings and then our buildings shape us" (Ferguson in Brown ed. 1988, 168). So what is being said about the sterile residential facilities we are providing for the disabled? We are assuming that they do not desire or need the same comforts that the rest of society desires in a home. Much of how society values them is also said in this lack for attention to their surroundings. Thoughtful environmental design can promote involvement of the disabled as active participants of society. Ferguson believes that introducing smaller residential dwellings integrated into communities will enhance the public's perceptions of the disabled as well as the increase positive social behaviors of the disabled. Allowing the disabled to be an active part of society would place more emphasis on the public understanding what the disabled can do, and not what they are handicapped from doing.

Self-concept is broadly defined as "a person's perception of self which is formed through experiences with and interpretations of one's environment and is greatly influenced by others" (Ferguson in Brown ed. 1988, 169). Disability can have damaging effects on a person's self-concept. Being able to adjust to the situation means much more than just being able to manage the physical environment, but it also means that they must develop a new self-concept. It is crucial that someone has a self-concept of being worthwhile, to avoid many psychological issues like depression, bi-polar disease, and anxiety. While many things can play into self-value and concept, a manageable physical environment can definitely have a positive effect on this. Again, Ferguson refers to the large residential institutions and how they have negative effects being depersonalized and forcing dependency.

Self-concept can also be affected by adaptive behavior, or one's ability to cope with the physical and social demands of the environment. A developed adaptive behavior allows that disabled person to function more independently within society. As a person gains more access to interact within the community, in turn, they are provide with more experiential and social interaction for a strong self-concept. The development of adaptive behavior is facilitated in environments that have been adapted to the particular needs of a disabled person. The modifications or adaptations to public facilities allow a person to be more self-sufficient. Ferguson used the example of someone whose legs are paralyzed. That person can still use their upper body to do several things: cook, drive, work, and use public restrooms; if the appropriate measures to adapt to their limitations are taken. These modifications can allow a disabled person to leave the restrictive institutions and become independent and productive in the community. For this to happen, designers must design for the disabled to move independently and "achieve a sense of environmental mastery" (Ferguson in Brown ed. 1988, 170).

This task of creating a totally adaptive environment in this world is not realistic, but it is important to provide options. There should be sufficient range and possibility that a disabled person can enjoy life as much as anyone else. It is not the intention to create options for every single adaptive environment as disabilities range a great deal. It is to ensure that there are not environmental barriers that keep the disabled from participating as part of mainstream society.

Ferguson used the example of Adventure Play for Handicapped Children. They realized that playgrounds are frustrating if not impossible for disabled children. In the 1960s, they developed an accessible playground in London to 'insure that the handicapped child can have rich, varied, and spontaneous experiences' (Ferguson in Brown ed. 1988, 171). The playground had a variety of challenges and alternatives to allow choice depending on the child's abilities. It provided choice and the opportunity for mastery by children of all disabilities. The one negative was that the playground was surrounded by brick walls, cutting off the opportunity to interact with 'normal' children. A similar project was conducted in New York: the Playground for All Children.

In terms of designing for the disabled, it is important to not assume they are a homogeneous group. This population could not be more diverse, with a range of individual disabilities and needs. Ferguson states that it is important to provide an environment that is safe, convenient, flexible, and barrier-free and enables choice, control and independence. To do this, the designers must be sensitive to the specific needs of the disabled users.

Ferguson calls for specific consideration to the design of outdoor spaces. The disabled need to experience the seasonal changes as well as sights, sounds, textures, and smells. ADA codes are primarily for indoor facilities and are short-sighted when looking at outdoor programming. Especially for program considerations for a camp, few adaptations and codes are in existence to facilitate similar program experiences to that of a normal summer camp. Finding modifications to allow the disabled to partake in challenging experiences often becomes the responsibility of the family. Ferguson gives an example of a family who devised a harness on a small rubber dingy to allow their son a similar experience to surfing. He was allowed to experience the same thrill and adventure as any able bodied person. By involving the disabled in the design problem-solving, many can achieve making a non-traditionally accessible element an accessible adaptation.

Safety, comfort, convenience, and accessibility are important design features to consider in environmental design. Safety measures such as handrails, safety glass and non slip surfaces will ensure more than safety, but will decrease frustration. Comfort and convenience can be promoted by use of orientation aids (like color coding or pictorial aides), by using bright and

"It has been shown that environments designed to stimulate the auditory, visual and tactile senses increase appropriate and acceptable behaviors in institutionalized mentally retarded adults"

warm colors (as opposed to typical institutional sterile colors), and utilizing different and less sterile forms of lighting and furniture. These changes have shown a positive effect on mood and behavior of the users. "It has been shown that environments designed to stimulate the auditory, visual and tactile senses increase appropriate and acceptable behaviors in institutionalized mentally retarded adults" (Ferguson in Brown ed. 1988, 175). It has also shown to be a catalyst in the learning processes of the mentally retarded as well.

Barrier-free environments allow a disabled person to move independently, promoting self control. The perception of control can prevent the feelings of helplessness or dependency. If a person's environment is causing a feeling of helplessness, and if this feeling is too repetitive, the person will accept the failure of independence, often in several facets of their life. It becomes a response pattern that begins to affect other situations. The person accepts being helpless, and will take that role in situations that they are capable of controlling. This is thought of as "learned helplessness". If a disabled person stops doing what they are capable of, their skills can deteriorate. Ferguson states that until more environments are barrier free, it is important to involve the disabled person in finding the solutions to the obstacles within the environment.

Other Supporting Literature

Adventure Play with Handicapped Children

Source: Soames, Paul, and Allan T. Sutherland. Adventure Play with Handicapped Children (Human Horizons). London: Souvenir Press Ltd, 1984. Print.

Play is a very vital role in a child's developmental process. It is an important method of learning, developing physical and mental skills, as well as promoting self-confidence and independence. It fosters a social interaction environment. "A child who is deprived of adequate opportunities for play is being denied the chance to develop these physical, emotional and imaginative capabilities to the full" (Soames 1984, 9). This is true especially of disabled children, who are often denied chances for play or interaction. Physically disabled children are hampered by lack of access; mentally disabled children are hampered by the lack of social skills and concerns of safety.

Three words sum up what an adventure playground consists of: exploration, experimentation, and expansion. Exploration can be experienced through height, space, movement, mobility,

touch, and relationships. Experimentation with textures, colors, equipment, and one's ideas are imperative. The need for adventure play becomes very apparent when you begin to look at the disabled child's normal experience: enclosed indoor environments; bound by much of their time inside four walls of a school, hospital, home, hostel, or training center. This boxed-in lifestyle will only restrict their potential to grow as a person.

Design for Independent Living

Source: Lifchez, Raymond, and Barbara Winslow. Design for Independent Living: Environment and Physically Disabled People. New York: Architect. P,1979. Print.

Sunlight is a very important element in designing for disabled people. The sun has psychological effects, putting one in touch with nature, something that is typically very difficult. However, sun or excessive heat is a threat to several disabled people as well. Designs that permit both exposure and protection from the sun are very valuable. One disabled person described exposure to the sun as "not hiding in the shadows" (Lifchez 1979, 102) which is very important in promoting independence and self confidence.

Meeting for social interaction is an often overlooked design opportunity. Most sidewalks can permit a standing group of people to stop and discuss, but when a wheelchair is brought into the picture, the sidewalk is blocked. Current paths usually do not accommodate for multiple wheelchair users to stop and converse without completely blocking traffic. Benches often line the edges of sidewalks, but if a wheelchair user wants to converse with a bench sitter, they must remain on the sidewalk in the flow of the traffic. Wheelchairs are much larger than just the user's body; they also require the room to maneuver around. Most disabled users have limitations with their neck or upper body motion, limiting their vision or peripheral views. They must be directed by some aid on the availability to move around.

The book also promotes user based research methods to inform design decisions. The authors list several methods such as: using existing information, interviews including personal and performance interviews, visual documentation like a film journal or time lapse videos, and setting up scenarios. Their studies have shown the importance of creating new and imaginative ways of bringing disabled people into the design process, resulting in a more truly accessible environment. This piece of literature reinforces the thesis of the Camp Adventure project. The

"Their studies have shown the importance of creating new and imaginative ways of bringing disabled people into the design process, resulting in a more truly accessible environment."

authors claim that empathy is the "fuel for interactionism" (Lifchez 1979, 129).

Accessible Designs for Hospitality

Source: Beasley, Kim A., and Thomas D. Davies. Accessible Design for Hospitality: ADA Guidelines for Planning Accessible Hotels, Motels, and Other Recreational Facilities. 2 Sub ed. New York: Mcgraw-Hill (Tx), 1993. Print.

"Accessible is applied to elements of the physical environment that can be approached, entered, and used by people with physical and mental disabilities" (Beasley 1993, 2). Accessible is a term that used to describe an environment that is compliant with wheelchair users, but in recent years has evolved to include a wide range of people with impairments. The overall goal is to make basic activities easier and safer for as many people as possible. Over the years, since 1961, standards have been written and revised to address growing issues for disabled people. In 1990, the Americans with Disabilities Act (ADA) became Federal law.

In general, features of accessible design often create a safer, easier environment. Possible slips and falls are eliminated; proper use of signage colors and textures allow a general understanding of safety and direction. Accessible design also tends to make operation and maintenance costs decrease. These considerations eliminate vertical obstructions and they provide wider doors, hallways, and ramps which ease movement.

Accessible design does not have to compromise the aesthetic values of a project. If accessible design is incorporated in the earliest stages of design, the project tends to have a cohesive and successful combination of aesthetic and accessibility.

Urban Wheelchair Use Human Factors Analysis

Source: Wachter, P. Urban wheelchair use: A human factors analysis. Chicago, Ill: Access Chicago, Rehabilitation Institute Of Chicago, 1976. Print.

"Physical disability will occur in every family…, and will certainly occur in every individual who does not meet sudden death at an early age" (Wachter 1976, X). The physically handicapped is

not an ordinary minority group; it is a group that every citizen will most likely join later in life. So why have we limited these citizens by architectural barriers and other limits of accessibility. "The majority of the urban environment is designed to meet the needs of a theoretical average man" (Wachter 1976, 2). The physically disabled are excluded from free movement, in a society that is based on being highly mobile and active. Due to this lack of design considerations, many disabled people remain indoors to avoid conflict and frustration. The assumption made by designer's lack of focus on accessibility is that the handicapped population is "negligible and not deserving of attention" (Wachter 1976, 2). The responsibility of creating a barrier-free environment lies within several people: architects, building contractors, government officials, citizens, etc.

Common user physical problems are lack of trunk balance, reduced circulation, reduced muscle tone, and desensitization of tissues. Most wheelchair users have lost some muscle control through a form of paralysis. Spinal injury victims are paralyzed from the damage location and down. Not having the pressure to apply to the footrests keeps the user feeling challenged to keep their trunk balanced. Loss of trunk balance can cause a fall, difficulty reaching, and frustration. When the user sits in the chair for extended time, pressure sores can occur due to the lack of blood and oxygen circulation. These sores can require months of special care if not surgery. To prevent this, the wheelchair users often use foam pads to distribute the body weight more evenly. Also, most chairs have non-porous backs and seats, to allow ventilation as condensed perspiration can cause discomfort and skin irritation. When muscle tone is reduced, blood can sometimes pool in the feet and legs and are not recirculated into the cardio-pulmonary system. To prevent this, tight socks or hose are often used to prevent the pooling of blood in the legs. Desensitization of tissues occurs during paralysis. A wheelchair user can self inflict a serious burn accidently, and not even realize it. They do not have nerve feelings to alert them to hot or sharp objects.

"Physical disability will occur in every family…, and will certainly occur in every individual who does not meet sudden death at an early age"

"The majority of the urban environment is designed to meet the needs of a theoretical average man"

Figure 2.17. Camp greeting. (Camp Barnabas.org)


Figure 2.18. Camp high fives. (Camp Barnabas.org)


Figure 2.19. Cross carry. (Camp Barnabas.org)

Precedent Study

Information gathered from Camp Barnabas site visit, www.campbarnabas.org,

Camp Barnabas Promotional Video. Youtube.

Camp Barnabas

Camp Barnabas is a not-for-profit, nondenominational Christian summer camp for kids with disabilities. It is located outside of Purdy, Missouri in the rolling hills of the Ozarks. The 123 acre property is filled with trees, creeks, pastures, and diverse wildlife. From June 1 to August 16, the camp holds nine, one week sessions, each targeted toward a specific special need. This includes physical and developmental disabilities as well as fatal diseases. The camp operates with of eight year-round staff members, over 130 summer staff members, and over 1,800 volunteers or Christian in Action (CIA). The camp serves over 1,300 campers each summer. “Named for Barnabas, a follower of Christ whose name means “son of encouragement,”...The principle of encouragement - enlarging the spirit, encouraging the heart - helps everyone connected with our ministry meet life with courage.” (Camp Barnabas).

Special People

“The essence of who we are is expressed in our campers. A young boy who is the only person in his school in a wheelchair spends a week racing through camp with 129 other people in their fourwheelers. A teenage girl with cystic fibrosis hangs out with other girls who know what it means to live your life more in the hospital than out. The brother of a boy with cerebral palsy sits by a campfire and listens as others voice his everyday hopes and fears because they, too, have a sibling with special needs. To allow these very special people a week in a world that says yes to their limitations, to offer their siblings a place to relate, to give their parents a break from the everyday world of the challenges of disability and disease...takes a place like Camp Barnabas.” (Camp Barnabas)

The camp offers nine, one week camps to a variety of special needs groups. Groups include the physically disabled, autism, developmentally disabled, hematology, oncology, burn patients, chronic illnesses, diabetes, sickle cell, hemophilia, amputees, craniofacial syndromes, blind/visually impaired, and the deaf/hard of hearing. Cost for each camper is $650. Camp activities include swimming, horseback riding, field games, arts and crafts, canoeing, rifles, archery,

fishing and other outdoor adventures. Camp Barnabas has a fully-accessible high ropes course. The camp has found adaptive equipment and programming approaches for all activities. Cindy Teas states, “the key is adapt, adapt, adapt” (Camp Barnabas Promo).

Ideals of Camp Barnabas

Paul Teas describes the camp as a “place where people grow, they’re challenged” (Camp Barnabas). These special people need to be pushed, challenged, and allowed to grow. Cyndy states that “sitting on the sidelines is what happens to disabled people everywhere they go. At camp, they’re active participants in life. They may need a little help, but they will get to do it.” (Camp Barnabas Promo). It is my strong belief that more individuals and groups should adopt these ideals. Currently, there are not enough adaptations in the world to allow the disabled to truly participate.

Design

The camp began from a pre-existing camp facility. Renovations of the facilities have been going on since the purchase in 1994. In 2005, Paul and Cyndy Teas, as well as Camp Barnabas, were featured on Extreme Makeover: Home Edition, Season 3 Episode 47. The Teas home was almost condemned,

Figure 2.20. Messy hug. (Camp Barnabas.org)

Figure 2.21. Stroll. (Camp Barnabas.org)

Figure 2.22. Friendly game. (Camp Barnabas.org)

Figure 2.23. Friends meet. (Camp Barnabas.org)

Figure 2.24. Excitement. (Camp Barnabas.org)

Figure 2.25. Smores. (Camp Barnabas.org)

and was saved by the Makeover team. They also revamped the Fish House, which is the medical lodge, as well as provided the Barnabunk, and Ty's special project: The Silver Lining. Camp size exploded after the makeover, and brought additional donations for camp renovation abilities and dreams. In 2008, the camp added 21 new prefabricated cabins. The next dream is to build a new health center, to allow for IV therapy, respiratory therapy, g-tube feedings and catheterization/ bowel management therapies. The current facility is at its maximum use, causing campers to spend time waiting at the health lodge rather than enjoying camp. They also plan to open the health lodge year-round to the community.

October 17, 2009, I took a tour with Donna, a camp administrator. I also spoke with Paul and Cyndy about the specific adaptations they have had to make for certain program elements. Paul did mention that they have struggled with ADA codes and the availability of engineering firms to challenge codes and create adaptations not yet governed by ADA codes. He said it certainly does not take an engineer to figure out how accessibility can happen. It takes an open mind, a sense of logic, and an understanding of the user. It may take awhile to have a company help create it and take liability for it, but almost anything can become accessible.

Figure 2.26. Camp Barnabas entrance sign. (Amanda White)

Figure 2.27. Camp Barnabas entrance. (Amanda White)

Camp Barnabas General Site Design Analysis

The entry to the camp is at a T-intersection with Farm Road 2060 just south of Pierce City, Missouri on Highway 37. The camp logo sign marks the entrance of the camp (Figure 2.26). An automatic gate with a call box is located at the entrance. This safety measure ensures the safety of the campers as well as the safety of the property. A season greeting was waiting to make the first impression once inside the property (Figure 2.27). The drive into the camp is a long, tightly tree-lined road (Figure 2.28). The road has an asymmetrical alignment of the trees. Figure 2.29 illustrates a section of the road with general measurements. Upon arrival to camp the campers drive through the entrance to a point where the counselors and staff greet them, where the camper gets out of the vehicle and their counselor leads them through the welcome line with chants and signs to create initial excitement to campers (Figure 2.30). The camper's luggage is taken by camp staff and delivered to their cabin. The parents, caretaker, or who ever may have transported them, then drive down the back exit road and leave through the gateway. This order limits the opportunities for campers to get anxiety about their parents leaving, as well as takes much hassle out of luggage transportation. This has become a seamless activity for the camp and has been reflected in design. It also limits vehicles on the site.

The site circulation is based on two loops of access, primarily used with golf carts, wheelchairs,

Figure 2.28. Camp Barnabas entrance drive. (Amanda White)

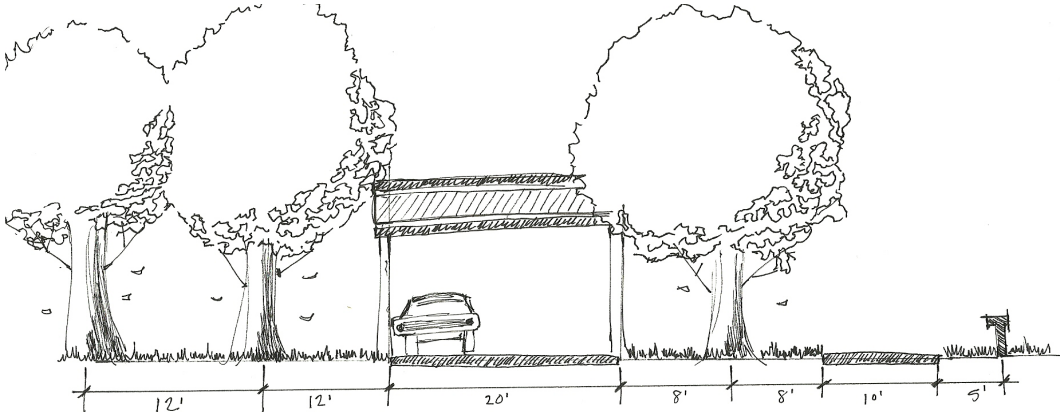

Figure 2.29. Camp Barnabas entrance drive section. (Amanda White)

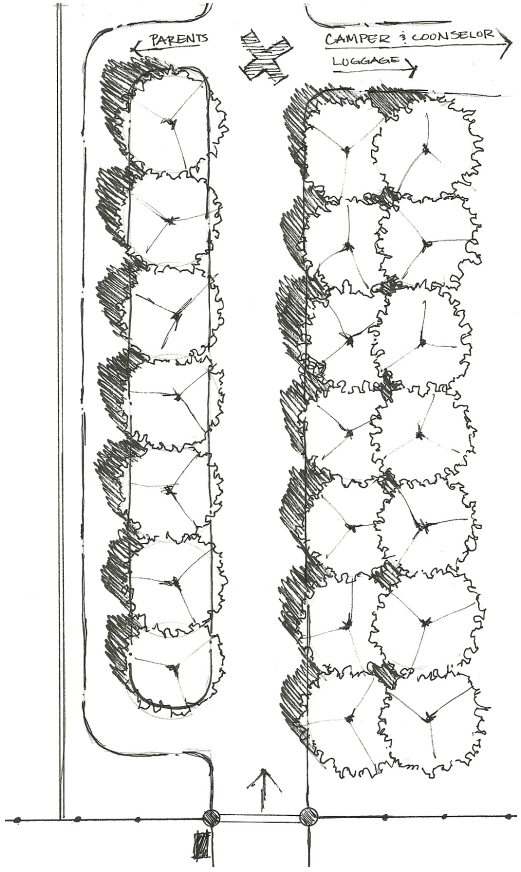

Figure 2.30. Camp Barnabas entrance drive plan. (Amanda White)

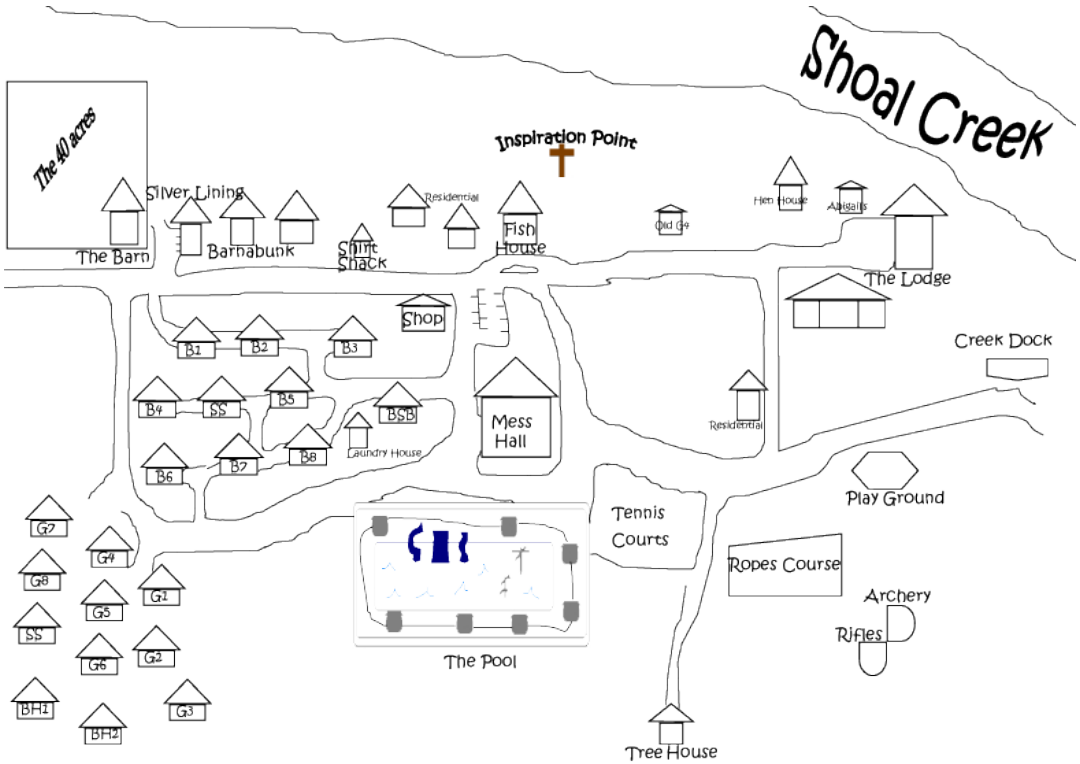

Figure 2.31. Camp Barnabas site plan. (Camp Barnabas)

and pedestrians (Figure 2.31). Several paths off of the two loops connect to programmatical elements. The "Mess Hall" (Dining), the "Fish House" (Medical Lodge), and the caretakers home (Paul and Cindy's home) are centrally located. The first two are located for ease of access for campers. Both are critical for the daily activities like food, medicine, and restrooms. When the campers and counselors leave the dorms in the morning, they only return for a rest period after lunch and for bedtime. This is for several reasons, but primarily for legal safety. To ensure safety for both camper and counselor, these measures of operational considerations have been taken. If a camper needs to tend to bladder/bowel activities, they must do so at the Mess Hall or Fish House. The "Fish House" is representative of Christ and life, which fits the medical uses. Because of the increased demand of the "Fish House", the next project slated for fundraising is a new Health lodge.

Design considerations for the true access of the users were found throughout the camp. Another program element, an accessible garden, was located just below the Mess Hall. The garden (Figure 2.32) was raised by used of rail road ties, so that the campers may be involved with the planting exercises or merely have interaction with the plants. Another program element that has taken on Paul's sense of adaptation is the Dock and the attached elements. The

camp is located on Shoal Creek, a beautiful picturesque river with diverse wildlife and vegetation. However, the property lies 40 feet above the creek with a cliff lining the waterfront. At first, a series of stairs were built to get campers down, but that limited those in wheelchairs (Figures 2.33 & 2.34). To help solve this challenge, Paul brought in engineering consultants to look at building an accessible elevator. Most firms were hesitant to accept the liability, but he finally found a company to design and construct the accessible elevator (Figure 2.35). Today, it allows campers of all abilities to enter at the camp ground level, and drop down to the waters edge. The one consideration not yet solved is the dock. With flooding each year, the dock breaks as the water rises (Figure 2.36). The camp has endured the costly damage, but is looking for more efficient designs.

Figure 2.32. Accessible garden. (Camp Barnabas)

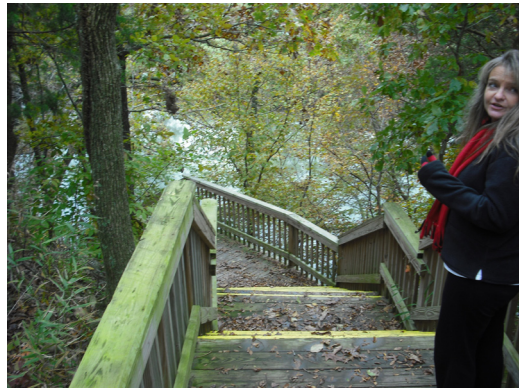

Figure 2.33. Stairs to dock. (Amanda White)

Figure 2.35. Elevator to dock. (Amanda White)

Figure 2.34. Overlook. (Amanda White)

Figure 2.36. Dock. (Amanda White)

Figure 2.37. Camper swimming. (Camp Barnabas)

Figure 2.38. Arbor. (Amanda White)

Figure 2.40. Three slides. (Amanda White)

Figure 2.39. Aquatic toys. (Camp Barnabas)

Figure 2.41. Camper sliding. (Camp Barnabas)

Pool Analysis

The pool has several accessible considerations.

1. Zero entry

2. Covered Huts to Store Chairs

3. Accessible Pool Toys

4. Accessible, Wide Slides

The entrance into the pool is one of the first concerns. The camp has several “water chairs” available. They are constructed with PVC pipe, wheels, and mesh netting for the seat. With the zero entry, the chairs can slide right into the pool. There are several covered arbors (Figure 2.38) with available seating but are sometimes use for storage of the chairs. This helps keep the chairs cool from the sun. The chair pads can get very warm, and with a camper’s loss of sensation, they may not realize they are getting burned. Keeping power chairs away from water is crucial. These arbors multifunction as a safe storage location. The pool has several toys for the campers to use (Figure 2.39). They can spray a friend nearby, or dump the bucket on their counselor. Making these toys accessible lets the camper feel involved. The pool has three accessible slides (Figures 2.40 & 2.41), ramps go around the pool up to the top of the slides where an assistant helps the camper and counselor(s) get set to ride down the slide.

High Ropes Course

The high ropes course has several accessible considerations.

1. A Pulley system to raise those who cannot climb

2. An Adjustable Repelling Wall

3. Sliding Platforms to sit and pull across High Ropes

4. Accessible Zip line

The High Ropes course (Figure 2.42) is one of the campers' favorite program elements. It is also the most challenging. This helps support the theory discussed in the literature; the disabled love to be able to participate in a challenge. The ropes course begins with a climbing wall (Figure 2.43), which has a pulley system to aid those who cannot climb themselves. Once at the top, the camper may begin walking the high ropes. If the camper cannot walk, a sliding platform allows them to sit and pull, or be pulled along the course (Figure 2.45). A staff member is available to help the camper along the entire course. The camper may also choose to go down the repelling wall which can be adjusted to a less challenging slope to allow a wider range of abilities to use it (Figure 2.43). The course typically ends with a ride down the accessible zip line, a camper favorite (Figure 2.45). The zip line is a switch back which allows a longer ride with a smaller footprint. Special harnesses are used with different disabilities.

Figure 2.42. High ropes course. (Amanda White)

Figure 2.43. Climbing wall. (Amanda White)

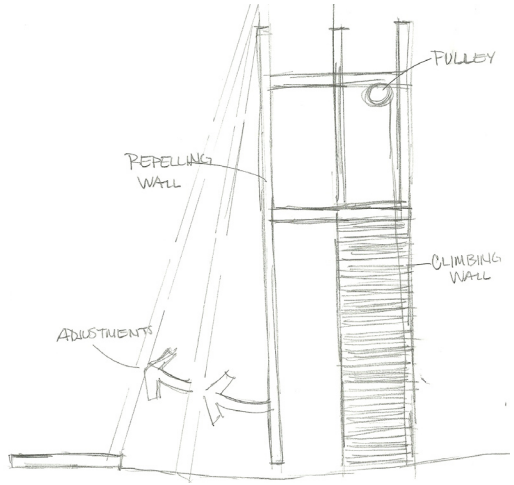

Figure 2.44. Climbing wall sketch. (Amanda White)

Figure 2.45. Platform challenge. (Camp Barnabas)

Figure 2.46. Zip line. (Camp Barnabas)

Figure 2.47. Camper on horse. (Camp Barnabas)

Figure 2.48. Horse riding facility. (Amanda White)

Figure 2.49. Accessible loading dock. (Amanda White)

Horse Riding Corral

The horse Riding corral (Figure 5.26) has several accessible considerations.

1. Accessible Loading Dock

2. Specialized Pairing of Horses to Campers Needs

3. Specialized riding equipment to Aid Camper

4. Designed Riding Trail, equipped with challenges

5. Sound Buffer

6. Accessible petting areas

Horse riding is a camper favorite and can be a therapeutic activity. Camp Barnabas has a trained specialist who comes in to help with the horse riding program. She matches up the campers characteristics to those of the specially trained horses. The horses range in breeds, but all are trained to be therapeutic riding horses.

The camp has designed a special loading dock to help with the transfers to the horses. The ramp is approximately 10’ wide, with railings and detectable strips to signal to the camper when they are approaching the ramp and the transfer location (Figure 2.49). The dock is built to a height of 3’0”, with a space between the docks to allow the horse to fit (Figure 2.52). The height was determined by the specific heights of the breeds. Camp Barnabas uses and the general length of camper’s legs. The design is careful to prevent camper’s feet from being caught between the horse and dock, but low enough to allow an easy transfer.

Once the camper is transferred onto the horse (Figure 2.50), special straps and braces are used to help the camper sit on the horse and stay stabilized. An assistant will walk along the horse and hold on to these straps, for safety reasons (Figure 2.51). The path out of the dock must be level for about 25-40 feet, to allow the horse a chance to adjust to the rider, and vice versa. Any sudden shifts in ground level could panic the horse or the rider. No large rocks are allowed for the first 1/8th mile for the same reasons. Once past the 1/8th mile mark, the course has designed challenges with a variety of material and slopes.

When the rider comes back into the arena, they must come into the loading dock, where the next camper is waiting. The rider is transferred to the dock on the right, the exit dock, and exits the

arena (Figure 2.55). The next rider is loaded on and the process repeats. It is an attempt to gather riders with the same match of horse to continue at one time, but switches are made rather seamlessly.

The barn has 10 stalls with access to the arena and pasture (Figures 2.53). The barn also is the home of several other animals for the campers to pet and play with. Rabbits, birds, turtles, and many more animals live either in a small room inside the barn, or in pens outside.

The design has met and conformed to CCHI and CCHA spatial boundaries. The associates also provide information for group riding programs and facility design specifications. A major implication with the horse riding program is that it requires a 50' sound buffer. The horses are rather sensitive, and with the special considerations of the riders, noise is an element that must be avoided. Spooking a horse with a disabled rider could be devastating. No cars, golf carts or activities are allowed within the sound buffer.

Figure 2.50. Transfer on to horse. (Amanda White)

Figure 2.51. Camper riding. (Amanda White)

Figure 2.52. Loading dock depth. (Amanda White)

Figure 2.53. Horse pasture. (Amanda White)

Figure 2.54. Loading dock. (Amanda White)

Figure 2.55. Loading dock exit. (Amanda White)

Figure 2.56. Beanbags to relax. (Amanda White)

Figure 2.57. Cubbies and shelving. (Amanda White)

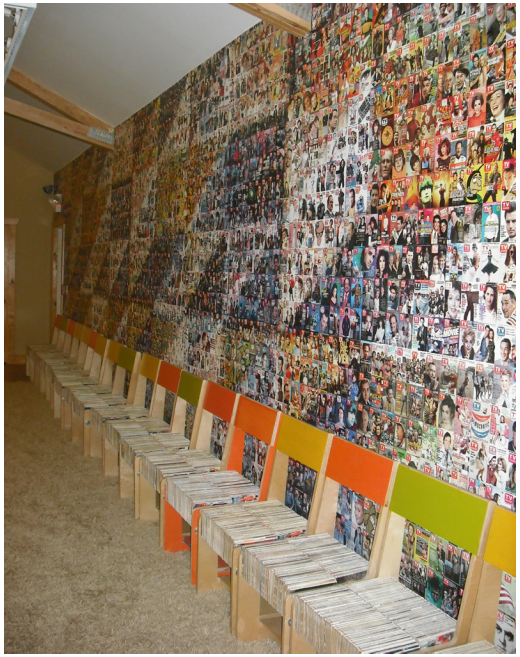

Figure 2.58. TV Guide wall mural. (Amanda White)

Figure 2.59. Mural wall. (Amanda White)

Silver Lining

During Extreme Makeover: Home Edition, Ty Pennington took on a special project of his own. He wanted to create a special place that met the autistic children's disabilities. He named the building, the Silver Lining. It is a room that is carpeted and allows the kids to have activities in here that can remain quiet. With autism, the child is very sensitive to sound. The construction of the room absorbs much of the sound. It is full of soft, plush carpet to roll around on, and oversized bean bags (Figure 2.56). There are cubbies with activities and materials as well a television (Figure 2.57).

The walls are the most fascinating, eye catching feature. The color striping was so visually stimulating (Figure 2.58). The wall was a mural of TV Guide covers (Figure 2.59). TV Guide donated hundreds of leftover Guides which were used not only as wall art, but as artistic seating (Figure 2.60). The TV Guides were fused together to help make seats and tables. The seats were surprisingly comfortable (Figure 2.61).

Ty's ability to play up the visual and textural stimulation, but down play the noise stimulation is a remarkable response to the autistic needs of these children. Children of all disabilities love the room and it has become a popular hangout. This is a great example of how considerations of the disabilities implications can create a great quality of life space.

Figure 2.60. TV Guide chair. (Amanda White)

Figure 2.61. TV Guide chair detail. (Amanda White)

Figure 2.62. Silver Lining room. (Amanda White)

Figure 3.1. Green leaf wider. (Adapted from Morguefile.com)

Figure 3.2. Hug photo montage. (Adapted from CampAdventureinc.com)

The Site

The Site chapter is to give understanding of the existing site, the opportunities it may hold, and the limits to address before considering any development. A series of site visits were used to gather data regarding the site and potential users. The section includes inventory studies as well as analyzing key elements that would determine the site's ability to sustain or recover from any form of disturbance.

Site Inventory

General Information

The site is located on 125 acres of natural mostly undeveloped land adjacent to Perry Lake. The property is leased to Camp Adventure, by the Army Corps of Engineers, and is subject to their development regulations. Ozawkie, a small town, is just across the lake along K-92. The site lies within Jefferson County and after review of both the Jefferson County and Ozawkie planning documents, it has been determined that neither local governments have direct governance over the property. The existing land use map for Jefferson County shows the property as "Government Land Use", giving regulation rights to the Army Corps of Engineers.

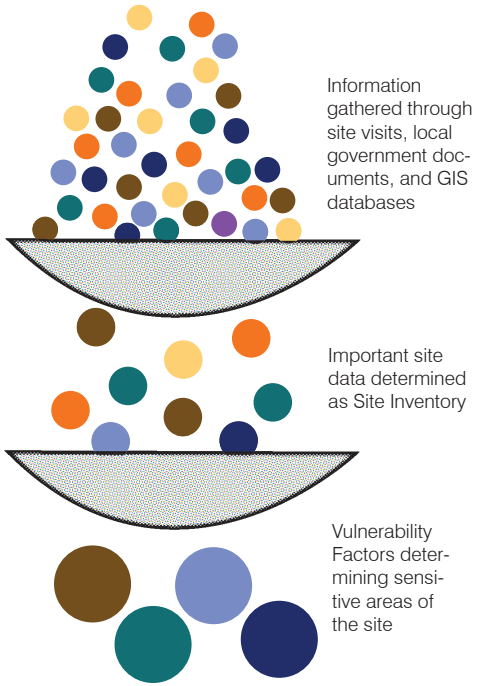

Figure 3.3. Process of Site Inventory and Vulnerability filtering process diagram. (Amanda White)

Process of Site Inventory and Vulnerablity Analysis

Inventory began with a broad gathering of all information available in GIS (Geographic Information System) databases, and local government planning documents. A set of data was selected to use for understanding the sites existing form and context. This information was filtered to gather factors that would determine the areas of the site that would be too sensitive to develop upon. See Figure 3.3, for a graphic representation of the filtering process. The remainder of the site is determined as eligible for development.

