OUR CHILDREN IN THE LANDSCAPE:
The UNIVERSAL PLAY SPACE

by

DONNA M. RODMAN

Dipl. Nursing, University of British Columbia, 1978
B.A., University of British Columbia, 1984
Cert. In Technology, British Columbia Institute of Technology, 1993

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF LANDSCAPE ARCHITECTURE

in

THE FACULTY OF GRADUATE STUDIES
THE FACULTY OF AGRICULTURAL SCIENCES

We accept this thesis as conforming
to the required standard

THE UNIVERSITY OF BRITISH COLUMBIA
April 1999

© Donna Marie Rodman, 1999
In presenting this thesis in partial fulfilment of the requirements for an advanced degree at the University of British Columbia, I agree that the Library shall make it freely available for reference and study. I further agree that permission for extensive copying of this thesis for scholarly purposes may be granted by the head of my department or by his or her representatives. It is understood that copying or publication of this thesis for financial gain shall not be allowed without my written permission.

The Faculty of Agricultural Sciences
Department of Landscape Architecture
The University of British Columbia
Vancouver, Canada

Date April 29, 1999.
ABSTRACT

A stratified random sample of 93 children, 4 to 10 years old, from 9 different schools in the Greater Vancouver Region was used to determine children's preferences for play environments and play equipment. As well, questionnaires and interviews were used to identify the preferences of their parents, school principals and safety officers as other important influences affecting the choices in the design of school play environments. The results of the study were consistent with a similar one involving children 11 to 16 years old; expressing strong preferences for variety, texture, colour, trees and natural elements such as water and sand. The children's specific comments reflected the effect of their play experiences in areas of social and environmental learning. The comments of the parents, principals and safety officers were focused primarily on safety.

The results were integrated to offer design guidelines for playgrounds, parks, and greenways. The guidelines were applied to present a full design for a playground of a school and an adjacent park in a community in the Greater Vancouver Region. As a result of the survey, a design matrix is created which takes a composite list for qualities of good play environments and compares the list to landscape features as having direct or indirect influences. The unique approach reflected a foundation that is comprehensive, interdisciplinary, holistic and universal for accessibility.
ABSTRACT

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF DESIGN DRAWINGS

Part A: The Research Project

1.0 Introduction

1.1 Problem

1.2 Objectives

1.3 Social Development

1.4 Cognitive Development

2.0 Related Literature

2.1 Why Play?

2.2 Why a Universal Play Space?

2.3 Why Children Learning in Nature?

2.4 Learning and the Natural Environment (The Theories)

2.5 Research Study Summaries

2.6 Contribution of Child Behaviour Theorists

2.7 Summary: A Matrix

3.0 Materials and Methods

3.1 Instruments

3.2 Sample

3.3 Method

4.0 Results

5.0 Discussion

5.1 Social Development

5.2 Cognitive Development
I. Research Survey Tool: Our Children in the Landscape 82

II. Textbook definitions of child development terminology 99

III. Response to Slides 1 - 13 with frequencies and mean values.
    #1: Child in Port Coquitlam: response to variable coloured vegetation 103
    #2: Child in Port Coquitlam: response to darkened thicket 104
    #3: Child in Port Coquitlam: response to beach 105
    #4: Child in Port Coquitlam: response to swing set 106
    #5: Child in Port Coquitlam: response to snowy reflections 107
    #6: Child in Port Coquitlam: response to gravel lot 108
    #7: Child in Port Coquitlam: response to Jungle Jim Playground 109
    #8: Child in Port Coquitlam: response to garden 110
    #9: Child in Port Coquitlam: response to darkened allee 111
    #10: Child in Port Coquitlam: response to grassy savannah 112
    #11: Child in Port Coquitlam: response to derelict site 113
    #12: Child in Port Coquitlam: response to rapid water 114
    #13: Child in Port Coquitlam: response to still water 115

IV. Table No. 2A. Statistical Data from Survey Matched to Table 2: Matrix 116
    Table No. 6. Selected childrens' comments related to social development 117
    Table No. 7. Selected childrens' comments related to cognitive development 120
    Table No. 8. Summary of comments offered by parents at a group meeting 123
    Table No. 9. Summary of comments by principals 124
    Table No. 10. Summary of comments of police safety liaison officers 125

V. Port Coquitlam Play for All Community Forum - February 21, 1995 127

VI. Aerial photo of Port Coquitlam Site taken September, 1997 130

VII. Vegetation communities in Port Coquitlam, map prepared by Gartner Lee 132

VIII. Environmental plan for Port Coquitlam prepared by Gartner Lee 134

IX. Fisheries classification map - July, 1998 136
X. ‘Port Coquitlam’ park/school design plant list

XI. ‘Port Coquitlam’ Park plant list according to landscape character zones

XII. Research Design Directives
# LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Piaget's Stages of Cognitive Development.</td>
<td>7</td>
</tr>
<tr>
<td>2. Matrix to compare studies, frequencies and theories</td>
<td>16</td>
</tr>
<tr>
<td>2A. Statistical Data from Survey Matched to Table 2. Matrix</td>
<td>116</td>
</tr>
<tr>
<td>3. Municipalities and districts participating</td>
<td>24</td>
</tr>
<tr>
<td>4. Ages of children participating</td>
<td>25</td>
</tr>
<tr>
<td>5. Family heritage of child participating</td>
<td>26</td>
</tr>
<tr>
<td>6. Selected children's comments related to social development</td>
<td>117</td>
</tr>
<tr>
<td>7. Selected children's comments related to cognitive development</td>
<td>120</td>
</tr>
<tr>
<td>8. Summary of comments offered by parents at a group meeting</td>
<td>123</td>
</tr>
<tr>
<td>9. Summary of comments by principals</td>
<td>124</td>
</tr>
<tr>
<td>10. Summary of comments of police safety liaison officers</td>
<td>125</td>
</tr>
<tr>
<td>11. Good Play Environment Matrix</td>
<td>47</td>
</tr>
<tr>
<td>12. Critical heights of tested materials</td>
<td>156</td>
</tr>
</tbody>
</table>
# LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figures</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Child’s landscape preferences compared to age of child (slides 1-7)</td>
<td>27</td>
</tr>
<tr>
<td>2. Child’s landscape preferences compared to age of child (slides 8-13)</td>
<td>28</td>
</tr>
<tr>
<td>3. Parents value of play in nature</td>
<td>29</td>
</tr>
</tbody>
</table>
## LIST OF DESIGN DRAWINGS

<table>
<thead>
<tr>
<th>Drawing No.</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>The overall vision</td>
<td>56</td>
</tr>
<tr>
<td>2.</td>
<td>Greenway and land use plan for Port Coquitlam</td>
<td>57</td>
</tr>
<tr>
<td>3.</td>
<td>'Port Coquitlam' school and park site plan (Scale 1:500)</td>
<td>58</td>
</tr>
<tr>
<td>4.</td>
<td>The raincatcher shelter</td>
<td>59</td>
</tr>
<tr>
<td>5.</td>
<td>'Port Coquitlam' park design - park images and concepts</td>
<td>60</td>
</tr>
<tr>
<td>6.</td>
<td>'Port Coquitlam' park design</td>
<td>61</td>
</tr>
<tr>
<td></td>
<td>- site plan, sections and elevations</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- constructed wetland &amp; storm water management</td>
<td></td>
</tr>
<tr>
<td></td>
<td>elevations and concepts</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Bubble diagram of landscape character zones</td>
<td>64</td>
</tr>
<tr>
<td>8.</td>
<td>Bubble diagram of park circulation and spatial planning</td>
<td>65</td>
</tr>
<tr>
<td>9.</td>
<td>'Port Coquitlam' school playground images</td>
<td>66</td>
</tr>
<tr>
<td>10.</td>
<td>'Port Coquitlam' school playground design - Kindergarten to Grade 2 (Scale 1:100)</td>
<td>68</td>
</tr>
<tr>
<td>11.</td>
<td>Play Activity Zone Bubble Diagram - Kindergarten to Grade 2</td>
<td>69</td>
</tr>
<tr>
<td>12.</td>
<td>'Port Coquitlam' school playground design - Kindergarten to Grade 2 - Elevations and Sections</td>
<td>70</td>
</tr>
<tr>
<td>13.</td>
<td>'Port Coquitlam' school playground design - Grade 3 to 6 (Scale 1:100)</td>
<td>71</td>
</tr>
<tr>
<td>14.</td>
<td>Play Activity Zone Bubble Diagram - Grade 3 to 6</td>
<td>72</td>
</tr>
<tr>
<td>15.</td>
<td>'Port Coquitlam' school playground design - Grade 3 to 6</td>
<td>73</td>
</tr>
<tr>
<td></td>
<td>- Elevations and Sections</td>
<td></td>
</tr>
<tr>
<td>16.</td>
<td>'Port Coquitlam' memory courtyards</td>
<td>74</td>
</tr>
</tbody>
</table>
Acknowledgments

I am continually reminded of the personal photo album where photographs briefly capture a moment in time when people met, share information, and part, perhaps to meet again. This acknowledgment is similar to an album and it serves to recognize people and places that have contributed to my work.

My Family
Thesis Committee CoChairs, Moura Quayle and Patrick Mooney
Thesis Committee Members, Dr. Marion Porath, Valerie Fronczek, James Carlberg
Mark A. Dale, CJP Architects
Jim LaCroix, City of Coquitlam
Cst. Tim Fanning, Safety Liaison Officer
Cst. Heather Brown, Safety Liaison Officer
Cst. Chris Nuessler, Business Liaison Officer
Cheryl Zipper, City of Port Coquitlam
Greg Moore, City of Port Coquitlam
Allen Jensen, City of Port Coquitlam
To all the principals, parents and children who have participated whose names must be kept confidential for privacy of information.
To my Cantonese translation team.
David Osmond, Principal, Gartner Lee Limited
Representatives from the Department of Fisheries and Oceans
PART A: THE RESEARCH PROJECT

1.0 INTRODUCTION

The importance of play in the natural setting for children’s experiential learning and environmental education has been recognized by Bernaldez, Ellis, Hart, Lyons, Morris, Piaget, and Scarfe. This study was aimed at:

(a) Identifying what young children (4 to 10 years old) feel and learn within landscapes, and

(b) integrating this information to guide the universal design of a play space in a school playground and an adjacent park also to be used as play space.

1.1 Problem

To nurture children’s learning, their needs and preferences must be examined and considered. A fundamental factor to take into account is the design of their play environment and its ability to support the nurturing of children.

A search of the related literature indicates that there has been little investigation of the differences in children’s preferences, related to age when designing playgrounds or parks. This study therefore is important because Landscape Architects need programming and decision-making information in order to design.

1.2 Objectives

This project examines the social and cognitive learning of children aged 4 to 10 years old in the natural environment and the application of that information for the creation of an age appropriate landscape design.

The objectives of this study related to learning are grouped below as they contribute to an understanding of children’s social development and cognitive development. The specific
application criteria to be used in creating an age appropriate landscape design are to be found in Section 5.3.

1.3 Social Development

The objectives of this study were:

- to interpret the behaviour of children in landscape;
- to interpret the meanings that children ascribe to landscape play environments;
- to gain an understanding of what children are feeling in different landscapes;
- to gain an understanding of children’s concepts of their abilities and their play environments;
- to gain an understanding of children’s social values from play e.g. sharing and waiting their turn; courage and curiosity; commitment without reserve; of self-acceptance; of eager expectation; positive initiative; self-esteem; warmth; loving-kindness and inner security.

“Physical accessibility to a playing space is important for every child and for every child, control of their environment is key to healthy development.” For the child with a disability however, the need for autonomy and independence develops within an environment where caregivers are continually present. Personal control is difficult to attain. This design sought to provide attractors for a child with a disability to take the risk of getting out of their chair and play in the sand with other children. Therefore, clarity of purpose of a play structure, as well as the provision of safety, to overcome any inaccessibility of a play space must be provided for the child to want to venture to participate. Additionally, the intention of this design project is to implement universal design principles. By doing so, it is anticipated that the inclusive nature of this type of design, will reduce the barriers to play for the child with special needs.
1.4 Cognitive Development

The objectives of this study were:

- to gain an understanding of the child’s concepts of:
  - *Time and distance*, in order to inform the design on how far a child will travel to reach a play space;
  - *Landscape preferences* for the quality of spaces, and the quality of experience that children are seeking when they play in the ‘natural environments’;
  - *Learning outcomes* for the child. Examples of the types of learning a child may experience in the process of their development include:
    - Identification - recognizing nature elements
    - Classification - noticing similarities and differences
    - Generalization - considering qualities of objects apart from objects themselves, abstracting size, colour, and shape and then classifying
    - Symbolizing or Mental Manipulation - the ability to move from dealing with objects to dealing with ideas
    - Conceptualization - concepts of objects and their qualities, concepts of relationships among objects, concepts of direction, concepts of size, concepts of space, time, speed, and sequence, groupings, equivalence, seriation and conservation
    - Skills in problem-solving involves attitudes as well as information - a willingness to ask questions, to experiment, to explore different ways of doing things, to try out alternatives
    - Multisensory Input - what things or activities feel like give the child freedom to explore activities that go into making creative learners.²

(Summary of Points made in *The Scarfe Papers, Scarfe, 1990*)

The foregoing points are not formally discussed. However, they are included to provide a perspective on the extent, level and type of learning that takes place within play spaces.

2.0 RELATED LITERATURE

A review and discussion of the related literature will assist in providing insight into the
fundamental rationale for the thesis.

2.1 Why Play?

Play is one of the foundations of the development of the child and hence, the adult. Play is essential to a child’s well-being and future growth. Play can be positive and spontaneous. Play involves a spirit of creative learning and is essential for a child to reach mature adulthood. It contributes to a child’s understanding of control, compassion, commitment, and conscience.

Play is essentially a research activity - an adventure, an experiment, a transactional process. It is motivated by innate curiosity and enquiry. It is the expression of children’s urge to find out and discover for themselves how to live, how to be. . . With young children, play serves the function of a non-verbal mode of communication or a figurative language that satisfies a felt need and develops the whole child. In play a child is most nearly self-directed, most open and creative. . . In play, children can completely lose themselves. Play is as necessary for mental health as food is for physical well-being. . . Play provides both freedom and discipline. . . Play is a serious activity and requires great effort . . . It has all the characteristics of a fine and complete educational process. In play, as in fine education, children are completely absorbed. They concentrate for a great length of time. They show initiative, imagination and intense interest. There is tremendous intellectual ferment and complete emotional involvement. No activity motivates repetition more thoroughly. No activity improves the personality so markedly. . . Play is, in fact, the most complete of all the educational processes, for its influences the intellect, the emotions and the body of the child. . . If play is thought of as a research activity that is completely necessary for growth and for a complete education, it becomes the most important activity for children, and the it of play the most important stimulus to mental activity for adults. . . The significant point that educators have learned, however, is that when an activity takes on the characteristics of play, normally more effort is expended and more work done. . . The sooner it is understood that thorough education goes on only when considerable effort is expended in the spirit of play, the better it will be for our whole education system. (Scarfe, 1990, pp. 11-13).

2.2 Why An Universal Play Space?

British Columbians want an education system which reflects their belief that all students are unique, all students are to be valued, and all students can learn. Based on this belief, and the growing recognition that we cannot afford, either socially or economically, to leave untapped the potential of anyone, British Columbia has been moving toward an inclusive education system in which students with special needs are fully participating members of a community of learners. 3

Universal design is a design approach combining barrier-free design with design for all
degrees of sensory awareness, all types of movement, and all levels of physical and intellectual function. The philosophy of universal design provides support for varying abilities through functional and aesthetic environmental design. In addition to social responsibility, equity of access is the hallmark of universal design. The seven basic principles of universal design are:

- *Equitable Use* by all
- *Flexible Use* to accommodate a wide range of preferences and abilities
- *Simple and Intuitive Use* so that the space is easily understood
- *Perceptible Information* is provided so all five senses are engaged
- *Tolerance for Error* means an intent to minimize hazards and the adverse consequences of accidental or unintended actions
- *Low Physical Effort* so that the physical access to features is easy, and any built structures can be used efficiently and comfortably with minimum of fatigue
- *Size and Space for Approach and Use* by everyone including people using mobility aids and wheelchairs

This thesis has added one additional principal as result of the study, that of *fun* by all.

Children learn by watching, imitating, and doing. In play, children can learn from their discoveries in a relatively safe environment. By watching and being included with other children, children with special needs can judge, participate and control the activities they become involved in. Designing universally assists with this integration and inclusion.

The universal playground, designed for the full spectrum of developmental abilities, benefits all children and works to the advantage of children with special needs. By most incidence studies, children with special needs represent approximately 10 per cent of the total school-aged population, and this percentage carries into the total community. This means that individuals with disabilities will always be a significant minority in society. Therefore, society needs to develop the skills and attitudes which enable the minority to make their maximum contribution. The informal environment of the school playground is an excellent place to begin. (*Universal, 1993, p. 9*)

2.3 Why Children Learning in Nature?

Involving children in natural settings means much more than play. In a 1969 edition of The Weekend Columbian, an article entitled “The Problem of Play” explains why children and nature must come together. Much of this article is based on the design work of Cornelia
Oberlander.

'A child does not mentally grasp a new concept until he has physically grasped it. Through this physical grasping, the child is strengthening his conceptual framework'...Children all need a natural setting and natural materials. They need a place of seclusion from disturbing influences and everyday pressures, a place which their imagination can enter and transform into a make-believe world. 'The idea is not to be novel in materials, but to be straightforward'... 'Children need a nature area with salal, ferns, trees, benches where they can rest and talk about nature with an older person'...The other prime desirable quality in materials is unfinishedness and mobility. 'As soon as a thing is finished, finite, it not longer involves the child'... 'the idea here is creativity: with moveable parts, you have an infinite variety of combinations with which the child can create his own environment...The child with an infinite variety of experiences under control learns the feeling of being the initiator rather than the object of manipulation and can achieve true self-expression and self-fulfillment.'

The outdoor classroom can serve as a teaching tool to help develop the children's attitudes toward the environment and its various elements.

Numerous research studies have shown that by the time students reach middle school, their interest in studying native ecosystems is limited and their attitudes toward the natural environment are primarily neutral or negative. Researchers have shown that this trend can be reversed if students are exposed to, and learn about, natural ecosystems at an early age.

2.4 Learning and the Natural Environment (The Theories)

Jean Piaget is the major contemporary theorist regarding the various stages in a child’s cognitive development. He believed that a child progressed through a series of periods: Sensorimotor, Pre-operational, Concrete, and Formal Operations. Table No. 1 below best captures and condenses his theories. Appendix II contains textbook definitions of child development terminology that the reader may find helpful.
Table No. 1 Piaget’s Stages of Cognitive Development

<table>
<thead>
<tr>
<th>Stage</th>
<th>General Description</th>
<th>Age Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensorimotor Period</td>
<td>The child progresses from instinctual reflexive action at birth to symbolic activities, to the ability to separate self from object in the environment. He develops limited capabilities for anticipating the consequences of actions.</td>
<td>0 1/2 1 1 1 1/2 2</td>
</tr>
</tbody>
</table>
2.5 Research Study Summaries

Several research studies have been conducted, primarily in the United States, on children and adolescent responses to the natural environment. They are summarized below.

- RESEARCH STUDY NO. 1

_Bernaldez, Fernando G.; Gallardo, Dolores_
Children's Landscape Preferences: From Rejection to Attraction.
Journal of Environmental Psychology 1987, June Vol 7(2)
_Analyzed the differences in landscape appraisal by children of 2 age groups (191 11 year olds and 292 16 year olds) trying to detect consistent trends in landscape desirability related to age. Multi variate analysis of the preference responses of the Ss to landscape photographs allowed the identification of 3 independent preference dimensions: The 1st and 3rd dimensions (illuminated vs shadowed; rough, harsh vs bland, smooth texture or relief) were considered as forms of a more general risk, uncertainty factor often influencing landscape preference. Younger Ss (11 yr olds) showed less preference for both shadowed, less illuminated scenes (1st dimension) and harsh, rough scenes with aggressive forms (3rd dimension) than older Ss (16 yr olds). There were no significant differences for the 2nd dimension (landscape diversity)._

Bernaldez and Gallardo had hypothesized that:

1. Some directions of variation in the patterns of landscape preference are related to visual characteristics with both ‘deterring, frightening’ and ‘challenging, stimulating, exciting’ effects.
2. The effect of these characteristics on preference can change with age. Younger children perceive them as frightening and tend to reject scenes exhibiting these features while older children can perceive them as stimulating thus evaluating them positively. (Bernaldez, 1987, p. 169-170)

Bernaldez was involved in earlier studies (Bernaldez, F.G. and Parra, F. 1979; Bernaldez, F.G., Parra, F. and Quintas, G.M., 1981; Bernaldez, F.G., Ruiz, J.P. and Ruiz, M., 1984) which focused on the differences between the landscape preferences of children and adults following participation in environmental education activities. The results confirmed a preference for water amongst children and concluded that children tend to prefer less naturalistic, less complex landscapes than adults. As well, differences in response to naturalistic landscape were noted, comparing children and elderly with young and middle aged adults. It was concluded that,

...the disordered, complex, ‘wild’ environment was less appreciated by both those under
The common factor of these experiments is the risk and/or a factor of uncertainty revealed in the information content (complexity, disorder), mystery or incongruence, which produces rejection (by children or the elderly) or stimulation (youth or adults). Gender has also been related to the preference for wild, spontaneous, disordered landscapes preferred by male university students vs more ordered humanized landscapes preferred by female students. This is an interesting perspective on why children play as they do within certain environments. Could it be, for example, that pre-teens are vandalizing and accessing ‘forbidden’ spaces for wanting to play? Are the vacant lots used for parties and ‘found’ play spaces in forested areas a manifestation of play looking for adventure and risk? Further research is needed in order to answer this question as the studies from the United States are few and not current.

