

**Recreational Trails  
for Everyone**

RECREATIONAL TRAILS FOR EVERYONE

DISABLED INDIVIDUALS PARTICIPATION  
ON RECREATIONAL TRAILS  
THROUGH  
'WHOLISTIC DESIGN'

A Practicum submitted to the Faculty of Graduate Studies  
in partial fulfillment of the requirements for the  
Degree of Masters of Landscape Architecture.

by

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## ABSTRACT

"60 to 70 percent of the population will at one time have a temporary or permanent disability severe enough to require a barrier-free environment. Instead of having a special label for the disabled, everybody else should be thought of as temporarily able-bodied."

Edward Roberts  
The Winnipeg Tribune  
World Congress of Rehabilitation  
June 25, 1980

Disabled persons' participation in recreation activities has historically taken place in specially designed facilities. From this type of facility, design standards have evolved to accommodate the autonomous functioning of the disabled. Combined with progressive rehabilitation programs, we have made ready a significant percentage of our population for the real world. Unfortunately, in our enthusiasm to accommodate the disabled via barrier-free design, we have often singled out and segregated individuals that want little more than just a chance to be average.

By examining the psychological, sociological, and physiological make-up of our growing disabled population, an holistic design approach is developed to expand our traditional design parameters. Through the redesign of Historic Lakeshore Walk at Riding Mountain National Park, this study demonstrates traditional landscape architecture skills with the progressive and enlightened approach, 'holistic design'.



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# 1. Introduction

## 1.1 THE PROBLEM

Jay Jorgensen's 1976 book, Landscape Design for the Disabled, discusses facts, ideas, and standards for designers to consider when creating facilities for disabled persons. However, these known facts, criteria and guidelines have not been adequately embraced, integrated and reflected by us, in our designs for the population at large. Consequently, physically disabled individuals are often precluded from participating on public outdoor recreational trails. Their exclusion largely results from a lack of social awareness, sensitivity, and understanding on the part of landscape designers. By denying the rich and varied opportunities that exist in our built environment to this portion of our complex population, man is handicapping his abilities to achieve his potential in physical, intellectual, and social growth.

Governments, private organizations and a large number of interest groups have invested significant sums of time and monies to facilitate the autonomous functioning of our disabled population. The principle of "mainstreaming" the disabled has been fostered by human rights legislation, and building codes that recognize standards to facilitate the use of mobility aids such as wheelchairs. Design criteria and guidelines have been sponsored and published by universities, professional societies, and private individuals. Unfortunately, landscape architects still tend to ignore the disabled unless specifically commissioned to include them. When commissioned, the tendency remains to either research and include published standards, or design with a well-intentioned but often misspent missionary spirit.

Canada has very few examples of outdoor recreational facilities that provide opportunity for use by the physically disabled. Facilities such as the Manitoba Society for Crippled Children and Adults "Lakeside Camp" at Gimli serve a rehabilitary function, but this type of segregated facility is only one step in the process towards the autonomous functioning of our disabled population. The almost total lack of recreational trails for everyone leads one to believe that our designers are ignorant of

National Park. This design offers the opportunity to demonstrate the body of knowledge and the approach outlined in 1.2.1 and 1.2.2.

### 1.3 LIMITATIONS

.1 The Manitoba Legislature defined a physical handicap "to be a physical disability, infirmity, malformation or disfigurement that is caused by bodily injury, birth defect or illness and includes epilepsy, but is not limited to any degree of paralysis, amputation, lack of physical co-ordination, blindness or visual impairment, deafness or hearing impediment, muteness or speech impediment, or physical reliance on a guide dog, wheelchair, or other remedial appliance or device," in The Human Rights Act, 1976 (p.2).

This practicum will focus on physically disabled persons who may be included in groups of individuals defined as non-ambulatory, semi-ambulatory, blind, or deaf. These individuals' ability to participate on recreational trails is constantly hampered by physical barriers that negate the usefulness of mobility aides such as wheelchairs or white canes.

Not included in this practicum's considerations are the mentally retarded and emotionally disturbed. They are not restricted in their use of recreational trails by physical barriers, given average motor skeletal development, and mobility skills.

.2 A recreational trail is defined as a specifically designed track set within an environment, that if travelled by a pedestrian, offers the opportunity for him to relax, refresh, entertain, amuse, or otherwise indulge himself in a manner that may agreeably occupy his time.

This practicum is limited to the design of a recreational trail. While acknowledging that the design of many things and types of facilities are needed to promote the autonomous functioning of disabled individuals, the design of a recreational trail offers the opportunity to both:

1. assemble currently scattered knowledge regarding the design of outdoor recreational facilities that will be useful to an integrated society;

2. demonstrate the traditional skills of landscape architecture on a problem that has not been adequately addressed in Canada.

.3 Working on the premise that the disabled are an integral part of our total society, a comprehensive discussion on the cost of construction for facilities designed to accommodate use by disabled individuals would be counter-productive. The costs of construction for integrated facilities then, is limited to the following:

Intelligent planning avoids extra expense, and a facility constructed from the outset with the problems of the disabled in mind should cost little, if any more, than a similar facility planned without these considerations in mind. Very little cost/benefit analysis work has been done on barrier-free site design. However, H.U.D., (1976, p.10), notes that "of three new existing structures studied, it was estimated that each building could have been constructed in such a way as to provide total accessibility for less than 1/10 of 1% of total construction costs." They have concluded that while there is little doubt that the inclusion of barrier-free elements increases costs, these increases run at substantially less than 1%. Ultimately, the long range societal benefits of autonomously functioning disabled individuals will more than offset the slightly increased design and construction costs of facilities that are responsive to the needs of the disabled.

## 2. Describing the Disabled

### 2.1 WHO ARE THE DISABLED

Given no central registry, comprehensive statistics regarding the number and type of physically disabled Canadians are unavailable. However, the reviewed literature provides us with the following sense of scale and significance of our disabled population.

Fournier (1977) points out that, including the aged, 14% of Canada's population is physically disabled. This is due in part to the fact that a Canadian's life expectancy has increased significantly between 1941 and 1971, from 63.0 to 69.4 for males, and 66.3 to 76.5 for females. In 1971, 11.7% or 2,521,452 individuals had attained at least 60 years of age. The Department of National Health and Welfare notes that all who are over 60 years of age are members of a "population at risk". Chronic disabilities resulting from diseases such as arthritis, rheumatism and blindness are directly related to the aging process. Supporting this, the statistical studies on the blind population of Canada, registered with the Canadian National Institute of the Blind in 1977, points out that 70.7% of the blind are 50 years old or older. As health programs succeed in extending the life of more Canadians, the numbers of aged will increase and their needs will augment accordingly.

The Manitoba Advisory Council on Recreation for the Handicapped, Inc., published a Profile of Handicapped Persons Resident with the City of Winnipeg in May, 1977. On page 2, they defined the population profiled, "as handicapped persons resident within the City of Winnipeg, and registered with an agency or organization perceived as providing service to handicapped people." Given this limitation, their tabulations revealed 12,704 handicapped persons, or 2.38% of the population of Winnipeg. The handicapped distribution by sex almost paralleled that of the general population. 48.81% of Winnipeg is male; 51.19% is female; 49.02% of the handicapped population is male; 50.18% female. The age distribution of the handicapped paralleled that of the general population, except for an upsurge in the handicapped population over 65 years, 28% of the handicapped



population, compared to 9.2% of the overall population, is 65. In categorizing disabilities, using the St. James Assiniboia Community of Winnipeg as an example, the following groups are represented: 44.39% physical, 10.47% visual, 8.6% hearing, 7.36% mentally ill, 3.12% multiple disabled. The tabulations further noted that of the disabled profiled, only 12.9% are institutionalized. The authors, Read Op (p.8), concluded that "in actual numbers, the data is subject to the erosion of time, for the City and its population are in a state of flux, constantly changing. However, in relationship terms, the report is not subject to erosion. A handicapped population of some 2% to 3% has been documented." Furthermore, it was the opinion of the study group, Read Op (p.7), that, "while the numbers presented to represent the handicapped persons involved with agencies and organizations from which data was tabulated, it is likely that, as representative of the City, the numbers are understated." The Winnipeg Study of Transportation for the Handicapped, in 1976, supports this contention, as they estimate 32,500 or 5.7% of the City's population as handicapped.

Assuming that Canada is a microcosm of a larger North American society, the following numbers are presented to reinforce the urgency of why we must promptly address design issues with an awakened awareness of a "total society". Goldfish, 1971, noted 6.4 million visually impaired Americans. The Bureau of Outdoor Recreation estimated that in 1973, 6.2 million Americans were subject to some type of permanent ambulatory problem. Beechel pointed out in 1975 that there were 8 million Americans who were deaf to the point of suffering a disability from it, with 351,000 of those individuals being profoundly deaf.

While noting the above described permanently disabled people, one must also be aware of the many temporarily disabled. Jorgensen, 1975 (p.2), points out that "it is a fact that nearly everyone is handicapped, inhibited or restricted in their activities at some time during their life." People can be temporarily and functionally impaired as a result of a broken leg from an accident, having to push a baby carriage, or because the design of building or site elements present architectural barriers.

## 2.2 CATEGORIZATION OF PHYSICAL DISABILITIES

The American National Standards Institute has noted four distinct groups of physically disabled individuals, that, for one reason or another, whether through birth or accident, have lost the use of some part(s) of their body or some of their sensory facilities.

- .Group One: non-ambulatory disabilities
- .Group Two: semi-ambulatory disabilities
- .Group Three: sight disabilities
- .Group Four: auditory disabilities

The degree of participation that an individual from any of these groups will display on a recreational trail is directly related to how that person is disabled, and to what extent this disability will restrict his mobility.

2.2.1 Group one, non-ambulatory disabilities, are impairments that, regardless of cause or manifestations, for all practical purposes, confine individuals to wheelchairs.

Group two, semi-ambulatory disabilities, are impairments that, regardless of cause, restrict people to walking with difficulty or insecurity. Crutches, leg braces, canes and walkers are common mobility aides used by semi-ambulant individuals.

Ambulatory limitations result from conditions that may be caused by many afflictions. These include:

- (a) Muscular dystrophy which is a genetically determined physical fault. Individuals with muscular dystrophy suffer an atrophy, becoming progressively less ambulant as muscle tissue deteriorates and is replaced by fat and connective tissue. People with the disease may be non-, semi-, and/or ambulant.
- (b) Multiple sclerosis which is a disorder of the nervous system, characterized by hardened patches scattered at random throughout the white matter of the brain and spinal cord. This disease is characterized by periods of progressively worsening degeneration of motor neuron control. A person becomes semi- or non-ambulant due to a loss of muscle control resulting from damage to the nerves that control them.
- (c) Cerebral palsy which is a partial paralysis and lack of muscle co-ordination resulting from a defect,

injury or disease of the nerve tissue contained within the skull. Cerebral palsied individuals vary greatly in their ambulatory abilities, depending upon the degree of their affliction. Suffering from its mildest form, one can be spastic, having an awkward gait. Suffering a more severe form, a person may be monoplegic where one lower limb is affected, or hemiplegic where both limbs on one side are affected. The most serious forms result in paraplegia, where both lower limbs are affected, and deplegia where the legs are more involved than the arms.

(d) Orthopedic disabilities which can be permanent, but are very often temporary. Permanent ambulatory limitations may result from diseases which are congenital such as spina bifida or scoliosis, infectious such as poliomyelitis or tuberculosis, or nutritional such as rickets. Accidents and/or injuries may restrict a person's ambulatory capacity when they result in amputation or paralysis. Within the group of disabled, we also find people who have suffered greatly as a result of the disastrous drug thalidomide. Temporarily orthopedic disabilities result from daily accidents, hampering people with broken legs, arms, sore backs and the like. Degeneration of the spinal column, as a result of the aging process, is a common affliction that orthopedically restricts a person's ability to move without some form of support. Arthritis is a catch-all term for more than 100 diseases that cause pain, stiffness, inflammation or damage to the joints, limits average mobility, and often requires mobility aids to be used by afflicted individuals. On Wednesday, January 9, 1980, the Winnipeg Tribune noted that in Canada, 850,000 people are so disabled by this disease that they cannot work. Not all of them are elderly; 300,000 sufferers are under 45 and 25,000 are under 15.

Ambulatory limited people require the use of mobility aids. For these individuals to function, designers must build environments that allow for the use of these aids:

.1 Wheelchairs: According to Ries, Jorgensen and others, the wheelchair most commonly used by autonomously functioning individuals is a self-propelled model. The chairs may be physically or electrically propelled. The standard adult model falls within the following limits:

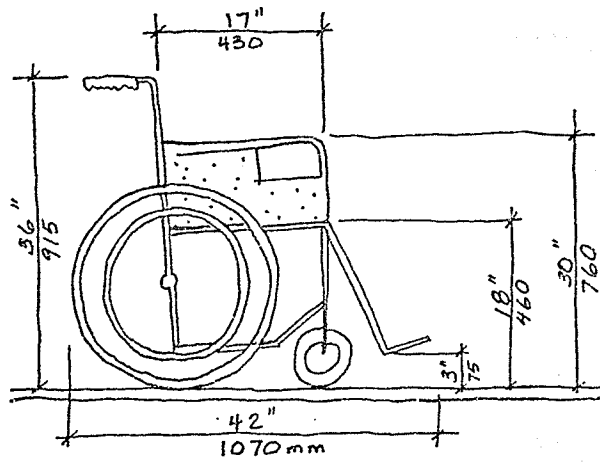
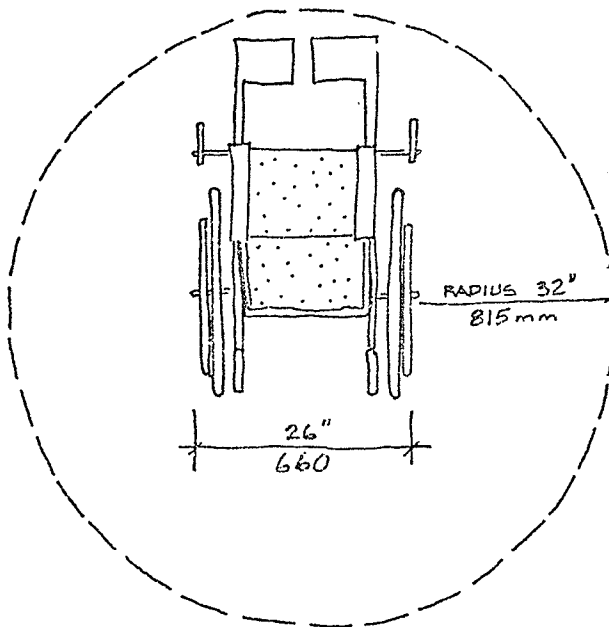


Figure 1



STATIONARY TURN RADIUS

Figure 2

Each individual's ability to function in a wheelchair differs, depending upon their disability, size, strength, and range of motion. Ries and Jorgensen have noted the following average horizontal and vertical reaching heights.

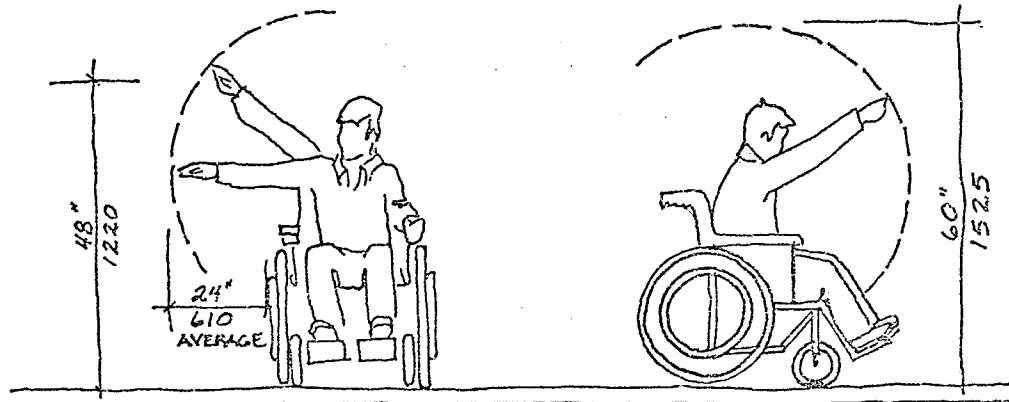


Figure 3

In most instances, designing a space that will accommodate wheelchairs ensures that it will also be large enough not to be restrictive for other people using it.

.2 Other common mechanical aids used for mobility, that change the basic shape of a person, and their personal spatial requirements are:

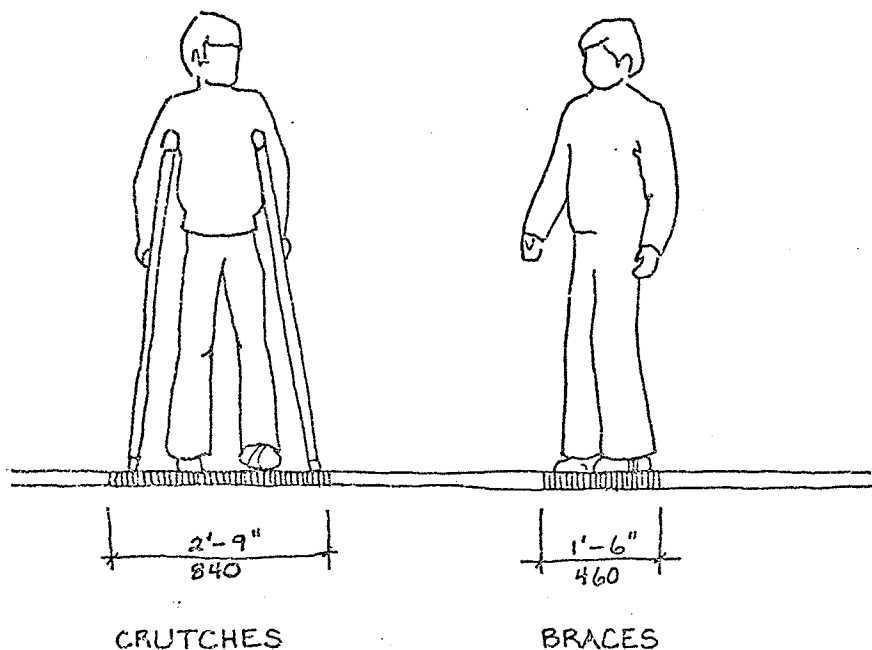


Figure 4

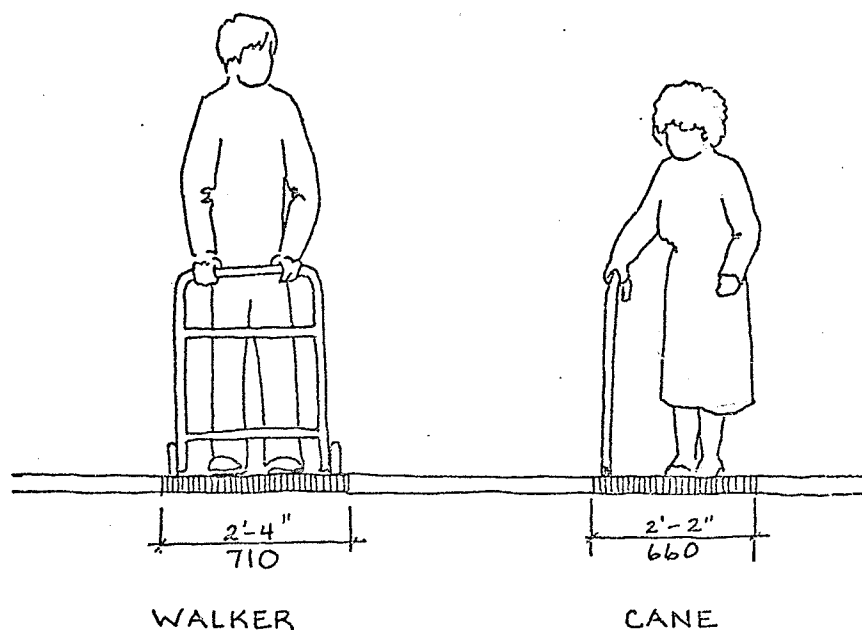


Figure 5

2.2.2 Group three, sight disabilities, may be total blindness, or impairments affecting sight to the extent that the individual functioning in public areas is insecure or exposed to danger. An individual with a sight disability, according to the American Medical Association, is said to be legally blind if he can see no more at a distance of 20 feet than a person with normal sight can see at a distance of 200 feet, or if the angular distance of the visual field is 20 degrees or less. The most common causes of blindness by type are: Cataract, Glaucoma, Myopia, Retinitis, Pigmentosa, Optic Nerve Atrophy, Retinal Detachment, Macular Degeneration, Albinism, Myasthenia, Corneal and Scleral Conditions, and Diabetic Retinopathy. The most common causes of blindness by etiology are: Multiple Sclerosis, Diabetes Mellitus and Retinoblastoma.

Most blind and visually impaired people have some vision, enabling them to distinguish light, large objects, and often to read large print. With the aid of a cane, guide dog, or companion, blind individuals can go almost anywhere a sighted person can go. If a blind person is reluctant to go somewhere, it is often a result of a lack of

confidence to deal with his physical environment.

While visually impaired individuals do not necessarily need any specific mobility aids, designers can support their functioning by building environments that include guidance systems that help maximize independent mobility, and minimize potential hazards, such as protruding objects.

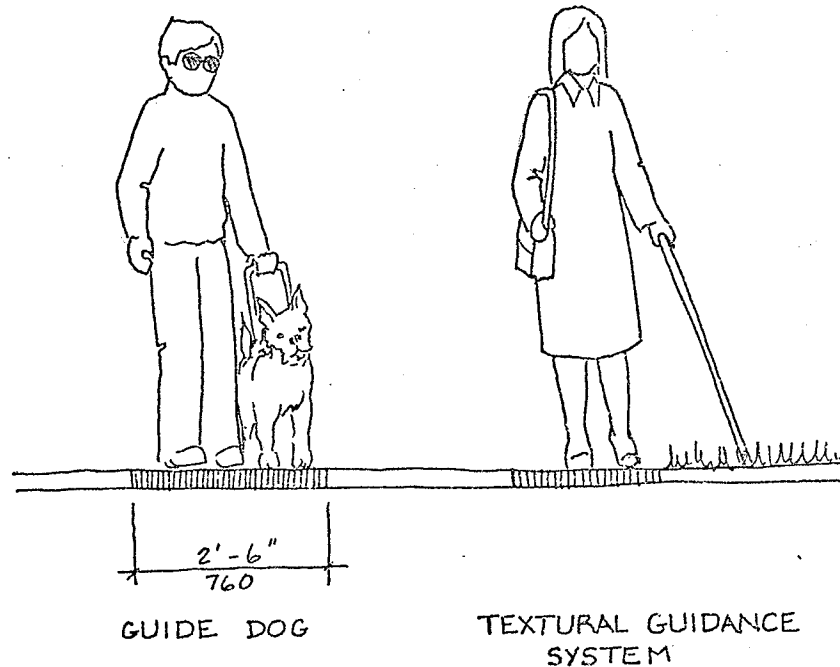


Figure 6

2.2.3 Group four, auditory disabilities, might make an individual insecure in the public areas because he is unable to communicate or hear warning signals. A hearing loss can result from damage to any of the parts of the apparatus, so that the transmittal of the sound waves or electrical impulses is stopped. Such damage can be caused by an infection, contraction of German measles by the mother during the first three months of pregnancy, congenital problems, scarlet fever, whooping cough, common measles, mumps, meningitis, obites media, otosclerosis, a blow to the ear, skull fractures, tumors or aging.

In a test of hearing, a person is considered to have normal hearing if he can detect sound with an intensity of 0-25 decibels in the critical speech frequencies of 500, 1000, and 2,000

cycles per second (Harvey, 1974). If the intensity has to be 25-55 before he can hear it, he is considered "hard of hearing". If the intensity has to be 55-75, and he relies primarily on his eyes to receive communication, he is probably deaf. If the intensity must be 75 or more decibels before detection, the person is considered profoundly deaf (Vescovi, 1966).

Vernon, 1970, and Garret, 1965, found that of auditorily disabled students over 16 years old, 30% were functionally illiterate, 60% had achieved a grade of 5.5 or less, and only 5% had rated grade 10 or better in education. This is not because deaf people are mute. Muteness is a separate problem involving the larynx. The lack of achievement in people deaf from an early age, is due to communication difficulties. The breakdown of the hearing apparatus destroys man's strongest line of communication. Most deaf people who do not speak have never heard our sounds, and, therefore, find it impossible to imitate and reproduce them. This affects a deaf person's ability to understand abstract thoughts, read, and learn.

The international sign language known as Amaslan, is now being taught not only to the deaf, but in our public schools. Designers may assist the functioning of the auditorily disabled by including information systems that display 'Amaslan', and directing the auditorily disabled to schooled support personnel, should they need more assistance.

In summation then, individuals with physical disabilities comprise a significant percentage of our total population. These individuals may be categorized as fitting into four distinct groups: non-ambulatory, semi-ambulatory, sight, and hearing. Individuals in these groups suffer from motor and/or sensory disabilities. As designers, it is necessary that we basically understand these physical disabilities if we are to design for our increasingly complex society.

### 2.3 CHANGING ATTITUDES TOWARDS THE DISABLED: DISPELLING THE MYTHS

The social acceptance of disabled persons is a slowly ongoing process. This partially results



from social myths, lingering from the days of strict institutionalization.

.1 When the word "handicapped" appeared in research literature or was brought up in conversation, it was frequently equated with wheelchair-bound, physically disabled people. This unfounded equation of "handicapped = wheelchair" is even fostered by the international sign of access for the disabled, that of a person in a wheelchair. The implication, then, as Beechel (1975) has pointed out, may be that individuals who are blind, deaf, or otherwise physically impaired, are not handicapped, or, another term must exist which applies to them. Since no other term has been found, one may deduce that the public tends to generalize the meaning of the word "handicapped". The salient point is that an anachronistic vocabulary might mislead a designer to overlook individuals who are not in wheelchairs, and exclude part of one's potential clientele.

.2 Many people still seem to feel that a person in a wheelchair will be accompanied by a non-handicapped individual, even if one is not visible. In fact, most people who use wheelchairs are capable of going anywhere on their own, provided that access and facilities are properly designed. Some are disabled to the point where they must be accompanied, but not the majority. When they are accompanied, it is usually for companionship, rather than assistance.

.3 A third prevalent misconception is that non- and semi-ambulatory individuals are generally mentally incapacitated too. If a mental disorder exists, it is a separate problem. Most people with ambulatory limitations have mental capabilities equivalent to the rest of the population.

.4 A notable misconception concerning blind individuals is that they have a "sixth sense". The blind are forced to develop an alertness much greater than a sighted person. A blind person has to listen, touch, smell, and remember. Memory is extremely important for both the person blind at birth and the person blinded later in life. Beechel, 1975 (p.4), stated that "experiments have shown that blind persons do indeed identify sounds better than do blindfolded sighted persons...not because they

hear better, but because they remember better and have practiced longer."

.5 The general public also commonly believe that blind individuals read Braille. At What Cost The Handicapped (C.B.S. 1979) states that only 5% to 10% of the people who are blind can read Braille. There are three main reasons for the low percentage figure. Firstly, given the legal definition of blind (see page ) many people who are legally blind have some vision, and therefore do not bother to learn Braille. Secondly, many legally blind individuals are elderly, and since general deterioration such as loss of finger sensitivity, general fatigue, and failing memory accompany old age, there is little potential for these individuals to learn Braille. Thirdly, age, extent of education, and type of employment at the onset of blindness can determine whether a person will learn Braille, and how much. Braille is essential if the newly blinded person is pre-school age and has his education in front of him. However, if the newly blinded person is in the latter part of his career, he may choose to get along without Braille, or learn just enough to read numbers or make cryptic notes.

.6 The popular misconception noted herein, was prominently stated by the American National Park Guide for the Handicapped, 1971 (p.1): "Among the Handicapped, the deaf visitor to the Park is probably the least disadvantaged. All...exhibits and trails are appropriately signed and marked with interpretive messages. Transcripts of audio programs and lectures have been made in some areas." The apparent assumption is that all a deaf person has to do is read the material and he will have acquired all the information provided. However, according to experts such as Vernon, 1970 and Garret, 1965, most deaf people have very little education, read poorly, and most likely have a very difficult time to understand interpretive messages or abstract ideas.

.7 A final misconception noted herein is that disabled people need help. This often leads to exaggerated courtesy, sympathy, and fosters over-protectiveness. The net result is a public that thinks the disabled cannot take part in many activities. All the disabled really want is to minimize their disability, to participate and feel as much as

possible the way everyone else does.

In summation, we laymen can now recognize that the physically, visually and auditorily disabled are, at most, medically exceptional individuals. First and foremost, they are people just like you and me.

