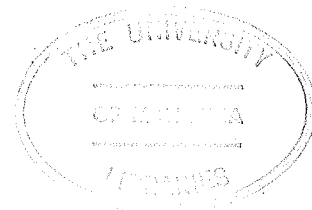




1979 - International Year of
the Child

PLAYSPACES TO ACCOMMODATE DISABLED CHILDREN

by **JAMES H. MELVIN**



PLAYSPACES TO ACCOMMODATE
DISABLED CHILDREN

A Practicum submitted to the Faculty of
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Abstract

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PLAYSPACES TO ACCOMMODATE
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Play is an integral part in the development of any child. Through play a child learns of the world, how to make decisions, succeed, fail, socialize, develops physically and mentally by means and actions of his own.

The avant-garde movement in playground design has drastically altered the physical environment of play spaces; from the sterile expanse of asphalt and swings to rich and varied interrelated facilities which are manipulative and challenging. Still, many of the modern play facilities do little to provide the opportunity for disabled children to participate.

This practicum examines the problem of providing play facilities for semi-ambulant and non-ambulant disabled children. A designer of integrated playspaces for able-bodied and disabled children must be cognizant not only of the wheelchair but other mobility aids that may be used. The design must offer facilities which welcome and challenge the handicapped individual while not sacrificing their appeal to fit children.

A number of design guidelines concerning selection of site, site planning and areas of concern in the design of specific facilities are established.

A design solution is presented for a selected elementary school in Winnipeg where a number of disabled children are in attendance through a normalization program.

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1. Introduction

1.1 THE PROBLEM

Playspaces can be designed to accommodate and enhance the physical, mental and emotional growth of a child. They can be developed as places where children can test, hypothesize, create, succeed, fail and investigate on their own; as places that compliment the street, the home, the institution. Rich and varied play opportunities should be available to all children and denied to none, perhaps least of all to the handicapped child.

Handicapped children are children first and foremost. Dattner (1969) is quick to indicate that the play of handicapped children follows the same pattern as that of normal children. "It serves the same function of expanding their experience and understanding of the world, and it affords them the same potential for enjoyment and expression." This is not to say that the handicapped child does not encounter difficulty in traditional playgrounds, but rather his use and adaptation to the equipment is hindered by the degree of handicap that he possesses.

Austin and Hayes (1974) suggest that handicapped children often have a great amount of enforced free time but are denied the right to participate in play through isolation, thus compounding their handicap and leading to social retardation. In short, they point out the pervasive need for play environments that will accommodate handicapped children.

Play, and the environment it occurs in, are important variables in the physical, social and mental growth of a person. Piaget states that environmental influences assume increasing importance as one grows. When 80% of a child's learning occurs before he is eight and when play is research or learning for life, then the play environment for all children, handicapped and non-handicapped, is of vital importance.

Environmental playgrounds, creative playgrounds and adventure playgrounds are the avant-garde in modern playground design. Environmental playgrounds are a wholistic approach towards the design of the playspace. Based on a concept from ecology that diverse environments are resilient and productive, the play yard becomes an extension of the formal learning environment of the school, by allowing children to explore and discover on their own. The yard is a problem-oriented, process-oriented and action-oriented place inviting the whole community to increase their awareness and understanding of the total environment. (Moore, 1972)

The creative playground is a playing and learning space designed by adults with the object of providing facilities which will generate a wide variety of activities for the child. The playspace can be totally designed relying on the adaptability, linking and juxtaposition of the facilities to provide versatility or the environment can provide the supportive or constructive base along with loose materials allowing the child to partially manipulate the environment. The playground does not necessarily rely on playleaders to function but rather the parents and children to supervise themselves. (C.M.H.C., 1977)

The adventure playground is an environment which is designed by children: a fenced in piece of vacant land containing an agglomeration of scrap material providing the children with the opportunity to construct, tear down and rebuild their playscape. A playleader is present only to guide and help, not to organize the child's playtime. (C.M.H.C., 1977)

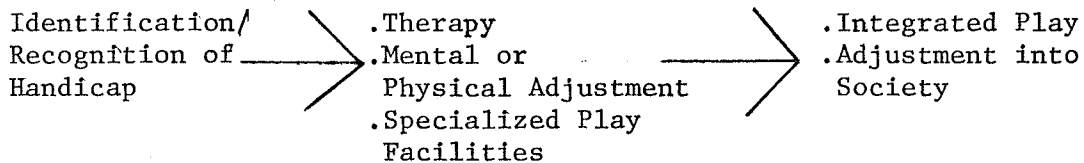
Behavioural scientists and designers have collaborated to develop play environments which attenuate the sterile qualities of traditional playgrounds while emphasizing the manipulative, learning, graduated challenge aspects of the playscape. Playgrounds as defined above have successfully demonstrated their appropriateness as ideal outlets in which a child can educate, experience and manifest those social, physical and cognitive qualities which are influential in the process of growing up.

This approach toward the design of play environments has been developing over the last forty years, primarily in European centres. Canada, unfortunately, has not advanced as far in playground design as such countries as Britain, Scandinavia or the United States. At the local level, in Winnipeg, innovative playscapes are severely lacking and traditional play facilities continue to be installed in many parks and schoolyards. Recently however, concerned parents and educators have become involved in the design and construction of play environments which better respond to the needs of their children. Unhappily, even these playgrounds do not accommodate the handicapped child.

1.2 INTENT OF THE PRACTICUM

Two kinds of playgrounds have been idealized for handicapped children: 1) playgrounds specifically designed and staffed for handicapped children where they can attempt and achieve all kinds of physical and mental activities at their own speed without competition from other children, and 2) play environments offering integrated play, permitting both handicapped and non-handicapped children to play together and to benefit from the experience; where the handicapped child can learn from observation and imitation of the non-handicapped child and, when necessary, be assisted in the use of some playground equipment. In the latter, the fit child will benefit from exposure to handicapped children and soon realize that they are more similar than dissimilar to himself. Both groups will avail socially from interaction induced in the integrated playground.

While both play environments are valid, the one advocating integrated play is healthier socially and mentally while being more economically sound to build. This is not to say that a specialized playground is unneeded, but rather that it functions as a therapeutic, intermediate step to integrated play.



In Winnipeg a playground designed for use by all children would be a valuable addition. A goal can be set for a playground that affords use by special children. To minimize frustrations caused by inappropriate design while maximizing opportunities for engagement with a stimulating environment. (Austin, 1978)

With the above goal in mind, a design for a play environment which accommodates the able and handicapped child is developed in this practicum. The study examines the different types of handicaps affecting children and talks of some of their debilitating effects. The different mobility aids which are used by children are also examined. Discussions with handicapped children, therapists and teachers, observations of disabled children and information gleaned from the literature, is used to determine guidelines that will assist in site selection, site planning and specific details of certain aspects of the play environment.

The culmination of the study is the design of a play environment to accommodate the integrated play of able-bodied and disabled children. This design will incorporate some of the guidelines established into a site plan/model of the proposed facilities.

1.3 DEFINING PLAY

Before planning for play one must first define what play is. One must also establish the motives for and the content of play.

There are many definitions of play and Ellis (1973) is quite thorough in his examination of them. Play is defined as extrinsic motivation; as voluntary behaviour, as intrinsic motivation, by content, and as an undefinable. Ellis concludes that new definitions of play will continue to be generated to fit the current concepts of play behaviour and that play can be defined by both its motive and content.

Caplan (1973) states that play is a child's way of life from infancy to his eighth year. A young child plays all the time, from morning until he sleeps. Playtime aids growth, it is a voluntary activity. Play offers a child freedom of action; provides an imaginary world, adventure, physical and social development. It also furthers cognitive awareness and concentration, investigation, role playing, is dynamic and vitalizing. Play is in fact, the act of growing up.

In today's society the environment of play is supplanted by the school. Entering school a child finds himself in a setting he can no longer control. As a student he must play at a specific time or in a specified way. It is at this stage of a child's growth that many definitions concerning the content or motivation of play break down. The child it seems is subject to the demands of two seemingly divergent forces. One, the rigorous routine development of the self through society's involvement via the school, and two, the child's own eagerness to acquire knowledge through self-understanding or play. Thus, while one method of gaining knowledge is unrestricted in its motives, the time made available for self-development via this method is restricted by the demands of a formal education. The environments closely associated with a child's free time, the school yard, the paths to and from school, and the immediate vicinity of home and neighbourhood, are vitally important in the self-development of the child.

This practicum acknowledges play as the virtue of all aspects of self-development through interaction with the environment. Specifically, the practicum is concerned with the environment immediately surrounding an institution where interaction is limited, intense and primarily scheduled.

1.4 THE ROLE OF THE PLAY ENVIRONMENT

Psychologists tell us that play is an extremely important aspect in the physical, mental and social growth of a child. Piaget (1962) and Caplan (1973) both indicate that there are stages of development that a child experiences. In each, different aspects of play are stressed, exponentially increasing the complexity of the individual's behaviour. Caplan points out that four to six year olds flirt with danger, and that creative play is at its high point for six to nine year olds, while the play environment for eight to twelve year olds becomes a stage for dramatization or the rehearsal of adult roles. Once into the teen years, play takes on increasingly adult forms.

Piaget and Inhelder (1969) see three principal categories of play and a fourth which serves as a transition between symbolic play and non-playful activities or serious adaptations:

- "1) Exercise play--does not involve symbolism or any specific play technique but consists in repeating, for the pleasure of it, activities acquired elsewhere in the course of adaptation. The child having discovered by chance the possibility of swinging a suspended object--first does it to understand it then does it for pleasure of causing an effect and confirming a newly acquired skill.
- 2) Symbolic play--reaches its apogee between the ages of 2 and 3 and 5 and 6.
- 3) Games with rules--transmitted socially from child to child thus increasing importance of the child's social life.
- 4) Out of symbolic play--develops games of construction--adaptations or solutions to problems and intelligent creations."

Piaget & Inhelder, 1969, p.59.

Thus, in play the child progresses from ritualization of an action to new levels of comprehension which form the basis for new theories, concepts, symbolic representation, associations, and limits. Through play the child learns to understand the world on his own terms.

The playground can become one place where the child can progress. Too often in the past however, playgrounds have only offered sterile asphalt wastelands providing the child with no choice or chance of manipulation and involvement.

Designers such as Friedberg and Dattner argue that the playgrounds should allow for three basic kinds of play--physical play, social play and cognitive play. These provisions can be met if "the environment provides the individual with an adequate range of experience; and the environment allows for some measure of control by the individual". (Dattner, 1969, p.41) The challenge for the designer is not just to provide the child with something to play with, but to make a palpable, manipulative environment with which the child can react, relate, discover and invent. Ideally the playground should be a miniature model of the world.

Probably the best demonstration of a "world model" playground is the Washington Environmental Yard project in Berkley, where the black-topped schoolyard was redeveloped into a diverse and dynamic educational/recreational resource. The schoolyard was not designed only for the onslaught of use at recess but as an extension of the classroom. Robin Moore (1974/75) would describe it as a curriculandscape --a whole earth, interdisciplinary environment permitting process, problem and action oriented activity in a flexible, open ended, diverse, safe way.

Dattner (1969), Moore (1973, 1974) and Friedberg (1970, 1975) stress essentially the same environmental qualities for the playscape in order to achieve a positive play environment. All three advocate that the playground should:

- 1) have complexity offering alternatives and the tools of the growth process,
- 2) provide sequences of movement--through linking of play facilities or the juxtaposition of play facilities,
- 3) allow manipulation--control of the environment by the individual "the degree of inventiveness and creativity and the possibility of discovery are directly proportional to the number and kinds of variables in it." (Nicholson, 1971),
- 4) offer stimulus for cognitive play--to learn by problem solving or observational learning--through openendedness and adaptibility,
- 5) offer stimulus for social play and interaction--again through openendedness and adaptability of equipment, scale of spaces,
- 6) offer a graduate challenge--allow the individual the exhilaration of accomplishment,
- 7) be diverse in movement, manipulation, openness, scale, natural elements, and all sensory dimensions--a basic concept of ecology that diverse environments are resilient and productive.

In the past, concern was focused on providing a space for play, nothing more, nothing less. Little thought was given to the character of the play environment. The result was a sterile asphalt place void of opportunities, and children only found in the hours directly adjacent to school time.

Today, the role of the playground has changed. In today's society, where less and less space is designated as "safe" areas for children to play in and many "natural" areas for play (river bottom lands, forests) are being usurped for housing and industry, the designed playground is becoming one of the last vestiges for the child to actively and creatively entertain himself. Present-day designers and behavioural scientists are more acutely aware that the playground character should provide opportunities for play that stress physical development, social interaction and cognitive awareness. The disabled individual is limited by both his disability and the handicapping environment and he, therefore, especially needs facilities that are designed for his use. Thus, for the disabled person the problem is compounded, by the few well designed play facilities for all children and the lack of those facilities accommodating the needs of the disabled.

1.5 THE CASE OF THE HANDICAPPED CHILD AND PLAY ENVIRONMENTS

The United Nations "Declaration of The Rights of a Child" states:

"The child shall have full opportunity for play and recreation...society and public authorities shall endeavour to promote the enjoyment of the right."

In Canada, Bill C-204, Rights for Children, is still being debated in Parliament. In principle it states:

"The child shall enjoy special protection and shall be given opportunities and facilities by law and other means to enable him to develop physically, mentally, morally, spiritually and socially in a healthy or normal manner...

The child who is physically, mentally or socially handicapped shall be given special treatment, education and care required by his particular condition.

...The child shall have full opportunity for play and recreation which should be directed to the same purposes as education; society and the public authorities should endeavour to promote the enjoyment of this right."

Bill C-204, An Act
Respecting Canadian Bill
of Rights for Children

Internationally and nationally the child is procuring individual rights. The bills result from a concern to protect children from abuse and neglect. The Canadian Bill extends concern towards the environment a child should be guaranteed. Although not yet law, the Canadian Bill also recognizes the special plight of the handicapped and stipulates that all children be given the opportunity to recreate.

One small aspect of a child's opportunity for and right to recreation may be interpreted as the playground facilities available to him. Playgrounds abound, but as argued earlier the quality and character of their environment is constricting and simple, providing little challenge or definite enhancement to a child's play. Even where play environments have been upgraded to challenge the child's ability, the predicament of the handicapped has frequently been ignored. While designers have become cognizant of the poor qualities implicit in traditional playgrounds, facilities in most modern playgrounds continue to be inaccessible for use by handicapped children.

Only because of the acute awareness of a few individuals have any designs or facilities appeared that attempt to accommodate the handicapped. Richard Dattner was one of the first designers to recognize that the handicapped child's play patterns are similar to that of normal children. He also states that certain design considerations must be made in order to accommodate the handicapped. Dattner cites his example of a hospital playground in New York City to indicate how the handicapped might be accommodated (Dattner, 1969, p.109-117).

In 1970 the Handicapped Adventure Playground Association (HAPA) opened their first facility designed specifically for handicapped children, based on the adventure playground concept introduced in Britain by Lady Allen of Hurtwood. HAPA felt that handicapped children should be able to play informally in a more exciting, challenging environment than the one provided in hospitals and special schools. This playground is strictly for the handicapped. While the children may invite non-handicapped friends to join them and while it is recognized that segregation is undesirable, HAPA argues that "in a public playground, one rarely sees severely handicapped joining in the activities of completely healthy children" (HAPA, p.5). HAPA does not explain why this occurs; if it is because of rejection by healthy children or if the environment does not permit interaction.

Other playgrounds designed for handicapped children include the facilities at Marlborough Park Special School in Bexley, England; the Magruder Environmental Therapy Complex, Forest Park School, Orlando, Florida--an adaptive playground for pre-school physically disabled children with perceptual deficits, and a one million dollar specialized playground for the handicapped at the Michael Dowling School in Minneapolis. Unfortunately, there is not a great deal of information to be found regarding existing play facilities for handicapped children.

Probably, the most positive and recent development in the field of playground design for handicapped children occurred in New York City. In 1978 the New York City planning department sponsored a competition which invited solutions for a playground design which would accommodate both able and disabled children (Progressive Architecture 4:78 and AIA Journal, March 1978). Hopefully this might act as a guide and stimulant for other cities to be concerned with the handicapped in their playground designs.

While rights are being sought for both children and handicapped, many new playground designs, unless specific and specialized in nature, are excluding the handicapped. The New York competition is a boost to the field of playground design.

2. Designing for the Disabled

2.1 PLAY AND THERAPY

"Play provides expression and challenge for the developing organism." (Hunt, p.18) However, if the handicapped are limited in their play experiences additional physical and psychological handicaps may result, constricting their normal responses and further isolating them socially.

Should play be therapeutic? Hunt feels play and recreation are not synonymous with therapy but that they may act as therapy. Moreover, a recreational situation may be therapeutic if it is closely structured to insure a predicted outcome. Dattner (1969) and Austin (1974) both stress three goals of rehabilitation for the physically handicapped: stabilization or arrest to deterioration of existing abilities; developing and strengthening skills that are imperfectly developed or that have suffered some deterioration or atrophy; and to provide alternate compensatory skills to replace those that are lacking or irreplacably damaged. While not advocating a strict program of therapeutic play for the handicapped child, both authors feel that these goals are important to be aware of when designing facilities for the handicapped. Probably the greatest therapy is the enjoyment gained from participation.

2.2 CATEGORIZATION OF HANDICAPS

While participation is the key in recreation for the handicapped, the amount of participation is directly related to the type of handicap and its severity.

In general, handicaps can be categorized three ways; emotional disturbance, physical handicap and mental retardation (Austin, 1974).

a) Emotionally Disturbed Children

"Emotionally disturbed" is a non-specific descriptive term sometimes used to describe a group of disorders which are more serious than psychoses, neuroses and personality disorders.

This practicum intends to focus primarily on the physically handicapped and those mentally retarded without full use or control of their bodies. The emotionally disturbed child however, has full functional use of his body while having some difficulty in the areas of judgement and perception.

b) The Physically Handicapped Child

Among the "physically handicapped" there can exist a remarkable range of physical abilities, emotional and social attributes and intellectual capabilities. Quite often physical handicaps are thought to be only those orthopedic impairments which interfere with the normal use of the musculoskeletal system. Also included in the physically handicapped category are blindness or partial sightedness, cerebral palsy, deafness or hearing loss, and epilepsy.

i) Blindness and Partial Vision

Blind children have varying degrees of vision from total blindness to vision permitting travel without assistance.

The early patterns of a blind person's movement are often retarded, but as revealed in the Chelsea adventure playground, once familiar and confident with the environment blind children are the "most perceptive, adventurous and constructive of all the different groups visiting the playground." (HAPA, p.17)

Of prime importance, when dealing with blind or partially sighted children in organized or structured game activities, are audible cues to orient the child to a specific end. However, to enjoy a free play environment, the blind child rarely needs any assistance, other than the chance to feel his own way.

ii) Deafness and Hearing Loss

In a play environment deafness is not a severe restriction to the physical ability of the child. In fact, the HAPA indicate that deaf children have a great love of social group activities in which their expression is in a visual imaginative sense.

The deaf have good motor skills, although a poor sense of balance or bouts of dizziness may be evident.

iii) Orthopedic Disability

Orthopedic disabilities are those which prevent individuals from properly performing the motor and locomotor functions of their bodies and limbs. The orthopedically incapacitated can be classified in the following way:

- 1) congenital, e.g. congenital hip dislocation, spina bifida, talipes (clubfoot), scoliosis (a lateral curvature of the spine),
- 2) traumatic, e.g. amputations resulting from accidents, illness and surgery, paralysis resulting from nerve injury, fractures and dislocations.
paraplegic--lost use of both legs; quadraplegic--lost use of all four limbs,
- 3) infectious, e.g. osteomyelitis, poliomyelitis, tuberculosis of the bone,
- 4) osteochondritic and nutritional, e.g. Perthes disease and rickets.

Hunt, p.104; Kraus, p.117

With so many classes of orthopedic disabilities it is not surprising that there are many aids and appliances available to make a person mobile. The most predominant is probably the wheelchair.

Hunt (p.104) states that "the orthopedically disabled child is less affected by his physical incapacities than by how he adjusts to the reactions of others towards him." The high value placed on physical appearance means that persons with crippling diseases or missing limbs are often ostracized--either openly or in subtle ways.

The social age of a disabled child depends primarily on the period of life in which the disability occurred. The earlier it happened the more hardpressed the child is to develop the social and motor skills of his chronological age group. (Hunt, p.106)

The disability itself inhibits the performance of normal movements. More specifically, motor performance can be slower, less free and co-ordinated; balance can be poorer, and the functioning strength of other limbs may be decreased. (Hunt, p.106)

While orthopedic disabilities are of the arms and legs, they are problems afflicting the development of the whole person. The needs of the orthopedically disabled child are not different from normal children but many are harder to satisfy and are exaggerated by his disability. Play and recreation are vitally important for the physically disabled child and can concurrently encourage him to lose his fear of moving and help him understand his limits and abilities more realistically.

iv) Cerebral Palsied

Cerebral palsy is a complex disability resulting from brain damage. The condition is regarded not as an orthopedic disability but a neurological impairment. (Kraus, p.120)

Cerebral palsy is classified as mild, moderate or severe in its impact. The degree of destruction in all types of cerebral palsy determines the seriousness of the movement problem. Not all parts of the body are equally affected--some areas function normally where others may be greatly restricted. There are five classifications of cerebral palsy, each designated by the limbs affected:

Hemiplegia--both limbs on one side

Quadraplegia--all four limbs

Monoplegia--one limb

Paraplegia--lower limbs

Diplegic--all four limbs involved, but
with the legs more involved than
the arms.

Hunt, p.132

Cerebral palsy individuals are also classified by their movement patterns. There are spastic individuals who move with difficulty. The spaticity can vary from a minor occurrence where an individual has an awkward gait to an extreme case where the person is completely stiff and unable to move voluntarily. There is the athetoid individual who has too much motion; his movements are involuntary and uncontrolled. Very few of these individuals are immobile. Many can walk with difficulty. Finally, there is the ataxic child, who has jerky movements and disturbed balance and co-ordination. (City of New York, Department of City Planning, 1976)

Kraus (p.120) tells us that cerebral palsy sufferers have difficulty in functioning socially and being accepted by others. Most cerebral palsied have a cosmetically different appearance, have jerky body movements and speech problems which make normal social relationships difficult. As a result, withdrawal and fear of social contact are common among persons afflicted with this impairment.

Kraus (p.120) also stipulates that "the primary function of recreation for the disabled child with cerebral palsy is to promote normal growth and development by providing the kinds of experiences and activities that other children receive."

Hunt lists five important principles which allow cerebral palsied persons to successfully participate in activities:

- "1) It is much more difficult for the cerebral palsied person to respond to moving objects than stationary ones--easy rythmic activities are more manageable.
- 2) Activities that require a strictly defined space are more difficult than those that require a generalized space. Croquet is less difficult than miniature golf.

- 3) Activities demanding free movements are more relaxing than activities requiring co-ordinated movements.
- 4) Moderately slow activities are simpler than fast. Bounce-ball catch easier than straight catch game.
- 5) Simple repetitive movements are performed easier than movements involving many changes."

Hunt, p.139-140

v) Muscular Dystrophy

Muscular dystrophy is a chronic non-contagious progressive disease manifested by the wasting of the voluntary muscular system of the body. Muscle deterioration progresses until the affected individual is completely physically dependent.

Depending on the progress and stage of the disease the child may be ambulatory or confined to a wheelchair. The ambulatory may have difficulty in walking, climbing stairs and getting up from a fall or sitting position. (Austin, 1974, p.2)

There are other physical handicaps such as asthma, cystic fibrosis, and cardiac conditions which children can be afflicted with. These "lesser visible" physical handicaps do not affect the child's physical dexterity to perform normally in a play environment but the endurance of the child suffering from these handicaps is restricted. However, through play a child will tend to increase his endurance up to his tolerance level. Outside of providing rest areas for these children little can be done by the designer of a playspace to increase a child's endurance.

c) The Mentally Retarded Child

The retarded child can be described in terms of his sub-average intellectual development which occurred during his development period and is accompanied by his inability to adapt appropriately to his environment. A retarded child has a mental age lower than that of his real or chronological age. The retarded child is not necessarily motorially retarded but often the lower the level of his intellectual functioning, the higher the probability of limited physical or neurological disability. (Austin, 1974)

When planning play facilities for the retarded the facility should not be inappropriate for the chronological age of the individual but should provide for graduated challenge in the facility use and success.

Of the handicaps that can affect a child and the problems associated with each disability, vast differences can occur between the abilities of two persons suffering from technically the same handicap. Each child should be dealt with individually through therapy programs aimed specifically towards personal rehabilitation.

"The physically disabled child perhaps encounters the greatest number of problems on traditional playgrounds. Although blind, mentally retarded and emotionally disturbed children can also benefit from various enabling features, it is the physically disabled who must demand the most attention in thinking about playground design for the handicapped." (Austin, 1978)

While Austin argues that it is the physically disabled who must demand the most attention in thinking of playground design, it seems rather the design should accommodate all those handicapped individuals confined or restricted in their movement to technical aids. Children are confined to technical aids not just because they are physically incapacitated, but confinement can also be a result of neurological or mental disorders and quite often is.

2.3 TECHNICAL MOBILITY AIDS FOR HANDICAPPED CHILDREN

Each handicap has its associated syndrome and each can require specific activities to emphasize the rehabilitative role of play. Many of the specific activities advised for certain handicaps can be met in modern creative playground designs without making alterations or concessions in the physical structure or layout.

However, what does become a concern to the designer when considering play facilities for the handicapped is the functional mobility of the child as a result of his disability. Concern is thus focused primarily on the orthopedically incapacitated, muscular dystrophy sufferers, the neurologically incapacitated (cerebral palsied) and those mentally retarded children with ambulatory impairment.

The functional mobility of the handicapped child can roughly be categorized into three groups:

- 1) the semi-ambulatory--those children capable of ambulatory movements with the aid of crutches, walkers, or prosthetic devices,
- 2) the non-ambulatory--those children only capable of gross locomotion with the assistance of technical aids (wheelchairs, castor karts, etc.),
- 3) those children whose condition enables semi-ambulatory movement but only for a number of hours per day.

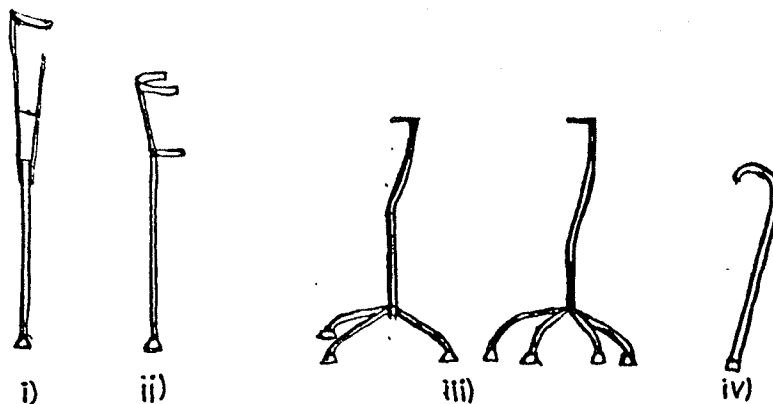
It is the group of individuals which fall into the above categories with which this practicum is primarily concerned. For it is these individuals that find the physical environment a real handicap with which to contend.

Devices have been produced which allow a disabled child to become more mobile, offer support to achieve a seated or standing position or are therapeutic in nature while offering mobility and/or support. An examination of these devices follows so that the designer of play facilities for handicapped children will be cognizant of some of the positions and constrictions a handicapped child faces.

a) Crutches

- i) axillary crutch--most often used by patients who need them for a short period of time.
- ii) elbow crutch--designed to give support from the forearm rather than the axilla.
- iii) tripod and quadraped walking aids--hand, elbow and forearm crutches with three or four feet for added stability.

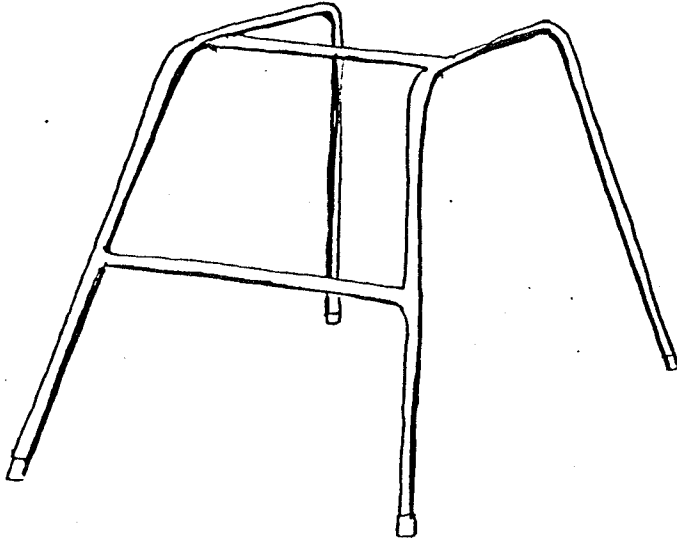
Wilshere, pp.9-10



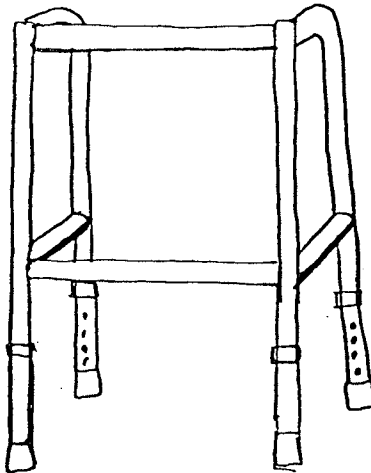
b) Walkers

"Pick-up walkers and push walkers offer to the user mobility and stability. Assisting balance and providing support, they enable those lacking in balance or strength to walk by transferring weight through hands." (Holte)

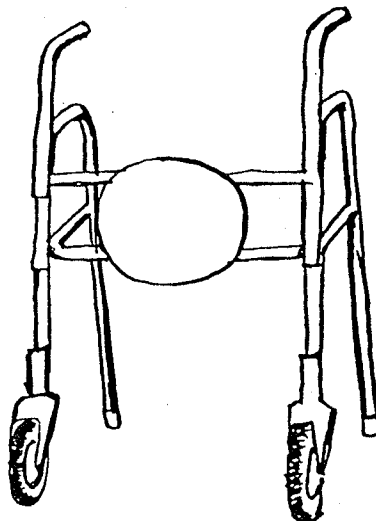
- i) parallel walker--gives support but is heavier and slower to use.



- ii) the adjustable mini-walker



- iii) the a-walker



c) Orthopedic Appliances

- i) calipers--calipers are designed either to give stability to a weak or frail leg, or to relieve a disused hip or knee joint of some of the body weight (Kennedy, p.75)
- ii) Toronto Brace (for use by Perthe's disease sufferers) or Birmingham containment hipsplint (Kennedy, p.103-105)
--both keep hip and knee in flexion with slight internal motion of hip joint
--the foot is off the ground and the knee at a right angle
--used in conjunction with crutches
- iii) braces or splints--braces are used for a variety of conditions including dropped foot, inversion and clubfoot. Do not necessarily restrict activity of wearer if lower foot ailments are the only disability.

d) Mobility Aids

i) The Castor Cart

"The Castor Cart is an arborite-faced platform with a wheel on each side and a castor on the back. It has a molded plastic pelvic support, a height adjustable, plas-tazote-lined aluminum back support and a seatbelt."

"The child propels the cart by pushing the wheels. The cart encourages independent mobility....and the seat is low enough for the child to get on and off by himself....use of the Castor Cart strengthens the upper extremities and improves co-ordination, trunk control and balance."

"Main users are children with spina bifida." (Holte)

Available in one size only:

platform length ----- 60 cm (24 in.)

platform width ----- 34 cm (13.5 in.)

wheel height ----- 20 cm (8 in.)

back support height - 23 cm-25 cm (9-10 in.) from platform

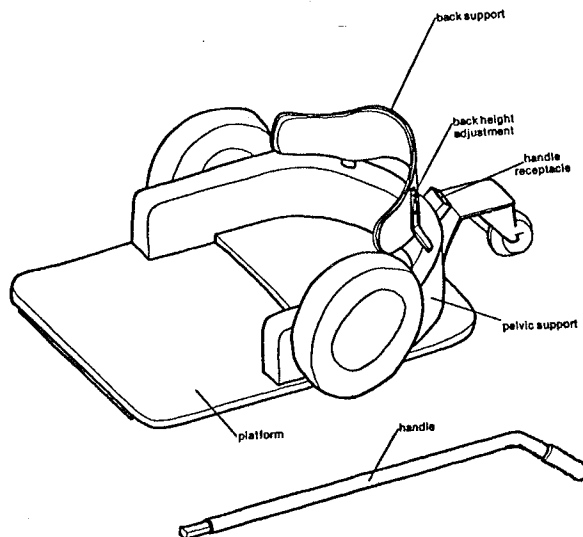


Diagram from Holte

ii) The Pommel Walker

"The basic Pommel Walker has a scissors-type frame with alternative link bolt holes for height adjustability. A chest support provides frontal support, a height adjustable pommel provides weight relief and reduction; and a removable pad which attaches to the pommel stem, fits behind the buttocks. Resting on four castors, the base forms three sides of a rectangle and is open to the rear."

"Developed for children unable to use conventional walking aids, the Pommel Walker holds the user upright and gives him mobility by voluntary muscle action. The open rear enables the child to enter on his feet rather than being lifted. The device encourages maintenance or improvement of lower limb function and also better trunk and head control, balance and posture."

"The Pommel Walker is suitable for patients from infant to adult sizes. Users include children with cerebral palsy, seizure disorders and retarded children who otherwise would not be walking." (Holte)

Pommel Walker available in three sizes:

mini--for children 75 cm-90 cm (30-36 in.) tall

junior scissors for children--1 m-1.40 m (40-56 in.) tall

senior scissors for children--1.45 m (58 in.) tall

A removable tray for use as a working surface can be supplied with walker.

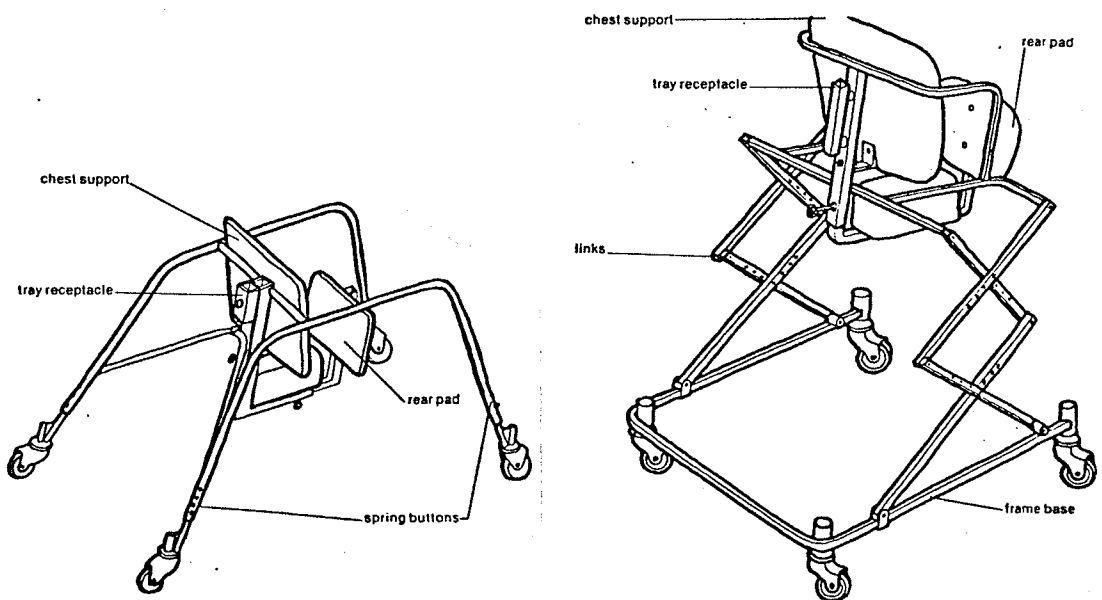


Diagram from Holte

e) Standing Devices

"Benefits to the patient of the upright position on a standing device include stimulation of bone growth; control or improvement of joint contractures; improved trunk and head control; better chest expansion in respiration and better kidney drainage. The arms are free to work and play and there are psychological benefits in change of position and in being at peer height."

i) The Standing Brace Mark II

"The Standing Brace Mark II allows crutchless standing for work and play and, used with a walker can help children learn to walk. Used mainly by children with spina bifida, but also by paraplegics and children with osteogenesis imperfecta and arthrogryposis." (Holte)

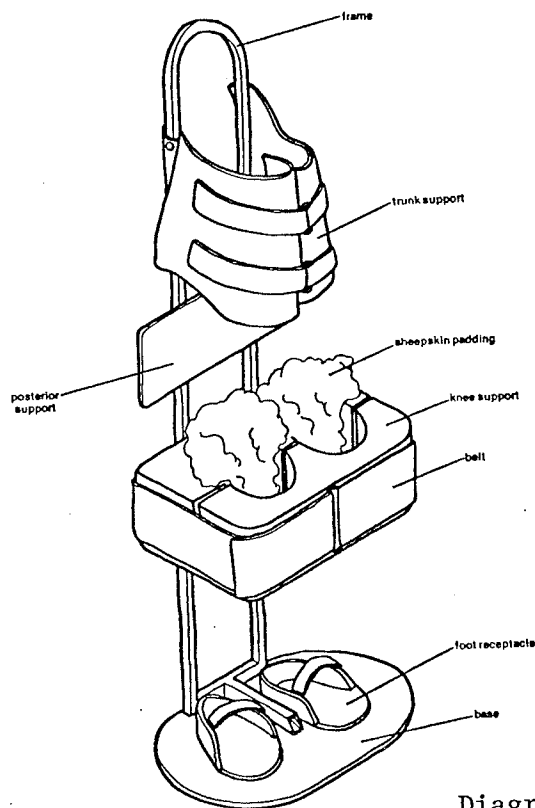


Diagram from Holte

ii) The Parapodium Mark II

"A standing and mobility device, the Parapodium allows crutchless standing and walking with underarm or elbow crutches, or with a walker. Children can develop a swing to or swing through gait, and good users learn to manage ramps, curbs and stairs. The locking knee and hip joints enable the child to sit without removing the device. Usually a child graduates to a parapodium after successful experiences with a Standing Brace Mark II. Users are paraplegic children, mainly those with spina bifida." (Holte)

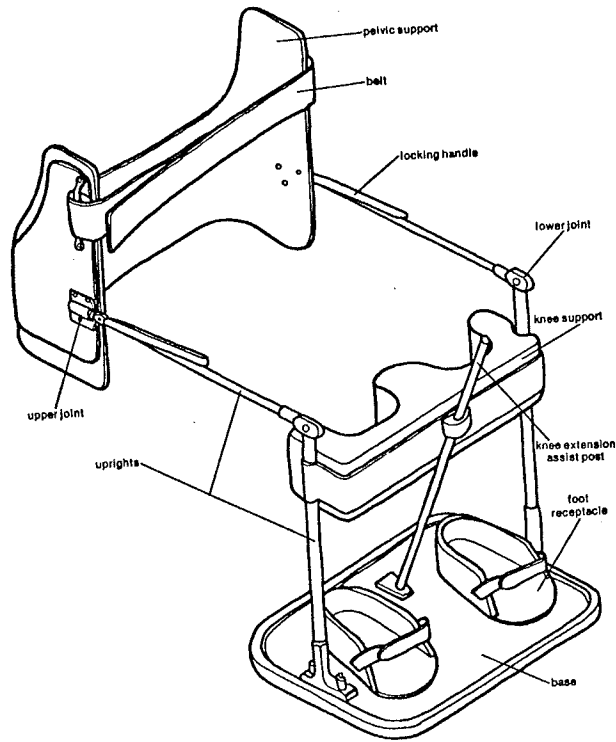


Diagram from Holte

f) The Wedge and Prone Board

Although not mobility devices they are useful for play activities in the prone position and encourage head control, hip extension and forearm or extended arm propping. (Holte)

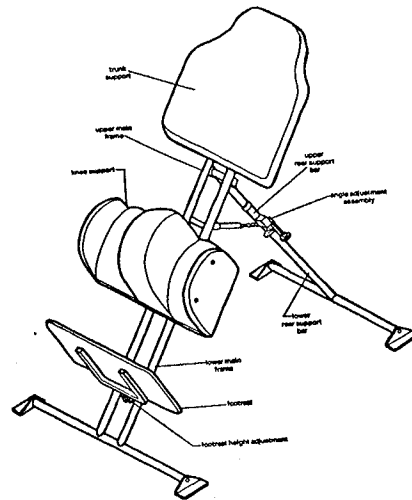
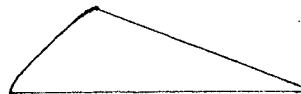


Diagram from Holte

g) The Wheelchair

In the United States there are five sizes of wheelchairs; small child, large child, junior, adult and oversize.

The small chair for children from two to six years has a relatively high seat, about 20 inches, which is the height for an adult.

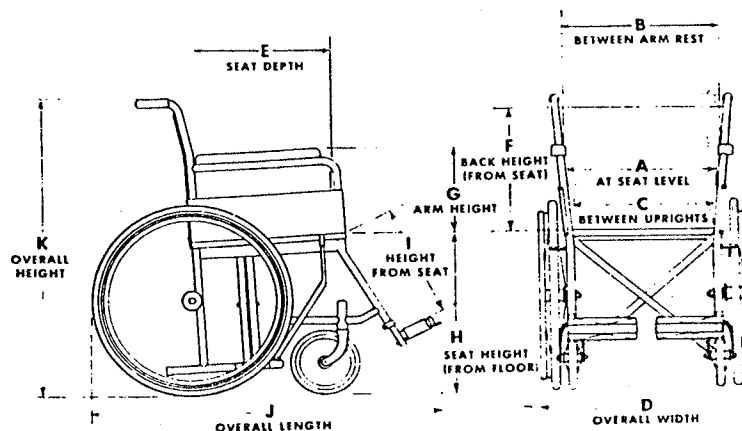
The large child chair is the next standard size of wheelchairs and is for children between six and twelve years of age. Allowance for growth is made by adjustment of the legrests and the width of the back and seat. As the width is changed, the greater opening of the chair lowers the seat which was high to begin with, because the chair was not fully unfolded. This increases the relative height of the armrest. (Kamenetz, p.128-130)

As the patient increases in weight and size he progresses through the junior, adult and, if need be, oversize models.

The dimension which is of most importance to the designer when planning any facility to be used while in the wheelchair (i.e. elevated play tables) is the height of the seat from the ground and the height of the armrest and width. These dimensions will help determine the relative height of the facilities. But as noted in the large child's chair these heights have the tendency to vary the greatest.

The principle dimensions of standard wheelchairs are given in the following table:

	<i>Small Child</i>	<i>Large Child</i>	<i>Junior</i>	<i>Adult</i>	<i>Oversize</i>
Seat Height (H)	18	20	19	20	20-22
Seat Width (C)	12	14	16	18	18-22
Seat Depth (E)	11	11	13-15	16	16
Leg Length (I)	3-9	7-11	13-18	15-20	15-20
Arm Height (G)	6	7	9	10	10
Back Height (F)	17	15	16	16	16
Overall Height (K)	35	35	39	40	41-42
Overall Length (J)	30	33	39	40	41-42
Overall Width (D)	19	21	22	24	26-30
Width Folded	10	10	10	10	11-12
Weight in Pounds	35	41	41	43	46-48



Diagrams from Kamenetz

Note that these are standard dimensions for wheelchairs; many accessories, bolsters, padding and other modifications can be made to personalize the chairs, altering these measurements. There are wheelchairs made with seat heights of 16 3/4 inches and 17 inches which increases the discrepancies in possible heights to 5 1/4 inches. With motorized wheelchairs the main difference in the measurements is the added weight and usually smaller rear wheels with no hand grips.

Wheelchairs are used by persons with all kinds of disabilities and are customized to the patient. Electric or motorized wheelchairs are most prevalent with children suffering from muscular dystrophy.

h) Specialized Vehicles

A number of specialty items have been devised for mobility in play. Many of these include traditional items such as tricycles and go-carts. The primary adaptations include an alternative method of propulsion other than foot pedals. There are hand propelled tricycles with hand pedals to generate motion to the chain and wheels. Others include pumping handles which steer, stop and propel the vehicles. Even play equipment such as toboggans must have special sides affixed so the handicapped child will not fall out.

Thus, the designer must not only be cognizant of wheelchairs when planning playgrounds, but of all the aids which enable the child to move about and play in the prone, seated or standing position.

Many of these technical aids have been developed for therapeutic reasons, allowing the child greater mobility and more flexibility in playing. However, conventional and modern playground environments are still inaccessible to the handicapped child who is confined to some of these technical aids. When new play environments are being designed, the designer must take into consideration the handicapped child when setting out his goals and objectives, so as to ensure that the elements in the design enable the handicapped child to participate.

3. General Goals and Objectives for Play Environments

3.0 GENERAL GOALS AND OBJECTIVES FOR PLAY ENVIRONMENTS

Many books (Hunt, Kraus, Crathy, Vannier) have been written providing a rationale for the development of recreational therapeutic programs for handicapped persons. The goals and objectives set out in these books are intended for use by recreational therapists, play leaders or teachers involved with handicapped individuals. The books also suggest games and activities for specific types of handicaps. Few books however, list goals and objectives the designer should be aware of when designing play environments which are to accommodate handicapped children. With the information contained in the preceding chapters regarding the value of play and the design of play environments, who the handicapped are and the limitation of each, and the technical aids that are used, goals and objectives can be formulated so the designer and the design of play environments may be more responsive to the handicapped individual.

3.1 GOALS

A general goal to strive for in all playground designs, especially those concerning special children is: "to minimize frustrations caused by inappropriate design, while maximizing opportunities for engagement with a stimulating environment." (Austin, 1978)

Specific to this practicum are the goals:

- 1) to provide an informal, exciting and challenging play environment which will accommodate handicapped children,
- 2) to encourage and integrate wherever possible the play of able and disabled children.

To satisfy these goals a number of objectives can be formulated which categorize areas of concern under which design guidelines can be developed.

3.2 GENERAL OBJECTIVES

1) Access

- . The play environment should be conveniently accessible from adjacent interior and exterior areas.
- . Play facilities should be accessible to all children.
- . The play environment and facilities (seasonally appropriate) should be accessible for year-round activity.
- . Area should be accessible for emergency and maintenance equipment.

2) Function

- . The environment must function so as to respond to the physical, social, cognitive and individualistic aspects of play of all users.
- . The play environment and facilities must be safe.
- . The play environment should be self motivating; it should not depend on paid supervision to function properly.

3) Organization

- . The environment should be organized so that it provides non-conflicting areas for the physical, social, cognitive and individualistic aspects of play.
- . Self-choice rather than compulsion should be stressed in the use of facilities.

4) Quality

- . The play environment should be varied and diverse offering a combination of soft and hard areas and natural and man-made elements for the user to explore and discover.

These are objectives which should be stressed in the design of all play environments. However, they become vitally important when dealing with disabled individuals who have movement or sensory problems.

**4. Designing to
Accommodate the
Disabled Child**

4.1 SOME LIMITATIONS OF DISABLED CHILDREN

In order to gain a better understanding of the limitations and capabilities attributed to the disabled child, several children were observed at school, therapy and play on numerous occasions.

The child's ability to dismount and mount his wheelchair is of primary importance. The dismount procedure can be accomplished by sliding from the seat to the wheelchair footrest, then onto the floor, or by a direct transfer to the floor. Dismount also occurs from the chair directly to apparatus such as a raised platform or steps. Mounting the chair can be much more difficult as it depends on very strong upper body muscles especially in the arms. Some children are able to crawl up and into the chair but many need the assistance of steps for dismounting or mounting of the chair. In the play environment the wheelchair should be forsaken for more unconventional modes of transport.

In a wheelchair most disabled children can play constructively at table top height, actively receive and retain objects in a sport or race their wheelchairs around obstacles.

Children suffering from spina bifida feel most secure in their wheelchairs, as their legs are in a known position and their limitations are set. The spina bifida child lacking feeling in the lower limbs, tends to perceive himself suspended in space when in an upright position. This lack of body awareness can stimulate a fear of height even when the child's feet are on the ground. These children are also unable to detect sprains, fractures, pressure sores or skin damage in their lower limbs.

Being out of the wheelchair is not dangerous for the child and relief must be experienced when the bond to the chair is broken in favour of crutches, walkers, parapodium, pommel walker or physically crawling, slithering or rolling. Locomotion activities tend to tire the individual very quickly. Some children can roll, crawl, or seal walk approximately 25-40 feet before needing a rest. This is a limitation to be considered when planning play facilities that would be experienced without the aid of a wheelchair or walker. Seemingly natural hiatuses or rest areas should be designed into facilities where disabled children can rest. The provision of shade and drinking water is also important as some of these children perspire profusely or dehydrate quickly through activities.

The pommel walker, while providing relief from the wheelchair, can be more difficult to steer, as the children are using limbs which they do not have great control of to propel the walker. The degree of control can be related to the degree of impairment the individual possesses. Thus, protective rails or curbs should be constructed along walkways to contain misdirected wheeled vehicles. Right angles should also be avoided to ensure movement in a generally forward direction.

Some disabled children have poor sitting balance and thus need back and arm support when in this position. On equipment or facilities requiring the seated position in order to partake, some seats offering back and side support should be provided, as well as other seat restraints appropriate to the activity.

The enthusiasm in activities, while confined to a wheelchair or other mobility aid, is directly related to the individual and his ability to perform the tasks required to participate. There are discrepancies in the abilities of the handicapped children but their competitive edge is not sacrificed and each child partakes to the limits of his abilities. Their participation in games is more important than winning. For handicapped children skills and learning abilities increasing their capabilities can be introduced through the play medium.

With ball throwing or pitching activities some allowance must be made for the child's inability to throw over distances. This lack of ability can be due to spasticity (which reduces reach), muscle weakness, or poor sitting or standing balance which reduces stability of the throwing position. Stability can be gained from a support structure such as a railing or walker, or from the assistance of another person.

Poor grip, muscle weakness or the need to support the body with one hand while throwing with another may require the use of a small light ball or a pliable object such as a "nerf" ball or bean bag for the projectile.

When throwing at a target poor eye-hand co-ordination, and problems with perception of space and distance may pose a problem. Markers indicating the distance from target as well as varying sizes of targets can be helpful. The child can be his own judge by either increasing his throwing distance from the target or throwing at targets of smaller sizes.

Those objects used to strike other objects may also have to be adapted for use by disabled children. Hockey sticks and baseball bats may be made of light durable plastic and the objects such as pucks and baseballs will also have to be adjusted in weight and size. Large oversized objects such as earthballs, where the child is using the whole body and not a motor action (throwing) to put it into motion can be used for activities where some handicapped children are involved.

4.2 BASIC APTITUDES TO BE STRESSED IN A FREE
PLAY ENVIRONMENT FOR HANDICAPPED CHILDREN

In a therapeutic play environment activities are usually performed in such a manner as to ensure a predicted outcome. In a free play environment the goal is enjoyment from participation. The therapeutic results occur indirectly through the active use of the equipment. In this sense therapy is present through normal play activities and through the realization of new skills.

Evans (1977) and Austin and Hayes (1975), list the skills and abilities to be stressed in the development of young handicapped children. Emphasis will be placed on these skills in regular therapy sessions. In the play environment, while all skills may not be evident, many will be fulfilled through operation, emulation or while commanding the use of equipment. These skills are:

a) Gross Motor Development

Definition: The development and awareness of large muscle activity.

Activities: Rolling, crawling, walking, throwing, skipping, hopping, climbing, projecting, receiving, striking and running. Other components of motor skill development, because of their contribution to the mature pattern of functioning include--body awareness, rythm, and balance (body awareness--cognition of various parts of the body in relationship to self and surroundings--three major components: sensory motor component, the conceptual motor component and opinion component).

b) Physical Fitness

Definition: Improvement of general physical condition both physiologically and psychologically.

Activities: Those that increase the degree of strength, flexibility, balance, endurance, speed, co-ordination, cardio-vascular fitness.

c) Sensory-Motor Integration

Definition: The use of sensory information to refine motor activity (motor skills, movement patterns).

Motor skills are motor activities limited in extent and involving a single movement or a limited group of movements which are performed with high degrees of precision or accuracy. Movement is limited but accuracy is stressed.

A movement pattern is a series of movements organized in a particular time-space sequence. Movement patterns range from almost random to the highly structured and from simple to complex. Two principal categories exist, locomotor patterns and manipulative patterns. In the motor pattern movement is stressed but accuracy is limited.

Activities: Balance (static and dynamic) and rythm (locomotion movement) involving gross and fine motor movements, laterality (internal awareness that body had left and right side), directionality (extension of laterality into the external world).

d) Perceptual Motor Skills

Definition: The functional utilization of primary auditory, and visual motor skills, touch and proprioception. Slight imperfections or impairment of any one system can disrupt the whole network and cause extensive imperfection.

Activities: Those developing abilities to receive auditory stimuli, retain and recall information, observe and identify, co-ordinate eye-hand tasks, recognition of objects by handling and the ability to plan an appropriate motor task from information received.

e) Social Interaction Skills

Definition: The skills involved in social involvement and adaptation.

Activities: Those encouraging peer group involvement, concession and reception and decision making.

f) Conceptual Skills

Definition: The functional level of concept attainment and general reasoning ability.

Activities: Those encouraging the child to utilize general information through re-organization, simplification, prediction, questioning, synthesizing or systemalizing.

g) Emotional Responsiveness

Definition: Expression of feelings appropriate to environment situation.

Activities: Drama, make believe, pantomime, direction, role playing.

Some of these skills and abilities are more appropriate to playground activities than others. Some are realized in all aspects of play, others in only select play activities. In Winnipeg most playgrounds emphasize physical fitness and gross motor development. The social, perceptual, conceptual and emotional abilities are more often stressed in a more formal atmosphere such as the classroom.

In the development of planning specific ideas or detailed design related to certain aspects of the play environment, this list of aptitudes to be stressed in the play environment can become important in the development, design, and evaluation of the play facilities.

4.3 THE FREE PLAY ENVIRONMENT

Schoolyards, playgrounds and parks can all be considered free play environments; that is, areas where the actions of the child are limited only by the diversity of the environment and his own imagination. In places where the diversity of the physical environment is small and facilities encouraging a number of activities are few, the child's imagination cannot be relied on totally to provide amusement.

Free play refers to the child's ability to do anything he wants. While supervision is part of the free play atmosphere its primary function is to assist and protect a child yet not limit or direct his play experience. Supervision of this manner need not be professional but can manifest via parents, elders or peers.

Free play for the handicapped child means the ability to do things on his own; without constant aid from others and to experience joy through self-participation in the use of the facilities. At present, existing playgrounds do not afford a free play environment to handicapped children. Too often the handicapped child is dependent on an able individual to assist him in the use of equipment or play with him. Rarely is he allowed to go forth and discover and manipulate the environment at his own pace or in his own way according to his own capabilities.

Play can be classified as either passive or active. Physically passive play usually entails a child playing alone in an inwardly active imaginative, creative manner related to each play experience. Active play entails physical exertion usually related to participation with others. The child may repeat an active series of events such as climbing, sliding, climbing, sliding in conjunction with a number of other children who are experiencing the same sensation. While rules are not necessarily involved in active play, conduct is often ordered and structured through the physical environment or via common understanding amongst participants.

A number of physical, social and cognitive benefits have been attributed to frequent and regular free play experiences. HAPA (1974) and Austin and Hayes (1975) document these as follows: Physical benefits include an increase in breathing capacity and lung action, accompanied by a longer duration before exhaustion due to better utilization of energy reserves. There are also increases in agility with a reduction in the number of movements required for a task. Coincidental with the development of strength and ability is an increase in the child's confidence. The child's cognition is advanced through greater concentration and attention and by the chance to observe-question-investigate-test and hypothesize. Socially, the handicapped child derives pleasure just from the opportunity of being with his peers in a similar environment. To play alongside his mates socially must be tremendously rewarding.

To accomplish the task of providing handicapped children the opportunity to play with and along side able-bodied children is not simply to solve the problem of accessibility, but also entails adapting equipment for continued use by all groups. To design special equipment for use only by handicapped children would only isolate them and further ignore their social needs.

In order to reduce the complications that confront handicapped individuals in a play environment a number of design guidelines can be formulated to be employed in the development of the playspace so as to accommodate the handicapped individuals.

5. Design Guidelines

As stated earlier, the goal to be satisfied is the creation of an exciting and challenging play environment for all children which encourages and integrates the play of able and disabled children (p.27).

To satisfy such a goal a number of objectives were stated relating to access, function, organization and quality (p.28). These objectives were deemed important aspects of all play environments. Also essential in the design of a play environment are those properties advocated by Dattner, Friedberg and Moore (p.7). They were: complexity; linking and juxtaposition of facilities; manipulation; openness and adaptability; scale; graduated challenge; and diversity.

To realize these objectives in a play environment designed to accommodate handicapped children a number of special considerations and guidelines concerning the site and play components can be formulated.

5.1 SITE SELECTION AND LOCATION

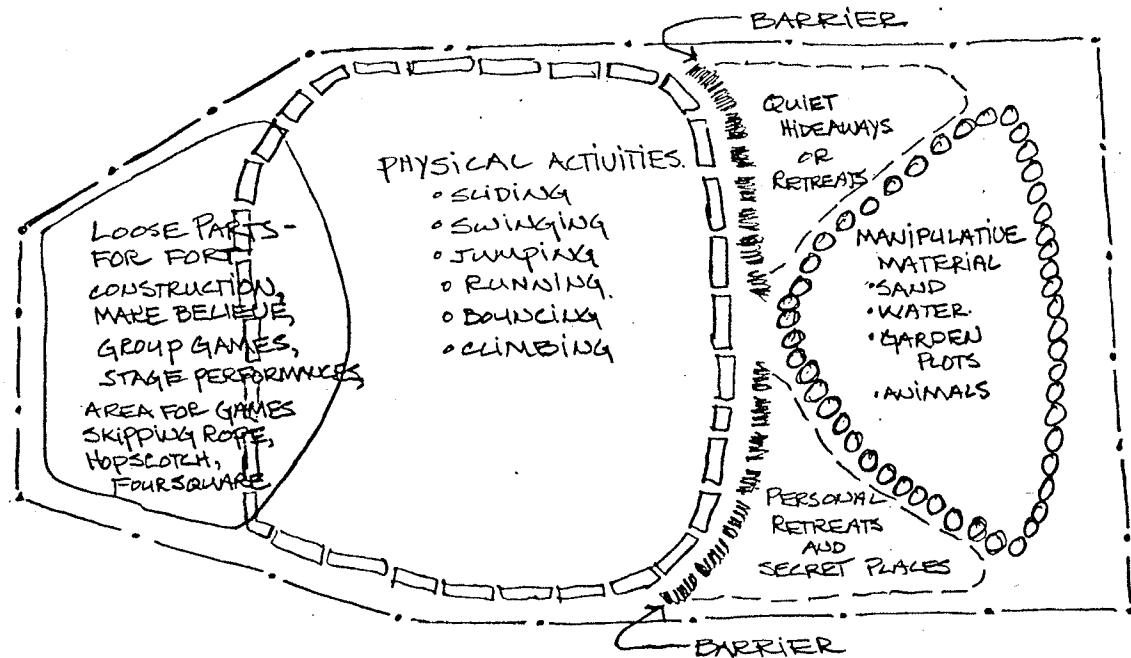
The ideal situation would be to have all playgrounds accommodate the disabled child, as a playspace for handicapped children is a playspace for all children.

If there are no existing playgrounds accommodating integrated play, the paragon location is a site at the regional level, such as Assiniboine Park. Here an entire family coming with the disabled child could participate in complementary activities: use of a playground, a trip to the zoo and conservatory. Other locations to consider are schools where handicapped children are in attendance through normalization or integration programs. Here use of the playspace would be guaranteed during school hours.

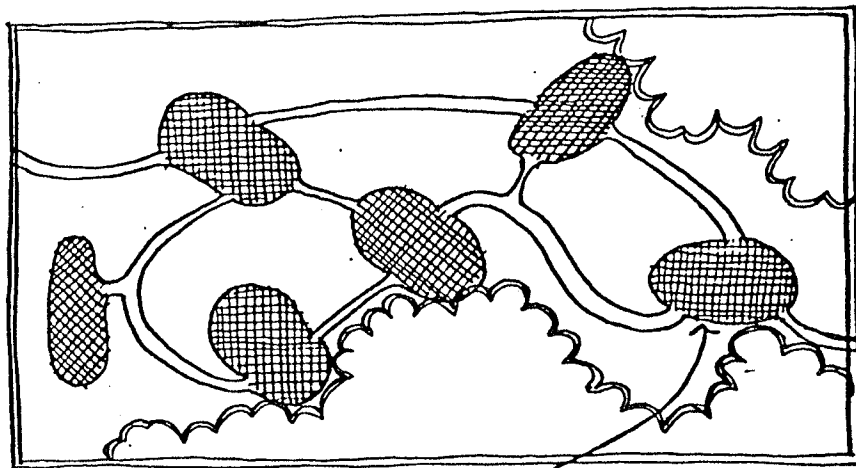
Qualities by which to evaluate potential sites and locations include size, micro-climate, topography, access, existing and complementary facilities.

a) Size

The space should be large enough to allow for physical, social, creative and quiet retreat play.



A dilemma is encountered when dealing with the spatial requirements of the play area. While using a mobility aid the disabled child can cover quite a large area of ground. The walks or paths to accommodate these aids should be wide and ramps for their use are also space consuming. Once out of an aid, however, the disabled child's mobility is severely reduced, dictating the organization of certain areas for activities be comprehensive in scale, so as not to completely deplete the child's energy in his locomotion about the space.

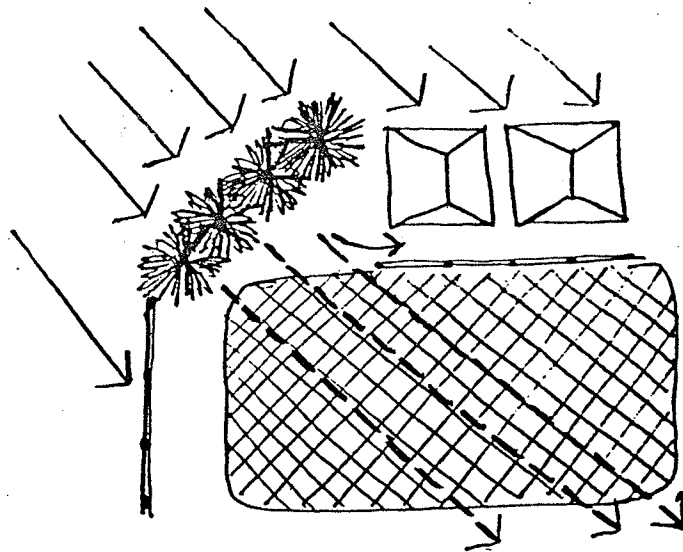


OVERALL SIZE AREA IS LARGE

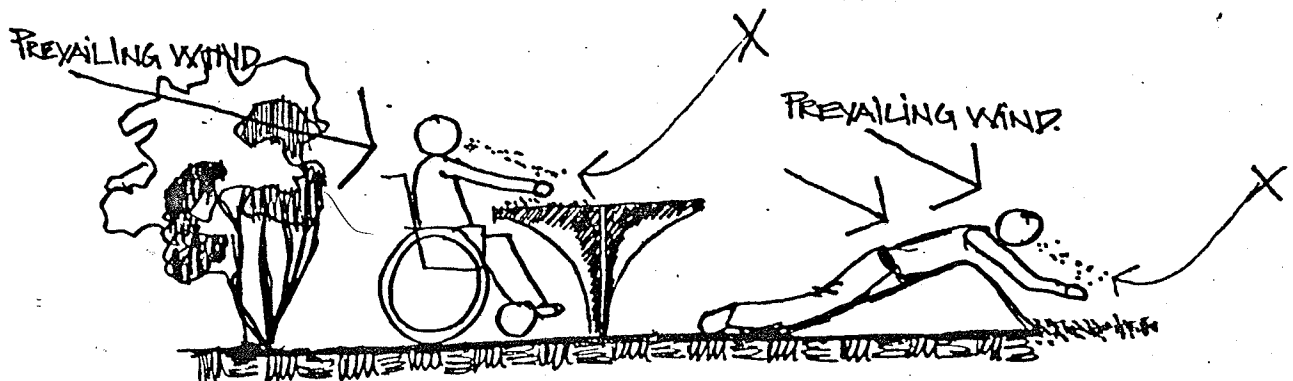
SMALL AREAS OF INTENSE FREE OF AID ACTIVITY.

b) Micro-Climate

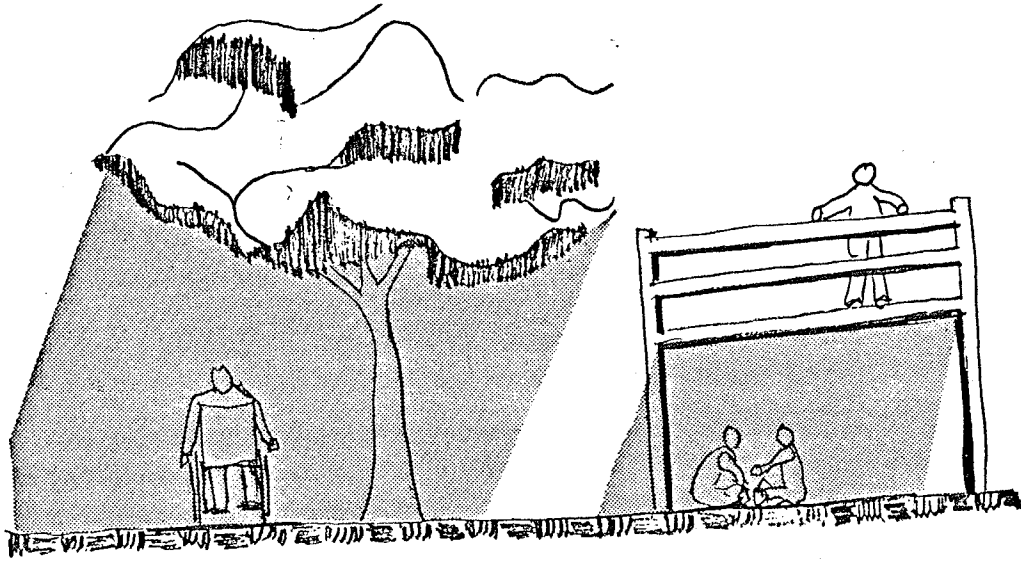
Natural or man-made characteristics should provide protection from prevailing winds.



