

Revisioning Playground Design for the Developing World School Campus:  
A Nature Playground Proposal For La Chuscada, Nicaragua

by

Glen Jarrett

A REPORT

submitted in partial fulfillment of the requirements for the degree

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Department of Landscape Architecture and Regional & Community Planning  
College of Architecture, Planning and Design

KANSAS STATE UNIVERSITY  
Manhattan, KS

2015

Approved By:  
Huston Gibson, Ph.D.

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# **Revisioning Playground Design for the Developing World School Campus**

A Nature Playground Proposal For  
La Chuscada, Nicaragua



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Masters Report submitted in partial fulfillment of the requirements for the degree of:  
Master of Landscape Architecture (MLA)

Major Professor: Huston Gibson, Ph.D.  
Supervisory Committee: Jessica Canfield and Bronwyn Fees, Ph.D.

Kansas State University  
College of Architecture, Planning, and Design  
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LANDSCAPE ARCHITECTURE  
/ REGIONAL & COMMUNITY PLANNING  
THE COLLEGE of  
ARCHITECTURE, PLANNING & DESIGN

# Abstract

Play is essential to the development of children, as it serves as the main platform for a child to begin to explore his or her world and understand their physical and social environment. It is not a frivolous activity, but a method of learning. Despite this recognition, many playground designs are still steered, wrongly so, by unwarranted societal fears of safety. Such playgrounds lack developmental benefits due to their composition of isolated, prefab plastic components on an asphalt field. Despite recognition in the late twentieth century that “childhood itself is in danger of extinction”, many playground are still sterile in nature. The time is now for designers to look critically at playground design trends and intervene to improve the quality of the environments our children are exposed too. The positive development of the next generation, our children, depends on it.

In the case of the community of La Chuscada in Chinandega, Nicaragua, economic status presents a major barrier to the creation of beneficial learning environments. This project addresses the hardships of implementing a developmentally beneficial playground, and through the collaboration with the Amigos for Christ philanthropic organization and interior architecture student Aaron Bisch, offers solutions to achieve this goal. Culture-specific influences of play are explored and survey data from the community of La Chuscada reveal strategies for the implementation of a nature playground design that offers developmental benefits for the children of the community.

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A big "thank you" to the Amigos for Christ Organization for allowing me to jump on board with the La Chuscada community school project. Applying the design proposal to a site in a foreign country presented challenges, but the organization's efforts in answering my questions and scheduling a trip to Nicaragua helped me "bridge the gap" of unfamiliarity with Nicaragua and begin to understand the needs and wants of those I am designing for. I would like to specifically thank Danny Dugan for his work in scheduling activities of the trip. In understanding our desire to get to know the community more authentically, you allowed us to interact with and get a glimpse into day-in-the-life the La Chuscada community members on many levels. I will always remember sitting in a hammock underneath the stars at Gloria's home in the La Chuscada Community. As I sat there that without being able to understand

any Spanish that was being said, but observing the warm conversation, laughter, and surrounded by the generous spirit of Gloria and her family, I could not have been more content. It was nothing fancy or rehearsed. It was genuine conversation as they relayed their hopes and dreams for the community to have a bright future. I am very grateful for your constant translating through the trip and the many simple, genuine interactions I experienced. I believe my project is all the better for it.

I would also like to thank interior architecture student Aaron Bisch. I enjoyed the collaborative process we developed over the course of this project, constantly bouncing ideas off of each other and challenging each other to explore ideas further. Your tangible passion for Nicaragua and this project fueled me throughout the year. It was a pleasure working with a good friend.

To fellow landscape architecture students, thank you for your encouragement throughout the year. You guys are a talented bunch. Go out and do big things. Special thanks Ross Devault, Katie Leise, and Rachel Fox who took time to check in on how my project was progression and to bounce ideas off one another throughout the process.

Lastly, I would like to thank my family whose love and encouragement has been constant.



For Nasareli and the other students of  
the La Chuscada community.



**Introduction**

**01**

# Background

The rural community of La Chuscada lies within the Chinandega department of Nicaragua. The community is located near Chinandega city and San Cristobal Volcano. In recent years the Amigos for Christ nonprofit organization has worked closely with the community in providing them water, health, education, and economic development. The organization's strategy is to not simply provide a quick fix (Amigos for Christ, 2015). Rather, they spend time planting deep roots in the community and involving members along every step of the way in order that the members gain a sense of ownership and the projects will continue to be sustainable in the future. The community provides some financial resources and volunteers their time working on construction projects that directly impact their community in a positive way. In early February of 2015 the La Chuscada community celebrated the inaugural opening of a temporary school that houses primary and secondary aged classes. The opening of the school was a large step forward for the community, allowing children who would normally have long commutes to schools in other communities the chance to learn close to home. With a large student base in the area and the belief that education truly is the

key to a bright future, the Amigos Organization has set their sights on constructing a large permanent school in the La Chuscada community in the near future. The organization's goal for the new school is to challenge conventional norms of school and playground design and create a place that allows students a top-tier educational experience. The following Master's Project and Report documents the study of developmentally beneficial nature playground design and its potential value to the growth and learning of a child. This project investigates three categories of design theory within the practice of nature playground design: nature connection, safety, and free play. The final solution is a design proposal to provide a developmentally beneficial play experience. Analyzing the La Chuscada community, current playground design in Nicaragua, and gaining an understanding of Nicaraguan culture allowed goals and objectives to be created for the intended playground design. The extracted design strategies to physically manifest types of play in a playground design from the literature review and the input of the La Chuscada community and Amigos Organization informed the design of the model school playground.

Figure 1.1 Morning Walk to School







# Context

## World



Figure 1.2 World Context Map

# Country

Nicaragua is divided into 15 departments (states). The focus site for the playground design of this project is located in Chinandega, Nicaragua on the western side of the country.

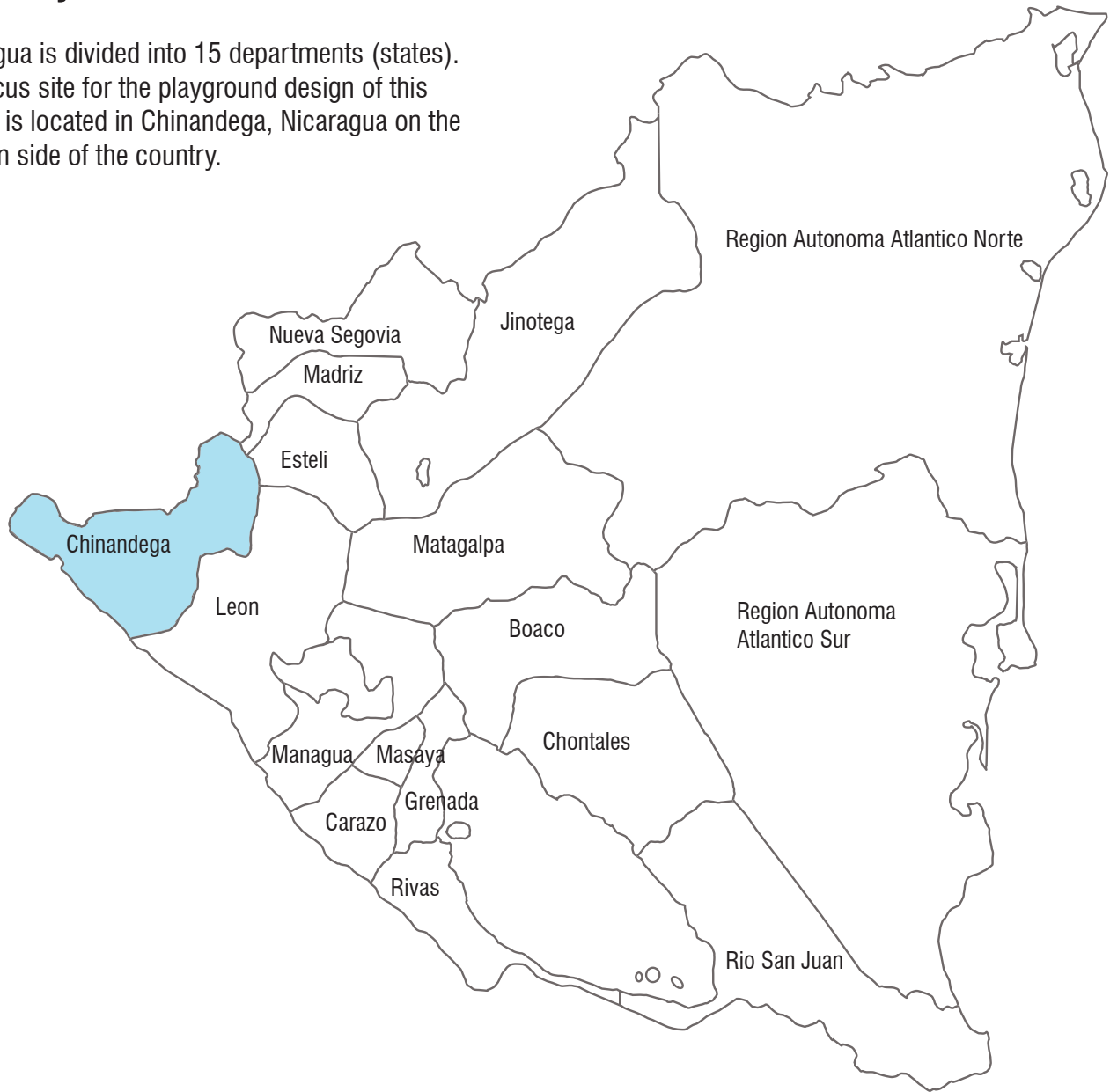


Figure 1.3 Country Context Map

# Context

## Region



Pacific Ocean



Figure 1.4 Regional Context Map



# Collaboration

Although this project's focus resides in the realm of landscape architecture and community planning, the project was very much a collaborative one. One individual that I have worked closely with this year is Kansas State University Interior Architecture graduate student Aaron Bisch. Bisch's master's project focuses on improving the classroom learning environment of schools. The third piece to the collaboration team was the Amigos for Christ organization, particularly employees Danny Doogan and Nidia Bland. They were instrumental in providing information on the La Chuscada community and setting up school visits and conversations with key community members while we visited Nicaragua.

From the get-go Aaron and I recognized great potential in working collaboratively on our reports. To begin, work projects the professional world are accomplished through very interdisciplinary methods. With countless contextual, political, and environmental factors it is very rare for one discipline group to solely complete a project. Secondly, we recognized that the notion of learning in school is often thought of to be confined strictly within the walls of a classroom. We wanted to challenge the idea of separation between the classroom and the playground. We felt that our projects presented a great opportunity to address the "in between spaces" between building and landscape, and that these spaces too can become creative learning environments. We also recognized

the potential to work directly with community members in the planning and design process to better account for their needs. With the Amigos organization poised to begin the conversations and schematic design of a new school in La Chuscada community, the schedule lined up perfectly for Aaron and I to hop on board. The Amigos have been a great organization to work with, encouraging us to challenge norms and be creative with our design proposals.



Figure 1.5 On Site Discussion

## Key Collaborators

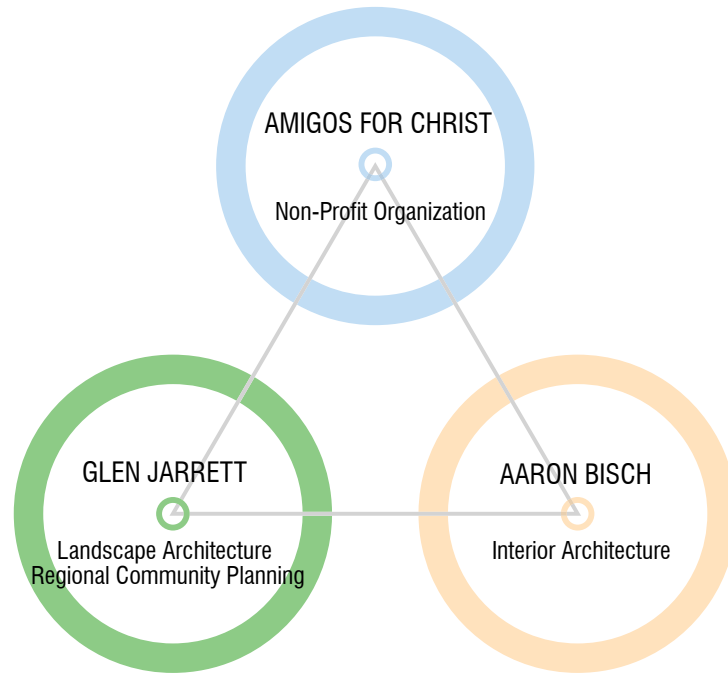


Figure 1.6 Involved Parties

## Collaboration Process

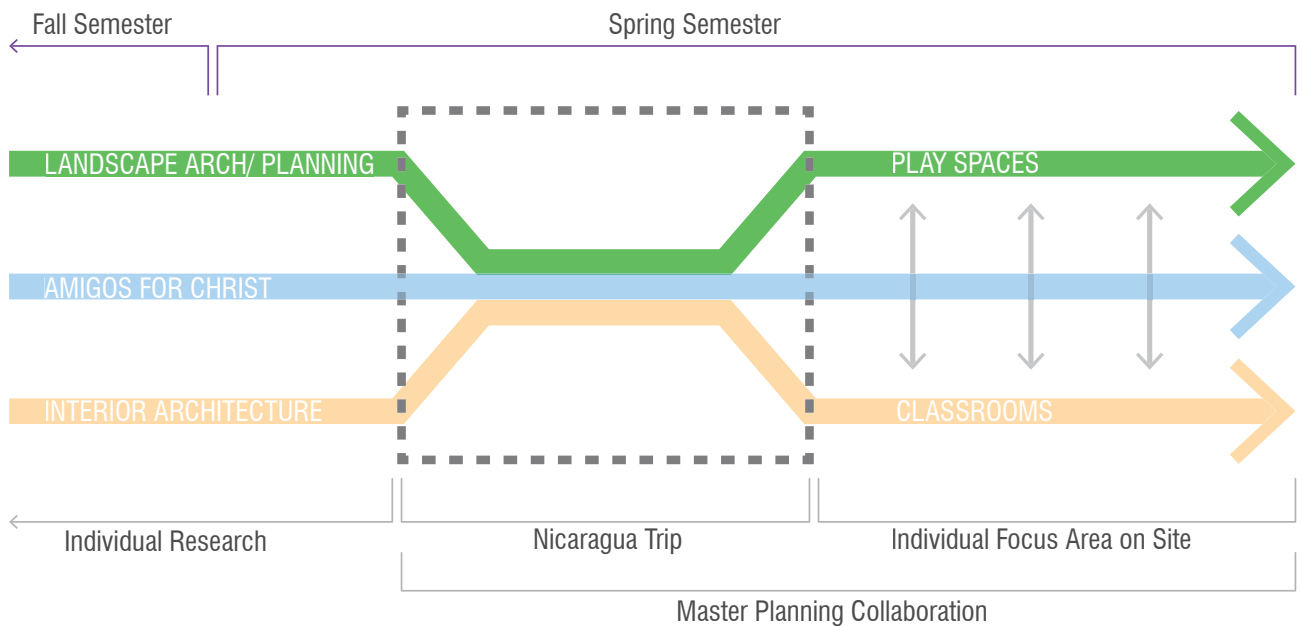


Figure 1.7 Collaborative Process

# Amigos For Christ

## Foundations of Organization

The following section describes each of the five foundations of the Amigos for Christ Organization. The foundations are listed on the organizations website at [amigosforchrist.org].

### Following Jesus

In everything we do, we want to model Jesus' ministry. We believe that He set the tone for what serving others looks like. Consistently referring to His life and ministry is where we will begin and finish everything we do. The following four foundations are built upon this one

### Being Transparent

Every penny that is given to Amigos for Christ will always be accounted for and our financial reports are always available to the public. In the same light, we want our personal lives to look the same "on and off stage" so to speak. Maintaining integrity in our work and personal lives is crucial.

### Striving For Excellence

We believe in utilizing every resource within our reach to carry out our mission to its maximum potential. From building houses and water systems to scrubbing toilets in our mission dormitories, it will be done to the best of our ability.

### Pursuing Growth

There is always potential for growth – both in our mission and in our personal lives. Amigos for Christ was built upon creative ideas inspired by a creative God. We continue to cultivate that ingenuity to move us forward. New initiatives and projects are frequently being created by volunteers and employees. We encourage all who come in contact with Amigos to "dream big", trust that God is in the driver's seat, and to use their talents to expand our mission.

### Connecting Cultures

We have much to learn from each other. Our mission trips completely immerse participants into the Nicaraguan culture for a deeper look into the lives of amazing people. Stepping out of our comfort zones to meet new people and experience different things can challenge us to come alive in new ways so that we can live abundant, purposeful lives. Relationship building is the backbone of what we do.

(Amigos for Christ, 2015)

# Project Focus Areas

The Amigos Organization focuses their project work in four key areas that they have identified to best bolster a community forward. These areas include water and sanitation, health care, education and nutrition, and economic development. The organization finds success through using the strategy of providing a community with basic needs first, and once on their feet, the community can continue to move forward. The role of this report in challenging design norms of playgrounds resides within the education and nutrition category of the amigos development scheme.

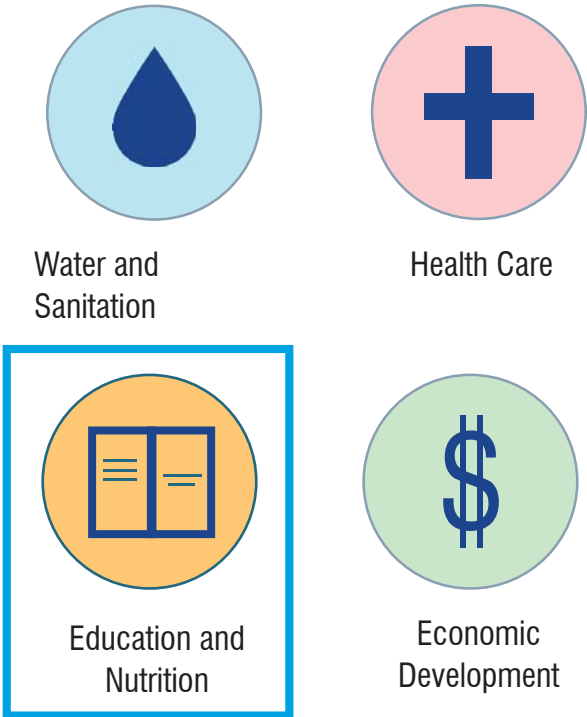


Figure 1.8 Amigo's Project Strategy

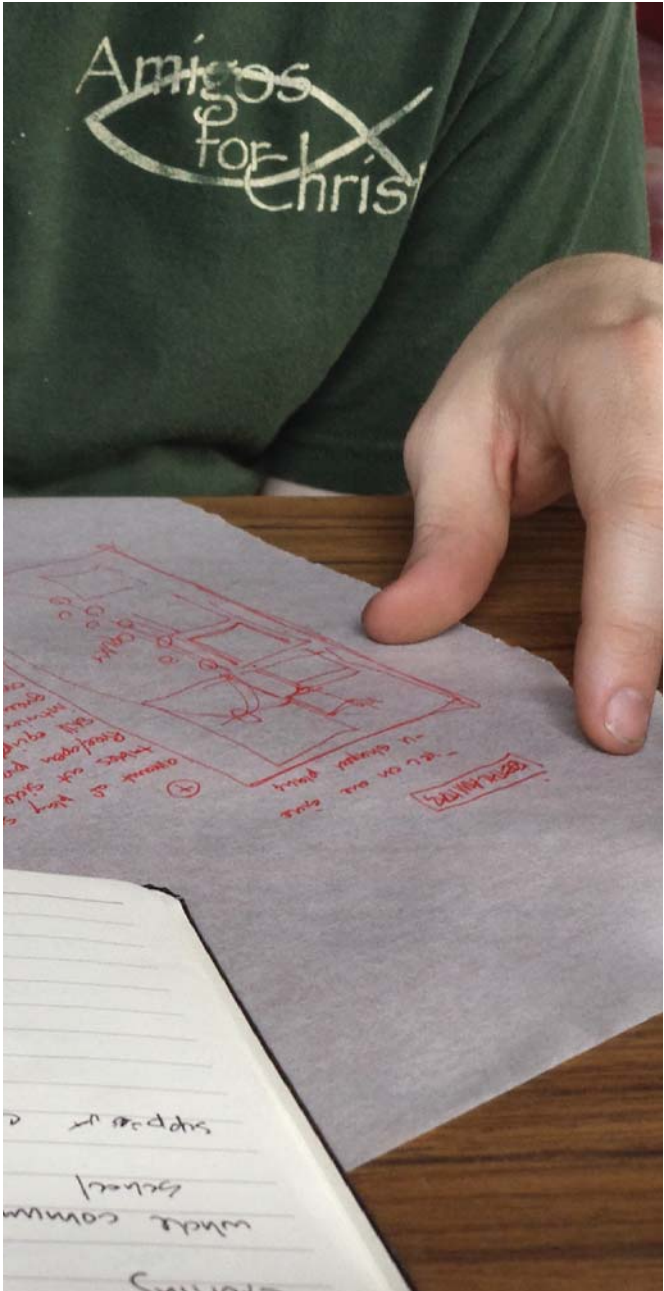


Figure 1.9 Working on Trace



# Intent

## Driving Forces

Play is an essential part of the development of children. Learning does not cease as soon as a child exits a classroom, but continues as he or she “plays”. It is important to understand that play is not an end product of activity, but rather the actual process of receiving and internalizing information as an activity is performed (Heseltine & Holborn, 1987). Many studies point to evidence that children who are exposed to better quality of play, where they learn to understand their physical and social environments, are recipients of a slew of positive benefits.

Understandably so, adults strive to make play environments safe for children. Unfortunately, in efforts to control variables that would affect children negatively, they have, in essence, stripped play environments of elements that promote self-decision making, creative thinking, and overcoming obstacles. In his *No Fear: Growing Up in a Risk Averse Society*, Tim Gill says that “For the past 30 years at least, childhood adolescence has been marked by shrinking freedom of action for children, and growing adult control and supervision” (Gill, 2007). Today, homogenous prefabricated plastic playground designs have become the norm. Such designs do not offer children an environment that fosters their motor, social, emotional, and mental developments. A new approach to playground design that challenges current trends needs to be taken.

This project not only challenges the playground design strategies are pertinent throughout a large portion of developed countries, but furthers the discussion of overcoming design and implementation challenges associated with applying a playground design to a school site in the developing country of Nicaragua, specifically within the community of La Chuscada. Challenges in this location come in the form of minimal resources and low economic situations. In many Nicaraguan communities, basic needs like running water, healthcare, and an education system are not present. Because of this, an individual’s time is spent concerned about meeting these needs in some fashion, not concerned with play. This is where Amigo’s previously done work in the community is critical. The organization has provided the basic need of water through a water system and education through the temporary school in the heart of the community. Now the community can start to address other wants and needs they previously haven’t. For this specific community, the dreams of creating a permanent school with creative learning environments both inside and out, is now becoming a reality. This project will identify various strategies of manifesting physical, pretend, and creative play in playgrounds of the United States and the United Kingdom. With cultural consideration, specific strategies will be applied to the school site in the La Chuscada community.

## Personal Interest

My personal interest in playground design began with reading *The Overprotected Kid* by Hannah Rosin (2014), published in The Atlantic online journal. In the article, Rosin describes her and her husband's realization that their ten year old daughter had not spent more than a few minutes unsupervised her entire life. This was due to the ever-tightening restrictions on what constitutes a playground and the culture of society today to always have a watchful eye on children. Reminiscing on her own childhood play memories, Rosin acknowledges the generational shift of "childhood norms" and the paranoia that surrounds the use of playgrounds today. She does offer hope for the future however, revealing a growing movement of adventure playgrounds, particularly in Europe, that allow children to play nearly unrestricted. Although making a large bound from strictly programmed playgrounds to loosely regulated adventure playgrounds would be near impossible against the political and cultural forces of a country like the United States today, Rosin's article brings to light the many issues that surround playground design and offers suggestions as to the direction playground design should take for the future.

In a world where there is constant scrutiny and review over the way children are raised and what they are exposed too, I believe that playgrounds, a large proponent of a child's life, have not been challenged and rethought enough.



Figure 1.10 Walking La Chuscada

## Goals and Objectives

The intent of this project is to create design guidelines for a developmentally beneficial playground design that incorporates natural elements, free play, and safety. These guidelines are applied to a playground design proposal for the future school in La Chuscada, Chinandega, Nicaragua. Before the guidelines could be applied, an evaluation of site conditions, local vernacular, and Nicaraguan culture was conducted. A typical playground overemphasizes safety measures without considering the other two factors of free play and nature connection. The following report challenges playground design norms and offers a creative approach to the evaluation of playgrounds.

With an emphasis in the realm of landscape architecture and community planning, this project also touches on many aspects of various disciplines in the design fields. The project will be completed in close collaboration with Bisch, an Interior Architecture student at Kansas State University, and the Amigos for Christ philanthropic organization. Aaron is focusing his work on the building layout and classroom design for the school, while this project will offer a proposal for a playground design. Recognizing that there is great potential for the school site to function as a social and cultural hub for the community and the opportunity to strongly connect learning environments between indoors and outdoors, we are approaching these projects not as separate

entities, but as a joint collaboration. Over arching goals for the school site and community as a whole unite the two projects. Within these overall goals exist goals for the respective focus areas on the school site for both Aaron and I. The target goals for the Amigos for Christ Organization were the driving force behind the design goals for both the site scale and individual focus area scale. Figure 1.11 illustrates how the goals on various scales relate to one another.

