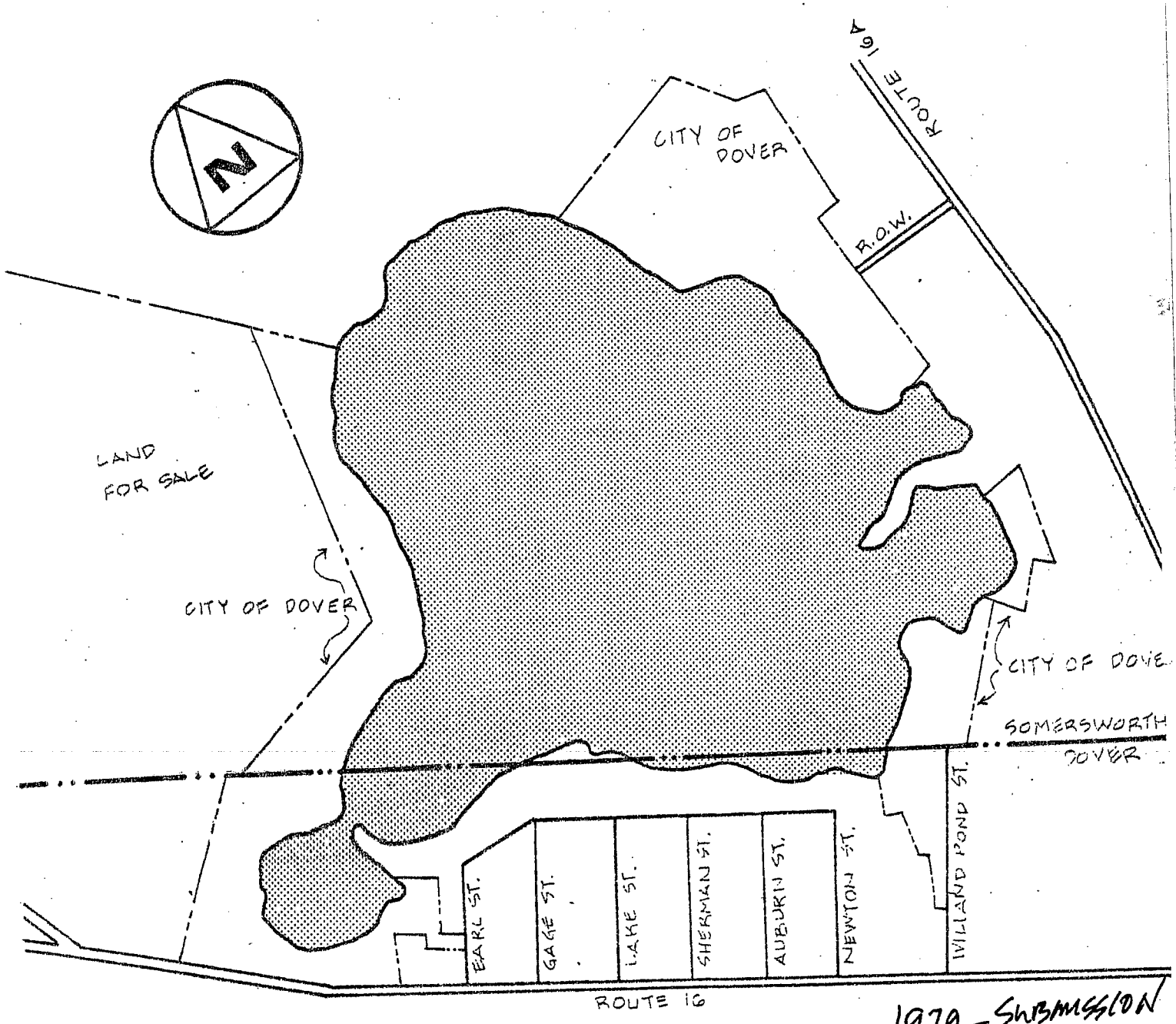
MASTER PLAN STUDY

WILLAND POND RECREATIONAL AREA

DOVER & SOMERSWORTH, N.H.

FOR THE WILLAND POND COMMISSION



1979 - SUBMISSION

DANIEL BISSON ASSOCIATES, INC.

This thesis is dedicated
to my late father
Adelard A. Bisson
whose interest in young
people instilled importance
in their lives and an
inspiration to my life.

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September 10, 1979

Strafford Regional Planning Commission
90 Washington Street
Dover, New Hampshire 03820

Attention: Ms. Nina Brown

Reference: Master Plan Study - Willand Pond Site
Located between Dover and Somersworth

Dear Ms. Brown:

We are pleased to submit the enclosed Master Plan Study for a Recreational Facility at the Willand Pond Site in Dover and Somersworth, New Hampshire. This study is the result of the investigative and design efforts of Daniel Bisson Associates, Inc., Thesis Advisor John G. Crowe and Thesis Experts, encompassing a period from September 1978 to the present.

The intent of this study is to provide the Willand Pond Commission with a firm and rational approach towards the planning and development of the Willand Pond Site, to indicate the existing conditions, delineate the specific requirements and indicate the various options.

We have enjoyed the opportunity to assist you in planning for a recreational facility at the Willand Pond Site and we thank you for your participation in this effort.

Very truly yours,

Daniel Bisson Assoc. Inc.

Daniel A. Bisson

Daniel A. Bisson

MASTER PLAN

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MASTER PLAN

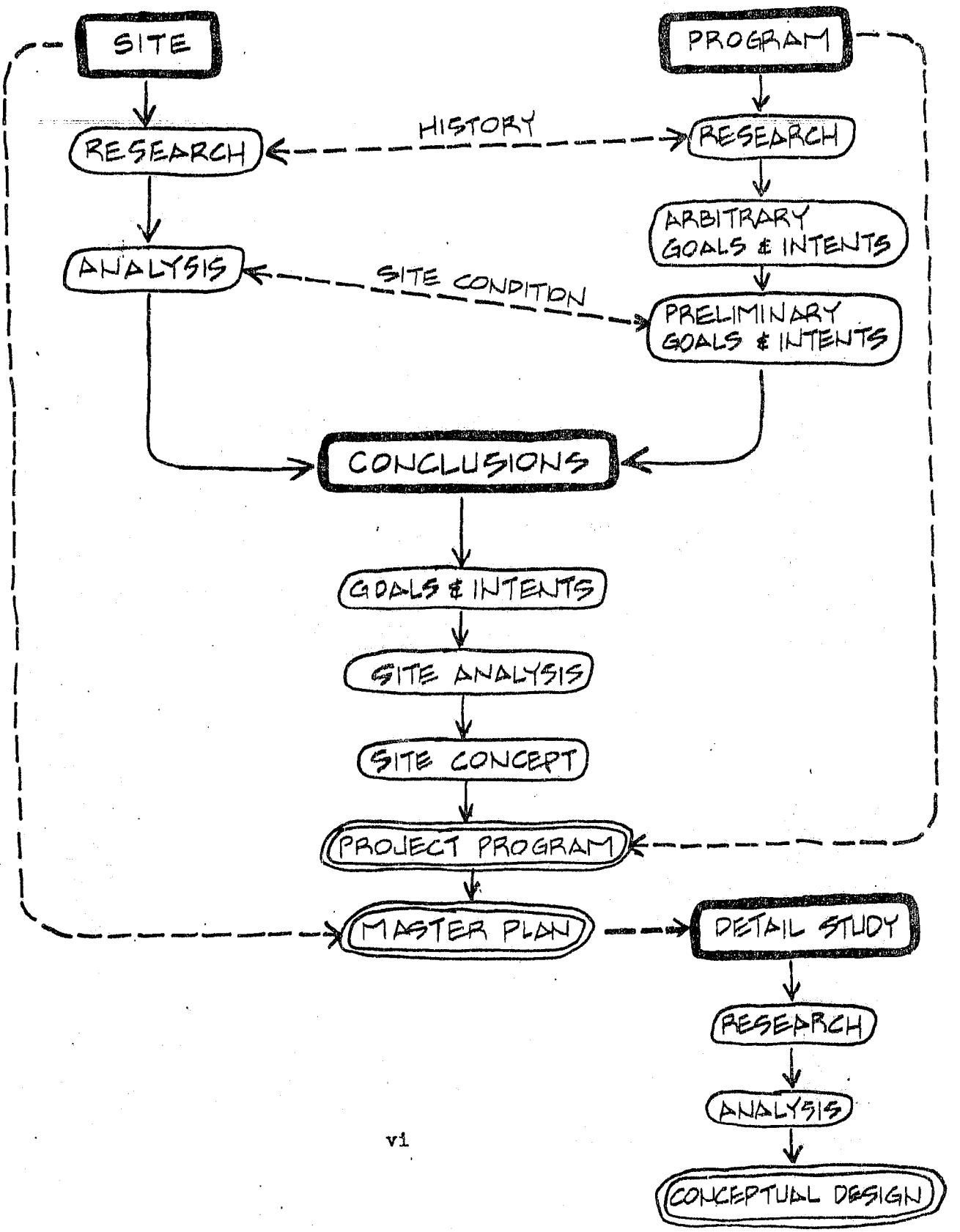
LEGEND

WILLARD POND

MASTER PLAN

METHODOLOGY

WILLAND POND / RECREATIONAL AREA



INTRODUCTION

The ever-increasing demand for residential, recreational, commercial and industrial development in New Hampshire has placed undue pressure on New Hampshire's natural environment to satisfy a multitude of needs. There is an need to insure that the present New Hampshire landscape does not become indistinguishable from places which have already suffered from urban and suburban sprawl. The key to protection rests with the way in which undeveloped land is utilized in the future.

This study evaluates the undeveloped area known as the Willand Pond Site. The primary purpose of the study is to preserve the natural features of the site and incorporate a recreational facilities for the cities of Dover and Somersworth.

The method utilized to obtain the optimum site capacity was to inventory the natural and man-made on site and off-site conditions, analysis the factors present and develop criteria for future developmental opportunities.

This study represents what we consider to be the most viable approach for developing a recreational facilities at the Willand Pond Site.

As with all studies, however, optional approaches must be considered carefully and weighed against an ever changing economics and recreational demand. This study is flexible and has been designed with the capability of responding to those factors.

I. HISTORY - WILLAND POND

1.0 SOURCES OF HISTORY

A written history of Willand Pond is scanty and almost forgotten. We found very little information digging through the avaliable materials at the Dover and Somersworth Libraries. At the Somersworth Library we found a collection of newspaper clippings pasted together in an old encyclopedia which contained some references to the history of Willand Pond; especially the period around the turn of the century.

Rather then rearranging the articles we are presenting them as they were written retaining style and flavor of the time.

1.1 OVERVIEW OF HISTORY

The first article selected gives an overview of the Willand Pond History.

Willand Pond and Central Park

Day April 6, 1926

The park is 36 years old and has had two names. First for its founder, H.W. Burgett, Burgett Park; second, by his successor, it was changed to Central Park. The first building erected on it was the present car-barn, in 1890. The pond has had 3 names. When the first settlers of Dover took sight of it they called it the "Great Pond." That name was used during a century and a half;

then it was changed to "Cochecho" Pond, which was in use when G. L. Whitehouse made the map of Dover in 1834. A dozen years later it came to be called "Willand" Pond; I do not know why Mr. Willand was thus honored, as he was owner of only a small part of the land bordering on it.

The pond covers eighty-four acres at high water. Two surveys have been made of it by engineers. The first in 1871, by James A. Weston of Manchester and Joseph B. Sawyer of Dover. The second survey was made by Percy M. Blake in the fall of 1887, which is on file in the Water Commissioner's Office at the City Building. November 1, 1887, Mr. Blake estimated the amount of water in the pond was one hundred-ninety-seven million gallons. At that time the ordinary high water mark was several feet about the surface, so at high water the pond contains several more gallons. When the high water mark is reached the surplus water soaks off through a piece of low, bushy ground (called health) of some 10 or 15 acres in extent, which lies on the health empties into the Salmon Falls River.

The pond is numerable thousands of years old. When it was formed, in the closing years of the glacial period, immense blocks of the ice sheet stood where the water now is; maybe it was a thousand feet high and under its bottom was the coating of hardpan which retains the water, but in it are holes through which the water flows in (spring), but cannot flow out. This "spring water"

comes from the north and northwest, just how and where it starts and soaks, no engineer can find out. Maybe some of it comes from Lake Winnipesaukee; at one geological period the water of that lake flowed through here and emptied into the tide water.

According to the latest geological investigation that old river-bed was about where the Railroad runs from Alton Bay to Dover. No water comes into the pond, except through these springs; nobody knows how many springs it has. In old times when the boys used to go in bathing and had a swim to all parts of the pond, they noticed in several places, the water was much colder, which indicated that cold water was flowing in from a spring.

On all sides, except at the outlet, the pond is bounded by a dry gravelly plain which is from twelve to seventeen feet above high water, and which extends from a quarter to half a mile from the pond. We know the contents of this plain from an inspection of the ditch that was dug in 1876, by the Cochecho Aqueduct Co., from Hussey springs to the pond to get an additional supply of water for its customers. The ditch was dug to various depths; at the highest part of the plain, it was twenty-five feet deep, so the water pipe would be lower than the surface of the pond. While the work of excavating was going on I went out there and inspected the material of the plain as exposed by the ditch. This ditch showed the plain to consist of interstratified gravel and sand containing abundant pebbles of all sizes, up

to a foot and-a-half in diameter. The material are nearly level in stratification. The layers of sand are from a few inches or two feet in thickness, but were short, not being apparently continous over one or two areas. At some points only the coarse gravel was found, with no clear sand or no boulders are seen on the surface or in the ditch. This shows that the material was not washed in by flowing water, but was simply dropped in from the melting ice, around the "chunk" that stood firm in the pond, which was the last to melt away.

In the survey made by Weston and Sawyer it is stated, in their report, that near the point where the water is taken for the city of Dover, at ten rods from its shore, the bottom of the pond is 60 feet below the surface at high water.

In this connection it may be of interest to state that while Willand Pond was being formed the Bardadoes Pond was being formed in a similar manner. Pine Hill was surrounded by ice during the forming period, of the gravel and sand, of which it consists.

The plain about Willand Pond is the highest land between Salmon Falls and the Cochecho River, the descent to which is over uneven areas of ledge or till. The shores of the pond on all sides rise steeply to the level of the plain. On the easterly side this escapement appears to have resulted from the undermining action of waves. On the south this plain decends from

twenty-five to fifty feet below which is the Great Cochecho Marsh, extended from the Hussey springs to the foot of Garrison Hill. The marsh consists of peculiar clay stratum, mixed with stand, in which neither trees or vegetation of any account can grow. It is the same now as it was 300 years ago and may be so three centuries hence. It was the outlet of the Hussey springs till the aqueducts were put in to supply the city with water. As it is now the city does not take all the water from a large brook. The Styx Brook carries off much water, except in very dry seasons.

The surface of the pond, when full, is 192 feet above the Cocheco River at low tide. January 1909, the Water Commissioners placed a marker in the water, the surface was then about 3 feet below high water; they called it "0". Since then they have reckoned the depth of water as so many inches above or below "0". During the administration of Mayor Dwight Hall there was tremendous anxiety about the water supply; at that time the pond's surface was considerable "0".

A water famine was feared; the city councils summoned water "experts" from Boston, who were ignorant of the geology of Strafford County; they advised converting Reynor Brook into a Pond, and then pump its water, very poor stuff into Willand Pond. Fortunately it commenced to rain soon after the decision was reached. The water in the pond commenced to rise, and the surface has never been below (0) since that "awful dry time."

1.2 PARK IMPROVEMENTS

The next three articles are very informative in giving clear picture of the park and its activities.

Park Improvements

September 5, 1890

The proposed new pavilion which is to re-built at Burgett Park, will be ready for use by September 18. The upstairs hall will be used for dancing or roller skating purposes, and the lower hall for a room for banquets. This building will be beautifully located on the point of land running into the lake, just south of the little cove where the electric motor-house stands. It is charming spot for such a building and lovely view across the lake may be had there from. There will be a long piazza in front on the water side, affording a delightful promenade. Beyond this pavilion are the tennis courts. Mr. Burgett will have as fine loam courts as can be made, with good rock bottom covered with layer of gravel and layer of good loam. There is a fine place there for tennis, giving ample room, or three or four courts, and such a charming spot will surely be a great attraction to tennis players and friends. This portion of the grounds is intended to be in one sense a separate park, being well removed from that part of the grounds where the swings and dance floor are so that a private party desiring the use of the pavilion or

courts will not be disturbed in their enjoyment of them. This is a grand good arrangement, and will be greatly appreciated.

Next season one will hardly know the locality so great will be the transformation with contemplated improvements. There will be a steamer on the lake and plenty of row-boats. In all probability there will be a road around the greater part of the lake close to the water. Various arbors and summer houses will be erected in pleasant nooks, and other structures put up to add to the attractiveness of the ground.

There was a concert at the Park Wednesday evening by the Dover Band. Although the concert was gotten up on the spur of the moment and not advertised much of any. Yet there was a large number of people at the Park to enjoy it. The platform where the band was was lighted by three arc lights, giving a brilliant illumination. Next summer Mr. Burgett proposes to have concerts at the Park by the Germania Band, Reeves' Band, or some other of the first class city bands, which will be a great musical attraction.

There are now eighteen or twenty arc lights at the Park, lighting up the grounds in a finner manner.

Burgett Park is destined to become the most beautiful and popular pleasure ground in New Hampshire. It will not only be a resort for excursionists and picnickers from Somersworth and Dover but also for those living in places within a radius of thirty miles.

Central Park Charming Place

1918

One of picturesque spots of Strafford County is Central Park located midway between Dover and Somersworth and Rochester street railway. Bounded on the west by Lake Willand a beautiful sheet of water which in early Indian and Colonial days figured prominently, it has an ideal location. The scenery around the lake is beautiful and picturesque, while cool breeze always sweeps across it even on the hottest days in summer.

All the accommodations and amusements for picnic or excursion parties are found at Central Park. There is a large two story pavilion, containing banquet hall, kitchen and public restaurant on the lower floor, and without doubt the finest dance hall in New Hampshire on the second. The floor of the hall is of hard wood, carefully laid and highly waxed. It covers and area of 75,000 sq. ft. Twenty windows open on a wide vers a surrounding three sides of the building while in the interior plate glass mirrors between the windows extend up from the floor to a distance of 8 feet or more. Hundred's of electric bulbs throw thur brillant lights through oriental hangings over the dancers, while the great mirrors seem to reflect endless whirling to the thrilling music. On the wide balcony without, a picturesque view out over the lake is seen through the branches of the stately pines which practically cover the whole park.

Central Park also contains an open air theatre having a seating capacity for two thousands. Every seat commands a view of the stage. The program is changed each week during the season. There is no more delightful pleasure on a hot summer's night than a ride in an electric car, a find show at the rustic theatre, a saunter through the wooded walks or a few dances at the pavilion, and then a ride home.

On Sunday afternoons and evenings during the summer season, fine sacred concerts are given by the leading bands of the county.

Somersworth as a Summer Resort

by Edmund S. Bager

Late 1891

Burgett Park, with its many attractive sports and features, is reached by means of the electric railroad in a few minutes. Willand's Pond, which borders a large portion of the Park, offers a sail on its waters in the steam launch or row in on of the many boats lying at the landing. In the Casino are given throughout the season entertainments of the highest order and every part of the Park offers rest and recreation the Somersworth Tennis club has its courts, superior to which few are found anywhere. On them are held each year tournaments in which those who stand confessedly skillful in the game are participants.

1.3 SPORTS

Sport were a big attraction at the Park.

Somersworth Free Press

1895

The Rochester and Somersworth baseball teams of the Cocheco League played their first game of the season at Burgett Park Saturday afternoon which was witnessed by about three hundreds spectators, the majority of whom came from Somersworth to cheer their team on to Victory.

1.4 THE POND HAS VIEWED TODAY

Foster's Daily Democrat

June 11, 1977 Saturday

Burgett Park - The Pond of Yesterday

Somersworth - Picture a casino over looking a shimmering Pond, a trolley car depot with a long veranda, a spacious open air amphitheater, and penny arcade.

The turn of the century amusement park could have been located anywhere-anywhere, except perhaps Somersworth, New Hampshire.

But Burgett Park, later know as Central Park thrived through the gay nineties until the 1920's on the site that is now know as Willand Pond.

The casino and amphitheatre is gone. The baseball diamond is over grown. The only remnant of those days are memories and the bear pits, which can still be seen in pond area, minus the bears. The bear pits used to be near the bandstand and the amphitheatre. They didn't perform. Beautiful fenced in baseball field in those days with a large grandstand.