Site Visits

Several site visits were conducted to gather different layers of data. The first site visit occurred in early June of 2009 with Barb and Aaron McGoyne, camp directors, and I. During that visit, the first meeting was conducted and the preliminary program was received from the camp directors. Several pieces of information were uncovered during his visit. Site history, utility access, and programming opportunities the directors had desired in respect to site locations were the major pieces. However, optimal views (Figure 3.4), existing buildings (Figure 3.5) or footings, and native rock outcroppings (Figure 3.6) were noted as well.

The second site visit was conducted by my major professor, Tim Keane, and Barb and Aaron

McGoyne and I on February 6, 2010. The purpose of this visit was to gather information pertaining to the vegetation, site hydrology, and to review areas that were conceptually slated to certain program elements. Due to a snow storm that swept in the day prior, the main success of the visit was a vegetation inventory (Figures 3.7, 3.8, & 3.9).

I conducted a site specific visit on February 28, 2010 with Barb and Aaron McGoyne and Challenge Options owners Charles and Christie Peterson. The purpose was to view the slated site for the Ropes Course to obtain a better understanding of the general site, slope, vegetation, and proximities.

Site Inventory Mapping

Data was collected from several sources to inventory and analyze site information. This data or GIS (Geographic Information System) data is electronic data that when used in a GIS computer program it enables the user to better analyze many layers of data. Data collected reflects both natural and social systems. All GIS data collected, its sources, and detailed information can be found in Appendix F.

Figure 3.4. View of site. (Amanda White)

Figure 3.5. Existing building. (Amanda White)

Figure 3.6. Native rock outcropping. (Amanda White)

Figure 3.7. Site visit. (Amanda White)

Figure 3.8. Vegetation inventory. (Amanda White)

Figure 3.9. Red oak leaves. (Amanda White)

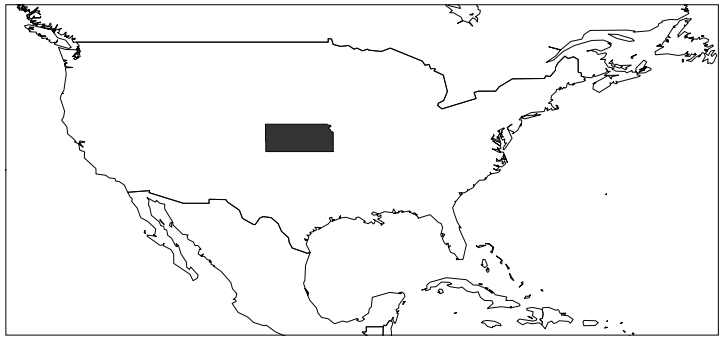

Figure 3.10. Map of Kansas within the USA. (Amanda White)

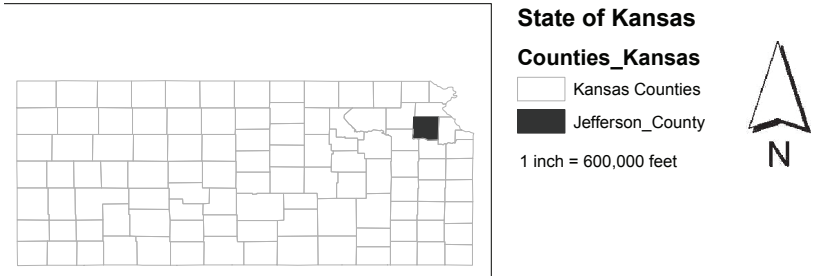

Figure 3.11. Map of Jefferson County within Kansas. (Amanda White)

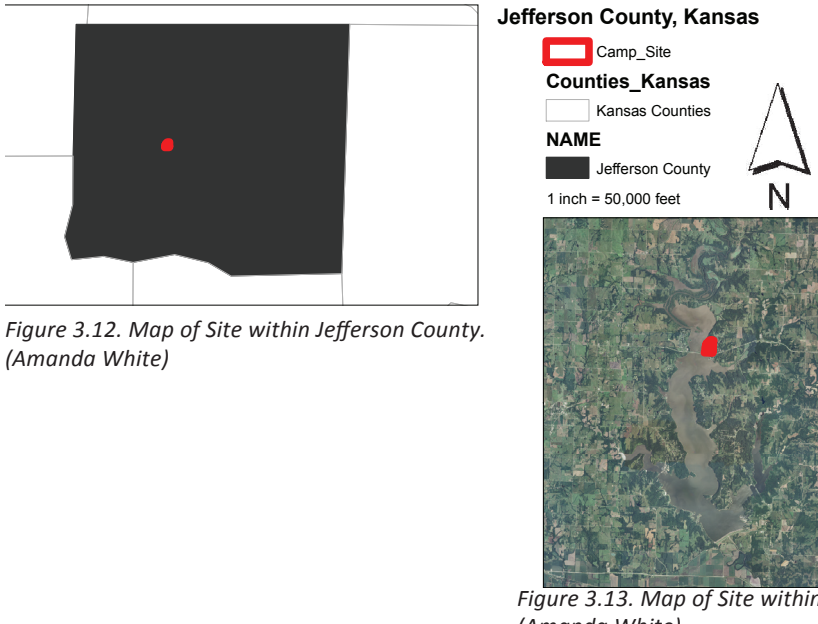

Figure 3.12. Map of Site within Jefferson County. (Amanda White)

Figure 3.13. Map of Site within Perry Lake. (Amanda White)

Location & Context

The site is located in Jefferson County, Kansas. It is approximately an hour west of Kansas City, or 15 minutes northeast of Topeka. (Figures 3.10 -3.12) The location is rurally set, located on Perry Lake. (Figures 3.13-3.14) Perry Lake is an Army Corps of Engineers lake, damming the Delaware River. This is for flood control of the Kansas River. The lake is also used for recreational uses such as boating, fishing, and camping. The site does have potential for lake access; however, after discussions with the Corps representative, Matt Beckman, it has been determined that the north end of the lake, north of K-92), is subject to siltation issues. It is noted as hazardous boating, therefore complicating the uses available with a site dock access. The site is adjacent to K-92 Highway, allowing for easy access to the interstate network.

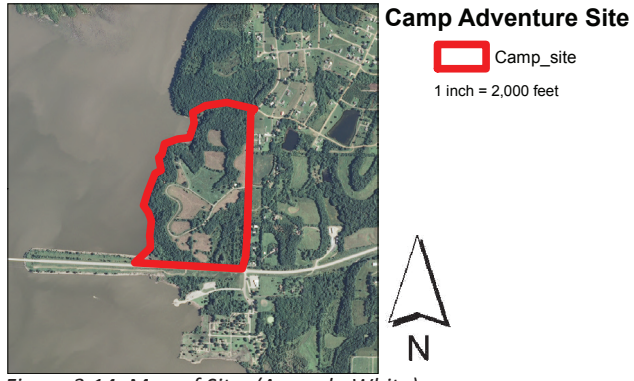

Figure 3.14. Map of Site. (Amanda White)

History of Site

The site, since ACOE ownership, has been a part of the public park system. It was Old Town North Park until the mid 1980s, when budget cuts caused the ACOE to reconsider excess park facilities. The park has been vacant until Camp Adventure's acquisition of the property. Due to prior development, there are existing buildings, footings, and building pads. (Figure 3.15) There is a vacant water treatment facility. The Building will be demolished, by the ACOE. The building pad will be left for development. There is a building footing, 16'x20', near the water treatment facility. There is a building pad near the southern portion of the site. There is a fence that borders the site. It runs approximately 50' inside the property line.

Figure 3.15. History of site inventory map. (Amanda White)

Figure 3.16. Existing roads inventory map. (Amanda White)

Existing Roads

The site is adjacent to K-92 Highway. (Figure 3.16) The site is accessed by Quail Hill Drive. Quail Hill Drive is currently gravel, but has potential for development due to the increased density northwest of the camp site. The camp site does have a private drive, which follows along the ridge line for the first straight portion of the "heart-shaped" road. The road responds to the vegetative patterns, swerving in and out of the tree mass. A branch shoots off of the main road and ends in a loop around "Eagle Point". Small paths have been made by golf carts to the far north parts of the site.

Existing Utilities

The site has existing utility options to begin considering for development. Overhead power lines do enter the site and run parallel to the private drive to the abandoned water treatment facility. (Figure 3.17) When the water treatment facility is demolished, the Army Corps of Engineers have agreed to take down all the power line poles up to the second pole inside the property. The camp intends to bury any future power lines needed. A rural water main runs parallel on the east side of Quail Hill Drive. The camp can connect to these facilities near the entrance of the site. For sewage considerations, it has been noted that the camp may need to pump their sewage up to the neighboring single family development's lagoon to the northwest's. If this is not possible or too costly, an old lagoon does exist on site, marked in orange, but has been overgrown with vegetation.

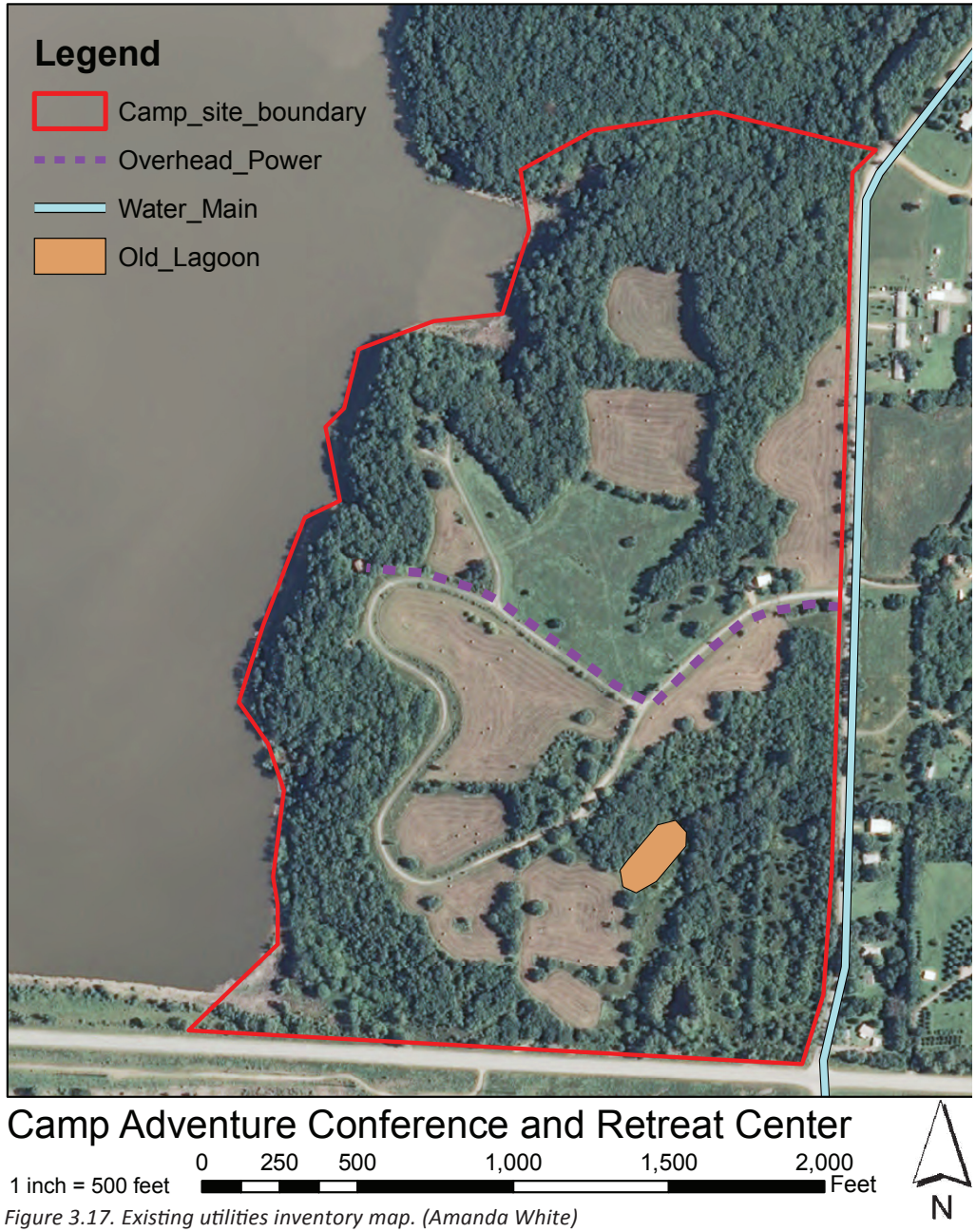

Figure 3.17. Existing utilities inventory map. (Amanda White)

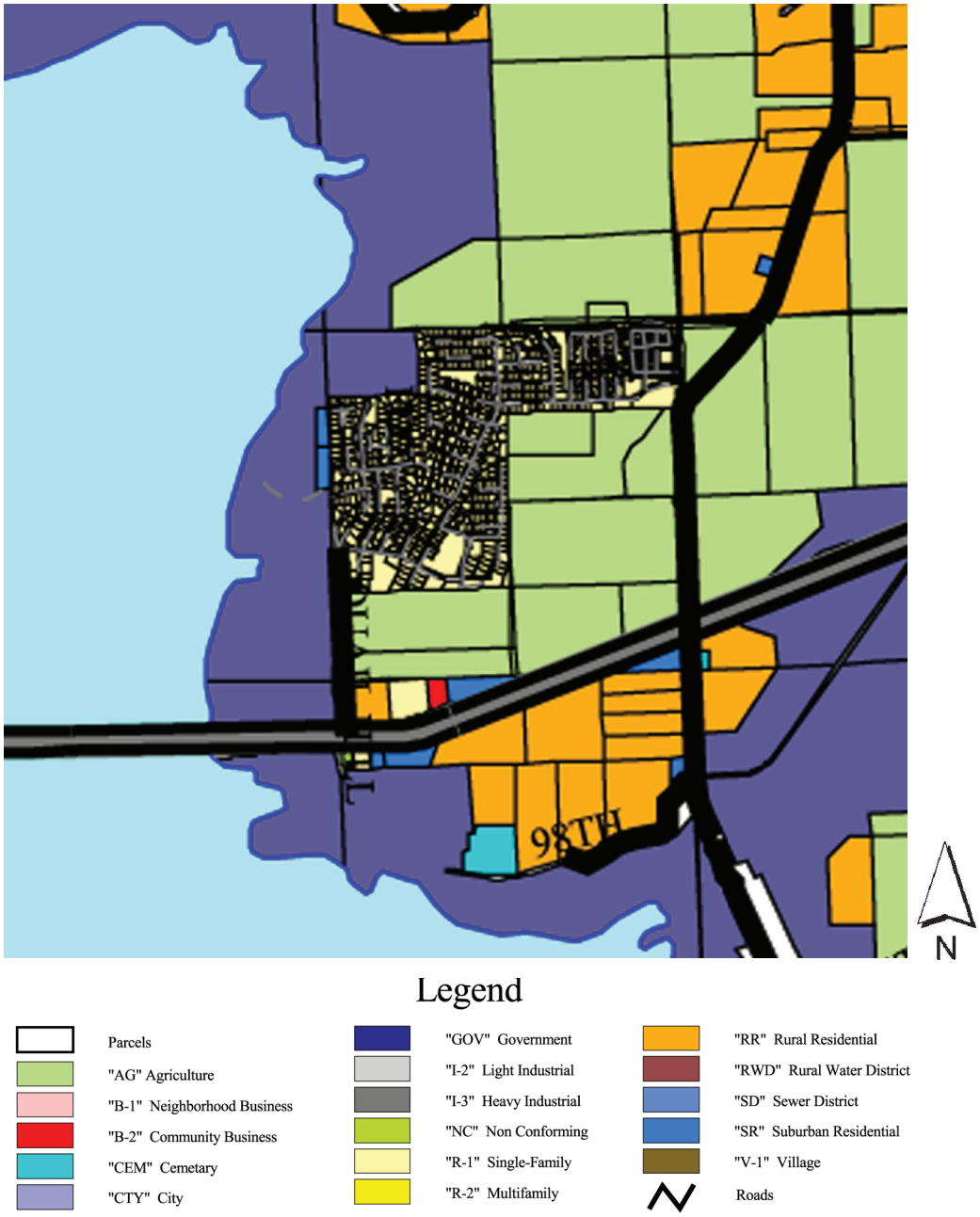

Figure 3.18. Existing land use map. (Jefferson County)

Existing Land Use

This land use map is a portion taken from the Jefferson County Comprehensive Plan, updated in 2001. (Figure 3.18) The land use plan shows the camp site as government land use, as it does today. Although Jefferson County's regulations do not directly affect the site, the regulations could indirectly affect the site through the surrounding properties. Adjacent land uses to the site include rural residential, single family, agriculture, community business, non-conforming, and suburban residential. The most important land use to note for future development is the single family development to the northwest of the site. It currently has on a few built properties, but is platted here to be fully built out. This development will increase traffic on Quail Hill Drive and K-92 significantly. It can also add strain on the demand of the rural utilities. The development could also bring several positives. It is possible that the camp may want to join use of their lagoon, and possibly other utilities that are added with development. Often when new developments are created, they bring along updated infrastructure as well. The camp is also considering using several of the program elements as a public attraction to gain funds for the camp costs. Adding families within such a close distance could mean that expected public users increase.

Vegetation

Because the site is so natural and maintains much of its natural vegetation, we believed it was important to take an expert in to take an inventory of the vegetation. Tim Keane, the major professor of the project, and the university's expert source on natural systems joined this site visit to assist in an vegetative analysis

.

Vegetation Inventory included: Ponderosa Pine, Honeysuckle, Buckbrush, Shag Bark, Hickory, Dogwood, Greenbriar, Raspberry, Black Oak, Red Oak, White Mulberry, Osage Orange, Eastern Red Cedar, Green Ash, Chinqapin Oak, Bur Oak, Hackberry, Smooth Brome, and Black Walnut.

Because of a program requirement of a nature class, we looked for areas the class could thrive. This is noted on the map as a "vegetative hotspot". (Figure 3.19) In this area, we located more than 12 different species of vegetation. There is some margin of error with the conditions during site visit #2, snow and ice, as we determined plants by bark and stems. Very few plants had remaining needles, leaves, or buds.

Figure 3.19. Vegetative inventory map. (Amanda White)

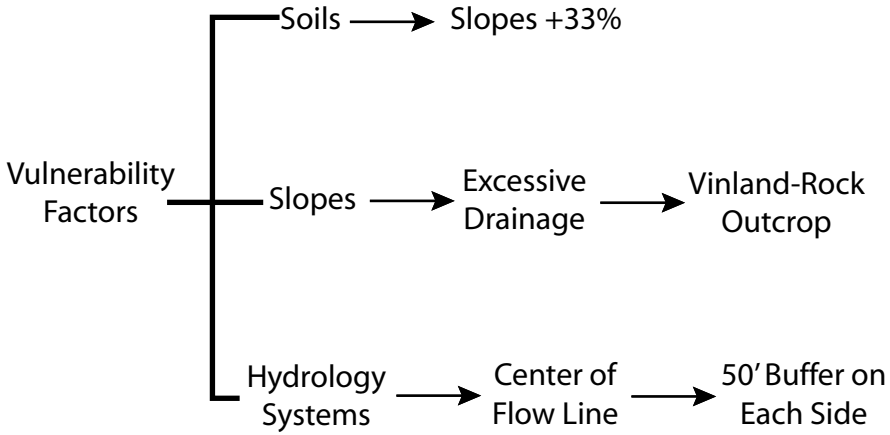

Figure 3.20. Process of finding vulnerable areas diagram. (Amanda White)

Site Vulnerability

Process

After collecting all of the inventory data, I began to look for key data that would suggest where the site would be too vulnerable for any development. Vulnerability can be defined as the ecosystem's ability to recover from any disturbance. Disturbance, in this case, may be implemented of program elements or activities. If an area is marked as "highly vulnerable" it will take the ecosystem a long time, if ever, to recover to it's natural state.

The three factors selected to determine the site's vulnerability is soils, slopes, and the hydrology systems. Although vulnerability can be viewed as a range of intensity, the Figure 3.20 illustrates the defining measures of an ecosystem that is "highly vulnerable". The following maps also give rankings for "lease vulnerable" and "moderately vulnerable". Again, the key to discovering the site's most sensitive areas is the "highly vulnerable" qualities.

Soils

Soil type can suggest the character of drainage that occurs. If a soil cannot contain enough moisture after a disturbance, most likely, the vegetation cannot recover. Soil with a higher moisture holding capacity will recover after disturbance much faster than soil with a low moisture holding capacity. The soils marked as vulnerable were determined by the drainage class as well as corrosion factors. (Figure 3.21) All soils ranked very or somewhat limited for dwellings with and without basements, an original factor, and therefore was taken out of the equation for vulnerability. The soils ranked least vulnerable were moderately well drained. The soils ranked as moderately vulnerable were somewhat excessively drained. These soils have a chance to contain some water, but not for long. The soils ranked highly vulnerable were excessively drained. These soils also co-align with much of the slope rankings, meaning that these slopes most likely do not contain much soil.

Figure 3.21. Vulnerability of soils map. (Amanda White)

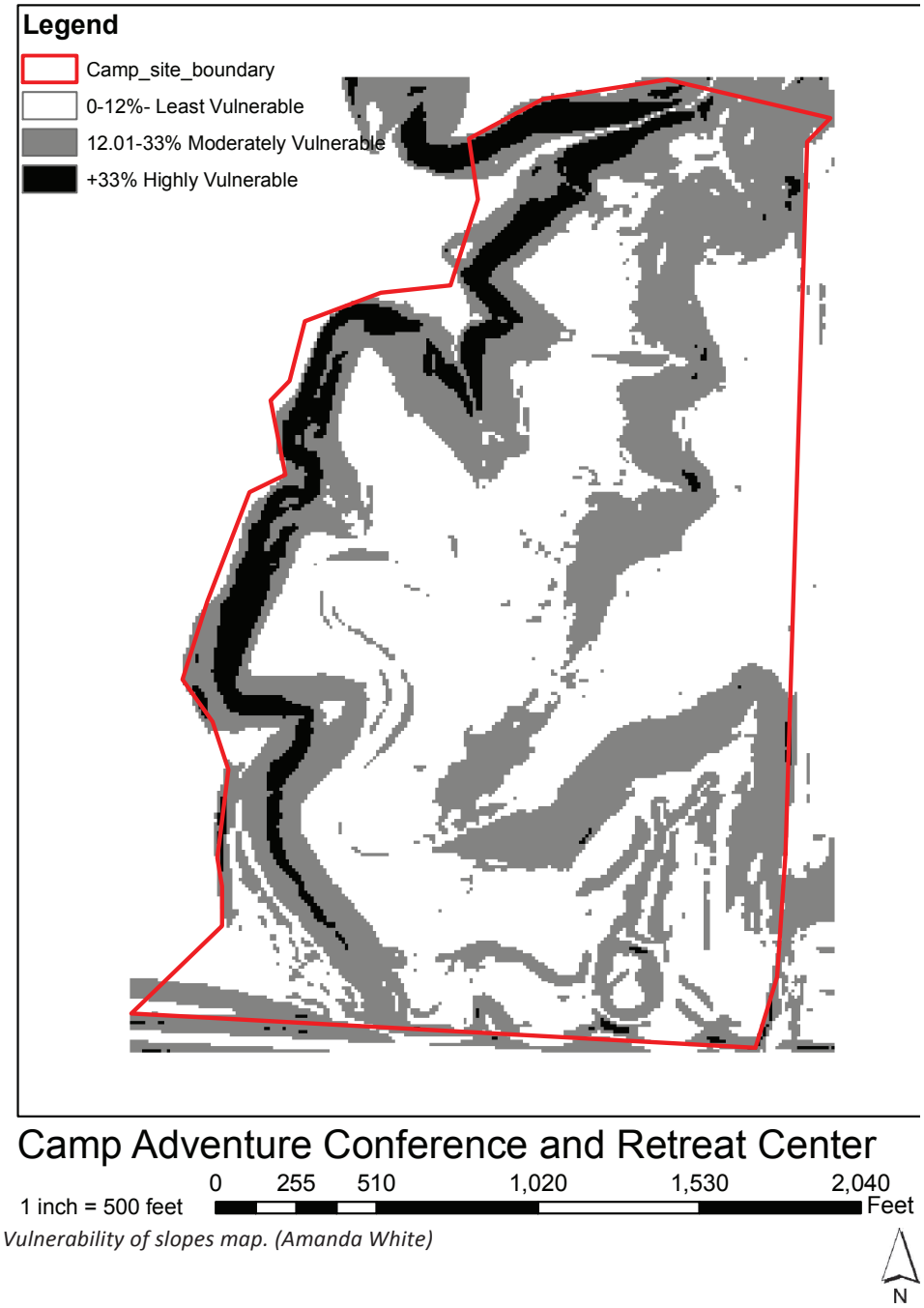

Figure 3.22. Vulnerability of slopes map. (Amanda White)

Slope

The site has a large range of slopes. The highest elevations of the site exist along Quail Hill Drive and extend out in a "finger form" along the crest of the hill. The slopes ripple down in varying slope ratios. The vulnerability factors were broken up into three categories. (Figure 3.22) The first, or the least vulnerable slopes, were those that fell in between 0-12%. These existing slopes can meet the accessibility needs of the camp. 0% -5% slopes do not need a handrail, and 5.01% - 8.33% require some form of handrail. These slopes will allow for easy vehicular parking or driving as well. The second range, or moderately vulnerable, fell in between 12.01% - 33%. These slopes will allow for many activities and can sustain its vegetation and natural form. The next range, or the highly vulnerable, are slopes that fell above 33%. These slopes are typically difficult to impossible to walk, and most importantly it cannot sustain vegetation and soil. If a slope cannot maintain vegetation, there is not a root system to keep the soil anchored to the underlying rock system. The slopes will be subject to erosion and be unstable for development.

Hydrology

The site has several small channels of hydrologic activity. These small creeks can be seen in terms of the topography. The center line of the stream has been marked by a small black line. (Figure 3.23) Included is a 50 foot buffer on each side of the line to allow for an increase of flow. With added development, the site will endure a higher rate of runoff, increasing the flow of the small creeks. If the creeks are not allowed to grow physically in size as well, development is subject to failure, flooding, and other forms of disturbance. All of these areas are deemed not suitable for development.

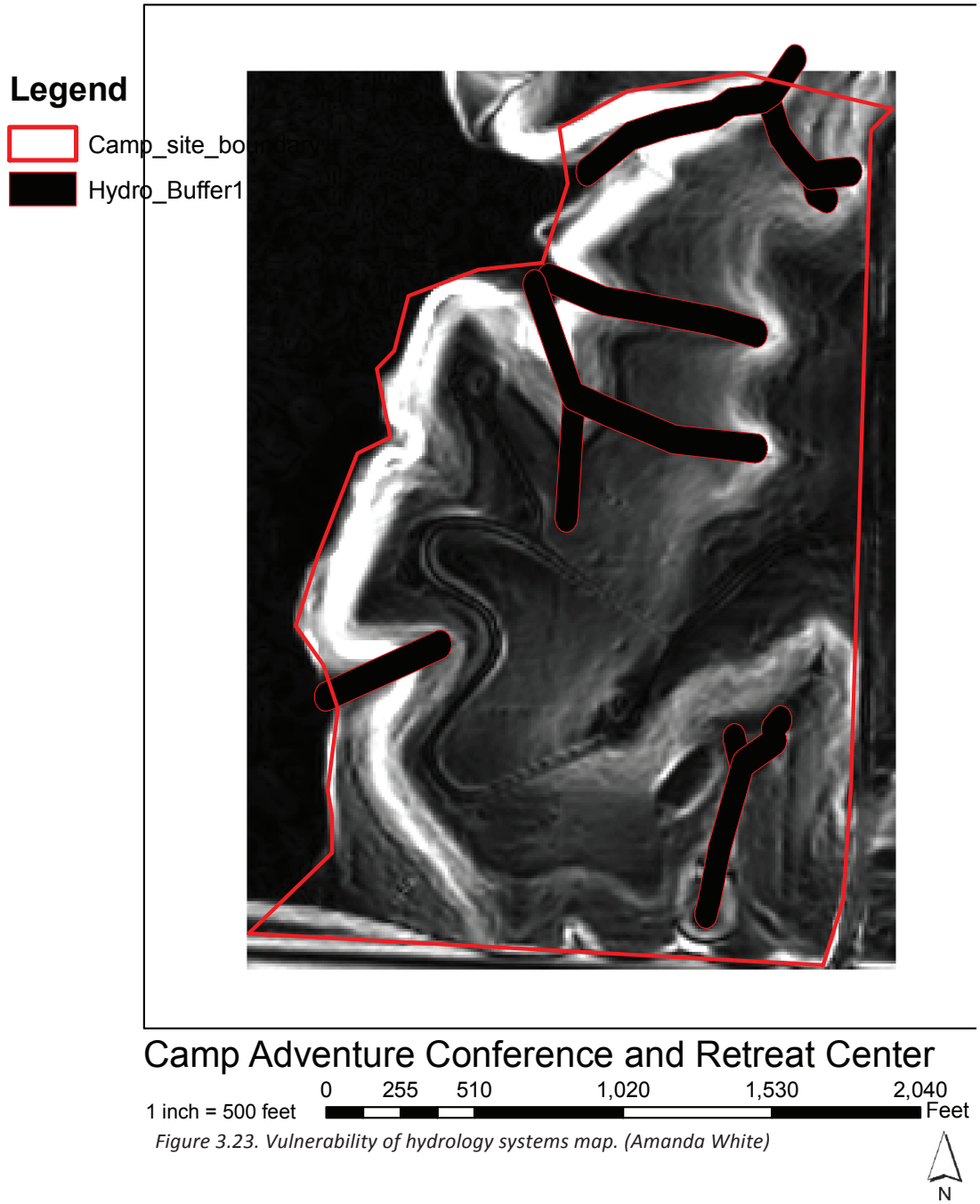

Figure 3.23. Vulnerability of hydrology systems map. (Amanda White)

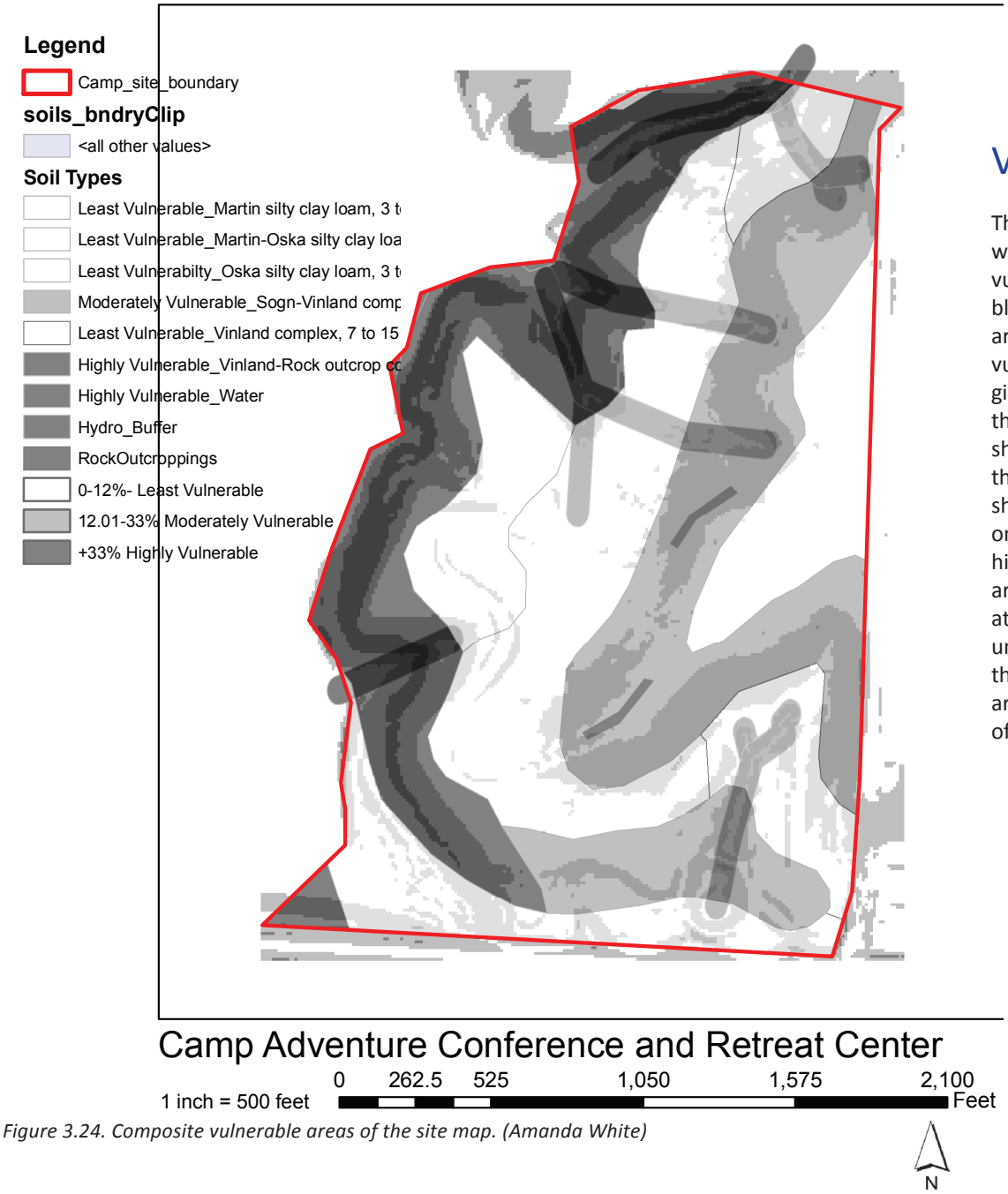

Figure 3.24. Composite vulnerable areas of the site map. (Amanda White)

Vulnerablity Analysis

The least vulnerable rankings are marked by white color. (Figure 3.24) The moderately vulnerable rankings are marked with a 50% black color. The highly vulnerable rankings are marked by black color. Then all of the vulnerability factors have been layered and given a transparency factor of 50%. The areas that have been deemed highly vulnerable show up as darker shades of grey and areas that are deemed as moderately vulnerable will show up in a lighter shade of grey, depending on the number of variables that it is ranked highly or moderately vulnerable in. The darkest areas are the areas that should be avoided at all costs. These areas will be subject to an unstable ecosystem and can degrade not only that surface but the surfaces surrounding. All areas in a shade of gray should be cautionary of the risks attached to those ecosystems.

Figure 4.1. Yellow leaf divider. (Adapted from Morguefile.com)

Figure 4.2. Fiesta photo montage. (Adapted from CampAdventureinc.com)

The Application

The Application chapter is the result of the user based research methods and the the application of the findings and input to design problems. The solutions are sculpted to respond to the issues discussed in the Foundation Chapter as well as input given during the user based research methods. The chapter carefully describes the process in which the design solutions were derived. The final sections are illustrations of the design solutions.

User Based Research Methods

As a result of my research on William H. Whyte and Environmental Psychology, I have become a designer that believes true design comes from the users; I act as the facilitator. There is evidence showing that when stakeholder/user input is evident in design, the design is better fit for the user/public. People tend to know their spaces better than a foreign designer typically credits them. This is especially true for the special user groups of the disabled. No one knows their difficulties and the barriers in the environment more than they do. I have determined that it is of utmost importance to use the camper's and staff's input to inform design decisions.

"I have become a designer that believes true design comes from the users; I act as the facilitator."

Several data collection methods were considered: diaries, observation studies, surveys, public meetings, and design charrettes. The original plan was to use several methods to gather different information. I wanted to use surveys to allow a wide range of users to give input. I also wanted to do observation studies where I watch the user with several scenarios and through description, I record the experience. It was also an option that I, the designer, spend a week in a chair in several scenarios as well. That was eliminated when we realized that these special disabilities inflict much more than limited mobility and making assumptions would not be valid. I also looked at having a group meeting and reviewing current ADA standards to evaluate if they are fitting to the group and possible modifications that could be made. Because this is a university setting, any research involving human subjects must be reviewed by the Committee on Research Involving Human Subjects (IRB). IRB is a section of the University Research Compliance Office in the Graduate School. They have specific applications and forms to complete, outlining the research procedures. Collectively, the project committee determined that to avoid difficulties with approval we needed to use the most standard procedures for data collection: an email survey and design charrettes or public meetings.

Survey

A survey was chosen as a method of gathering information from the largest group of people associated with the camp. Most questions were open-ended, allowing for a range of responses. There were quantitative questions to gather a small list of technical data, but the majority of the questions were qualitative questions. The questions were driven from a preliminary program provided by the camp directors during the initial site visit. The survey was emailed to a current list of people associated with Camp Adventure, campers and staff, and sent out through a website "Survey Monkey". Those who responded to the survey had 10 days to complete it.