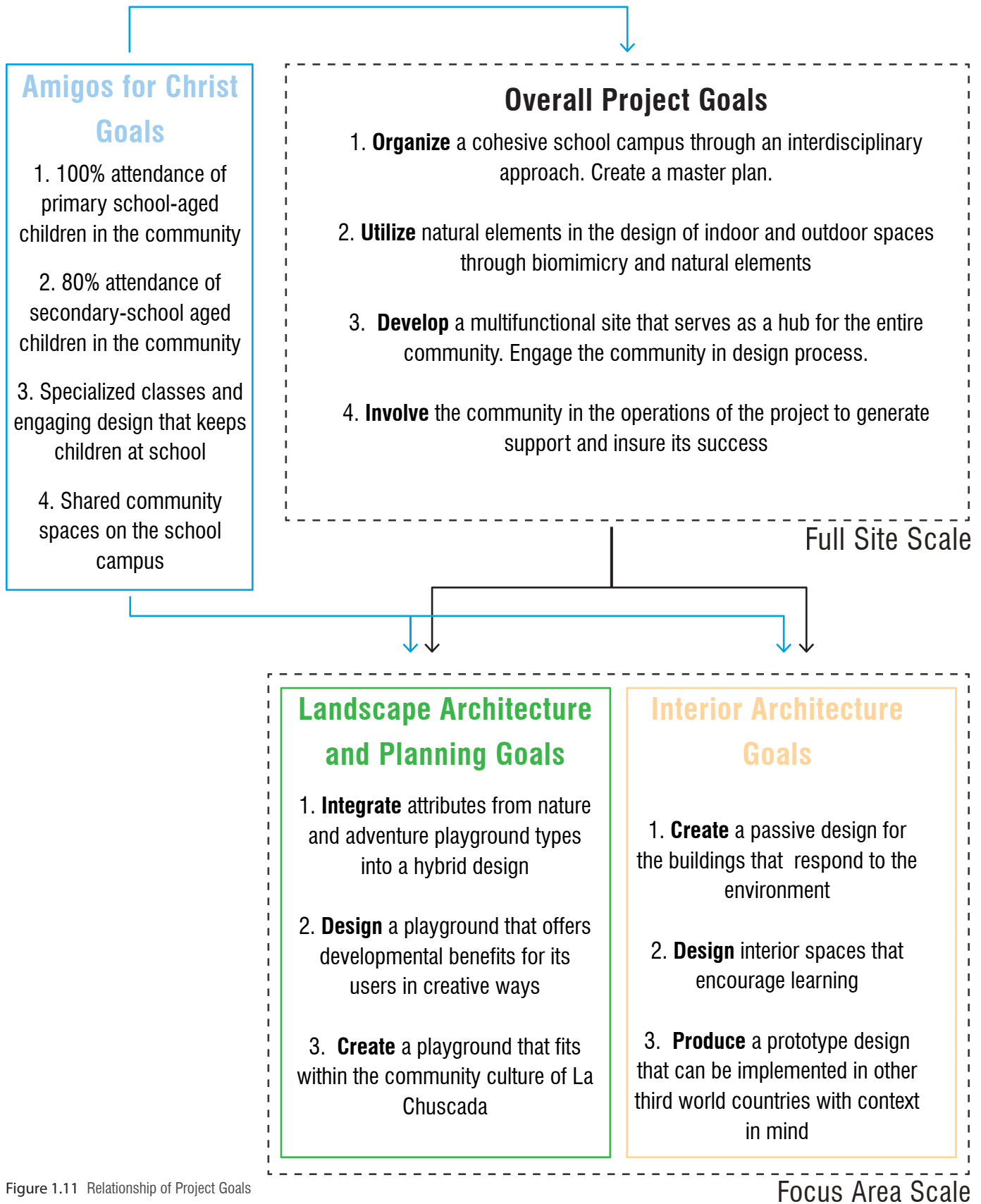


Figure 1.11 Relationship of Project Goals

## Goals and Objectives

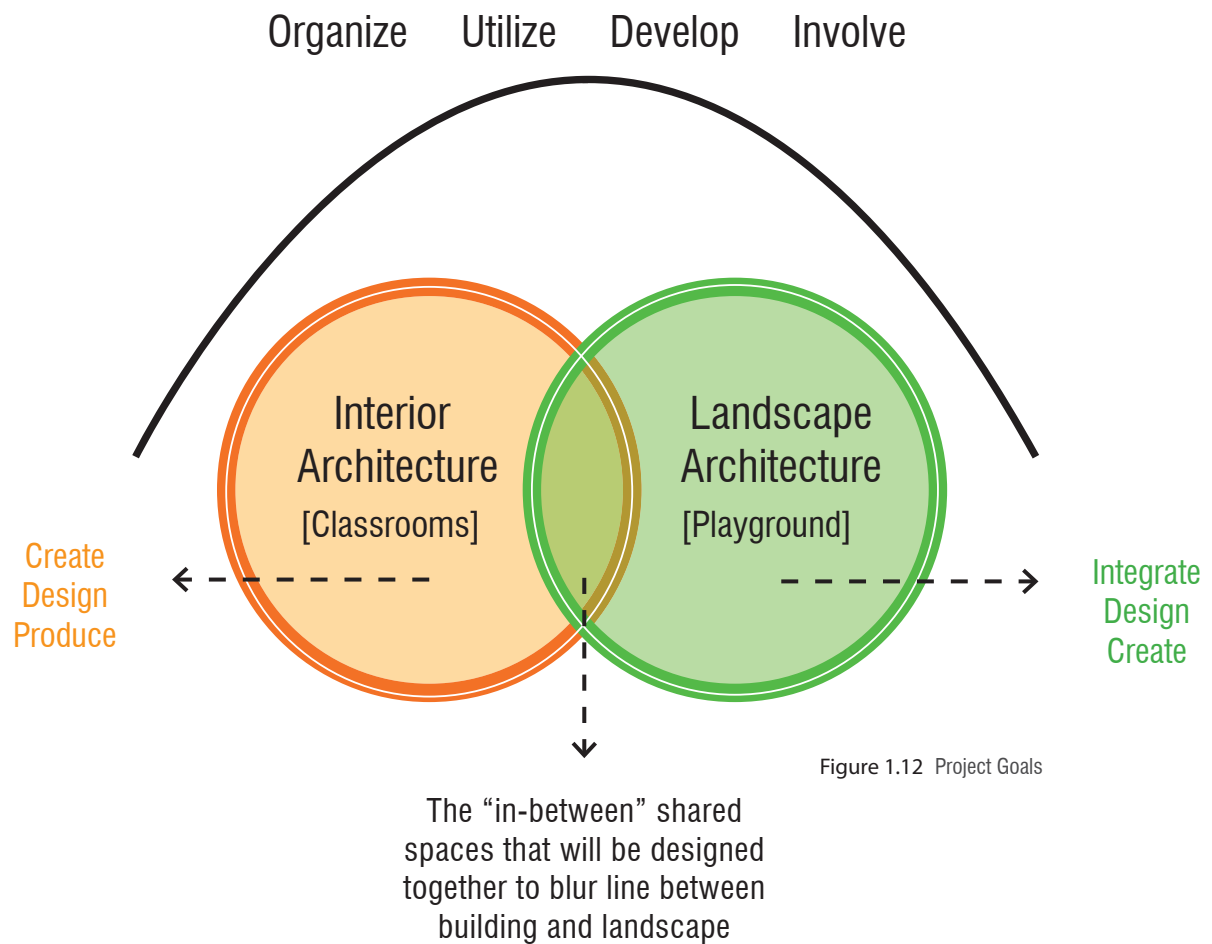


Figure 1.12 Project Goals

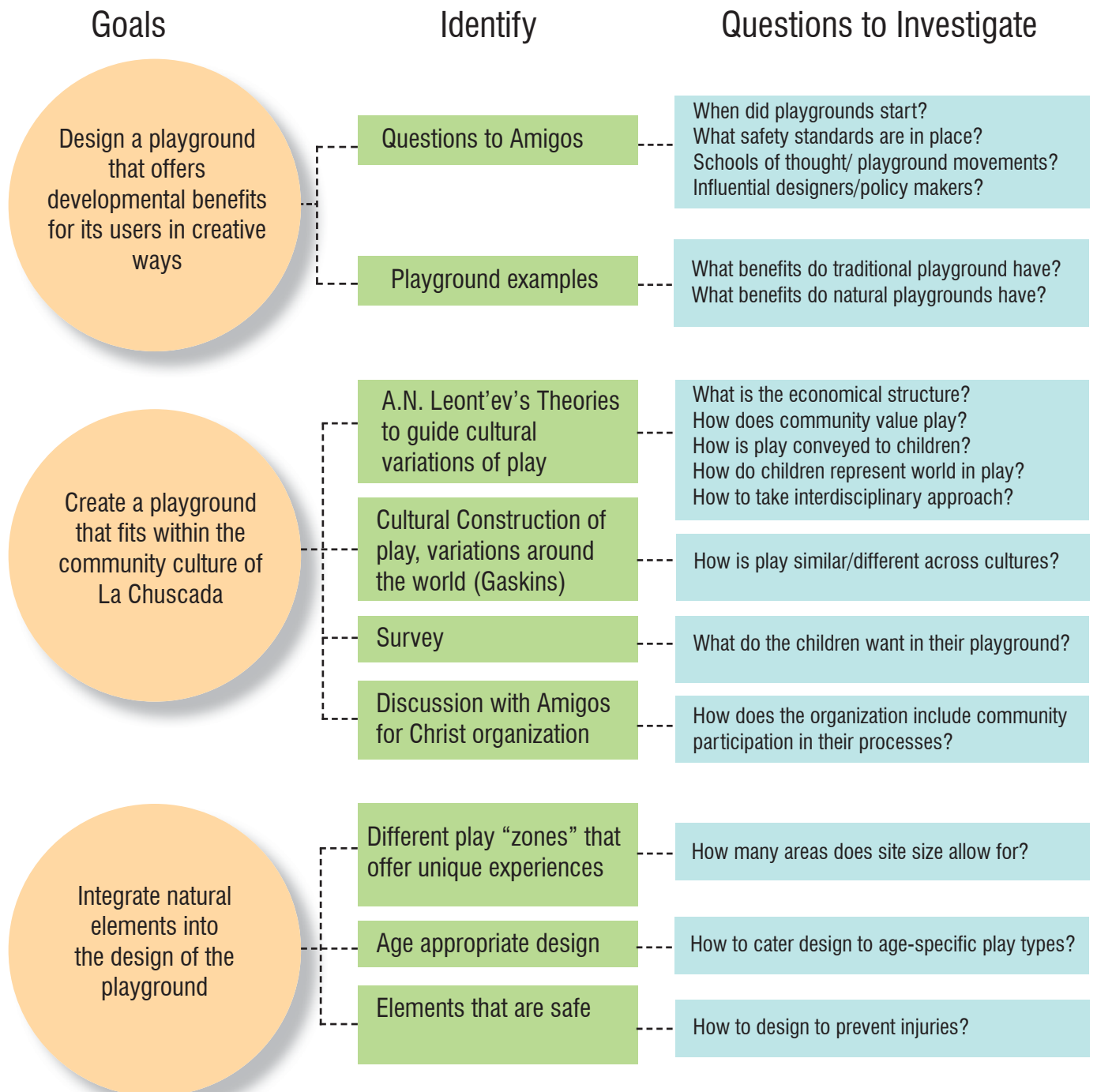


Figure 1.13 Project Goal Development

# Inquiry

## Primary Dilemma

Playgrounds are often cast as dangerous environments that support a frivolous activity; play. The truth however, is that play is a powerful learning tool and playgrounds have great potential to positively shape the growth and development of children (Miller, 1972). If properly designed and maintained, a playground serves as an extension of the classroom. They provide a necessary environment for a child to explore and understand themselves and the world around them (Mason, 1982). In the way playgrounds engage an individual and bring groups together, they serve as a place for physical, social, mental, and emotional development of a child.

## Primary Research Question

How can a developmentally beneficial nature playground be designed within the resource and financial restrictions of the La Chuscada community in Nicaragua?

## Subsequent Questions

- What design guidelines can be applied to integrate natural elements into playground design?
- What design guidelines can be utilized to make the playground a safe environment?
- How can the design guidelines account for the broad culture of Nicaragua as well as the specific culture of La Chuscada?
- What makes the playground design proposal a richer play environment than current existing conditions?

# Strategy

A playground proposal that addresses safety, integrates natural elements, applies principals of free play, and considers the unique culture will be a suitable environment for the students who will be attending the school in La Chuscada. A playground that incorporates these elements in a variety of creative ways will provide children with a place to develop necessary life skills. Figure 1.14 illustrates the overlap in natural play principals and cultural consideration to form this project’s design proposal. This approach to playground design, particularly within the country of Nicaragua, opens doors to new ways of thinking

on how playground can function more beneficially for the youth. Because play is such an integral part of the learning process of children, it is important to design playgrounds with care and consideration. This project aims to offer guidelines on how to approach not only playgrounds, but any environment in which children are engaged. As the Amigos further there philanthropic reach across Nicaragua, this masters report and project cans serve as a guiding instrument and model for how a playground can become a dynamic place for both individual growth and social interaction.

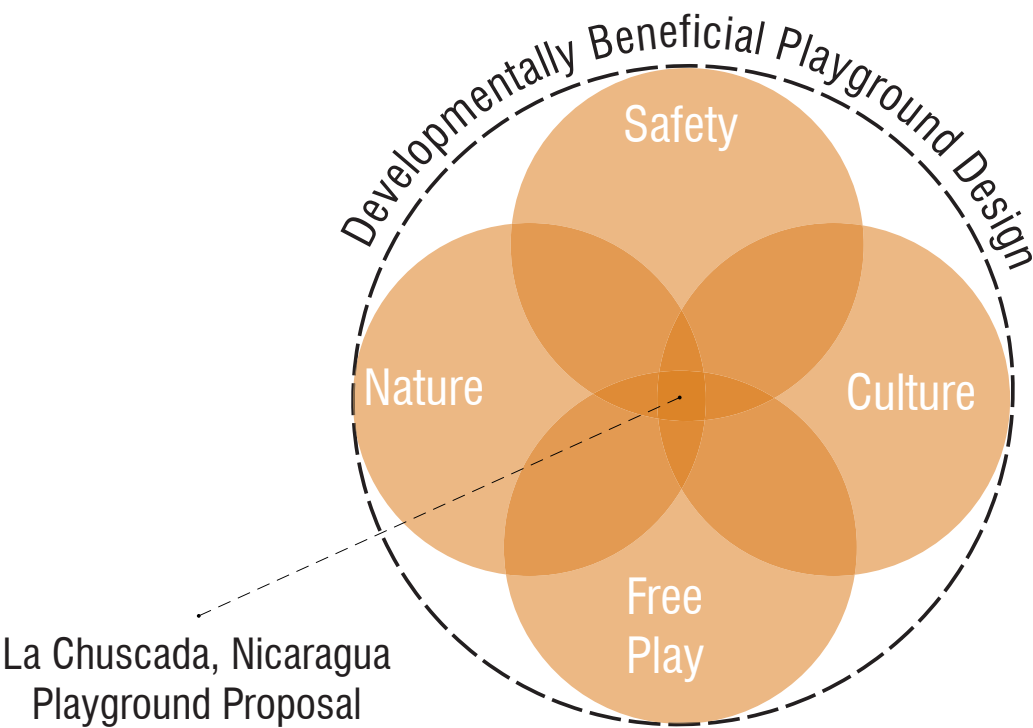


Figure 1.14 Project Strategy



## Project Limitations

### Physical

One of the major hurdles of this project was choosing a focus site outside of the United States. Although this location offered much potential and benefits in certain aspects, frequent site visits and communication with the local community was not possible. Outside of a week trip to visit the La Chuscada community in Nicaragua, which was very beneficial in understanding the site and culture, all communication was done through email and video chat with the Amigos for Christ organization. That being said, those I worked with at the organization went above and beyond to answer any questions I had and relay information to me throughout the process. Another limitation existed in the physical boundary of the specific project site. This boundary shaped the spatial organization of elements on the school site and influenced the playground design outcome.

### Non-Tangible

An undefined limitation is the fact that the La Chuscada school playground is a future project, thus not built and tested. Without being able to truly test before and after effects of the nature playground implementation on children's physical, emotional, mental, and social skills, this report remains theoretically based. This being the case, the research of nature playground projects and scholarly experiments do point to evidence that the natural playground will be beneficial for the development of the students at the La Chuscada school when built.

# Relevance

## To Profession

Landscape architects have a responsibility to protect the health, safety, and welfare of the public. They strive to improve existing conditions and push the boundaries of existing creative explorations. Criticism from leading scholars has brought to light the shortcomings in the design of many playgrounds in recent years. It is important for landscape architects to critically analyze how playgrounds are functioning in regards to their capability of fostering play types that allow for learning and development of children. This project addresses several topics at the forefront of playground discussion today and offers strategies for addressing the shortcomings of traditional playgrounds through the creation of a dynamic nature play environment. A playground that addresses safety, an integration with nature, and variation of play types makes this project directly relevant to landscape architecture and other related design professions.

## To Community

This project is very relevant to the community of La Chuscada. The building of the school is a huge step forward in a positive direction. Before the temporary school was built in February 2015, children had to travel to other communities to attend classes or did not go to school at all. Building the school in the core area of the community greatly reduces the burden of travel. In addition, including the community throughout the process and locating a school in their “home” will give them ownership and pride in how the school functions. Not only is the school relevant in creating a better learning environment for the children of La Chuscada, it also will serve as a cultural hub with spaces designed to allow for community engagement to foster relationships. Looking specifically at the playground design proposal of this project, it challenges the norms of how a playground should look and function, offering a diverse range of play elements that promote developmental benefits. In La Chuscada, as in any community, children are the future. Providing learning environments that allow children to explore their world and develop important life skills is a way to ensure the future is bright.

# Maslow's Hierarchy

Maslow created a tiered system that illustrates basic human motivation. He explains that once a level of needs are met, a person moves on to the next, instead of staying satisfied at the level. In his original paper, Maslow uses the hunger for bread as an example:

**“It is quite true that man lives by bread alone -- when there is no bread. But what happens to man's desires when there is plenty of bread and when his belly is chronically filled?**

**At once other (and ‘higher’) needs emerge and these, rather than physiological hungers, dominate the organism. And when these in turn are satisfied, again new (and still ‘higher’) needs emerge and so on. This is what we mean by saying that the basic human needs are organized into a hierarchy of relative prepotency.”**

**(Maslow 1943)**

As Figure 1.15 demonstrates, once the basic needs at the bottom of the pyramid are met, a person will have “higher” needs, and systematically climb the pyramid. In relation to this specific project, it is understood that in order to achieve a higher level of learning and design within the La Chuscada community, basic needs of the people must be met. As mentioned in the Driving Forces section in chapter one, the Amigos for Christ organization plays a key role in this projects

success. Designing a hybrid playground that offers developmental benefits where children experience a sense of accomplishment and social interaction is achievable only when the basic needs of water and health (at the bottom of the pyramid) are addressed.

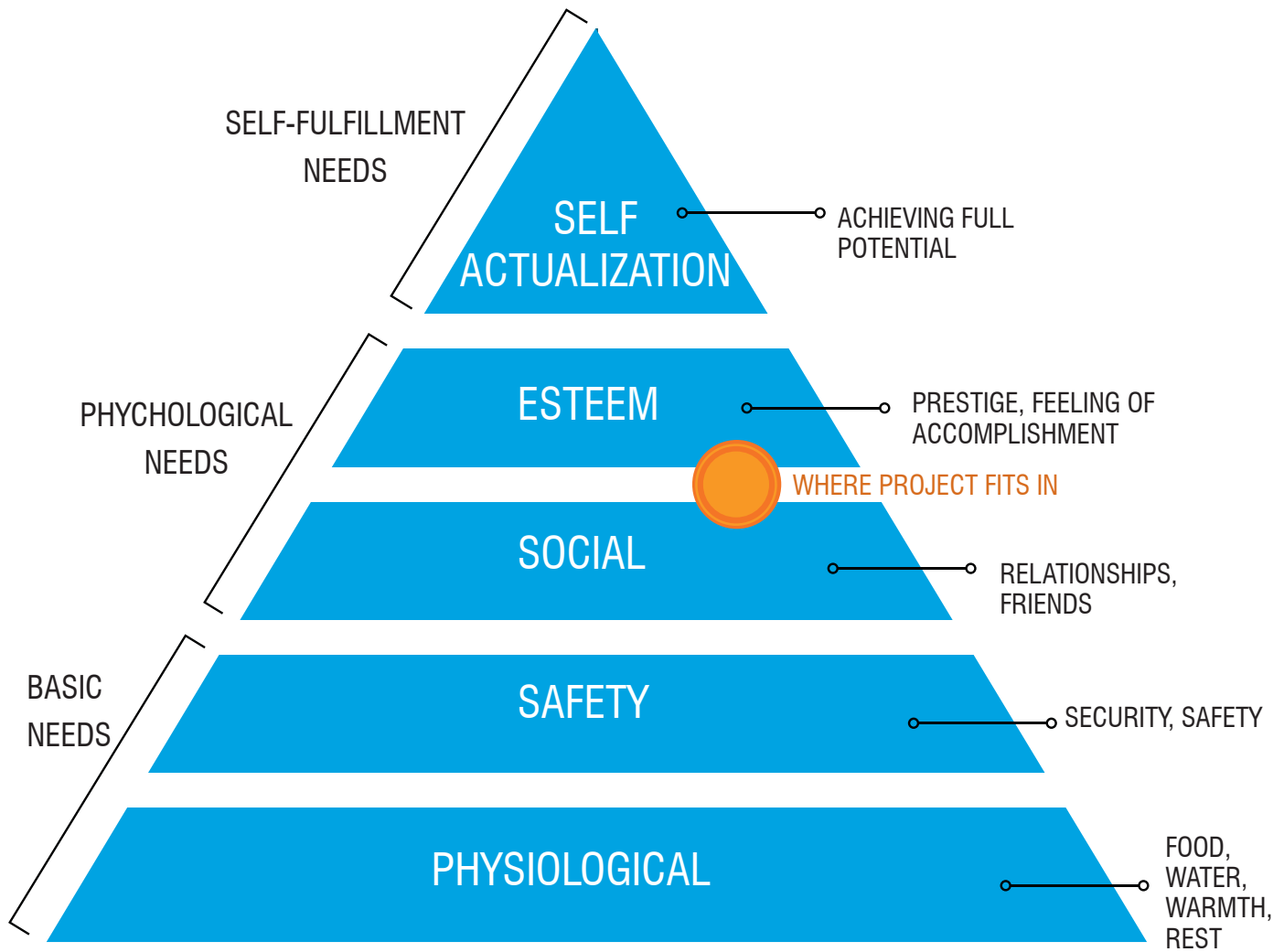


Figure 1.15 Maslow's Hierarchy

# Philosophy and Path

The site was chosen for several reasons. Foremost, choosing a site outside of Western middle-class culture presents opportunities to further the argument that there is no “one size fits all” design for playgrounds because of cultural influences on the way children play. Working on the same site as Interior Architecture student, Bisch, allows the design to expand outside the formal boundaries of the playground. We believe that we can work together to make the school site a cultural hub for the surrounding community and creating spaces, both inside and out, that foster learning and social interaction. We are also inspired by the idea that this is not an abstract design application, but rather a real project with stakeholders and a timeline. As we discussed the process of working together, we felt the notion of “It doesn’t matter unless you build it” described in *Design Like You Give a Damn*, was particularly relevant in our projects (Architecture for Humanity, 2012). This line struck us as particularly important with our projects. What benefit to the community of Chinandega would merely designing on paper offer? We believe our projects have the power to be truly transformative through the process of actually being built through the philanthropic work of the Amigos for Christ Organization. At the same time, we understand that the process is very important as well. We realize that working hand in hand with the Amigos organization and getting input from the La Chuscada community is important to make the project strong, as well as make the project sustainable for the community years down the road.

# Project Organization

## 1. Introduction

The introduction establishes the project dilemma, research questions, and driving forces of the project. The reader is also familiarized with the location of the project design application through various maps. In addition, the collaboration component of this project with the Amigos for Christ organization and Kansas State interior architecture graduate student Aaron Bisch is explained. The chapter concludes with the relevance of the project to the realm of landscape architecture as well as the processes followed to answer the research question of the project and formulate a design proposal.

## 2. Knowledge Base

The initial course of action for the project was to gather relevant background information on playgrounds. The knowledge base is the compilation of various literature sources that establish a fundamental understanding of research in the realm of playground design. The knowledge base research focused on topics of playground safety, integration of nature, and the concept of free play. In addition, the types of play and corresponding developmental benefits are investigated. This step in the project serves as the foundation for the following stages in the process.

## 3. Methodology

The methodology section of this report investigates various strategies of physically manifesting types of play in a playground design. The section discusses several case studies and provides the reader with a catalogue of playground elements. This section also provides explanation of the various play zone typologies and what elements from the catalog each will employ in the design proposal for the La Chuscada school. In addition, the methodology section covers the strategy of creating and facilitating the survey with the students in the community.

## 4. Findings

Before offering a design proposal for a playground, it was necessary to gain an understanding of Nicaraguan culture and the La Chuscada community. This was achieved through a week visit to Nicaragua where Aaron Bisch and I worked alongside the Amigos for Christ Organization to evaluate the organization of existing schools, survey the community for their wishes for the future school, and do site analysis. In this phase of the process we also gained a deeper understanding of the programming and enrollment strategies of the Amigos for Christ organization that influenced the following design application phase.

## 5. Design Application

After analyzing the existing urban and rural schools in Nicaragua, gaining an understanding of local vernacular and culture, and understanding the Amigos for Christ's goals In La Chuscada community, it was possible to provide a master plan and primary school playground design of the future school. The Design Application phase applied nature playground design guidelines discussed in the methodology phase of the report. This was done in the form of a site plan of unique play zone typologies with corresponding images of what kind of play elements exist within each.

## 6. Conclusion

The final step in the process discusses the benefits of the implementation of nature play focused playground at the school in La Chuscada. The playground design, a union of research and community input, includes natural elements and free play qualities in a creative and safe manner. The chapter concludes with a summary and discussion. Further research questions are offered to continue to reverse current "one size fits all" mentality with research and cultural considerations.

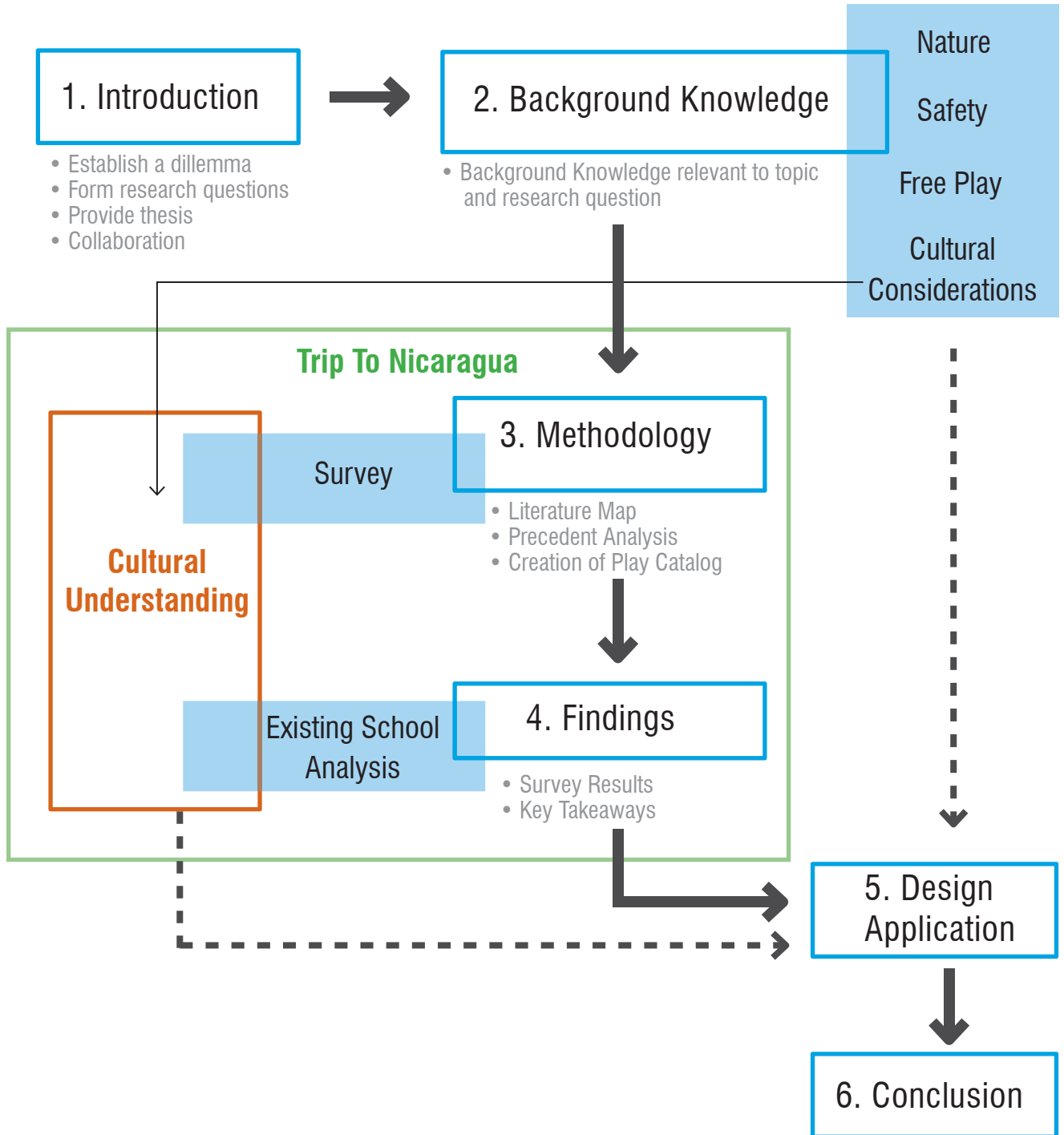


Figure 1.16 Project Process





# Knowledge Base | 02

# Play

Play may be difficult to define, but virtually nobody has trouble recognizing it when they see it (Pellegrini, 2009). The difficulty of defining play lies in its complexity and the many ways it permeates a child's life. In order to attempt to give a better understanding of play, Heseltine and Helborn (1987) illustrate the extremes on either side of how one can view play, that, in a sense, bookend the definition. The existing extremes are either an "almost mythical description" or a "dismissal of its importance" (Heseltine & Helborn, 1987). Within these two extremes lies the core essence of play; its ability to be a learning and developmental tool.

Play is an innate characteristic of humans, necessary to retain a healthy perspective and balance in our lives. It differs from work in that it is a "supremely voluntary undertaking", a "manifestation of internal needs and wishes" (Dattner, 1969). Play is a dynamic way of learning through the process of doing (Caplan, 1973). The act of doing is key. Individuals learn best through active participation, as opposed to only being exposed to information verbally. Through the action of play the whole person is involved and all senses are engaged (Miller, 1972).

Adult representations of play produce norms of what constitutes 'play' and, by definition, what does not. From this perspective, adults make judgments about the quality of play. But perhaps this misses the very

essence of play, which is always an expression of children's subjective experience. Children, as children, have a different way of seeing, feeling, and acting in the world, which comes alive in their play. Above all, play should not be prescribed, but should be open to interpretation and allow for the creative spirit of children to be expressed (Miller, 1972).



“ Play is the only way the highest intelligence of humankind can unfold. ”

- Joseph Chilton Pearce 1980



Figure 2.1 Climbing Trees

# Types of Play

Play comes in all shapes and sizes. Rich varieties of play are beneficial to a child's growth and development process. For the purposes of this project, play will be categorized into three main types according to Mason's classification: physical, pretend, and creative/constructing (Mason, 1982). Despite separate categories, Mason reminds the reader that individual play activities do not fall exclusively within one specific category because of much overlap between play activities. For example, pretend play often incorporates physical activity (e.g. as a child pretends to be a character, they often run and do other activities that the character might do). The following paragraphs explain each of the three play classification types:

## (1) Physical

Perhaps the most easily identifiable type of play, physical activity encompasses many varieties of play. These include running, jumping, swinging, crawling, climbing, balancing, swimming, throwing, kicking, and others. These activities allow a child to understand their physical selves and their ability shape the environment around them (Caplan, 1973). Physical activities can be done through structured games or unstructured free play, but no matter the type, it is more desirable to have many different options for physical activity to occur in the design of the playground. For this report, the purpose of identifying different types of play that fit into the 'physical' category is not to claim that one kind is better than another. Instead play types are identified to see how they are considered and integrated into the design of a play environment. For instance, it's not to say that jumping is better than climbing, but to say that a playground that allows jumping, climbing, balancing, and swinging to occur is better suited for children than one that allows only climbing and running. In essence, less is not more.

## **(2) Pretend**

When pretend play is actually happening can be difficult to analyze in a playground environment, but makes up a significant portion of children's play. Referred to as "role play" at times, this type of play involves children acting as characters outside their current situation. These roles can change from day to day, and range from acting as a parental figure or a teacher, to being a cowboy or an astronaut. According to Caplan, in order for a child to strengthen his or her "spontaneity and self-expression, lengthy involvement in pretend play is crucial" (Caplan, 1973, p. 154). Having open-ended and flexible spaces is a key strategy in designing for pretend play. For example, designing an elevated platform to look exactly like a space ship can deter varieties of pretend play because it has such a concrete identity. A platform that serves just as a platform however, can be a spaceship one day and a castle the next because of its adaptable roles (Mason, 1982). Caplan reminds us that, although the norm, placing concrete objects on a playground is not a must for pretend play to occur. Instead, simply designing an environment where a child can come up with his or her own creative game or imaginary scenario is effective (Caplan, 1973).

## **(3) Creating**

The third major category of play involves creating or constructing. To be creative and make something is one of the most desirable forms of play (Mason, 1982). Creative activities are often overlooked in playground design due to some forms needing a play supervisor and potential for various pieces to get stolen or broken. Despite these concerns, introducing creative play opportunities when possible offers some unique benefits. With creative play elements an environment is in constant flux with the addition or subtraction of pieces. This ever-changing environment opens doors to new play opportunities and keeps children engaged without becoming bored (Mason, 1982). In addition, the act of creating or constructing allows a child to have "success experiences" when they accomplish their goal (Miller, 1972).