Some disabled children will be playing on their stomachs or at heights in sand thus the prevailing winds should be buffered to reduce the amount of free-flowing sand.

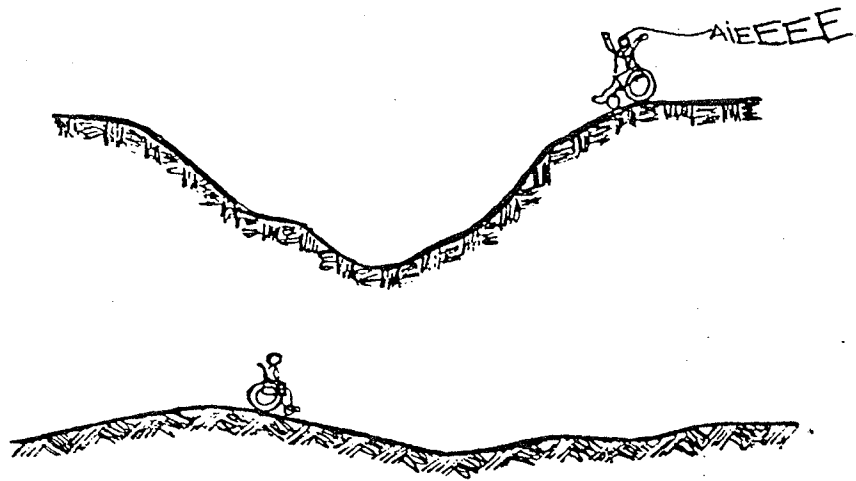


Shaded areas of play are important as handicapped children can become dehydrated quickly. Due to medication they take, they may perspire profusely.



c) Topography

A flat or mildly undulating topography is desirable. Steep slopes pose physical and costly constraints when designing or planning for disabled children.



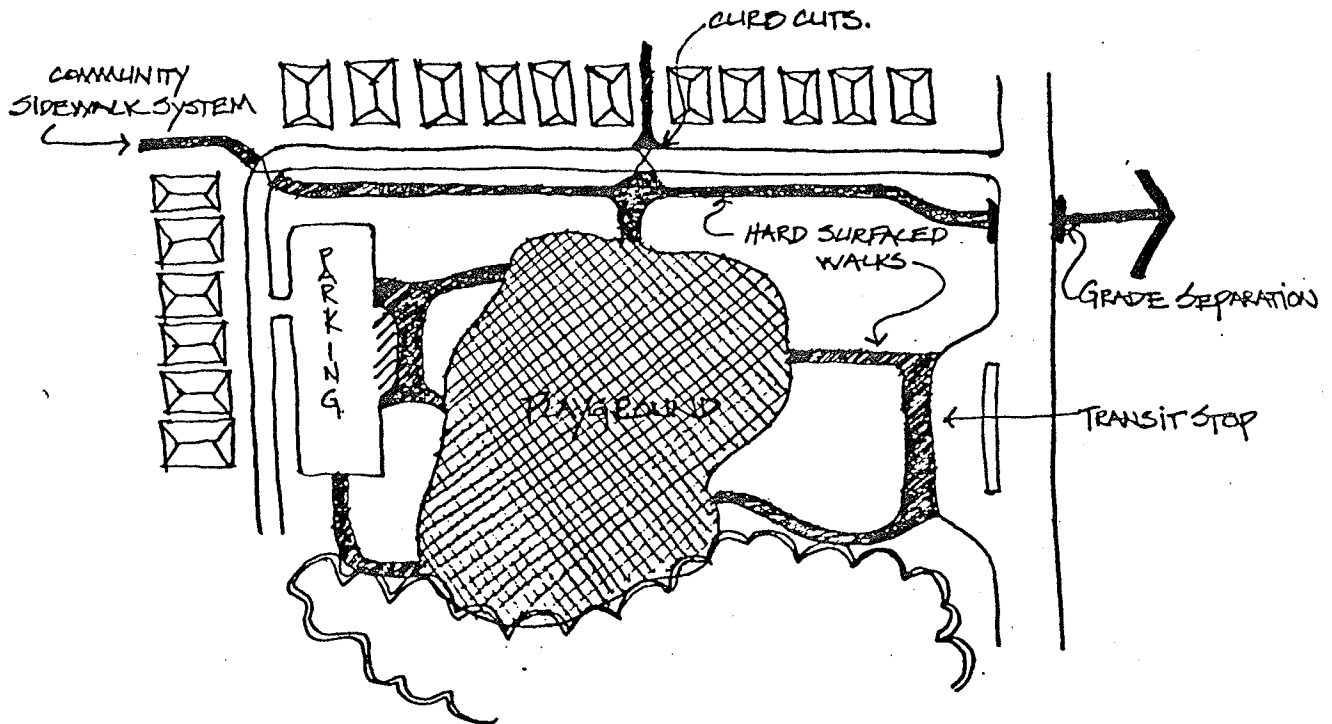
d) Access

Area should be easily accessible by car, public transit or handi-transit.

Depending on scale, the area should be easily accessible at the regional, community or local scale.

The playsite should be accessible by a hard surfaced safe route other than a roadway.

Circulation surfaces within the playground are to be of a hard non-skid nature.



e) Existing and Complementary Facilities

Facilities near by which can be used by all members of the family make any trip to the playground multi-purpose. Complementary facilities might include athletic fields and court sports, zoos, conservatories, bicycle path, existing playground facilities, natural areas, trails, art galleries, museums, etc.



5.2 SITE PLANNING

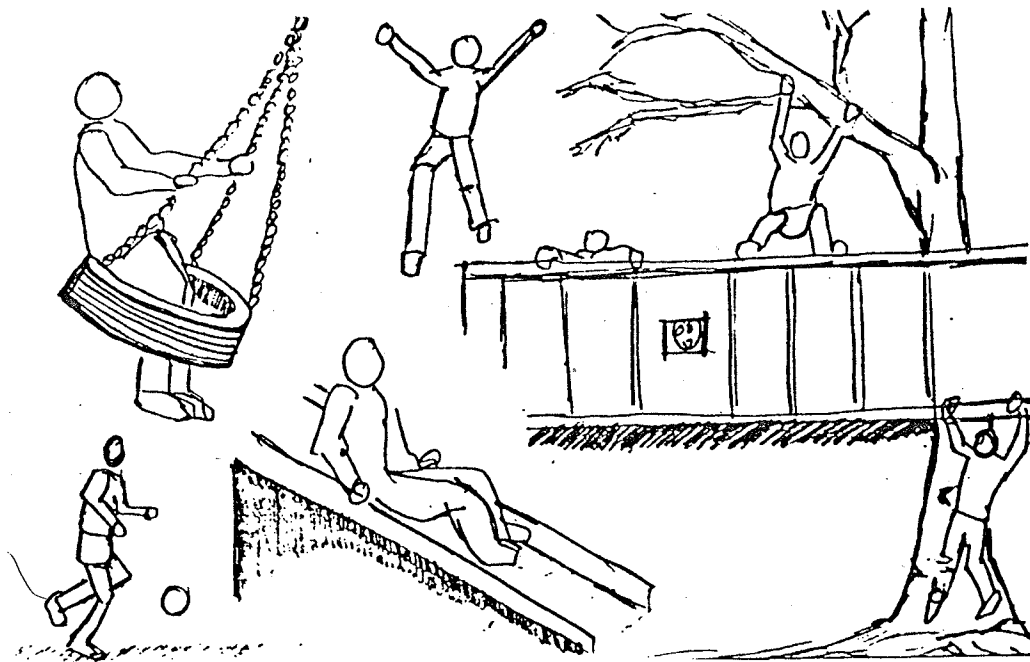
a) Function and Organization

The objectives state that the function and organization of the playspace should provide areas for the four categories of play in a manner that each will complement the other without interference. Each category of play, physical, social, creating and individualistic, is realized in a different way while stressing the use of different parts of the body. Each category has physical requirements which can be designed to conform to the functioning of the body. While being spatially separated, each category is inter-related forming the total play environment.

i) Physical Play

In the physical play area the whole body is in motion, usually in a random and noisy manner. Activities which stress gross motor development, sensory-motor integration, and physical fitness are usually planned for this area.

The apparatus can define the child's activity, as swings and slides do, or the facilities can be opened providing the base or skeleton for the child to be physically creative on.

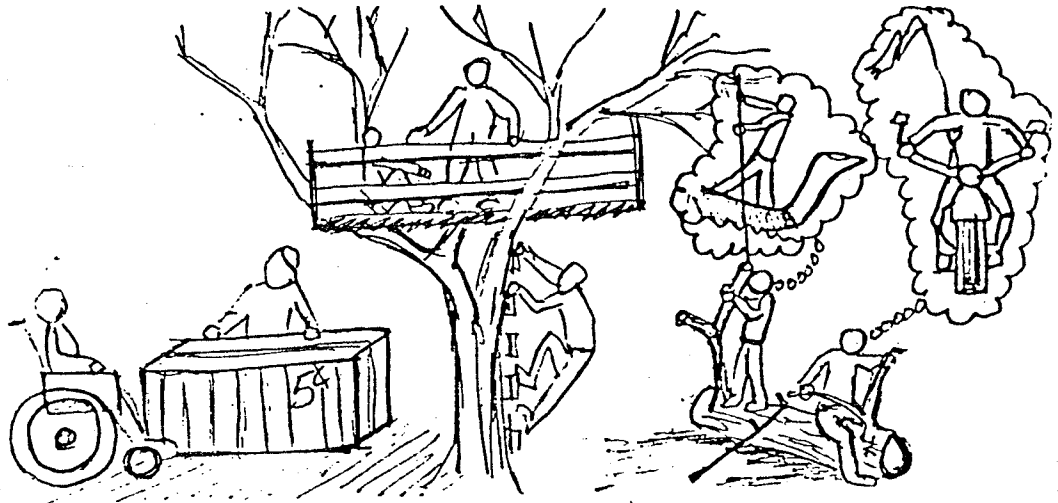


Creative climbing structures are important in modern playgrounds, but to exclude that apparatus which defines play can be dangerous. Many disabled children are unable to play in a totally unstructured environment and need the equipment which defines an activity.

Due to the size of the equipment deemed appropriate to achieve the excitement and enjoyment of physical play and the active and random nature of it, the area set aside for physical play is usually quite a large proportion of the total site.

ii) Social Play

The activities involved in social play quite often entail the use of the whole body as well. The physical structures and the spaces created in the physical play area often become the backdrop for social play. Some play equipment encourages mutual involvement for its proper use. If use of it means the integration of able-bodied children and disabled children then all the better.

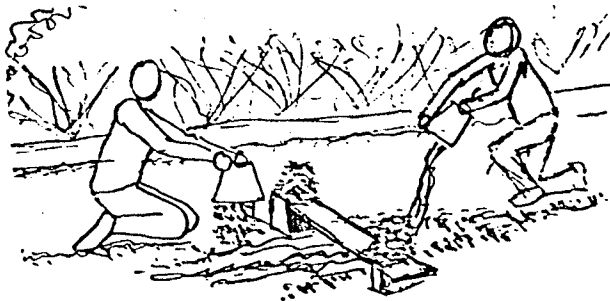


Because social and physical play quite often make use of the same equipment these two aspects of play are frequently blended.

The physical quality of the play environment should provide areas that permit or encourage interaction amongst children on a passive or active scale.

iii) Creative Cognitive Play

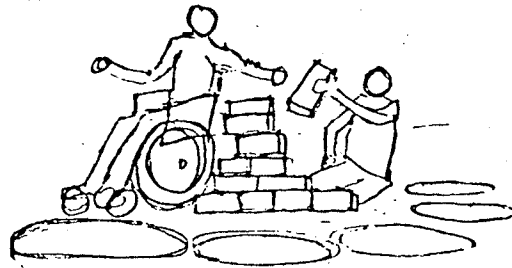
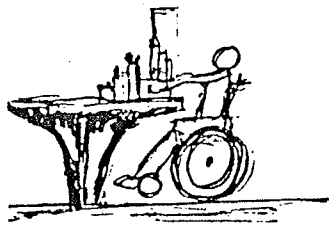
This play area should contain palpable, manipulative material to stimulate an individual's creativeness. Primary materials include sand and water and when found in combination with "loose parts" (pots, blocks, boards, etc.) the child's creativeness is limitless.



A natural environment with plants and animals is a prime area to increase a child's knowledge of how the world functions. Subtle details in the play environment such as basic shapes and colors can become part of the child's everyday experience and knowledge.



The most difficult aspect of creative cognitive play for the disabled child is access to manipulative materials and convenient spaces for their use.



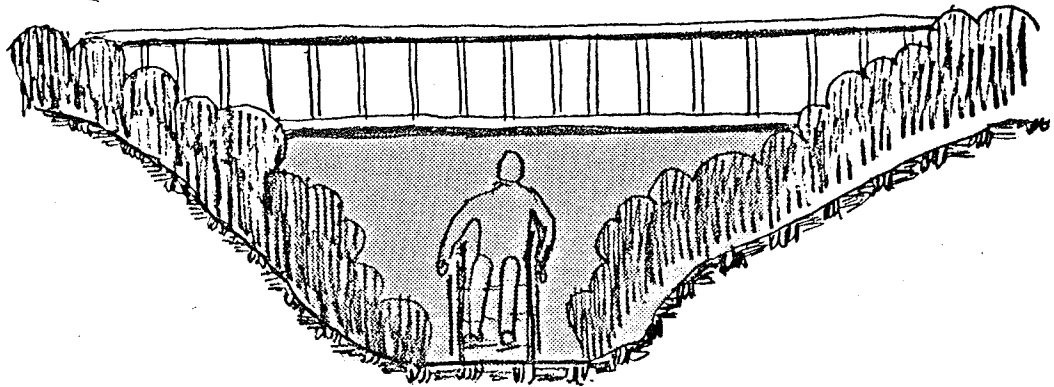
The creative play area should be planned where interference or interruption from the physical play area cannot occur. However, the creative play area should not be so remote that the children playing there do not feel that they are part of the total play environment. Activity paths to, views to and noises from the physical play area can all be part of the creative play environment.

iv) Individualistic or Quiet Retreat Play

Areas should be provided in the play space where the individual child can escape the activities and attention of other children. These spaces cannot always be planned; rather these are spaces a child will discover and personalize on his own.



For the handicapped child these spaces can be hard to find, for once off the beaten path, the child may have trouble maneuvering a wheelchair. However, if there are some remote areas of the play environment which are accessible the disabled child will soon discover them and stake a claim on them.



b) Surfacing

In a play environment all types of surface materials can be used. Each material has characteristics and qualities which are both desirable and undesirable depending on how, why and where they are used.

Surface material in a play environment must be soft to cushion falls, hard for court and wheeled sports, resilient to heavy use and durable to climatic influences. However, no one surface material has been developed which has hard, soft and variable surface characteristics.

Surfacing material can be classified into soft, variable or hard and the characteristics by which to judge their suitability for uses can be listed.

i) Soft

- . crushed rock
- . earth
- . lawn-grass
- . river rock
- . bark chips
- . sand

Soft Surface Characteristics

- . irregularity and softness can make walking difficult
- . difficult surfacing for people with mobility handicaps or for wheeled vehicles to negotiate
- . susceptible to erosion
- . withstands only light traffic
- . softer materials such as sand and grass are ideal to cushion falls
- . well drained
- . low installation costs, high maintenance requirement
- . manipulative

- ii) Variable
 - . unistone (sand base)
 - . turfstone
 - . brick (sand base)
 - . patio-stone (sand base)
 - . wood--deck
 --rounds
 - . exposed aggregate

Variable Surface Characteristics

- . materials of modular form--installed in pieces
- . overall surface made of small units which can fluctuate with frost heaving
- . irregularity in surface and wide joints can make walking for disabled individuals difficult
- . moderate maintenance requirements, moderate to high installation costs
- . joints can trap crutch or cane tips, narrow heels and small wheels; joints should be now wider than 1/2"
- . ice and snow removal can be difficult
- . joints, colors and patterns can be basis for creative games
- . can be used to help delineate space, change of activity or use of area
- . wood decking can have smooth finish to facilitate sliding and crawling

- iii) Hard
 - . asphalt
 - . concrete
 - . tile/brick in concrete
 - . terrazzo

Hard Surface Characteristics

- . firm and regular surfaces for walking or wheeled vehicles
- . high installation costs, low maintenance cost
- . ice and snow removal feasible without damages to surfaces
- . expansion joints should be kept to a minimum
- . asphalt, black color, retains heat in summer
- . asphalt, overall rough surface, tough on children who must crawl or slide
- . concrete cracks from frost action where asphalt tends to be more flexible before cracking
- . concrete, tile and terrazzo can be trowled or polished to a smooth surface allowing sliding
- . concrete can be built into forms such as play pads in sand boxes and ramps
- . oil base of asphalt can stain persons and damage plants
- . appropriate where water comes in contact with wheeled mobility aids

At a time when playground designers are advocating a reduction in large areas of hard surface, designs of playspaces for handicapped children must advocate the reintroduction of hard surfaces capable of allowing unimpaired wheeled vehicle movement. A smooth or slick hard surface is also useful in those areas where disabled children must slither or slide to participate.

Soft surfacing is excellent in areas where children might fall or rough play could result in injury. This material can be natural such as sand or artificial such as air cushions or foam.

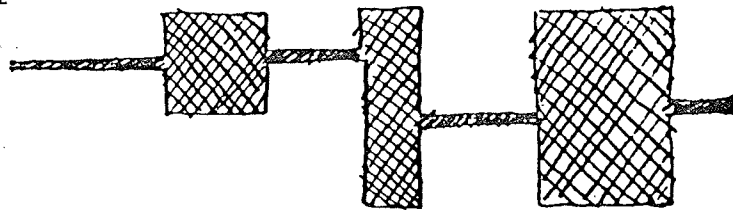
Whatever the material and its use the designer should be aware of problems arising where two materials meet and the design solution should not have any lip or wide joint if wheeled vehicles are to smoothly traverse the junction. If a surfacing junction occurs where wheeled vehicles are not to traverse then definite containment, curbs or edges should be established.

c) Circulation

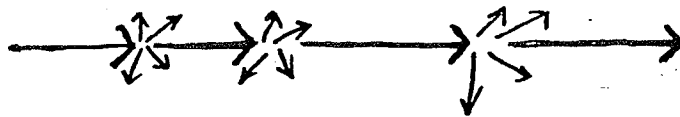
In order to ensure disabled children accessibility to all areas of the playground a circulation system of a hard surface material should be provided. The circulation system is an important aspect of the environment for it can determine patterns of use, sequence of movement, and attach prominence or unimportance to different areas and facilities. Unlike the random and uninteresting quality of vast expanses of asphalt, and the tendency towards exclusion from facilities of wheeled vehicles if only soft material is used, a hard surfaced path system can provide definite links to facilities while meandering around the soft surfaced play areas.

A number of circulation patterns are feasible, each focussing or dispersing activity in a logical manner.

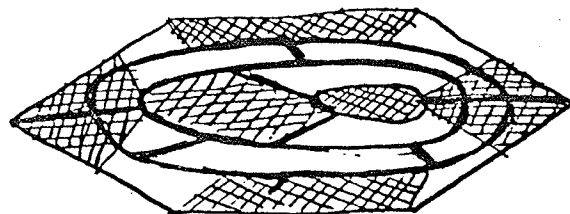
. linear/nodal



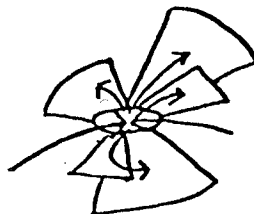
DISPERSAL CONTINUUM.



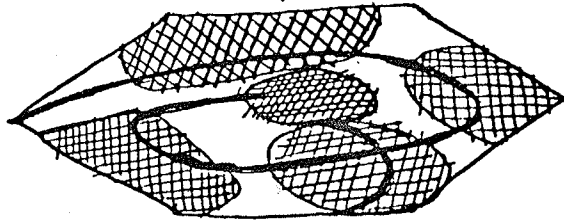
. concentric ring



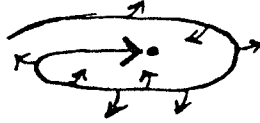
CENTRAL FOCUS WITH SECTORAL DIVISION.



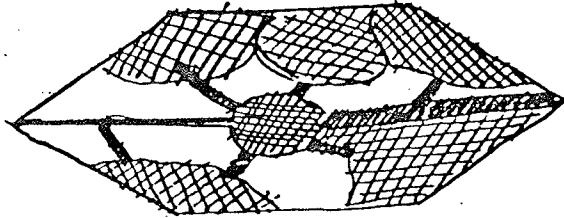
. spiral



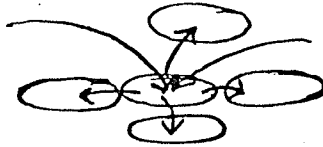
CENTRAL FOCUS



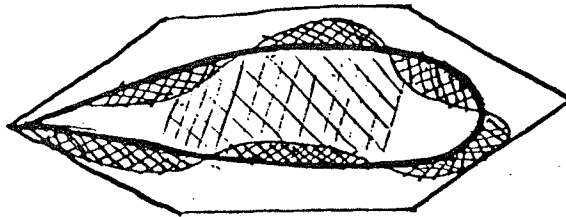
. wagon wheel



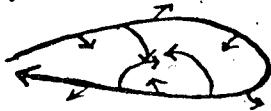
FOCUS - DISPERSE



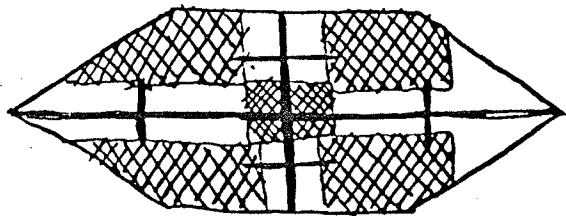
. loop



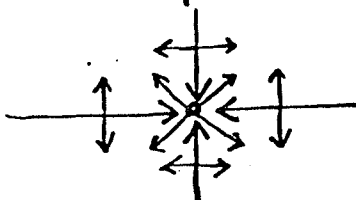
DISPERSAL - NO FOCUS



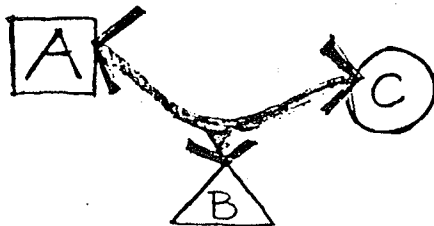
. grid



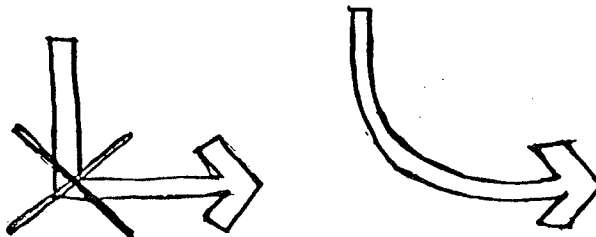
DIVISION DISPERSAL-FOCUS



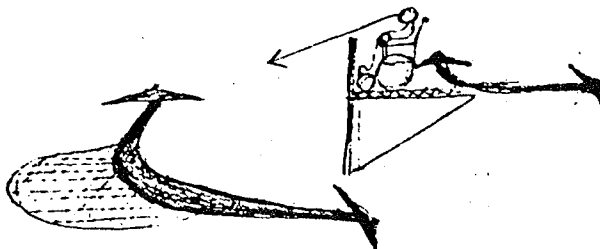
- . The circulation system should encourage a "natural" flow between facilities. Many times this will be the only link between facilities for the disabled child.



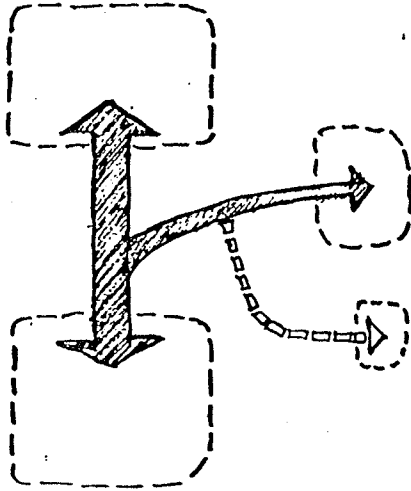
- . Right angles are to be avoided in the path system to facilitate an unimpaired forward motion.



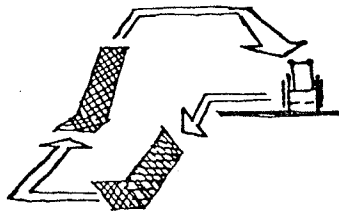
- . Hiatuses or rest areas should be included in a circulation system.



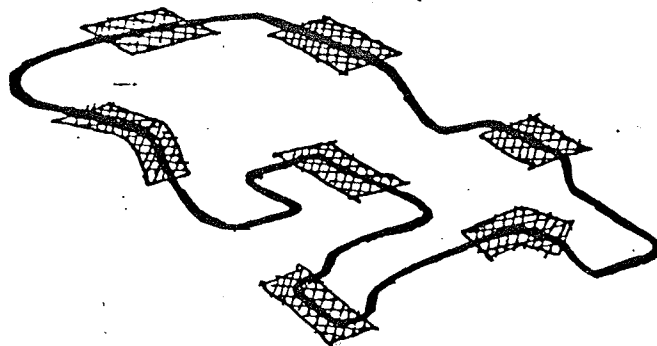
- . A hierarchy of path sizes and material construction could be established to delineate the importance and use of areas.



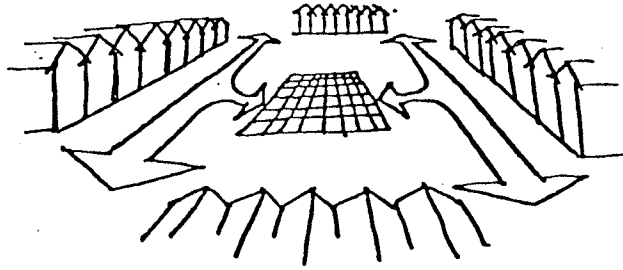
- . The circulation about equipment or playground should be circuitous so as to guide disabled children back to areas where mobility aids might be abandoned.



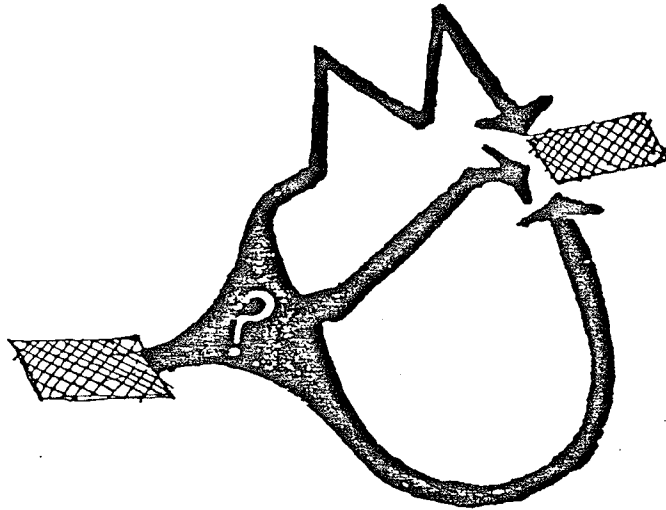
- . A circulation system should become a play environment on its own.



- . The circulation of the playground should connect with neighbourhood or community circulation.

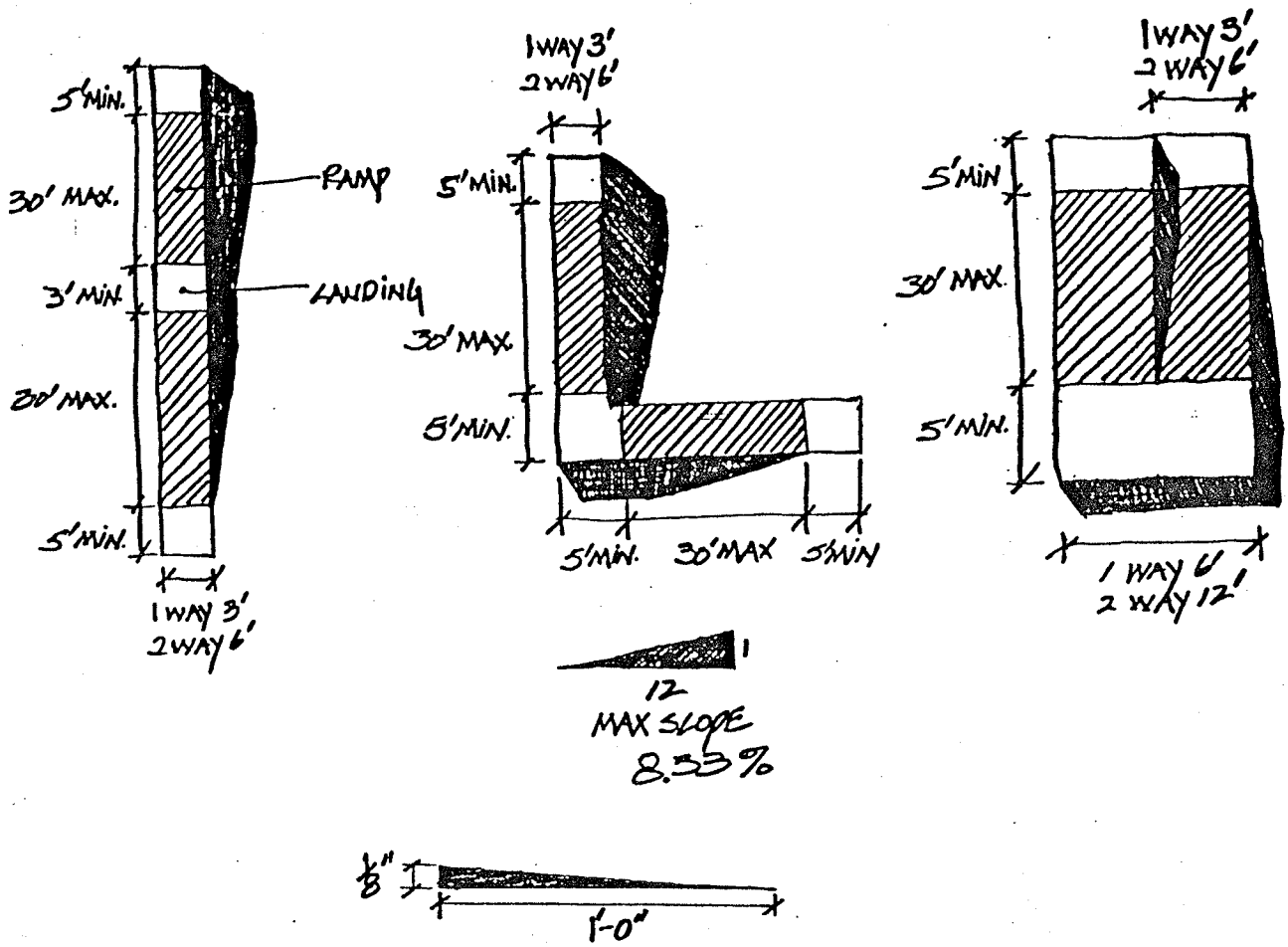


- . The circulation system should provide choice.



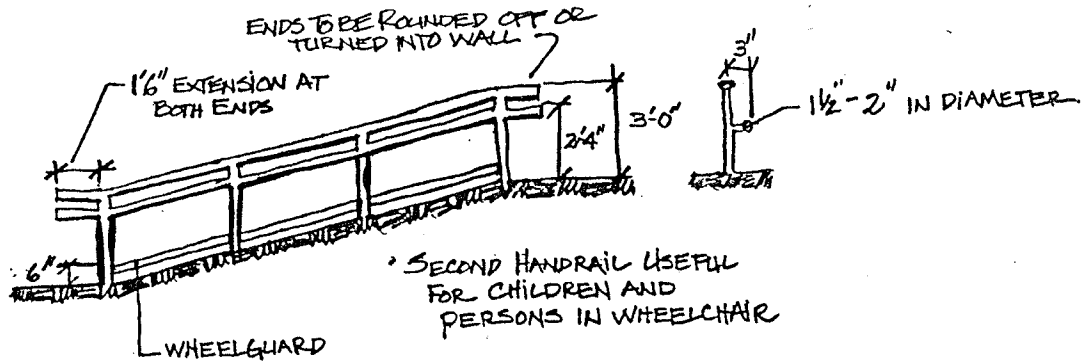
d) Walks, Slopes, Ramps, Handrails

- . Walks should be stable and firm, relatively smooth and of a non-slip surface. One-way walks should be no less than 3'0" wide and two-way walks no less than 6'0" wide.
- . Walks should be pitched with a continuous cross slope for water run-off.
- . Ramps should have a gradient not greater than 1:12 or an 8.33% maximum slope. Ramp runs should not be greater than 30 feet with intermediate platforms not shorter than 3'0" and stopping and turning platforms not smaller than 5'0" square.



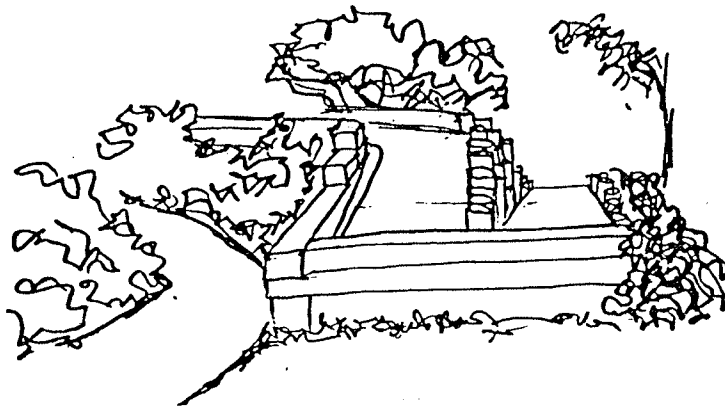
CONTINUOUS CROSS SLOPE

- Open structured free standing ramps, where falls from ramps to ground are possible, should be equipped with handrails according to the following specifications.



- HANDRAILS TO BE PROVIDED ON BOTH SIDES OF RAMP.

- . Ramps built into play hills should have a protective edge which adds to the richness and diversity of the play environment.



- . Landings or platforms should be equipped with protective edging or railings.
- . For short rises a slope of 1:7 is permissible with platforms every 15 feet.

(Dimensions from C.M.H.C. Housing the Handicapped.)

e) Fountains

Some disabled children will dehydrate quicker than normal children, therefore drinking fountains should be provided for the use of disabled children.

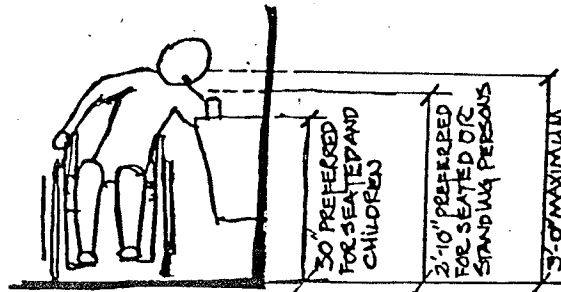
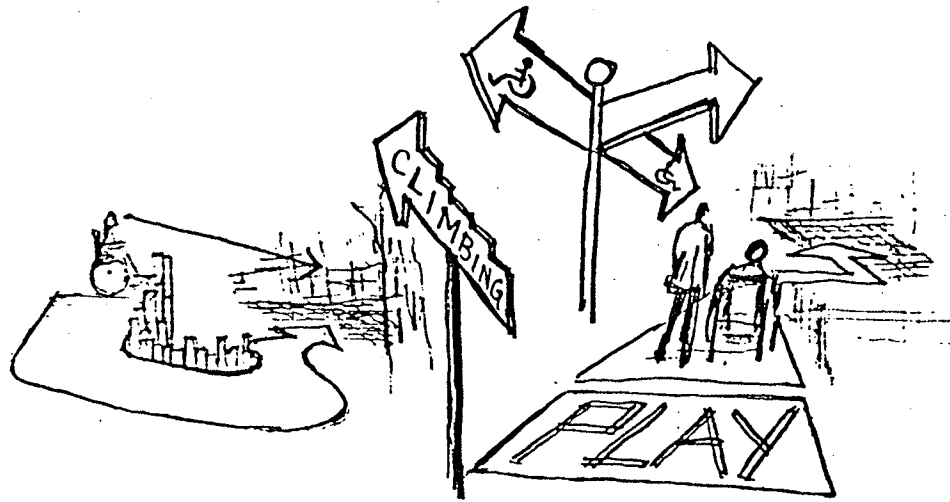


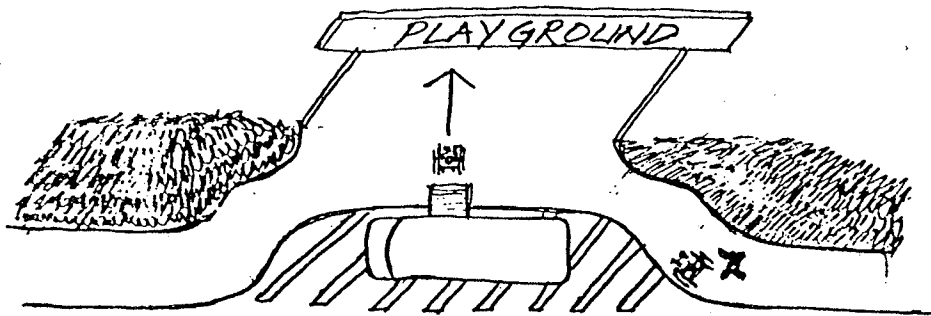
Diagram: North Carolina Building Code

f) Entrance

- . The entrance to the play environment should orient the child to the various aspects of the environment, either visually or via signs.

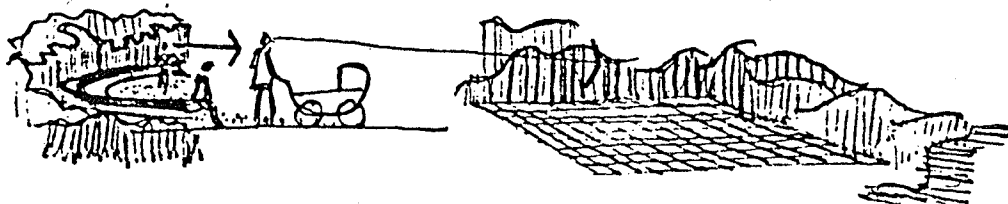


- Entrances should be provided allowing access to emergency and maintenance vehicles.
- A zone where children can safely be dropped off and picked up should be provided at the main entrance.

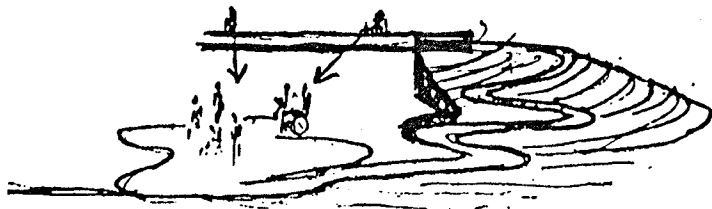


g) Seating and Observation

- Seating areas should be provided where adults or supervisors can view activities of children. Comfortable seating areas near the entrances are ideal for this function.

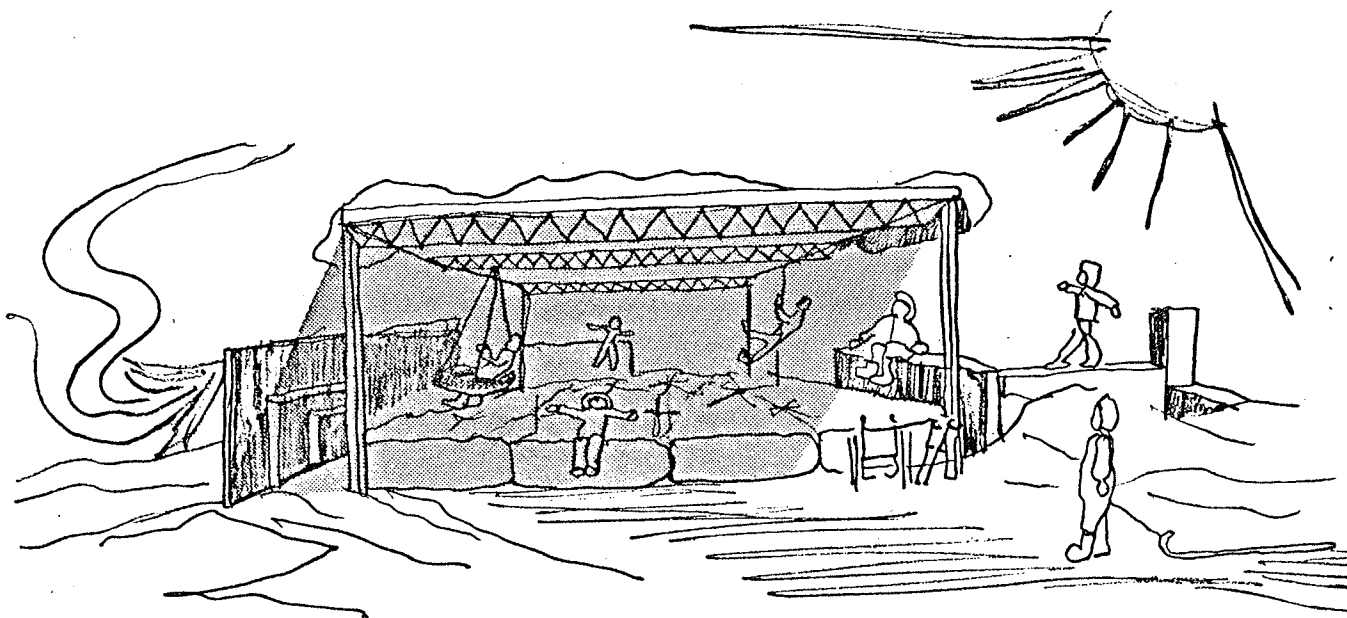


- . Frequent rest areas and seating should also be provided for children. These areas should occur where the children can have unobstructed views of other children playing.



h) Shelter

- . Areas providing shade and all-weather shelter should be an integral part of the play environment.
- . Shelter from prevailing winds, sun and snow.
- . Shelters or space frames can be used to protect vulnerable play equipment, as storage for loose play material.

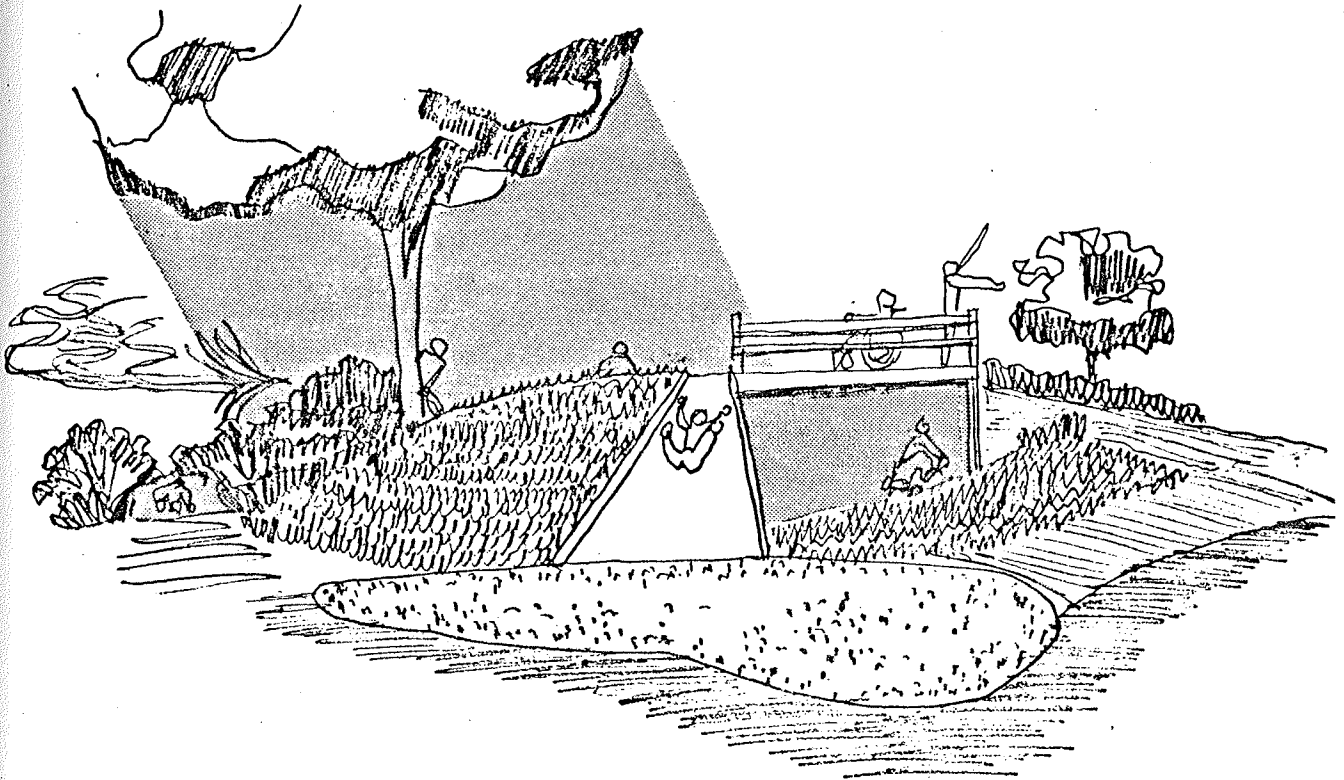


i) Washrooms

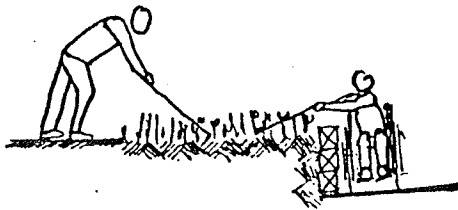
- . Indoor washroom facilities equipped to handle disabled children should be conveniently accessible from the play environment.

j) Plant Material

- . The landscaping should blend the playground with the surrounding environment while providing shade, shelter, elements and spaces for playing in and around, screens and an interesting topography.



- . Areas where children can cultivate plants might be provided.



- . Plant material should be hardy species which are not harmful to the children. (See Appendix for partial list of common poisonous plants.)

k) Maintenance

- . The area should be well maintained with any large cracks or heaves in the hard surfaces for wheeled vehicles fixed immediately.
- . Materials that do not require constant replacement should be used.

5.3 PLANNING SPECIFIC

This section examines some of the activities and elements that create the play environment. Through drawings, sketches and writing it intends to designate the problems faced when accommodating elements and activities for the disabled child and to stimulate the reader's mind regarding possible solutions. The elements and ideas depicted or suggested are only some of the possible ways in which play activities and the environment might be conceived.

The appropriateness of the ideas will depend on site selection, existing conditions, available finances, user groups and climatic conditions.

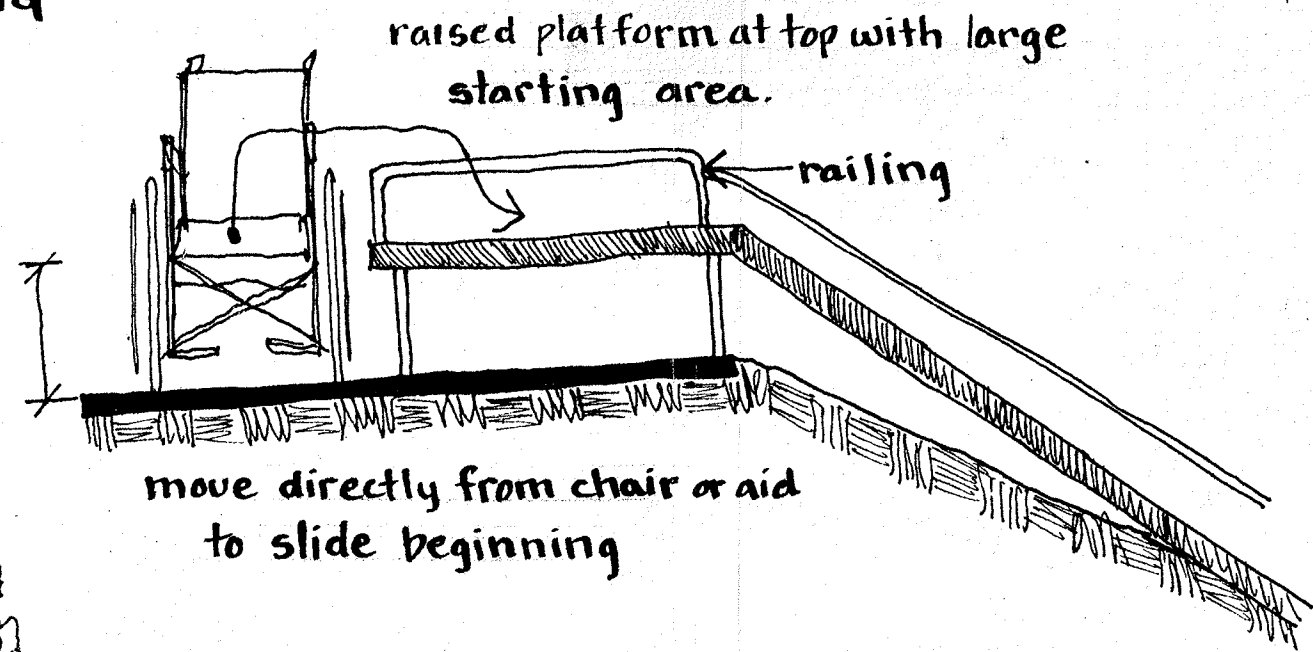
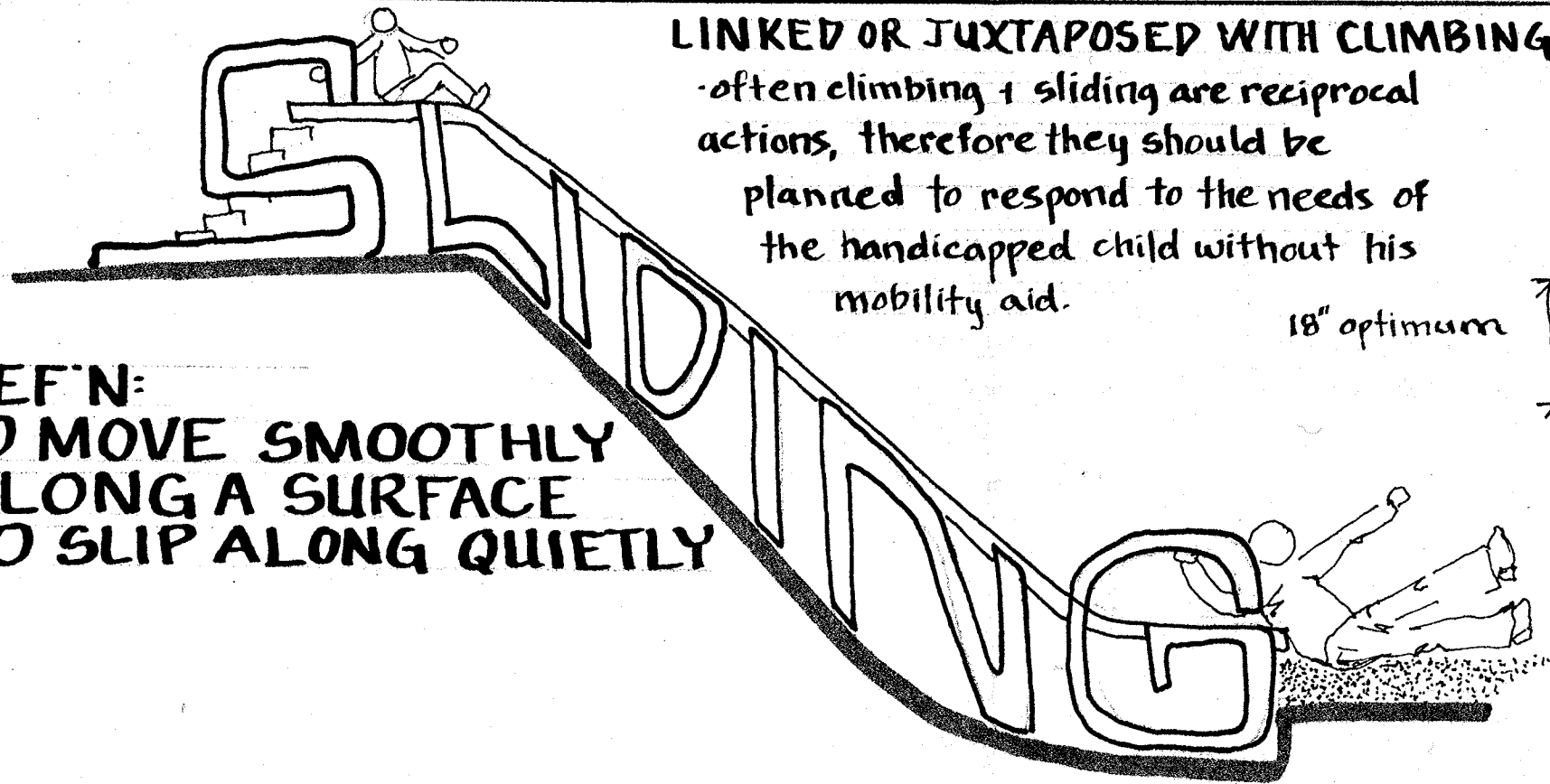
Some of these ideas exist already in specialized playgrounds built for disabled children, others are design notions resulting from the playground for all children competition and still others are conceptual ideas which need refinement in order to construct.

LINKED OR JUXTAPOSED WITH CLIMBING

often climbing + sliding are reciprocal actions, therefore they should be planned to respond to the needs of the handicapped child without his mobility aid.