Conclusions from the Survey

The survey went out to over 110 people, and 28 people responded. The questions were of open-end form to allow participants to freely answer. It was determined that perhaps, things I was not aware of, might come to light if the participants were allowed to answer as openly as possible. The open ended questions were somewhat effective in the terms of discovering interests I was not aware of. However, it became very difficult to analyze the information in a standard format.

Twenty-eight people responded to the survey. They participants ranged in age from 13 to 69 years old. Twenty-two of those were from Kansas and four were from Missouri. The participants involvement with the camp ranged from a candidate senior staffer at zero years to someone who has been with the camp for 33 years. Nine campers, fifteen staff, and four parents/guardians made up the participant group. Eleven of those people did not have any disabilities at all. Five participants have spina bifida, and four have cerebral palsy. Two participants have other conditions such as epilepsy. Six participants noted use of a power wheelchair, and 10 noted use of a manual wheelchair. These numbers do overlap with many using power wheelchairs using manual as a backup resource. Wheelchair widths ranged from 18” to 36”. The measurement from the floor to those in a wheelchairs lap measured from 24” to 28”. Allergies are a major issue for most of the campers and many staff. The allergy inventory consisted of wasps stings, poison ivy, poison oak, jasmine, latex and seasonal allergies.

An internet program “Wordle” was used to help analyze some of the qualitative data. In this program, you enter a piece of text into field and the program automatically generates a visual diagram of the terms used. The terms used the most often are larger and those only used once are small. This is effective in some cases and below are examples and the corresponding “Wordle” diagram. The most important terms are listed below as well as ‘keywords’.

Figure 4.3. "Difficulties of past camp environments" wordle diagram. (Adapted from Wordle.com)

Keywords that describe difficulties with past camp facilities: narrow, cabin, ramps, showers, wheelchair. (Figure 4.3)

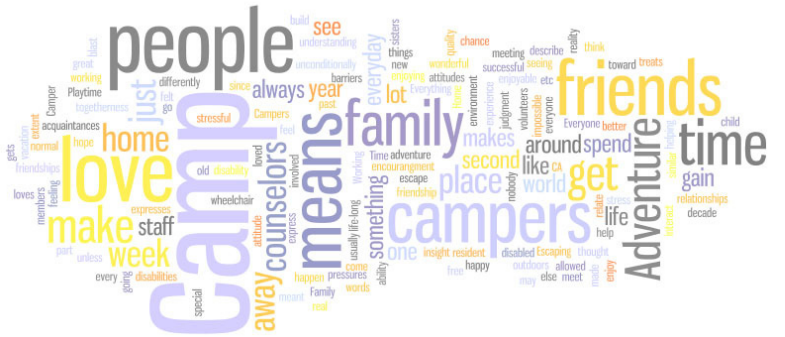

Figure 4.4. "What camp means to you" wordle diagram. (Adapted from Wordle.com)

Keywords that describe what Camp Adventure means: people, friends, love, campers, family, time. (Figure 4.4)

Figure 4.5. "What do you see at the new camp facility" wordle diagram. (Adapted from Wordle.com)

Keywords that describe what they see in the new Camp Adventure: people, friends, showers, wide, activities, open, pool, safe. (Figure 4.5)

Keywords that describe the most important elements of Camp Adventure: environment, riding, time, needs, fun, new, campers, able, friendships. (Figure 4.6

Keywords that describe safety concerns: ramps, steep, falling, walks, transfers, beds, doorways, ledges, bunk beds. (Figure 4.7)

Figure 4.5. "What are the most important elements at camp" wordle diagram. (Adapted from Wordle.com)

Figure 4.6. "What are your safety concerns" wordle diagram. (Adapted from Wordle.com)

Design Charrettes 1 & 2

Shortly after the survey, I conducted a design charrette to gather programmatic input. A charrette is a collaborative session where designers, stakeholders, and public can come together to draft solutions to carefully stated design problems. An invitation email was sent to the Camp Adventure associates, the Army Corps of Engineers at Lake Perry, a local Landscape Architecture firm, and

Figure 4.7. Charrette #2 participants. (Amanda White)

Figure 4.8. Charrette #2 presentation. (Amanda White)

Figure 4.9. Charrette #2 review. (Amanda White)

fellow classmates of the LAR 700 Project Programming, to the first of two design charrettes. With a wide range of specialties and interest, a series of design questions can be discussed quickly. The first charrette was held on December 19, 2009 at the Kansas City Design Center. A snow storm came in the day before the meeting and reduced attendance. Two campers did attend and participated. However, few conclusions could be drawn from this meeting as the group's desires.

February 6, 2010, we met again with better attendance to present a conceptual design master plan. The entire group of sixteen participants discussed concerns and opportunities, and then each person had a chance to comment and "sharpie up" the conceptual master plan. I then presented conceptual plans, sketches, and images for the seven selected program elements. Again, the floor was opened up to those participating to voice concerns and comments. As I engaged conversation among the group, Shannon Gordon, a Senior Project Manager at Ochsner Hare and Hare and a participating member of my committee sketched our collaborative ideas. The sketching of our conversation content worked extremely well as I had a visual memo to guide my progress back in studio. The group was extremely grateful for the work, and excited to see their dream coming to paper with direction and future.

Conclusions from the Charrettes

The first charrette was unfortunately deemed irrelevant in terms of forming a general consensus of the group with such a small polling. Therefore much of the discussions planned in the first charrette had to be moved into the second charrette. The best thing that occurred in the second charrette was Shannon Gordon's sketching. He could quickly delineate what the participants and I were discussing and it gave them a visual to better understand if we were on the same page. It also became a paper trail for me to remember what the discussions were about when I returned to the drawing board in studio.

Conclusions referring to all of the design decisions taken from the charrette will be found with the individual elements.

Design Process

The design process began at the initial site visit meeting. The preliminary program was given from the directors, derived from camper input and studies of similar camp's programs. This preliminary program gave some basis to the questions asked in the survey, conducted in November 2009. In November, the individual program elements were narrowed to a select seven by the camp directors and I. The select seven program elements were chosen based on the immediate need for fundraising purposes or the extent of adaptation, so that an in-depth study would be done. Then in December 2009 and January 2010, a series of base conceptual plans and sketches were done of the master plan and the select seven program elements.

The base conceptual plans and sketches were taken to the second charrette, presented and discussed, and resulted in a design for the final master plan. The campers, camp staff, and camper's parents in attendance gave input to design decisions as well as Shannon Gordon and Andy Budke, practicing professionals from Ochsner Hare and Hare who are acting as members of the project committee. Having professionals involved with the design process and charrettes was a very important step to ensure the designs were with reality of the building community. Their input at the charrettes were extremely valuable as they gave insight to possible construction materials and methods the designs and were extremely helpful in fielding questions that were out of my knowledge base. I returned to Kansas State University to move forward into design development.

Program

The program was derived from a list provided by the camp directors. The camp directors had taken input from the campers during early development and they had toured other disability camp facilities to observe the possibilities. The program is a rather large dream in comparison to the current funding available. However, for a truly cohesive camp facility, the design must be looked at for the end product.

The program is listed below:

Main Building (Houses sleeping dorms, kitchen, dining hall, activity hall, and other rooms)
Caretaker's Home
Cabins/RV Parking
Classrooms

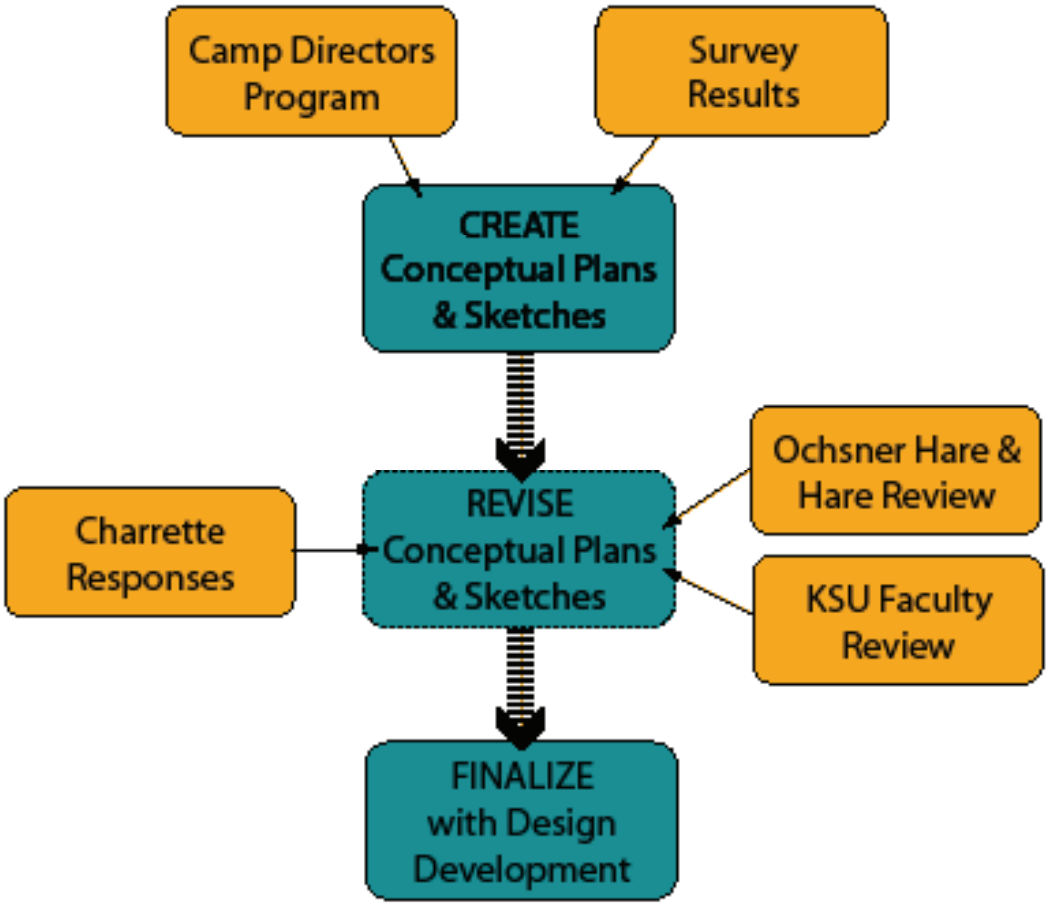

Figure 4.10 Design process diagram. (Amanda White)

Ropes Course
Tree house
Horse riding Corral
Aquatic Center
Dock for Lake Access and Waterskiing
Baseball Field
Go-Kart Track
Miniature Golf Course
Observation Tower (Two story building housing a weather center with a top obersevation deck)
Archery
Pond for Fishing and Paddle boating
Nature Trails and Nature Center
Lookout Deck
Amphitheater
Outdoor Chapel
Chapel
Campfire Ring
Gymnasium
Accessible Playground

Program Design Process

The design process (Figure 4.10 began in August when the preliminary program was provided. The program list then aided in shaping the questions asked during the survey. Information gathered from meetings with the camp directors concerning program as well as the responses from the survey results helped to shape ideas for the creation of the conceptual plans and

sketches. I created a conceptual master plan as well as plans and detail sketches for the selected program elements. At the second charrette, input was given from the charrette participants, as well as Ochsner Hare and Hare professionals review and comments. A week after the charrette, a mid-crit meeting was held with the KSU committee and the drawings were critiqued as well. All input from the three sources was then used as revisions to the plan and then proceeded into final design development.

Individual Program Element Needs

When I began to look at how I could address the issues between creating a program element that reflected the needs of the site and the user, I referred to one of my professors, Eric Bernard's, model for 'place'. (Figure 4.12) I translated this theory into my own model for each individual program element (Figure 4.13). The top of the circle represents the dynamic factor, or the program element or experience. The varying program elements call for different experiences. I saw this section as the one with the most potential. I wanted to approach experience with not only the user input gathered, but to take it a step further and imagine the coolest experience ever that these campers could have. After all, this is the place that caters to their abilities ,needs, and desires. The left portion of the circle

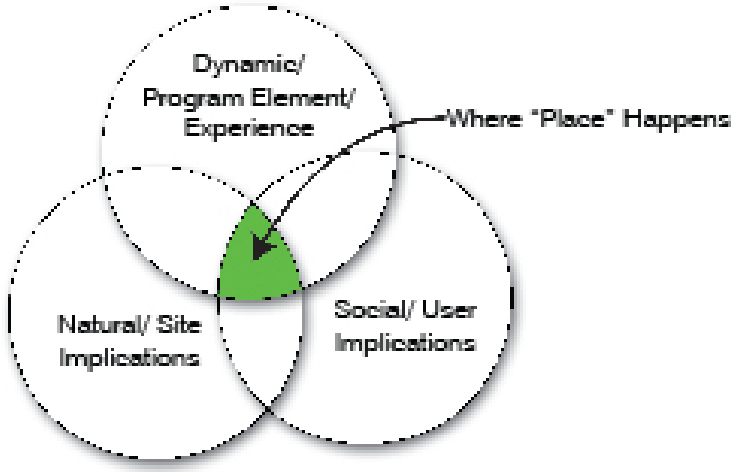

Figure 4.11. Theory of 'place'. (Adapted from Eric Bernard)

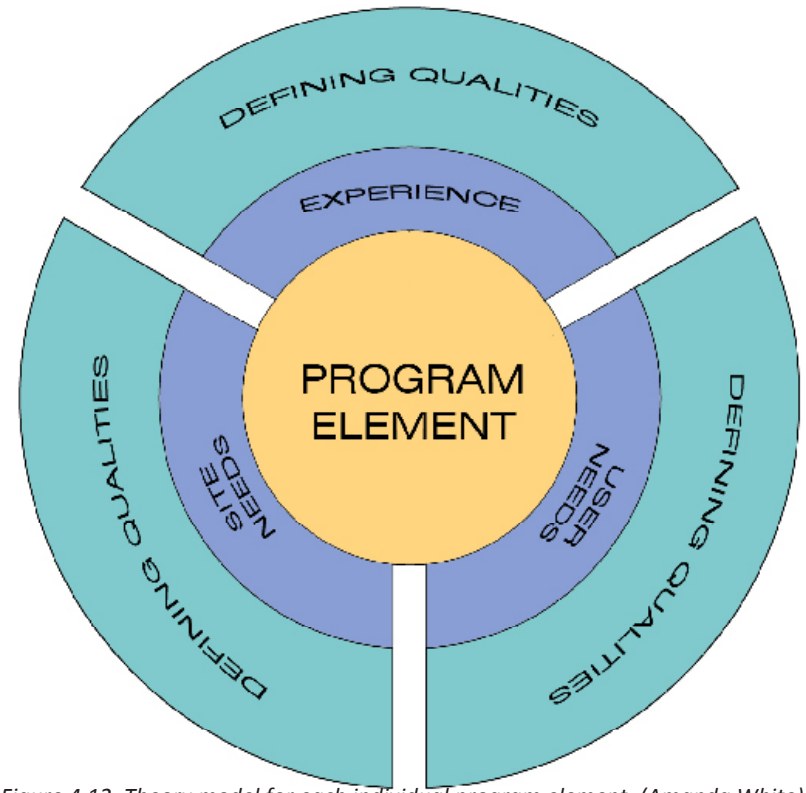

Figure 4.12. Theory model for each individual program element. (Amanda White)

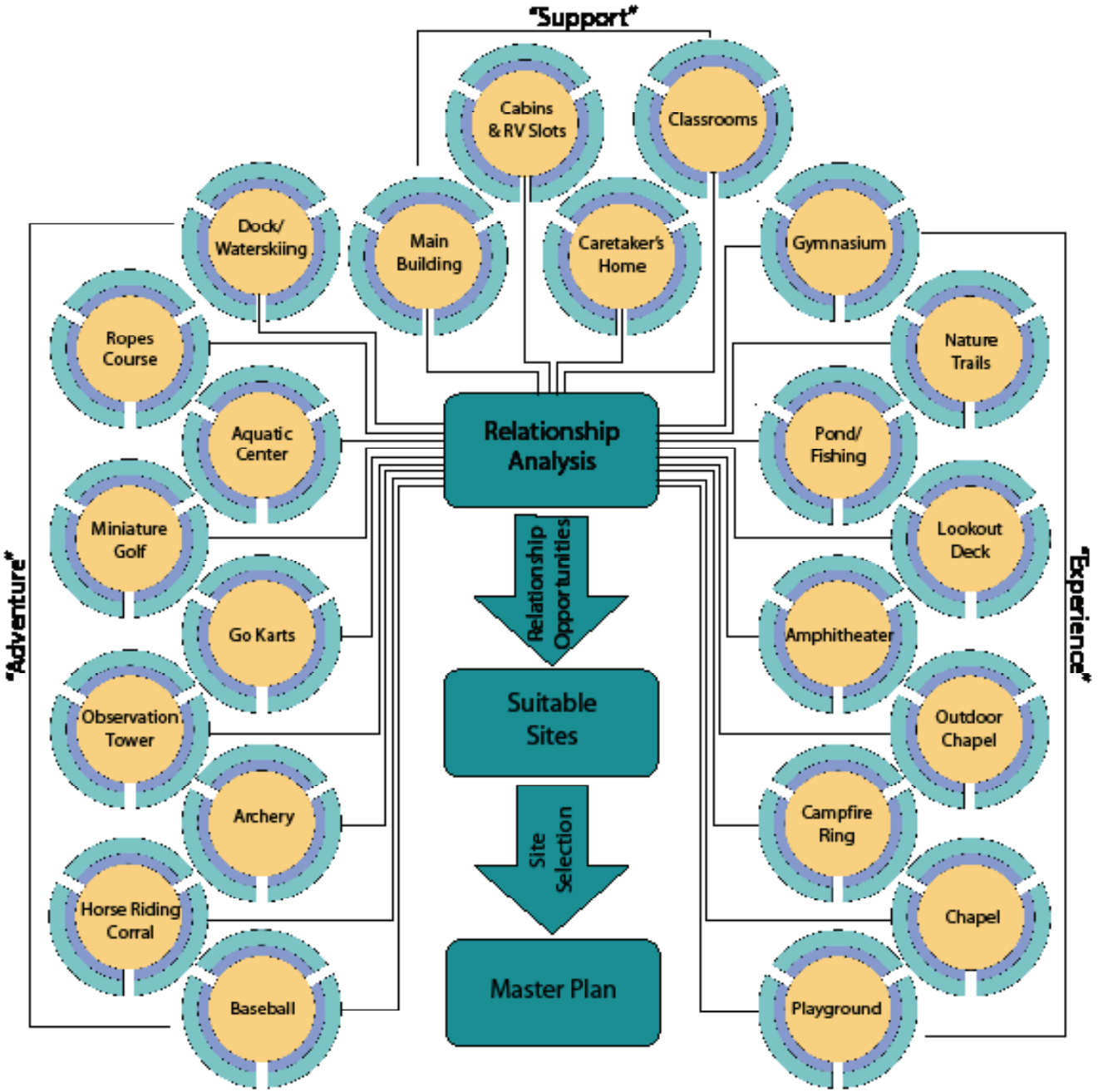

Figure 4.13. Program design process diagram. (Amanda White)

represents natural system implications. This section is a list of the things the program element would need out of a natural site like location, slope, and utilities. The right portion of the circle represents social or user implications. Because this group has special or particular needs, there are certain considerations that must be included. Together this section represents the needs and wants, derived from user input, research, and general needs of that element. This circle diagram is a representation of what the program must contain to be reflective of the user input and camp directors vision.

A circle diagram, as described above, was developed for each program element. The program elements were divided into three categories: adventure, experience, and support. The Adventure group, the most exciting and highly themed of the program elements, are typically not handicap-friendly. “Experience” program elements are those that are traditional summer camp opportunities. They should represent a more natural state and be enjoyed for simply what they are. “Support” program elements are buildings that are not within the range of design for this project. Siting of these buildings is important, but they engage a different set of program elements within. In the program design process (Figure 4.13), all program elements are inventoried and then analyzed in the “Relationship Analysis”. The results from the “Relationship Analysis” are “Relationship Opportunities”. Then the site inventory was revisited to locate suitable sites for each program element in terms of characteristics and size. Each site was selected for each program element resulting in a Master Plan layout. This completes the program design process.

Relationship Analysis

I conducted a relationship analysis to determine possible relationships and barriers between program elements. The initial step in this study of relationships was a program element analysis (Table 4.1). The program elements were crossed with the characteristics needed to support the experience in a program element relationship analysis (Table 4.2). These results are all objective and are subject to change with user input.

Color Ranking for the Program Element Analysis (Table 4.1)

If a program element received a green marking for a characteristic, it means that the program element does require this character. If it received a yellow marking, it is because it is possible the program element could possess this character, but it is not required. The average size listed for each element was collected by Google mapping the name of the program element, selecting three examples at random, calculating the areas of the three, and averaging to get the average

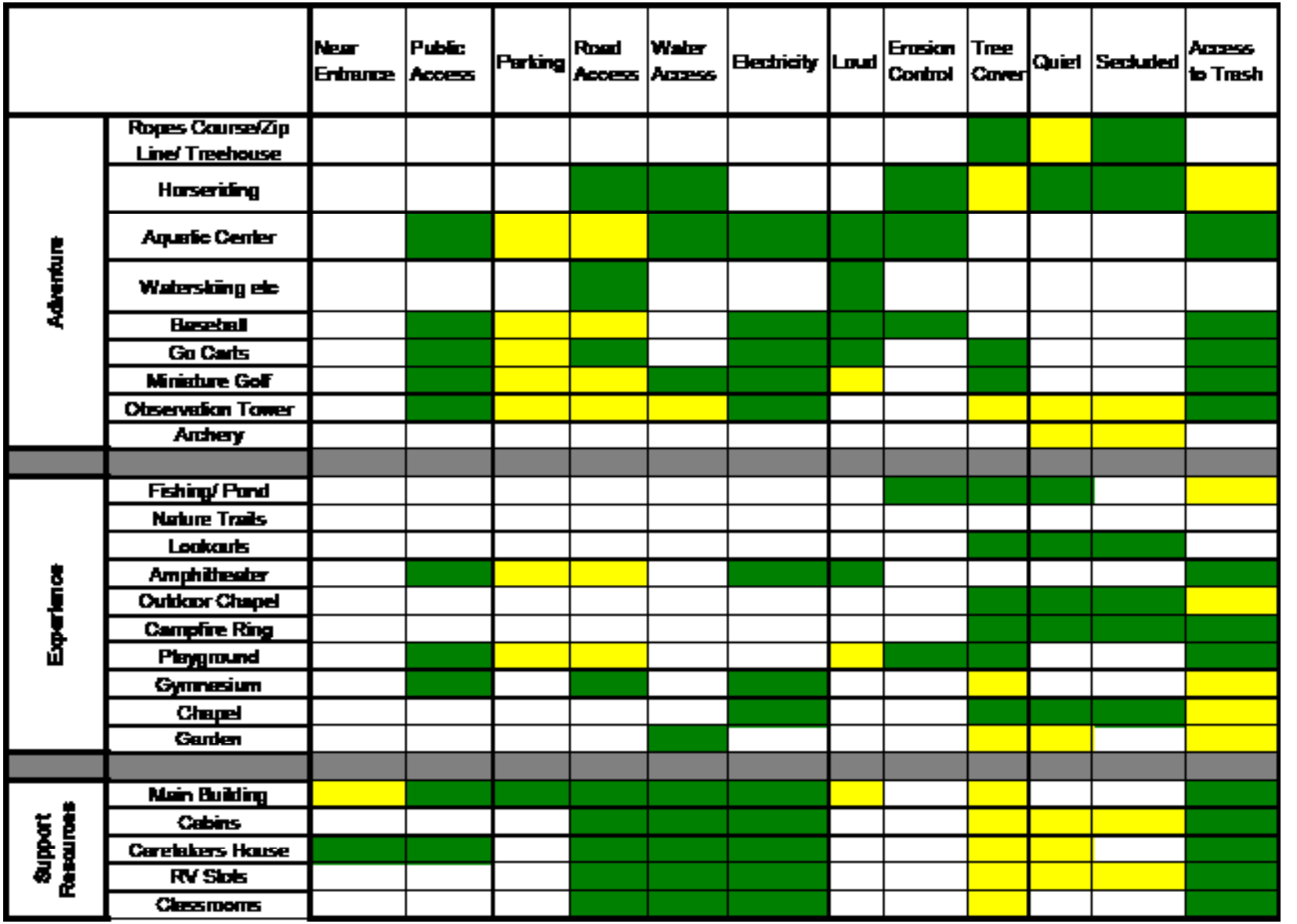

Table 4.1. Program element analysis. (Amanda White)

Slope	Soils	Views	Rock Outcroppings	Average Size
Varied				300'*100
0-2%				150'*150
				250'*250
				30'*15
1-2%	good drainage			150'*150
Varied				150'*350
Varied				150'*250
Varied		Of entire site		25' radius
0-2%		In a Clearing		100'*50
	Good Clay			350'*350
				30'*20
Varied				150'*150
				30'*50
Varied				30' radius
	Good Drainage			30'*40
				120'*80
				30'*50
				30'*30
		Of Entire Site		120'*60
0-2%				16'*30
		Of Entire Site		50'*50
0-2%				55'*25
0-2%				30'*20

Ropes Course	Ropes Course/Zip Line/ Treehouse	x	
	Horseriding	2	
	Aquatic Center	0	loud
	Waterskiing etc	0	loud
	Baseball	0	loud
	Go Carts	2	loud
	Miniature Golf	2	loud
	Observation Tower	3	
	Archery	1.5	
	Fishing/ Pond	1.5	
	Nature Trails		
	Lookouts	2.5	
	Amphitheater	1	loud
	Outdoor Chapel	2.5	
	Campfire Ring	2.5	
	Playground	1	
	Gymnasium	0.5	
	Chapel	2.5	
	Garden	1.5	
	Main Building	0.5	loud
	Cabins	2	
	Caretakers House	1.5	
	RV Slots	2.5	
	Classrooms	0.5	

Table 4.2. Program element relationship analysis. (Amanda White)

size. These qualities are also subject change based on the program element analysis. The program elements were then crossed and compared with each other to determine the commonalities and strengths of relationships.

Numerical Ranking of the Program Element Relationship Analysis (Table 4.2)

If the two program elements have a resultant of the same color (either green and green or a yellow and yellow) in a characteristic column, then one point is given. If the two program elements have an unmatching color result, but it does have some color (green and yellow), then a half point is given. The points are tallied and a final score is given. After the said program element has been compared to all other program elements, a primary ranking is given (green) and secondary rankings are given (yellow). The one quality that cannot co-exist with one another is sound (loud, quiet). If a program element is to be quiet, all program elements determined as loud are ineligible (red) and vice versa.

Relationship Opportunities

I began to search for “clusters” and “barriers” within the program elements. I began taking the relationship analysis and chose the ropes course as the program element to begin with. On the ropes course relationship analysis card, I chose the top ranking element and sketched the relationship the relationship analysis was indicating. In the case of the horse riding corral, it needs a sound buffer and cannot closely related to any other program element, so that is represented with a line between closely relating elements. Figure 4.14 is a sketch of this relationship opportunities analysis.

The relationship opportunity diagram is completely subject to change for several reasons. First, the relationship analysis is completely based on the choices made in the program element analysis. If any of those qualities were to change, it could alter the results of the relationship opportunities. Second, I randomly chose “Ropes Course” to begin with, but the relationship opportunities may look slightly different if another program element was chosen to start with. Third, I objectively chose what I believe is the highest ranking element, and in several instances, there were several elements within close range.

I do believe the relationship opportunities study was rather successful in that I came to an understanding of “zones”: a public zone, a reflective linear path zone, and a support building zone. The bubble diagram may be very conceptual, but when compared to the final result, it was rather similar. This diagram informed layout and connections between program elements.

Suitable Sites and Site Selection

The site inventory was revisited for a critical look at the site provided to the potential program elements. Existing Utilities and History of the Site maps were the most informative. Then critically looking at the areas of the site determined vulnerable, would be considered as ineligible for development of program elements. The best possible location for the individual program element would then need to be compared to the relationship analysis of all the program elements as well as the size and existing slope available.

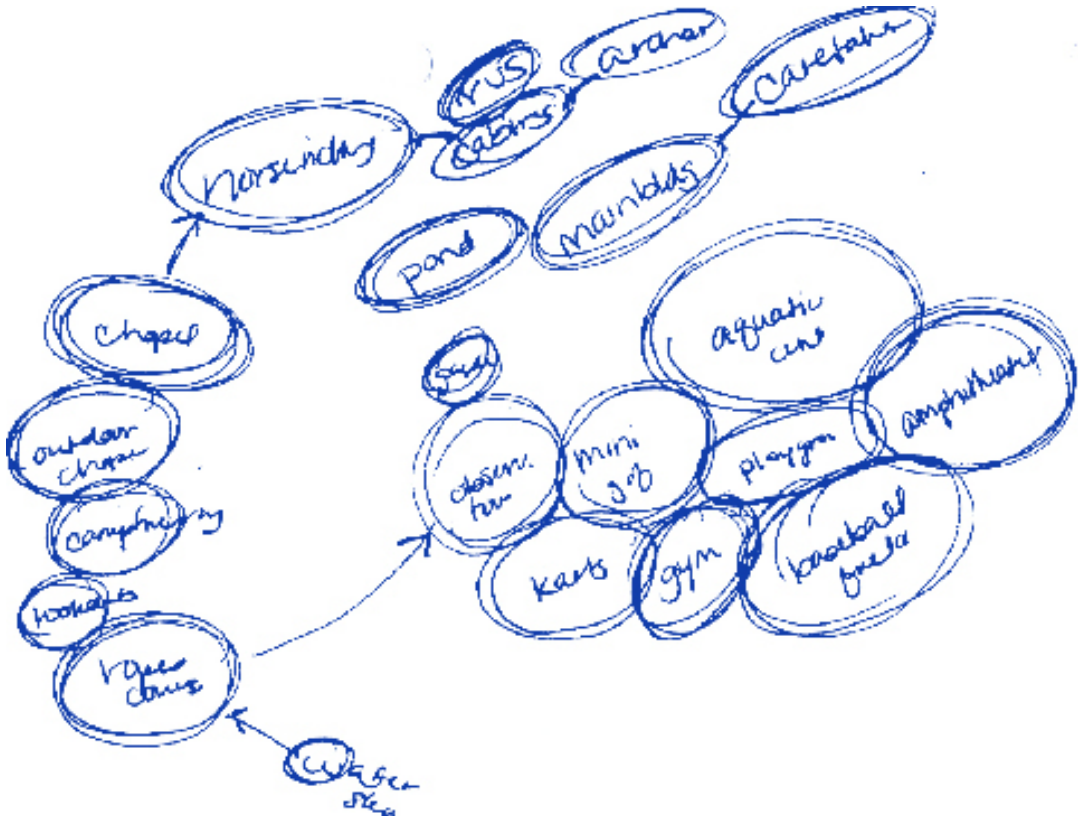

Figure 4.14. Relationship Opportunities diagram sketch. (Amanda White)

Figure 4.15. Illustrative Master Plan. (Amanda White)

Master Plan

General Layout Considerations

The initial reasoning for layout was that of private vs. public access of elements. (Figure 4.16) Many of the elements will be rented out to non-profit organizations or used by the camp for fundraising events. The intent was to keep these public elements near the entrance to limit vehicular access to the overall site, and to keep any wandering visitors out of dangerous or liable situations. The public elements are noted by the green color and the private noted by the yellow.

Another consideration of layout was that of utility needs. (Figure 4.17) The site currently has electricity, but those power lines will be removed up to the entrance of the site and buried. Those elements needing electricity, water, and sewage infrastructure were grouped together to limit the cost of multiple lines. These were also kept near the entrance where the utilities enter the site. Several elements needing electricity which could use solar power are marked on the diagram as well. The cabins near the horse riding facility have toilets that turn any waste into ash. Water will need to be piped down to the horse barn as well.

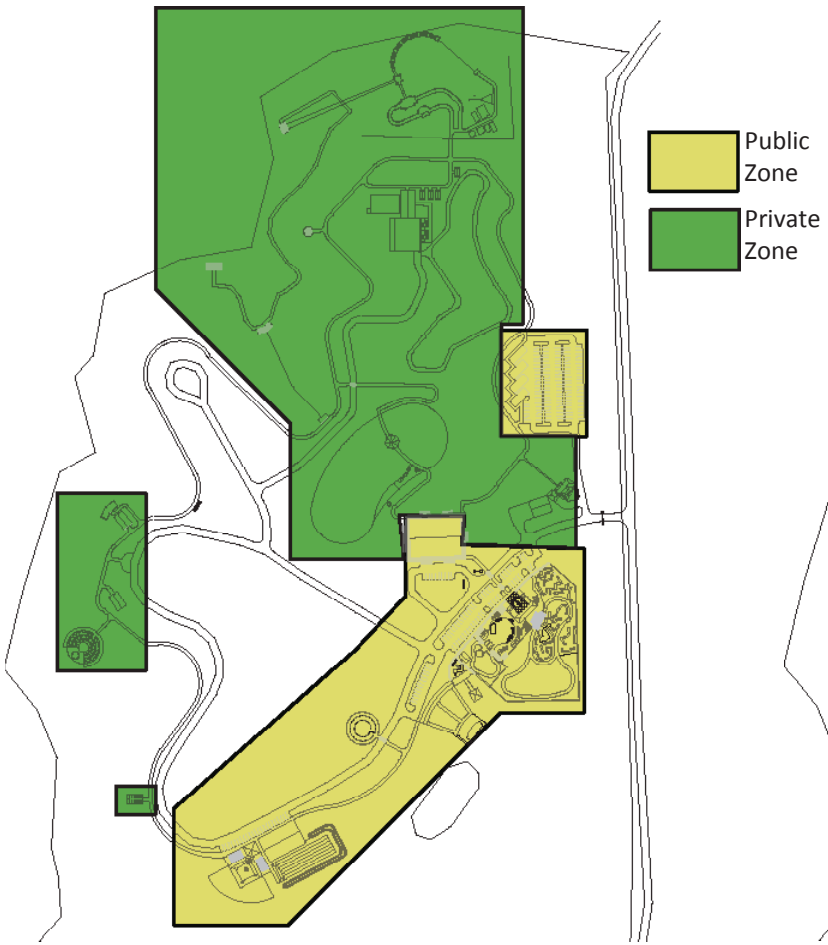

Figure 4.16. Public vs. Private diagram. (Amanda White)

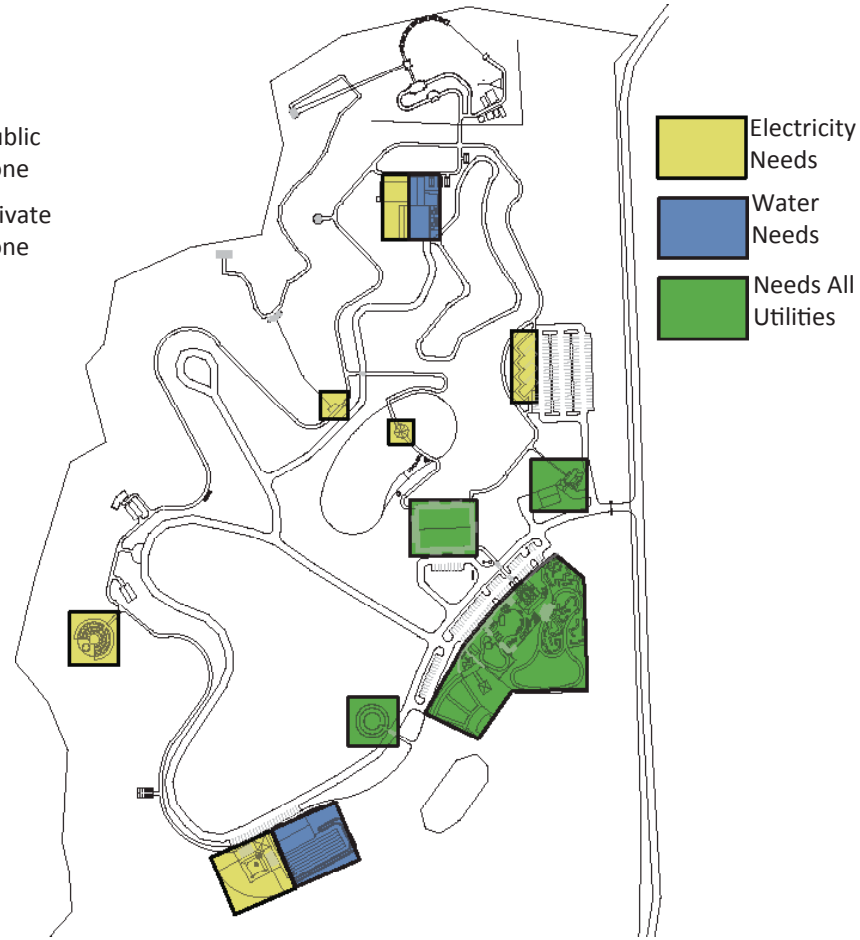

Figure 4.17. Utility needs diagram. (Amanda White)

Figure 4.18. Master plan layout. (Amanda White)

Master Plan Layout

The Main Building (Figures 4.18 & 4.19) is the primary need of the camp to begin holding camp sessions at their new home. A preliminary sketch of the building layout is located in Appendix E. The building will hold a giant main room, allowing for a plethora of activities. It also houses the dorms for the men and women campers and counselors and rooms for senior staff members as well. It houses a fully equipped commercial kitchen and a large dining room. There are several additional rooms for an office and storage. The building is to be of a log appearance with native stone columns. A wrap around deck completes the exterior. The deck is covered as well and has several areas that extend out for viewing. The Main Building needs great views as well as visual access of the entire site. It is be near the entrance for ease of access. Loading areas have been allotted for vans with ramps as well. Parking for those who are arriving to camp is available. The Main Building truly is the hub of camp with all systems linking into it.