# Benefits of Play

The activities that fall within the previously described play types of physical, pretend, and constructive offer developmental play benefits when performed. Figure 2.2 illustrates the connections between play types and developmental benefits. As one can imagine, greater variety of play types that child is exposed to correlates to greater developmental benefits. Just as with play type categories, the categories of developmental benefits from play have some overlap. This project will use a classification of developmental benefits prescribed by Peggy Miller in *Creative Outdoor Play Areas* (1972). Miller categorizes developmental benefits into four main categories of basic motor skills, mental development, social development, emotional development. The following paragraphs explain each of Miller's developmental classification types:

## (1) Motor Skills

Perhaps the most easily identifiable type of play, physical activity encompasses many varieties of play. These include running, jumping, swinging, crawling, climbing, balancing, swimming, throwing, kicking, and others. These activities allow a child to understand their physical selves and their ability shape the environment around them (Caplan, 1973) Physical activities can be done through structured games or unstructured free play, but no matter the type, it is more desirable to have many different options for physical activity to occur in the design of the playground. For this report, the purpose of identifying different types of play that

fit into the 'physical' category is not to claim that one kind is better than another. For instance, it's not to say that jumping is better than climbing, but to say that a playground that allows jumping, climbing, balancing, and swinging to occur is better suited for children than one that allows only climbing and running. In essence, less is not more.

## (2) Mental Skills

Mental development is gained through play when children are faced with problem solving activities. As a child develops communication skills, learns the meanings of words and symbols, and problem solving through play, they are acquiring a tool kit of skills to apply to later challenges in their lives (Miller, 1972).



### **(3) Social Skills**

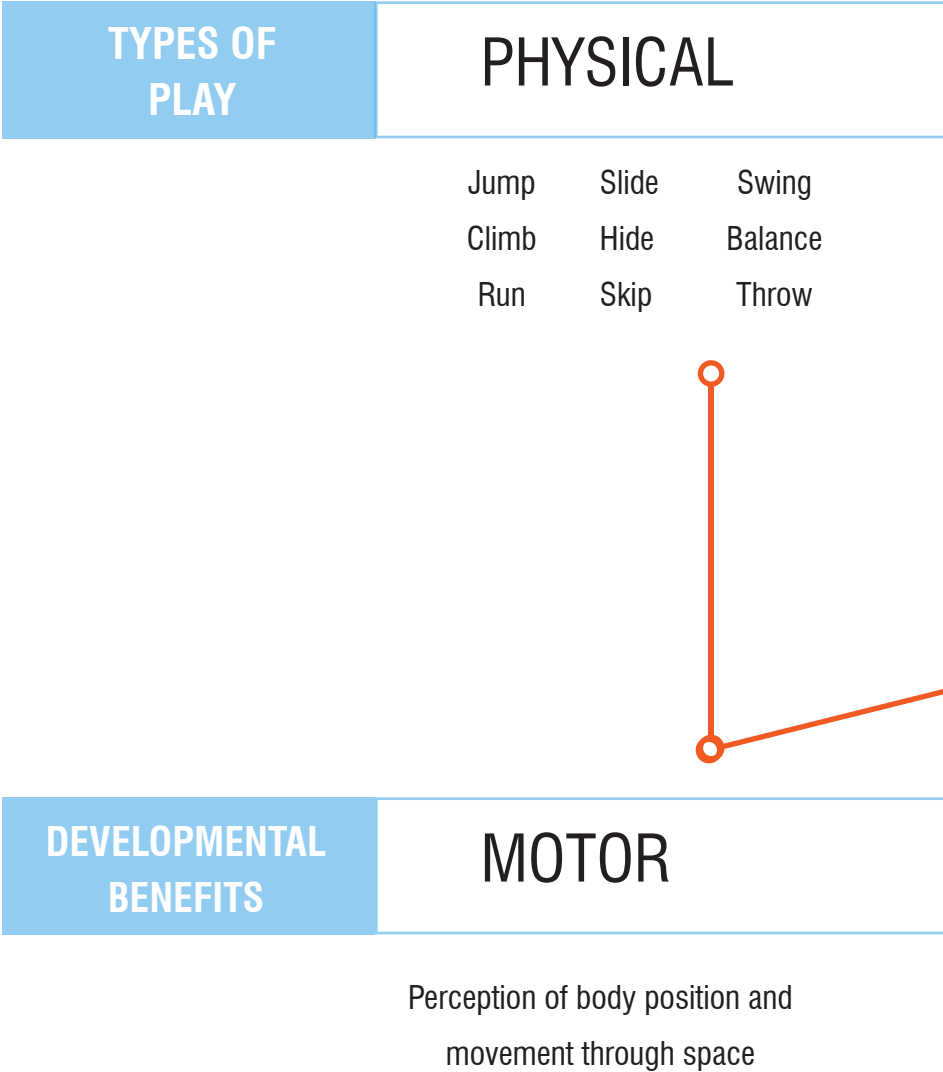
Another easily identifiable developmental benefit of play is social development. Children will throw a ball together, swing, build sand castles, and do many other activities with their peers. An individual becomes less self-centered as they play with other children, learning cooperation and how to work as a team with others. Social interaction between children in play is pure, unaffected by artificial barriers between religious groups, races, and socioeconomic backgrounds that affect adults in today's society (Miller, 1972).

### **(4) Emotional**

The fourth category of developmental benefits from play describes by Miller is emotional development. Similar to mental development, the category is less tangible and harder to measure than the others, but it is an important aspect of play. Through emotional development, children better understand themselves and build a perception of self. Children develop self-confidence and a sense of accomplishment through play, especially when they are overcoming a new challenge or obstacle. They learn their limitations, and abilities. Again, these skills acquired through play as a child will be beneficial in dealing with life's challenges as an adult. Emotional development is important for what Miller describes as "inner space"- the mind and the heart (Miller, 1972).

“ Play is an earnest, engrossing, absorbing, intense activity for young children. It is each child's means of pulling together his intellectual, social, emotional, and physical state-of-being ”

(Hymes, 1973, p. 75)



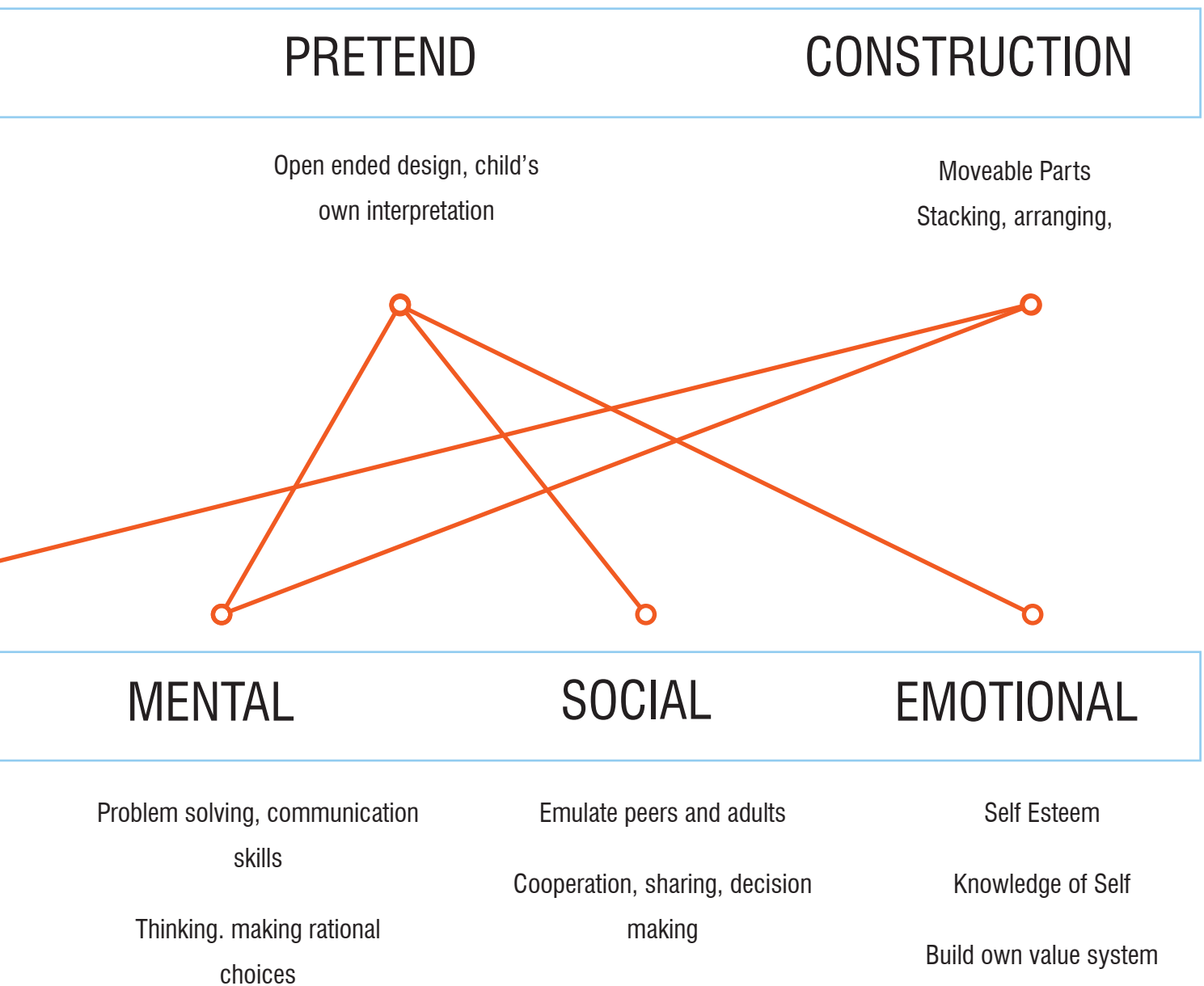


Figure 2.2 Play Types and Corresponding Benefits

# Playground History

## Playgrounds in the United States and United Kingdom

Playgrounds are the product of the recognition of a need for open space in cities and towns. In order to provide space for children that were protected and supervised, some of these open spaces were transformed into specialized children-focused areas that we identify as “playgrounds” (Erikson 1985, p.8). Even though there was an understanding of children’s need for open space early on in the United States, the first organized playgrounds were not established until just before the twentieth century. The initial driving forces behind the creation of playgrounds were movements by philanthropic organizations to get children, particularly those in the slums, off of the street where traffic posed a danger. In the United States the first playgrounds, known as “sand gardens”, were simple compared to the elaborate play environments seen today. They were wood constructed boxes filled with sand and containing outdoor equipment like shovels and wagons to play with. Within a relatively short time span from the time of the first sand garden, new ideas in how playgrounds should function pushed playground design in different directions. The late 1800’s and early 1900’s brought about the “model” and “recreational” playgrounds. Soon after, as various municipal and educational agencies began funding park projects, the “municipal” playgrounds took hold across the United States. Within this era of playground design, the joining of municipal and educational bodies resulted in one

playground being created for a community, instead of having to put resources into multiple playgrounds. The Great Depression and World War II halted any more major advancements in playground design during their duration (Frost, 2012). Shortly after World War II however, the “adventure” playground was introduced in the United States. See the significant playground movements of the United States and their responding benefactors in Figure 2.3.

Playgrounds in the United Kingdom started in a similar manner to in the United States; as a strategy to address concern with children’s health and fitness (Heseltine & Holborn, 1987). Even though the initial reasons for the start of playground was the same, the United Kingdom’s playground progression followed a different path than that of the United States because the UK had more strict land use assignment and more federal planning laws at the time (Heseltine & Holborn, 1987). Throughout time the United States has developed a more heightened concern for playground safety than the United Kingdom and other European countries because of fear of lawsuit. This remains the situation despite the countries sharing similar accident rates on playgrounds (Gill, 2007). Today there are movements developing in both the United States and the United Kingdom to refocus the strategy of playground design to better integrate natural elements. With great political forces and perceptions working against such movements, only time will tell the future of playground design in these countries.

## United States Playground Movements

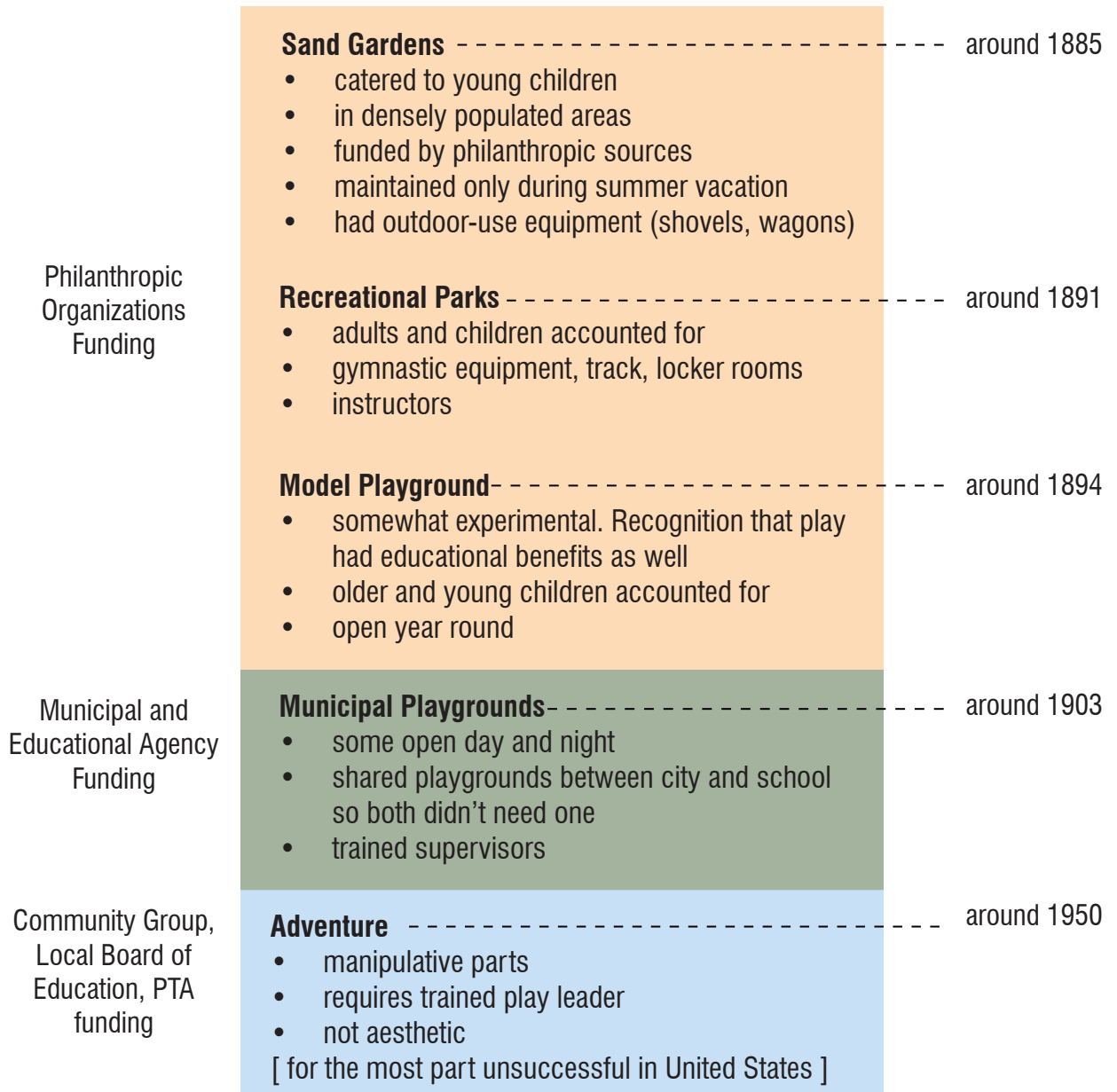


Figure 2.3 Playground Movements in the United States

# Playground Types

The three types of playgrounds that will be examined for this report are traditional, nature, and adventure playground. The pros and cons within each type will be identified for the purposes of this project. Ultimately, the playground design for the site in Nicaragua will be nature play oriented. It will offer a culmination of various elements seen in these playground types that engage children in physical, pretend, and creative play. These elements are organized in an image catalog, located on page 4 of the Methodology chapter of this report.

## Traditional



Figure 2.4 Traditional 1 | By Calvin, 2014



Figure 2.5 Traditional 2 | By Gill, 2012



Figure 2.6 Traditional 3 | By Calvin, 2014

# Nature



Figure 2.7 Nature 1 | By Davies White



Figure 2.8 Nature 2 | By TBG Partners



Figure 2.9 Nature 3 | By TBG Partners

# Adventure



Figure 2.10 Adventure 1 | Hanna Rosin



Figure 2.11 Adventure 2 | Hanna Rosin



Figure 2.12 Adventure 3 | Hanna Rosin



# Nature

## Current Nature Disconnect

Development strategies in the United States that have followed a “find-and-conquer” method for many years has had a major impact on human connection to nature. As cities were developed in aggressive fever, man-made elements took over, making the distinction between what was “wild” and “urban” very clear. The result was the thinking that the wild, or nature, was somewhere else (perhaps in a national park or forested area), not where people lived (Louv, 2005). In addition to development strategies, Louv attributes the disconnect with nature to more stringent park rules, environmental and building regulations, covenants of communities, and fear of lawsuits. In addition, lack of adequate outdoor private spaces, fear of violence in public spaces, hectic schedules of adults, and the manufactured aesthetic of most playgrounds has reduced children’s interaction with nature as well (Herrington, Studtmaann 1998, p 204). In his *A History of Children’s Play and Play Environment’s* Joe Frost also adds “out-of-control cyber play” to the list of causes of nature-disconnect (Frost 2010, p 214). Although this list is not exhaustive, when many of these factors are working in unison they present a huge barrier to the inclusion of nature in play environments for children. Together these items send a message to children that play cannot be free-form, and must be done through organized activities on a field or court (Louv, 2005). Frost identifies the many

factors that prevent human interaction with nature as a “perfect storm” that has serious negative effects on the development and overall well-being of children (Frost, 2010, p. 214).

## Nature Deficit Disorder

Although hesitant to do so among the growing trends of over-diagnosis in today’s society, the severity of the disconnect with nature in play environments spurs Louve to identify today’s society as having a “nature-deficit disorder”. Nature-deficit disorder is described as the human alienation from nature, bringing about negative effects like diminished use of senses, struggles to pay attention, and increased physical and mental illnesses (Louv, 2005). Children’s contact with nature is also important for their stewardship towards the natural environment later in life. Miller describes that there is a direct relationship between experiencing and appreciating nature. If a person interacts with nature as a child they will have concern for its well being later as an adult (Miller, 1972).

## Nature's Importance

### Biophilia

The theory of biophilia states that humans have the existence of biophilia, a fundamental, genetically based human need and tendency to affiliate with nature (Kahn, 1997). Nature in this regard can be plants or other living organisms. Researches have traced biophilic tendencies back to ancient times, where certain features of a landscape offered better chances at survival for humans. Kahn uses water as an example, explaining it not only offered a physical necessity of hydration, but also could act as a layer of defense from other species and supported other plant life and animals from which humans defended. Kaplan and Kaplan (1989) have done extensive research on what type of landscapes people prefer. Their findings revealed that people tend to prefer natural environments more than built environments. If it is built environment, people prefer ones with water, trees, and other vegetation more than those without.

## Attention Restoration Theory

Nature has restorative qualities, particularly in regards to activities that require direct attention. Olmsted spoke of nature's restorative qualities, saying it "employs the mind without fatigue and yet exercise it; tranquilizes it and yet enlivens it; and thus, through the influence of the mind over the body, gives the effect of refreshing rest and reinvigorating to the whole system" (Olmsted, 1865, p. 22). Several studies bring validity to this concept. One is from Hurtig et al. compared how well people from two groups performed the direct attention task of proofreading. The three groups in the study were urban vacationers, wilderness vacationers, and a non-vacationing group. The wilderness group showed a significant improvement in the task of proofreading (Hurtig et al., 1991).

# Safety

Safety is a hot-topic of playground design today, but discussions about it are not a new development. In fact, playgrounds in both the United States and the United Kingdom were born from efforts to provide safer environments for children. In the United States safety awareness can be traced efforts by philanthropic organization to get slum children off the streets where risk of health and injury were prevalent (Erikson, 1985). Playgrounds in the United Kingdom developed in a similar manner, addressing concerns of children's social environment, health and fitness (Gill, 2007). The irony in these efforts is that although children were given a play environment separate from traffic on the streets, early playgrounds still had a host of safety concerns.

From the beginning of playground environments to current day, various design movements to make playground safer have occurred. The first commercially manufactured items of playground equipment were introduced in the 1920's in the form of a slide and merry-go round. Shortly after in the early 1930's the National Recreation Association (NRA) published the first standards that included maintenance suggestions and proposed heights for elements on playgrounds (Thompson et al., 2007). At this time no entity collected injury data for playgrounds so it is hard to measure the impact of the NRA's standards on the overall safety of a playground, but it did begin a movement towards more standardized playground designs in attempts to

prevent injury. With the start of injury data collection at the end of the 20th century, deliberate moves were made by organizations to reevaluate safety protocols on playgrounds, creating "the safety era" (Thompson et al., 2007, p. 14). Making playgrounds more safe for children is an understandable and noble effort, but criticism has arisen in the lengths that the obsession of safety has reached, essentially making today's playground sterile environments. One such critic, Lady Allen of Hurtwood, strongly emphasizes this point in describing that a physical injury, such as a broken arm, is better than having a broken spirit (1968). The following sections address safety perceptions, design considerations, and dangers of playgrounds being too safe.

“ Better a broken arm than  
a broken spirit ”

- Lady Allen of Hurtwood, 1968

## Perceptions

Risks do exist on playgrounds. The level of risk is often misconstrued however. This is due to what John Adams (2003) describes as “virtual risks”. According to Adams, virtual risks are socially or culturally constructed from pre-established beliefs, convictions, and prejudices. Although an actual threat of safety may or may not be real, beliefs about them have real consequences. Unstructured outdoor play has been banned by many communities because of threat of lawsuits, and obsession with order, and perceptions that it is unsafe. According to Louve, “perception is nine-tenths the law” (2005, p. 27).

In today’s day and age, perceptions are heavily dictated by the media. Unfortunately in regards to playgrounds, the media does not touch on the learning and developmental benefits that playground can offer. Instead, headlines often consist of playground injury reports and neighborhood abductions, despite how infrequent they may occur. This chalks up outdoor play environments as dangerous. Where do children turn when their parent do not allow them to play outside? Inside to their phones, television, and computer screens. Unknown to parents, the indoor environment of their own home is often less safe for their children. In the 17 year span between 1990 and 2007, nearly 300 deaths were recorded in the United States alone due to falling furniture in homes (CBS, 2009). Gill

offers that getting over the unwarranted fear of risks on playgrounds begins with a person understanding that no environment is completely risk-free. “Every game you play, every craft activity you run, every play area you use, every table and chair in your room is a potential source of harm,” he states. (Gill, 2012, p. 1).

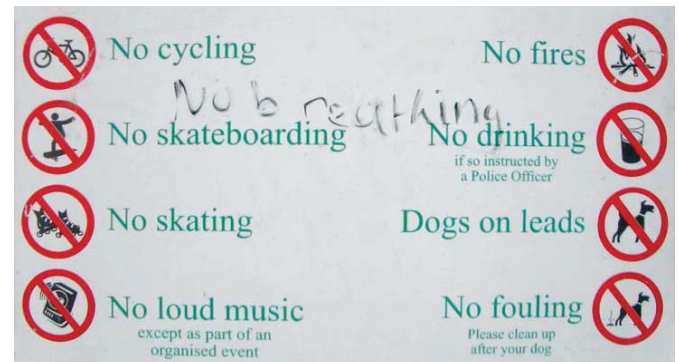


Figure 2.13 Strict Rules | By Gill, 2007

## Design Considerations

There are a variety of ways to design a playground to be safer for children to play on. Two of the major contributors that add to play risks are equipment height and surfacing of the ground plane.

### Equipment Height

Some slides, swings, and other equipment of the early 1900's reached heights of anywhere between 12 and 20 feet. In *S.A.F.E. Play Areas*, the contributing authors explain that equipment designed to be so tall adds unnecessary risk to a child's play without added reward (Thompson et al., 2007). Because play experience becomes varied and interesting through greater task complexity, the authors explain that a child using a slide that is 10 feet high verses 8 feet offers no greater play value, because the task is not different (Thompson et al., 2007). In this regard, the authors encourage challenging conventional design to make it more creative and challenging, rather than simply adding height.

### Surfacing

Surfacing beneath play equipment is another major consideration in influencing injury prevention on playgrounds. Many playgrounds today are composed of equipment on an impermeable surfaces. Hard surfacing like concrete with lower shock-absorbing

capabilities increase the risk of injury if a child were to fall on it. *S.A.F.E. Play Areas* authors describe two categories of acceptable surfaces under equipment. The first is loose fill material, whether it be organic (wood chips, mulch) or inorganic (sand, pea gravel). The second is unitary materials that are bonded together, such as rubber mats (Thompson et al., 2007).

Designing with safety in mind is important, but in no way will all injuries be able to be avoided. The key is to minimize the amount of injuries through deliberate design moves to make sure equipment and surfacing are adequate.



Figure 2.14 Tall Slide | By B.P., 2011

## Dangers Of Being Too Safe

There is a delicate balance between designing a creative and challenging play environment or a sterile and boring one. No parent wants their child to get hurt, but scrapes and bruises are learning experiences. Gill challenges the current societal trends of creating 'cotton wool kids', living in a bubble of parent supervision and safe from all possible harm, by explaining that the process of a child making mistakes and learning from them is vital to growth and development (Gill, 2012). Helle Nebelong, Danish landscape architect, furthers the

argument in saying, "When the distance between all the rungs in a climbing net or a ladder is exactly the same, the child has no need to concentrate on where he puts his feet. Standardization is dangerous because play becomes simplified and the child does not have to worry about his movements. This lesson cannot be carried over to all the knobbly and asymmetrical forms with which one is confronted throughout life" (Nebelong, n.d.) Designing playgrounds to be void of all risk and challenge is doing a disservice to our children and their futures.

“ When the distance between all the rungs in a climbing net or a ladder is exactly the same, the child has no need to concentrate on where he puts his feet. Standardization is dangerous because play becomes simplified and the child does not have to worry about his movements. This lesson cannot be carried over to all the knobbly and asymmetrical forms with which one is confronted throughout life ”

- Helle Nebelong, n.d.

# Free play

Free play, as defined by Bernard Vanleer, allows children to play “with equipment of their choosing, without following any specific rules or regulations” (CHETNA, n.d.). In this way, a child is able to explore his or her world through their own personal process of overcoming challenges and discovery. It is open ended, highly unregulated, and without rules. With ever-growing restriction on what types of play can happen on a playground due to fear of injury and lawsuits, environments that foster free play have been continually shrinking. The problem? Research points to evidence that children who engage in less rule-oriented play experience greater developmental benefits. Psychologists at the University of Colorado, Boulder analyzed the play processes of a group of seventy six year olds, focusing on when they engaged in “less structured” or “structured” types of play. They concluded that children who engaged in “less structured types of play had greater self-directed executive function, an umbrella term describing cognitive functions like memory, problem solving, and reasoning (Barker et al, 2014). This research correlates to Peter Grays research as a psychology professor at Boston College. In his book *Free to Learn: Why Unleashing the Instinct to Play Will Make Our Children Happier, More Self-Reliant, and Better Students for Life*, Gray discusses free play’s importance on development: “The drive to free play is a basic, biological drive. Lack of free play may not kill the physical body, as would lack of food, air, or water,

but it kills the spirit and stunts mental growth. Free play is the means by which children learn to make friends, overcome their fears, solve their own problems, and generally take control of their own lives. It is also the primary means by which children practice and acquire the physical and intellectual skills that are essential for success in the culture in which they are growing” (Gray, 2013, p. 5). Within the broad topic of free play, several theories that relate to the concept of open ended, unrestricted play reside. The following sections discuss these theories.



## Affordance Theory

Developed by James J Gibson, the concept of environmental affordance describes how human perception is not just limited to the awareness of objects and events in the environment, but also of their functional meaning (Gibson, 1986). The origins of the concept of affordances that inspired Gibson are rooted in Gestalt psychology. In his *The Ecological Approach to Visual Perception*, Gibson refers to Kurt Koffka's *Principals of Gestalt Psychology* and the over-exaggerated thought process of prescientific man for clarity in describing situational influences. Koffka's work describes man behaving only as the situation tells him to act, where a fruit says, "Eat me"; water says, "Drink me"; thunder says, "Fear me," and woman says, "Love me." (Koffka 1935, p. 3). Although there is a relationship between affordance theory and gestalt phycologist's beliefs, Gibson notes that gestalt psychologists never went beyond only objecting accepted perception theories of the time. Gibson states that the crucial difference is that the affordance of something does not change as the needs an individual does.

At its core, affordance theory is redefining the defenition of value and meaning (Gibson, 1986). The affordance is always there to be perceived, despite if the needs of the observer change and he/she does not attend to the affordance anymore. In describing the affordance in terms of ecological physics, as opposed to physical

physics, Gibson states that one can start to understand that an object offers what it does because of what it is (Gibson, 1986).

Heft (1998) builds upon Gibson's work, describing that affordances related to an environment are it's functionally significant properties. For instance, surface off the ground at a certain height can be perceived by an individual as climbable. In this way, play elements can be described in the way they permit or afford a person to partake in certain activities. The list of affordances is broad, including items like lift-able, balance-able, hide-able, and hang-able activities. Table 2.1 adopted from Heft's *Affordances of Children's Environments: A Functional Approach to Environmental Description*, illustrates the affordances offered by physical design elements of a children's outdoor environment. They key consideration in affordance theory is relation of object to a specific individual. Each person has a different set of skills and capabilities, thus, the affordances of a playground for a small child can be different than that of a young adult (Heft, 1998, p 30). Heft argues that affordance theory can inform the design of the environment by revealing the functional attributes of features. This is different than the form-oriented description that often accompanies playground design today, which Heft states can be "fixed and adevelopmental", unchanging as the development of an individual or group continually grows and changes (Heft, 1998). In looking at the design of a playground,



it is important to consider the capabilities of the user group and strive to offer as many affordances as possible, making play rich and varied.