#### 2.4 NEW ATTITUDES

Significant numbers of disabled persons in North American society have fostered a new attitude aimed at the inclusion/participation of disabled individuals in the activities of daily life. Known as "mainstreaming", this attitude acknowledges that our total population shares a human biology, an environment, and a lifestyle that is national in character, and which should be as accessible as possible to all who pursue it. In 1974, the Department of National Health and Welfare, under Lalonde, (p.32), noted that "the evidence uncovered by the analysis of underlying causes of sickness and death now indicates that improvement in the environment and an abatement in the level of risks imposed upon themselves by individuals, taken together, constitute the most promising way by which further advances can be made." To foster the health of Canadians, the Government evolved a policy based on the Chinese expression "Moi Sui" which means "to touch, to feel, to grope around." It reflects a deliberate approach to innovative and creative action even when scientific certainty and predictability are in question. Until the scientific community resolves some of the debates on health related questions of environment and lifestyle, we as designers of outdoor environments are responsible to further our government's policy, based on the principle of "Moi Sui". We are charged with promoting the health of our fellow man by designing facilities which will physically support the following hypothesis that the Government has adopted as being sufficiently valid to warrant positive action:

- .1 It is healthier to be slim than fat.
- .2 Exercise and fitness are better than sedentary living and lack of fitness.
- .3 Prolonged stress is harmful. The absence of stress - tranquility - is desirable.

.4 The less polluted the air is, the better it is.

.5 The less polluted the water is, the better it is.

Our new attitudes are further reflected by our Federal Government's Health Care Efficiency Strategy". They note that the word "efficiency" in this context is not limited to the narrow economic meaning of low cost per unit of production, but includes as well as cost, two other important elements: "accessibility of service" and the "effectiveness of results". Their adherence to the principle of "mainstreaming" then, is based upon their realized needs of our total population.

Our new attitudes and responsibilities to design for a total population have also resulted from the advent of, and an expanded commitment to, space-aged prosthetic devices, ingenious self-help appliances, and rehabilitation therapy. Resulting from these technical and training advances, the disabled within our society have been able to uplift themselves in terms of their ability to become mobile. Mobility encourages the disabled to participate in day to day life. Unfortunately, designers of outdoor recreational facilities have been slow to respond to this mobility. Disabled individuals are constantly hampered in their attempts to use parks and other public outdoor recreational facilities by such standard design responses as six-inch curbs, ten foot wide parking stalls, and crowned gravel paths. Our new found landscape responses of curb cuts, ramps, and identifying the occasional parking space for "handicapped drivers", cannot be considered as adequate design responses, particularly as these responses are often added after the fact. As landscape designers, we strive to add a greater dimension to human life. We must recognize that the "average man" is changing and becoming increasingly more complex. Realizing this, we must begin to design for our increasingly complex, "total society".

## 2.5 LEGISLATED PUBLIC RESPONSIBILITY

Out of a growing public awareness of the disabled, and through the work of many Government and private organizations, Canadians have adopted international attitudes towards the disabled. We have

legislatively recognized that the disabled should be given a chance to lead more fruitful lives with provisions and opportunities for obtaining as satisfying a lifestyle as possible.

The Province of Nova Scotia's "Statutes", in 1969, recognized the inherent dignity and the equal and inalienable rights of all members of the human family as the foundation of freedom, justice and peace in the world. This was a reaffirmant of the Charter of the United Nations, and the Universal Declaration of Human Rights, which proclaims a common standard for achievement by all people and nations. The "Statutes of Nova Scotia", 1969 (p.55), enacted that "all public agencies and all persons in the Province have the responsibility to ensure that every individual in Nova Scotia is afforded an equal opportunity to enjoy a full and productive life and that failure to provide equal opportunity threatens the status of all persons." More specifically, they declared that "every individual and every class or individual has the right to obtain admission to, and enjoyment of accommodations, services and facilities customarily provided to members of the public." Manitoba's legislature amended the 1974 Manitoba Human Rights Act in 1977, to specifically include physically handicapped individuals. The Government of Canada's "Canadian Human Rights Act", 1977 (p.887) has stated a purpose of providing every individual an equal opportunity with other individuals to make for themselves "a life that he or she is able and wishes to have, consistent with his or her duties and obligations as a member of, without being hindered in, or prevented from doing so by discriminatory practices." While this specific reference is only in regard to employment, the Federal Government has the mandate to recommend general policies that extend the philosophy into daily life.

Summarily, the Federal Government and the Province of Manitoba share a common definition of a physically handicapped person. Across our land it is increasingly becoming a discriminatory practice not to provide the disabled with goods, services, facilities, or accommodation customarily available to the general public.

Assuming North America is a macrocosm society, we may expect Canadians to benefit from American legislation such as the 1963 Public Law 88.20. This Law was enacted to promote the co-ordination

and development of effective programs relating to outdoor recreation. The Law maintains that it is desirable that all American people of present and future generations be assured adequate outdoor recreation resources; and that it is desirable that all levels of Government and private interest take prompt and co-ordinate action in this regard.

In 1968, United States Public Law 90-280 was passed to facilitate the integration of a total society. It requires that all buildings totally or partially funded by Federal monies must be designed so as to be free of barriers which would restrict use by handicapped people.

The Vocational Rehabilitation Act of 1973, Public Law 95-112, clearly states that, "No otherwise handicapped individual in the United States... shall solely by reason of his handicap, be excluded from participation in, be denied the benefits of, or be subject to discriminations under any program or activity receiving Federal financial assistance."

Although Canada has no law specifically complementary to United States Public Law 88-20, Governmental legislative actions in this vein are noteworthy. Canada's National Building Code has included physically handicapped requirements since 1975. Manitoba and British Columbia have now adopted provincial building codes which are both more comprehensive than the N.B.C. The British Columbia code includes a progressive section number ten, which documents such things as seating requirements in public facilities. Physical demonstrations are currently being pursued by all three government levels. In 1975, Parks Canada undertook the design of a nature trail to accommodate the blind at Piding Mountain National Park. In 1977, the Manitoba Department of Parks and Recreation upgraded Pine Grove Halt, a wayside travelling stop, to accommodate the disabled. In 1979, the City of Winnipeg is slated to construct a physical fitness trail that will accommodate non- and semi-ambulant people in Assiniboine Park.

Given the foregoing, Canada's current philosophy of public recreation is beginning to respond to our responsibility to plan so that all citizens, including those with physical limitations, have the opportunity to use the same kinds of publically provided recreation. Today, we recognize that to deny the equal right of use to public recreation facilities

to any segment of the community is to prevent participation as a central part of one's life.

## 2.6 LEISURE TIME AND RECREATION NEEDS

Jean Mundy (1976) points out that with the changes occurring in our society, in terms of more non-work years than work years, man has found himself with increasing amounts of leisure time.

Historically, the needs of the disabled have emerged from a past of minimal social concern, or at best, an outmoded attitude that isolation from community life offered an appropriate answer to their dilemma. Once the individual was isolated, the isolation and associated dependence tended to become the permanent condition for many. In the late 1940's, society's view of the disabled changed. They realized that many physically disabled persons, who had been effective contributors to society, could in many instances still be productive members of society with proper physical and psychological rehabilitation. With such rehabilitation, many of the disabled became potential members of the work force. However, jobs for the disabled were, and remain, difficult to obtain, leaving these individuals with greater amounts of leisure time. Furthermore, being physically rehabilitated but psychologically "non-productive", left them with very poor self-images. They remained as a segregated population, being restricted in all levels of social experiences.

Peisman (1958) notes that this leisure time is a major factor in modern personalities. He has described this new personality as "other-directed" for its control mechanism is not a conscience located by generation, but a set of peer group norms. This other-directed personality manifests its properties not so much in an individual's work life as in his consumption patterns. For this new type of personality, leisure time pursuits have replaced work patterns as the decisive sphere where selfhood is realized.

Recreation is an important part of popular culture and takes place during leisure time. Our normative behavior then, can be clearly associated with leisure time and recreational activities. The concept of recreation as a change agent, and vehicle

for modifying individual behavior has been recognized for some time now (Stein, 1977). We realize that the provision of wholesome opportunities for the satisfaction of leisure needs is an essential ingredient to good individual and community health. Furthermore, recreation can be an important tool in the total rehabilitation process of the disabled, particularly in the social development or redevelopment of an individual. As pointed out by Beechel, 1975 (p.3), "recreational benefits such as: change of environment, introduction to new knowledge, stimulation to pursue new interests, relaxed social interaction that can lead to a better understanding between different types of people, and an expansion of particular goals;" are of critical importance to the disabled. What the disabled need then, given above average amounts of leisure time and introverted personalities, are recreational opportunities that allow these individuals to learn skills of interaction and leisure behavior. Given the opportunity, disabled individuals can reap the benefits that Beechel has pointed out.

Summarizing, disabled people have historically been isolated. However, modern rehabilitation has made many disabled persons potential members of our daily work force. But, unable to find work and left with undirected spare time, rehabilitated persons tend to revert to isolation and poor self-image personalities. Given the opportunity to spend this spare time participating in recreation, the rehabilitated positive self-image, and good individual/community health can be fostered and built upon.

## 2.7 RECREATION FOR EVERYONE

Errickson, 1977 (p.45), has noted that "one of the primary self-deceits imposed upon the general public and ourselves, is the homily recreation for all". This concept is far from being satisfactorily practiced. Public recreation does not serve the needs of our total population. The providers of recreational opportunities have, in fact, excluded those who need it most, the disabled. Man continually designs facilities that promote the segregation rather than the integration of society.

The need for recreational facilities that sup-



port societal interaction is espoused by all major organizations which are dedicated to the "mainstreaming" of disabled individuals. These include the Canadian National Institute for the Blind, the Canadian Paraplegic Association, and the Manitoba Society for Crippled Children and Adults. Exemplifying these organizations, the C.N.I.B. is opposed to specially designated facilities for the sole use of persons who are blind or visually impaired. While strongly approving services, activities and benefits which recognize the special needs of blind or visually impaired persons, the C.N.I.B. disapproves of any activity which perpetuates misconceptions and stereotyped thinking which tends to set blind or visually impaired persons apart from the rest of society. The C.N.I.B. follows the tenet that loss of physical vision does not totally deprive an individual of aesthetic satisfactions, since vision is only one of the senses through which any of us perceive the world. Facilities such as the "Roaring Fork Braille Trail" in the White River National Forest, Colorado, carry psychological impacts that are distasteful to the blind or otherwise visually impaired people who have a consciousness of the dignity of self. Furthermore, even more harmful is the effect on the sighted public, for "Braille Trails" build up a stereotype which involves ideas that these people should be segregated, that they are helpless to take part in normal pursuits, and that the public should pity them as they go their separate ways. Participation in recreation is a voluntary action, and some disabled people, just as some "average" people, will require more support and encouragement than others to join in a leisure pursuit.

Recreational facilities should offer no special social shelters to the disabled, or the average individual. Inherent in progressive facilities, then, is the opportunity for our "total population" to interact. A typical reaction for a disabled person has been pointed out by amputee, Cindy Walker. Interviewed by Trends Magazine, 1974 (p.4), she notes "that despite difficult moments, putting handicapped people into mixed situations is not only important, but necessary. One must operate on the basis of the reality of a situation that a person cannot test his self-confidence, or expect to gain more, if one is never given the opportunity.

Naturally, you are going to have those awful moments of not understanding, and total mental barriers between the handicapped and the normal population, but you can't retreat from them, you've got to work through them." From interviews and personal experiences I can add that a normal reaction from an average person in a mixed situation will be an initial feeling of discomfort. One of the major problems we face in our associations with physically disabled persons is our tendency to extend an observable disability to a point where it spreads to the total person. For the average person to truly accept a total population, we too cannot retreat.

Designers have a significant role to play in helping man constructively utilize his leisure time by providing recreational plans that reflect the basic premise of a disabled individual's right to public goods and services. By designing 'holistic' recreational facilities, we can provide the opportunity for progressive societal interaction to occur in settings that may help us over our initial reactions, and allow/encourage personalities to emerge.

## 2.8 SUMMARY

- To design environments for everyone, we must:
- .1 understand that everyone is at least temporarily disabled, at one time or another, through age, disease, accident, or some traumatic experience
  - .2 provide physical consideration for: non-ambulant people in wheelchairs; semi-ambulant individuals using any number of mobility aids; visually impaired people; and the auditorily disabled
  - .3 understand that permanently disabled individuals are, at most, medically exceptional, and that first and foremost, they are people
  - .4 understand that our historical concept of the "average man" is no longer valid, and address design issues of a broader based "total society"
  - .5 understand that to deny the equal right of use to public recreation facilities to any segment of the community is to prevent participation as a central part of one's life.
  - .6 understand that a disabled person who is given the opportunity to participate in recreation can not

only promote his own mental/physical health, but  
add to the collective health of the community.  
.7 understand that as landscape architects, we are  
in a position to promote recreational opportunities  
in stimulating environments that are accessible to  
everyone.

# 3. Designing for the Disabled

## 3.1 OVERALL GOAL

Based on the arguments and facts presented in the preceding chapters, an overall goal may be formulated. We must strive to design recreational facilities which minimize barriers that frustrate disabled individuals, while maximizing their opportunities to participate in stimulating appropriate environments.

To satisfy this overall goal, this practicum:

- .1 presents a 'holistic' design philosophy, which is unbiased towards the disabled;
- .2 presents 'holistic' design criteria that one may use in designing recreational trails for all;
- .3 presents a summary of performance specifications that may be used in designing recreational trails for all.

## 3.2 A 'HOLISTIC' DESIGN PHILOSOPHY

Given the view that persons with physical disabilities have an equal right to recreation opportunities with all other members of the community, a listing of "appropriate opportunities" has not been presented, as it would only place arbitrary limits on what these individuals can or should do. However, to stimulate thought and promote open-mindedness, it is noteworthy that physically disabled individuals, interviewed by Trends Magazine in July 1975, expressed that they enjoyed participating in all types of recreation, including skiing, kayak racing, horseback riding, bowling, archery, football, track and field, skydiving, camping and trampoline play for excessively obese disabled individuals.

To design any facility with the intent of promoting opportunity for use by our total population requires not only an understanding of the needs of our clientele, but a full understanding and appreciation of the underlying base behind those needs. What the disabled do not specifically need is to be designed for. Traditionally, to include the disabled, most designers start from the premise of

designing for the disabled. Although they may be consciously looking for an integrating design that works better than existing examples, most are starting with at least a subconscious bias: accepting that the design is for the disabled. This will mean that the resulting facility will contain all of the traditional facets of structure and the various rules, regulations, building codes and construction standards that have come to be established in designing for the disabled. The design will be so rigid that everyone will recognize another "handicapped facility".

Pomeroy, 1964 (p.71), states that "program planning for the physically handicapped is basically no different from planning for the non-handicapped. As with all recreational programs, the primary objective should be to provide more and better recreation opportunities for the satisfaction, enjoyment and benefit of the people they are intended to serve". What the disabled do need is for designers to take an open-minded, "holistic approach", aimed at allowing the disabled the opportunity to participate in recreational activities as everyday members of our society. Designers must incorporate barrier-free design principles as documented by Jorgensen, Beechel, and others, in such a way as to make our designs unified whole entities. We must use finesse, innovation, and imagination as the tools to achieve this goal. Only in this way can over design and under design be avoided, and our end result be looked upon as a better quality built environment for all.

### 3.3 'HOLISTIC' DESIGN CRITERIA FOR RECREATIONAL TRAILS

These following criteria are particularly important when designing recreational trails for our population with its ambulatory and sensory problems.

#### .1 Trail Access

.The geographical location of the trail should be accessible by public and/or private transportation.

#### .2 Trail Organization

.The trail should offer a choice of routes

so that a person may participate at a self-comforting level of physical involvement.

.The trails organization should stimulate ones senses, and include areas where social interaction may occur.

.3 Trail Functionality

.Self-guiding trails must be safe.

.Guided trails must have staff able to assess the ability of participants, and develop programs to stimulate these abilities.

.Trails should be self-motivating.

.4 Trail Quality

.The built trail should complement the diversity and quality of the environment through which it travels.

.5 Trail Maintenance

.The built trail should be maintained in a manner to ensure user safety and to limit the physical impact the users will place upon the travelled area.

3.4 PERFORMANCE SPECIFICATIONS SUMMARY TO ACCOMMODATE THE DISABLED ON RECREATIONAL TRAILS

The following summary of performance specifications will assist designers in ensuring basic functionality and safety in their recreational trail designs. This summary should not be used in isolation, but, in conjunction with such published standards as the National Building Code of Canada, the Manitoba Building Code, and the National Parks Trail Manual.

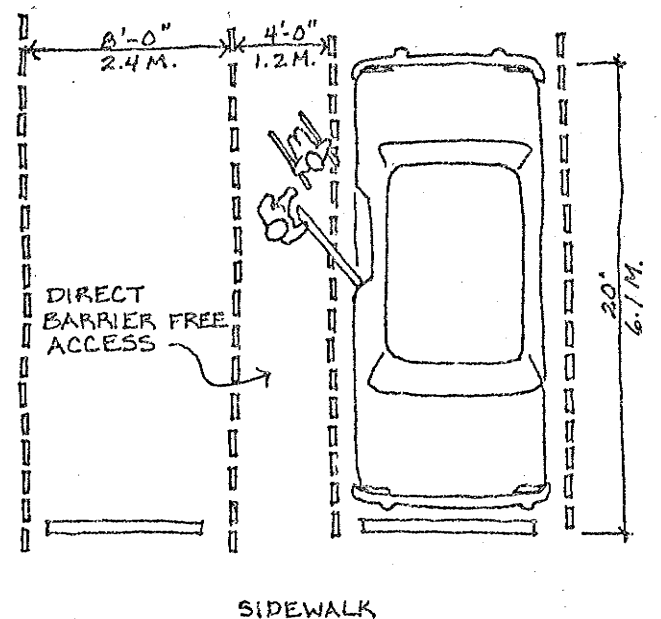
.1 Location: (1) Trails built in locations such as City, Provincial, and National Parks, which already have special interest for the general population, will predictably attract our disabled population as well.

(2) Trails built in the proximity of rehabilitation facilities will offer the rehabilitating individual the chance to get out and test his developing self-image. Just like a child does, a rehabilitating individual expands his physical boundaries slowly, before becoming confident enough to independently travel "far" from home.

.2 Access: Trail access should be via public and/or private transportation systems.

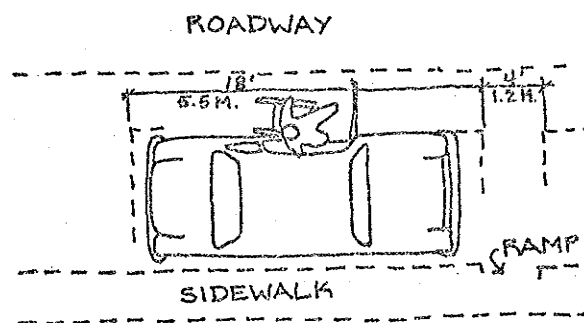
.3 Parking/Drop-off Zones: Jorgensen (1975) notes that parking and/or drop-off zones are inseparable components of access.

A good criteria for general public parking lots is to reserve one stall, plus one percent of the total parking, for the disabled. Parking stalls should be wide enough to allow disabled individuals enough room to leave both sides of a car. Access to a sidewalk should be direct.



90° PARKING

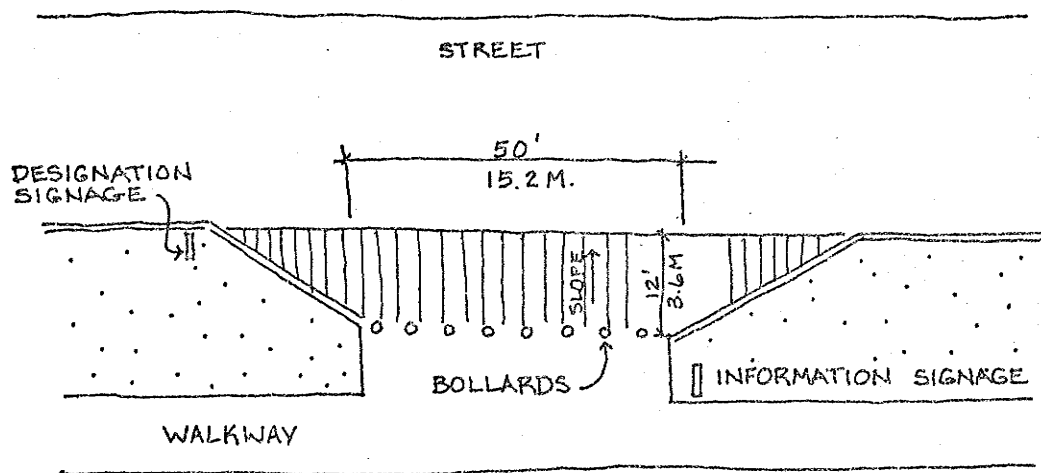
Figure 7



PARALLEL PARKING

Figure 8

According to H.U.D., the minimum width of a drop-off zone should be 12' (3.66m). The zone should be at least 50' (15.2m) long to accommodate a bus or two cars. Bollards, or some other device, should separate the drop-off zone and adjacent activity areas to stop vehicular encroachment. Signage should be erected to identify the zone's function.



## DROP-OFF ZONE

Figure 9

.4 Waiting Areas: Jorgensen (1975) notes that level areas should be provided adjacent to drop-off zones. These areas should contain benches, environmental protection, and direct access to facilities or activity areas.

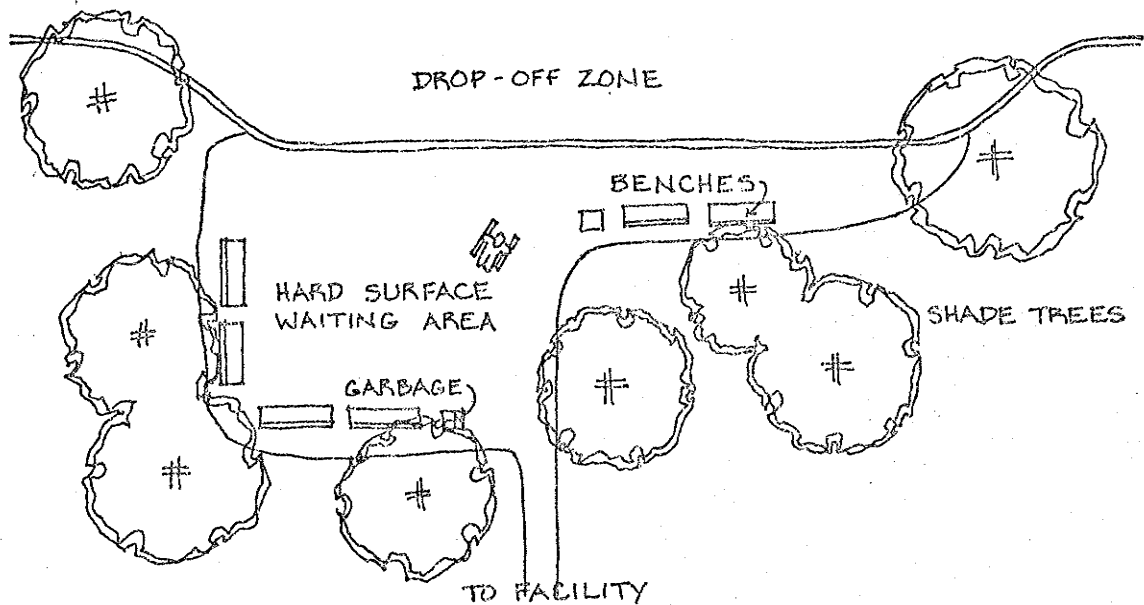


Figure 10



.5 Physical Character: Generally, trails to accommodate ambulatory disabled individuals should traverse land that is flat or gently undulating. However, all people have varying degrees of physical abilities, and a choice of trail topography that will require differing strengths should be offered.

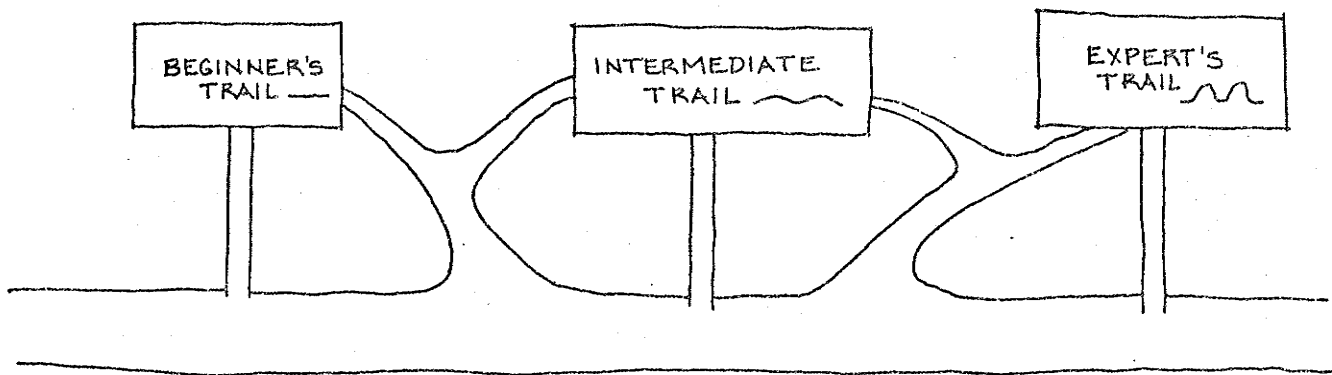


Figure 11

Schwartz has noted that one may find the visually handicapped almost anywhere that is suitable for an "average" group. Provided that there is a definite distinction between the trail surface and the surrounding area, one can easily "shoreline" his way around.

.6 Guidance Systems: Trails should have a discreet but definite guidance system, and be kept free of obstacles which might protrude on to, or overhang, the trail, and be unsafe.

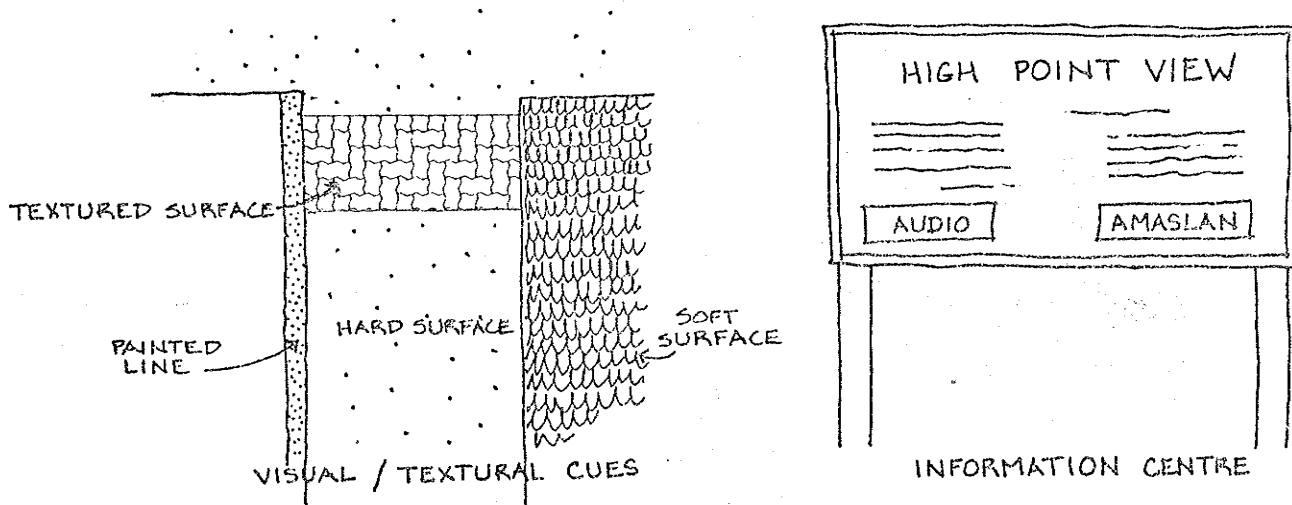


Figure 12

A line painted atop the curb can be used by a visually impaired person for orientation and guidance. Textural surfaces enable individuals to keep orientation through tactile changes and can be used as keys to cue imminent hazards such as abrupt changes of grade, stairs, ramps, intersections, or the locations of special information. Information centres should display their messages in written and/or audio form, as well as in amaslan, the international sign language.

.7 Communication: Non-ambulatory individuals view the world from a seated position, and designers must note this fact. If earth berms or other structures are to be used to define a space, give direction, and so forth, they must be no higher than 48" (1220mm) to allow a wheelchair user to see over them. This also applies to fences, signs, barriers and other common landscape elements.

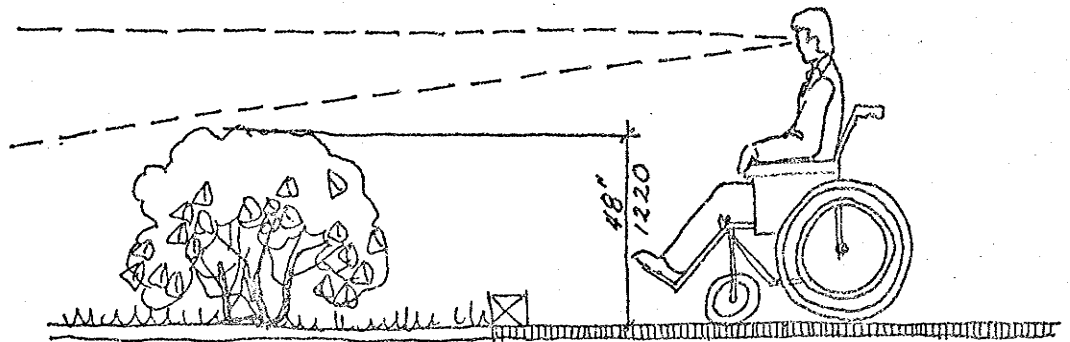


Figure 13

Cassette tapes have proven very successful in communicating with the blind. They are more versatile than signs, easy to change the message on, and vandal proof. Braille signs are a poor expenditure, as only 5% of the blind read Braille.