The miniature golf and go-kart elements have been grouped into one facility, joint to the pool complex (Figures 4.18 & 4.20). The overall theme for the complex is "Around America". The go-kart track is looped into the golf course, with the track sunken to ensure safety of the drivers. Imagery and themed development would tie the theme into the program as well as add visual excitement. The golf course is a 18-hole course with challenges and full accessibility. The go-kart track has two loop options, allowing for the choice of long or short drive. The go-karts are specialized karts run optionally by use of a joystick similar to a wheelchairs operation. The karts are two-person so that counselors can assist and enjoy the ride.

The sports complex includes three program elements: a gymnasium, archery, and a baseball field (Figures 4.18 & 4.21). The gymnasium has been sized for a basketball court and a set of bleachers on each side, two classrooms, and equipment storage. Possible classes, such as turbo kick, could be taught inside the classrooms. The archery ring is sized for six lanes of targets. The shooting area is covered to shade participants. The distance to the targets is based off the requirement for women's archery lanes. For a backstop, a 6' berm surrounds the area. The baseball field is sized to the dimensions provided by the National Wheelchair Softball Association. A full field has been suggested, equipped with an announcer's box, concessions and plenty of bleachers for those cheering on the game. Parking has been allotted for the sports complex as the facilities may be rented out as well.

The reflective zone includes the outdoor chapel, the campfire ring, the health lodge, the chapel, and the picnic area (Figures 4.18 & 4.23). The outdoor chapel was sited to set against the sunset.

Figure 4.19. Main building. (Amanda White)

Figure 4.20. Miniature golf/ Go-kart complex. (Amanda White)

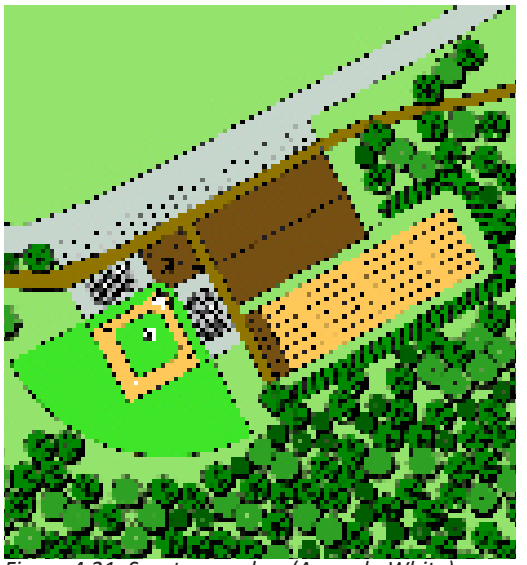

Figure 4.21. Sports complex. (Amanda White)

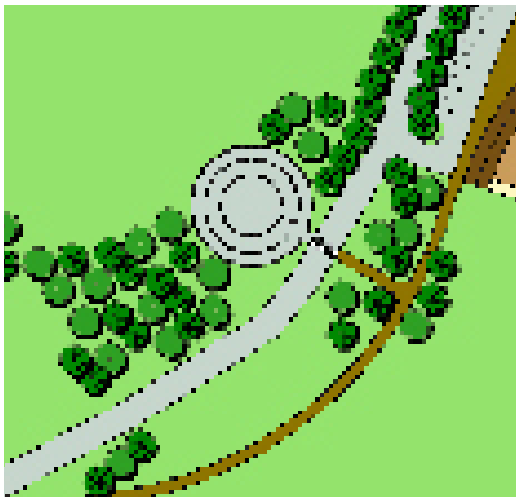

Figure 4.22. Observation tower. (Amanda White)

Figure 4.23. Reflective zone. (Amanda White)

It is an open air chapel with the pulpit being slightly covered. Rows of moveable benches are available whether the participants are in a wheelchair or not. The pulpit is backed by a natural dry-laid limestone wall affixed with a large dark stained wooden cross. The health lodge is set where an existing building pad sits. It lies just off the road and near the 'reflective zone' plaza. The 'reflective zone' plaza is a drop off point for the wheelchair trailer to bring campers and counselors down for campfire or quest, a bible-study like class for the campers. The plaza will serve those waiting for a ride, or those just getting to the reflective zone. The plaza connects into the nature trail and is a short walk to all 'reflective zone' program elements. The chapel is the next building, located at the old water treatment building pad. It is a small white chapel, traditional in style and use. An overlook deck is just behind the chapel, fixed between two great white ash trees, oriented to the sunset. The trees in front of the overlook deck have been selectively trimmed to frame the view of the lake and sky. The picnic area is five tables with moveable benches, allowing wheelchairs to roll up to the tables.

The observation tower doubles as a weather center as well (Figures 4.18 & 4.22). The two story, castle turret-like structure is home to a local weather station's Doppler and together the station and the camp have created a 'weather station'. Measurements

can be taken here as well as viewing cloud formations. Educational information covers the walls teaching all about weather patterns and formations. A ramp wraps the building up to the observation deck. Through the cutouts, visitors can see all of the lake, the camp, and surrounding areas. The observation tower was sited to the highest point on the site for these viewing purposes.

A cable lift is located off the nature trail and can transport campers down to the boardwalk and eventually the dock (Figures 4.18 & 4.24). The dock has been located inside a cove to allow for boat rides and waterskiing. The boardwalk wraps around to the zip line platform. A fence and gate cross the boardwalk in appropriate locations to keep trespassers off of the site for liability and security purposes. The boardwalk is located approximately 15' above water level.

A large parking lot was designed for counselors during camp, but to also fit large groups renting facilities or attending fundraising events (Figures 4.18 & 4.25). Four RV hookup locations have been designated. The nature trail sweeps by the parking lot picking up pedestrians and taking them to the Main building. The caretaker's house as been located near the entrance to the site, just past the entrance gate. The caretaker's house also connects into the nature trail system. The caretaker's house is also adjacent to the shed, which contains all of the golf carts and camp equipment.

Figure 4.25. Cable lift & dock. (Amanda White)

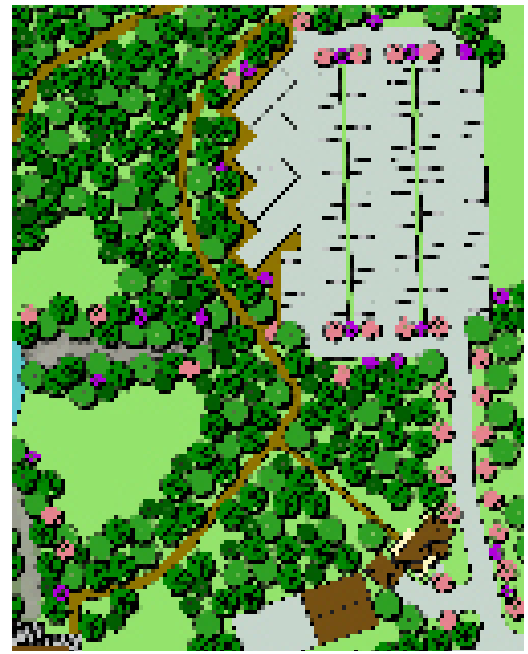

Figure 4.26. Caretakers home & parking. (Amanda White)

Identity Features

Several design elements pull the entire camp program together. The first element is the nature trail. It is important to note that this is the primary circulation of the camp and not the roads. Signage that is easy to read and understand is important to successfully give direction. Another element is the use of wood. From the building materials, to the nature trail and boardwalks, the wood will be a unifying material as well as help give theme to the 'wild west adventure' the camp is portraying. Another material, the native limestone is the alternate to the wood and the third element to the identity of the camp. Together the three design elements tie all program elements together and create a unifying theme across the site.

Individual Program Elements

Aquatic Center

The aquatic center was selected as one of the seven program elements to receive in-depth study for several reasons: it is one of the camper's favorites, there are many forms of adaptation to apply, and it can be used as a leasing portion of the camp. The camp directors provided a rather loaded scope for the aquatic center. The aquatic center is to include a zero-depth entry, lazy river, slides, a splash pad, and pool toys. In past pool experiences, issues concerning the wheelchairs came about. The counselors would have to bring extra towels to cover the wheelchair seats, as they tend to absorb heat, and if a camper with lost sensation sits on that seat, they may get a severe burn without even knowing it. Water and power wheelchairs should not be in close proximity for safety of the battery and power controls. In past situations, the camper was transferred to a manual chair or a specialized pool chair composed of PVC pipe and mesh netting. The manual chair or the special pool chair would then slowly proceeding down a ramp into the pool, where the camper would then float out of the chair when in deep enough. Another option for transferring the camper into the pool is to have a two-person lift from the side of the pool into a person and an inner tube waiting in the pool. This method tends to have more potential for error and accidents.

Figure 4.26. "Water experience" wordle diagram. (Adapted from Wordle.com)

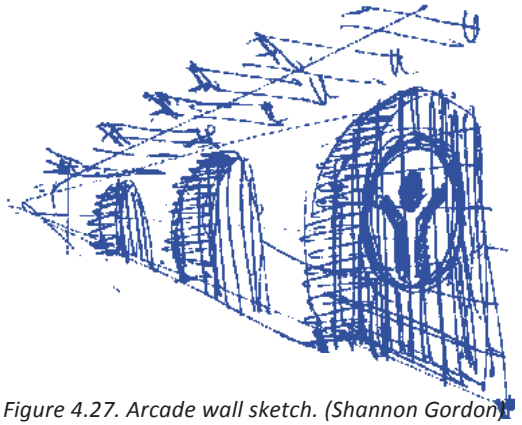

Figure 4.27. Arcade wall sketch. (Shannon Gordon)

User Input

Survey

The one question asked during the survey that could pertain to the pool was "What does a water experience mean to you?" Keywords illustrated in the "Wordle" diagram are water, swimming, pool, swim, chairs and beach (Figure 4.26). Some of the descriptive responses included use of water toys, sprinklers, splash pads, white water rafting, water balloons, slides, music, beach environment, and wheelchair storage.

Charrette

The conceptual design brought to the second charrette was rather comprehensive of the director's vision and the survey responses. One camper did make the suggestion of being able to push a button while sitting in one of the cabanas, and one of the pool toys dumps on an unexpecting victim. A staff member suggested that the surrounding wall, while tall enough for insurance purposes could be more interesting than just a wall. Shannon Gordon then sketched up an iron gated arcade revealing the Camp Adventure Icon (Figure 4.27). A senior staff member

mentioned the importance of the pump house location and suggested placing it hidden from the lazy river in the vegetation, near the wall, incase of flooding or the need for emergency drainage. The general comment was that the aquatic center needed more shade, especially considering the sensitive skin of most campers. One suggestion was to have an entire area of the pool covered by some structure.

Process

The Individual Program Element Needs diagram (Figure 4.28), as described earlier, illustrates the needed and desired features and qualities of the aquatic center. The 'dynamic features needed' are best wrapped up in the theme of "The Lost Springs". Originally dubbed "Cabo Cabana", the aquatic center is full of lush vegetation, color, and activities. The items needed to support this theme is a curvy, natural shape, imitating a natural spring; a long gracious curving lazy river; cabanas to provide relief from the hot sun; a splash pad, allowing wheelchairs to run over the jets; slides wide enough to allow a camper and counselors to slide together down; pool toys that allow interactive play between pool participants and participants in adjacent cabanas; areas designed for layout with comfortable chairs; lounge chairs built into the pool near the zero entrance; tables with moveable seating to allow a number of wheelchairs to pull up to eat/drink; bright colors to create an exciting environment; music system and speakers built throughout the pool and lazy river area; and a concessions and restroom facility.

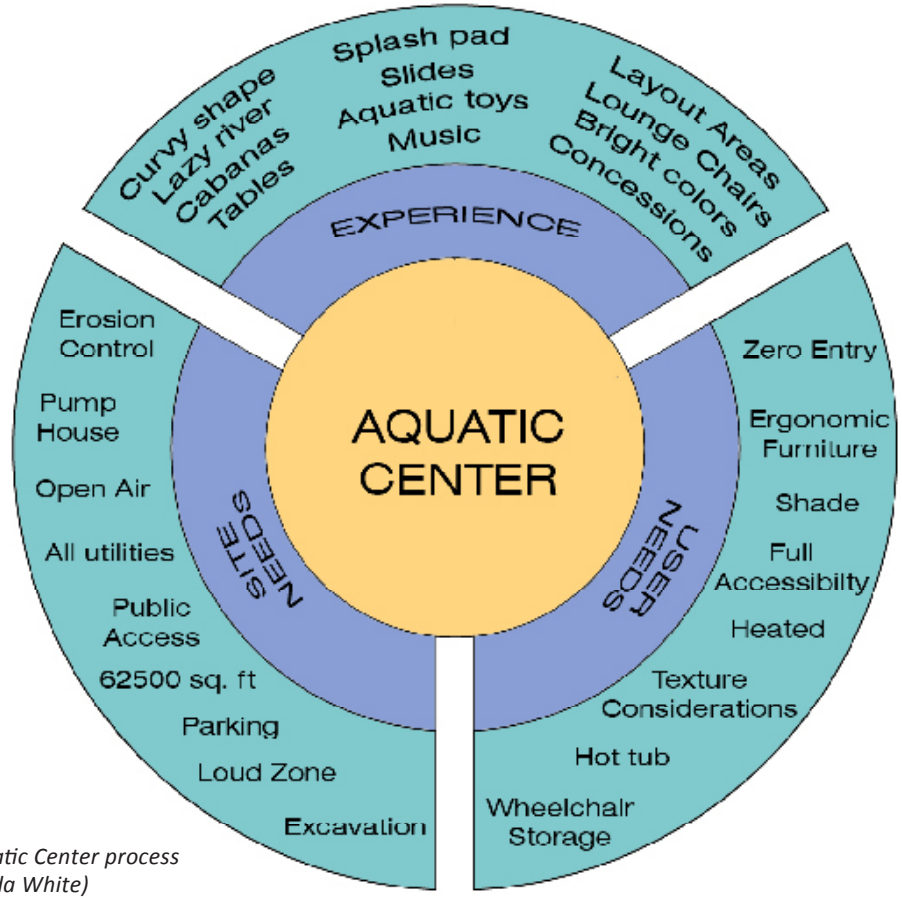

Figure 4.28. Aquatic Center process diagram. (Amanda White)

The 'user needs' involved in the design of the aquatic center include a hot tub for muscle relaxation for the campers should be large enough for several campers and their counselors. It should be built into the ground to ease transfers. There should be zero entry pool to allow for easy access into the pool and a wheelchair storage facility, where once in the aquatic center campers can be transferred into a special pool chair and their chair is stored in a shaded safe area away from water activities. The use of shade structures, whether they are umbrellas or a large shade structure, needs to be involved in the pool area. Full accessibility, texture considerations of materials to ensure the chairs will not slip along the pool as well as detectable paving in appropriate location are needed as well. Heated pool water is important as those with cerebral palsy may experience spasms with cold water. The use of ergonomic considered furniture is important as typical furniture isn't conducive to their bodies.

Figure 4.29. Lazy river example. (See List of Figures)

Figure 4.30. Lazy river example. (See List of Figures)

Figure 4.31. Site furnishings example. (See List of Figures)

Figure 4.32. Site furnishings example. (See List of Figures)

Figure 4.33. Splash pad example. (See List of Figures)

Figure 4.34. Zero entry example. (See List of Figures)

Figure 4.35. Aquatic toys example. (See List of Figures)

Figure 4.36. Slide example. (See List of Figures)

The ‘site needs’involved in the design of the aquatic center include erosion control to ensure clean water; a pump house to allow pool filtration; excavatable soils as the pool and lazy river will need to be dug out; open air to the sun and cool breezes; full line of utilities including electricity, water, and sewage; public access as they plan to rent the facilities out to non-profit organizations; parking for visitors; located in the loud zone as it is determined to be one of the noisiest activities; and approximately 62,500 square feet should be reserved for the aquatic center.

Examples

The example pictures collected for the charrette were categorized into six categories: lazy river (Figures 4.29 & 4.30), slides (Figures 4.36), site furnishings (Figures 4.31 & 4.32), zero entry and splash pads (figures 4.33 & 4.34), architectural styles and aquatic toys (Figure 4.35). The images to the left illustrate the desired character.

Design

The pool is grouped with the miniature golf and go-kart facilities as well. The entrance plaza serves all three facilities (Figures 4.37 & 4.38). The building that lies straight ahead as one enters the plaza is the concessions building. It is where admission and concession snacks and drinks can be purchased. This building services the plaza as

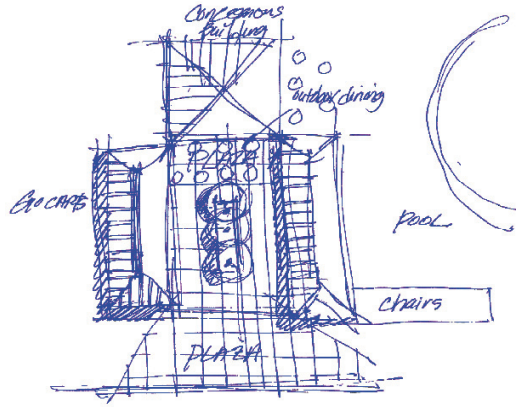

Figure 4.37. Preliminary entrance plaza sketch. (Shannon Gordon)

Figure 4.38. Aquatic Center/ Miniature golf/ Go-kart complex entrance plaza perspective. (Amanda White)

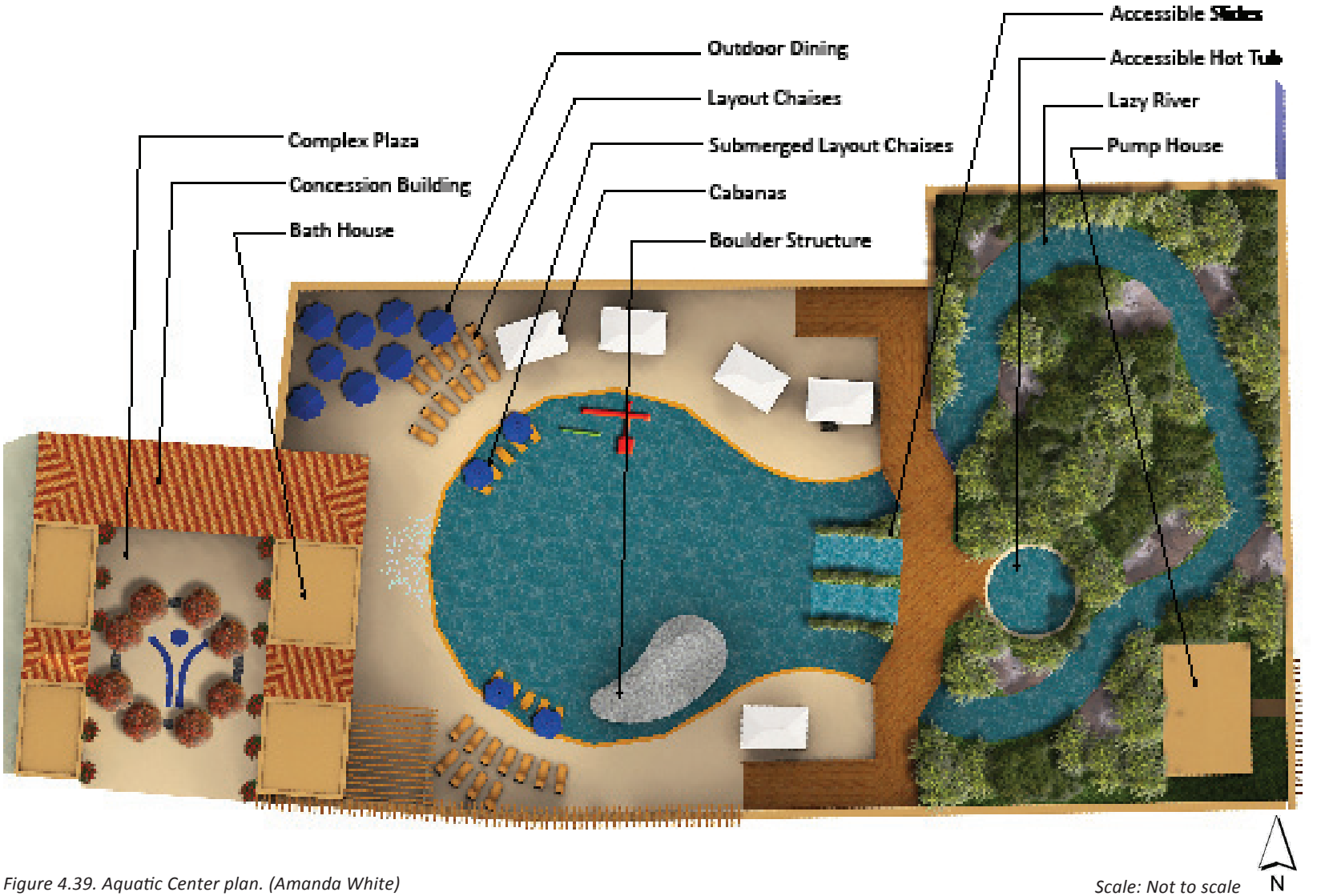

Figure 4.39. Aquatic Center plan. (Amanda White)

Scale: Not to scale

well as the dining areas of the pool and the miniature golf/go-kart complex. The building to the right of the concessions building is the bath house. The center of the building is an entrance hall which feeds into the two bath houses, one for men one for women. The dimensions of the bath houses were determined by ADA spatial standards for six showers, six rest rooms and six sinks in each bath house.

Once inside the pool complex (Figure 4.39), a camper would need to be transferred into a designated pool chair (made of PVC and mesh netting), and their wheelchair would be put in the storage area under the trellis. The camper may then decide to go to the splash pad near the entrance of the pool. The splash pad is not always on, but is set to a synchronized rhythm system, often playing with the music. The pool is zero entry, allowing the campers to roll into the pool with ease. The bottom depth at the center is four feet. They may choose to lay down on a chaise lounge outside the pool or take a chaise chair in the shallow end of the pool. This allows campers who do not wish to fully immerse to sit in the shallow end and have the water rush along their fingers and legs (Figure 3.40). Umbrella hookups are available along the chaise chairs. This allows the choice of shade or not. The umbrella hookups are a lock system built into the bottom of the pool, and when the umbrella pole slips in, the system locks. Being built into the bottom of the pool, chairs and feet can walk or roll right over the hookups without disturbance.

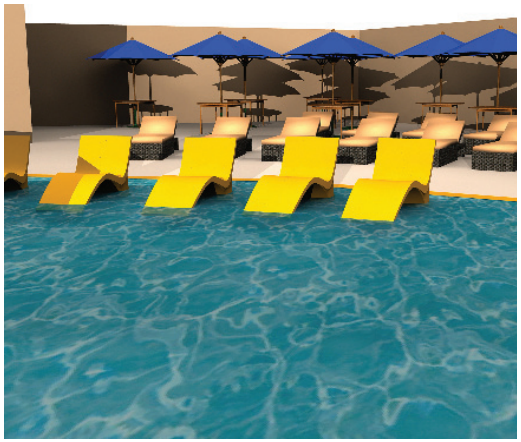

Figure 4.40. In-water chaise lounges. (Amanda White)

There are several cabanas lining the edge of the pool. This is to allow campers and counselors to gather in shade and visit outside of the water. Two of the cabanas close to the aquatic toy center have controls that allow for interaction with those playing in the aquatic toy center. The cabana's form take on a natural stone look, but are softened by a loose linen cover and siding. The aquatic toy center has a variety of toys; from toys that spray, to those that dump, to those that bubble. The controls are at a height of the pool chairs reach. On the opposite side of the pool is a large boulder structure. It is similar to an open cave, water trickles over the openings misting those below. The boulder offers a moment of heat relief and adds character to the "lost springs".

There are ramps on each side of the pool, leading up to the mountain of rock and vegetation. The ramps bridge over the lazy river up to a level of the slide entrance (Figure 4.42). The slides are wide enough for a camper to slide with a counselor on each side. Opposite of the slides is an in ground hot tub. It is surrounded by lush vegetation and is a relaxing environment (Figure 4.43. The lazy river cycle begins near the bottom of the slide and gently flows around to the other side of the slides. The lazy river is ten feet wide, again allowing a camper to float with a counselor on each side. The lazy river is characterized by its surroundings of native rock and lush green

Figure 4.41. Aquatic Center perspective. (Amanda White)

vegetation. The lazy river's environment is truly reflective of a lush springs setting.

A ten foot high stucco wall surrounds the entire pool complex. However, an arcade cutout allows for those outside to view the excitement inside. Decorative wrought iron fencing, displaying the Camp Adventure icon, decorate the arcade cutouts, and natural wood forms a trellis look overhead. Green vines wrap along the iron and wood softening the harsh western aesthetics. The pump house is located in a hidden area near the surrounding wall to the south.

Figure 4.42. Lazy river. (Amanda White)

Figure 4.43.Barn sketch. (Amanda White)

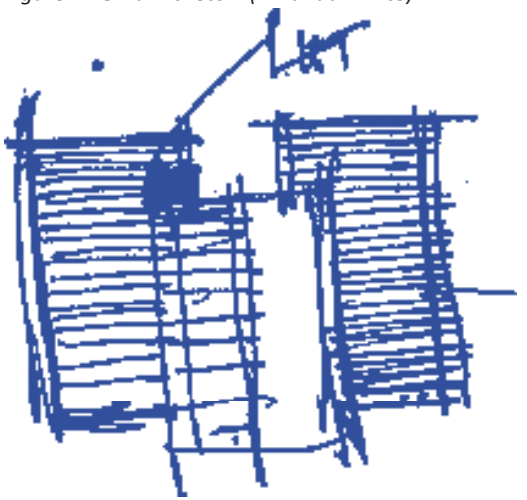

Figure 4.44.Loading dock sketch. (Shannon Gordon)

Figure 4.45.Barn sketch. (Shannon Gordon)

Horse Riding Corral

Horse riding is a camper favorite. The camp has only been able to host a riding program a few times due to facilities approval and extreme summer heat. The direction given from the camp directors is that the facility is to house horses only when the program is in session. The horse riding corral was chosen as a select program element for several reasons: it is a camper favorite and camp directors would like to implement the facility and program into camp activities as soon as possible; the materials for the facility are readily donated, therefore construction could commence quickly; and the adaptation to the loading docks will need special design considerations.

User Input

Survey

The one question asked during the survey that was directed at horse riding was “Do you ride horses. If so, how is horse riding therapeutic to you?” Thirteen people said they rode horses before and enjoyed it, and one person said they do not ride anymore. Participants commented that horse riding was therapeutic in that it relieved stress, improves balance, increases independence, communication, and is very calming. One person described riding a horse as feeling “like I’m walking because I’m high enough to see scenery, but I’m not putting any effort into it”. To someone who cannot walk, that must be a very empowering experience.

Charrette

I had come up with example images and a conceptual loading dock layout. The loading dock was based on Camp Barnabas’ dock and suggestions. There was very little input on the horse riding facilities at the charrettes. However, one person suggested that the loading dock would be more effective in enabling campers to assist with transfers or loading on the horses if the deck had a hydraulic lift (Figure 4.44). This was determined as probably too expensive for the actual need, but if the need was increased could be an option.

Horses of Hope Input

I contacted the Horses of Hope program, out of Baxter Springs, Kansas. The group has conducted a therapeutic riding program with Camp Adventure in the past when the facilities allowed. It is intended that the facilities at Camp Adventure will be a satellite program facility for the Horses of

Hope program. They will bring their trained horses to the facility during the sessions requiring a riding program, and they will actively run the program. This group met with me on February 23, 2010 to discuss the conceptual design and considerations they would recommend. In terms of the arena they suggested a size of 80'x100'. The fence around the arena would need to be 4' tall and have a smooth finish to the inside of the arena to prevent injury. This means the post of the fence is on the outside, unable to snag a rider.

They had many suggestions for the loading docks. They suggested that the loading dock be set at 30" and transfers only occur on one side of the dock. They suggested having two docks instead of one. The also advised having the loading docks separated from the arena, to control any issues with a horse.

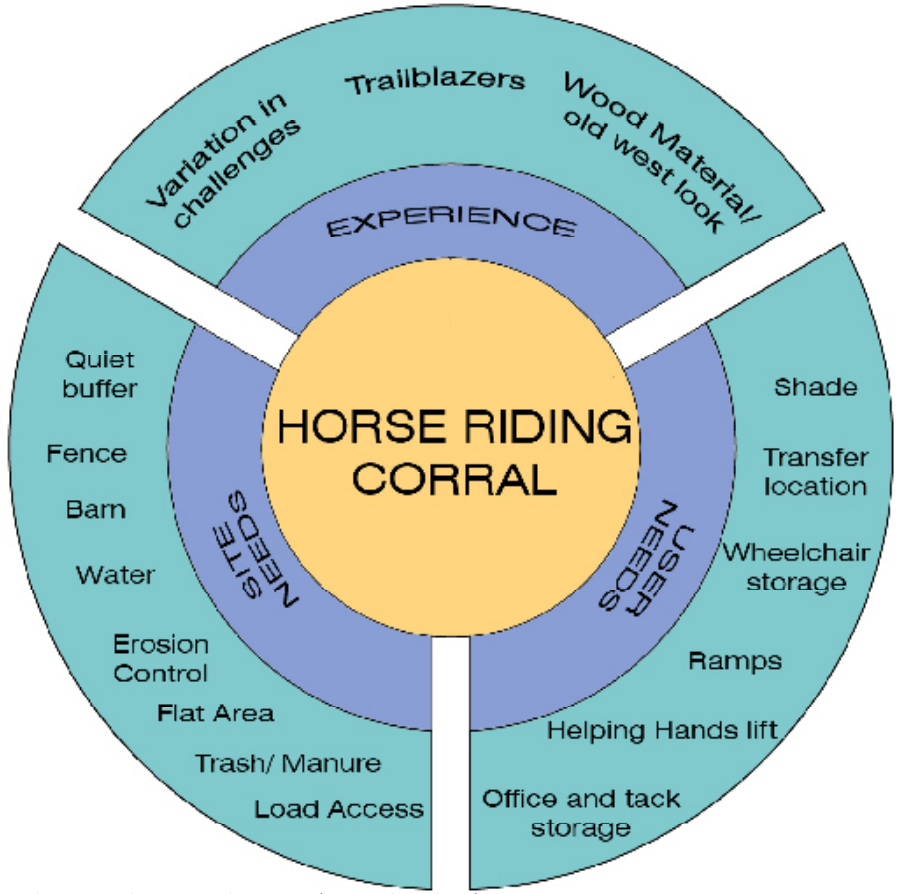

Figure 4.46. Horse riding corral process diagram. (Amanda White)

Horses of Hope suggested having six to eight horse stalls of 15'x15'. In the barn, there would also need to be an office and a tack storage room of similar size. A release pen of 60'x90' is also required. All water for the horses could be piped down and feeding would be done in the stalls and release pen. They suggested that an area be designated for daily manure. Every two days, the manure would need to be removed and/or spread somewhere on site.

Horses of Hope's biggest suggestion, from past experience with Camp Adventure, is that the arena and loading docks be covered. An open air covered arena would allow the riding program to continue despite rain. The trails would need to be 10'-12' wide with no more than a 5% slope. They advised a riding trail length between a ¼ mile and ½ mile.

Process

The Individual Program Element Needs diagram (Figure 4.46), as described earlier, represents the needed and desired features of the horse riding facility. The dynamic features needed are best wrapped up in the theme of "Trailblazers". The items needed to support this theme include: variation in trail experiences; challenges along the trail; and old west themed architectural features. The 'user needs' include: covered area for loading dock for those staff who would be running the program all day; a transfer location for the campers to the horses including a custom loading dock, shaded

wheelchair storage during their ride, and a hoyier lift or helping hands lift to aid in difficult lifts. The 'site needs' include: a quiet buffer of at least 50' to avoid spooking the horses; fence to contain horses; barn to house horses; water piped to the barn; erosion control elements so that the footing is not washed out and that contaminates are not washed into water supplies; road access to allow horse trailers to reach the barn; flat area for the riding arena, loading docks, barn and release pen.

Figure 4.47. Fence example. (See List of Figures)

Figure 4.48. Barn example. (See List of Figures)

Figure 4.49. Trail example. (See List of Figures)

Figure 4.50. Trail example. (See List of Figures)

Examples

The example pictures collected for the charrette were categorized into three categories: fencing, barn styles, and riding experience. The following images (Figures 4.47- 4.50) illustrate the desired character.

Design

A new road has been implemented connecting the Eagle Point Road to the riding arena (Figure 4.51). The road follows the existing slope around for ease of hauling a horse trailer. The riding arena is 100'x80'. It should have 4"-6" of recycled rubber footing. There is a four foot fence around the perimeter of the arena with the posts being on the outside. There is a watch area with benches to the west of the arena. Adjacent to the east edge of the arena are two covered loading docks (Figures 4.52, 4.53, & 4.54). The docks have a 8.33% sloped ramp up to the loading dock at 30" high. The ramps are 5' wide with railing, and the dock is 10'x10'. There is a gap from the loading dock to the staff dock of 3' for the horse to stand. The staff dock is against the arena railing and is 10'x5'. Each loading dock is a separate

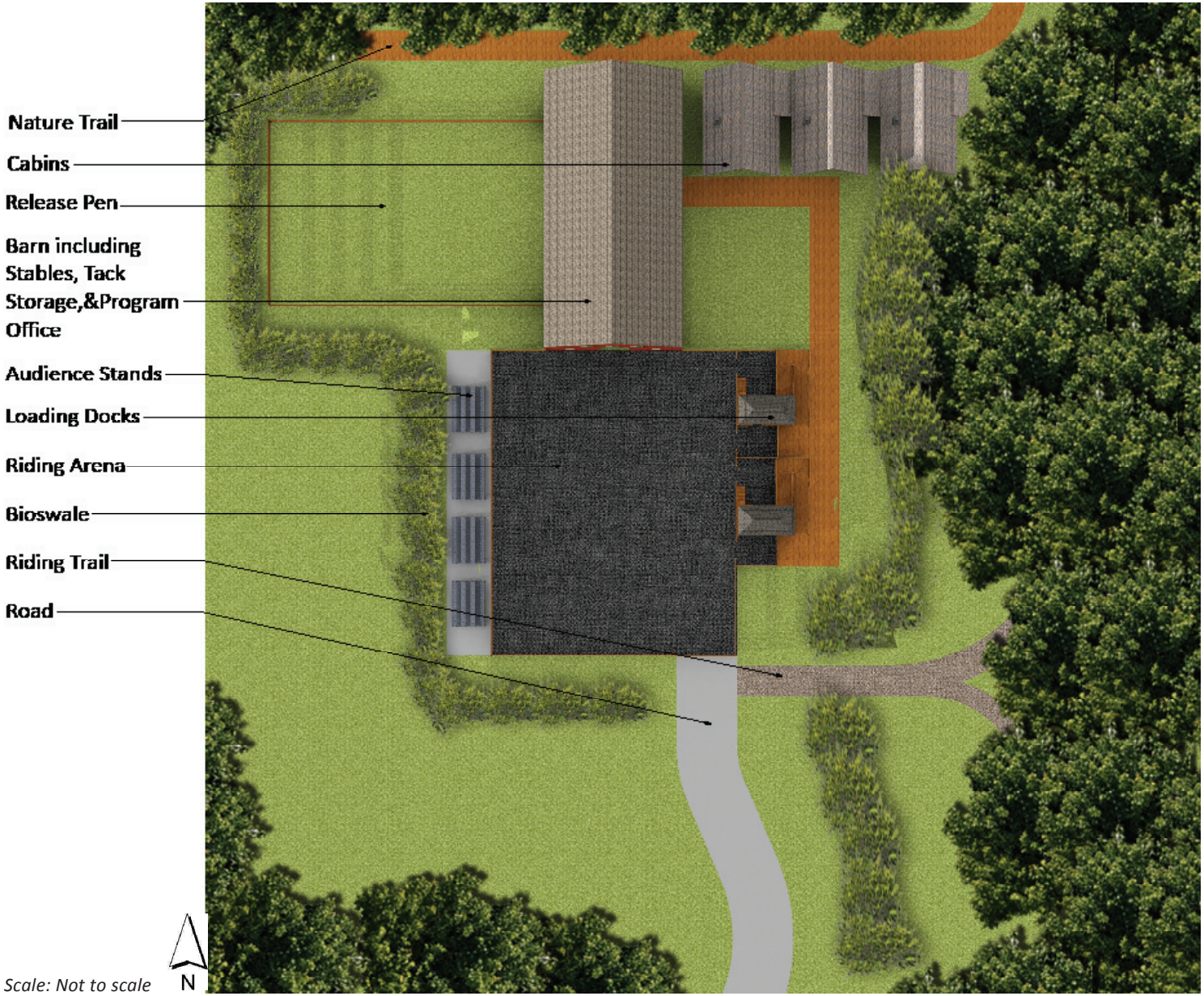

Figure 4.51. Horse riding facility plan. (Amanda White)

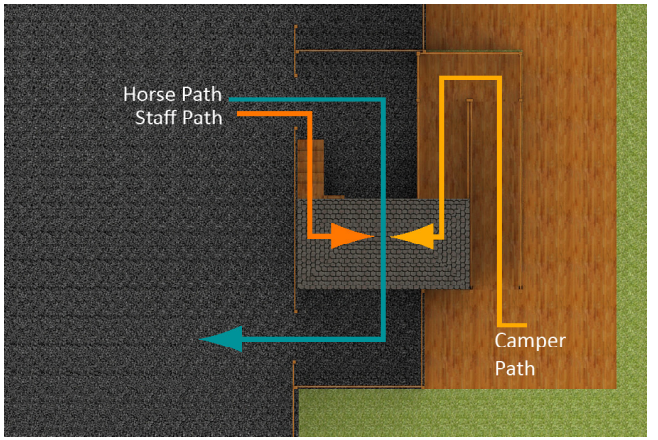

Figure 4.52. Loading dock plan. (Amanda White)

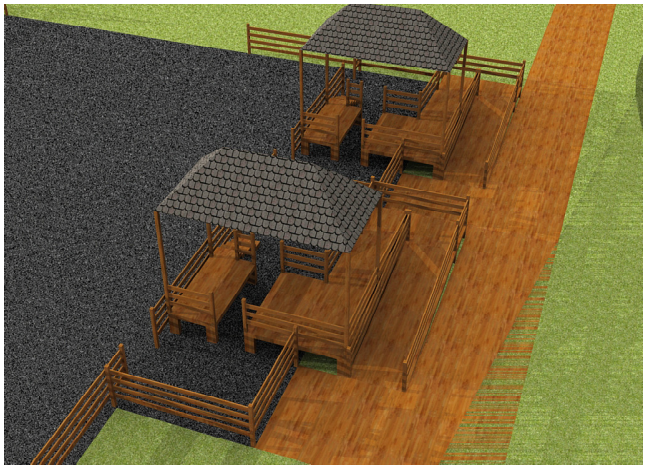

Figure 4.53. Loading dock. (Amanda White)

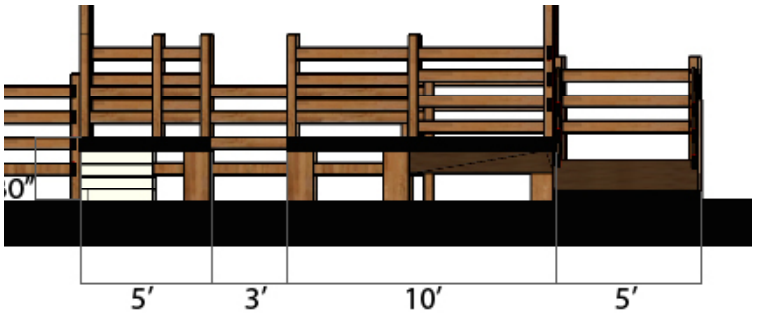

Figure 4.54. Loading section. (Amanda White)

area to better control the horse and loading situation. There is a gate into the loading dock pen, as well as gate out back into the arena. This configuration is the best method to minimize risk of accidents concerning transfers. There is ample room for wheelchair storage.