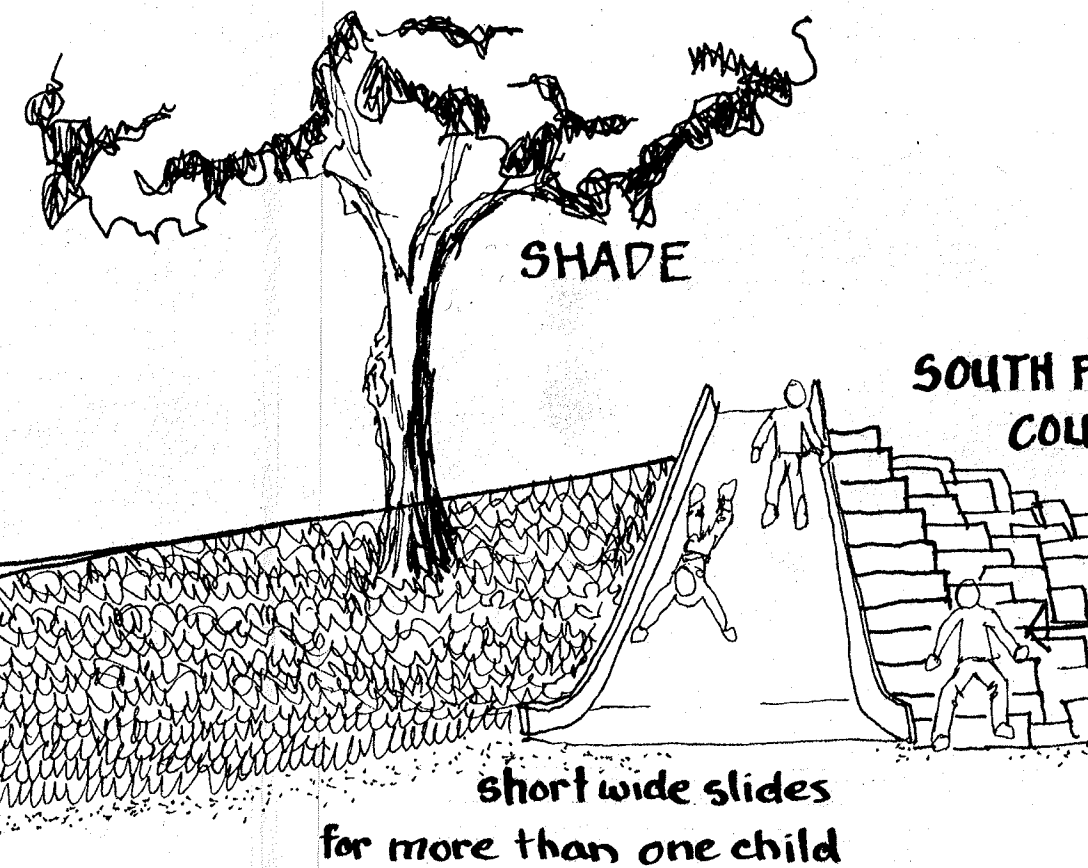
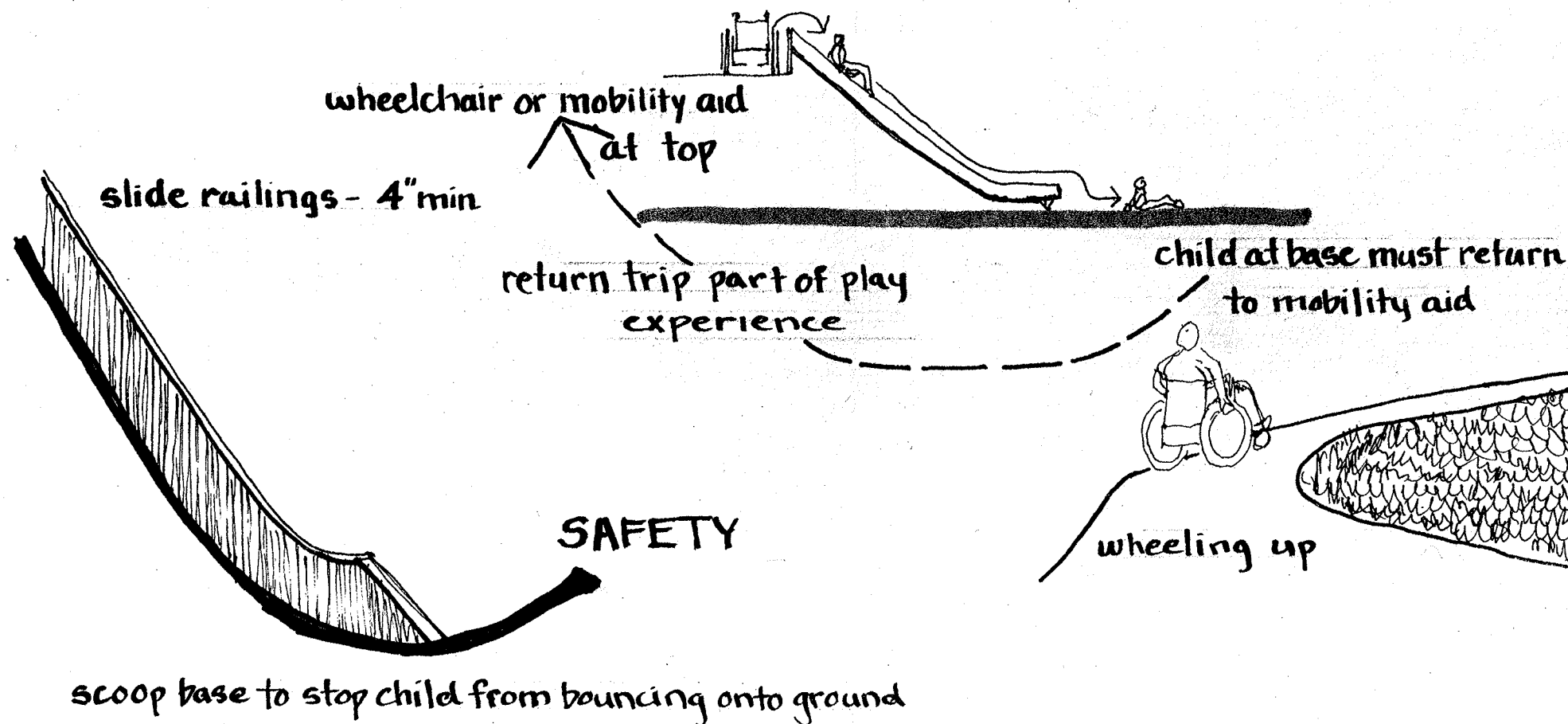
18" optimum

DEF'N:
TO MOVE SMOOTHLY
ALONG A SURFACE
TO SLIP ALONG QUIETLY



large
while

PROBLEM: HOW TO GET CHILD FROM SLIDE BASE TO SLIDE BEGINNING



ge

HORIZONTAL

air mattress to cushion landing
large mattress - joy from rebound
while just sitting on extra area

protective edge

vandal proof

retaining and support
wall

belt system of heavy
rubber mat

ROPE SLIDE - slide down, then pull self back
up with rope

tube could double as skateboard
shute or water trough

tube

SOUTH FACING SLIDE SURFACE
COULD GET TOO HOT

bump up

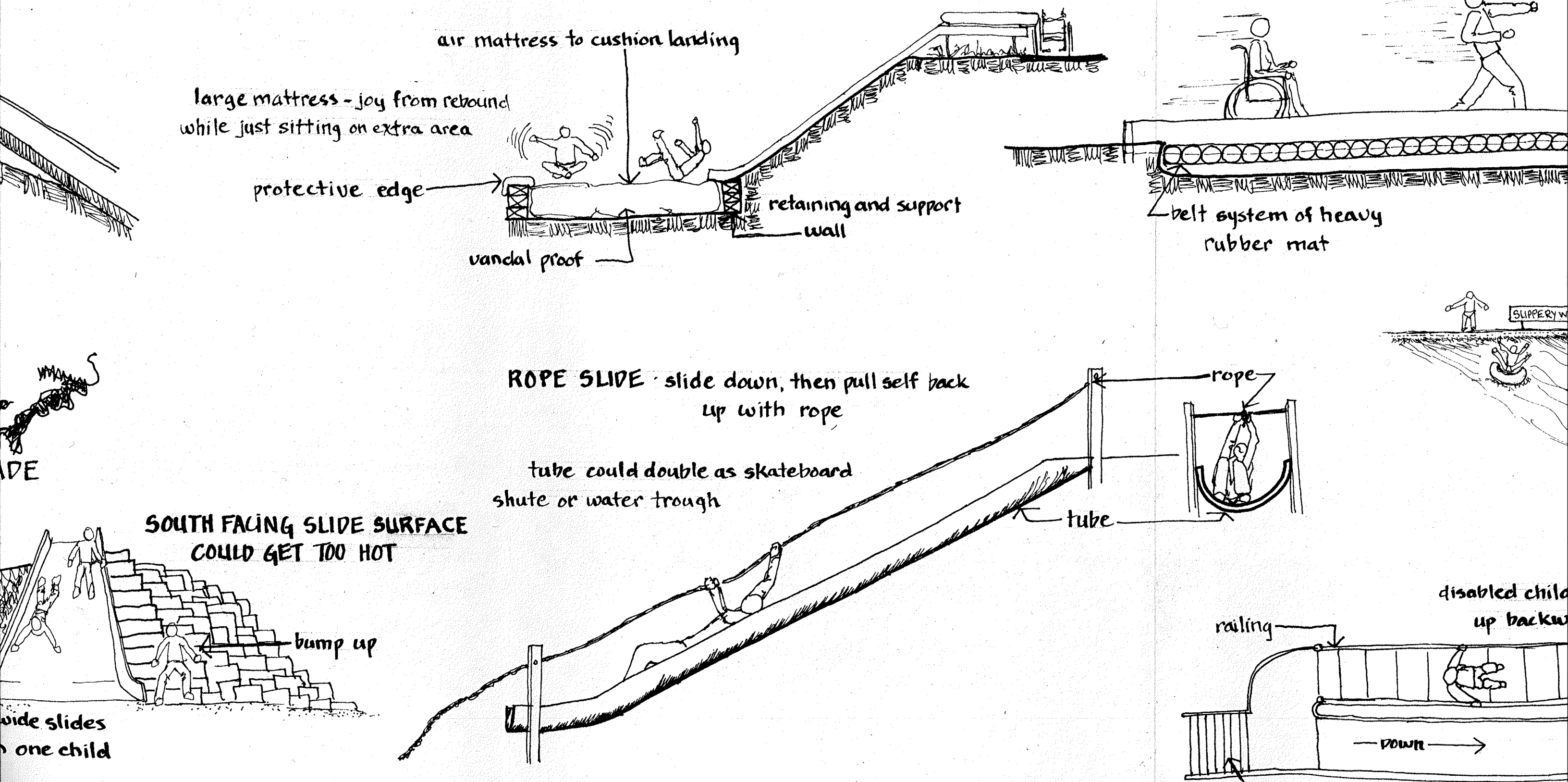
wide slides
for one child

disabled child
up backw

railing

down

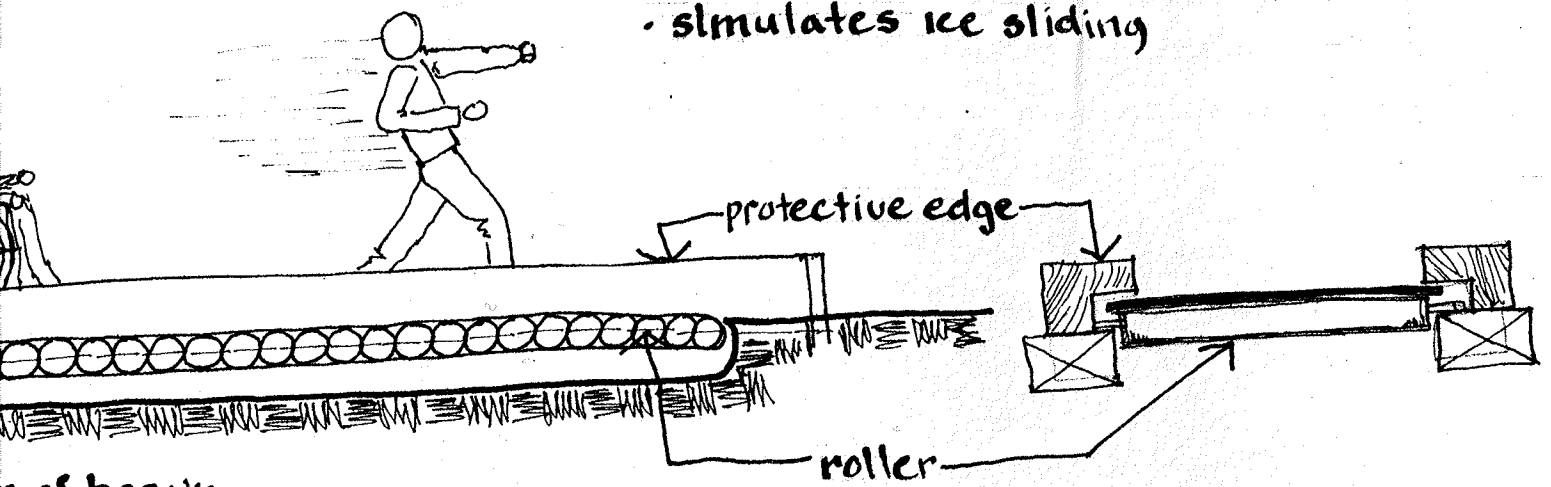
conventional steps



RAMPS + SLIDES OF VARIOUS PITCHES CAN INCREASE CHALLENGE + CONFIDENCE

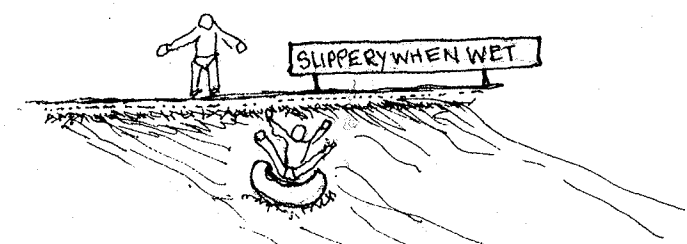
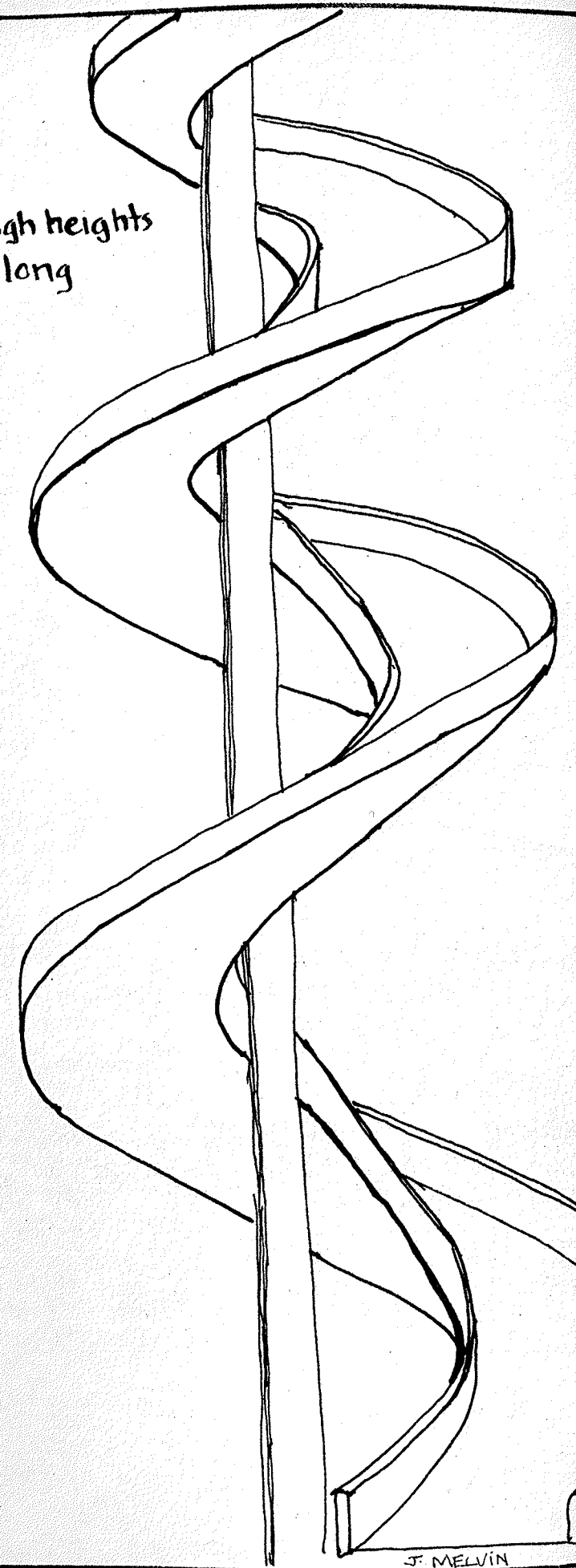
HORIZONTAL ROLLER SLIDE

simulates ice sliding



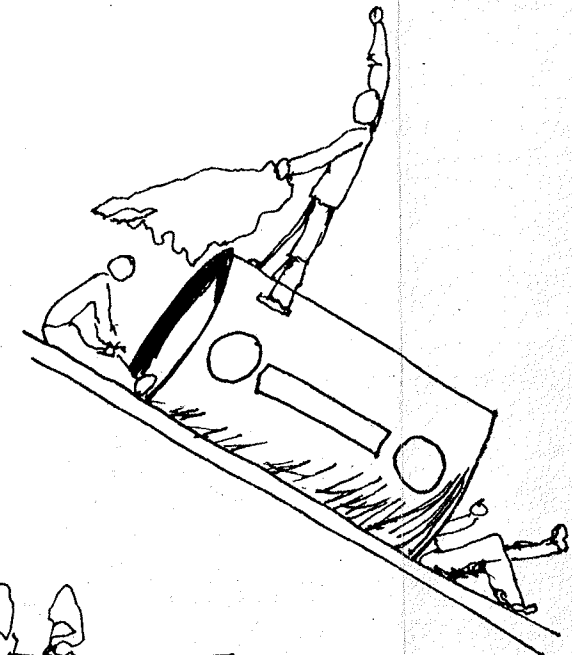
mat of heavy

slow down from high heights by twisting slide - long slides are narrow

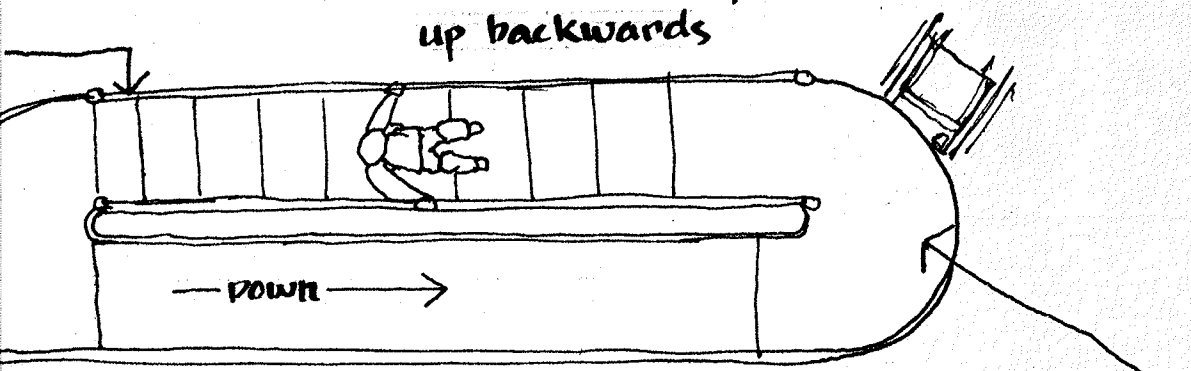


slide through objects - gives sense of space and body awareness

WATER SLIDE



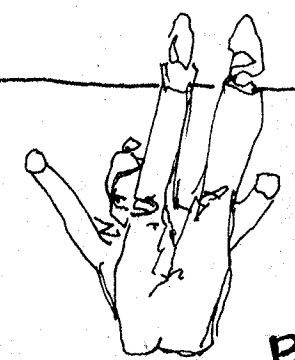
disabled child bumps up backwards



move from wheelchair to landing platform

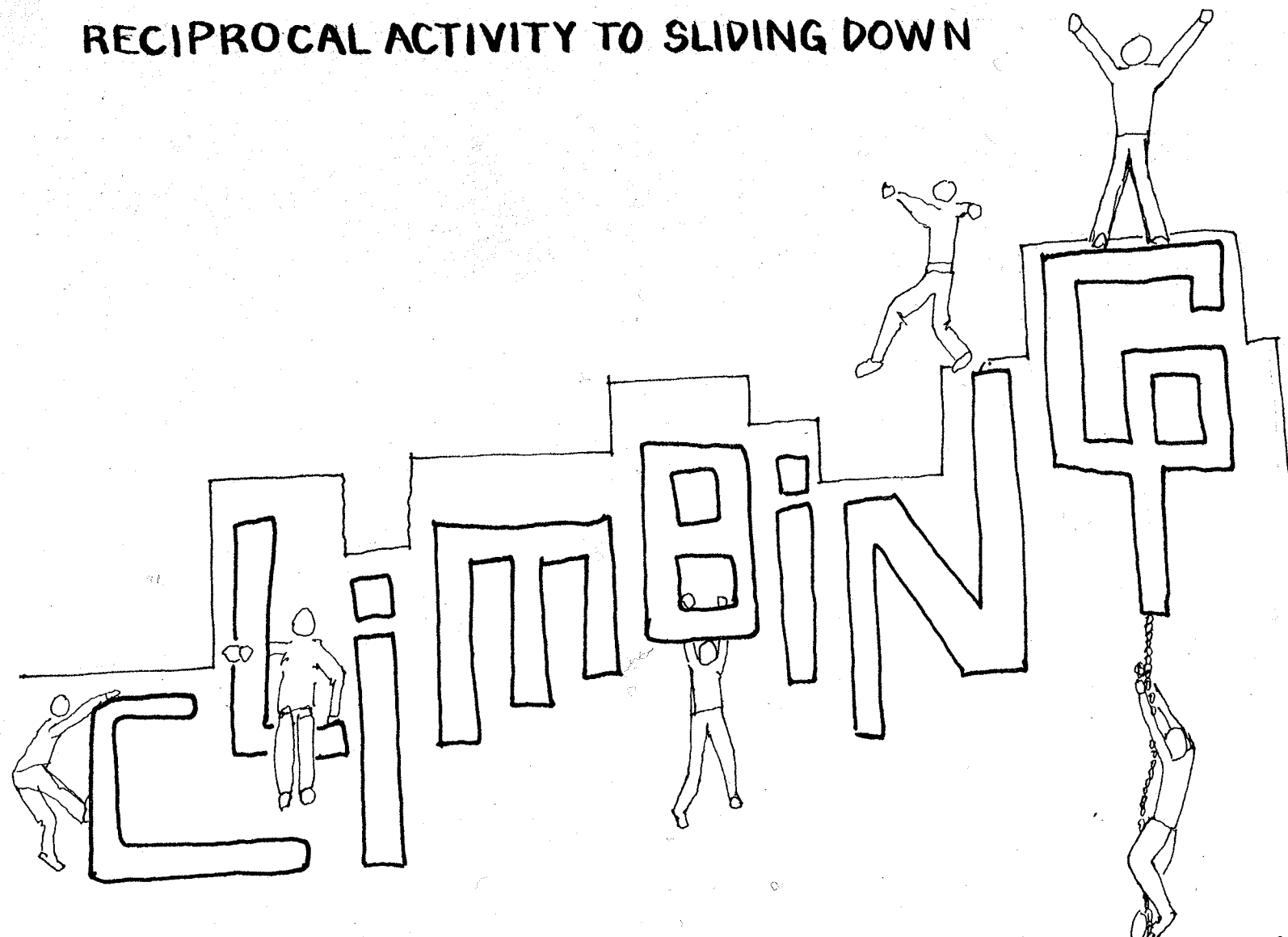


SLEPPING



BUM SLIDE

RECIPROCAL ACTIVITY TO SLIDING DOWN

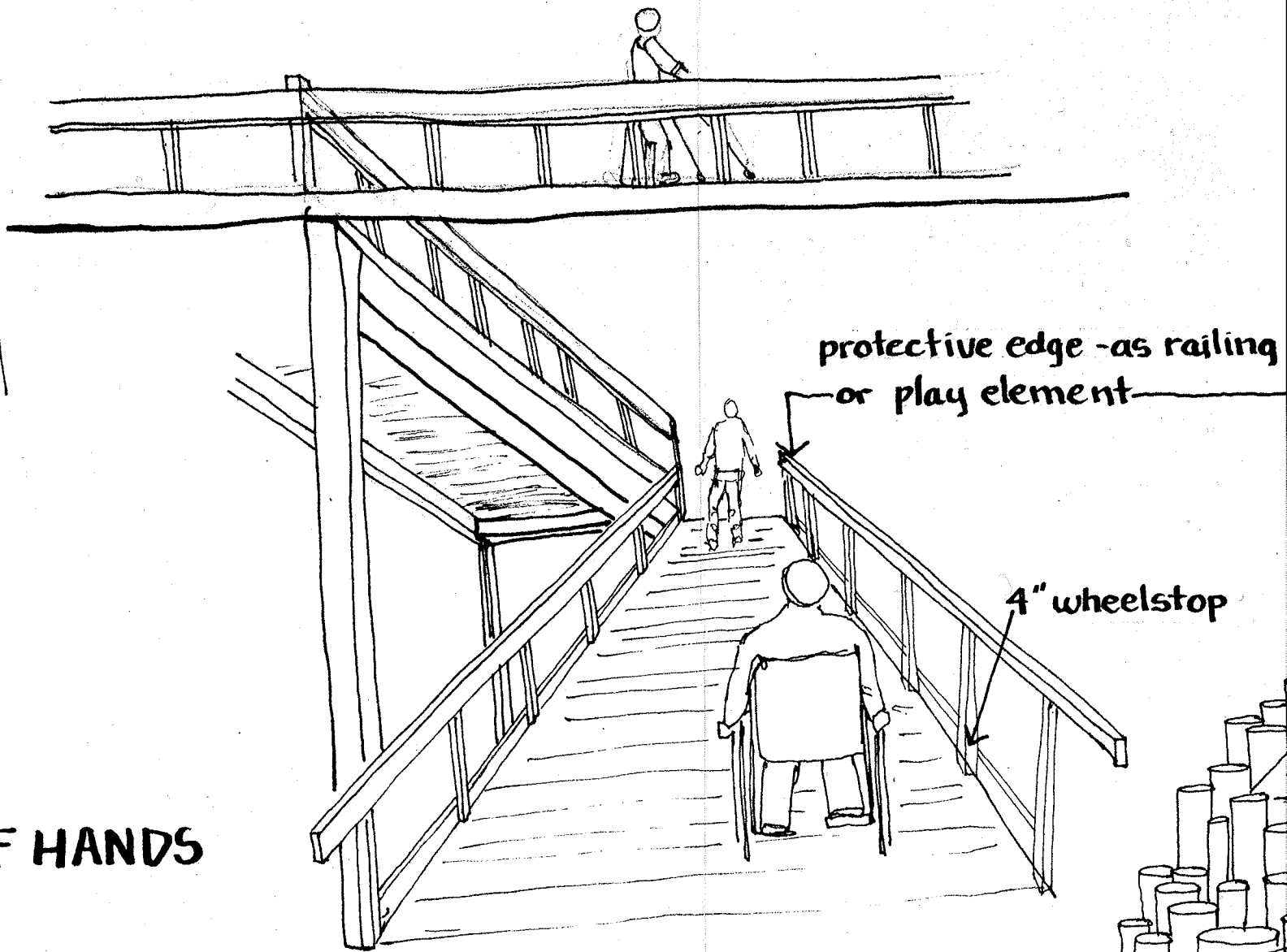


DEF'N: TO GO UP OR DOWN ESPECIALLY BY USE OF HANDS AND FEET, TO RISE TO A HIGHER POINT

- some disabled children lack the coordinated use of feet or grasping function of hands

DEVELOPMENT OF GROSS MOTOR SKILLS AND PHYSICAL FITNESS

key level
wheeled v
levels

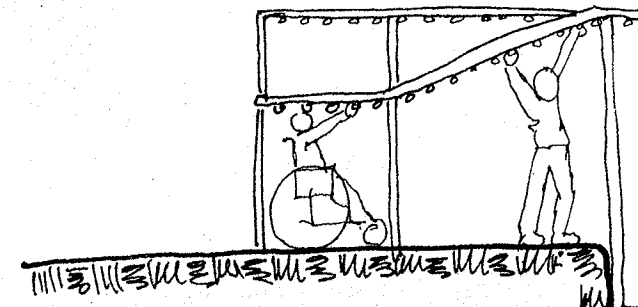


ramps permit wheeled vehicles to climb - max. slope 1:12

key levels in climbing structure for wheeled vehicle access are those midway levels off which activities occur

CLIMBING STRUCTURES

- limitless shape and materials
- children construct



HAND OVER HAND OVER
 · initial area low enough to
 in wheelchair - as bar rises u

protective edge - as railing
 or play element

4" wheelstop

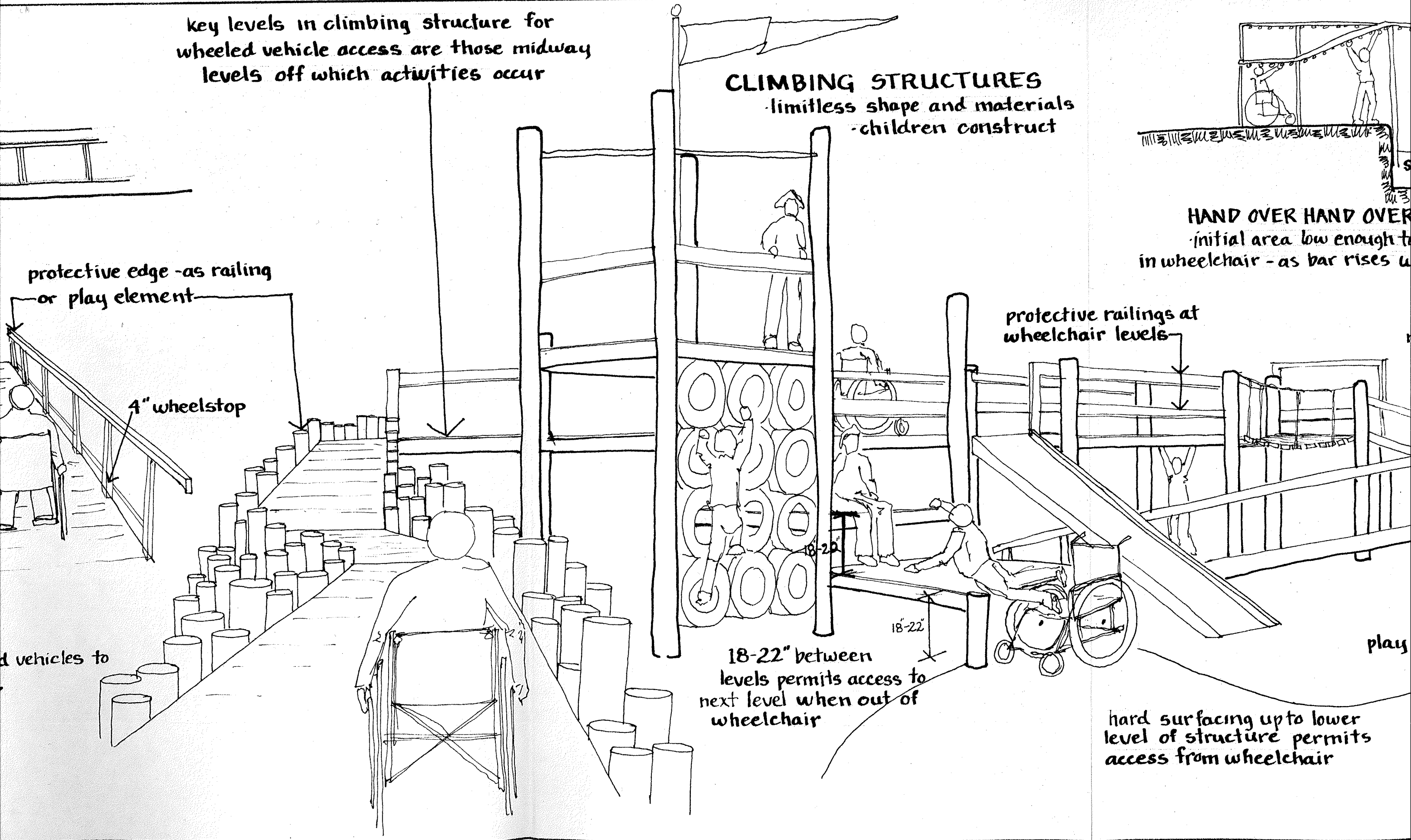
protective railings at
 wheelchair levels

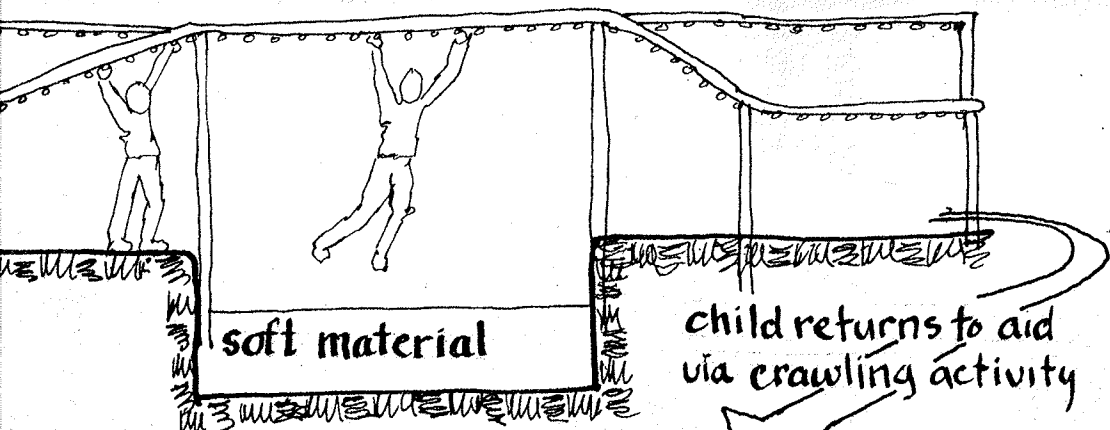
vehicles to

play

18-22" between
 levels permits access to
 next level when out of
 wheelchair

hard surfacing up to lower
 level of structure permits
 access from wheelchair



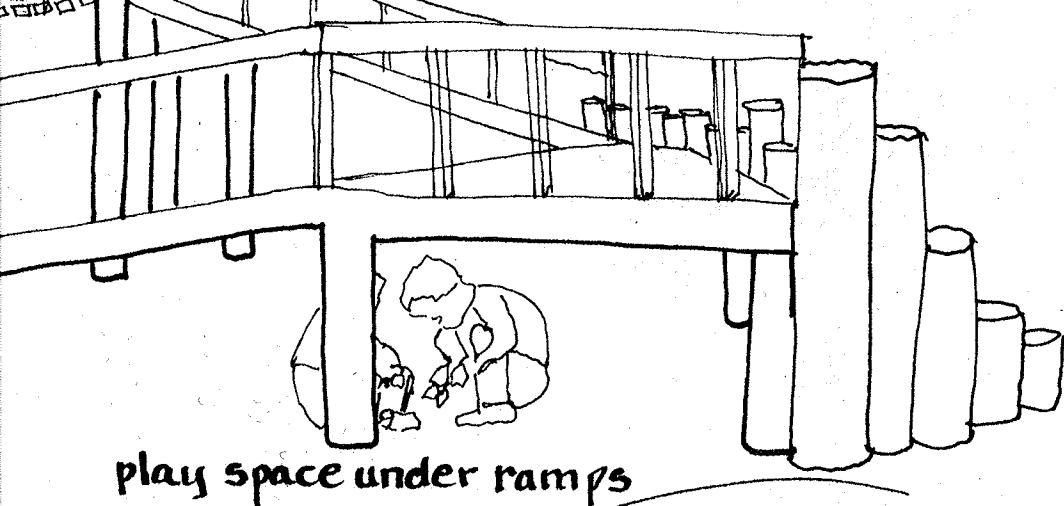


child returns to aid via crawling activity

HAND OVER OPEN AREA

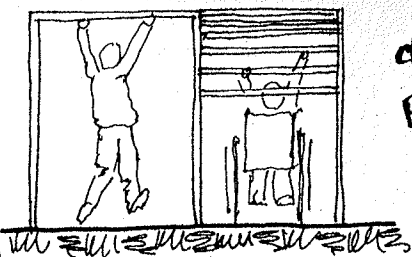
low enough to reach from seated position
bar rises walk along until drop off.

ramp landings part of play structure - platforms at wheelchair access levels are to be at least 6' square to permit turnabout



power permits

hole in deck through which child pulls himself



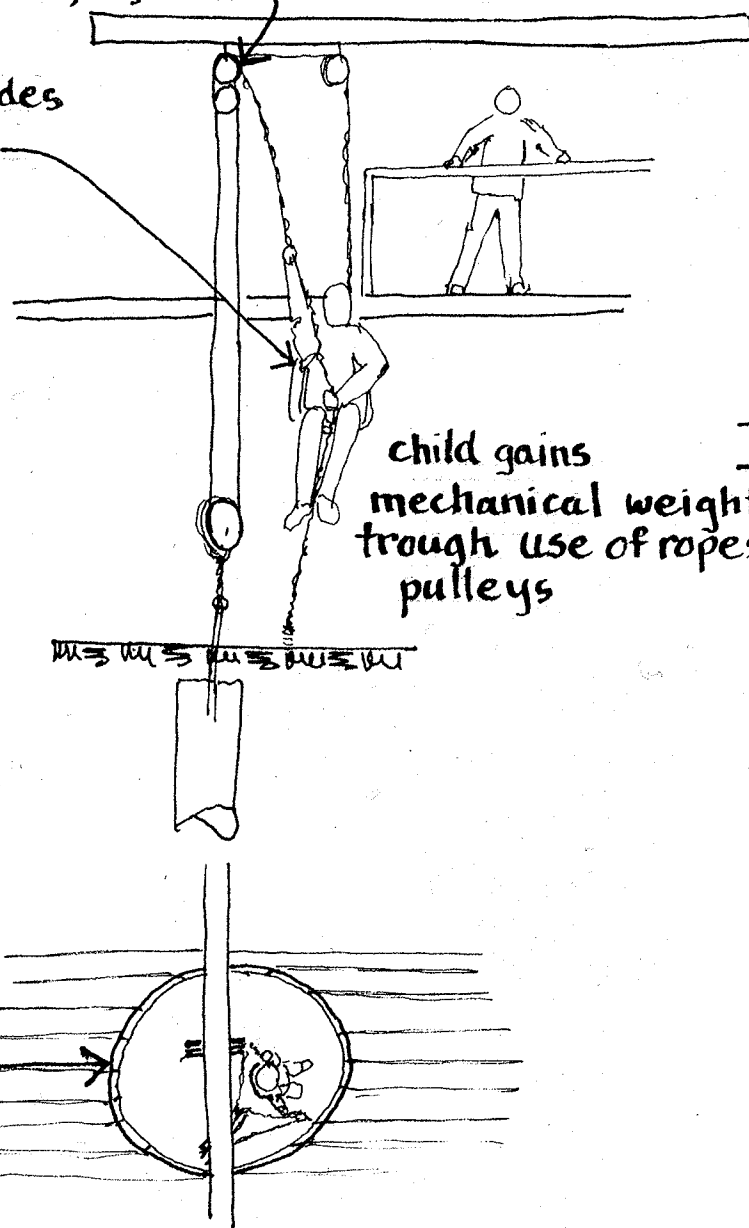
disabled + able-bodied child play side by side

develops eye/hand coordination.

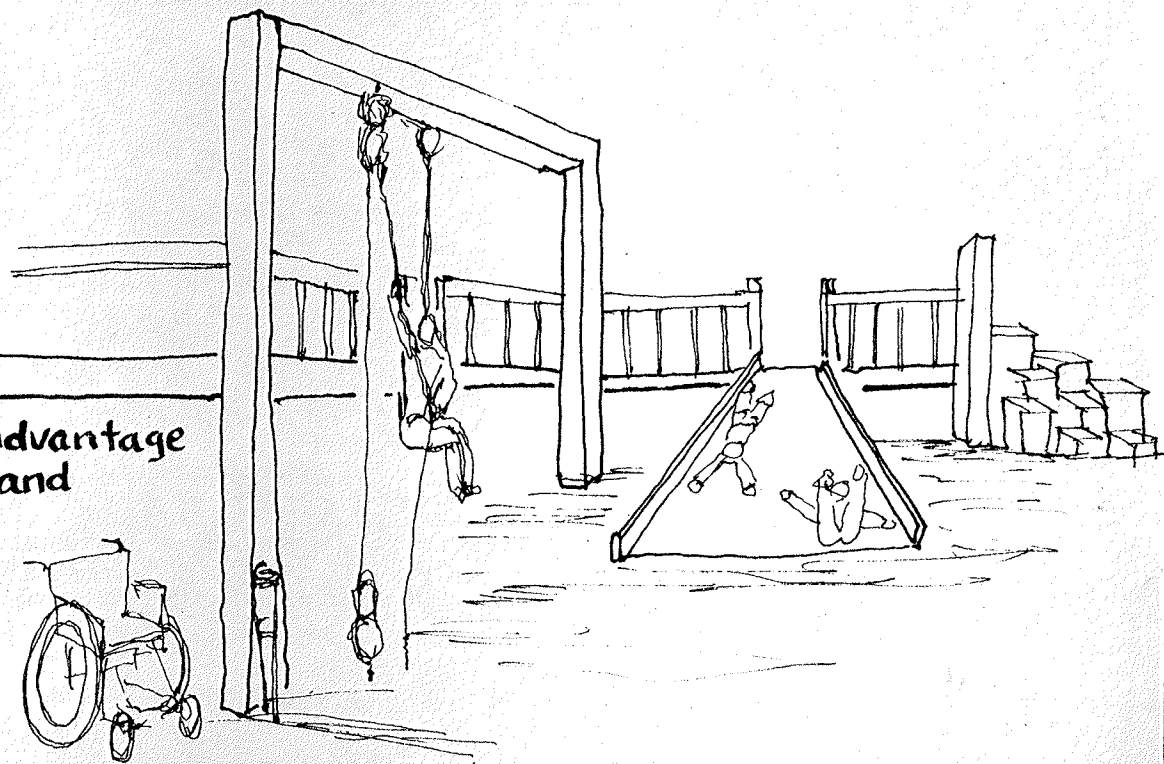
more sophisticated play apparatus providing a greater challenge and demanding an understanding of how it functions.

self-locking pulley system

seat with back, sides and safety belt.



FACILITIES LINKED IN A MANNER THAT ENABLES PLAY WITHOUT TECHNICAL AIDS WITH RETRIEVAL OF AID WHEN FINISHED

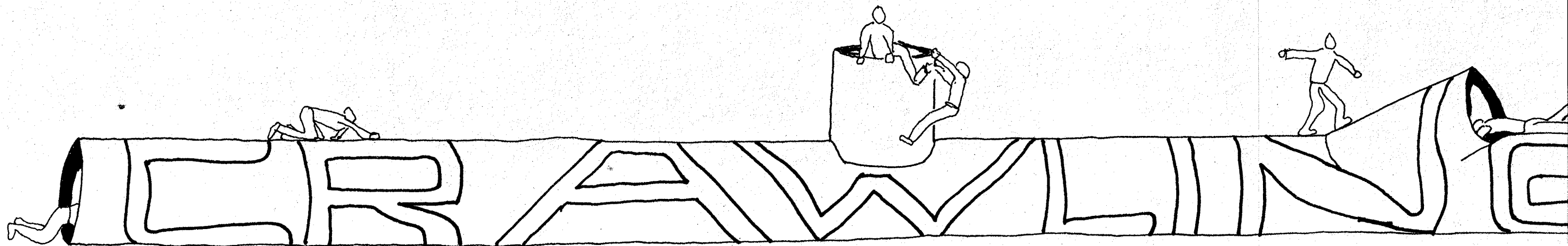


SEAT-PULLEY UP DEVICE

-device could be located near base of slide permitting child to raise himself back up to starting level.

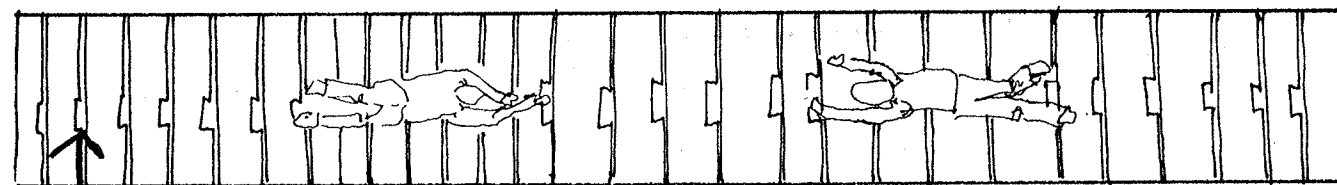
DEF'N: TO MOVE SLOWLY BY DRAWING THE BODY ALONG THE GROUND

AN ACTION A GREAT MANY DISABLED CHILDREN CAN PERFORM WHEN
OUT OF THEIR MOBILITY AIDS

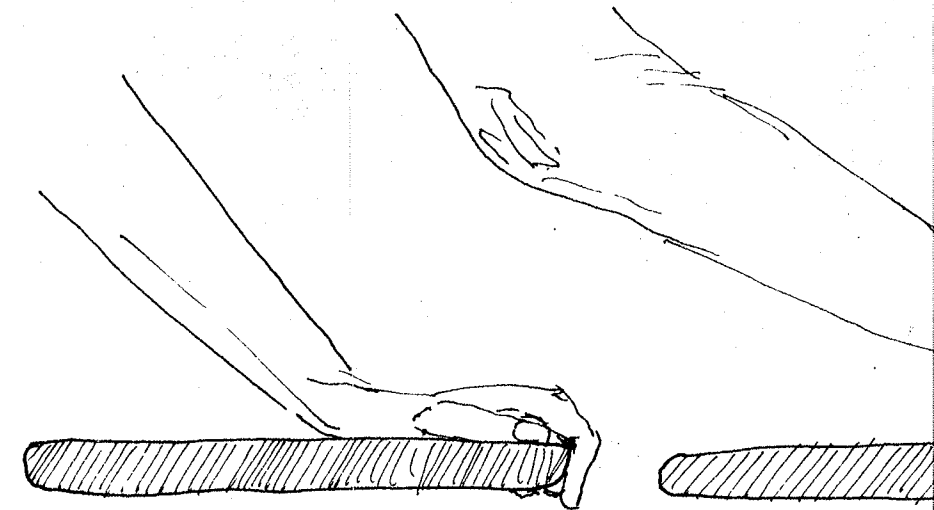


surfaces should be smooth so not to
scratch or injure hands, knees or other
parts of the body

LEVEL PLATFORM CRAWL



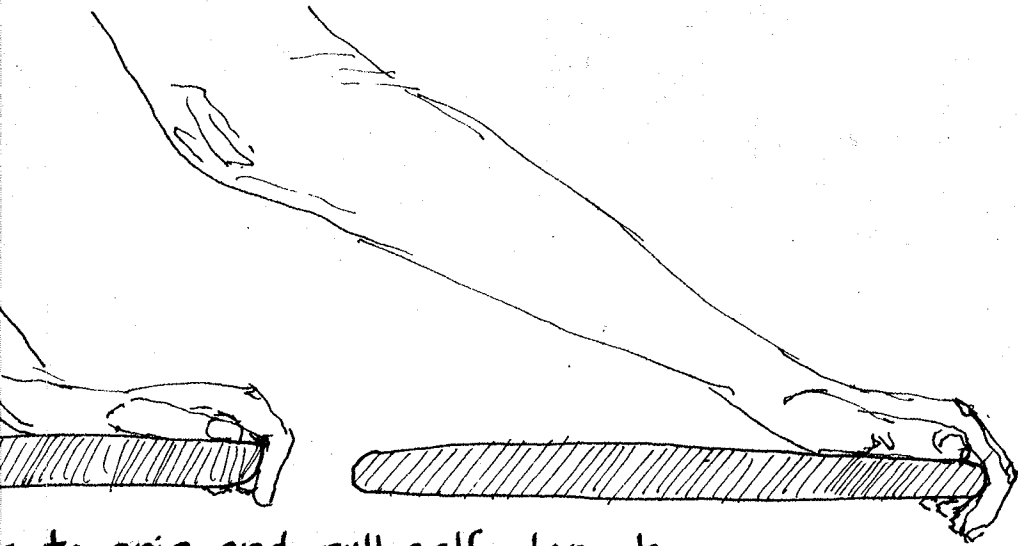
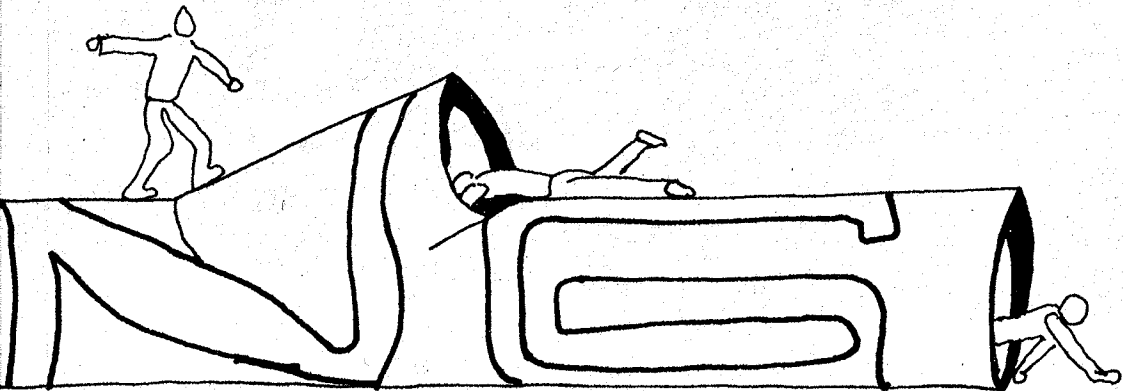
hand holes



openings to grip and pull self along
still permits smooth surface

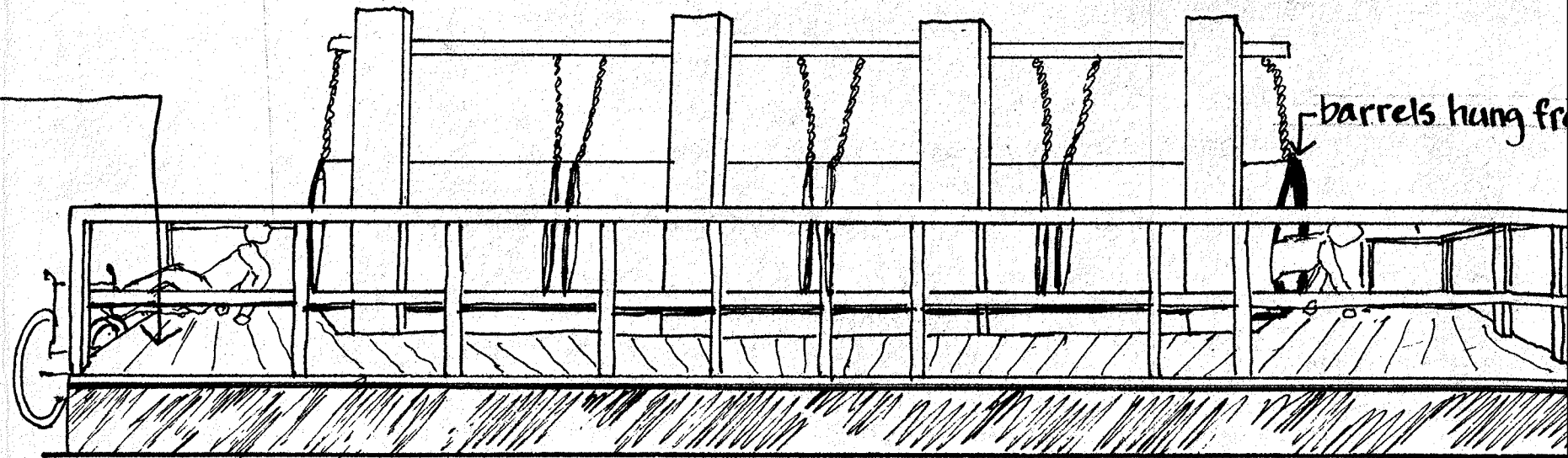
OUND

platform permits crawl back to mobility aid or could be part of a crawling circuit leading to different facilities and eventually returning to mobility aid

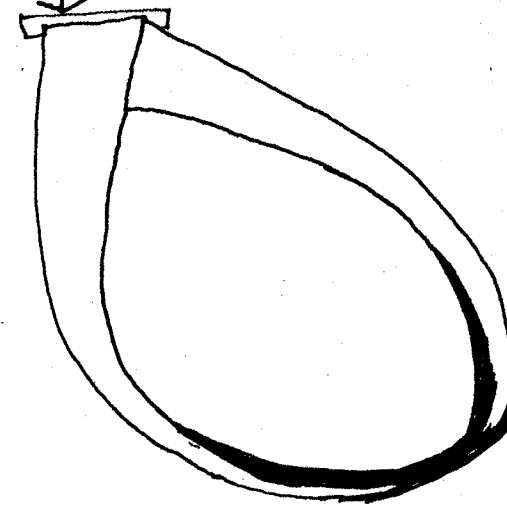


s to grip and pull self along by permits smooth surface

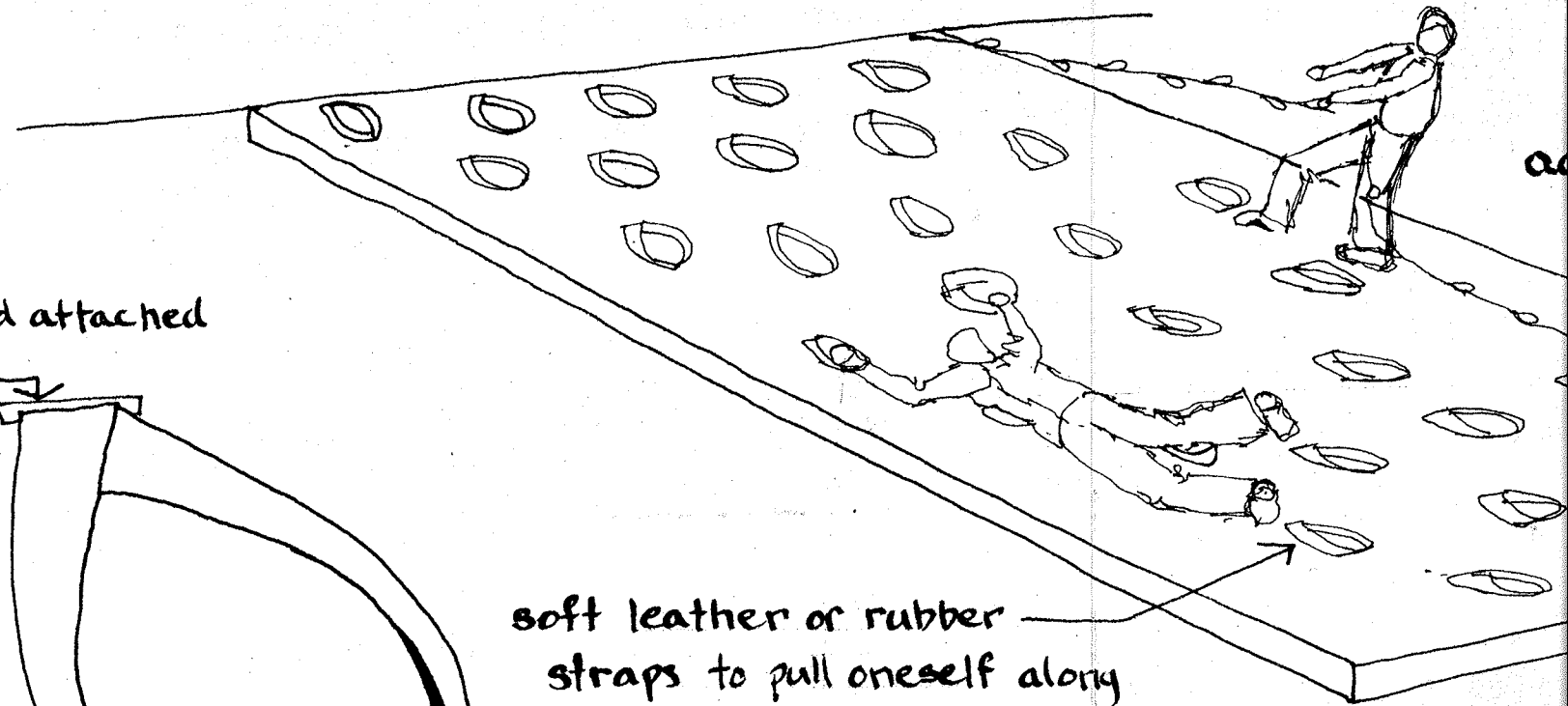
CRAWL THROUGH BARRELS



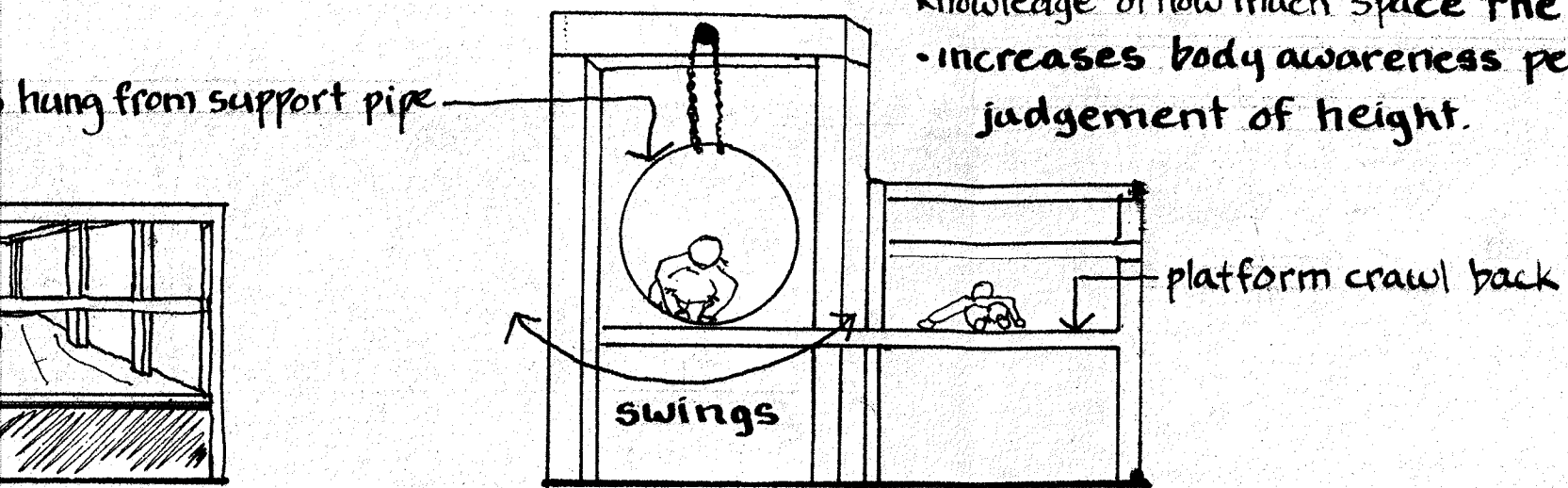
strap through board attached to underside



soft leather or rubber straps to pull oneself along surface

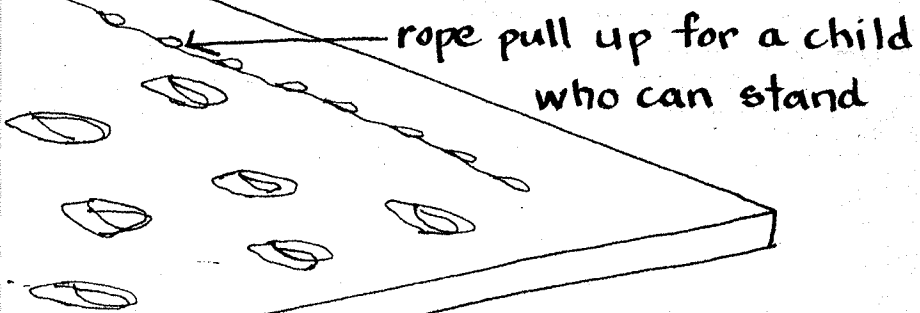


the enclosed space of the barrel increases the child's knowledge of how much space the self takes
 • increases body awareness permitting judgement of height.



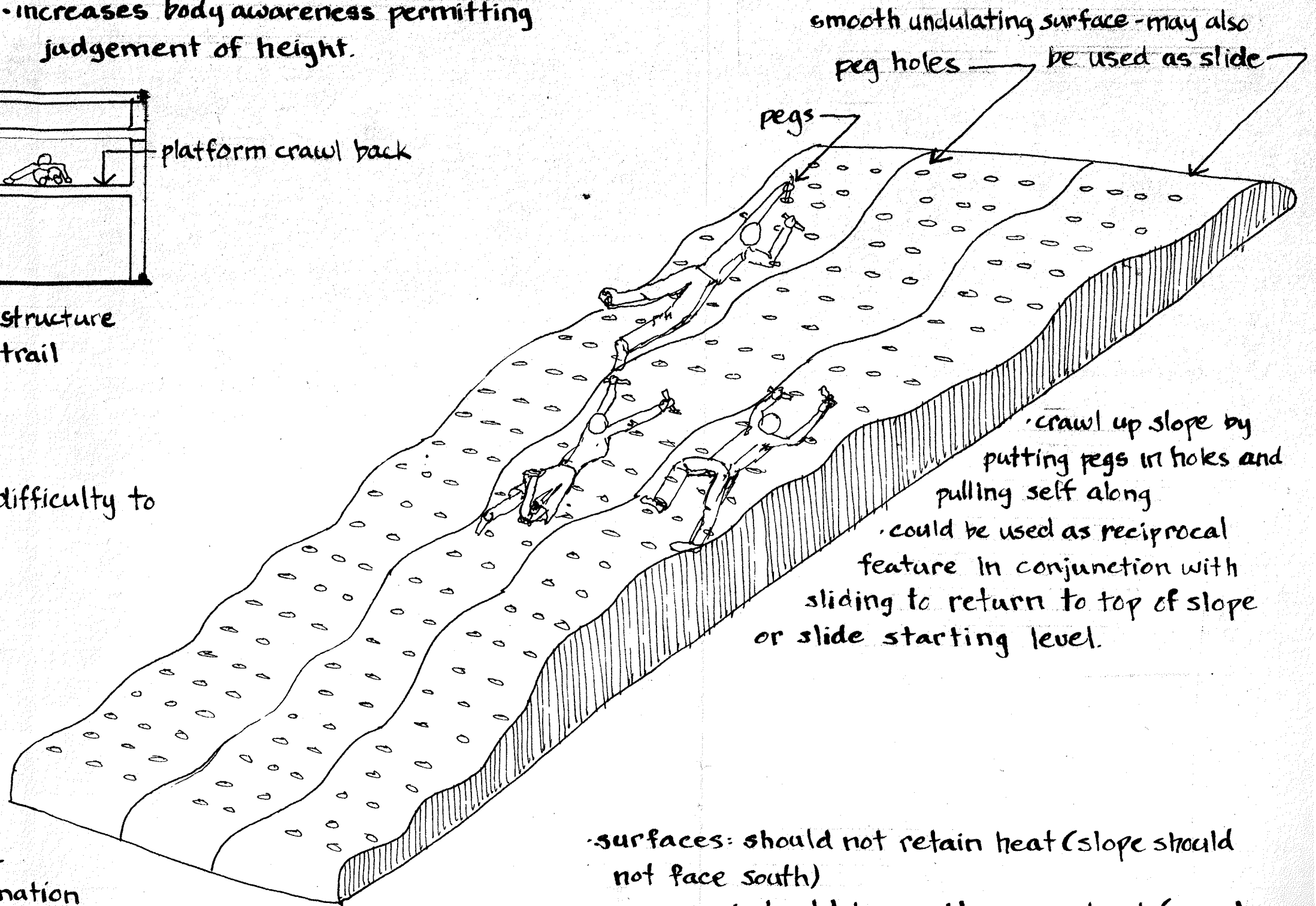
could be part of climbing structure or facility on handi-trail

adjustable slope permits an increase in difficulty to perform task.



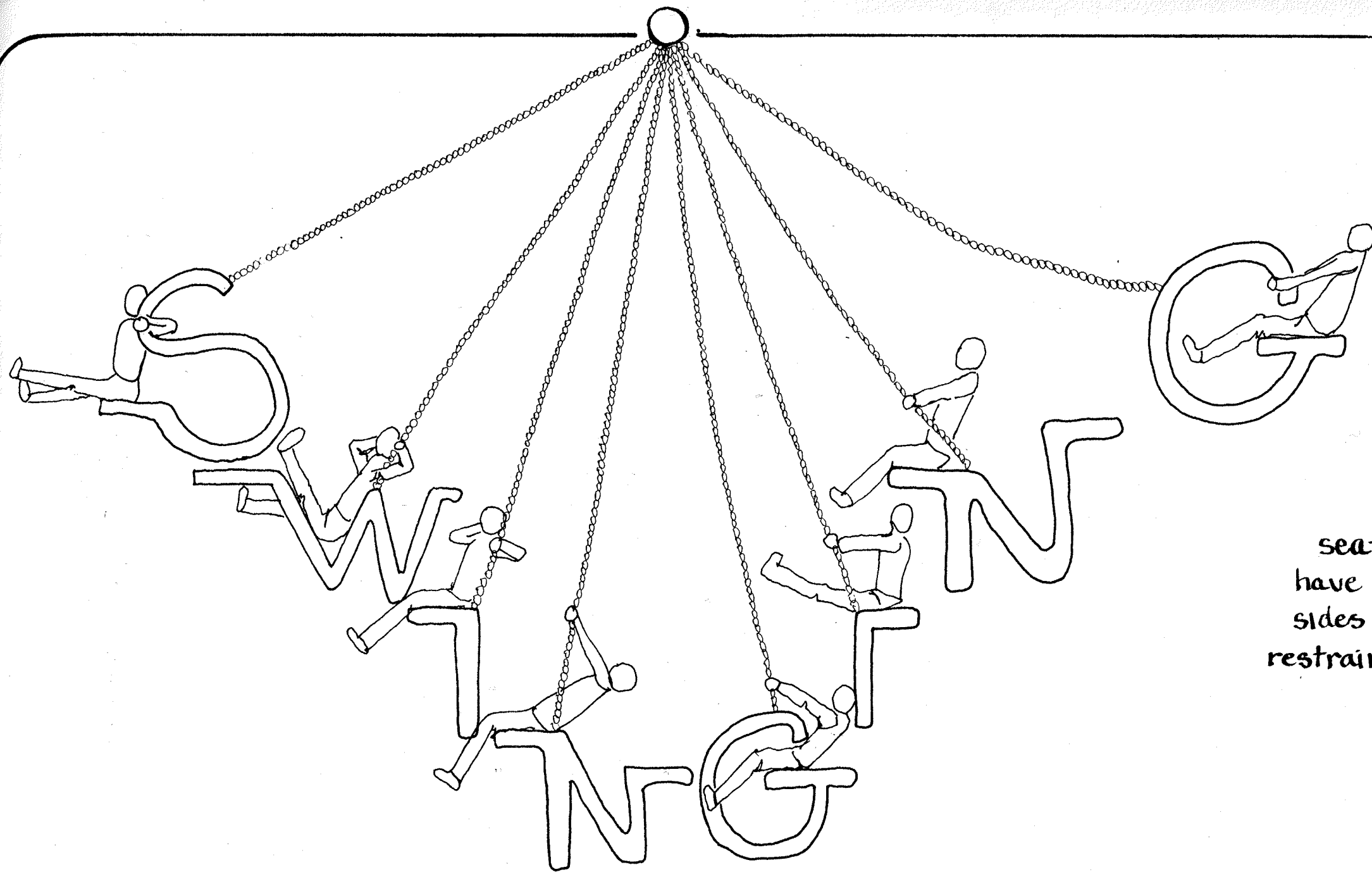
STRAP AND PEG CRAWL

- helps develop eye/hand coordination
- develops upper body strength-especially in arms

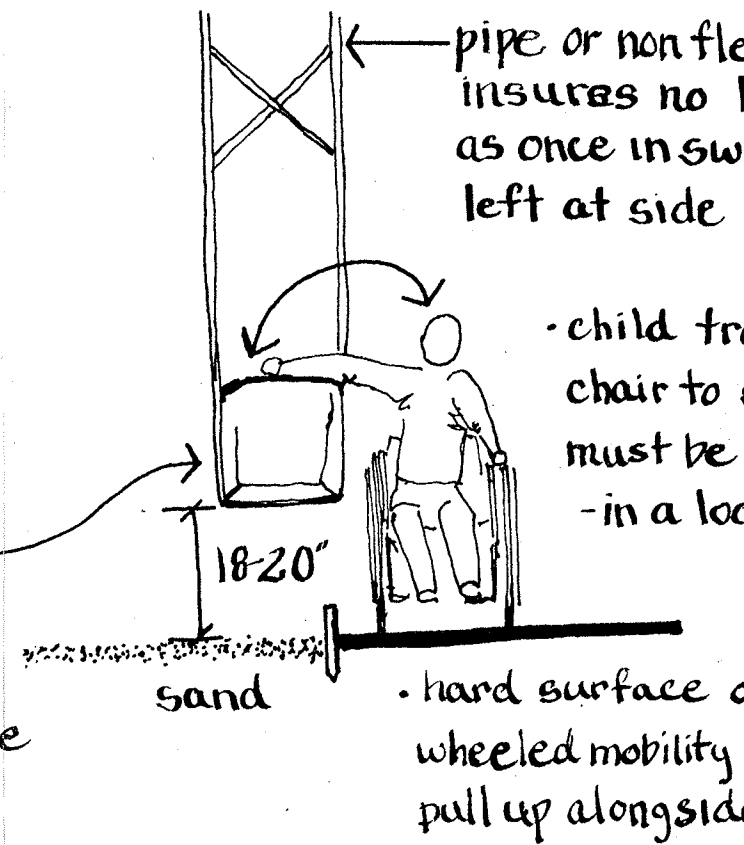


- crawl up slope by putting pegs in holes and pulling self along
- could be used as reciprocal feature in conjunction with sliding to return to top of slope or slide starting level.

- surfaces: should not retain heat (slope should not face south)
- should be weather resistant (wood, arborite, stainless steel.)



MOUNTING



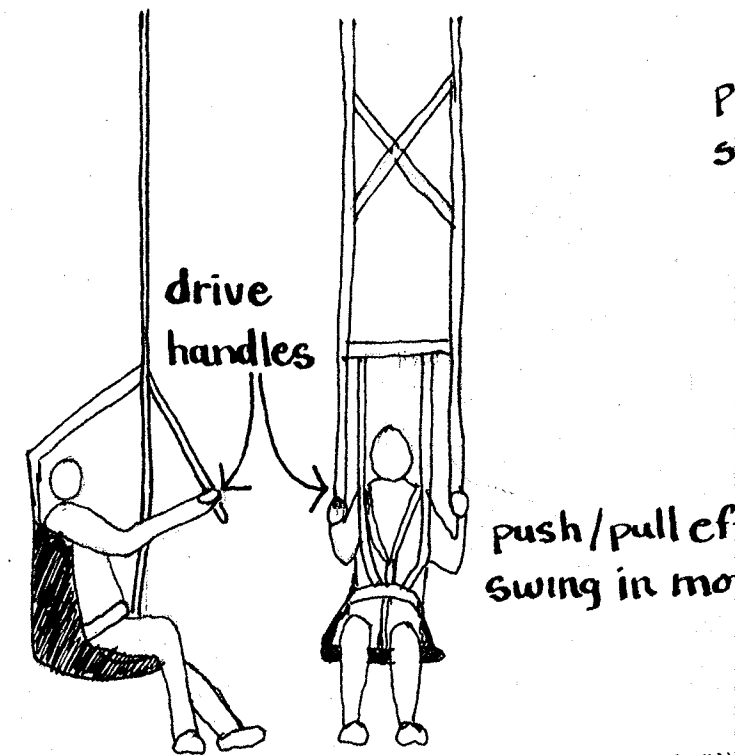
seat must
have back and
sides with
restraint feature

DEF'N: TO MOVE RAPIDLY BACK AND FORTH IN AN ARC.