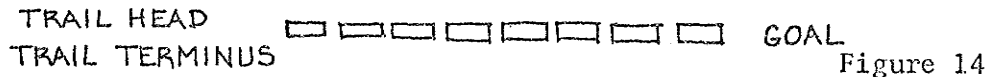
Deaf individuals are the most difficult to communicate with because of their frequent lack of education. There are several ways that one might initially present a trail to a deaf individual(s). For example, the support staff of an interpretive trail could go to a school, institution or club for the deaf, and explain their trail. The deaf individuals could then be prepared to visit the trail by first learning about any concepts that they were going to see.

Another way to introduce recreational trails to the deaf would be to make promotional

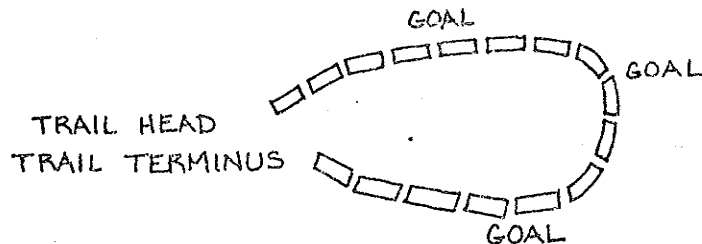
films about the trails, and have sign language dubbed in for deaf audiences.

.8 Trail Length: Terrain, distinctive features, and travel time should determine trail length. Donna Pastore, a Braille specialist with the Library of Congress, (Trends, 1974) has noted that walks covering about 1,600' (488m) of territory and take an hour to an hour and a half are ideal. While this may hold true for many people, designers should only use this as a broad rule of thumb, and build trails of varying lengths to satisfy the differing physical abilities of people.

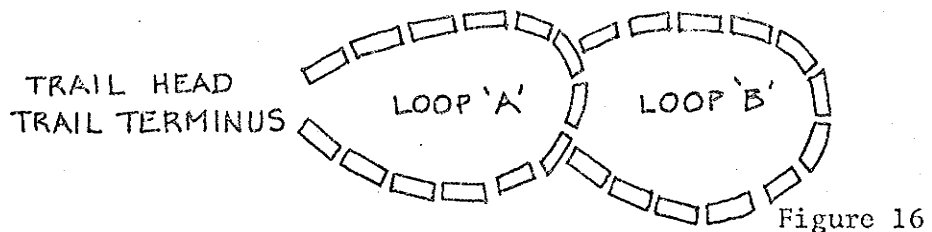
.9 Trail Form: Linear, goal oriented trails should be short, if they are to accommodate slow moving non- and semi-ambulant people.



Loop form trails that have their goals or messages occurring sequentially along the trail are successful in that a user does not have to retrace his steps to return to the terminus.



Stacked loop form trails offer the same advantages as the loop form, plus they give a user the opportunity to extend his outing if he so desires.



Labyrinth form trails offer links to a variety of goals, give the user a multitude of choices, and may frequently be revisited as a

different route through the labyrinth. Guidance systems become very important in conjunction with this form, as one does not want the disabled user to overextend himself or become lost.

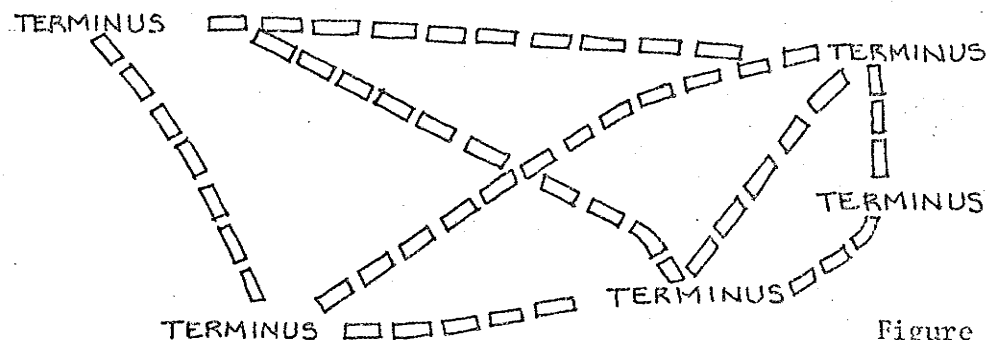


Figure 17

.10 Tread Width: Tread width should not be rigidly constant. In rough terrain, the tread may be narrow, while in areas with few constraints, wider. Two way trails are more economical than one-way systems, and are more conducive to social interaction. H.U.D. recommends the following trail widths.

#### ONE WAY

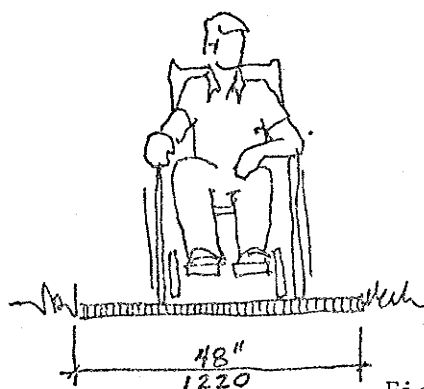


Figure 18

#### TWO WAY

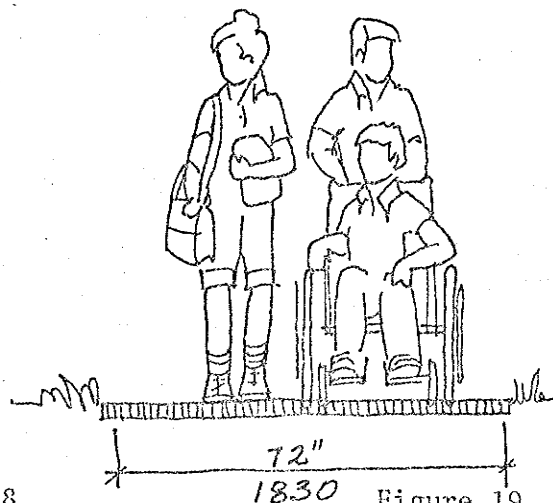


Figure 19

.11 Tread Surfaces: Many materials exist that can be used for tread and shoulder surfacing. Their suitability for use should be judged on a trail by trail basis. Naturally, the harder and smoother the surface, the easier it is to roll a wheelchair on. The softer the material, the more

difficult it is to walk on. Jorgensen, 1975, has noted some of the following materials and characteristics.

<u>Surface Material</u>	<u>Characteristics</u>
-------------------------	------------------------

Soft:

- |               |                                 |
|---------------|---------------------------------|
| .crushed rock | .irregularity and softness      |
| .earth        | can make walking difficult      |
| .turf-grass   | .difficult surfacing for people |
| .river rock   | with mobility handicaps or for  |
| .bark chips   | wheeled vehicles to negotiate   |
| .sand         | .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 requirements        |
|               | .manipulative                   |

Medium:

- |             |                                  |
|-------------|----------------------------------|
| .unistone   | .materials of modular form--     |
| (sand base) | installed in pieces              |
| .brick      | .overall surface made of small   |
| (sand base) | units which can fluctuate with   |
| .wood--deck | frost heaving                    |
| --rounds    | .irregularity in surface and     |
| .exposed    | wide joints can make walking for |
| aggregate   | disabled individuals difficult   |
|             | .moderate maintenance require-   |
|             | ments, moderate to high install- |
|             | ation costs                      |
|             | .joints can trap crutch or cane  |
|             | tips, narrow heels and small     |
|             | wheels; joints should be no      |
|             | wider than 1/2" (13mm)           |
|             | .joints, colors and patterns can |
|             | be basis for guidance systems    |
|             | and cues                         |

Hard:

- |             |                                     |
|-------------|-------------------------------------|
| .asphalt    | .firm and regular surfaces for      |
| .concrete   | walking or wheeled vehicles         |
| .tile/brick | .high installation costs, low       |
| in concrete | maintenance costs                   |
| .terrazzo   | .expansion joints should be kept    |
|             | to a minimum                        |
|             | .asphalt, black color, retains heat |
|             | in summer                           |

- .concrete cracks from frost action where asphalt tends to be more flexible before cracking
- .oil base of asphalt can stain persons and damage plants
- .appropriate where water comes in contact with wheeled mobility aids

To accommodate the disabled, the tread surface should possess stability and firmness, be relatively smooth in texture, and have a slip-resistant surface. The use of expansion joints should be minimized and preferably kept to under 1/2" (13mm).

To accommodate the disabled, the tread shoulders should be of a different texture than the tread itself, to serve as a 'shoreline' guidance system. Furthermore, they should be relatively soft, to slow down runaway wheelchairs or cushion a fall.

.12 Vegetative Clearing: Vegetation and man-made objects must be kept clear of the trails right-of-way, particularly so the visually impaired do not injure themselves.

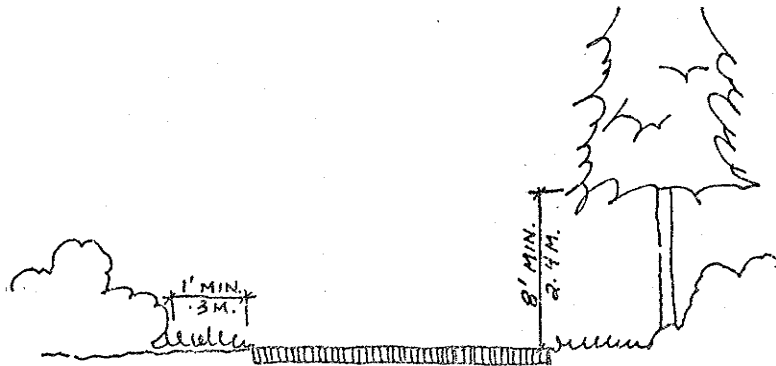


Figure 20

.13 Planting: The planting should blend with and highlight the existing environment, while providing shade, shelter, screens, framed views, and spacial definition. The plant material should be hardy species and planted so that any characteristic specific to a plant will not result in a situation potentially dangerous to the disabled. H.U.D. (1975) has noted some of the following plant characteristics and the potential dangers that these present, in

### Barrier-Free Site Design.

<u>Plant Characteristic</u>	<u>Potential Danger</u>
.poisonous	.may irritate or sting if touched .adventurous people may sample by tasting
.debris	.cones can cause problems for wheeled vehicles .seed pods can be slippery for pedestrians and cause problems for wheeled vehicles .naturally pruned branches may fall on pedestrians, or fall onto the walk and present an obstacle or danger .fruits and berries can be very slippery atop a walking surface
.drooping branches	.branches weighted with snow, water, or by wind can drop below the minimum clearance height and cause facial or other injuries
.shallow root systems	.can cause an uneven trail which one cannot roll a vehicle on, or present an obstacle on which one may trip and fall
.odor	.plants with strong odors tend to make some people nauseous
.pollen	.flowering plants can cause asthmatic and allergic reactions
.thorns and spikes	.can be particularly dangerous to visually impaired
.insects	.because of the extreme reaction some people have to bites, plants that attract these pests should not be used

.14 Grading: Jorgensen, Parks Canada, and others recommend the following grading ranges for disabled people.

.0% - 3%	.preferred
.3% - 5%	.negotiable grade of average independent wheelchair
.5% - 8.33%	.ramps up to a maximum 30' (9.1m) run

Within this context, designers must consider how the finished trail grade will relate to the natural topography. To minimize environmental impact from trail construction and for interruption of natural systems, the built trail should follow the natural contours of the land as closely as possible. In some instances, regrading or ramp building may not be appropriate, and in these cases, elevating devices should be considered. While many 'wheelchair athletes' can negotiate and indeed have a great deal of fun on grades steeper than 8.33%, designers should take great care not only to protect these people, but the general public in such situations. Short, steep pitches may be used, but must be followed with level rest or slow down stretches.

Generally, it is advisable to avoid creating long sustained grades. It is better to provide variation, with gently sloping sections giving relief between steep climbs. In situations where grades are very steep, it may be more suitable to provide ramps, switchbacks, steps, or elevating devices.

.15 Ramps: Jorgensen and H.U.D. note that ramps should have a textural signal prior to the ramps to act as a warning device, carry a minimum 100 lb./sq.ft. live load, have low curbs along the sides to provide surfaces against which wheeled vehicles can turn their wheels in order to stop, and have level rest areas at their ends. Handrails that extend past the ramps end, and a non-slip surface must be provided.



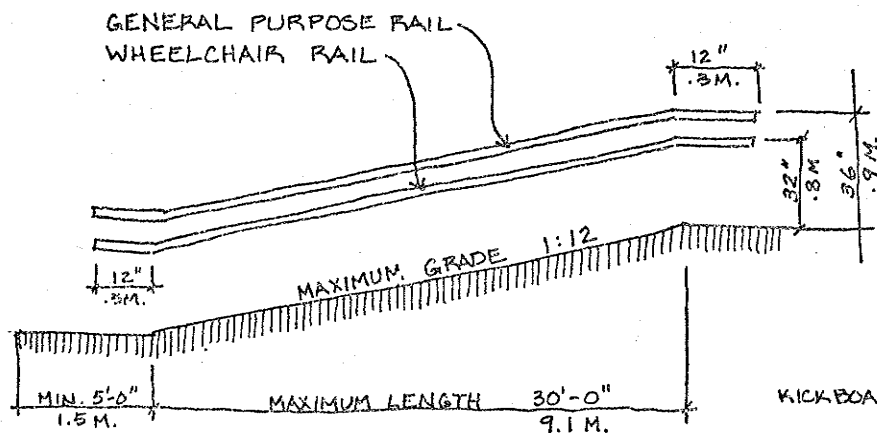


Figure 21

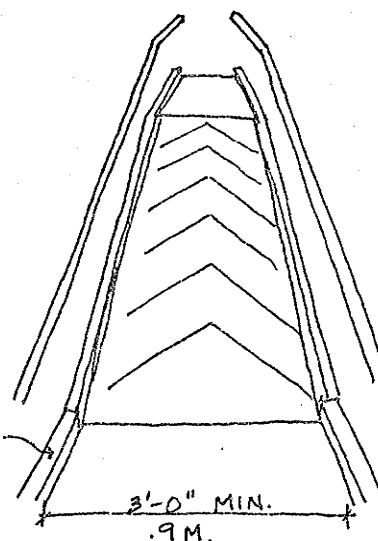


Figure 22

.16 Stairs: Jorgensen notes that stairs that are to be used by semi-ambulants or elderly people should be designed so that they are usable with a minimum expenditure of energy. The nose of the riser should be eased so as not to catch shoes, or braces. The run should be deep enough to allow a man to place his whole foot on it, and be slip resistant. Stairs should rise no more than 6' before a landing is provided. H.U.D. notes the following stair as being preferred.

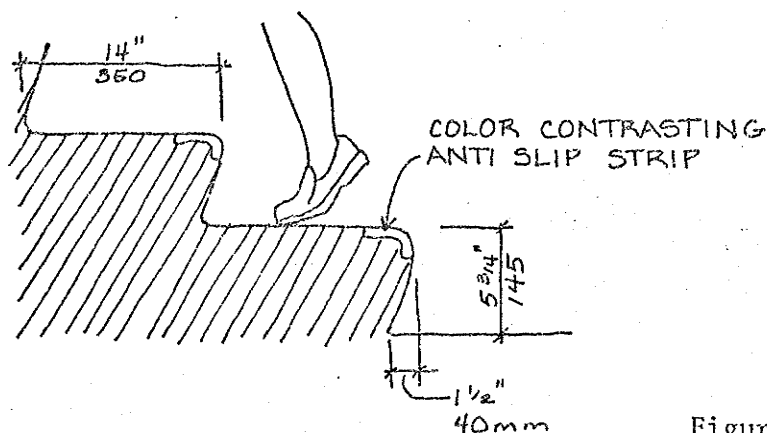


Figure 23

.17 Handrailings: If possible, handrailings should be on both sides of stairs or ramps. If not possible, one down the middle is mandatory. They should support 250 lbs. and be securely fastened at all times. They should 'bend' and extend past landings at least one foot, to act as a cue to the visually impaired. If this extension would intrude or conflict with some other space and be a danger, a notch or knurling on the rail may be used to provide a cue. Rails must be designed so that one's hand fits over the top and can get a good grasp. H.U.D. and Jorgensen note the following preferences.

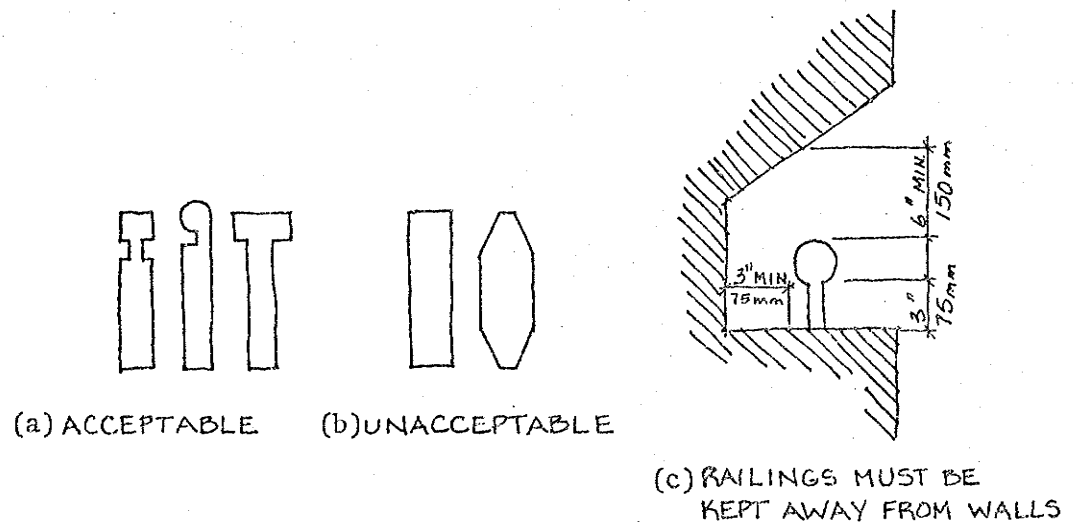


Figure 24

.18 Rest Areas: Jorgensen and Ries note that many elderly and disabled people rest often. Rest areas should be provided frequently, be at the same grade as the trail, but out of the way of the main traffic flow. Seating should be arranged so that wheelchairs fit in the arrangement. Accessories such as garbage containers and drinking fountains should be considered. Plantings for shade and enclosure may be necessary.

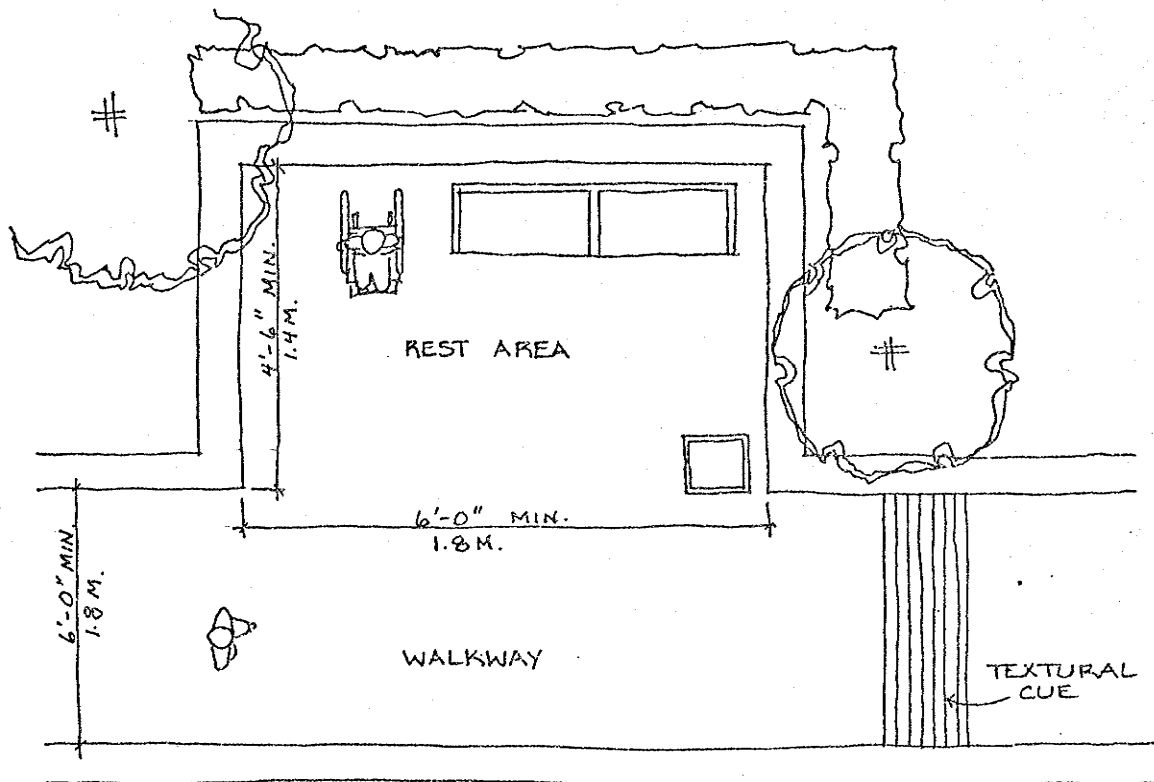


Figure 25

.19 Seating: Benches should have back and arm supports to give added body support to individuals affected by weakness or spasm. As amputee and leg brace wearers find it difficult to rise from a sitting position, low benches should be avoided.

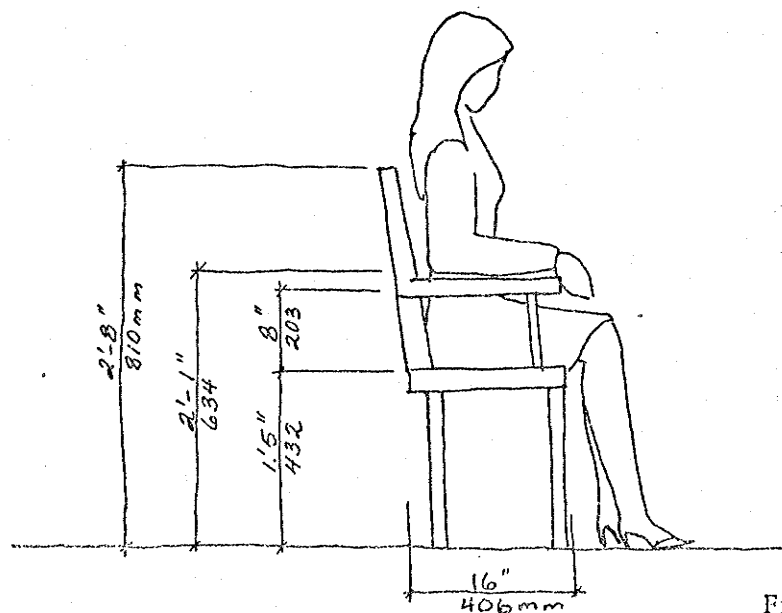


Figure 26

.20 Drinking Fountains: Largely due to glandular problems, disabled individuals tend to consume more water, more frequently than non-disabled people. Therefore, drinking fountains should be provided frequently. The drinking bowl must cantilever out over the support stand to allow wheelchair access. The handles should be lever type to allow for easy operation by all individuals.

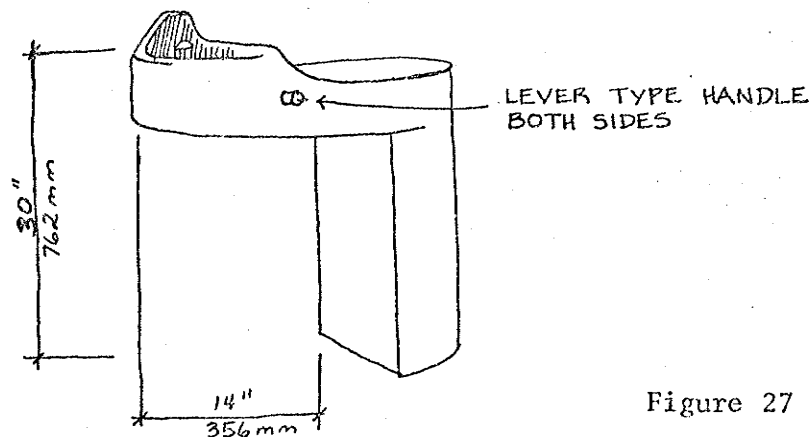


Figure 27

.21 Waste Receptacles: Should have their opening between 30" and 36" (762 and 914mm). Lids should be operable by one hand, and the overall unit securely anchored to the ground as semi-ambulant and the elderly often use such elements for support. If lids are spring loaded, the spring should be easy to push for physically weak individuals.

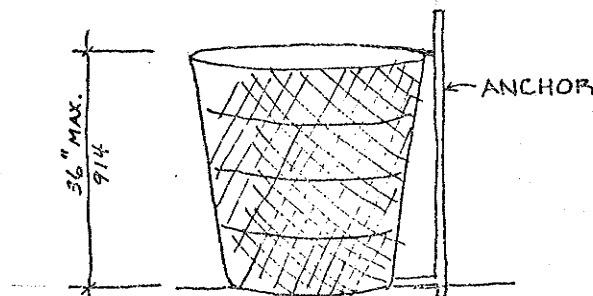
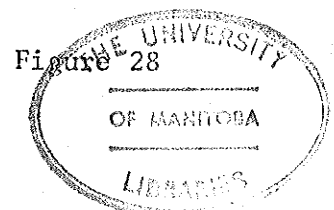
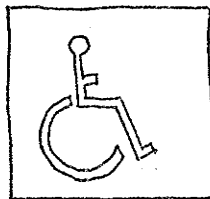


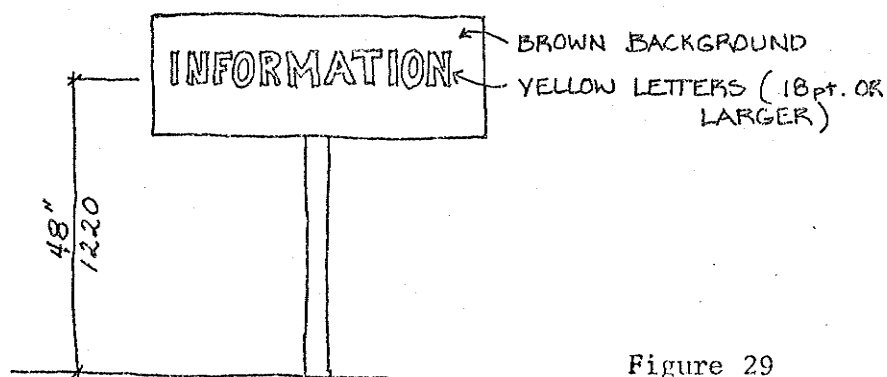
Figure 28



.22 Signage: Accessibility to facilities should be designated by the international access symbol.



Special care must be used on information signage regarding the use of symbols, as many times a blind person will not recognize a symbol where he would be able to recognize letters. Letters should be routed so they can be finger traced and be painted a contrasting color to the sign.



.23 Lighting: H.U.D. and Jorgensen note that proper lighting should be provided at all drop-off/pick-up zones, parking areas, signage locations, step areas, ramps, and all hazard areas. The diagonal projection of light from one standard to the next should overlap.

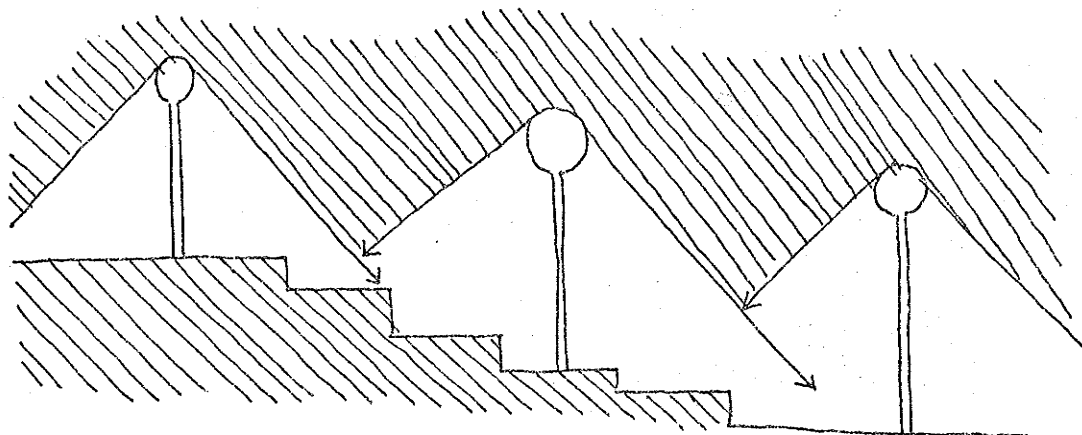


Figure 30

## DOORS AND ENTRIES

Diagram illustrating the required clear zone for a door swing. The diagram shows a door opening into a room. The clear zone is defined by a dashed arc. The dimensions are:

- 5'-0" Desirable 3'-0" min. level floor (both sides)
- 2'-8" clear min. width

.25 Washrooms are an integral part of trail design and Beechel provides the following specifications.