RESEARCH STUDY NO. 2

Berg, Mary; Medrich, Elliott A.
Environment & Behaviour, 1980 Sep Vol 12(3)
Compared children’s play patterns across neighbourhoods of different social status, terrains, levels of access to play space, and levels of municipally provided after school services. In a California City, 764 11-12 yr olds were interviewed in their homes, while their parents completed a questionnaire that proved socialization priorities and child rearing practices affecting aspects of out-of-school life. It is argued that few neighborhoods are designed with the needs of young people in mind. By examining how children’s play patterns in 4 neighborhoods are constrained or facilitated by the terrain, by the availability of “managed” and “unmanaged” play space, and by play problems associated with questions of safety and mobility, it is possible to see how planning and land-use decisions affect the everyday experience of the young.

Berg’s study should influence the fundamental shaping of the land formations and topography within the design work of playgrounds and parks. Flat land and grassy open spaces are to be highly prized. Function of the play spaces and social spaces should avoid ridged segregation, with forms shaping spaces in an enclosing manner and the grouping of activities so children could quickly move through congruent spaces into new spaces.

Sometimes the threat of older people keeps them [children] away (Glenn); occasionally it was the distance from home or fear of crossing major (San Bernardino)...But in every neighborhood, “found” play space was highly prized...These unplanned areas, which
often were nothing more than a vacant lot or a garbage-strewn stream, met certain needs that
developed play space could not. At the very least they offered privacy - for these
were places where often no one but a child would go or would want to go. This should
not be surprising, for it reflects children’s desires to have something that is theirs, at a
time when virtually everything else - houses, shops, streets, public transportation - is built
for or “belongs” to grownups. (Berg, 1980 p. 340)

Adjusting the scale of school play spaces (such as the play houses, and their
accompanying gardens, the friendship plazas and amphitheatres), may give the child a sense of
privacy, seclusion, and ownership because this is a scale of place particular to the child where
adults don’t fit. Perhaps these are some of the same features that make treehouses, so attractive
to the child. The practical problem is how to have child- scaled spaces while at the same time
providing access to maintenance people to work in such areas.

The work of Mary Berg was concerned with the social geography of the city as opposed
to quantified landscape preferences. Her study has a high degree of qualitative information that
transcends four different socio-economic neighbours and helped this paper by providing insight
into play patterns, safety and mobility, and issues prevalent in urban settings. The content of her
study influenced a few of the questions in this project’s questionnaire with respect to
neighbourhoods and the mobility of children.

Because Berg’s study appears to have been a qualitative study, it became difficult to
apply direct statistical comparisons. However, the qualitative research does help to develop the
questions that can be applied to a study such as this one. Elizabeth Lyons’ study (1983) does
include quantified landscape preferences. It was possible to compare Ms. Lyon’s results with
those of this study exploring the assumptions that Ms. Berg drew from her qualitative surveys.

- RESEARCH STUDY NO. 3

Lyons, Elizabeth
Demographic correlates of Landscape Preferences.
Tested 283 Ss (aged 8-67 yrs) on individual differences in landscape preferences. Ss were divided into groups according to age and were instructed to rate 5 vegetational biomes (topical rain forest, temperate deciduous forest, northern coniferous forest, savannah, and desert). Between-S differences in age, gender, and residential experience were found to contribute significantly to differences in landscape preference ratings. Preferences changed through the life cycle, with the highest preferences shown by young children and the lowest by elderly Ss; preference diverged in adolescence for males and females and for urban and rural residents. Preferences were highest for the most familiar biome. No evidence was found to support the hypothesis that landscape preference is shaped by innate or revolutionarily determined factors. These findings suggest that the development of landscape preference is a cumulative process sensitive to socially differentiating factors. In the study of landscape preference, it is necessary to identify both the physical aspects of the landscape as well as the social and demographic characteristics of the Ss in order to identify the sources of variation in preference.11

Lyons found several common themes in her research as cited below.

1. Young children (3-6.5) show higher preference (lower mean values) for lush deciduous forests and a green savannah than the other age groups. In the author’s opinion, this reflects their development stage.

2. Younger children were less consistent in assessing landscapes than older children.

3. Gender differences are subtle but present and require further examination.

4. In combination with Ms. Berg’s quantitative surveys, both researchers have “findings that support the hypothesis that a person’s landscape preference is strongly influenced by his or her residential experience in different biomes.” (Lyons, 1983, p. 503)

5. The constraints of apartment dwelling on children’s play and children’s development has also been exposed in these two studies. “Subjects from one-family houses showed higher preferences [for one-family house pictures] than did subjects who lived in multiple-family dwellings.” (Lyons, 1983, p. 505)

6. Age appears to be a determining variable when “taken alone and with gender or residence” (Lyons, 1983, p. 506). Further,

Some biological explanations are more accepted than others; factors that affect environmental cognition, such as perception, size, agility, and perhaps thermoregulatory ability, change with age, but strong evidence for biological basis for differences in preferences between the age groups in this (Lyons) study is not readily available. (Lyons, 1983, p. 506)

7. Exploration and explanation is needed to examine the divergence between genders and biomes.

...A child also learns about landscapes from books, family, teachers, and friends, and so
develops a visual vocabulary of sights connected with meaning... .Such a framework of values can perhaps explain the divergence of male and female preferences after grade 6. Although the subjects had grown up in the same biome, at a critical age they assimilated different gender-related values that influenced the way that they assessed landscapes... .The landscape preferences of urban and rural residents appear to diverge at the same critical age; it is important that this life stage be carefully analyzed in future studies, for it appears to be one where the effects of differential socialization are felt. (Lyons, 1983, pp. 508-509).

2.6 Contributions from Child Behaviour Theorists

The paucity of significant research studies in the area of environmental psychology and children has resulted in gaps in our understanding of children’s developmental needs relative to play environments.

In 1973 Dr. Michael Ellis published a book Why People Play in which he analyzed the classical theories of play and related their value to the scientist and the professional working with children. His analysis of the literature and his personal experience has led him to develop a theory of play as arousal seeking. The principals of the arousal-seeking model are:

1. Children play for the stimulation they receive;

2. that stimulation must contain elements of uncertainty (they are to some extent novel, complex, or dissonant); and

3. that the interactions producing the stimulation must rise in complexity with the accumulation of knowledge about or experience with the object (the extent to which the uncertainty concerning the object is reduced).12

D. Morris takes the arousal seeking theory one step further by associating the theory to how a child may become a young offender, taking risks beyond the reasonable. Morris proposes that by depriving a child of a stimulating and growth enhancing environment the child’s development is seriously compromised. The child’s response is to attempt to self-stimulate. “Children as they escalate their attempts to generate arousing interactions are seen to become progressively naughtier, and may ultimately be accused of “acting-out” behaviour if they are
driven to extremes.” (Ellis, 1973, p. 133)

Roger Hart is one of the world’s authorities on environmental education. His most recent publication *Children’s Participation: The Theory and Practice of Involving young Citizens in Community Development and Environmental Care* (1997), emphasizes the need for genuine participation by the child. Detailed cases studies are provided from urban and rural, poor and middle class communities. He has provided a resource book that presents organizing principles, successful models, practical techniques and resources for involving children and that focus on the perspectives of the child. He has produced a model showing developmental levels of children in the coordination of their perspectives. For children ages 3 to 7, “egocentric or undifferentiated perspective” leads to a child playing from their own personal point of view and not considering the other’s perspectives. What the child does in play is place an emphasis on the physical connections and clear action activity. The play activity therefore does not enter the child’s consciousness. This means that any play ‘functions’ contemplated cannot be rigidly segregated and play must stay freer to allow the child to grow. Play spaces therefore need to be flexible to allow for activities to carry over into adjacent spaces. Play spaces need not be materialistic and may not require complex play equipment.

The next level of development is a subjective or differentiated perspective where the child recognizes differences in perspective. This results in “a series of unilateral relations. Group activities are thought of in terms of outcomes that benefit self or please others. Reciprocity is based on physical acts only.” (Hart, 1997, p. 32) The design response to such a theory is to provide areas where group play can occur, and areas where that play could be at the small, social scale and areas where more physical group play is occurring, such as at a basketball court. Developed play space therefore could have a social, dramatic quality or a physical
play quality with a sensory feature responding to the increased perceptiveness of the child toward others, a nurturing play activity on the part of the child.

Table No. 2, Matrix to Compare Studies, Frequencies and Theories, brings together the theories of Piaget, Ellis, Morris and Hart. Their theories are not discussed in their entirety but rather specific concepts are grouped under landscape preferences.

2.7 Summary: A Matrix

Piaget (Belkin, G.S. and Gray, J.L., 1977) has substantially contributed to the understanding of cognitive development of children at various age levels. Other authors have helped in the understanding of the significance of play in child development and the relationship between age and preferences for design characteristics which may guide the creative selections for play environments. The matrix that follows compares and synthesizes the important features of the literature reviewed. The congruency among the theories or frequencies may indicate where and why the assumptions drawn from the study results have influenced the final design of a school ground and adjacent park as submitted in this thesis.

The responses to the survey appear to match effectively with Piaget’s cognitive development theory and D. Morris’ theories on interaction. In the context of knowing the children’s qualitative responses, the author sees little incongruence with the other studies and theories. However, the survey appears to indicate that children are perceiving with greater insight at younger ages and, that risk taking behaviours are also beginning at younger ages.

By way of explaining the intricacies of Table 2: Matrix to Compare Studies, Frequencies and Theories, the criteria for +, -, and = are described below. Each of the studies used various statistical means to gather their information and it is difficult to obtain a consistent value for each variable. Additionally, the dependent and independent variables for each study had differences.
What is attempted here is to align similar variables and simply indicate whether there was (a) a stimulated response or high preference as indicated by the +; (b) a rejected response indicated by -; (c) a balanced response where there is no significant difference between age groups indicated by =; and (d) a split response that usually reflected either + or - depending on the age of the children. Table 2A: Statistical Data from Survey Matched to Matrix found in Appendix IV has been included in order to clarify the above definitions for the symbols as that criteria is applied to the author's study.
<table>
<thead>
<tr>
<th>MATRIX TO COMPARE STUDIES, FREQUENCIES AND THEORIES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>RESEARCH STUDIES ON PREFERENCES</strong></td>
</tr>
<tr>
<td>Less Materialistic</td>
</tr>
<tr>
<td>Less Complexity</td>
</tr>
<tr>
<td>Less detail, less contrast in shadows, bland</td>
</tr>
<tr>
<td>Preference for Water</td>
</tr>
<tr>
<td>Diversity, balance of forms</td>
</tr>
<tr>
<td>Perception of Safety</td>
</tr>
<tr>
<td>Risk Taking Influenced by general 'risk uncertainty'</td>
</tr>
<tr>
<td>Disordered, Complex, Wild</td>
</tr>
<tr>
<td>Influenced by general 'risk uncertainty'</td>
</tr>
<tr>
<td>Sloped Terrain</td>
</tr>
<tr>
<td>Streets &amp; Hills</td>
</tr>
<tr>
<td>Diversity in balanced proportions of form, surfaces</td>
</tr>
<tr>
<td>More structured quality</td>
</tr>
<tr>
<td>Wooded Open Space</td>
</tr>
<tr>
<td>Shadows, diversity in balanced form</td>
</tr>
<tr>
<td>Grass to Hay On</td>
</tr>
<tr>
<td>Developed Play Space</td>
</tr>
<tr>
<td>Unaesthetic School Yard</td>
</tr>
<tr>
<td>Flat Land</td>
</tr>
<tr>
<td>Functions Not To Be Rigidly Segregated</td>
</tr>
<tr>
<td>Found Play Space (Child Taking Ownership)</td>
</tr>
<tr>
<td>Street Complexity in Texture, Colour, Shape</td>
</tr>
<tr>
<td>Beach at Edge of Forest</td>
</tr>
<tr>
<td>Diversity, balance of natural features</td>
</tr>
<tr>
<td>Swing Sets for Toddlers &amp; Kindergarten</td>
</tr>
<tr>
<td>Garden</td>
</tr>
<tr>
<td>Wild Urban</td>
</tr>
<tr>
<td>Derelict</td>
</tr>
</tbody>
</table>

**CHILD BEHAVIOUR THEORISTS**

- **Jean Piaget (1896-1980)**
  - Preoperational
    - Child is in the here and now
    - Child not able to group objects
  - Concrete Operations (7-10.5)
    - motived by engagement with the environment
    - child has a need for stimulation
    - intense processing of information
    - relative complex logic - relativism, reversibility
    - child attempts to understand two or more aspects of a problem simultaneously

- **Concrete Operations (7-10.5)**
  - Child wants to focus on more than one thing at a time
  - Play is caused by the growth of the child's intellect and is conditioned by it. Play occurs when the child can impose on reality his own conceptions and constraints
  - a child's thoughts are captured by what has been or is being experienced

- **Michael Ellis (1973)**
  - Play as a pleasurable activity for the child (7-10.5)
  - child needs to increase the rate of change of stimulation
  - Play space as a culture
  - child-rearing practices of various cultures "would reflect the essential characteristics of the culture. Rearing patterns in themselves create stress...children will play games...leading to enculturation...conflict-encultivation hypothesis"

- **D. Morris (1969)**
  - Play as Arousal-Seeking. Play is caused by the need to generate interactions with the environment or self that elevate arousal (level of interest or stimulation) towards the optimal for the individual

- **Roger Hart (1996)**
  - Level 0 (approx. ages 3 to 7)
    - Egocentric or undifferentiated perspective. Other's perspective not differentiated from one's own perspective.
  - Level 1 (approx. ages 4 to 9)
    - Subjective or differentiated perspectives.
    - Recognition of differences in perspective.
    - A series of unilateral relations.

**REFERENCES**

3.0 MATERIALS AND METHODS

3.1 Instruments

The survey instrument used to gather data on the children’s landscape preferences related to the play environment is shown in Appendix I. It is a questionnaire to be completed by the parent and an interview guide is provided with pictures to help the parent solicit and record the child’s preferences and responses. The interview items primarily focus on the child’s play activities and their feelings of safety.

The questionnaire, photographs and the format used were pilot tested in March 1998 with the children of fellow classmates in Sociology and Landscape Architecture at the University of British Columbia. As well, three educators, a research methodologist, an educational psychologist, and a sociologist, offered suggestions for its revision.

A cover letter, the questionnaire instrument, and a description of the procedures were reviewed and passed by the Ethical Review Committee of the University of British Columbia.

Since young children were the primary focus of this study, photographs of various scenes were an important part of the instrument. The subject of the photographs emulated previous studies (Lyons, 1983, Bernaldez, 1987) as cited in the Related Literature. They alternated between pretty, natural, barren, scrubby, derelict, play spaces and water courses.

For gathering the quantitative data, the Likert Scale was used. The questionnaire items were used as a starting point for conducting interviews but allowing a free format to let the child pursue the topic. Notes were recorded immediately after the interviews for a qualitative analysis.

3.2 Sample

Children aged 4 to 10 years were the study subjects. Group selection occurred by stratified sampling of:
Group 1 - preschool at 4 years, 10 - 50 children
Group 2 - School or community centre at 6 years, 10 - 50 children
Group 3 - School at 8 years, 10 - 50 children
Group 4 - School at 10 years, 10 - 50 children
Group 5 - Private or School or the Parents Association for Children’s Therapies and Services (PACTS), across ages, 10 of each of: dependent with disability, moderately mentally challenged, severely and profoundly handicapped, physical disability, visually impaired, hearing impaired, autistic, severe behaviour disorder, moderate behaviour disorder, child in rehabilitation. [Source for special needs categories: data sheets from School Finance and Data Management, Ministry of Education]

The sample selection process used convenience and quota sampling simply because the parents consented to participate at their convenience. Quotas were hoped for but difficult to achieve depending on the school and the principal’s ability to help with the distribution of the survey. Giving out addresses of parents and maintaining confidentiality within the survey data was not difficult and was necessary for the safety of the children. Thirty-three parents found it convenient to respond to and participate in the survey in Port Coquitlam.

3.3 Method

The principals of 10 elementary schools in the Greater Vancouver Region were invited to assist in the study. Parents of 93 children attending the schools were first approached by the participating principal. If the parents agreed that their children could take part in the study, then a letter of consent and the questionnaire were delivered to the schools.

Thirty-three of the parents of the total sample of 93 children lived in the municipality of Port Coquitlam, the site of the school ground design. 11 parents in the sample of 93 were asked for their permission to have an interviewer speak to their children at home, with the parent present, for clarification or free elaboration on the questionnaire responses.

The instrument was also handed out to parents in a parent group meeting which took place in West Vancouver. The parents were advisors to designers for the installation of a new
play ground to replace an older playground.

The principals of all of the schools were also informally asked to indicate their preferences or concerns for the design of play spaces. They were included because they have a major decision making responsibility and influence in landscape design approvals.

A new school planned for construction in Port Coquitlam, B.C., was selected to be the site chosen for design development illustrating the purpose of this thesis. The school needed a design for a playground and an adjacent public park to be accessed for play by the students. The architectural firm that was commissioned for the development of the school graciously agreed to review and critique all aspects of the landscape design objectives and offered recommendations for this thesis.

The objectives of the landscape design required the determination of the children's preferences and other factors impacting the play environments (e.g. safety, security). Therefore, in addition to the children, parents and school principals, were also interviewed together, conducted with five police safety liaison officers. The officers served areas that include an inner city school, a very high income community (West Vancouver), a middle income community (Port Coquitlam) and a community with a broad spectrum of socio-economic mix of families bordering the University.

The procedures used for the analysis of the quantitative data were statistical: e.g. frequencies, histograms, contingency tables, and sorting and prioritizing of the children's response variables. The challenge in the statistical analysis of this nature for this study is to find the balance of variables which ideally provide a normal, bell shaped curve, reducing skewedness, and thereby providing one with a ranking of the most significant variables. These variables, the author speculates, are similar to universal landscape design features. In other words, there are
fundamental features such as still water, trees, colourful vegetation, open spaces without dark edges, that are attractive features for the children in the sample. While not having access to all the statistical results of the cited studies by Bernaldez (1987) and Lyons (1983), their published discussions appear to support the findings of this study though the studies were conducted with older children. The author is suggesting here that similar variables may have been revealed in younger children. More research needs to be conducted with the younger age groups to investigate the possibility of common variables.

4.0 RESULTS

Municipalities and districts in the Greater Vancouver Region which participated in the study are identified in Table 3. There were a total of 9 schools with 93 children who responded to the questionnaire. The children’s age categories and demographic backgrounds are shown in Tables 4 and 5 respectively. There were 50 girls and 43 boys. The children’s responses and those of their parents’ are summarized in Figures 1, 2, and 3. The children’s interview comments are paraphrased and shown in Tables 6 and 7 (Appendix IV) as related to social development and cognitive development importance.

The interviews with the children were most revealing. The children as a whole appeared to be very enthusiastic or very derogatory in their preferences, reflecting an honesty and clarity in expressing their views. At times, there was less consistency in their responses, for example, during the interview process, as the child delved deeper into the photographic images, the child would reconsider the initial value response. Sometimes the child had difficulty in deciding whether the photograph was ‘I like it a lot’ or ‘I like it somewhat’. The ‘I don’t like it’ choice, when stated, was firm. The overall impression taken from the responses and the reactions of the children are:
1. Children show strong preferences for colour, trees, natural elements (e.g. water and sand), texture and variety;

2. Calmer water was more appreciated than rushing water;

3. Preferences changed with the age of the child;

4. Simpler environments appealed to the younger child (4 to 6 years old). The older children preferred more complex compositions;

5. The children were eager to share specific experiences or stories as they related their thoughts on each photograph;

6. The postulation that landscape preference can have a human evolutionary history could be examined further particularly with the extraordinary preference for the water and the beach environments;

7. Frequently during the interview with a child, the child would show favourite books or relate favourite nature stories repeated from experiences. This suggests that a child who learns about the environment from sources outside the environment is able to express themselves with greater depth and meaning than those who don’t. The meaning a child attaches to a particular environment may have attached to it the values of peers, parents, and other social influences;

8. A change appears to occur at age 6 as the assimilation and interpretation of landscape preferences appears to diverge toward a dislike for derelict and gravel lot sites. The jungle jim playground also appears to have reduced appeal. (Figures 1 and 2)

   A few of the children went so far as to draw in the blank pages of their booklets the places they valued. The children had a richness to their descriptions of their valued environments. Books on nature came off shelves and found objects were brought to the dining
room tables. One little boy described the young life of eagles and how they nested in detail. (The lessons were very valuable and contributed to the design of the goose nest sand box shown in as Drawing No. 10). In another instance, a child recalled an entire legend regarding rocks and water and good and evil after viewing the rapid water photograph (Slide No. 12 in Appendix III).

The small sample size means that the foregoing interpreted qualitative statements are impressions that lack substantive support. But such individual elaborations clearly were coming from children wanting to convey an important part of their understanding and the stories served to provide thickness to the design itself.

Participation from within the community of parents with children having special needs was limited to three. However, the results from surveys and workshops conducted in the community of Port Coquitlam in February 1995 (Appendix V) were helpful in putting these children into the consideration of the design for the Constellation Bridge (Drawing No.12), and the pathways' connectivity throughout the site. (Drawing No.10)

Five parents attended a group meeting. Their comments are summarized in Table 8 (Appendix IV). It became evident that the parents are sensitive to (a) how the play spaces are maintained, (b) the safety of their children at play, (c) a concern for the simplification of the play spaces, and (d) the understanding that the play spaces are also common spaces shared by the community.

The themes that were generated from the informal interviews with the principals were: (a) that children are playing very differently than they were 5 years ago and are no longer as physically fit as they were 5 years ago. This impacts their desire to play in the outdoor nature space, and (b) pressures exist beyond the control of the child or the school that impacts outdoor play because of encounters with 'stranger' adults or the display or existence of drugs and crime.
The summary of the principals' comments are shown in Table 9 (Appendix IV).