The camper, once transferred to the horse will take a few laps around the arena before exiting the arena at the road gate and taking the trail. The trail is 10' wide and is a ¼ mile length. The greatest slope should be no more than 5%. The loop of the trail was kept inside the nature trail to ensure the safety of the horse and rider. Pedestrians, golf carts, and emergency trucks will be on the nature trail, and therefore should be kept away from the horse's path. The trail loops back around to the road gate where the rider would ride back into a loading dock pen and transfer off. For difficult transfers, a helping hands lift (xx) has been attached to the covered loading dock.

The barn has 8 horse stalls, an office, and a tack storage room, all 15'x15'. A release pen exits to the west of the barn and is 60'x90' (Figure 4.55). A path out the east side of the barn takes pedestrians to the nature trail to exit the facility, as well as the staff to their designated cabins. As the staff would need to remain on site each night for safety of the horses, three cabins have been allotted for their use. These cabins are meant to be energy efficient as they run off of solar power and the sewage is combustible ash.

Figure 4.55. Horse riding facility. (Amanda White)

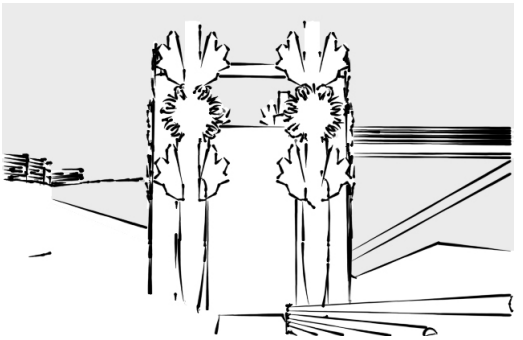

Figure 4.56. Climbing wall sketch. (Amanda White)

High Ropes Course

The ropes course is a new program activity to Camp Adventure. Some campers have attended other camps, and the zip line ranks very highly as a favorite. The camp wants to host a challenge course provider as a satellite program. The reason for choosing the ropes course as part of the select program element design is that it will take considerable adaptation to fit the needs of the campers.

User Input

Survey

No questions pertaining to the design of the ropes course were asked in the survey.

Charrette

There were no major suggestions regarding the ropes course design were made at the charrettes.

Challenge Options Input

I met with Challenge Options, or Charles and Christie Peterson, on February 23, 2010 to discuss the design of the high ropes course. This feature is such a specialized activity, I knew I needed to consult a specialist. The company operates out of Oskalossa, Kansas, a neighboring town to Ozawkie, home of Camp Adventure. Challenge Options works thorughout the country implementing ropes course structures and training those who will run the programs. It is the goal of Camp Adventure that Challenge Options operates a satellite training facility out of their camp facility. This option will allow the camp to have a portion of the construction discounted, and Challenge Options will have a facility that illustrates their facility design and construction talents as well as their program and training skills.

Challenge Options has never constructed a program strictly for the disabled. Typical adaptations are referred to as 'universal design'. Because they need the structure to work as a piece for training able bodied persons, we arrived at the decision of a 'three track approach'. One track is designed for wheelchair bound participants, one for those physically disabled with some upper body abilities, and one for those who are not disabled. After a visit to the site the site inventory and the camp directors indicated as the potential area for the high ropes course, Challenge Options put together a conceptual layout of structures and challenges (Figures 4.60 & 4.61). Although my design work is based on experiential value of the element, I illustrate the options

and adaptations made to fit the camper's needs. A further study would need to be done by Challenge Options to determine actual heights, sizes, and lengths of all elements.

Process

The Individual Program Element Needs diagram (Figure 4.57), as described earlier, represents the needed and desired features of the ropes course. The 'dynamic features needed' are best wrapped up in the theme of "Indiana Jones Indian Adventure". The items needed to support this theme include: temple-like structure decorated with carvings and totem poles; zip line adventure; options of paths or challenges; overlook area to watch others during challenges. The 'user needs' include: accessible challenge paths; pulley for climbing wall; railings and pedal stops for wheelchairs; and detectable paving. The 'site needs' include: tree cover; located in the quiet zone; fenced area for insurance purposes; varied slope to aid in zip line feature.

Examples

The example pictures collected for the charrette illustrated the character and experience (Figures 4.58 & 4.59). The following images illustrate the desired character.

Design

The high ropes course is set deep in the

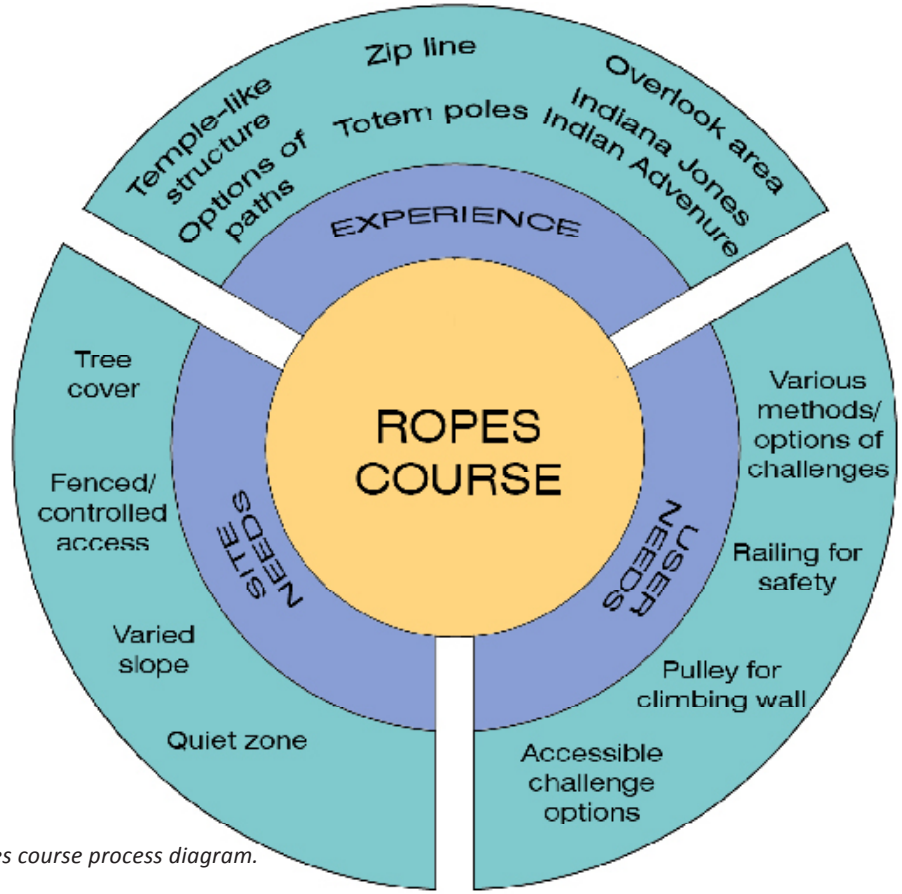

Figure 4.57. Ropes course process diagram. (Amanda White)

Figure 4.58. Theme example. (See List of Figures)

Figure 4.59. Challenge example. (See List of Figures)

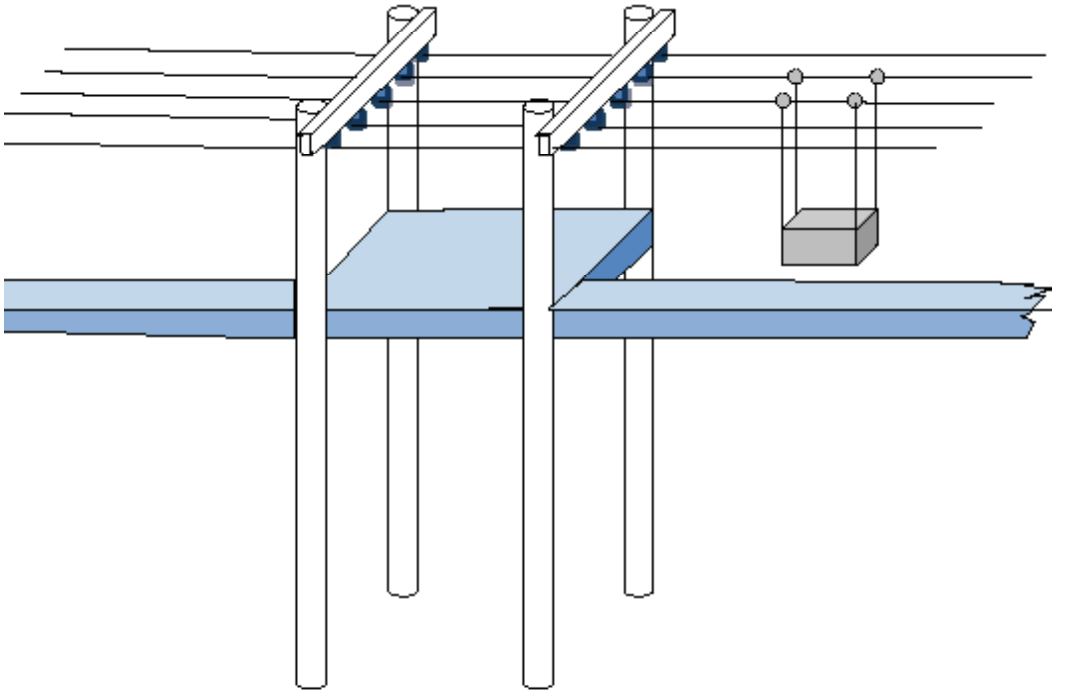

Figure 4.60. Multi-track challenge options solution. (Challenge Options)

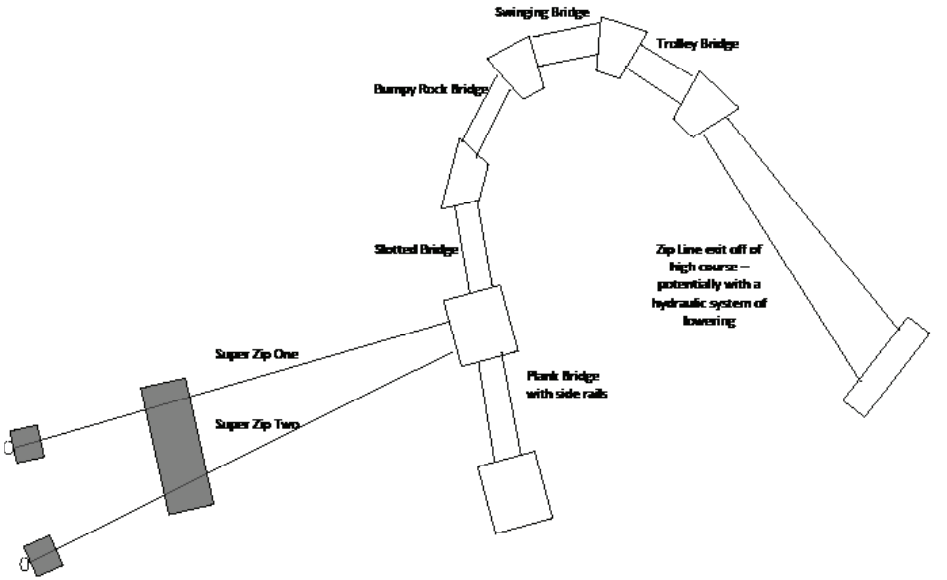

Figure 4.61. Challenge course plan. (Challenge Options)

woods. A small marked path juts off of the nature trail. A path to the low ropes course takes campers to the east. The trail follows around to a large wall engraved with Indian symbols (Figure 4.62). The plaza in front of the wall is the overlook area. Campers have a chance to watch their friends climb the 30' climbing wall and cheer them on. The climbing wall is also engraved with Indian symbols, deep enough for the climber to use them as grips. The tower is a massive structure flanked with decorative totem poles. Campers can either climb the climbing wall (or with the assistance pulley, be hoisted up) or they may continue past the overlook to a gracefully climbing ramp up to the top of the tower. This allows for choice, and the ability to enjoy different pieces of the High Ropes Course without feeling pressured. Educational information about the local Indian Tribes is found on the tower. The entire area is densely treed, and with selective trimming, views and clearings are made available to heighten the experience.

Once at the top of the tower, a bridge juts out across a deep ravine to a central station. This is the super zip (Figures 4.63 & 4.64). The super zip is two massive zip lines that run over 400'. The zips allow for adaptive methods to be used including a unit that allows those who are completely paralyzed to lay in, similar to a hammock, and enjoy the ride. The benefit of having two zips is for races. The campers love to compete whenever possible. The super zips whip

Figure 4.62. Climbing wall with totem poles. (Amanda White)

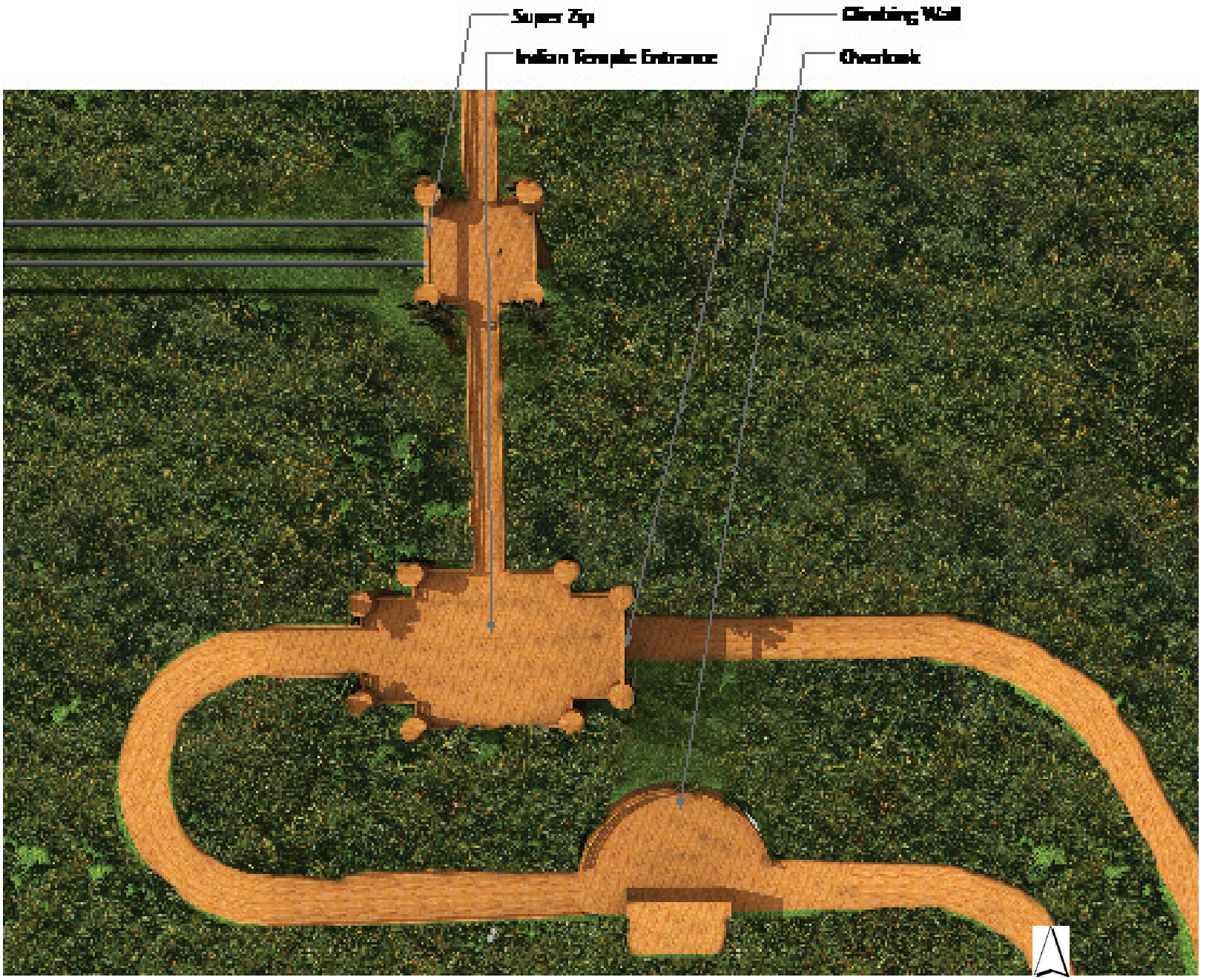

Figure 4.63. Observation deck, climbing wall and super zip in plan. (Amanda White)

Scale: Not to scale

through the ravine racing toward the water. This experience gives the camper a rush of senses and a blast of excitement. The end of the super zip is a platform which takes the campers on a boardwalk along the shore line, past the dock and up to the cable car.

Past the central zip line station, the ropes course continues. A bridge connects to the remainder of the course. The approach decided upon was that of a three paths. Each challenge has three methods of approaching it (Figure 4.65). The first is a bridge that allows wheelchairs to cross. Railings and wheelchair guards are included but this allows someone who is completely paralyzed to see all the challenges and participate in some of them. The second line is a suspended platform. Many of the campers have significant arm strength and can pull them selves along with the assistance of this platform. The third line is the typical challenge line for able bodied participants. The course continues with six challenges: plank bridge, slotted bridge, bumpy rock bridge, swinging bridge, and a trolley bridge. At the termination of the high ropes course line is a zip line as well. The platform at the end of the zip line is met with another path that follows along the low ropes course up to the original path near the nature trail.

Figure 4.64. Super zip. (Amanda White)

Figure 4.65. Three track challenge options. (Amanda White)

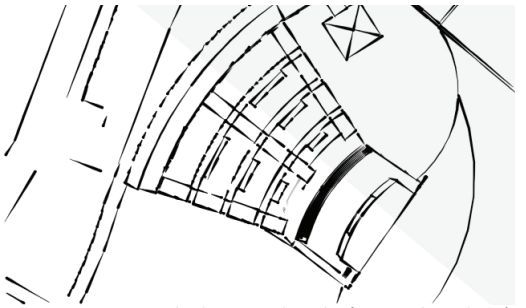

Figure 4.66. Amphitheater sketch. (Amanda White)

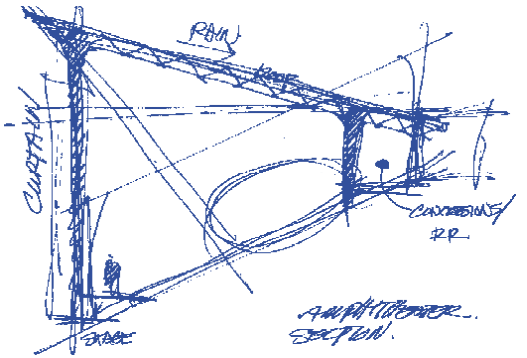

Figure 4.67. Amphitheater section sketch. (Shannon Gordon)

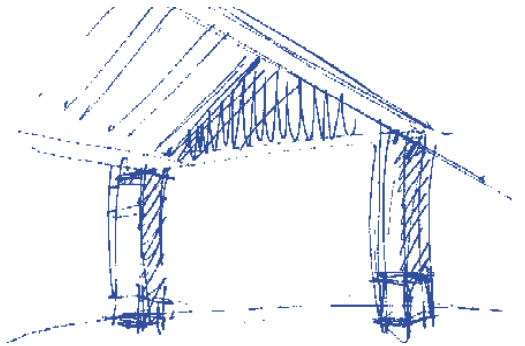

Figure 4.68. Roof sketch. (Shannon Gordon)

Amphitheater

The amphitheater is a new feature to camp activities. The amphitheater will be used for camp shows as well as fundraising events. This element is viewed as a feature that can raise substantial financial help for the camp's foundation. This will be one of the first elements implemented so that these fundraisers can begin. Concerts and craft shows may be held at the amphitheater facility. For this reason, it is included in the select program element designs.

User Input

Survey

No questions pertaining to the design of the amphitheater were asked in the survey.

Charrette

The drawings brought to the charrette were preliminary and included very little detail as the intentions from the camp directors were not yet understood. Participants suggested that the entire amphitheater and stage be covered as one piece. They also suggested that from this roof, curtains fall down to protect the audience from weather.

Process

The Individual Program Element Needs diagram (Figure 4.69), asdescribed earlier, represents the needed and desired features of the amphitheater. The items needed to support this element include: use of recycled tire flooring; use of native limestone; surround sound system; dynamic lighting; concession area available; grass seating adjacent to the designed seating; colonnade entrance; storage and green room; and occupancy for at least 500 people. The 'user needs' include: covered area for shade; slope conducive to viewing the stage but fitting to ADA; designated areas for wheelchairs; ramp access to the stage; aisles for easy access. The 'site needs' include: loud zone siteing; public access location; parking availability; access to roads; orientation of the structure in relation to solar aspect; electricity access; availability to trash; and a slope fitting to amphitheater viewing.

Examples

The example pictures collected for the charrette illustrated precedent projects and material choices. The following images illustrate the desired character.

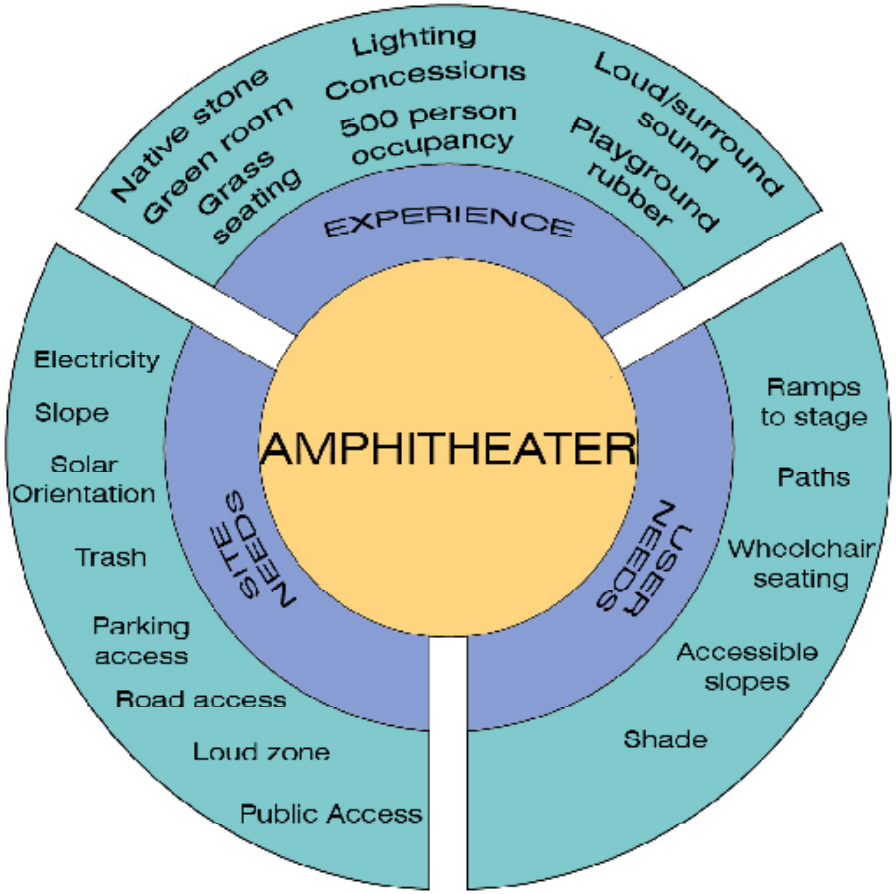

Figure 4.69. Amphitheater process diagram. (Amanda White)

Figure 4.70. Collonade example. (See List of Figures)

Figure 4.71. Amphitheater example. (See List of Figures)

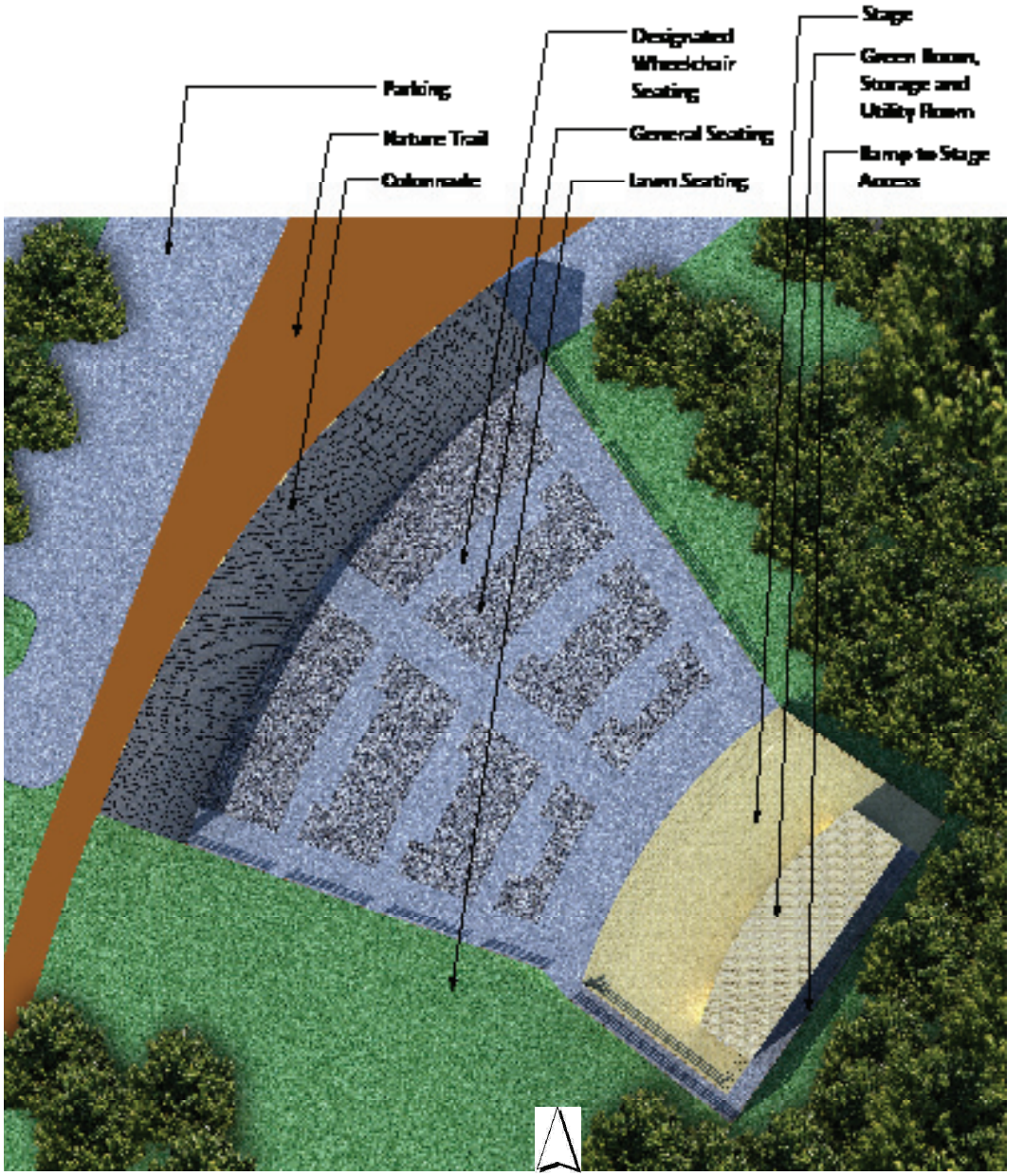

Figure 4.72. Amphitheater plan. (Amanda White) *Scale: Not to scale*

Design

When entering the amphitheater complex, the colonnade is the first element seen. The colonnade is a graceful piece with beautiful limestone columns to a metal roof. The colonnade is 15' wide allowing for room for the sides to be flanked with various vendors. Three paths make up the access of the amphitheater seating, one central and another on each side. The slope of the overall area is 5% and the flooring consists of recycled tire tiles. The stage sits 5' above the bottom of the seating. A ramp wraps around the back of the stage. The stage area consists of a stage and a building housing a green room for performers, utilities, and storage. The roof is a metal feature covering the entire amphitheater complex. Canvas sheets are attached to the perimeter of the roof structure, being released to fall down to protect the audience from high winds or rain. The sheets are weighted at the bottom to keep from moving. Conceptual grading was included to illustrate the minimal grading needed to fit the 5% slope (Figure 4.73). Seating and overall design was based on movie theater standards (Figure 4.74). As a landing was needed ever 20' to meet ADA standards, a row of wheelchair seating was allowed adjacent to the landing.

Note: Several of the illustrations have the roof removed for visual purposes.

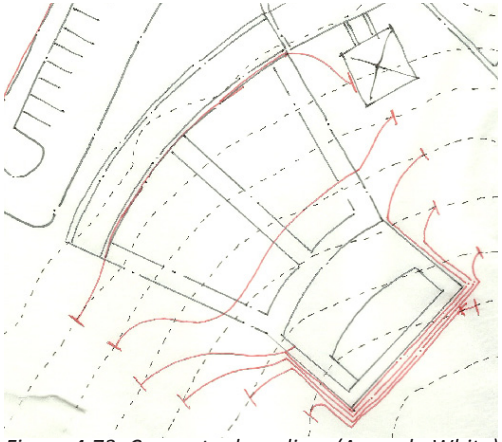

Figure 4.73. Conceptual grading. (Amanda White)

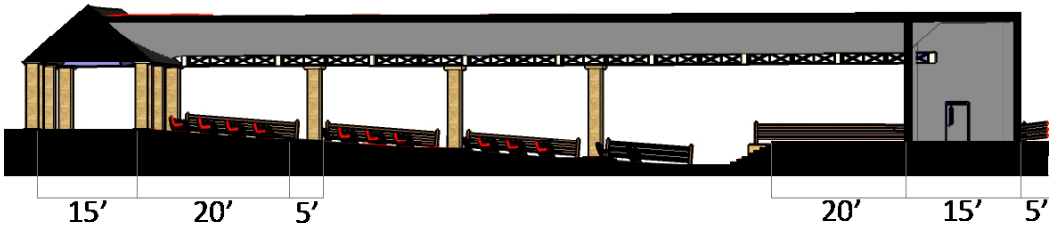

Figure 4.74. Amphitheater section. (Amanda White)

Scale: Not to scale

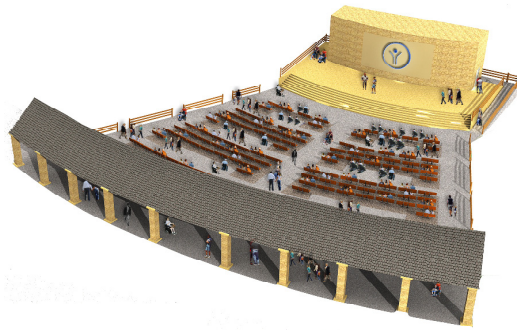

Figure 4.75. Collonade perspective. (Amanda White)

Figure 4.76. From the collonade perspective. (Amanda White)

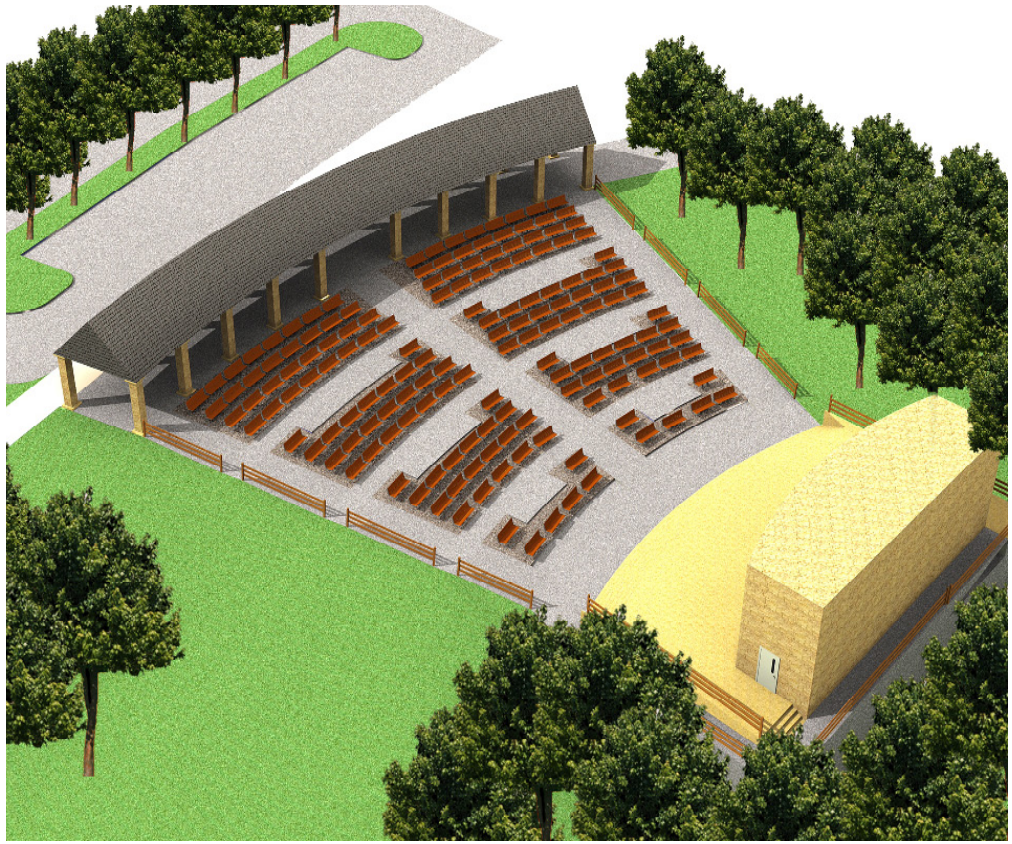

Figure 4.77. Amphitheater perspective - note: shown without roof structure. (Amanda White)

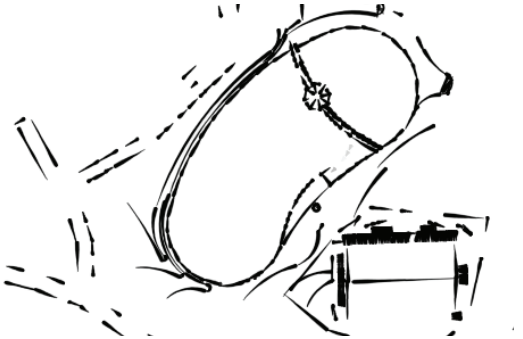

Figure 4.78. Pond area sketch. (Amanda White)

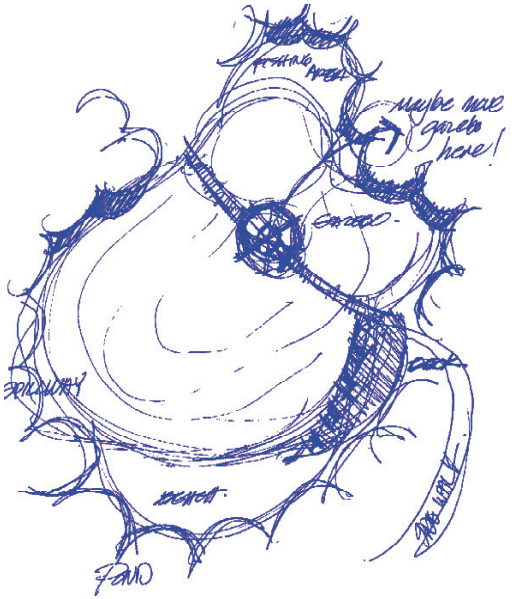

Figure 4.79. Pond sketch. (Shannon Gordon)

Pond

The pond was derived as an important part of the camp program because of difficult access to the lake. The camp directors want to ensure a place for the campers to fish and paddleboat. Fishing is one of the most popular activities at camp. Past dock designs were not conducive to fishing or paddleboat transfers. The pond was chosen as select program element so that an in-depth study could be done on a better method for both.