## RESTROOMS

43

### 3.5 ANNOTATED BIBLIOGRAPHY OF DESIGN STANDARDS AND CRITERIA RELATED TO THE DISABLED

Beechel, Jacque, Interpretation for Handicapped Persons, A Handbook for Outdoor Recreation Personnel, United States National Parks Service, Seattle, WA, 98195, 1975. An introductory book that notes successful and unsuccessful interpretive accommodations for blind, deaf, deaf-blind, retarded, and ambulatory limited individuals. Includes an appendix directory of trails for the handicapped in the United States.

H.U.D., United States Department of Housing and Urban Development, Barrier-Free Site Design, U.S. Government Printing Office, 1975. Includes design criteria, suggestions and sketches on general site accessibility and common accessory details.

Jorgensen, Jay, Landscape Design for the Disabled, American Society of Landscape Architects, McLean, Virginia, 1975. Jorgensen has assembled design standards and criteria from a variety of published and unpublished sources. These include standards for wheelchair and mobility aids, parking, curb cuts, walks, ramps and stairs. Also discussed are playgrounds and campgrounds.

Parks Canada, Trail Manual, Minister of Supply and Services, Queen's Printer, Ottawa, 1978. The manual provides guidelines for the development and management of recreational trails for our National Parks, and National Historic Sites. Included are sections on environmental protection and related considerations.

Ries, Michael L., Design Standards to Accommodate People with Physical Disabilities in Park and Open Space Planning, University of Wisconsin, Madison, 1973. An introductory standards book. A good reference for a designer with a working knowledge of designing for the disabled.

## 4. The Application of 'Holistic' Design to Historic Lakeshore Walk

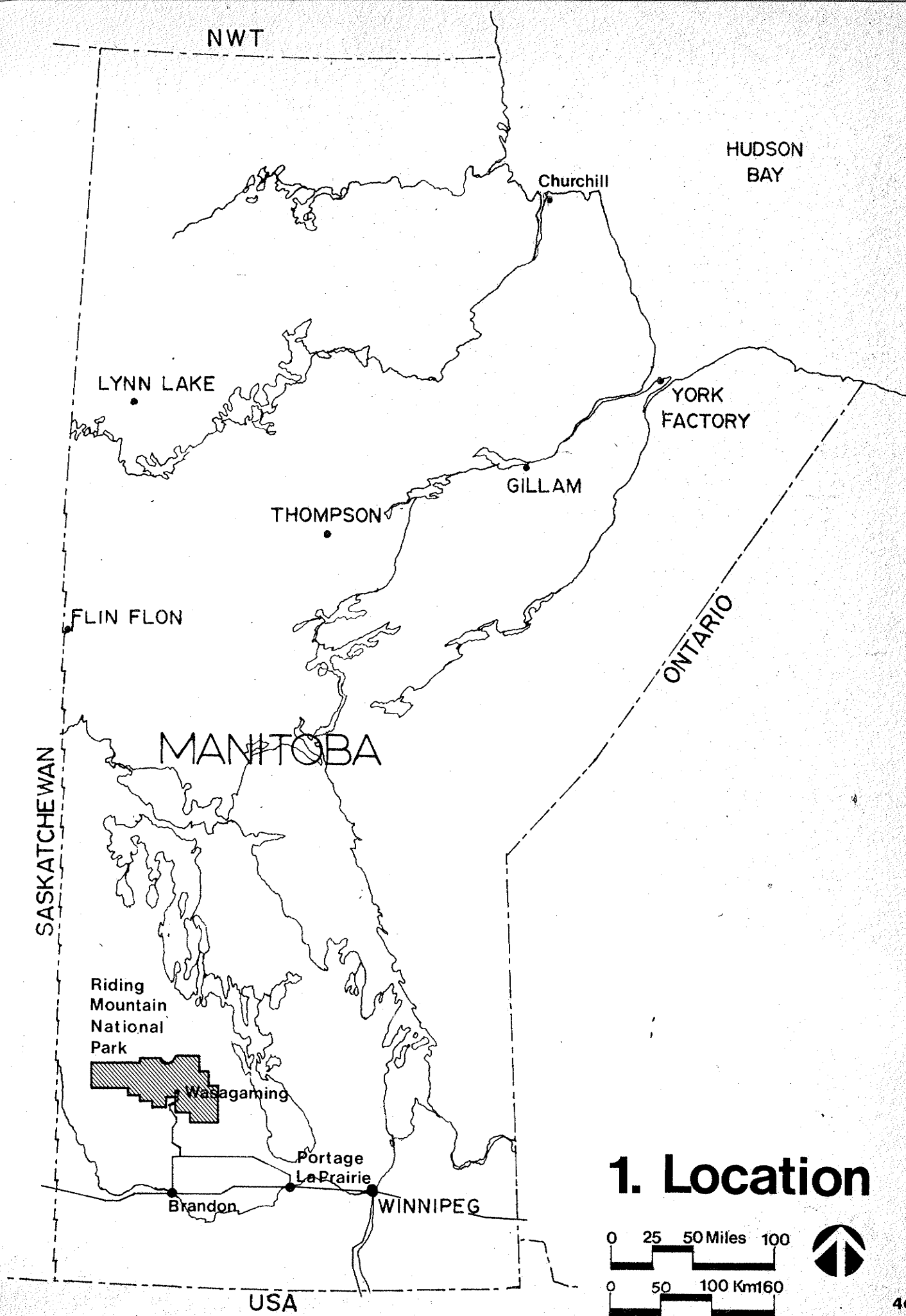
### 4.1 TRAIL LOCATION (See Maps 1 & 2)

Canada's National Parks have been established to preserve and conserve some nationally unique feature(s) for the enjoyment and use of our present and future generations. As such, they are locations that contain existing resources and infrastructure that often lend themselves well to recreational trail development.

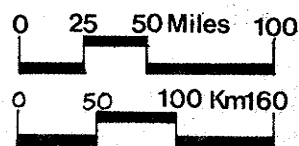
Riding Mountain National Park is located 60 miles (97km) north of Brandon, 160 miles (257km) northwest of Winnipeg. The Park, which represents .005% of the area of Manitoba, is accessible by public and private transportation to everyone, including the 1,000,000 people who live within a 300 mile (483km) radius.

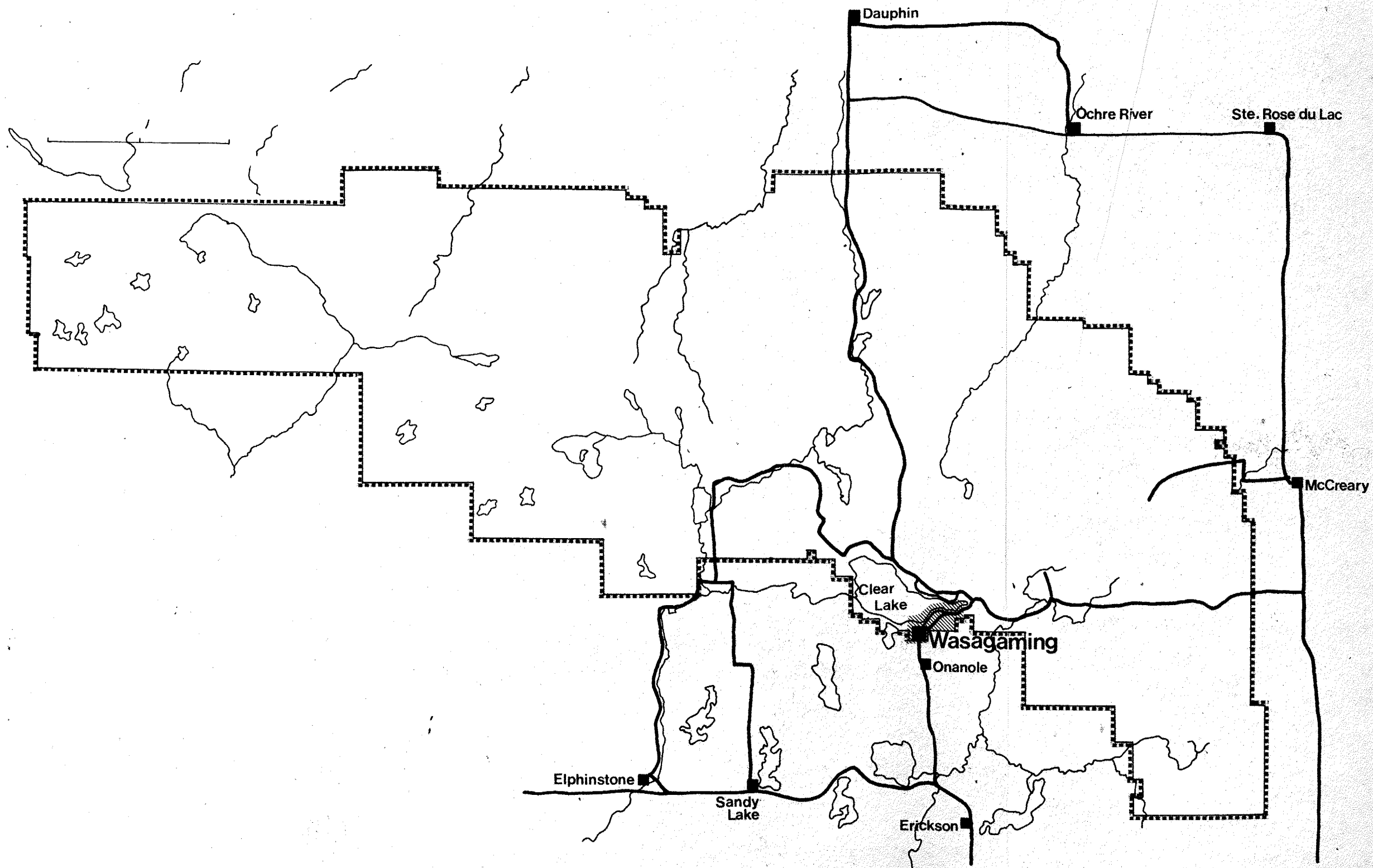
The Park is located on a rolling plateau that forms part of the Manitoba Escarpment. Its 251,000 square miles include both hardwood and softwood forests, prairies, rolling hills, valleys, lakes and streams. Within the Park proper, set adjacent to the south shore of Clear Lake, the Wasagaming townsite serves as the administrative centre of the Park and the major visitor gathering place. The townsite and lake have been identified in Parks Canada's 1977 Master Plan for Riding Mountain National Park as having the recreational potential to support such activities as angling, family boating, camping, lodging, pedestrian trails and associated facilities.



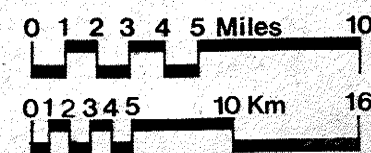


## 1. Location





## 2. Riding Mountain National Park



#### 4.2 CONTEXT (See Map 3)

The townsite of Wasagaming is the administrative and service centre for most of the Park's activities. It is in close proximity to the main entrance gate, and, as such, sees, houses, feeds, and directs the majority of the Park's visitors.

Historic Lakeshore Walk is located between the townsite of Wasagaming and Airplane Bay, along the southern shore of Clear Lake. The "Walk" was built during the 1930's to serve as a leisure walk between the day use area and Airplane Bay. The 1.5 mile (2.4km) Walk followed the shoreline, bounded on the north by Clear Lake and on the south by private cottages. Public access to the Walk was provided at many points via easements off Wasagaming Drive. Now in a state of disrepair, the Walk is to be redeveloped as a leisure trail.

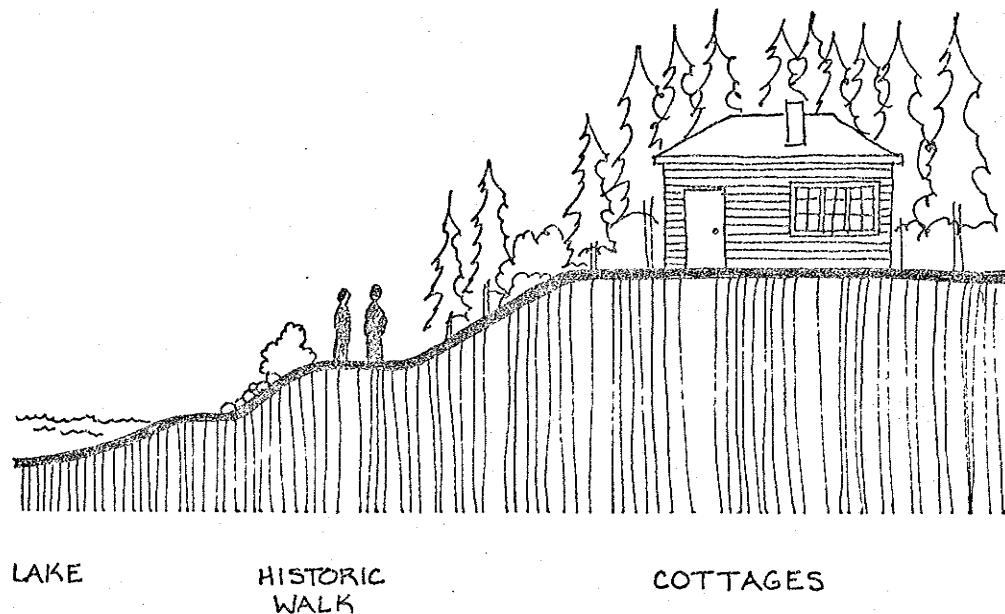


Figure 33

Clear Lake

Airplane Bay

Cottages

campground

campground

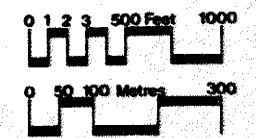
National Park Boundary

Park Gate

- Historical Lakeshore Walk
- P.T.H. 10
- Parkway
- Public Access to Lake

- Visitor Centre
- Parking
- Visitor Accommodation
- Day Use
- Commercial Service
- Sand Beach

### 3. Context



#### 4.3 SITE ANALYSIS

##### 4.3.1 Climatic; from Keck's 1975 The Climate of Riding Mountain National Park, Manitoba

###### - Mean Daily Temperature (<sup>o</sup>F/<sup>o</sup>C) at Wasagaming

J	F	M	A	M	J	J	A	S	O	N	D
-5	1.2	15.9	32.7	46.7	56.3	60.1	59.6	50.1	36.7	18.6	2.8
-20.5	-17.1	-8.9	.4	8.1	13.5	15.6	15.3	10.0	2.6	-7.4	-16.2

###### - Monthly Rainfall in Inches/Centimeters

J	F	M	A	M	J	J	A	S	O	N	D
.85	.75	.75	1.75	1.0	3.85	3.35	2.5	2.0	2.0	1	1
2.1	1.9	1.9	4.4	2.5	9.8	8.5	6.3	5.0	5.0	2.5	2.5

- Total Annual Precipitation - 18.74"/47.59  
 Mean Annual Rainfall - 14.09"/35.78

- Clear Lake Average Ice Free Days - 194  
 Ice Free Yearly Average - May 12  
 Ice Covered Yearly Average - November 23

###### - Mean Average Water Temperature of Clear Lake (<sup>o</sup>F/<sup>o</sup>C)

J	J	A	S
50.00	60.00	65.00	61.20
10.00	15.50	18.30	16.10

###### - Annual percentage of winds from various directions:

Calm	N	NE	E	SE	S	SW	W	NW
2.7	6.2	10.8	5.7	19.5	7.4	10.1	11.5	25.7

Keck notes the overall climate of the Park as the cool, continental type. It experiences colder winters and a much wider temperature range than most areas of similar latitude. The temperatures of Clear Lake reflect the low annual air temperatures of Wasagaming. The low water temperature discourages beach use except on warm, sunny days. As precipitation can stop most outdoor activities, it is fortunate that it occurs only a relatively small

fraction of the total time available for tourist and recreation pursuits in the summer months.

#### 4.3.2 The Lake

In the Riding Mountain National Park Resource Description and Analysis, Barlow notes that Clear Lake is the largest body of water within the Park. Oriented roughly southeast-northwest, it is roughly three miles wide (4.8km) and seven miles long (11.3km). A significant feature of the lake is that it has an unobstructed fetch extending five miles (8.0km) to the northwest of the beach at the Day Use Area. Prevailing northwest winds along this fetch have caused spring ice push and summer wave erosion of the Historic Lakeshore Walk between the Day Use Area and the foot of Harebell Street.

Barlow further notes that Clear Lake is the only large, deep, oligotrophic lake in the Park. Correspondingly, it has the greatest fish species diversity and most complex aquatic ecosystem in the Park. The southern portion of the lake provides spawning and rearing grounds for both walleye and northern pike populations. Given the lake's very clear water, the spring spawning run is suitable for interpretation; however, strict protective measures must be observed as the fish are very vulnerable to poaching and disturbance.

Clear Lake is an exception to the limited sport fishing in the Park, and angling for walleye, whitefish, northern pike, and perch is possible.

#### 4.3.3 Topographic Considerations

Historic Lakeshore Walk, running along the foot of the lake's bank, is flat. The new desire line of the Walk, where a path at the top of the bank replaces the eroded portion of the Historic Walk, is flat from the Day Use Area to the foot of Dogwood Street. From Dogwood Street to the foot of Harebell Street, the desire walk line rises, and one encounters slopes of up to 10%. Significant slopes of up to 14% are encountered at the Harebell access easement. All other access easements are relatively flat until one reaches the banks of the lake, where stairs are required to reach the Walk. Along Wasagaming Drive, the sidewalk and road are flat to sustained grades. From Hawthorne Street to Goldenrod Street, a sustained grade of 5% is encountered. Between Orchid Street and Trillium Street, a sustained grade in excess of 6.5% is encountered.

#### 4.3.4 Townsite/Day Use Area

The Parks Canada master plan projects the townsite as the only urban-style concentration of facilities in the entire Park. Wasagaming is to be maintained at its current size and capacity, and developed to provide necessary services to cater to the needs of different types of visitors using the Park.

The focal point of the townsite is intended to be that area where the commercial land uses meet the day use and beach area. A portion of Wasagaming Drive is to be redeveloped as a pedestrian mall and a visitor centre is proposed in this area. The Day Use Area is the geographical starting point for the Lakeshore Walk.

#### 4.3.5 VISUAL ANALYSIS

The following visual analysis is an integral part of the site analysis and is keyed to map number four. The photographs, taken in a sequential manner from the Day Use Area to Airplane Bay, record existing physical and visual conditions, actual and potential uses and misuses, and serve as a design aide.

Currently, the Walk has no defined head or starting point. However, existing infrastructure exists adjacent to and within the Day Use Area that may be developed.

1





2



3

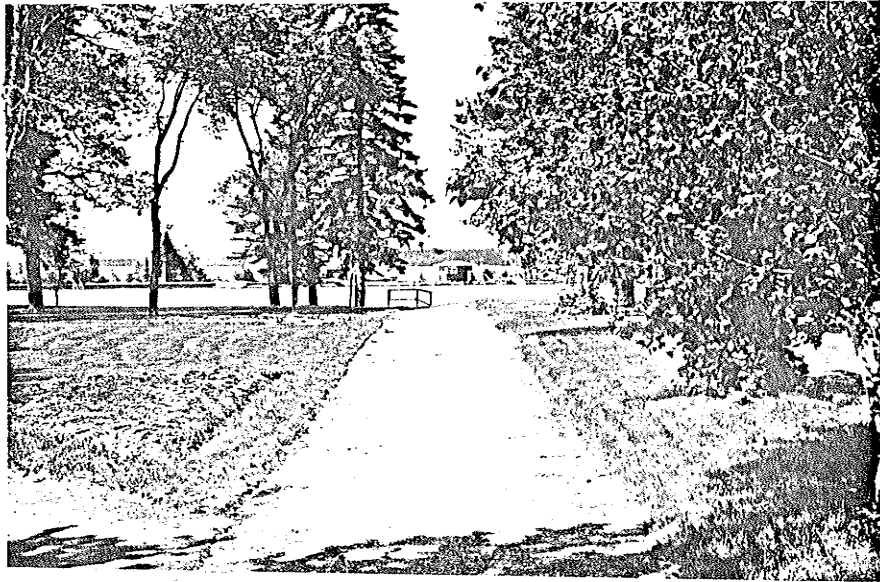


4



The area above the storm sewer outlet at the east end of the Day Use Area appears suitable to be developed as a rest area and view point of the beach and harbour.

5



6



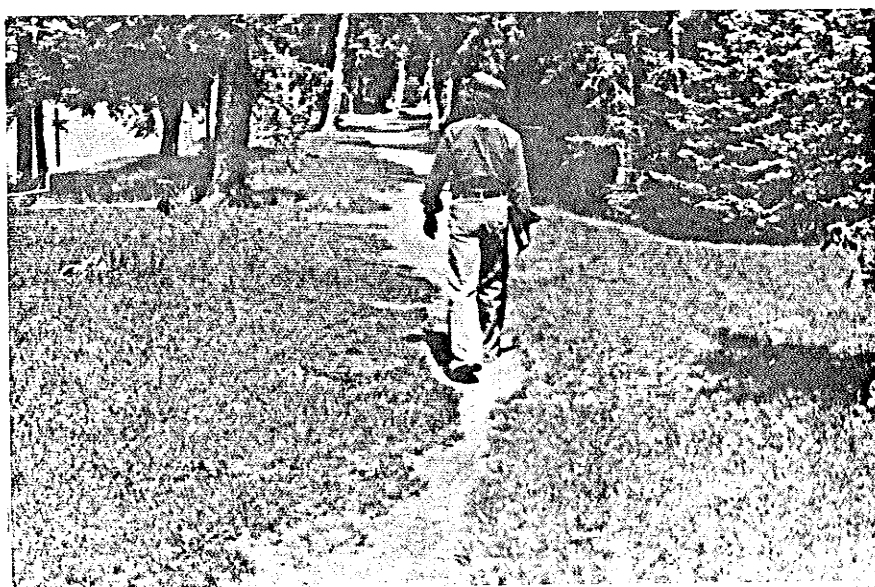
The Historic Lakeshore Walk has been completely eroded away just east of the Day Use Area.

7



Since the erosion of the Walk, a new desire line of walk has developed that runs parallel to the original route, atop of the lakeshore bank.

8



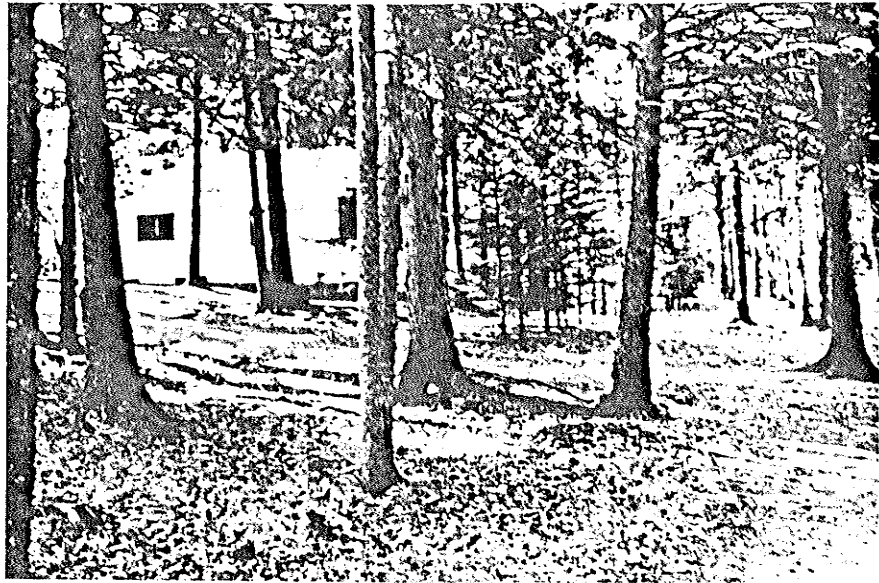
This desire line, or "High Trail" travels through part of the park's "Mixed Forest Zone".

9



This high trail is separated from Wasagaming Drive by a private cottage development. The Trail is on public open space, while the cottages exist on leased land. Parks policy is to reacquire these leased lands as they become available. On redeveloping the Walk, as long as no structures are built that will interrupt the cottagers view of the lake, one can anticipate that these entities will continue to exist in harmony.

10



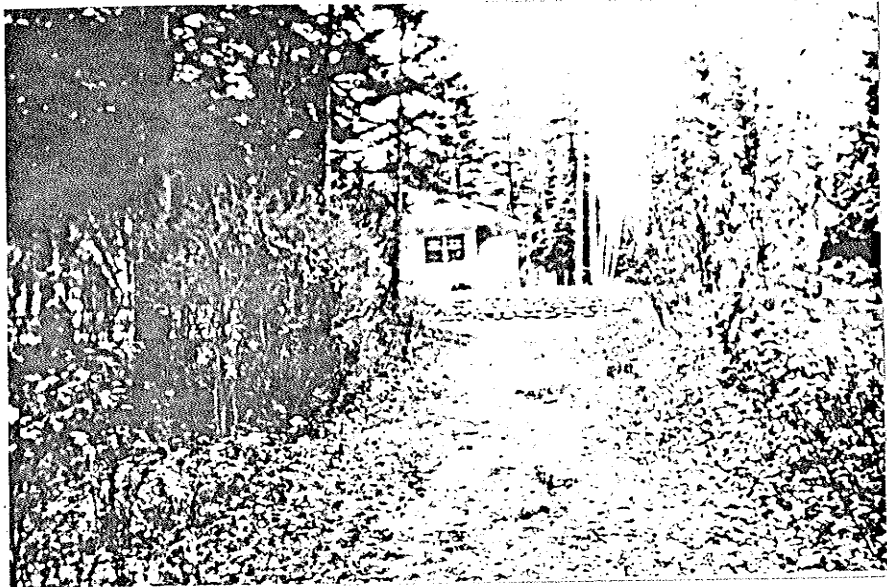
Public access to the lakeshore and the Walk  
is provided via easements.

11



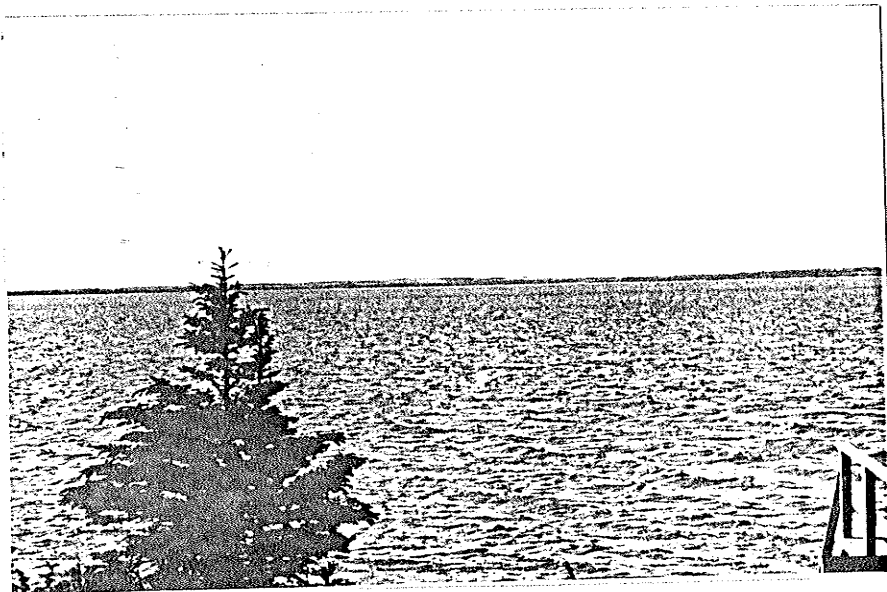
The cottages along the Walk and Wasagaming Drive are some of the oldest and most interesting in the Park.

12



Back along the Trail, at the foot of Goldenrod Street, one is treated to an unobstructed view of the lake's five mile northwest fetch.

13





Before going on, one can rest at a circa 1960 shelter to enjoy the view.

14



Through dense forest, the Trail rises 12 feet in elevation between Goldenrod and Harebell Streets.

15



An enframed potential high view point exists  
at the foot of Harebell Street.

16



From here, one may serpentine his way down to  
join up with the remaining Historic Lakeshore Walk.

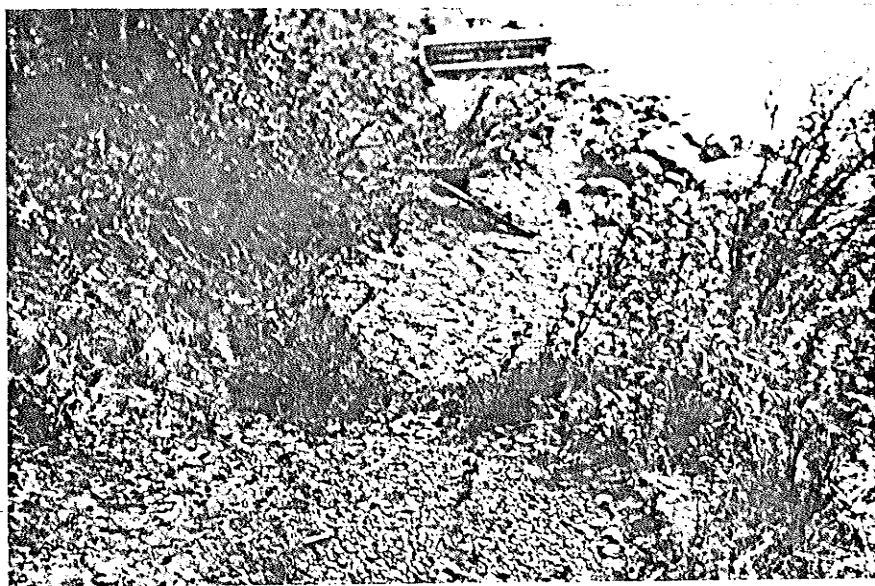
17





To the west, the remnants of the Historic  
Walk.