Strong rivalry between Dover and Somersworth in baseball at Central Park. It would be packed with spectators when there was a game between two towns. Aside sports, visitors were drawn to the area to see shows (of all sorts) but most were burlesque-not high class at all.

The dance hall were beautiful with big long mirrors on walls.

The trolley was an important part of the park success. The amusement area was laid out in 1890 by H. W. Burgett, an agent acting for the Consoliated Light and Power Co. and Union Street Co. both trolley firm. The trees were always beautiful, the maples surrounding the area where ballpark used to be.

I guess the automobile just killed it.

1.5 WILLAND POND CONSERVATION COMMISSION

November, December 1977 five months after the newspaper article of June 11, 1977 the cities of Dover and Somersworth joined forces to preserve and enhance the natural amenities of the Willand Pond Site.(Exhibit A).

By June 1978 both City Councils passed a written Master Plan "Willand Pond Master Plan" (Exhibit B) the Plan was to give direction for the Willand Pond Conservation Commission with objectives, policies, aesthetic values and recreational possibilities of the site.

I talked to a few members of the Willand Pond Commission to see if it were possible for a project for my thesis at Boston Architectural Center. They directed me to Nina Brown, staff support Dover and Somersworth Willand Pond Conservation Commission. From conversations with Nina Brown the Willand Pond Area became the site for my thesis.

Undecided about what type of development would be considered for the site I discussed possibilities with my advisor, experts and other key people. The soil types in the area proved to be extremely permeable (see Figure 4-2). Sanitary facilities on the site would be hazardous in polluting the pond and with no adequate city sewage lines near by any large industrial, commercial or apartment complex would be unfeasible.

Being community property the feeling was to investigate a recreational facility. The project was then formally begun through a letter received from Nina Brown (Exhibit C).

II. INVENTORY FOR PROGRAM DEVELOPMENT

2.0 PROGRAM

The need for a program for any project is essential in giving direction and focusing on priorities. This inventory shall develop a program by reviewing existing studies, conducting in depth interviews with key people and reviewing existing recreational areas in both communities.

2.1 STRAFFORD ROCKINGHAM REGIONAL STUDY

In 1974, the Strafford Rockingham Council conducted a mail survey of attitudes of the regional residents towards the recreational opportunities in the region. The analysis and survey forms are attached as Exhibit D of this study. The analysis give us some overall attitudes towards recreational facilities to be noted:

Table II "Activities Ranked by Frequency" is interesting to note is that five of the ten highest ranking activities were passive pursuits. This is an interesting result in a survey of outdoor recreation activities which one might expect more invigorating activities. This indicates that more people wish to enjoy their free time in an more relax manner.

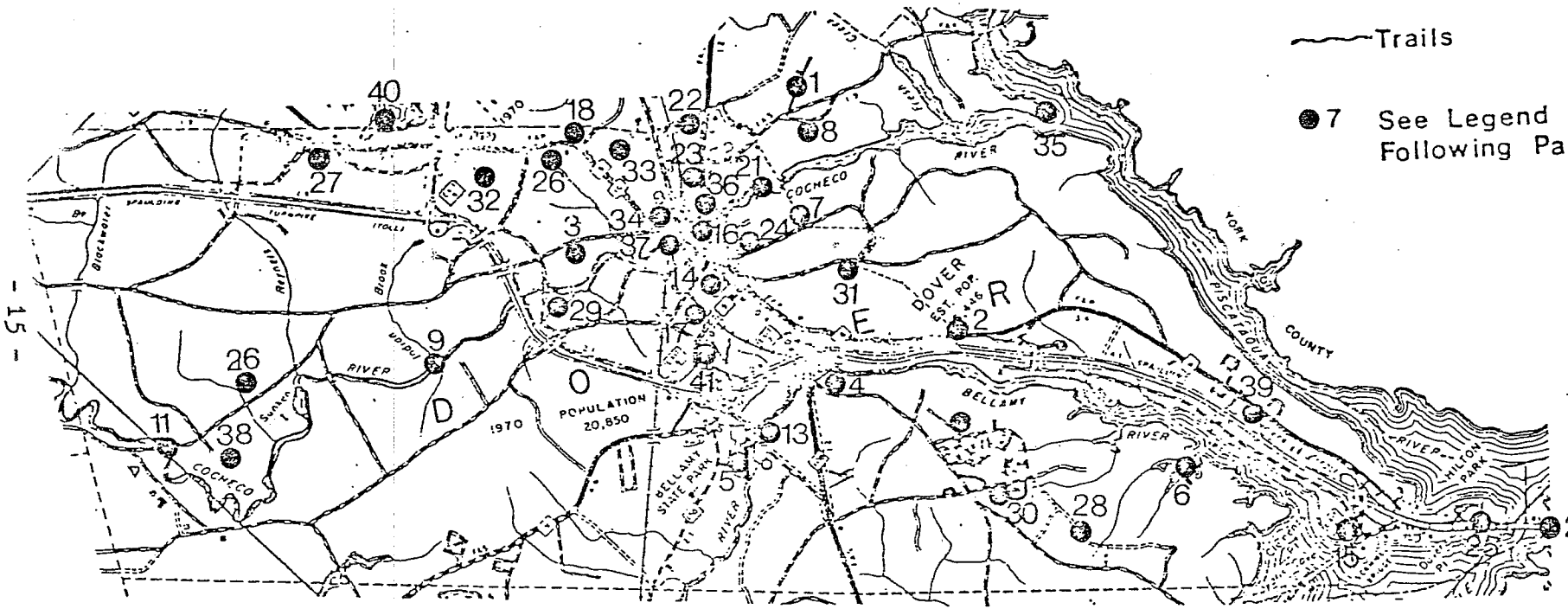
Table VI "Activity Index and Satisfaction with Recreational Opportunities" the response is clear in that the very active

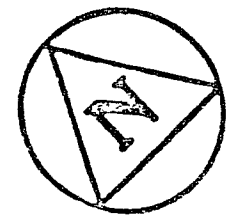
Dover, N.H.
Open Space and Recreation Inventory

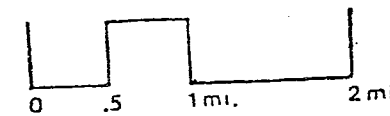
****Designated Scenic Roads

Trails

●7 See Legend on Following Page



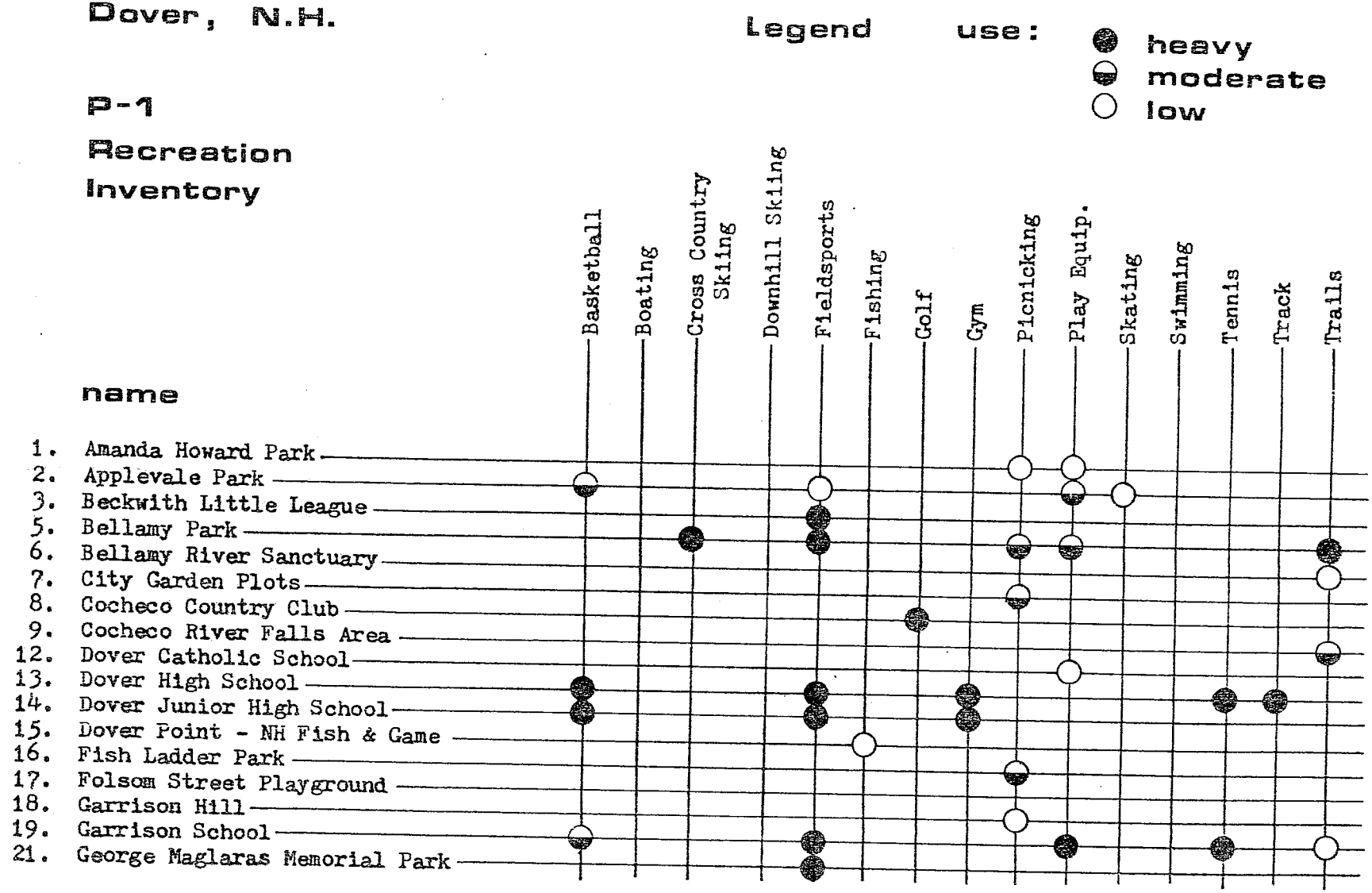




Culture Inventory Date: 1971
Source: N.H. General Highway Map

Dover, N.H.

P-1
Recreation Inventory



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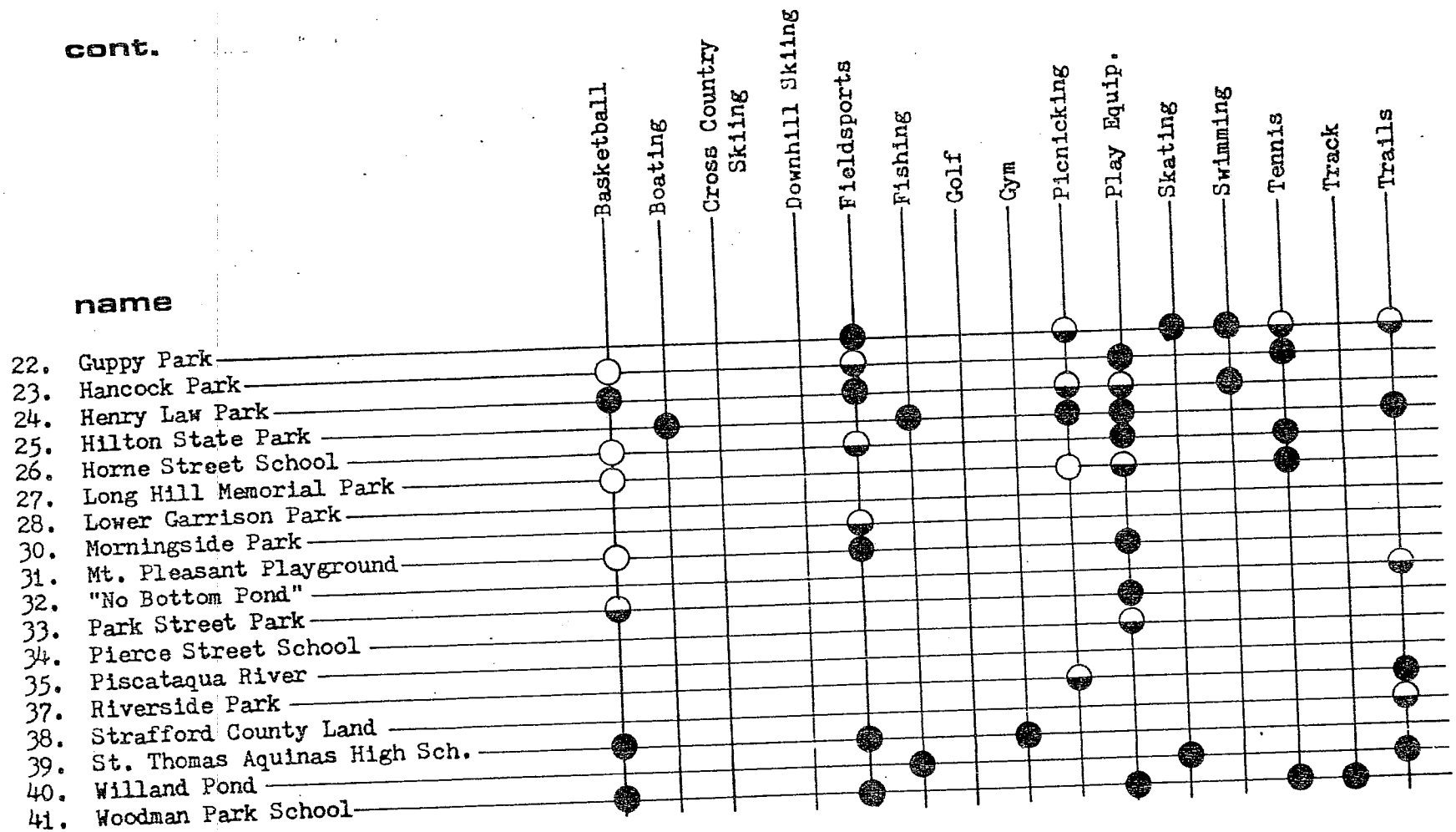
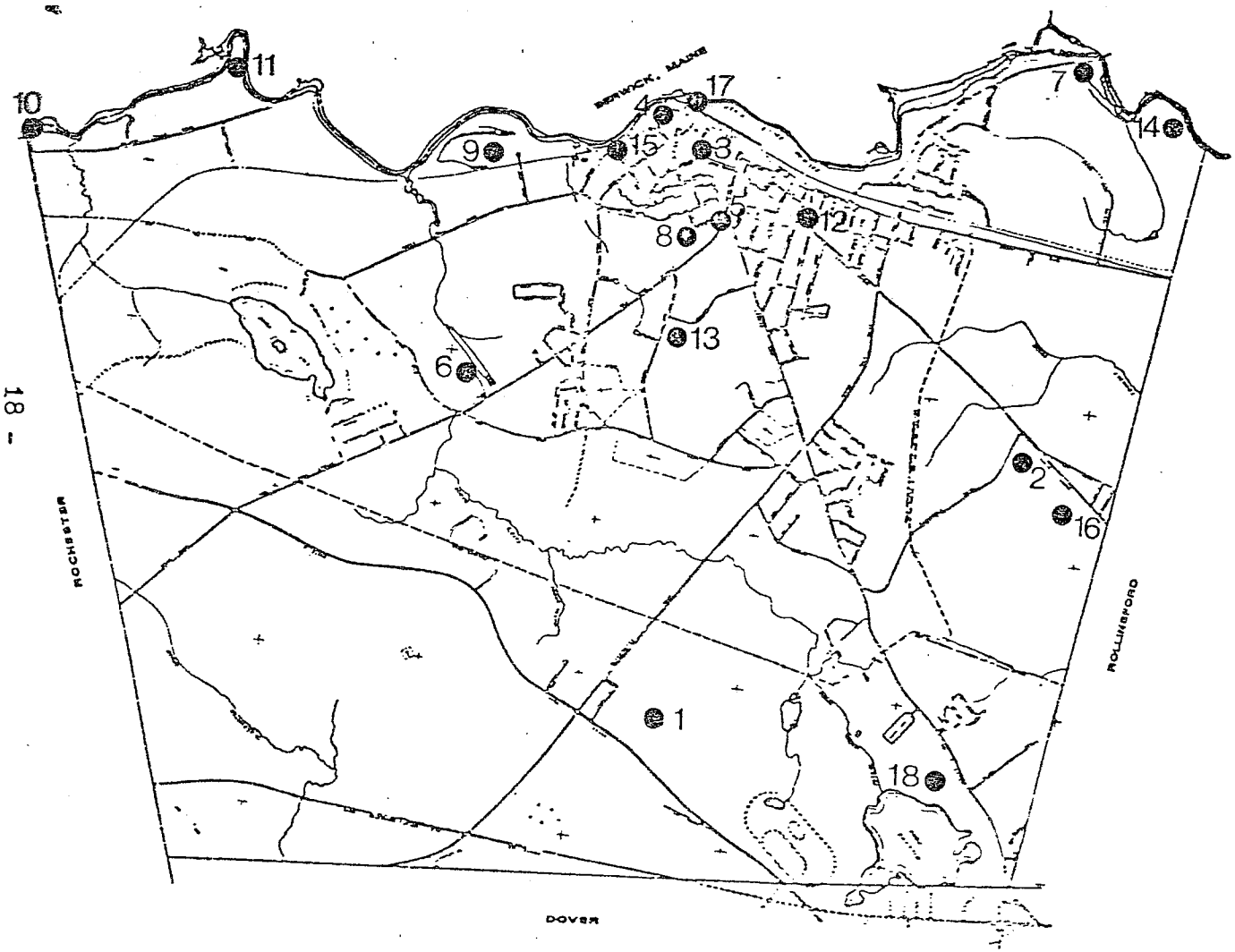

name
Basketball
Boating
Cross Country Skiing
Downhill Skiing
Fieldsports
Fishing
Golf
Gym
Picnicking
Play Equip.
Skating
Swimming
Tennis
Track
Trails
22. Guppy Park
23. Hancock Park
24. Henry Law Park
25. Hilton State Park
26. Horne Street School
27. Long Hill Memorial Park
28. Lower Garrison Park
30. Morningside Park
31. Mt. Pleasant Playground
32. "No Bottom Pond"
33. Park Street Park
34. Pierce Street School
35. Piscataqua River
37. Riverside Park
38. Strafford County Land
39. St. Thomas Aquinas High Sch.
40. Willand Pond
41. Woodman Park School



Somersworth, N.H.
Open Space and Recreation Invento

****Designated Scenic Roa

Trails

● 7 See Legend on Following Page

N

0 1000' 3000' 6000'

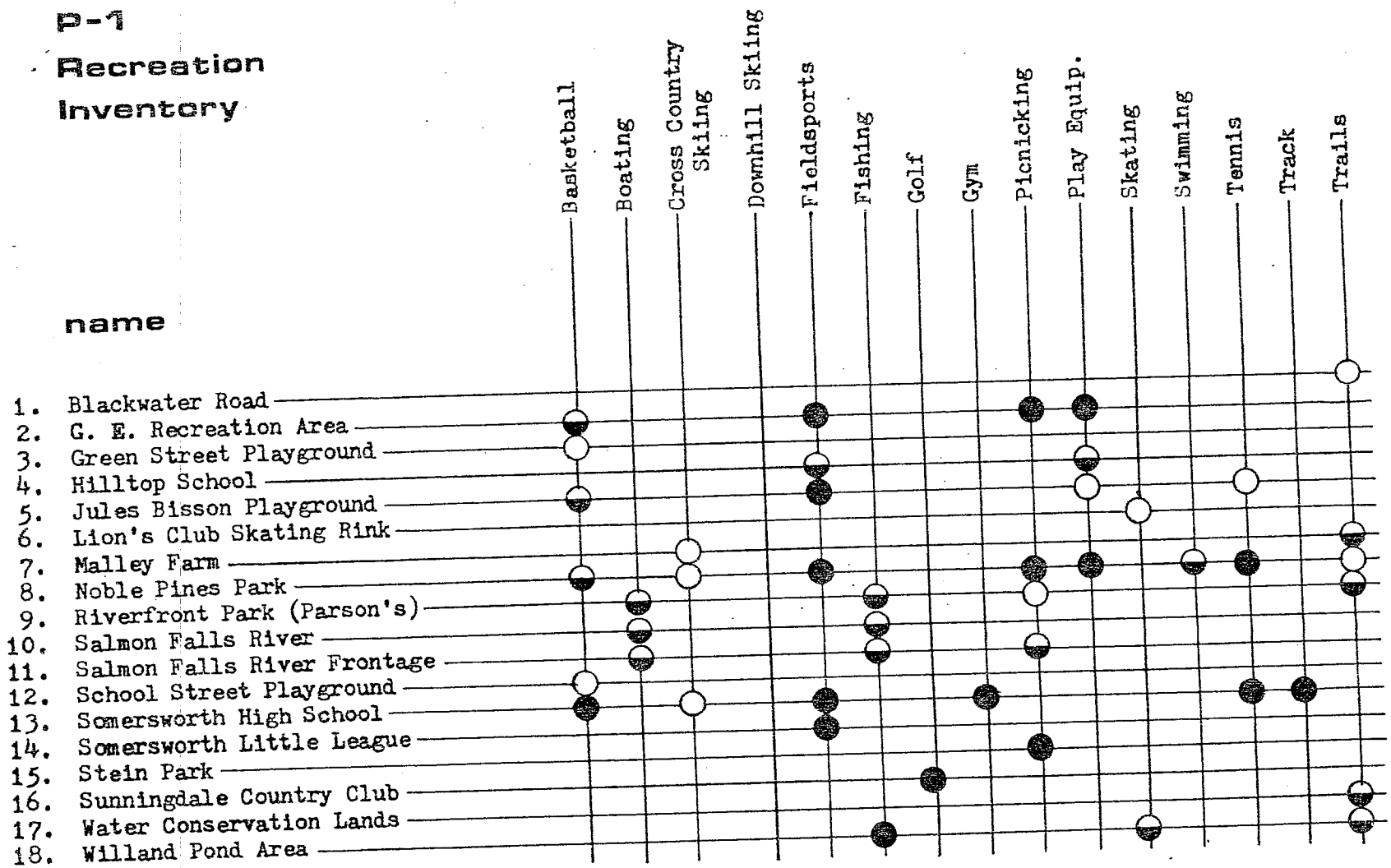
Culture Inventory Date: 1977

Somersworth , N.H.