FOUR CRITERIA TO REALIZE FOR DISABLED CHILD TO SWING

- 1) child must be able to mount swing apparatus
- 2) alternative methods to put swing in motion
- 3) braking of swing
- 4) dismount and return to mobility aid

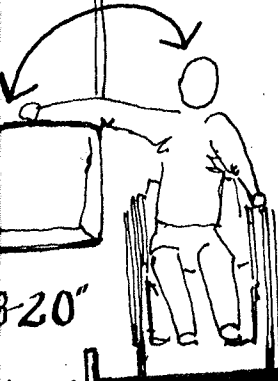
MOVING



COMMERCIALY AVAILABE SWING

NTING

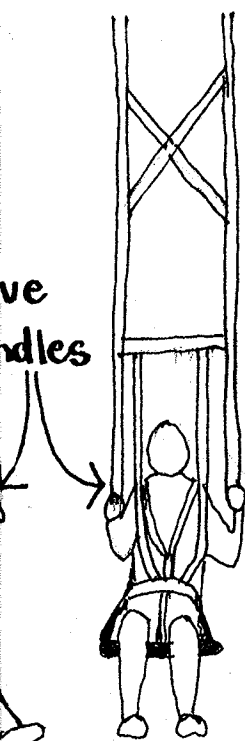
pipe or non flexible material insures no lateral movement as once in swing mobility aid left at side



- child transfers from chair to swing seat - swing must be sturdy and steady - in a locked position

- hard surface allows wheeled mobility aids to pull up alongside swings

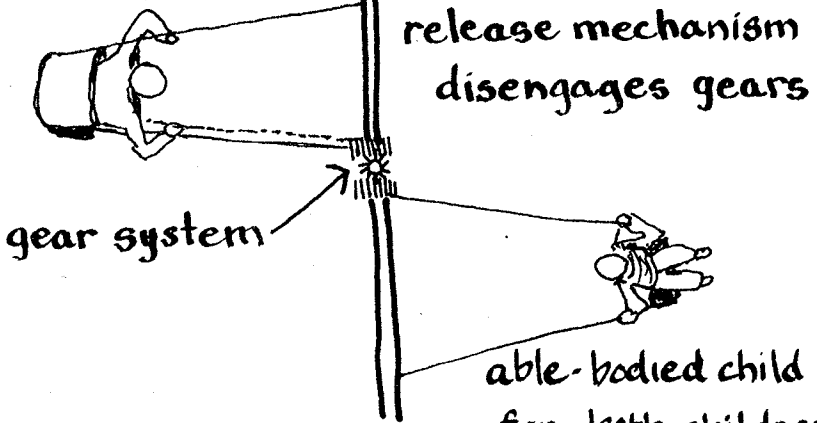
NG



push/pull effort sets swing in motion

COMMERCIALY AVAILABE SWING WITH DRIVE HANDLES

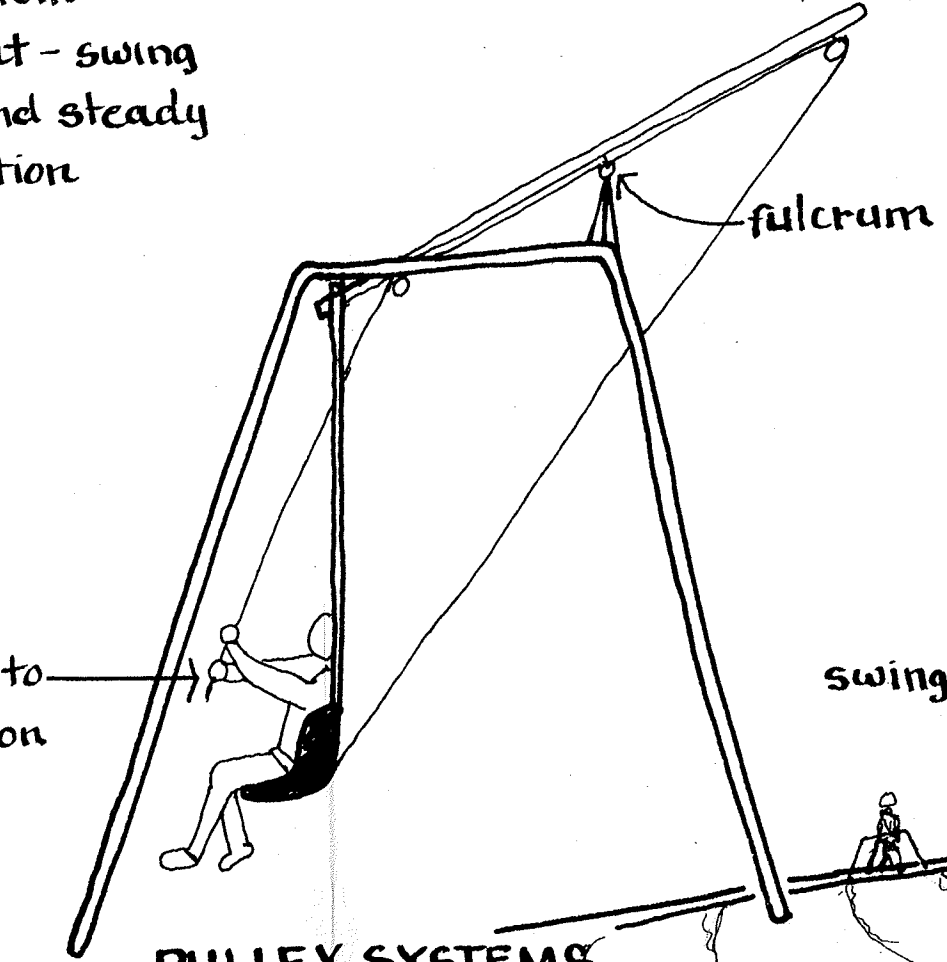
disabled child



release mechanism disengages gears

gear system

able-bodied child pumps for both children



fulcrum

pull down to start motion

PULLEY SYSTEMS



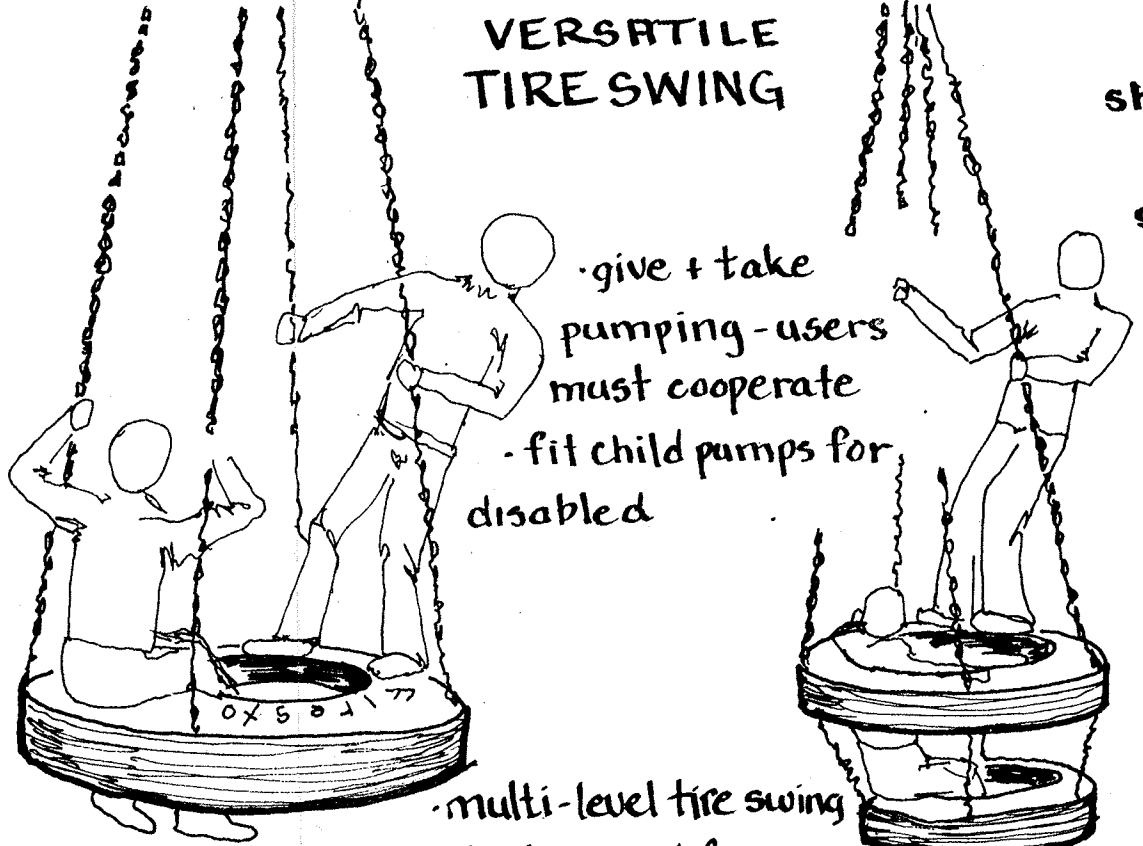
swings at end for disabled

shade

hard surface access to swings

sand

VERSATILE TIRE SWING



- give + take pumping - users must cooperate

- fit child pumps for disabled

- multi-level tire swing - back support for disabled

- easy access low to ground

back swings down to allow for entrance + exit

shade co

seats + for dis + fit c

RSATILE
LE SWING

• give + take
pumping - users
must cooperate
it child pumps for
abled

- level tire swing
support for
abled

• easy access low to ground

ack swings down to allow
for entrance + exit

rd surface
access to swings

WHEELCHAIR SWINGS

shade canopy →

seats + spaces
for disabled
+ fit child

ramp

wheelchair fastend in box
and push/pull on bar
sets box in motion

- wheelchairs must be securely fastened (by foolproof device)
- propulsion can be difficult - combined weight of child, chair, support platform and structure.
- braking also a problem due to combined weight
- elaborate and expensive structures which dictate one use.
- better for children to swing out of confines of mobility devices.
- wheelchair swings are good ideas only for those children who are confined to a wheelchair.

wheelchair space

seat

Parallelogram Movement

skateboards, castor casts

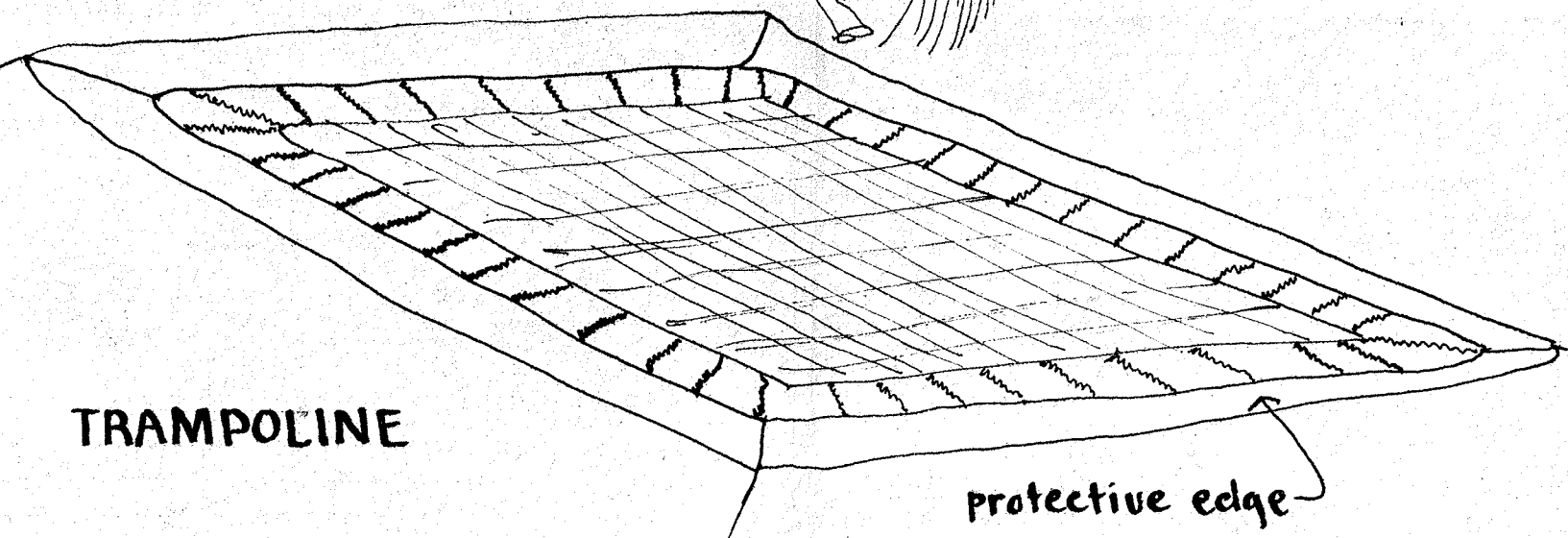
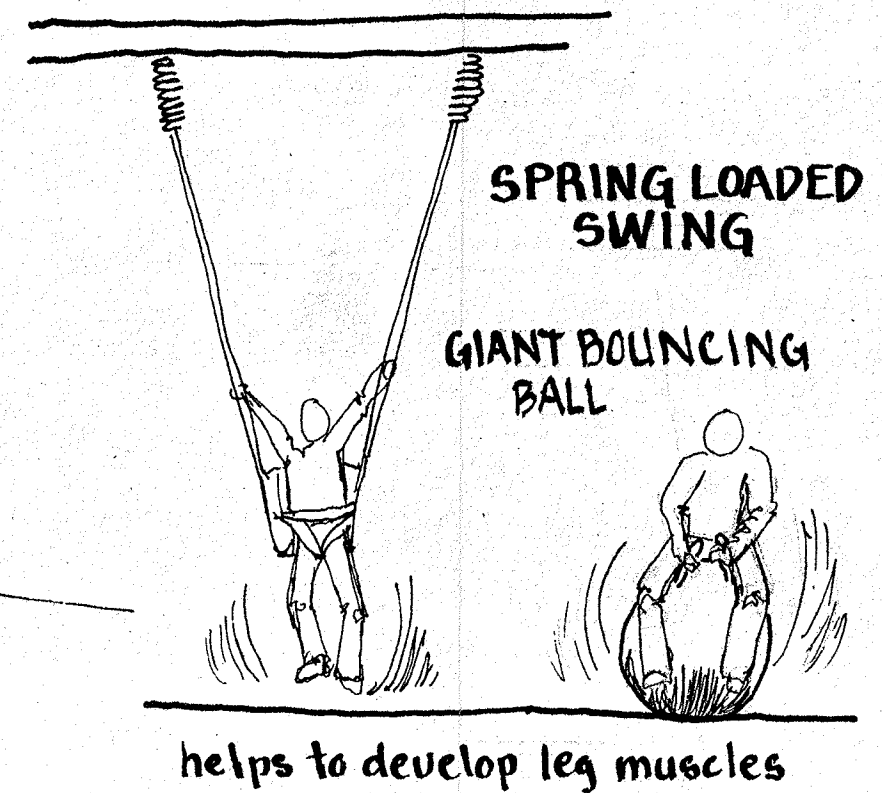
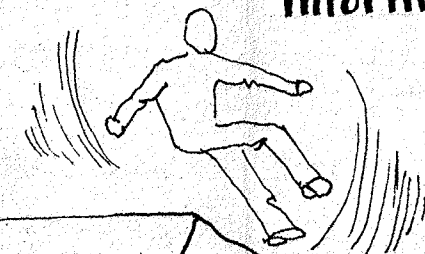
pulley system
to put swing in
motion

HAMMOCK SWING

initiate motion with arms + hands

smooth surfaced bowl permitting wheeled
objects to run through basin +
up other side.

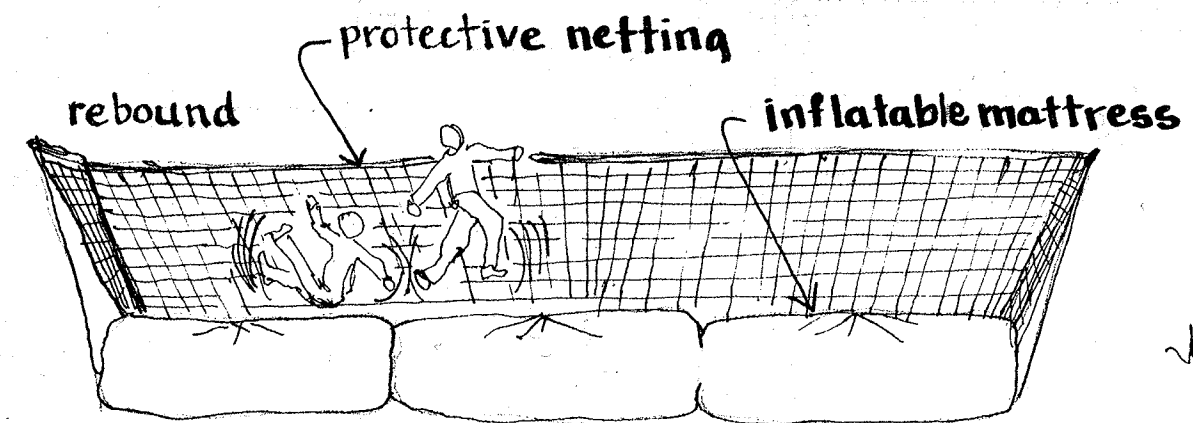
MOTION IN SPACE - "dropping and landing - the reflexive movements of the body sending kinesthetic information and tactile information via proprioception on a safe and soft landing"



TRAMPOLINE

protective edge

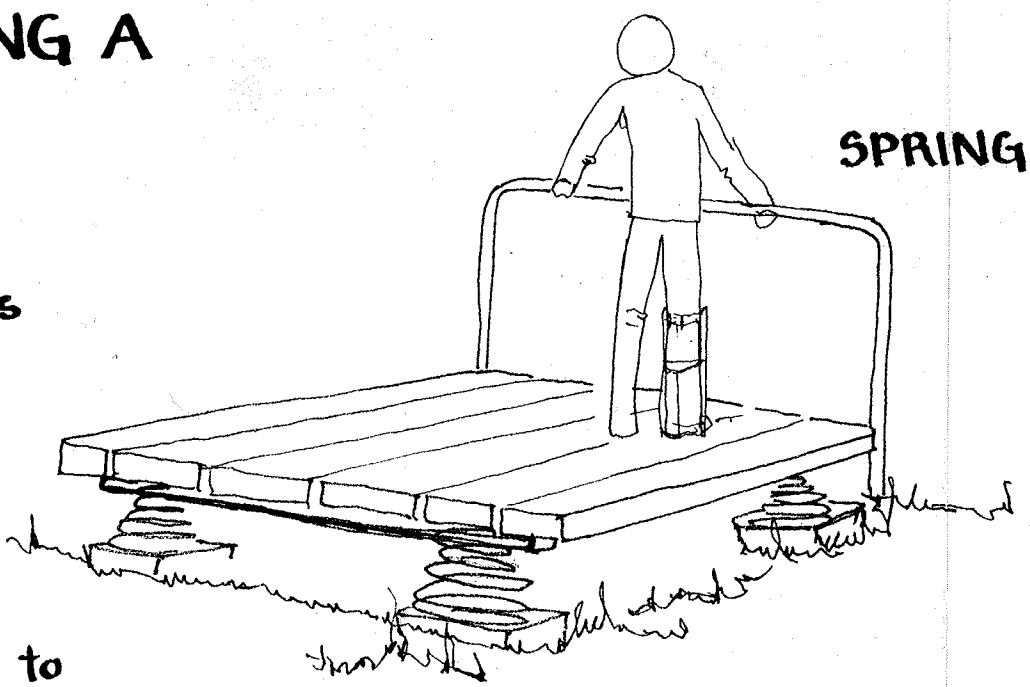
DEF'N. : A REBOUND OR RECIPROCAL ACTION BROUGHT ABOUT BY AN OBJECT IN MOTION CONTACTING ANOTHER CAUSING A REVERSE IN MOTION.



rebound

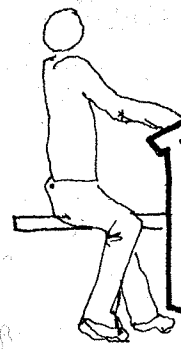
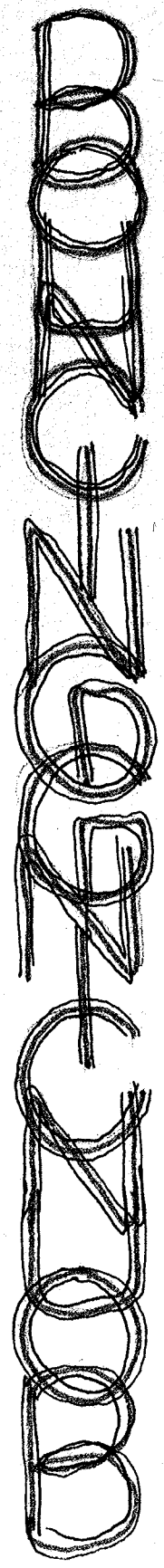
protective netting

inflatable mattress



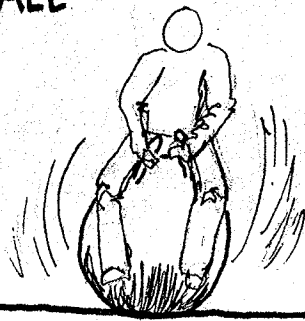
SPRING PLATFORM

activity can occur where child uses his own energy to cause bounce, or it can be a rebound situation utilizing someone else's energy to cause bounce.



SPRING LOADED SWING

GIANT BOUNCING BALL

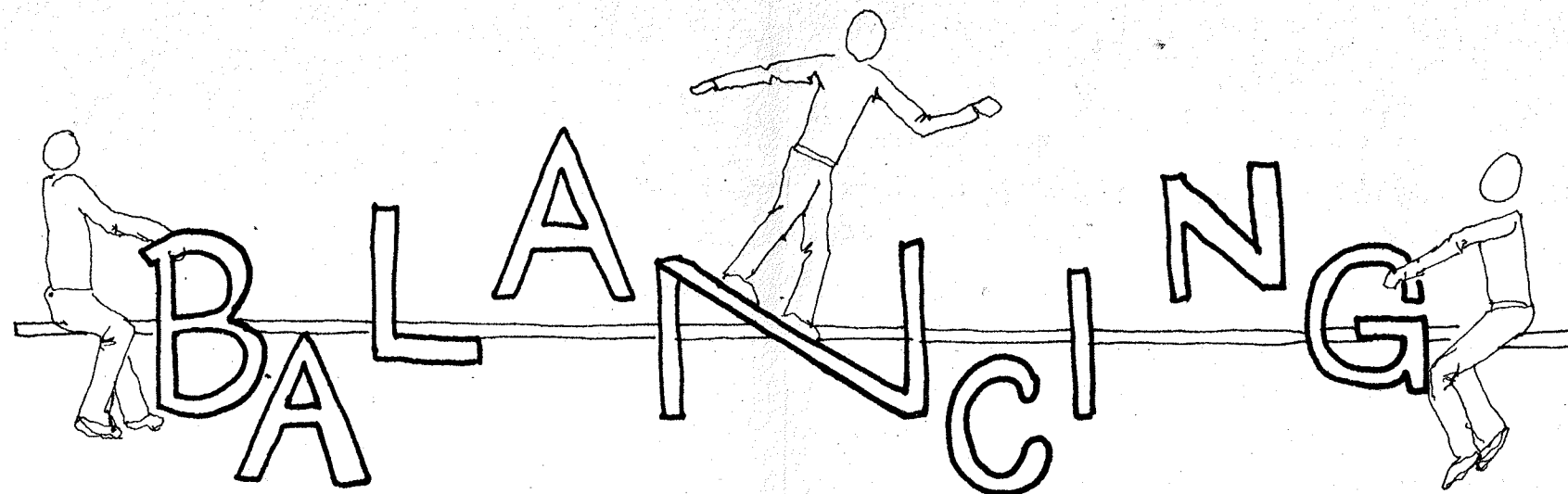


top leg muscles

NG PLATFORM

DISABLED CHILDREN NEED THE OPPORTUNITY TO EXPERIENCE THE SENSATION OF BALANCE BOTH IN AND OUT OF MOBILITY AIDS, AND IN AN EXCITING WAY WHICH IS PART OF THE PLAY ENVIRONMENT.

- balance while out of mobility aid helps the child become more acutely aware of his own weight and body balance
- balancing items could be part of climbing structures, occur along handi-traits or items found in rest areas



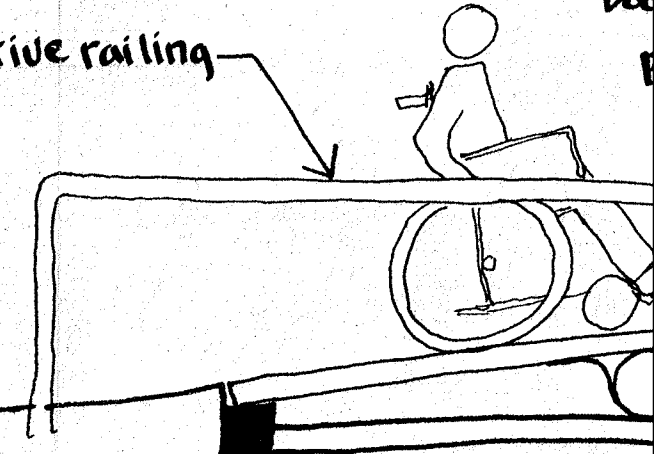
DEF'N: MAINTAINING AN EQUILIBRIUM

- PHYSICAL EQUILIBRIUM BETWEEN TWO OBJECTS
- AN INNER EQUILIBRIUM INVOLVING ONES OWN BALANCE

low beam equipped with support rails

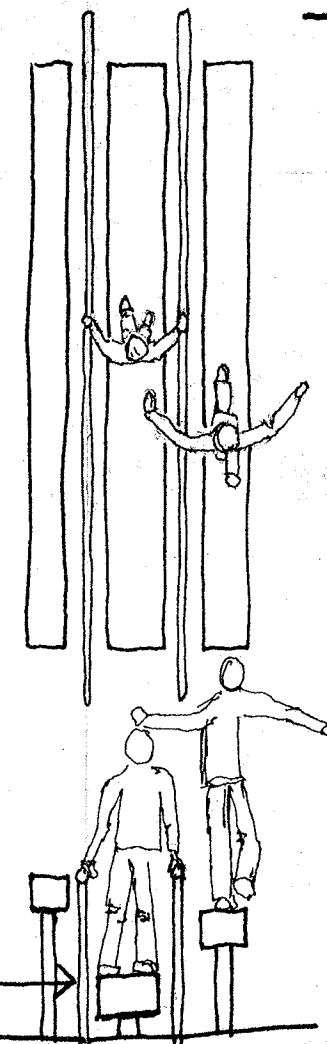
BALANCE BEAMS - dynamic balance.

protective railing



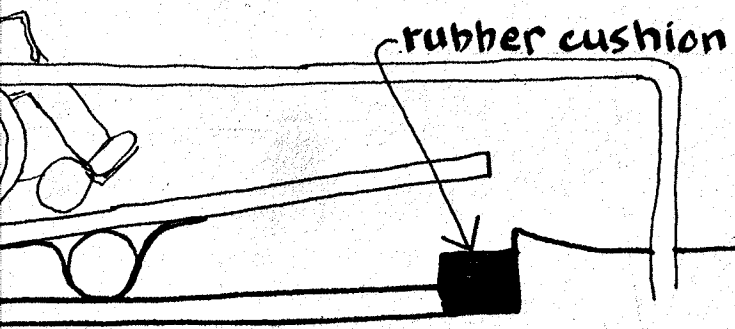
VEHICULAR OR MOBILITY AID

variation - platform



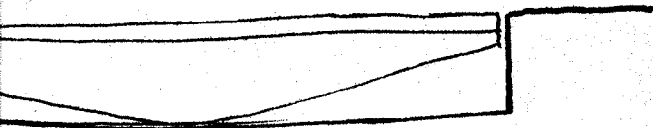
hand as se

fulcrum off centre so board returns to initial position



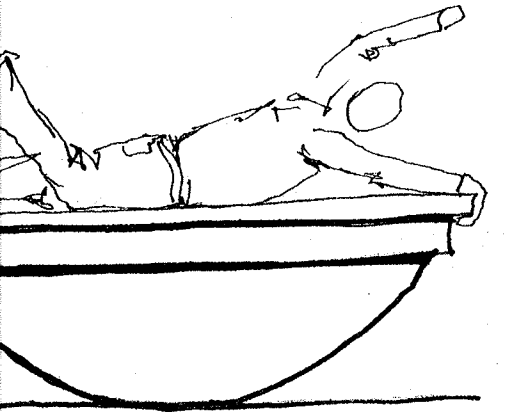
ABILITY AID BALANCE BOARD

platform base is curved

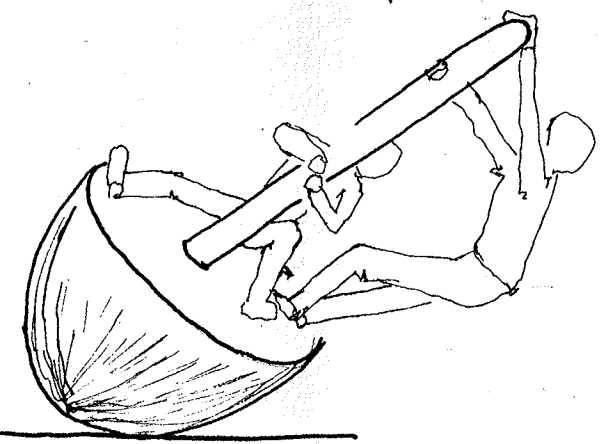


ROCKER PLATFORM

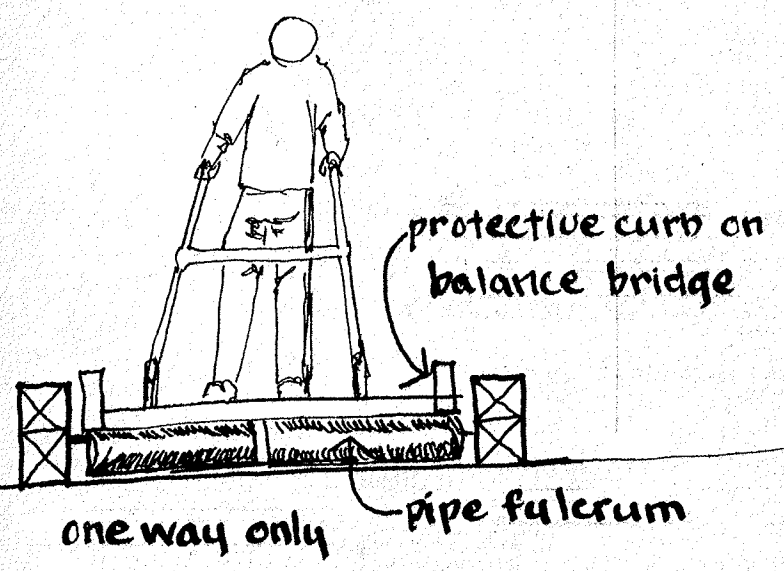
- large enough for four
- change in weight displacement causes rocking motion
- challenge to stay on



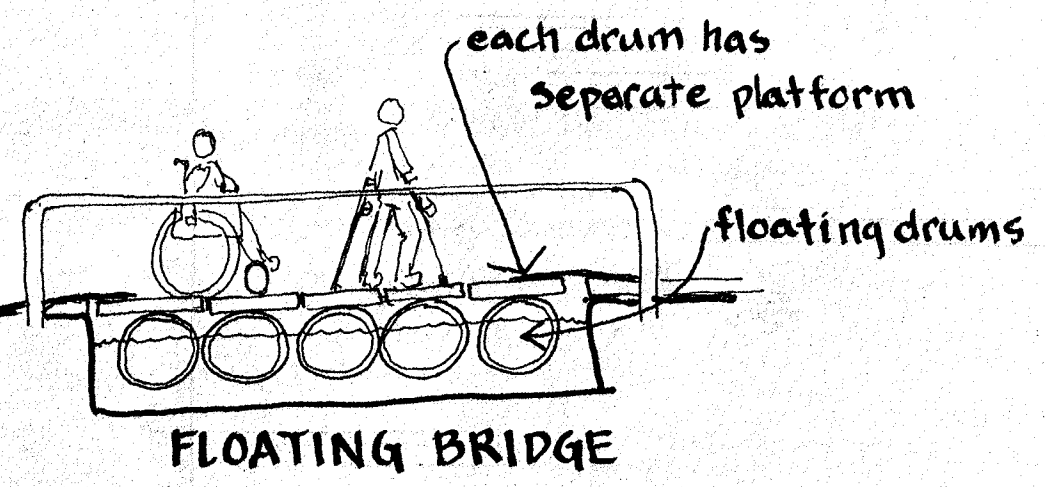
handicapped child rides as able-bodied child sets saucer in motion



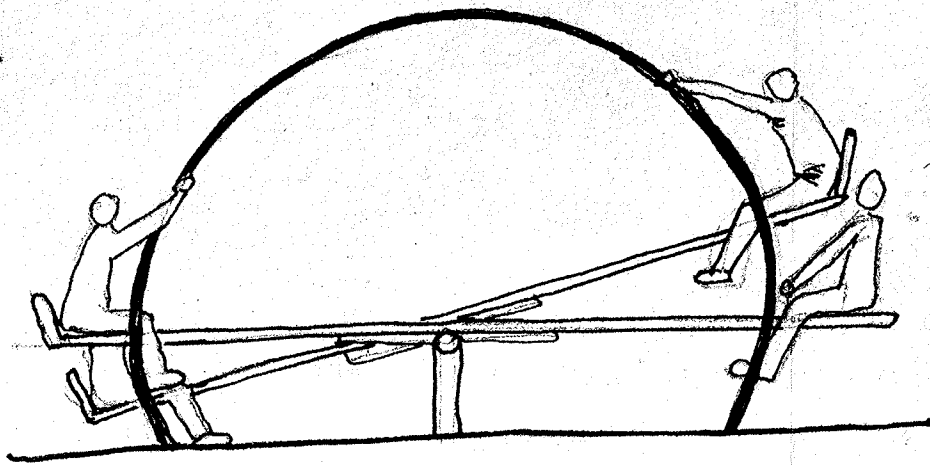
ROCKING SAUCER



one way only pipe fulcrum



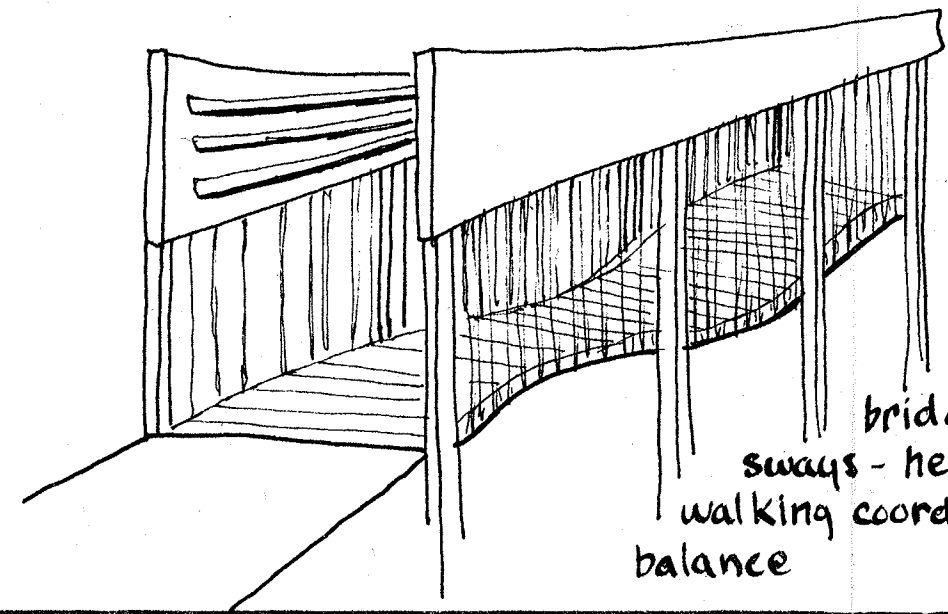
FLOATING BRIDGE



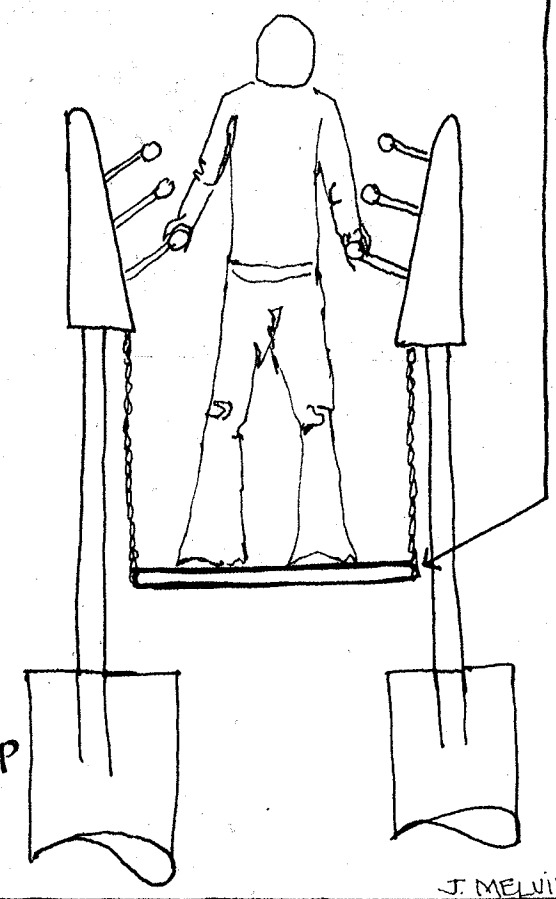
TEETER-TOTTER ADAPTATION

wood covered with rubber tread to reduce slipping

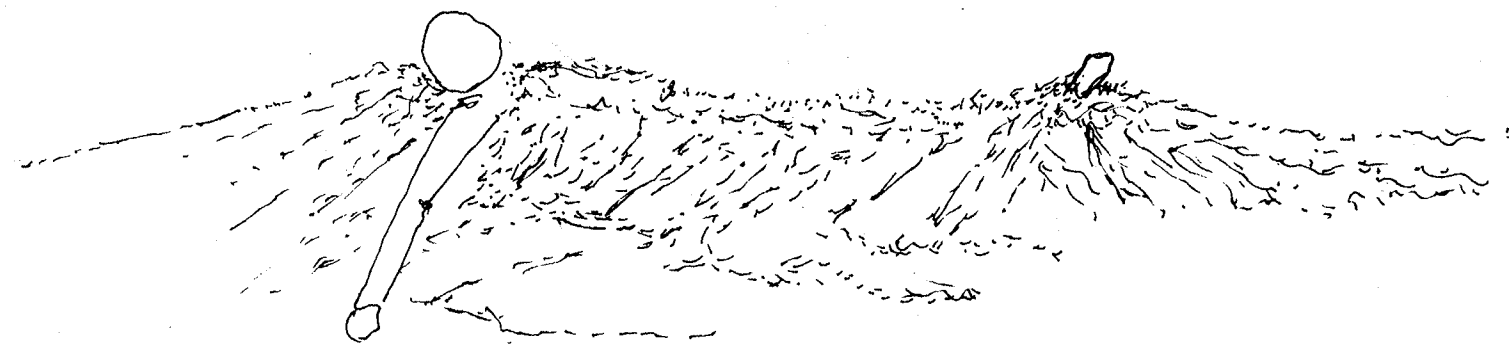
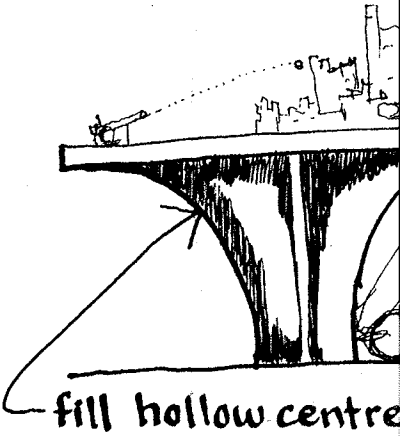
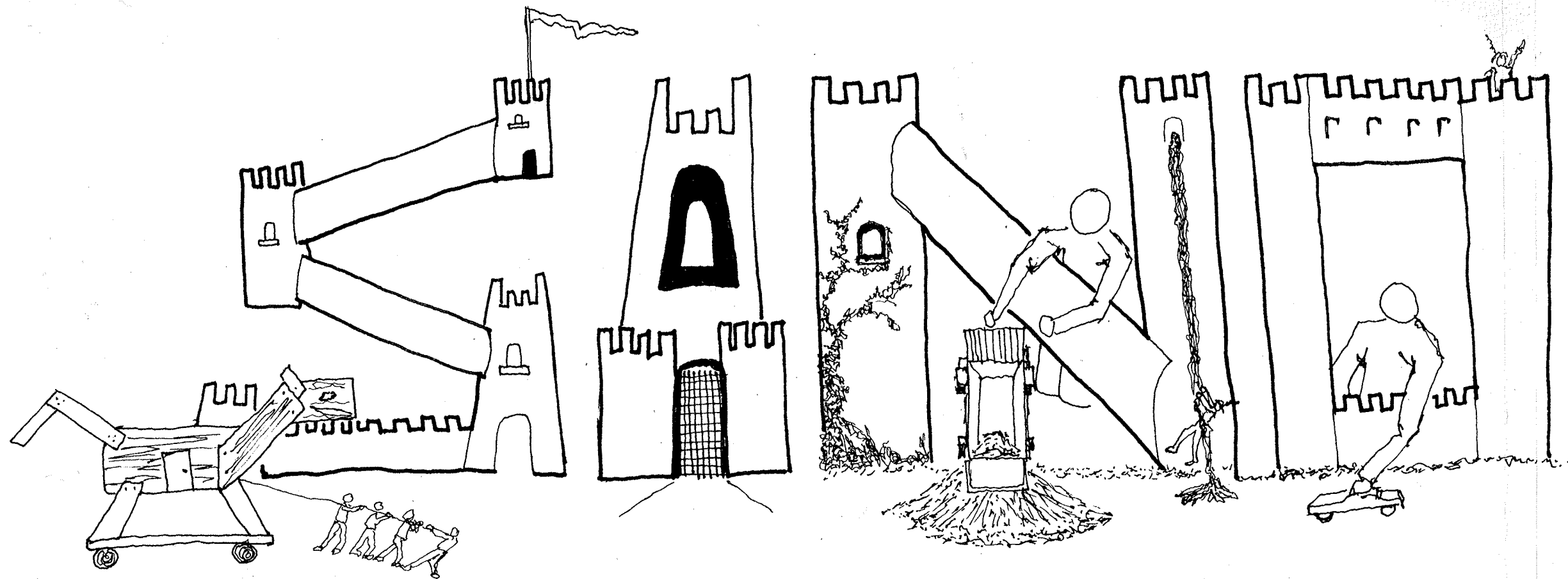
LINKING BRIDGES



bridge swings and sways - helps child develop walking coordination and balance

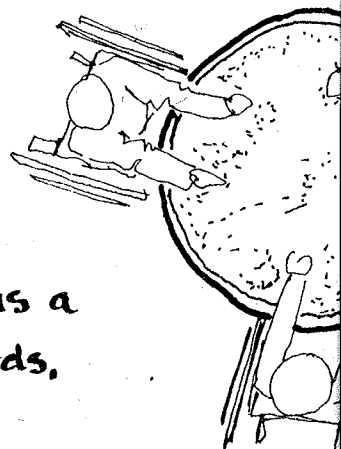


SAND TABLES



SAND PLAY - A CREATIVE, MANIPULATIVE MEDIUM FOR GROUP OR INDIVIDUAL PLAY, LIMITED ONLY BY THE CHILD'S IMAGINATION.

circular shape permits access from all sides

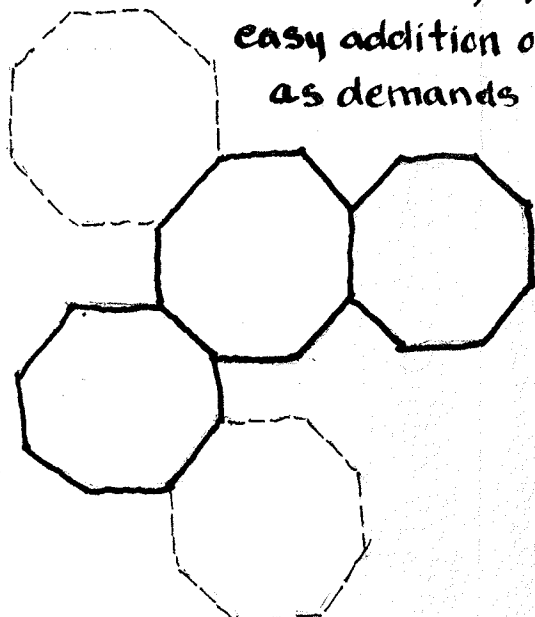


can also be used as a games table - cards, marbles, jacks

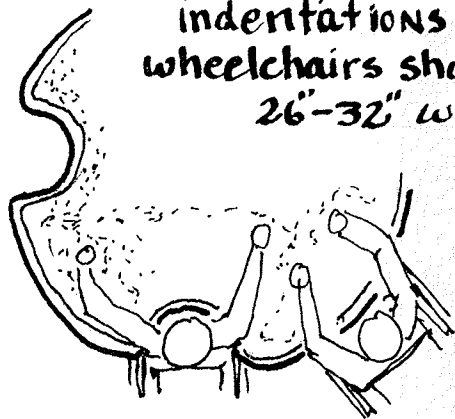
tables at the differing tabletop heights sh

D TABLES

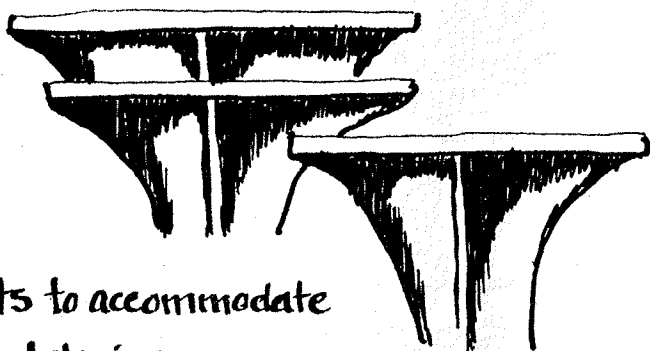
modular design permits
easy addition or subtraction
as demands dictate.



indentations for
wheelchairs should be
26"-32" wide

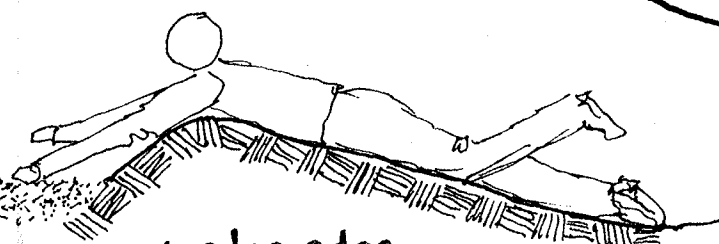
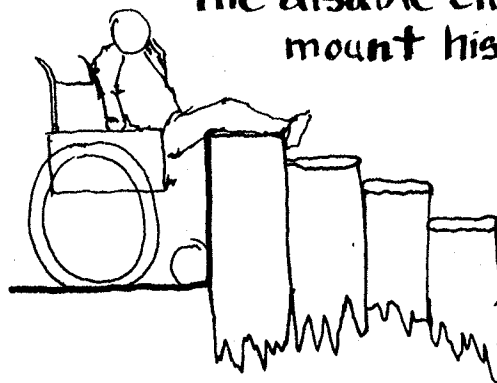


indentations in circumference
increase reachable play space to sides

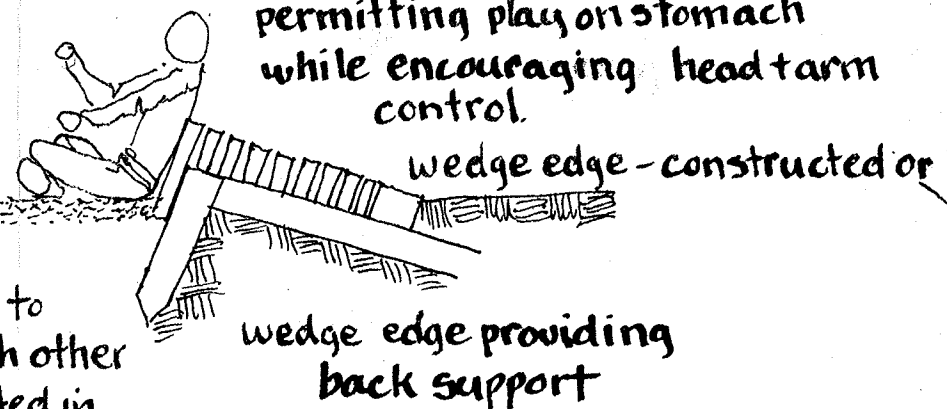


tables at different heights to accommodate
the differing heights of wheelchairs
top heights should vary between 24"-32"

sand box edges should provide the opportunity for
the disabled child to dismount and
mount his wheelchair



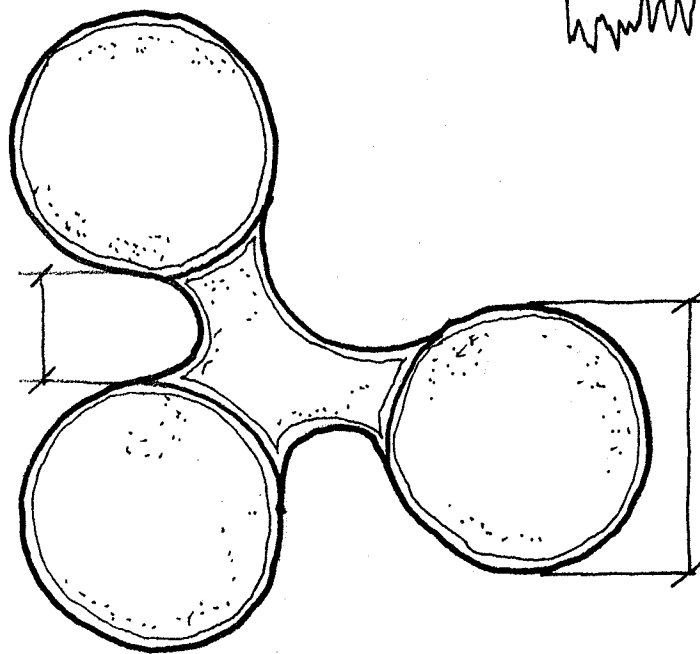
wedge edge
permitting play on stomach
while encouraging head/arm
control.



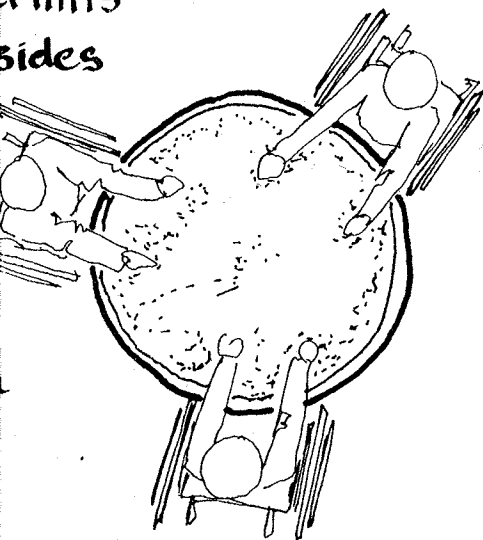
wedge edge - constructed or

wedge edge providing
back support

table diameter of
48" permits children to
play across from each other
(arm reach while seated in
wheelchair is approx. 24")

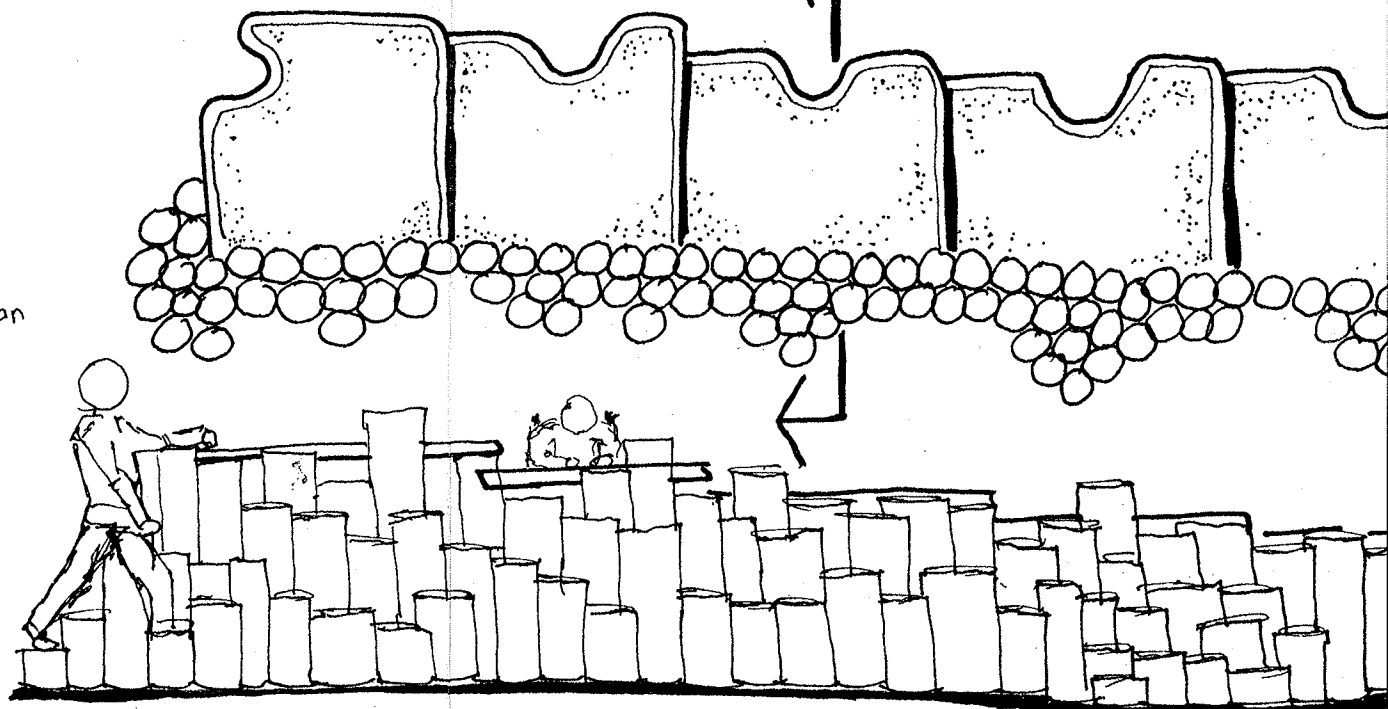


permits
sides



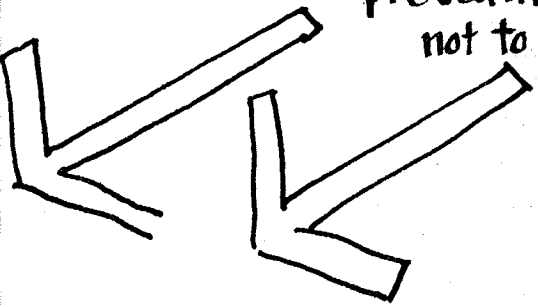
plan

elevation



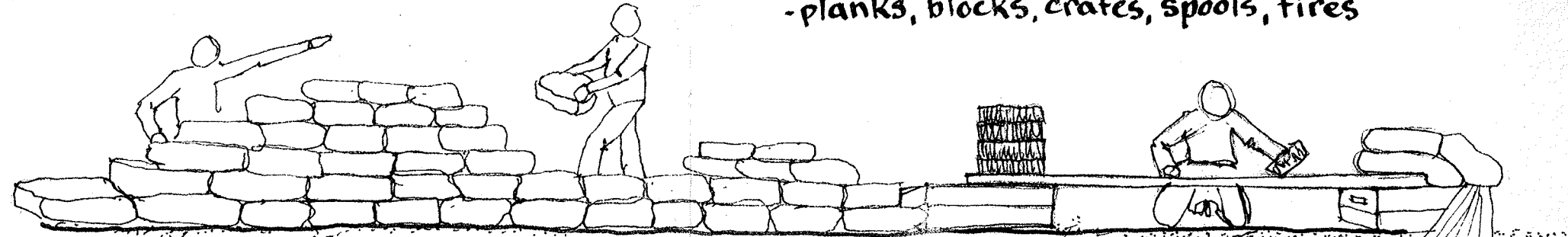
SAND TABLES AND SAND PITS SHOULD BE DESIGNED INTO A
eg - climbing structure, snowtrap or wind

prevailing winds from behind so
not to blow sand in face when in pit or at table



LOOSE PARTS AND CONSTRUCTION

-planks, blocks, crates, spools, tires

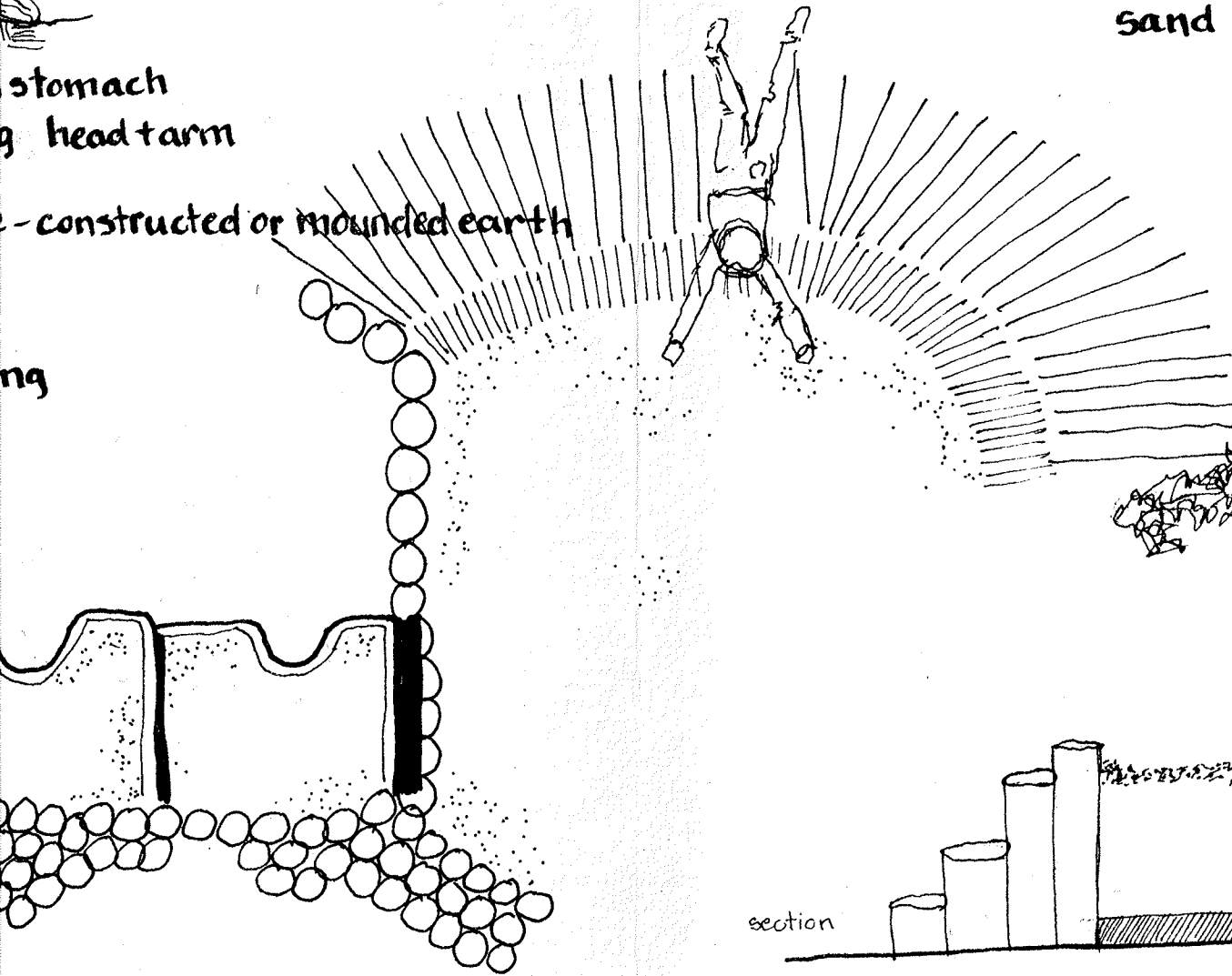


sand bag forts - allows children to create their own enclosure
-construct, destruct, reconstruct.