18



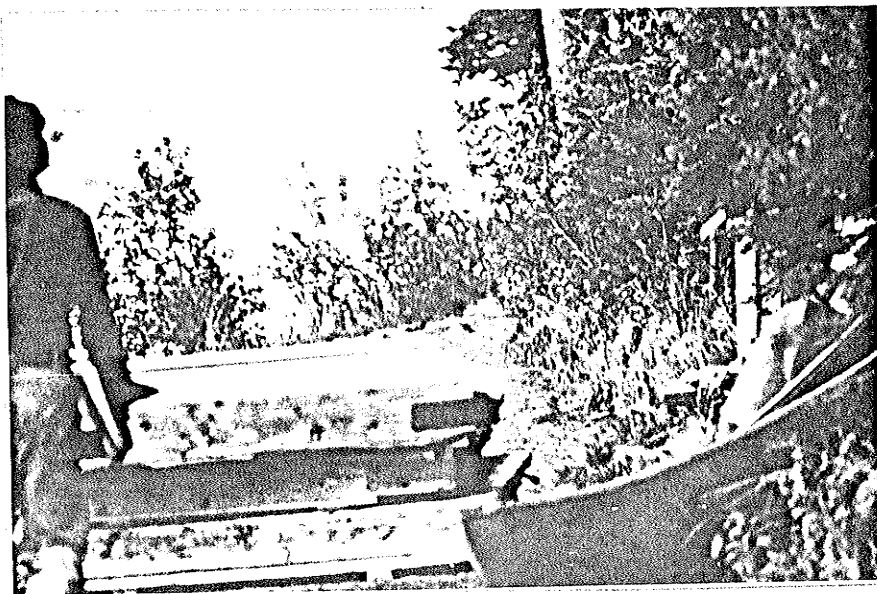
Heading east, the Walk follows the shoreline  
at the base of the lake's steep banks.

19



The Walk sometimes stores Park docks and unauthorized private boats.

20



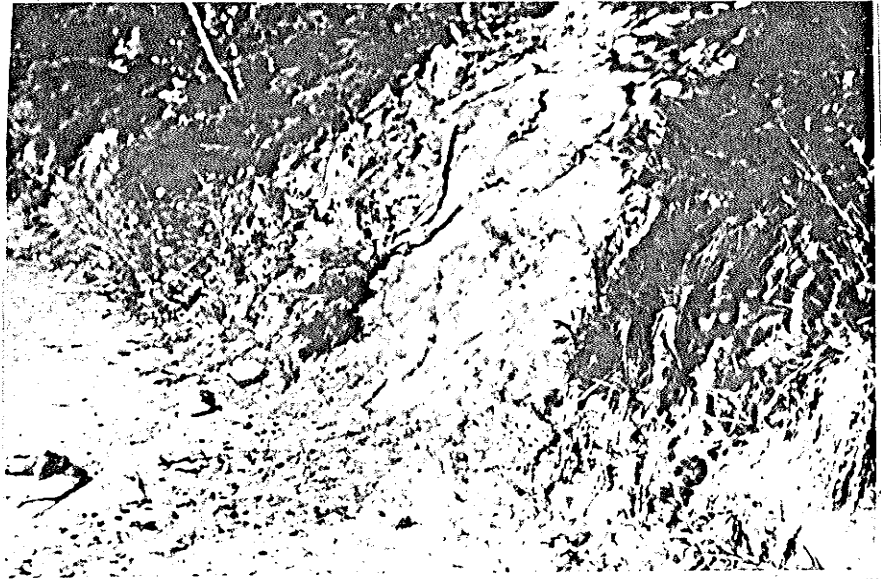
Unauthorized access steps join private cottages and the lake.

21



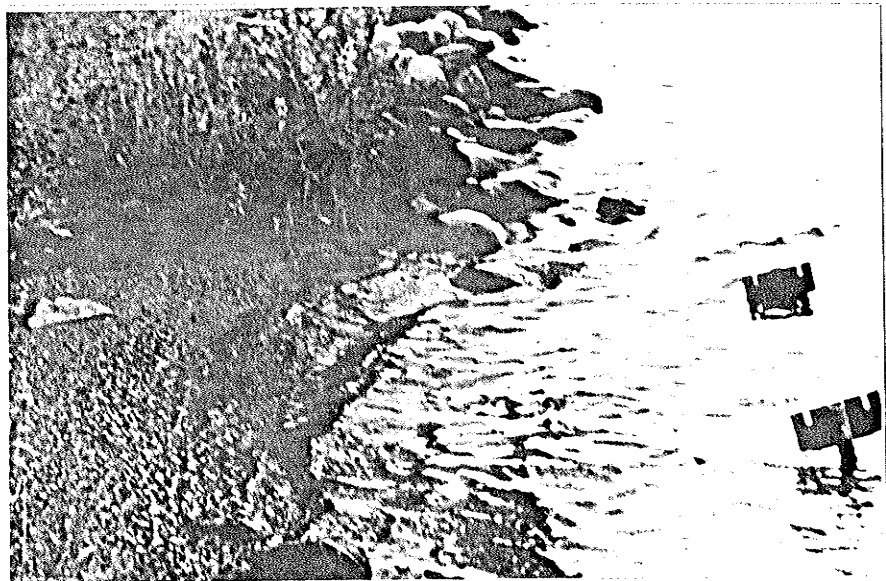
This has fostered cases of bank erosion.

22

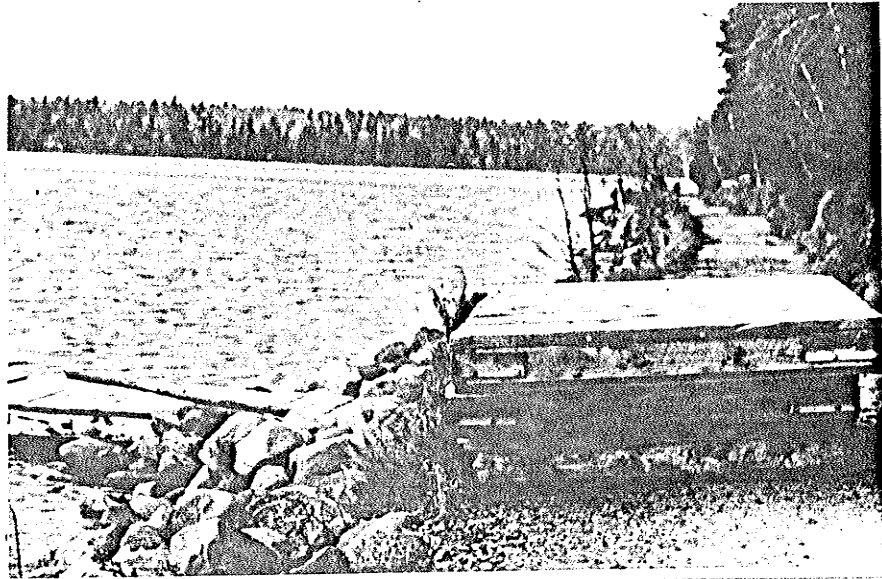


The walk, and the rip rap too, have eroded as a result of seasonal Park docks coming in and out.

23

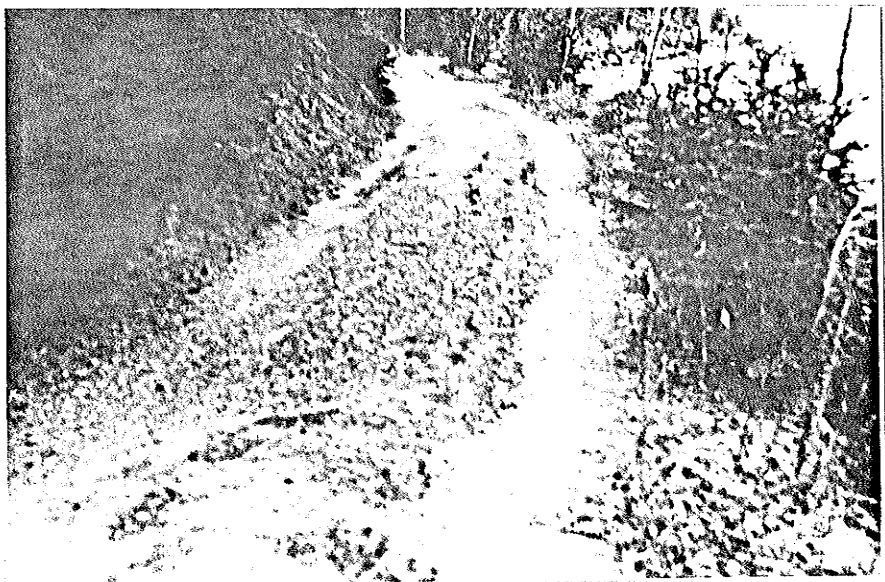


24



The Walk suffers from tire rutting caused by service vehicles.

25

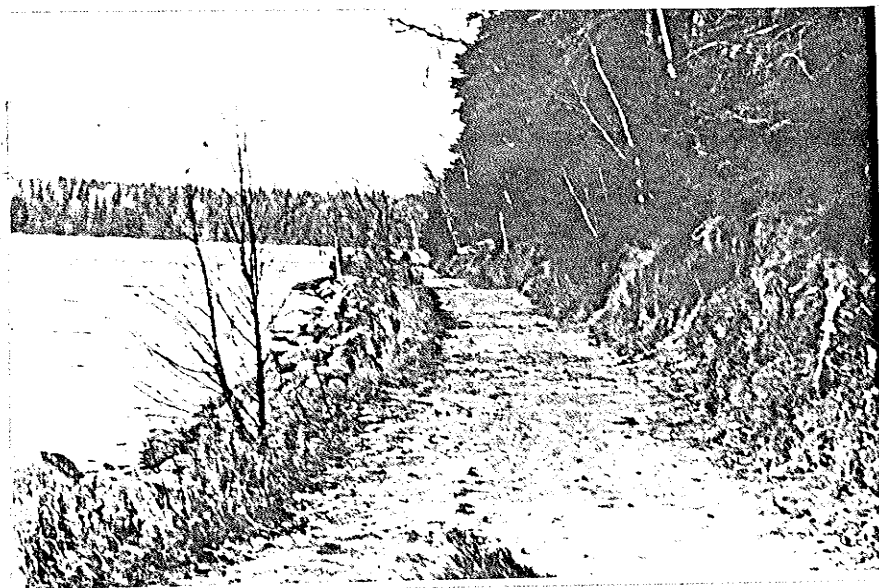


As one winds his way towards the Bay, the  
surface conditions continually change.

26



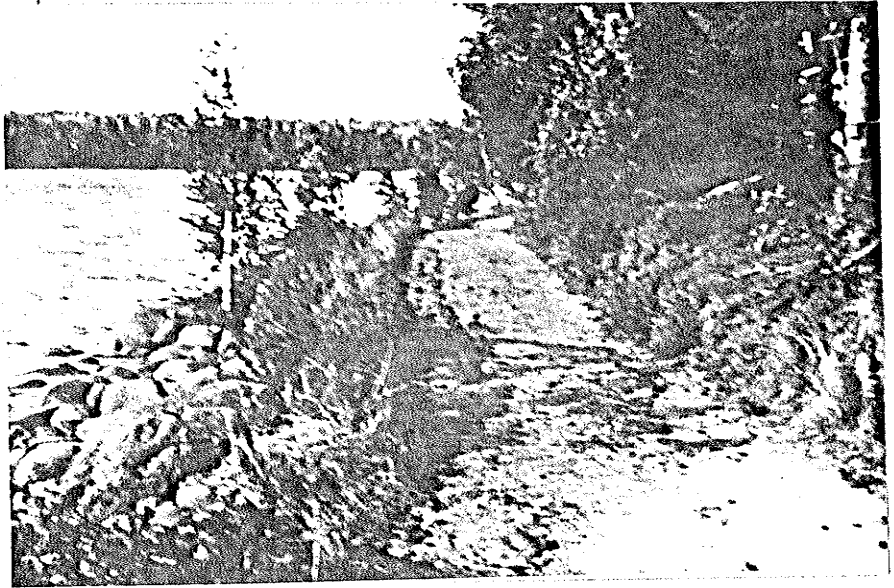
27





So do the edge conditions.

28



29



And, similarly, one's view.

30

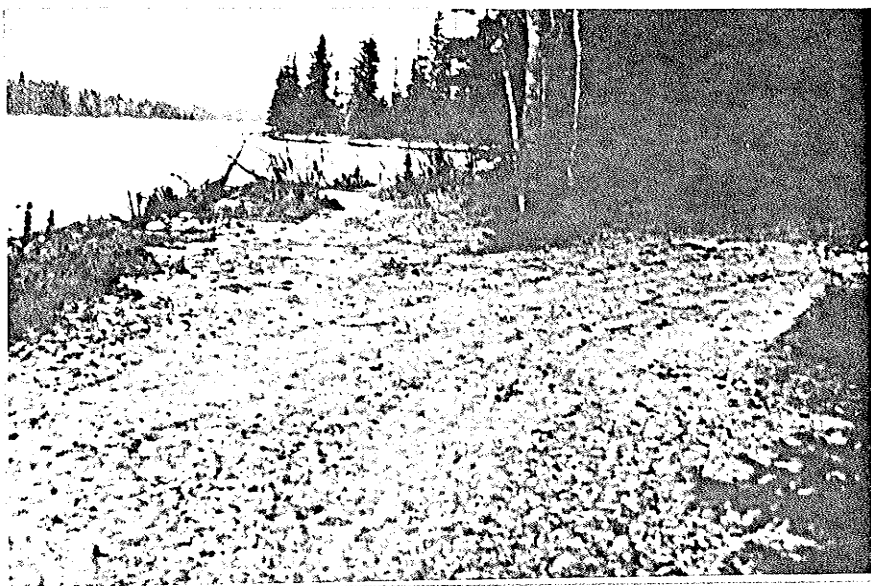


31



Within site of Airplane Bay, the Walk turns inland.

32



And leads one towards the Bay via a clearing through the forest.

33





Over the service road and past the range  
station.

34



And service shed to the Bay.

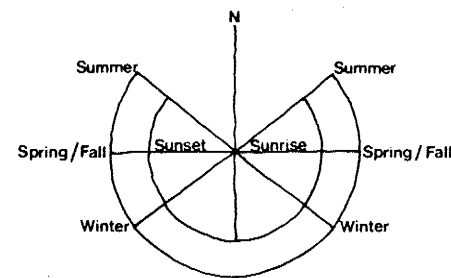
35



A popular beach, boating area, Airplane  
Bay.

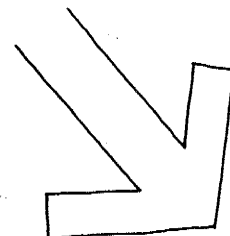
36



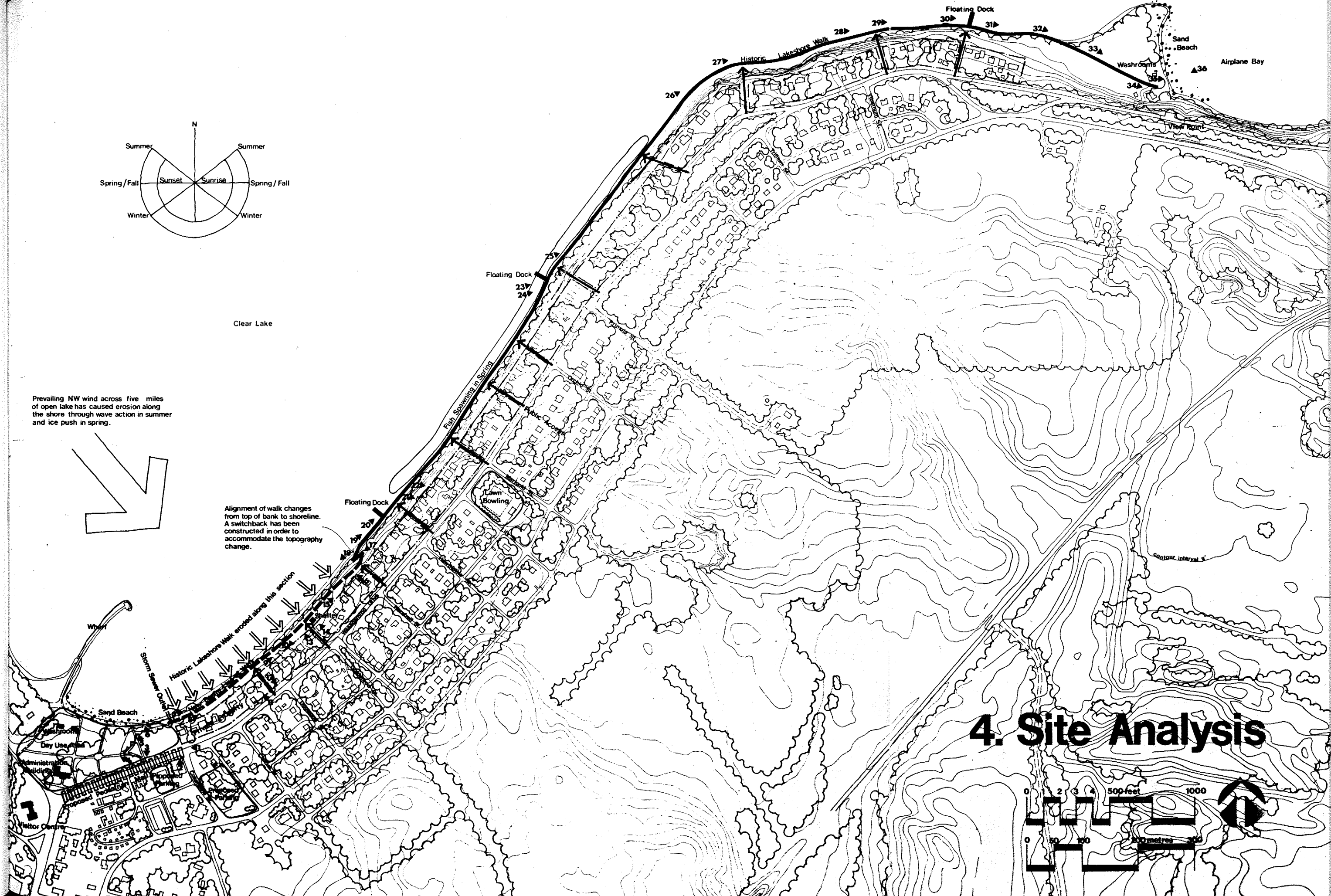


Clear Lake

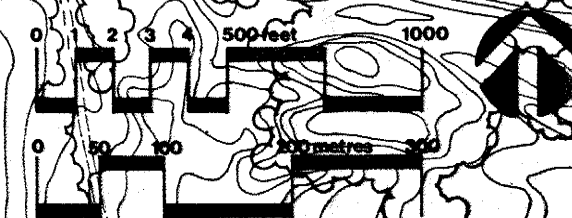
Prevailing NW wind across five miles of open lake has caused erosion along the shore through wave action in summer and ice push in spring.



Alignment of walk changes from top of bank to shoreline. A switchback has been constructed in order to accommodate the topography change.



## 4. Site Analysis



# 5.

## Master Plan

- The recreation trail incorporates (see map 5):
- (a) the proposed pedestrian mall as a trailhead;
  - (b) the desire line of walk atop the lakeshore bank between the lake and the private cottage development;
  - (c) the public access routes at Goldenrod and Harebell Streets;
  - (d) the Wasagaming Drive sidewalk between the proposed mall and Harebell Street;
  - (e) the remnants of Historic Lakeshore Walk along the shoreline between Harebell Street and Airplane Bay; and
  - (f) the Airplane Bay site as a component destination.

The trail may be described as loop, extended loop, and linear in design. The Gold Loop starts at the east end of the pedestrian mall and travels north towards the lake. At this point, it takes advantage of the view of the Harbour and Beach. A sitting area, with considerations such as signage and waste receptacles, is provided. From here the trail follows the top of the bank to the foot of Goldenrod Street, where is located the "5 Mile View Point". The Gold Loop then goes south along the public access and west along the Wasagaming Drive sidewalk, returning to the trail head past the circa 1930 cottages. Only 2600 feet (800m) in length, the Gold Loop should be a great place to stroll or roll, and introduce the visitor to some of the Park's most delightful views.

The Brown Loop is an extension of the Gold Loop. The Brown Loop capitalizes on topographic changes between Goldenrod and Harebell Streets as the elevation rises 12 feet (3.6m). It also has an enclosed feeling as it passes through dense forests not found on the Gold Loop. From the enclosed "High Point View", the viewing platform looks out over and down onto the lake. Although only 500 feet (152m) are travelled between the "5 Mile View Point" and the drop-off/pick-up zone at the top of Harebell Street, the traversed topography will undoubtedly take its toll, thus the pick-up zone. The trail along Wasagaming Drive between Harebell and Goldenrod Streets has a sustained grades of 3% to

5% and the pick-up zone allows visitors to choose whether or not to walk back. or the energetic crowd who choose the extended route, the trail is approximately 3,500 feet (1066m) in total.

The Green Trail is an approximate 1.5 mile (2.4km) outing. Following the lakeside portions of the Gold and Brown Loops to the "High Point View", the Green Trail switches back to the lakeshore and follows the Historic Lakeshore Walk to Airplane Bay. Along the lakeshore portion, the visitor may be splashed by waves on a windy day, may view the fish spawning in the spring, and may get an understanding of erosion control on the banks through a natural process. At Airplane Bay, the beach, picnic and associated facilities are to be upgraded, making it a destination point to the integrated trail. A drop-off/pick-up point is found at Airplane Bay because many visitors will find the 1.5 mile (2.4km) excursion in the fresh Park air to be enough for one day. Since most parties will not have a person who wants to drop them off at the trail head and pick them up at the end, Airplane Bay will have facilities for pick up by boat to return to the wharf via a lake cruise.

While the trail functions much like the Historic Lakeshore Walk, certain opportunities have been capitalized on and some problems have been attacked:

(a) By developing the trail head at the east end of the proposed pedestrian mall, a visual focus and ending are developed in the first stage of the mall's development.

(b) By surfacing the desire line of the walk with a hot mix asphalt, the environmental impact that visitors are currently causing will be greatly alleviated.

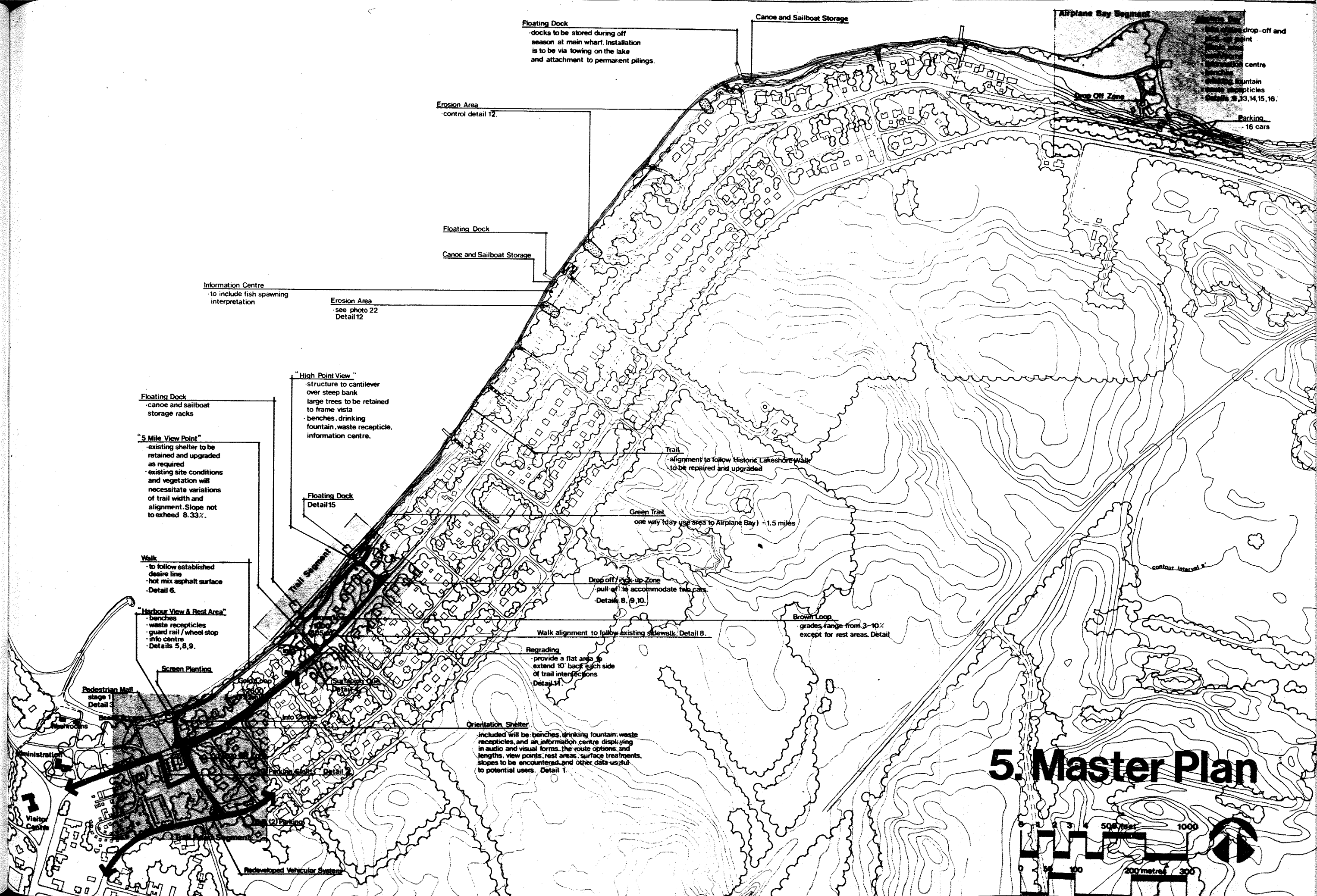
(c) By developing the trail as a series of loops, as well as a linear trail, individuals of varying physical strengths have the opportunity to participate on a level that they are comfortable with. Furthermore, the trail is now really three trails, not just one.

(d) By providing floating docks that are towed into place yearly and anchored to permanent footings, the walk will not be a cluttered storage area, nor should there be any reason for having service vehicles travelling along the lakeshore portion of the trail and leaving tire damage on a facility that has no reason to be driven on.

(e) By providing proper canoe and sailboat storage racks, in conjunction with the docks. The boaters who currently foster erosion in launching and storing their boats should be better controlled.

(f) By organizing and developing the Airplane Bay Area, one of the Park's currently haphazard play areas can be managed in such a way as to help ensure its beauty and assets for our future generations.