The interviews (Table 10 in Appendix IV) with the three Police Safety Liaison Officers and two RCMP patrolling constables also confirmed the safety concerns expressed by the principals (Table 9). During the course of conducting the survey in one of the schools, a flyer was sent out by the school regarding a male stranger frequenting children's playgrounds.

The relationship between the elementary schools and evening activity in the forested areas across from some schools had, until two years ago, resulted in increased vandalism and increased effort by the RCMP to control youth crime. These two examples are included to show the validity of the adults safety concerns.
Table No. 3. Municipalities and Districts Participating.

<table>
<thead>
<tr>
<th>Municipality/District</th>
<th>Frequency</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vancouver</td>
<td>21</td>
<td>22.6</td>
<td>23.7</td>
</tr>
<tr>
<td>Delta</td>
<td>2</td>
<td>2.2</td>
<td>25.9</td>
</tr>
<tr>
<td>Richmond</td>
<td>13</td>
<td>14.0</td>
<td>39.9</td>
</tr>
<tr>
<td>North Vancouver</td>
<td>2</td>
<td>2.2</td>
<td>42.10</td>
</tr>
<tr>
<td>Port Coquitlam</td>
<td>33</td>
<td>35.5</td>
<td>77.6</td>
</tr>
<tr>
<td>West Vancouver</td>
<td>22</td>
<td>23.7</td>
<td>100.00</td>
</tr>
<tr>
<td>Total</td>
<td>93</td>
<td>100.00</td>
<td></td>
</tr>
</tbody>
</table>

Mean: 8.720
Mode: 6.00
Kurtosis: 14.051
Skewness: 3.936
Median: 6.000
Std. dev: 16.468
Table No. 4. Ages of Children Participating

<table>
<thead>
<tr>
<th>Age of Child</th>
<th>Frequency</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 years old</td>
<td>6</td>
<td>6.5</td>
<td>6.5</td>
</tr>
<tr>
<td>6</td>
<td>29</td>
<td>31.2</td>
<td>37.7</td>
</tr>
<tr>
<td>8</td>
<td>26</td>
<td>28.0</td>
<td>65.7</td>
</tr>
<tr>
<td>10</td>
<td>30</td>
<td>32.3</td>
<td>98.0</td>
</tr>
<tr>
<td>Missing Data</td>
<td>2</td>
<td>2.2</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>93</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Mean: 7.753  
Mode: 10.000  
Kurtosis: -0.005  
Skewness: -0.547  
Median: 8.000  
Std. dev: 1.982
Table No. 5. Family Heritage of Child Participating.

<table>
<thead>
<tr>
<th>Family Heritage</th>
<th>Frequency</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chinese</td>
<td>6</td>
<td>6.5</td>
<td>6.5</td>
</tr>
<tr>
<td>Spanish</td>
<td>1</td>
<td>1.1</td>
<td>7.5</td>
</tr>
<tr>
<td>Canadian</td>
<td>25</td>
<td>26.9</td>
<td>34.4</td>
</tr>
<tr>
<td>British</td>
<td>22</td>
<td>23.7</td>
<td>58.1</td>
</tr>
<tr>
<td>South African</td>
<td>4</td>
<td>4.3</td>
<td>62.4</td>
</tr>
<tr>
<td>Eastern European</td>
<td>6</td>
<td>6.5</td>
<td>68.8</td>
</tr>
<tr>
<td>Japanese</td>
<td>1</td>
<td>1.1</td>
<td>69.9</td>
</tr>
<tr>
<td>Western European</td>
<td>10</td>
<td>10.8</td>
<td>80.7</td>
</tr>
<tr>
<td>Pakistan</td>
<td>2</td>
<td>2.2</td>
<td>82.9</td>
</tr>
<tr>
<td>Philippino</td>
<td>1</td>
<td>1.1</td>
<td>84.0</td>
</tr>
<tr>
<td>Scottish</td>
<td>2</td>
<td>2.2</td>
<td>86.2</td>
</tr>
<tr>
<td>First Nations</td>
<td>1</td>
<td>1.1</td>
<td>87.3</td>
</tr>
<tr>
<td>German</td>
<td>2</td>
<td>2.2</td>
<td>89.5</td>
</tr>
<tr>
<td>Mayan</td>
<td>1</td>
<td>1.1</td>
<td>90.6</td>
</tr>
<tr>
<td>Missing Data</td>
<td>9</td>
<td>9.7</td>
<td>100.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total:</td>
<td>93</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Mean: 6.452  
Mode: 4.000  
Kurtosis: 0.371  
Skewness: 0.996  
Median: 5.000  
Std dev: 3.245
Figure No. 1. Child’s Landscape Preferences Compared to Age of Child (Slides 1-7)  
*(Sample size: 93)*
Figure No. 2: Child's Landscape Preferences Compared to Child's Age (Slides 8-13)
(Sample Size: 93)
Figure No. 3: Parents' Value of Play in Nature
5.0 DISCUSSION

Piaget’s stages of pre-operational and concrete operations in a child’s cognitive development were aligned through Table No. 2, Matrix to Compare Studies, Frequencies, and Theories. The responses of the children (n=93) to the slides are summarized graphically in Figures No. 1 and 2. Specifically, however, in Piaget’s pre-operational period, the young child can understand and respond to an object individually but not group things. For example, for the 4 year old child, the mean values for Slide No. 1, Variable Vegetation, (Appendix III)(Complexity in texture, colour and shape) and Slide No. 2, Darkened Thicket, (Appendix III)(Disorganized, complex wild) are 2.8 and 3.2 respectively. The values are high corresponding with a ‘sort of like’ or ‘don’t like’ selection. These choices in combination with how the children responded to the slides may reflect their cognitive stage. The younger children selected and focused on specific items in the photographs. The older children gave values of 1.16 and 2.56 for the slides respectively. The complexity of the pictures appeared to stimulate the children and they showed preferences for the finer details of the slides. They selected several items in the slides to respond to and then chose which they found appealing to them. Amazingly the children would then project themselves into the photograph and began to describe how they would play in the space and exactly where they would play. It is the action and the choices of the children that best illustrate their stage of cognitive development and this study appears to add one more part to our understanding.

The results of the questionnaires and interviews must be interpreted with caution given due recognition to the limitations of these methods of inquiry. As well, this study’s sample size was relatively small, representing children with a wide variety of backgrounds and had limited participation of children with special needs. The assumption of bias can also be made in the
potential that the majority of the sample may have consisted of parents with an interest in either the topic or the nature of the research. Their children therefore may have been encouraged to participate. Even so, by comparing the results of this study to that of others (Lyons, 1983, Bernaldez, 1987) the frequency of responses appear to be congruent.

It would be fair to say that there are “milestones in children’s development”. The responses to the survey appear to be consistent with Piaget’s cognitive development theory (Belkin, G.S. and Gray, J.L., 1977) and D. Morris’s theories (Ellis, 1973) on interaction. The study was congruent with other studies and accepted theories of child development. Today’s children are perceiving with greater insight, at younger ages, how they want to relate to their natural environment, and, in fact, how they wish to explore their nature environment safely.

5.1 Social Development

The responses of the children to many of the slides where potential playing could occur gave credence to the suggestion that play and social development are entwined intimately. The comments for three different slides (Table No. 6 in Appendix IV) clearly reflect the social value of the environment in which the children play and their attraction to spaces where other children are playing. It is evident that certain images invoked responses that related to the friendliness of a space. Those spaces that did not attract children, that were empty, that lacked vegetation, that lacked meaning for playful engagement, were rejected as not being desirable environments. The children to their credit, attempted to find small benefits, like playing in puddles, to respond in a positive manner to the photographs. However, the consensus is that activity attracts positive attention and play, inactivity is a lonely experience. The social value of a space is very important to the child viewing that space. If others are there, they appear to feel that the space is safe, is friendly and they will engage.
5.2 Cognitive Development

Finding the connection between nature and the cognitive development of children was difficult. The insights are not as obvious between the qualitative responses and the quantitative responses by simply the verbal responses to photographs. The comments from the photographs (Table No. 7 in Appendix IV) show how children connect the environment events or forces to nature and then to their experiences. This level of insight on the part of the child was scarce simply because of the lack of cuing permitted in the research technique, and that in most cases, the children were looking at photographs without interviewer participation.

Cognitive development in a child is a matter of developing balance as the child continually integrates and coordinates many branches of knowledge. At this young age, children are experiencing so much that the input of information is intense. Effective interaction of the child with the environment is a form of adaptation in their development and for Piaget, the interaction is cognitive. The children are using their sensorimotor, pre-operational and operational thinking skills to assimilate and accommodate. As the child moves from pre-operational to operational, they begin to project themselves into spaces, based on previous experiences or previous memories. Drawing on those experiences, helps them judge whether they like a space, whether they could be safe without an adult, and what to expect in the space, for example, the types of animals that might live there.

The children expressed likes and dislikes regarding the bridges. The dominate response was liking the bridge, experiencing walking on the bridge, and curiosity about what could be under the bridge. For the children, their advances in the symbolic understanding of their world comes with experiences, legends or storytelling, and an imagination that is free and endless. The interpretation of the symbolism embedded in the children’s responses to the photographs would
require interpretation by an educational psychologist and is beyond the scope of this thesis.

5.3 Implications for Design

There are several implications of this study for Landscape Architecture. Children are sensitive, caring human beings who interact with their environment in a very intimate manner. Their play environment is more appealing to them if it offers variety of colours, textures, natural elements and trees. Play has great value to children. To deprive them of the opportunities to learn through play is to destroy character building opportunities that make a child whole.

Children seek out play because they intuitively know this. To have a child return repeatedly to a play site is a complement to the designer of such a site and perhaps is an indication that the designer has addressed and met the deeper needs of child in their play development and their play places.

Currently, nearly all playgrounds seem to be designed to produce only the first effect, gently diverting the child to gross motor activity when there is nothing else to do. Understanding the nature of play . . . should allow playground designers to first differentiate the goals of the playground and plan more appropriately. (Ellis, 1973, p.139)

Children will respond to boring and restrictive circumstances by increasing their arousing or stimulation seeking behaviour. In considering the results of the research studies of Lyons (1983) and Bernaldez (1987), it would be constructive to apply further research in the area of arousal seeking behaviour. Risk-taking as we understand it, may have levels of escalation depending on the age of the child and the circumstances. The results from the survey taken suggest that this may be the case by the increase in the mean values for the younger children (4 years old) and the older children when looking at the thicket slide. The younger children indicated a greater dislike for the thicket and expressed this by referring to the lack of leaves and the colour, whereas their older counterparts either disliked the slide or sort of liked it. They
expressed ideas of the thicket being a nesting habitat and an interesting place to hide (Table No. 7).

For our children in the landscapes of the schools today, the lack of stimulating and safe play venues is a worrisome trend for child development consultants, educators, the police department, parents, and the community as a whole. Our children will suffer for this deprivation as they grow into their teen years. They may increasingly challenge adults, driving up the levels of stimulation in their environment until they run counter to the law.

The research results show that children have a very intense interest in the natural world. There is an eagerness in each child to explore, investigate, manipulate and engage at a very active level. In the author's opinion, it would appear that younger children are increasingly acquiring preferences and behaviours that formerly belonged to older children. Even in this small sample, their selections and preferences demonstrate a higher level of awareness of their environment both aesthetically, as they feel good or bad about spaces, and practically, as they determine whether a space is safe or not.

As a result of the research, objectives were developed that helped in the design process. Those objectives are found below and form the preliminary stages of developing the design performance guidelines in Section 7.0 by which to proceed on other projects.

5.4 Design Objectives for Play Spaces

A good play space for children should:

- create an environment that is supportive of the physical, social, developmental and emotional needs of children;

- create an environment that is universally accessible, addressing the concerns of children with special needs and parents in wheelchairs
attending to their children in natural and play environments;

- increase public access to the natural and built environment so that the community can participate in the site thereby combining recreation with regeneration of habitat;

- support ecological learning and teaching through exposures to a range of habitats;

- enhance the trails and potential links between neighbourhoods to increase the appeal to the community of the integration of green spaces;

- encourage community cohesiveness with a greenway;

- reflect the ecological context in which the School is situated thereby encouraging the transference of learning in the school yard to the larger community amenities;

- respond to the landscape preferences discovered in the research survey tool. For example, if the children indicate a preference for climbing on rocks over climbing on rubber tires, then the play site will have rocks to climb on.

As a result of the surveys, interviews and precedent research, a set of design guidelines was prepared to support the designer of the park and the adjacent school site. The proposed design (Drawing No. 3) worked with the environmental context of the site to develop a greater understanding of the interrelationship between the park site, school site and the community. The resultant design included the park site and the school site within a neighbourhood greenway.
PART B: THE DESIGN PROJECT

We are threatened today by two kinds of environmental degradation: one is pollution - a menace that we all acknowledge; the other is loss of meaning. For the first time in human history, people are systematically building meaningless places. - Walter, 1988 from Landscapes for Learning, Sharon Stine.

To counter the historic trend toward the loss of wildness where children play, it is clear that we need to find ways to let children roam beyond the pavement, to gain access to vegetation and earth that allow them to tunnel, climb or even fall. And because formal playgrounds are the only outdoors that many children experience anymore, shouldn’t we be paying more attention to planting, and less to building on them? - G. Nabhan and S. Trimble, 1994 (Stine, 1997, p. 194)

6.0 INTRODUCTION TO SITE AND PROGRAMME

To explore and understand the environmental drivers behind the development pattern of the site it is necessary to conduct a site analysis, looking at the environmental drivers that will influence the direction of the site design. Appendices VI, VII, VIII AND IX will give a comprehensive and quick view of the site and its context relative to the points below. The design response is found in Section 8.0 of the thesis and Drawings No. 1, 2, and 3 will assist in giving views of the site.

The site’s relationship with the larger context is an important part of the site analysis as we have a new neighbourhood growing beside a potential salmonid enhancement area, as well as lagoons which can be included in a nature park. Public access to the school play area needed careful consideration. As well, there was potential for creating a larger ‘outdoor’ classroom within the site design. The proposed universal play space would spill over into a park which was located on the north side of the school.

In order to realize these opportunities, an analysis of the environmental aspects of the site had to be conducted. The political and economic drivers were further considered as the design of the site evolved and constraints relative to safety, security, jurisdiction, and demographics of
owners of the single family developments came to light.

6.1 Context

The 'Port Coquitlam' community is comprised of about 122 hectares (301 acres) of land. It is located in the northeastern quadrant of Port Coquitlam. It lies in a transition zone between developed urban lands to the west and north, and agricultural land uses to the east and south. The Carnoustie Golf Course is located to the southeast and the City Lagoons (approx. 105,000 sm) are located to the northeast of the 'Port Coquitlam' Elementary School site (24,000 sm) and community park site (18,400 sm). As well, a new secondary school is under construction to the west of the elementary school site. A sports field, baseball diamond and running track also are proposed to the west. Appendix VI is an aerial photograph of the site as at September, 1997.

6.1.1 History of the Site

The 'Port Coquitlam' community has a predominately rural history with farm lands developing on the fertile flood plain of the Pitt River. In 1948, a flood occurred which rather devastated the established community resulting in dyking and the installation of several pump stations. All buildings are now to be 5.15 metres above the flood plain.

6.1.2 Environmental Factors

The chief constraint to developing this site is surface drainage. A detailed analysis of how the drainage is addressed relative to the streams, fisheries watercourses, and the City Lagoons is beyond the scope of this thesis. An understanding of the soil type, precipitation, topography, ecological sensitive areas, vegetation (native and invasive), and impacts of engineered infrastructure assisted in the site planning for the landscape architecture design. The concluding remarks will summarize how the site
drainage was managed relative to the site and such sensitive waterbodies.

The documents aiding the analysis of the environmental factors were:

- 'Port Coquitlam' Lagoon Hydraulic Study (Draft 1997)
- Environmental Assessment of Port Coquitlam (June, 1992)

6.1.3 'Port Coquitlam' Area Control Plan

This document, though dated March 1991, was useful to guide the design thesis with respect to the objectives and policies of the Corporation of the City of Port Coquitlam for, but not limited to:

- Residential land use
- Neighbourhood parks
- Community Destination Parks
- Safe Site Access

6.2 Environmental Considerations

6.2.1 Drainage

The City is bounded by the Coquitlam, Fraser and Pitt rivers. The general drainage pattern is from the north to the south. A number of constructed drainage ditches and pumping stations are used for storm water drainage.

The City Lagoons were originally primary sewage treatment facilities for Port Coquitlam and have not been used for 27 years. The entire infrastructure, including the sanitary force mains, remains intact and only the operation of them has changed. The infrastructure will support sewage overflows which as yet have never been recorded. The most critical condition that may occur would be if there was a sanitary pump station failure at the McLean Pump Station.

There is no surface water input to the Lagoons except for rain. While the infrastructure is in place for sewage overflow, input is restricted by gates and dykes.
Swales are located around the perimeters of the lagoons and these can drain into the lagoons by means of natural rivulets as can ground water. Cedar Creek, a salmon bearing creek, on the north side of the site, has a tendency to flood during peak flows and it is proposed by a Port Coquitlam planner, that a connecting stream between the Creek and the Lagoons would supply the Lagoons with needed fresh water input, while at the same time reducing the potential for flooding in Cedar Creek.

Surface drainage is directed through sloped sites to catchment areas over the entire ‘Port Coquitlam’ site. The school site has a small wetland forming in its center where cattails and flocks of ducks are abundantly present. Otherwise, the school site is flat with its edges falling off into a swale or a slope. The school site itself really has little interaction with the streams other than runoff from the site. Therefore much of the site planning included developing and enhancing a topography of shallow and dry ‘swales’ in the form of open grass spaces where the rainwater could recharge the ground water. The school’s playing fields were briefly examined for grading and drainage.

6.2.2 Topography

Approximately 45% of the land area with the City Boundaries lies within the flood plain of the three rivers. An extensive dyke system has been constructed along the Coquitlam and Pitt Rivers to prevent flooding.

6.2.3 Soils

Soils are silty to silty clay loam overlying coarse soils. The soils are fine-grained acting as an impermeable barrier hence the poor drainage of the area. The soils of the site are flood plain soils from mountain streams. The school site appears to have the silty clay loam mixed with gravel and sand. More specifically, in the Gartner Lee Environmental
Assessment report dated June 1992, an assortment of information on the surficial geology reveals that the site is a mixture of Fraser River sediments, mountain stream channel fill and overbank sediments, capilano sediments and bog and swamp.

6.2.4 Wildlife and Vegetation

The lagoons are inhabited by amphibians (possibly salamanders and/or frogs). Several birds and waterfowl were seen using the Lagoons - Green-winged Teal, the Wood Duck, a Great Blue Heron, mallards, Canada geese, goldeneyes, blackbirds, robins and wrens. Overwintering raptors can be found, particularly near Colony Farm and Red-tailed Hawks and Northern Harriers have been recorded. Appendix VII is a map prepared by Gartner Lee: Vegetation Communities in Port Coquitlam. Appendix VIII is an Environmental Plan also prepared by Gartner Lee.

The vegetation surrounding the lagoons and the school site included:

Black Cottonwood (*Populus trichocarpa*), Red Alder (*Alnus rubra*), Willow (*Salix alba*), Pacific Crab Apple (*Malus fusca*), Reed Canary Grass (*Phalaris arundinacea*), Hardhack (*Spiraea douglasii ssp. douglasii*), Himalayan Blackberry (*Rubus discolor*) and Salmonberry (*Rubus spectabilis*) bushes and Hawthorns (*Crateaegus laevigata*). All are ideal for creating riparian corridors contributing to the fish habitat.

6.2.5 Fish Habitat

The Coquitlam River and its tributaries represent a high priority system for fisheries management agencies, both federal and provincial. The area has a high potential as a producer of salmon however siltation has been a problem. A no net loss policy is now being applied to the habitat.

The potential to integrate the lagoons with a developing fish enhancement
network is significant and sustainable. The principal problems are lack of good water circulation and high water temperatures in the summer in the lagoons. Appendix IX is a rough draft of the Fisheries Classification Map dated July, 1998 for Port Coquitlam.

6.2.6 Climate

The Fraser Valley Lowland is classified as an inshore maritime zone. This area is reported to have some of the most cloudy and rainy weather in Canada. From April to September, Port Coquitlam has frequent long spells of sunny weather and the air is warm, moderated by the sea-breezes. The low rainfall in the summer sometimes results in soil moisture deficits but otherwise the significance of the wind is minimal.

6.2.7 Development

Industrial development in the City of Port Coquitlam expanded during the 1950's. The building of the Lougheed Highway lead to a boom. Industries included sand and gravel excavation, light industrial, foundries, metal manufacturers, chemical companies, and warehouse activities. The Meridian Industrial Park is predominately warehouse type activities. The Dominion Triangle, recently removed from the Agricultural Land Reserve, classified as having environmentally sensitive areas, is now under review for land uses.

Currently there are three development companies constructing in the area surrounding the 'Port Coquitlam' Site: Parklane Developments, Sure-Lok Properties, and the Quantum Group. The developments are predominately townhouses in the $250,000 to $350,000 range. The consumer who appears to be purchasing in this area are 45 and older, couples without children, who are settling to enjoy the amenities of the golf course and 'country life'. For example, in the Quantum Group development of the 75
townhouses, 55 have sold. Of the 55 units, one has been sold to a family with a two year old child.

With the exception of being required to build 5.15 metres above the potential flood line, the housing type really does not have to conform to any issues with respect to topography or soil conditions for example. The layout of the housing developments is another matter and further investigation is required with respect to the movement of children across this landscape to reach their school.

6.3 Summary of Site Considerations for the Landscape Design

The five most important site factors which contributed to the landscape design are: (a) topography, (b) surface drainage, (c) wildlife and vegetation, (d) climate, and (e) development. All factors impacted primarily the circulation on the site; the placement of vegetation colonies within landscape character zones; the placement of a constructed wetland; and the placement of common areas.