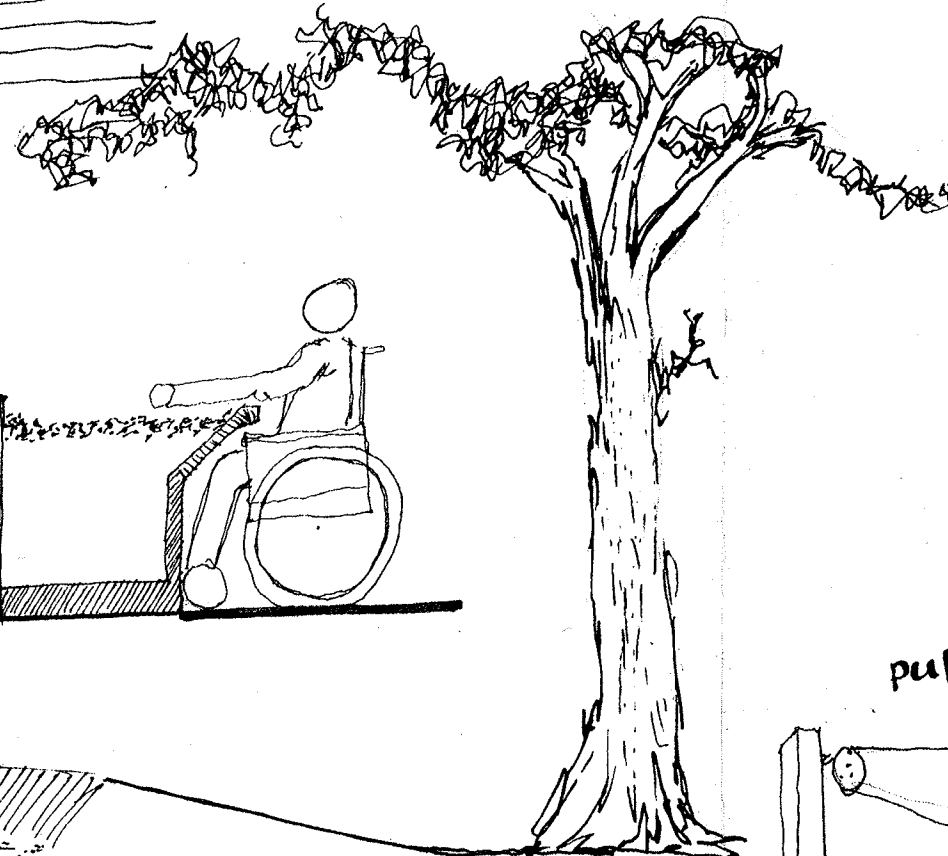
stomach
g headtarm

-constructed or mounded earth

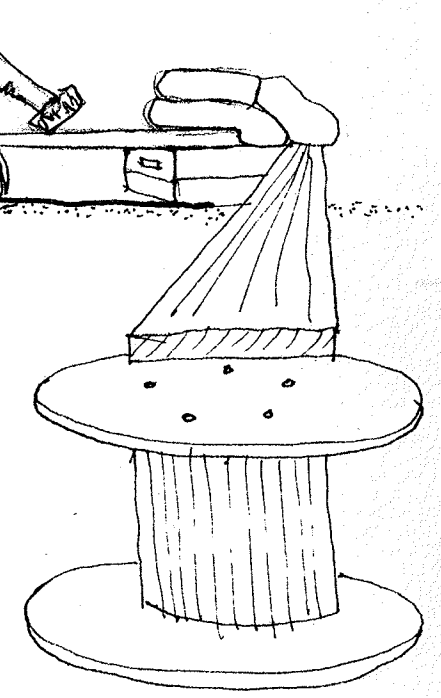
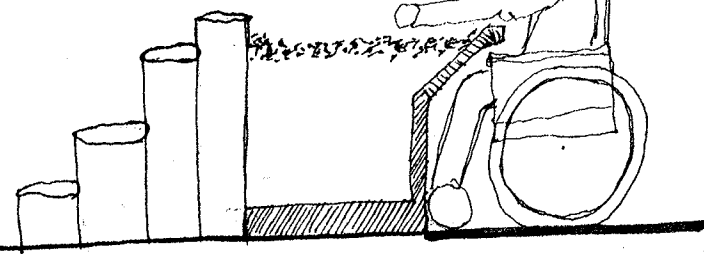
ng



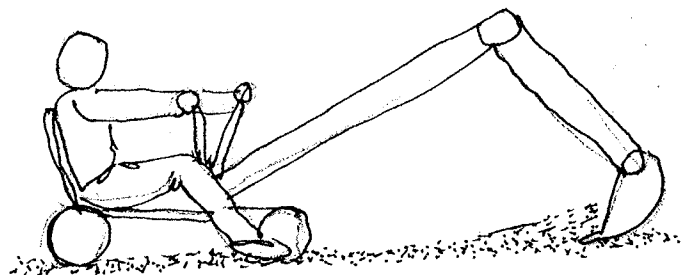
SHADE - very important as sand can
get extremely hot in summer
-trees, trellis, buildings, fences.



section

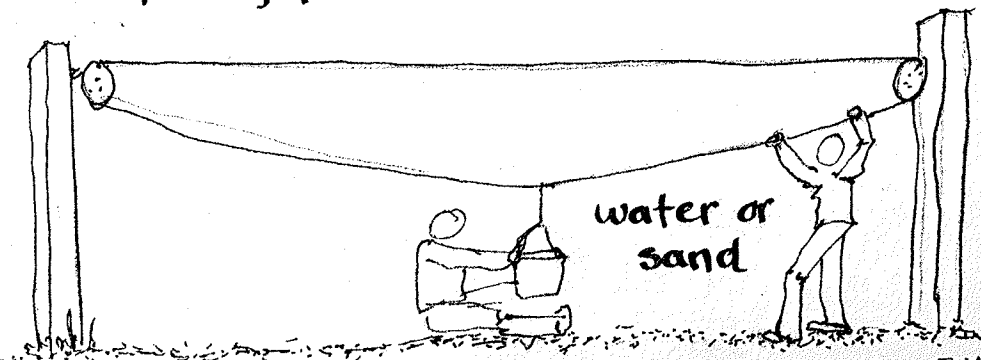


S
A
N
D



sand crane - mechanically
manoeuvre sand

pulleys, cables and buckets to move material



water or
sand

DESIGNED INTO A COMPREHENSIVE STRUCTURE CAPABLE OF ALTERNATIVE USES
snowtrap or wind break in winter,

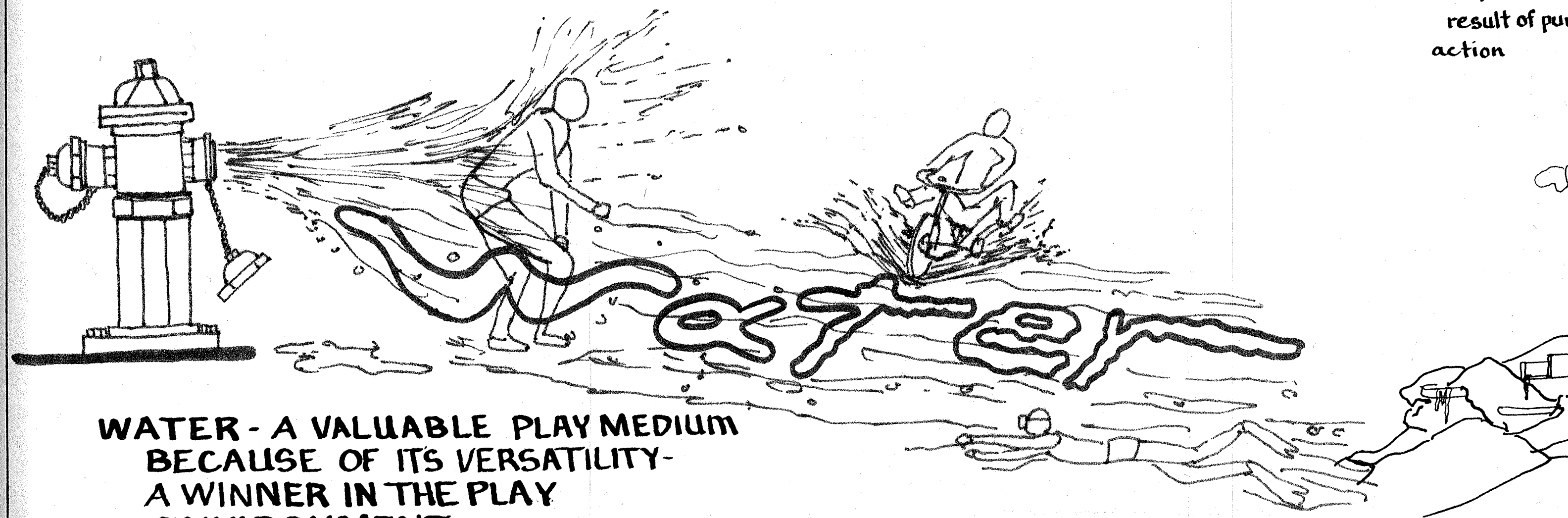
PROPERTIES - WET

- COOLING - REFRESHING
- REFLECTIVE
- FLOWING MOTION (fast, slow, dripping, torrent)
- AUDITORY QUALITY (soft + soothing, roaring)

CAN BE INTRODUCED IN THE FORM OF:

- fountains
- ponds
- pools
- streams
- sprinklers/sprays
- hand pumps/faucets - controlled source
- troughs
- ice

contro
- child ca
output and
result of pun
action



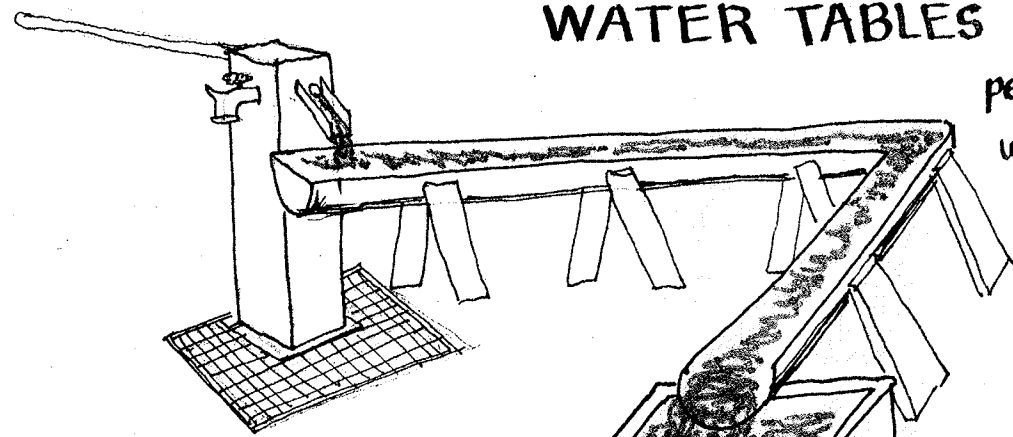
**WATER - A VALUABLE PLAY MEDIUM
BECAUSE OF ITS VERSATILITY -
A WINNER IN THE PLAY
ENVIRONMENT**

trough
form

OF:

WATER TABLES

permanent or movable water troughs can carry water near areas where plants or garden plots are.



controlled output
child can control
output and can see
result of pumping
action

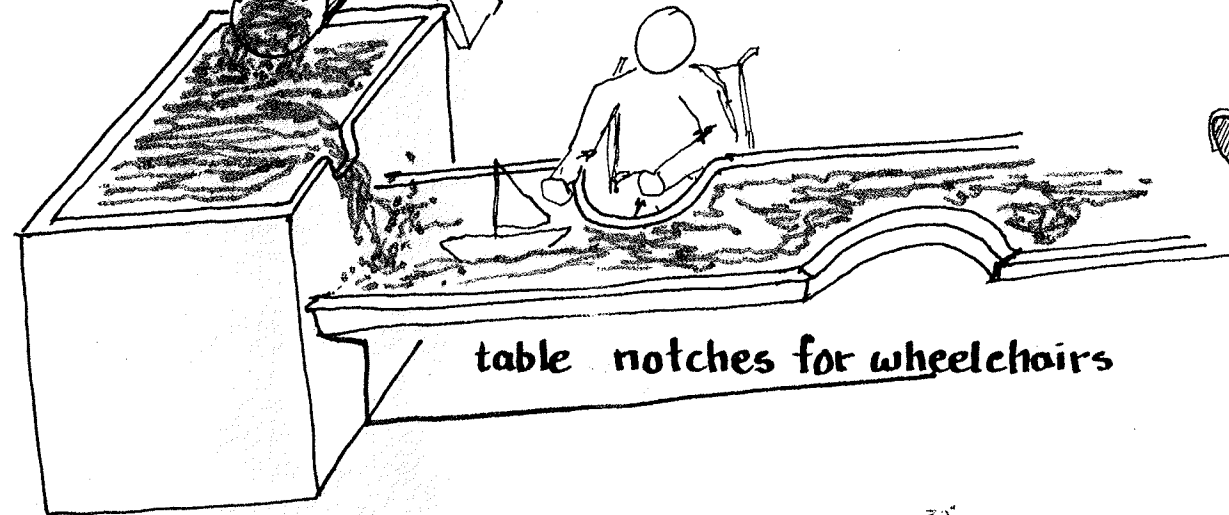
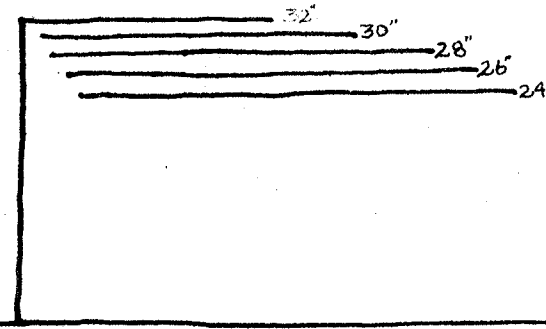
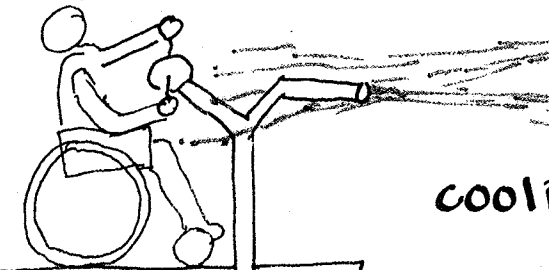


table notches for wheelchairs

table heights should
vary to accommodate different
heights of mobility aids
table top heights should vary
between 24"-32"

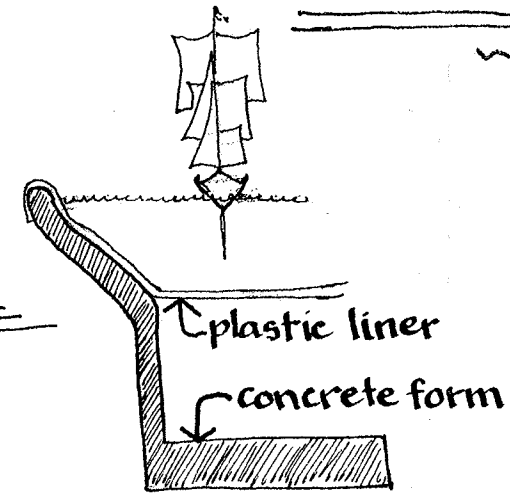


pump with hands



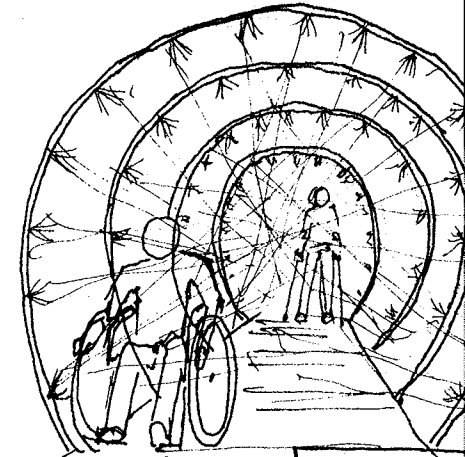
cooling

SQUIRT GUN



plastic liner

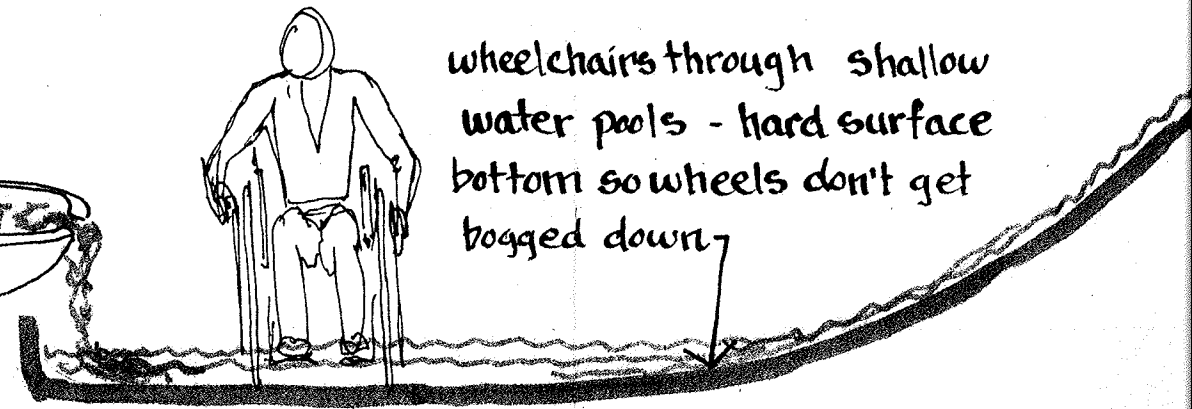
concrete form



SPRAY TUNNEL

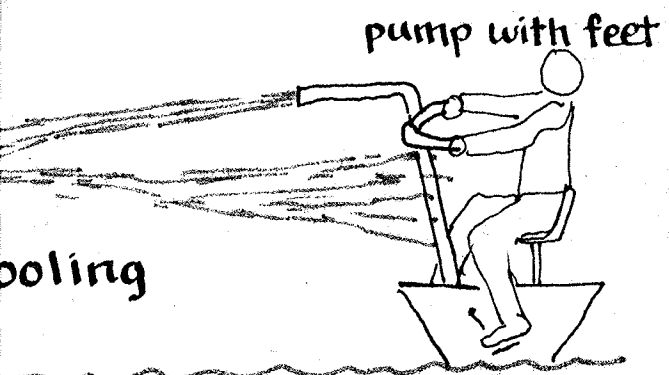
WATER SLIDE

wheelchairs through shallow
water pools - hard surface
bottom so wheels don't get
bogged down

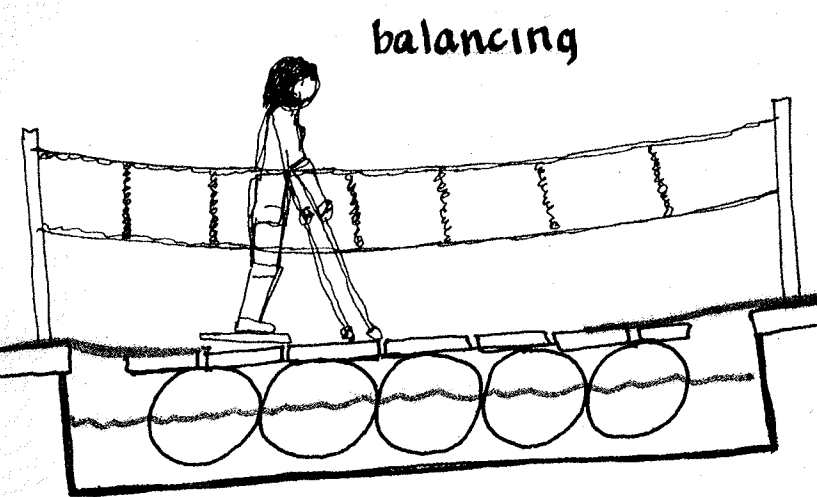


4-6" deep

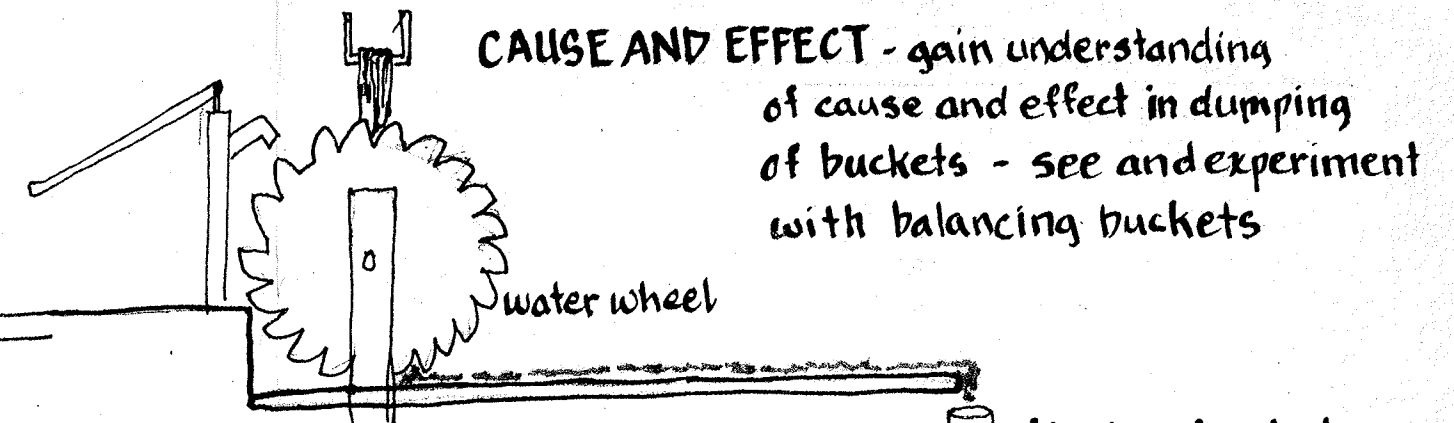
troughs and tables are constructed to
form interesting play elements in winter



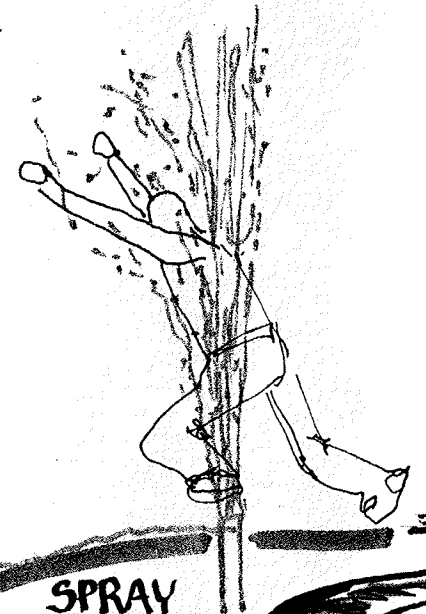
GUNS - squirting direct result of pumping - force of squirt related to pump therefore child is rewarded for effort



FLOATING PLATFORMS



CAUSE AND EFFECT - gain understanding of cause and effect in dumping of buckets - see and experiment with balancing buckets

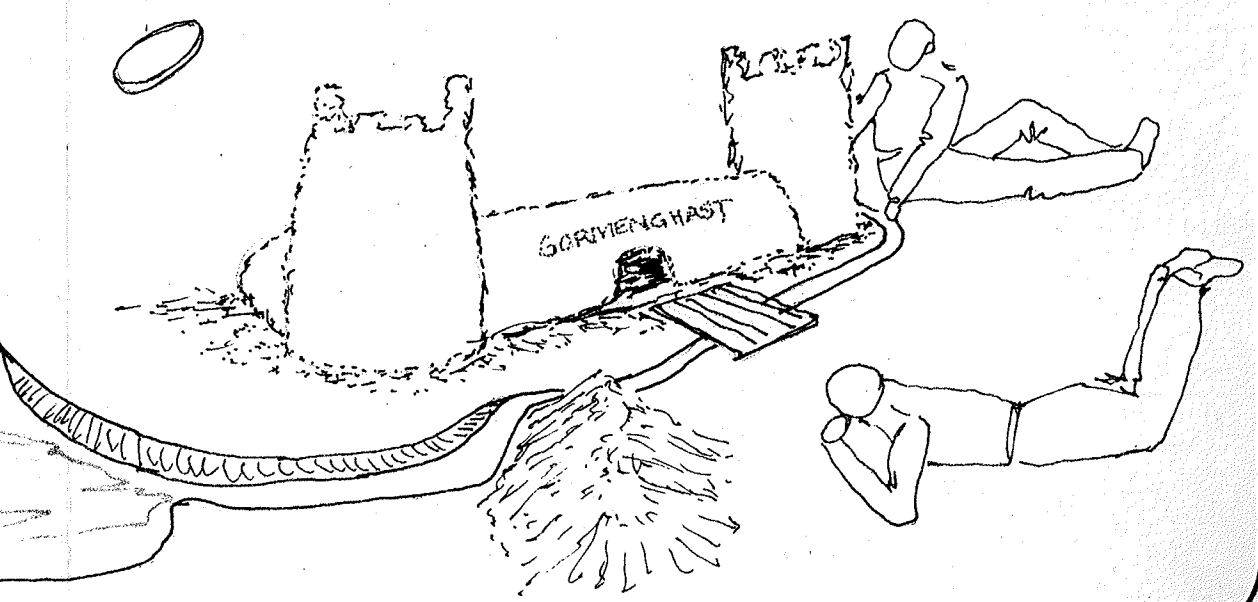
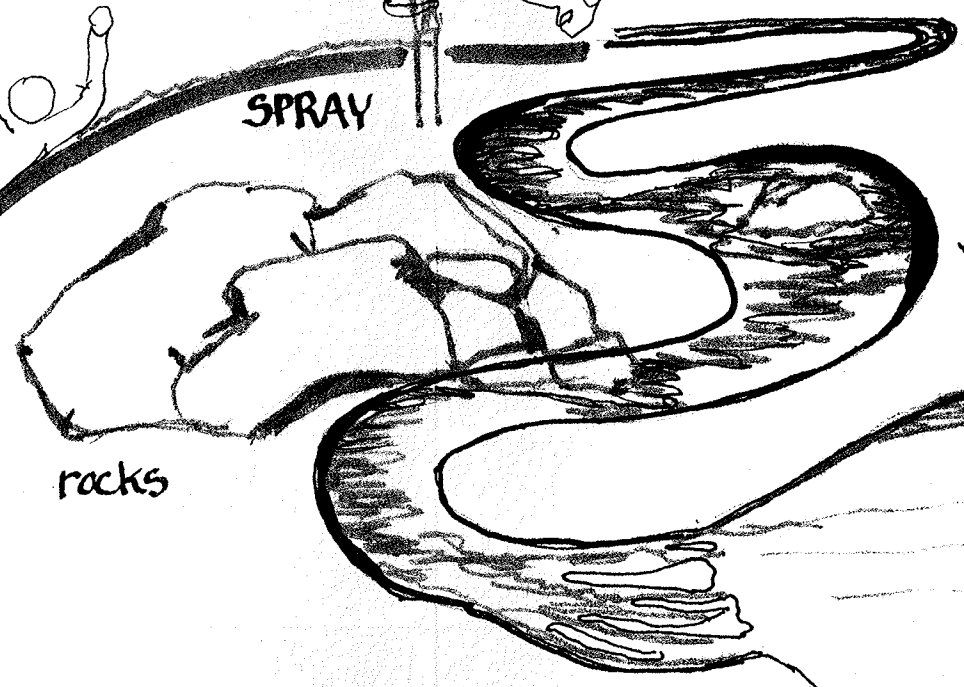


emergent vegetation

wishing well
pretend water

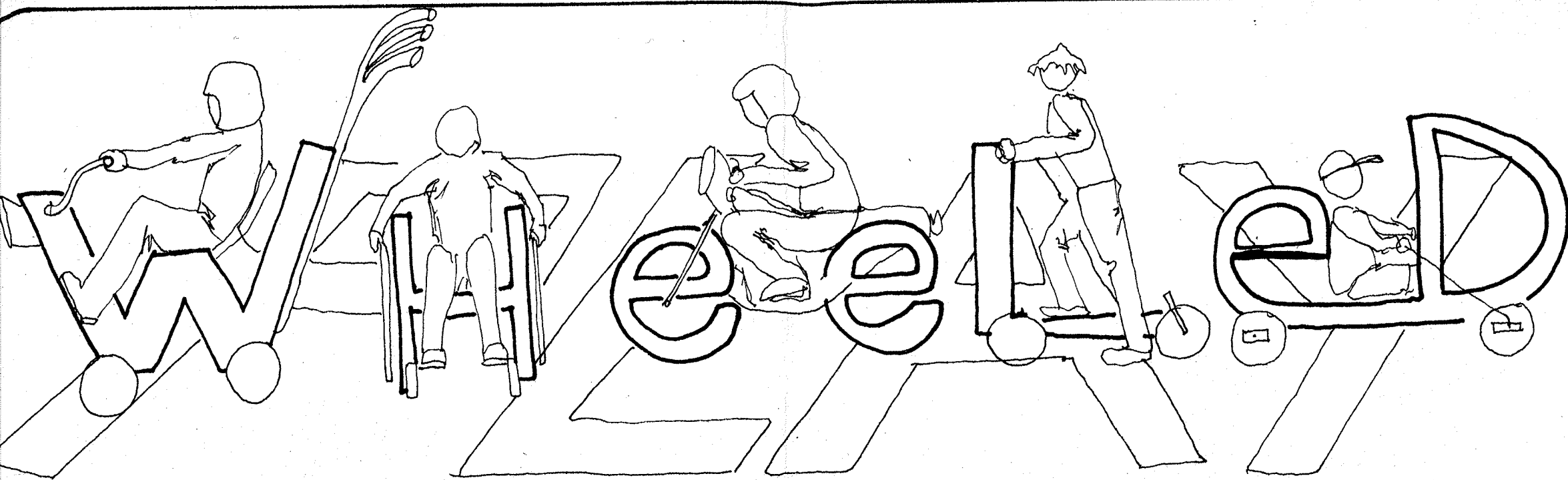


sand, earth, and water compliment each other and therefore should be found near each other in the play environment.



NATURAL STREAMFLOW

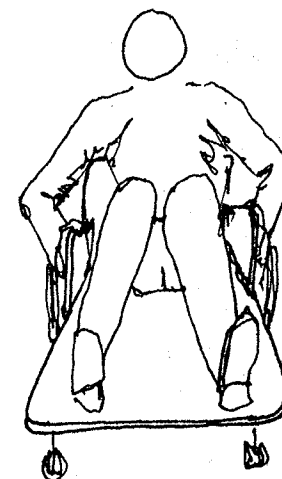
ponding



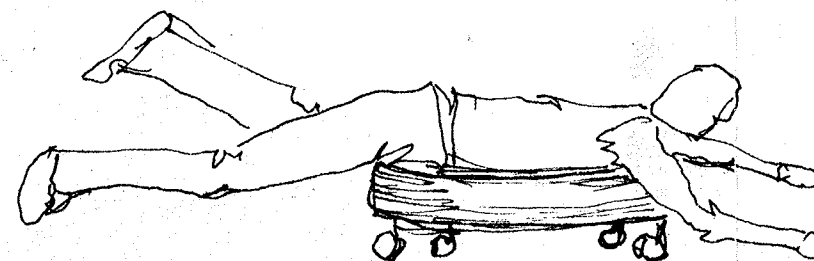
VEHICULAR
- system

FOR THE DISABLED CHILD WHO DEPENDS ON WHEELED VEHICLES FOR A MAJOR PORTION OF HIS MOBILITY, THIS ASPECT OF THE PLAY ENVIRONMENT BECOMES VERY IMPORTANT

oversized castor cart



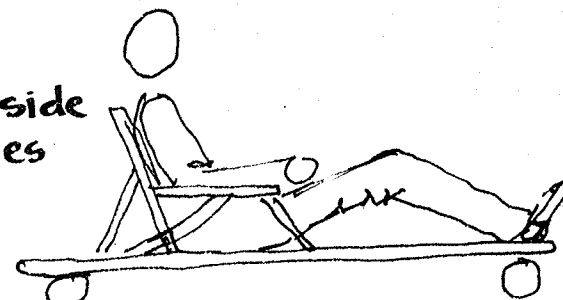
both items low to ground, easy for disabled to mount and dismount



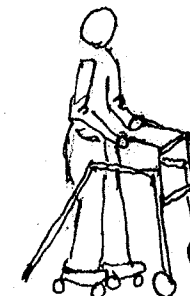
tire and castors

UNCONVENTIONAL WHEELED ITEMS

oversized sit down skateboard
for non-ambulant child.
- works on same principle as skateboard - shift weight to one side to cause cart to turn - child becomes aware of balance through steering



- push by hands along ground
- adaption by addition of pedals or crank to propel vehicle



roller skates and A walker

signs of
increas
of traf
to whee

VEHICULAR TRACK BUILT INTO CIRCULATION SYSTEM

- system becomes a play element

HARD SMOOTH SURFACE

HANDI-TRAIL - a fitness trail for disabled
offering activities performed both in + out
of chair
- a combination of fitness and play elements

gas station

bus stop

height judgement increased
at underpass

ramps
+ bridges

max slope 8.33%

SLALOM
COURSES

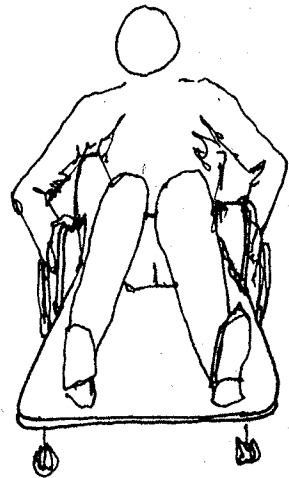
MAZES

BALANCING

UNDULA

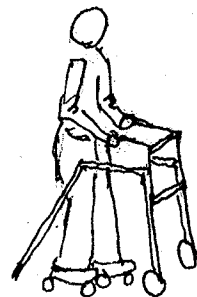
HAND OV

oversized castor cart



both items low to ground,
easy for disabled to
mount and dismount

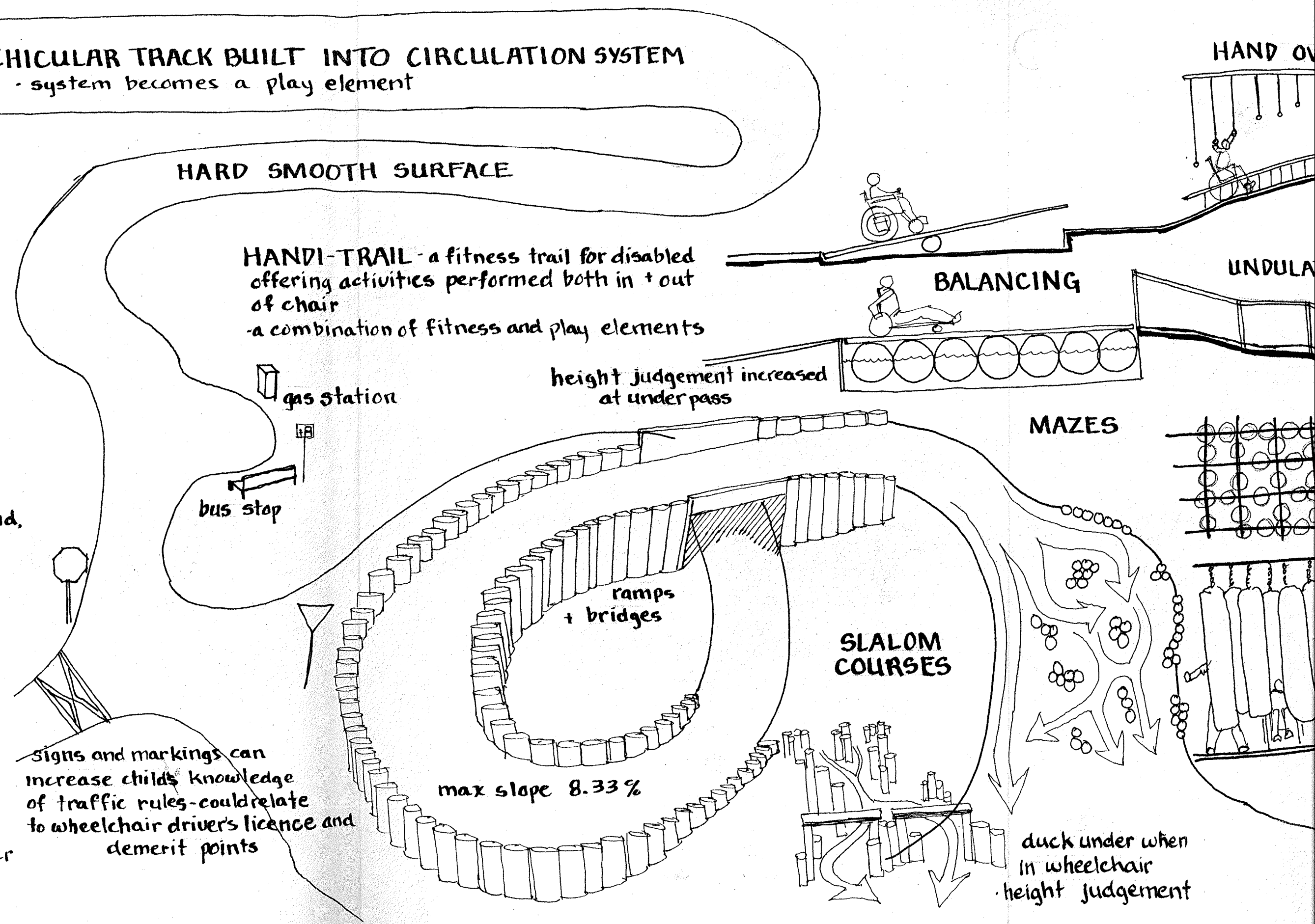
ED ITEMS

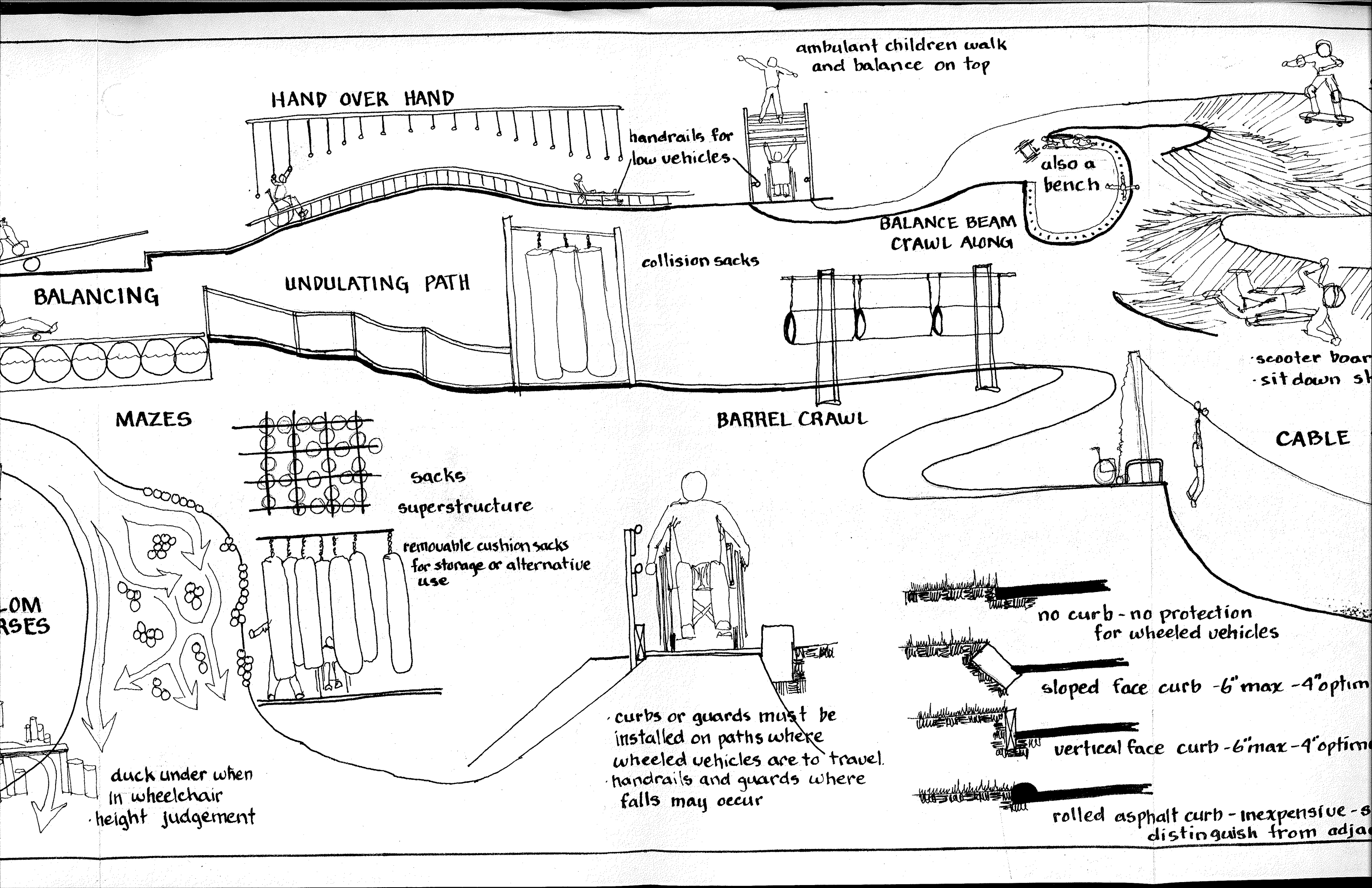


roller skates and A walker

signs and markings can
increase child's knowledge
of traffic rules - could relate
to wheelchair driver's licence and
demerit points

duck under when
in wheelchair
- height judgement





HAND OVER HAND

ambulant children walk and balance on top

handrails for low vehicles

also a bench

BALANCE BEAM CRAWL ALONG

BALANCING

UNDULATING PATH

collision sacks

BARREL CRAWL

scooter board
sit down sk

CABLE

MAZES

sacks
superstructure

removable cushion sacks
for storage or alternative use

OMNES

duck under when
in wheelchair
height judgement

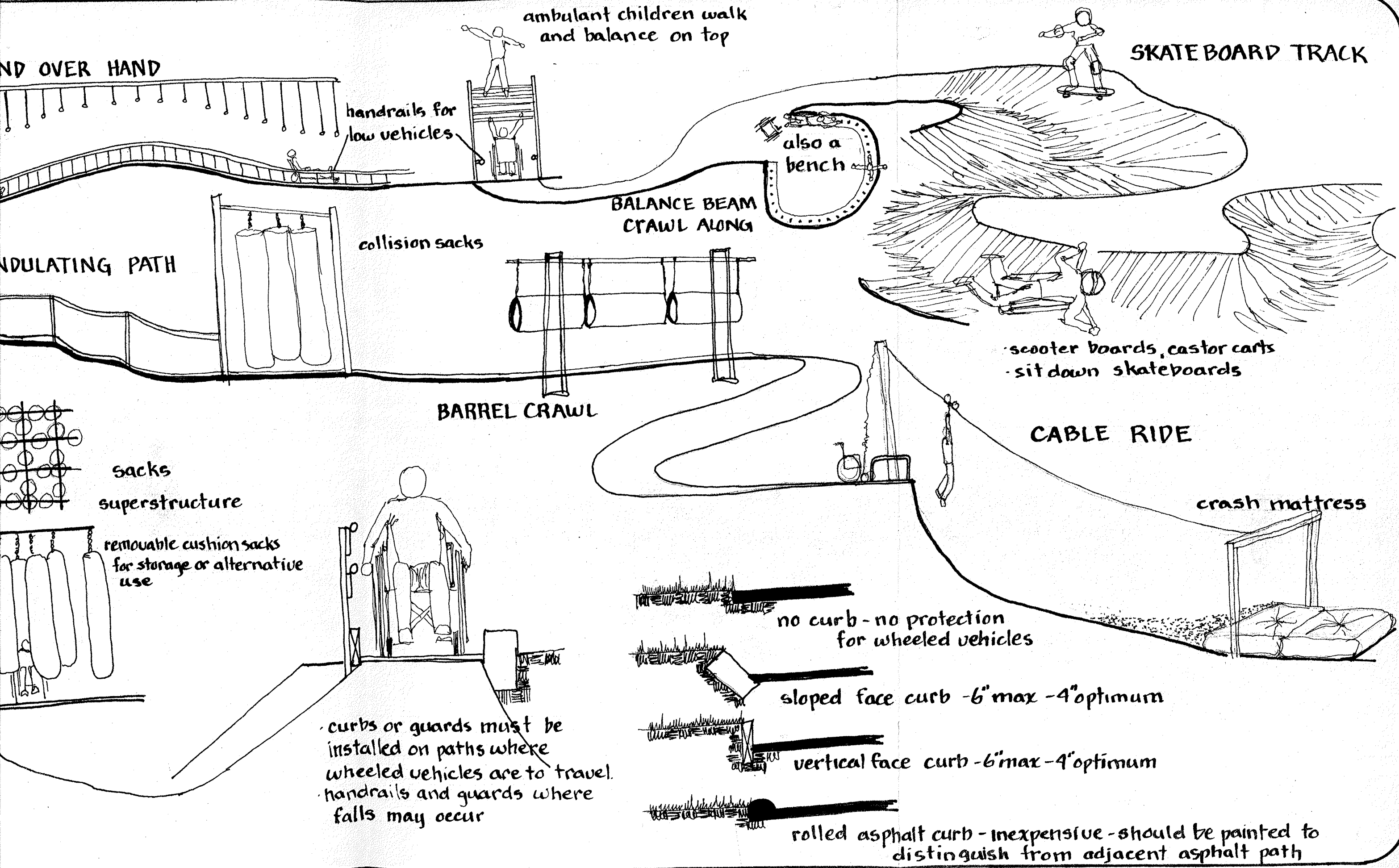
curbs or guards must be
installed on paths where
wheeled vehicles are to travel.
handrails and guards where
falls may occur

no curb - no protection
for wheeled vehicles

sloped face curb - 6" max - 4" optimum

vertical face curb - 6" max - 4" optimum

rolled asphalt curb - inexpensive -
distinguish from adjacent



ambulant children walk and balance on top

SKATE BOARD TRACK

HAND OVER HAND

handrails for low vehicles

also a bench

BALANCE BEAM CRAWL ALONG

collision sacks

WOBBLING PATH

scooter boards, castor carts
sit down skateboards

BARREL CRAWL

CABLE RIDE

crash mattress

sacks superstructure

removable cushion sacks for storage or alternative use

curbs or guards must be installed on paths where wheeled vehicles are to travel. handrails and guards where falls may occur

no curb - no protection for wheeled vehicles

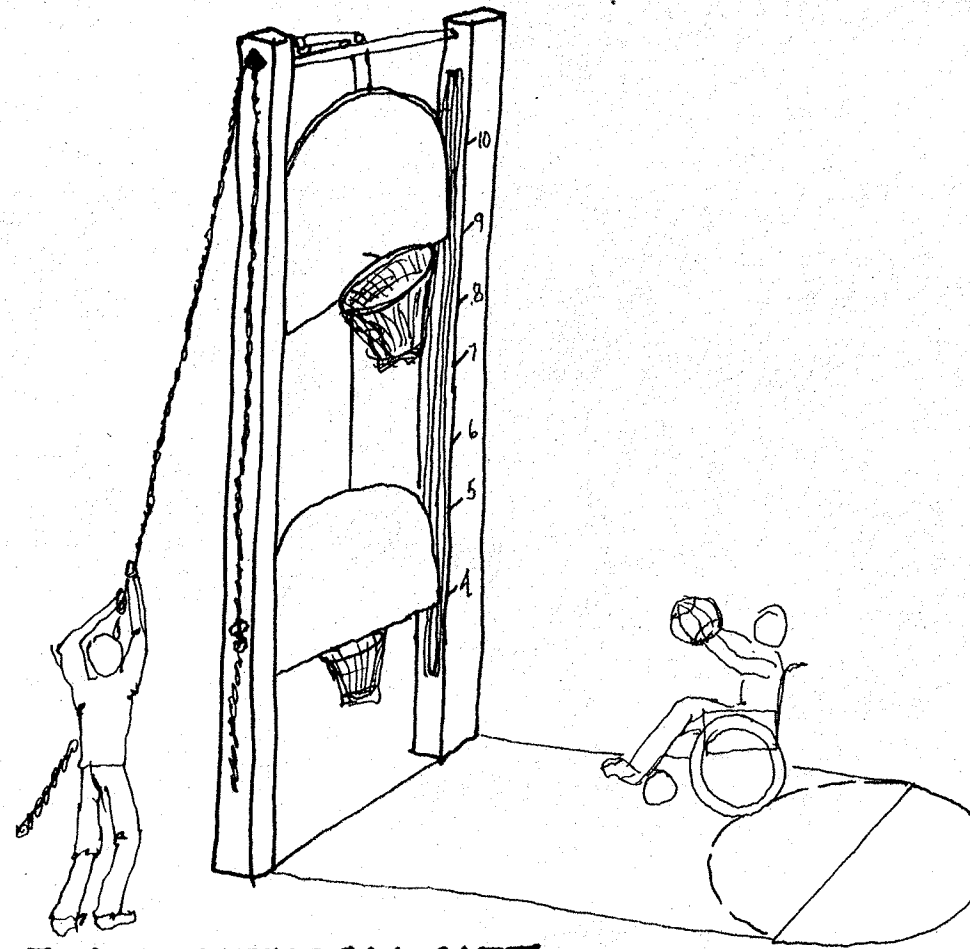
sloped face curb - 6" max - 4" optimum

vertical face curb - 6" max - 4" optimum

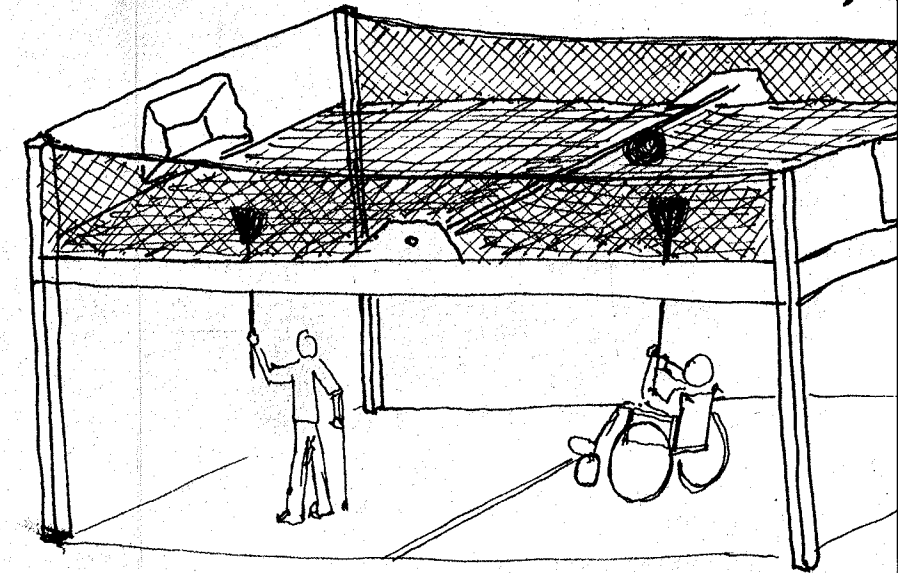
rolled asphalt curb - inexpensive - should be painted to distinguish from adjacent asphalt path

COURT SPORTS

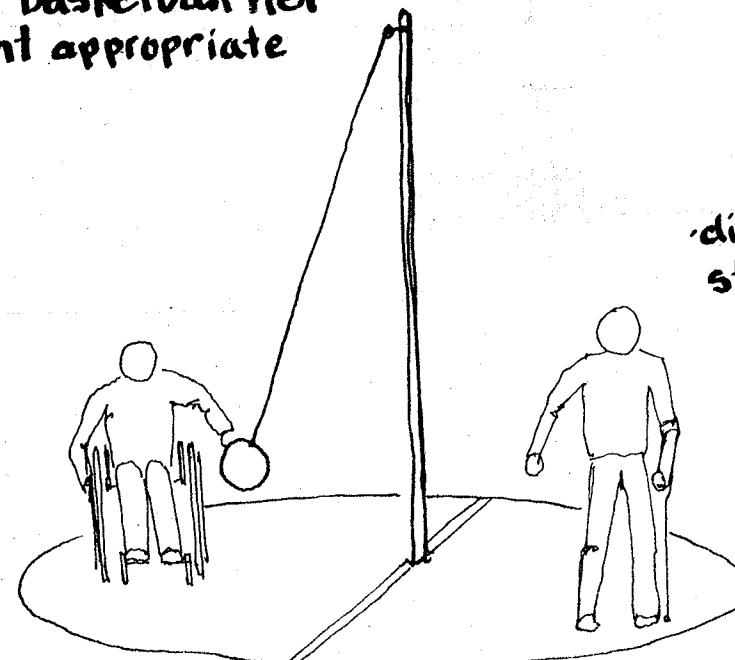
AN IMPORTANT ASPECT OF THE PLAY ENVIRONMENT AS COURT SPORTS ENCOURAGE SOCIALIZING AND COMPETITION ALONG WITH PARTICIPATION IN A REGULATED AND ORDERLY MANNER



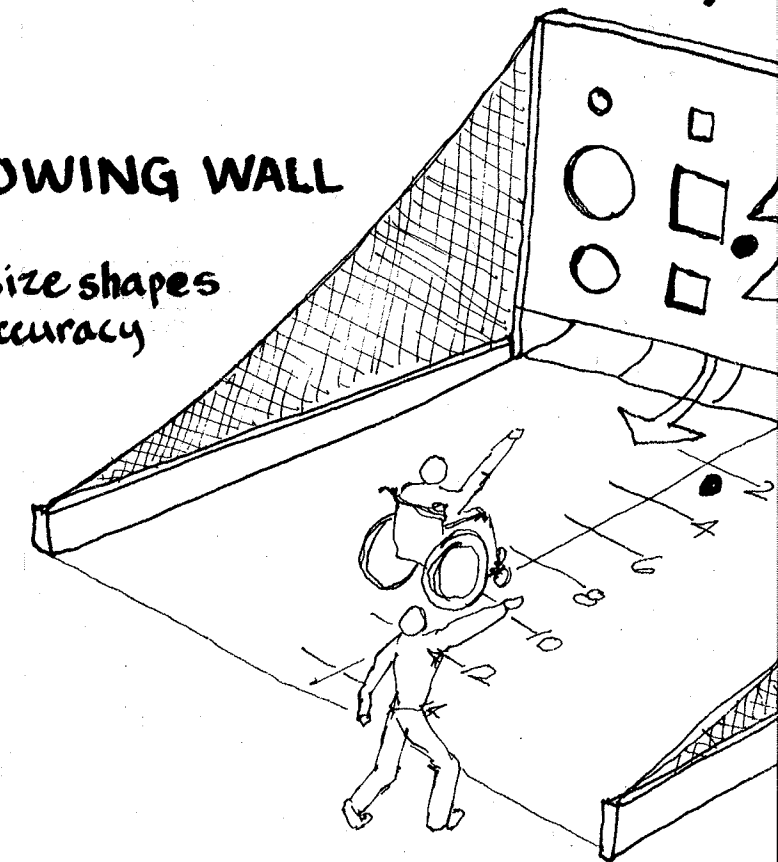
ADJUSTABLE BASKETBALL NET
 - can manually hoist basketball net to the desired height appropriate for the participants



ELEVATED BROOMBALL



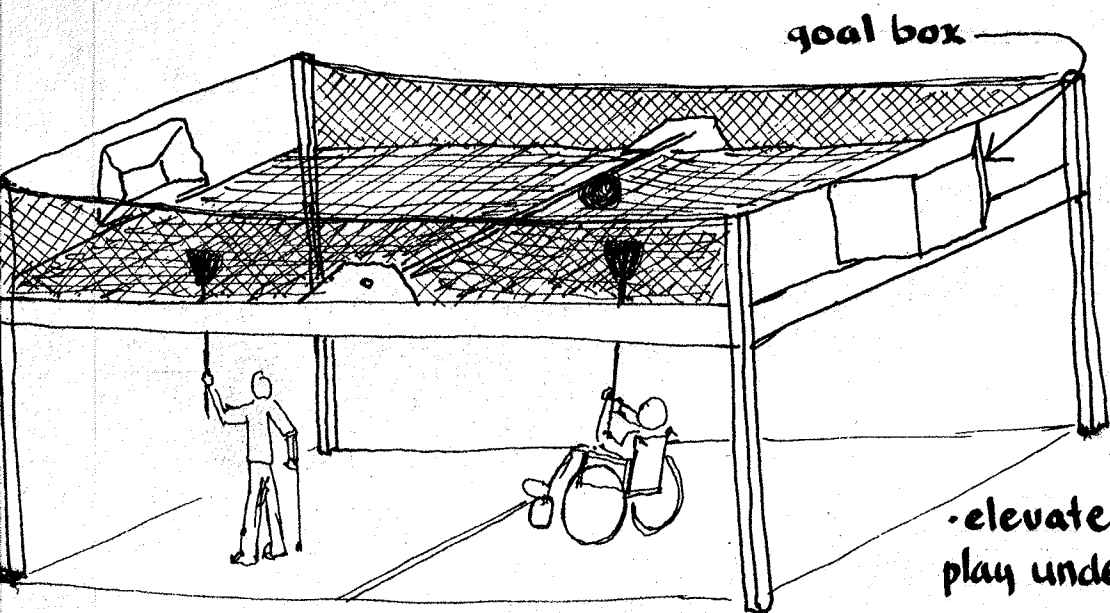
TETHERBALL - ball in rest position hangs lower for reach of seated individuals.



THROWING WALL
 - different size shapes stressing accuracy

measure line - to self judge

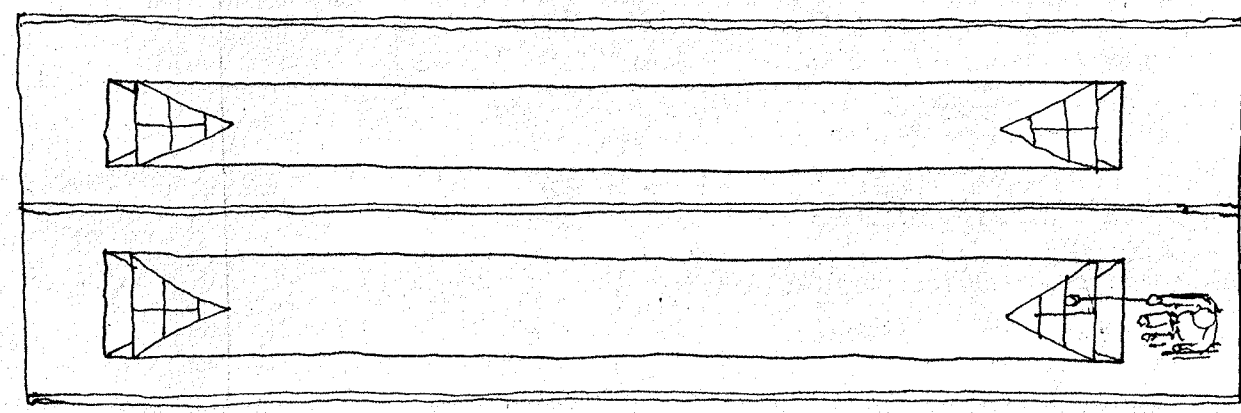
FORM PERCEPT of primary shapes are taught



goal box

-elevated games - all participants play under a handicap

ELEVATED BROOMBALL



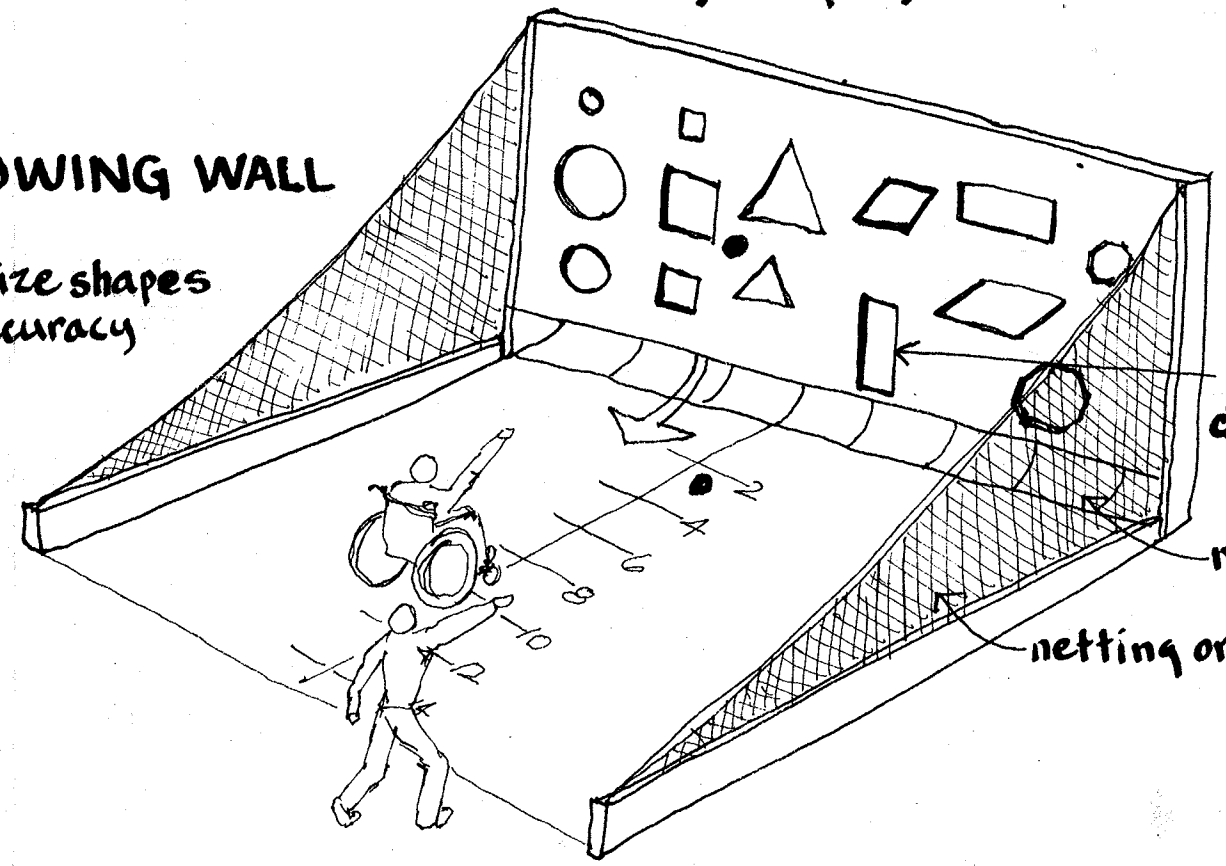
SHUFFLEBOARD - no adaptive measures necessary

Most court sports can be adapted for use by disabled persons, however sometimes the rules are altered such that the able-bodied children find that it has lost its excitement and competitive edge. Other times the numerous rules and fast action make it unrealistic to have disabled individuals and fit individuals on the same court.

FORM PERCEPTION - wall consists of primary shapes and forms which are taught in progression

THROWING WALL

different size shapes for accuracy

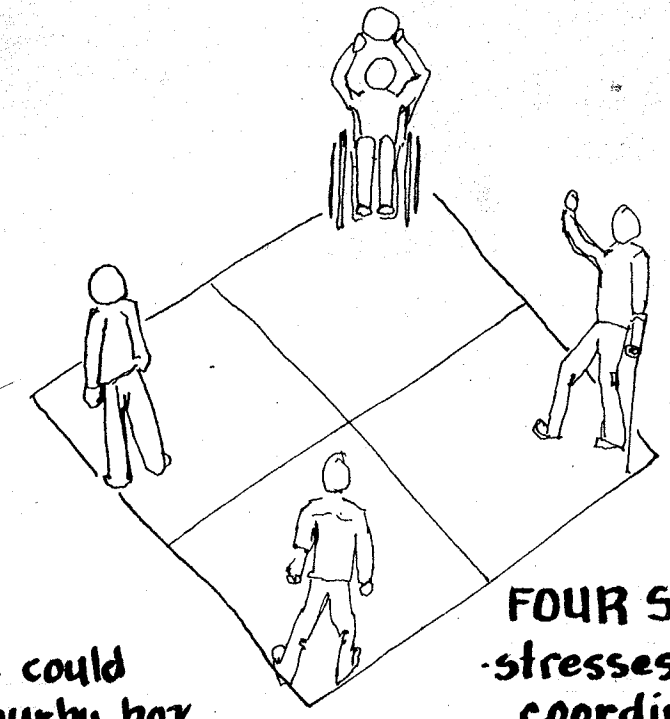


rectangle could double as burby box

return chute

netting or screen wall

measure line - to self judge throwing distance



FOUR SQUARE

-stresses eye hand coordination.

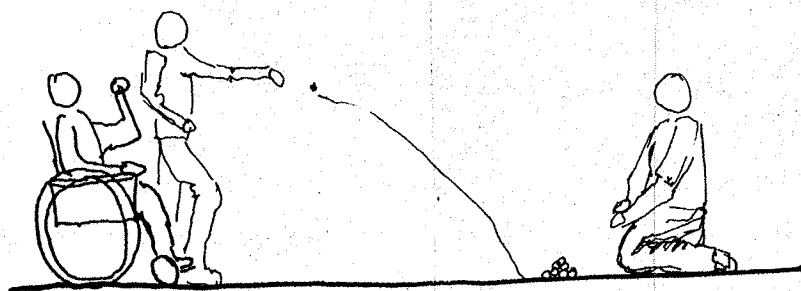
A VARIETY OF BALL TYPES SHOULD BE AVAILABE SO DISABLED CHILDREN CAN GRASP AND THROW THEM - different sizes, weights, materials (nerf balls, foamies, bean bags), and styles (balls with finger holes).

FIELD DAYS

Activities where the disabled can participate or compete against the clock or another form of measurement. Where a judgement of past performance can be used to encourage the child for a new personal best.

If competing against able-bodied children then time or distance handicaps can be arranged

PICK UP GAMES

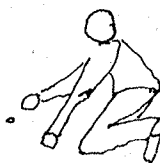
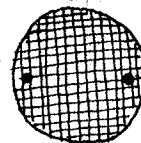


ALLIES or MARBLES

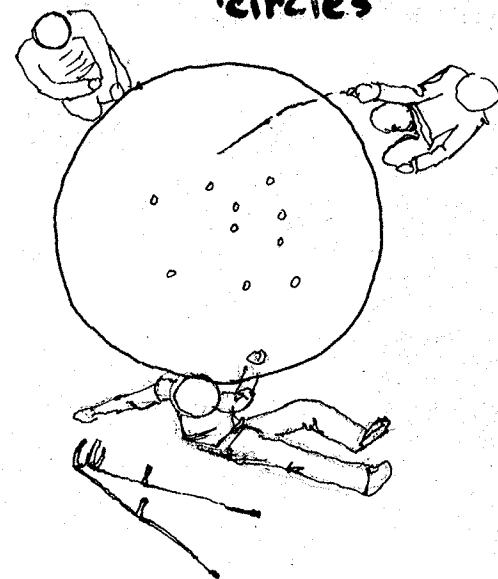
'piles of four'



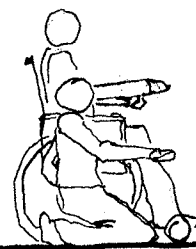
'manhole' - first person to shoot alley down manhole wins.