User Input

Survey

Over 80% of participants polled that they enjoy and partake in both fishing and paddleboating. One participant commented that they would like to fish off a covered dock. No other major findings resulted in the survey questions.

Charrette

Participants gave several suggestions for the pond design. One suggested including a beach area where campers could get out of their chair and feel the sand. Another suggested making the dock floatable, as well as the boardwalk. Another participant suggested splitting the pond into better sizes, one portion for paddleboating, one for fishing (Figure 4.79). This would keep the fishing hooks and boats in separate areas for safety precautions.

Process

The Individual Program Element Needs diagram (Figure 4.80), as described earlier, represents the needed and desired features of the pond. The items needed to support this element include: a beach area; primitive campfire ring for an informal use; fishing dock; boardwalk across the pond; native plants; fishing locations along the shoreline. The 'user needs' include: special designed docks for easier and safer transfers; safety rail for fishing; wheelchair stops for wheelchair safety; and accessible slopes. The 'site needs' include: erosion control; feeding surface water; clay liner to hold water; excavation of soil and rock for pond depth; quiet zone location; designated area for trash or fish cleaning; area of two to three acres.

Examples

The example pictures collected for the charrette illustrated gazebo types, boardwalks, docks,

and pond character. The following images illustrate the desired character (Figure 4.81 & 4.82).

Design

The siting of the pond was selected by the camp director's desire to have a close relation to the Main Building. A conceptual grading plan illustrates the grading required to hold the pond's water (Figure 4.83). The grading will be extensive work but is possible. To the west portion of the pond, a dam will be created to hold the water. Excavation for the pond will begin to cut into rock the closer to the Main Building the pond gets. Water will be collected from the areas surface water as well as parking and roof collection and filtered through a waterfall feature to the pond. Water from the main parking lot will be collected as shown in Figure 4.84, and piped into an outlet of an existing creek, which will feed the pond as well. An overflow pipe keeps the pond from flooding. The overflow pipe is day lighted into an existing creek.

A path will wind down from the Main Building to a dock area . The dock area will contain an area for trash and fish cleaning, picnic tables, and paddle boat docks. A boardwalk extends out of the dock area across the lake. In the middle of the boardwalk, a large iconic gazebo sits (Figures 4.86 & 4.87). The gazebo's main use is for fishing, but can serve for other purposes as well. The railing and

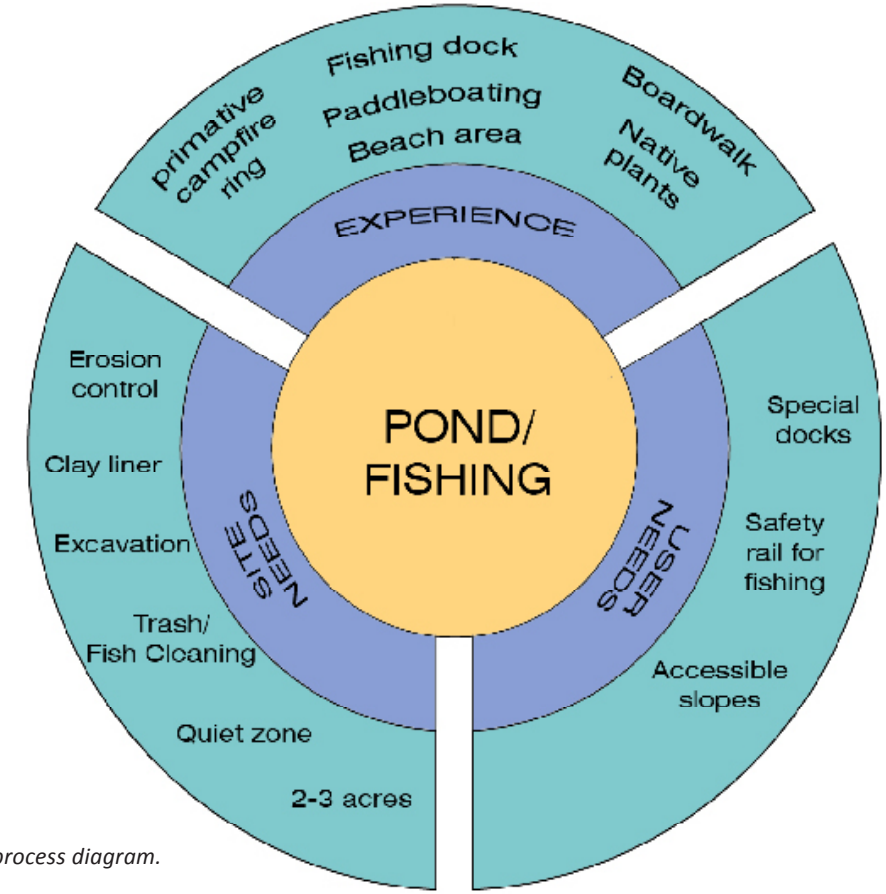

Figure 4.80. Pond process diagram. (Amanda White)

Figure 4.81. Dock example. (See List of Figures)

Figure 4.82. Pond example. (See List of Figures)

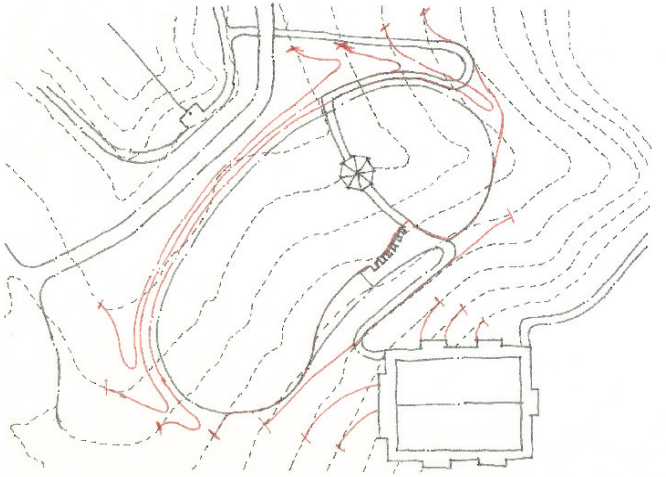

Figure 4.83. Pond conceptual grading. (Amanda White)

general boardwalk design was derived from design standards found in "Landscape Design for the Disable" (Jorgensen,113-114), Fishing occurs on the northern portion of the pond, and paddle boating on the south portion. The boardwalk continues to the other side of the pond and wraps along the berm, allowing for areas for people to fish off the shore. The path later connects into the nature trail system.

The docks are of special importance (Figures 4.86 & 4.87). Past docks were not conducive to transfers from a wheelchair. The docks rock uncontrollably and the distance from the boat to the dock is difficult to control. In this design, the docks are set in concrete, and a specific size fit to the paddleboats is notched out of the dock. 2" is allowed on each side paddleboat to fit. The depth to the is calculated to fit the boat and is with tires, adding friction to hold the place.

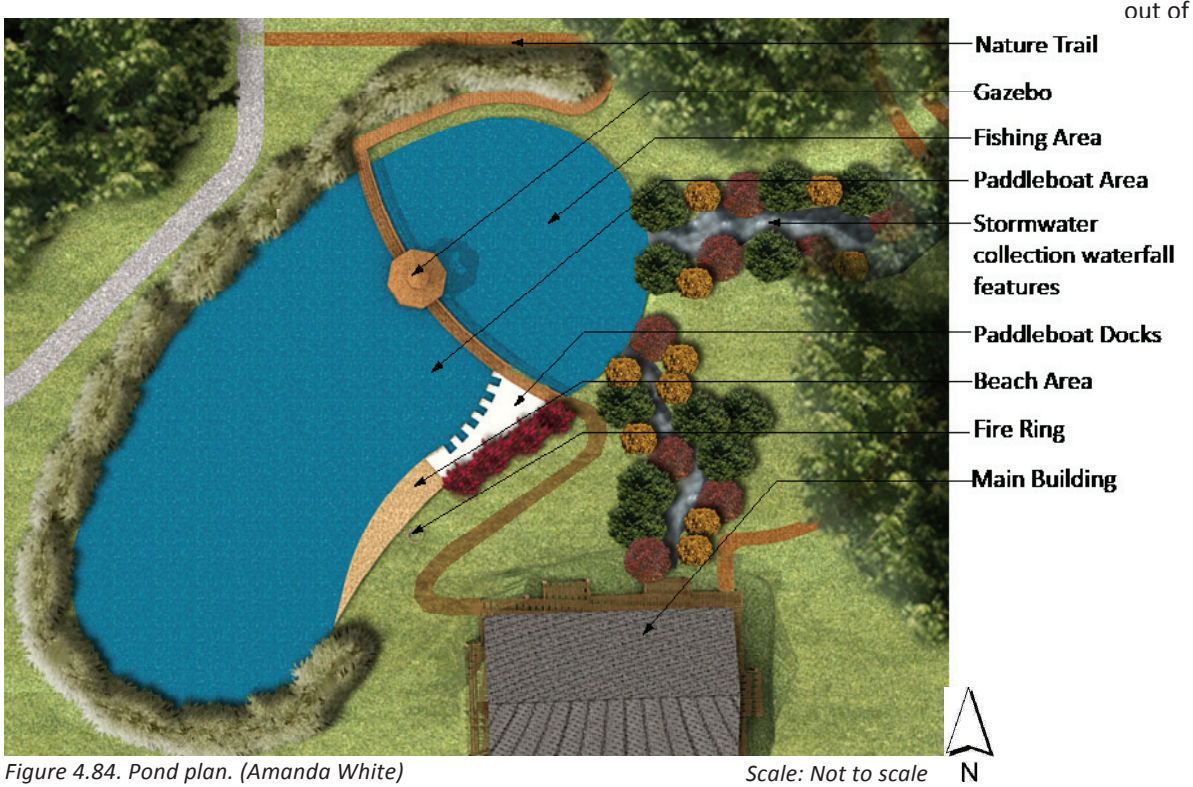

Figure 4.84. Pond plan. (Amanda White) *Scale: Not to scale*

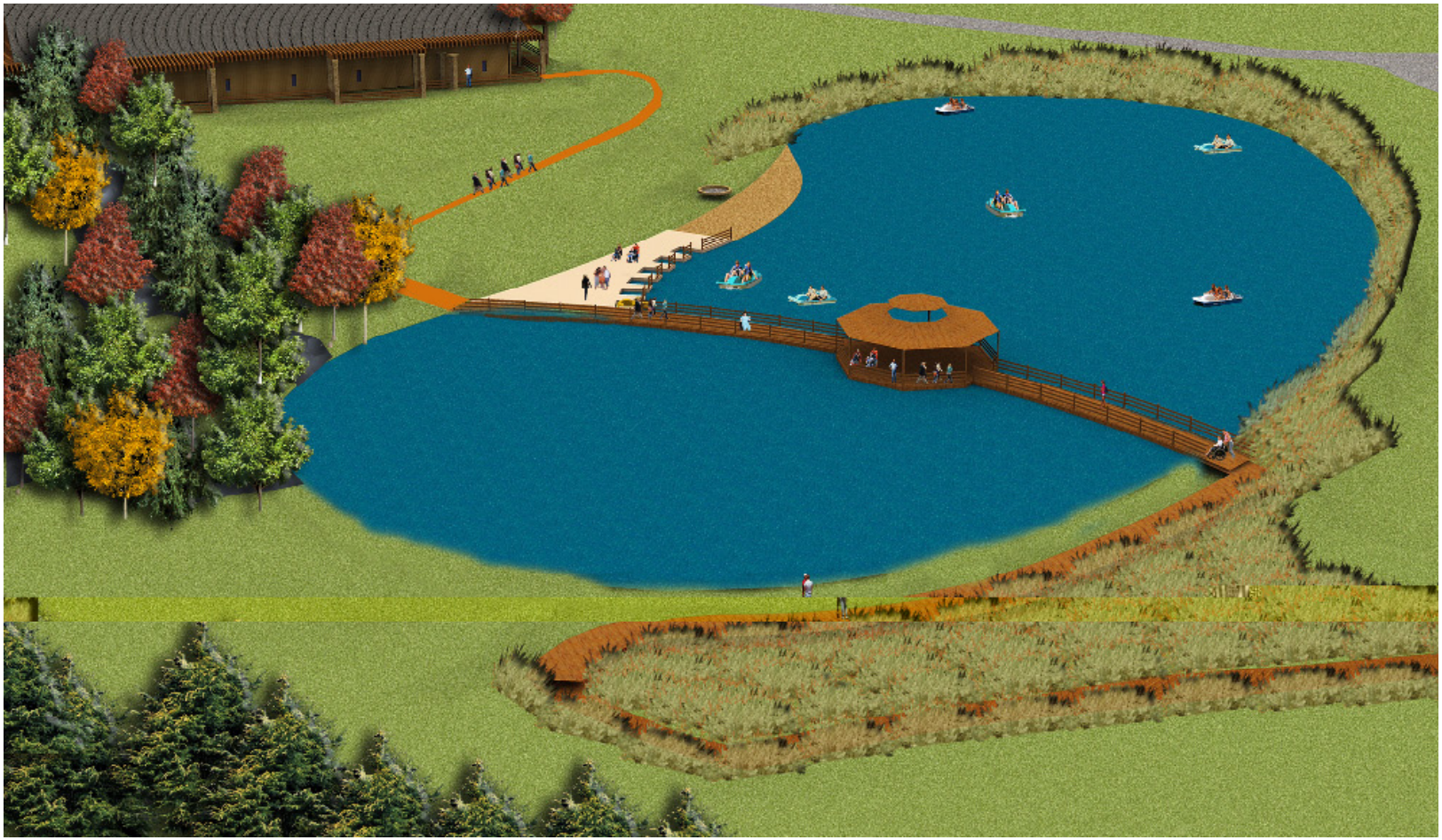

Figure 4.85. Pond perspective. (Amanda White)

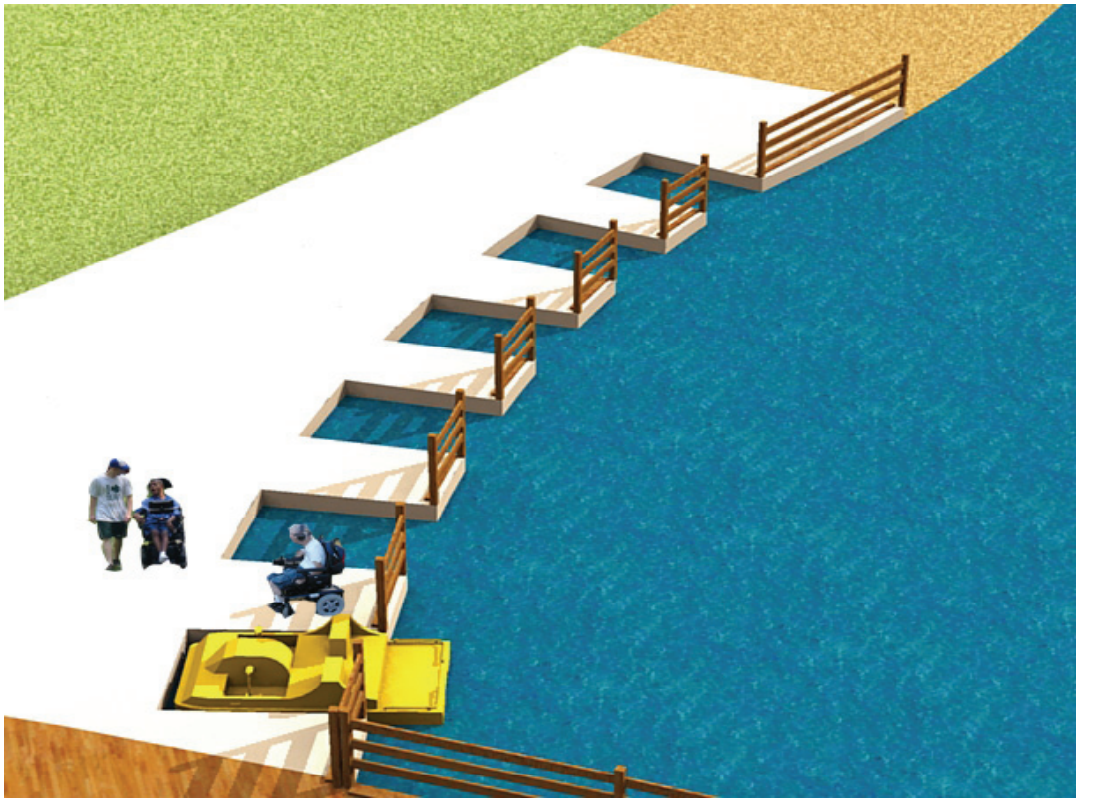

Figure 4.86. Dock perspective. (Amanda White)

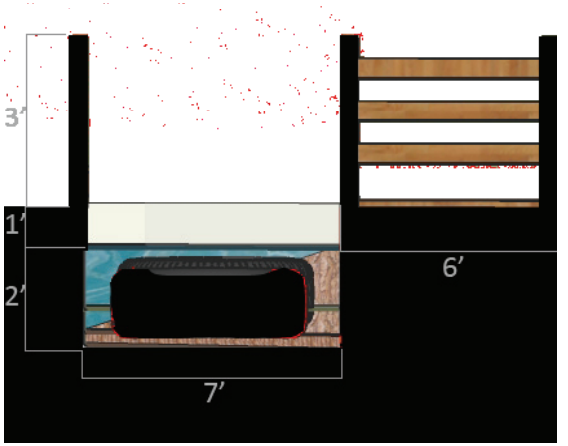

Figure 4.87. Dock section. (Amanda White)

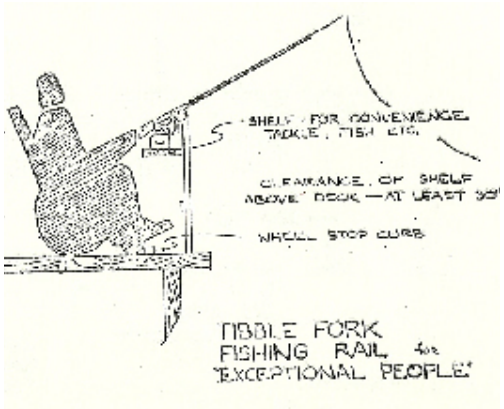

Figure 4.88. Railing diagram. (Jorgensen 1975, 114)

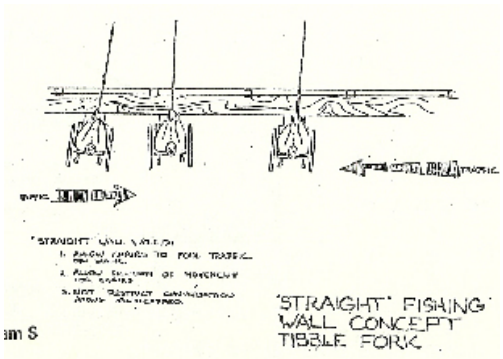

Figure 4.89. Dock diagram. (Jorgensen 1975, 113)

Figure 4.90. Boardwalk perspective. (Amanda White)

Figure 4.91. Gazebo Perspective. (Amanda White)

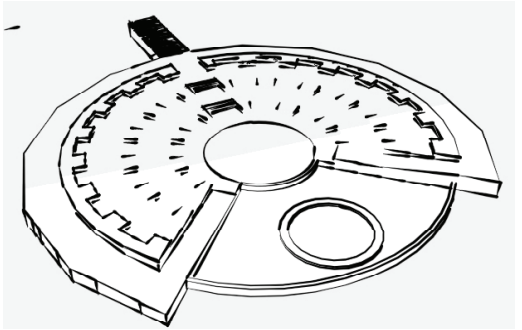

Figure 4.92. Campfire ring. (Amanda White)

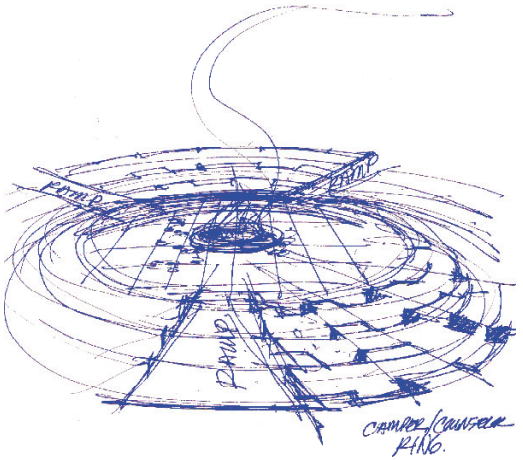

Figure 4.93. Campfire sketch. (Shannon Gordon)

Campfire Ring

The campfire ring is a very integral part of the camp experience. Being a Christian camp, campfire is a somewhat religious event. Campfire tends to be a camper's favorite program activity. The campfire ring was chosen as a select program element to recieve further study for several reasons : it is a camper favorite ; it will need to be one of the first elements implemented because of its importance to the camp experience ; and thoughtful adaptations can be made implemented into the design.

User Input

Survey

The question asked during the survey pertaining to the campfire activities was « What is your favorite part of campfire? ». Responses included : friendship, songs, easy access, the fire, being outdoors, the stars, the skits, and being together.

Charrette

There were no major suggestions made during the charrettes to the design of the campfire ring (Figure 4.93). They did suggest that a more primitive campfire ring be placed somewhere else on site as well for an informal activity.

Process

The Individual Program Element Needs diagram (Figure 4.95), as described earlier, represents the needed and desired features of the campfire ring. The dynamic features needed are best wrapped up in the theme of "reflective relationships". The items needed to support this theme include: reflective setting, possibly set deep in the woods or set against the sunset; spiritual environment; a stage for skits and those leading; a fire pit; a form that fosters a close relationship between the counselor and camper; and a feeling of unity as a group. The 'user needs' include: accessible ramps; stacked form for all to have visual access; designated areas for wheelchairs; ample room for people to move; area for campers to get out of chairs; and lighting for safety. The 'site needs' include: clearing in woodland; set in the quiet zone; secluded site location; controlled

fire zone; the use of natural materials; and a sunset view.

Examples

The example pictures collected for the charrette illustrated the form and material ideas. The following images illustrate the desired character (Figures 4.95 & 4.96).

Design

The campfire ring is set deep in the woods in the 'reflective zone' of the site (Figure 4.97). It is oriented to look into the sunset. The campfire ring is made up of stacked concentric rings allowing for all to see the rest of the group as well as the activities and skits occurring at the center stage. Each ring is defined by an elevated seat wall, which is the base for the next level (Figure 4.98). Each seat wall level rises by 18 inches. The seat wall is faced with ashlar stone and it finished with a flagstone patterned cap and level.

When considering issues with past campfire programs, the connection between campers and counselors came to mind. In past situations, counselor sat on the ground, breaking the connection of singing, hugging, and dancing by vertical level. In this design, the seat walls are notched out to allow wheelchairs to pull into those spaces (Figure 4.100). This allows counselors to sit at the same level of their campers. There is a seat along the seat wall for each designated

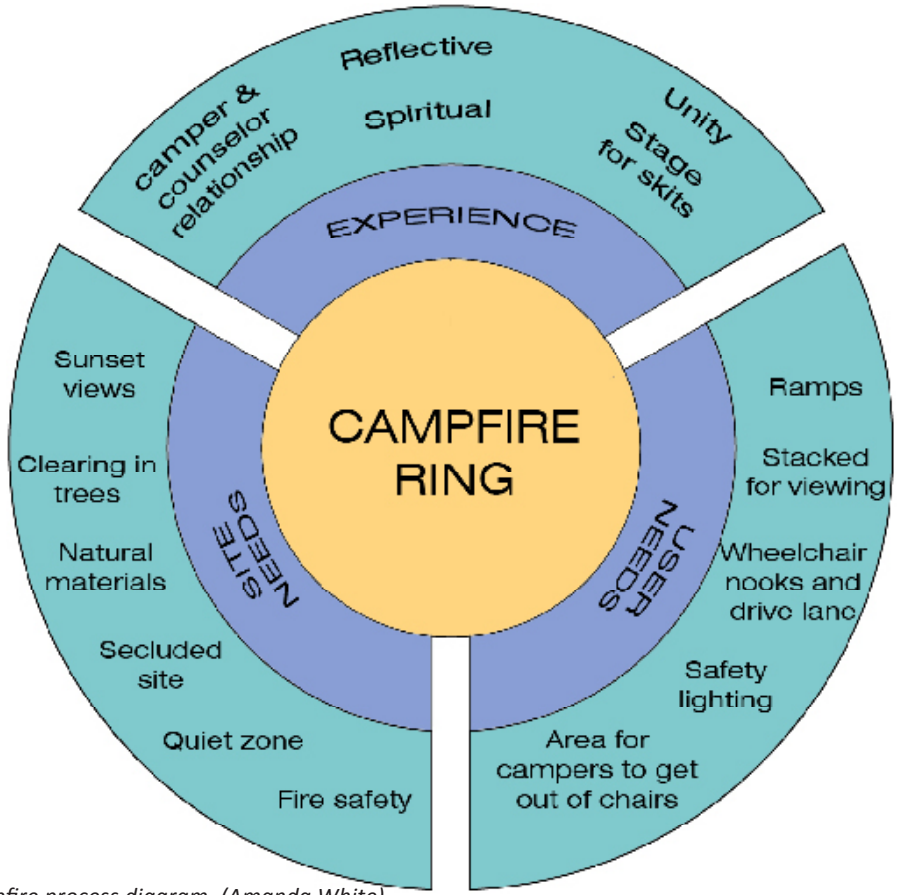

Figure 4.94. Campfire process diagram. (Amanda White)

Figure 4.95. Fire ring example. (See List of Figures)

Figure 4.96. Seating example. (See List of Figures)

Figure 4.97. Campfire ring plan. (Amanda White)

Figure 4.98. Campfire ring section. (Amanda White)

wheelchair spot. The fire is set back from the stage and seating for safety reasons. Step lighting is to be implemented for safety. When leaving the campfire, people should exit in a single line, and the long path into the woods allows for a moment for each individual to reflect on the days activities and to reflect on their spirituality.

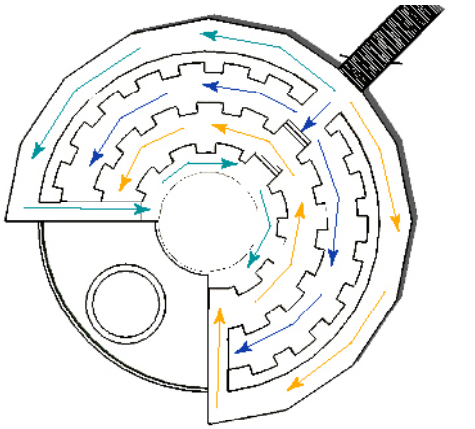

Figure 4.99. Ramping system. (Amanda White)

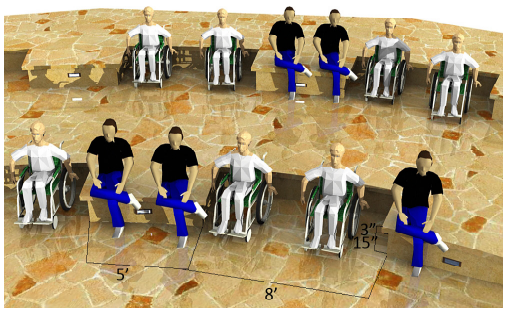

Figure 4.100. Notched seating. (Amanda White)

Figure 4.101. Campfire ring perspective. (Amanda White)

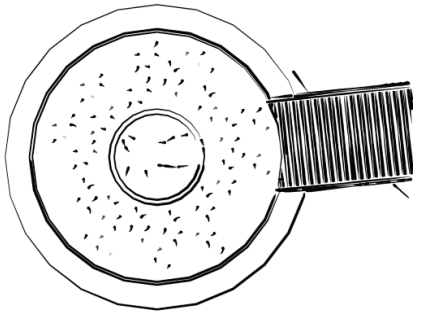

Figure 4.102. Memorial sketch. (Amanda White)

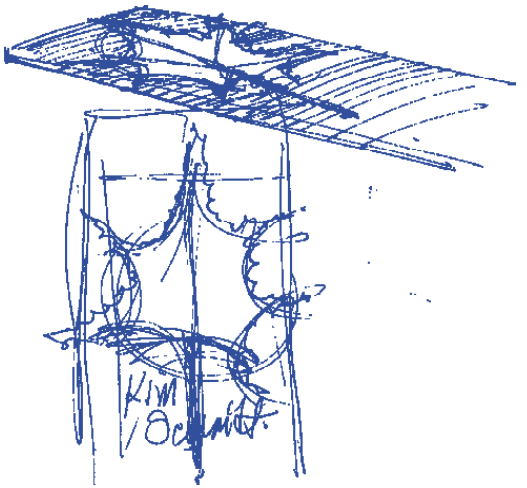

Figure 4.103. Nature trail/ memorial sketch. (Shannon Gordon)

Nature Trail

The nature trail was chosen as a selected program element because it will be simple to construct in phases. The trail is to be an elevated wood trail that can accomodate a truck in case of an emergency. All program elements should be relatively close to the trail, so that it can act as the emergency ciruclation system. There is also a need for some form of a memorial to those campers and staff that have touched the lives of those in Camp Adventure, and have passed on.

User Input

Survey

Several questions were asked in the survey pertaining to nature and the outdoors.

What does nature mean to you ? Many people respond in some form that it is 'God's work'. Other replies included beauty, coexistance, forests, paths, wildlife, insects, fishing, hiking, aroma, and vegetation.

Do you enjoy the outdoors ? If so, what do you enjoy particularly ? Answers ranged from freedom, camping, fishing, hunting, photography, fresh air, aroma, peaceful, and shade.

What interests you about nature ? Answers ranged from the naturalness, the symbiotic relationships, wildlife, and the purity of nature

What would you like to see on a nature trail ? Answers ranged from animals, plants, trees, butterflys, and insects to wheelchair access and trashcans. Some intersesting answers were animal tracks, medicinal plants, and a pond.

Charrette

The main topic of conversation at the charrette was the memorial node. At my suggestion of inlayed bronze leaves, symbolizing the Camp Adventure family tree, the participants began to roll with suggestions. One camper suggested the use of the symbology of doves.

Process

The Individual Program Element Needs diagram (Figure 4.104), as described earlier, represents

the needed and desired features of the nature trails. The 'dynamic features needed' are best wrapped up in the theme of "Boardwalk". The items needed to support this theme include: memorial node for campers who have passed; the ability to fund the boardwalk by purchased planks or something similar; designated areas for nature class; the trail is the link along the entire camp and all activities; and that the trail is drivable. The 'user needs' include: width is enough for two wheelchairs to pass; accessible points; shade; signage of location and plants; accessible slopes. The 'site needs' include: tree cover; cuts through diverse plant areas; is designated as a 'quiet' zone; and accessible slopes.

Examples

The example pictures collected for the charrette were categorized into two categories: trail experience and memorial ideas. The following images, in those relative groupings, illustrate the desired character (Figures 4.105 & 4.106).

Design

The trail design starts from the Main Building and extends off of the wrap around deck. The trail crosses the camp private drive and heads toward the Aquatic Center complex. The trail follows the sidewalk to the south towards the amphitheater and the sports complex. Then the trail enters the reflective zone, set

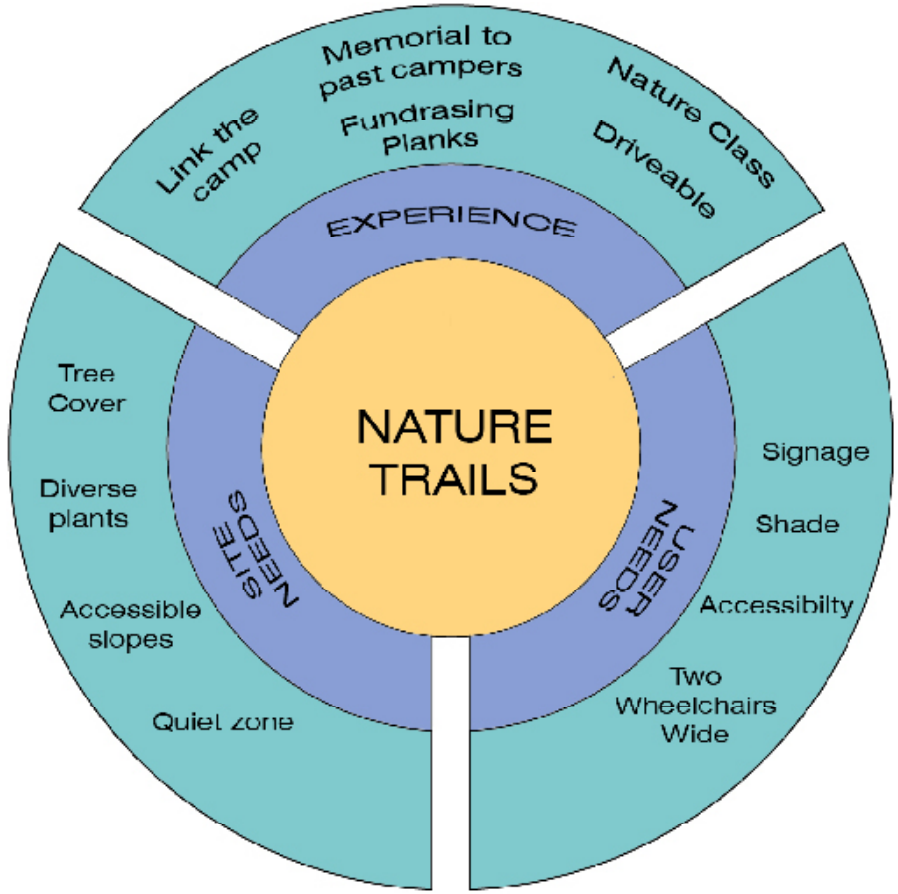

Figure 4.104. Nature trail process diagram. (Amanda White)

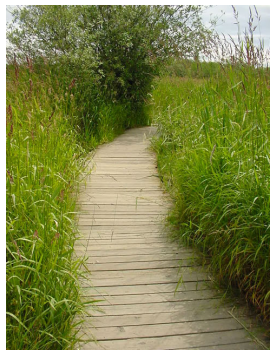

Figure 4.105. Boardwalk example. (See List of Figures)

Figure 4.106. Boardwalk trail example. (See List of Figures)

Figure 4.107. Nature Trail and plant indicator. (Amanda White)

in the woods and passes the campfire ring, the health lodge, the outdoor chapel, the chapel, the overlook deck and a picnic area. A path from the pond connects in shortly after the picnic area. The trail follows the Eagle Point Road around and then picks up and follows the new road to the horse barn. The trail follows the slope around to a central location between the horse barn and the ropes course. The trail climbs up to the top of the site and follows the slope around for pedestrians from the parking lot and caretaker's house.

The trail is an elevated boardwalk 10' wide. It is elevated 6" off of the ground. The boards can be sold as donation plaques to help fund the project. Along the trail, various plants are indicated by plaquards at a determined height of viewing from a wheelchair, 3'.

The memorial node is a location in the reflective zone, set in the woods. The location was chosen so that it could be a quiet place of solitude. The camp has an award titled 'Camp Angel' and after much consideration, found that theme to be appropriate for the memorial. The central feature of the memorial ring is an engraved image of an angel. Feathers symbolize when an angel has been in a location. In this design, the feathers are engraved and symbolize the individual

campers that have passed. Each camper memorialized will be designated by a feather and their name will be inscribed in the shaft of the feather. A seat wall surrounds the memorial so that all can have a moment to sit and remember.