# 6. Design Details

## 6.1 TRAIL HEAD SEGMENT

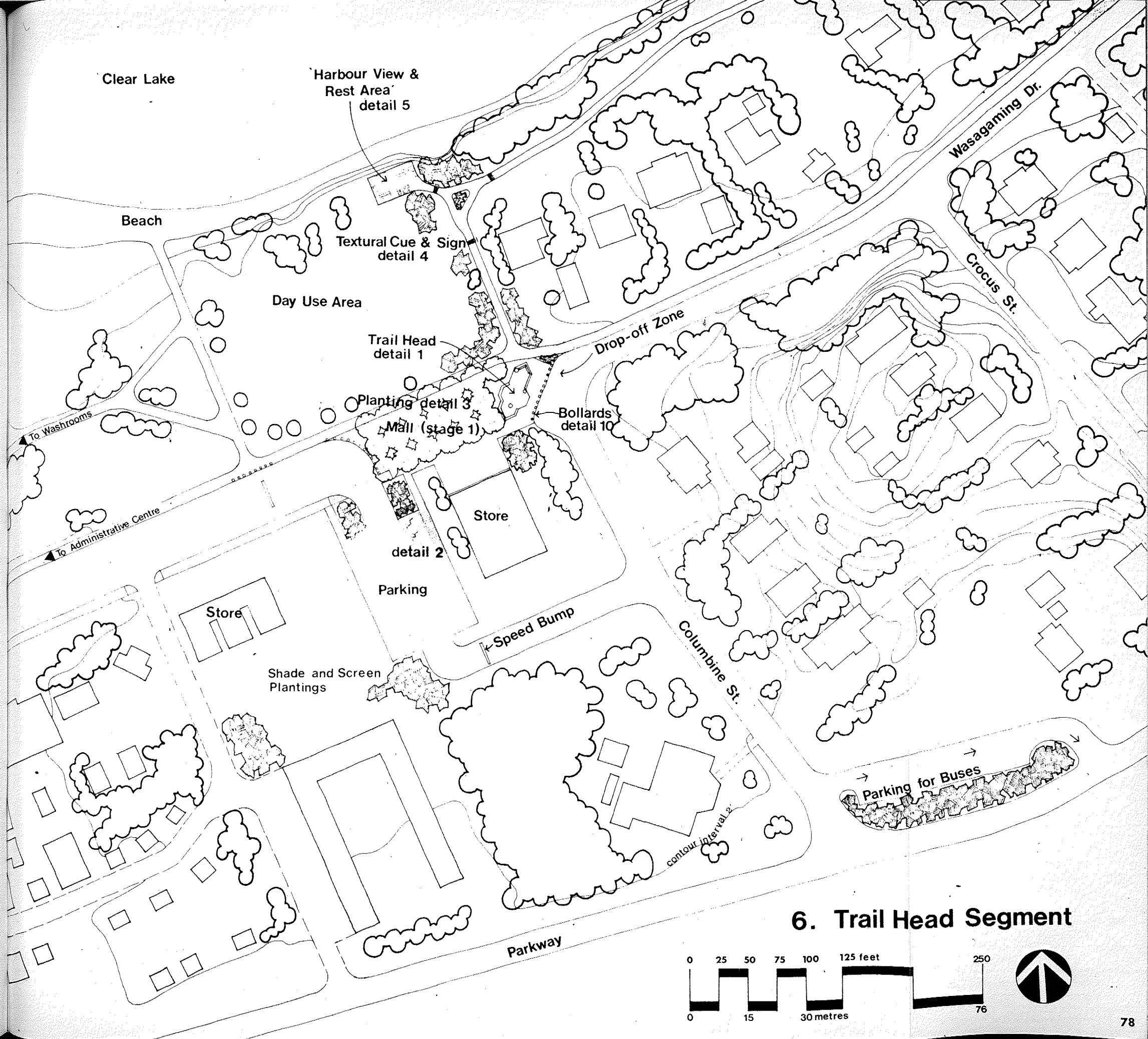
The trail head (see map 6) and its immediately associated facilities has been located on a closed-off portion of Wasagaming Drive. The Parks Canada master plan has proposed that this portion of the street become a pedestrian mall and the development of the trail head serves as the initial move in this direction. By physically tying the commercial side of Wasagaming Drive to the day use/administrative side, the pedestrian mall is intended to be a focal point of the townsite and thus an ideal trail head/terminus for the recreation trail.

The trail head itself is a sun and rain shelter located on the pedestrian mall. It will function as a pick-up/drop-off point and an information centre presenting audio and visual information pertaining to the trail, Park programs, tours and directions to services and events (see detail 1).

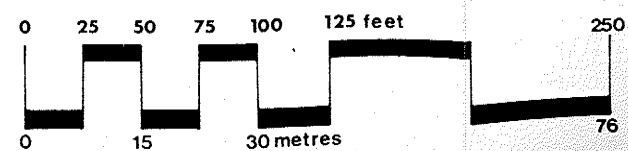
Adjacent to parking (see detail 2), the shelter makes a natural gathering place for the start of bus tours to other parts of the Park. The treed mall (see detail 3), as well as acting as a pedestrian link between facilities, provides a shady hard surface area capable of handling large numbers of people who may be introduced to plays and displays encouraging the use of the more natural and remote parts of the Park.

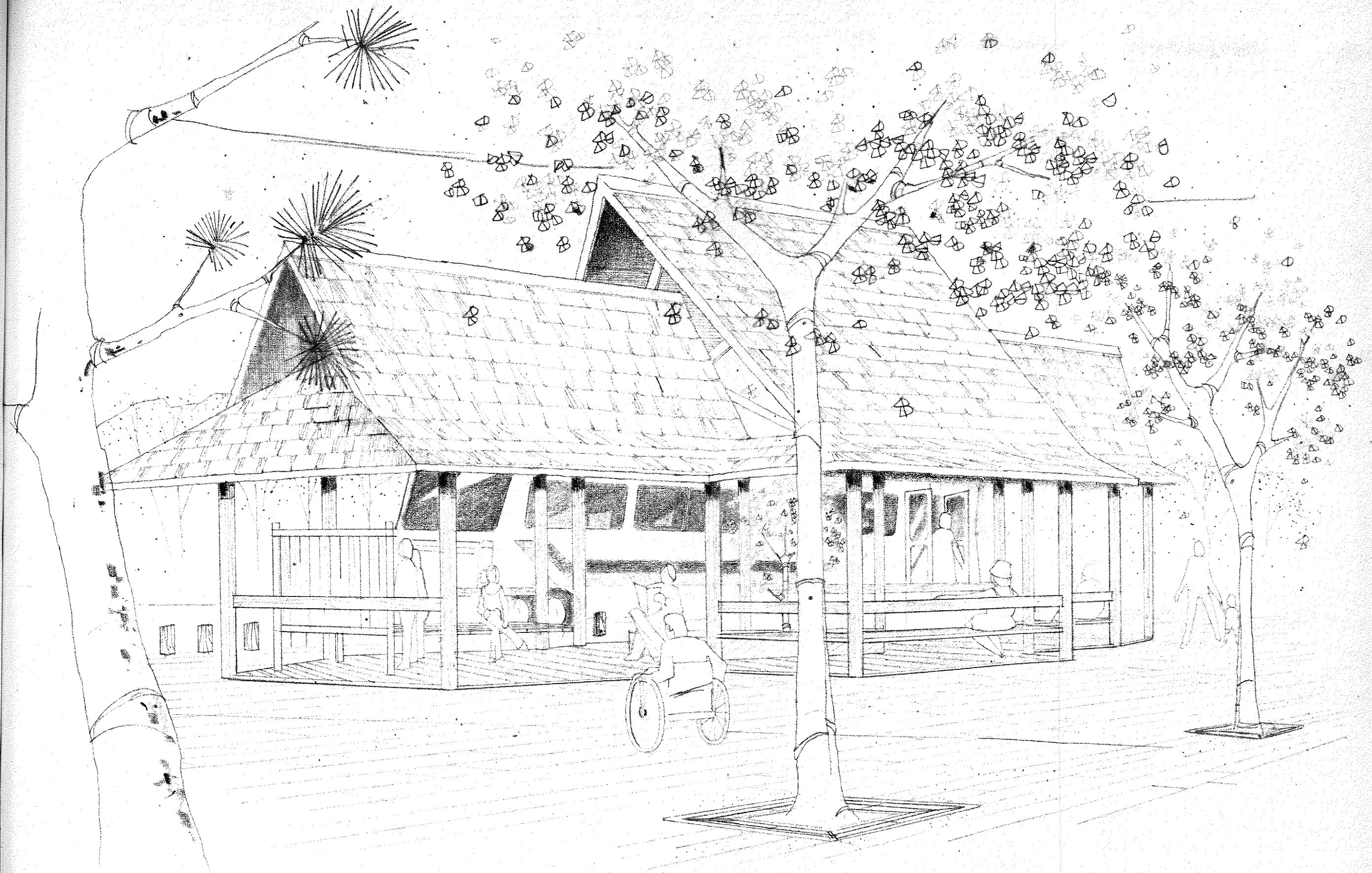
The trail leaves from the shelter and heads towards the lake, Textural paving cues, and information signage are provided to alert and inform pedestrians of directional changes and upcoming events (see detail 4). The "Harbour View and Rest Area" is the first of three such areas along the trail. It is a passive area, with its elements arranged in such a way that a wheelchair can sit right in amongst fixed benches (see detail 5).



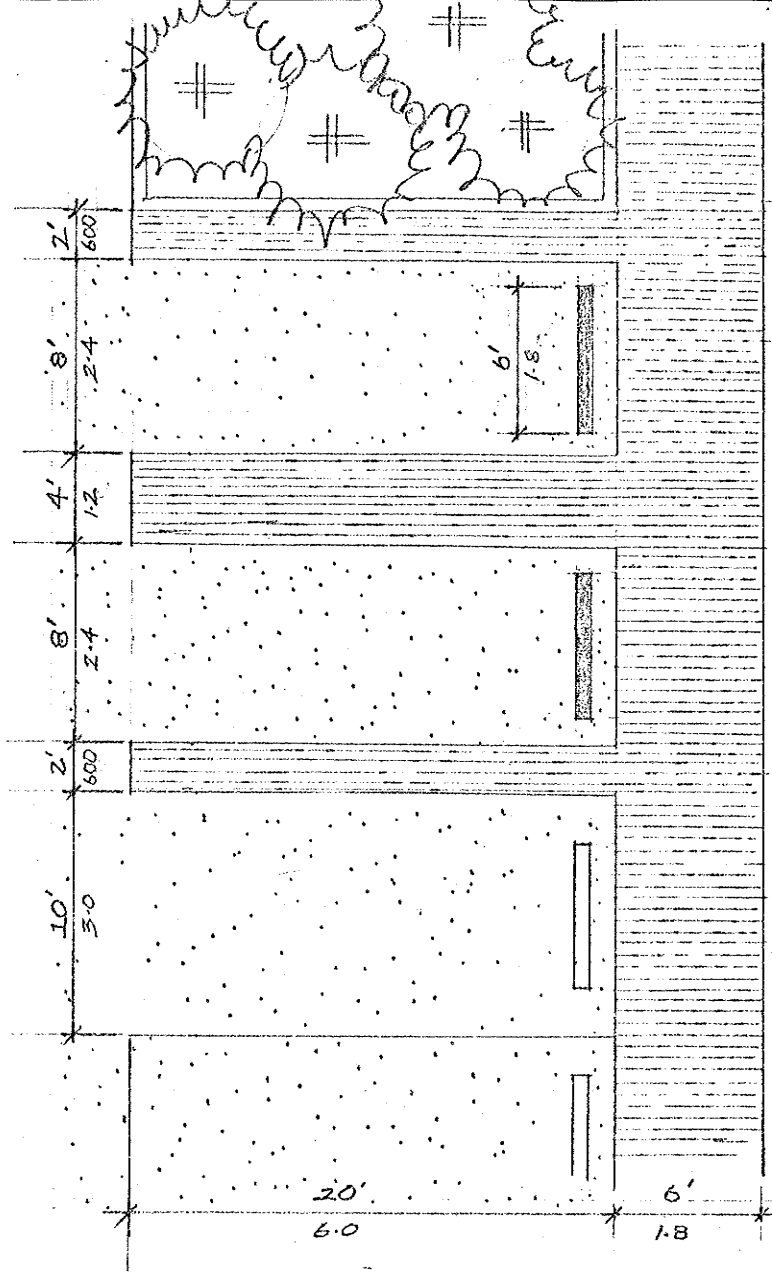


## 6. Trail Head Segment

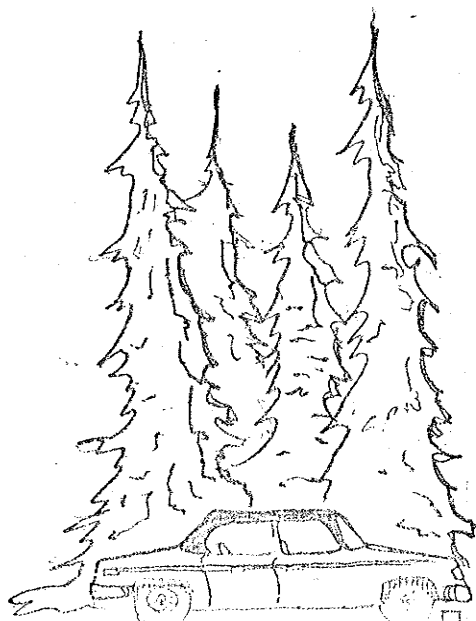




1. Trail Head

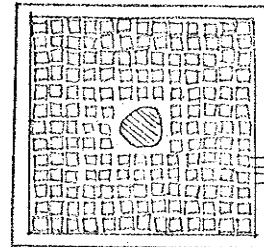


THE RESERVED PARKING SPACES ARE BASED ON ACCESSIBILITY TO THE USE AREAS. A MINIMUM OF 2 SPACES PER LOT ARE DESIGNATED FOR USE BY DISABLED PEOPLE. AT AIRPLANE BAY, 3 SPACES HAVE BEEN RESERVED DUE TO THE SPECIFIC TOPOGRAPHIC NATURE OF THE SITE.



## 2. Parking

WHILE THE 'PATMORE' SEEDLESS VARIETY OF GREEN ASH IS NOT INDIGENOUS TO THE PARK, THE SPECIES IS LOCATED IN THIS VEGETATIVELY DISTURBED SECTION OF THE PARK, THIS CLONE OF THE SPECIES, WITH ITS LATE LEAFING AND EARLY LEAF DROPPING HABITS WILL ALLOW THE WARM SPRING AND FALL SUNS TO WARM THE MALL. SHADE WILL STILL BE PROVIDED IN THE SUMMER. THE SEEDLESS CHARACTER WILL REDUCE MAINTENANCE, AND IS A SAFETY FACTOR REGARDING A PEDESTRIAN'S PROBABILITY OF SLIPPING AND BEING INJURED.

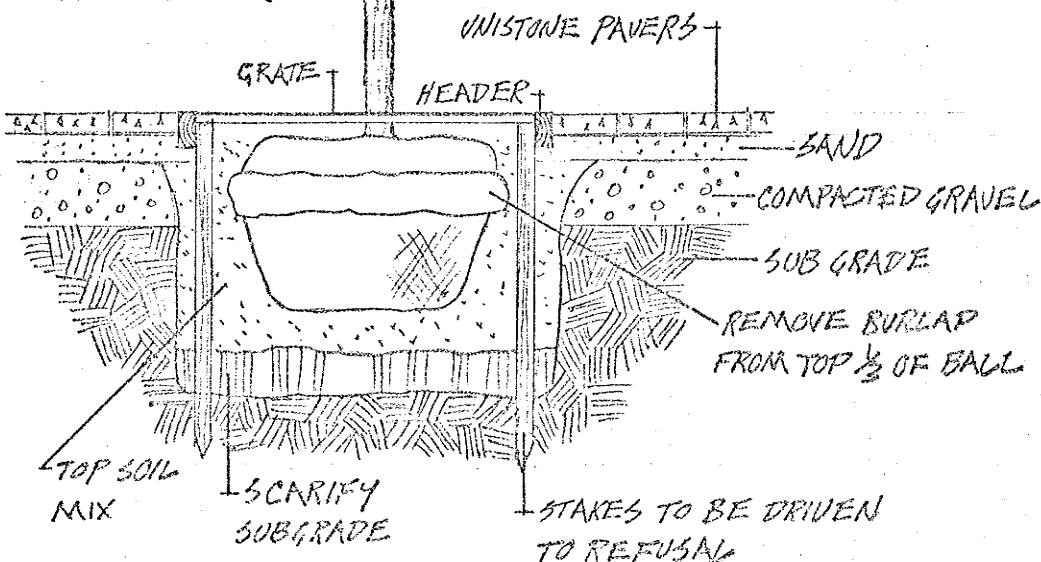


PLAN VIEW OF GRATE

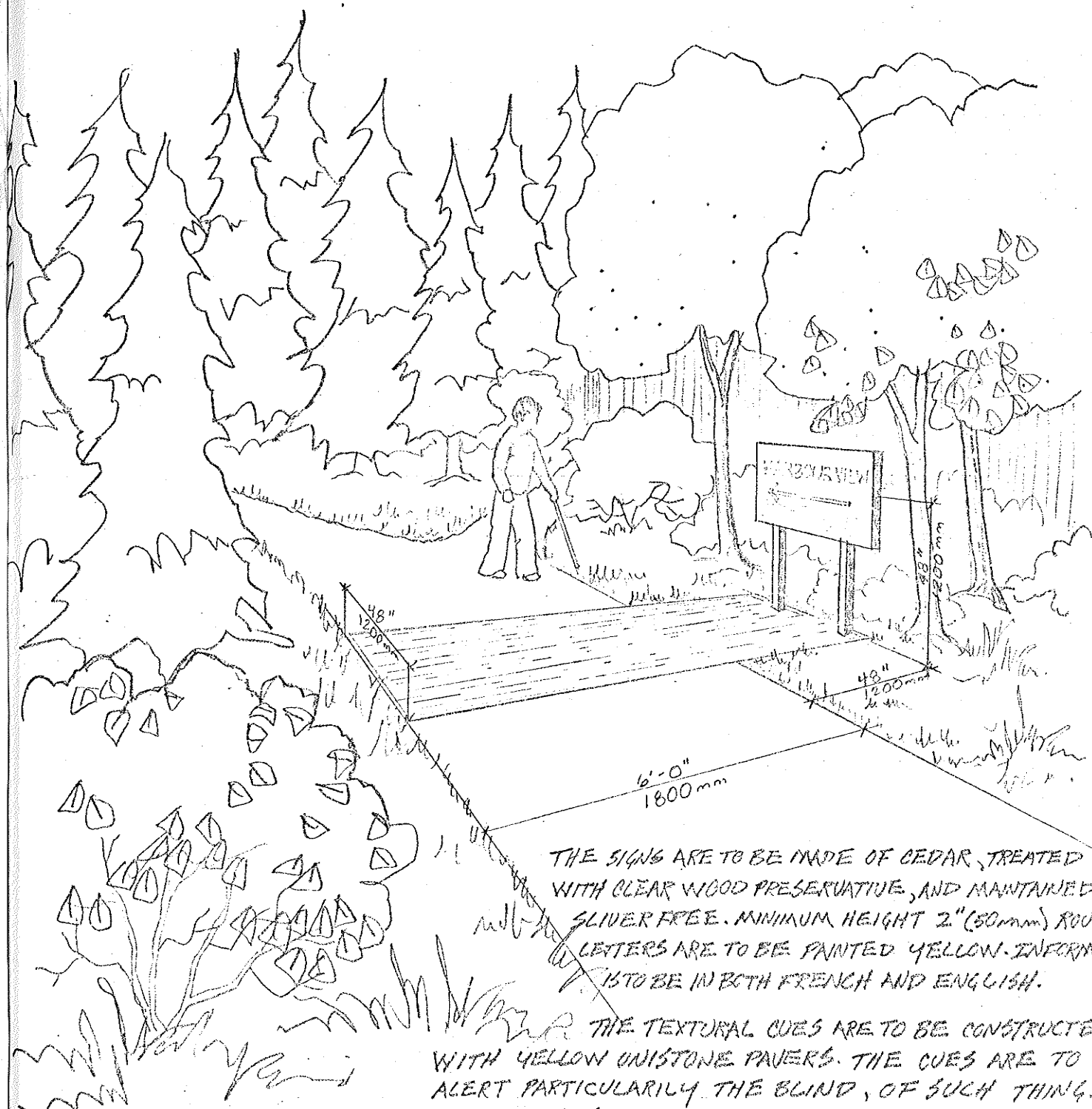
THE SMALL GRATE OPENINGS ARE NECESSARY SO THAT ONE'S CANE OR OTHER MOBILITY AID DOES NOT GET CAUGHT, CAUSING PROBLEMS.

FRAXINUS PENNSYLVANICA  
'PATMORE'

ALL TREES TO BE  
B&B, SPECIMENS.  
MINIMUM BRANCHING  
HEIGHT TO BE 8' (2.4m)



### 3. Mall Tree Planting



THE SIGNS ARE TO BE MADE OF CEDAR, TREATED WITH CLEAR WOOD PRESERVATIVE, AND MAINTAINED SLIVER FREE. MINIMUM HEIGHT 2" (50mm) ROUTED LETTERS ARE TO BE PAINTED YELLOW. INFORMATION IS TO BE IN BOTH FRENCH AND ENGLISH.

THE TEXTURAL CUES ARE TO BE CONSTRUCTED WITH YELLOW UNISTONE PAVERS. THE CUES ARE TO ALERT PARTICULARLY THE BLIND, OF SUCH THINGS AS CHANGES OF GRADE, RAMPS, WALK INTERSECTIONS, AND THE LOCATION OF SIGNAGE.

#### 4. Signage/Textural Cues



TYPICAL OF THE TRAILS "VIEW POINTS", BENCHES ARE LOCATED SO WHEELCHAIRS CAN FIT RIGHT IN. THE VIEW IS UNOBSTRUCTED. A CEDAR CURB SURROUNDS THIS PARTICULAR AREA TO ACT AS A WHEEL STOP AND WARNING CUE. DECIDUOUS PLANTINGS AND LIGHTING ARE PROVIDED FOR SHADE AND SAFETY.



## 5. Harbour View Rest Area

## 6.2 TRAIL SEGMENT

The blow up titled "Trail Segment" (see map 7) allows the opportunity to express in some detail a variety of typical situations that present themselves along the trail.

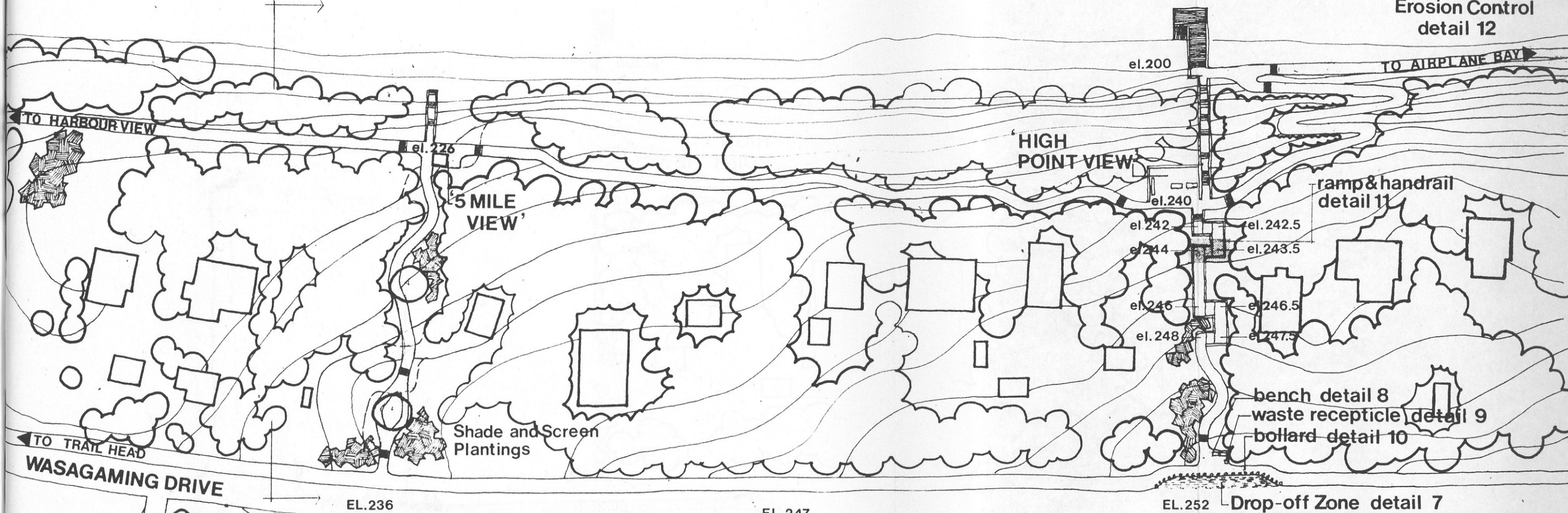
Assuming one has reached the "5 Mile View Point" via the lakeside section of the trail (see detail 6), one can rest and enjoy the view while deciding whether to ascend to the "High Point View" or return to the "Trail Head" via the Goldenrod easement and Wasagaming Drive (see detail 6). If one chooses to go on from the "5 Mile View" to "High Point View" at elevation 240, he can rest again while deciding where to turn now. To head southwest up to the foot of Harebell Street, one follows the ramp system (see detail 11) to the drop-off zone. Located here are typical trail furnishings (see details 8, 9, 10, 11).

Energetic individuals who decide to head for "Airplane Bay" from the "High Point View" descend to elevation 200 via a serpentine route with sustained grades up to 3%. Upon reaching the lakeshore portion of the trail, one faces about a mile (1.6km) walk to the Bay. Along with the natural beauty of the lakeshore environment, one may also see (detail 12) how man is trying to combat bank erosion caused by unauthorized lakeshore access routes from earlier days.

CLEAR LAKE

Section detail 6

Erosion Control  
detail 12



EL. 236

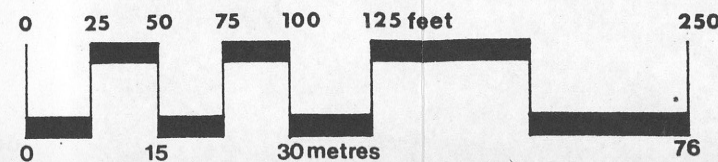
EL. 247

EL. 252 Drop-off Zone detail 7

GOLDENROD ST.

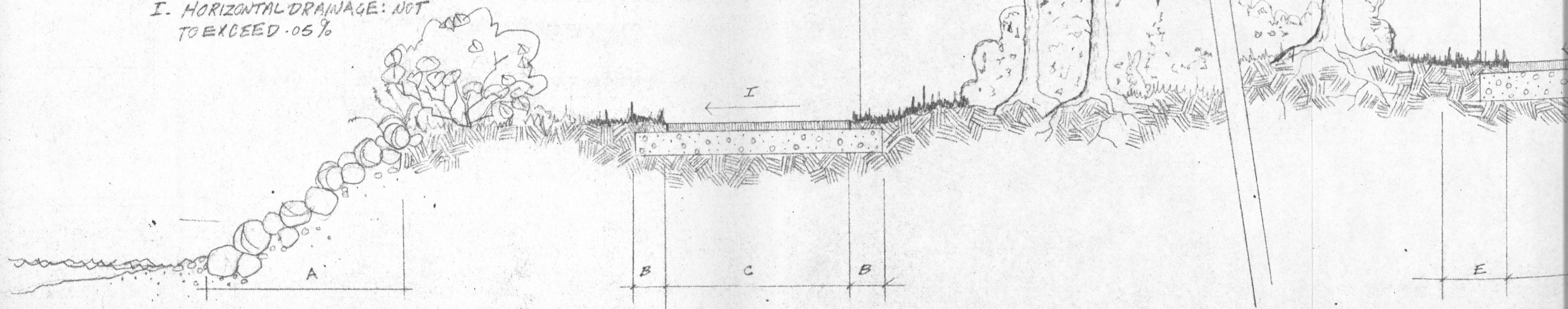
HARBELL ST.

7. Trail Segment





- A. RIP RAP: TO BE PLACED OR REPLACED WHERE NEEDED TO CONTROL BANK EROSION. ROCKS AND BOULDERS USED TO BE INDIGENOUS TO THE PARK.
- B. SOFT EDGES: 1'-0" (.3 m) MINIMUM. TO ACT AS A TEXTURAL GUIDANCE SYSTEM AND SOFT SURFACE TO SLOW ERRANT WHEELCHAIRS. MATERIAL TO BE GRASSES INDIGENOUS TO THE PARK.
- C. WALK: 6'-0" (1.8 m) WIDE. SURFACE TO BE A 2" (50 mm) LIFT OF HOT MIX ASPHALT, PLACED ATOP A 8" (200 mm) COMPACT GRANULAR BASE.
- D. OVERHEAD BRANCHES: TO BE KEPT CLEAR OF THE RIGHT-OF-WAY TO A MINIMUM HEIGHT OF 8'-0" (2.4 m)
- E. SOFT EDGE: 2'-0" (.6 m) MINIMUM, CLEARED. THE WIDE SOFT EDGE ALONG THIS SECTION RECOGNIZES THE TRAILS DOWNHILL GRADES ALONG THIS SECTION OF THE TRAIL, AND THE POTENTIAL NEED FOR SLOWING DOWN WHEELCHAIRS.
- F. WALK: 8'-0" (2.4 m) WIDE - EXISTING WALK TO BE RESURFACED WITH A 2" (50 mm) LIFT OF ASPHALT
- G. CURB: 6" (15 mm) TOP TO BE SURFACED WITH REFLECTORIZED YELLOW PAINT.
- H. WASAGAMING DRIVE
- I. HORIZONTAL DRAINAGE: NOT TO EXCEED .05%



## 6. Walk Cross Sections



BE PLACED OR REPLACED WHERE  
CONTROL BANK EROSION. ROCKS AND  
TO BE INDIGENOUS TO THE PARK

1'-0" (0.3 m) MINIMUM. TO ACT AS A  
ANCE SYSTEM AND SOFT SURFACE TO  
ANT WHEELCHAIRS. MATERIAL TO BE  
GENOUS TO THE PARK.

(1.8 m.) WIDE. SURFACE TO BE A 2"  
OF HOT MIX ASPHALT, PLACED ATOP  
COMPACT GRANULAR BASE.

PANCHES: TO BE KEPT CLEAR OF THE  
TO A MINIMUM HEIGHT OF 8'-0"

2'-0" (0.6 m) MINIMUM CLEARED.  
FT EDGE ALONG THIS SECTION  
THE TRAILS DOWNHILL GRADES ALONG  
OF THE TRAIL, AND THE POTENTIAL  
OWING DOWN WHEELCHAIRS.

4 m) WIDE. EXISTING WALK TO BE  
WITH A 2" (50 mm) LIFT OF ASPHALT  
TOP TO BE SURFACED WITH  
ED YELLOW PAINT.