Legend use: heavy, moderate, low

P-1

Recreation Inventory



people are more satisfied but still find something missing. In fact, the only group that seems satisfied with it's recreational opportunities are those who do not use them often.

Table VIII "Comments by Residents Concerning Recreation" the five most mentioned comments; more tennis, bike trails, swimming, ice skating and park areas all concern capital intensive development. Three of the five; swimming, picnicking and ice skating are related to activities which ranked high on the activity frequency list (Table II).

Conclusion: It seems clear from the study that the residents of the region are not completely satisfied with their opportunities and that those people who wish to use the facilities the most are the least satisfied. It is also important to note that the facilities most wanted are those primary use is by individuals and not for organized team or league sports. There also seems a trend toward family related activities.

2.2 DOVER AND SOMERSWORTH RECREATIONAL FACILITIES (Inventory P-1)

We have contacted the past and present Directors of the Park and Recreation Department of Dover and Somersworth. Through several meetings with them we have gathered the types and locations of recreational activities in both communities. As shown on Inventory P-1 we have also distinguish the amount

of use by designated heavy, moderate or light use. This inventory give an overview of what exist in both communities.

In conjunction with the information on Inventory P-1 we inquired on the needs of present and future recreational facilities. They are as follows in order of priority.

Dover

Interviewed: Don Heyliger - Director of Park and Recreation Dept. Nina Brown - Strafford Regional Planning Commission assisted in developing Dover's recreational facilities.

1 - Trails (walking, skiing, jogging, bicycling)

2 - Day camp facilities (lecture area, play area, swimming, etc.)

3 - Family activities (passive: picnicking, trails, fishing, etc. active: playfields, swimming, skating, etc.)

4 - Multi-use playfields (organized and family activities)

5 - Indoor complex (squash, hand ball, racket ball, basketball, etc.)

Somersworth

Interviewed: Carol Bickford - Director of Park and Recreation Dept. Dan Daigel - former Director of Park and Recreation Dept. George Bald - Mayor of Somersworth.

1 - Indoor complex (gym equipment, basketball courts, hand ball, etc.)

2 - Multi-use play fields (organized and family activities)

3 - Family activities (passive: pincking, walking trails, boating, fishing, etc. active: playfields,

skating, swimming, etc.)

4 - Trails (walking, jogging, skiing, dirt bikes, snowmobiles)

There as been an increase use of recreational facilities in both communities. This is due to the increasing cost of traveling where by people seek closer recreational opportunities. Also the increase in population as added to the demand on existing facilities. The population census is shown below by year and age group. The projected population figures are not shown due to its in accuracy. For instance the projected growth in 1977 for Somersworth in the year 2000 has been surpass in January of 1979.

TOTAL POPULATION

	U.S. CENSUS		N.H.O.C.P.	
Year	60	70	75	77
Dover	19131	20850	22183	22376
Somersworth	8529	9026	9968	10174
New Hampshire	606787	737378	833461	877488

Note: 1977 Population Estimate of New Hampshire cities and towns prepared by The New Hampshire Office of Comprehensive Planning August 1978.

ESTIMATE OF SELECTED AGE 1977

Age	3-5	6-17	18-64	65+	Total
Dover	2000	4871	12802	2703	22376
Somersworth	919	2357	5935	964	10174

Note: State of New Hampshire Interior Dept. Communication September 5, 1978.

Interviews were also conducted with neighbors bordering the Willand Pond Site (Exhibit E). In general they were concerned with the future of the pond and hoped it would be maintained for the benefit of the towns people. Other comments such as the site being abused by night time activities, drinking and litter.. A need for management and surveillance of the area. Swimming and boating on the pond was mentioned but regarding pollution as a problem. Polluting the pond has been our concern as well, in January of 1979 a sample of Willand Pond was sent to the Water Test Laboratory of New Hampshire. Them test proved satisfactory for swimming the results are in Exhibit F .

2.3 GOALS AND INTENTS FOR WILLAND POND SITE

There is a definite need to expand the recreational facilities of Dover and Somersworth for there existing and future population. The two communities have similar priorities in expanding there services and the Willand Pond Site is suitable for most of

there activities.

Through consultation with the Dover and Somersworth Park and Recreation Departments, reviewing recreational facilities and analysis of existing studies we have organized the following goals and intents for Willand Pond Site.

OUTDOOR ACTIVITY

Activity	Quantity or (No. of participants)	Approx. size each
Football with quarter mile running track	1	750 X 270
Baseball / Softball	2-5	150 X 150
Basketball / Volleyball	2-6	90 X 50
Tennis	4-6	60 X 120
Soccer	1	300 X 200
Amphitheater	(300+)	15 sq. ft.
Swimming	(200+)	50 sq. ft.
Ice Skating	(200+)	25 sq. ft.
Boating	(100+)	$2\frac{1}{2}$ people per rowboat or canoe
Picknic		
Family area	30-50	500 sq. ft.
Group area	8-16	2000 sq. ft.
Children play area (Swings, jungle gym, etc.)	—	50 X 50
Trails (nature, jogging, skiing, snowmobiles, bicycling	—	—
Seating	—	—
Fishing	—	—
Day Camp Facilities	(100+)	—

INDOOR ACTIVITIES
(Community Center)

Activity	Quantity or (No. of Participants)	Approx. size each
Gymnasium with minimum height of 22' to permit a basketball playing court (42X74) with seven tiers of telescoping bleachers one side seating approx. 325 spectators	1	65 X 90
Handball / Squash	4-6	34 X 50
Weight Room	1-2	50 X 20
Swimming Pool	(100)	36 sq. ft.
Classroom	4-6	50 X 20
Gymnastics	1-2	50 X 20
Locker Room Male Female	 (150+) (150+)	 14 sq. ft. 14 sq. ft.
Office	1-4	20 X 20
Support Facilities	Add 20% of Total Area	

SUPPORT FACILITIES

Facility	Quantity or (No. of participants)	Approx. size each
Parking	500	In an area of 100 X 100 approx. 30 to 38 cars with aisles
Emergency Roads	—	Min. 12' wide

WILLAND POND RECREATIONAL AREA
WILLAND POND COMMISSION

BOUNDARY DIVISIONS AND OWNERSHIP

DANIEL BISSON ASSOCIATES INC / ARCHITECTS AND PLANNERS
4 THERESE ROAD, SALEM, NEW HAMPSHIRE (03079) TELEPHONE (603) 893-6668

BOUNDARY DIVISIONS AND OWNERSHIP

AVAILABLE ACREAGE

PROPERTY	
P-1	11.5 ACRES
P-2	15.0 ACRES
FOR SALE	8.0 ACRES
	1.5 ACRES
WATER SURFACE	
WILLAND POND	52.5 ACRES
TOTAL	
WILLAND POND & P-5	176 ACRES

LEGEND

- CITY PROPERTY
- PROPERTY FOR SALE
- PRIVATE PROPERTY

I - A

- 26 -

III. INVENTORY OF EXISTING FUNCTIONAL CONDITIONS

3.0 EXISTING DEVELOPMENT AND ZONING

In addition to an inventory of the natural site conditions, an investigation into the legal, physical (man-made) and functional factors that affect site is neccessary to fully develop a Master Plan. The factors affecting this site include zoning by-laws, existing buildings and developed areas and boundary divisions.

3.1 ZONING BY-LAWS

The Town of Somersworth Zoning By-Laws classify the area northwest of the site, as commercial or industrial. This land is currently for sale. The areas which are under municipal ownership are classified as a Conservation District. The Zoning By-Laws of Dover and Somersworth limitations are in accordance with "State of New Hampshire Water Supply and Pollution Control Commission" and the local Conservation Commissions.

3.2 BOUNDARY DIVISIONS AND OWNERSHIP (Inventory I-A)

As shown on Plan Inventory I-A several property lines and boundary divisions provide governing factors for the development of the Willand Pond Site. The primary boundary restriction are the isolation of Parcels P-3, P-4, P-5, P-6, (approximately

4.5 acres) from development consideration. The abuting properties of the isolated parcels are residential and developed properties. Due to this isolation we have abandoned any present thoughts for the creation of recreational facilities on Parcels P-3, P-4, P-5, P-6.

Other boundary restrictions are privated ownerships between Parcel P-1, and P-2. Exhibit C "Willand Pond Master Plan", under Activities: It states a Policy to institue a 250 feet wide protection area (buffer strip) around Willand Pond. The properties between Parcels P-1 and P-2 are predominately undeveloped wetlands and should be persued in acquiring municiple ownership or easement rights between the two Parcels.

The acquistion of the land northwest of the site that is for sale would allow the expansion of the Willand Pond land area. The recreational needs of the two communities that were set in Section II show that additional land other than the existing Willand Pond Site are needed. Due to the extent of the program this area represents the only feasible section of the site for development of specific activities (stated in Section II) without intruding on the wetlands and natural amenties of the Willand Pond Site. It is to the advantage of the Willand Pond Commission that we include this area as part of the inventory. Based on the above total the Willand Pond Site would comprise

EXISTING TRAFFIC

the following:

Total Acreage

Note: Property between P-1 and P-2 will be considered as easement rights only.

Property		
	P-1	11.5 Acres
	P-2	15.0 Acres
	For Sale ($250,000)*	87 Acres
		113.5 Acres
Water		
	Willand Pond	62.5 Acres
Totals		
	Willand Pond Site	176.0 Acres

3.3 EXISTING TRAFFIC
(Inventory I-B)

Willand Pond is located at the junction of N. H. Routes 16 and 16A. To the west is the Spaulding Turnpike, a two-lane divided highway with an exit at the junction of Routes 16 and 16A. This roadway network would serve as the primary access to the Willand Pond Site from Dover and Somersworth

* Purchase price from the City of Somersworth Assessor Office. (Jan. 1980)

The State of New Hampshire has conducted studies of traffic flow along these and other surrounding roadways in this region. Plan Inventory I-B differenciaties state primary systems from state secondary systems and gives and annual average 24 hour traffic count as follows.

Figures to units---------Permanent counts
Figures to tens----------Control counts
Figures to hundreds------Short term counts

It should be noted that the Spaulding Turnpike is a heavily traveled highway, and becomes a major access to routes 16 and 16A which passes Willand Pond Site. The traffic counts indicate that route 16A carries more traffic than route 16. The reason being that 16A has along its roadway many commerical establishments which creates traffic congestion. This accurs from the junction of Routes 16 and 16A heading north for approx ½ a mile to Dover Auto Parts Sales, see Plan Inventory I-B.

Along Route 16 there is traffic congestion, this occurs at the intersection of 16B where there is a poorly designed and dangerous intersection, see Plan Inventory I-B.

By observation and data on Plan Inventory I-B the major access to Willand Pond Site be persued off of routh 16 and north of the intersection of route 16 and 16B. Also and

alternate means of access, for emergency vehicle be persued of route 16A at an existing right of way located on the north side of the used car sales.

IV. INVENTORY OF NATURAL AND SITE CONDITIONS

4.0 CRITICAL NATURAL AND SITE CONDITIONS

The aspects of nautral conditions determined to be the most critical to future development at this site are topography, slope, drainage, soils, vegetation, environmental impact. Other site condition such as utilities and site visual features shall determine what is avaliable to support the site,locate historical remains, existing paths and other features which may enhance the site.

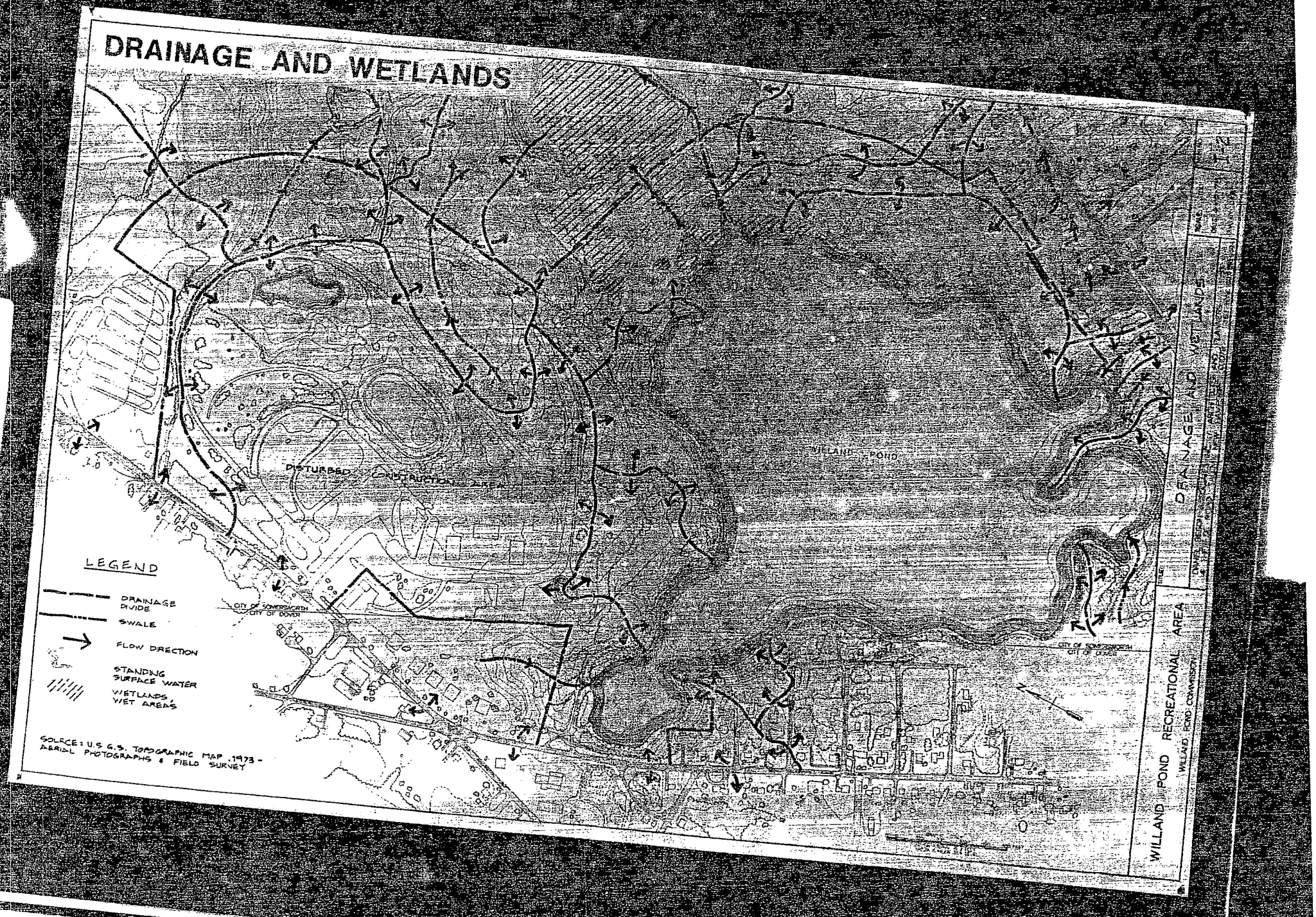
Determinations contained herein are drawn from a combination of observations made on the site and the review and analysis of prior technical reports, maps, aerial photos and investigation by other. While the information discussed in this report is the most comprehensive to date, additional study of soil and water conditions needs to be monitored as planning, design and construction proceed.

4.1 TOPOGRAPHY

The topographic change of the site only becomes a constraint when combined with difficult soil conditions and the presence of groundwater. While the site elevations range from 190 to 218 feet above mean sea level, the vast majority of the land lies between elevations 200 and 210. In general the slopes

SLOPES
LEGEND
0% - 5% SLOPE
5% - 15% SLOPE
15% - 25% SLOPE
25% + SLOPE
SOURCE: AERIAL PHOTOGRAPHS
DATED 11-30-67 & 4-27-76
BY JAMES W. SEWALL CO.
OLD TOWN, MAINE
WILLAND POND RECREATIONAL AREA
SLOPES

I - 1


DRAINAGE AND WETLANDS
LEGEND
DRAINAGE DIVIDE
SWALE
FLOW DIRECTION
STANDING SURFACE WATER
WETLANDS, WET AREAS
SOURCE: U.S.G.S. TOPOGRAPHIC MAP, 1973 - AERIAL PHOTOGRAPHS & FIELD SURVEY
DISTURBED CONSTRUCTION AREA
WETLAND POND
CITY OF SOMERSWORTH
CITY OF DOVER
WILLAND POND RECREATIONAL AREA
DRAINAGE AND WETLANDS
WILLAND POND COMMISSION

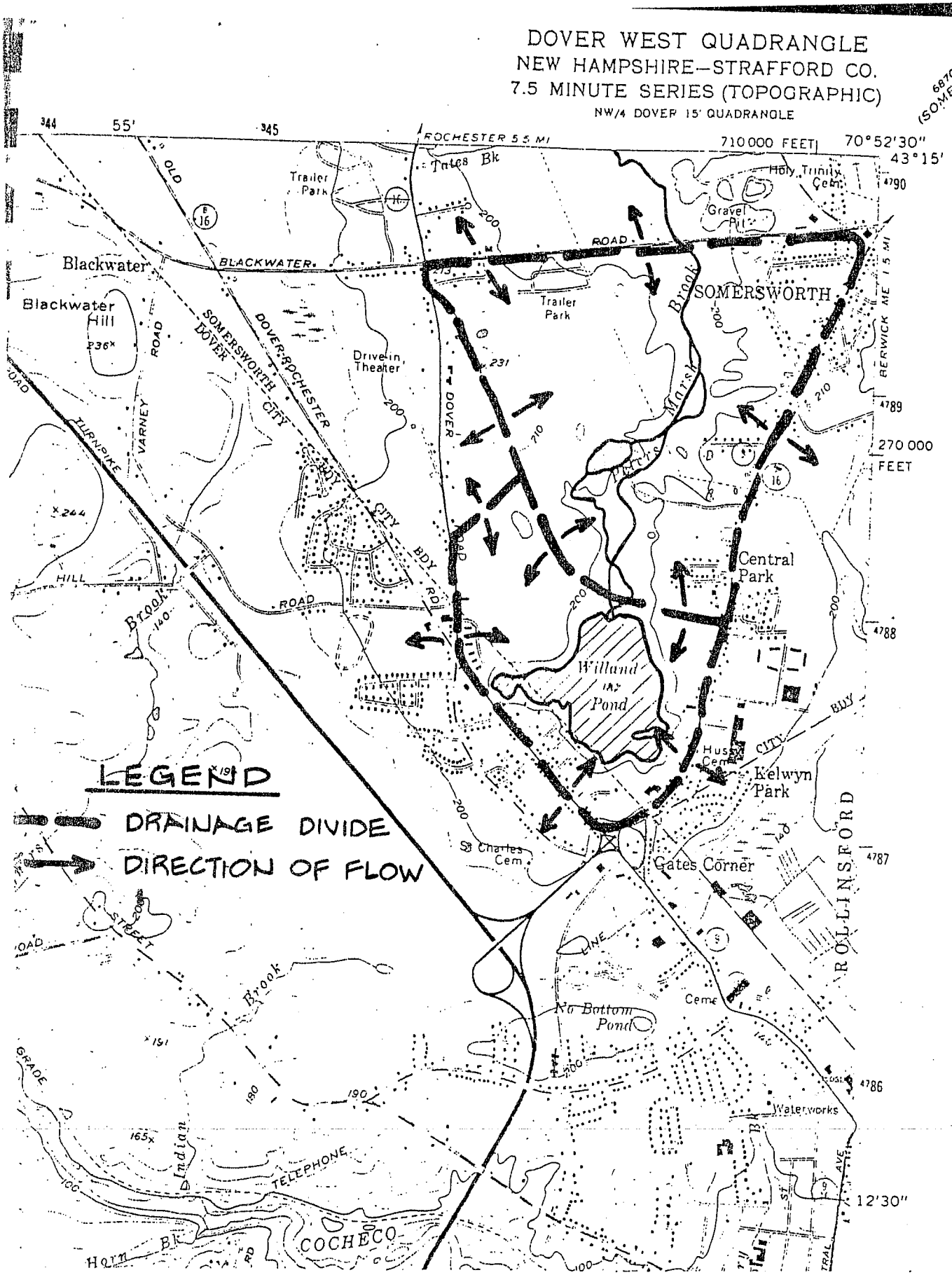
are constant enough within this range such that there is a low percentage of pocketed and peaked areas. The topography as two areas of change, one is the topography around the Ponds edge where the steepest changes occur and second is the flat terrace area to the north west of the site were moderate pocketed areas occur.