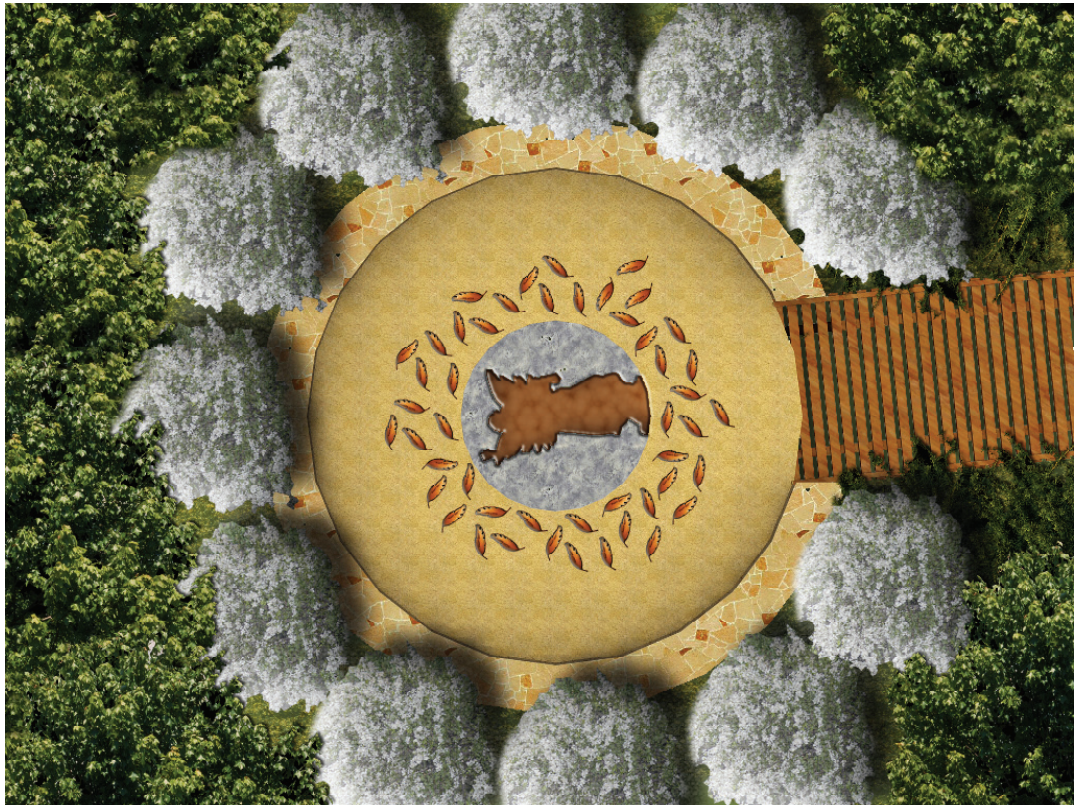

Figure 4.108. Camp Angel Memorial plan. (Amanda White)

Figure 4.109. Memorial feather. (Amanda White)

Figure 4.110. Camp Angel Memorial. (Amanda White)

Figure 5.1. Fern divider. (Adapted from Morguefile.com)

Figure 5.2. Final night hug montage. (Adapted from CampAdventureinc.com)

Conclusions

The Conclusion chapter concludes the report and project. It discusses the project specifically, as well as how the project fits into the profession. A Literature Cited section is included to give reference to all literature pieces the contributed directly to the report.

Conclusion

I believe the overall process was a success. I had carefully laid out the steps of the project during the process diagram task, in September. I did stick to the original timeline and path rather closely. The beginning and ending of tasks did begin to blur and overlap more than predicted. However, the overall process and order of tasks seemed to stay in tact. Taking the time to define the process really helped me from adding in more or wander off on a tangent. I defined exactly what I wanted to accomplish and when it should happen, and it kept me on track.

The user-based research methods and results came with issues and success. I had to rush the survey preparation, and in hind site, could have better prepared the questions. Many of the questions were simply too open-ended and the responses I received weren't as descriptive as I was hoping for. The charrettes went as well as hoped, considering the weather. Some of the findings may not have seemed as profound or come from user input as I had assumed them. Being a counselor and an active participant in the camp, I truly am a user. My input often came before the campers could tell me. It was very difficult to gauge what I received for user input, and what I had already known from experience.

Following the user input, the design portion seemed rather easy. I had done all of the work gathering ideas and examples prior to the design work. The charrette truly was a huge help as it allowed for the client to give feedback in a collaborative effort. We were working out the design details right there, taking any guess work out of the equation. The group that participated in the charrette was extremely efficient and great to work with as well. I am sure that not all public meetings go as well. The group received my ideas well and constructively critiqued the designs and offered suggestions when possible.

The camp directors already had a rather solid idea of what their master plan would look like. In a few instances, I had to adjust their vision to fit what I knew what right as a designer. For instance, the location of the amphitheater was originally desired in a more southern location on a south facing slope. As a designer, I know that an amphitheater or any spectator event should never face south. The finalized amphitheater is at a southeast facing orientation. This is not optimal but there were no slope facing north that would be fitting to the program. However, keeping the orientation more easterly will allow evening sun to be a disturbance. The argument stated should be strong enough to show that the decision made in this master plan is the correct one.

I would have liked to have gotten into the rendering phase earlier. I wanted to learn 3D Studio Max and apply it to the project. I knew this would be a challenge, but wanted to learn another piece of software before leaving the program. I had contacted Will Yankey, the college's local expert on the program, and set up sessions with him to apply the designs I had created into 3d Max. This

was extremely difficult to try to get design work done as I was just learning a new program. If I had entered the rendering a few weeks earlier, I believe the 3d Max renderings would have been more successful.

I originally wanted to design all of the program elements. Ambitious and unaware of the work load I was bringing on myself, I struggled with giving up the idea of doing them all. I directed the camp directors to choose five, which had turned into seven. This scope was still quite a bit for the amount of time I ended up having for rendering. I also originally set out to have a phasing and implementation section. I did not even have time to glance at a possible plan or phasing or implementation options. One person, myself, was not enough to get the work done in the time allowed. Many offices will have a team work on a project of this scope. I learned that I was quite ambitious, which is fine, and I believed I handled the reality of time quite well. I achieved what I truly set out to do: a master plan and design details.

Looking back, my thesis of the application of user based research methods was rather difficult but I still believe it is important to designers and their work within the public realm. If a team were running the user based research methods, I believe I would have had more success. I had to set forth questions in the survey before I was truly acquainted with the project. Dealing with the public and people's opinions can clog up a designers focus, but it is not worth ignoring just because it's difficult. Especially with a group as special as Camp Adventure, user input is crucial to creating the right environment for them. Even as a user of the camp, I found myself assuming things. It is important to carefully pull yourself out of the scope and take a look with unbiased eyes at the issues and the opportunities.

Overall, I believe this project was successful. I completed the most important goals for the camp and myself. I am grateful that I had to opportunity to put my interest in environmental psychology and user based research into practice, especially to a project that was so applicable to the practices. I am surprised at the amount of work an individual can do in such a short period of time. Knowing that the other goals could have been met if time permitted is a feeling of accomplishment. I am glad I could use my computer rendering skills to tell the story and illustrate the design ideas. This illustrated my strengths in rendering, as well as, gave me an opportunity to learn more about the programs. The camp has touched my heart personally and to be able to give them something more than my time during one week each year is unexplainable. Working with the camp directors and the campers to arrive at a plan for their dream has been amazing. Hopefully, this report will serve as a basis for more designers to use the user based research methods to arrive at better design solutions for a unique and challenging world.

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Figure 6.1. Dark green leaf divider. (Adapted from Morguefile.com)

Figure 6.2. Camp Formal photo opt montage. (Adapted from CampAdventureinc.com)

Appendices

The Appendix provides supporting documentation to previous chapters. The previous chapters have citations leading to the appendix contents.

Appendix A: Glossary

ADA. Americans with Disabilities Act; the most comprehensive federal civil-rights statute protecting the rights of people with disabilities. (www.adata.org)

Adaptive Behavior. The ability to cope with the physical and social demands of the environment; also contributes to the development of a positive self-concept within disabled persons since a greater degree of adaptive behaviour means that an individual can function more independently within the community. (Brown 1988, 169)

Anaesthesia. Loss of sensation especially to touch usually resulting from a lesion in the nervous system or from some other abnormality. (www.merriam-webster.com/medical)

Anterior Walker. A walker that is pushed with the frame in front of the body. (Dormans 1998, 314)

Asphyxia neonatum. Oxygen deprivation caused by respiratory failure in newborns. (Dormans 1998, 4)

Ataxia. Problems with balance and controlling position of body in space. (Dormans, 1998, 9)

Athetosis. Involuntary writhing movements, i.e. involuntary jerky movements. (Dormans, 1998, 9)

Axillary Crutches. Crutches providing support under the arm with pads, and weight bearing is provided on a horizontal bar between the two uprights. (Dormans 1998, 316)

Cardio-Pulmonary. Of or relating to the heart and lungs. (www.merriam-webster.com/medical)

Catheter. A tubular medical device for insertion into canals, vessels, passageways, or body cavaties for diagnostic or theraputic purposes (as to permit injection or withdrawl of fluids or to keep a passage open). (www.merriam-webster.com/medical)

Cerebral Palsy. A disability resulting from damage to the brain before, during, or shortly after birth and outwardly manifested by muscular incoordination and speech distrubances. (www.merriam-webster.com/medical)

Cerebro-Spinal Fluid. A colorless liquid that is comparable to serum, is secreted from the blood

into the lateral ventricles of the brain,and serves cheifly to maintain uniform pressure within the brain and spinal cord. (www.merriam-webster.com)

Cognitive Impairments. Specific aspects of higher cortical function,such as memory,language processing, problemsolving, and attention. (Dormans 1998, 25)

Contracture. Chronic shortening of spastic muscles, resulting in abnormal positioning of joints. (Dormans 1998, 84)

Cortical Blindness. Loss of vision caused by abnormalities of the brain rather than abnormalities of the eye or the optic nerve. (Dormans 1998, 24)

Cranium. The skull, as it encloses the brain. (www.merriam-webster.com)

Cystic Sac. A sac-like cyst filled with cerebro-spinal fluid and spinal cord tissue. (Anderson 1977, 13)

Degenerative. Worsening of a disease; progression. (Dormans 1998, 7)

Diplegia . Both sides of body involved, legs more than arms. (Dormans 1998, 9)

Desensitization. Reduce sensitivity; to make insensitive or nonreactive to a sensitizing agent. (www.merriamwebster.com/medical)

Deteriorate. To become impaired in quality, functioning, or condition. (www.merriam-webster.com/medical)

Dystonia. A state of disordered tonicity of tissues (as of muscle). (www.merriam-webster.com/medical)

Environmental Psychology. An interdisciplinary science that focuses on the interplay between human beings and their surrounding environment, both at the micro or macro levels. (environmentalpsychology.com)

Epilepsy. Persistent pattern of seizure activity over a period of time. (Dormans 1998, 87)

Forearm Crutch. Crutches that have one upright support leg, a cuff that fits around the forearm, and weight bearing is provided on a horizontal projection below the cuff. (Dormans 1998, 316)

Fracture . The breaking of hard tissue (bone). (www.merriam-webster.com/medical)

Gastrointestinal. Relating, or affecting, both the stomach and intestine. (www.merriam-webster.com/medical)

Hemiplegia. Arm and leg on same side involved, arm usually more than leg. (Dormans 1998, 9)

Hydrocephalus. An abnormal increase in the amount of cerebrospinal fluid within the cranial cavity that is accompanied by expansion of the cerebral ventricles, enlargement of the skull and especially the forehead, and atrophy of the brain. (www.merriam-webster.com/medical)

Hypertonia. Increased muscle tone. (Dormans 1998, 8)

Hypotonia. Low muscle tone, normal or increased deep tendon reflexes. (Dormans 1998, 9)

Imbalance. Lack of balance. (www.merriam-webster.com/medical)

Immobile. Incapable of being moved; not moving. (www.merriam-webster.com/medical)

Incontinence. Inability of the body to control the evacuative functions; ie. Bowel and bladder. (www.merriam- webster.com/medical)

Involuntary. Done contrary to or without choice; not subject to control of the will. (www.merriam-webster.com)

Kyphosis. Spinal curvature in form of “hunchback”. (Dormans 1998, 160)

Manual Wheelchair. A wheelchair that is propelled by physically maneuvering the wheels. (Dormans 1998, 321)

Meningocele. A protrusion of meninges through a defect in the skull or spinal column (as in spina

bifida) forming a cyst filled with cerebro-spinal fluid. (www.merriam-webster.com/medical)
Menings. The three membranes that cover the brain and spinal cord. (www.medterms.com)

Mental Retardation. Subaverage intellectual ability equivalent to or less than an IQ of 70 that is accompanied by significant deficits in abilities (as in communication or self-care) necessary for independent daily living, is present from birth or infancy, and is manifested especially by delayed or abnormal development, by learning difficulties, and by problems in social adjustment. (www.merriam-webster.com/medical)

Motor Impairment. Significant problem controlling movement and posture. (Dormans 1998, 6)

Muscle Spasm. Persistent involuntary hypertonicity of one or more muscles usually of central origin and commonly associated with pain and excessive irritability. (www.merriam-webster.com/medical)

Muscle tone. The resistance of a muscle to passive stretch. (Dormans 1998, 6)

Myelomeningocele. Spina bifida in which neural tissue of the spinal cord and the investing meninges protrude from the spinal column forming a sac under the skin. (www.merriam-webster.com/medical)

Non-Porous. Not-permeable.

Non-progressive . Motor-Impairment does not worsen over time. (Dormans 1998, 7)

Normalization. To make normal. (www.merriam-webster.com)

Orthopedic Abnormalities. Abnormalities of the skeletal system.(www.medterms.com)

Paralysis. Complete or partial loss of function especially when involving the power of motion or of sensation in any part of the body. (www.merriam-webster.com/medical)

Perinatal. The time from the onset of labor and extends into the early days of postnatal life. (Dormans 1998,16)

Pharynx. Throat. (Dormans 1998, 259)

Posterior Walker. A walker that is pulled with the frame in behind of the body. (Dormans 1998, 314)

Postnatal. The first few hours or days following birth. (Dormans 1998, 17

Power Wheelchair. A wheelchair that is propelled by use of a motor, powered by a lead acid battery. (Dormans 1998, 321)

Prenatal . The development of a fetus from conception to the onset of labor. (Dormans 1998, 15)

Prosthetic. An artificial substitute or replacement of a part of the body such as a tooth, eye, a facial bone, the palate, a hip, a knee or another joint, the leg, an arm, etc. A prosthesis is designed for functional or cosmetic reasons or both. (www.medterms.com)

Quad Cane. A cane with a horizontal handle and a large base with four short legs for additional support. (Dormans 1998, 316)

Quadramembral Cerebral Palsy. Total body cerebral palsy, or global involvement of the musculoskeletal system in abnormalities of muscle tone and movement. (Dormans 1998, 8)

Quadriplegia. Both sides of body involved, but one limb (usually arm) relatively spared. (Dormans 1998, 9)

Quality of Life. Concept of measuring a persons cognitive and behavioral perceptions of life satisfaction. (Brown 1988, 25)

Scolosis. Curvature of the spine caused by unbalanced muscular foces in the back and the pelvis. (Dormans 1998, 84)

Seizure. An episode of abnormal, disorganized electrical activity in the brain that usually results in abnormal involuntary movements, sensations, or alterations of consciousness. (Dormans 1998, 86)

Precedent Study: Camp Barn-

Self-concept. A person's perception of self which is formed through experiences with and interpretations of one's environment and is greatly influenced by others. (Brown 1988, 169)

Sensation. A mental process (as seeing, hearing, or smelling) due to immediate bodily stimulation often as distinguished from awareness of the process—compare perception; awareness (as of heat or pain) due to stimulation of a sense organ; a state of consciousness of a kind usually due to physical objects or internal bodily changes. (www.merriam-webster.com/medical)

Shunt. A passage by which a bodily fluid (as blood) is diverted from one channel, circulatory path, or part to another. (www.merriam-webster.com/medical)

Spastic Rigidity/ Spastic Diplegia. The original diagnosis for what is now cerebral palsy, also the effect of cerebral palsy. (Dormans 1998,4)

Spasticity. Velocity-dependent resistance to stretch, clasp-knife response, increased deep tendon reflexes, clonus. (Dormans 1998, 9)

Sphincter. An annular muscle surrounding and able to contract or close a bodily opening. (www.merriamwebster.com/medical)

Spina bifida. A neural tube defect marked by congenital cleft of the spinal column usually with hernial protrusion of the meninges and sometimes the spinal cord. (www.merriam-webster.com/medical)

Spina Bifida Cystica/ Aperta. A bony defect in the vertebral column that causes a cleft in that column. The meningeal membranes that cover the spinal cord and part of the spinal cord protrude through this cleft, and are clearly visible. The opening can be surgically repaired, usually shortly after birth. Some children will also need treatment for related problems, such as hydrocephalus. (www.medterms.com)

Spina Bifida Occulta. A bony defect in the vertebral column that causes a cleft in that column. The cleft remains covered by skin. Treatment is usually not required. (www.medterms.com)
Spinal Column. The articulated series of vertebrae connected by ligaments and separated by more or less elastic intervertebral fibrocartilages that in nearly all vertebrates forms the supporting axis of the body and a protection for the spinal cord and that extends from the hind

end of the skull through the median dorsal part of the body to the coccyx or end of the tail—called also backbone, spine, vertebral column. (www.merriamwebster.com/medical)

Spinal Cord. The thick longitudinal cord of nervous tissue that in vertebrates extends along the back dorsal to the bodies of the vertebrae and is enclosed in the vertebral canal formed by their neural arches, is continuous anteriorly with the medulla oblongata, gives off at intervals pairs of spinal nerves to the various parts of the trunk and limbs, serves not only as a pathway for nervous impulses to and from the brain but as a center for carrying out and coordinating many reflex actions independently of the brain, and is composed largely of white matter arranged in columns and tracts of longitudinal fibers about a large central core of gray mattersomewhat H-shaped in cross section and pierced centrally by a small longitudinal canal continuous with the ventricles of the brain. (www.merriam-webster.com/medical)

Static. Lack of movement or change. (www.merriam-webster.com/medical)

Stoma. An artificial permanent opening especially in the abdominal wall made in surgical procedures. (www.merriam-webster.com/medical)

Trunk. The human body apart from the head and limbs. (www.merriam-webster.com/medical)

Urinary Diversion. Diversion of the urinary tract.

Urinary Tract. The tract through which urine passes and which consists of the renal tubules and renal pelvis of the kidney, the ureters, the bladder, and the urethra. (www.merriam-webster.com/medical)

User Based Research Methods. Research methods that gather user or human input or information.

Ventricle. One of the system of communicating cavities in the brain that are continuous with the central canal of the spinal cord, that like it are derived from the medullary canal of the embryo, that are lined with an epithelial ependyma, and that contain a serous fluid. (www.merriam-webster.com/medical)

Vertebrae. Any of the bony or cartilaginous segments that make up the spinal column and

that have a short more or less cylindrical body whose ends articulate by pads of elastic or cartilaginous tissue with those of adjacent vertebrae and a bony arch that encloses the spinal cord. (www.merriam-webster.com/medical)

Voluntary Movements. Regulated by will. (www.merriam-webster.com/medical)

Appendix B: Resources

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Camp Barnabas Promotional Video. Youtube. 21 Oct. 2009. Television.

Appendix C: Process Information

This appendix was included so that readers could understand where the project began in August with the preliminary statements of how the project is relevant to contemporary landscape architecture, the original goals of the project, assisting agencies and groups to the project, the philosophy, the project process, and how the project was to progress over time.

Key Issues Relevant to Contemporary Landscape Architecture

"My body makes me disabled, but my environment makes me handicapped" (Brown 1988, 165) It is no secret, in some cases, ADA codes are unfit, or merely the enforcement of the codes is lacking; this world is not designed for the disabled. It is possible that ADA codes are dated; or it is possible that they are not based off of user-based research. Clare Marcus Cooper once stated the issue for design professionals adherence to better user based designs "…is not that designers are lacking for creative ideas, but rather that they are frequently hampered by not having the time to search out appropriate people based research….research based recommendations cannot substitute for public participation" (Project for Public Spaces). User-based research methods, such as surveys, testimonies, and observation are critical to the success in the use of any site. William H. Whyte, with the "The Street Life Project" in 1971, began this push for looking at why places designed for people, had no people. He discovered that simple elements, that met the minimum code requirements, were the driving force pushing people away. For example, the seating height and orientation plays a large role in whether a person will feel comfortable to sit there. The option of having movable seating versus a stationary bench determined the amount of people who stayed on the site as well as how long they stayed. Because the developers met the minimum, and ignored studying the preferred, the site resulted in lost space.

The same principles of studying human preference to develop a template for a successful public space have been carried through with the current firm of Project for Public Spaces. Fred Kent is leading PPS, using user-based research methods to gain knowledge and apply this to the design of the most popular public spaces in America. More firms in the Landscape Architecture field need to not only understand the importance of user-based research but feel compelled to complete such studies. User-based studies will result in better use of their project, making it, socially more successful.

Using this method along with the application of environmental psychology theories, I will be looking for improvements to current ADA codes. This should not be an isolated event. It is of great importance that the government takes note and restructures the ADA codes to follow user based research. The success from this project is hoped to spark an inspiration for future improvements for the quality of life of the disabled.

Goals for final product

1. Provide a Master Plan and design drawings with program input from Camp Adventure, Inc. for the implementation of the campgrounds and facilities.
2. Develop an understanding of the environmental psychology or experiential quality of those who are disabled.
3. Plan and execute a series of human based research methods that should inform future design criteria for the specific camp design.
4. Orchestrate a real project and tackle the obstacles and challenges that occur with policy, funding, and the public.
5. Use recent learning of Photoshop rendering applications; learn better hand rendering techniques; learn 3d Max and apply to final product.

Assisting Agencies

Camp Adventure, Inc (client) – CA is the client of the project. Camp Adventure will provide general information. Camp Adventure will comprise the majority of the user group. The Board of Directors will give overall direction, be involved with reviews, and receive the end product. Camp Adventure is the primary audience for the book.

Contact: Barbara McGoyne

Ochsner Hare & Hare, LLC (Landscape Architecture Office) -- OHH will take over the project for construction documentation phase and beyond. OHH will provide guidance, be involved with reviews, and provide information and support.

Contacts: Ken Boone, Shannon Gordon, and Andy Budke.

The US Army Corps of Engineers is the leasor of the property and has existing regulations on the

land. They will provide those regulations, and will be involved with reviews and user input.

Contact: Matthew Beckman

Camp Barnabus is a disability camp in Missouri. Their camp is similar and will be used as a precedent study as well as possible resources of adaptations and current law applicable to design decisions.

Contact: Paul & Cindy Teas

Horses of Hope is a therapeutic riding group who will act as the facilitators in the riding program at Camp Adventure. They will provide guidance to requirements for the Horseriding program design.

Contact: Shelly McCollum

Challenge Options is a local ropes course builder and facilitator. They will operate a satellite program from the Camp Adventure ropes course facility, and will give guidance and direction to the design of that program element.

Contact: Charles Peterson

Philosophy

The theory behind the design of the process diagram (Figure 6.3) ties tightly into the process philosophy. It is simple: User Data is CENTRAL to everything. So the design of the process diagram is similar to a dial of a lock, each ring is able to slide into the perfect combination for the project. Since the project includes obtaining user data, I must complete the Institutional Review Board's process for approval of user research methods, which puts every task at risk to change.

The center is the philosophy ring. The idea that user data is central to everything is represented in the central circle titled "User Data". Then the four sub-circles are the groups contributing to the collection of this input material. The four groups are the educational group (Amanda White, the Committee Group, and fellow LAR 700 students), the professional group (Ochsner Hare & Hare), the priority user group (Camp Adventure, Inc, past and current campers and staff), and the governmental group (Army Corps of Engineers, Jefferson County, and local citizens). The collection of these four groups is critical to gathering the most complete user input.

Process Diagram (Figure 6.3)

The path is in consecutive order, with the understanding that overlapping and multi-tasking is the key with user input as the guiding principle. Progress must continue regardless of when the user input is returned/gathered.

Project Description & Intent

August 1- October 1
The Project Description & Intent is to fully articulate and define the goals set forth for the project. It is also to show the viability of the project to the faculty and students. It is the "initial road map" to demonstrate how the project will develop.

Literature Map & Review
September 1- November 13
The intent is to gather a breadth of literature pertaining to the different issues within the project, and identify the most important texts that will guide considerations. It is also a chance to help frame the argument for the importance of user data.

Design Process
September 8- December 8
The design process is the form in which the methodology and timeline is defined. This takes on the full year project timeline and tasks. The philosophy, path, tasks, and time are all communicated in this phase.

User Analysis
September 28- November 13
This phase is meant to collect information about the Camp, its operations, and the users. This will spell out the specific diseases of the users and their implications.

IRB Application & Submittal
October 1- October 27
The user based research methods must pass IRB approval. Defining the methods concisely, completing consent waivers, and the IRB Application all must be completed before submission. IRB approval typically takes 10-14 days. Any discrepancy could cause this phase as well as the

specific research methods back two weeks. The IRB approval directly effects the timeline of user based research and analysis.
Precedent Study
October 15- November 15
This phase is to analyze similar examples of disability camps. This may help visualize potential solutions, understand the scope and scale of my own project, or refine the process and approach.

User Based Research Methods
Survey - November 9 -19
The survey will gather the largest amount of qualitative data from a large group of users.
Charrettes - December 19 & January 23
Charrettes are a collaborative design meeting where a diverse group can come together to solve problems. There will be two charrettes: a Programmatical Charrette and a Conceptual Design Charrette.

Site Inventory & Analysis
August 31- December 8
This phase is to take inventory and analyze contextual and site information related to the project. Inventory of data should form a better understanding of the site's existing form. The analysis should synthesize my understanding of the site and the potential program.

Program
October 19- January 18
This phase is to explore and define the form and function of individual elements and the project as a whole. Preliminary definition of a program will help shape site analysis.

Research Analysis
November 20- January 31
This phase is to take a critical look at the survey results and charrette findings and find the common trends. These findings should be compared to the program and make user based adjustments.

Final LAR 700 Document
November 27- December 8
This document is a collaborative in-progress document to support the project's continuance into

LAR 740 and the design portion.

Conceptual Design
January 18- February 5
This phase is to explore two conceptual design plans and the organizational properties within the full site master plan. The Conceptual Design Charrette will occur during this phase, allowing user input to guide the design. One will be chosen and taken on into the design development phase.

Design Development
February 8- March 31
This phase is to further develop the conceptual design into a single, more detailed plan. Massing and connections will become shapes and paths. The plan is an illustrative representation.

Select Program Element Design Details
February 22- March 31
The selected program elements will be further looked at with direction from research of ADA standards and user input. This will help derive the best adaptation method to make these elements fully accessible.

Phasing
April 1- April 15
A phasing plan will be created to help the camp determine what the development process should be. Cost, user preference, and readily accessible materials and labor will all be taken into consideration.

Implementation Plan
April 1- April 15
The implementation plan will help Camp Adventure take this document and proceed with direction. Potential funding options will be included.

Book Production
April 1- May 5
The final book will be produced to professional quality and will be the complete compilation of the project's findings. The book will be in printed format, as well as pdf.

Graduate Committee Presentation
Early May
The project must be presented to the Graduate Council to confirm completion of the Master's criteria.

Time

The time is communicated on the outer ring of the diagram (Figure 6.3), shown by months. The project starts with August 1 being the beginning and finishing up in early May. Winter Break and Spring Break have been taken into consideration.

Meetings

The middle ring with four bands is the meetings ring (Figure 6.3). Each band represents a sub group from the philosophy center. The most inner is the governmental group, then the priority users or Camp Adventure, and the professional group of Ochsner Hare & Hare, and then the educational group. Below is a listing of the meetings and the purpose of meeting.

A. Meet to discuss the direction and understandingof the project
B. Meet about IRB approval, and ResearchMethods.
C. Meet to discuss program and site inventory/analysis
D. Programmatical Charrette
E. Meet to discuss Final LAR 700 document and progress
F. Conceptual Design Charrette
G. Meet to Review Conceptual Design
H. Meet to critique Design Development
I. Meet to critique Program Element Design
J. Meet to discuss final product
H. Final Review

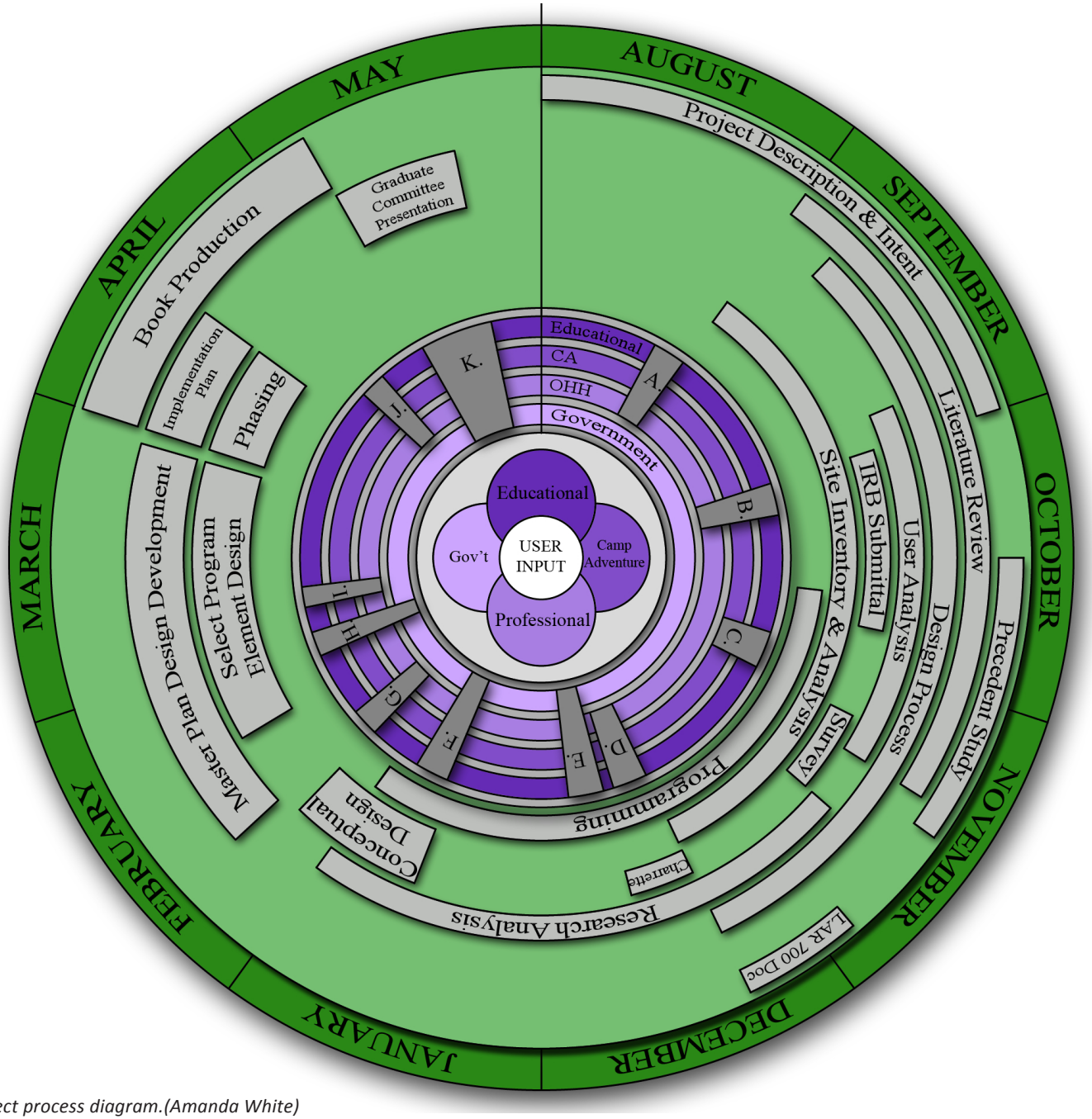

Figure 6.3. Project process diagram.(Amanda White)

Appendix D: User analysis

Cerebral Palsy

Information gathered from sources:
Dormans, John P, and Louis Pellegrino. Caring for Children with Cerebral Palsy: A Teambased Approach. 1st ed. Baltimore: Brookes Publishing Company, 1998. Print.

Hardy, James C.. Cerebral Palsy (Remediationof Communication Disorders Series). 1st ed.Englewood Cliffs, New Jersey: Prentice-Hall, 1983. Print.

In 1862, William John Little presented a study in which 47 children were diagnosed with what he termed, spastic rigidity (now known as spastic diplegia). He proposed that this motor impairment syndrome was a result of birthing difficulties. He linked asphyxia neonatorum (meaning oxygen deprivation caused by respiratory failure in newborns) to spastic respiratory. This birth related brain injury, later termed cerebral palsy, is the effect of the asphyxia neonatorum cause. This relationship didn't truly evolve until the 1980s. Cerebral means brain centered, and palsy means lack of muscle control. The disease is non-progressive, meaning the disease doesn't get worse over time, and is incurable. With advances in the medical research world, concepts of cerebral palsy have evolved. It is now believed that there are more causes to the disease and that is can occur prenatal (before birth), perinatal (during the birthing), and postnatal (after the birth).
In general, it is an injury to the brain causing some form of difficulties with motor functions. Dormans and Pelligrino state that there are three recurrent elements that define cerebral palsy:

1. there is a significant problem with motor function

2. this issue with the motor functions is the result of something going wrong with the brain during its early development

3. that the disturbance of the typical brain development occurred over a specific period of time and does not represent a continuing, recurrent, or progressive process

Cerebral Palsy is a motor impairment syndrome, indicating that all people with cerebral palsy have a significant problem controlling movement and posture. Although the disease itself is not progressive or degenerative, the motor impairments inflicted may change or worsen over time. Abnormalities in muscle tone, movement, and posture are important in classifying the subtype

of cerebral palsy Muscle tone may be increased (i.e. hypertonia) or decreased (i.e. hypotonia). Abnormalities of movement may be manifested by disturbances of voluntary movements or the presence of involuntary movements. Posture refers to the motion and positioning of one body part relative to another. Posture represents the integration of movement patterns as these occur with in the context of altered muscle tone. These qualitative factors have led to classifying cerebral palsy by physiological type (Table 6.1).

Cerebral palsy is also classified by the geographic distribution within the body. This is often described by the limbs involved in the motor impairment (Table 6.2). Total body cerebral palsy or quadramembral cerebral palsy are terms to describe a person whose entire musculoskeletal system is abnormal in relation to muscle tone and movement. Figure 6.4 illustrates the geographic involvement (hemiplegia, diplegia, and quadriplegia) and the muscle tone involvement (athetoid, dystonic, and ataxic), as well as the portion of the brain that has been damaged causing the motor impairment.

Spastic cerebral palsy is the most common type, accounting for 70-80% of cases, and is categorized by the limbs affected. 25-35% of children with spastic cerebral palsy have spastic diplegia, with their legs being more affected than their arms. 35-40 % of children with spastic cerebral palsy have spastic hemiplegia, having one side of their body being affected. The side of the body of the limbs that are affected relates to the side of the brain that sustained the damage. In the case of spastic quadriplegia, or 40-40% of cerebral palsy cases, all four limbs as well as the trunk, and the muscles that control the mouth, tongue, and pharynxare affected. The best way to relate spasticity to the normal person is to make a tight fist and understand the tightness that occurs in the arm. This is a constant muscle contraction for whatever limb is affected. The case of those with spastic quadriplegia, concerning the face, their facial muscles is tightly stretched, as if you dropped your jaw with excitement. Those with this type of cerebral palsy often have issues controlling drooling, eating, swallowing, and speaking. With spastic quadriplegia, there is the implication of wider brain dysfunction and a much worse implications than other forms of cerebral palsy. Mental retardation, seizures, sensory impairments, and medication complications are few of these implications. Muscles contracted so tightly for such long periods of time can be painful and frustrating. Many of their movements are involuntary and difficult to manage.

Dsykinetic cerebral palsy (10-15% of cerebral palsy cases) is characterized by muscle tone abnormalities affecting the entire body. The muscle tone can change within hours. Children with dsykinetic cerebral palsy are typically display rigid muscle tone while awake and a more typical or relaxed muscle tone while asleep. Involuntary movements are often and sometimes not

Physiological Type	Description
Spasticity	Velocity-dependent resistance to stretch, clasp-knife response, increased deep tendon reflexes
Athetosis	Involuntary writhing movements, often with chorea (i.e.involuntary jerky movements)
Rigidity	"Lead-pipe" hypertonia, fluncuating tone, prominent primitive reflexes
Ataxia	Problems with balance and controlling position of body in space
Hypotonia	Low muscle tone, normal or increased deep tendon reflexes
Mixed	Evidence of two or more physiological types

Table 6.1. Cerebral palsy classification by physiological type. (Adapted from Dormans 1988, 9)

Distribution Type	Description
Hemiplegia	Arm and leg on same side involved, arm usually more than leg
Monoplegia	One limb, usually arm affected (a variant of hemiplegia
Diplegia	Both sides of body involved, legs more than arms
Quadriplegia	Both sides of body involved, both legs and arms significantly affected
Triplegia	Both sides of body involved, but only one limb (usually arm) relatively spared
Double hemiplegia	Both sides of body involved, but one side is more than other; arms usually more affected

Table 6.2. Cerebral palsy classification by distribution type. (Adapted from Dormans 1988, 9)

visually detected, and are the key marker of this type. Rapid, random, jerky movements and slow, writhing movements are seen in athetoid cerebral palsy, a sub type of dyskinetic cerebral palsy.