4 DRIVE

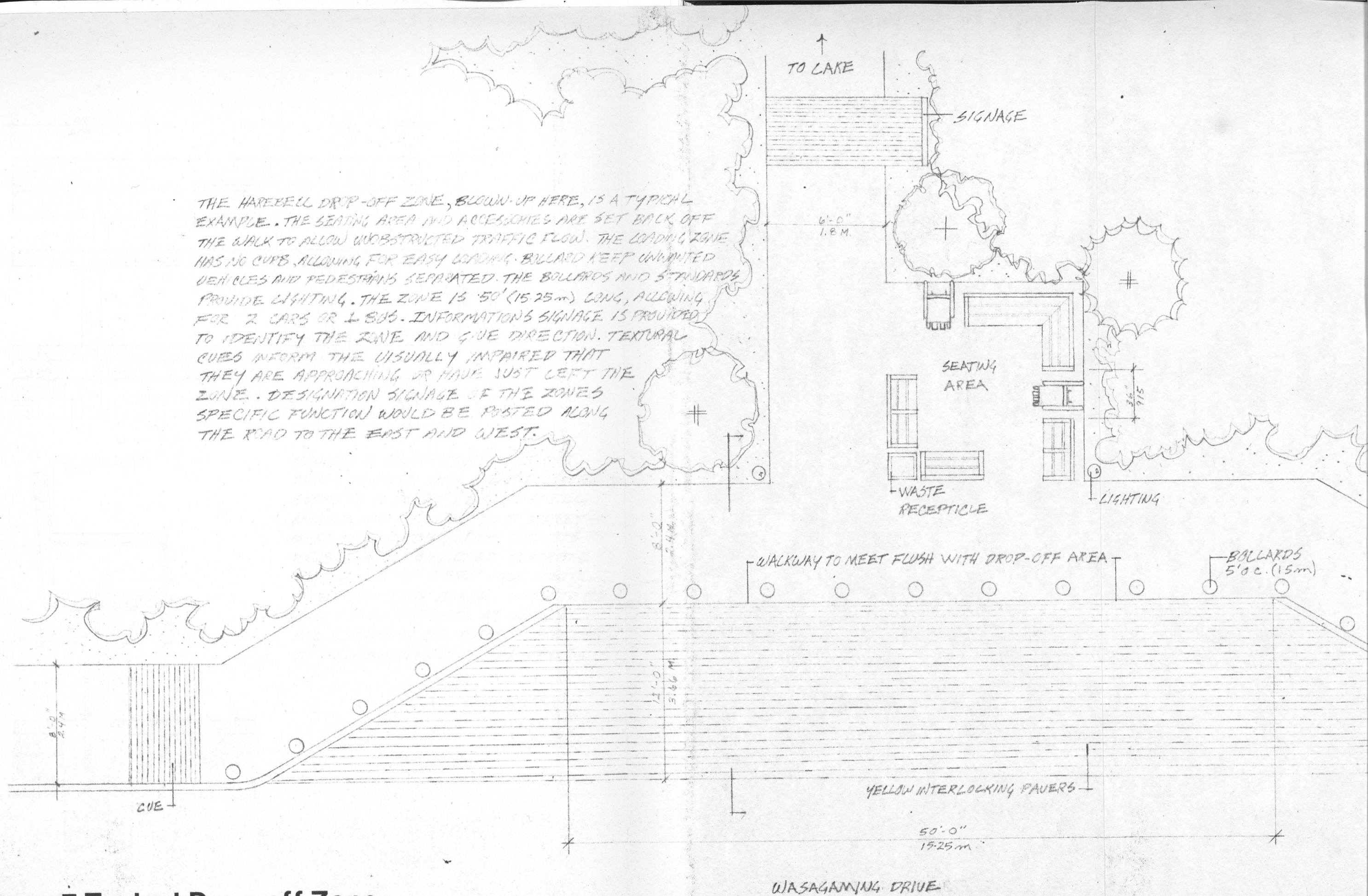
DRAINAGE: NOT  
15%



Sections



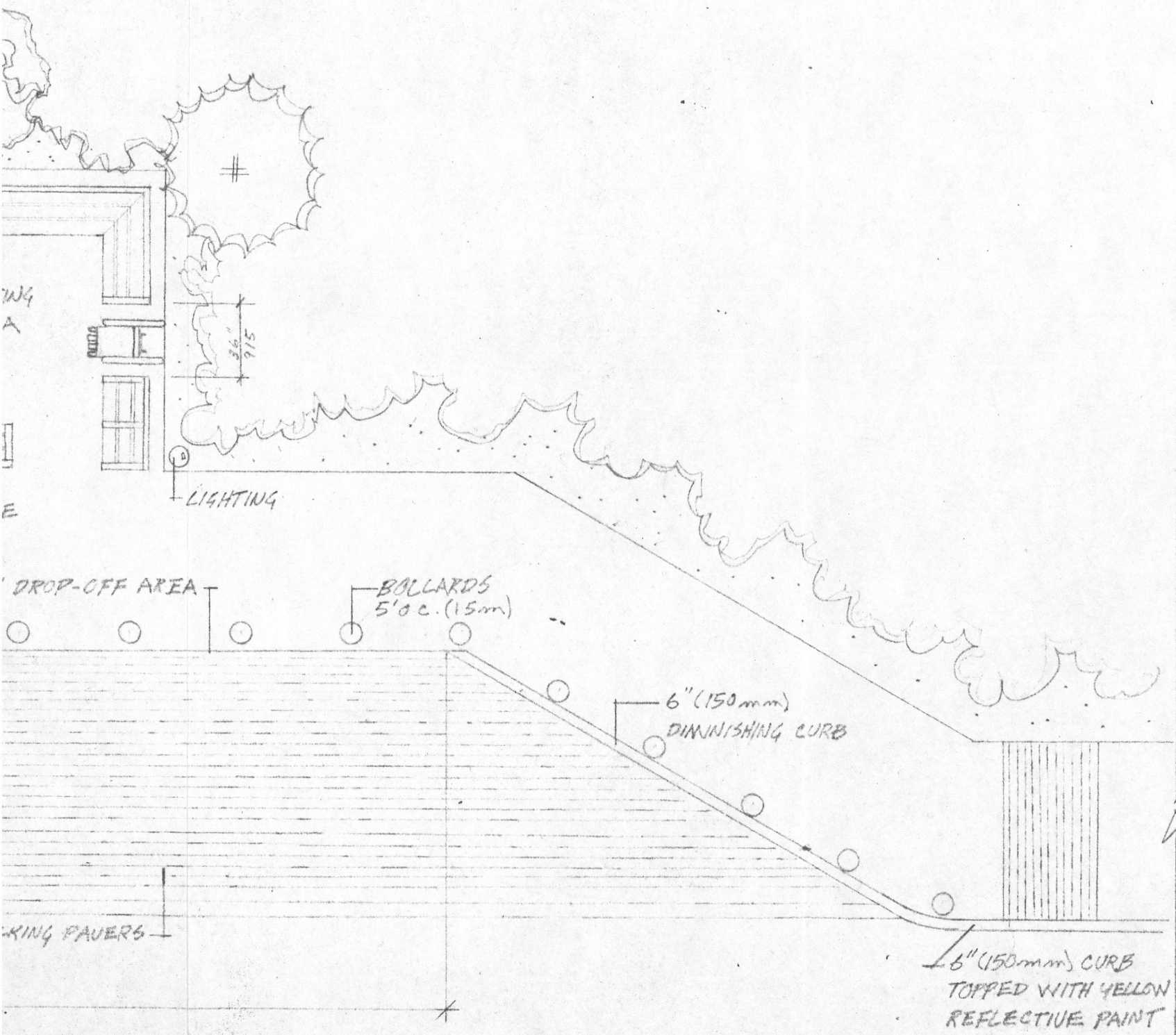
THE HARBELL DROP-OFF ZONE, BLOWN-UP HERE, IS A TYPICAL EXAMPLE. THE SEATING AREA AND ACCESSORIES ARE SET BACK OFF THE WALK TO ALLOW UNOBSTRUCTED TRAFFIC FLOW. THE LOADING ZONE HAS NO CURB, ALLOWING FOR EASY LOADING. BOLLARDS KEEP UNWANTED VEHICLES AND PEDESTRIANS SEPARATED. THE BOLLARDS AND STANDARDS PROVIDE LIGHTING. THE ZONE IS 50' (15.25m) LONG, ALLOWING FOR 2 CARS OR 1 BUS. INFORMATION SIGNAGE IS PROVIDED TO IDENTIFY THE ZONE AND GIVE DIRECTION. TEXTURAL CUES INFORM THE VISUALLY IMPAIRED THAT THEY ARE APPROACHING OR HAVE JUST LEFT THE ZONE. DESIGNATION SIGNAGE OF THE ZONES SPECIFIC FUNCTION WOULD BE POSTED ALONG THE ROAD TO THE EAST AND WEST.



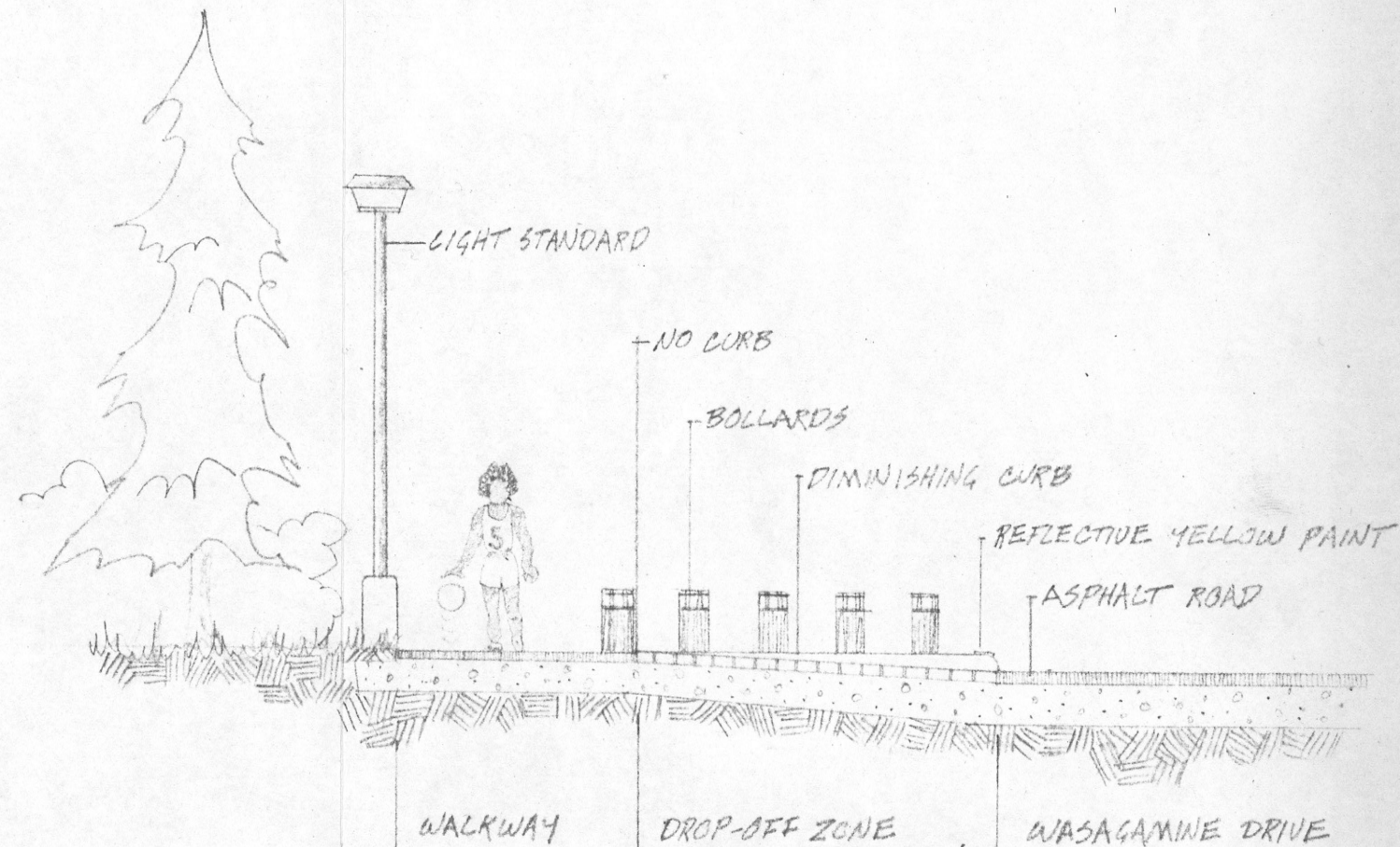
7. Typical Drop-off Zone



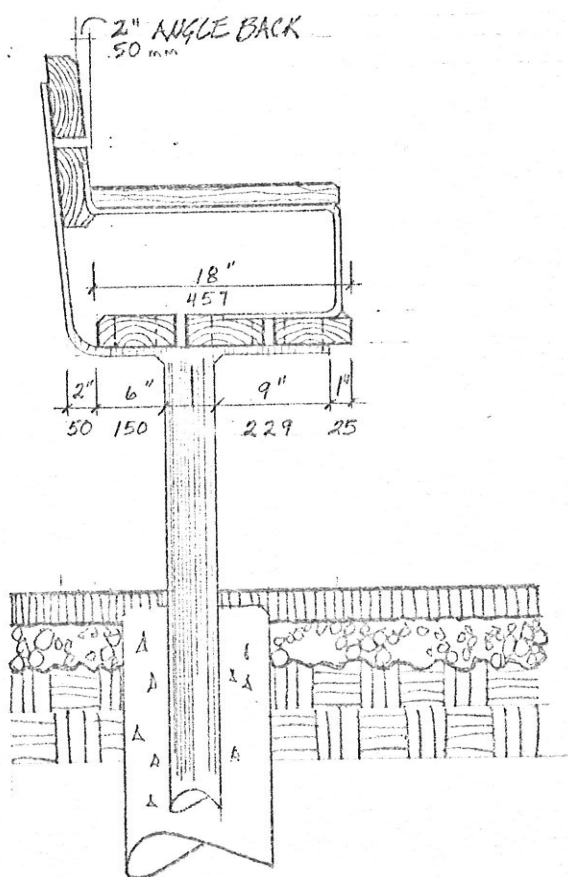
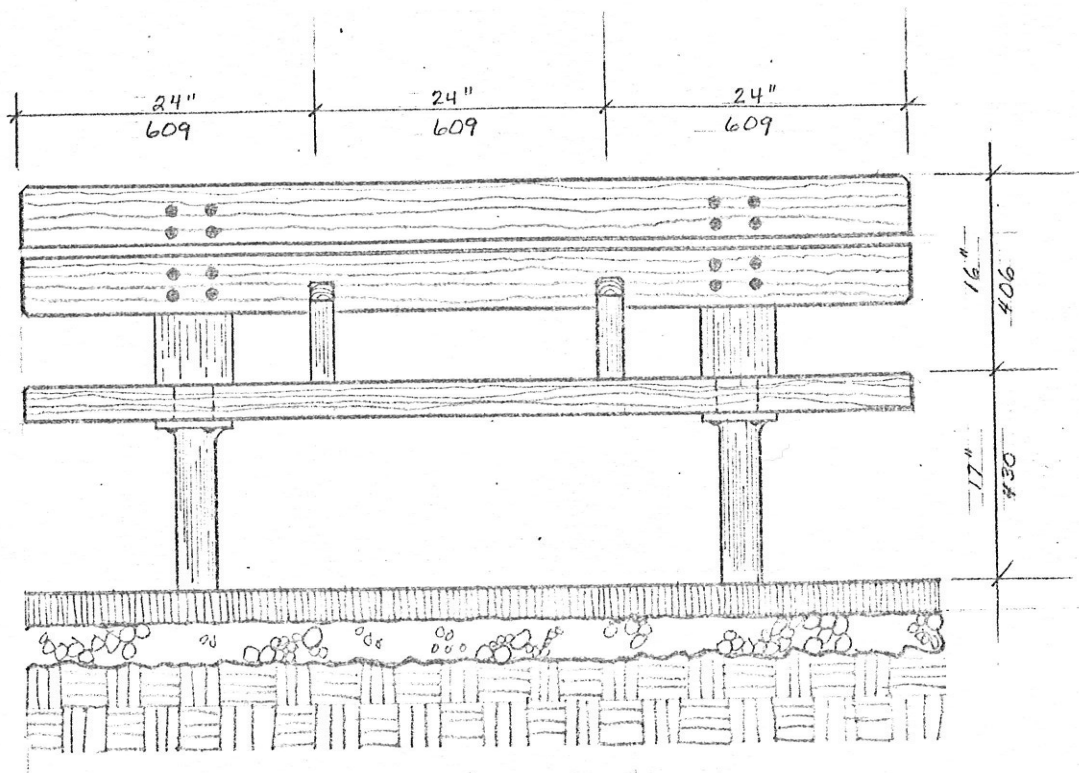
GNAGE



PLAN



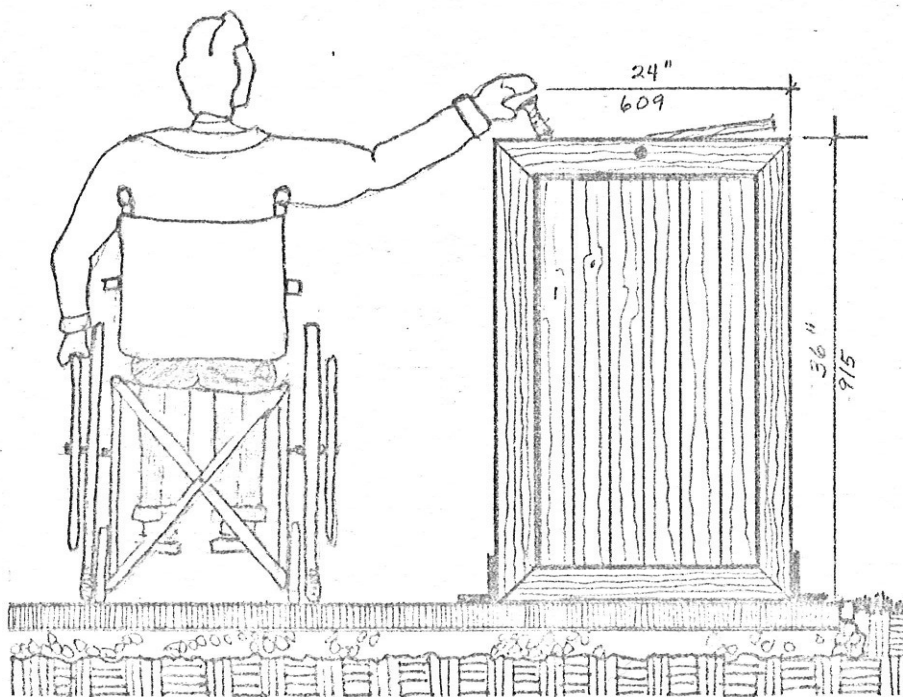
CROSS SECTION



BENCHES TO BE CONSTRUCTED OF 2X5 CEDAR, TREATED WITH CLEAR PRESERVATIVE. SUPPORTS TO BE 3/8" X 6" WIDE STEEL ANGLED AND WELDED TO 3" DIAMETER STEEL PIPE SECTIONS. PIPE SUPPORTS TO BE SET IN 10" DIAMETER CONCRETE PILES X 6'-0" DEEP. ALL METAL TO BE PAINTED BLACK. WOOD TO BE BOLTED TO SUPPORTS AS SHOWN. ALL EDGES TO BE EASED. BENCHES TO BE MAINTAINED SILVER FREE.

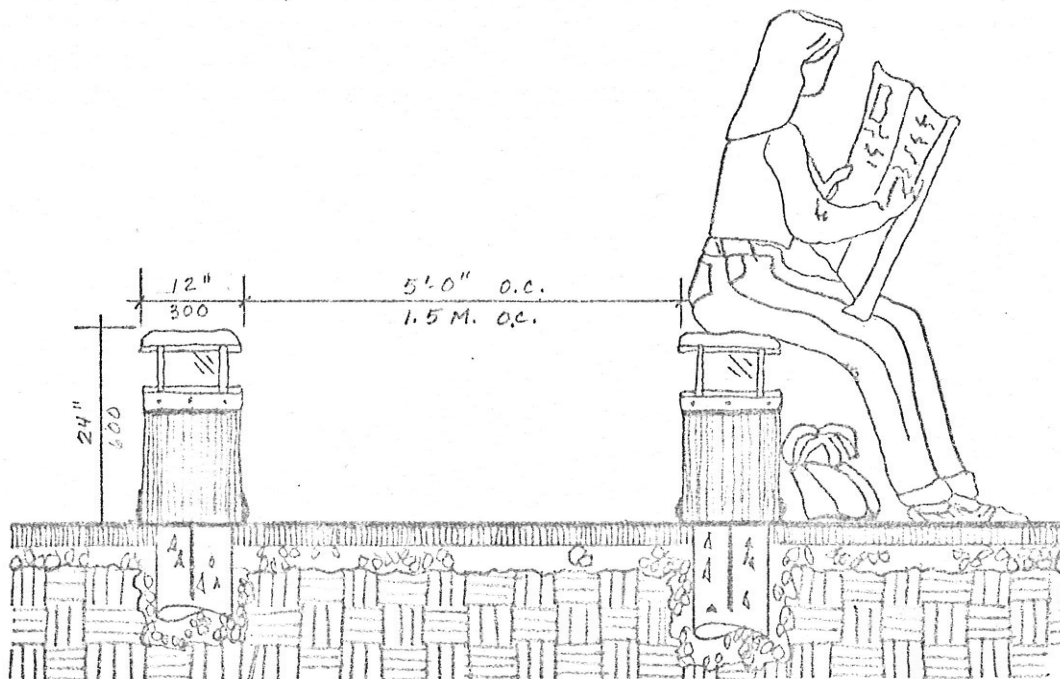
## 8. Bench





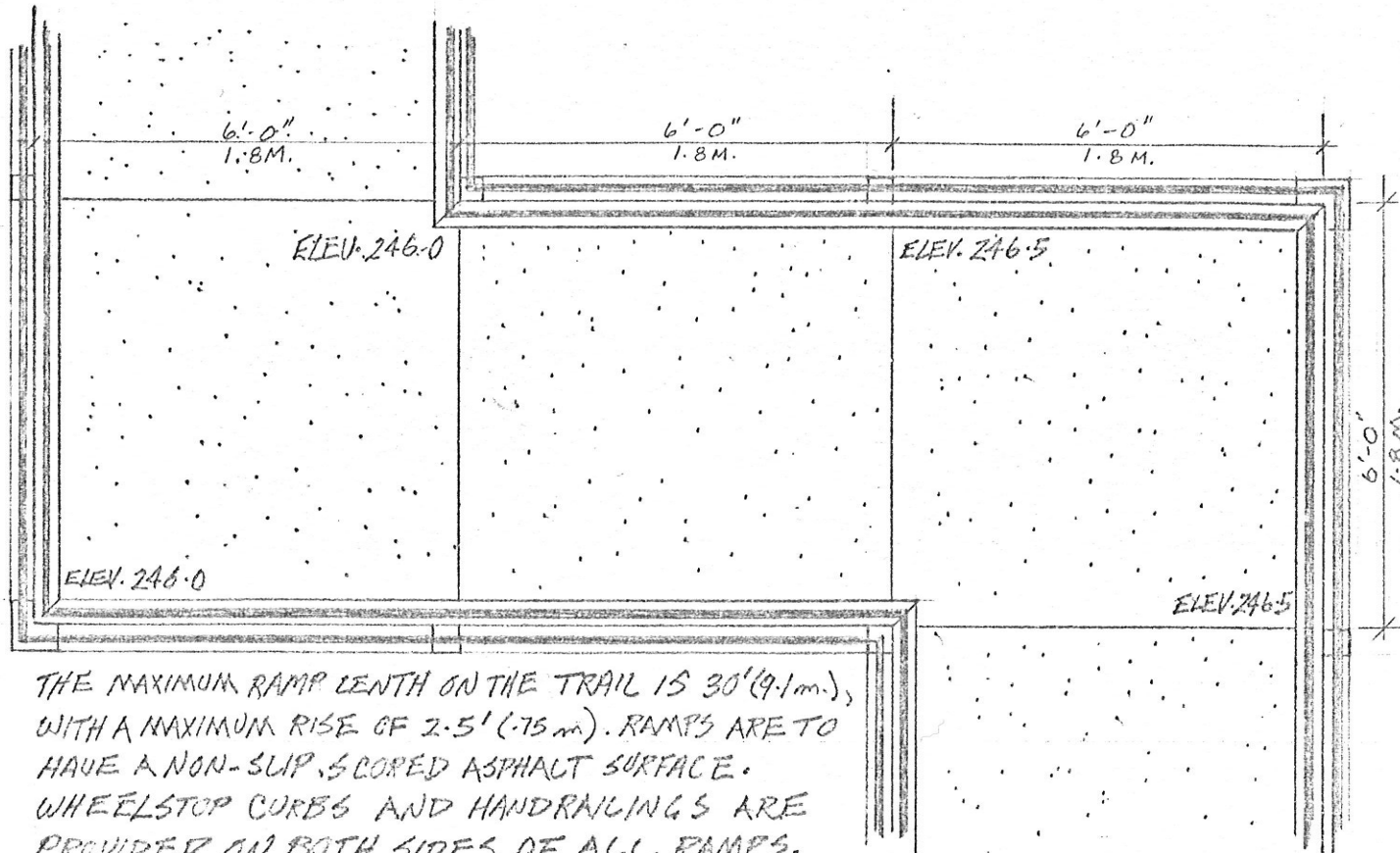
STANDARD WASTE DISPOSAL CANS TO BE PLACED INSIDE A 610X610X915 mm. CEDAR SHELL. WOOD TO BE TREATED WITH CLEAR PRESERVATIVE. PIVOTING COVER TO BE MADE OF YELLOW FIBERGLASS. ALL EXPOSED EDGES TO BE EASED AND THE SHELL MAINTAINED SLIVER FREE. TRASH PICK-UP TO BE AS REQUIRED TO KEEP POTENTIAL INSECTS OR PESTS TO A MINIMUM.

## 9. Waste Receptacle

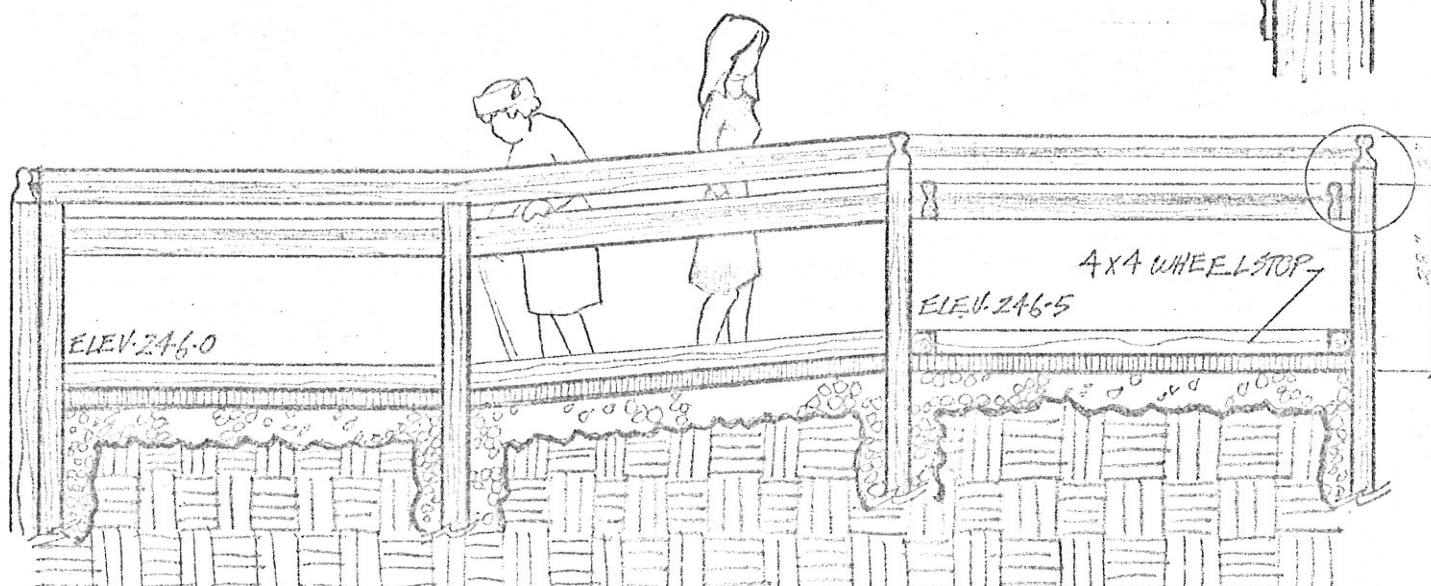
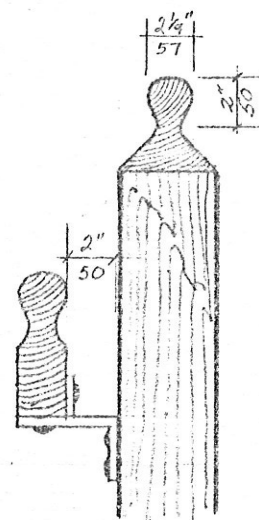


BOLLARDS ARE TO BE PRESSURE TREATED WOODEN ROUNDS, ANCHORED TO CONCRETE PILES. STEEL FRAMED CAP LIGHTS ARE TO BE PAINTED BLACK. USED FOR PEDESTRIAN/VEHICULAR TRAFFIC SEPARATION, THE 5'-0" (1.5m) CENTRES ALLOWS FOR WHEELCHAIRS TO PASS BETWEEN THE BOLLARDS.