4.2 SLOPES
(Inventory I-1)

Steepness in grade is an obvious limiting factor to construction types which lend themselves to flat or gentle sloping sites. conversely, sloping areas can be utilized positively to screen, block, shield or control views, catch exposures, etc. Plan Inventory I-1 illustrates the areas with slopes in the following ranges: 0-5%, 5-15%, 15-25%, 25% plus.
In general, the most desirable slope conditions for building construction if the 0-5% range if economics are the main concern. While the steeper ranges increase development cost, they also provide a pleasant site relief and interesting walkways. Thus, possibly the most aesthetically pleasing portion of the site, yet the most costly to develop, is the area bordering the Pond's edge.

4.3 DRAINAGE AND WETLANDS
(Inventory I-2)

The location of existing surface water flows has been plotted on the inventory plan and checked by field observations.



MAJOR DRAINAGE FEATURES

FIGURE 4 - 1

As reviewed under the previous discussion of topography, the majority of the site is characterized by large areas of constant or positive gradients. As a result, there are few areas which would form drainage pockets without natural outlets.

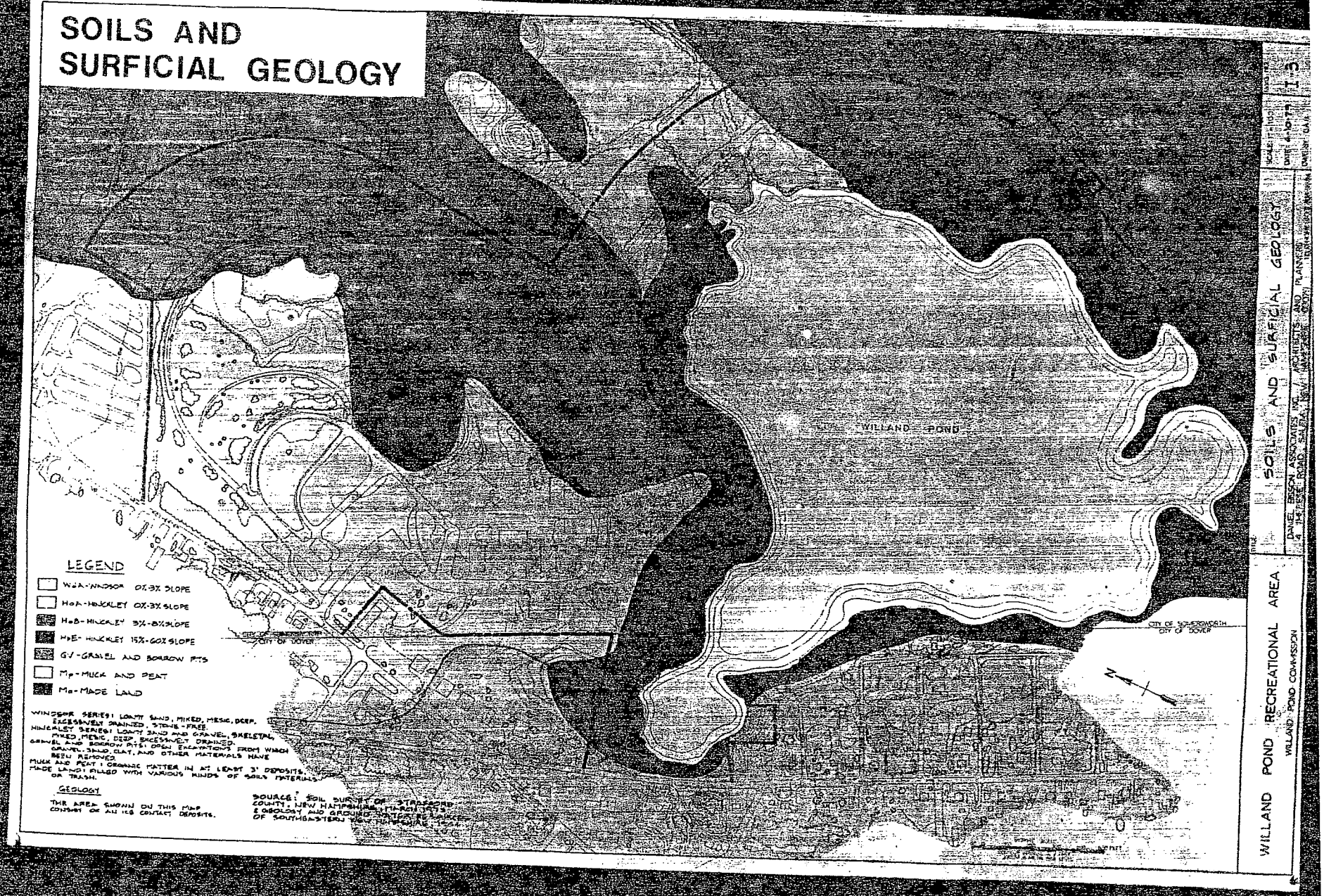
The major drainage feature (Figure 4-1) in the area incompassed by Routes 16A, 16 and Blackwater Road which form man made drainage divides. The plotting and checking of watersheds reveals that all the site drains into Willand Pond or Peters Marsh Brook. The water then drains in a northerly direction through a culvert under Blackwater Road leading to Tate's Brook. Taking an easterly direction draining into the Salmon Falls River which borders between New Hampshire and Maine and finally to the ocean.

The area shown as "Disturbed Construction Area", on Plan Inventory I-3 having flat gradients or depression as resulted in pockets where water collects during periods of heavy precipitation. Due to the permeability of the soils (later discuss under soils inventory) the pocketed water perculates through the soil rapidly. There is no major flooding problems but the area at present is unsuitable for any activity.

4.3.1 Natural Drainage Amenities

Two drainage conditions have been determined to be of such high quality that appropriate measures should be taken for their

SOILS AND SURFICIAL GEOLOGY



LEGEND

- WnA-WINDSOR 0%-3% SLOPE
- HoA-HINCKLEY 0%-3% SLOPE
- HoB-HINCKLEY 3%-8% SLOPE
- HoE-HINCKLEY 15%-60% SLOPE
- GV-GRAVEL AND BORROW PITS
- Mp-MUCK AND PEAT
- Ma-MADE LAND

WINDSOR SERIES: LOAMY SAND, MIXED, MESIC, DEEP, EXCESSIVELY DRAINED, STONE-FREE.
HINCKLEY SERIES: LOAMY SAND AND GRAVEL, SKELETAL, MIXED, MESIC, DEEP, EXCESSIVELY DRAINED.
GRAVEL AND BORROW PITS: OPEN EXCAVATIONS FROM WHICH GRAVEL, SAND, CLAY, AND OTHER MATERIALS HAVE BEEN REMOVED.
MUCK AND PEAT: ORGANIC MATTER IN AT LEAST 3' DEPOSITS.
MADE LAND: FILLED WITH VARIOUS KINDS OF SOILS MATERIALS OR TRASH.

GEOLOGY

THE AREA SHOWN ON THIS MAP CONSIST OF ALL ICE CONTACT DEPOSITS.

SOURCE: SOIL SURVEY OF STRAFFORD COUNTY, NEW HAMPSHIRE, MARCH 1973.
ECOLOGY AND GROUND WATER RESOURCES OF SOUTHEASTERN NEW HAMPSHIRE, 1964.

WILLAND POND RECREATIONAL AREA
WILLAND POND COMMISSION

SOILS AND SURFICIAL GEOLOGY

DANIEL BESON ASSOCIATES INC.
4 HAMPSHIRE ROAD, SALEM, N.H. ARCHITECTS AND PLANNERS

SCALE: 1" = 1000'
DATE: 4-10-77
DRAWN: G.A.S.

I-3

preservation: Peters Marsh and Brock north of the Willand Pond and Willand Pond itself about 62 acres. Both of these excellent site amenities are indicated on Plan Inventory I-2. Maintenance of the hydrological conditions which control both of these features must be carefully considered in the engineering design phase of the site development in order to insure their preservation.

4.4 SOILS AND SURFICIAL GEOLOGY
(Inventory I-3)

The depth to bedrock and groundwater, presence of organic material, draining properties, quality and quantity of topsoil, gravels and the like are considered to be the critical issues. These factors are critical in determining the direction of construction, parking and activity areas.

Plan Inventory I-3 identifies the existing soils types as identified by the U.S. Department of Agriculture Soil Conservation Service*, and is useful as a guide to surficial conditions. While the actual boundaries of the various types and depths usually follow these approximate configuration, field testing is mandatory to determine the actual conditions. These soils types are numbered and described in Exhibit J.

* Soil Survey of Strafford County, New Hampshire United States Department of Agriculture Soil Conservation Service in Co-operation with Agricultural Experiment Station: Issued March 1973.

4.4.1 Soils Limitation

The soil Survey of Strafford County New Hampshire also contains information that can be applied in managing farms and woodlands; in selecting sites for roads, ponds, buildings and other structures; and in judging the suitability of tracts of land for farming, industry, and recreation. While it is impossible to cover all the material we have selected the information most pertinent to this study as shown on Figure 4-2.

4.4.2 Geology and Ground Water

The major source of information for this study was by two reports. Geology and Ground-Water Resources of Southeastern New Hampshire in Exhibit G. and Willand Pond Well Exploration in Exhibit H. Both report were lengthly and have been condensed in the Exhibits.

In general the geology of the site being an ice contact deposits consisting of permeable material are capable of yielding large amount of water and of transmitting it rapidly. Properly constructed wells in these deposits produce several hundred gallons per minute. Alternate water supplies are being persued for both communities, this area should be considered.

LIMITATION

Degree & Kind of limitation for	Soil Types					
	WdA	HaA	HaB	HbE	Gv	Mp
Site for Bldgs without Bsmt.	slight	slight	slight	moderate		severe, high water table
San. facilities (seasonal use)	slight	slight #1	slight #1	severe, slope		severe, high water table
Campsites tents	moderate, droughty	moderate, droughty	moderate, droughty	severe, slope		severe, high water table
Athletic fields	moderate, droughty	moderate, droughty	moderate, droughty	severe, slope		severe, high water table
Parks & picnic areas	moderate, droughty	moderate, droughty	moderate, droughty	severe, slope		severe, high water table
Roads & Parking area unpaved	slight	slight	slight	severe, slope		severe, high water table
Vegetation cover (grass)	severe, droughty	severe, droughty	severe, droughty	severe, slope		severe, high water table
Home site foundation (3 stories or less)	slight	slight	slight	severe, slope		poor, stability, high compressibility
Septic tank sewage effluent disposal	slight, #1	slight, #1	slight, #1	severe, slope, #1		severe, high water table
Lawns & landscaping	severe, droughty	severe, droughty	severe, droughty	severe, slope		severe, high water table
Streets & Parking lots (paved)	slight	slight	moderate, slope	severe, slope		severe, high water table #2
Sewage lagoon	severe, rapid permeability	severe, rapid permeability	severe, rapid permeability	severe, rapid permeability		severe, high water table

were not included because they are too variable

Note: #1 Possible pollution hazard to nearby lakes, streams, springs, wells.

#2 High organic matter content - ponded; poor stability.

It should be noted at this point the level of the pond surface water. The water level has fluctuated over the years as follows:

Oct. 12, 1887	El. 194.0 feet
Oct. — 1954	El. 188.7 feet
April 15, 1959	El. 182.5 feet
Aerial Photo 1967	Between El. 182.0 feet and El. 184.0 feet
Aerial Photo 1976	Between El. 188.0 feet and El. 190.0 feet

** Note: All elevations above mean low tide.

Water quality has been analysis by the State Laboratory. Some reports show above average levels of iron and carbon dioxide. They basically give the water a slight taste and odor which can be treated. The water is found to be of good drinking quality.

Bedrock as been reported at many levels with most being below 30 feet below grade which makes construction very suitable on the site.

4.4.3. Conclusions

The purpose of this inventory was to determine three factors:

1. The soil types and its charateristics
2. The depth location and quality of water
3. The depth and location of bedrock

VEGETATION
LEGEND
- HARDWOODS CONSTITUTE AT LEAST 80 PERCENT OF THE STAND
- SOFTWOODS CONSTITUTE AT LEAST 80 PERCENT OF THE STAND
- A MIXTURE OF HARDWOODS AND SOFTWOODS WITH HARDWOODS PREDOMINATING
- A MIXTURE OF SOFTWOODS AND HARDWOODS WITH SOFTWOODS PREDOMINATING
- OPEN AREAS
- HIGH DENSITY - 81 TO 100 PERCENT CROWN CLOSURE
- LOW DENSITY - 30 TO 80 PERCENT CROWN CLOSURE
SOURCE: AERIAL PHOTOGRAPHS BY DANIEL BIRSON & PAUL ROUDE, JAN. 1979
WILLARD POND RECREATIONAL AREA
VEGETATION
DANIEL BIRSON ASSOCIATES FOR ARCHITECTS AND PLANNERS
I-4

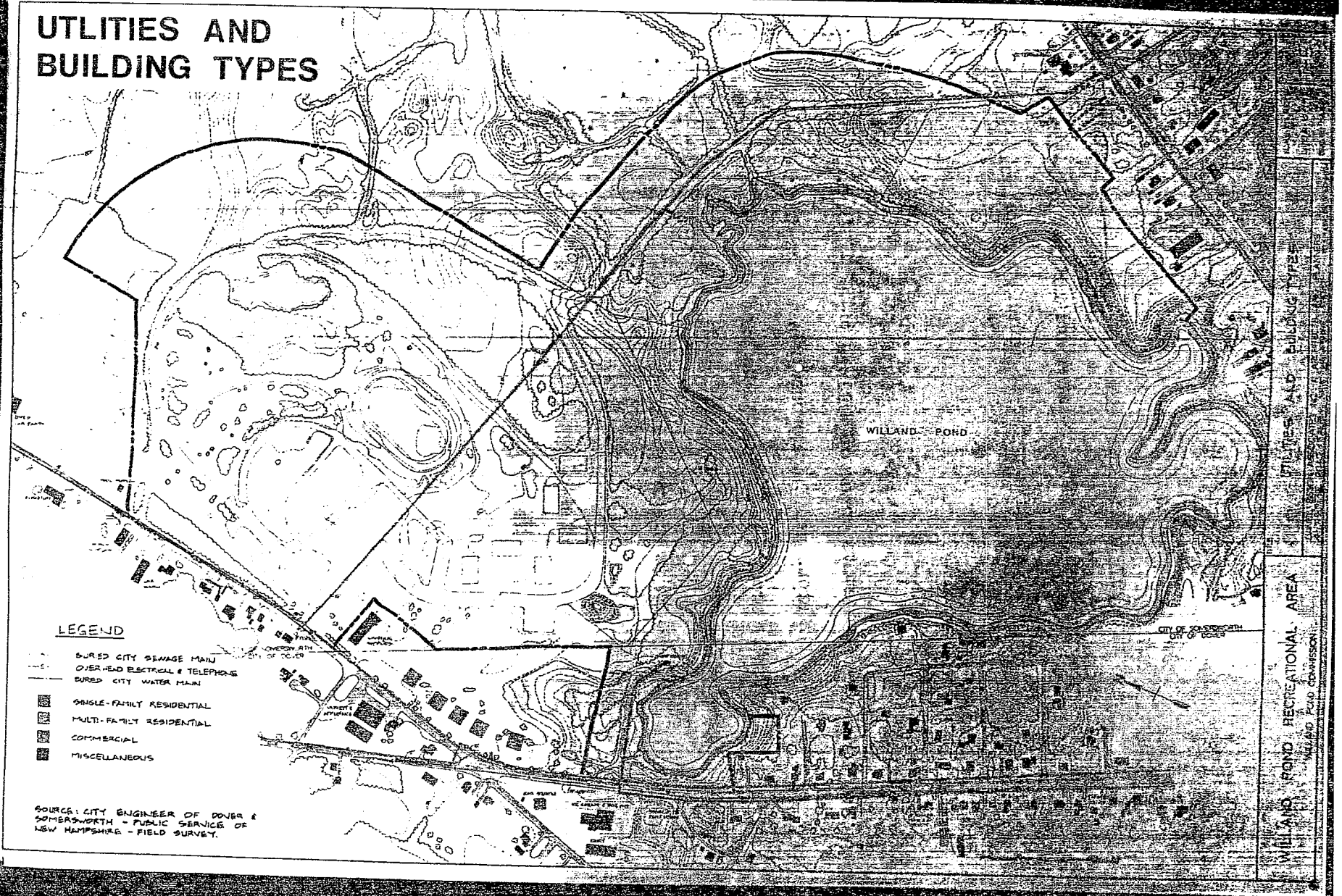
These factors, can force the direction of any project or program. As with any preliminary investigation, the findings of this program must be substantiated and refined by borings and laboratory analysis prior to definitive design.

4.5 VEGETATION
(Inventory I-4)

The vegetative cover of Willand Pond area consist of a mix stand of Coniferous and Decidenous trees. The Coniferous stand border chiefly around the pond on the east and west side and east portion of property for sale. The Coniferous stand consist of white pine, pitch pine and eastern hemlock and are 10 to 24 inches in diameter. The understory vegetation if limited to consentration of young Coniferous of the same species. The area known as Peters Marsh to the north consist mainly of Deciduous types such as sugar maple, red maple, quaking aspen, and grey birch. As shown on Plan Inventory I-4 there are combination of mixed hardwood and soft woods which usually composed of the species above plus red oak, white oak and lewbush blueberry.

Vegetation as been commonly recognize as visual amenity. Vegetation as a much broader role. As a functional element of the environment the plant cover serves to stabilize slopes, retard erosion, conserve water quality and quantity, maintain local micro climates, filter the atmosphere, decrease noise, create buffer, and support wildlife habitat. In general,

UTLITIES AND BUILDING TYPES



Vegetation shall be dealt with great care in keeping the integrity of the site.

4.6 UTILITIES AND BUILDING TYPES (Inventory I-5)

A portion of this submission is concerned with the location and development of adequate utilities for the site. There is also a need of relating to the neighbors of the Willand Pond Site. Building types classification will determine possible congestion and access to the site, aid in selecting areas to be screened due to blighted areas, and suggest possible interaction of building types with the Willand Pond Site.

4.6.1 General Drainage Design

The storm drainage design concept for development of the site shall utilize, where possible, the natural drainage system shown on Plan Inventory I-2. Run off of storm water where the natural drainage system come in conflict with development, such as parking and playfields, buffer strips and natural surface conducts will be created, thus decreasing the requirement and expense of a piped, underground system. Surface berms will be utilized to direct the flow of water to catch basins and into underground network when flow is not possible.