Ataxic cerebral palsy (less than 5% of cases) is characterized by abnormal voluntary movements, involving balance and position of the trunk and limbs. For those who can walk, they have a widebased, unsteady gait. They experience difficulties during voluntary movements, such as overshooting when reaching for something. Problems' concerning the timing of motor movements is also a characteristic.

Associated Impairments and Disabilities

Approximately 40% of people with cerebral palsy have some vision abnormality, and at least 7% have a severe visual deficit. Many are nearsighted, have a lazy eye, have a loss of vision within a portion of their visual field, or cortical blindness: loss of vision due to abnormalities of the brain, not the eye). Many people with cerebral palsy have to have hearing aids to compensate for hearing loss. Some people have issues with somatosensory deficits. This is where they have lost awareness of where their limbs are in space.

People with cerebral palsy also often experience cognitive impairments, mental retardation, and learning disabilities. They have difficulties with memory, language, problem solving, and attention. Cognitive impairments are more frequent in children with cerebral palsy than those of the general population. 75% of children with cerebral palsy are diagnosed with mental retardation or a learning disability.

Children with cerebral palsy also have more medical or surgical problems and are considered associated impairments or secondary impairments. 46% of children with cerebral palsy have seizures, which is a sudden surge of electrical activity in the brain that usually affects how a person feels or acts for a short time. Seizures, or epilepsy, are an example of an associated impairment. Secondary impairments are made up of medical problems like hip dislocations, muscular contractures, and scoliosis. These are usually caused by the abnormal muscle tone and can be surgically or prosthetic ally fixed. Respiratory, gastrointestinal and urinary tract dysfunctions can also occur with cerebral palsy. Most children with cerebral palsy live well into adulthood, the life expectancy rate of those with cerebral palsy is slightly less than the general population. Life expectancy is also derived from the type of cerebral palsy.

Developmental Disability

Cerebral palsy is a developmental disability and falls into the same diagnostic category as mental retardation, autism, learning and language disorders, and attention disorders. (Table 6.3) Development refers to the growth in which human behavior changes during the life cycle, in particular, during childhood. Disability is referring to the decrease in skills or function as the result of a physical or psychological impairment. Basically, it is more difficult for those with a developmental disability to acquire skills or abilities. Diagnosis for the developmental disability is based on the behavioral and functional characteristics of the child.

The functional characteristics fall into two groups: basic physiological and psychological functions and integrated functional processes (Figure 6.5). The basic processes involve sensory functions, cognitive processes, and motor functions. The integrated processes involve socialization, daily living skills, and mobility skills. The basic processes can be thought as impairment to the person's ability to function as a person. They have difficulty speaking, or understanding someone. Integrated processes cause complications for the person to live in mainstream society. They have difficulties with maintaining or understanding relationships, being mobile, and even feeding, dressing, or grooming theirselves. Figure 5.4 illustrations how cerebral palsy affects a person's developmental disabilities.

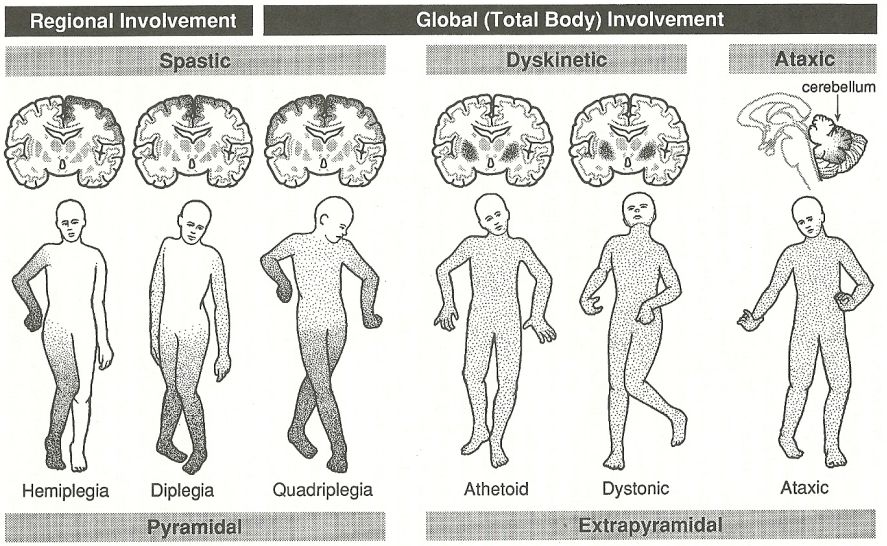

Figure 6.4. Cerebral palsy classification by physiological, distribution, and neurological substrate. (Dormans 1988, 12)

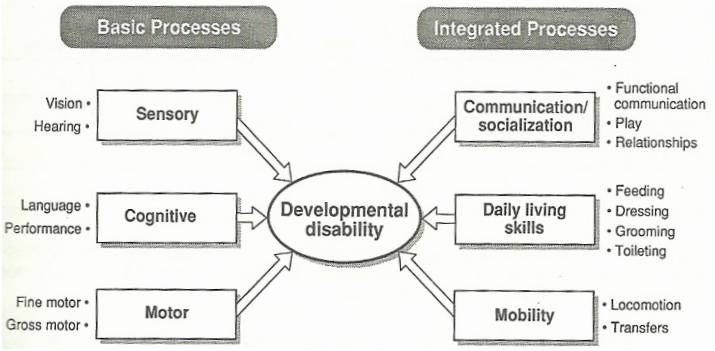

Figure 6.5. Function domains that characterize a development disability. (Dormans 1988, 33)

	Sensory	Cognitive	Motor	Commu-nication	Daily living skills	Mobility
Cerebral Palsy			✓			✓
Mental Retardation		✓			✓	
Autism		✓		✓		
Deafness	✓			✓		

Table 6.3. Development profile across functional domains. (Dormans 1988, 34)

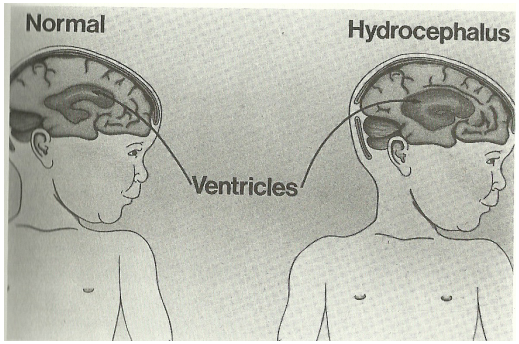

Figure 6.6. Ventricular system characteristic of hydrocephalus. (Rowley-Kelly 1992, 11)

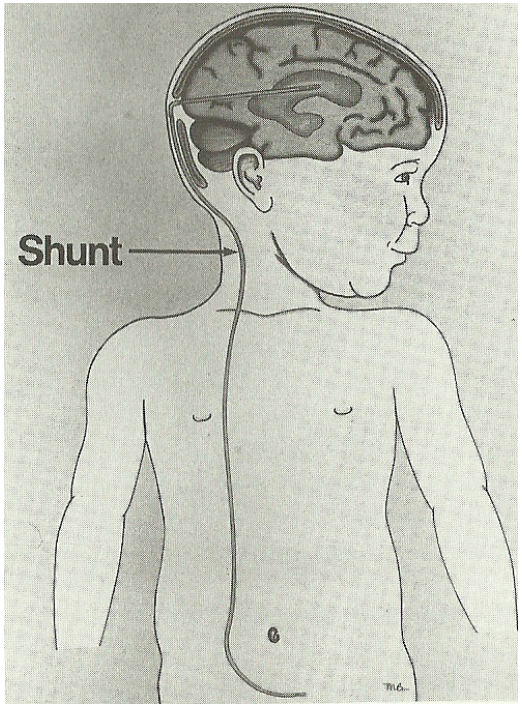

Figure 6.7. Shunting procedure for hydrocephalus. (Rowley-Kelly 1992, 11)

Spina Bifida

Information gathered from sources:

Anderson, Elizabeth M., and Bernie Spain. The Child with Spina Bifida. New York: Routledge, 1977. Print.

Rowley-Kelly, Fern L.. Teaching the Student With Spina Bifida. Baltimore: Brookes Publishing Company, 1992. Print.

Spina Bifida is a developmental defect of the spinal column, caused when one or more of the arches of the spinal vertebrae have failed to fuse together. In this case, the spine is 'bifid', a Latin term meaning 'split in two'. Through the gap in the spine, either the spinal cord itself or the surrounding membrane, will protrude out, depending on the type the spina bifida. Basically, the nerve cords fail to close or fuse together and the nerve cords remain immature and have not formed properly. The supporting tissues, including the vertebrae and the cranium also are formed abnormally. It is believed that spina bifida occurs in every 2 of 1000 births in the United States, and predominately occurs in females with a 3:1 ratio to boys.

In the brain, there are ventricles, or cavities within the brain, that a fluid called cerebro-spinal fluid is produced. This fluid bathes and protects the nerve cells. In a child with spina bifida, the cerebro-spinal fluid (CSF) will build up and cause what is called hydrocephalus. This is not only an obstruction to the normal circulation of the CSF, but it can cause nerve cells to become stretched and crushed, enlarging the child's head and causing several issues like migraines and pressure (Figure 6.6). If the hydrocephalus is progressing, the individual must under a surgical 'shunting' procedure (Figure 6.7). "The principle involved is to drain the excess CSF away into the blood stream either directly via the heart or indirectly by absorption from the peritoneum" (Anderson 1977, 36). Any complications with the shunt can lead to life threatening situations,

or permanently impair intellectual functioning. The shunt may be compromised if it is blocked, infected, or disconnected.

There are two classifications of spina bifida: spina bifida occulta and spina bifida cystica. Spina bifida cystica is then divided into two different conditions: meningocele and myelomeningocele. In spina bifida occulta, the vertebral arches do not fuse, but the spinal cord and membrane does not protrude out of the spinal tube. Physically, small dimples, or tuft of hairs may be the marking as there is little to no distinct external evidence. Occulta is Latin for hidden, describing the physical detection of the defect. Spina bifida occulta is rather common and has very little effect on a person's spinal cord and nerves. The small lump is typically surgically removed and does not affect the neurological functions.

The main type of spina bifida is spina bifida aperta (Latin for 'open') or spina bifida cystica (cyst-like). This type is where "some of the spinal cord tissue herniates into a sac-like cyst filled with cerebrospinal fluid" (Anderson 1977, 13). Spina bifida meningocele is the condition where the meninges (membrane) protrudes through the gap of the spine and forms a cystic sac, usually covered by normal skin. The sac typically only contains the meninges and the CSF, keeping the spinal cord intact inside the spinal tube. Because the nerve cord can function properly, there is no significant impairment. This occurs in 15-25 % of spina bifida cystica cases.

The other type of spina bifida cystica is myelomengingocele. Again, this is caused when the vertebra fails to close, but in the case of myelomengingocele, the meninges and the spinal cord extend out into the sac. Figure 6.8 illustrates the typical spine and the effects of both meningocele and myelomeningocele. This results in a permanent and irreversible neurological disability. The sac may look like a large blister and can be up to baseball size (Figure 6.9). The sac lies somewhere along the spinal column and varies greatly in size, extent and contents with each child. Sometimes skin will cover a portion of the lesion, but the area is exposed to injury and infection. If the cystic sac is allowed to grow, the nerve roots may expand increasing the paralysis and increasing weakness of legs and abdominal muscles. The nerves can also dry out and deteriorate if they are not protected. Most infants undergo surgery within 24 hours to ensure that the nerves are protected. The doctor places the spinal cord back into the spinal cavity and covered with the other tissues and skin to protect it from any further damage or infection. Over 90% of those with myelomengingocele have some degree of weakness of their legs, inability to control their bladder or bowel (incontinence), and a variety of orthopedic abnormalities.

The extent of the paralysis is a direct correlation to the geographic relation along the spine.

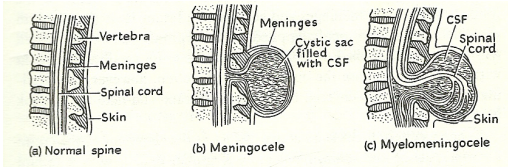

Figure 6.8. Diagram of section through spine or meningocele or myelomeningocele conditions. (Anderson 1977, 13)

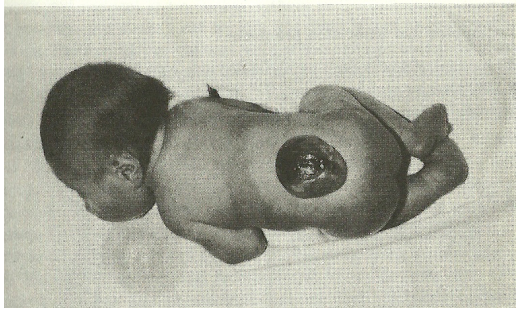

Figure 6.9. Infant with cystic sac. (Anderson 1977, 15)

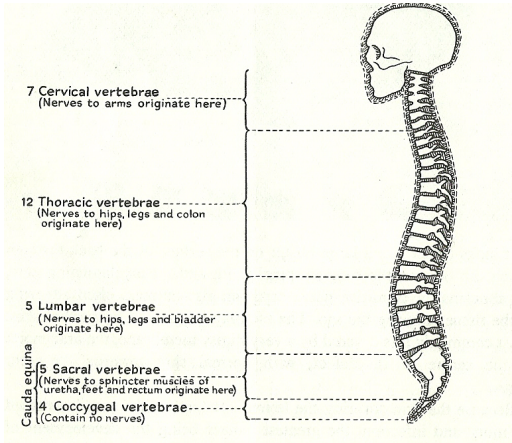

Figure 6.10. Vertebrae associated with paralysis diagram. (Anderson 1977, 16)

From the point of injury and down, the body is paralyzed, depending on its severity and extent. In Figure 6.10, there are zones along the spine that control the nerves to different muscles and limbs. The majority of children with spina bifida have the lesion occurring at the Lumbar vertebrae or below. Despite the location of the lesion and its effects of paralysis, hydrocephalus makes independent walking still difficult. In addition to the initial neurological damage, more abnormalities to the vertebrae are often present such as scoliosis and kyphosis (both are curvature of the spine). The rib cage, hips, ankles and knees can also be abnormal.

Individual limbs can also become deformed because of an imbalance of the muscles, related to the lack of nerve supply. The large muscles used to operate limbs normally work in pairs. This is called reciprocal innervation. When one muscle contracts to raise a limb, the opposing muscle expands to release it. However, if one muscle of the pair has poor nerve supply, then it will not be able to equally reciprocate the power. This can cause a limb to permanently be held in an abnormal position, or a range of movement can diminish.

Joint deformities are also often present with spina bifida. Hips can dislocate. Knees can be fixed in a rigid position and not be able to bend voluntarily. Feet may not be aligned correctly because of muscle tendons in the calf and ankle. These contractors often worsen over time as the child grows, or because of lack of movement. Paralyzed children also often develop fractures after long periods of being immobile. Exercising these muscles is clearly an important part of maintaining functional abilities.

Spina bifida also produces a loss of sensation (anaesthesia) in the affected parts of the body. The nerve supply is damaged or lacking, and when a child touches something hot or sharp with that limb, the nervous system doesn't send the message to the brain that it is being sensitized. The camp training always gives an example of giving a camper a curling iron to hold while the staff hair sprayed. The camper wasn't paying attention and set the curling iron on her lap and suffered first degree burns without even knowing it. Those with spina bifida must also take precaution of pressure. If too much pressure is applied to a point of someone's body, the blood will cease from circulating and the oxygen to the tissue will also be cut off. The tissue becomes damaged and will begin to deteriorate. As the tissue breaks down, the skin becomes red and takes on the appearance of an ulcer. A typical person sitting in a chair for an extended time will be sensitive to the pressure and discomfort and shift their weight or change positions. Spina bifida prevents this sensation, allowing pressure sores to occur if the situation isn't addressed early enough. If ignored, pressure sores can become so serious that they must have the dead tissue surgically removed. Similar to cerebral palsy, campers like to stand, be repositioned, or lie down to allow

for better circulation. It can be as simple as a wrinkle in a sock; pressure sores are difficult to catch and must be constantly prevented. “If the axiom that ‘an ounce of prevention is worth a pound of cure’ applies, it does to skin breakdown” (Rowley-Kelly 1922, 21).

Damage to the spinal cord and associated nerve roots will have adverse affects involving a loss of sensation with the bladder and sphincter control. This can lead to incontinence of urine or facaes. Incontinence has more than social implications, it can become a life threatening factor if the kidneys become infected. Doctors can treat this by three different practices: manual expression, use of urinary appliances not involving surgery, and urinary diversion surgeries. One procedure is by inserting a catheter into the uretha and connecting it to a collection bag, which is strapped to the upper leg. However, due to high risk of infection, if not carefully managed, this is not typically a long term solution. Assistance is always needed for management/changing of the catheter or collection bag. A common operation is a ureterostomy or an ileostomy, depending on where the connection is able to be made. Basically, a portion of the intestine is brought to the surface of the abdomen and a spout, or ‘stoma’, is connected to a collection bag. Considerations are that the ‘stoma’ can often become infected and may need medical care. In both cases of a catheter or a ‘stoma’, careful attention must be paid to the collection bag. If the bag falls and drops, it can break, spilling toxins.

Incontinence also leads to many social implications for the individual. Social isolation is one of those, finding it difficult for society to understand and accept their medical needs and issues. The problem arises outside of school hours typically. School does provide some level of social connection for the spina bifida student, but once school lets out, most of those connections are forgotten. The difficulties of mobility have a direct influence on social isolation. Other reasons for social isolation are architectural barriers, social behavior factors, and self-concept and attitudes. Depression ranks very highly among spina bifida individuals. Christy Brown, a study participant describes it as “instead of coming to a better understanding of my handicap as I got older, I only became more troubled and bitter” (Anderson 1977, 254). As with cerebral palsy, those with spina bifida are apt to have seizures. Thirty percent or more of individuals with spina bifida develop epilepsy.

Adaptive Methods and Equipment

Information gathered from sources:

Dormans, John P, and Louis Pellegrino. Caring for Children with Cerebral Palsy: A Teambased

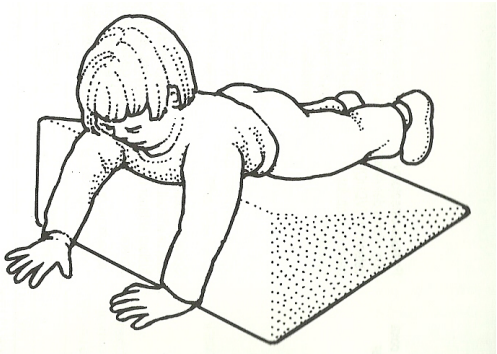

Figure 6.11. Child using wedge for hip extension. (Dormans 1988, 206)

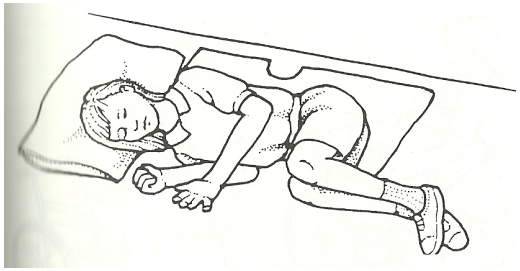

Figure 6.12. Child in sidelying position. (Dormans 1988, 207)

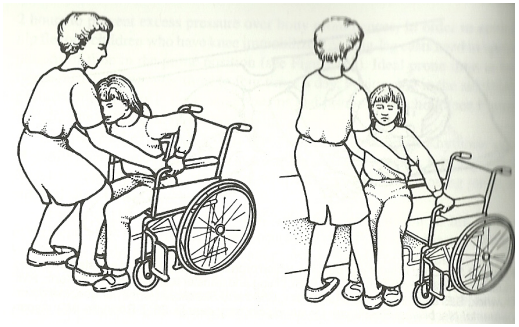

Figure 6.13. Stand-pivot transfers. (Dormans 1988, 208)

Approach. 1st ed. Baltimore: Brookes Publishing Company, 1998. Print.

The abnormality of the muscle tone can cause much stress on the body. There are several methods of positioning the body to relax or promote extension. Sitting in a wheelchair can cause much pressure on the trunk of the body. Several of the campers enjoy getting out of their chair to redistribute the pressure, and overall relax. At campfire, we often bring out spare mattresses to transfer the camper to. Another suggestion, made in Dormans literature, is to use a wedge shaped mattress, and it will promote hip and knee extension (Figure 6.11). This also allows the person to move their arms and head freely, which could be desired for song/skit participation at campfire. Lying down in the sidelying position promotes relaxation and reaching and reduces muscle spasms (Figure 6.12). To stretch the legs, campers often ask to bear hug and stand for a few minutes. This allows the blood to recirculate and relieve some pressure from the trunk.

A transfer is when an immobile person is manually relocated from one position to another. This can be done in three ways. The first is a stand-pivot transfer (Figure 6.13). This is possible when the person has ability to support their weight with their legs. The caregiver helps the person stand up, turn, and then sit down. Some campers can even do their own transfer in a similar fashion if they have an aide to help balance. Some can use an arm to pull and pivot their weight as well, provided there is something for them to grab on to. A two-person lift is conducted when a person is unable to stand (Figure 6.14). One caregiver positions themselves behind the person, lifting the upper body, and another caregiver lifts underneath the knees/thighs, to lift the lower body. Then with one swift move together, the caregivers transfer from a chair to a bed, or vice versa. The key with spastic movement is to have a secure hold on the limbs so that the limbs are not able to involuntarily spasm, injuring the person or a caregiver.

There are several adaptive devices or techniques that a person with cerebral person can use to compensate for limitations. In Table 6.4, a list of adaptations for daily living is given. An extension of a handled comb or brush helps a person brush their hair. They can add weighted devices to increase accuracy to adapt to issues with controlling movement.

Walkers provide support by use of light metal frames. They have four legs, and some have wheels. Anterior walkers are those you push in front of you, much like the typical walker we associate with today. However, this type can contribute to hip flexor tightness and prevent use of the hip extensor muscles. The Posterior walker (Figure 6.15) is pulled behind the body and promotes an extended trunk and more upright posture.

There are two main types of crutches: axillary and forearm. Axillary crutches (Figure 6.16) are the typically known crutches with support under the arms with pads, and a weight bearing handle to grip with the hands. The forearm crutches (Figure 6.17) have a cuff that fits around the fore arm, and a handle to support weight. Both crutches require the user to have more trunk control and balance than a walker requires. The user's arms must be strong, to bear a large portion of their own weight. However, it allows the user to be more versatile; they can use to go up or down stairs. Quad canes (Figure 6.18) provide a little more support than the crutches. There is a horizontal handle with a large base, supported by four short legs. This provides more balance an is often the transition from a walker to crutches.

Wheelchairs come in various sizes and shapes, and are equipped with several functions. Manual wheelchairs (Figure 6.19) are often used when the individual can maneuver the wheels themselves. The seating system can often be changed. The chair is usually lightweight-allowing someone to transport the chair easily. The can also usually collapse to save space. The chairs have large rear wheels and very small directional front wheels. There's also some form of footrests, arm rests, and push handles.

Power wheelchairs (Figure 6.20) are often used for those who do not have the strength

Figure 6.14. Two person transfer. (Dormans 1988, 209)

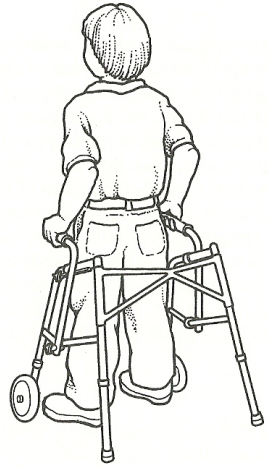

Figure 6.15. Posterior walker. (Anderson 1977, 315)

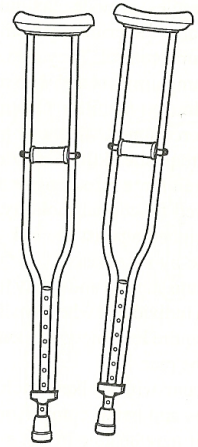

Figure 6.16. Axillary crutches. (Anderson 1977, 316)

		Functional skill area			
Problem area	Principle of adaptation	Dressing	Hygiene	Feeding	Play/school
Limitations in reaching	Compensate with extended handles or eliminate need to reach	Dressing stick, long shoe horn, elastic shoelaces, or sock donner	Extended handled comb, brush, or sponge; or toilet aid	Electric feeder or long-handled spoon	Elevated or tilted work surface or reachers
Limitations in grasping	Eliminate need for grasp or build up handles to compensate for weak grasp	Zipper pull, button aid, or Velcro closures	Built-up handles on tooth-brush, comb, and so forth; universal cuff; sponge or wash mitt; or wiping tongs	Universal cuff, utensils with built-up handles, or hand splint	Pencil grip, automatic page turner, card holder, or switch-activated toys
Limitations in assuming sitting or standing positions	Provide external support or eliminate the need for sitting or standing	Dress in supine or sidelying position or dress while seated in wheelchair	Tub or shower seat, grab bars, transfer board, toilet safety frames or rails, or high-back toilet supports/commodes	Appropriate seating	Appropriate seating or tray
Limitations in general strength	Use lightweight devices, use powered equipment, use gravity to assist with strength, or limit or eliminate the need to move against gravity	Dress in supine or sidelying position	Electric toothbrush	Plastic utensils or elevated table or tray	Lightweight toys or double set of school books to avoid carrying books home
Limitations in control of movement	Use weighted devices or friction surfaces to increase accuracy or use adaptive positioning to stabilize proximal body parts	Weighted handles on button aids or zipper pulls or Velcro closures	Soap on a rope or rubber-suction bath mat	Covered cup or nonslip mat	Computer or typewriter, nonslip mat or suction cup toys, or adapted toys

Table 6.4. Commonly used adaptive devices and techniques. (Dormans 1988, 338)

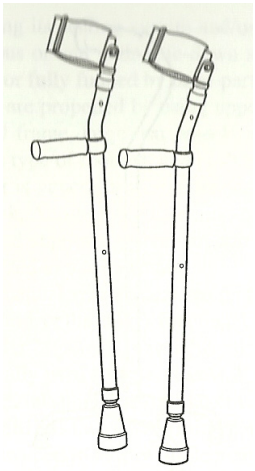

Figure 6.17. Forearm crutches. (Anderson 1977, 317)

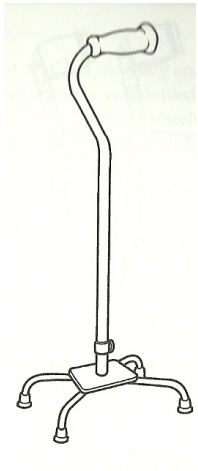

Figure 6.18. Quad cane. (Anderson 1977, 318)

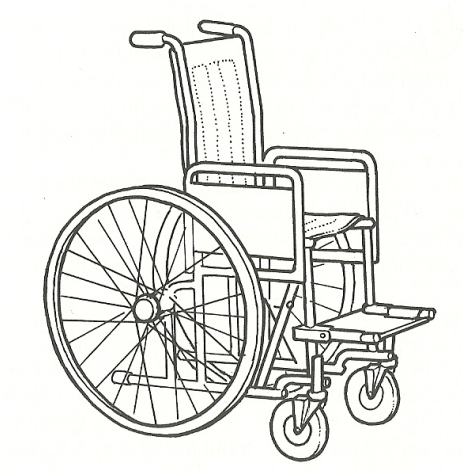

Figure 6.19. Manual wheelchair. (Anderson 1977, 319)

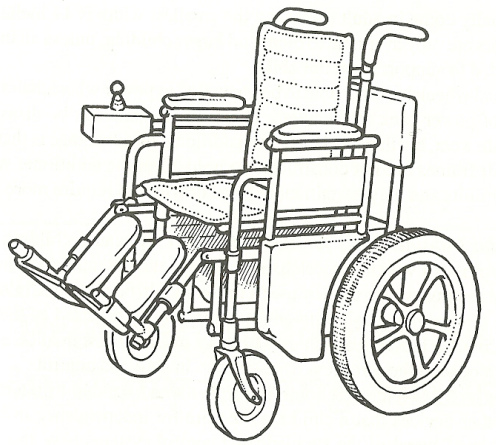

Figure 6.20. Power wheelchair. (Anderson 1977, 321)

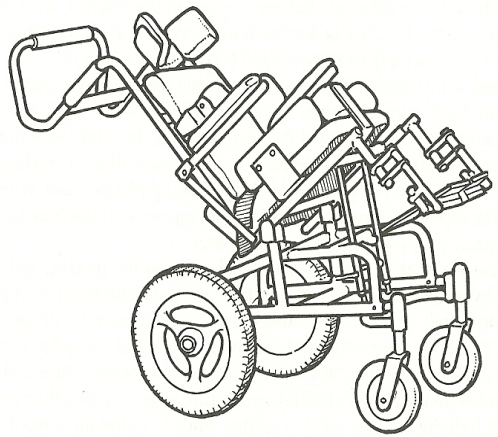

Figure 6.21. Power wheelchair with tilt options. (Anderson 1977, 320)

to maneuver a manual chair, but has cognitive understanding to operate a power chair. Power chairs have several controls for speed, acceleration, turning speed, and tilt options (Figure 6.21). The tilt allows for the body to reposition easily and distribute weight more evenly. These features are controlled by use of a joystick, usually located somewhere along the armrest. Power chairs also have a gel or lead acid battery that supplies the power to the motor. Batteries must be recharged often, and must be charged in a safe location for safety concerns. These batteries can blow up and leak acid. I have personally been involved when a battery blew up. This was an extreme urgency as we had to quickly transfer the camper out of the chair and take her and myself to the showers and be specially cleansed to avoid any acid burns. The acid spill had to be specially treated and the chair did not work for the remainder of camp. This can be extremely costly for both the chair and for facilities. Safe measures of power chair storage must be taken. Power chairs are extremely heavy, usually weighing around 50 pounds without the battery. They are difficult to disassemble. Special care must be taken with power wheelchairs as equipment for them cost any where from $800-20000. Newer chairs today with all the accessories and features can cost up to $40,000. Most families do not have the financial resources to cover these costs, and the government or other programs help.

Appendix E: Main Building

The Main Building was conceived by the camp Board of Directors. The Board located an engineering firm who creates steel frame buildings and this layout is typical of that construction. They then took the conceptual floor plan to Kaster Architects in Overland Park, Kansas for further detailed design. Figure 6.22 is a rendered conceptual plan created by the camp directors.

Figure 6.22. Main Building conceptual floor plan. (Camp Adventure)

Appendix F: GIS Data Atlas

The atlas is a composite table of the data collected for site information. (Figure 6.5) The table lists the category, the dataset name, a description, the source of the data, the location of the data on the authors computer, the author or creator of the data, the modification date, the acquisition date of the data, the scale and the projection and coordinate system information. The table was created for use of the author to track data information, but was included so that others interested in the data may find its source easily.

Project Data Category *Natural System* *Social System* *Program Element-* *Dynamic*	Dataset Name	Data Description	Data Source *(Firm, Client, URL, Etc.)*	Data Location (Path on computer or location in project file-notebook if hard copy)	Data Author-Creator	Data Currency or Relevancy Date	Data Acquisition or Access Date	Data Scale	Projection & Coordinate System
Natural System	*V-TOPO-20080901.dwg*	*Site Base File containing site boundaries, 1 foot contours, utilities and vegetation.*	*Project Surveyor X Provided by Firm Y*	*D:\Projects\ProjectName\Source\Survey\V-TOPO-20080901.dwg*	*Project Suveyor*	*5/10/2007*	*8/1/2008*	*1 in = 10 ft*	*Kansas State Plane North Zone, US Foot, NAD 83, NAVD 88*
natural system	3mElevationGroup	elevation data, 3m	http://datagateway.nrcs.usda.gov/	D:\Projects\CampAdventure\GIS\source\3melevation	USDA/NRCS - National Cartography & Geospatial Center	modified 11/1/2009	10/25/2009	NA	NAD_1983_UTM_Zone_15N
social system	Counties_Kansas	kansas counties	http://datagateway.nrcs.usda.gov/	D:\Projects\CampAdventure\GIS\Geodatabase\CampAdventure.gdb	USDA/NRCS - National Cartography & Geospatial Center	4/1/2008	9/30/2009	1:3000000	NAD_1983_UTM_Zone_15N
social system	states and provinces	kansas boundary	ESRI	D:\Projects\CampAdventure\GIS\Geodatabase\CampAdventure.gdb	ESRI	Modified 10/01/2009	9/30/2009	1:15000000	NAD_1983_UTM_Zone_15N
social system	countries	Countries	ESRI	D:\Projects\CampAdventure\GIS\Geodatabase\CampAdventure.gdb	ESRI	Modified 10/01/2010	9/30/2009	1:50000000	NAD_1983_UTM_Zone_15N
dynamic system	ks_county_census2000_pop1860_2000_popc	ks population estimates	ESRI	D:\Projects\CampAdventure\GIS\Geodatabase\CampAdventure.gdb	ESRI	Modified 10/01/2011	9/30/2009	NA	NAD_1983_UTM_Zone_14N
dynamic system	cntry08.sdc	ks population projections	ESRI	W:\93\Data_And_Maps_93\Data_and_Maps_and_StreetMap_North_America\world\data	ESRI	Modified 10/01/2012	9/30/2009	NA	NAD_1983_UTM_Zone_14N
social system	spcszn83.sdc	state plane zones	ESRI	W:\93\Data_And_Maps_93\Data_and_Maps_and_StreetMap_North_America\usa\other	ESRI	Modified 10/01/2013	9/30/2009	1:5000000	NAD_1983_UTM_Zone_14N
social system	utmzone	UTM grid	ESRI	W:\93\Data_And_Maps_93\Data_and_Maps_and_StreetMap_North_America\world\data	ESRI	Modified 10/01/2014	9/30/2009	NA	NAD_1983_UTM_Zone_14N
dynamic system	placeply	US Census Populated Areas	ESRI	W:\93\Data_And_Maps_93\Data_and_Maps_and_StreetMap_North_America\usa\census	ESRI	Modified 10/01/2015	9/30/2009	NA	NAD_1983_UTM_Zone_14N
dynamic system	ks_county_pop_1860_2007_animate	Census Animate	Eric Bernard	T:\GIS\Geodatabase\KS_Atlas_080309.gdb	Eric Bernard	Modified 10/01/2016	9/30/2009	NA	NAD_1983_UTM_Zone_14N
natural system	soils_ks_Jefferson.shp	Soils	http://datagateway.nrcs.usda.gov/	D:\Projects\CampAdventure\GIS\source\soil_ks087\soils_ks_Jefferson.shp	USDA/NRCS - National Cartography & Geospatial Center	3/13/2009	9/30/2009	NA	GCS_North_American_1982
dynamic system	Tiger2000_Census_Block.shp	Census Block	http://datagateway.nrcs.usda.gov/	D:\Projects\CampAdventure\GIS\source\census_block\Tiger2000_Census_Block.shp	USDA/NRCS - National Cartography & Geospatial Center	Modified 10/01/2009	9/30/2009	NA	GCS_North_American_1983
dynamic system	Tiger2000_Census_Block_Group.shp	Census Block Group	http://datagateway.nrcs.usda.gov/	D:\Projects\CampAdventure\GIS\source\census_block_group\Tiger2000_Census_Block_Group.shp	USDA/NRCS - National Cartography & Geospatial Center	Modified 10/01/2010	9/30/2009	NA	GCS_North_American_1984
dynamic system	Tiger2000_Census_tract.shp	Census Tract	http://datagateway.nrcs.usda.gov/	D:\Projects\CampAdventure\GIS\source\census_tract\Tiger2000_Census_tract.shp	USDA/NRCS - National Cartography & Geospatial Center	Modified 10/01/2011	9/30/2009	NA	GCS_North_American_1985
dynamic system	land_use_land_cover\	Landuse	http://datagateway.nrcs.usda.gov/	D:\Projects\CampAdventure\GIS\source\land_use_land_cover\	USDA/NRCS - National Cartography & Geospatial Center	Modified 10/01/2012	9/30/2009	NA	GCS_North_American_1986
natural system	ortho_imagery\Aerial_NAIP	Aerial Image	http://datagateway.nrcs.usda.gov/	D:\Projects\CampAdventure\GIS\source\New Folder\ortho_imagery\	USDA/NRCS - National Cartography & Geospatial Center	Modified 11/01/2009	10/25/2009	NA	NAD_1983_UTM_Zone_15N
natural system	wbdhu12_a_ks087.shp	Watershed_Original	http://datagateway.nrcs.usda.gov/	D:\Projects\CampAdventure\GIS\source\hydrologic_units\wbdhu12_a_ks087.shp	USDA/NRCS - National Cartography & Geospatial Center	Modified 10/01/2012	10/25/2009	NA	NAD_1983_StatePlane_Kansas_North_FIPS_1501

Table 6.5. GIS data atlas. (Amanda White)