The creation of slopes on the north side of the park provide backdrops for wildflowers and elevated viewing into the park wetland. The slopes on average drop 1 metre. Therefore, because of the lack of significant elevations, view corridors through groves become essential to look into the center of the park. The groves are reduced in size to open the central area. Landformations and slopes also became important features in the school grounds for dividing spaces, creating viewing areas and enhancing play activities and physical activity. The design resulting from shaping the elevated flood plain, showed promise for varying topography between gently rising knolls and show depressions.

The overall circulation found within the greenway land use concept and park design has been approached through minimizing the human encounters with streams and wetlands while

42
embracing water features such as the lagoons. Respecting the recommended riparian leave areas requirements aids in determining where pathways should go beside stream corridors, as well, having main circulation paths away from sensitive water bodies helps. The lagoons are protected somewhat by the elevation of paths which surround them. Additionally, secondary channels are proposed to run beside the main paths in the park for flood control. Such channels are to be shaped as part of the landscape, covered in vegetation, and to serve their multi-purposes of adding an interesting topographic relief to a park which is flat while simultaneously acting as channels should an unexpected flood event occur.

Plant selection was kept to B.C native species as well as species typically found around wetland and riparian areas. In addition, an attempt was made to replicate the habitat that surrounds this site because replacing nesting habitat displaced by development needed to be considered. The site by the lagoons offered such an opportunity for nesting habitat that this aspect of the design could not be diminished in any fashion. In fact, it became a notable feature in the playground as well when a sand box was designed like a goose nest and an area was set aside for eco-forest projects.

Sail cloth shelters and roof overhangs found their way into the site. These elements are suggested to be included with part of the building design. Such shelters are considered because of the precipitation in the area and the need to provide reasonable shelter from rain and sun and that could easily be maintained, could be removed, and would respond to seasonal variations. The shelters were designed to provide comfortable outdoor spaces.

There has been rapid development of the area to match population growth. If the planners could implement the greenway and land use concept now before full development occurs, the ambience of Port Coquitlam will have cohesiveness and interconnectivity. The fact that town
homes and single family homes will be bordering the school and park, means too that the
neighbours can experience the school and park intimately. The concept that the school and park
spaces will be opened to the community, means perhaps that greater value can be placed on
community ownership of a park space.

6.4 The Programme

Below are the quantitative and design proposal particulars regarding the park and school
sites. The actual design of the site is to be completed by the end of April. Construction of the
school building may begin as early as April, 1999.

The proposed programme includes:

One grass playing field (no irrigation system)
Hard surface play area(s), to accommodate both school and neighbourhood use
Play equipment for children ages 2-7 and 7-11
Open green area
Parking for 48 cars, for both school and park use
School capacity for 375 students (14 classrooms and two kindergartens)
Main floor of school facility: 2,900 sq.m.
Area of school site: 24,280 sq.m.
Area of park site: Approx. 24,300 sq.m.

The proposed design included each of the foregoing programme elements. By applying
universal design principles to the design it was possible to unify different features into a common
theme that could be carried between the school site and the park site. An example of such a
principle would be the design of pathways with simple forms, not having significant 90 degree
angles and no dead ends. By providing a simple pathway the experience of the site was one of
easy access, smooth transitions, and clear lines of sight to the object of potential interest, and/or
view point. Another example, is the extension of the school parking onto the park site with the
implied (and bylaw) restriction to the parking being used for overflow parking when community
events were taking place at the school, or the reverse, when parking was increased on weekends.
because of sports or park events. By creating a shared space for parking, the multipurpose use of the space increased the options of how the park and school in combination could flexibly serve the surrounding community.

The site also gave an opportunity to create a universal play space that goes beyond the boundaries of the school playground itself to a larger, outdoor classroom within a community park. This added greater significance to the design by serving a larger population group. It also became possible to have a land swap between the school and the park located at the north of the site. Fiscally it made sense to share the facilities of both spaces. Ultimately, the Coquitlam Parks and Recreation Department and Education blended their efforts to make the highest use of the site under budget constraints. Play equipment, for example, would be included in the park site for unrestricted access during school hours and weekends, while the public washrooms for the park would be attached to the plumbing infrastructure of the school on the north side, also for easy access.

In the environmental review it was revealed that Port Coquitlam experiences contrasting precipitation patterns.

The Fraser Valley Lowland is classified as an inshore maritime zone. The mean daily maximum temperature...is 15 degrees with a mean annual precipitation from the same period being 1,930 mm (Atmospheric Environment Service, 1982)...In the winter, low pressure systems from the Pacific Ocean and the relatively warm, humid air produce some of the most cloudy and rainy weather in Canada. . . .The six month period from April to September has frequent long spells of sunny weather as Pacific high pressure cells move in. The air is warm but moderated by the sea-breezes. The relatively low rainfall during this period often results in agricultural soil moisture deficiencies in the summer months.\textsuperscript{16}

A ‘raincatcher’ shelter (Design Drawing No. 4 in Section 7.0) was provided in the park emulating the work of Architect: Norman Foster. The theme of the raincatcher sail clothe follows through into the school grounds in the form of providing the cover for the Goose Nest Sandbox,
the sails of the shipwreck, a few shade structures in the vegetable garden. Potentially, the sail clothe could be used for the roof overhangs over the outdoor play spaces that surround the school.

7.0 PERFORMANCE DESIGN GUIDELINES: DESIGNING GOOD PLAY ENVIRONMENTS

The design portion of this thesis implemented the results and insights gained from the research findings and literature review. In fact, speaking with the children was an inspirational experience that deepened the meaning of the design. Firstly, the thesis will bring together a comprehensive Matrix that links together the qualities of good play environments with the components which are often found as part of the design parameters for Landscape Architecture. The second portion will introduce the design itself and provide brief design guidelines.
Table No. 11. Good Play Environment Matrix

<table>
<thead>
<tr>
<th>Qualities for Good Play Environments</th>
<th>Supportive Elements in Play Environments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Topography</td>
<td>Direct</td>
</tr>
<tr>
<td>Diversity</td>
<td>Indirect</td>
</tr>
<tr>
<td>Natural Areas</td>
<td>Direct</td>
</tr>
<tr>
<td>Natural Elements</td>
<td>Indirect</td>
</tr>
<tr>
<td>Surfaces</td>
<td>Direct</td>
</tr>
<tr>
<td>Soft</td>
<td>Indirect</td>
</tr>
<tr>
<td>Hard</td>
<td>Direct</td>
</tr>
<tr>
<td>Play Pieces</td>
<td>Direct</td>
</tr>
<tr>
<td>Accessibility</td>
<td>Direct</td>
</tr>
<tr>
<td>Sequence of Movement</td>
<td>Direct</td>
</tr>
<tr>
<td>Manipulation</td>
<td>Indirect</td>
</tr>
<tr>
<td>Stimulus for Cognitive Play</td>
<td>Direct</td>
</tr>
<tr>
<td>Stimulus for Social Play</td>
<td>Indirect</td>
</tr>
<tr>
<td>Graduated Challenge</td>
<td>Direct</td>
</tr>
<tr>
<td>Safety</td>
<td>Direct</td>
</tr>
<tr>
<td>Security</td>
<td>Direct</td>
</tr>
<tr>
<td>Simplification</td>
<td>Direct</td>
</tr>
</tbody>
</table>
7.1 Good Play Environment Matrix

Qualitative responses have been placed on Table No. 11 Design Element Matrix. The matrix creates a composite list for the qualities of a good play environment for children. The qualities are paired with topography, natural areas, natural elements, equipment, surfaces (hard or soft) and accessibility. The measure is whether there could be a good fit between a natural element and the quality of play that could take place with the natural element present. The fit can either be a direct or indirect fit or not exist.

The topics that can be examined superficially through the matrix are:

- **Diversity** of the good play environment  For a child, physical space is more than an activity space. It is an emotional space and when it is used by more than one child at a time, it can produce a little bit of conflict or it can encourage cooperation among children. Diversity means that parts of a space can: (a) be used by more than one child at a time; (b) be used in more than one way; (c) serve more than one function; (d) have a variety of different circuits within the space; (e) have a variety of ways to get up and down; (f) have varied cultural activities; and (g) have the greatest variety of different activities.

- **Sequences of movements** for children can be varied, not patterned, and move from the use of fine motored movement to gross motored movement.

In the wilds of homes and yards, how do children usually move? They race pell mell, hop, zig zag, and inch along. They rarely move like adults, measured strides from Point A to Point B. The primal urge to climb on, crawl under, squeeze in, and so on often compels action. . . .Children's settings can be characterized in terms of mobility in two ways: freedom to move within the setting from place to place or activity to activity, and the amount of mobility allowed or required by the routines and activities.17

Walking and running are enjoyed by all not only for the pleasure of actual movement, but also because of the new sights to see, the adventures experienced. For the
designer, this movement means: (a) easy access to the outside or common space, (b) abundant space that is well organized and (c) open space that allows free expression through movement.

• *Manipulation.* "If anything is clear about the learning environment, it is that children need *stuff*, loose parts to manipulate, things to take apart and put together. Manipulatives encompass small or fine motor, perceptual motor, cognitives, dramatic play, science and math... . children will manipulate... and test their physical powers of motor and perception, their cognitive understandings, and their imaginations.” *(Greenman, 1998, p. 170)*

For designers, manipulation means designing spaces that: (a) allows a child to add or modify; (b) provides for storage, for display, boundaries or areas to contain loose parts and defined spaces that allow individual territory; and (c) allow games or projects to be carried out by two to four children at once.

• *Stimulus for cognitive play.* In this type of play, the child is testing ideas, exercising ingenuity, manipulating objects and using their curiosity and imaginations. Cognitive play is a concentrated effort. Designers can help in this activity by (a) providing a safe environment into which a child can play when their attention is diverted to examine something very minute; (b) providing outdoor rooms that give good sitting areas encouraging group interaction; (c) providing the space that permits the leaving of a creative mess; and (d) protecting cognitive play spaces from noisy environments and intrusions from physical and social play.

Quiet, retreat play goes well next to creative, cognitive play and this grouped with it to simplify the associations in the design for ‘Port Coquitlam’ Elementary. The designer
can: (a) provide caves and tunnels for hiding; and (b) match the scale of the design with the child. The scale helps with the freedom to escape and be independent as such spaces often do not permit adult access without difficulty.

- **Stimulus for social play and interaction.** Similar to the design considerations for cognitive play, designers can help by designing for the development of social skills and cooperation in the play of children. This can be accomplished by (a) the creation of outdoor spaces that encourage conversation to occur; (b) creating spaces that are scaled for the child to move an object in to share with others e.g. a cardboard box; (c) including a common space where manipulative objects e.g. dump trucks, tents, tricycles can be grouped and then be scattered; and (d) designing for the complete use of the whole body. This type of play will not find conflict with physical play areas.

- **A graduated challenge for abilities and age groups.** Designers can design climbing logs that have different heights of steps, footholds, and hand holds. Rocks can be graduated in size and abutted with each other for climbing. Spaces therefore need to be designed that: (a) have a hierarchy of the design features e.g. different sizes of loose objects, a variety of graded and sloped surfaces; (b) provide alternatives to differing heights and reaches for children in play equipment, for example; and (c) provide for alternate play activity, where physical play may be minimal, and sensory experiences are sought e.g. tactile (touch) exploration, exploration by taste.

- **Safety and security.** Providing for the safety and security of children is one of the most important design considerations. This thesis will not address this issue in the main. There is an interview from the School Safety Liaison Officers. The principles for crime prevention through environmental design are not elaborated upon in this thesis but are
principles that can guide the location of the playground relative to streets, parking lots and vacant lots.

- Simplification. Applying the principles of universal design mentioned at the beginning will assist the designer in addressing this criteria. Examples of simplification include: (a) the creation of paths with no dead-ends; (b) the reduction in sharp bends in the paths; (c) vegetation selections that allow light through, have raised canopies with clear visibility to other areas; (d) smooth transitions and convenient access from adjacent interior and exterior areas; (e) imaginative use of materials on surfaces, walls, doors, windows, that send sensory cues of how to engage in play e.g. A ball wall with colourful bullseyes to aim at and the ball comes back to you - the activity is easy to do and engages the child simply in eye-hand coordination play.

7.2 Research-Design Connections

The points that follow are organized around a presentation of the design for the ‘Port Coquitlam’ School and its adjacent park site. The approach is to introduce the larger context of the site, give the design of the park site with accompanying drawings, discuss the school site at the larger scale and then examine specific designs for the Kindergarten to Grade 2 and Grades 3 to 6 outdoor play spaces. The sections below, therefore, are summarizing the research-design connections which are presented in detail in Appendix XII.

7.2.1 The Greenway Connection

In an attempt to solve a concern for interconnectiveness of a community, a greenway and lands use plan was developed (Drawing No. 2). The concept was to facilitate safe circulation through the ‘Port Coquitlam’ Community to connect the neighbourhoods to the city lagoons and to the dykes along the Pitt River. The concept
needed to have appeal for the community, the developers and the planners. It attempted to increase the movement of people, plants, animals, and water to give the ‘Port Coquitlam’ community wholeness and to promote sustainability by supporting the biological diversity of the area. It was successful in including the new park site and the elementary school site so that both sites could be accessed by the community as common areas serving education and recreation functions.

7.2.2 The Park

To design the park site, it was necessary to ask a few questions of many stakeholders. Referring to Tables No. 8, 9, and 10 (Appendix IV) will provide some of the insights and concerns conveyed by the stakeholders. To bring the survey results into the design it was necessary to ask how the results could effect the conceptual design stage. As the design responses and interventions addressed the concerns of the community and stakeholders, specific issues and practical solutions came to light such as: controlling access to different portions of the park through a hierarchy of trails; simplifying the design to 3 to 5 landscape character zones; increasing safety and security by not providing lighting, decreasing the size of vacant open spaces, and providing viewing corridors.

7.2.3 The School

The survey interviews with the children were enlightening and inspiring. They stimulated a design response that created age appropriate designs for two areas of playgrounds: Kindergarten to Grade 2 and Grades 3 to 6. Providing diversity and yet balanced consistency between play features proved challenging as did balancing large open spaces used for sports with small intimate spaces created for social and cognitive
play. The multiple use of space meant that both adult oriented and child oriented spaces needed to be created providing for different scales. For example, the ‘Circle of Friends’ amphitheatre also performed the duty of being the outdoor garden spaces for a nature science classroom. The increased access of the school site by the community also meant that comfortable seating and shelters needed to be provided. Storage within the school but accessible from the outdoors was provided for playground pieces, found objects, and toys, for example. The school design at various scales is comprehensive and detailed.

The layout of a play space requires careful consideration. The designer wants to create play spaces that ensure frequent use. One of the purposes of the survey was to obtain insight into children’s feelings and perceptions of play landscapes in order to determine what would attract them to a play site on a frequent basis. Table No. 6, Design Element Matrix, together with the discussion in Section 5.0 of this thesis, contributed to the guidelines in Appendix XII.

7.2.4 Play Activity

Children are wonderfully prepared for active learning through play. From the results of this study, it is evident that children need an environment rich in experience. It is during recess that play happens, and the author recalls that recesses were often too short. Designing for the kindergarten to grade two means understanding the qualities of good play as described previously. Creating a range of play environments that offers the comfort and security of play while at the same time allows the risk and mobility of play is important.

For the child in the between years of grade 3 to 6, this study appears to support the concepts in cognitive development wherein the child attempts to make the world sensible.
by constructing or discovering the properties and relationships that make the world work.

Play at this stage gains complexity as children are able to assimilate more information and associate that information. The design for the older child's playground reflects the increased complexity.

7.2.5 Universal Access

The author maintains that flexibility and ease of use are integral to universal access. For the child with varying levels of ability, play can be fun or it can be difficult to do. Whether they can access the play environment and be included with other children makes the difference, in the author's opinion, between a well adjusted child who succeeds later in life and a child who struggles with their own attitudes toward barriers or attitudes of others about what they are able to do.

Universal design is a design approach which combines barrier-free design with design for "all degrees of sensory awareness, all types of locomotion, and all levels of physical and intellectual function." There are fundamental requirements and considerations for universal design but it is addressing the needs of children where further research in universal design needs to occur. As it is, the design guidelines outlined in Appendix XII are basic and research in greater detail is the intent for the future.
8.0 DESIGN RESPONSE

8.1 Design Drawings

The design drawings are presented here in an orderly fashion beginning from the larger context drawings to specific site designs, elevations and concept details. The order in which they will appear is as follows:

- The overall perspective vision.
- Greenway and land use plans for Port Coquitlam.
- School and park site plan (Scale: 1:500)
- The raincatcher shelter
- ‘Port Coquitlam’ Park design - park images and concepts
- ‘Port Coquitlam’ Park design
  - site plan, sections and elevations
  - constructed wetland & stormwater management - elevations and concepts
- Bubble diagram of landscape character zones
- Bubble diagram of park circulation and spatial planning
- ‘Port Coquitlam’ School Playground Images
- ‘Port Coquitlam’ School playground design - Kindergarten to Grade 2 (Scale: 1:100)
- Play Activity Zone Bubble Diagram - Kindergarten to Grade 2
- ‘Port Coquitlam’ School playground - Kindergarten to Grade 2 - Elevations and Sections
- ‘Port Coquitlam’ School playground design - Grade 3 to 6 (Scale: 1:100)
- Play Activity Zone Bubble Diagram - Grade 3 to 6
- ‘Port Coquitlam’ School playground design - Grade 3 to 6 - Elevations and Sections
- ‘Port Coquitlam’ School memory courtyards
PUTTING PRETTY AND PLAY INTO RIVERWOOD PARK
‘PORT COQUITLAM’ PARK DESIGN
PARK IMAGES AND CONCEPTS

PHOTO CREDIT: Johnson & Millard, How To Grow
The Wildflowers

WETLAND AND BOARDWALK DURING WET OR DRY SEASON
SECTION B-B
SCALE 1:250
EAST VIEW

RAISED ASPHALT PATHWAY UNDER ELEVATED TREE CANOPY
GROUND COVER MIX OF BC NATIVE SPECIES AND WILDFLOWERS

- PACKED GRANULAR STONE
- 1% SLOPE AT EDGES FOR DRAINAGE
- PERIMETERS OF PATHWAY TO HAVE REINFORCED WOOD SOLDER BLOCKS AND ROCK EDGES ON TOP W/ SEEDED WILDFLOWERS

PEDESTRIAN PATHWAY OF PACKED GRANULAR STONE
- MINIMIZE X-SLOPE
- 2% MAX SLOPE

SECTION C-C
SCALE 1:100

MEADOW FLOWERS, GRASSES, SEDES, FERNS
- NESTING HABITAT ENHANCEMENT
- ROCK FORMATIONS AND CLUSTERS OF TREES TO PLAY UNDER, WITHIN AND AROUND

SECTION D-D
SCALE 1:50
EAST PLAZA
KINDERGARTEN TO GRADE TWO

'PORT COQUITLAM' SCHOOL PLAYGROUND IMAGES

GOOSE NEST SANDBOX

- SEASIDE, ESTUARY OR CLEAN, NATURAL SAND
- SAND TO BE WASHED
- 1.5 MM TO VERY FINE

SAND PLAY PROMOTES HAND MANIPULATION FOR THE CHILD WITH SPECIAL NEEDS

- LOCATE SANDBOX IN PARTIAL SHADE AREA
- COVERS FOR SANDBOX NEEDED
- ADEQUATE DRAINAGE VIA PERCOLATION, OR TILE OR DRAIN LEACH FIELD

CONCEPTS & SECTIONS
DONNA M. RODMAN
March, 1999
THE BETWEEN YEARS
GRADES 3 TO 6

SCHOOL ECO-PROJECT

PLAY AS FUN
- STRETCHING THE IMAGINATION IN ADDITION TO THE MUSCLES
- PLAY AS INITIATION AND REALIZATION OF SCHEMAS
- PLAY AS WONDER AND DISCOVERY
- PLAY BUILDING CHILDHOOD RELATIONSHIPS AND LASTING FRIENDSHIPS
- PLAY AS AN EXPERIENCE

SENSORY SPACES
- CAN BE USED SAFELY BY ALL CHILDREN
- CREATE RESPONSES TO THROUGH THE INTERACTION AND MANIPULATION BY THE CHILD - CHILD IS IN CONTROL & IS ENRICHED
- PLAY CREATED WITH AN ACTIVE COGNITIVE RESPONSE AS PART OF THE PLAY
- USE OF TACTILE PLANTS, AROMATIC PLANTS, PROMPT COLOURS
- SOUNDS OF WIND FLOWING THROUGH BAMBOO STALKS, WOODSHIBES OR A MOBILE FOREST
- WORKING THROUGH LAND TO FEEL AND SMELL THE FOLIAGE
PORT COQUITLAM' SCHOOL PLAYGROUND
KINDERGARTEN TO GRADE 2
ELEVATIONS AND SECTIONS

KINDERGARTEN TO GRADE TWO
SECTIONS
DONNA M. RODMAN
PORT COQUITLAM' SCHOOL PLAYGROUND DESIGN
GRADE 3 TO 6

PLAN VIEW Gr. 3-6
Scale: 1:100
RIVERWOOD ELEM.
PLAY AND CIRCULATION

3-5 Grades

PLAY ACTIVITY ZONES:

COGNITIVE PLAN
- Creative Problem-Solving
- Cognitive Activity
- Communication (Spoken Word)
- Social Skills (Group Conferences, Play, Work)
- Repeat Reads

PHYSICAL PLAN
- Coordination, Speed, Agility
- Balance, Movement
- Gross Motor Activity
- Cooperative Play - Grand Schemes
- Social/Dramatic

INTERMEDIATE PLAN
- Transition Activities
- Stratified Planning
- Fine to Gross: Play Time

SPORTS FIELD

PLAY ACTIVITY ZONE BUBBLE DIAGRAM
GRADE 3 TO 6
8.2 Summary

School grounds are transition zones between a school facility and a community. In the case of ‘Port Coquitlam’, the transition space was even greater with an accompanying park and lagoons. By examining, photographing and researching the information on the ‘Port Coquitlam’ Area, it was possible to obtain a greater understanding of how the park and school site would fit into the rest of the community. The links created by the pathways through the park site from Cedar Creek and to the City Lagoons knitted the site to its boundaries. It brought together the issues of accessibility within the community as well as the possibility of increasing the community’s access to a delightful dyke trail system along the Pitt River.