4.6.2 Sanitary Sewer

The Sanitary Sewer System to serve the future building programs

shall conform to the New Hampshire Water Supply and Pollution Control Commission, Local Codes and Agencies. As shown of Inventory I-5 a sanitary line does exist near by Willand Pond parallels Route 16 from the Dover side. This system has not been determine to be adequate for the site.

4.6.3 Electric and Telephone Service

Contact has been made with the local Electrical Public Service Department. The present street above ground service suppling the area appears adequate to service to planned program at the site.

The telephone service parallels the electrical service on both routes 16 and 16A. Current data available indicates that this system has the capacity to properly serve the site.

4.6.4 Fire Protection and Domestic Water

The fire protection, designated on Plan Inventory I-5 by Ⓜ Hy. for Fire Hydrant, is pressurized by the existing Domestic Water System. Service around the perimeter is adequate but additional services will be required in the site itself.

The Domestic Water Distribution System, designated by a blue line (——— - ———), around and through the site is more than adequate for the planned program.

ENVIRONMENTAL FACTORS
WILLAND POND RECREATIONAL AREA
WILLAND POND COMMISSION
ENVIRONMENTAL FACTORS
DANIEL PEASON ASSOCIATES, P.C. / ARCHITECTS AND PLANNERS
14 THORNE ROAD, SALEM, NEW HAMPSHIRE 03079
WILLAND POND
NORTH
SOUTH
WINTER
LEGEND
NOISE
WINDS
VIEWS
SOURCE: SAT HANEU AIRPORT ROCHESTER, NH
AND FIELD SURVEY

The primary feed for the domestic water supply is a 16 inch diameter pipe entering the site from route 16A near the Amoco Gas Station and follows a westerly path to route 16 near the Portland Glass Company. This system provides the Willand Pond Site with more than adequate water supply.

4.7 ENVIRONMENTAL FACTORS
(Inventory I-6)

There is a greater need for sensitivity in dealing with natural elements in controlling or enhancing the site architecturally.

The Consideration of this Inventory is how the site and its program may best use the natural processes and elements. Natural elements shall be considered and emphasis shall be on isolating them, protecting against them, and directing them. This study will take a positive approach in showing how natural processes, elements and factors are able to be utilized and emphasized to a greater extent by site planning, site design and manipulation of site elements.

4.7.1 General Data

Weather (0° F)

Spring: average temperature 48.3°
changeable weather

Summer: average temperature 71.3°
warm with cool nights
July and August-average
humidity 65-73%

Autumn: average temperature 55°
changeable weather

Winter: average temparture 31°
cold-changeable weather

Precipitation:

Rainfall: Yearly average 38.8 inches

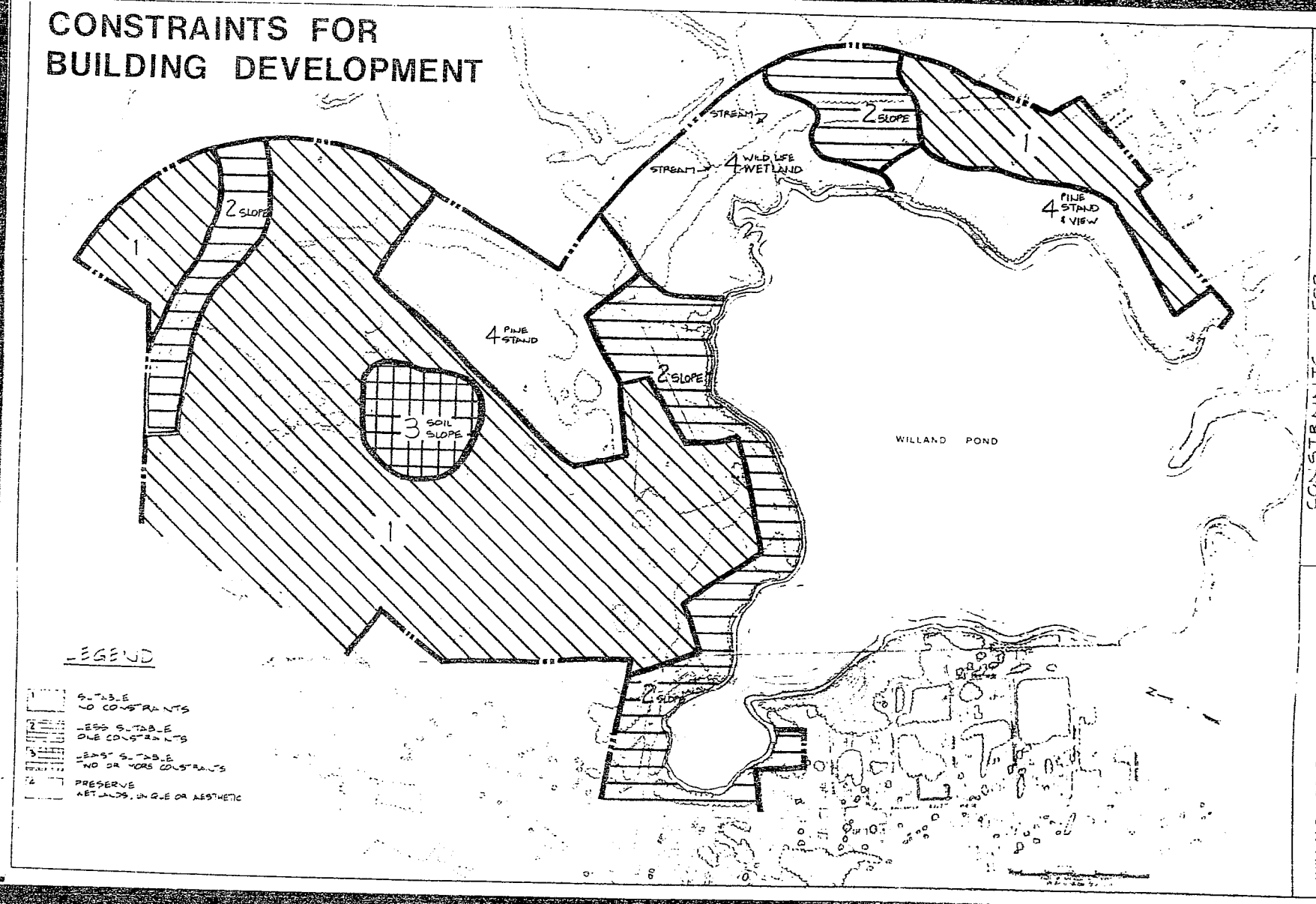
Snow and Sleet: Average annual accumulation
64.1 inches - maximum accumulation
for a 24 hour period - 19.0 inches

Sunshine: Average annual number of clear days -
197 days or 54%.

4.7.2

Other elements and factors shown on Inventory I-6 will be used later in the design stage of this study.

CONSTRAINTS FOR BUILDING DEVELOPMENT



WILLAND POND RECREATIONAL AREA

CONSTRAINTS FOR

V. ANALYSIS OF INVENTORIES

5.0 CONSTRAINTS FOR BUILDING DEVELOPMENT (Inventory I-7)

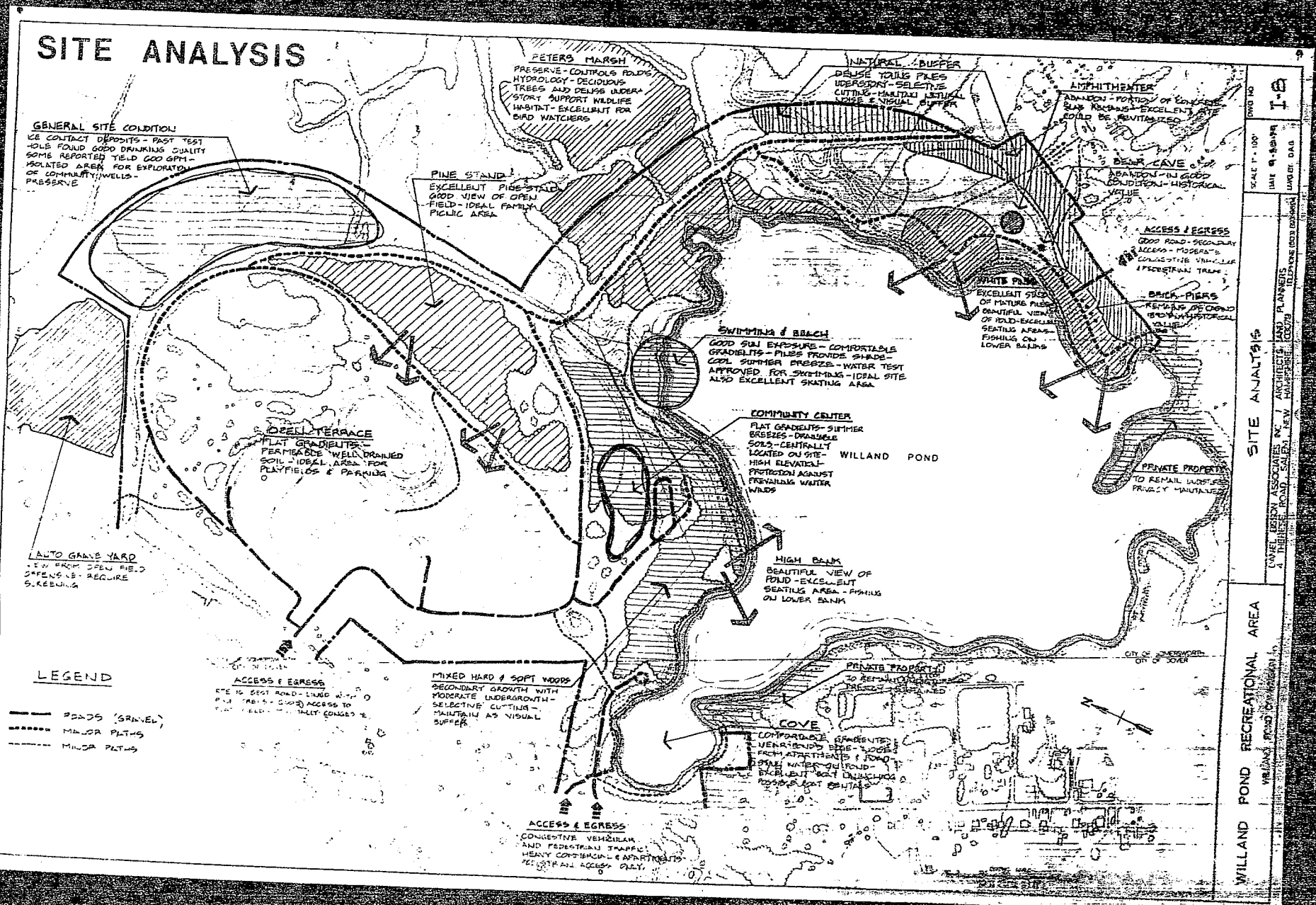
The inventory, analysis and review of the natural and physical constraints must lead to a rating system, to be applied to the future development. The following is the rating system formulated for the site:

1. Suitable - free of significant constraints, should permit construction within normal cost parameters.
Example - bedrock below 12 feet, groundwater below 10 feet.

2. Less Suitable - contains at least one significant constraint, thought to be buildable but not without incurring above average construction costs. Example - soil not able to withstand great loads or slope between 5% and 25%.

3. Least Suitable - contains more than one significant constraint. Should be avoided, if possible, as extra-ordinary construction cost may be incurred. Example - poor soil and groundwater within 4 feet of surface and slope in excess of 8%.

4. Preserve - should remain in an undeveloped state due to to unique ecological and / or aesthetic role. Substantial buffer zone needed. Example - detention and wetlands areas.


SITE ANALYSIS
PETERS MARSH
PRESERVE - CONTROLS FLOOD HYDROLOGY - DECIDUOUS TREES AND DENSE UNDER STORY SUPPORT WILDLIFE HABITAT - EXCELLENT FOR BIRD WATCHERS
NATURAL BUFFER
DENSE TALL PINES UNDERSTORY - SELECTIVE CUTTING - MAINTAIN NATURAL NOISE & VISUAL BUFFER
AMPHITHEATER
ABANDON - PORTION OF CONCRETE SLAB REMAINS - EXCELLENT SITE COULD BE REVITALIZED
BEAR CAVE
ABANDON - IN GOOD CONDITION - HISTORICAL VALUE
GENERAL SITE CONDITION
ICE CONTACT DEPOSITS - PAST TEST HOLE FOUND GOOD DRINKING QUALITY SOME REPORTED YIELD 600 GPM - ISOLATED AREA FOR EXPLORATION OF COMMUNITY WELLS - PRESERVE
PINE STAND
EXCELLENT PINE STAND GOOD VIEW OF OPEN FIELD - IDEAL FAMILY PICNIC AREA
ACCESS & EGRESS
GOOD ROAD - SECONDARY ACCESS - MODERATE CONGESTIVE VEHICLE & PEDESTRIAN TRAFFIC
WHITE PINE
EXCELLENT STAND OF MATURE PINES BEAUTIFUL VIEWS OF POND - EXCELLENT SEATING AREAS - FISHING ON LOWER BANKS
BRICK PIERS
REMAINS OF OLDER BOAT HOUSE - HISTORICAL VALUE
SWIMMING & BEACH
GOOD SUN EXPOSURE - COMFORTABLE GRADIENTS - PINES PROVIDE SHADE - COOL SUMMER BREEZES - WATER TEST APPROVED FOR SWIMMING - IDEAL SITE ALSO EXCELLENT SKATING AREA
OPEN TERRACE
FLAT GRADIENTS - PERMEABLE WELL DRAINED SOIL - IDEAL AREA FOR PLAYFIELDS & PARKING
COMMUNITY CENTER
FLAT GRADIENTS - SUMMER BREEZES - DRAINABLE SOILS - CENTRALLY LOCATED ON SITE - HIGH ELEVATION - PROTECTION AGAINST PREVAILING WINTER WINDS
WILLAND POND
PRIVATE PROPERTY
TO REMAIN UNDISTURBED PRIVACY MAINTAINED
AUTO GRAVE YARD
VIEW FROM OPEN FIELD DEFENSIVE - REQUIRE SCREENING
HIGH BANK
BEAUTIFUL VIEW OF POND - EXCELLENT SEATING AREA - FISHING ON LOWER BANK
LEGEND
ROADS (GRAVEL)
MAJOR PATHS
MINOR PATHS
ACCESS & EGRESS
MIXED HARD & SOFT WOODS
SECONDARY GROWTH WITH MODERATE UNDERGROWTH - SELECTIVE CUTTING - MAINTAIN AS VISUAL BUFFER
PRIVATE PROPERTY
TO REMAIN UNDISTURBED PRIVACY MAINTAINED
COVE
COMFORTABLE GRADIENTS VERY SHOAL SIDE - LOCATED FROM APARTMENTS & POND - SHALLOW WATER ON POND - EXCELLENT BOAT LAUNCHING POSSIBLE BOAT RENTALS
ACCESS & EGRESS
CONGESTIVE VEHICULAR AND PEDESTRIAN TRAFFIC HEAVY COMMERCIAL & APARTMENTS TO SERVE ALL ACCESS ONLY
CITY OF PORTSMOUTH
CITY OF DOVER
N
WILLAND POND RECREATIONAL AREA
SITE ANALYSIS
DANIEL DESIGN ASSOCIATES, INC. / ARCHITECTS LAND PLANNERS
4 THORNTON ROAD - SALEM, NEW HAMPSHIRE 03079
SCALE 1" = 100'
DWG NO T-8

Inventory I-7 Constraints for Building Development has combined all of the existing site constraints and provides and indication of the capabilities of different site areas to support building development.

5.1 SITE ANALYSIS
(Inventory I-8)

Based on the evaluation of inventories in this study, field observations and program development for the Willand Pond Site we have selected areas which are most suitable for specific uses as shown on Inventory I-8.

The areas designated with specific uses are not final decisions, rather the intent is to recommend the best use for an area.

We feel that certain areas must be dealt with great care in keeping the integrity of the site amenities. We have come up with some basic conclusion as shown on Inventory I-8 and as follows:

—— Peter Marsh which control the hydrology of the pond, support wildlife and is aestheticly appealing in the fall not to be disturbed.

—— The large pine stand on the east side not be disturb due to its aesthetic quality and view points.

—— Existing paths should be saved if found feasible to do so.

—— Historical landmarks shouldn't be destroyed but high-lighted.

—— Major access and egress should be as shown unless modification of the two alternates points are made less hazardous.

—— Open terrace is excellent for open field and any type of construction, this area would require minimal site work which in term cost are kept down.

—— New wells for drinking water are always being sought, the Willand Pond Site has great Potential for large quantities of drinkable water, community wells should be pursued.

—— Swimming area requires a sunny area with flat gradients as showed.

—— Areas which are privately owned should not be disturbed, privacy maintained.

—— Community building entrance on the southwest side protecting against prevailing winter winds.

WILLAND POND RECREATIONAL AREA
WILLAND POND COMMISSION
SITE CONCEPT
DANIEL BISSON ASSOCIATES INC. / ARCHITECTS AND PLANNERS
4 THEINE ST. ROAD SALEM, NEW HAMPSHIRE 03079
C-1
SITE CONCEPT
LEGEND
ACCESS ROAD
MAINTENANCE & EMERGENCY ACCESS
TRAILS
PARKING
VIEWS
AMPHITHEATER
HISTORICAL FESTIVITIES BACK ONE, PIECE
WILLAND POND
TOT LOT
FAMILY PICNIC AREA
GROUP PICNIC AREA
MAIN ENTRANCE
VISUAL BUFFER
VISUAL BUFFER FROM WINDSOR

C - 1

VI. CONCEPTUAL DESIGN

6.0 BUBBLE DIAGRAM

The bubble diagram is a tool in helping to show the relationships between different activities. There are various reasons for the interaction of activities, some are very obvious. Others are not, such as relating the community center to skating a need for a warm place to change from shoes to skates or the playfields away from the amphitheater due to the conflict of each others noise.

At this stage relationships are being formed and a concept begins to be developed.

6.1 SITE CONCEPT
(Plan C-1)

Site concept Plan C-1 is the first attempt in organizing areas with an activity. Decision have been made by a rational approach using the previous information from the inventories. Some of the basic rational for the location of activities are as follows:

—— The community center and pond both are major focal points needing priority to access.

—— Community center located due to its access, center point from playfields, picnic area and swimming area, orientation to summer breezers, prevealing winter winds, drainable soils, flat gradients elevation for sewer lines and accessible parking.

—— Picnic area located near playfields and swimming area due picnickers are major users.

—— Amphitheater separate from playfields due to interference of each others program and activity, using an old site which was once an amphitheater with good orientation to the sun, natural shape, and access.

—— Group picnic and family picnic slightly separated due to different types of activities seeked by both. Shaded area, well drained, good summer breezes, high elevation.

Site concept Plan C-1 also has conflicts to be resolved. They are as follows:

—— Main entrance needs control and surveillance.

—— Boat launch area, tight space for parking and turning loop.

—— Boat launch area, access with vehicle difficult.

—— East entrance needs control and surveillance.

—— East entrance needs parking, which doesn't cut into site as shown.

6.2 SITE CONCEPT ANALYSIS

There is a need to examine in detail the conflicts in the site concept Plan C-1. We have dealt with the conflicts individually as well as there interaction with the site. They are as follows:

The main entrance poses a problem of surveillance and control. As shown on Figure 6-1 a natural solutions is to place the community center at the entrance. The solution also poses a problem, which removed the support facility to the swimming area.

Figure 6-2 introduces a bath house as a support facility and the manager's resident as surveillance for the site.

The next concern is the boat launch area. As shown on Figure 6-3. The major problems are parking, turning loop and access to the area. We have abandon this location due too major alterations needed in making the area workable. The only other location with acceptable gradients is near the swimming area. As shown on Figure 6-4 this location does solve the problem of parking and access. It also combines the bath house as a facility for many activities, which are swimming, boating skating, playfields and picnic areas. The area definitely becomes a focal point and is centrally located on the site. With this in mind we feel that the community center would reinforce this area and become the supporting facility for the surrounding activites as shown on Figure 6-5.

The main entrance is left again with the problems of control and surveillance. As shown on Figure 6-6, placing the manager's resident and gate house near the entrance gives the entrance ample control and surveillance.

The east entrance poses similar problems of control and surveillance. At present this area is heavily abused by vandals and night time parties. A positive method of control is to establish an element of heavy use which it's presence would deter vandals.

At present there are elements of historical value at this end

of the site such as the amphitheater which is to be revitalize, the bear cave and piers of the pavilion which could become a feature of interest by posting pictures and explanations. To complement these elements it would be advisable to purchase the trolley barn. At present, a car dealership approximate value of trolley barn and land $125,000*. Erected in 1890 the trolley barn was the first sturcture built on the site making it historically valuable. As shown on Figure 6-7 it would serve as an historical center to support the other historical elements on the site, providing a comfort station, day camp center working with the amphitheater and educational lectures. Also providing parking and controlling the entrance.