A Preliminary Functional Taxonomy of Children's Outdoor Environments	
1. Flat, relatively smooth surface:	Affords walking, running Affords cycling, skating, skateboarding
2. Relatively smooth slope	Affords coasting down (e.g. on bike, wagon) Affords rolling, sliding, running down Affords affords rolling object down
3. Graspable/Detached Object	Affords affords drawing, scratching Affords throwing Affords hammering, batting Affords spearing, skewering, digging, cutting Affords tearing, crumpling, squashing Affords building of structures
4. Attached Object	Affords sitting on Affords jumping on/over/down
5. Non-Rigid Attached	Affords swinging on
6. Climbable Feature	Affords exercise, mastery Affords looking out from Affords passage form one place to another
7. Shelter	Affords microclimate Affords prospect/refuge Affords privacy
8. Water	Affords splashing Affords pouring Affords floating objects Affords swimming, diving, boating, fishing

Table 2.1 Affordances | By Heft, 1998

## Theory of Loose Parts

Another major theory of play that relates to creating a rich play experience is the theory of loose parts. Proposed by Simon Nicholson (1972), this theory states that, “In any environment, both the degree of the inventiveness and creativity and the possibility of discovery are directly proportional to the number and kind of variables in it” (p.6). Simply put, children creatively learn through the manipulation of their environment through play. Inclusion of loose parts in a playground allows a child to move and manipulate pieces within the larger space. The result is the creation a new play experience each time, as the placement and organization of the parts change. In his *How Not to Cheat Children: A Theory of Loose parts*, Nicholson reminds the reader that the idea that “creativity is for the gifted few” is a lie of our education system and culture. According to Nicholson, when the creation of play environments is dictated solely by design professionals and builders, and what they create is always “right”, children and adults in the community are cheated out of a rich environment, left only with sterile spaces (Nicholson 1971, p. 30).

# Cultural Considerations

Play is often viewed as universally consistent among children. While the act of playing is indeed universal, play is not done the same universally. Because all play is not the same, one cannot judge its adequacy for those partaking in it without a closer look (Jean Piaget Society et al., 2007). Many theories of play's link to developmental benefits are set in Western middle-culture and are unable to fully capture differences that may exist among various cultures around the world. To a certain degree, research done in the past that suggests that children in Non-western low-income cultures were playing "less imaginatively" than children in the Western world. Studies that assume this fact are amiss because they lack key elements of: 1) studying children in places they are familiar/comfortable with, 2) considering social and economic conditions, 3) considering that other cultures could have play characteristics not called out in popular Western theory (Jean Piaget Society et al., 2007).

Variations can exist due to economical, value, and communicative structures of play in communities, particularly those with low-income trends. Even of these play environments don't fit the "ideal play environment" mold of middle-class Western thought, it doesn't guarantee that this type of play is bad, because again, it's dependent upon the specifics of a place (Göncü, 1999). Thus, play needs to be considered as a culturally activity. Understanding cultural influences on play requires the following:

1. Understanding how economical structure determines availability of play in the children' community
2. Identifying community beliefs about value of play
3. Analysis of how community values are portrayed to children
4. Examining how children represent their worlds in play
5. Using an interdisciplinary approach

(Göncü, 1999, p. 148-149)

## Including La Chuscada Community in the Design Process

In depth research and creative exploration is often absent in the instillation of a new playgrounds. Instead, more playgrounds seem to be selected from a prefab catalog of a playground manufacturer more often than not. If a playground does happen to be designed creatively with beneficial developmental characteristics, there is still an essential piece missing in the equation of the design. This missing piece is the

input of children; the main beneficiary of the playground instillation. Frost and Stickland composed a survey in which they asked children to pick their favorite choice of three playgrounds with different levels of stationary and moveable/manipulative elements (Brett et al., 1993). Their study found that a majority of younger children picked the playground with more moveable pieces, while the older kids more frequently chose the one with stationary elements. Using feedback, similar to that gathered by Frost and Stickland, allows for designers to produce a playground that meets the needs and wishes of its actual users. Children are able to provide important contributions to the design process that adults may not consider (Erikson, 1985). Adults often need assistance in figuring out what children want in a playground design (Miller, 1972). When the specific users are involved in a design process,

no matter the project, they generally tend to have a sense of ownership and take better care of it (Erikson 1985, p 39). Involving the children of Nicaragua in the design process of this Master's project, is, in essence, an attempt to "bridge the gap", not only between designer and user, but between cultures as well. Not letting the children of the La Chuscada community influence the design of the school playground would be a missed opportunity. Dattner describes the error in not including children in the design process and only using adult perspectives, saying, "It is as if the children were supplied with shoes with absolute disregard for the size of their feet- the size of shoes having been determined by persons who would never have to wear them" (Dattner, 1969, p. 3).

“ Children’s play environments can and should be a reflection of the community, school, or center they are a part of. They should reflect the philosophy and spirit of each place and be an extension of the classroom and adults ”

(Keeler, 2008, p.17)

# Age Appropriate Design

The following section describes the typical developmental path of children through play described by Frost et al. in the Developmental Benefits of Playground. The contributing authors divide early stages of play development into four age categories: infants, toddlers (18-38 months), preschoolers (3-5 years), school-age (6-8 years)(Frost et al., 2004). As a child gets older, his/her development is dependent on play. For the purposes of this report's focus on design application for primary school aged children, the attention will be on the categories of preschoolers and school-aged children.

## Preschool (3-5 years)

As preschool children begin to learn about the world around them, they experience rapid maturation. This growth typically happens in all developmental categories and its extent is visible through play (Sawyer, 1997). The early stages of preschool play encompass much pretend play, as children sharpen their cognitive processes. Constructive play, or the manipulation of object, building, and arranging, also is an integral part of play in this age group (Hughes, 1999). Children like to touch objects and explore ways of using them, so even if the construction lacks organization and goals early on, it is still important (Frost et al., 2004). In this age range children also start to form small groups or partners they play along with, learning social skills and how to work with others (Hirsh-Pasek and Golinkoff, 2003). Taking turns,

sharing, listening, and understanding accompanies playing with other children. This stage is also crucial for children physical maturation. Gallehue describes this period as the Fundamental Movement Phase, which includes walking, running, jumping, balancing, climbing, kicking, and other ranges of movement (Gallahue, 1993). Free play design is a good method for providing these opportunities to children.

## School-Aged (6-8 years)

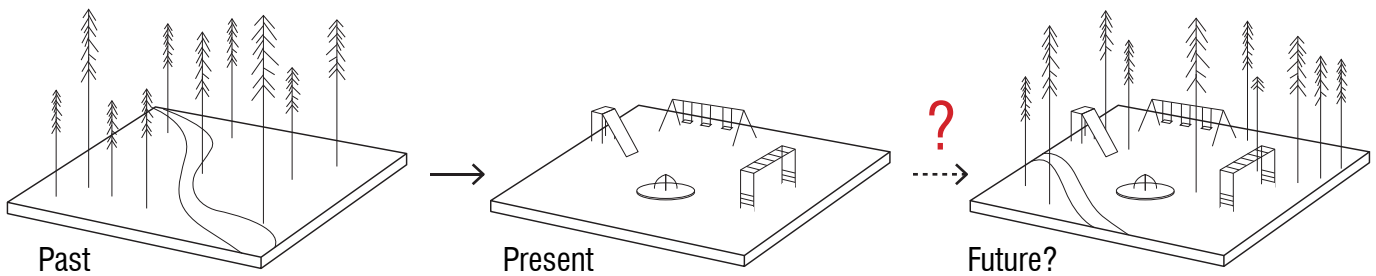
A shift in thinking happens as children get older and enter into what Frost et al., (2004) describes as the school-age period. One main change is the beginnings of games with rules. Rule-oriented games can range from physical to mental. As one can imagine, game with rules associated with them get more complex and require more strategy and planning as children continue to get older (Johnson et al., 1999). Having ample space is a necessary for children as they become more physically able to do more challenging activities in this age period. Another shift in this period that begins to surface is differences in boys in girls play. Pellegrini et al. (2002) describes that boys participated more frequently and in more physical types of play, while girl's games become more verbal.

# Chapter Conclusion

Applying nature play principals and cultural considerations to the playground design for the future La Chuscada school was the focus of this report in order to avoid following the current trends of creating sterile play environments. Instead of designing a playground to be all manufactured elements, the design proposal discussed in the Design Application Chapter of this report integrates natural elements and play equipment

together. Figure 2.15 illustrates the design process that many playgrounds have taken in developed countries, as well as the strategy of playground design for the future La Chuscada school.

## Developed Countries Playgrounds



## The Playground in La Chuscasa

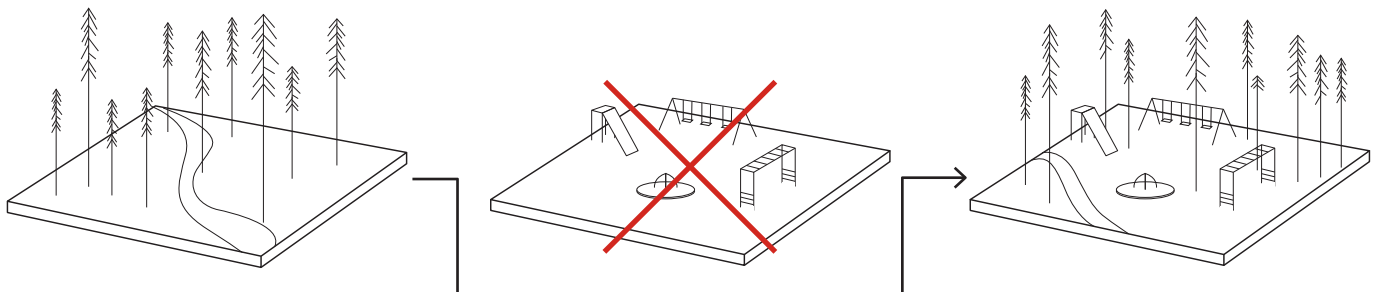


Figure 2.15 Playground Progression



# Methodology | 03



# Literature Review

A literature review provided the base knowledge on the subject of playground history, societal perceptions, and current trends in design in the United States, United Kingdom, and Denmark. It also provided evidence of the benefits of connecting play with nature. Key terms, ideas, and concepts were derived from the literature review to be applied to this Master's report and project. Refer to the literature topics explored in Chapter 2: Knowledge Base.

## Safety

S.A.F.E. Play Areas; Creation, Maintenance, and Renovation. Thompson et al. 2007

Playground Design: Outdoor Learning Environments for Learning and Development. [Playground born from safety efforts] Eriksen, Aase 1985.

In Defense of Bad Luck: A Society Which Can't Accept That 'Accidents Happen' is Destined to be Governed by a Stiffling Culture of Blame [Safety Perception, Wether Real or Fake, Have Consequences] Adams, John 2003.

Affordances of Children's Environments: A Functional Approach to Environmental Description [Affordance Theory] Heft, Harry 1998

How Not to Treat Children: The Theory of Loose Parts [Loose Parts Theory] Nicholson, Simon 1971

Free to Learn: Why Unleashing the Instinct to Play Will Make Our Children Happier, More Self-Reliant, and Better Students for Life [Theory of Free Play] Gray, Peter 2013

## Free play

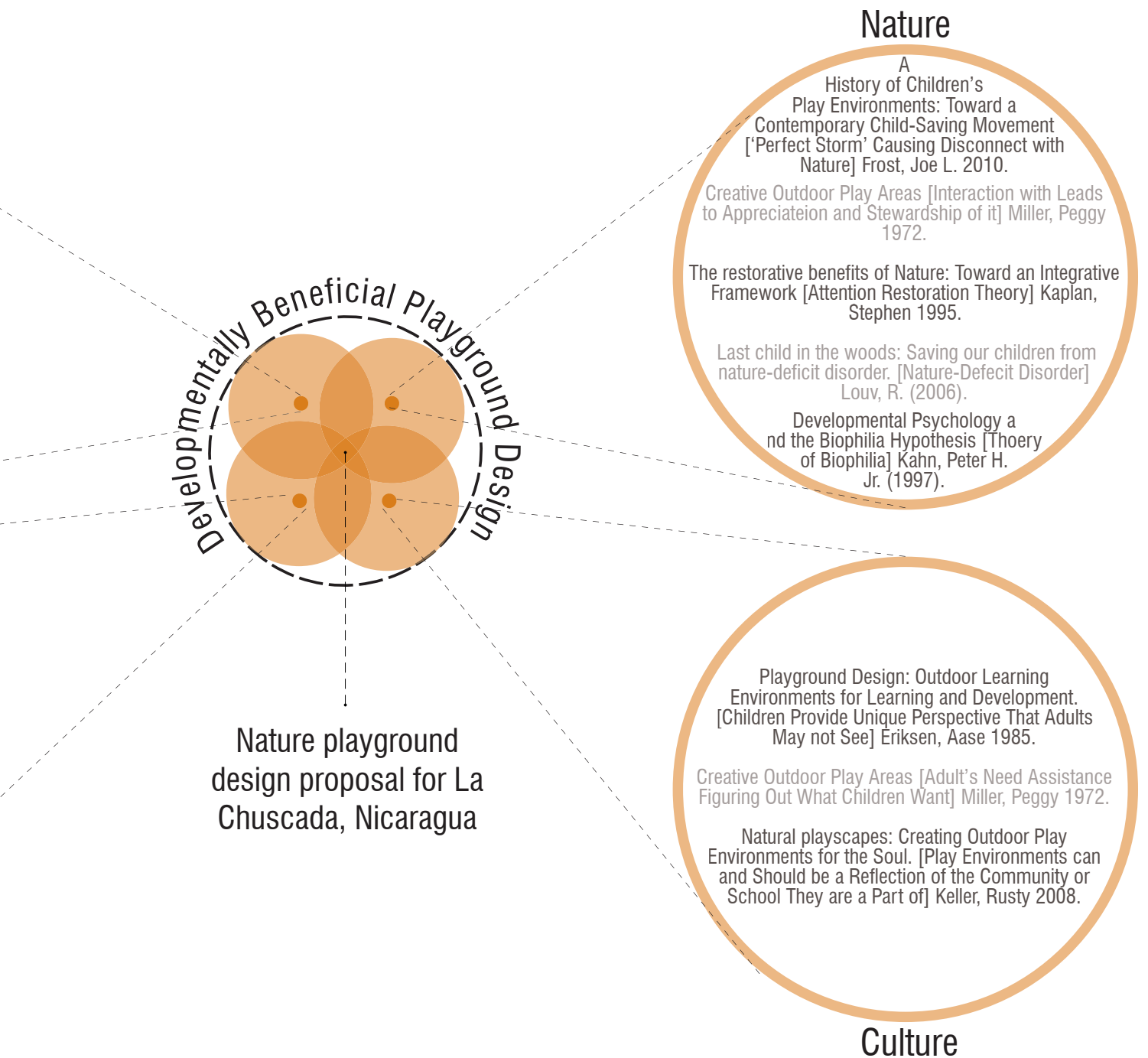


Figure 3.1 Literature map

# Precedent Analysis

## Dinton Pastures

Location: United Kingdom

Designer: Davies White Landscape Architects

Year Built: 2014

Designed by Davies White Landscape Architect's, the Dinton Pastures Playground in the UK challenges conventional thinking of how a playground should function and look. "Forget metal equipment and multi colored rubber surfaces, our innovative designed wild design rejects preconceived notions of a playground in favor of a more natural approach to play", Davies White explains why the playground looks far from typical (Davies White, 2014, p. 1). The firm also emphasized natural elements throughout the entire playground, not just to restricted areas. Elements include grassy mounds, tunnels, playful planting, timber decking, sand, bridges, and boulders. The result is an "Inclusive, exciting and challenging space to play with unlimited creativity and imagination for all the family" (Davies White, 2014, p. 1).



Figure 3.2 Dinton Pastures 1 | By Davies White



Figure 3.3 Dinton Pastures 2 | By Davies White

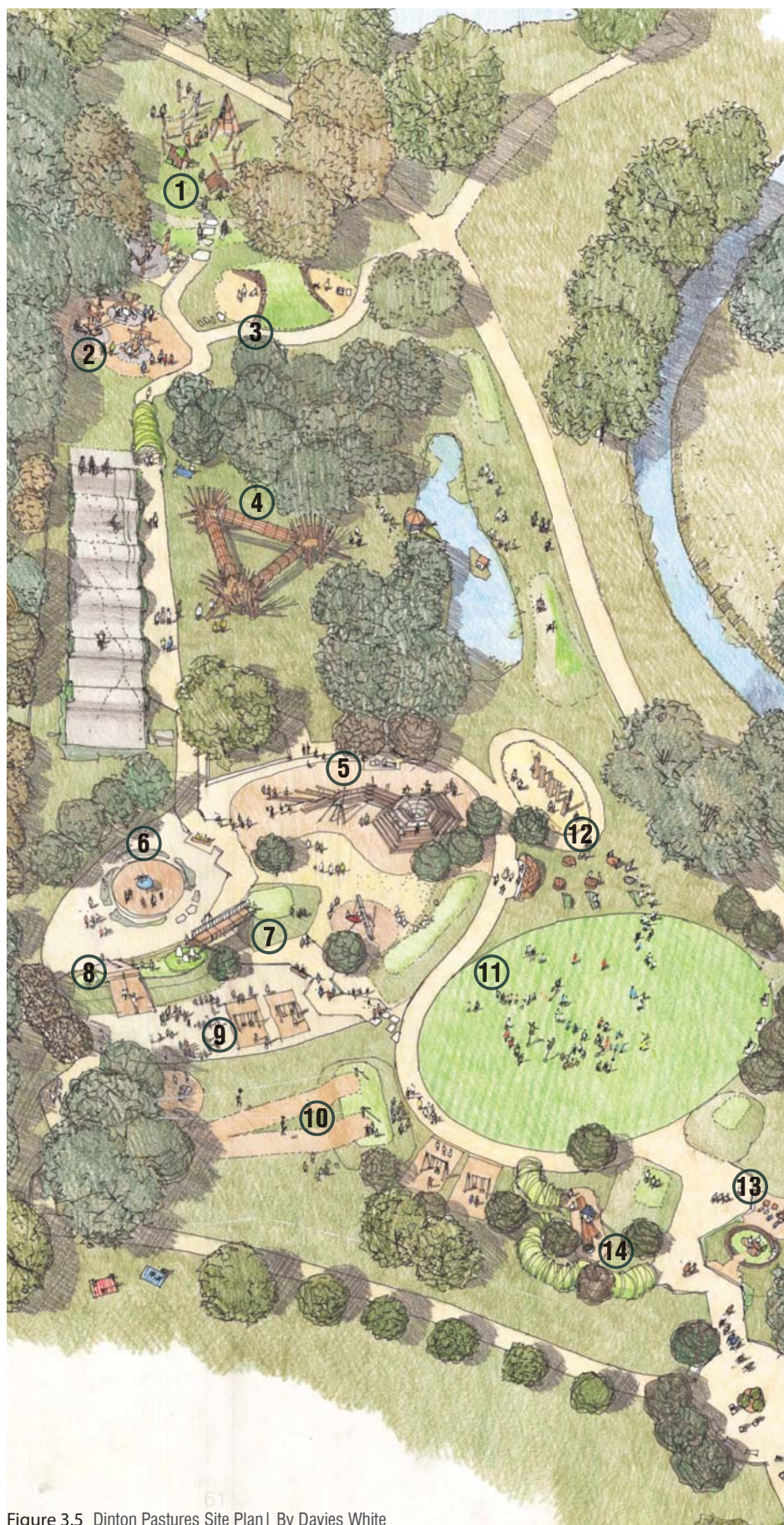


Figure 3.4 Dinton Pastures 3 | By Davies White



## Playground Elements

- ① Elevated Structure
- ② Log Structures
- ③ Tunnel
- ④ Elevated 'Nest' Structure
- ⑤ Climbing Net Structure
- ⑥ Sand Pit
- ⑦ Elevated Mounds with Bridge
- ⑧ Slide
- ⑨ Swings
- ⑩ Zip-Line
- ⑪ Open Lawn
- ⑫ Climbing Trunks
- ⑬ Sitting Area
- ⑭ Vegetative Tunnels





## Lucy and Ian Family Garden

Location: Austin Texas

Designer: W. Gary Smith and TBG Partners

Size: 4.5 acres

Year Built: 2014

The Lucy and Ian family Garden at the Wildflower center in Austin, Texas was a join design effort between TBG Partners and W. Gary Smith Design. The children's garden, located near the center of the Wildflower Center, incorporates various dynamic play spaces in a whimsical way. A focus of the project was to connect children and families to nature. Interactive features made from natural elements provide learning experiences in the topics of biology, ecology, hydrology, and geology. Two of the main goals were to create and safe and immersive natural environments where children, in a sense, could 'get lost' in their own play. The two parties involved in the design of the gardens were deliberate in including educational recreation components and sustainable approaches, using elements sourced directly from the site.



Figure 3.6 Lucy and Ian Family Garden | By TBG Partners



Figure 3.7 Lucy and Ian Family Garden | By TBG Partners



Figure 3.8 Lucy and Ian Family Garden | By TBG Partners

## Playground Elements

- ① Creek
- ② Elevated Earthen Grotto
- ③ Maze
- ④ Mosaic Wall maze
- ⑤ Wooden Nests
- ⑥ The 'Stumpery' Logs
- ⑦ Small Open Lawn
- ⑧ Large Open Lawn
- ⑨ Pavilion



Figure 3.9 Lucy and Ian Family Garden Site Plan | By TBG Partners



# Play Element Catalog

As discussed in the background knowledge chapter of this report, the principals of natural playground design are to integrate natural elements, to allow for open programming for a diversity of play types to occur, and to make the play environment safe. The broad scope of these principals allows much room for interpretation and creativity in the physical design of the playground. Herein lies one of the best attributes of nature play: its ability to provide endless options for play to occur through adding, subtracting, or rearranging natural elements. In order to better understand many different approaches to manifest physical, pretend, and constructive play in the physical design of a playground, various previously constructed playgrounds in the United States, the United Kingdom, and Denmark were studied. The catalog images are grouped into categories of the three main types of play they afford an individual: physical, pretend, creating. This process was by no means a comprehensive case study analysis of the playground as a whole, but rather a method of identifying specific pieces of equipment that have been incorporated into the playground and highlighting what type of play they afford the user. Armed with creative ideas from the play element catalog and the knowledge for the financial and resource restriction of the La Chuscada community, an appropriately designed nature playground will be proposed. See Figure 3.10- 3.64 for a catalog of various playground elements that allow for physical, pretend, and creative play to occur.

## Climbing



Figure 3.10



Figure 3.11



Figure 3.12



Figure 3.13



Figure 3.14



Figure 3.15



Figure 3.16



Figure 3.17



Figure 3.18



Figure 3.19



Figure 3.20



Figure 3.21



Figure 3.22



## Balancing



Figure 3.23



Figure 3.24



Figure 3.25



Figure 3.26



Figure 3.27



Figure 3.28

## Jumping



Figure 3.29



Figure 3.30



Figure 3.31



Figure 3.32

## Sliding



Figure 3.33



Figure 3.34



Figure 3.25



Figure 3.36



Figure 3.37

## Swinging



Figure 3.38



Figure 3.39



Figure 3.40



Figure 3.41



Figure 3.42



Figure 3.43



# CREATING



Figure 3.44



Figure 3.45



Figure 3.46



Figure 3.47



Figure 3.48



Figure 3.49



Figure 3.50



Figure 3.51



Figure 3.52



Figure 3.53



Figure 3.54



Figure 3.55

# PRETEND



Figure 3.56



Figure 3.57



Figure 3.58



Figure 3.59



Figure 3.60



Figure 3.61



Figure 3.62



Figure 3.63



Figure 3.64

# Survey

## Strategy

A survey was conducted to better understand the culture and play preferences of the La Chuscada community. With assistance of a teacher reserving some class time at the end of the school day, the survey was administered by Amigos for Christ employee Danny Doogan at the community's current temporary school. Figures 3.65 and 3.66 show the survey being taken at the school. Children were asked to pick four individual images from a group of pictures randomly assorted on a desk when asked the question, "what are your favorite activities to play?". Figure 3.67 displays the images and type-of-play categories of the survey. The role of the survey was to help inform the playground design for the future school.



Figure 3.65 Conducting the Survey 1



Figure 3.66 Conducting the Survey 2



# Category Organization



Figure 3.67 Survey Organizations

# Design

Previous methods will be used to inform in the design of a playground in Chinandega, Nicaragua. The synthesis of best practices of playground design and community feedback will influence the layout of the playground and the elements within it. I worked with Bisch, a graduate student in interior architecture, who designed the building layout and interiors on the site, to determine strategies for indoor-outdoor connections. The playground design will focus on encompassing natural-play characteristics throughout various unique “zones” that offer the children different play experiences and challenges for developmental growth.



Figure 3.68 Design Phase 1





Schematic Design

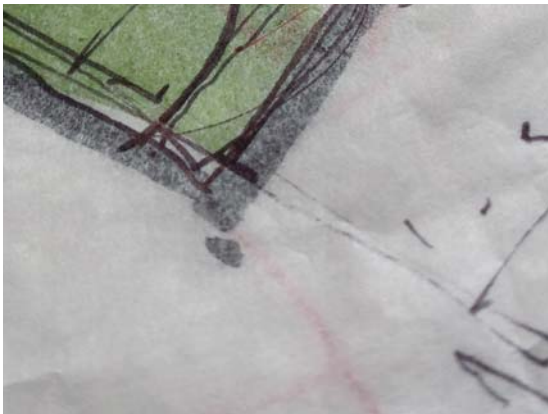


Figure 3.69 Design Phase 2



Refined Site Layout

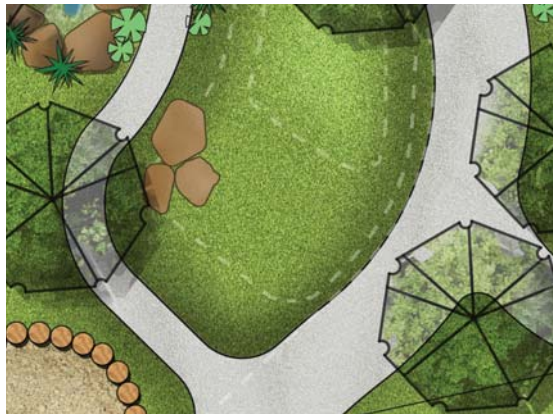


Figure 3.70 Design Phase 3



# Findings | 04

# Cultural Immersion

A week trip to Nicaragua played a crucial role in informing the design moves for the future school in La Chuscada. The trip allowed us to gain an understanding of Nicaraguan culture, specifically that of the La Chuscada community. We also learned about what materials are typically used in construction and analyzed the site where the school is to be built. Visits to existing schools to analyze the positives and negatives about their spatial organizations and programming took up much of the beginning of the week. The end of the week consisted of spending a large amount of time in La Chuscada. These days were comprised of walking the roads of the community to get an understanding of the extend of its boundaries and what typical travel to school looks like, visiting with parents and children, and spending time on the future site and at the temporary school while classes were in session. The progression of the week's schedule from broad

to narrow in scope allowed us to see general trends in school layout and playground design of Nicaragua before narrowing our vision to focus on the specific community that this masters report's design proposal will directly influence. See calandar of trip itinerary on pages 78-79

We understood going into this trip that we would not be the teachers, but rather the ones learning. As IDEO states in their Human Centered Design toolkit, "The real experts are the people your designing for" (IDEO , 2009). This trip was a great opportunity for us to gain a broad understanding of Nicaraguan culture and local design and construction techniques. The trip was full of new experiences, learning, and meeting many generous people. The following sections of this chapter illustrate our findings and the key concepts that influenced the future school design.



Figure 4.1 Gloria's Family





4.2



4.3



4.4



4.5



4.6



4.7

“ The Real Experts Are the People You Are Designing For ”

(IDEO: Human Centered Design, 2009)



4.8



4.9



4.10



4.12



4.11

Figure 4.2- 4.12 by Author: See Citations for Image Titles

# Trip Schedule

A week trip to Nicaragua played a crucial role in informing the design moves for the future school in La Chuscada. The trip allowed us to gain an understanding of Nicaraguan culture, specifically that of the La Chuscada community, learn about typical material uses, and analyze the site where the school is to be built. Visits to existing schools to analyze the positives and negatives about their spatial organizations and programming took up much of the beginning of the week. The end of the week consisted of spending a large amount of time in La Chuscada. These days were comprised of walking the roads of the community to get an understanding of the extent of its boundaries and what typical travel to school looks like, visiting with parents and children, and spending time on the future site and at the temporary school while classes were in



Figure 4.13 Trip Path

## February 2015

Sunday	Monday	Tuesday
<div>15</div> <ul style="list-style-type: none"><li>• Arrival in Chinandega</li><li>• Bike ride around city</li><li>• Visit San Louis School</li></ul>	<div>16</div> <ul style="list-style-type: none"><li>• School visits:<ul style="list-style-type: none"><li>El Chonco</li><li>Rotario</li><li>Villa Catalina</li><li>Bethelmitas</li><li>Montica</li><li>Reuben De Rio</li></ul></li></ul>	<div>17</div> <ul style="list-style-type: none"><li>• Site visit</li><li>• Temporary school visit</li><li>• Walk around La Chuscada</li><li>• Spent night in community</li></ul>





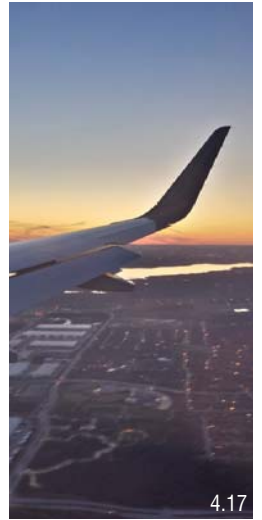
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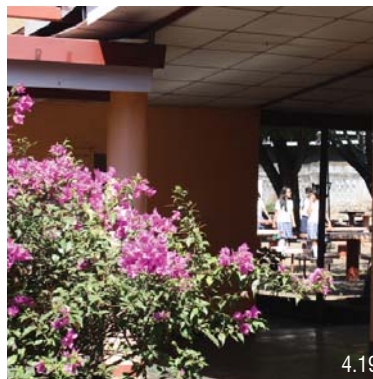
4.16



4.17



4.18



4.19



4.20

Figure 4.14- 4.20 by Author: See Citations for Image Titles

Wednesday	Thursday	Friday
<p><b>18</b></p> <ul style="list-style-type: none"> <li>• Sit in on shool classes</li> <li>• Walk around La Chuscada</li> <li>• Design cherrettes</li> </ul>	<p><b>19</b></p> <ul style="list-style-type: none"> <li>• School visits: Mina De Aqua</li> </ul>	<p><b>20</b></p> <ul style="list-style-type: none"> <li>• Site visit</li> <li>• Visit Temporary school</li> <li>• Design cherrettes</li> <li>• Prepare for Saturday departure</li> </ul>

Figure 4.21 Trip Calandar

# La Chuscada Community

## The People

The community is composed a diverse group of people. Some have been living in the community a long time, while others are invested in it because of an occupation. No matter the case, each person holds their own wishes for what they want to see in a new school. While spending time interacting with community members, their hopes for the design and programming of the school became clear. Four major groups that have a stake in the new school were identified. These groups are the community leaders, parents, teachers, and students.