The analysis also brought to bear the environmental underpinnings of the entire site within its context. We, as Landscape Architects, want to understand the numerous environmental influences which will have an impact on site design.

The analysis aided greatly in preparing the Park/School Design Plant List (Appendix VIII) as plant species present on or near the site (Section 6.2.4) were incorporated into the planting selections for the park and the school. Because the school ground design included an eco-forest project, it was determined that some of the vegetation would attempt to replicate the riparian and forested environment in which the site was originally located. The exceptions included specimen trees for viewing and seasonal variety in both the park and the school; and the bamboo forest, the edible bosque, the sensory garden, all located in the play grounds.

The concern was for drainage and flood control measures resolved by shaping the topography of the land on the park side to provide secondary channels which could be used to accept overflow in a flood and gives the site relief and interest for the park visitor.
Additionally, a constructed wetland was included in the design. It served as a solution to many different problematic aspects on the site. It pleased the RCMP in that there would not be such an enormous open field in the center of the park. It was aesthetically pleasing to visualize the wetland and would be an amenity to attract the community to the site. The wetland became a technique for holding water in the area producing an alternative pattern of distribution for storm drainage systems. The wetland would serve to provide (a) infiltration for urban runoff; (b) the potential for ground water recharge; and (3) water for wildlife. In general, the more water there is in a landscape, the larger and more diverse is the wildlife community.19

As the design for the school playgrounds evolved, it became clear that a unifying theme needed to prevail. Several themes actually began to take shape: the repeat use of landsforms and vegetation to shape spaces; the continued concept of using canvassed structures for shelters; plant selections were B.C. natives and wetland plant species predominately; and the insistence of applying universal design principles for bridges and walkways for example.

9.0 CONCLUSIONS

This work suggests that every professional Landscape Architect may find it useful to follow and consider the performance design guidelines as a basis for the design of play spaces for children. The guidelines are comprehensive with potential to be developed in detail.

The following are the ten basic functions to consider:

(a) to design in an interdisciplinary framework;
(b) to design with a deep knowledge of the user group;
(c) to design with an openness to allow for different ways of viewing the natural environment;
(d) to design after consulting with user groups who impact the principal user group;
(e) to design holistically, creating links to the larger context;
(f) to design with a fundamental theme recognizing that nature is the best designer;
(g) to design with a knowledge of work or ideas that have preceded you;
(h) to design with the intention that something new may come of your insight, or not;
(i) to design consciously within socially responsible paradigms; and
(m) to design for equitable diversity and inclusion.

This thesis is to be the start of a journey into the private world of the young child and their play. It is also a very important step in realizing the critical importance of our design in molding and shaping the lives of the generation to follow.

2Scarfe, Neville V. (1990). The Scarfe Papers. Edited by The Children’s Play Resource Centre: Unless otherwise footnoted, reference from this booklet will be indicated by ‘Scarfe’ with the date and page number in parenthesis.


12 Ellis, M. J. (1973). Why People Play. New Jersey: Prentice-Hall, Inc. p. 135. Unless otherwise footnoted, reference from this paper will be indicated by ‘Ellis’ with the date and page number in parenthesis.


15 Stine, S. (1997). Landscapes for Learning. New York: John Wiley & Sons, Inc., p. 47. Unless otherwise footnoted, reference from this paper will be indicated by ‘Stine’ with the date and page number in parenthesis.


Links, cahd@ncsu.edu.

Branch, Province of British Columbia.


APPENDIX I

RESEARCH SURVEY TOOL

OUR CHILDREN IN THE LANDSCAPE:

THE UNIVERSAL PLAY SPACE
QUESTIONNAIRE

OUR CHILDREN IN THE LANDSCAPE:
THE UNIVERSAL PLAY SPACE

DONNA M. RODMAN Dipl. Nursing, B.A., CTech
THE UNIVERSITY OF BRITISH COLUMBIA
SCHOOL OF LANDSCAPE ARCHITECTURE
SURVEY QUESTIONNAIRE

It is striking to note the discrepancies between what we know and what is practiced in the design of various environments. The natural elements which are supportive of the physical, social, developmental and emotional needs of children can be determined by examining what children are feeling and what children are learning as they integrate and play in different landscapes.

1. QUESTIONNAIRE FOR THE PARENTS

My name is Donna Rodman and I am a graduate student in Landscape Architecture at the University of British Columbia and as part of my research, I am conducting interviews of parents and their children. The purpose of my research is to find out how suitable landscapes are that we design and what is an environmental fit that meets the needs of children. I would like to thank you for agreeing to participate in this questionnaire and it will take approximately 30 minutes of your time to complete. Please do not write your name on this survey to assist me in keeping your comments confidential.

For each question, unless otherwise instructed, please circle the number for ONE response which best reflects your opinion.

1 What do you see as valuable in the play environment for your children?

<table>
<thead>
<tr>
<th></th>
<th>Strongly Valued</th>
<th>Somewhat Valued</th>
<th>Neutral</th>
<th>Somewhat Not Valued</th>
<th>Absolutely No Value</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Natural Setting</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>2. Learn about Environment</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>3. Learn about Wildlife</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>4. Jungle Jim Playground (Manufactured Play Equipment)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>5. Physical Play (Active)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>6. Swing Set</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>7. Playgrounds that Children Build</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>8. Mental Play (Passive)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>9. Group/Cooperative Play</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>10. Playing with Parent</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

2 Do you agree or disagree that your child enjoys playing with or in the following:

<table>
<thead>
<tr>
<th></th>
<th>Strongly Valued</th>
<th>Somewhat Valued</th>
<th>Neutral</th>
<th>Somewhat Not Valued</th>
<th>Absolutely No Value</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Tether Ball</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>2. Swing Set</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>3. Teeter-Totter (see-Saw)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>4. Monkey Bars</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>5. Slide</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>6. Monkey Rings</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>7. Balance Beam/Low Wall</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>8. Tires (Tunnel)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>9. Tires (Swing)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>10. Spinning Saucer</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>11. Hobby Horses</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>
2. Do you agree or disagree that your child enjoys playing with or in the following? (cont.)

<table>
<thead>
<tr>
<th>Item</th>
<th>Strongly Valued</th>
<th>Somewhat Valued</th>
<th>Neutral</th>
<th>Somewhat Not Valued</th>
<th>Absolutely No Value</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sand Box</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Climbing Trees</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Climbing Rocks</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Playing in Natural Stream</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Playing in Fountain</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Playing in Water Park</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Climbing in Ruins</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Hiding in Bushes</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Hiding in Caves or under Tables</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Treehouses</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Damming Streams of Water</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Beachcombing</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Family Pet</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Other Friends</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Solitary</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

3. How do you feel your child is responding to the following play areas?

<table>
<thead>
<tr>
<th>Play Area</th>
<th>Very Happy</th>
<th>Somewhat Happy</th>
<th>Neutral</th>
<th>Somewhat Unhappy</th>
<th>Absolutely Unhappy</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Back Yard</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Shared Common Space</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Daycare</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>School Yard</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Friend's Yard</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Neighbourhood Park</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Corner Store</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Beach</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Bike Trail</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

4. Is the physical accessibility to enter the following play site something you are happy with?

<table>
<thead>
<tr>
<th>Play Site</th>
<th>Very Happy</th>
<th>Somewhat Happy</th>
<th>Neutral</th>
<th>Somewhat Unhappy</th>
<th>Absolutely Unhappy</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Back Yard</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Shared Common Space</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Daycare</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>School Yard</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Friend's Yard</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Neighbourhood Park</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Corner Store</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Beach</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Bike Trail</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

5. Are you seeing a change in your child's behaviour in the following play areas? (Please briefly describe the behaviour - eg. happy, curious, withdrawn, frustrated.)

<table>
<thead>
<tr>
<th>Play Area</th>
<th>Positive</th>
<th>Negative</th>
<th>None</th>
<th>Comments:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Back Yard</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shared Common Space</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Daycare</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>School Yard</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Friend's Yard</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neighbourhood Park</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corner Store</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beach</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bike Trail</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For each question that has boxes, please place a check mark in the box of your choice.
5. Are you seeing a change in your child by their participation in the following play areas? (Please briefly describe their behaviour - e.g. happy, curious, withdrawn, frustrated). (cont.)

<table>
<thead>
<tr>
<th>Positive</th>
<th>Negative</th>
<th>None</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>6. Neighbourhood Park</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Corner Store</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Beach</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Bike Trail</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6. In 3 or 4 words, please state what aspect of the play environment in the following play areas you are happy or unhappy with for your child:

1. Back Yard:
   - Very Happy __________________________________________ (1)
   - Somewhat Happy ______________________________________ (2)
   - Neutral _____________________________________________ (3)
   - Somewhat Unhappy ____________________________________ (4)
   - Absolutely Unhappy ___________________________________ (5)
   - N/A ________________________________________________ (6)

2. Shared Common Space:
   - Very Happy __________________________________________ (1)
   - Somewhat Happy ______________________________________ (2)
   - Neutral _____________________________________________ (3)
   - Somewhat Unhappy ____________________________________ (4)
   - Absolutely Unhappy ___________________________________ (5)
   - N/A ________________________________________________ (6)

3. Daycare:
   - Very Happy __________________________________________ (1)
   - Somewhat Happy ______________________________________ (2)
   - Neutral _____________________________________________ (3)
   - Somewhat Unhappy ____________________________________ (4)
   - Absolutely Unhappy ___________________________________ (5)
   - N/A ________________________________________________ (6)

4. School Yard:
   - Very Happy __________________________________________ (1)
   - Somewhat Happy ______________________________________ (2)
   - Neutral _____________________________________________ (3)
   - Somewhat Unhappy ____________________________________ (4)
   - Absolutely Unhappy ___________________________________ (5)
   - N/A ________________________________________________ (6)

5. Friend's Yard:
   - Very Happy __________________________________________ (1)
   - Somewhat Happy ______________________________________ (2)
   - Neutral _____________________________________________ (3)
   - Somewhat Unhappy ____________________________________ (4)
   - Absolutely Unhappy ___________________________________ (5)
   - N/A ________________________________________________ (6)

6. Neighbourhood Park:
   - Very Happy __________________________________________ (1)
   - Somewhat Happy ______________________________________ (2)
   - Neutral _____________________________________________ (3)
   - Somewhat Unhappy ____________________________________ (4)
   - Absolutely Unhappy ___________________________________ (5)
   - N/A ________________________________________________ (6)
6 (Cont.)

7. Corner Store:
   - Very Happy  
   - Somewhat Happy  
   - Neutral  
   - Somewhat Unhappy  
   - Absolutely Unhappy  
   - N/A  

8. Beach:
   - Very Happy  
   - Somewhat Happy  
   - Neutral  
   - Somewhat Unhappy  
   - Absolutely Unhappy  
   - N/A  

9. Bike Trail:
   - Very Happy  
   - Somewhat Happy  
   - Neutral  
   - Somewhat Unhappy  
   - Absolutely Unhappy  
   - N/A  

7 In 3 or 4 words, please state what, if any, concerns you may have about your child at the following sites:

   - Back Yard  
   - Shared Common Space  
   - Daycare  
   - School Yard  
   - Friend's Yard  
   - Neighbourhood Park  
   - Corner Store  
   - Beach  
   - Bike Trail  

8 What do you think about the design of the perimeter or edge of the site in relation to the security of your child (ie. molesting, drug pushers, abduction, bullying)?

   - Back Yard  
   - Shared Common Space  
   - Daycare  
   - School Yard  
   - Friend's Yard  
   - Neighbourhood Park  
   - Corner Store  
   - Beach  
   - Bike Trail  
9 Do you drive your child places he/she wants to go after school or on weekends?
1. Yes □
2. No □
3. No License □
4. No Car □
5. Depends on Where □

10 About how many of your son's/daughter's friends live within walking or bicycling distance of your home?
1. More than half □
2. Less than Half □

11 Has there ever been a problem of traffic safety for children in your neighbourhood?
1. Yes □
2. No □
3. Uncertain □

12 How much do you worry about children's safety in your neighbourhood?
1. A lot □
2. Some □
3. Not very much □
4. Not at all □

13 Are children afraid to walk around your neighbourhood during the day?
1. Yes □
2. No □
3. Not sure □

14 After school and on weekends, how often does your son/daughter go to places outside the neighbourhood by himself/herself or just with friends?
1. Once a week or more □
2. Less than once a week □
3. Never □

15 Are there enough safe places in your neighbourhood for your son/daughter to play?
1. Yes □
2. No □
3. Not sure □

Finally, could you please answer the following questions:

16 Are you:
1. Male □
2. Female □

17 Please list only the ages of all family members living in your household.

Father's Age □ 1 00 - 14 □ 7 40 - 44 □ 2 15 - 19 □ 8 45 - 49 □ 3 20 - 24 □ 9 50 - 54 □ 4 25 - 29 □ 10 55 - 59 □ 5 30 - 34 □ 11 60 - 64 □ 6 35 - 39 □ 12 65 - 69


Sons' Ages □ □ □

Daughters' Ages □ □ □

Other family members' ages: Grandparents, Daughter or Son in Law, Aunts, Uncles

Relationship □ Age □

Relationship □ Age □

18 What is your family heritage or ethnic background?

19 All together, how many years have you lived at your present address?
1. Less than one year □
2. A number of years □

20 In what city, district or municipality do you live?
21 Are you currently:
1. Married    □  4. Divorced □
2. Have never been married □  5. Widowed □
3. Separated □

22 What is the last grade or year of school you completed?
1. Some Elementary □
2. Elementary School □
3. Some High School □
4. High School Grade □
5. Some College □
6. College Graduate □
7. Some Graduate School □
8. Graduate/Professional Degree □

23 Are you currently?
1. Employed Full Time □  5. Full-Time Student □
2. Part Time □  6. Part-Time Student □
4. Self-Employed □

24 Do you own your home or do you rent it?
1. Own □  2. Rent □  3. Other □  Please specify

Those are all the questions I have. Thank you very much for your time and help. My faculty advisor, Patrick Mooney, will have the results of the study in the form of a report if you should want them. I will be visiting on ___________ to interview your child.

11. Interview of Children

Hi, my name is Donna. I am a student at the University of British Columbia. I am doing some work to find out whether you like certain places or not. What we are going to do is look at some pictures together and I want you to tell me how much you like the pictures and what you feel is special about the picture for you. You can tell me to stop or if a picture scares you, please tell me that too.

For each picture, I want you to point to the circle that best tells me that you like it. The big circle with lots of colour tells me you really like that picture. The smaller circle in yellow tells me you sort of like it. The very little circle tells me you don’t like the picture very much. Before I start, are there any questions?

A. Begin flip chart of questions after clarifying the following symbols with the child.

![Symbols](image)

Please record any responses as to any features or special meanings / feelings
For the supervising Parent/Interviewer:
Please complete demographic information below

1. Age of Child
2. Sex of Child
   1. Male
   2. Female

Please put an 'X' in the box you want

B. I want you to think about going to school now.

3. How do you get to school?
   1. Walk
   2. Bus/Driven

4. Do you have a long way to go to get to school?
   1. Yes
   2. No

   How do children measure distance?

5. Is it easy getting to school or hard getting to school?
   1. Easy
   2. Hard

6. Is it fun getting to school or it not fun getting to school?
   1. Fun
   2. Not Fun

Response:
7 Can you tell me why it is easy/hard getting to school?
   1. Easy: 
   2. Hard: 

8 Can you tell me why it is fun/not fun getting to school?
   1. Fun: 
   2. Not Fun: 

Please have the child answer freely and ‘a lot’, ‘some’, ‘most time’, ‘little time’, are notable answers.

9 How much do you like playing at home?
   1. 

How much do you like watching TV?
   2. 

How much do you like playing in the school yard?
   3. 

How much do you like playing with your friend in your friend’s yard?
   4. 

How much do you like playing on the computer?
   5. 

10 How often do you play in the school yard after school?
   1. Less than once a week
   2. Once a week or more
   3. Not applicable

11 How often do you play in the school yard on weekends?
   1. Less than once a week
   2. Once a week or more
   3. Not applicable

12 Are you ever scared when you go to play somewhere?
   1. Yes
   2. No
   3. If yes, what scares you?

13 Is it safe in your neighbourhood to be out alone during the day?
   Please check one box.
   1. Very Safe
   2. Safe
   3. A little safe
   4. Not safe at all

14 What things don’t you like about the neighbourhood?

   Traffic
   Crossing a big street
   Noise
   No other children around
   Neighbourhood needs more facilities (ie. playground) and recreation services or programs
14 What things don't you like about the neighbourhood? (Cont.)

Other comments noted: ___________________________________________________________ [6]

______________________________________________________________________________

15 What things do you like about the neighbourhood?

Little or no traffic ______________________________________________________________ [1]
It's quiet _________________________________________________________________________ [2]
Can hear and see the animals ____________________________________________________ [3]
Lots of friends to play with _______________________________________________________ [4]
Lots of places to go for fun ________________________________________________________ [5]
No big streets to cross ___________________________________________________________ [6]
Other comments noted: ___________________________________________________________ [7]

______________________________________________________________________________

16 Do you ever visit friends of yours who live too far away for you to walk there or go by bike?

1. Yes [ ]
2. No [ ]

How do you get there? ____________________________________________________________ [1]

That is all the questions I have. You have been very helpful and I thank you. I am going to give you a little certificate for participating and helping me and you can place it on your dresser or in a book.
APPENDIX II

TERMINOLOGY IN CHILD DEVELOPMENT


Adaptation. Effective interaction with the environment. For Piaget, interaction is a cognitive one involving the child’s use of sensorimotor, Pre-operational, or operational thinking skills. It is subdivided into assimilation and accommodation...in assimilation, the child tries to incorporate features of the environment into already existing ways of thinking about them. In accommodation, the child tries to incorporate new features of the environment into her thinking by slightly modifying existing modes of thought. Working with tools never used before but having observed being used, the child will realize certain movements will give certain results. This is assimilation. Adjusting how the tools are used as a result of experiencing them is called accommodation.

Organization. The child is continually integrating and coordinating many branches of knowledge.

Equilibration is a third mechanism invoked to explain how a child shifts from one stage to the next. The goal of better organization is to reach a more lasting state of balance in thought. This goal is achieved as thought becomes more logical and abstract.

Preoperations. The child’s symbolic system expands and use of language and perceptual images moves well beyond his abilities at the end of the sensorimotor period. . . .The Pre-operational stage is sometimes divided into an earlier phase (two to four years of age) and later phase (five to seven years of age).

- Egocentrism, the child’s inability to distinguish easily between his own perspective and that of someone else. Examples of this perspective deficit abound in the young child’s social interactions. . . .a telephone conversation between four year-old Mary, who is at home, and her father, who is at work.
  Father: Mary, is Mommy there?
  Mary: (Silence; nods)
  Father: Mary, may I speak with Mommy?
  Mary: (Again, silence; nods)

- Animism, the belief that inanimate objects have human qualities and are capable of human action. Remarks like “That tree pushed the leaf off and it fell down” or “The sidewalk was angry with me. It made me fall down” . . . Animism is a failure to distinguish the appropriate occasions for employing the human and the nonhuman perspectives.

- Conservation. The child’s inability to conserve properties of objects in the face of superficial changes in their appearance. Consider the child confronted by two identical glass beakers, A and B, filled with milk to the same height. Beside them is an unfilled beaker, C. Beaker C is tall and narrow, beakers A and B are shorter and have a larger
diameter. The milk is poured from B into C, and the child is asked whether the amounts of milk in A and C are the same or different. The nonconserver will say the amounts are different, tending to judge sameness or difference in terms of the relative heights or widths of the two containers. He fails to understand that both containers hold the same amount of milk, even though they look different.

- **Hierarchical classification.** Faced with a random collection of objects that can be grouped on the basis of two or more properties, the child is seldom able to use these properties consistently to sort the objects into what an adult would refer to as a good classification. An important social consequence of these deficits in the young child’s thinking with classes is that he fails to understand: (a) the various ways people can be cross-classified with regard to social characteristics; and (b) the different ways people can be compared with a group that includes them. The important point...the child’s thought about people is constrained in many important ways by his preoperational limitations.

- **Free Classification** typically found in the adult’s method of being able to sort objects into an ordered array.

- **Class inclusion**. A child is shown a picture of objects ...and is asked, “Are there more shapes in front of you or more circles?” The child in this stage would probably by puzzled by the question but in any event would answer that there are more circles. He has a hard time thinking about the whole set of forms taken collectively while simultaneously thinking about the subset, the three circles. He tends to focus on the various subsets (in this case there are two, circles and squares) for purposes of the comparison, despite what the question calls for him to do. An important social consequence of these deficits in the young child’s thinking with classes is that he fails to understand: (a) the various ways people can be cross-classified with regard to social characteristics; and (b) the different ways people can be compared with a group that includes them.

- **Serialization**. Ordering a set of objects from least to greatest along some clearly quantifiable dimension. If the child is asked to order a set of objects, such as wooden sticks, from shortest to longest, he typically produces an incorrect ordering as below:

```
|   |   |   |   |
```

It has been shown that double serialization is more difficult than single serialization (Brainerd, 1978b), and it is likely that single-serialization ability can be readily improved through structured practice.

- **Centration** is a narrow concentration on one feature of the situation to the exclusion of others (Flavell, 1977; Piaget & Inhelder, 1969). In the liquid conservation problem, for example, the child may focus on the liquid as being higher in its new container but not on the fact that it is simultaneously narrower than before.