An alternate method would be to bring in a commerical venture on the site, which would deter vandals by its presence. There are many possibilities, such as, retail stores of all types, fast food chains, restaurant, entertainment center, etc.

Leaning towards a fine restaurant shown on Figure 6-8 for the following reasons. The major business hours are weekends and late evenings, these are the prime hours where vandals are in the area. The restaurant would have as an attraction the pond, it's paths and surrounding stands of pines which are the basic areas of vandals and party seekers.

A restaurant can control the number of people it serves due to

* Purchase price; from the City of Somersworth Assessor.

the number of tables within the restaurant. Other commerse do not have this advantage of controlling the number of users. The result is that a restaurant can control the size of the building and parking area.

The concern for the need for a restaurant is a realistic one. A market study and analysis of the area is required. We have made observations of the existing fine restaurants in the area. The City of Dover has one, Somersworth has none, Rochester 10 miles north about three, Rollinsford 5 miles east has none and Portsmouth 15 miles South about 14. Approximately 80,000 people live withing a 20 mile radius.

Visiting about 10 of these restaurants on weekends it was evident that business is good and after 6:00 pm on weekends there's an 1 to 2 hours wait for a table. We feel that a restaurant has merit and again we must emphasis a need for further studies.

Figure 6-9 shows the combination of trolley barn purchase and restaurant. Both of these elements would complement each other in the following manner. The trolley barn would control the entrance and provide surveillance during the daytime, and the restaurant provide surveillance during the evenings and night time, due to its business hours. By having both trolley barn and restaurant on the site the east entrance would have almost around the clock control and surveillance.

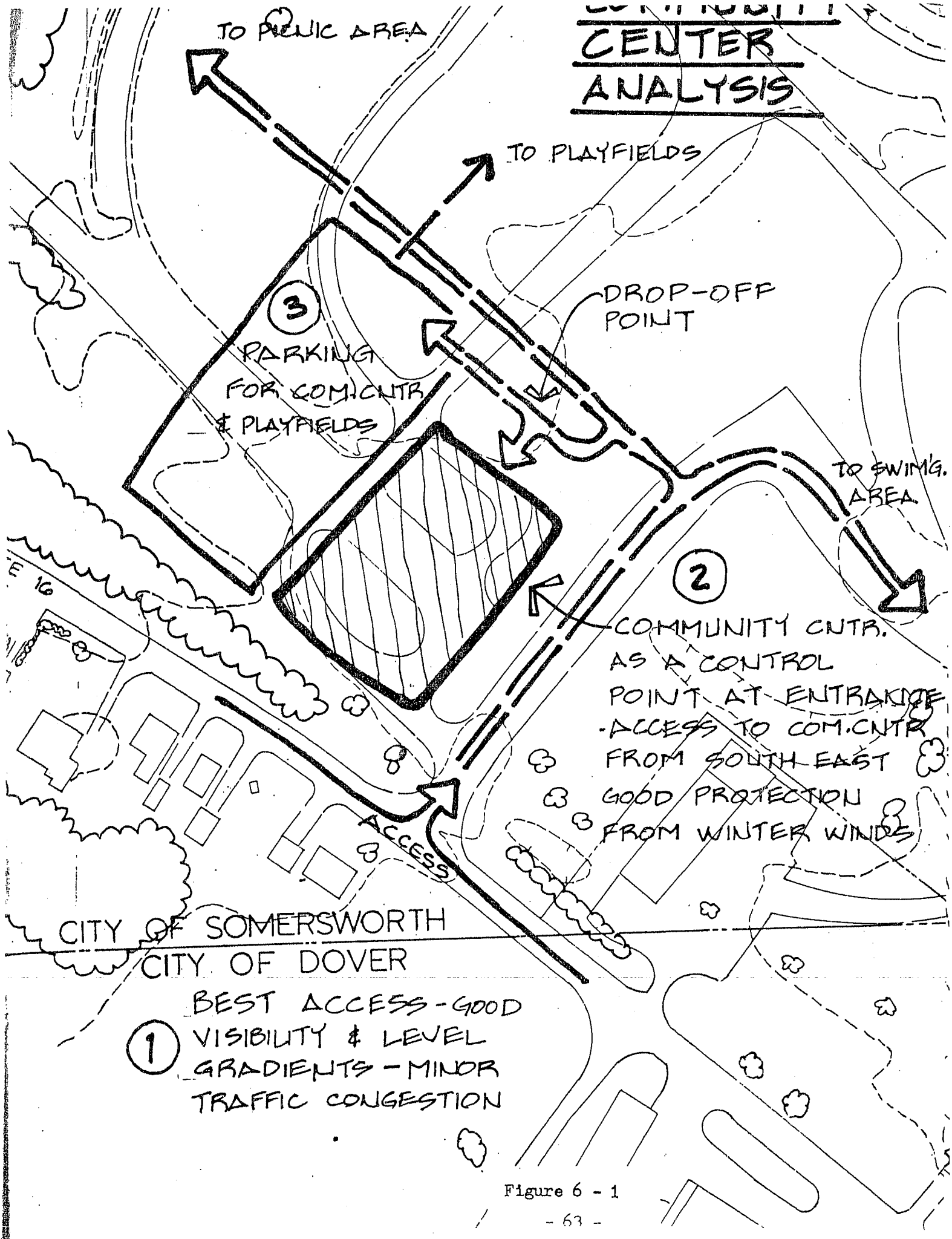

CENTER
ANALYSIS
TO PICNIC AREA
TO PLAYFIELDS
DROP-OFF
POINT
3
PARKING
FOR COM.CNTR
& PLAYFIELDS
TO SWIM'G.
AREA
2
COMMUNITY CNTR.
AS A CONTROL
POINT AT ENTRANCE
-ACCESS TO COM.CNTR
FROM SOUTH EAST
GOOD PROTECTION
FROM WINTER WINDS
ACCESS
CITY OF SOMERSWORTH
CITY OF DOVER
1
BEST ACCESS - GOOD
VISIBILITY & LEVEL
GRADIENTS - MINOR
TRAFFIC CONGESTION

Figure 6 - 1

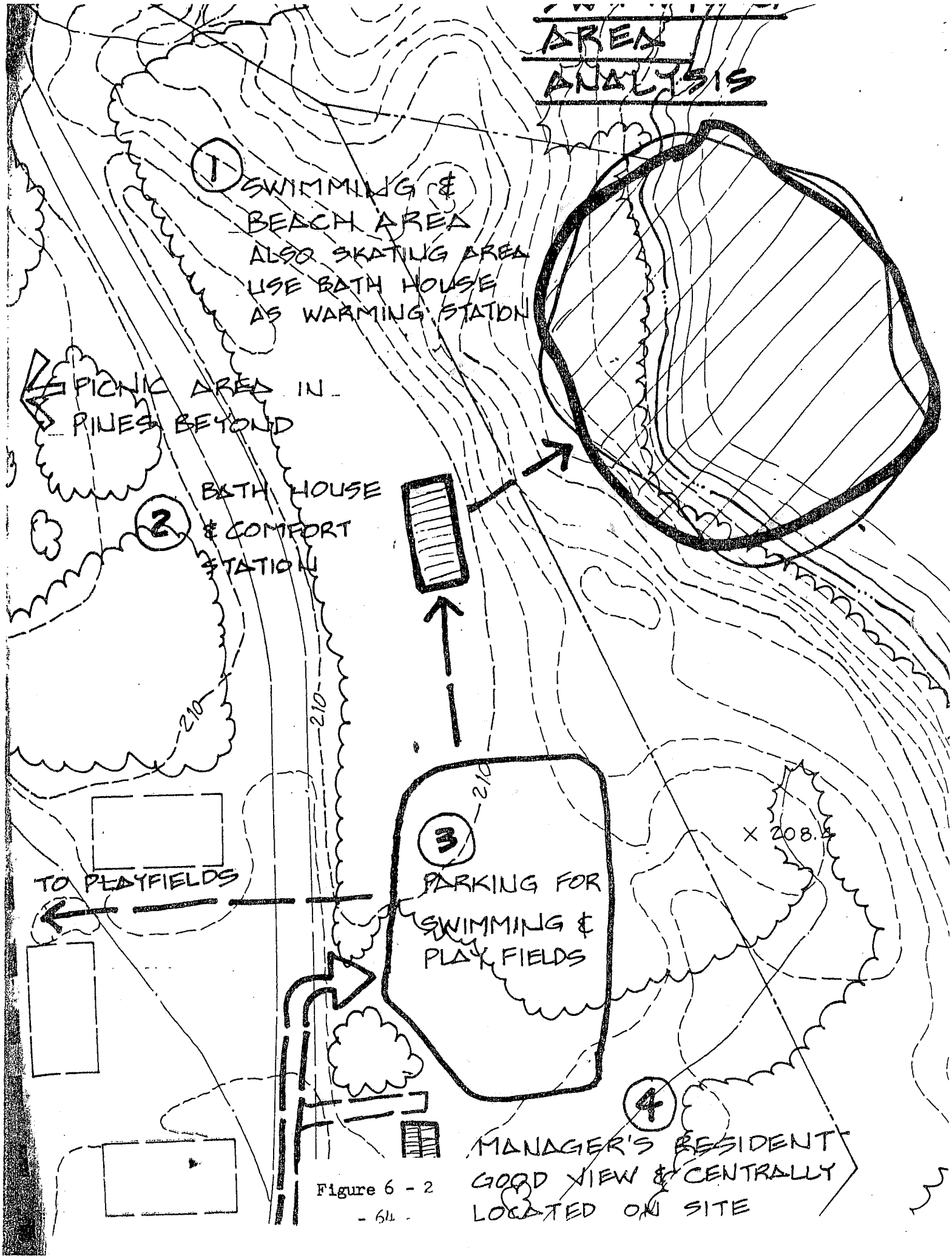

AREA ANALYSIS
1 SWIMMING & BEACH AREA ALSO SKATING AREA USE BATH HOUSE AS WARMING STATION
PICNIC AREA IN PINES BEYOND
2 BATH HOUSE & COMFORT STATION
210
210
210
3 PARKING FOR SWIMMING & PLAY FIELDS
TO PLAYFIELDS
X 208.5
4 MANAGER'S RESIDENT GOOD VIEW & CENTRALLY LOCATED ON SITE

Figure 6 - 2

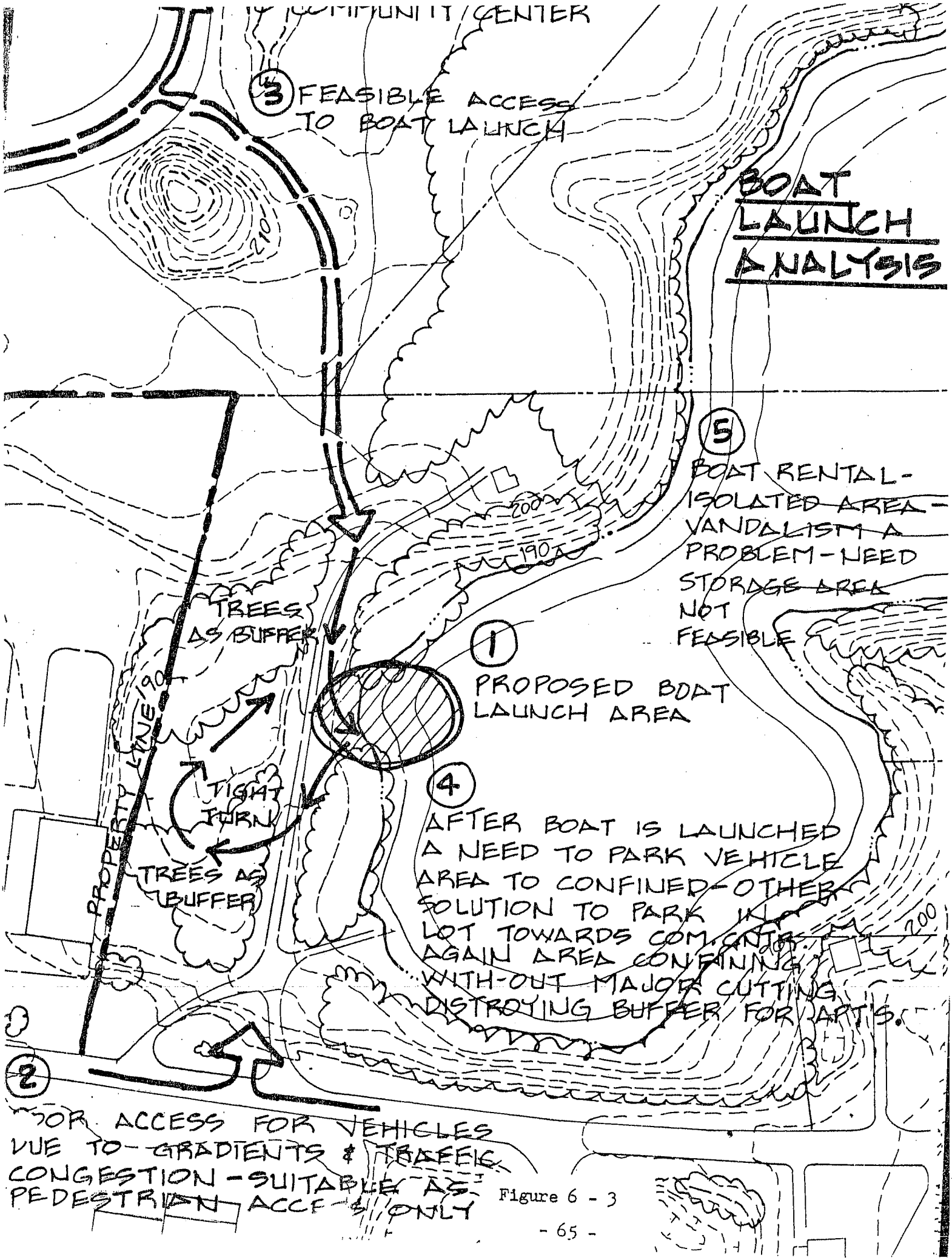

UNIT / CENTER
3 FEASIBLE ACCESS TO BOAT LAUNCH
BOAT LAUNCH ANALYSIS
210
200
190
5 BOAT RENTAL - ISOLATED AREA - VANDALISM A PROBLEM - NEED STORAGE AREA NOT FEASIBLE
TREES AS BUFFER
1 PROPOSED BOAT LAUNCH AREA
PROPERTY LINE
TIGHT TURN
4 AFTER BOAT IS LAUNCHED A NEED TO PARK VEHICLE AREA TO CONFINED - OTHER SOLUTION TO PARK IN LOT TOWARDS COM. CNTR. AGAIN AREA CONFINING WITH-OUT MAJOR CUTTING DISTROYING BUFFER FOR ARTS.
TREES AS BUFFER
2
FOR ACCESS FOR VEHICLES VUE TO GRADIENTS & TRAFFIC CONGESTION - SUITABLE AS PEDESTRIAN ACCESS ONLY

Figure 6 - 3

SWIMMING & BOATING AREA ANALYSIS

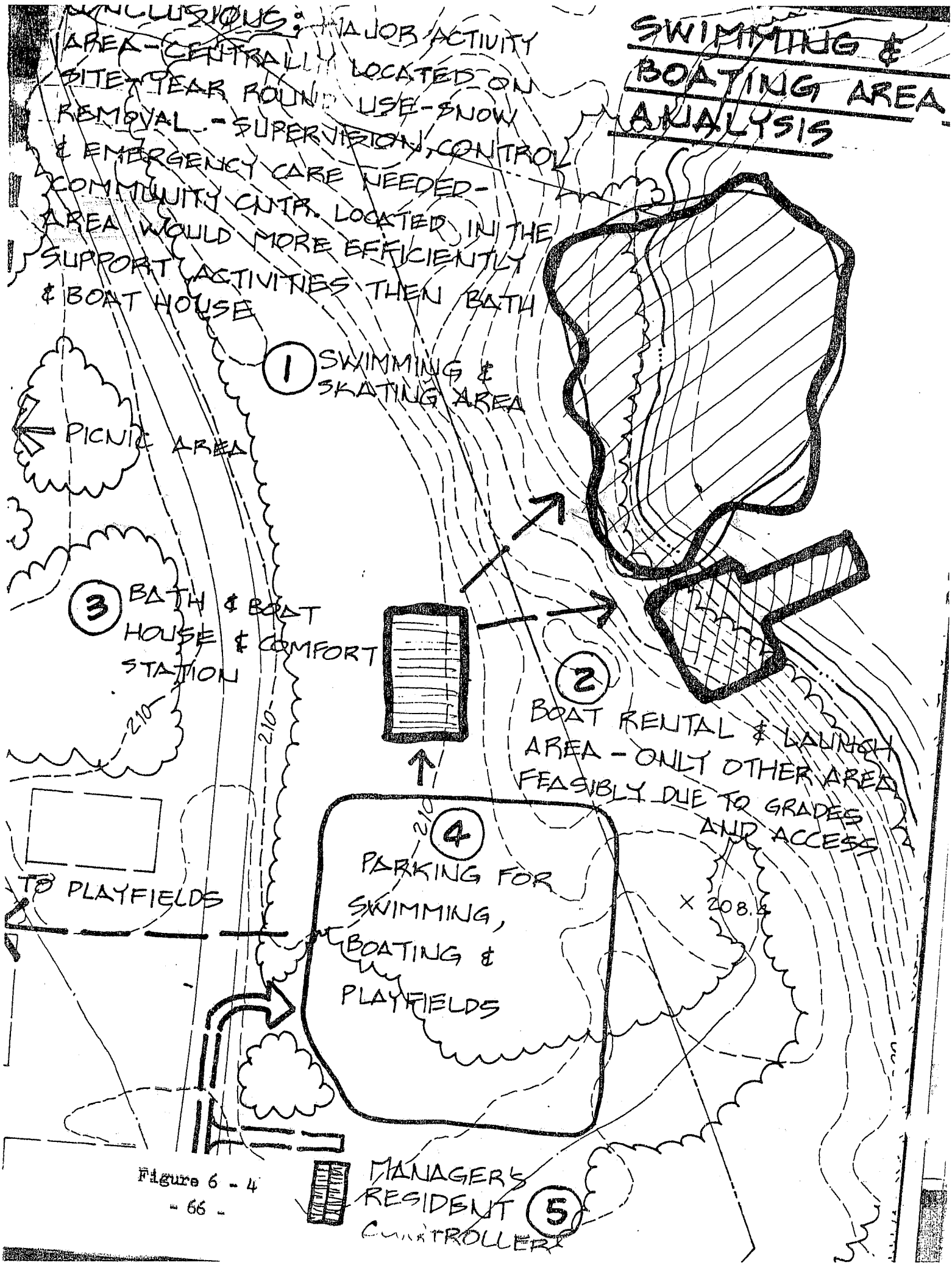


Figure 6 - 4

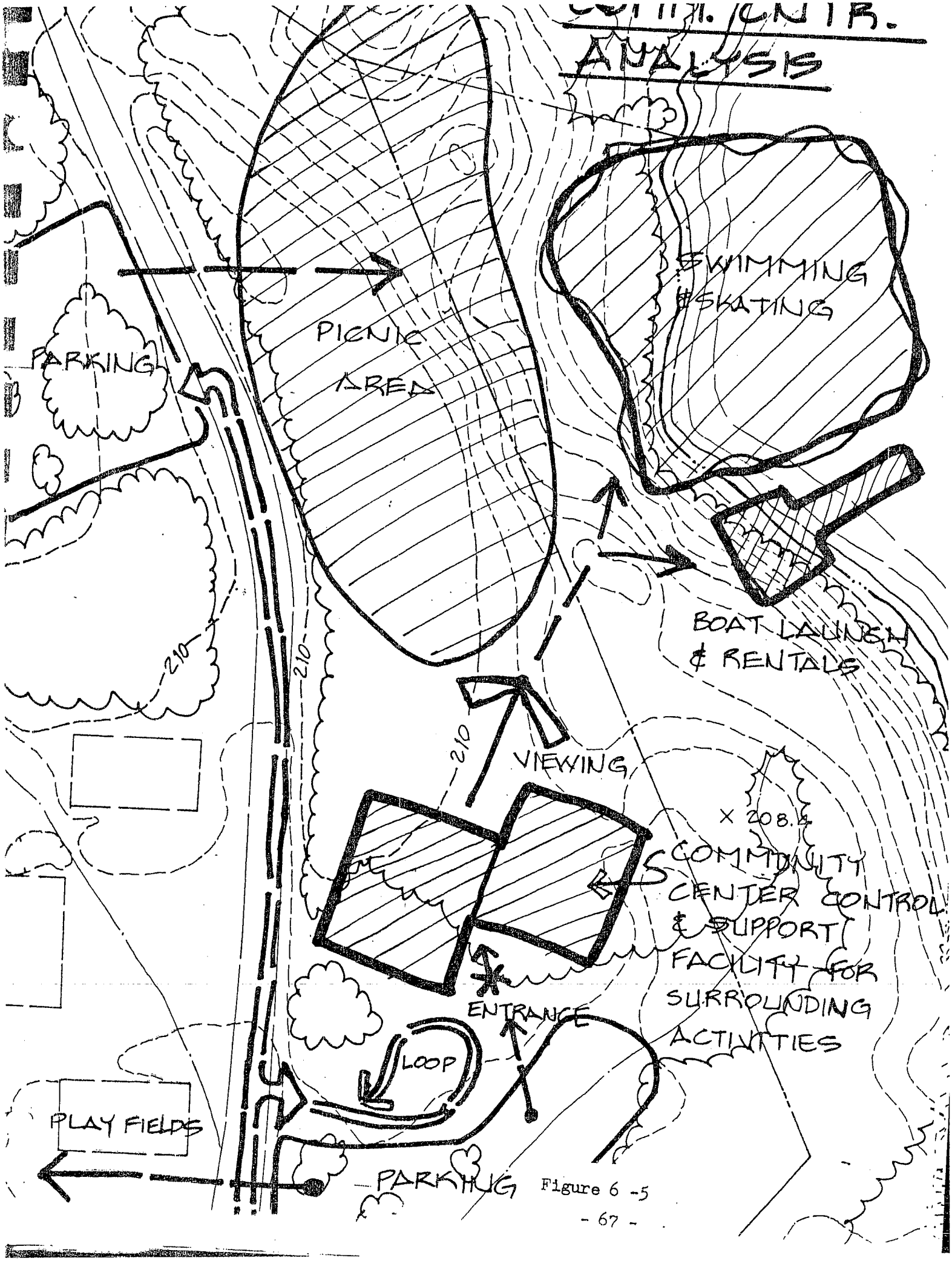

ANALYSIS
SWIMMING
SKATING
PICNIC
AREA
PARKING
210
210
210
BOAT LAUNCH
& RENTALS
VIEWING
X 208.4
COMMUNITY
CENTER CONTROL
& SUPPORT
FACILITY FOR
SURROUNDING
ACTIVITIES
ENTRANCE
LOOP
PLAY FIELDS
PARKING