- Total Population: 563
- Number of Families: 130
- Family Types: Nuclear (mother and father). Many homes have 2-3 families
- Typical Occupation: women-vendors, men- farmers or langostinos (lobster factory workers)
- Religion: 83% Catholic, 7% Evangelicals, 10% no practice

(Amigos For Christ, 2015)

## What Are The Needs Of The Community For The School ?



Figure 4.22 Key User Groups



# Layout



Figure 4.23 La Chuscada Community Layout

# Temporary School

The temporary school is located directly adjacent to the future school site that is the focus of this master's report. The temporary school exists as a way to begin the educational programming in the La Chuscada community before the permanent school is built. Because of its temporal status, the main structure of temporary school is made of wood rather than the typical Nicaraguan architectural vernacular of concrete. The building is composed of a row of seven connected classrooms. Large windows on each side allow breezes into the classrooms in lieu of no air conditioning. A sidewalk stretches along the length of building, covered from the elements by an overhead roof. The school has a set of bathrooms detached from the main building. A large dirt field, which is the future school site, serves as an area of play for the students. Although organized sports of baseball and soccer can happen in this space, there is not playground for the students to use.

Both primary and secondary grades share the seven classrooms of the temporary school building. The classrooms are roughly square, 6.6x 7 meters in size. Currently, because of a shortage of instructors, some teachers teach multiple grades. Another existing burden is the lack of resources to provide desks and supplies in all the classrooms. The Amigos For Christ Organization works with the Nicaraguan Ministry of Education to provide these necessities at the school, but currently resources are short. Nonetheless, the

temporary school existence at all is a step in the right direction for the community. Many community members recognize its benefits and hold much excitement and pride for what is to come with the future school project.



Figure 4.24 Makeshift Desk

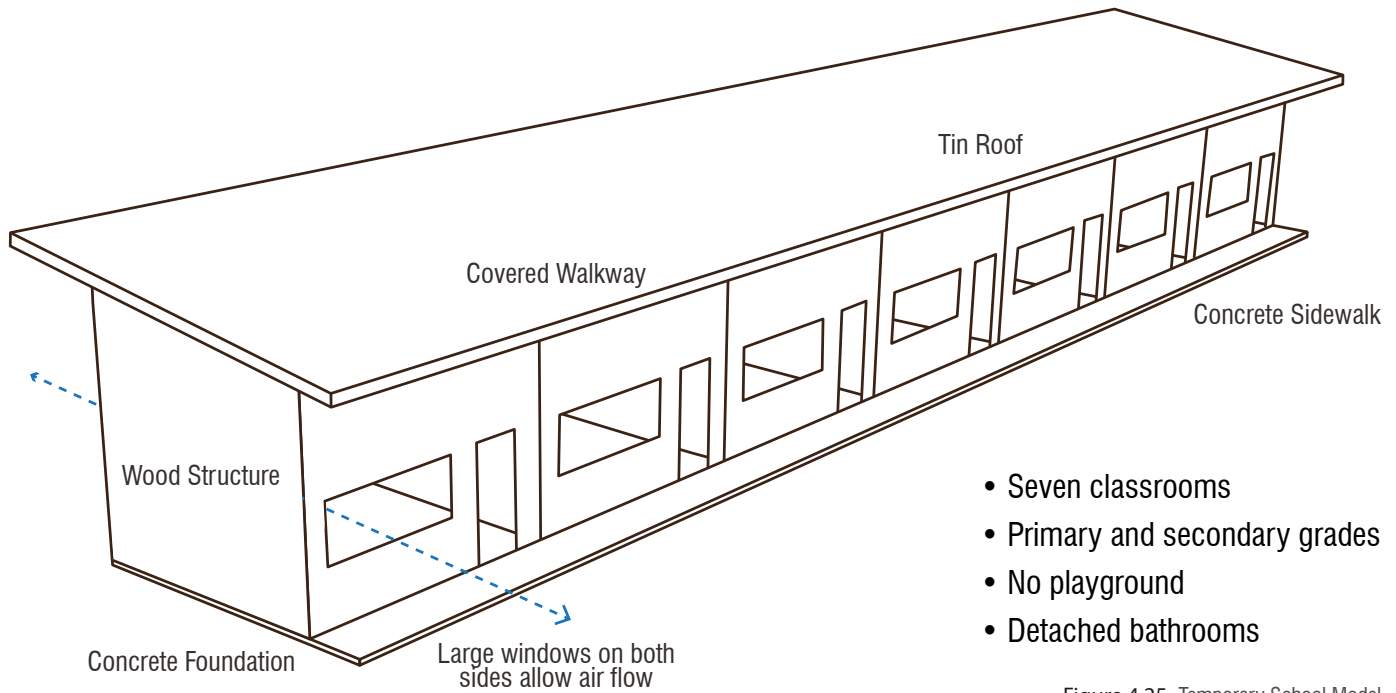


Figure 4.25 Temporary School Model

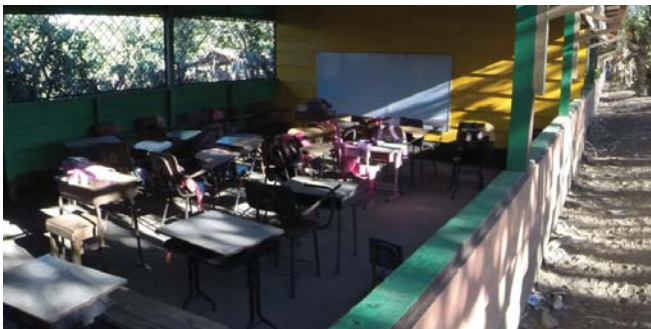


Figure 4.26 Classroom



Figure 4.27 Rounding the Bases

# The Site

The focus site is centrally located in the La Chuscada community. Just a few meters from the temporary school, the dirt field is currently vacant, used for student baseball games and tag games. Outside of a few homes, only agricultural fields surround the site. Amigos for Christ purchased the previously farmed land from a community member, and intend to transform the essentially “blank slate” into a top-tier school campus. The school campus edge will be defined by a wall, marking it as a sacred space and providing security.

At 137 meters by 45 meters, the long and thin site presents certain challenges in the master plan layout. Strategic building layout is necessary to meet required classroom numbers and allow passive cooling systems to work. The site entrance will be located on the northeast corner, accessible from the community’s main road.

Despite certain challenges, the site also presents great opportunity. The central location of the site makes it easily accessible to community members. In addition, the community already has a student base interested in attending school, as seen by temporary school attendance numbers. Because the site is owned by the Amigos for Christ organization, they are able to drill a well on this site. The on-site well will provide all water needs for the school to function.





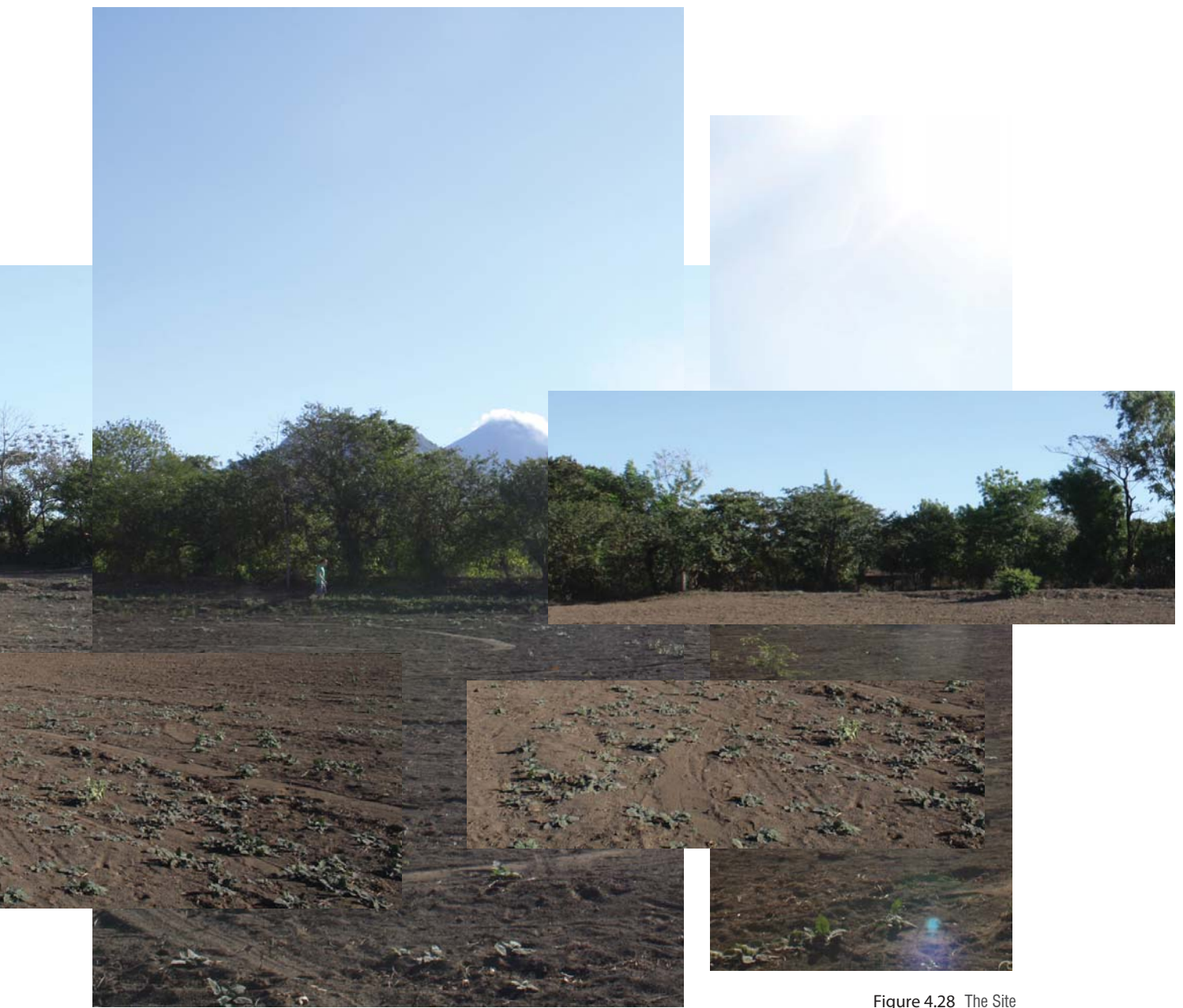


Figure 4.28 The Site

# Existing Urban Schools

## Bethlemitas



Figure 4.59 Bethlemitas School

## Ruben Da Rio



Figure 4.60 Ruben da Rio School

## Montica



Figure 4.61 Montica School

## San Louis



Figure 4.62 San Louis School



# Existing Rural Schools

**El Chonco**



Figure 4.63 El Chonco

**Villa Catalina**



Figure 4.64 Villa Catalina School

**Mina Da Aqua**



Figure 4.65 Mina Da Aqua School

**La Chuscada**



Figure 4.66 La Chuscada School

# Existing School Organization

In addition to studying the vernacular of the existing rural and urban schools around Chinandega, it was important to also analyze their organization and programming. Observations of what worked and what did not in regards to organization was the main method of analysis of existing schools. These observations

were strengthened by personal comments from teachers, students, and parents about the school they were affiliated with. Site design strategies were able to be extracted through this analysis process and applied to the school site of La Chuscada.

## Montica

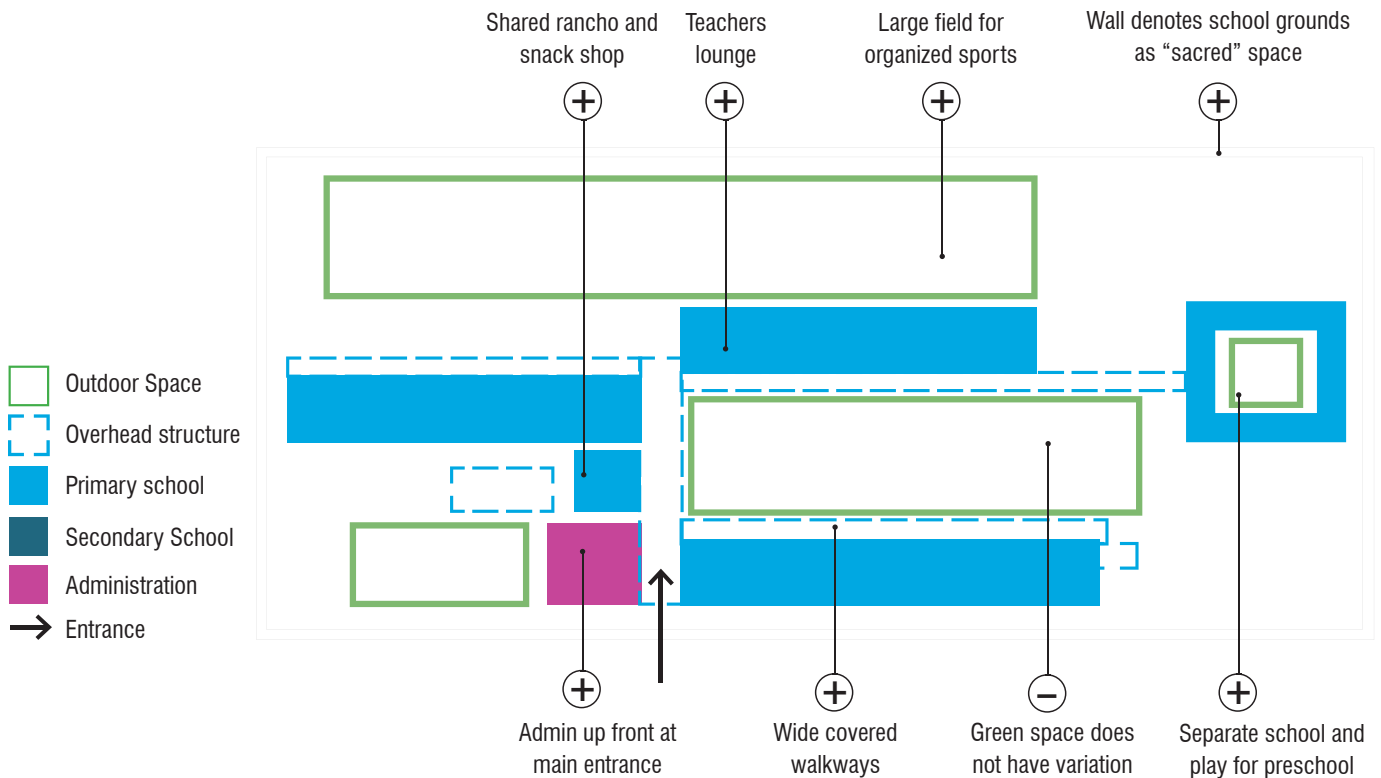


Figure 4.67 Montica Analysis



# Bethlemitas

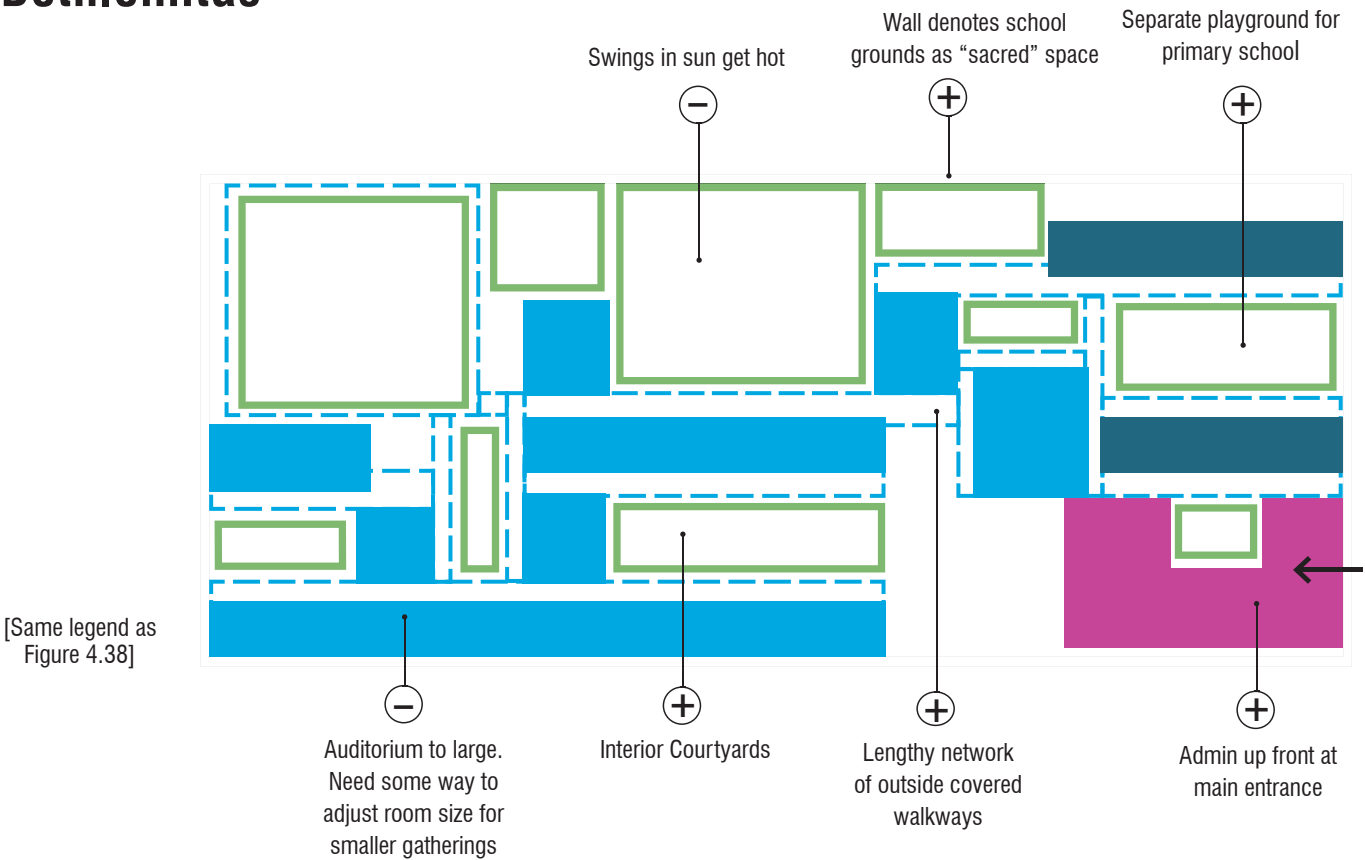


Figure 4.68 Bethlemitas Analysis

# Mina Da Aqua

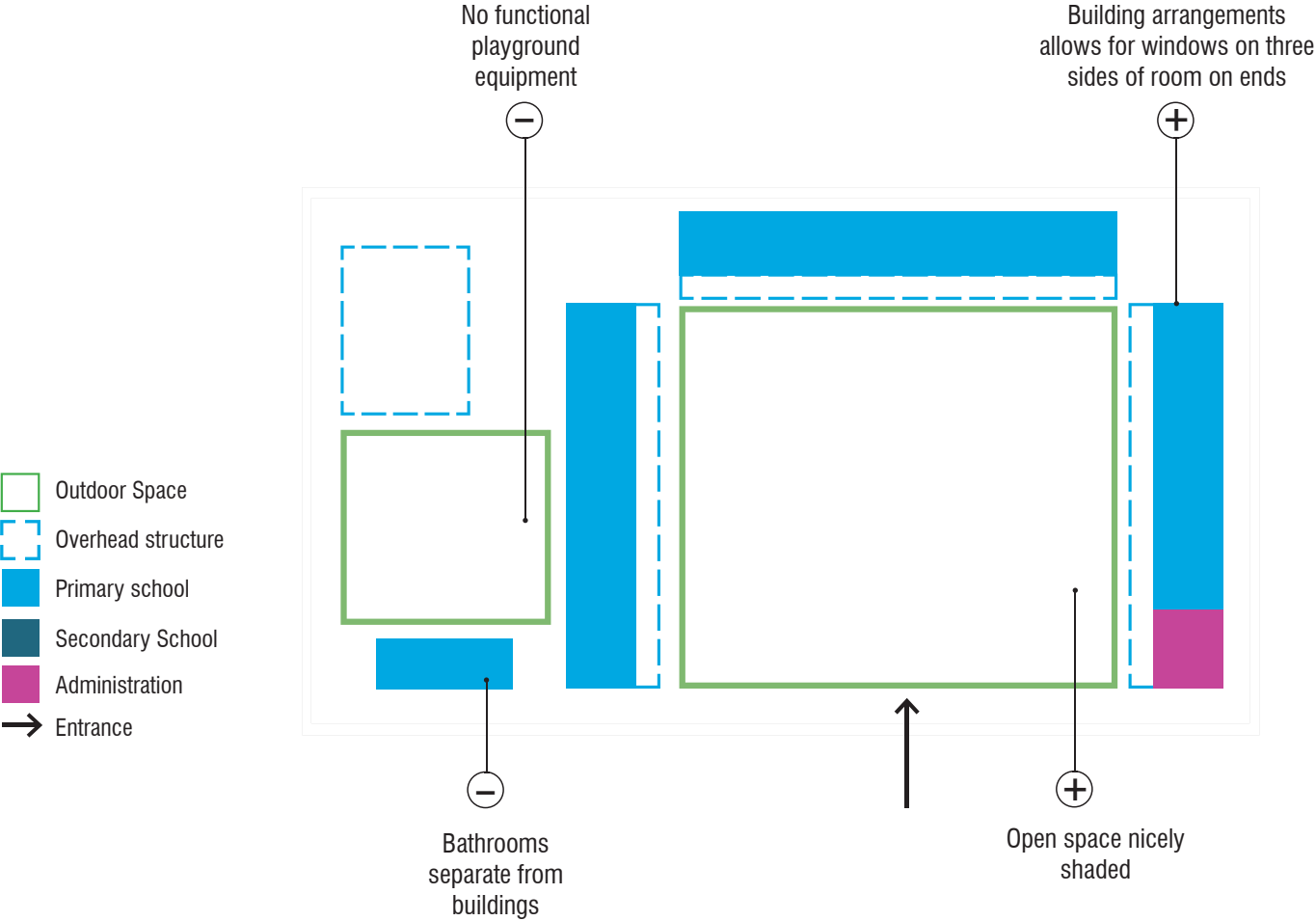


Figure 4.69 Mina Da Aqua Anlaysia

## Analysis Takeaways

Important factors to consider in the design of the school in the La Chuscada community were drawn from analysis of existing schools in and around the city of Chinandega, Nicaragua. Being mindful of these considerations in the design proposal will allow the school spaces, both indoor and outside, to be better learning environments for children. The list of big take aways from the existing school analysis follows:

### **Separation of primary and secondary classes**

- reduces chaos of children crossing paths
- can focus on age-appropriate design in each

### **Covered outdoor walks**

- protects from sun and rain

### **Administration located at entrance of site**

- this allows parents and visitors to take care of business up front without having to walk through the entire school site
- safety and security

### **Raised foundations of buildings**

- keep water out of classrooms during the rainy season
- can create interesting “stage” spaces and seating opportunities

### **Shared community spaces**

- rancho, sports field, eating center
- specialty classrooms for dance and art

### **Need for nature in playgrounds**

- currently very little vegetation
- shade needed

### **Need for variety in playgrounds**

- currently just equipment on dirt field
- little variety outside of swings and slides

# Existing Playgrounds

## Equipment

Similar to many playgrounds in developed countries, most of the playgrounds in Nicaragua were void of natural elements. The playgrounds in and around the city of Chinandega typically consisted of metal equipment on a dirt field. Some playground, such as the city park in downtown Chinandega, did contain larger stepped platforms and bridges that started to connect various equipment pieces to make a larger unit. Swings and slides were the most popular variety of equipment used, with some playgrounds also including see-saw and monkey-bars. Outside of these few elements though, the playground had very little variety and opportunities for exploration and creativity.

## Materials

The most used material for the equipment on playground was metal. Because of the wet rainy season much of the equipment, unless recently installed, was rusting. In addition, in Nicaragua's characteristically hot weather, the metal serves as a hazard for children to get burnt on because of its exposure to the sun. This is a result of having little to no protective shade form vegetation on playgrounds.



Figure 4.70 Chinandega City Park



“ We are raising today’s children in sterile, risk-averse and highly structured environments. In so doing, we are failing to cultivate artists, pioneers and entrepreneurs...”

(Hammond, 2011)



Figure 4.41- 4.48 by Author: See Citations for Image Titles



# Survey

## Results

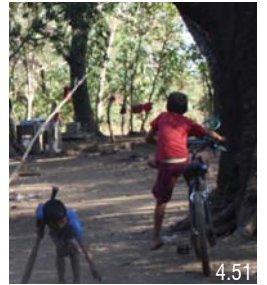
As described on page 70 of this report, children of the La Chuscada community were surveyed about their favorite types of play. A total of twenty four children participated, and their answers were very telling to their perception of play. The definitive majority of images selected were from the “organized sports” and “equipment play” categories. Each of these categories had 37 images selected from them. The next largest category, “passive activity”, had sixteen selections, followed by “nature play” with four. See Fig 3.67 for how the categories were organized.

## Reflection

After spending some time in the community of Lachuscada, the large disparity in responses between “nature play” and the “organized sports” and “equipment play” categories came as a surprise. As we toured the community throughout the week we observed children playing, but the play we most often observed falls into the category of nature play. We observed children climbing large tree roots, playing in the dirt, picking up tree littering and rubbing them together to make noises, and collecting sticks. Outside of observing nature play occurring, there were children kicking a soccer ball around and playing baseball together. Riding bicycles also seemed to be a popular activity. One of the most interesting aspects

survey answers was that one of the highest picked categories was “equipment” type play, despite there being not playground in the community. Exploring the reasons behind the survey selections could be a separate masters report in itself, but there are some educated guesses that can be formed from the children’s answers and spending time in Nicaragua. One hypothesis is that Nicaraguan children visualize play as only happening on a playground. The nature play observed on the trip happened in the community, in and around the children’s homes. Perhaps, to the children, the everyday activity of climbing trees and collecting leaves is not extraordinary. On the contrary, when the children and their families make it into the city of Chinandega on a rare occasion, they often visit the city park. This park is full of brightly colored playground equipment and food vendors. To the children, this rare but special occasion can hold significant meaning. As a result, when asked about their favorite type of play activities as in the survey conducted for this report, there answers reflect their fascination with the park in the city.





**Figure 4.49- 4.57** by Author: See Citations for Image Titles

## Influence on Design

The survey was done in attempts to better understand Nicaraguan culture and the preferences of the La Chuscada community. Although this project intends to focus on a nature playground design, it would be amiss to completely ignore the survey because the answers did not align directly in favor of nature play. The children chose images based on their perceptions of play and their preferred activities. These responses need to be taken into account in the design of the playground, instead of producing a completely foreign type of playground to them. That being said, a balance still needs to be maintained. Designing a playground based solely on the children's responses and not take into account previously conducted research for this report would result in the production of a playground that does not offer many developmental benefits to them. Strategies can be taken to include familiar elements in creative ways while introducing nature into the fabric of the playground design. To be effective, nature needs to be introduced in a deliberate and refined manner, separating it from the nature that surrounds it in the community currently. The children need to know that this it is a playground. It's a special place for them to grow personally and socialize with their peers.







Figure 4.88 Playground Montage | By Author

# THE BIG IDEAS

## Extracting Key Concepts From Analysis of Existing Conditions

In doing an analysis of the current temporary school, interacting with community members, and gaining an understanding of contextual and cultural influences, big ideas that influence the design of the future school emerged. Strategies employed in the physical design of the future school will allow these important considerations to come to life.



### Community Core

The community has put a lot of investment of time and resources to make the temporary school happen, and the members look forward to the creation of the permanent school. The community is spread out however, and does not have a communal space to interact, learn, and share with one another.



#### Future School Design Strategies:

- communal gardens
- rancho gathering space



### Nature Connection

There is very little integration of nature into the current temporary school site, particularly in play areas. As the site exists, the students have an open dirt field to play organized sports like baseball and soccer, but do not have a designated playground space where nature is integrated into the design.



#### Future School Design Strategies:

- nature playground elements
- gardens



## Keep Students At School

At the current temporary school there are no walls around the property to delineate the school as a 'sacred space'. Children come and go as they please, often times walking home during the middle of the school day. There are also no after school programs to keep students interested and engaged in learning.