'circles'

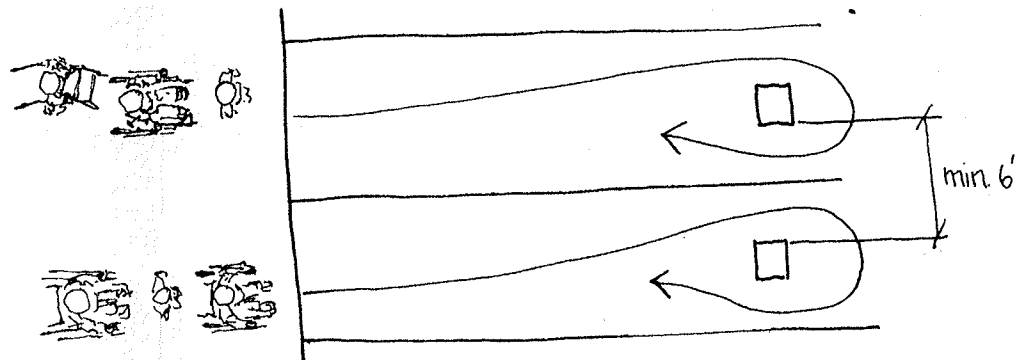
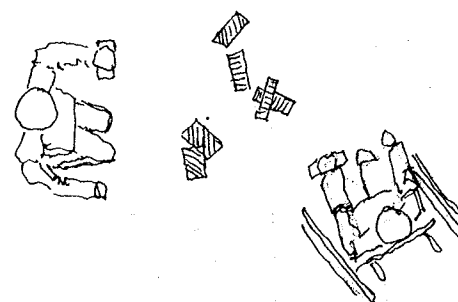


CARD COLLECTION GAMES



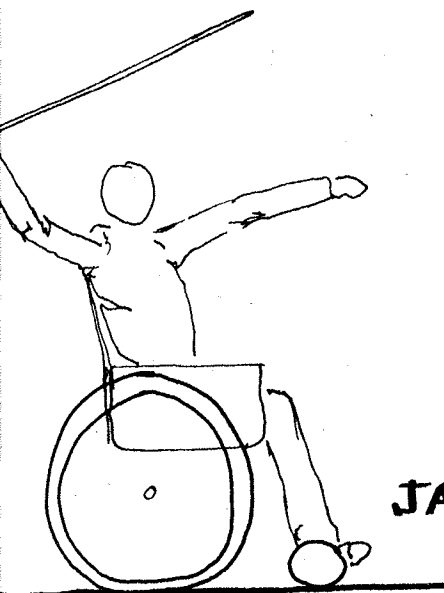
'knockdowns'

'heads n' tails'



RELAY RACES - teams comprised of able and disabled children.
 - wheeling, crawling, rolling, throwing, slalom.
 - race could go through handi-trail course

JAVELIN, SHOT PUTT



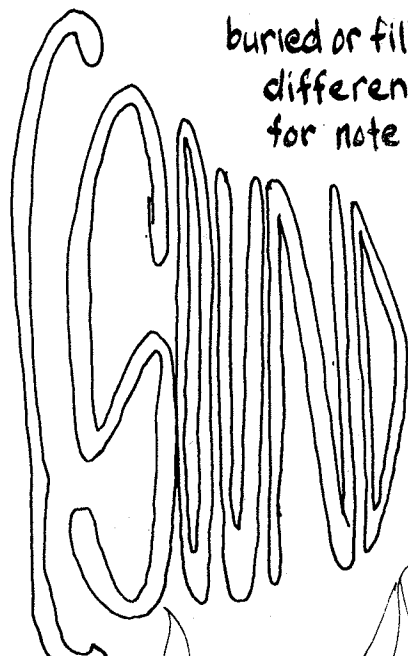
SENSORY

STIMULATION

ELEMENTS IN THE PLAY ENVIRONMENT EVOKING REACTIONS FROM THE SENSES

THE OPPORTUNITY TO MAKE DECISIONS AND TEST OUT THEIR CONSEQUENCES IN A CONTROLLED SITUATION

discovery, experimentation, creation, testing
concluding



buried or filled to
different depths
for note change



oil barrels as separation wall

storage

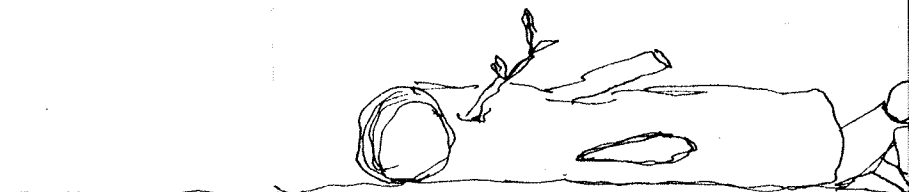


pipe balustrade
to bang

- creative-primitive sound-banging items
- melodic-soothing
- loud-release
- rhythmic-inbred beat-gets body in motion



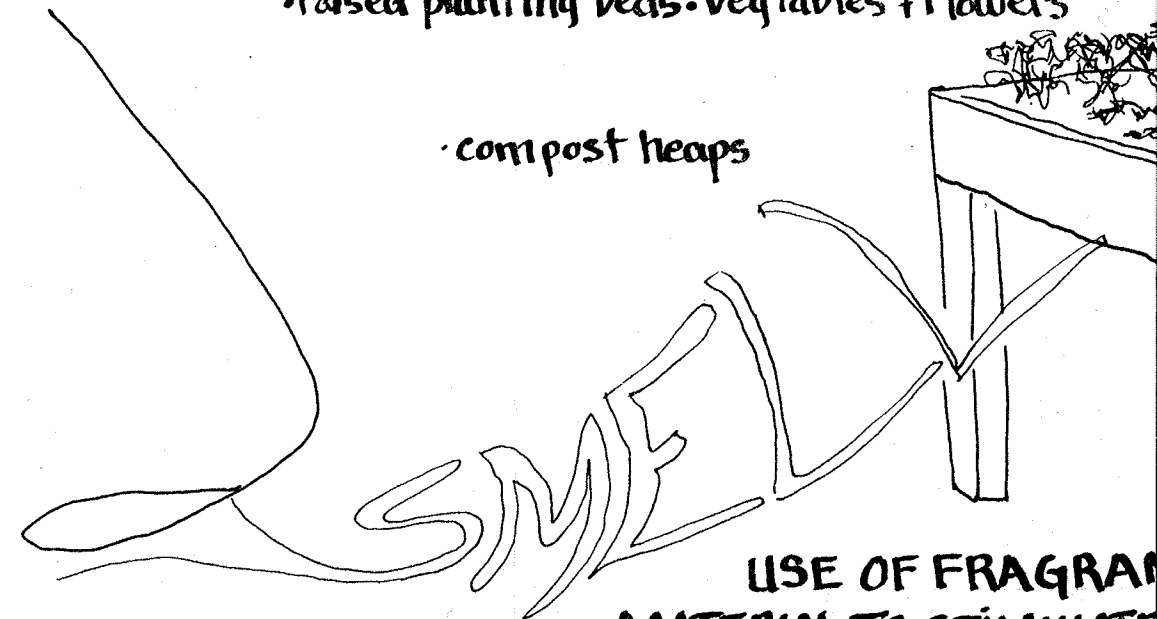
learn about heat and fire
by making use of it



hollow logs to bang

raised planting beds-vegetables + flowers

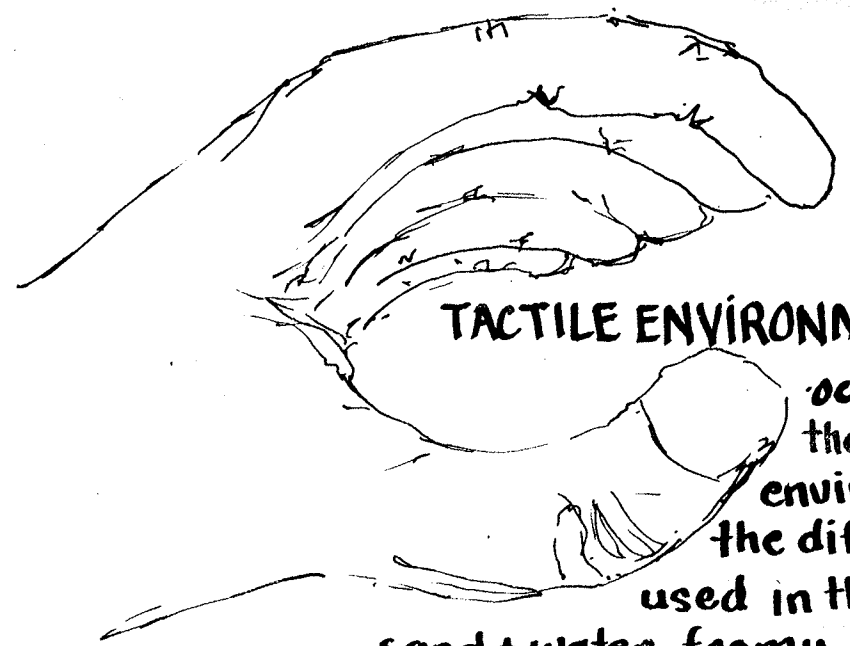
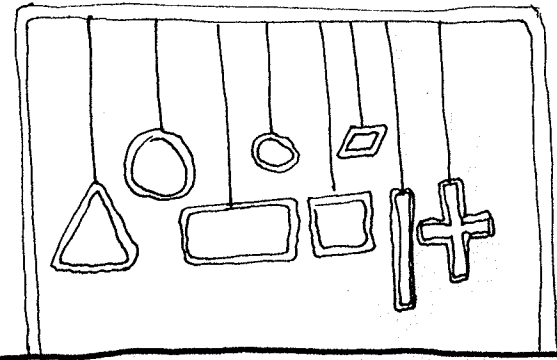
compost heaps



USE OF FRAGRANT
MATERIAL TO STIMULATE



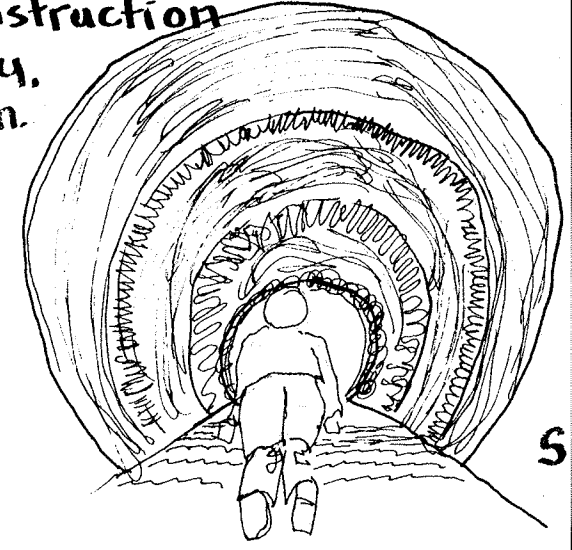
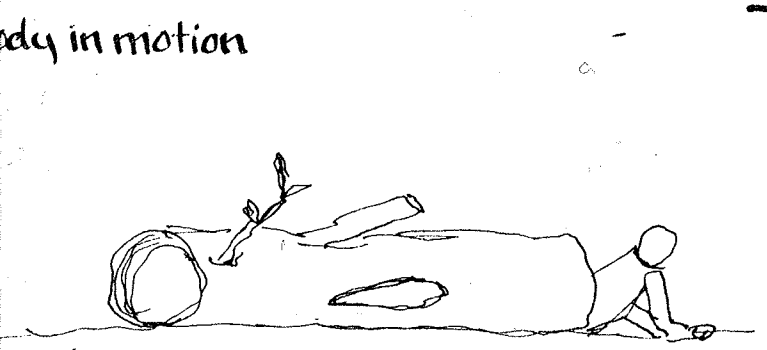
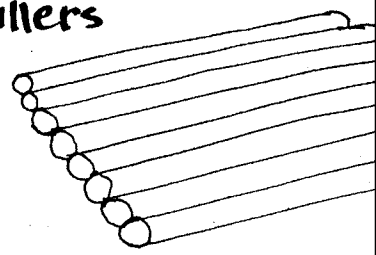
chimes in primary forms



TACTILE ENVIRONMENT

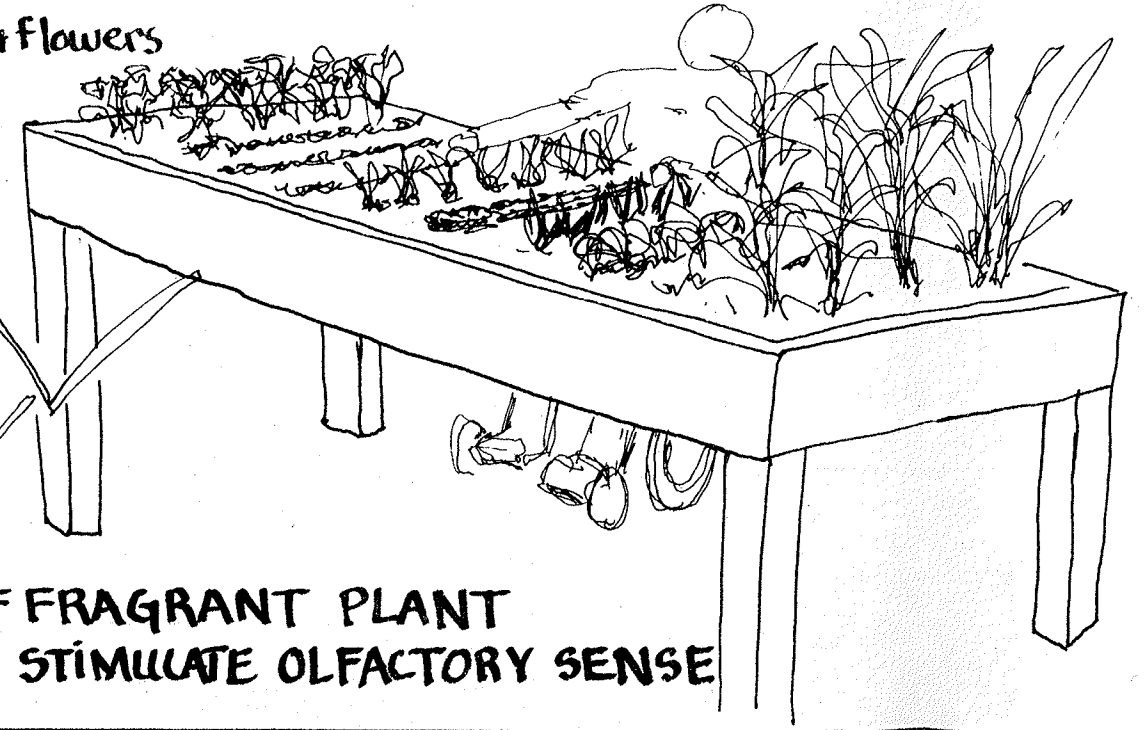
occurs as part of the built play environment - from all the different materials used in the construction
- sand + water, foamy, spongy, wood, hot + cold, smooth + rough.

textured surfaces
rollers

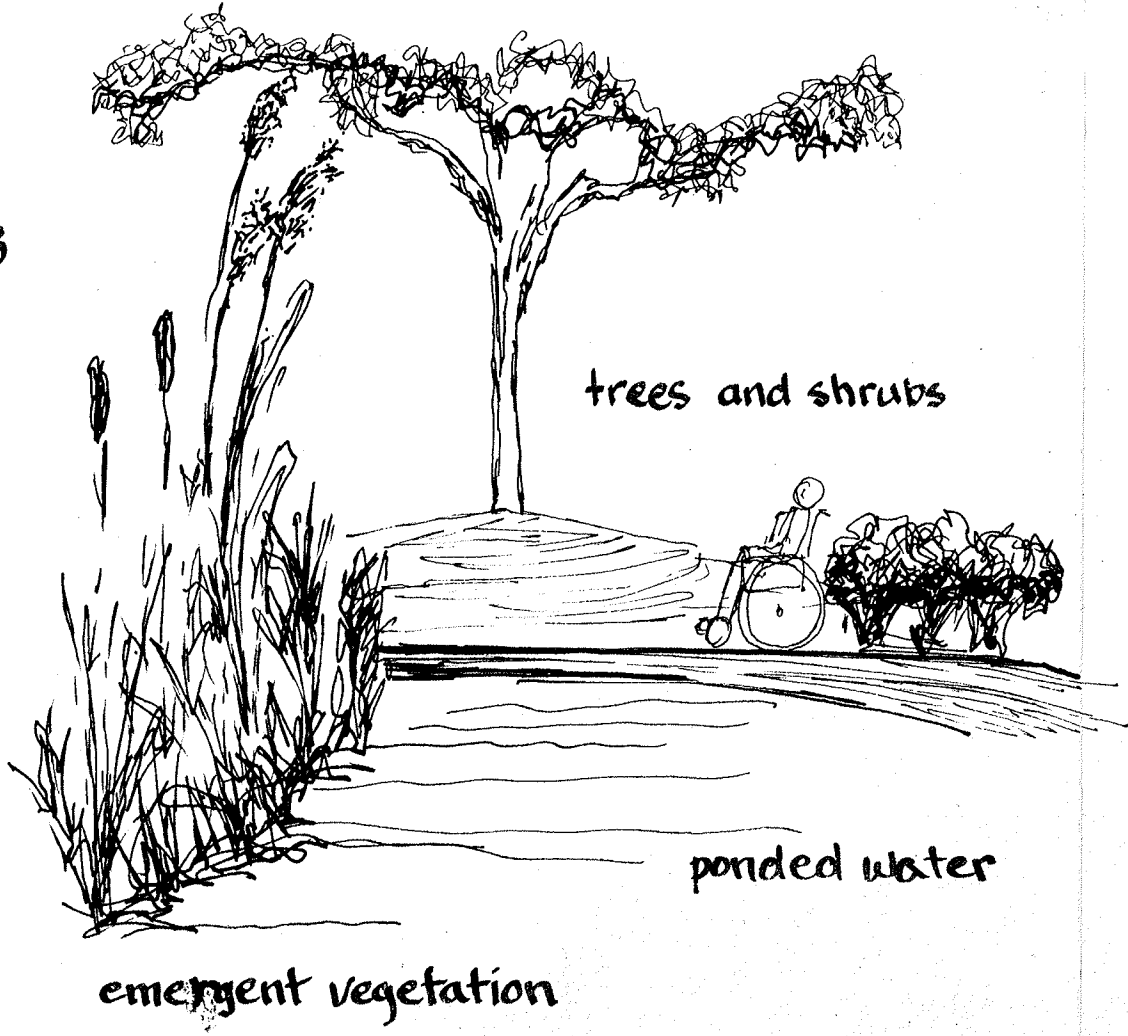


FRAGRANCES

planting beds - vegetables + flowers
compost heaps

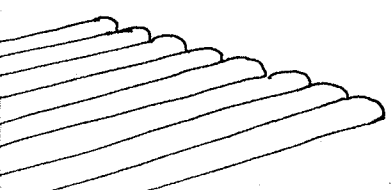


USE OF FRAGRANT PLANT MATERIAL TO STIMULATE OLFACTORY SENSE

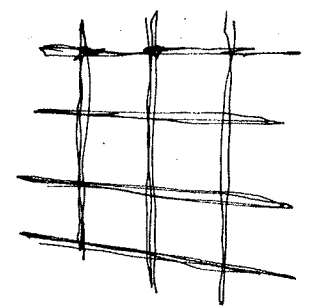
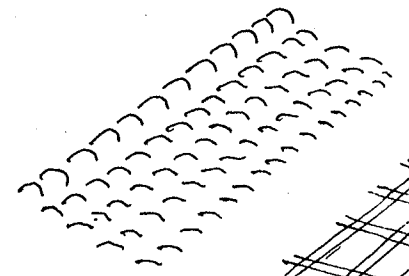


visual

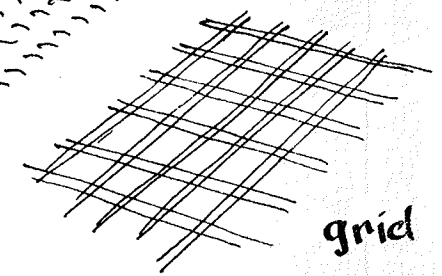
surfaces



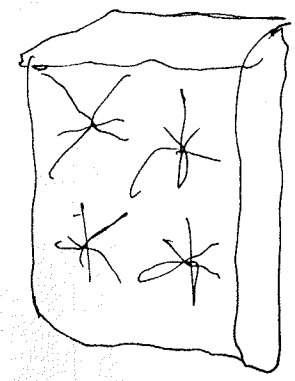
bumps



netting



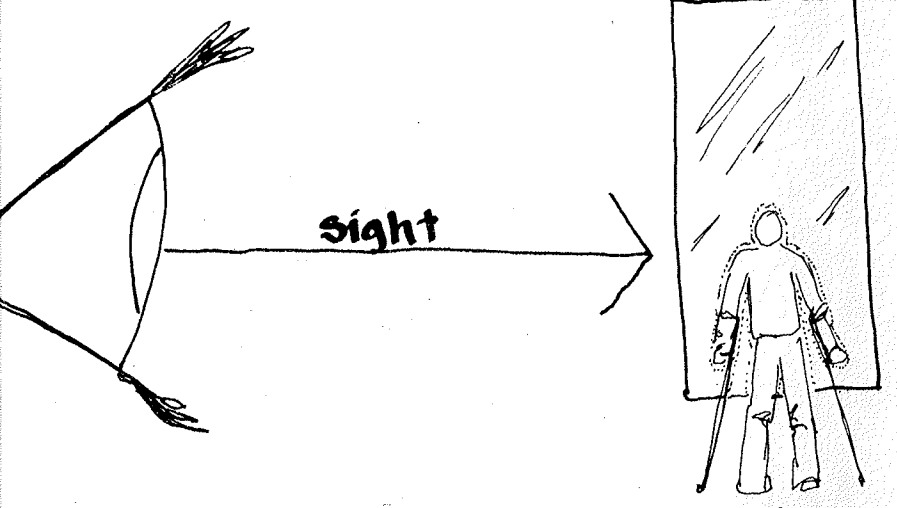
grid



cushion mattress

tactile tunnel - different surface finishes to stimulate tactile sense

SPACE AND BODY AWARENESS

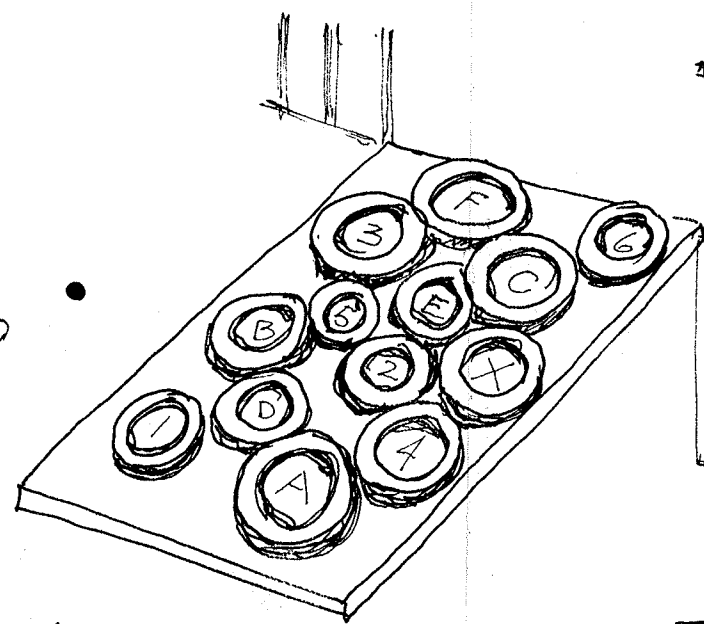
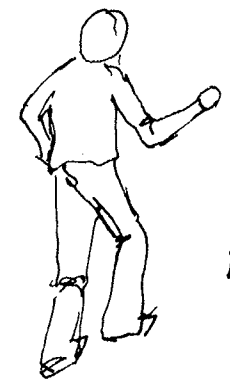


sight

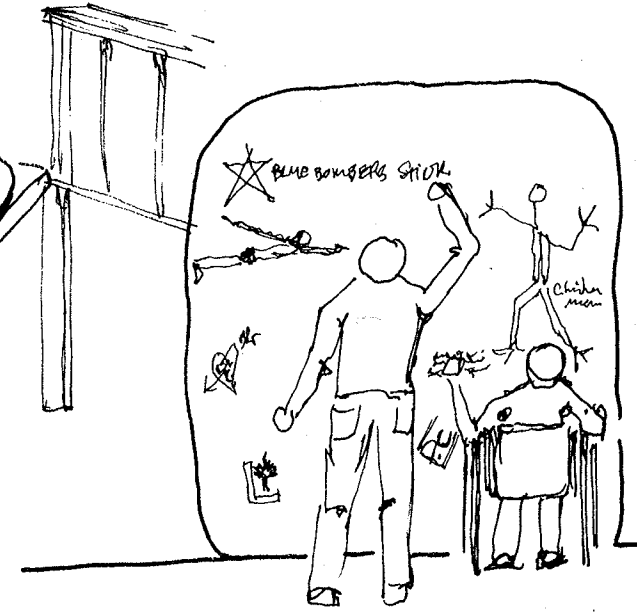
REFLECTIVE SURFACES

visual images of body - learn from self observation

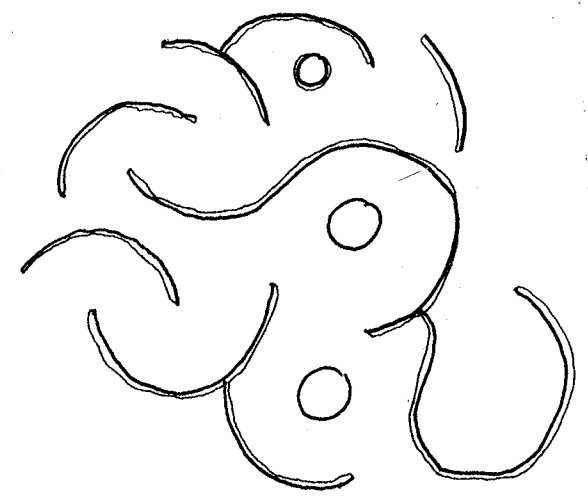
USE OF VIBRANT COLOURS, NUMBERS + LETTERS TO STIMULATE ACTIVITY



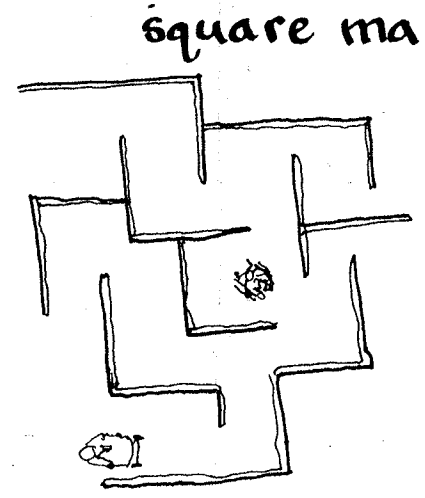
climbing-throwing structure



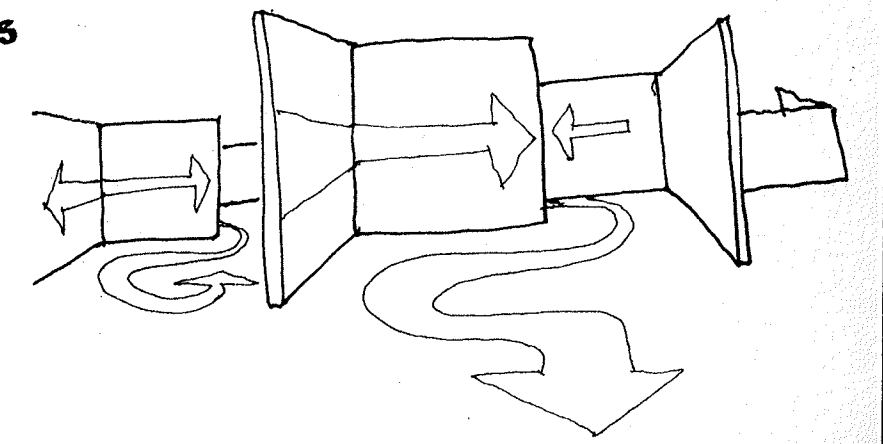
writing surfaces to creatively express oneself



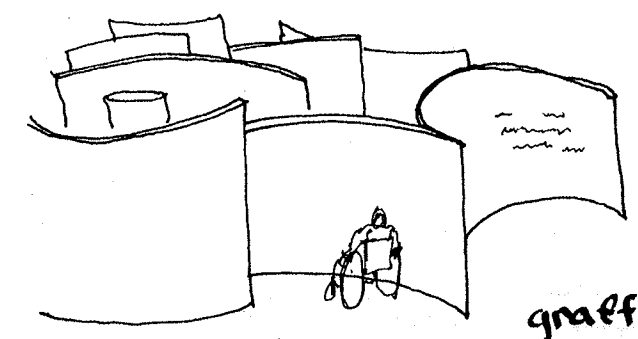
circular mazes



square mazes



MAZES: test sensory - motor integration -
- directionality
- laterality
- perception
- motor patterns
- coloured panels or graphics to aid orientation.



graffiti wall

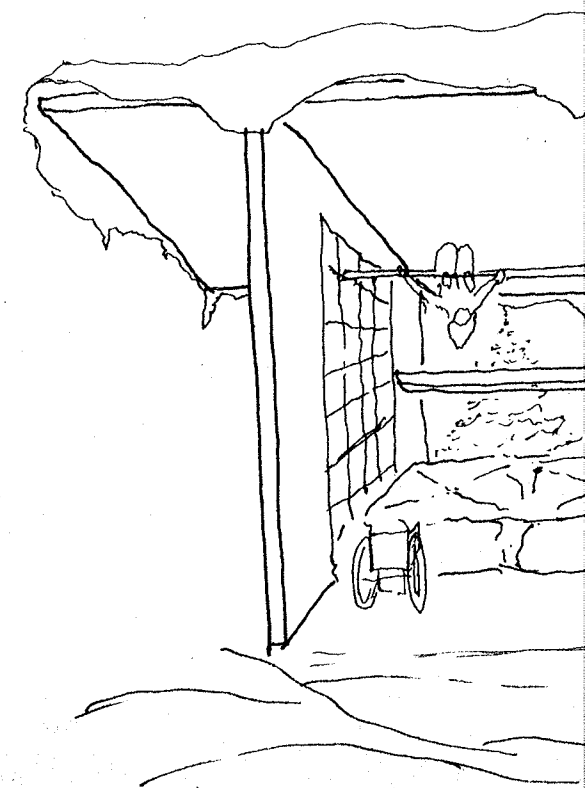


WINTER PLAY

FOR HANDICAPPED CHILDREN
OUTDOORS IN WINTER IS
FRUSTRATING:

- snow covered ground
conventional mobility
- coldness a problem due
and inactivity
- time consuming process
for the elements (15 min
to dress and undress)
- greater reliance on

DUE TO THE ABOVE FACTORS
DO NOT PLAY OUTDOORS



AY

PPED CHILDREN PLAY
I WINTER . CAN BE

covered ground makes the use of
ventional mobility aids difficult.
ess a problem due to lack of mobility
inactivity
consuming process of dressing appropriately
the elements (15 min. recess time too short
dress and undress child)

ter reliance on peers for assistance.

ABOVE FACTORS MOST DISABLED CHILDREN
PLAY OUTDOORS IN WINTER.

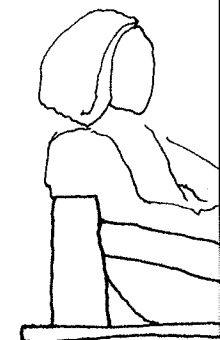
INCREASED MAINTENANCE

-costs } use should justify maintenance
-labour }

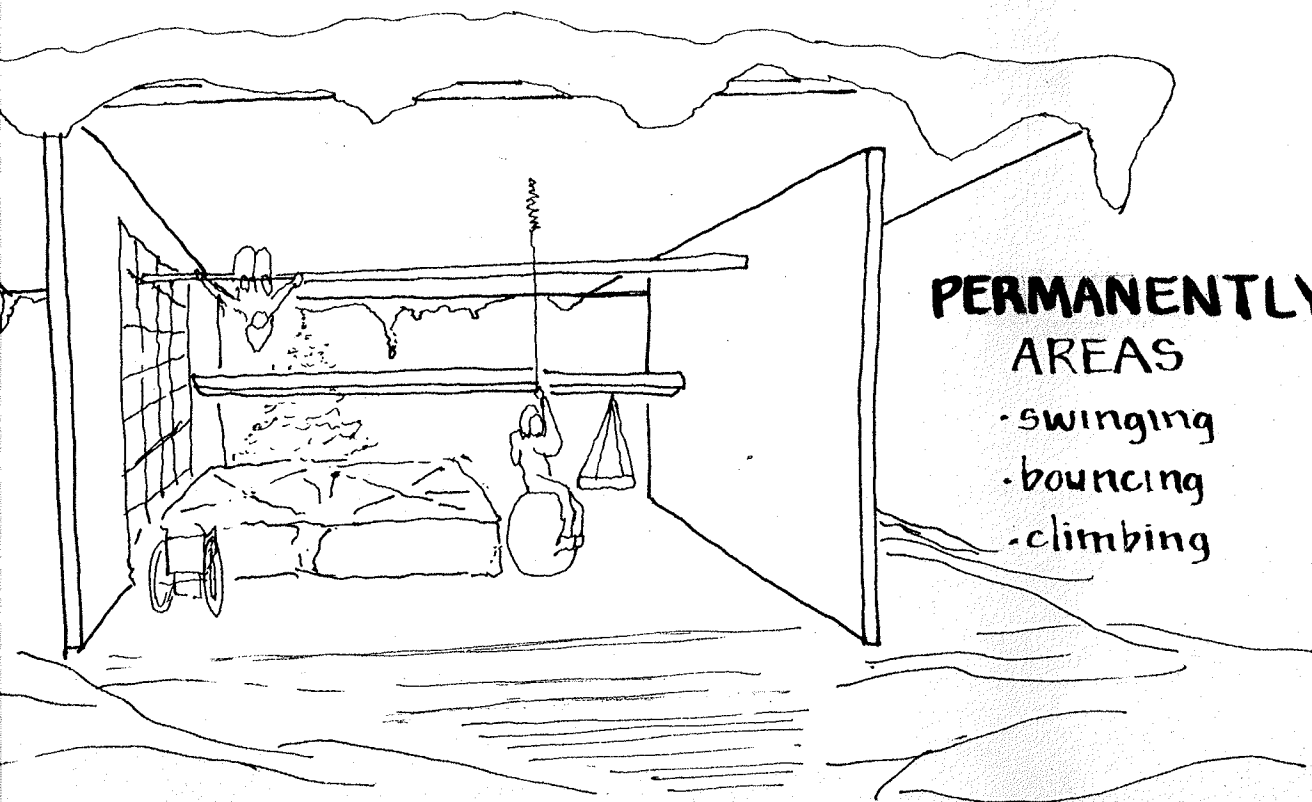


major walks should be kept clear of ice and snow

GET BY W



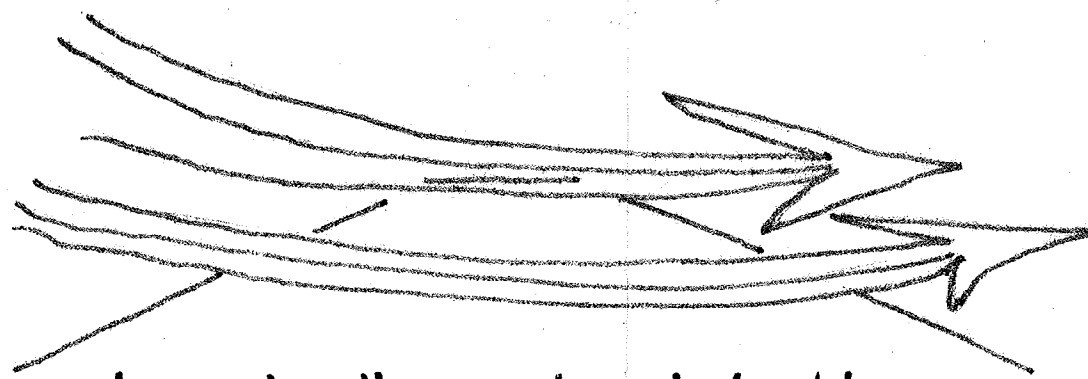
back and side



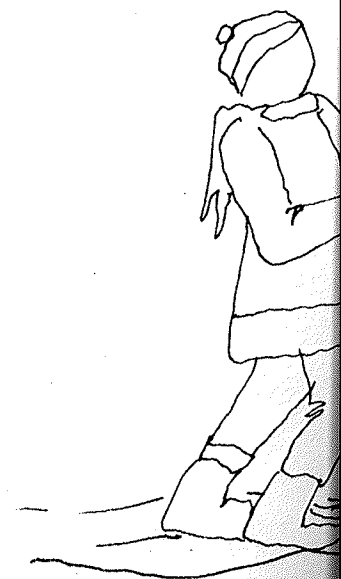
PERMANENTLY COVERED

AREAS

- swinging
- bouncing
- climbing

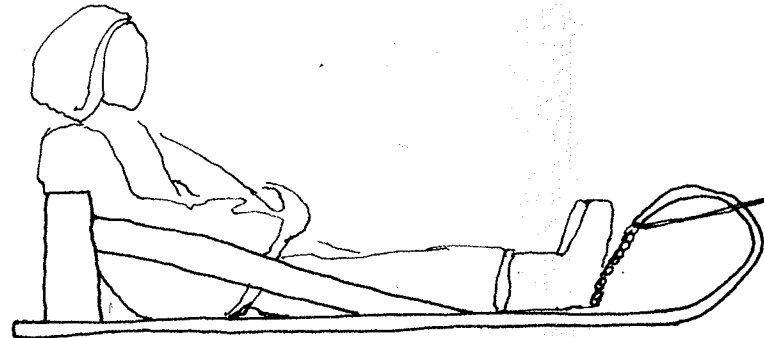


wind swept walkway - clean but cold

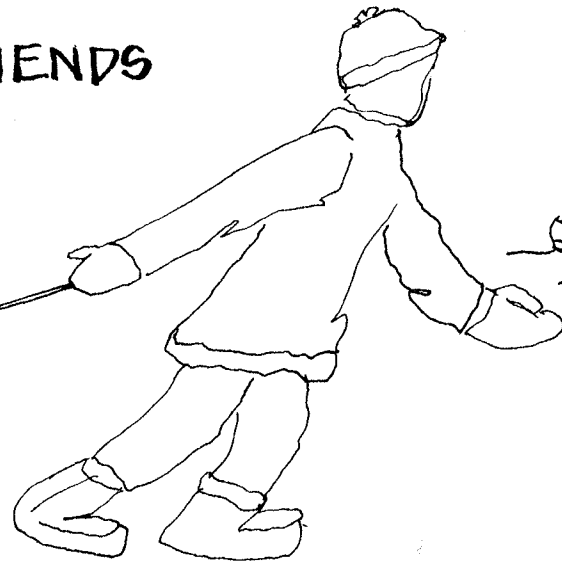


GET BY WITH A LITTLE HELP FROM FRIENDS

snow steps to bump up to hilltop

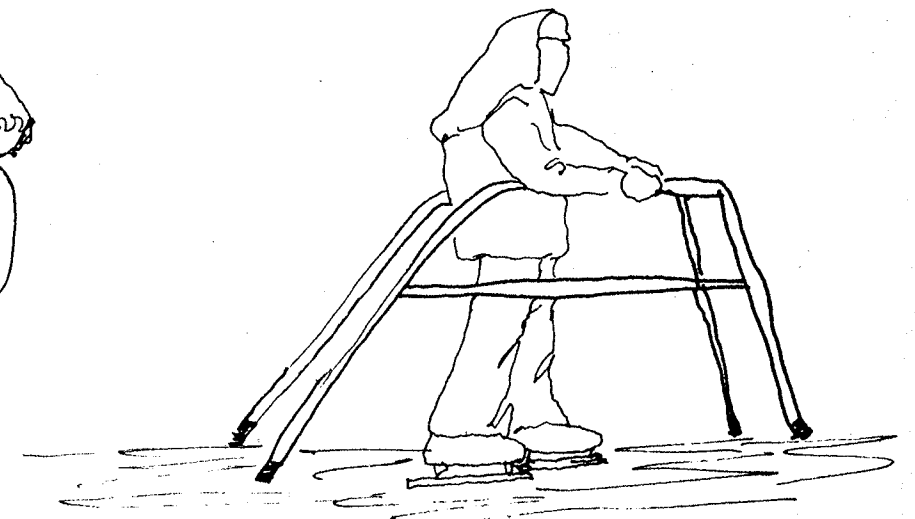


back and side supports added to toboggan



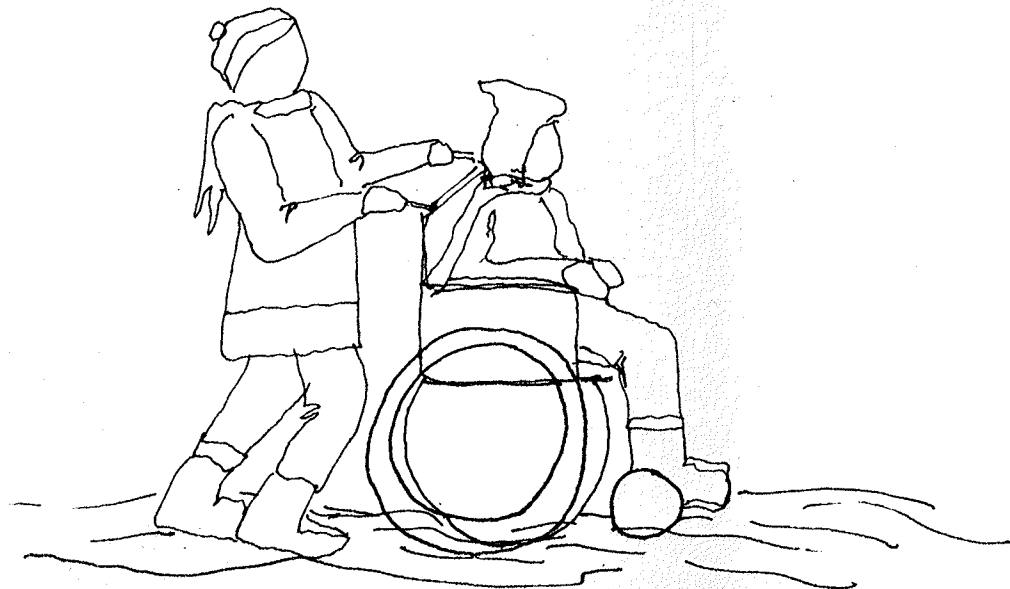
cross-country skiing for semi-ambulant disabled

snowball rolling



ice-skating using walkers or crutches

support could also be provided by other children



elbow crutch with ski-pole attachment



double blade outrigger attachment to crutch



6. A Winnipeg Case Study

In Winnipeg there are a number of institutions which have a population of handicapped children. The St. Amant Centre in St. Vital is a domicile institution for mentally retarded individuals, from severely retarded to trainable retarded. The Manitoba School for the Deaf is also a residence-institution and school with a substantial population of "bused" individuals. Both these centres are specialized and concentrate their resources in a specific field.

The Health Sciences Centre in Winnipeg is the focal point of medical practice and research in the province. The centre's many departments and affiliates cater to a large transitory population of handicapped children. Patients who attend the occupational or physiotherapy departments; in- and out-patients of the Children Centre, the Rehab Centre, and the pediatrics department as well as the close proximity of the Society for Crippled Children and Adults, the Canadian Paraplegic Association and the Manitoba League for the Physically Handicapped all constitute a portion of the handicapped population concentrated in the area.

A number of schools also have a percentage of handicapped children in their population. Robertson Elementary School has 40 trainable retarded individuals in attendance. These children are "bused" from all over the Seven Oaks School Division to be part of a normalization program at this institute. Ellen Douglas is a small elementary school with a total population of approximately 40 handicapped children. The disabilities with which the children are affected are diverse in type and severity. This elementary school is the primary institute for teaching the specialized population in the Winnipeg district. However through its normalization program it has been able to transfer 15 students to Lord Roberts Elementary School as of September 1978. Plans for the future include an increase in the number of students attending the integration program at Lord Roberts with a general reduction of the specialized conditions present at Ellen Douglas.

All the aforementioned sites in Winnipeg require the development of a play environment which is sympathetic with the specialized needs of their specific population.

6.1 SITE SELECTION

The Lord Roberts site was selected as an exemplary site for this study as the school was the only institute presently dealing with the integration of children suffering from a number of different handicapping conditions in the elementary grades one through six. The users of the site are both able-bodied and handicapped children of various capabilities. The site also offers the opportunity to consider adjustments to existing facilities so as to make them accessible to the handicapped children.

Lord Roberts Elementary School is located at 665 Beresford Avenue in the Fort Rouge District of Winnipeg. There are approximately 600 children in attendance from kindergarten to grade six.

The handicapped children are integrated into the normal program of the school except for "in-school" occupational and physiotherapy sessions.

The school is built on one level except for the major gymnasium which is down a steep flight of stairs. Thus, the children are capable of self-locomotion to all classes except physical education. Some of the more ambulant handicapped children are allowed to "bump" themselves down the stairs to the gym to take part in the activities.

At Lord Roberts School there are two definite outdoor play areas. One, located at the west end of the school, is a small area strictly for the kindergarten children. The major playground is located at the east end of the school and contains large asphalt areas, playing fields, earth mounds and a commercial climbing play structure.

A questionnaire was circulated amongst the handicapped children to gain an understanding of their activities, perceptions and aspirations in the Lord Roberts playground and any playgrounds near their home. The parents and teachers of these students were also queried for information regarding present playground design and improvements that might be made.

The questionnaire revealed that while most of the handicapped children were excited about the existing play structure and hills, they were disheartened by the inaccessibility of these elements. The children's answers also pointed out the fact that in winter they rarely play outside because it's hard to get around and it's too cold for non-active play. They also stated that there are few places for them to play around their homes and if there are they must be accompanied by an older individual who can assist them in the use of the facilities.

All the handicapped children stressed the desire for play equipment which allowed them to swing, slide and balance or sand boxes, tunnels and climbing structures to stimulate their imagination. Basically, the handicapped child wants to partake in the same playground activities along side fit children.

Parents and teachers stated that for the majority, outdoor play equipment was not available for use by handicapped children as the ground surface or the construction of the facility made it inaccessible, not safe, or not adaptable to the special needs of the handicapped.



McKITTRICK PARK

COCKBURN ST

LEEDS AVE

RATHGAR AVE

LORD ROBERTS

ELEMENTARY
SCHOOL

STUDY SITE

DALY ST

BERESFORD AVE

SITE CONTEXT MAP



scale 1"=100'



RATHGAR AVE

LORD ROBERTS

ELEMENTARY
SCHOOL

STUDY SITE

BERESFORD AVE

COCKBURN ST

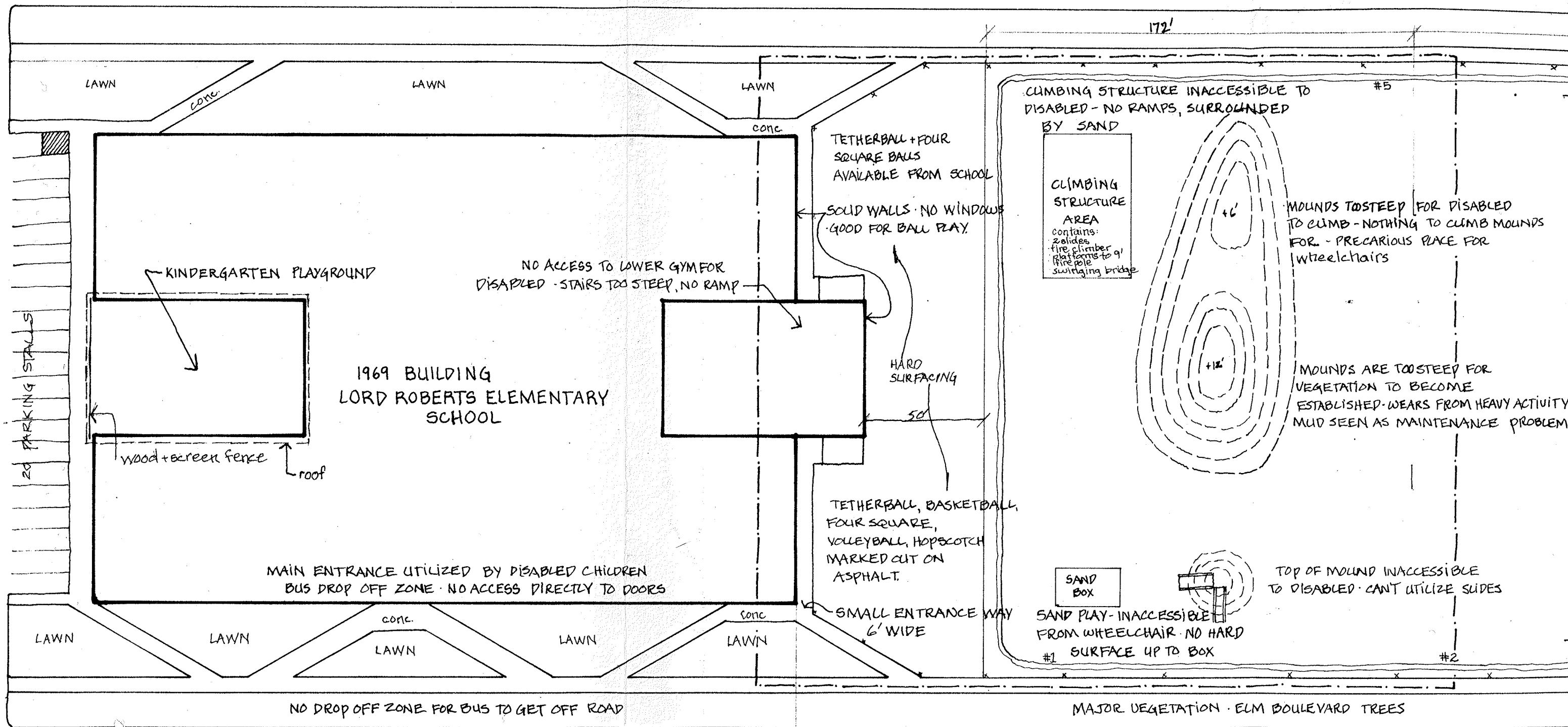
DALY ST

SITE CONTEXT MAP



north

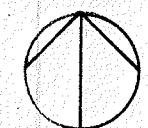
scale 1"=100'

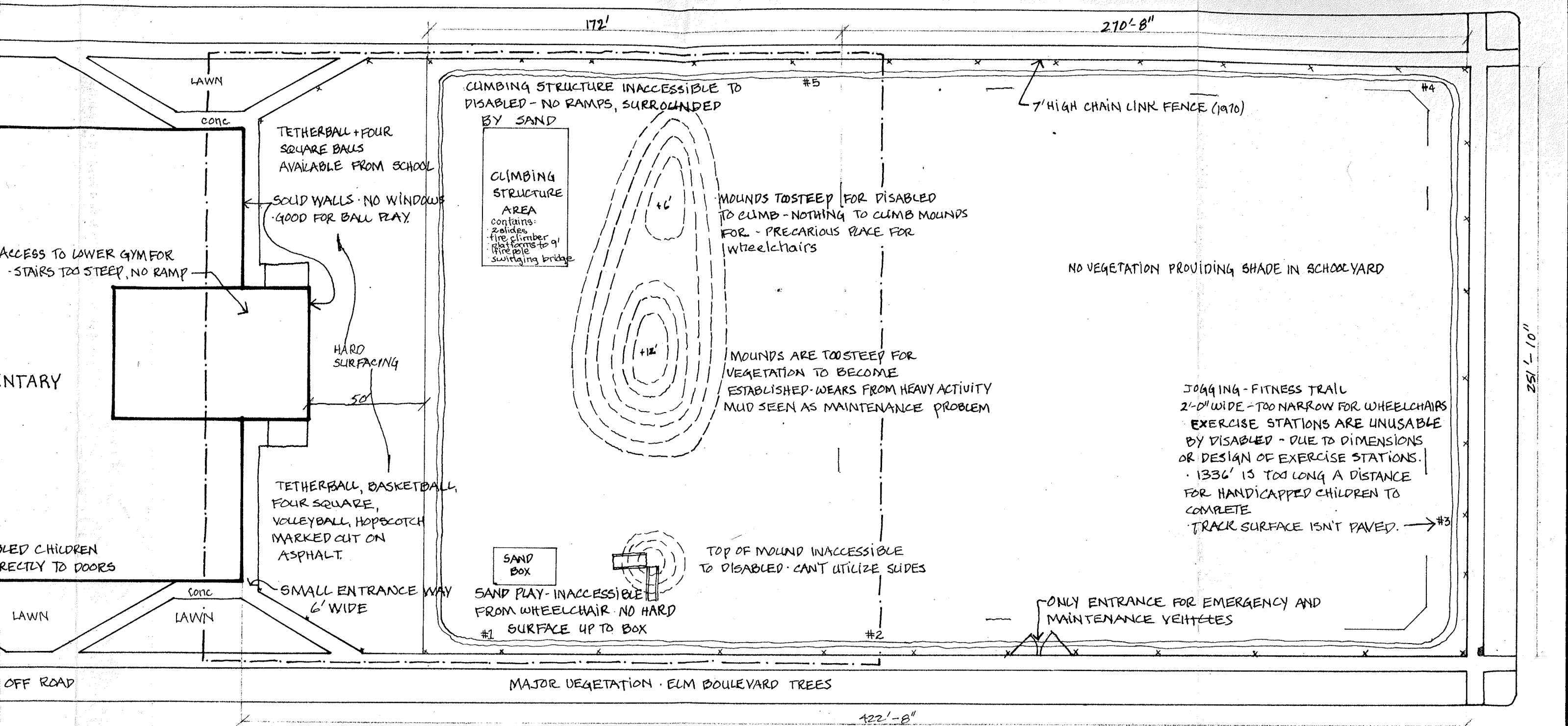


----- TOTAL PLAYGROUND AREA 2.96 ACRES
 ----- STUDY AREA 1.32 ACRES

BERESFORD AVENUE

FOR DISABLED CHILDREN PLAY ARE
 CHILDREN ARE UNABLE TO TR
 LIMITED (RECESS OR LUNCH HO
 HANDICAPPED CHILDREN SHOUL
 WHEELCHAIR SPEED IS 1/2 M.P

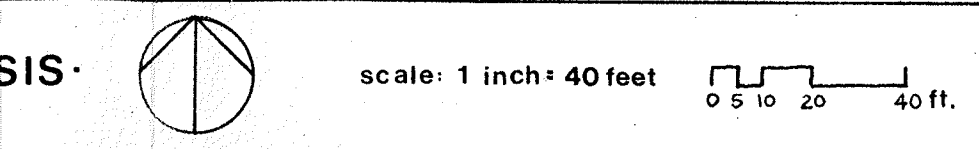


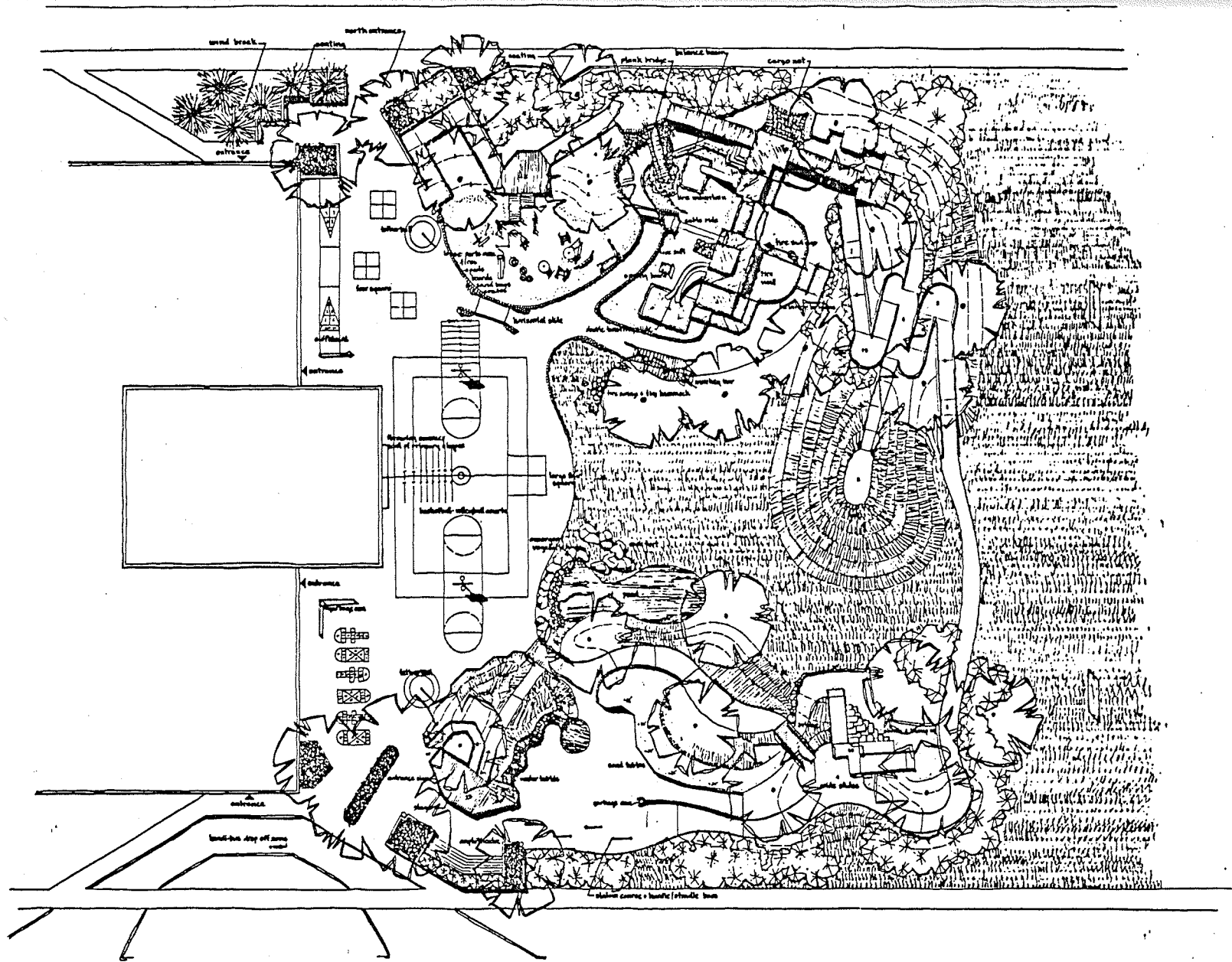


AREA 2.96 ACRES

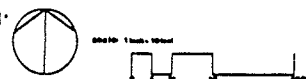
BERESFORD AVENUE

FOR DISABLED CHILDREN PLAY AREAS SHOULD BE CLOSE TO BUILDING. SOME CHILDREN ARE UNABLE TO TRAVEL GREAT DISTANCES. WHEN PLAY TIME IS LIMITED (RECESS OR LUNCH HOUR) THE MAJORITY OF ACTIVITIES AVAILABLE TO HANDICAPPED CHILDREN SHOULD BE LOCATED CLOSE TO SCHOOL. AVERAGE WHEELCHAIR SPEED IS 1/2 M.P.H. (132 FT/MIN)



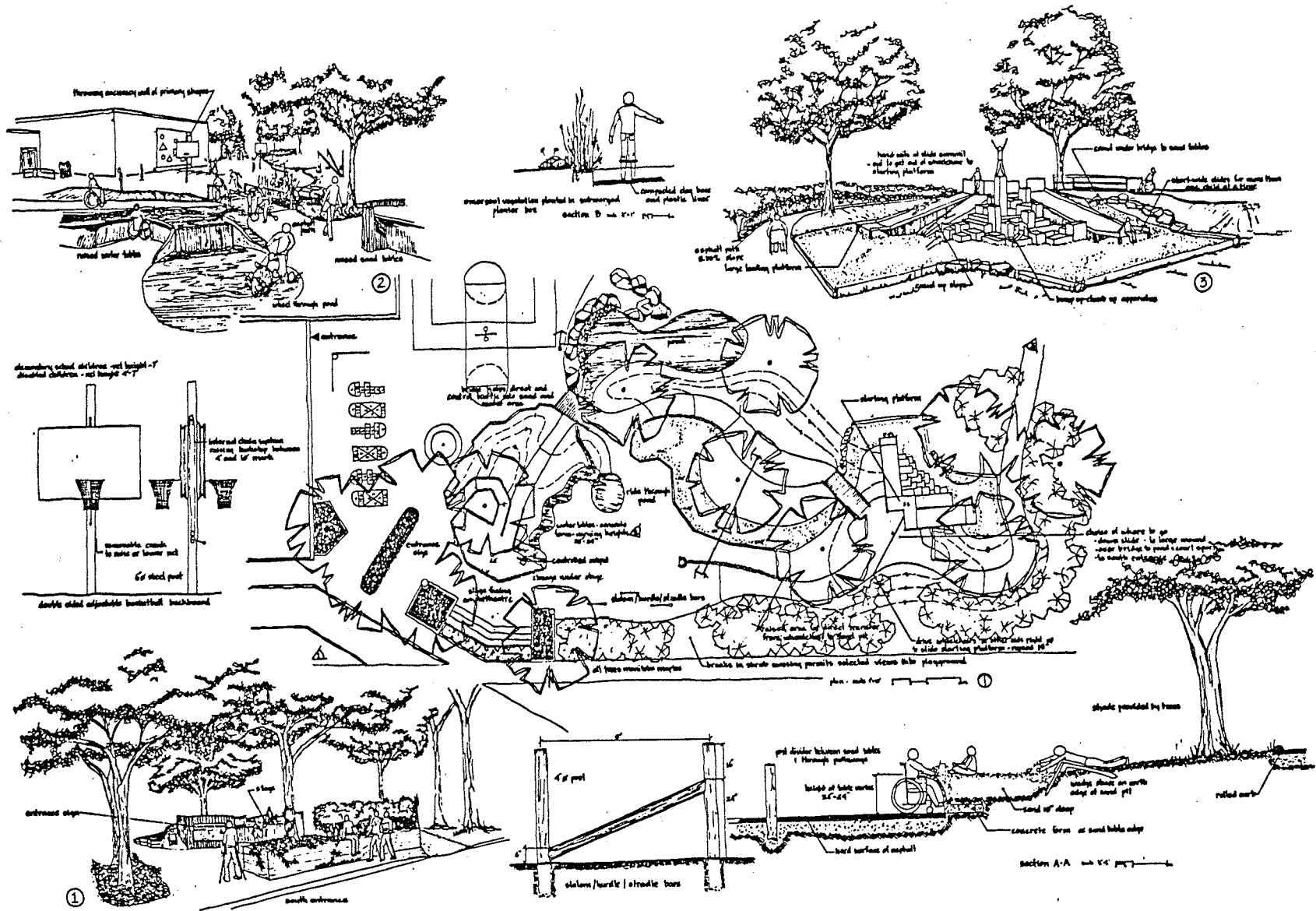


LORD ROBERTS ELEMENTARY SCHOOL 'SITE PLAN'



PLAYSPACES TO ACCOMMODATE DISABLED CHILDREN

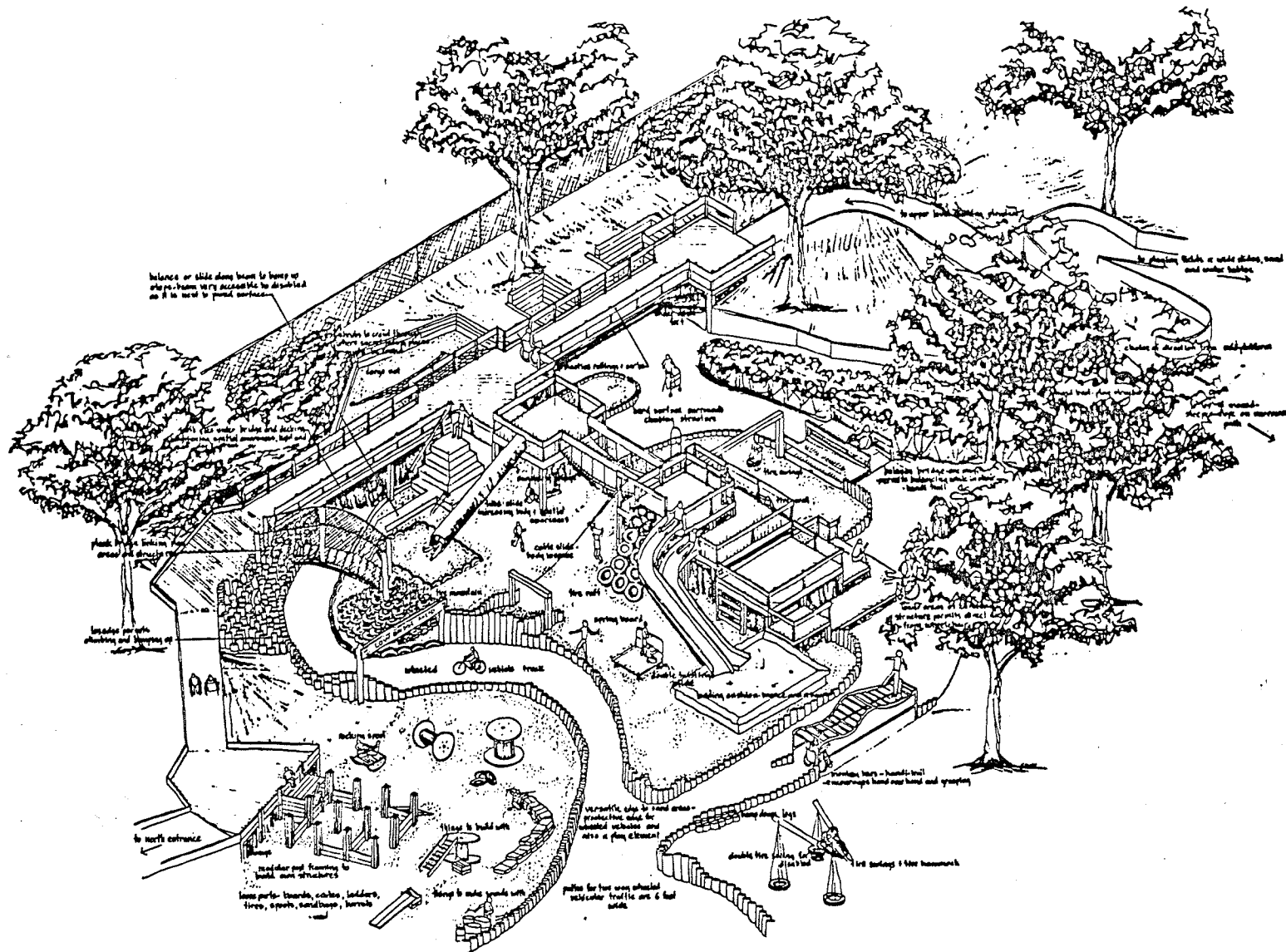
A PRACTICUM by JAMES MELVIN
MEMBER OF AMERICAN ARCHITECTS
 SOCIETY OF BRITAIN



LORD ROBERTS ELEMENTARY SCHOOL 'SOUTH YARD DETAIL'

PLAYSPACES TO ACCOMMODATE DISABLED CHILDREN

A PRACTICUM by JAMES MELVIN
 Department of Landscape Architecture
 University of Toronto



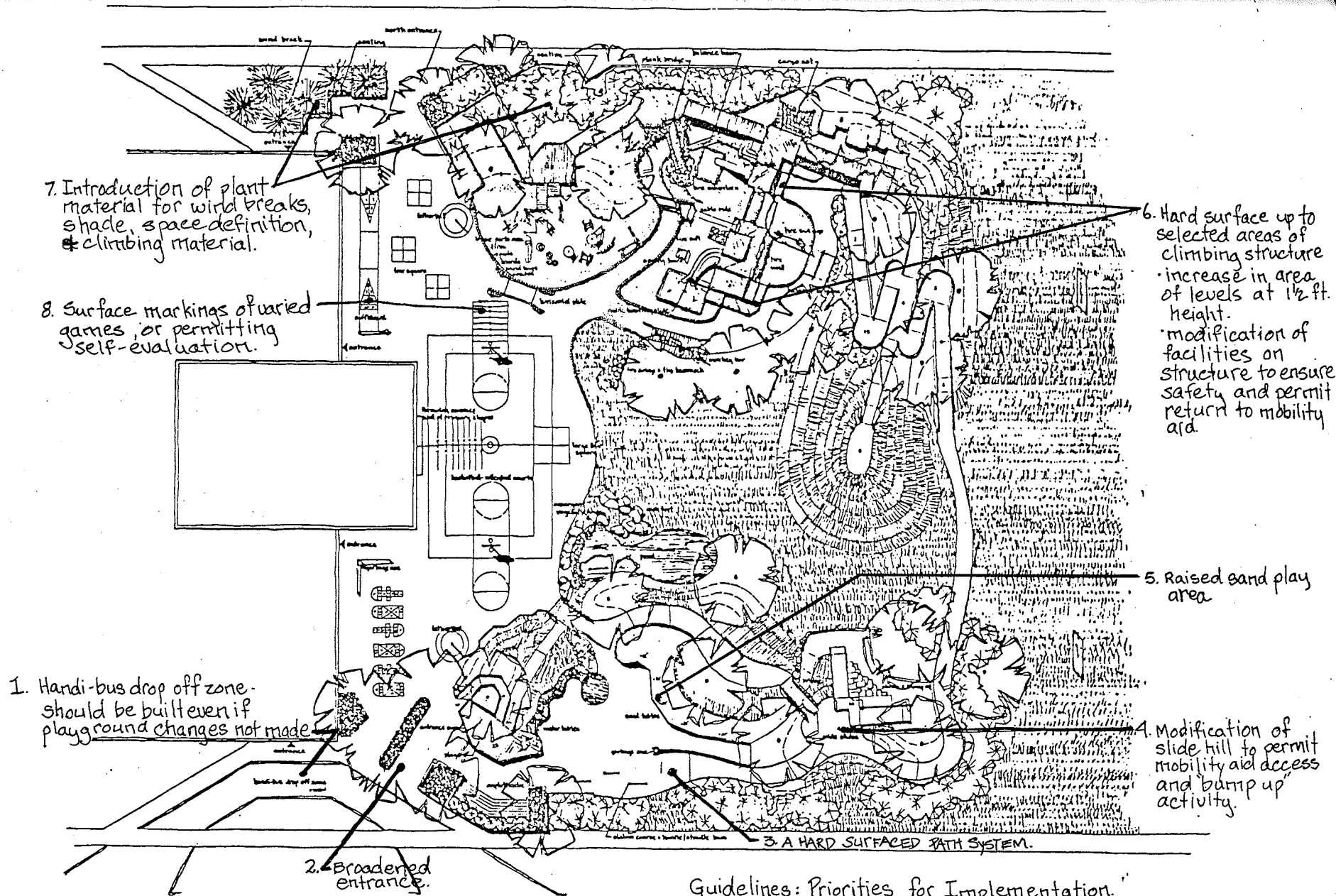
6.6 GUIDELINES: PRIORITIES FOR IMPLEMENTATION

While satisfying the objective of the practicum, the design proposes a viable, innovative playspace to accommodate disabled children. Naturally, it includes a number of elements and changes to enrich the present playspace for all children. However, the success of the playspace does not rely on the exact replication of the play environment as illustrated in the site plan. Rather, a number of priorities or elements can be identified within the design which would alter the existing Lord Roberts play environment in order to accommodate the disabled child.