Figure 6 -5

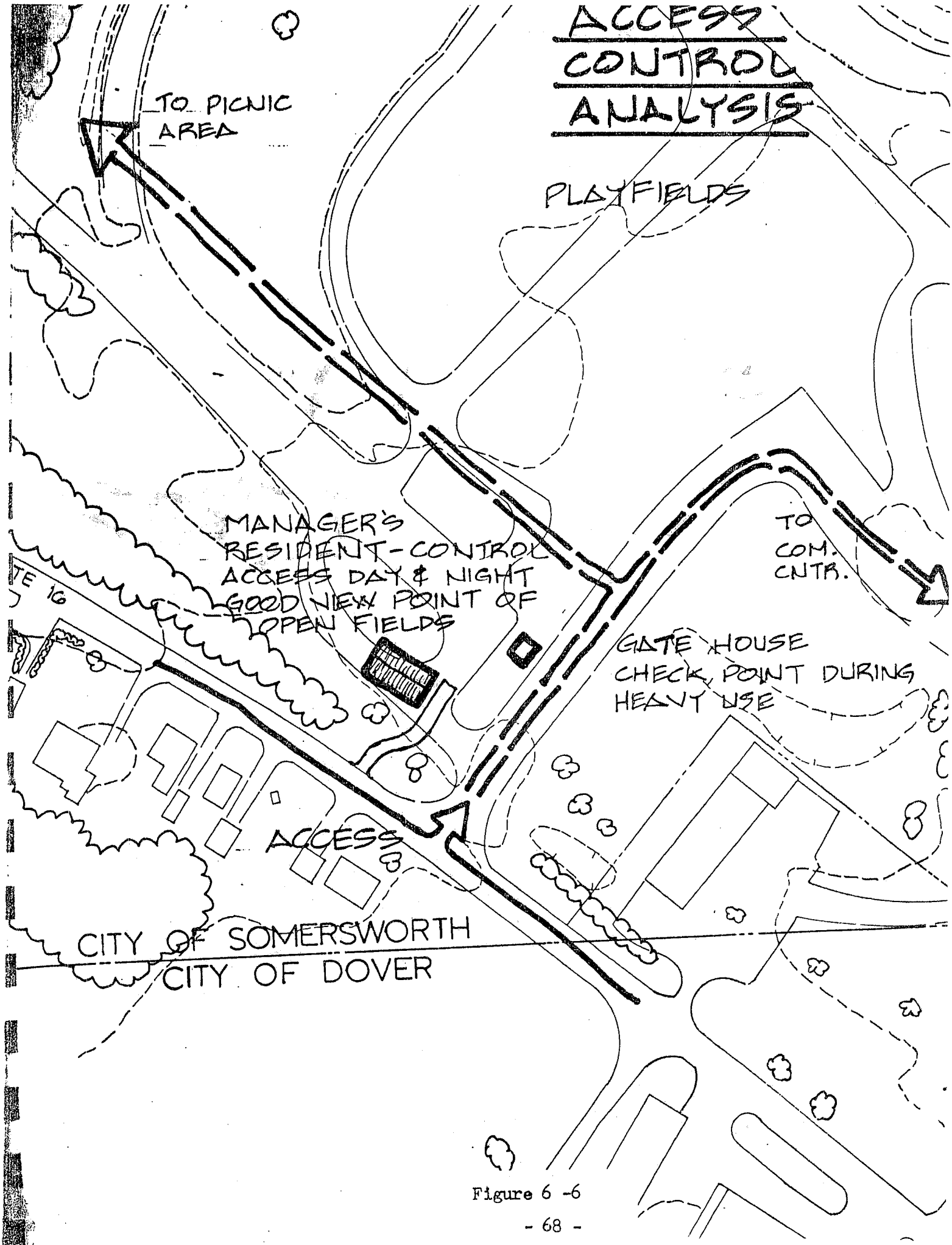

ACCESS CONTROL ANALYSIS
TO PICNIC AREA
PLAYFIELDS
MANAGER'S RESIDENT-CONTROL ACCESS DAY & NIGHT GOOD VIEW POINT OF OPEN FIELDS
TO COM. CNTR.
GATE HOUSE CHECK POINT DURING HEAVY USE
ACCESS
CITY OF SOMERSWORTH
CITY OF DOVER

Figure 6 -6

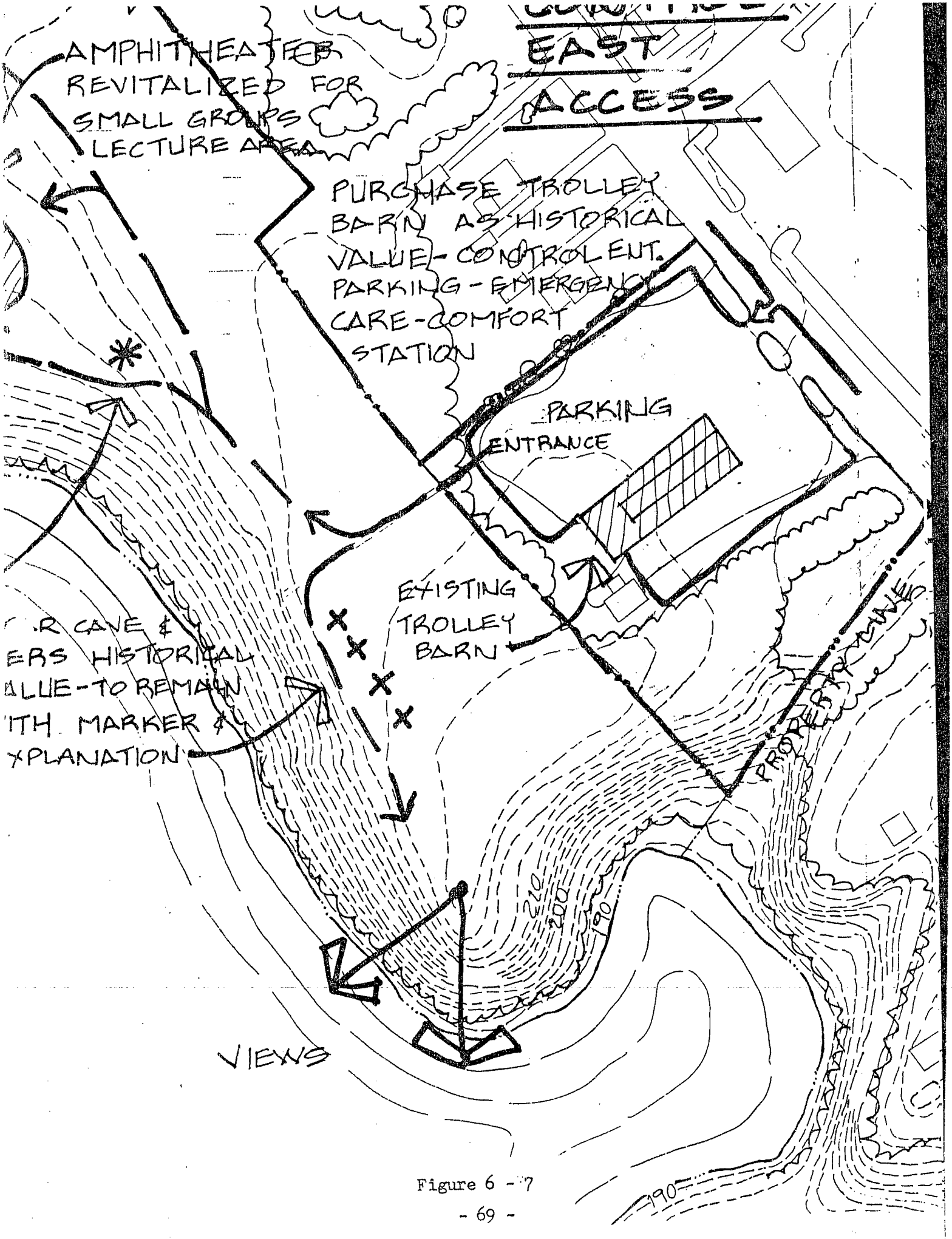

AMPHITHEATER
REVITALIZED FOR
SMALL GROUPS
LECTURE AREA
EAST
ACCESS
PURCHASE TROLLEY
BARN AS HISTORICAL
VALUE- CONTROL ENT.
PARKING - EMERGENCY
CARE - COMFORT
STATION
PARKING
ENTRANCE
EXISTING
TROLLEY
BARN
R CAVE &
ERS HISTORICAL
ALUE - TO REMAIN
ITH MARKER &
XPLANATION
VIEWS
220
200
190
190

Figure 6 - 7

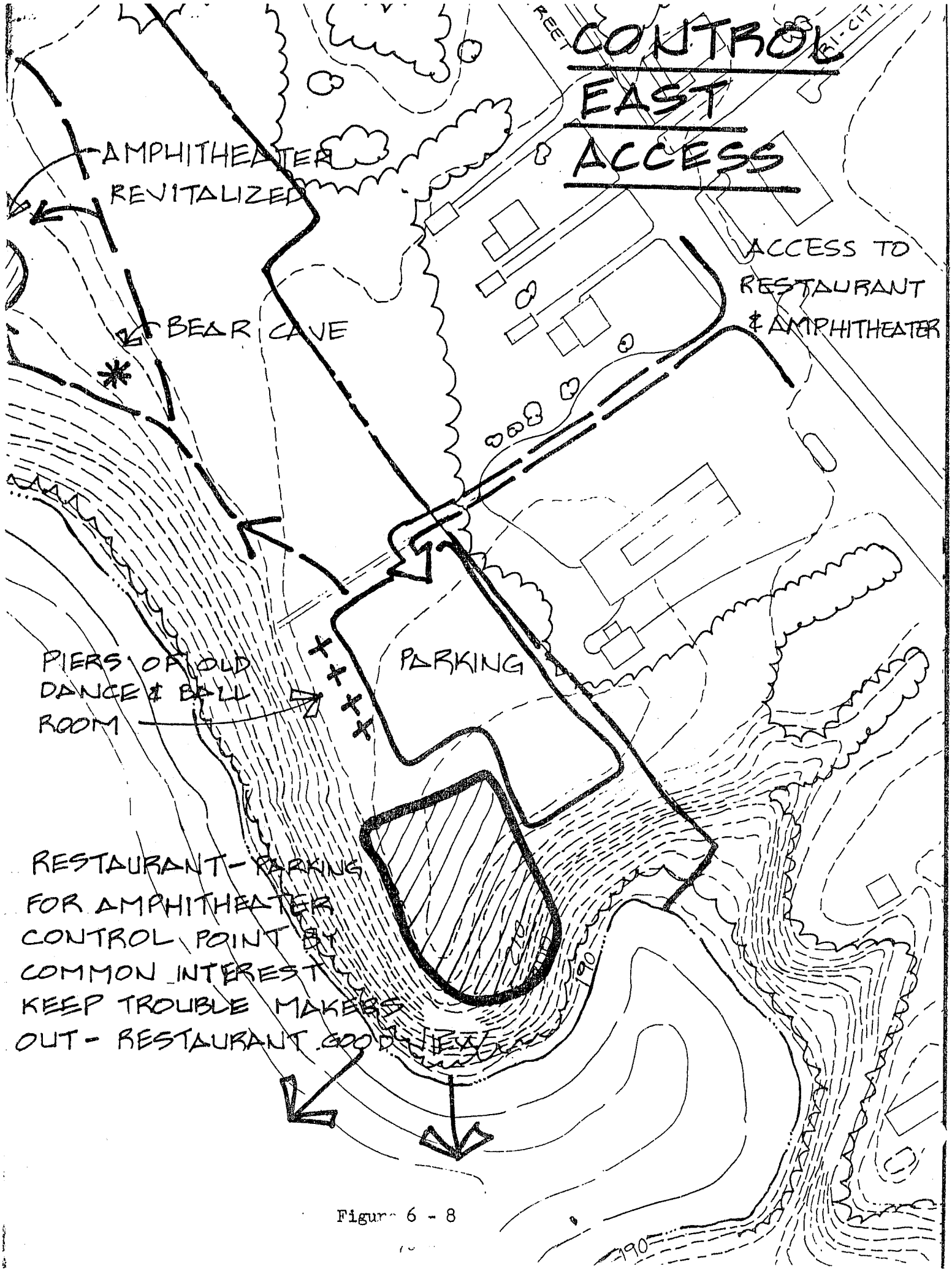

CONTROL
EAST
ACCESS
AMPHITHEATER
REVITALIZED
BEAR CAVE
ACCESS TO
RESTAURANT
& AMPHITHEATER
PIERS OF OLD
DANCE & BALL
ROOM
PARKING
RESTAURANT - PARKING
FOR AMPHITHEATER
CONTROL POINT BY
COMMON INTEREST
KEEP TROUBLE MAKERS
OUT - RESTAURANT GOOD
190
190

Figure 6 - 8

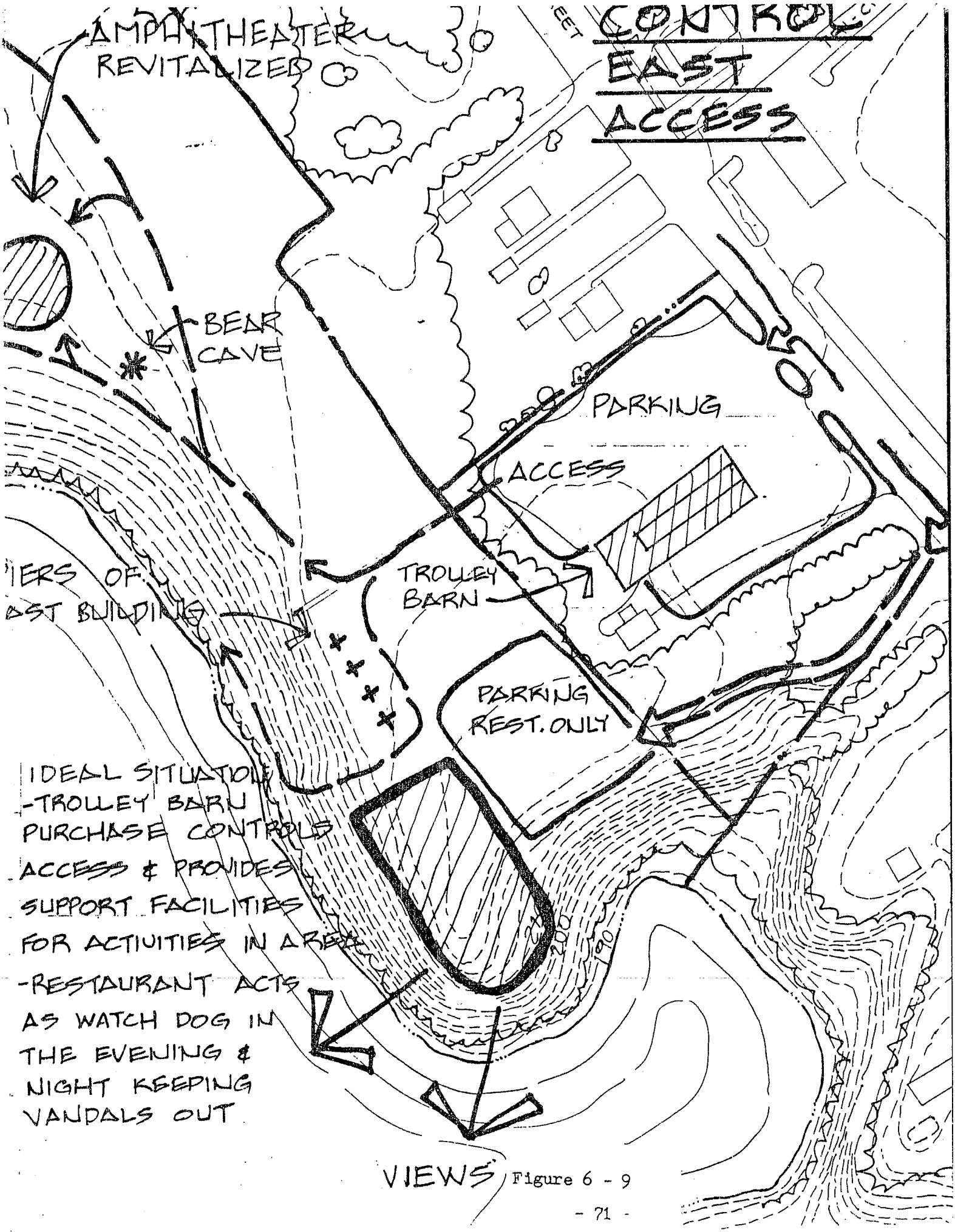
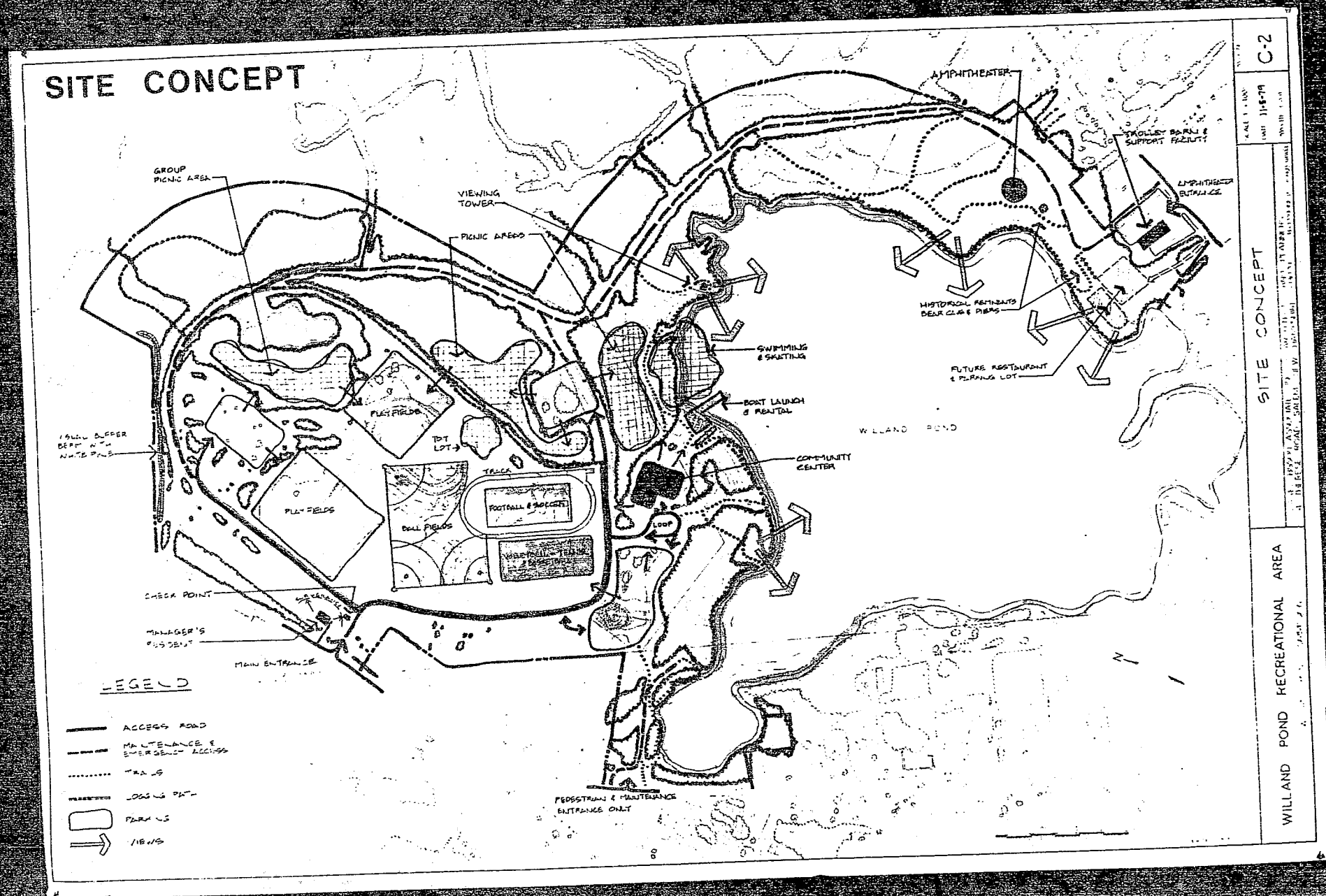