### Future School Design Strategies:

- specialized classrooms for activities
- exciting play spaces
- property wall with guarded entrance



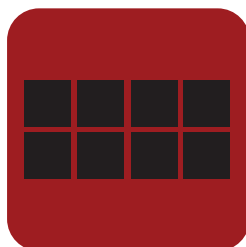
## Weather Considerations

Nicaragua has a dry and rainy season. The dry season is very hot and a lot of dirt to be kicked up by the wind or human movement. During the rainy season many areas experience flooding during characteristic intense downpours. This causes damage to property and often washes out dirt roads.



### Future School Design Strategies:

- highly shaded areas
- raised building foundations
- covered walkways



## Bring Order To Chaos

Currently all grades are concentrated in one connected building. This layout causes distractions between primary and secondary school students as they pass each others rooms during the school day. Another large distraction is parents or siblings interrupting the teacher to talk to a child who is in class.



### Future School Design Strategies:

- separate primary and secondary
- separate parent space





**Design Application**

**05**

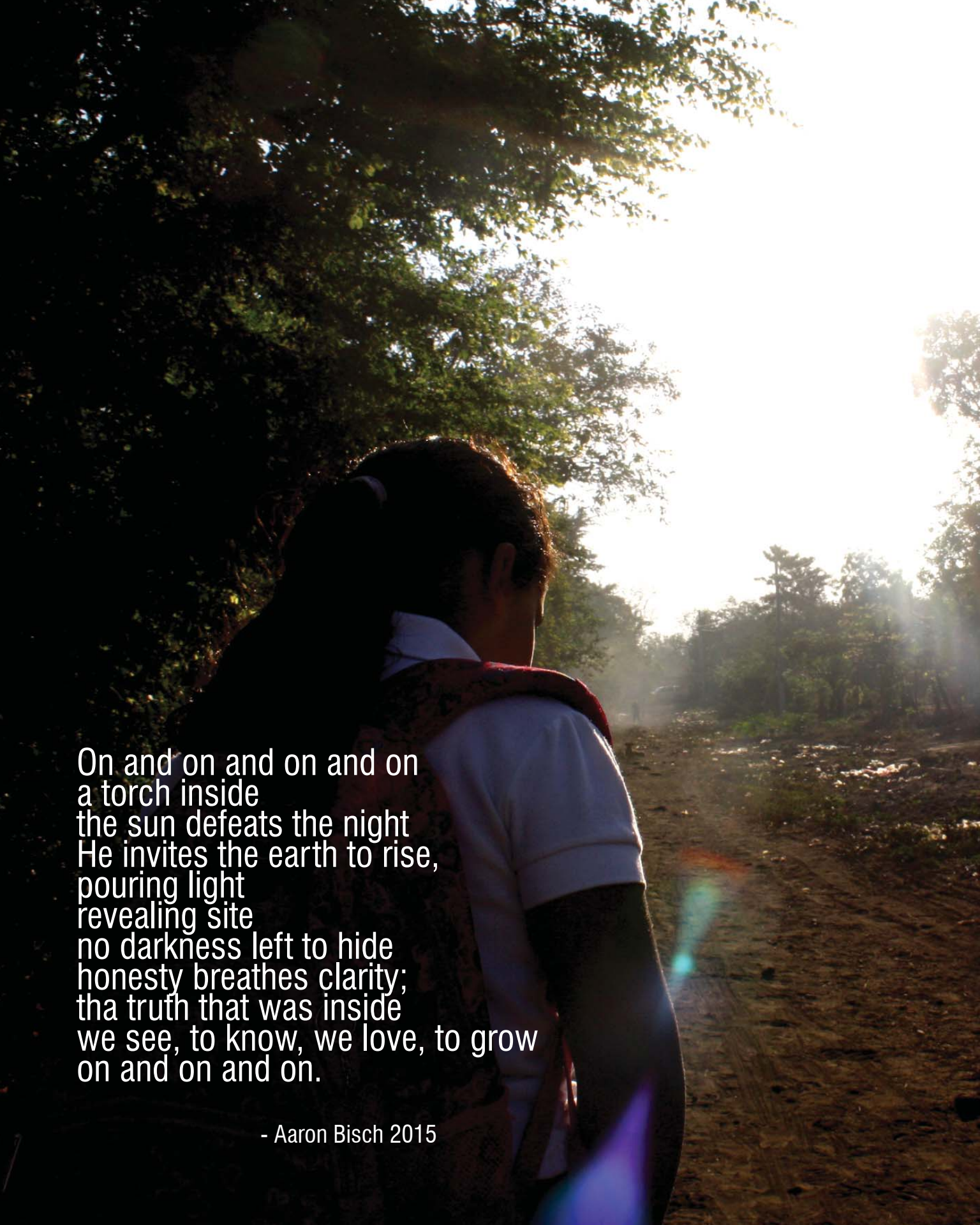
# Concept

## Revealing Potential

The driving forces behind the design proposal are to integrate nature play research with feedback from the community while challenging and pushing conventional norms of playground design. With the Amigos for Christ Organization at the helm, the La Chuscada community has a unique opportunity to create a school campus that provides many learning opportunities and social interaction. From the recognition of great opportunity was born the concept of “reveal”. Reveal means to make known or bring to light. When poised with the question, “What do you want for your children in this school?” many La Chuscada parents and grandparents answered with “The opportunity for a better life than I have had”. Currently, members of the community focus on the daily struggle of survival without a wide lens for what the future may hold. A model school can begin to widen this narrow scope of focus by opening doors of opportunity for children in the community through education and personal growth. At its core, education is shedding light, bringing the previously unknown to the surface. Educating the younger generation had a wide reaching positive influence. What children learn in school is carried with them outside the school campus, taken home with them, and the community as a whole benefits.

Reveal is not creating anew. The La Chuscada has a solid foundation of community leaders and members invested in creating a bright future. With Amigos for Christ, the community has already begun the process of positive growth through building water system and temporary school. Reveal is continuing this process. Reveal is to make clear, to destroy ambiguity. Reveal is showing the potential that each child in the community has. In providing rich learning and play environments, the community is poised for a bright future.

Figure 5.1 On The Way To School

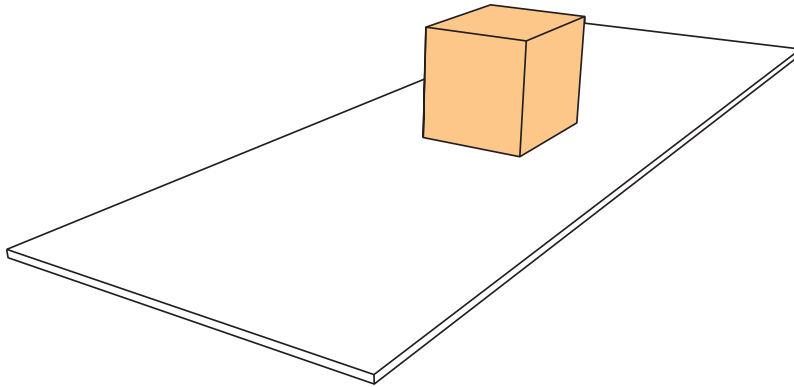
A person with dark hair tied back, wearing a white short-sleeved shirt and a patterned vest, stands in a forest. They are looking towards a bright light source, likely the sun, which is creating a strong lens flare and illuminating the scene. The background shows dense green foliage and a dirt path.

On and on and on and on  
a torch inside  
the sun defeats the night  
He invites the earth to rise,  
pouring light  
revealing site  
no darkness left to hide  
honesty breathes clarity;  
tha truth that was inside  
we see, to know, we love, to grow  
on and on and on.

- Aaron Bisch 2015

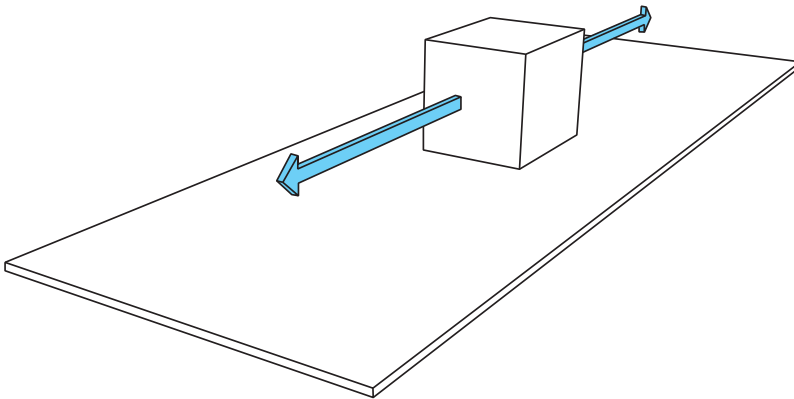
# Site Organization

①



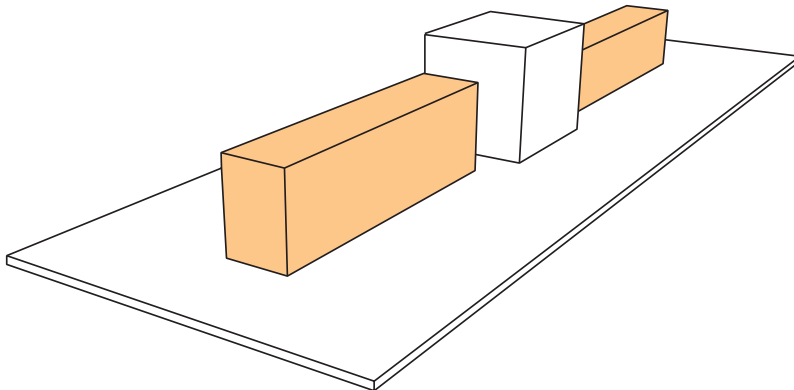
Community is central to the school's success. Similarly, the community space is at the core of the site.

②



The site is narrow and long. Build layouts will run parallel with the long edge of the site to maximize space.

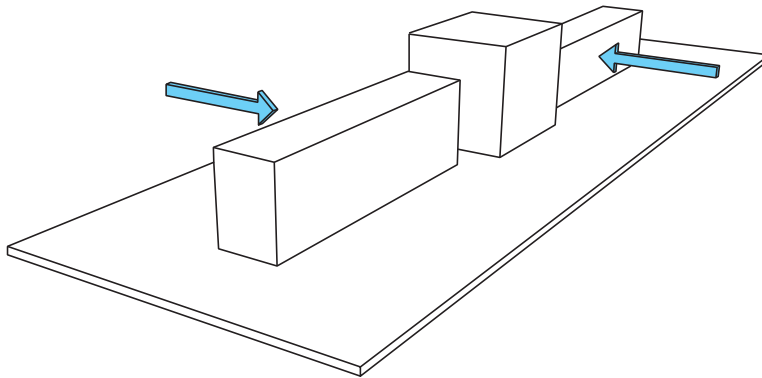
③



Separation of primary and secondary school buildings to minimize distractions during the school day. Shared spaces located in central community area of site.

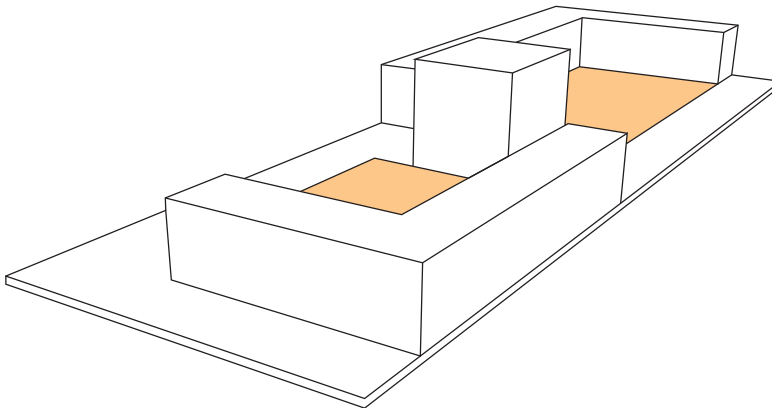


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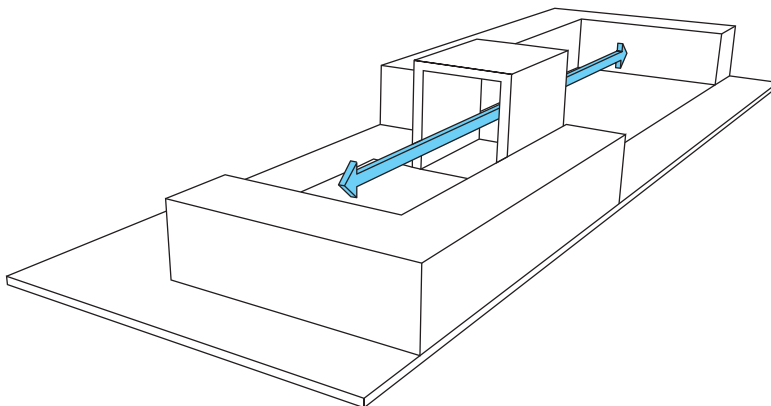
Shift primary and secondary school buildings opposite directions from center of site to create subspaces.

5



Both primary and secondary have adjacent outdoor spaces. Maintain strong indoor and outdoor connection throughout the entire site.

6



Maintain permeability across the site. The community space becomes a shared and transitional zone with visual connection between the outdoor spaces

Figure 5.2 Big Moves

# Master Plan Programming

Site programming was influenced by the Amigos for Christ Organization's target enrollment numbers and take away from the analysis of existing schools conducted on the trip to Nicaragua. The strategy revolves around the separation of primary and secondary school functions stemming from a core community space. This will eliminate primary and secondary students crossing paths during the school day outside of in the shared community space, reducing noise and distractions while class is in session. The location of the administrative offices, and circulation to and from, is separate from the circulation past the classrooms for the same reason. Outdoor space is provided adjacent the classrooms for both the primary and secondary schools. Another large open space exists on the southern end of the site for organized sports. Specialty classrooms for dance, art, and other activities are located next to the community space. The inclusion of ample outdoor space and specialty classrooms was done accomplish a main goal of the Amigos for Christ Organization keep students on campus after the school day is over.

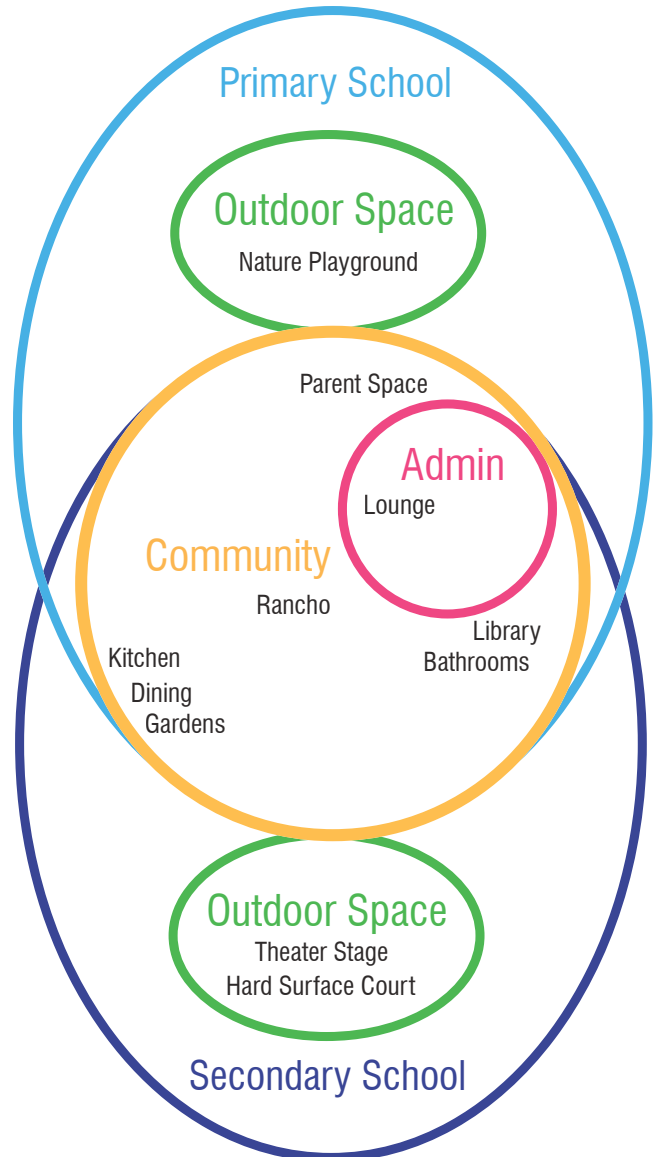


Figure 5.3 Programming Diagram

- Ⓐ Child Care
  - Ⓑ Administration
  - Ⓒ Community/Shared Spaces
  - Ⓓ Specialty Classrooms
  - Ⓔ Primary School
  - Ⓕ Secondary School
- 
- ① Primary School Playground
  - ② Secondary Shool Open Space
  - ③ Ball Feild

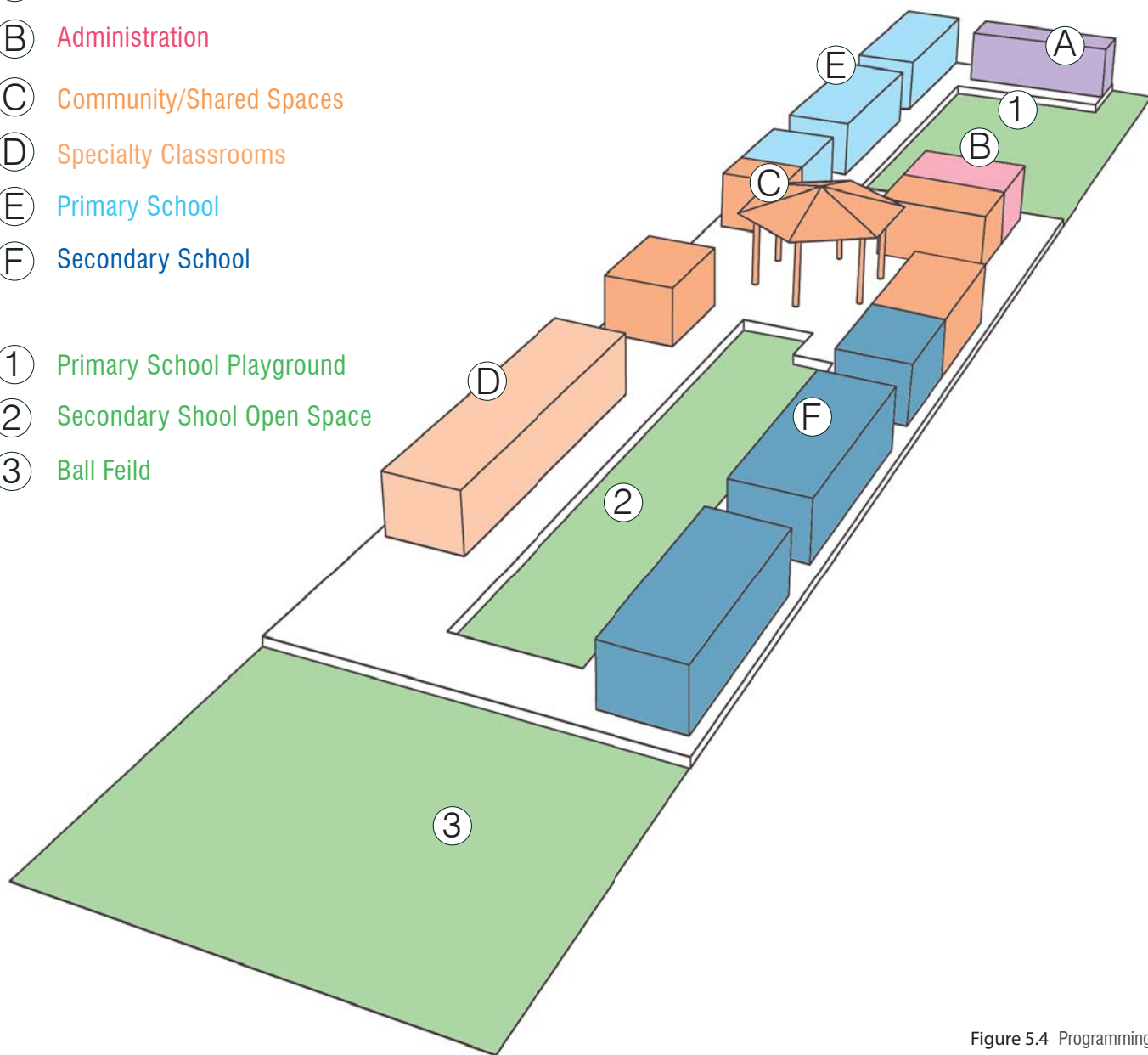
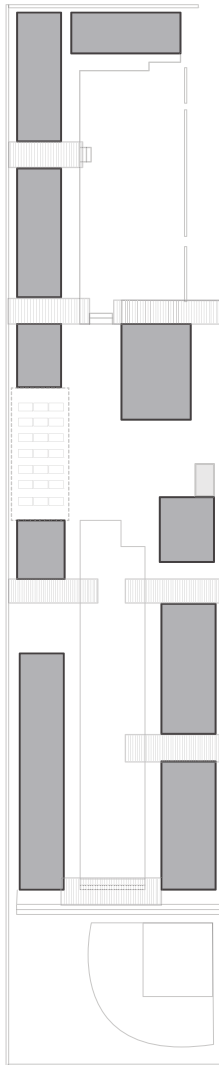


Figure 5.4 Programming

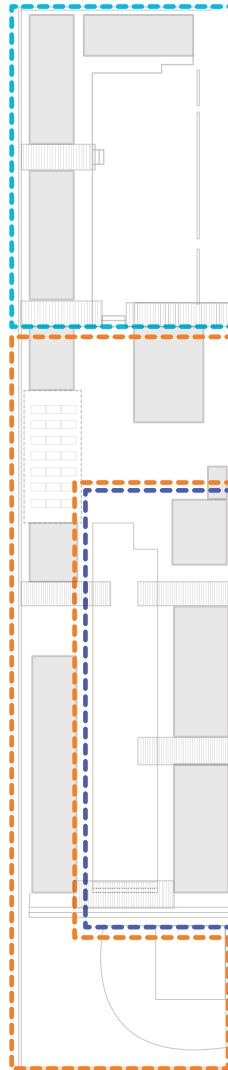
# Master Plan Diagrams




Building Massings



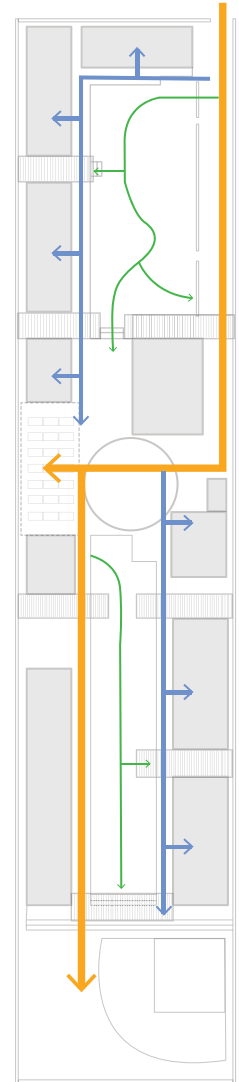
 Buildings




General Zones



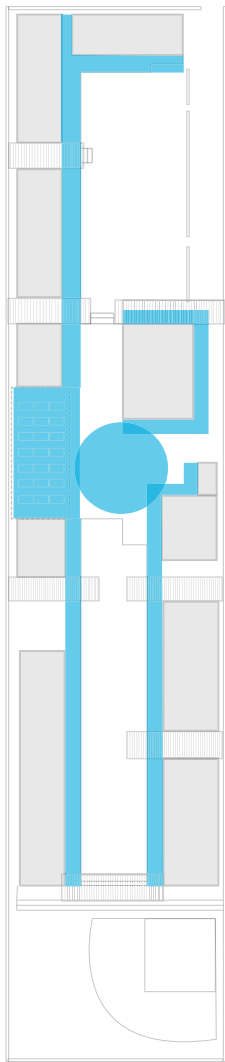
 Primary School Zone  
 Community Spaces  
 Secondary School Zone

Circulation



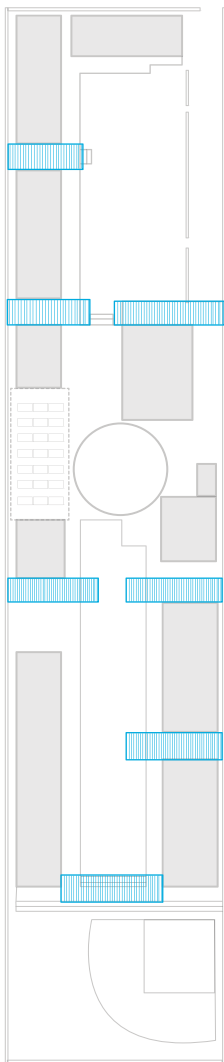
 Tertiary Circulation  
 Secondary Circulation  
 Primary Circulation

Covered Walkway Network



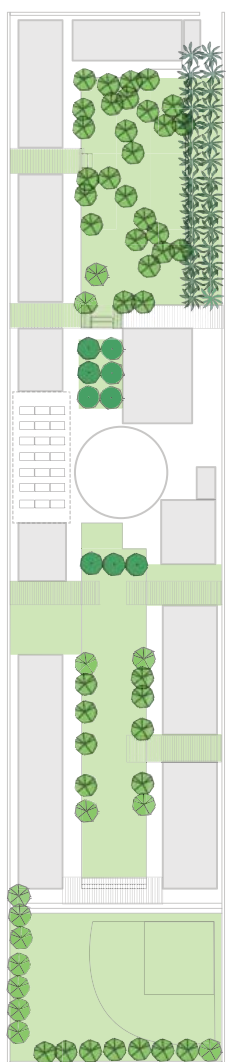
Overhead Covering

Overhead Planes



Subspaces with Overhead Covering

Green Space



Outdoor Space Covering

Figure 5.5 Site Diagrams



# Focus Area

## Primary School Playground

The design proposal of this Master's Report and project is a nature playground for the primary school students at the future model school in Nicaragua. Influenced by principals of nature playgrounds from literature, the design provides the user with a rich and varied experience of play. The proposal is also mindful of connections between the playground and other areas of the site. To make such connections, the 'edge treatment' around the perimeter of the playground was addressed in a collaborative process with Bisch to bring natural elements closer to the classroom and start to blur the distinct lines between architecture and landscape.