Those crucial elements of the design which would enable disabled children to use the playspace are as follows:

- 1) The handi-bus drop off zone -- an essential area where the handi-bus can pull completely off the road and drop the disabled children near both an entrance to the school and the primary entrance to the school yard.
- 2) Accompanying the handi-bus drop off zone would be a broadened entrance to the playground. The existing 6 foot opening would be widened to 20 or 25 feet.
- 3) A hard surface path system is vitally important for use of the playspace by disabled children. The path system need not be circuitous initially but rather, should lead to the present facilities of the playground: the slides, climbing structure and sand box.
- 4) Modification of the present wide slide hill, to enable mobility aid access to the slide origin, complete with raised starting platform, handrails and a "bump-up" structure built into the existing hill.
- 5) A raised portion of the sand box area which makes it accessible to disabled children in wheelchairs.
- 6) Accompanying hard surface access to selected areas of the climbing structures should increase the size and number of lower levels (ie. 1 1/2 ft.) which abut the hard surface, permitting transfer from mobility aid to climbing structure. It is not necessary to immediately provide wheeled vehicles access to upper levels, but this should be considered so as to permit participation by severely disabled children. Returning to mobility aids is also considered important in the adaptation of the climbing structure, therefore, curving slides towards the base of the structure or additional "bump-up" facilities and soft landing pads are crucial.
- 7) The introduction of plant material is deemed a priority. Evergreens provide windbreaks while fast growing deciduous trees such as Manitoba maples provide important shade and extra climbing facilities. The addition of plant material can bring about the definition of exterior spaces, dictate movement and add a diversity to the play yard which currently does not exist. Initial plantings need not be large caliper trees. Protected whips which will mature with time can suffice.
- 8) Changes which are not necessarily priorities but rather quick, low-budget adaptations to the present playspace, are the addition of surface markings on the hardtop. Markings for shuffleboard which is useable by the disabled or lines demarcating distance for self-judgement are useful as are painted targets on the vertical surfaces. Lower basketball nets would be more convenient and desirable for all the elementary school children.

The priorities listed are some of the easily introduced adaptations that can make the Lord Roberts playgrounds immediately accessible to the disabled child. The site plan drawing can be viewed as a dynamic product towards which the playspace can evolve.



Guidelines: Priorities for Implementation.

7. Summary and Conclusions

Play is an extremely important aspect in the physical, mental and social growth of a child. A child's welfare and prosperity is directly related to the surrounding environment and his capability to interact intelligently and responsively to it. The playground is one environment not to be overlooked in the development of a child.

All children do not have the same ability to prosper from intense interaction with the environment. A handicapped child is limited in his abilities yet, like normal children, is unlimited in desire. There are many different types and reasons why a child may be handicapped. Mildly handicapped children can usually adjust and enjoy all aspects of modern playgrounds. Others, however are severely restricted in their experiences at playgrounds, not because they lack initiative, but rather it is too frustrating or dangerous to try and adapt to the facilities that were designed without them in mind.

The practicum has presented guidelines for the design of playground facilities for handicapped children. The guidelines reflect those elements to be considered in the selection of a site for a playground accommodating disabled children; the use of materials and the planning of the playsite along with the design of specific elements which may comprise the play environment.

While there are many types of play environments and also a great number of disabilities that can afflict children, this practicum has dealt primarily with the design of an integrated free play environment for both able-bodied and disabled children. The physically handicapped child who is non-ambulatory or semi-ambulatory constituted the primary focus for the design.

Lord Roberts Elementary School presented itself as an ideal location for an exemplary design. It is the only elementary school in Winnipeg offering the normalization program for the physically handicapped child. The existing playground offered the opportunity to illustrate both the design of facilities for integrated play, and the adaptation of existing facilities to accommodate the disabled child.

The free play environment was proposed so that the disabled child could learn how to use the facilities during school hours while, if necessary, assistance could be given from teachers or therapists. During post-school hours or weekends the disabled child could return with peers, brothers, sisters, or parents to experience the play environment. Thus, the operation of the playground and subsequent use by disabled children would not be dictated by the hours of supervision. In the summer months the integrated playground would be a valuable addition to the leisure adaptive play program offered by the City of Winnipeg Parks and Recreation Department.

The design illustrates how playground facilities can be adapted to include the combined play of able-bodied and disabled children with not a reduction but an increase in the richness and variety of the play environment. A play environment accommodating the handicapped child should be stimulating, imaginative and creative for the able child; a playspace for handicapped children is a playspace for all children.

Appendix

The following page is a partial list of common poisonous plants which may be harmful or fatal to children. The list is a reprint from Family Safety Magazine, redistributed by CBC Public Relations, Winnipeg, Manitoba. For a more complete list and information, please refer to Hardin, James W. and Jay M. Areana, Human Poisoning from Native and Cultivated Plants.

COMMON POISONOUS PLANTS

HOUSE PLANTS

Toxic Part	Symptoms
Bulbs	Nausea, vomiting, diarrhea. May be fatal.
Leaves, Branches	Extremely poisonous. Affects the heart, produces severe digestive upset and has caused death.
Leaves	Fatal. One leaf can kill a child.
All parts	Intense burning and irritation of the mouth and tongue. Death can occur if base of the tongue swells enough to block the air passage of the throat.
Seeds	Fatal. A single rosary pea seed has caused death. One or two castor bean seeds are near the lethal dose for adults.
Berries	Fatal. Both children and adults have died from eating the berries.

FLOWER GARDEN PLANTS

Young plant, Seeds	Digestive upset, nervous excitement, depression. May be fatal.
Fleshy roots	Digestive upset and nervous excitement.
Bulbs	Vomiting and nervous excitement.
Leaves, Flowers	Irregular heart beat and pulse, usually accompanied by digestive upset and mental confusion.
Underground stems	Severe, but not usually serious, digestive upset.
Leaves	One of the sources of the drug digitalis, used to stimulate the heart. In large amounts, the active principles cause dangerously irregular heartbeat and pulse, usually digestive upset and mental confusion. May be fatal.
Foliage, Roots	May be poisonous in large amounts. Has proved fatal to cattle.

VEGETABLE GARDEN PLANTS

Leaf blade	Fatal. Large amounts of raw or cooked leaves can cause convulsions, coma, followed rapidly by death.
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ORNAMENTAL PLANTS

Berries	Fatal. A few berries can kill a child.
Seeds, Pods	Mild to severe digestive upset. Many children are poisoned by this plant.
Bean-like capsules in which the seeds are suspended	Severe poisoning. Excitement, staggering, convulsions and coma. May be fatal.

Plant	Toxic Part	Symptoms
Laurels, Rhododendron, Azaleas	All parts	Fatal. Produces nausea and vomiting, depression, difficult breathing, prostration and coma.
Jessamine	Berries	Fatal. Digestive disturbance and nervous symptoms.
Lantana camara (red sage)	Green berries	Fatal. Affects lungs, kidneys, heart and nervous system. Grows in the southern U.S. and in moderate climates.
Yew	Berries, Foliage	Fatal. Foliage more toxic than berries. Death is usually sudden without warning symptoms.

TREES AND SHRUBS

Wild and cultivated cherries	Twigs, Foliage	Fatal. Contains a compound that releases cyanide when eaten. Gasping, excitement, and prostration are common symptoms that often appear within minutes.
Oaks	Foliage, Acorns	Affects kidneys gradually. Symptoms appear only after several days or weeks. Takes a large amount for poisoning. Children should not be allowed to chew on acorns.
Elderberry	Shoots, Leaves, Bark	Children have been poisoned by using pieces of the pithy stems for blowguns. Nausea and digestive upset.
Black locust	Bark, sprouts, foliage	Children have suffered nausea, weakness and depression after chewing the bark and seeds.

PLANTS IN WOODED AREAS

Jack-in-the-pulpit	All parts, especially roots	Like dumb cane, contains small needle-like crystals of calcium oxalate that cause intense irritation and burning of the mouth and tongue.
Moonseed	Berries	Blue, purple color, resembling wild grapes. Contains a single seed. (True wild grapes contain several small seeds.) May be fatal.
Mayapple	Apple, foliage, roots	Contains at least 16 active toxic principles, primarily in the roots. Children often eat the apple with no ill effects, but several apples may cause diarrhea.

PLANTS IN SWAMP OR MOIST AREAS

Water hemlock	All parts	Fatal. Violent and painful convulsions. A number of people have died from hemlock.
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PLANTS IN FIELDS

Buttercups	All parts	Irritant juices may severely injure the digestive system.
Nightshade	All parts, especially the unripe berry	Fatal. Intense digestive disturbances and nervous symptoms.
Poison hemlock	All parts	Fatal. Resembles a large wild carrot. Used in ancient Greece to kill condemned prisoners.
Jimson weed (thorn apple)	All parts	Abnormal thirst, distorted sight, delirium, incoherence and coma. Common cause of poisoning. Has proved fatal.

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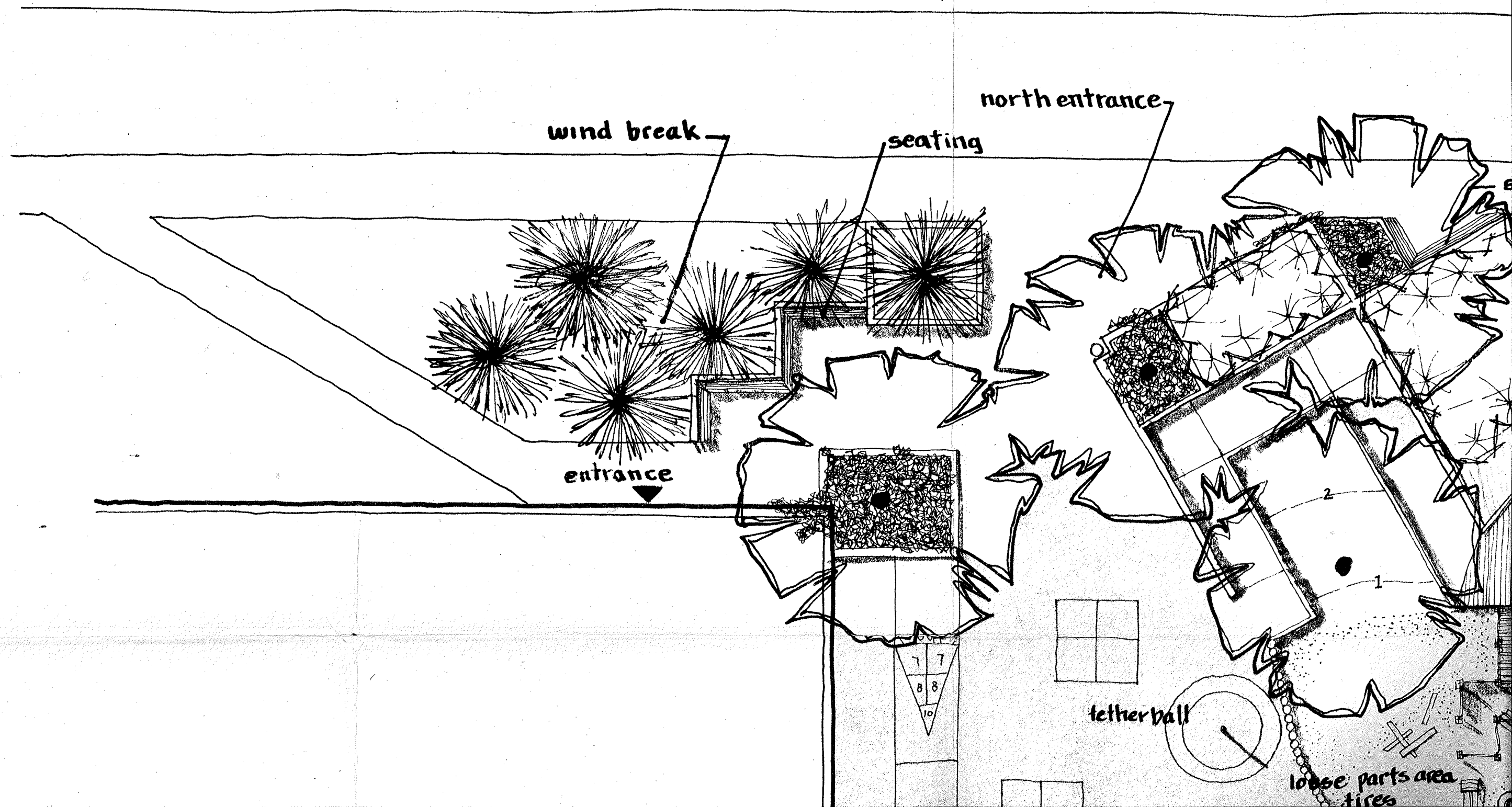
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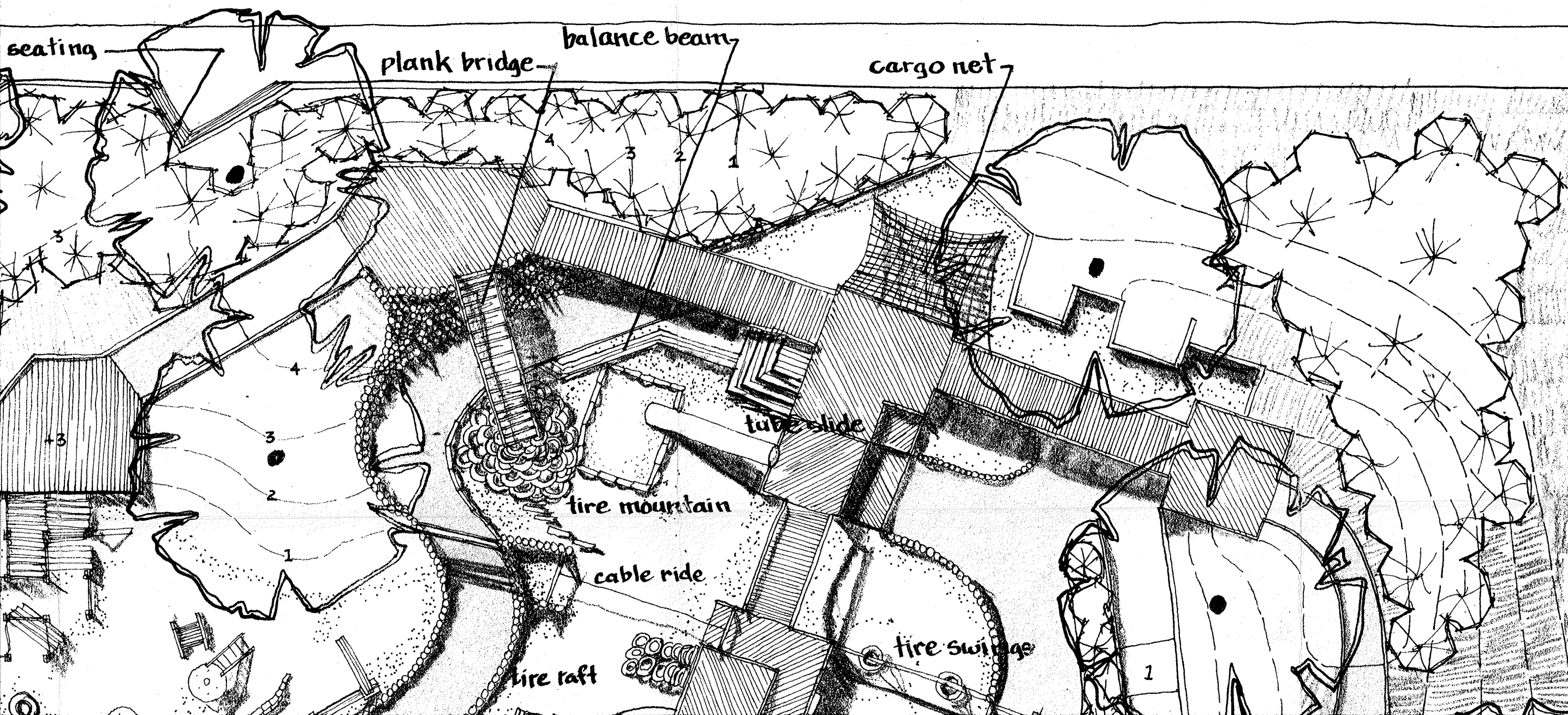
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SITE PLAN





seating

plank bridge

balance beam

cargo net

tube slide

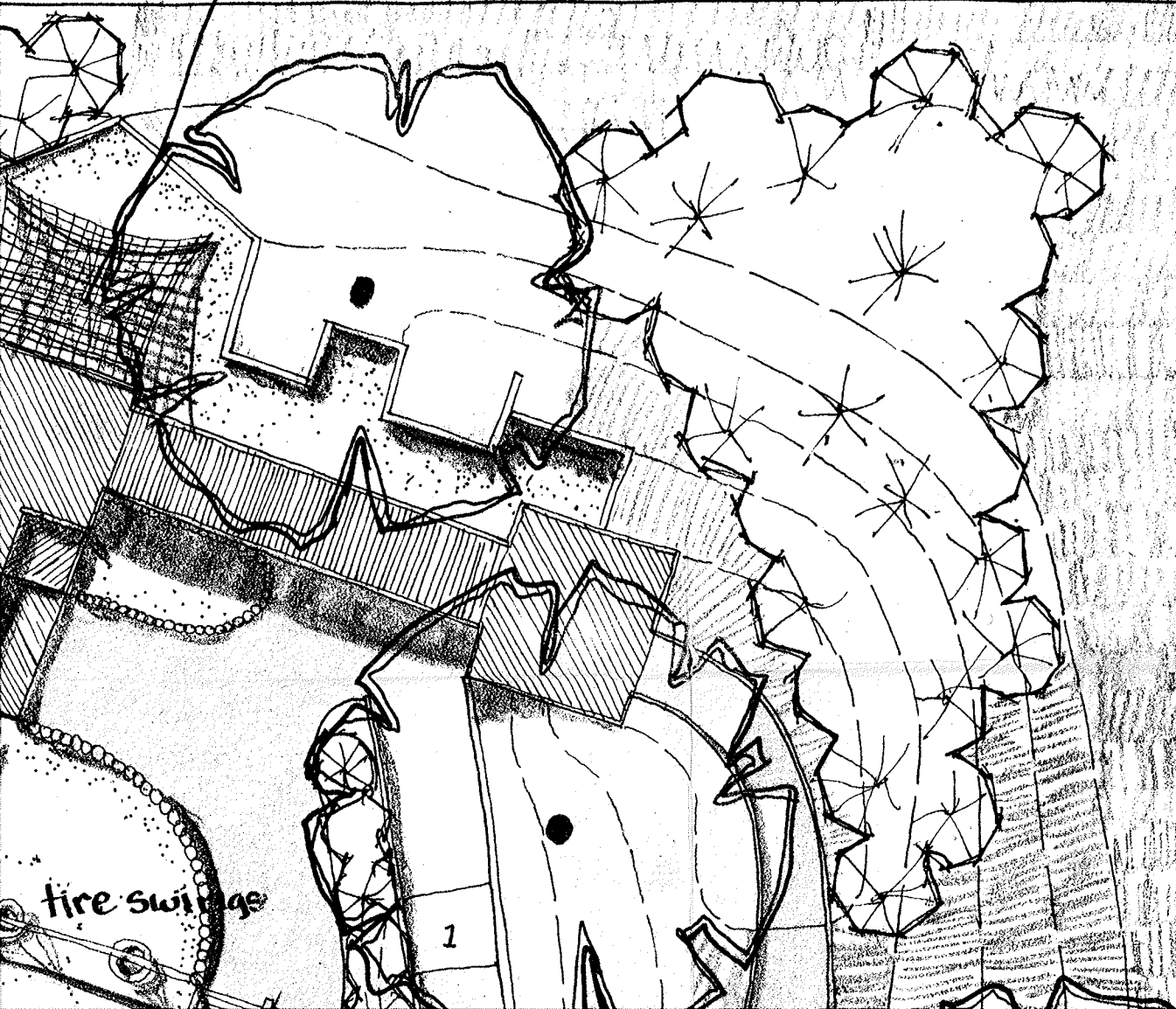
fire mountain

cable ride

fire raft

fire swings

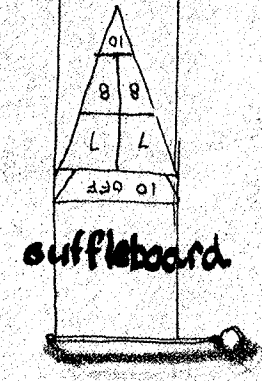
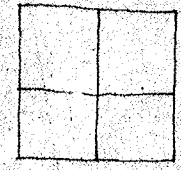
cargo net



fire swing

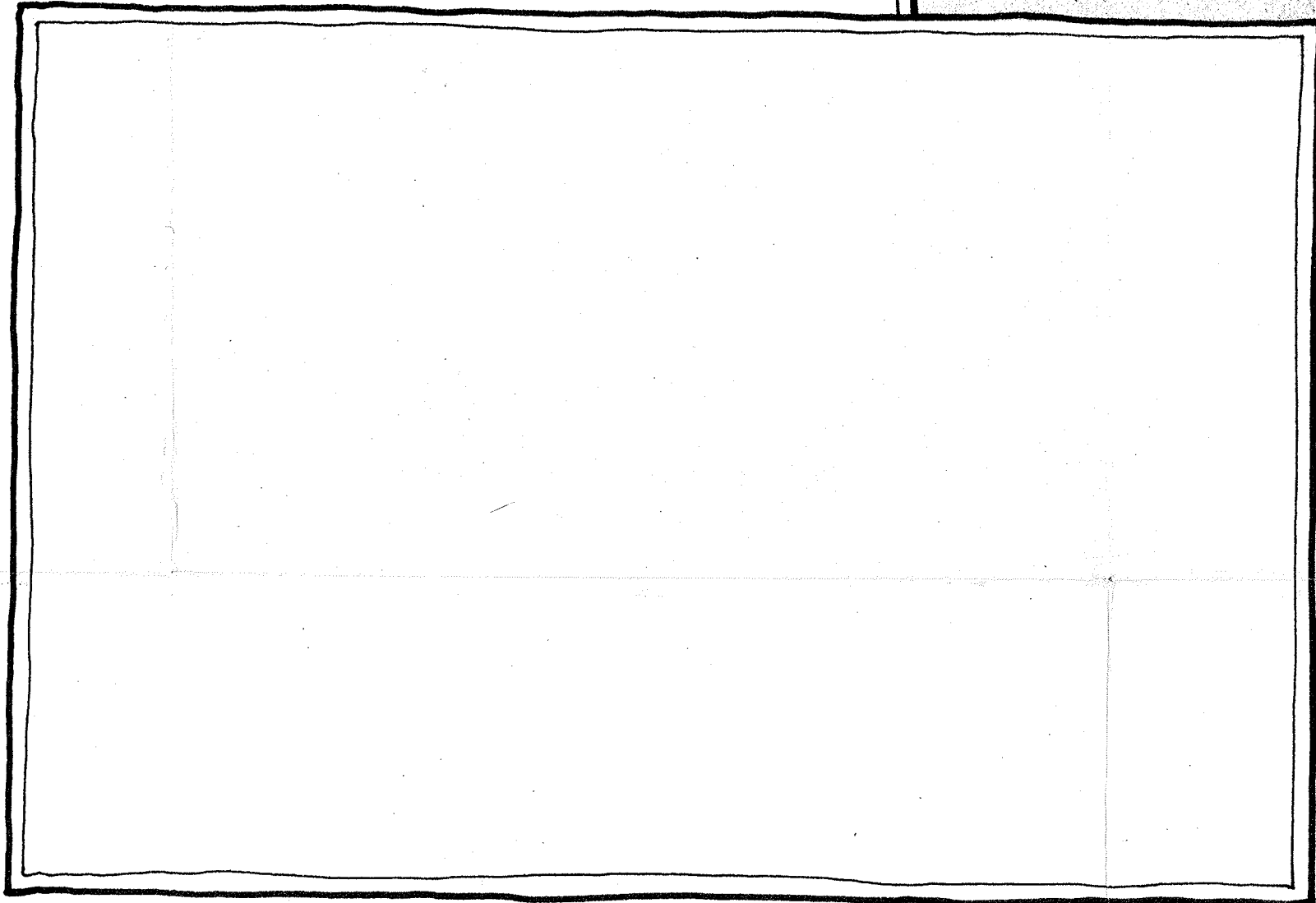
1

four square

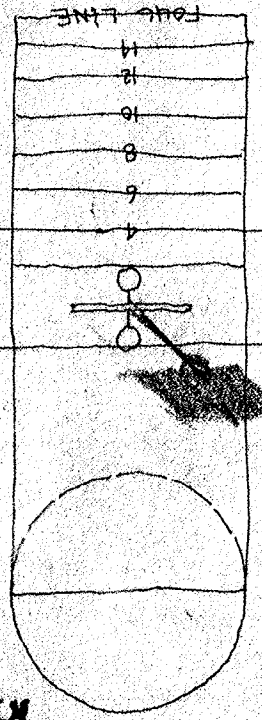
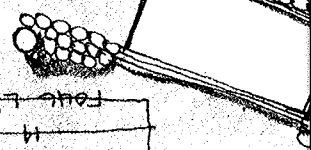


surfboard

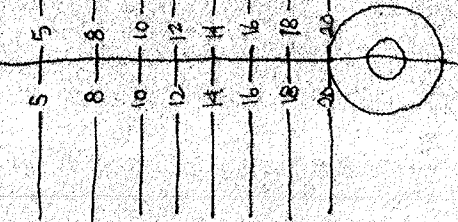
← entrance



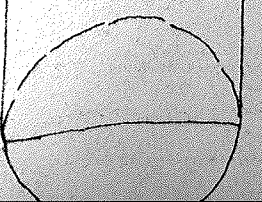
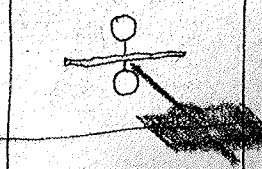
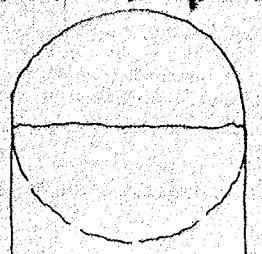
sand bag crates



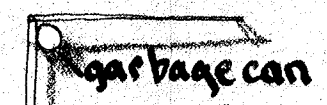
throwing accuracy
wall of primary shapes



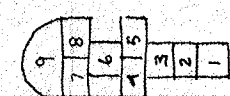
basketball-volleyball courts

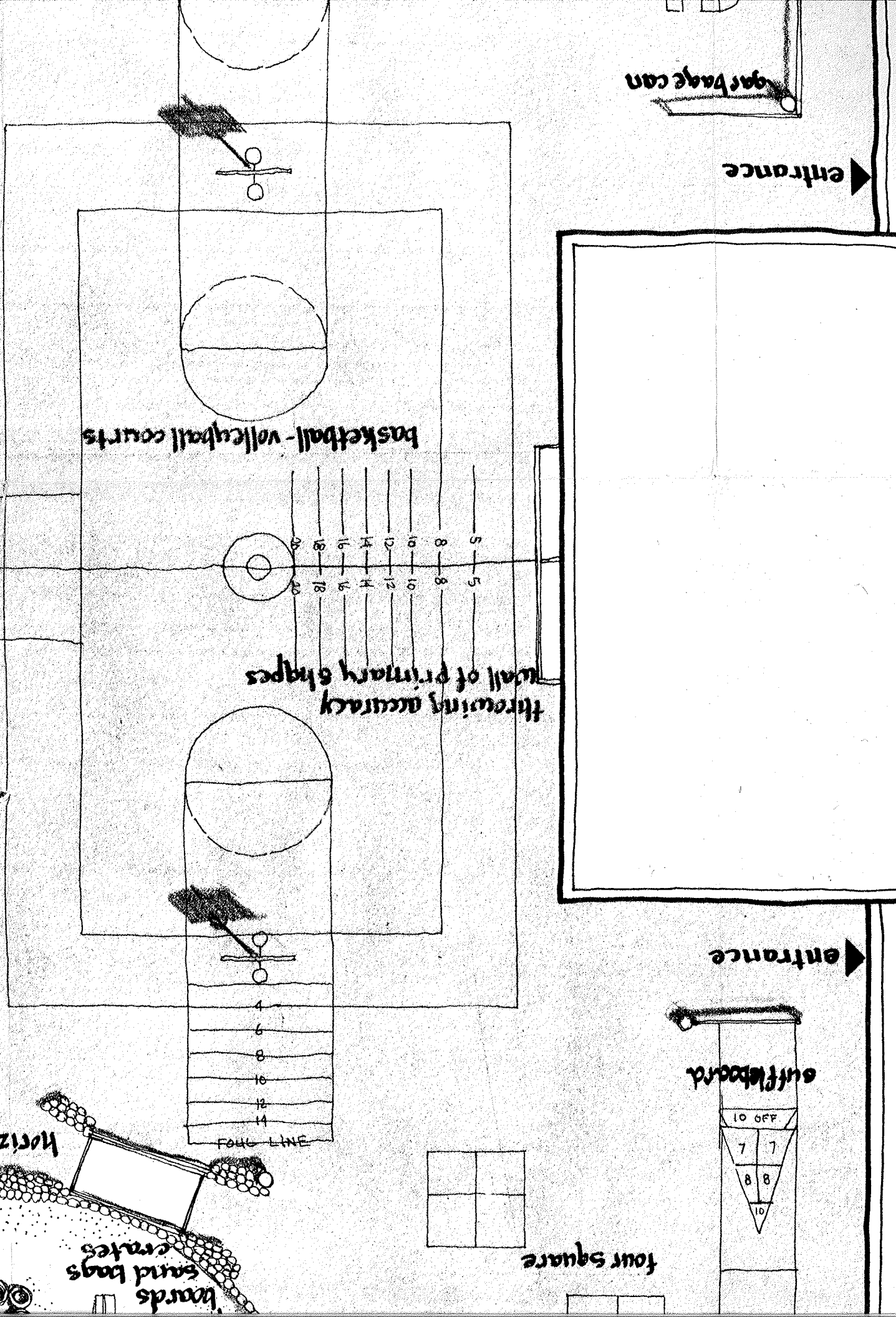
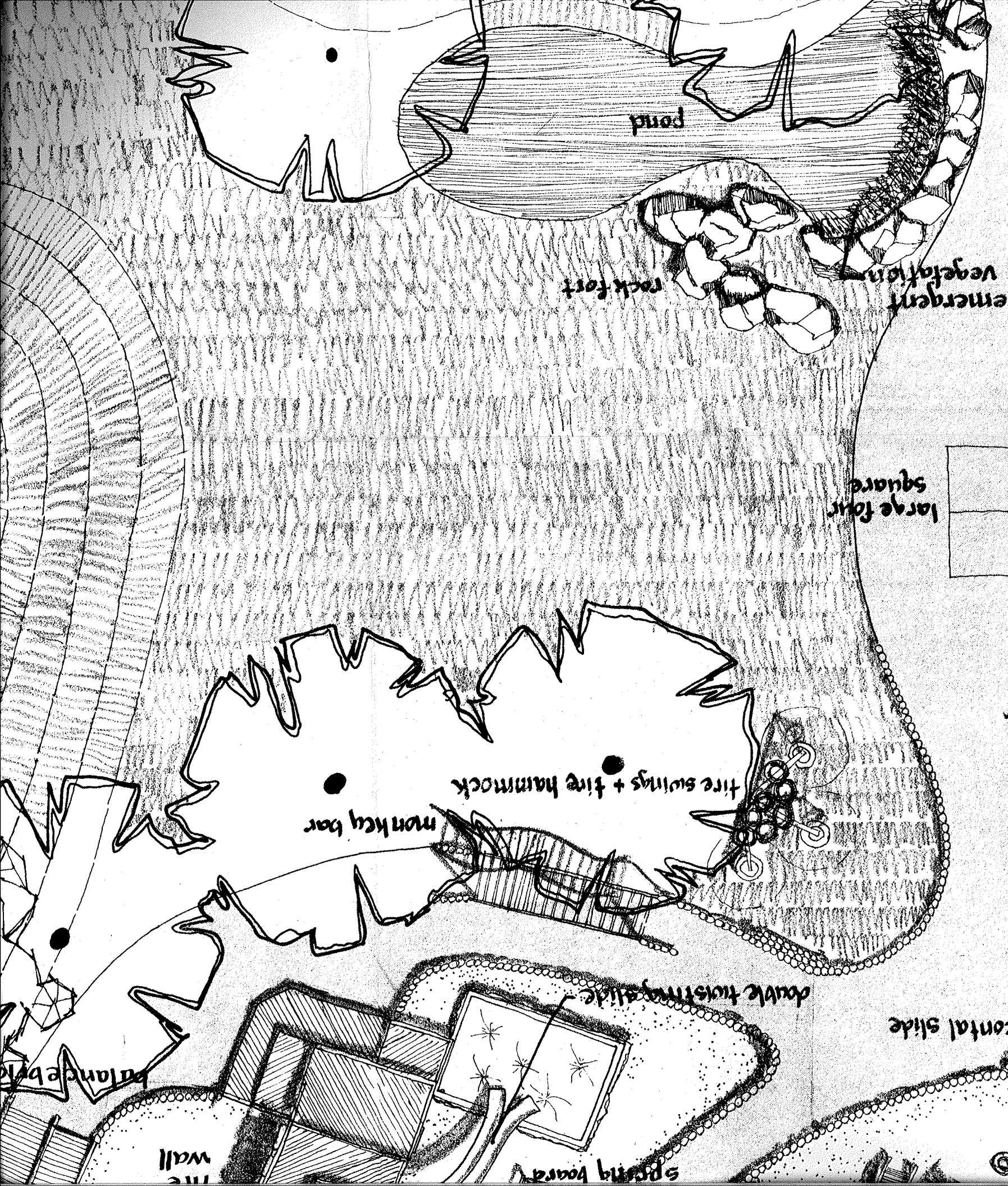


← entrance



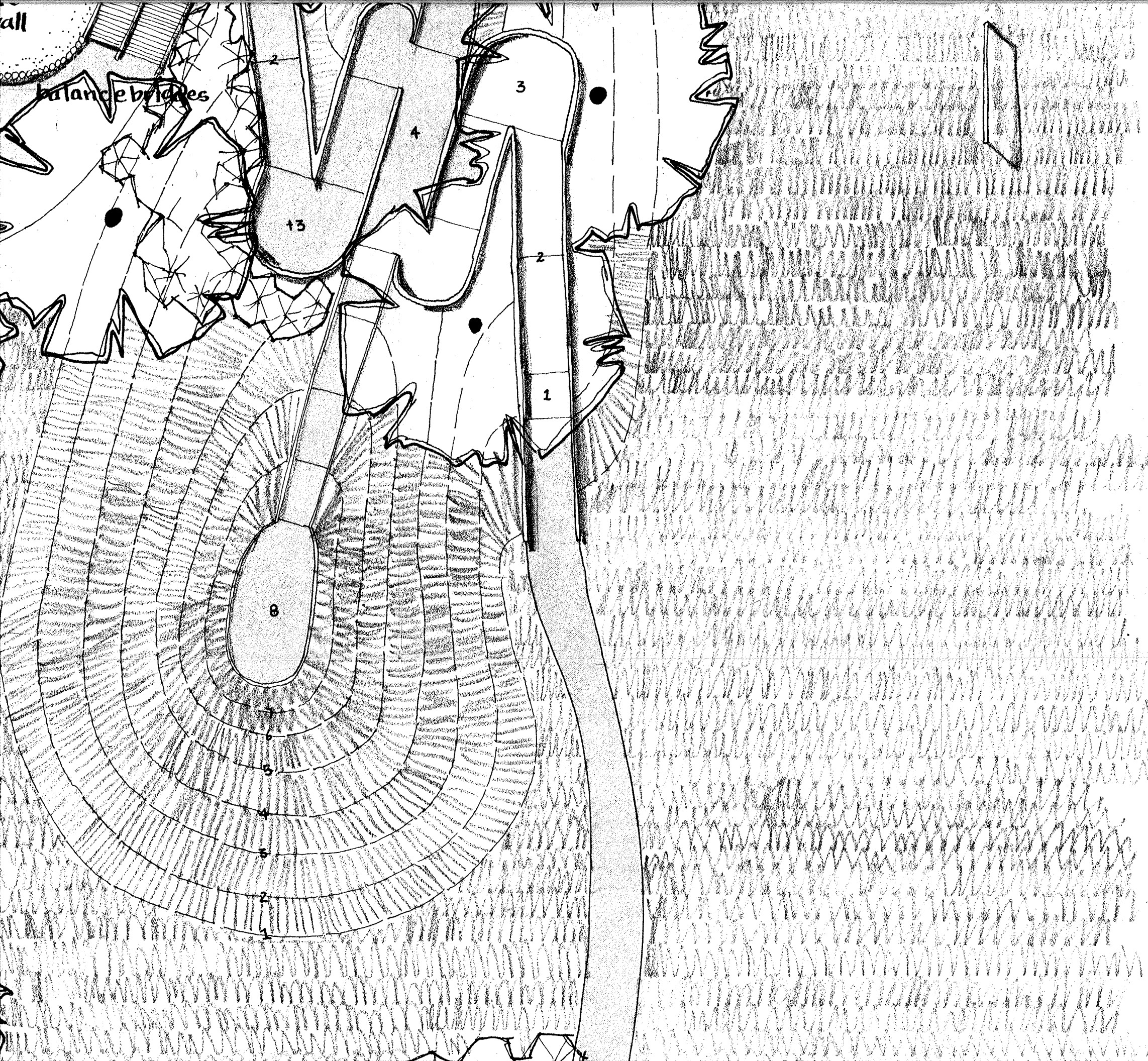
garbage can

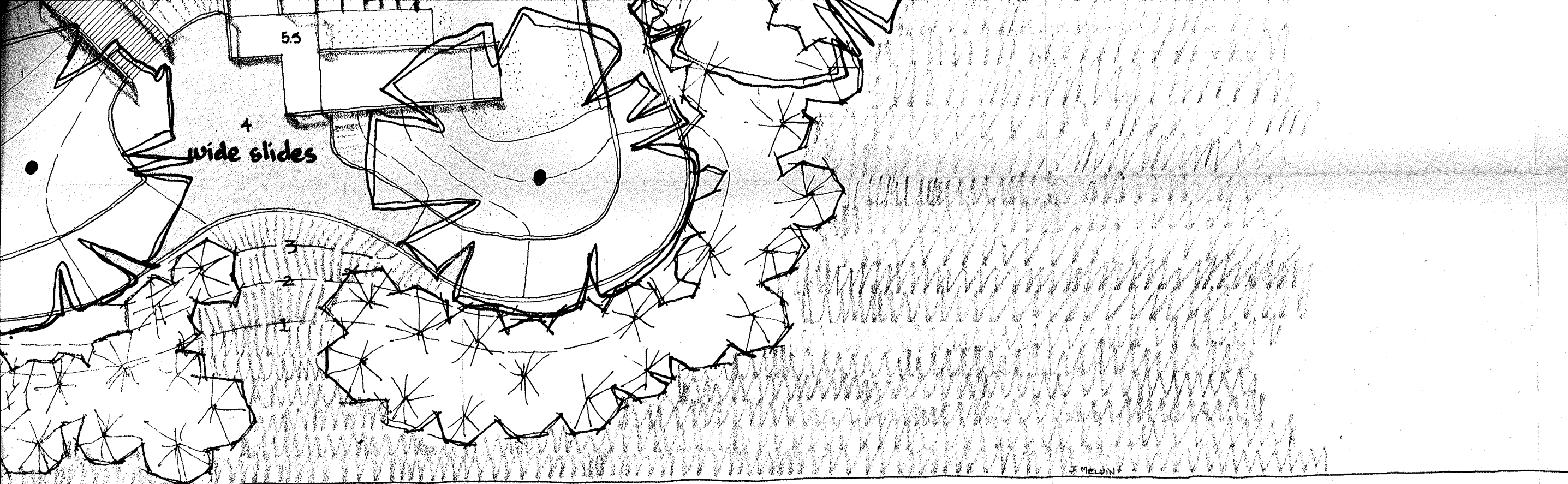




all

balance bridges





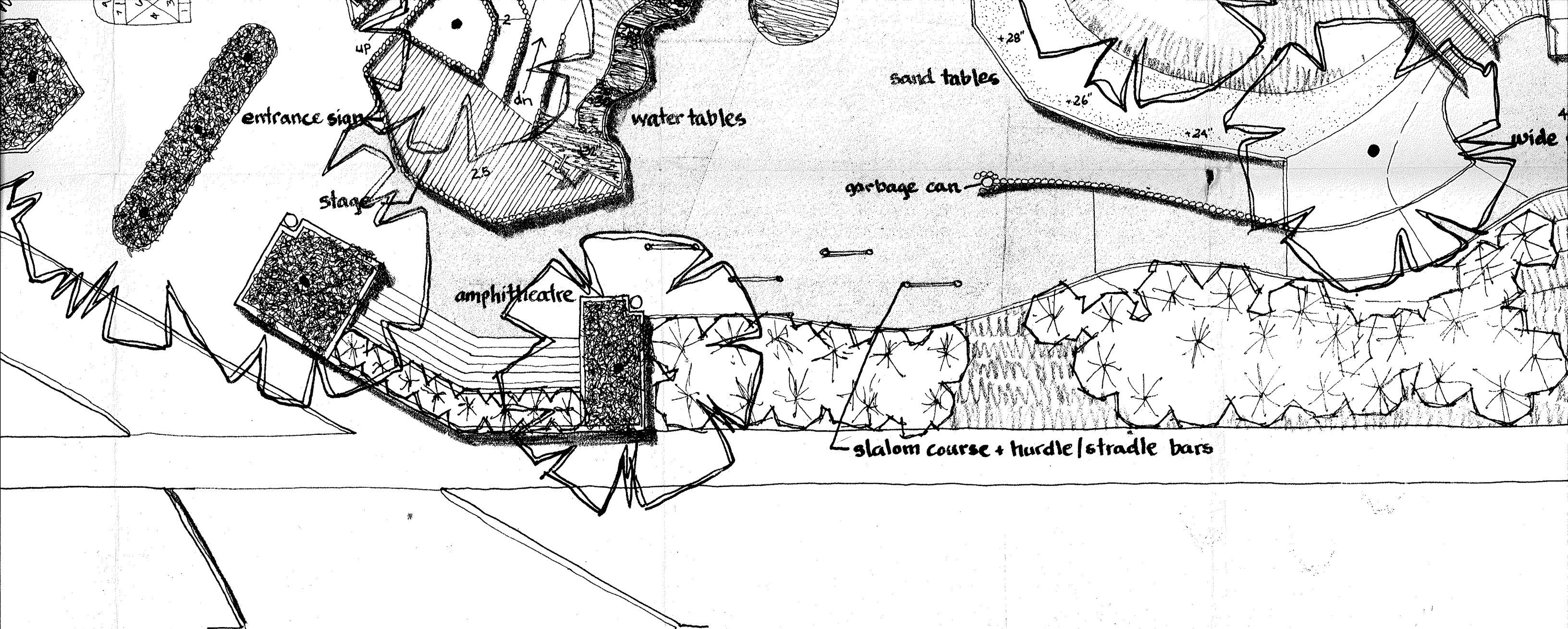
SPACES TO ACCOMMODATE DISABLED CHILDREN

A PRACTICUM by JAMES MELVIN

Department of Landscape Architecture

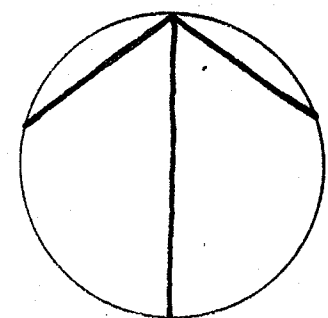
University of Manitoba

1979

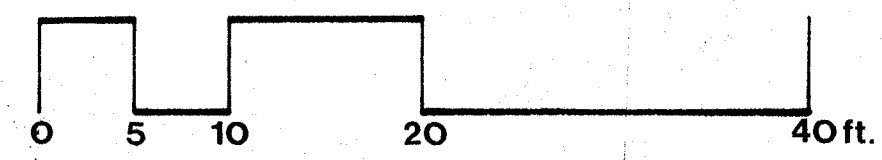


SCHOOL

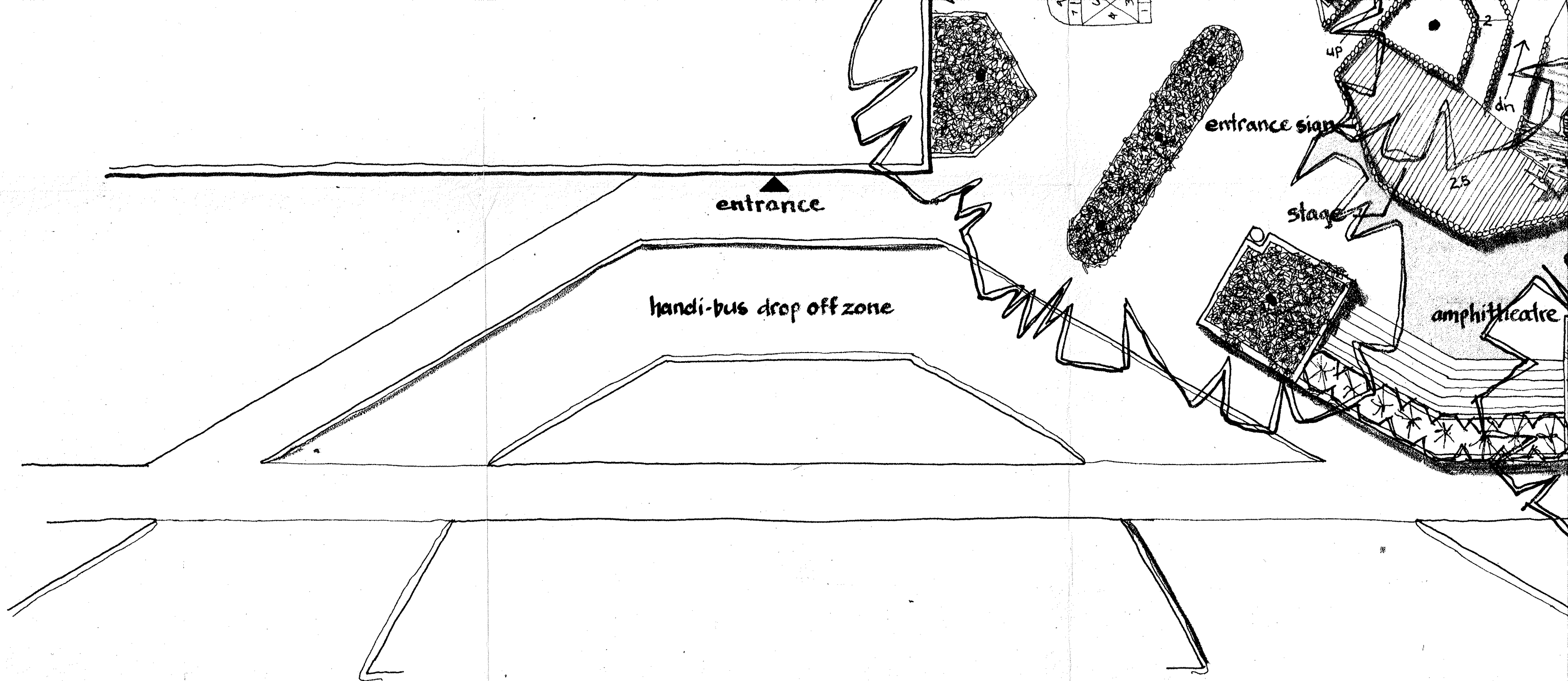
SITE PLAN



scale: 1 inch = 10 feet

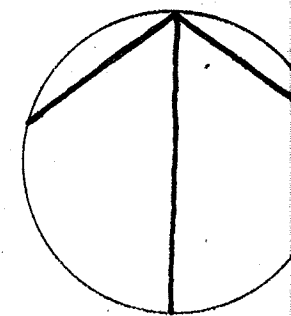


PLAYSPACES



LORD ROBERTS ELEMENTARY SCHOOL

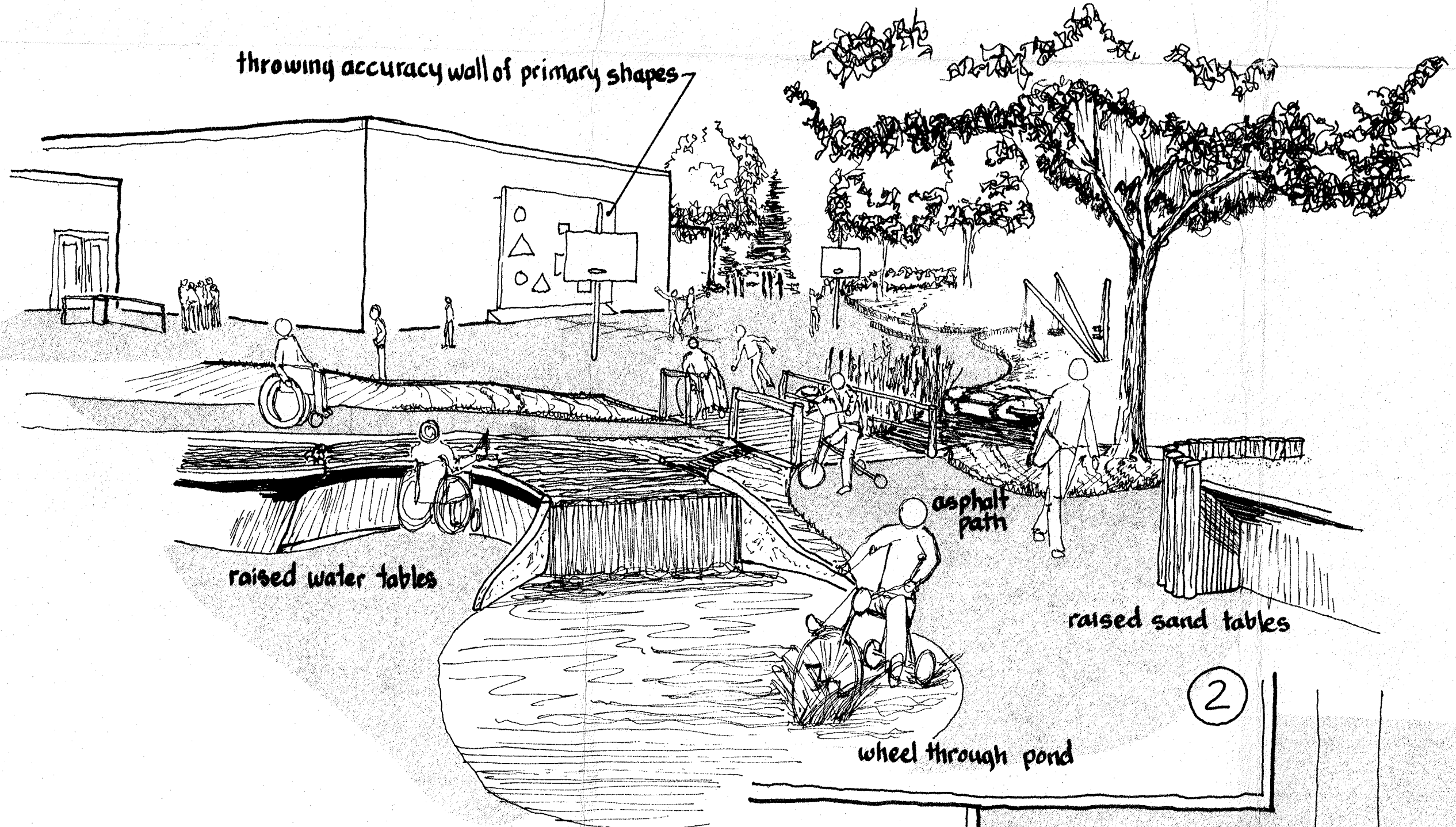
·SITE PLAN·



2

DETAILS: SOUTH YARD ENTRANCE

throwing accuracy wall of primary shapes



raised water tables

asphalt path

raised sand tables

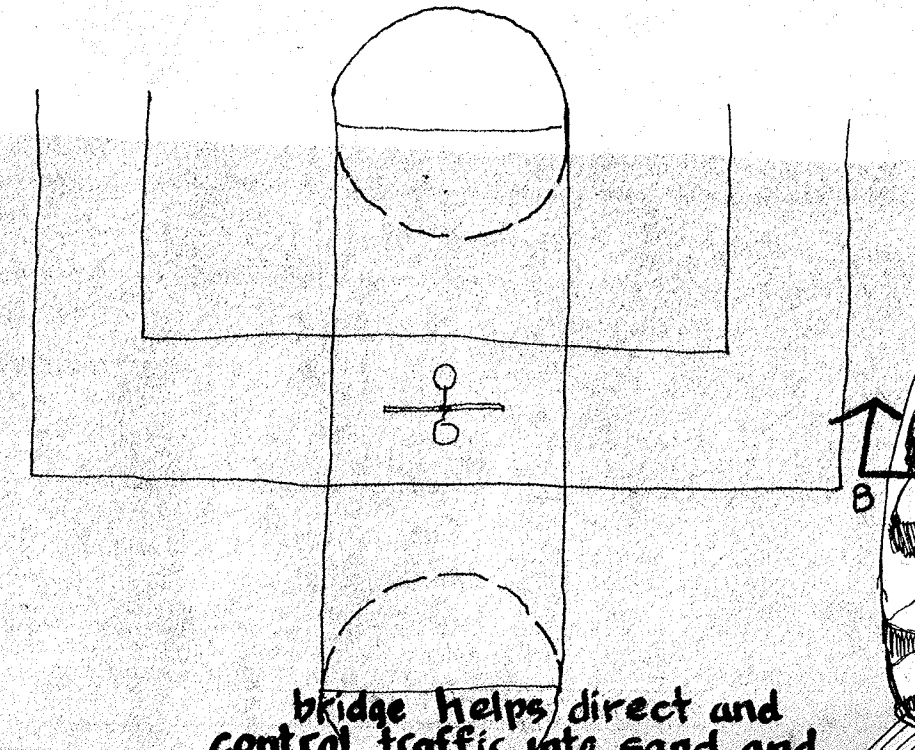
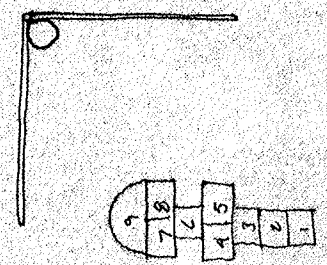
wheel through pond

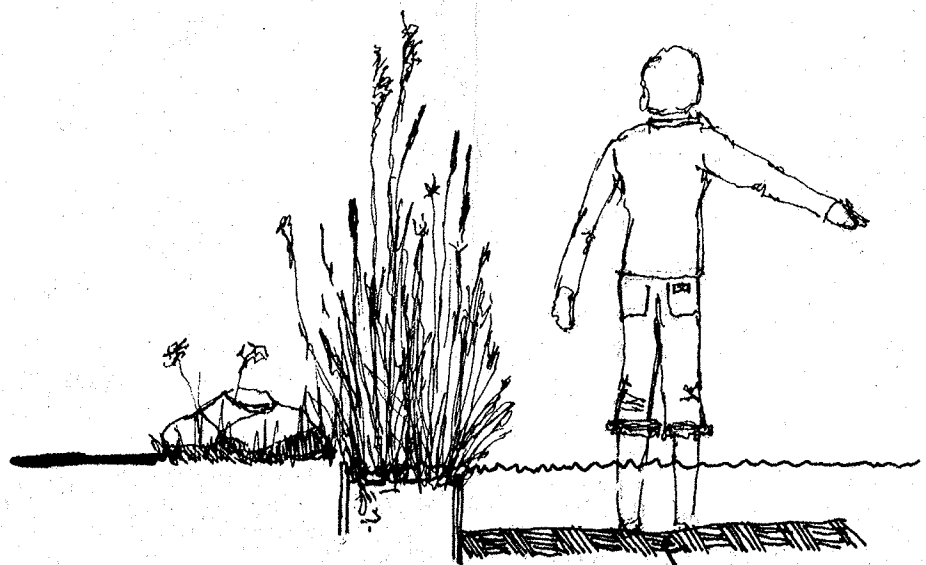
2

emergent vegetation planted planter box

elementary school children - net height - 7'
disabled children - net height 4'-7'

← entrance

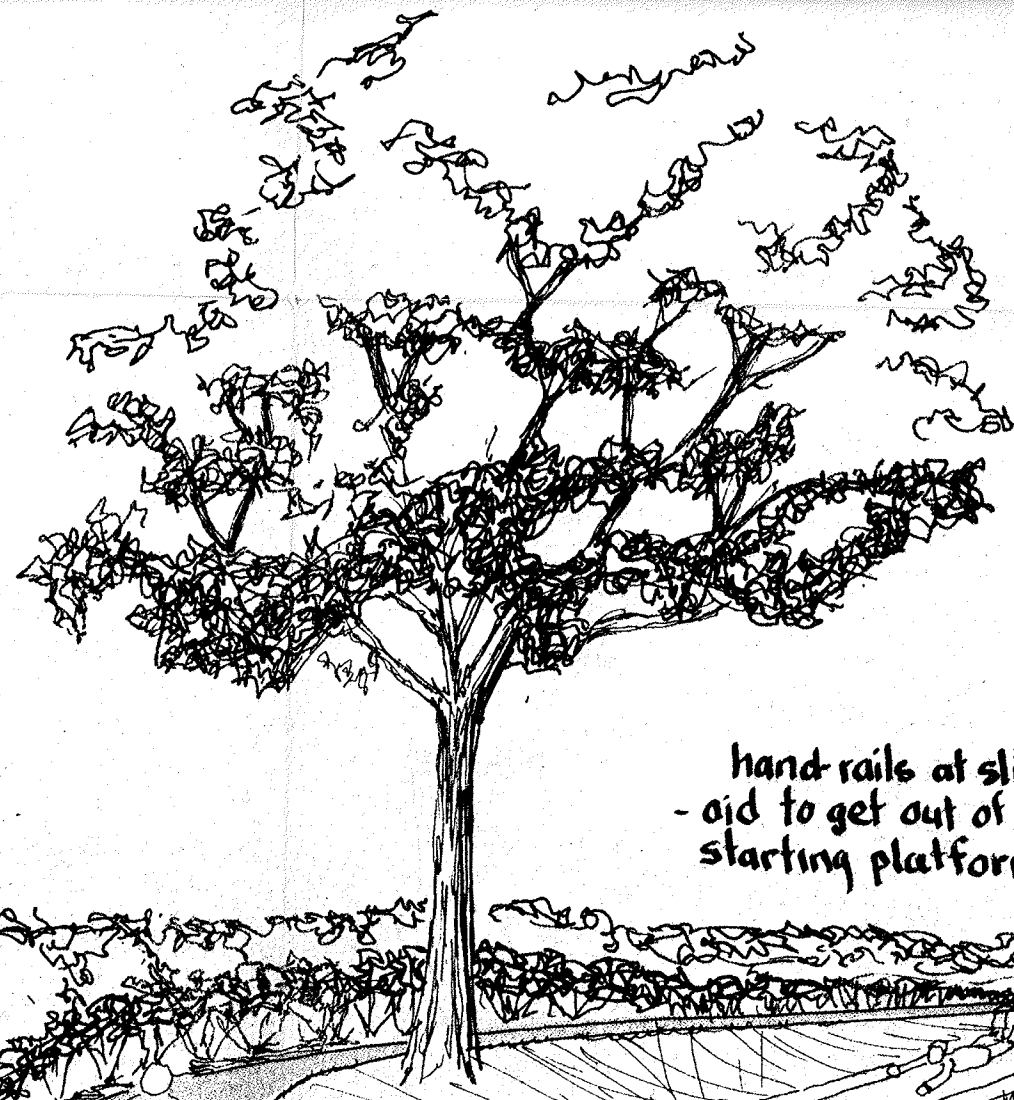




vegetation planted in submerged planter box

compacted clay base and plastic liner

section B scale 1/4" = 1' 0.5 1 3 Ft.