- **Irreversibility** can also be illustrated by reference to the conservation problem. One way for the child to see that the amount of liquid has remained unchanged is by mentally reversing the action - pouring the milk from beaker C into beaker B - an imagining the result. The child in the Pre-operational stage cannot do this (Piaget, 1977).

*Operations* are internalized sets of actions that allow the child to do mentally what before was
done physically. They are highly organized and conform to certain rules and principles of logic. The operations appear in one form in the concrete operations period and in a more advanced form in the formal operations period.

Concrete operations stage... the child’s thinking crystallizes into more of a system, and the many flaws associated with the Pre-operational stage completely disappear. The actual system is described by Piaget in terms of relatively complex logic... One limitation of concrete thinking is its reliance on clearly available perceptual and physical supports. The child needs to have objects and events on hand in order to think about them, or to be able to imagine a concrete example of them while solving a problem... The child’s thought is captured by what has been or is being experienced, rather than by what might be or by some purely abstract, verbal description of reality.

- Relativism... is the shift from egocentrism... The child can now decenter, or operate with two or more aspects of a problem simultaneously.
- Reversibility. ...the child’s ability to reverse actions. He can now mentally pose and operate on a series of actions; for example, he can perform mental arithmetic, imagine a game of ping-pong, mentally pour liquids back and forth, and so on.
APPENDIX III

CHILDREN’S RESPONSES REGARDING THEIR LANDSCAPE PREFERENCES
Sample Size: 33

Sample Location: British Columbia
SLIDE1  variable colour vegetation

<table>
<thead>
<tr>
<th>Value Label</th>
<th>Value</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cum Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>really like</td>
<td>1.00</td>
<td>21</td>
<td>63.6</td>
<td>63.6</td>
<td>63.6</td>
</tr>
<tr>
<td>sort of like</td>
<td>2.00</td>
<td>10</td>
<td>30.3</td>
<td>30.3</td>
<td>93.9</td>
</tr>
<tr>
<td>don't like</td>
<td>3.00</td>
<td>2</td>
<td>6.1</td>
<td>6.1</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>33</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Hi-Res Chart #1: Histogram of variable colour vegetation

- Mean: 1.424
- Std err: 0.107
- Median: 1.000
- Mode: 1.000
- Std dev: 0.614
- Variance: 0.377
- Kurtosis: 0.440
- S E Kurt: 0.798
- Skewness: 1.169
- S E Skew: 0.409
- Range: 2.000
- Minimum: 1.000
- Maximum: 3.000
- Sum: 47.000

Valid cases: 33  Missing cases: 0

Slide No. 1

- Std. Dev = 0.61
- Mean = 1.42
- N = 33.00
<table>
<thead>
<tr>
<th>Value Label</th>
<th>Value</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cum Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>sort of like</td>
<td>2.00</td>
<td>9</td>
<td>27.3</td>
<td>27.3</td>
<td></td>
</tr>
<tr>
<td>don't like</td>
<td>3.00</td>
<td>24</td>
<td>72.7</td>
<td>72.7</td>
<td>100.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>33</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

**Hi-Res Chart #2: Histogram of darkened thicket**

- **Mean**: 2.727
- **Std err**: .079
- **Median**: 3.000
- **Mode**: 3.000
- **Std dev**: .452
- **Variance**: .205
- **Kurtosis**: -.915
- **Skewness**: .409
- **S E Skew**: .798
- **Skewness**: -1.070
- **Range**: 1.000
- **Minimum**: 2.000
- **Maximum**: 3.000

**Valid cases**: 33  
**Missing cases**: 0

**Slide No. 2**

- **Std. Dev = .45**
- **Mean = 2.73**
- **N = 33.00**
<table>
<thead>
<tr>
<th>Value Label</th>
<th>Value</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cum Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>really like</td>
<td>1.00</td>
<td>24</td>
<td>72.7</td>
<td>72.7</td>
<td>72.7</td>
</tr>
<tr>
<td>sort of like</td>
<td>2.00</td>
<td>8</td>
<td>24.2</td>
<td>24.2</td>
<td>97.0</td>
</tr>
<tr>
<td>don't like</td>
<td>3.00</td>
<td>1</td>
<td>3.0</td>
<td>3.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>33</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Hi-Res Chart # 3: Histogram of beach

- Mean = 1.303
- Mode = 1.000
- Kurtosis = 1.679
- S E Skew = .409
- Maximum = 3.000
- Std err = .092
- Std dev = .529
- S E Kurt = .798
- Range = 2.000
- Sum = 43.000
- Median = 1.000
- Variance = .280
- Skewness = 1.553
- Minimum = 1.000

Valid cases = 33
Missing cases = 0

Slide No. 3

- Mean = 1.30
- N = 33.00

Std. Dev = .53
<table>
<thead>
<tr>
<th>Value Label</th>
<th>Value</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cum Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>really like</td>
<td>1.00</td>
<td>18</td>
<td>54.5</td>
<td>54.5</td>
<td>54.5</td>
</tr>
<tr>
<td>sort of like</td>
<td>2.00</td>
<td>11</td>
<td>33.3</td>
<td>33.3</td>
<td>87.9</td>
</tr>
<tr>
<td>don't like</td>
<td>3.00</td>
<td>4</td>
<td>12.1</td>
<td>12.1</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>33</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Hi-Res Chart # 4: Histogram of swing sets

- Mean: 1.576
- Std err: .123
- Median: 1.000
- Mode: 1.000
- Std dev: .708
- Variance: .502
- Skewness: .838
- S E Skew: .409
- Range: 2.000
- Minimum: 1.000
- Maximum: 3.000
- Sum: 52.000

Valid cases: 33
Missing cases: 0
SLIDE5 snowy reflections

<table>
<thead>
<tr>
<th>Value Label</th>
<th>Value</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cum Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>really like</td>
<td>1.00</td>
<td>21</td>
<td>63.6</td>
<td>63.6</td>
<td></td>
</tr>
<tr>
<td>sort of like</td>
<td>2.00</td>
<td>8</td>
<td>24.2</td>
<td>24.2</td>
<td>87.9</td>
</tr>
<tr>
<td>don't like</td>
<td>3.00</td>
<td>3</td>
<td>9.1</td>
<td>9.1</td>
<td>97.0</td>
</tr>
<tr>
<td>missing</td>
<td>9.00</td>
<td>1</td>
<td>3.0</td>
<td>3.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>33</td>
<td></td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Hi-Res Chart #5: Histogram of snowy reflections

- Mean: 1.667
- Mode: 1.000
- Kurtosis: 20.033
- Std dev: 1.472
- Skewness: 4.126
- Minimum: 1.000
- Maximum: 9.000

Valid cases: 33, Missing cases: 0
## Value Label

<table>
<thead>
<tr>
<th>Value Label</th>
<th>Value</th>
<th>Frequency</th>
<th>Percent Valid</th>
<th>Cum Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>really like</td>
<td>1.00</td>
<td>4</td>
<td>12.1</td>
<td>12.1</td>
</tr>
<tr>
<td>sort of like</td>
<td>2.00</td>
<td>7</td>
<td>21.2</td>
<td>33.3</td>
</tr>
<tr>
<td>don't like</td>
<td>3.00</td>
<td>20</td>
<td>60.6</td>
<td>93.9</td>
</tr>
<tr>
<td>missing</td>
<td>9.00</td>
<td>2</td>
<td>6.1</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>33</td>
<td></td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

### Hi-Res Chart # 6: Histogram of gravel lot

- **Mean**: 2.099
- **Mode**: 3.000
- **Kurtosis**: 8.789
- **Skewness**: 2.736
- **Variance**: 2.960
- **Range**: 8.000
- **Minimum**: 1.000
- **Maximum**: 9.000
- **Sum**: 96.000

**Statistical Summary**

- Std err: 0.300
- Median: 3.000
- Variance: 2.960
- Skewness: 2.736
- Range: 8.000
- Minimum: 1.000
- Maximum: 9.000
- Sum: 96.000

**Histogram of gravel lot**

- Std Dev = 1.72
- Mean = 2.9
- N = 33.00
SLIDE7  jj playground

<table>
<thead>
<tr>
<th>Value Label</th>
<th>Value</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cum Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>really like</td>
<td>1.00</td>
<td>22</td>
<td>66.7</td>
<td>66.7</td>
<td></td>
</tr>
<tr>
<td>sort of like</td>
<td>2.00</td>
<td>10</td>
<td>30.3</td>
<td>30.3</td>
<td>97.0</td>
</tr>
<tr>
<td>missing</td>
<td>9.00</td>
<td>1</td>
<td>3.0</td>
<td>3.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>33</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Hi-Res Chart # 7: Histogram of jj playground

Mean 1.545  Std err .247  Median 1.000
Mode 1.000  Std dev 1.416  Variance 2.006
Kurtosis 25.660  S E Kurt .798  Skewness 4.821
S E Skew .409  Range 8.000  Minimum 1.000
Maximum 9.000  Sum 51.000

Valid cases 33  Missing cases 0

Slide No. 7

Std. Dev = 1.42  Mean = 1.5
N = 33.00
### Slide No. 8

#### Histogram of garden

<table>
<thead>
<tr>
<th>Value Label</th>
<th>Value</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cum Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>really like</td>
<td>1.00</td>
<td>23</td>
<td>69.7</td>
<td>69.7</td>
<td>69.7</td>
</tr>
<tr>
<td>sort of like</td>
<td>2.00</td>
<td>8</td>
<td>24.2</td>
<td>24.2</td>
<td>93.9</td>
</tr>
<tr>
<td>don't like</td>
<td>3.00</td>
<td>2</td>
<td>6.1</td>
<td>6.1</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>33</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

#### Descriptive Statistics

- **Mean**: 1.364
- **Std err**: .105
- **Median**: 1.000
- **Mode**: 1.000
- **Std dev**: .603
- **Variance**: .364
- **Skewness**: 1.474
- **Kurtosis**: 1.274

**Validation Details**

- **Valid cases**: 33
- **Missing cases**: 0

**Chart Information**

- **Std Dev**: .60
- **Mean**: 1.36
- **N**: 33.00
<table>
<thead>
<tr>
<th>Value Label</th>
<th>Value</th>
<th>Frequency</th>
<th>Percent</th>
<th>Percent</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>really like</td>
<td>1.00</td>
<td>16</td>
<td>48.5</td>
<td>48.5</td>
<td>48.5</td>
</tr>
<tr>
<td>sort of like</td>
<td>2.00</td>
<td>14</td>
<td>42.4</td>
<td>42.4</td>
<td>90.0</td>
</tr>
<tr>
<td>don't like</td>
<td>3.00</td>
<td>3</td>
<td>9.1</td>
<td>9.1</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>33</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Bi-Res Chart # 9: Histogram of darkened allee

- Mean: 1.606
- Std err: .115
- Median: 2.000
- Mode: 1.000
- Std dev: .659
- Variance: .434
- Skewness: -.631
- Range: 2.000
- Minimum: 1.000
- Maximum: 3.000
- Sum: 53.000

Valid cases: 33
Missing cases: 0
SLIDE 10

<table>
<thead>
<tr>
<th>Value Label</th>
<th>Value</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cum Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>really like</td>
<td>1.00</td>
<td>13</td>
<td>39.4</td>
<td>39.4</td>
<td>39.4</td>
</tr>
<tr>
<td>sort of like</td>
<td>2.00</td>
<td>15</td>
<td>45.5</td>
<td>84.8</td>
<td>84.8</td>
</tr>
<tr>
<td>don't like</td>
<td>3.00</td>
<td>5</td>
<td>15.2</td>
<td>100.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>33</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Hi-Res Chart # 10: Histogram of grassy savannah

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>1.758</td>
</tr>
<tr>
<td>Mode</td>
<td>2.000</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>-.871</td>
</tr>
<tr>
<td>S E Skew</td>
<td>.409</td>
</tr>
<tr>
<td>Maximum</td>
<td>3.000</td>
</tr>
<tr>
<td>Std err</td>
<td>.123</td>
</tr>
<tr>
<td>Std dev</td>
<td>.708</td>
</tr>
<tr>
<td>S E Kurt</td>
<td>.798</td>
</tr>
<tr>
<td>Range</td>
<td>2.000</td>
</tr>
<tr>
<td>Sum</td>
<td>58.000</td>
</tr>
</tbody>
</table>

Valid cases: 33  Missing cases: 0

Slide No. 10

Grassy savannah

Std. Dev = .71  Mean = 1.76  N = 33.00
SLIDE11  derelict site

<table>
<thead>
<tr>
<th>Value Label</th>
<th>Value</th>
<th>Frequency</th>
<th>Percent</th>
<th>Percent</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>really like</td>
<td>1.00</td>
<td>2</td>
<td>6.1</td>
<td>6.1</td>
<td>6.1</td>
</tr>
<tr>
<td>sort of like</td>
<td>2.00</td>
<td>3</td>
<td>9.1</td>
<td>9.1</td>
<td>15.2</td>
</tr>
<tr>
<td>don't like</td>
<td>3.00</td>
<td>27</td>
<td>81.8</td>
<td>81.8</td>
<td>97.0</td>
</tr>
<tr>
<td>missing</td>
<td>9.00</td>
<td>1</td>
<td>3.0</td>
<td>3.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Total        | 33    | 100.0     | 100.0   |

Hi-Res Chart. # 11: Histogram of derelict site

Mean          | 2.970 |
Mode          | 3.000 |
Kurtosis      | 20.411|
Skewness      | 3.765 |
Variance      | 1.46  |
Range         | 8.000 |
Minimum       | 1.000 |
Maximum       | 9.000 |

Valid cases   | 33    |
Missing cases | 0     |

Slide No. 11

Std. Dev = 1.21
Mean = 3.0
N = 33.00
<table>
<thead>
<tr>
<th>Value Label</th>
<th>Value</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cum Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>really like</td>
<td>1.00</td>
<td>23</td>
<td>69.7</td>
<td>69.7</td>
<td>69.7</td>
</tr>
<tr>
<td>sort of like</td>
<td>2.00</td>
<td>6</td>
<td>18.2</td>
<td>18.2</td>
<td>87.9</td>
</tr>
<tr>
<td>don't like</td>
<td>3.00</td>
<td>3</td>
<td>9.1</td>
<td>9.1</td>
<td>97.0</td>
</tr>
<tr>
<td>missing</td>
<td>9.00</td>
<td>1</td>
<td>3.0</td>
<td>3.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>33</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Hi-Res Chart # 12: Histogram of rapid water

- Mean: 1.606
- Std err: 0.257
- Median: 1.000
- Mode: 1.000
- Std dev: 1.478
- Kurtosis: 20.442
- S E Kurt: 0.798
- Skewness: 4.202
- S E Skew: 0.409
- Maximum: 9.000
- Sum: 53.000

Valid cases: 33
Missing cases: 0

Slide No. 12

![Histogram of rapid water](slide12.png)
<table>
<thead>
<tr>
<th>Value Label</th>
<th>Value</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cum Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>really like</td>
<td>1.00</td>
<td>25</td>
<td>75.8</td>
<td>75.8</td>
<td>75.8</td>
</tr>
<tr>
<td>sort of like</td>
<td>2.00</td>
<td>7</td>
<td>21.2</td>
<td>21.2</td>
<td>97.0</td>
</tr>
<tr>
<td>missing</td>
<td>9.00</td>
<td>1</td>
<td>3.0</td>
<td>3.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>33</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Hi-Res Chart # 13: Histogram of still water

Mean: 1.455  Std err: 0.247  Median: 1.000
Mode: 1.000  Std dev: 1.416  Variance: 2.006
Kurtosis: 27.092  S E Kurt: 0.798  Skewness: 5.017
S E Skew: 0.409  Range: 8.000  Minimum: 1.000
Maximum: 9.000  Sum: 48.000

Valid cases: 33  Missing cases: 0

Slide No. 13
APPENDIX IV

TABLES OF INTERVIEWS WITH CHILDREN, PARENTS
AND POLICE SAFETY OFFICERS

Table No. 2A Statistical Data from Survey Matched to Table 2. Matrix
Table No. 6. Selected Children’s Comments Related to Social Development

**Jungle Jim Playground**: Picture No. 7 in Appendix III.

<table>
<thead>
<tr>
<th>Age of Child</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 years old</td>
<td>Everything is fun.</td>
</tr>
<tr>
<td>6 years old</td>
<td>Sort of Like - Looks like fun but too many people.</td>
</tr>
<tr>
<td></td>
<td>Like it - Nice colours, no pollution, children seem to get along good, colourful, friendly, nice trees.</td>
</tr>
<tr>
<td></td>
<td>Like it - Lots of friends and nice play area.</td>
</tr>
<tr>
<td></td>
<td>Like it - Looks like fun because it is a big playground with lots of kids.</td>
</tr>
<tr>
<td></td>
<td>Sort of like - It is too crowded.</td>
</tr>
<tr>
<td></td>
<td>Like it - lots of kids in picture - its nice.</td>
</tr>
<tr>
<td>8 years old</td>
<td>Like it - “is that school” (parent said no) “oh, that looks like a fun playground”</td>
</tr>
<tr>
<td></td>
<td>Sort of like - She likes parks with swings more and this one looks too crowded.</td>
</tr>
<tr>
<td></td>
<td>Like it - Slides hurt wet and dry, need more slides, don’t have to wait.</td>
</tr>
<tr>
<td></td>
<td>Like it - The kids look really happy, it looks really fun and there is lots of things to do.</td>
</tr>
<tr>
<td></td>
<td>Like it - All the children, let me on, funk, nice adventure.</td>
</tr>
<tr>
<td>10 years old</td>
<td>Don’t like it - I like bigger spaces were I can play sports. Boring because there are no kids (e.g. the children are too young to play with), its not safe to play there alone.</td>
</tr>
<tr>
<td></td>
<td>Sort of like - bit too small, gets crowded, someone may get hurt.</td>
</tr>
<tr>
<td></td>
<td>Like it - wicked playground.</td>
</tr>
<tr>
<td></td>
<td>Like it - looks like fun and safe</td>
</tr>
<tr>
<td></td>
<td>Like it - its really fun to be there and play with some other kids.</td>
</tr>
<tr>
<td></td>
<td>Like it - lots of kids.</td>
</tr>
<tr>
<td></td>
<td>Like it - If you get hurt there is people around to help you.</td>
</tr>
<tr>
<td></td>
<td>Like it - Looks like a good playground, lots of people enjoy it.</td>
</tr>
<tr>
<td></td>
<td>Like it - Looks like a place where everyone would go and have tons of fun.</td>
</tr>
</tbody>
</table>

**Swing Set**: Picture No. 4 in Appendix III

<table>
<thead>
<tr>
<th>Age of Child</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 years old</td>
<td>Like it - can swing high and with friends</td>
</tr>
</tbody>
</table>
6 years old
Like it - it is very safe and there could be parents around.
Like it - swings going high - share your swing - swing beside each other.
Sort of like it - kind of likes the picture because its just swings, no other things to play on.

8 years old
Like it - likes getting dizzy, favourite swing, face to face, likes to do swinging by myself.
Like it - I like it because there lots of space to run around and swings are fun. Sort of like it - Its okay. It's just a swing set.
Like it - can swing open, can do leg-log twist, share of swings
Sort of like it - Misty colour, houses, likes to twist the swing, to get dizzy on the swings.

10 years old
Sort of like it - Rocks in the sand, but swinging with friends is easy.
Sort of like it - Need to add more swings to share.
Don't like it - Nothing is happening.
Don't like it - No body around.
Sort of like it - don’t play on swings that much anymore.
Sort of like it - A little boring.
Sort of like it - Its kind of nice, but sad, because its kind of desolate, no kids there.
Did not like it - Too peaceful, looks like something bad is about to happen.

Gravel Lot: Picture No. 6 in Appendix III

Age of Child Comment
4 years old No responses
6 years old Sort of like it - Hm, I kind of like it.
Don’t like it - not very good, too much pollution in street and around some buildings
Don’t like it - Lonely
Sort of like it - Would like to play in the puddles.
Like it - It has buildings.
Don’t like it - It has lots of buildings.
Don’t like it - wouldn’t like to go there.
Don’t like it - Nothing really to do.
Don’t like it - doesn’t look like too much fun to play here.
Don’t like it - Yucky.
Don’t like it - looks dirty and ugly.
Don’t like it - don’t like city pictures pollution.

8 years old
Don’t like it - garbage, dirty-like, don’t like holes in the water, yucky, dirty.
Don’t like it - I don’t like this one. It is not a healthy picture.
Don’t like it - Its all dirty.
Sort of like it - lots of mud puddles.
Don’t like it - it looks polluted and I wouldn’t like to play there.
Don’t like it - Too much oil on the road, don’t like potholes, afraid of heights, no birds, no life, no action.
Don’t like it - Bad town.