40 meters x 20 meters

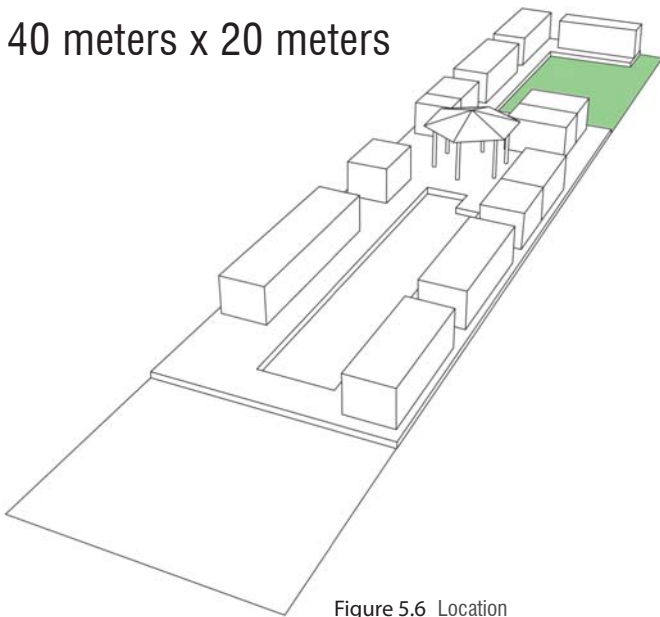


Figure 5.6 Location

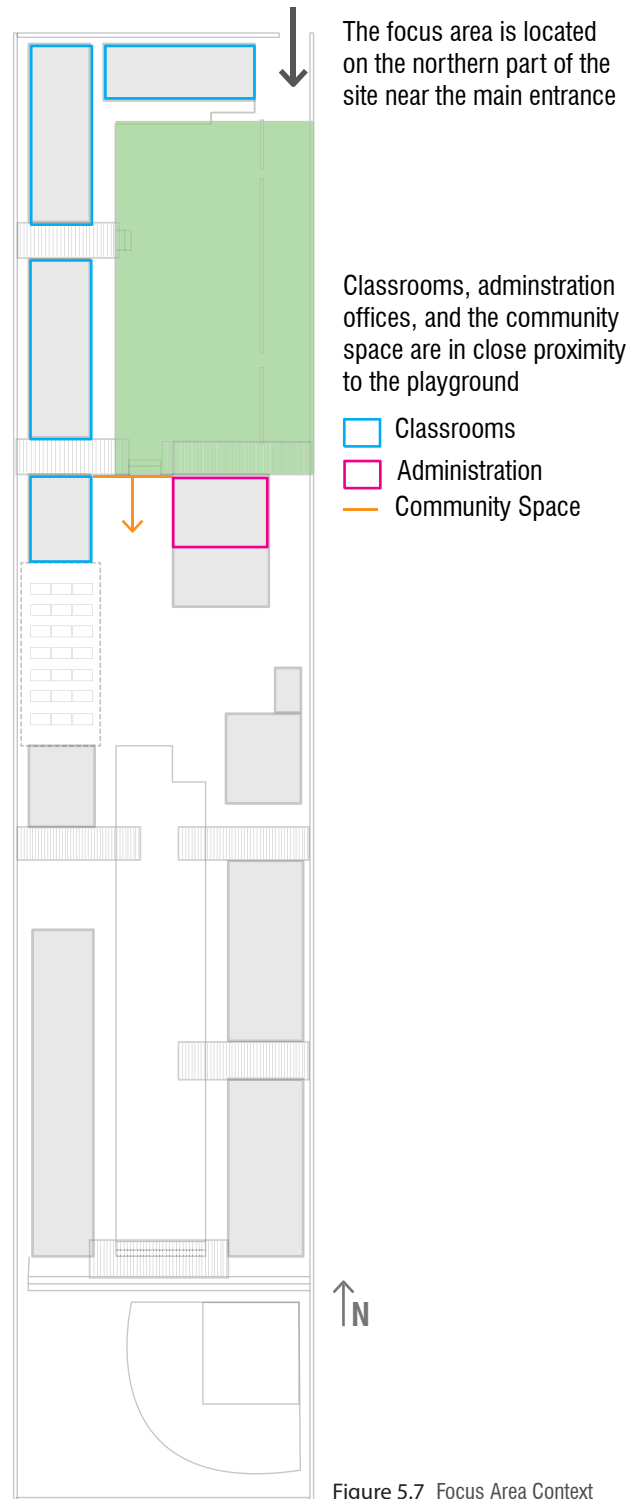
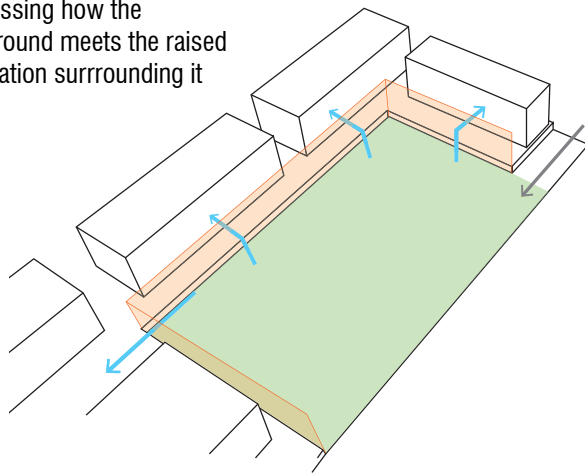


Figure 5.7 Focus Area Context

# Important Considerations

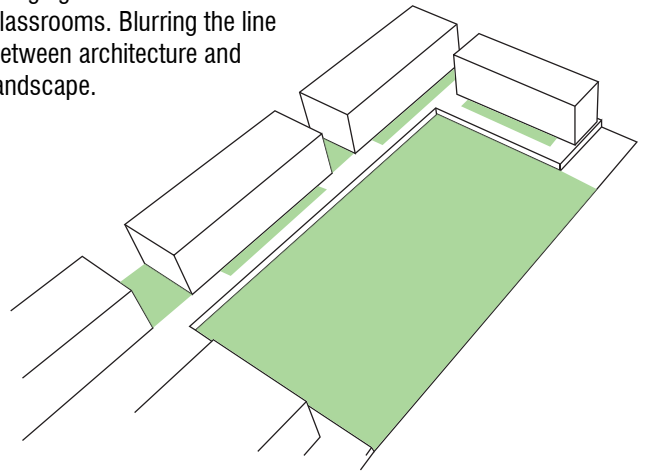
## Edge Treatment

Addressing how the playground meets the raised foundation surrounding it



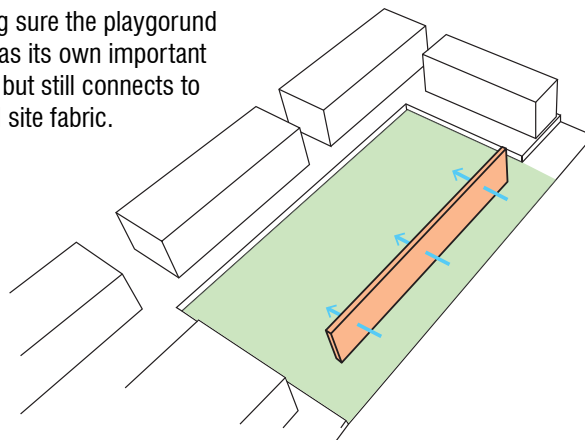
## Merging of Nature and Architecture

Bringing nature closer to classrooms. Blurring the line between architecture and landscape.



## Connection to Circulation

Making sure the playground reads as its own important space but still connects to overall site fabric.



## Varied Experiences

Create unique space that offer a variety of play opportunities

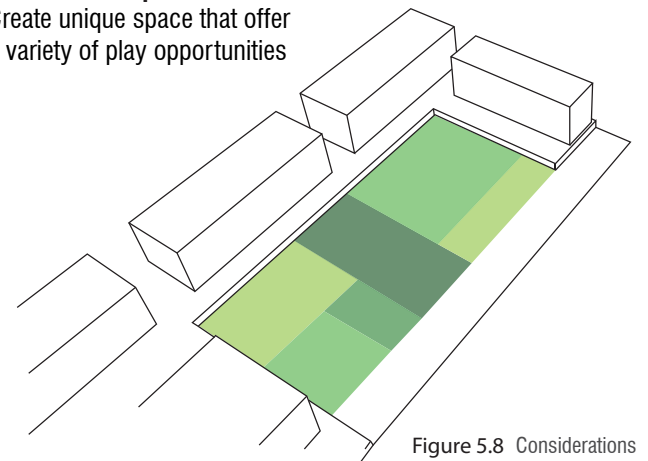


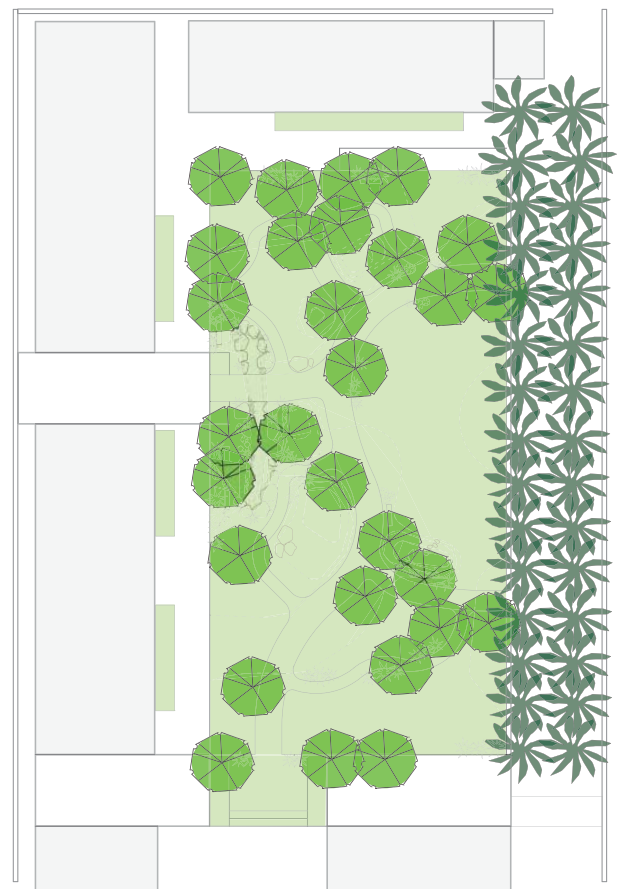
Figure 5.8 Considerations

# Focus Area Diagrams

Circulation



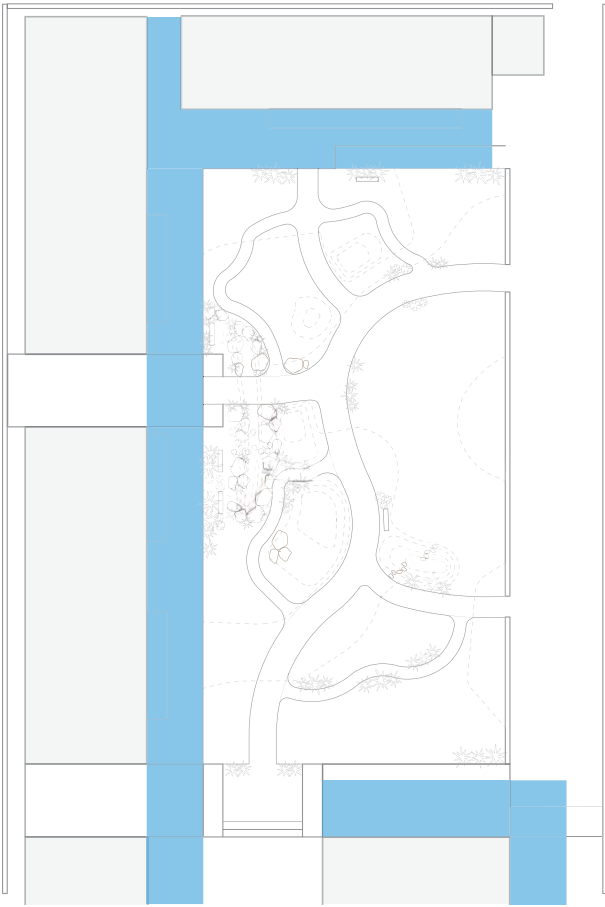
Vegetation



- Tertiary Circulation
- Secondary Circulation
- Primary Circulation

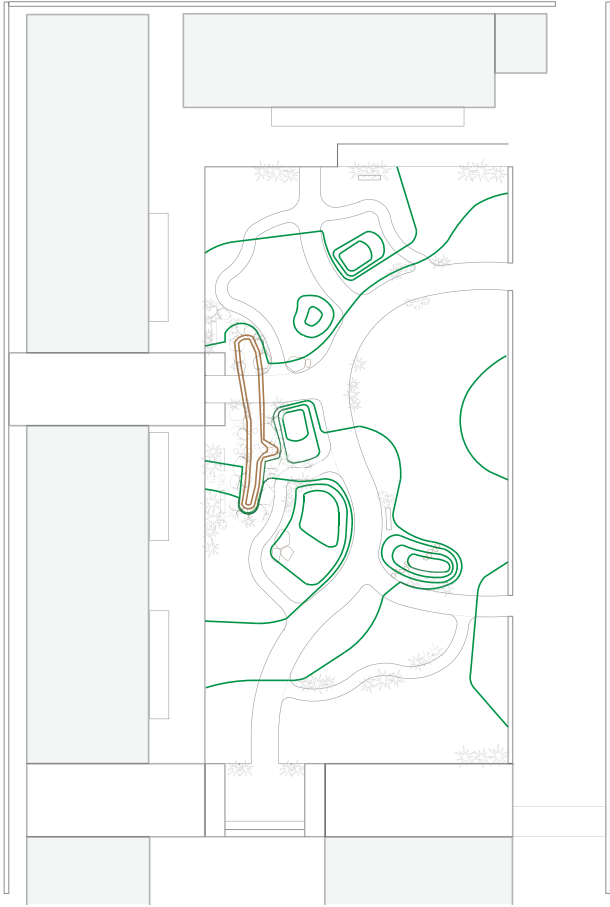
Outdoor Space

# Covered Walkway Network



Overhead Covering

# Topography



Tertiary Circulation  
Secondary Circulation

Figure 5.9 Focus Area Diagrams

# Play Zone Typologies

The playground design proposal for the La Chuscada school focuses on providing the children with a diverse play experience. Different qualitative experiences are provided through the creation of unique play zones. Each play zone has specific character that separates it from the others. Figure 5.10 shows the zone typologies that exist in the playground design proposal. A description of each zones and their physical design elements and qualitative character begins on page 144 of this chapter.

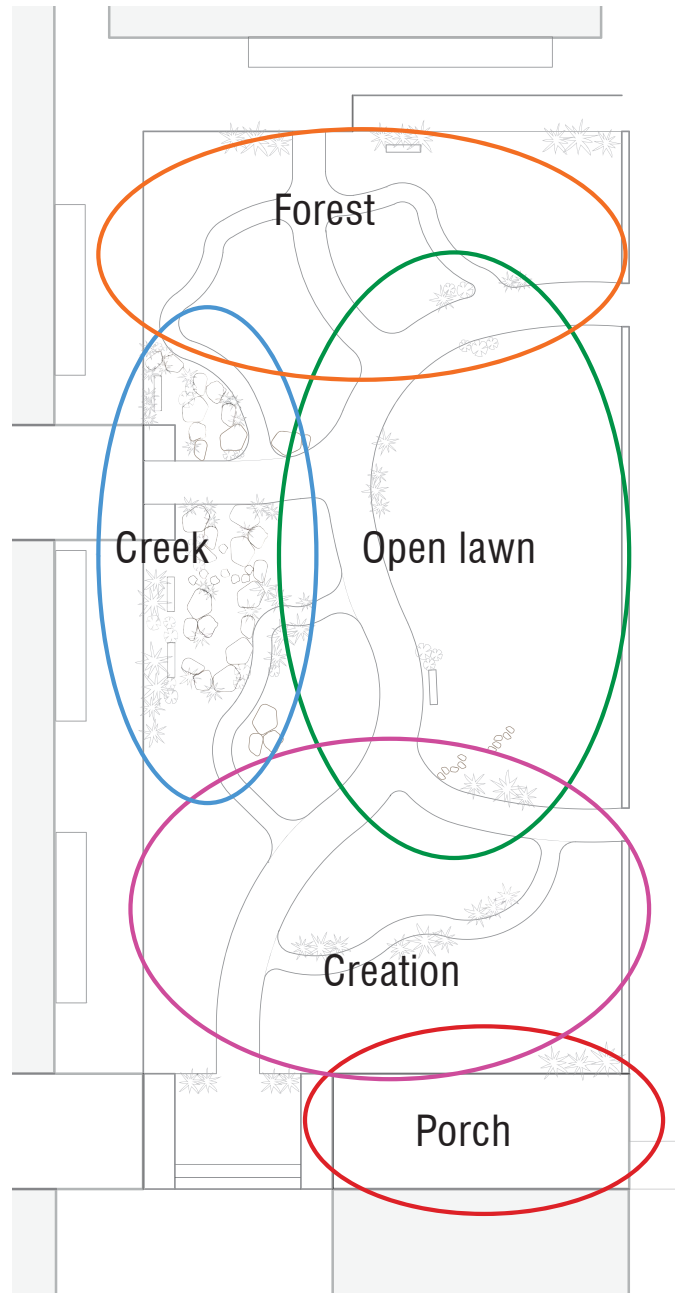


Figure 5.10 Zones



# Topographic Variation

Current playgrounds in Nicaragua consist of equipment on an open field. This design proposal offers a vision of creating varying topography on the playground to provide different experiences for a child moving through the space. Figure 5.11 illustrates how various spaces and experiences can be formed through topographic manipulation throughout the playground site.

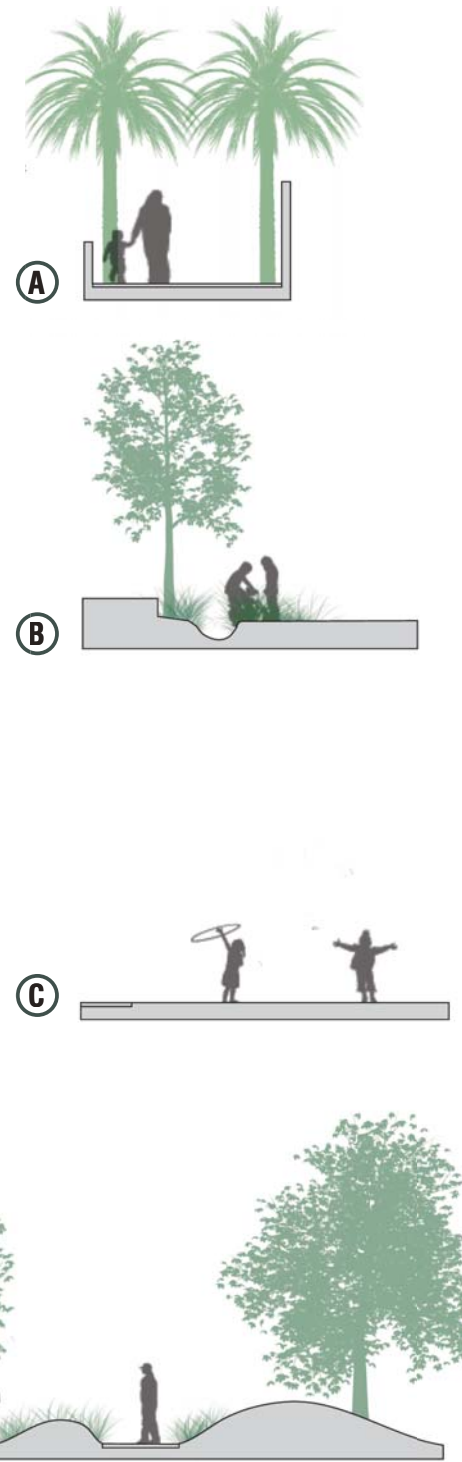
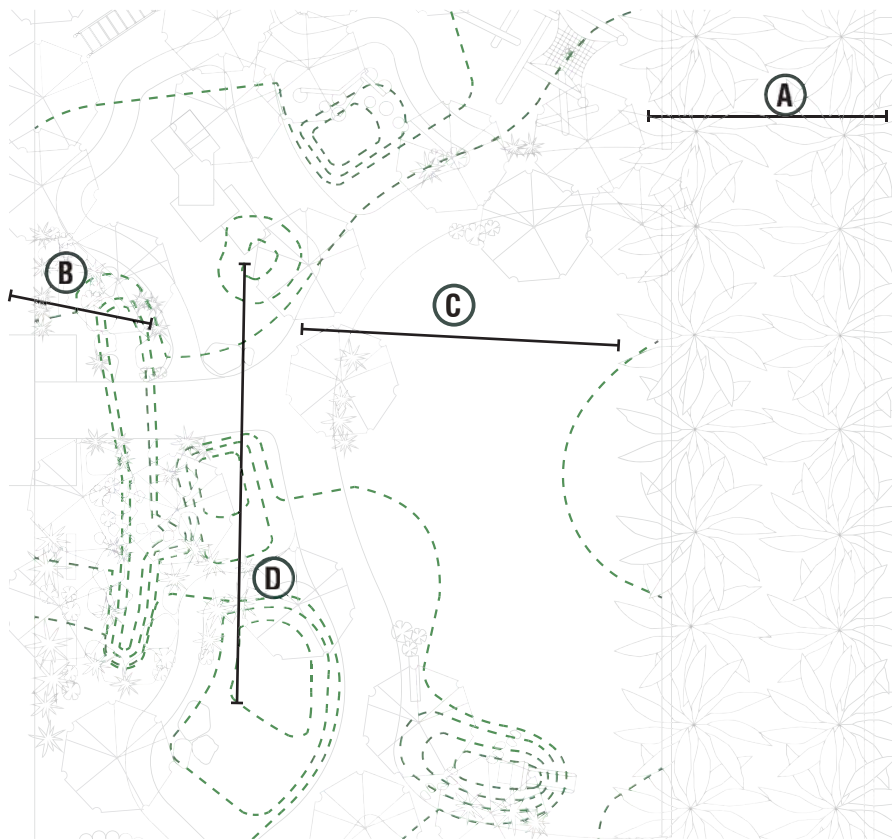


Figure 5.11 Topography

# Design Influences

Playground Topics	Concepts Associated with Beneficial playground design	Physical translation within the landscape
Nature	<ul style="list-style-type: none"><li>Nature Deficit Disorder</li><li>Attention Restoration</li><li>Environmental Determinism</li><li>Biophilia</li><li>Health/ Quality of Life</li></ul>	<ul style="list-style-type: none"><li>Naturalized areas</li><li>Diverse vegetation species</li><li>Balance of open\enclosed spaces</li><li>Natural textures</li></ul>
Safety	<ul style="list-style-type: none"><li>Risk taking</li><li>Adult Supervision</li><li>Injury Prevention Strategies</li><li>Maintenance</li><li>Fall Surfaces and Heights</li></ul>	<ul style="list-style-type: none"><li>Soft surfaces</li><li>Proper Spacing Between Equipment</li><li>Site lines for play supervisor</li><li>No pinch points, proper sizing</li><li>Well maintained equipment, unbroken</li></ul>
Free Play	<ul style="list-style-type: none"><li>Affordance Theory</li><li>Non-structured Programming</li><li>Non-prescribes equipment</li><li>Creativity</li><li>Theory of Loose Parts</li></ul>	<ul style="list-style-type: none"><li>Open ended design</li><li>Provide a lot of options</li><li>Non-prescribed types of play</li></ul>

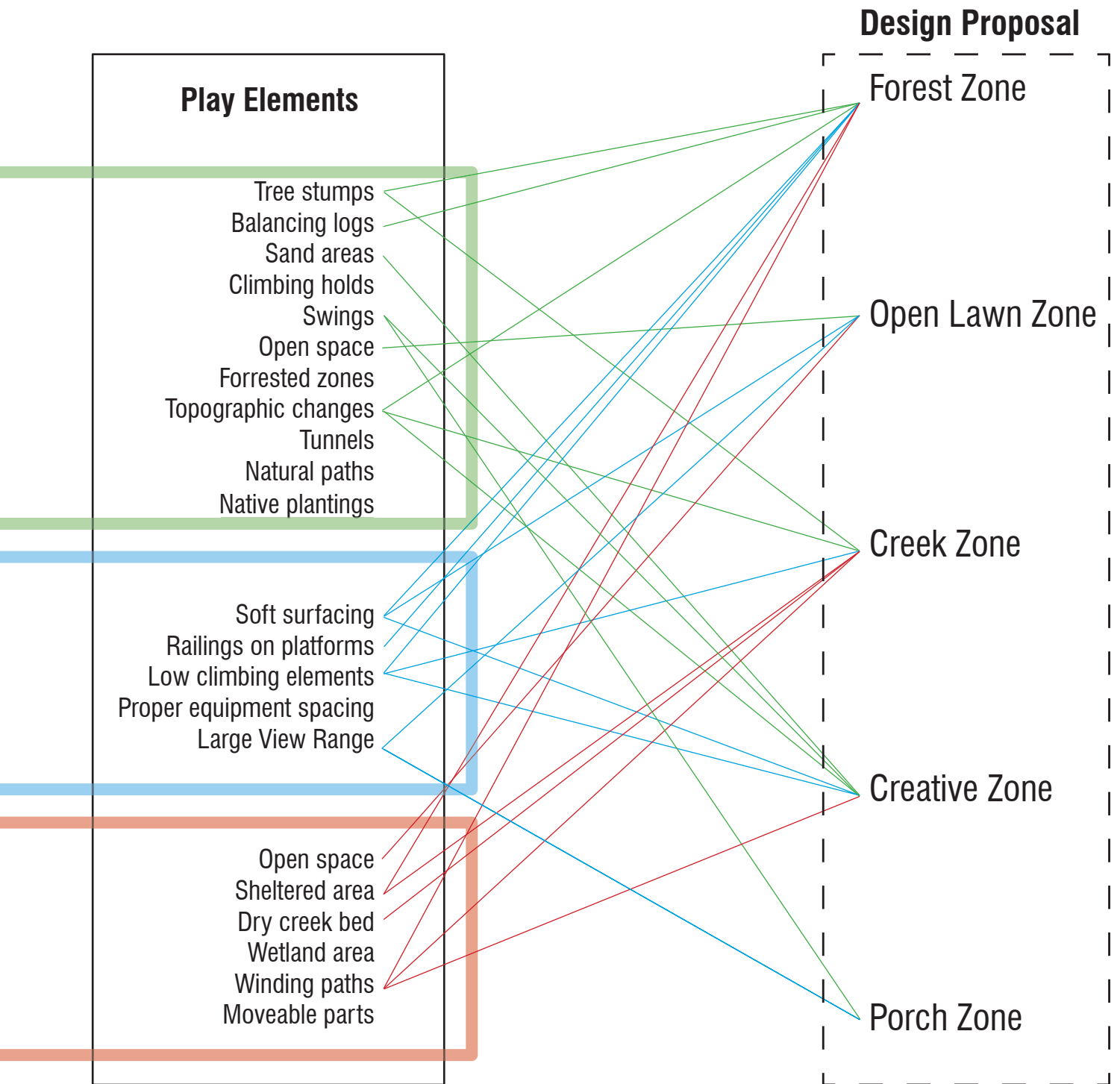
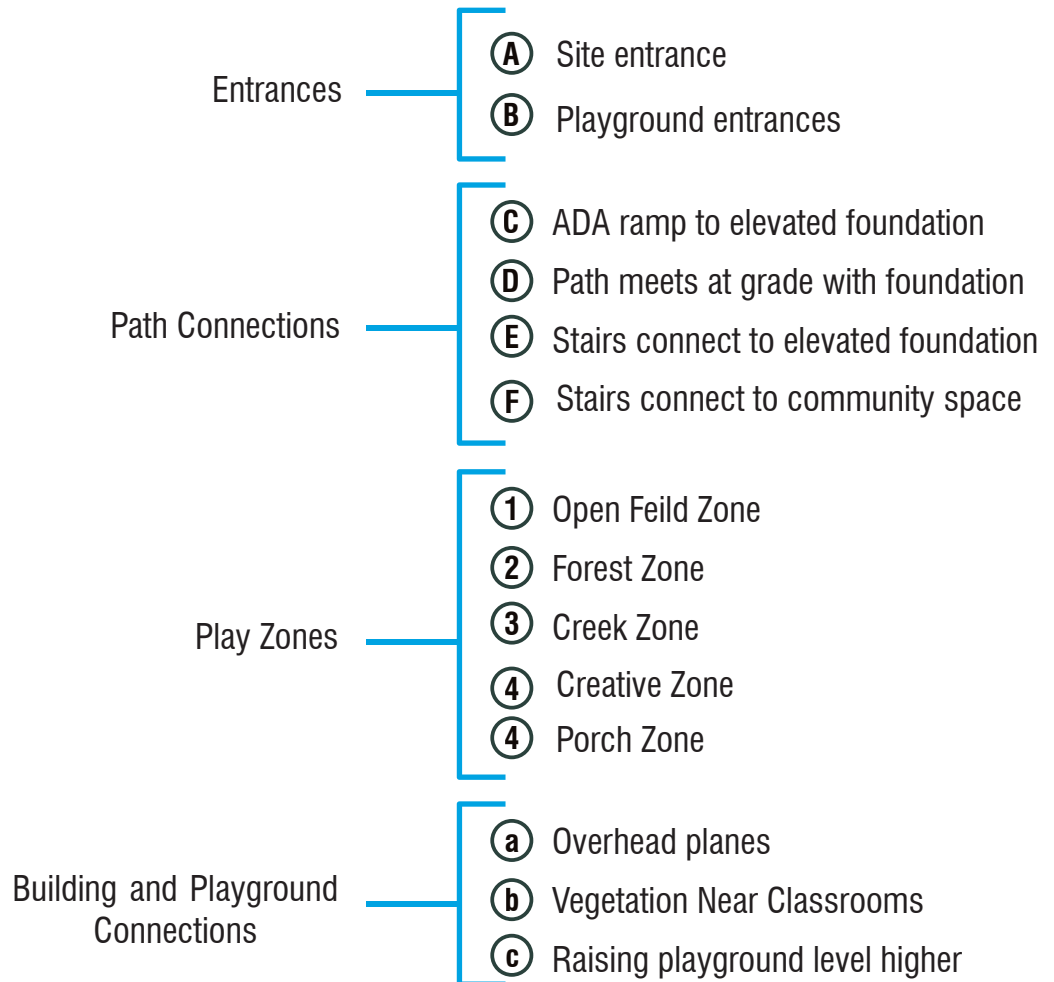


Figure 5.12 Design Influences

# Focus Area Plan

Providing a rich variety of spaces that allow a child to explore his or her world by engaging in physical, pretend, and creative play. A description of each zones and their physical design elements and qualitative character begins on page 144 of this chapter.





Classroom Building

Classroom Building

Classroom Building





# The Open Lawn

The open lawn zone is a space that allows for the gross motor skills of running, kicking, and throwing to occur. It's size lends itself for group activities in addition to individual games. The boundaries of this zone are defined by earthen mounds and trees, but the space does not have any impeding elements within it.

## Qualities

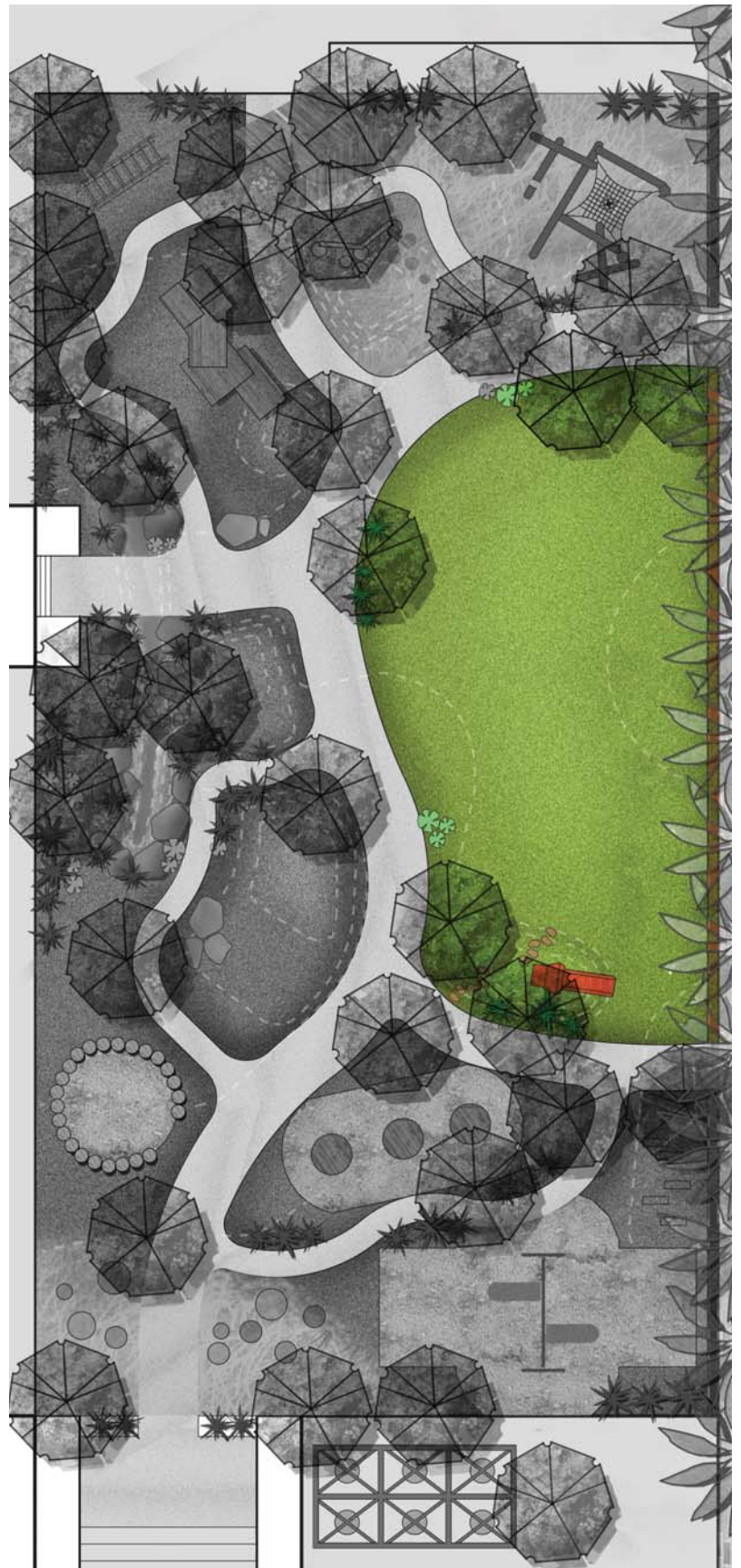
- Sunny
- Open
- Expansive Views
- Grass
- Room
- Flat

## Design Elements

- Grass
- Trees
- Earthen mounds









# The Porch

The front porch serves as the entry threshold of the site, adjacent to the primary school playground. Parents want to be involved in their child's schooling process, but currently they have the ability to roam around during the school day, often interrupting classes to talk to their child. This zone intends to be a welcoming space that offers the parents a chance to still be engaged in their child's school day, but in a more restricted manner. With administration programming adjacent and a route to the community rancho and kitchen, parents can take care of any business needs without having to pass through the primary or secondary school zones.