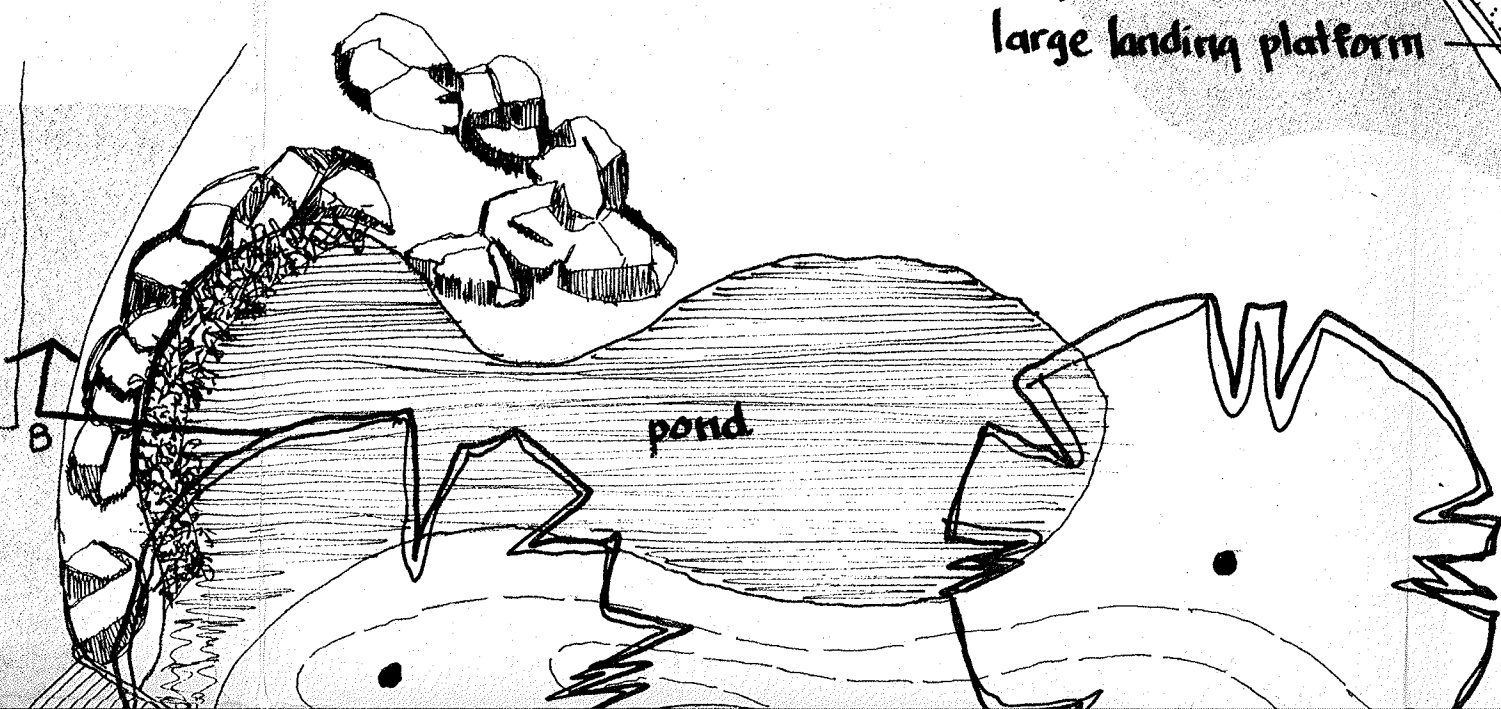


hand rails at slide summit - aid to get out of wheelchair to starting platform

asphalt path 8.33% slope large landing platform

crawl up slope

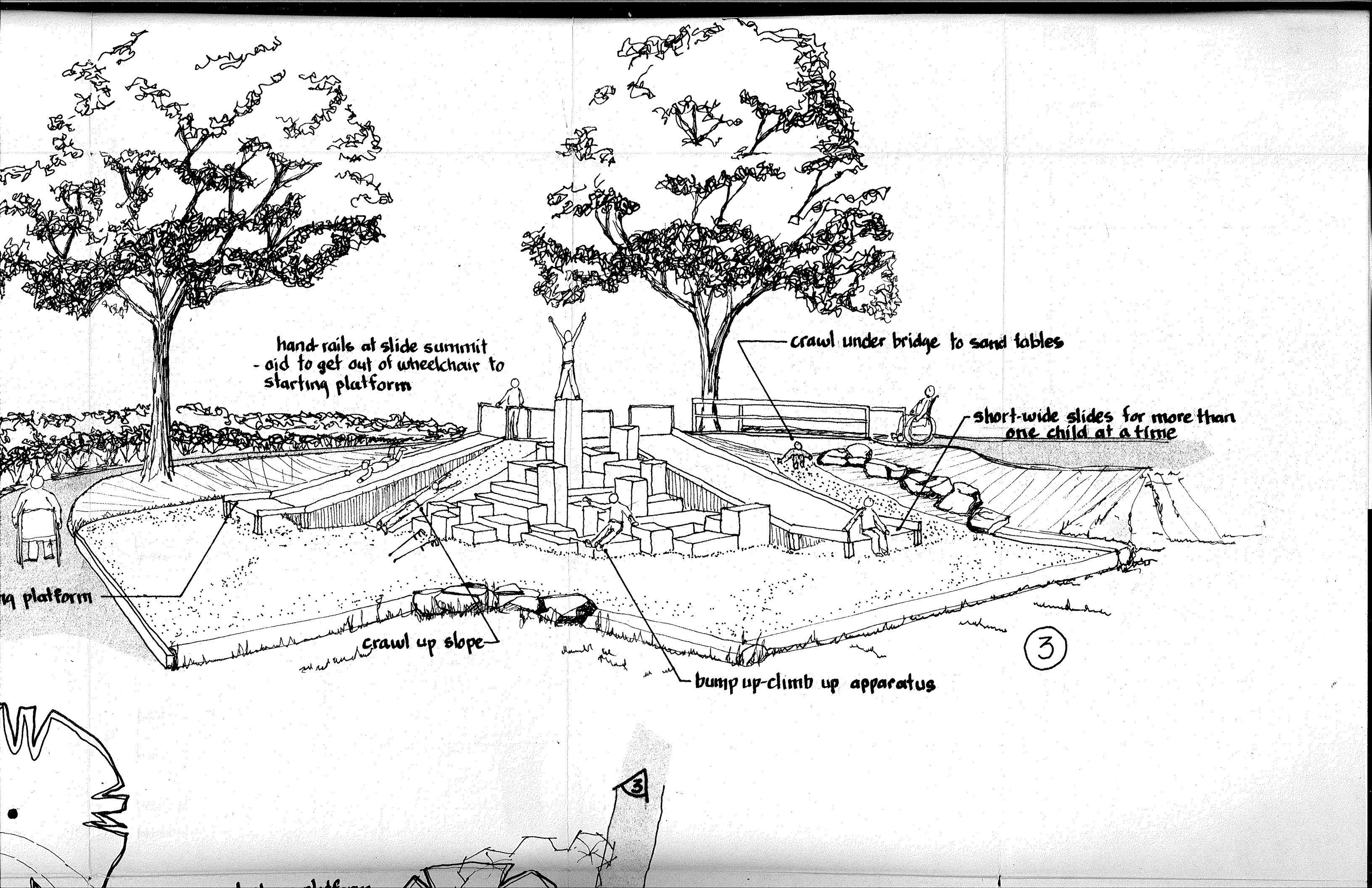
bump up



pond

direct and into sand and





hand rails at slide summit
- aid to get out of wheelchair to
starting platform

crawl under bridge to sand tables

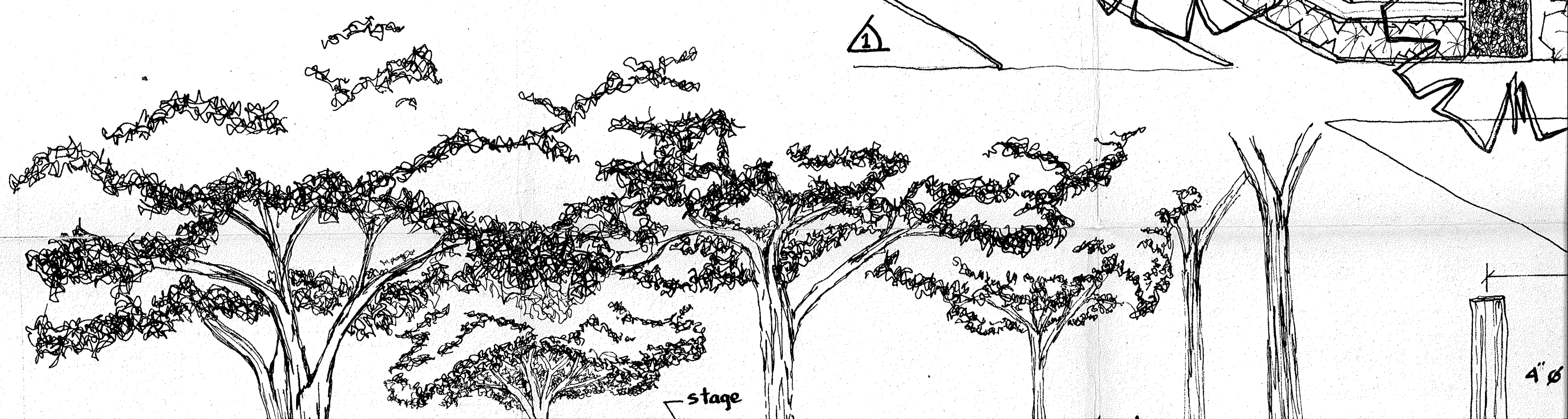
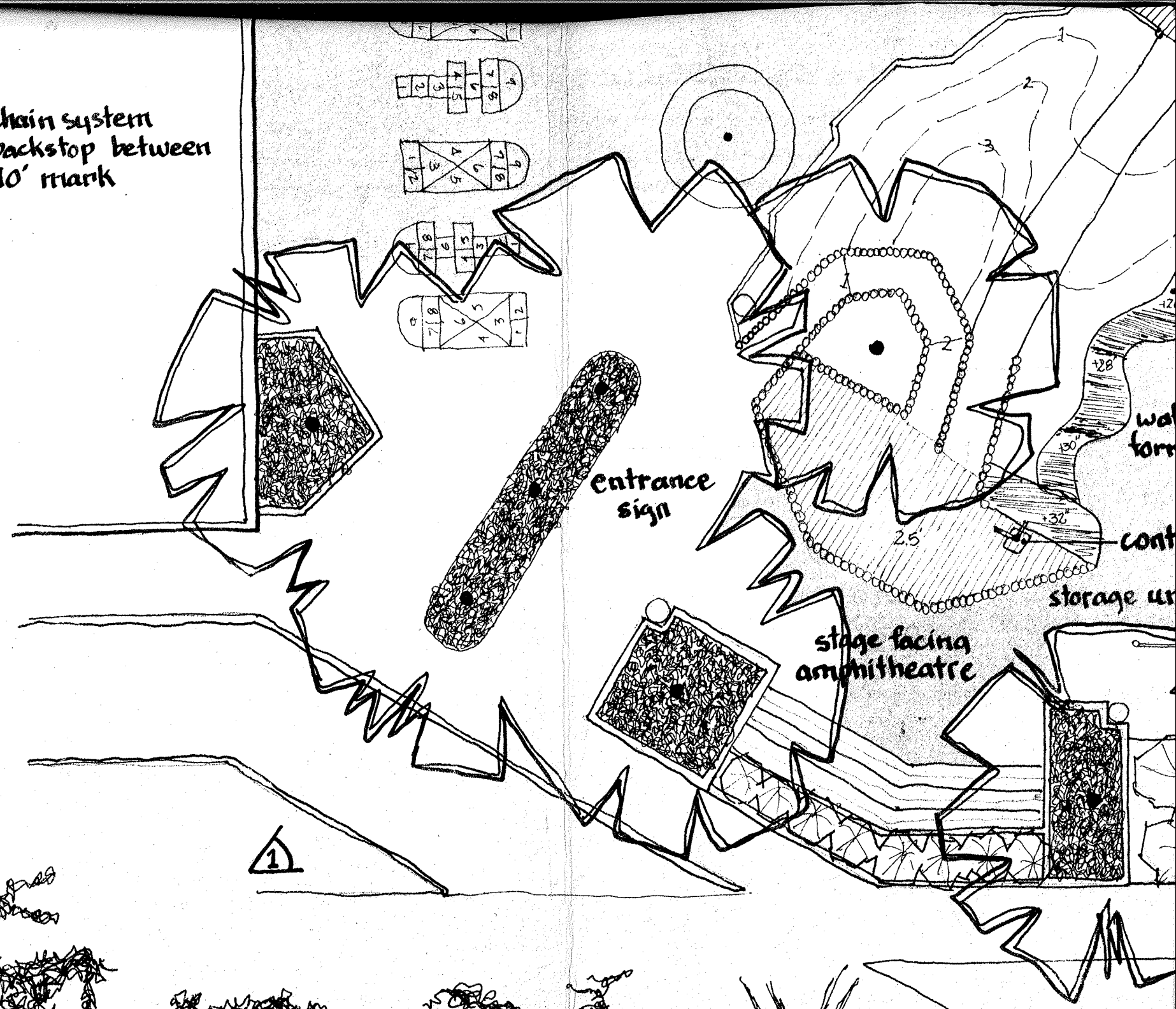
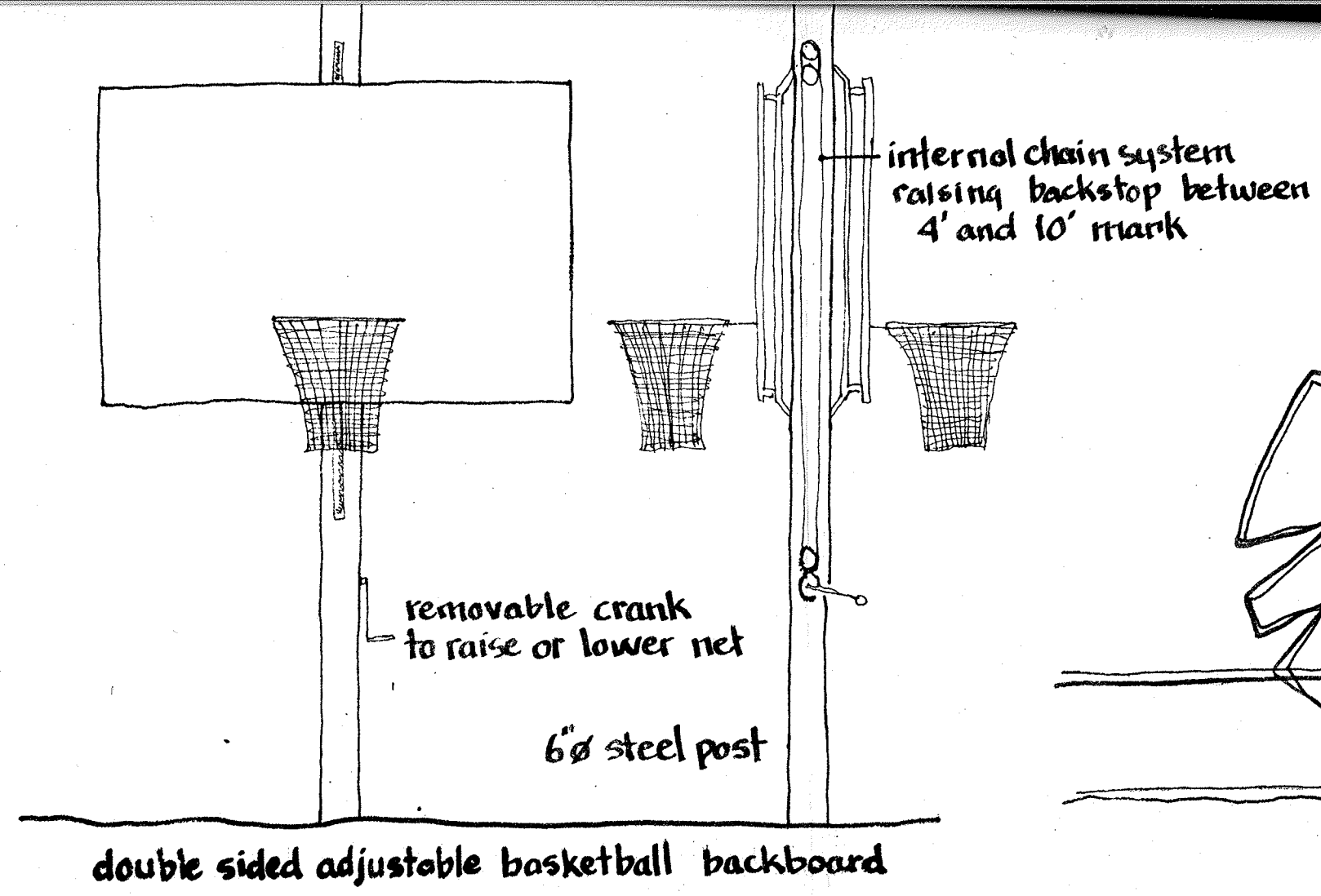
short-wide slides for more than
one child at a time

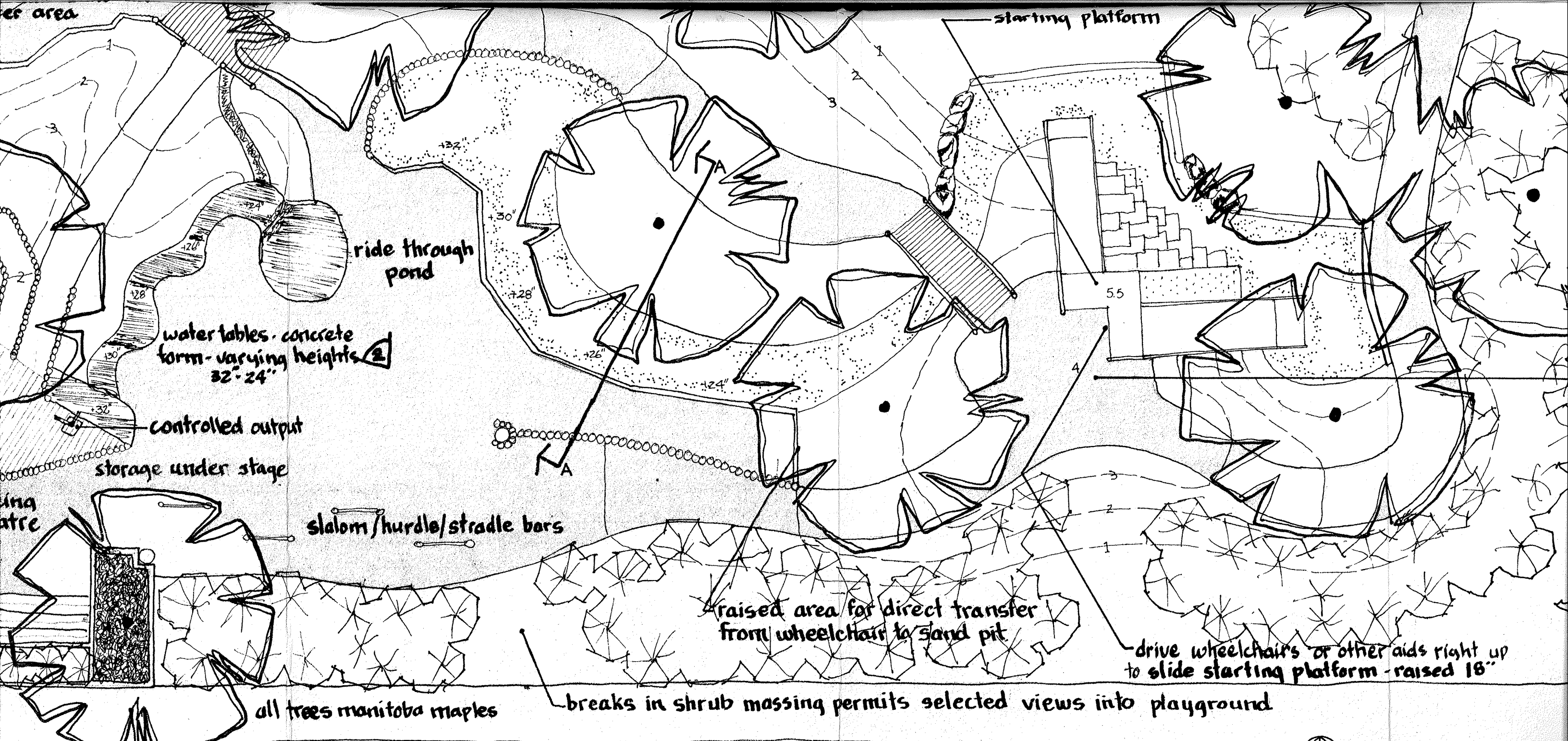
starting platform

crawl up slope

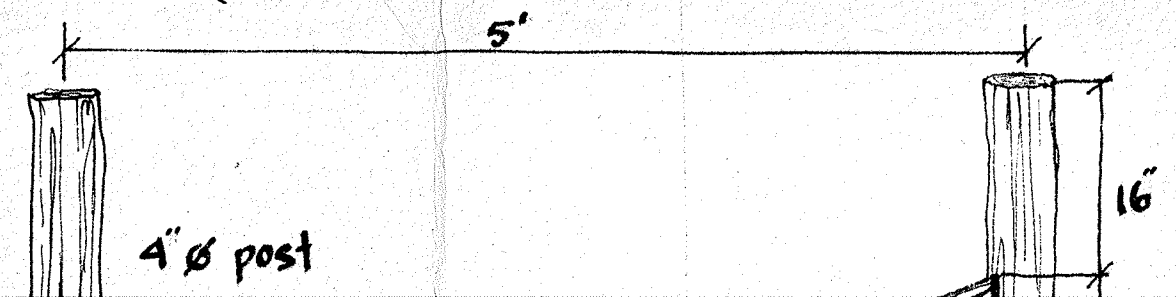
bump up-climb up apparatus

3



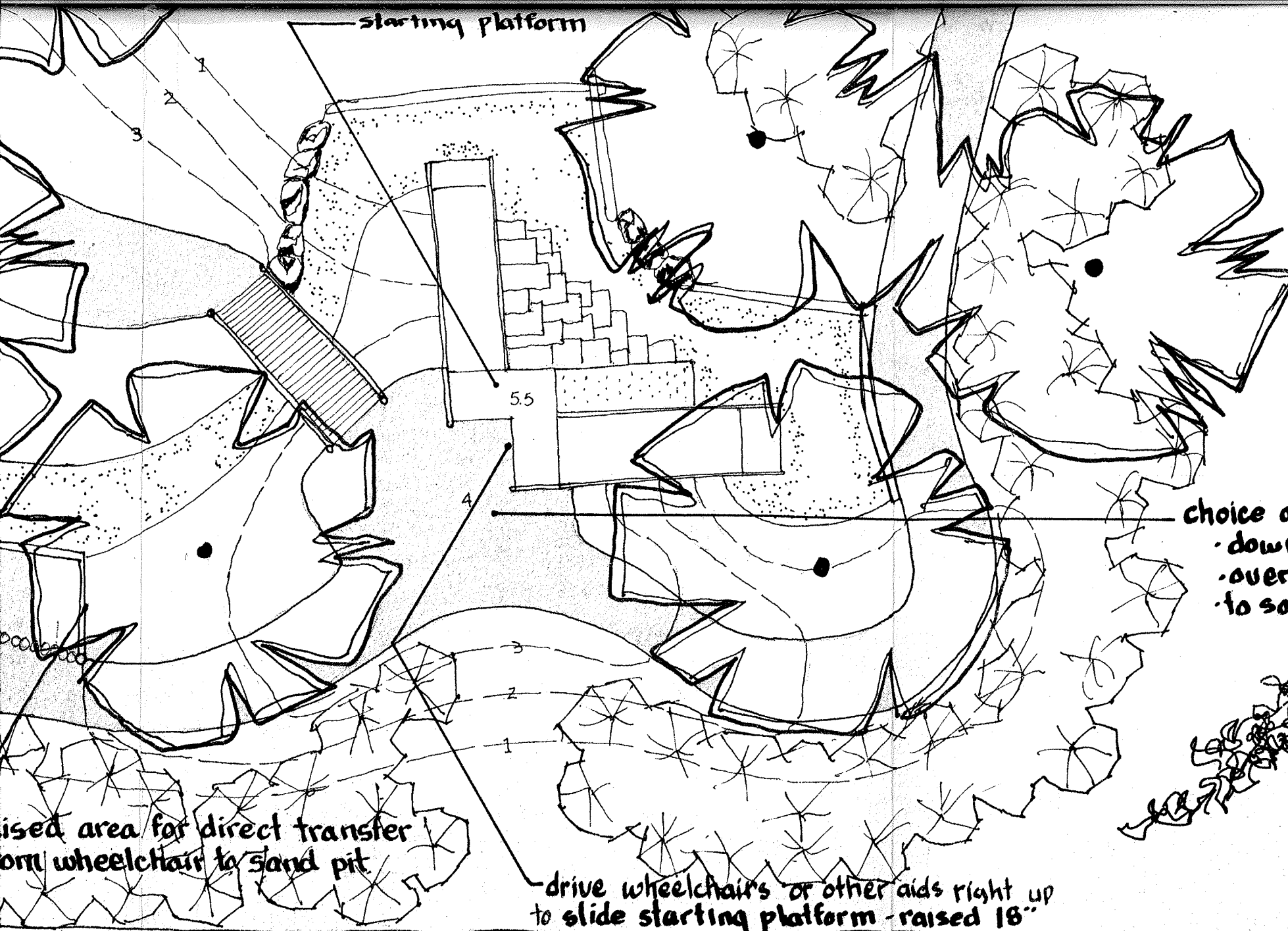


plan · scale · 1" = 10' 0 5 10 20 FT.



post divider between sand tables + through pathways





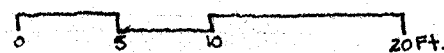
choice of where to go
 · down slide · to large mound
 · over bridge to pond + court sports
 · to south entrance

raised area for direct transfer
 from wheelchair to sand pit

drive wheelchairs or other aids right up
 to slide starting platform - raised 18"

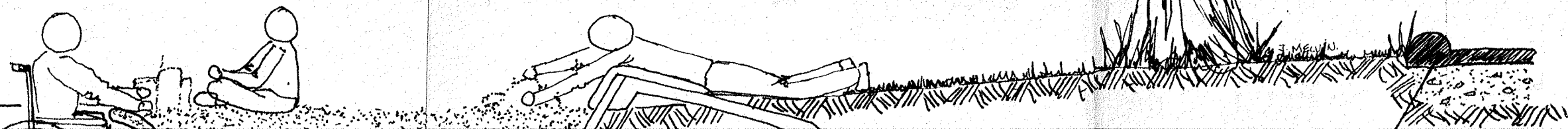
massing permits selected views into playground

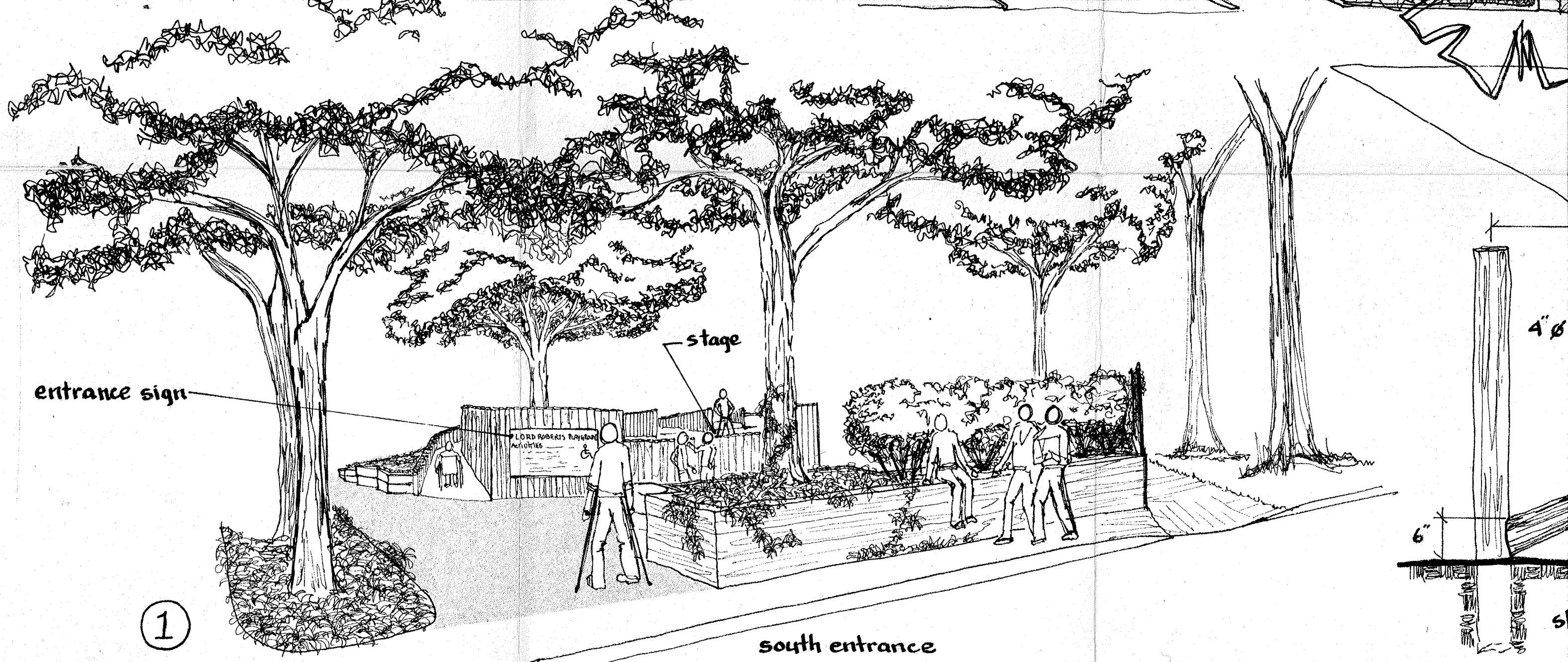
plan · scale · 1" = 10'



shade provided by trees

post divider between sand tables
 + through pathways



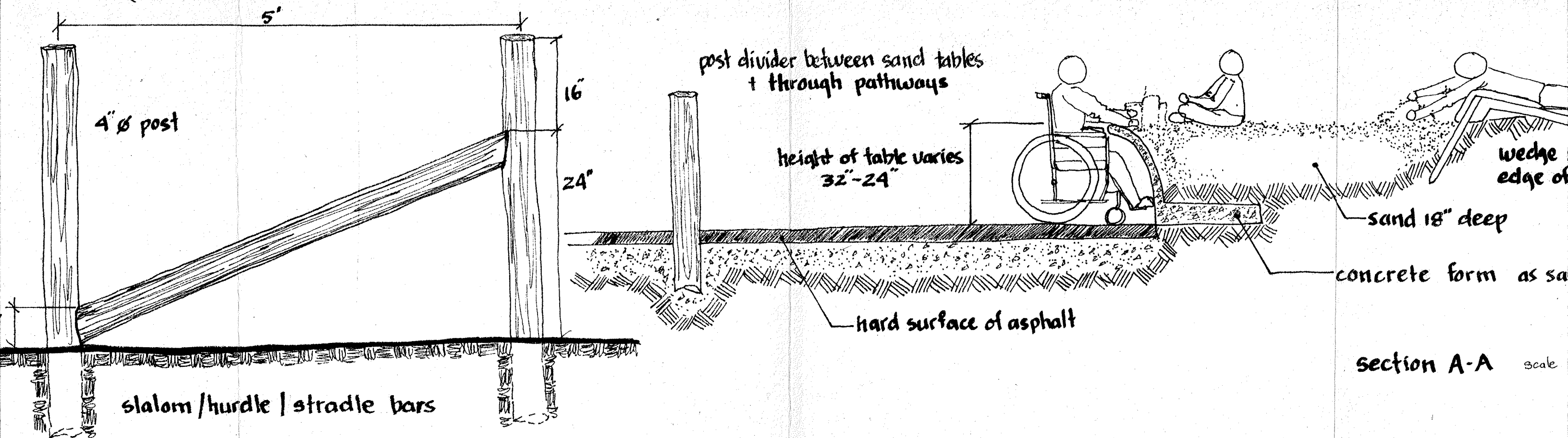
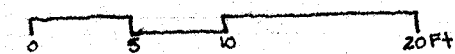


LORD ROBERTS ELEMENTARY SCHOOL - SOUTH YARD DETAIL -

all trees manitoba maples

breaks in shrub massing permits selected views into playground

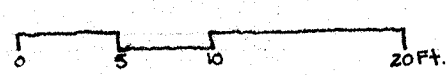
plan · scale · 1" = 10'



PLAYSPACES TO ACCOMMODATE DIS

rub massing permits selected views into playground

plan · scale · 1" = 10'



shade provided by trees

post divider between sand tables
+ through pathways

height of table varies
32"-24"

hard surface of asphalt

wedge shape on north
edge of sand pit

sand 18" deep

concrete form as sand table edge

rolled curb

section A-A

scale 1/2" = 1'

LAYSPACES TO ACCOMMODATE DISABLED CHILDREN

A PRACTICUM by JAMES MELVIN

Department of Landscape Architecture

University of Manitoba

1979

3

ISOMETRIC

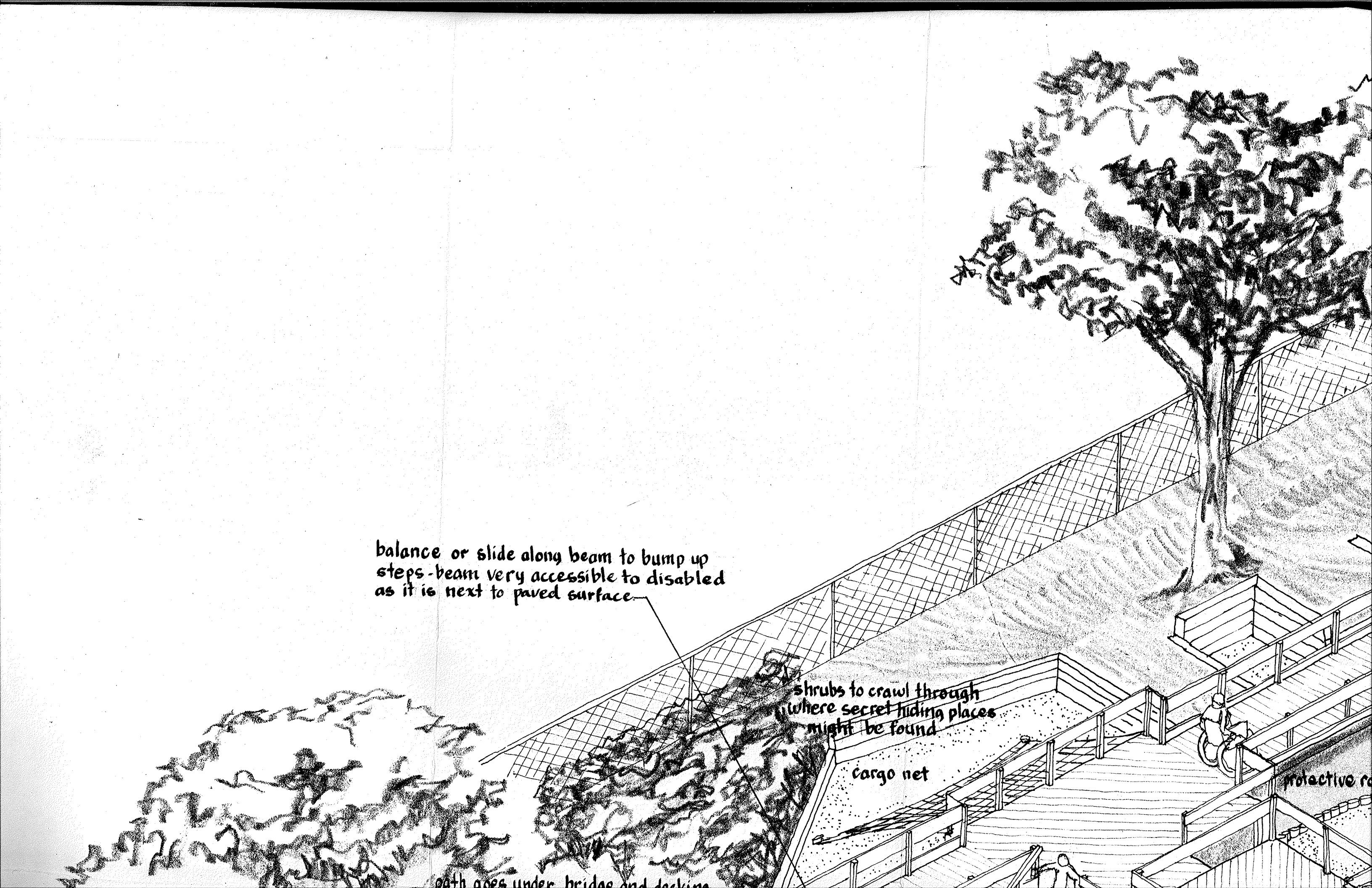
balance or slide along beam to bump up
steps - beam very accessible to disabled
as it is next to paved surface.

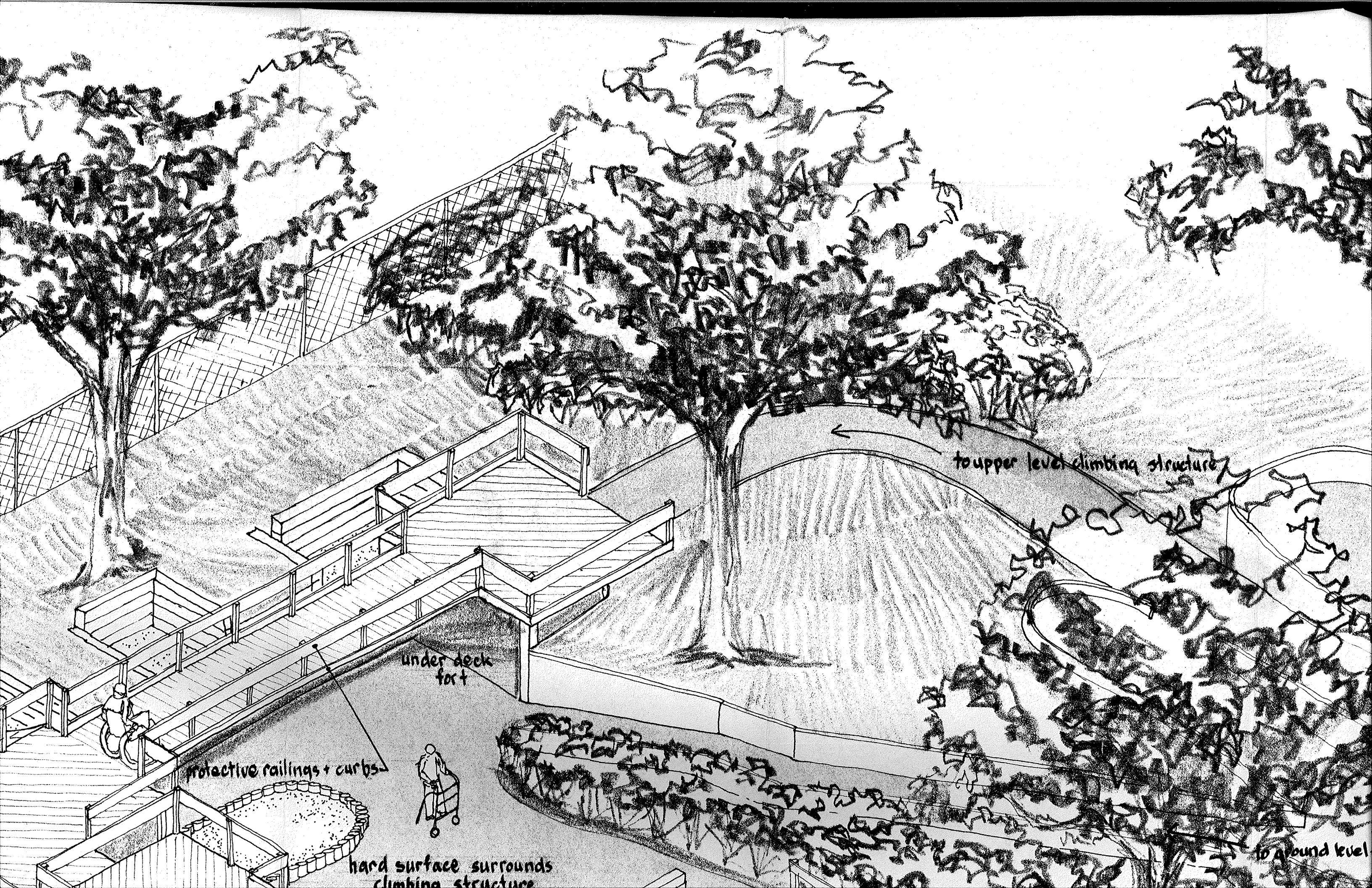
shrubs to crawl through
where secret hiding places
might be found

cargo net

protective railing

path goes under bridge and decking





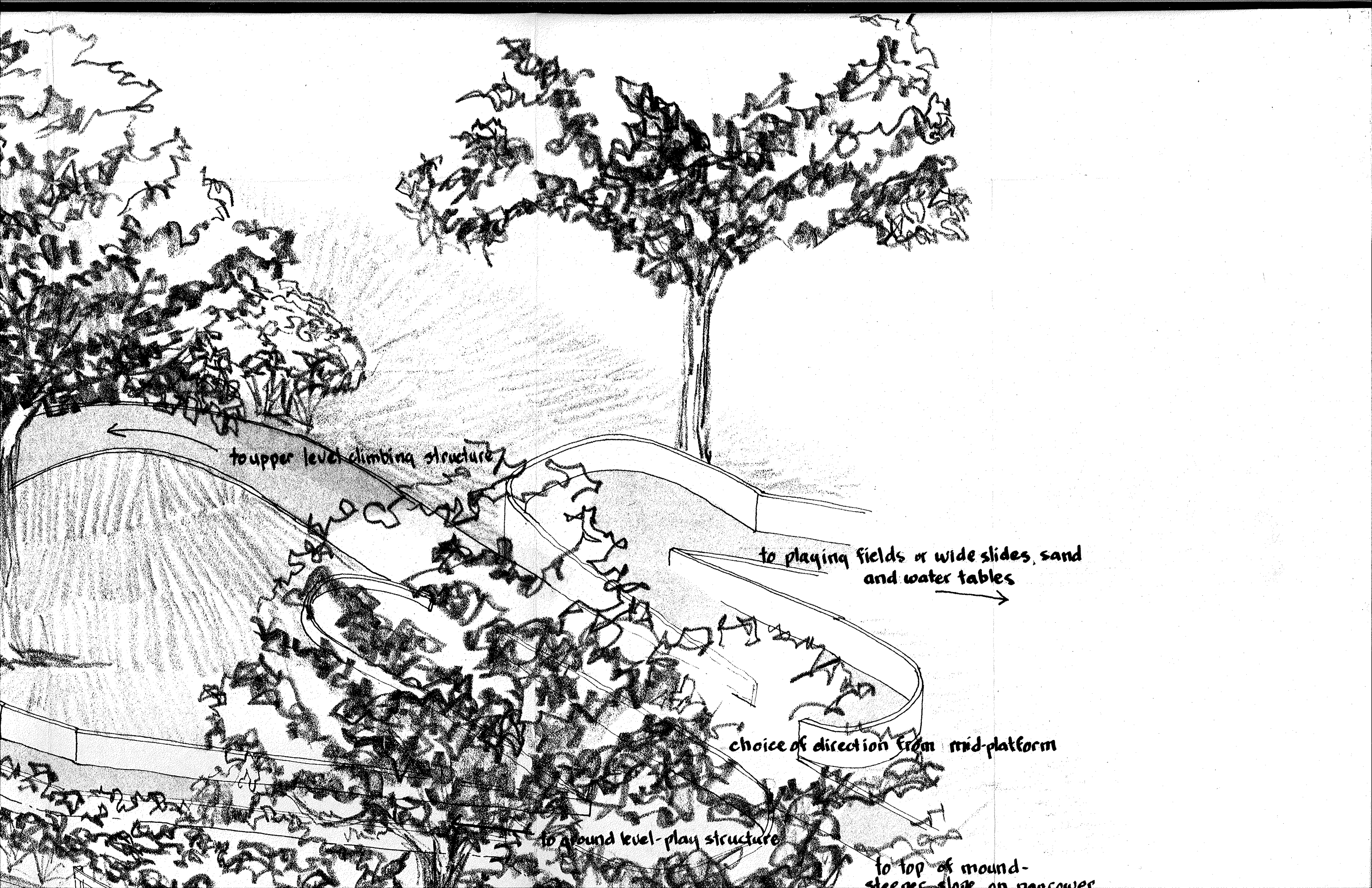
to upper level climbing structure

under deck fort

protective railings + curbs

hard surface surrounds climbing structure

to ground level



to upper level climbing structure

to playing fields or wide slides, sand and water tables

choice of direction from mid-platform

to ground level-play structure

to top of mound-
steeper slope on mounds

heightening spatial awareness, light and dark areas

plank bridge linking play areas and structures

log edge permits climbing and bumping up

to north entrance

Swinging bridge

tube slide
increasing body + spatial awareness

cable slide -
body in space

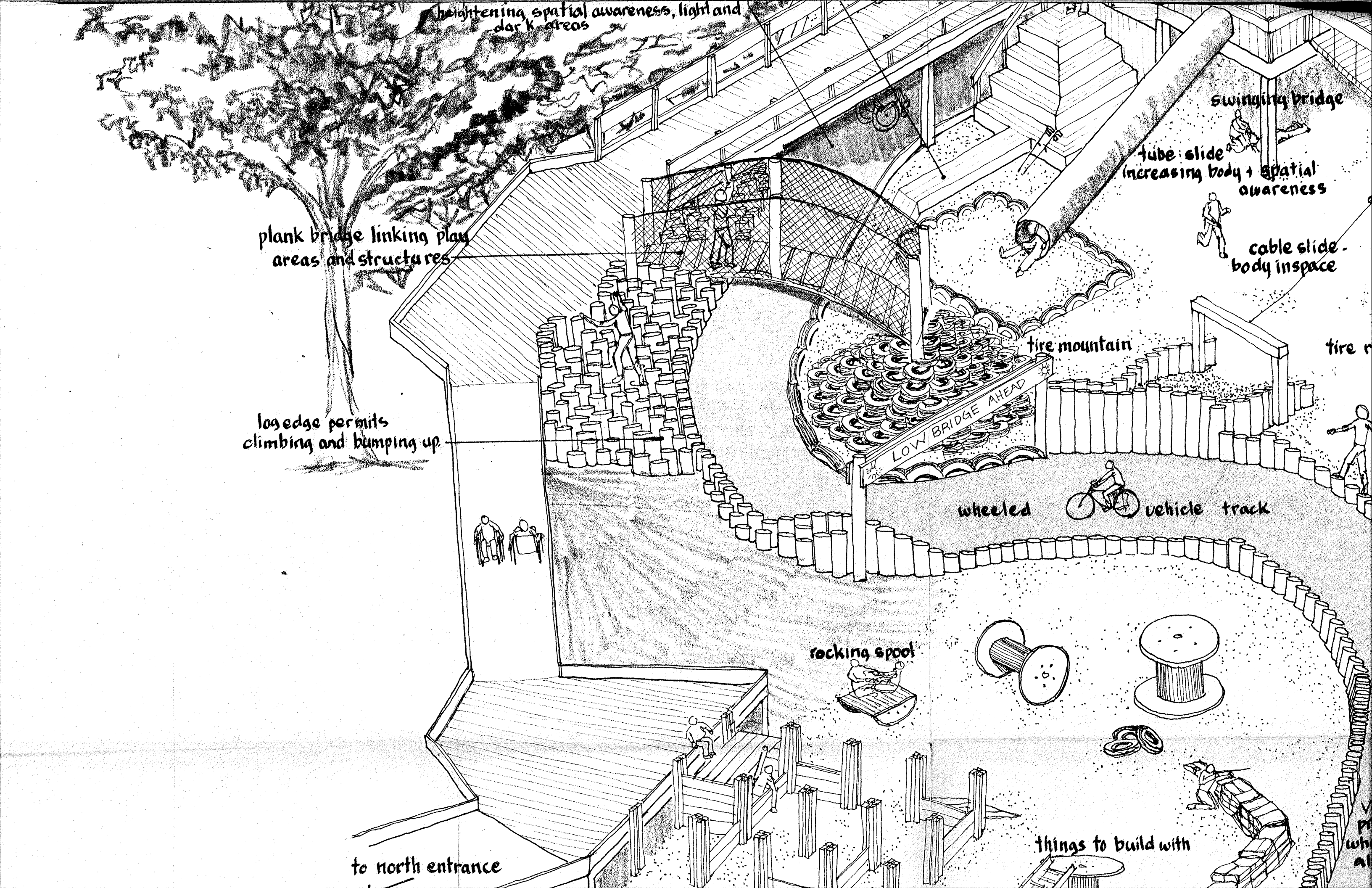
tire mountain

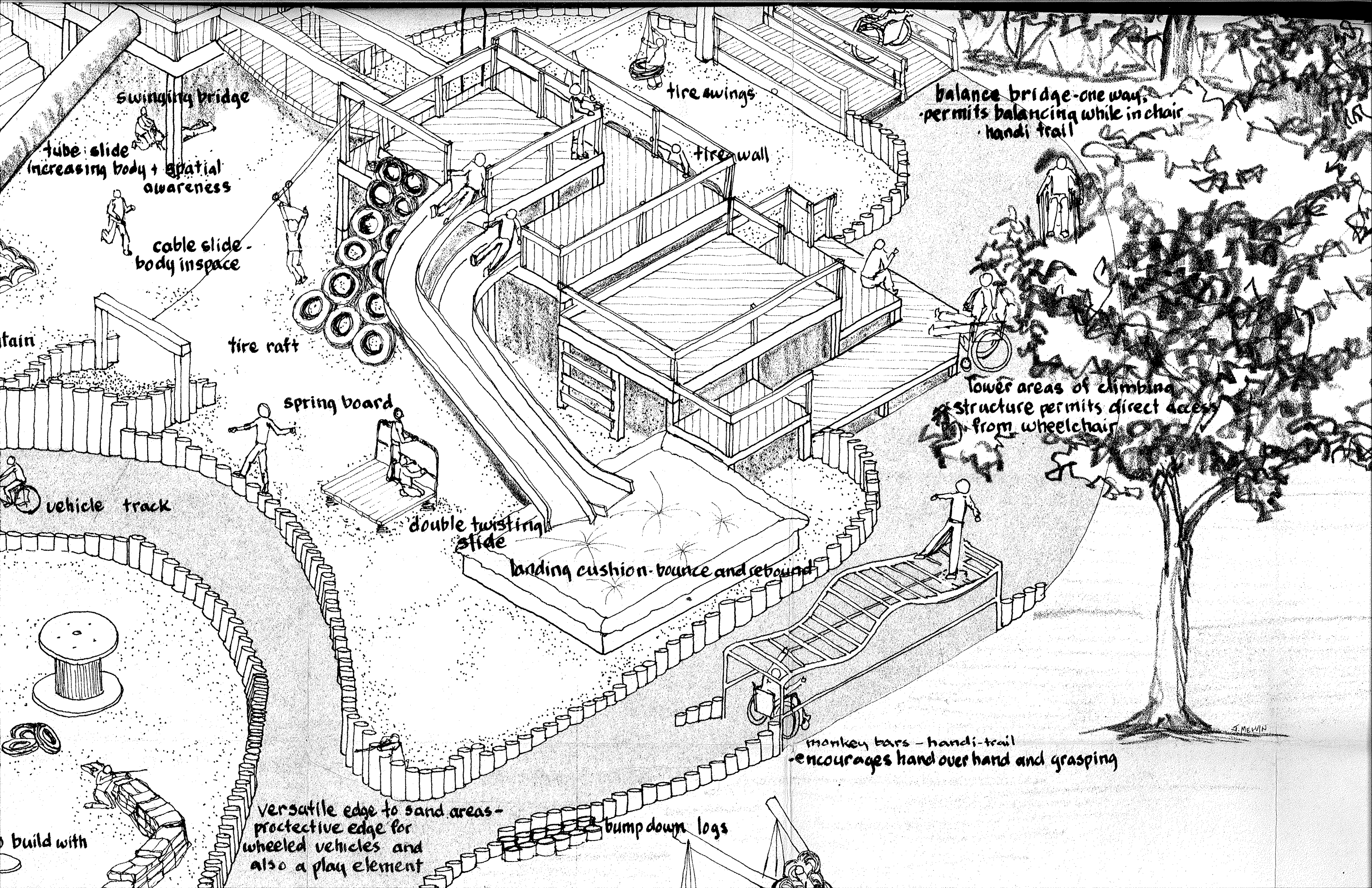
LOW BRIDGE AHEAD

wheeled vehicle track

rocking spool

things to build with





Swinging bridge

tube slide
increasing body + spatial awareness

cable slide -
body in space

tire swings

tire wall

balance bridge - one way,
permits balancing while in chair
handi trail

train

tire raft

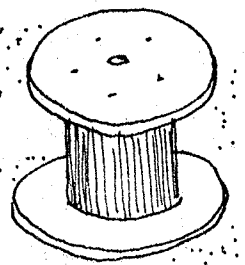
spring board

lower areas of climbing
structure permits direct access
from wheelchair

vehicle track

double twisting
slide

landing cushion - bounce and rebound



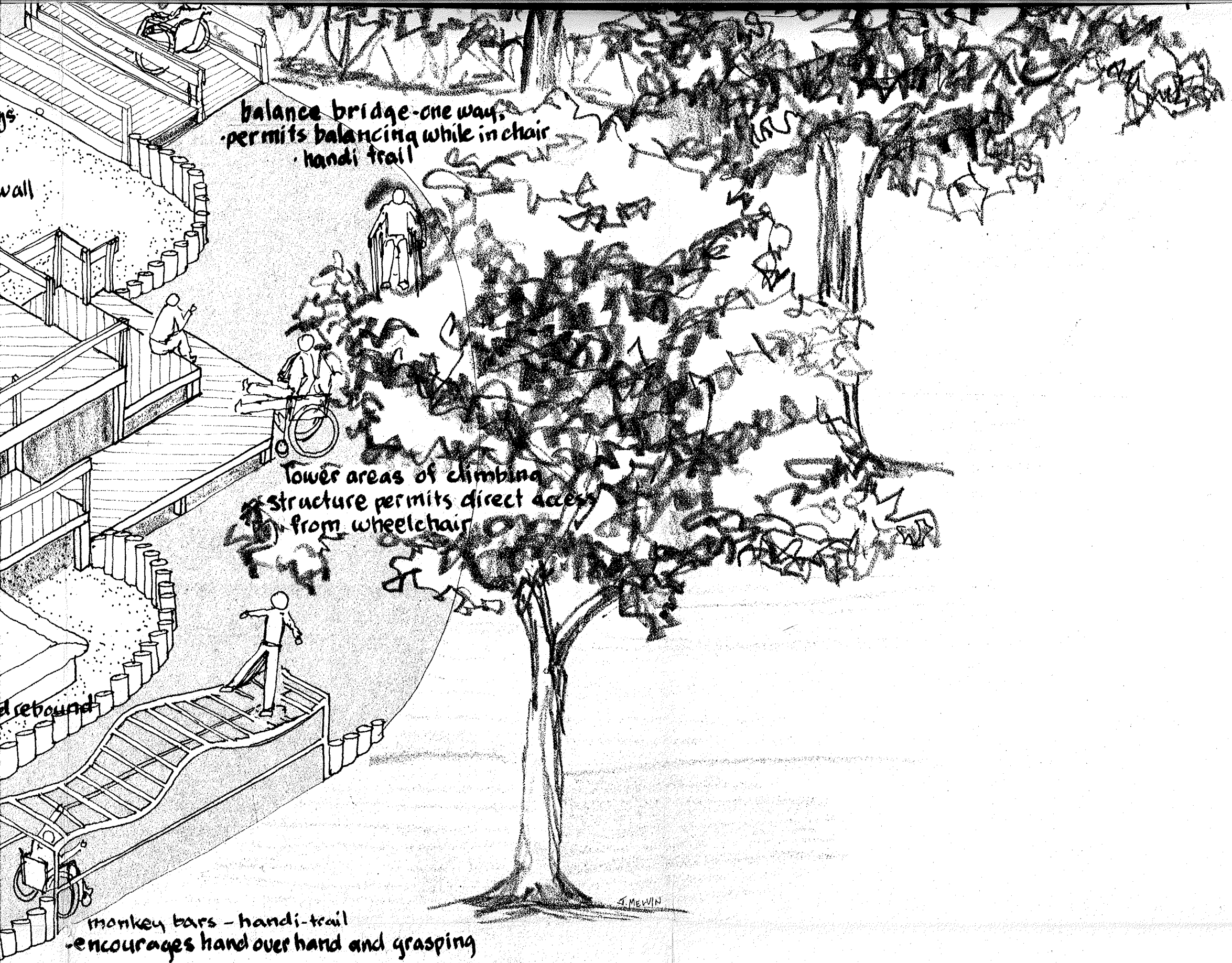
to build with

versatile edge to sand areas -
protective edge for
wheeled vehicles and
also a play element

bump down logs

monkey bars - handi-trail
encourages hand over hand and grasping

S. MEWIN



balance bridge-one way,
permits balancing while in chair
handi trail

Tower areas of climbing
structure permits direct access
from wheelchair

monkey bars - handi-trail
encourages hand over hand and grasping

gs
wall

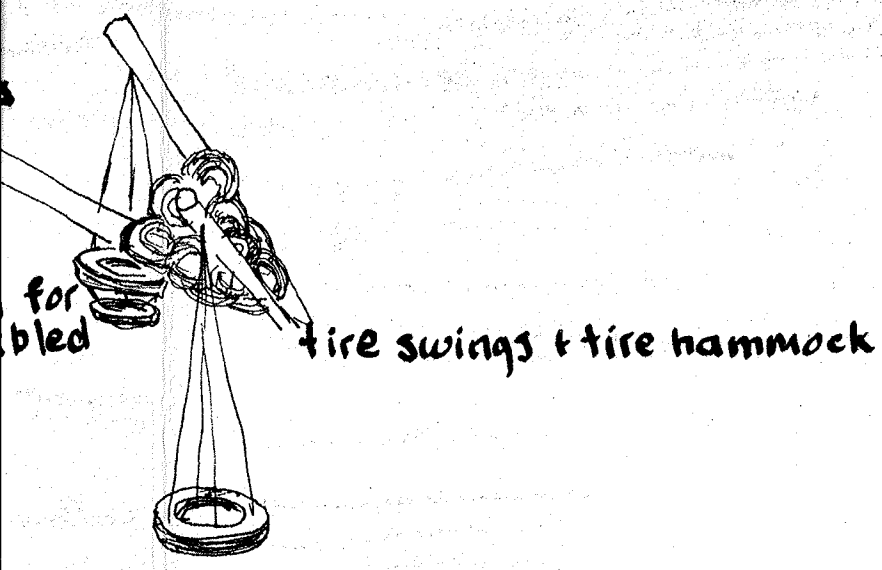
rebound

J. MELVIN





monkey bars - handi-trail
encourages hand over hand and grasping



for
bled
tire swings + tire hammock

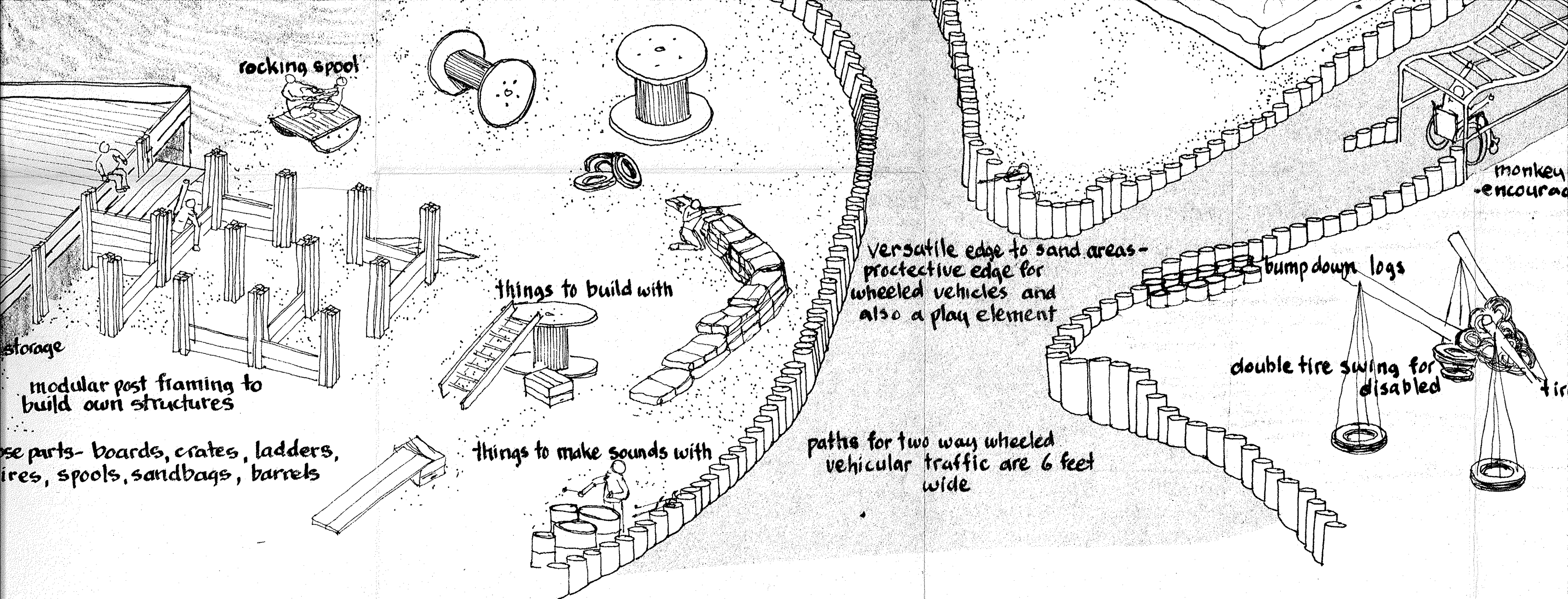
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1979



rocking spool

storage

modular post framing to build own structures

use parts- boards, crates, ladders, tires, spools, sandbags, barrels

things to build with

things to make sounds with

versatile edge to sand areas - protective edge for wheeled vehicles and also a play element

paths for two way wheeled vehicular traffic are 6 feet wide

bump down logs

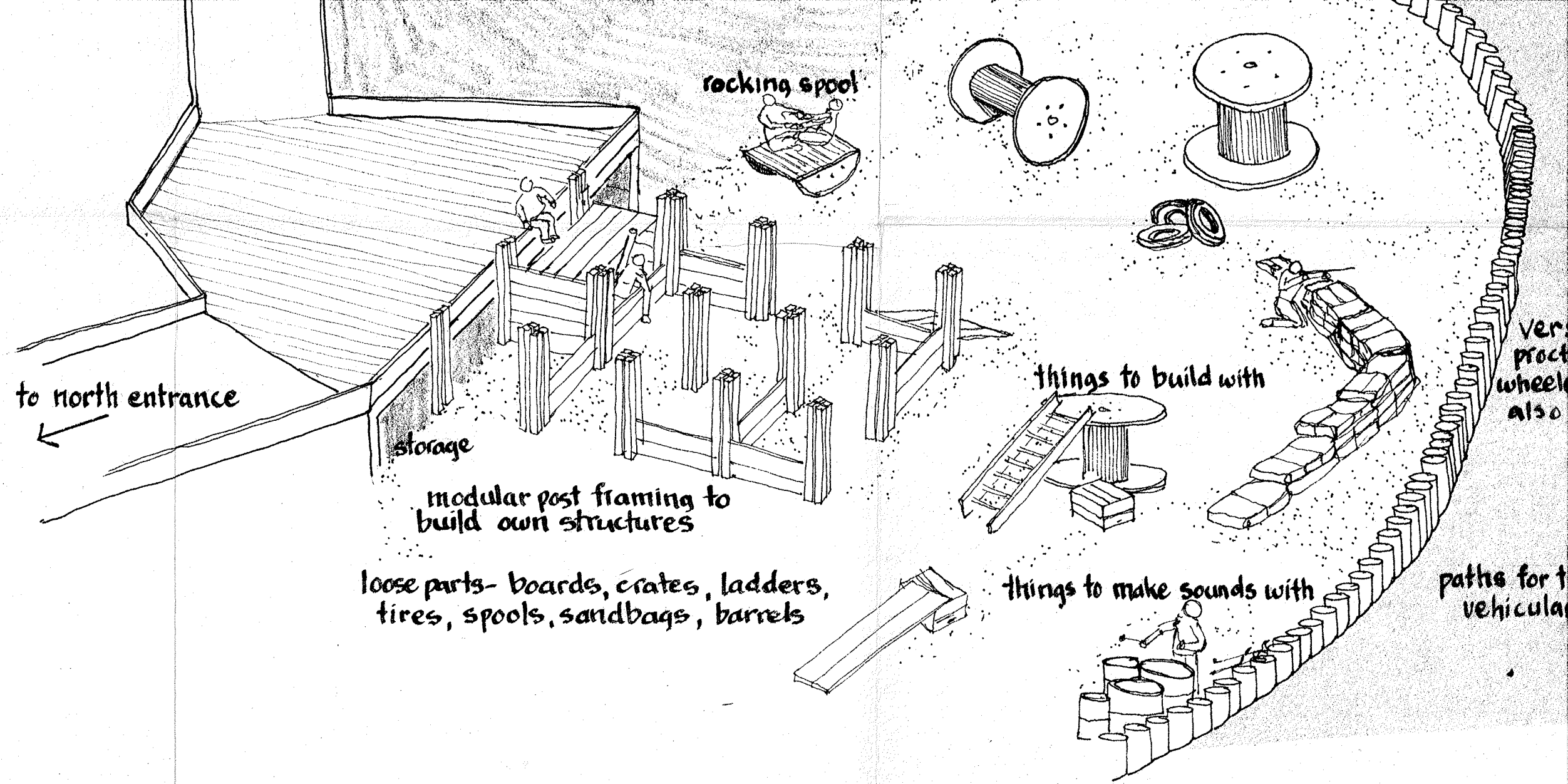
double tire swing for disabled

monkey enclosure

PRIMARY SCHOOL

ISOMETRIC

PLAYSPACE



LORD ROBERTS ELEMENTARY SCHOOL · ISOMETRIC ·