10 years old

Sort of like it - like to live in the buildings, step in puddles, can see water splash, cannot let people inside the fence.
Don’t like it - not pretty, very stark, no sign of life or nature.
Sort of like it - Can play basketball, would not feel safe, not much of a community space, not a lot of people around
Sort of like it - not interesting.
Like it - I can play street hockey with my friends.
Don’t like it - its sad. Its like a factory. It looks like the factory has taken over where the park should have been.
Don’t like it - dirty, not safe.
Don’t like it - It doesn’t look like a friendly place.
Don’t like it - polluted, no grass, no park, too many buildings.
Don’t like it - empty, not safe.
Table No. 7. Selected Children's Comments Related to Cognitive Development

**Variable Vegetation:** Photo No. 1 in Appendix III

<table>
<thead>
<tr>
<th>Age of Child</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 years old</td>
<td>No response</td>
</tr>
<tr>
<td>6 years old</td>
<td>Sort of like - it looks like it is fall - it looks somewhere I’ve been before. Sort of like - Because it has lots of sun and it wouldn’t be where bad guys would be. Like it - I feel good. Like it - She likes the coloured leaves, it makes her feel summery. Like it - Makes me think of fall.</td>
</tr>
<tr>
<td>8 years old</td>
<td>Sort of like it - if it was open more and you could see the other side of the forest, it would be better “the trees make it feel squished in and claustrophobic” Like it - I can catch fish there. Like it - Sunlight plants, colourful leaves, water, healthy plants, small good plants, smooth plants, soft squeezy Sort of like it - not much colour, only three trees ;have colour because of the sunlight. Like it - fresh plants, colour of the trees, fresh green, easier to see in the sun, fish like to see shade and sun.</td>
</tr>
<tr>
<td>10 years old</td>
<td>Like it - some places very calm and peaceful, somewhere you find never-ending surprises. Sort of like it - too peaceful, a little dark. Sort of like it - Doesn’t like the trees around there, no one can see. Sort of like it - can make forts, can jump over there.</td>
</tr>
</tbody>
</table>

**Darkened Thicket:** Photo No. 2 in Appendix III

<table>
<thead>
<tr>
<th>Age of Child</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 years old</td>
<td>No responses</td>
</tr>
<tr>
<td>6 years old</td>
<td>Don’t like it - because bad guys would hide in the bushes, and there is no sun and it looks dangerous. Don’t like it - doesn’t like the bare branches, the bushy area too dark.</td>
</tr>
</tbody>
</table>
Don’t like it - really dark, too many trees, blocks the sun
Like it - lots of sticks to build a fort with.
Sort of like it - looks like a swamp.
Sort of like it - don’t like it because trees, I can trip over them.

8 years old
Don’t like it - too closed in, too many trees, might be scary.
Don’t like it - there isn’t much colour and it looks dull.
Sort of like it - animals that rest there, houses, animals feel protected, its dark, unsafe, can’t see.
Don’t like it - the trees are bald and its scary.
Don’t like it - the trees without leaves are not nice, not many branches for people to hang on - fear of falling.
Don’t like it - No colour, its dark, lonesome trees, scary - dark, get lost in it if you hide in here, maybe somebody cannot find you.
Sort of like it - like the misty colour, like the trees, interesting shapes, too dark.
Don’t like it - no bushes in it.

10 years old
Sort of like it - not much colour - everything seems dead.
Sort of like it - too dark and spooky.
Don’t like it - dark and gloomy, hasn’t been looked after, doesn’t look like a place I’d want to be
Don’t like it - frightening, not much colour.
Don’t like it - dark, a place I wouldn’t want to be in alone.
Don’t like it - looks like a spooky forest and somewhere I never want to go.

Grassy Savannah: Photo No. 10 in Appendix III

<table>
<thead>
<tr>
<th>Age of Child</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 years old</td>
<td>No responses</td>
</tr>
<tr>
<td>6 years old</td>
<td>Sort of like it - doesn’t like big tall grass. Don’t like it - looks kinda weird because it should be a train track. Sort of like it - ok, but no trees or lake only a swamp, no detail e.g. Trees, mountains, or lake Sort of like it - There might be someone hiding under the bridge Sort of like it - bridge, its kind of like Saskatchewan. Sort of like it - because I would like to slosh through the grass and lie down to look at the clouds. Sort of like it - looks misty, railway tracks are scary.</td>
</tr>
<tr>
<td>8 years old</td>
<td>Like it - I can catch butterflies and grasshoppers Sort of like it - Bicycling, crossing bridges, climbing up and climbing</td>
</tr>
</tbody>
</table>
down, too much grass, too high, and get lost in the grass.
Sort of like it - Not a good play space.
Like it - There is fish underneath the water - you can walk on the bridge.
There is a playground over there.
Like it - if there was no water, could run in the fields, like it because of animals, frogs.
Like it - It looks calm, like a farm, and I'd like to spend time with my family there.
Like it - There would be a lot of things living there.
Sort of like it - board walk, green grass, afraid of the windy storm, ugly under the bridge.
Sort of like it - bridge looks like fun to walk on.
Sort of like it - not colourful enough and no sun, angry sky, wouldn't like to play, too dangerous.

10 years old
Sort of like it - can walk on the bridge and hear footsteps.
Don't like it - bridge could collapse, needs higher sides and more support, not a good area.
Like it - it has lots of things to look at such as bridge, field, etc.
Sort of like it - could be snakes, no body around if you need help.
Like it - would like to go up in the tower and look out.
Table No. 8. Summary of Comments Offered by Parents (n=5) At a Group Meeting

There is no sense of arrival at parks.

Pushing strollers through gravel is difficult and gravel serves no one.

Teachers want an outdoor teaching classroom but supervision of the child is needed.

Root retention, we need to know how to protect roots from further damage. Trees are old and how to keep branches from falling and hitting a child in important to us.

Who will be responsible for operating and maintaining the washroom. Will it be working on the weekends?

We want views through the park from surrounding houses.

Children are capable of managing the recycling of garbage in the park.

Parks need established territories for different age groups. So formal entries, areas for 4,5, and 6 year olds are very important. Areas are needed for seating and parents and seniors. We only need three different playground apparatuses. The removal of a slide from a playground is a good idea because of the child falling off the slide.

Cross walks to parks need careful planning and positioning. Don’t want children having to walk behind parking cars. Need areas for storing bicycles and strollers so they are not strewn along the paths. Pathways are problems as they act as speedways for roller blades and skateboards. We need grass.
Table No. 9. Summary of Comments by Principals (n=9)

Suburbs

Children are not as physically fit as they were. Use of the walking bus to get children to school is a very social and environmental friendly thing to do.

We have found that in areas where there are Hell’s Angels living, the neighbourhood is safe because they protect their own environment for their children.

Placing a school next to a park is a problem because of the playground being so close to the park where older children or predator adults may hang out.

We have a camera monitor on the playground and this has deterred the bullying activity.

Inner City

Play develops team skills.

Circular spaces do create special spaces. A special place attracts good and bad. Younger children in the parks are intimidated by older ones and the teenagers past 14 - 17 are more aware of the bigger place and roam. During the day, parks are usually clear.

Parks are needed for social projects. We have a lack of play area in common spaces. Lack of having balls to play with in these common spaces however.

Because of family violence and alcohol, it is a struggle for children in Canada. They don’t get a change from it if they experience it in parks as well. Other areas of problem for children are garages, and stairwells.

What scares children are weird people and the mentally ill. Seeing needles all over is a problem because young children are curious and want to touch them. The younger children have fears of strangers and that they will be dragged off. They learn at a young age that people are unpredictable.

We have children who are scared, children who are street smart, and children who see the lifestyles as normal. Children are not out typically at night. If they are it is because the parent is not supervising them.

There is a problem of satellite kids. These are children sent over with money to find a place to stay. The parents are in Hong Kong and not supervising. They attract people who are after them because they have money and this gets these kids into trouble.

We hear stories that drugs are being sold at convenience stores. Fencing off of parks is a plan that might work. In the summer, the parks are busy with drug addicts and the streets have beggars.
Table No. 10. Summary of the Comments of Police Safety Liaison Officers (n=5)

Suburbs

Keeping fences mended helps deter access to the wilder side.

The problem for children is getting to school through the traffic. We worry about pedophile and who is babysitting the parent’s children e.g. the playground supervisor, the coaches.

Kids will adapt and are very open to finding a good time in a place.
It is a better community for children when everyone is involved.
There is a problem with bullying and this means that supervision is needed in a playground. The bully wants to feel strong, and wants to overpower some one else. The bully creates victim mentalities in children.

The important part of our job is communication, education, nurturing self-esteem in teaching the children to love themselves and the parents must look after themselves and their children.

Providing for parents in the playground is important and mothers want to feel safe. Also, we like to see benches with covers over them for shelter. Quite a bit of networking occurs at the playground between parents. We want to see playgrounds were parents want to come.

We encourage kids to spend more time doing outdoor activities by creating kid friendly places. Lighting attracts activity at a park. This discourages the hanging out activity at the cornerstone.

We have concerns for traffic at night particularly the soccer games at night and encourage that the soccer games be over by 8:00 p.m.

There is a danger for the child’s safety in nature. The wild parts of a site do create barriers that typically a child will not cross.

The supervision of children is key and the ratio should be 1 supervisor for every 5 children.

Inner City

For the children of the inner city we have concerns for bullying, sexual abuse, the dirt and grubbiness and the mentally ill person. We have people sleeping in the school grounds. Chinatown is unsafe because of the drug addicts and alcohol and the fear of the unknown amongst the children. Alleyways scare children because that is where people hang out. It is frightening for children because of the mentally ill.

The play activity of some children is to tease people and children will turn this into a game. The suggestion of doing a walking bus to school for safety of the children is a good neighbourhood solution.
Shop lifting is a problem and it stems from the financial need of the families and it gives the children something to do.

Bullying occurs in the basketball courts, washroom and at the community centers. The bully is on a power trip. If a child does not play by the rules or is not good, the children will ostracize the child. There is a lot of girl bullying and the ‘look’ sparks a fight. The bully is particularly evident in grade 7 and 8. We are witnessing a lot of girl violence.

In the Chinese community the Parents tend to be grandparents while the parents are back in another country working. The grandparents act as stabilizing forces but traditional ways also can be disruptive.

Gang activity is occurring in the older children and they seek a central meeting area in the inner city. Roads are barriers and restrict access for the younger children. The children do seek to share information with each other and do so at school when they can meet.
PLAY FOR ALL COMMUNITY FORUM

February 21, 1995
7:00 p.m. - 9:00 p.m.

Summary of Group Work

1. When you think of accessibility, what does it mean to you?

Group 1

- Belonging
- Everyone/everywhere
- Wheels
- Participation - all aspects
- Security
- Freedom of Play
- Surfaces, edges
- Parking
- Washrooms - physically & time

Group 2

- Barrier-free environment (to me)
- Accessible to all
  - strollers
  - wheelchairs
  - letdowns/curbs
- Common sense
- Forethought to planning/design
- Balance

Group 3

- Inclusion
- Pathways, etc. to get to equipment and people to interact
- Equipment that is user-friendly for all - allows participation
Group 4

Level walkways.paths
Lead to area of equipment/structures and directly to play equipment
No more peak gravel, sand, bark mulch, poor drainage
Good surfacing: rubber (tiles, foam)
Wide range of difficulties of equipment (age variations)
Colour variations and tactile \ visual
Shape for support/seating - back support and foot rests
Cost effective ideas (i.e. cut tires swings) “not necessarily specialized equipment”
Accessible for parents/adults to get on and up to equipment with child
Double slides, roller slides - safety issues - dome, tube, high sides; two people seating -
friends, support person
How to involve children to know it’s “user friendly”
APPENDIX VII

VEGETATION COMMUNITIES IN PORT COQUITLAM
PREPARED BY GARTNER LEE
APPENDIX VIII

ENVIRONMENTAL PLAN FOR PORT COQUITLAM
PREPARED BY GARTNER LEE
APPENDIX IX

FISHERIES CLASSIFICATION MAP
JULY, 1998
APPENDIX X

PARK/SCHOOL DESIGN
PLANT LIST

Broadleaf Evergreens

*Gaultheria shallon* (Salal)
*Mahonia aquifolium* (Oregon grape)
*Mahonia nervosa* (Cascade Oregon grape)
*Phyllocladus empetriformis* (Pink mountain heather)
*Symphoricarpus alba* (Snowberry)

Conifers

*Abies lasiocarpa* (Subalpine fir)
*Chamaecyparis lawsoniana* (A. Murr.) )Parl. (Lawson cypress)
*Chamaecyparis nootkatensis* (Yellow cedar)
*Taxodium distichum* (Bald cypress)
*Tsuga heterophylla* (Western hemlock)
*Tsuga plicata* (Western red cedar)

• Wetland Perimeter

*Pinus contorta* Doug. Ex Loud. Var. contorta (Shore Pine)

Deciduous Trees

*Acer circinatum* (Vine maple)
*Acer macrophyllum* (Big leaf maple)
*Alnus sinuata* (Sitka alder)
*Carpinus betulus* (European Hornbeam)
*Crataegus x lavallei* (Lavalle Hawthorn)
*Cornus nutalli* (Pacific dogwood)
*Quercus garryana* (Garry oak)
*Rhamnus purshiana* (Cascara tree)

• Wetland Perimeter

*Acer rubrum* L. (Red maple)
*Acer saccharinum* L. (Silver maple)
*Alnus rubra* (Red alder)
*Betula papyrifera* (Paper birch)
*Populus trichocarpa* Torr. & A. Gray (Black cottonwood)

Deciduous Shrubs

*Amelanchier alnifolia* (Saskatoon serviceberry)
Lonicera involucrata (Twin berry)
Philadelphus lewisii (Mock orange)
Ribes sanguineum (Red flowering currant)
Rubus spectabilis (Salmonberry)
Sambucus racemosa (Red elderberry)
Sambucus cerulea (Blue elderberry)
Sorbus sitchensis (Sitka mountain ash)
Vaccinium membranaceum (Black huckleberry)
Vaccinium parviflorum (Red huckleberry)
Viburnum opulus (Highbush Cranberry)

- Wetland Perimeter
Cornus stolonifera (Red Osler dogwood)
Physocarpus capitatus (Ninebark)
Myrica gale (Sweet gale)
Salix hookeriana (Hooker’s willow)
Salix scouleriana (Scouler’s willow)

Roses
Rosa nutana (Nootka rose)
Rosa rugosa (Rugosa rose)
Rosa woodsii (Wood’s rose)

Bamboos and Ornamental Grasses
Phyllostachys aureosulcata (Yellow-Groove Bamboo)
Phyllostachys nigra (Black Bamboo)

Groundcovers
Arctostaphylos uva-ursi cv. “Vancouver Jade” (Vancouver Jade)
Cornus canadensis (Bunchberry)
Fragaria chiloensis (Coastal strawberry)
Linnaea borealis (Twinflower)
Tolemeia menziesii (Piggyback plant)
Vines

*Lonicera ciliosa* (Western trumpet honeysuckle)

Ferns

*Adiantum pedatum* (Maidenhair fern)
*Blechnum spicant* (Deer fern)
*Polystichum munitum* (Sword fern)

Perennials

*Anemone occidentalis* (Western pasque flower)
*Asarum caudatum* (Wild ginger)
*Balsamorhiza sagittata* (Spring sunflower)
*Camassia quamash* (Common camas)
*Castilleja miniata* (Common red paintbrush)
*Delphinium menziesii* (Menzie’s larkspur)
*Dodecantheon pulchellum* (Shooting star)
*Erythronium oregonum* (White fawn lily)
*Penstemon fruticosus* (Shrubby penstemon)
*Sisyrinchium augustifolium* (Blue-eyed grass)
*Trillium ovatum* (Western trillium)
*Similicina racemosa* (false solomon’s seal)

Wetland Plants

- **Perimeter marsh**
  *Carex stipata* (Sawbeak sedge)
  *Carex rostrata* (Beaked sedge)
  *Carex obnupta* (Slough sedge)
  *Juncus effusus* (Common rush)
  *Glyceria borealis* (Northern mannagrass)
  *Lysichiton americanum* (Skunk cabbage)
  *Typha angustifolia* (Narrow-leaved cattail)

- **Shallow Marsh** (0.3 to 0.6 m)
  *Alisma plantago-aquatica* (Water-Plantain)
  *Scirpus cyperinus* (Wool grass)
  *Scirpus americanus* (American threesquare)
  *Eriophorum angustifolium* (Narrow-Leaved Cotton-Grass)

- **Deep Marsh** (0.6 to 1.0 m)
  *Typha latifolia* (Broad-leaved cattail)
Specimen Trees

*Magnolia x soulangiana* (Saucer Magnolia)
*Hamamelis mollis* (Chinese Witchhazel)
*Acer palmatum ‘Bloodgood’* (Japanese Maple)
*Betula pendula ‘Youngii’* (European White Birch)
APPENDIX XI

PLANT LIST ORGANIZED FOR PORT COQUITLAM PARK
LANDSCAPE CHARACTER ZONES

Landscape Character Zone A - Grove, Bosque

*Acer saccharinum* L. (Silver maple)
*Crataegus x lavallei* (Lavalle Hawthorn)

Deciduous Shrubs

*Philadelphus lewisii* (Mock orange)
*Sorbus sitchensis* (Sitka mountain ash)

Groundcovers

*Fragaria chiloensis* (Coastal strawberry)

Perennials

*Anenome occidentalis* (Western pasque flower)
*Asarum caudatum* (Wild ginger)
*Balsamorhiza sagittata* (Spring sunflower)
*Camassia quamash* (Common camas)
*Castileja miniata* (Common red paintbrush)
*Delphinium menziesii* (Menzie’s larkspur)
*Dodecantheon pulchellum* (Shooting star)
*Erythronium oregonum* (White fawn lily)
*Penstemon fruticoso* (Shrubby penstemon)
*Sisyrinchylum augustifolium* (Blue-eyed grass)
*Trillium ovatum* (Western trillium)
*Similicina racemosa* (false solomon’s seal)

Landscape Character Zone A₁ - Open Meadow, Specimen Trees

*Phyllodocue empetriformis* (Pink mountain heather)
*Acer circinatum* (Vine maple)
*Carpinus betulus* (European Hornbeam)
*Cornus nutallii* (Pacific dogwood)
*Rhamnus purshiana* (Cascara tree)
*Arctostaphylos uva-ursi* cv. “Vancouver Jade” (Vancouver Jade)
*Linnaea borealis* (Twinflower)
Perennials

*Anemone occidentalis* (Western pasque flower)
*Asarum caudatum* (Wild ginger)
*Balsamorhiza sagittata* (Spring sunflower)
*Camassia quamash* (Common camas)
*Castilleja miniata* (Common red paintbrush)
*Delphinium menziesii* (Menzie’s larkspur)
*Dodecanthion pulchellum* (Shooting star)
*Erythronium oregonum* (White fawn lily)
*Penstemon fruticosus* (Shrubby penstemon)
*Sisyrinchium augustifolium* (Blue-eyed grass)
*Trillium ovatum* (Western trillium)
*Similicinca racemosa* (false solomon’s seal)

Specimen Trees

*Magnolia x soulangiana* (Saucer Magnolia)
*Hamamelis mollis* (Chinese Witchhazel)
*Acer palmatum ‘Bloodgood’* (Japanese Maple)
*Betula pendula ‘Youngii’* (European White Birch)

Landscape Character Zone B - Groves of BC Natives

Broadleaf Evergreens

*Gaultheria shallon* (Salal)
*Mahonia aquifolium* (Oregon grape)
*Mahonia nervosa* (Cascade Oregon grape)
*Symphoricarpus alba* (Snowberry)

Conifers

*Chamaecyparis lawsoniana* (A. Murr. ) Parl. (Lawson cypress)

Deciduous Trees

*Acer macrophyllum* (Big leaf maple)
*Acer rubrum L.* (Red maple)
*Acer saccharinum L.* (Silver maple)

Deciduous Shrubs

*Amelanchier alnifolia* (Saskatoon serviceberry)
*Lonicera involucrata* (Twin berry)
*Ribes sanguineum* (Red flowering currant)
Rubus spectabilis (Salmonberry)
Sambucus racemosa (Red elderberry)
Sambucus cerulea (Blue elderberry)

Roses

Rosa nutana (Nootka rose)
Rosa rugosa (Rugosa rose)
Rosa woodsii (Wood’s rose)

Groundcovers

Cornus canadensis (Bunchberry)
Tolemeia menziesii (Piggyback plant)

Ferns

Adiantum pedatum (Maidenhair fern)
Blechnum spicant (Deer fern)
Polystichum munitum (Sword fern)

Landscape Character Zone - C - Riparian, Nesting, Dense Vegetation

Conifers
Abies lasiocarpa (Subalpine fir)
Chamaecyparis nootkatensis (Yellow cedar)
Taxodium distichum (Bald cypress)
Tsuga heterophylla (Western hemlock)
Tsuga plicata (Western red cedar)

Deciduous Trees

Acer macrophyllum (Big leaf maple)
Quercus garryana (Garry oak)

Deciduous Shrubs

Amelanchier alnifolia (Saskatoon serviceberry)
Ribes sanguineum (Red flowering currant)
Rubus spectabilis (Salmonberry)
Sambucus racemosa (Red elderberry)
Sambucus cerulea (Blue elderberry)
Vaccinium membranaceum (Black huckleberry)
Vaccinium parviflorum (Red huckleberry)
Viburnum opulus (Highbush Cranberry)
Groundcovers

*Cornus canadensis* (Bunchberry)

Vines

*Lonicera ciliosa* (Western trumpet honeysuckle)

Ferns

*Adiantum pedatum* (Maidenhair fern)
*Blechnum spicant* (Deer fern)
*Polystichum munitum* (Sword fern)

Landscape Character Zone D - Wetland/Fresh Water Marsh

Deciduous Trees

*Alnus sinuata* (Sitka alder)

- **Wetland Perimeter**

  *Pinus contorta* Doug. Ex Loud. Var. contorta (Shore Pine)
  *Acer rubrum* L. (Red maple)
  *Alnus rubra* (Red alder)
  *Betula papyrifera* (Paper birch)
  *Populus trichocarpa* Torr. & A. Gray (Black cottonwood)
  *Cornus stolonifera* (Red Osler dogwood)
  *Physocarpus capitatus* (Ninebark)
  *Myrica gale* (Sweet gale)
  *Salix hookeriana* (Hooker’s willow)
  *Salix scouleriana* (Scouler’s willow)

- **Perimeter marsh**

  *Carex stipata* (Sawbeak sedge)
  *Carex rostrata* (Beaked sedge)
  *Carex obnupta* (Slough sedge)
  *Juncus effusus* (Common rush)
  *Glyceria borealis* (Northern mannagrass)
  *Lysichiton americanum* (Skunk cabbage)
  *Typha angustifolia* (Narrow-leaved cattail)

- **Shallow Marsh** (0.3 to 0.6 m)

  *Alisma plantago-aquatica* (Water-Plantain)
  *Scirpus cyperinus* (Wool grass)
  *Scirpus americanus* (American threesquare)
Eriophorum angustifolium (Narrow-Leaved Cotton-Grass)

- Deep Marsh (0.6 to 1.0 m)

Typha latifolia (Broad-leaved cattail)
APPENDIX XII

RESEARCH-DESIGN DIRECTIVES

The results of attempting to make the research-design connections are presented below. Such connections have generated specific design guidelines or directives. A series of questions were asked to initiate the design and these are presented under part (a). A few of the children’s responses to the slides are given as examples under part (b). The responses of the children clarified the perceptions the author had about the meaning of play spaces for the children. They are provided only as insights. Item (c) is important because it is in this section that the design directives are presented. The directives are only the beginning of producing performance based design guidelines for children's play spaces, with greater significance for the child.