## Qualities

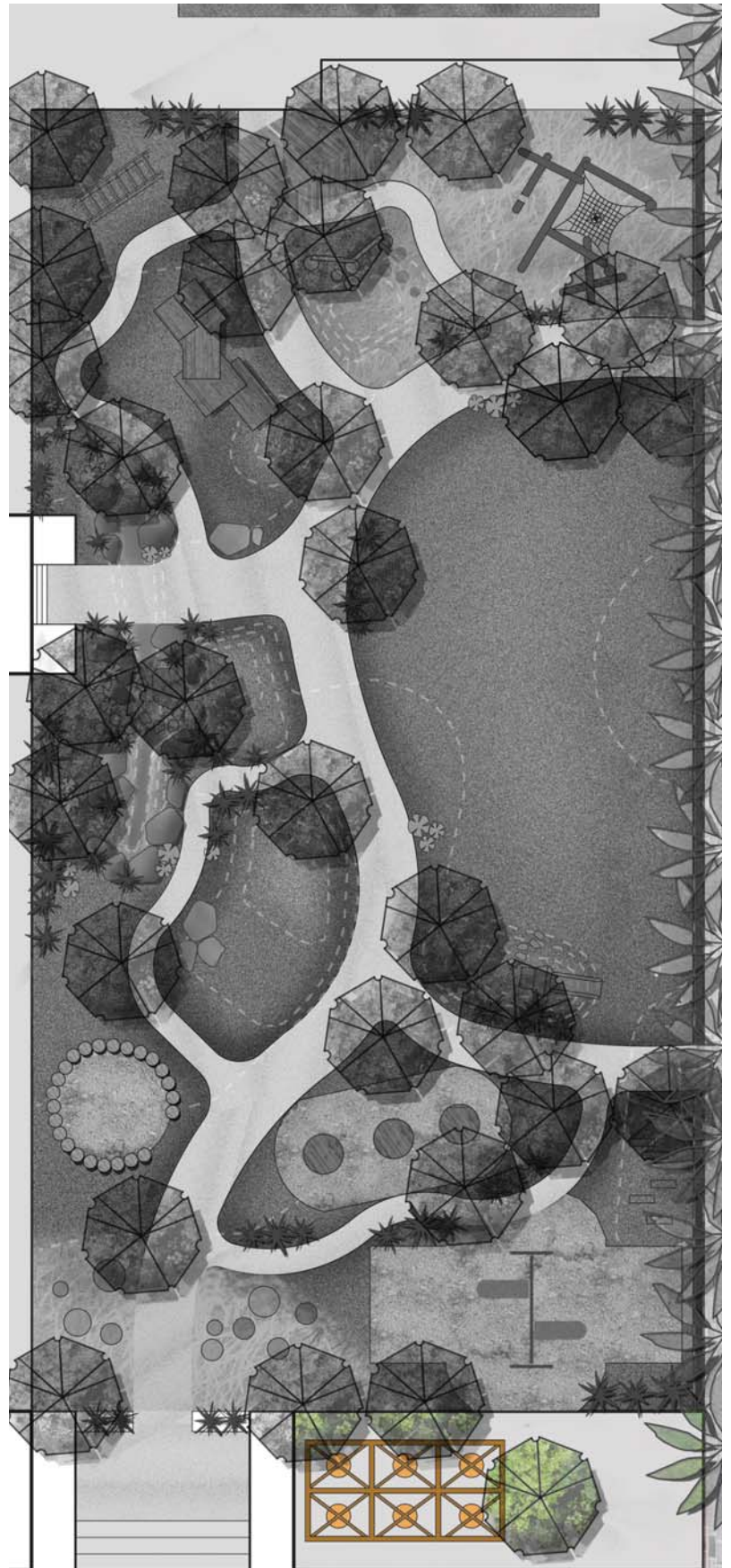
- Welcoming
- Warm
- Comfortable
- Shaded

## Design Elements

- Benches
- Trees
- Hammocks
- Trellis









# The Creation Zone

Various precedent study playgrounds were analyzed qualitatively to see what various strategies were taken to manifest physical, pretend, and constructive play in the physical design. With the budget and resource restrictions in mind, strategies from certain precedent studies will directly influence the design of the La Chuscada playground because of their feasibility of application. The precedent study playground were chosen for their creative methods and variety of play opportunities they provide children. The precedents include:

## Qualities

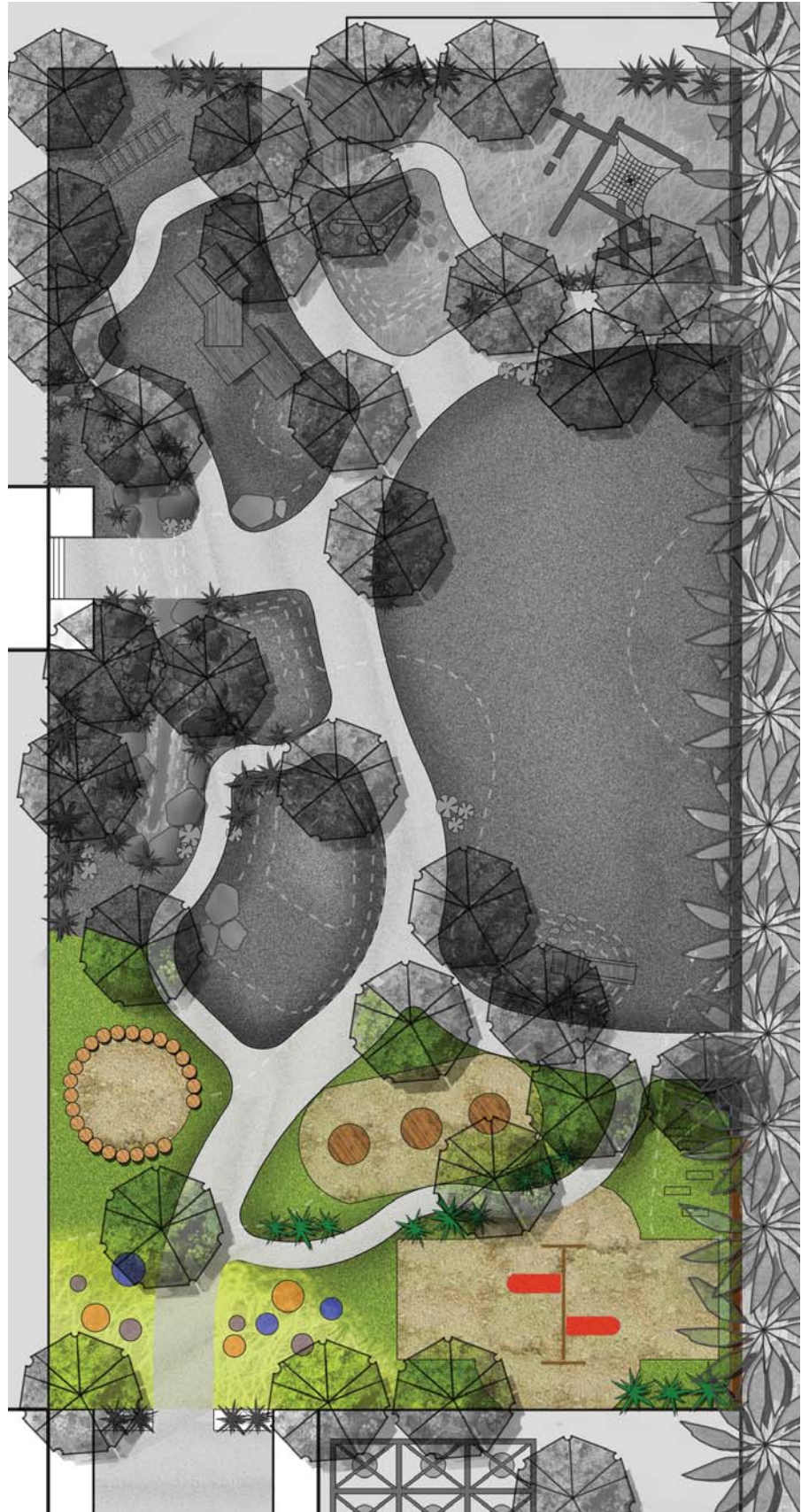
- Variety in options
- Adaptable environment
- Encouraging exploration
- Colorful

## Design Elements

- Sand Pit
- Moveable blocks
- Tools









# The Forest Zone

## The Forest

The forest zone offers an experience opposite the open lawn zone. The space is heavily shaded and more intimate. Overhead trees and structures provide a sense of enclosure and protection for its users. As a child climbs on fallen logs and up climb holds they are shielded from the sun by the overhead canopy. The children interact with various textures, from rough bark to smooth rock holds, as the play in this zone. Various paths wind through the forest, leading to large public climbing elements as well as more secluded sitting areas.

## Qualities

- Heavily shaded
- Protected
- Hidden
- Dark

## Design Elements

- Logs
- Climb holds
- Trees
- Soft paths
- Benches
- Elevated platforms









# The Creek

The creek zone features naturalized plantings bordered creek bed. Children are able to sit, balance, jump-between, and climb the boulders. The rainy season transforms the zone from a dry bed to a small creek where the children can play with the water.

## Qualities

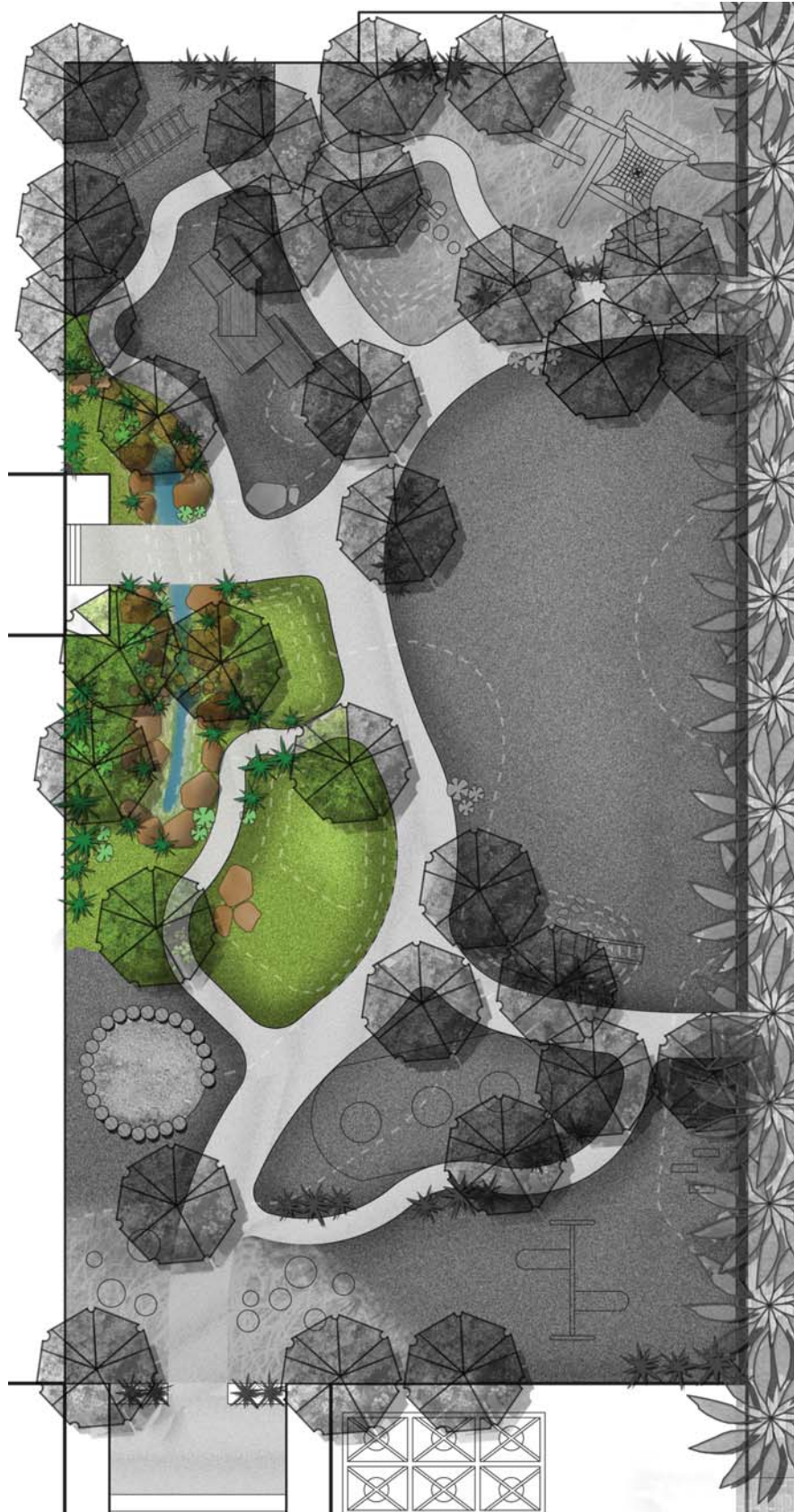
- Welcoming
- Warm
- Comfortable
- Shaded

## Design Elements

- Boulders
- River rock
- Naturalized plantings
- Stepping stones











**Conclusion**

**06**

# Takeaways

A beauty of nature play design is the limitless options of organizing, rearranging, and creating elements to differ the play experience. Because of this characteristic, the design proposal of this project does not prescribe strict, must-follow instruction set of exact elements that need to be included in the playground at the future La Chuscada. Instead, the design proposal creates various play zone typologies that will provide children with a rich and varied play experience. In addition, it offers a catalog of play elements that provide a user physical, pretend, and creative play. Armed with the knowledge of how to create qualitatively varied play zones and play elements that may correspond with specific zones, the Amigos for Christ Organization can implement specific elements that fit within their budget and construction feasibility. Though the Amigos can select a variety arrangements for how the play elements are manifested in the design of the playground, there are several key considerations that must be included to make the nature playground a developmentally beneficial one:

1. Inclusion of natural elements
2. Variety
3. Unprescribed play
4. Safety

In following these criteria that are at the core of developmentally beneficial play, the Amigos can

adjust playground elements to be unique to specific communities they work with currently and in the future. It is in this regard that this report has a far reaching impact outside of just the La Chuscada Community. It can be used to inform play design in other areas of Nicaragua and around the world when paired with cultural understanding of the specific place.

# Future Research

The final outcomes of this project's research and proposal raise questions about the potential for furthering the research beyond the scope that this project covered. The current research gathered existing principals within the realm of nature play design and synthesized them to fit within the cultural and physical conditions of the site in the La Chuscada community of Nicaragua. A limitation in the strategy is potential for a disconnect in the components interpretation and observational research. This is due to the time limitations of the project. Moving forward, there is opportunity to map and observe how children play and interact with elements in a nature-focused playground. This knowledge can further the discussion in placement of equipment variety of play spaces.

Another large component to further develop of this project would be advancing the survey. The survey's purpose is to bridge the gap in understanding between cultures in order to implement a design that better caters towards its specific users. This is to combat the widespread "cookie-cutter" approach to design that fosters a mentality of one-size-fits-all. The survey's role is particularly important in this project because it attempts to provide a means of connection between much of the playground design research being rooted in developed countries culture and a design proposal site in the developing country of Nicaragua. Because of IRB research protocol the survey was not able to

be used in quite the manner it was originally intended. More on this subject follows in the Reflections section of this chapter.

# Reflection

## Survey

The most challenging aspect of this project was finding a strategy of discussing the survey results with the reader while still following Kansas State University IRB protocol. Without knowing what to expect on the trip to Nicaragua in regards to how Bisch and I would be interacting with the community, I completed an IRB application that stated I would be getting parental consent from each of the children's parents who took the survey. The reality of the situation on the trip is that the only time the survey was able to happen was during the school day when the parents were at work or home. Within our time frame it would have been impossible to track the children's parents for a consent signature. For this reason the hard data and precise results for the survey were not discussed throughout the project. Despite this, the survey was still very revealing of trends in what children view as play and as a playground and did influence the design proposal of this project. The hurdles of the survey on this project were revealing in several aspects. The first was my own naivety on how stringent restrictions are on data collection that involves children in any way, shape, or form. Another was the difficulty in administering a survey in a culture that is unfamiliar. As I mentioned previously, I did not know when and how we would be interacting with the community members. Lastly, and most importantly, is the importance of doing a survey in the first place. I learned things from the survey that

were previously unknown to me through other stages of the project. The survey allowed the children's voices to be heard alongside the expert's in the fields of childhood development and design.

## Involving the Community

The most rewarding aspect of this project was the interaction with the La Chuscada community members on our trip to Nicaragua. At times in today's design culture I believe the term "community involvement" has become a buzzword that is tagged on all projects to convince people their voice was heard. The extent of which communities are actually involved and influence a design varies among projects, but my interaction with the community in La Chuscada opened my eyes to how important this is. People not only want to be heard, but also have important insight to contribute. Immersed in an unfamiliar culture, I relied on the Amigos For Christ Organization and community members to teach me important aspects of Nicaraguan culture and design vernacular along the way. Bisch and I's goal was to understand the community as much as we could, leading to an overnight stay at community member Gloria's home. After a walking the extents of the community with her and her grandchildren, we went back to her house for dinner and relaxation. The rest of the evening was spent in hammocks under the stars, the family asking us questions about our families and where we were from in the United States and us



returning questions of our own about the community and daily life in Nicaragua. With Danny Doogan translating the entire time, we began to understand the hardships and triumphs of life in rural Nicaragua and the dreams of the community for the future school. We talked and laughed well into the night. The evening will be remembered forever. It was a great reminder of the importance of building relationships and that the people you are designing for are the real experts.

# Appendix A: References

Adams, J. (2003). Spiked-essays | Essay | In defence of bad luck. Retrieved from <http://www.spiked-online.com/Printable/00000006E02C.htm>

Amigos For Christ. (2015). Nonprofit Organization: Mission Trips in Nicaragua | Missionary in Nicaragua |. Retrieved from <http://amigosforchrist.org/>

Architecture for Humanity (Organization). (2012). Design like you give a damn: [2]. New York: Abrams.

Barker et al. (2014). Less-structured time in children's daily lives predicts self-directed executive functioning. *Frontiers Journal: Developmental Psychology*. doi:10.3389/fpsyg.2014.00593

Bisch, Aaron. 2015. On and on. Reveal concept poem.

Brett, A., Moore, R. C., & Provenzo, E. F. (1993). *The complete playground book*. Syracuse, NY: Syracuse University Press.

Caplan, F., & Caplan, T. (1973). *The power of play*. Garden City, NY: Anchor Press.

CBS News. (2009). Number of Kids Killed by Falling TVs Rises - CBS News. Retrieved from <http://www.cbsnews.com/news/number-of-kids-killed-by-falling-tvs-rises/>

CHETNA Organization. (n.d.). Chapter 5: Play Is children's work. In *Child and Play*. unknown, India: CHETNA.

Dattner, R. (1969). *Design for play*. New York: Van Nostrand Reinhold Co.

Davies White Landscape Architects (2014). *Dinton Pastures Playground Project*. United Kingdom

Eriksen, A. (1985). *Playground design: Outdoor environments for learning and development*. New York: Van Nostrand Reinhold

Frost, J. (2010). *A history of children's play and play environments: Toward a contemporary child-saving movement*. New York, NY: Routledge.

Frost, J. (2012). *Evolution of American Playgrounds*: Scholarpedia. Retrieved from [http://www.scholarpedia.org/article/Evolution\\_of\\_American\\_Playgrounds](http://www.scholarpedia.org/article/Evolution_of_American_Playgrounds)

Frost, J. & Association for Childhood Education International. (2004). *The developmental benefits of playgrounds*. Olney MD: Association for Childhood Education International.

Gallahue, D. (1993). Motor development and movement skill acquisition in early childhood education. In *Handbook on research on the education of young children*.

Gibson, J. J. (1986). *The Theory of Affordances*. In *The ecological approach to visual perception* (1st ed.). Lawrence Erlbaum Associates Publishers.

Gill, T., & Fundação Calouste Gulbenkian. (2007). *No fear: Growing up in a risk averse society*. London: Calouste Gulbenkian Foundation.

Gill, T. (2012). *Moving on from the zero risk childhood | Rethinking Childhood*. Retrieved from <http://rethinkingchildhood>.

Göncü, A. (1999). *Children's engagement in the world: Sociocultural perspectives*. Cambridge: Cambridge University Press.

Gray, P. (2013). *Free to learn: Why unleashing the instinct to play will make our children happier, more self-reliant, and better students for life*.

Hammond, Darell. (2011). If We Don't Let Our Children Play, Who Will Be the Next Steve Jobs? [http://www.huffingtonpost.com/darell-hammond/if-we-dont-let-our-children\\_b\\_1017485.html](http://www.huffingtonpost.com/darell-hammond/if-we-dont-let-our-children_b_1017485.html)

Hartig, T., Mang, M. & Evans, G. W. (1991). Restorative effects of natural environment experience. *Environment and Behavior*, 23, 3-26.

Heft, H. (1988). Affordances of Children's Environments: A Functional Approach to Environmental Description. *Children's Environments Quarterly*, 5(3), 29-37. Retrieved from [https://www.jstor.org/stable/41514683?seq=1#page\\_scan\\_tab\\_contents](https://www.jstor.org/stable/41514683?seq=1#page_scan_tab_contents)

Herrington, S., & Studtmann, K. (1998). Landscape interventions: new directions for the design of children's outdoor play environments. *Landscape and Urban Planning*, 42, 191-205. doi:10.1016/S0169-2046(98)00087-5

Heseltine, P., & Holborn, J. (1987). *Playgrounds: The planning, design and construction of play environments*. New York: Nichols Pub. Co.

Hirsh-Pasek, K., & Golinkoff, R. (2003). *Einstein Never Used Flashcards: How Our Children Really Learn--and Why They Need to Play More and Memorize Less*. Rodale, NY.

Hughes, F. P. (1999). *Children, play, and development*. Boston: Allyn and Bacon.

Hurtwood, Lady Allem. (1968). Play-scapes: all the best playgrounds are here. Retrieved February 18, 2014, from <http://www.play-scapes.com/quotes/>

Hymes, J. (1973). 'Childhood' in early childhood education. *Theory into Practice*, 12(2), 72-76. doi:10.1080/00405847309542433

IDEO (2009). *Human Centered Design 2nd Edition*. Retrieved January 2015. [http://www.ideo.com/images/uploads/hcd\\_toolkit/IDEO\\_HCD\\_ToolKit.pdf](http://www.ideo.com/images/uploads/hcd_toolkit/IDEO_HCD_ToolKit.pdf)

Jean Piaget Society., Göncü, A., & Gaskins, S. (2007). *Play and development: Evolutionary, sociocultural, and functional perspectives*. Mahwah, NJ: Lawrence Erlbaum.

Johnson, J. E., Christie, J. F., & Yawkey, T. D. (1999). *Play and early childhood development* (2nd ed.). Glenview, IL: Scott, Foresman.

Kahn, P. (1997). Developmental Psychology and the Biophilia Hypothesis: Children's Affiliation with Nature. *Developmental Review*, (17), 1-61. doi:10.1006/drev.1996.043

Kaplan, R., & Kaplan, S. (1989). *The experience of nature: A psychological perspective*. Cambridge: Cambridge University Press.

Keeler, R. (2008). *Natural playscapes: Creating outdoor play environments for the soul*. Redmond, WA: Exchange Press.

Koffka, K. (1935). Chapter One: Why Psychology? In *Principles of gestalt psychology* (pp. 1-14). Harcourt, Brace and Co.

Louv, R. (2005). *Last child in the woods: Saving our children from nature-deficit disorder*. Chapel Hill, NC: Algonquin Books of Chapel Hill.

Maslow, A. H. (1943). A theory of human motivation. *Psychological Review*, 50, 370-396. doi:10.1037/h0054346

Mason, J. (1982). *Where - The environment of play*. West

## Chapter 6: Conclusion

Point, NY: Leisure Pr.

Mercogliano, C. (2007). In defense of childhood: Protecting kids' inner wildness. Boston, MA: Beacon Press.

Miller, P. L. (1972). Creative outdoor play areas. Englewood Cliffs, NJ: Prentice-Hall.

Nebelong, Helle. (n.d.) Play-scapes: all the best playgrounds are here. Retrieved February 24, 2014, from <http://www.play-scapes.com/quotes/>.

Nicholson, S. (1977). How Not to Cheat Children: The theory of Loose Parts. *Landscape Architecture*, 62, 30-34. Retrieved from <http://d14kfxvbwqc5jb.cloudfront.net/docs/documents/pdf/ip/Imagination-Playground-Theory-of-Loose-Parts-Simon-Nicholson.pdf>

Olmsted, F. L. (1865). p 22. The value and care of parks. Reprinted in Nash, R. (Ed.) (1968), *The American Environment: Readings in the history of conservation*. Reading, MA: Addison-Wesley, pp. 18-24. Orbach, J., Ehrlich, D. & Heath, H. A. (1963).

Pearce, J. C. (1980). *Magical child: Rediscovering nature's plan for our children*. New York: Dutton.

Pellegrini, A. D., Kato, K., Blatchford, P., & Baines, E. (2002). A Short-term Longitudinal Study of Children's Playground Games Across the First Year of School: Implications for Social Competence and Adjustment to School. *American Educational Research Journal*, 39(4), 991-1015. doi:10.3102/00028312039004991

Pellegrini, A. D. (2009). *The role of play in human development*. New York: Oxford University Press.

Rosin, H. (2014). *The Overprotected Kid - The Atlantic*. Retrieved from <http://www.theatlantic.com/features/archive/2014/03/hey-parents-leave-those-kids-alone/358631/>

Sawyer, K. (1997). *Pretend play as improvisation: conversations in the preschool classroom*. Mahwah, NJ: Lawrence Erlbaum Associates Publishing.  
TBG Partners Landscape Architects (2014). *Lucy and Ian Family Garden*. Austin, Texas.

Thompson, D., Hudson, S. D., & Olsen, H. M. (2007). *S.A.F.E. play areas: Creation, maintenance, and renovation*. Champaign, IL: Human Kinetics.

# Appendix B: Images Cited

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Figure 2.11 Rosin, Hannah (2014) Adventure 2 [Photograph]. <http://www.theatlantic.com/features/archive/2014/03/hey-parents-leave-those-kids-alone/358631/>

Figure 2.12 Rosin, Hannah (2014) Adventure 3 [Photograph]. <http://www.theatlantic.com/features/archive/2014/03/hey-parents-leave-those-kids-alone/358631/>

Figure 2.13 Gill (2007). Strict Rules [Photograph]. <http://www.gulbenkian.org.uk/pdf/files/--item-1266-223-No-fear-19-12-07.pdf>

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Figure 3.4 Davies White (2014). Dinton Pastures 3 [Photograph]. <http://www.davieswhite.co.uk/site/>

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Figure 3.6 TBG Partners (2014). Lucy and Ian Family Garden [Photograph]. <http://tbg-inc.com/>

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Figure 3.10 Davies White (2014). Climbing 1 [Photograph]. <http://www.davieswhite.co.uk/site/>

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Figure 3.16 The Natural Playgrounds Company (2014). Climbing 7 [Photograph]. <http://www.naturalplaygrounds.com/>

Figure 3.17 The Natural Playgrounds Company (2014). Climbing 8 [Photograph]. <http://www.naturalplaygrounds.com/>

Figure 3.18 The Natural Playgrounds Company (2014). Climbing 9 [Photograph]. <http://www.naturalplaygrounds.com/>

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Figure 3.24 Davies White (2014). Balancing 2 [Photograph]. <http://www.davieswhite.co.uk/site/>

Figure 3.25 The Natural Playgrounds Company (2014).

Balancing 3 [Photograph]. <http://www.naturalplaygrounds.com/>

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Figure 3.27 The Natural Playgrounds Company (2014). Balancing 5 [Photograph]. <http://www.naturalplaygrounds.com/>

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Figure 3.43 The Natural Playgrounds Company (2014). Swinging 6 [Photograph]. <http://www.naturalplaygrounds.com/>

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Figure 3.49 The Natural Playgrounds Company (2014). Creating 8 [Photograph]. <http://www.naturalplaygrounds.com/>

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