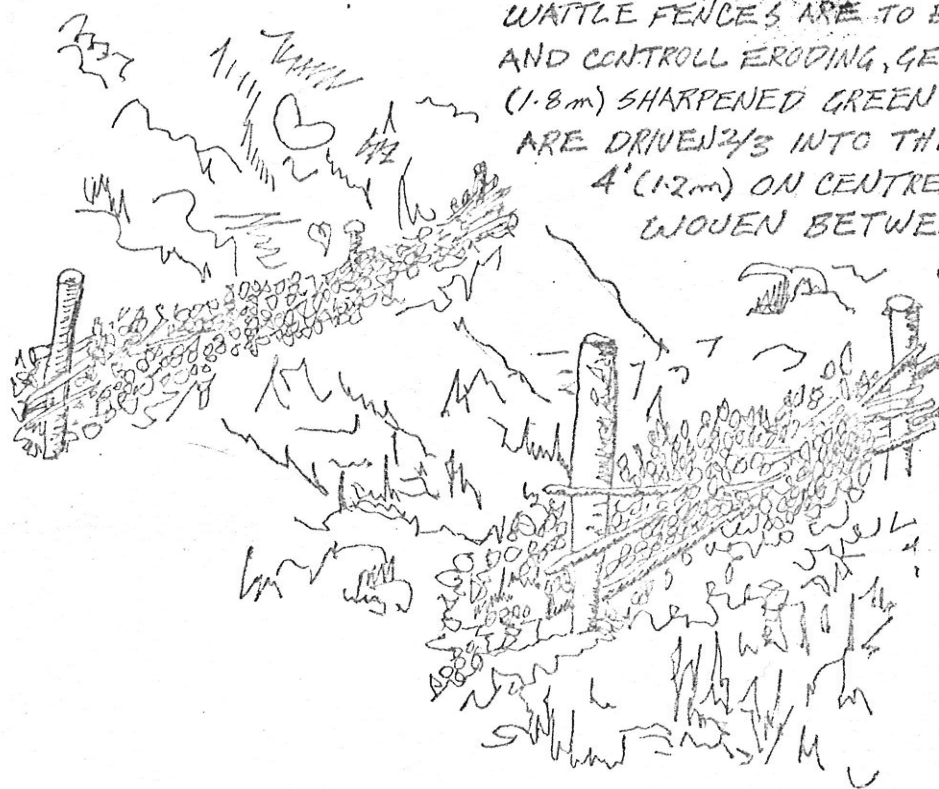
## 10. Bollards



THE MAXIMUM RAMP LENGTH ON THE TRAIL IS 30' (9.1 m.), WITH A MAXIMUM RISE OF 2.5' (.75 m.). RAMPs ARE TO HAVE A NON-SLIP, SCORED ASPHALT SURFACE. WHEELSTOP CURBS AND HANDRAILINGS ARE PROVIDED ON BOTH SIDES OF ALL RAMPs. HANDRAILS ARE TO BE MADE OF CLEAR FIR, TREATED WITH WOOD PRESERVATIVE. CONNECTING METAL BRACKETS ARE TO BE PAINTED BLACK. ALL EXPOSED SURFACES ARE TO BE EASED. WOOD SURFACES ARE TO BE MAINTAINED SLIVER FREE.

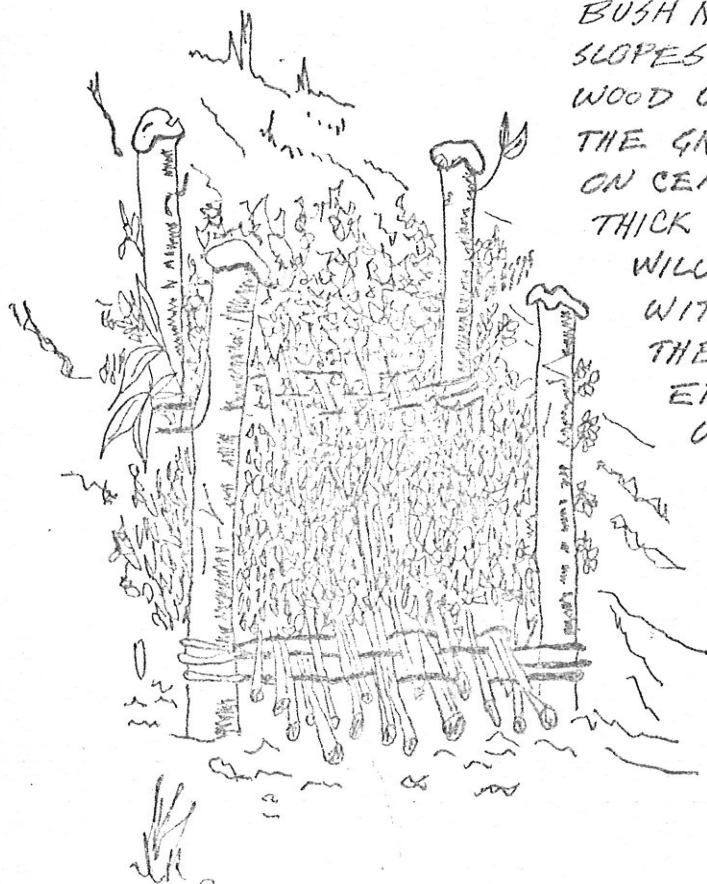


## 11. Ramp/Handrail



WATTLE FENCES ARE TO BE USED TO RE-VEGETATE AND CONTROL ERODING, GENTLE SLOPES. SIX FOOT (1.8m) SHARPENED GREEN WOOD WILLOW STAKES ARE DRIVEN  $\frac{2}{3}$  INTO THE GROUND, APPROXIMATELY 4' (1.2m) ON CENTRE. WILLOW BRANCHES ARE WOVEN BETWEEN THE STAKES. THE

WATTLES ARE TO BE OVERLAPPED AND OFFSET DOWN THE ERODING SLOPE.



BUSH MATS ARE TO BE USED ON STEEP ERODING SLOPES. EIGHT FOOT (2.4m) SHARPENED GREEN WOOD WILLOW STAKES ARE DRIVEN  $\frac{2}{3}$  INTO THE GROUND, APPROXIMATELY 2' (.6m) ON CENTRE. THEN, APPROXIMATELY 6" (150 mm) THICK BUSH MATS, MADE OF SPROUTABLE WILLOW BRANCHES, WOVEN TOGETHER WITH BAILING WIRE, ARE PLACED BETWEEN THE STAKES, AT RIGHT ANGLES TO THE ERODING SLOPE. THE MATS ARE WIRED TO THE STAKES.

THESE MATS, AND WATTLE FENCES, WILL TRAP ERODING MATERIAL, DEVELOP SOIL BUILD-UP, SPROUT, AND EVENTUALLY CONTROL EROSION.

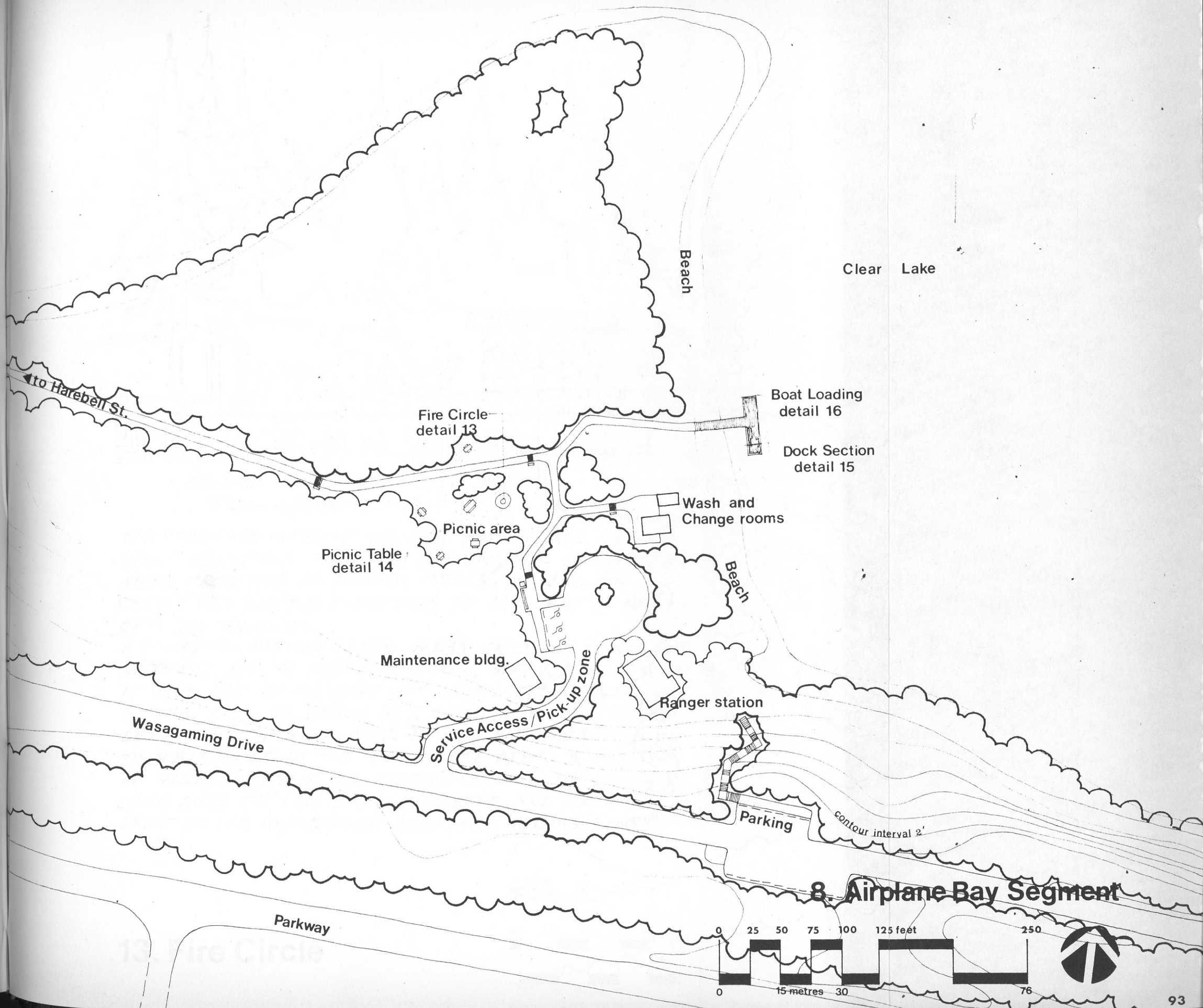
## 12. Erosion Control



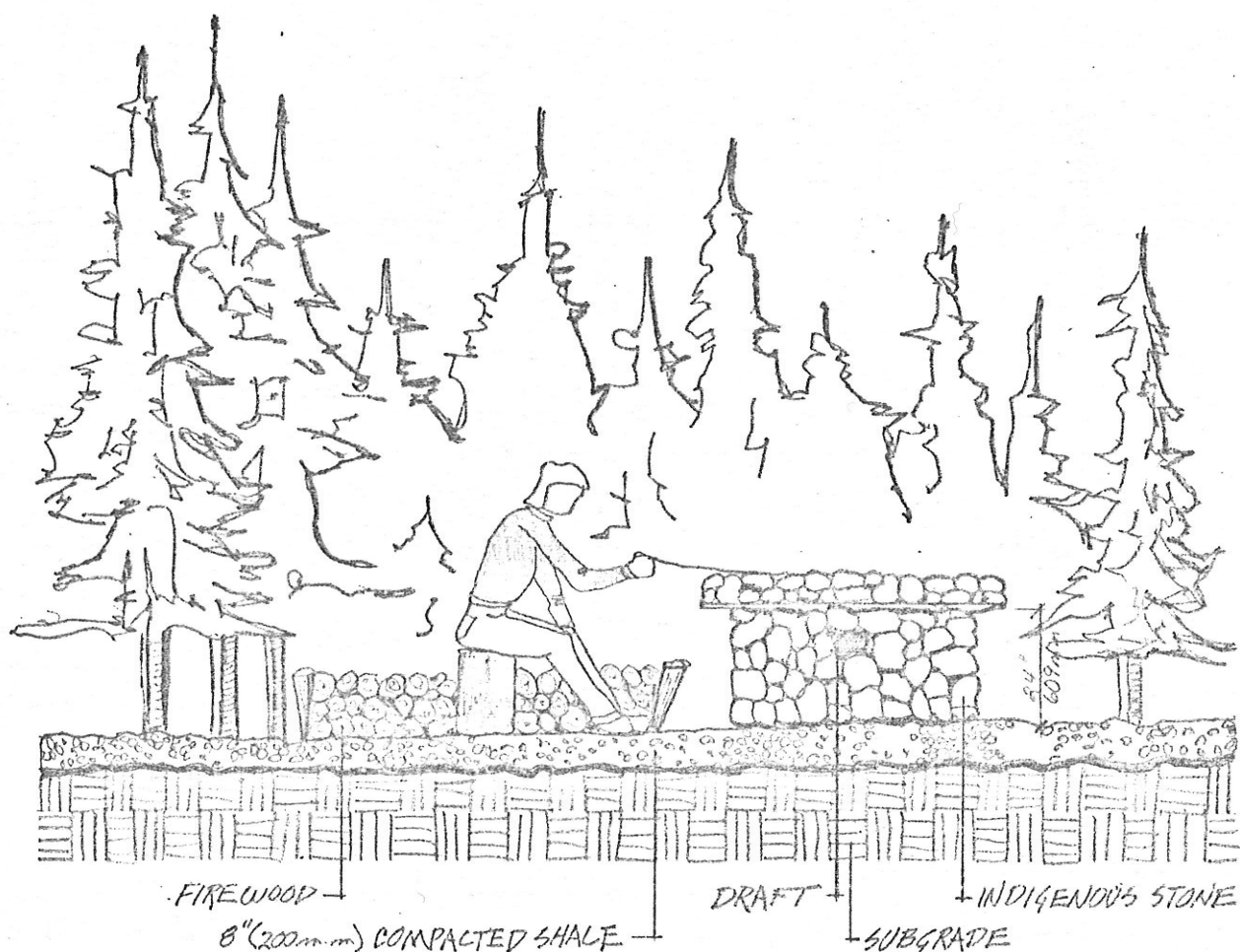
### 6.3 AIRPLANE BAY SEGMENT

The Airplane Bay segment (see map 8) has been developed as a terminus to the walk. The existing buildings, which are currently used as dead storage, can be upgraded to support facilities to the walk, and the area generally. The old ranger station is to be reactivated to serve as an administrative and support office. This may be particularly important as a communicative link or first-aid station in case of emergencies. The storage shed can be developed as a washroom and change house. The washroom should be the pump-out type, and access for this function can be gained from the drop-off/pick-up zone. The picnic area maintains a good view of the beach and dock area. The fire circle (see detail 13) and picnic tables (see detail 14) are placed atop a compacted limestone surface. The tables themselves are to be movable to accommodate large families. While supporting general lake associated recreation, the dock also works as a fishing platform (see detail 15) and a boat cruise passenger pick up facility (see detail 16).

Although the trail has been discussed as joining the townsite and Airplane Bay, one must remember that the reverse is also true. With vehicular access to the Bay's activity zone, it is possible for visitors who may not be comfortable negotiating the Harebell switchback to experience the lakeshore portion of the Walk, by starting out from Airplane Bay.



## 8. Airplane Bay Segment

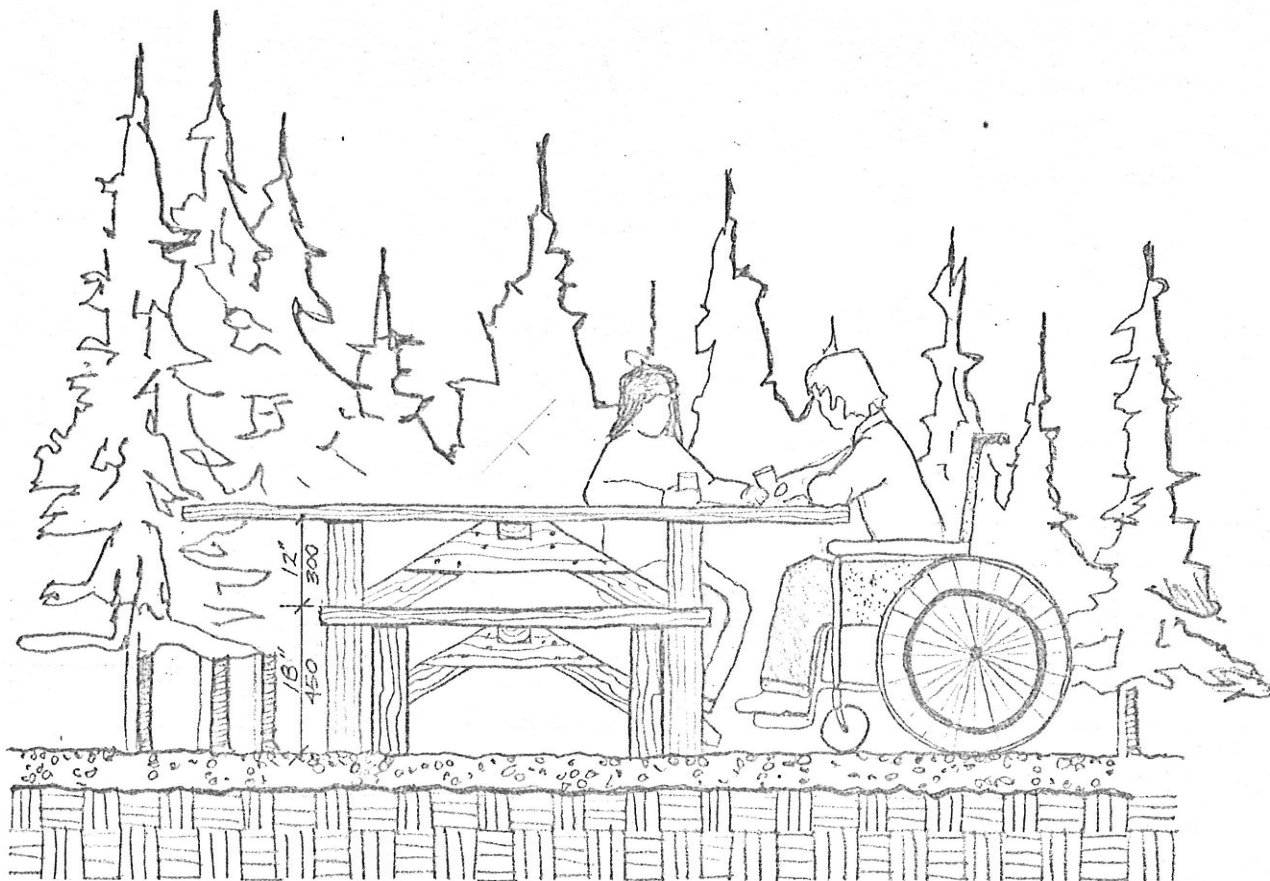


CAMPFIRES ARE OFTEN AN INTEGRAL PART OF TRAIL RELATED "PARK" ACTIVITIES. WHETHER THE CAMPFIRE IS USED FOR NIGHT PROGRAMS OR COOKING MEALS, IT WILL BE EASIER FOR DISABLED PERSONS TO USE IF IT IS RAISED OFF THE GROUND.

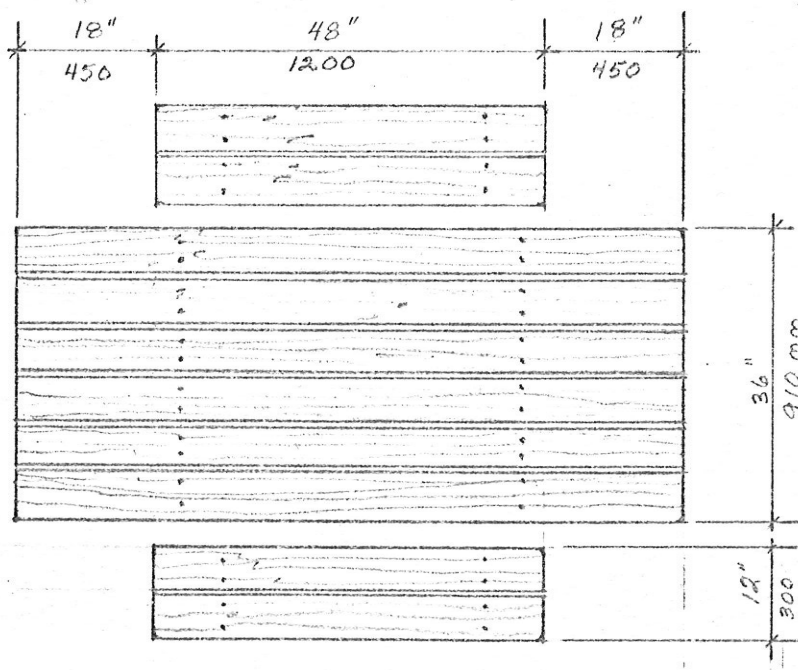
A MOVABLE, NARROW GAUGE MESS GRILL, IS TO BE SET ATOP THE PIT, TO ACT AS A COOKING SURFACE. FURTHERMORE, IT WILL ACT TO PREVENT HOT ASHES FROM RISING OUT OF THE FIRE. TO SERVE AS A DRAFT, A STONE IS TO BE LEFT OUT OF EACH SIDE OF THE PIT. FIREWOOD IS TO BE STORED IN THE IMMEDIATE AREA. A NUMBER OF WEATHERED LOGS, APPROXIMATELY 24" (600mm) LONG AND 12" (300mm) IN DIAMETER, ARE TO BE LEFT IN THE IMMEDIATE AREA FOR USE AS SEATS.

### 13. Fire Circle



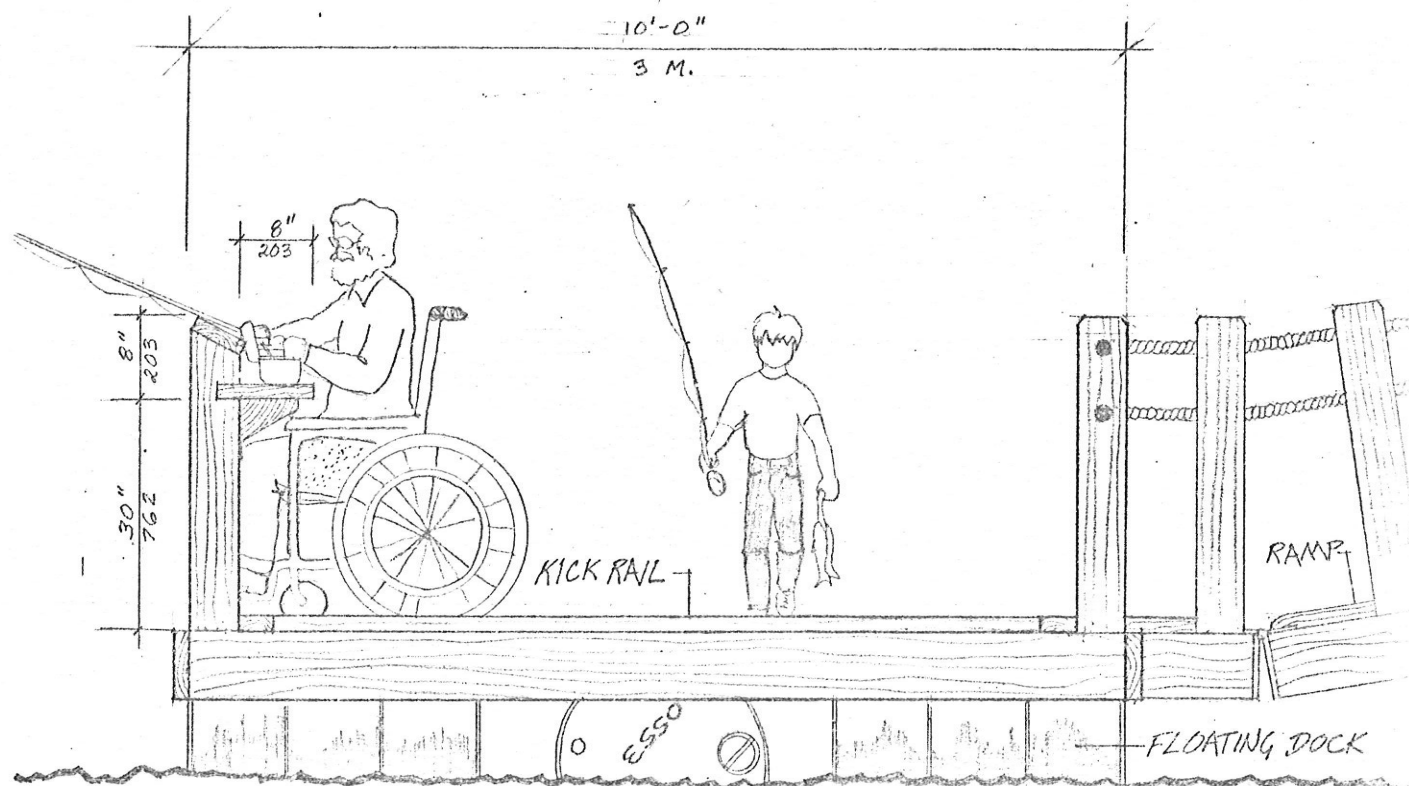


PICNIC TABLES ARE TO BE MADE OF CEDAR, TREATED WITH CLEAR WOOD PRESERVATIVE. ALL FASTENERS ARE TO BE COUNTER-SUNK. THE TABLES ARE TO BE FREESTANDING AND MOVABLE. BENCHES ARE TO BE CHAINED TO THE TABLES. ALL EXPOSED EDGES ARE TO BE EASED. ALL SURFACES ARE TO BE MAINTAINED SLIVER FREE.

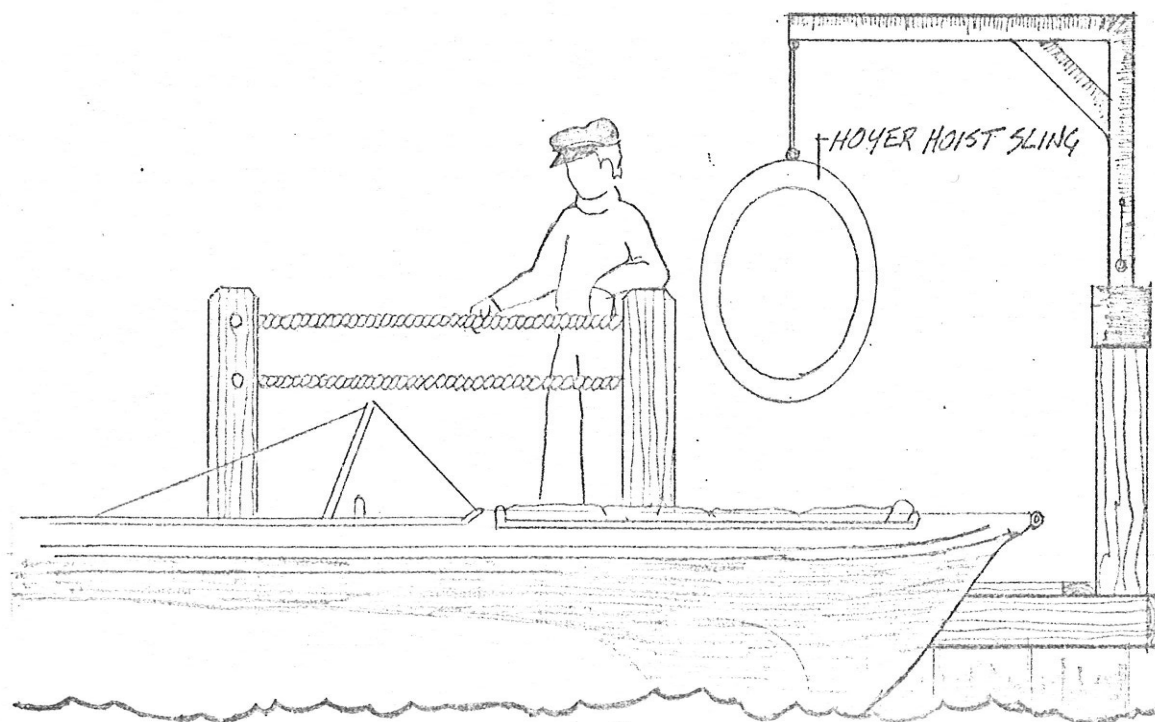


14. Picnic Table

## 15. Floating Dock Cross Section



FLOATING DOCK TO SUPPORT 450 P.S.I. . DOCK TO BE CONSTRUCTED OF PRESSURE TREATED CEDAR. DECK PLANKING TO BE TONGUE AND GROOVE. ALL EXPOSED EDGES TO BE EASED. ALL EXPOSED EDGES TO BE MAINTAINED SLIVER FREE. ACCESS RAMP SLOPE NOT TO EXCEED 10%.



## 16. Boat Loading Cross Section

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