I. THE GREENWAY

a. Designer Reflection

• Could a greenway link communities divided by stream channels?
• How could a greenway facilitate the community to use an park amenity which could be part of an official community plan?
• Can a greenway be placed ahead of a development in anticipation of future development?
• Can a greenway act to preserve agricultural land?
• Can a greenway be safe and accessible by law enforcement services in rural settings?
• How will the greenway help the children understand about and move about in their environment? Will it increase concerns about safety?
• By opening and linking neighbourhoods in the community, can the greenway improve the community’s cohesiveness and reduce the vandalism?
• How will the greenway conserve nature in the face of change?

b. Children's Reflections, Responses, and Wisdom

• The street is a place to meet.
• Streets lined with trees were not intimidating.
• Preference for light along paths of travel.
• Being driven to friends house predominately.
• Fear of stray dogs and speeding cars.
• Shortcuts through blocks are preferred over crosswalks across big streets.
• Nothing special about a road with trees on it.
• Shady and breezy. Sun on outside is nice.
• Street with lined trees, looks like a cemetery.
• Street looks like a tunnel and a great place to explore.
c. **Design Directives**

1.0 Accommodate nature through protecting trees and their root systems, creating swales and water detention areas along roadways. It is suggested that by exposing the natural processes of, for example, biofiltration, were the public can see them working, the public will be increasing aware of their importance.

2.0 Increase the movement of plants, animals, and water by designing greenways that give our communities wholeness and promote sustainability by supporting biological diversity.

3.0 In a cul-de-sac street pattern, access from the cul-de-sacs to the greenway recommended to be by footpaths and narrow roadways between houses, making use of back alleys and rail lines.

4.0 Reclaim vacant sites to provide for pocket parks.

5.0 Increase the connectivity of a community and create points of destination within a greenway.

6.0 Join destinations in a linear fashion to make them easy to find and easy to move between.

7.0 Design greenway corridors with riparian leave areas to support stream stewardship.

8.0 Insure the greenway travels off of the main roads to increase safe travel by children through the greenway.

II. **THE PARK**

a. **Designer Reflection**

- How does the park relate to the community?
- How can this relationship be enhanced?
- What kind of statement can the Park make within its community?
- Can the Park be a transition zone?
- Will the Park have a regenerative function?
- Where will the washrooms go?
- Where can the eco-forest project go?

b. **Children’s Reflections, Responses, and Wisdom**

- Worry about big kids in the park.
- Go with mom or dad.
- Not enough swings.
- Want to be where I can get help if I need it.

c. **Design Directives**

1.0 Keep the site design to between 3 to 5 landscape character zones.

2.0 The natural environment can appeal to wide ranges in ages and development stages.

3.0 Use of a great variety of materials, colours, textures, will enrich the child’s positive experience of the natural environment.

4.0 Isolate school facilities from the park area to minimize the unsupervised overlap use of
5.0 Use and create barriers that help control access such as ha-ha’s, a gate and redirect primary paths away from school grounds.

6.0 Provide school-park transition zones for the natural progression from structured play to free play, giving an area of reflection and a place to pause to view and orientate at the gateway between the school and the park.

7.0 Accommodate major public greenway movement on primary circulation through the northern part of the park and direct major use by school children to the southern portion of the park nearest the school.

8.0 Provide daytime and early evening access by the community by having:
   d. Hierarchy of trails - three different trail conditions and characteristics which deal with four attributes - grade, cross-slope, width and surface.
   e. Parking and parking by-law signage clearly visible.
   f. Clean demarcation of boundaries through gates, ditches, and ha-has.
   g. No lighting provided to discourage use of park as a late evening party destination.
   h. Provide Public washrooms at the school site beside the gym and multipurpose spaces of the schools.
   i. Open areas with elevated tree canopies provide clear lines of sight increasing the perception of safety, feelings of openness and freedom, and variety of views within a small area.

9.0 Provide site enclaves that create areas of privacy permitting the community to take ownership.

10.0 Provide identifiable formal entries help to establish the presence of the park and introduced order to the overall design.

11.0 Provide vistas through groves or bosques gives visual access into the interior of parks, inviting exploration through hiking and activities like picnics.

12.0 Shape landforms that rise above the ground plain to (a) show off diverse colour patterns through elevation, (b) give shape and topographic relief to a site, and (c) draw the viewers eye to open spaces on horizons where specimen trees appear in glades and on open plateaus.

13.0 Facilitate safety and security within the park site by: (a) providing no lighting; (b) providing no sheltered spaces (sheltered space was provided); (c) reducing the open field area through the introduction of a wetland habitat; (d) installation of night security gates to parking areas; (e) posting of parking by-law regulations; (f) providing access for emergency vehicles to the park by the cul-de-sacs (and dykes for the greenway link); and (g) providing viewing corridors from the street through and into the bosque.

14.0 Provide shelter in the park with multiple functions including: (a) protection of visitors from weather and sun; (b) providing a viewing and sitting area for visitors; and (c) providing an educational value.

III. THE SCHOOL

a. Designer Reflection

• How does the school relate to the community?
• How does the relationship express itself through the school grounds?
• How does the school bring its physical, social and symbolic presence into the
area?

• Are the school grounds intended to be buffers or links?
• Do the grounds interrupt the flow in the community or act as a sheltered space where the adults cannot contact the children?
• Do the grounds link the school or protect the school from the community? Or can the grounds be managed to serve both purposes?
• Is hiding the school grounds what we want to do?
• Green vegetation or grey concrete, what is your choice of weapon?
• Quality of life in the community will be impacted by the school’s presence. Quality of environment will also be impacted. What is the vision for the school’s role in influencing or changing the quality of the community’s experience?
• What is the school’s intention as far as impression of accessibility and openness for the community?

b. Children’s Reflections, Responses, and Wisdom

• Liking for bigger spaces where I can play sports.
• Lots of variety. Liking for rubber floor. There is no gravel.
• Jungle jim a bit small, someone could get hurt. Too crowded.
• Like to swing high up.
• Colourful play equipment.
• Tons of people, and I bet the slide is really slippery.
• Lots of fun stuff.
• Lots of people, is a good play space.

c. Design Directives

1.0 Incorporate existing landscape features into the site plan.
2.0 View corridors and external views should be preserved.
3.0 Safety and security within the school site are enhanced by the rotation of the school building to increase the angle of view into the kindergarten to Grade 2 yard.
4.0 Provide access and circulation around the parking lot and drop off points, including a loading zone for parents waiting to pick up their children.
5.0 Provide outdoor and indoor transition spaces to facilitate movement between building and surrounding nature. Seamless transitions include the height of the threshold of the doors between indoor and outdoor spaces.
6.0 Insure that school building orientation facilitates energy conservation in relation to site, site access, and site typography.
7.0 Use the site plan as a positive element to create variety in spaces and to increase flexibility in one or two spaces for multiple uses.
8.0 Provide a balanced design in the site plan which does not emphasize heavily one aspect of an outdoor teaching program at the expense of another.
9.0 Emphasize as many play options as is reasonably possible and with a natural, non-institutional approach within the site plan.
10.0 Accommodate found play space or playing with loose materials by providing access to open spaces and openings in the vegetation surrounding the play elements.
11.0 Balance in the design also mitigates the relationship between large open spaces used for
sports and the small, intimate spaces created by enclosed areas intended for other uses including play.

12.0 The transitions between large (adult oriented) and small scale (child oriented) spaces should include appropriate distances, and buffers which handle the various scales.

13.0 Provide design of edges and the movement away from the edge into the transition space that gives perspective from small viewing and open spaces to larger vistas quickly.

14.0 Large landforms should have multiple uses such as: (a) acting as dividers between differently scaled spaces; (b) providing a view as a prospect/refuge and/or as a seating area to view events from; (c) creating wind breaks; and (d) acting as a means to direct excessive water flow into streams, channels or soaker pits.

15.0 Landforms give variety to a site which encourage running and climbing.

16.0 Provide gradual transitions to knolls with 5-10% (max.) slopes. Permit the child using a mobility aid to join other children on the higher landforms.

17.0 Edges to be defined by the presence of light (raised canopies and shrubbery with open habits) and colour (leaf and flower colours which varied with a tendency to be light/white in colour).

18.0 To deter entry into vegetation, edges should be defined by low and densely branched shrubs.

19.0 Provide hardening of edges through ha-ha’s, stone walls, formal entries with controlled gates locked during school hours, wooden yet open railed fences, metal railings and the chain link fence.

20.0 The school layout, direct access to playgrounds from the street, means examining the school’s relationship to highways, exit ramps, and streets so that concerns regarding policing for child abduction are met.

21.0 Provide sheltered areas from rain, prevailing winds and also increasing the opportunity for use of solar gain.

22.0 Environmental and noise pollution, visual ‘garbage’, and real garbage, are deterred by the use of trees, shrubs, walls, fences, earth mounds, or changes in site levels.

23.0 Hard surface and soft surface treatments will define space and assist with (a) wayfinding; (b) providing a sense of arrival; (c) designating parking and loading areas; (d) providing access safety; (e) increasing the efficiency of access for service and emergency vehicles; (f) increasing the aesthetic qualities and meaning of space and unify the space based on hierarchies and movement patterns.

24.0 Provide common themes through the soft landscape to provide: (a) shelter; (b) a balance to the harder lines of the school building, (c) natural aesthetics, and (c) an educational value.

Design themes include:

- Ecological ‘Forest’
- Wildlife Habitats
- Plain Jane Trees, Hedges, Scrub, Shrubs
- Water and Urban Biofiltration and Recycling (Regenerative Habitats)
- Art/Sculpturing Courtyards (Renaissance Themes)
- Garden/Tree Nursery Themes with a Rural Flavour

25.0 Hard surface treatment can be varied for creating accessible outdoor classrooms and unified by pathways of only two different surface materials, for example.
26.0 Function influences form and helps to distinguish between different uses of space. Outdoor classrooms may parallel the interior of the school building.

27.0 Consider the exit routes and doorways out of the building with respect to grading.

28.0 Drop the elevations of parking areas and main entry points to the school in order that the school is easy to enter without extensive ramps or stairs.

29.0 Increase community access to the school site by providing areas for quiet sitting and conversation. Amphitheatres, enclosed courtyards, ‘greens’ surrounded with seating, tables, huts, miniature plazas, will help at both the adult and child scale, to create intimate spaces.

30.0 Specify site furnishing with sensitivity to the size of children, their abilities to reach, and climb safely.

31.0 Provide facility for comfortable and sheltered seating for adult supervision of children’s play.

32.0 Provide vandal-proof storage facilities for the affordable means of mobility of children including bicycles, skateboard, roller blades.

33.0 Provide accessible storage adjacent to the playgrounds and as a secured, integral part of the school building.

34.0 Provide outdoor shelving for the storage of found, nature objects such as rocks, leaves, pieces of wood.

IV. PLAY ACTIVITY

a. Designer Reflection

• What does play mean?
• How can a design make play meaningful?
• How does play work?
• What are the qualities of a good play environment?
• What are some of the perceptions of playing on jungle jim equipment?
• What is attractive in a play space?
• Can play spaces be for adults too?
• Is building a play activity?
• What can be made simple enough that imagination must start to make the space meaningful?

b. Children’s Reflections, Responses, and Wisdom

• I like the pretend spider web.
• Liked play equipment, lots of children to play with, colourful, friendly.
• Looks like fun and safe.
• It would be really fun to play there.
• Swings, slides, lots of things to play on.
• Looks crowded and sort of fun.
• Looks like a place where everyone would go and have tons of fun.
• Busy, fun.
c. **Design Directives**

1.0 **Provide** for uninterrupted, rapid and safe circulation patterns that encourage diverse sequences of movement between spaces and play activities.

2.0 **Create** outdoor rooms where *cognitive* play spaces can protect children from noisy environments and intrusions from physical and social play.

3.0 *Social* and *dramatic* play find no conflict with physical play areas.

4.0 **Place quiet, retreat** play with creative, cognitive play and adjacent to (a) adult seating areas; (b) within enclosed, reduced scaled spaces like the underside of bridges, lower canopied trees; and (c) provide for an alternate way to exit an enclosing space.

5.0 Provide on the playground, everyday objects, landmarks and colours to stimulate for active minds and imaginations.

6.0 Provide spaces for water play that can include sprinklers, hand pumps and shallow if not dry play streams.

7.0 Naturally rounded boulders of many sizes provide attainable and varied landscapes at the scale of the child and on which they can sit, step over and climb.

8.0 The placement of play equipment in the playground requires an understanding of play-use patterns.

9.0 It is not recommended to have a single piece of equipment positioned in a large sand area to serve all intended play types as this builds in conflicts if the play equipment is heavily used all at once.

10.0 Provide a simple, direct access to the kindergarten to grade 2 play space. Simplification and directness of the pathway reduces the complexity of the space for the child at the pre-operational stage. Set the quiet play areas apart from the physical play activity areas by (a) pathways and (b) large open spaces.

11.0 Cooperative play space is a valued experience as the children seek to relate with others.

12.0 Provide areas for running spaces for the child in grade 3 to 6 and beyond. This space in fact needs to be wider and longer than the spaces for running of children kindergarten to grade 2 and the author believes this addresses the need of the child who extends themselves farther into their play spaces.

13.0 Increase diversity of movement by creating (a) openness that is flexible in its use; and (b) elevation that promotes effort in movement. Open spaces are flexible, when flat, for the carrying on of many diverse movements without hindrance e.g. running, skipping, dancing, spinning, whereas elevation leads to movements which require a bit of control such as rolling, climbing, sliding.

14.0 Increase the complexity of play areas to reflect the child’s cognitive development level, e.g. the older child’s playground (Grade 3 to 6) has greater complexity in terms of play areas, the spatial quality is one where differentiation occurs in a significant manner.

15.0 Provide a circular design for the primary pathway to facilitate running, tricycles, roller blades.

16.0 Keep indoor/outdoor transition spaces minimal as the time and distance perceptions of younger children are much shorter than for the older child. Please note that their perceptions of time is based on the physical effort they require to reach their intended play activity area.
V. UNIVERSAL ACCESS

a. Designer Reflection

- How much is known about universal design and designing for children?
- What type of scale are we addressing for the child?
- Is the tolerance for error greater for the child when applying universal design principles?
- Every child is unique; how does one overcome the perception that universal design recognizes uniqueness - one size does not fit all?
- What type and level of detail is needed in designing for children?

b. Children’s Reflections, Responses, and Wisdom

- Open space looks safe.
- It [the boardwalk, Slide No. 10] looks kinda weird because it should be a train track.
- Bridge could collapse. Needs higher sides and more support, not a good area.
- Looks like a big open space. No special feeling about it.
- Looks dark but fun. Long bridge to walk.
- Looks misty, railway tracks are scary.

c. Design Directives

1.0 Ramp Inclines. The minimum standard according to the British Columbia Building Code is a ratio of 1:12. Children using wheelchairs appear to have greater agility and upper body strength than their adult counterparts. Given that children want to move from point A to point B quickly, the recommendation is that children can handle a 1:8 or 1:10 ratio typically. On the safer side however, given the possibility to slip on wet ramps in our Vancouver climate, the recommendation is in fact to keep to the standard of 1:12 ratio or to design so that no ramps are required at all.

2.0 Ramps to be designed with wooden floor boards close to one another, running perpendicular to the direction of movement, so that the wheels of the chairs will not become caught in the spaces between the boards.

3.0 Ramp Width. Ramps should be a minimum of 3'6" wide for one wheelchair and 6' for two. The recommendation for ramps is to be designed at 3'6" simply so that a child may span the width of the ramp to reach the handrails on either side. Typically it is recommended that a designer work with a child who is entering the school programme in order to modify such dimensions to suit the children’s abilities to be mobile.

4.0 Ramp Railings. Rails heights are recommended to be at three heights: 38", 17.5" and at the baseboard level. The baseboard level is required to prevent small wheels or crutches from slipping off any platform’s edge. The handrail should have a diameter of 1.5 - 2" and be offset from the ramp guard.

5.0 Ramp Guard. Vertical railing that prevents climbing up and over is highly recommended to prevent falls from ramp railings.
6.0 Ramp railings may not be necessary for many children. The recommendation is to inquire of the user group whether rails are desired or not and to judge based on the potential for falls and landing on resistant surfaces. It is the author’s recommendation that safety come first and when in doubt, guards and railings are necessary to better insure anyone’s safety on a ramp.

7.0 Ramps should never be longer than 20 feet without a landing between segments. The landing serves for resting going up and for safety when a child races down a ramp.

8.0 Design the ramp to be a playful thing. The ramp could have interactive surfaces like waves and moveable parts. The Constellation Bridge is an example of a decorative guard and handrail. The guard is imbedded with recessed glass spheres replicating star constellations. The bridge (a) allows the play of light to occur along a unique surface; (b) provides a tactile experience; and (c) gives a lesson on star constellations.

9.0 It really is not necessary to level a site to make it wheelchair accessible. Instead, reducing the length required for ramps, taking advantage of any existing slope, digging down to create a shallow depression or adding a slight slope to a flat terrain just adds stimulation for everyone.

10.0 Shorter ramps combined with landscaping help soften and blend a structure into the environment.

11.0 Providing visual and tactile markers at the beginning and end of all ramps is a helpful design detail. Also, the coloured markers on the ends help to avoid injury as a child running may see the edge of the ramp before striking it.

12.0 It is crucial to have continuous surfaces from every ramp to the adjacent sidewalks and then low thresholds into the school building.

13.0 Resilient surfaces can be used and are currently under development with respect to surface treatments and falls. The tables below give examples of the critical heights and the materials’ testing depths according to the CAN/CSA-Z614-98 standards for Children’s Playspaces and Equipment. There is a difference of opinion as to what to use for surfacing. There are portable mats now available for placing over sand to access by children using mobility aids.
## Critical Heights of Tested Materials

(See Clauses 10.3 and 10.4.3.)

<table>
<thead>
<tr>
<th>Material</th>
<th>Uncompressed depth</th>
<th>Compressed depth</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>150 mm (6 in)</td>
<td>225 mm (9 in)</td>
</tr>
<tr>
<td>Wood chips</td>
<td>2.1 m (7 ft)</td>
<td>3 m (10 ft)</td>
</tr>
<tr>
<td>Double-shredded bark mulch</td>
<td>1.8 m (6 ft)</td>
<td>3 m (10 ft)</td>
</tr>
<tr>
<td>Engineered wood fibres</td>
<td>1.8 m (6 ft)</td>
<td>2.1 m (7 ft)</td>
</tr>
<tr>
<td>Fine sand</td>
<td>1.5 m (5 ft)</td>
<td>1.5 m (5 ft)</td>
</tr>
<tr>
<td>Coarse sand</td>
<td>1.5 m (5 ft)</td>
<td>1.5 m (5 ft)</td>
</tr>
<tr>
<td>Fine gravel</td>
<td>1.8 m (6 ft)</td>
<td>2.1 m (7 ft)</td>
</tr>
<tr>
<td>Medium gravel</td>
<td>1.5 m (5 ft)</td>
<td>1.5 m (5 ft)</td>
</tr>
<tr>
<td>Shredded tires(\dagger)</td>
<td>3.6 m (12 ft)</td>
<td>N/A</td>
</tr>
</tbody>
</table>

**Notes:**

1. The above table represents the minimum depths to meet the 200 g/HIC 1000 measurements.
2. The maintenance requirements are integral to the reliability of surfacing materials.

*Results of tests conducted by the United States Consumer Product Safety Commission (CPSC), according to ASTM F 355 test methods.

\(\dagger\) This data is from tests conducted by independent testing laboratories on a 6 in depth of uncompressed shredded tire samples produced by four manufacturers. The tests reported critical heights that varied from 3 m (10 ft) to greater than 3.6 m (12 ft). It is recommended that persons seeking to install shredded tires as a protective surface obtain test data from the supplier showing the critical height of the material when it was tested in accordance with ASTM F 1292.

---


It is recommended that the choice of surfaces be evaluated against user needs and desires of those ministering the facility.

---

14.0 Loose surfacing material needs to be contained by soldier courses. It should not spill onto platforms, ramps, or stairs, making surfaces slippery.

15.0 Vary surfaces and textures to create zones, edges, approaches, degrees of challenge, types of equipment helps children with perceptual problems. It also gives variety, interest and different sensory experiences exposing the child to the diversity of their environment.

16.0 Reasonable, pathways should be a minimum of 4 feet wide for one child using a wheelchair, 6 feet for two children.

17.0 Circulation needs to (a) provide choices to reverse or turn around, experience continuous and unimpeded motion; (b) never dead end; (c) never restrict access to any type of play equipment; and (d) lead to areas where resting can occur e.g. under a shade tree.
18.0 Placing 'parking' zones beside play benches, or near equipment onto which a child can transfer, means that a child can leave their chair and integrate fully with other children sharing the space.

19.0 Making playgrounds accessible not only accommodates the child in a wheelchair but also a parent in a wheelchair supervising their growing children.

20.0 Benches and seating areas that surround a playground site need a comfortable back support and arm rests for easy movement in and out of the bench.