AMPHITHEATER
REVITALIZED
CONTROL
EAST
ACCESS
BEAR
CAVE
PARKING
ACCESS
TROLLEY
BARN
PARKING
REST. ONLY
IDEAL SITUATION
-TROLLEY BARN
PURCHASE CONTROLS
ACCESS & PROVIDES
SUPPORT FACILITIES
FOR ACTIVITIES IN AREA
-RESTAURANT ACTS
AS WATCH DOG IN
THE EVENING &
NIGHT KEEPING
VANDALS OUT
VIEWS

Figure 6 - 9


SITE CONCEPT
AMPHITHEATER
TROLLEY BARN & SUPPORT FACILITY
AMPHITHEATER ENTRANCE
GROUP PICNIC AREA
VIEWING TOWER
PICNIC AREAS
HISTORICAL REMNANTS BEAR CLAW & PIERS
SWIMMING & SKATING
FUTURE RESTAURANT & PARKING LOT
BOAT LAUNCH & RENTAL
WILLAND POND
COMMUNITY CENTER
PLAY FIELDS
BALL FIELDS
TRACK
FOOTBALL & SOCCER
CHECK POINT
MANAGER'S RESIDENCE
MAIN ENTRANCE
PEDESTRIAN & MAINTENANCE ENTRANCE ONLY
LEGEND
ACCESS ROAD
MAINTENANCE & EMERGENCY ACCESS
TRAILS
PARKING
N
C-2
SITE CONCEPT
WILLAND POND RECREATIONAL AREA

6.3 SITE CONCEPT
(Plan C-2)

By solving the conflicts from site concept Plan C-1 thru analysis we submit site concept Plan C-2. From this concept the Master Plan can be developed into an organized recreational facility. By the approach we have taken the site amenities can be preserve, the most feasible area for construction can be determined, entrances are controlled and surveillance obtained.

VII. PROGRAM FOR MASTER PLAN

7.0 WILLAND POND SITE

The function of an activity should determine the type of site best suited to accommodate its particular requirements and likewise, the basic configuration or georgraphy of the site should influence the design characteristics of an activity or building. When these primal considerations are given correct emphasis they then generate the most appropriate design which generally satisfies functional, economic, and aesthetic requirements. When any of these three conditions are out of balance, the other elements suffer and ultimately the user suffers the consequences.

7.1 MASTER PLAN PROGRAM

The Master Plan Program has been developed through-out this study. In Chapter II "Inventory for Program Development" we have investigated recreation in Strafford and Rockingham Counties as well as in Dover and Somersworth Communities.

The "Strafford Rockingham Regional Council Study" (See Exhibit D) was conducted in determining the attitudes of recreation in the region. The conclusions showed that the residents of the region are not completely satisfied with their recreational opportunities. Also the most wanted facilities are those primarily used by individuals and trends towards family related activities.

We then investigated the existing recreational facilities in Dover and Somersworth by gathering the types and locations of recreational activities and determining the amount of use as shown on Inventory P-1. This information was reviewed and accepted by the Director of the Park and Recreation Departments of Dover and Somersworth. They were further helpful in organizing the goals and intents for recreation in their communities and the Willand Pond Site.

At this point we needed to refine the program to suit the Willand Pond Site and define the users. The scope of the Master Plan Program is justified by the lack of recreational opportunities in the area. It is true that Dover and Somersworth would maintain the facility with a population of 33,000, but taking into consideration the people with in a 15 mile radius with approximately fifty towns and cities totaling over 170,000 people. Over 80% of these communities have a population of 3000 or less having little or no recreational facilities in there community. Portsmouth being the largest city in the area (pop. 26,000) doesn't even have a YMCA. Their main recreational facilities are the school gyms and other private facilities which are small and always filled to capacity.

After many discussions with the Park and Recreation Departments we have agreed on the following program for the Willand Pond Site, however this program must be flexible due to an ever changing economical and recreational demands.

OUTDOOR ACTIVITY

— Football and quarter mile track

750 ft. x 270 ft. General use and organized teams. Provide space for high jump pole vaulting, running broad jump, short put, discuss and hammer throw. Also field used for soccer and lacrosse.

— Baseball and softball. One baseball, two softball legal sizes. General use and organized teams. Best orientation 1st choice 20° (from pitchers plate facing home base) 2nd choice 200°, 3rd choice 225°.

— Tennis, 6 courts

78 ft. x 36 ft. General use, grouped together for convenience and maintenance, fence in enclosure.

— Basketball, 4 courts

85 ft. x 50 ft. General use, grouped together for convenience and maintenance, fence around back board.

— Multi- Purpose playfield, 4 fields

40 ft. x 30 ft. General use, such sports as touch or flag football, soccer, speed ball, lacrosse, frisbee, field hockey, etc.

— Swimming area, 300 swimmers'

50 square feet per person. Look out tower. Fenced in water front with turnstile entrance. Swimming areas divided by wood docks and float lines. Three swimming areas; non-swimmers 3'- 6" depth with kick rail, beginners 3'- 6" to 6'- 0" depth and swimmers 6'- 0" to 12'- 0" depth diving platform.

— Boating, 100 boats

Rentals only, to controling numbers and safety. Canoes and row boats with 4 launching ramps.

— Fishing, shore line and boats

— Picnicking, family and group

Family orientated areas of 200 tables with cooking pits located near swimming area and in wooded areas.

Groups orientated areas of 50 tables with large cooking pits separately located from family areas due to its nature of being more active and with organized programs. Such groups as scouting groups, clubs, employee picnics, etc.

— Tot lot, ages from one to twelve

Play equipment with slides, ramps, climbing appartus, water area, etc. Parent viewing area with seating and shaded areas for comfort.

— Jogging trails, fitness trail

Trails maked with sign graphically showing exercises. Various exercises such as balance beam, log hop, chin bar,

leg stretch, trapeze swing, parallel bars, climbing pole, etc. All exerises to be design for all ages.

— Seating,

Along trails and paths for views, aesthetically pleasing areas and viewing activities.

— Winter Sports

Skating and hockey on Pond at swimming area.

Cross country skiing on trails and paths.

Ice fishing on pond, snow races on fields, racing sled, skiing, snowmobile, snowshoe, etc.

INDOOR ACTIVITY

Community Center Complex

— Gymnasium, 2 playing courts

Playing court 90 ft. x 50 ft. Provide basket ball, floor gymnastics, spectator seating and locker rooms near by. Minimum height 25 feet.

— Hand ball, racketball, and paddle ball, 6 to 8 courts

40 ft. x 20 ft. x 20 ft. height. Courts designed for both squash and paddle ball.

— Weight room, one area

1000 square feet, workout area, office, instruction area, storage.

— Gymnastics, one area plus set up on gym floor.

3000 square feet, floor area for equipment, office,

instruction area, storage.

—— Locker room, men and women areas 300 lockers each

Provide showers and toilet, 14 sq. ft. per locker at peak use.

—— Teen center, one area

1000 square feet individual counciling, work shops, class area.

—— Senior citizen center, one area

1000 square feet small group area, group activity for crafts and hobbies, counciling and information area.

—— Multi-purpose class room, 4 to 6 classes

600 square feet, multi-purpose space for groups, lectures, slide shows, karate, weight watcher's, etc.

—— Auditorium, one area with stage

2500 square feet provide small kitchen, coat room. General use for shows, dances, gatherings, etc.

—— Office, general management

500 square feet.

—— First aid station, emergency help.

300 square feet.

—— Terrance, open air

3000 square feet minimum for exhibits, viewing, seating, etc.

Trolley Barn

—— Museum area,

displays of local history during the turn of the century, Willand Pond as Burgett Park and Central Park, mill towns, the trolleys, etc.

—— Day camp center

Meeting area, office, use in conjunction with amphitheater as lecture center.

—— Information center and comfort station.

Amphitheater

—— Open air type, 1000 seats

For lectures, concerts, plays, work with school program.

—— Restaurant future commercial venture.

Market study and area study required.

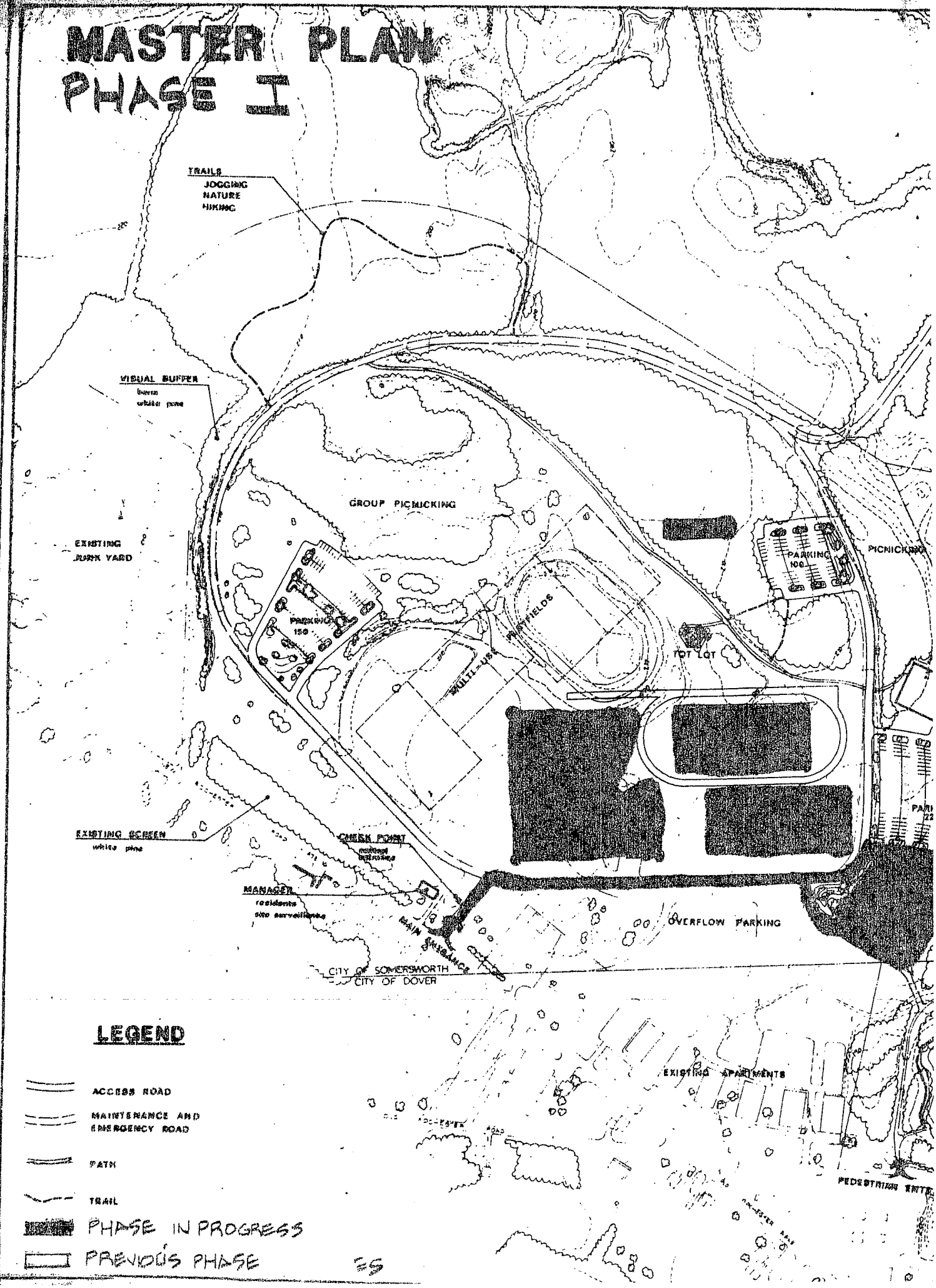
VIII. MASTER PLAN
(Plan MP)

The "Master Plan Study" has evaluated the undeveloped area known as the Willand Pond Site. The primary purpose of the study was to preserve the natural features of the site and blend in recreational facilities for the cities of Dover and Somersworth.

By evaluating the data collected in inventories, program development and preserving the historical remnants of the Willand Pond Site we submit what we consider to be the most viable Master Plan for the development of recreational facilities on the site.

However, as with all master plans optional approaches must be considered carefully and weighed against and ever changing economics and recreational demands. This Master Plan and Master Plan Study is flexible and has been designed with the capability of responding to those factors.

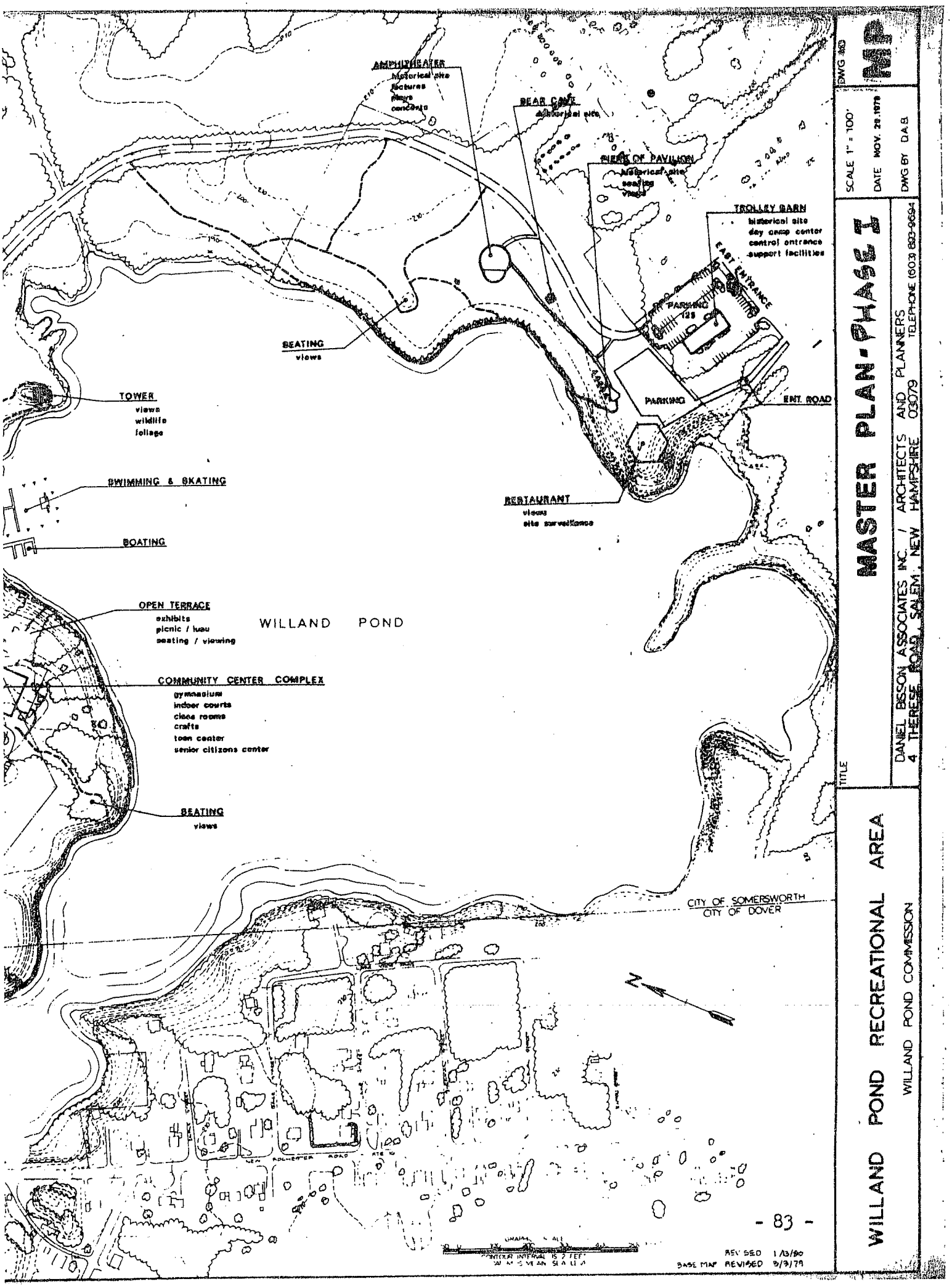
MASTER PLAN
PHASE I



LEGEND

- ACCESS ROAD
- MAINTENANCE AND EMERGENCY ROAD
- PATH
- TRAIL
- PHASE IN PROGRESS
- PREVIOUS PHASE

ES


AMPHITHEATER
historical site
lectures
plays
concerts
BEAR CAVE
historical site
PIERS OF PAVILION
historical site
seating
views
TROLLEY BARN
historical site
day camp center
control entrance
support facilities
EAST ENTRANCE
PARKING
125
PARKING
ENT. ROAD
SEATING
views
TOWER
views
wildlife
foliage
SWIMMING & SKATING
BOATING
RESTAURANT
views
site surveillance
OPEN TERRACE
exhibits
picnic / luau
seating / viewing
WILLAND POND
COMMUNITY CENTER COMPLEX
gymnasium
indoor courts
class rooms
crafts
town center
senior citizens center
SEATING
views
CITY OF SOMERSWORTH
CITY OF DOVER
N
- 83 -
REVISED 1/13/80
BASE MAP REVISED 9/3/79
MASTER PLAN-PHASE I
DANIEL BESSON ASSOCIATES INC. / ARCHITECTS AND PLANNERS
4 THERESE ROAD, SALEM, NEW HAMPSHIRE 03079
TELEPHONE (603) 893-9694
SCALE 1" = 100'
DATE NOV. 28, 1979
DWG BY D.A.B.
DWG #3
MP
TITLE
WILLAND POND RECREATIONAL AREA
WILLAND POND COMMISSION

IX. PHASING FOR MASTER PLAN

9.0 PHASING CONCEPT

A variety of activities are located throught out the Willand Pond Site which consist of major construction of buildings, pond related activities and field sports. The process of planning and implementation of such a project must be an ordered and rational series of construction phases. It is necessary in phasing the site due to economical constraints of available funds of both communities. It is also necessary to phase the site with a variety of activities and focusing on the immediate needs early in the first phases.

The following phases have been reviewed and approved by key people and the Directors of Parks and Recreation Department.

9.1 PHASE I

(Master Plan - Phase I)

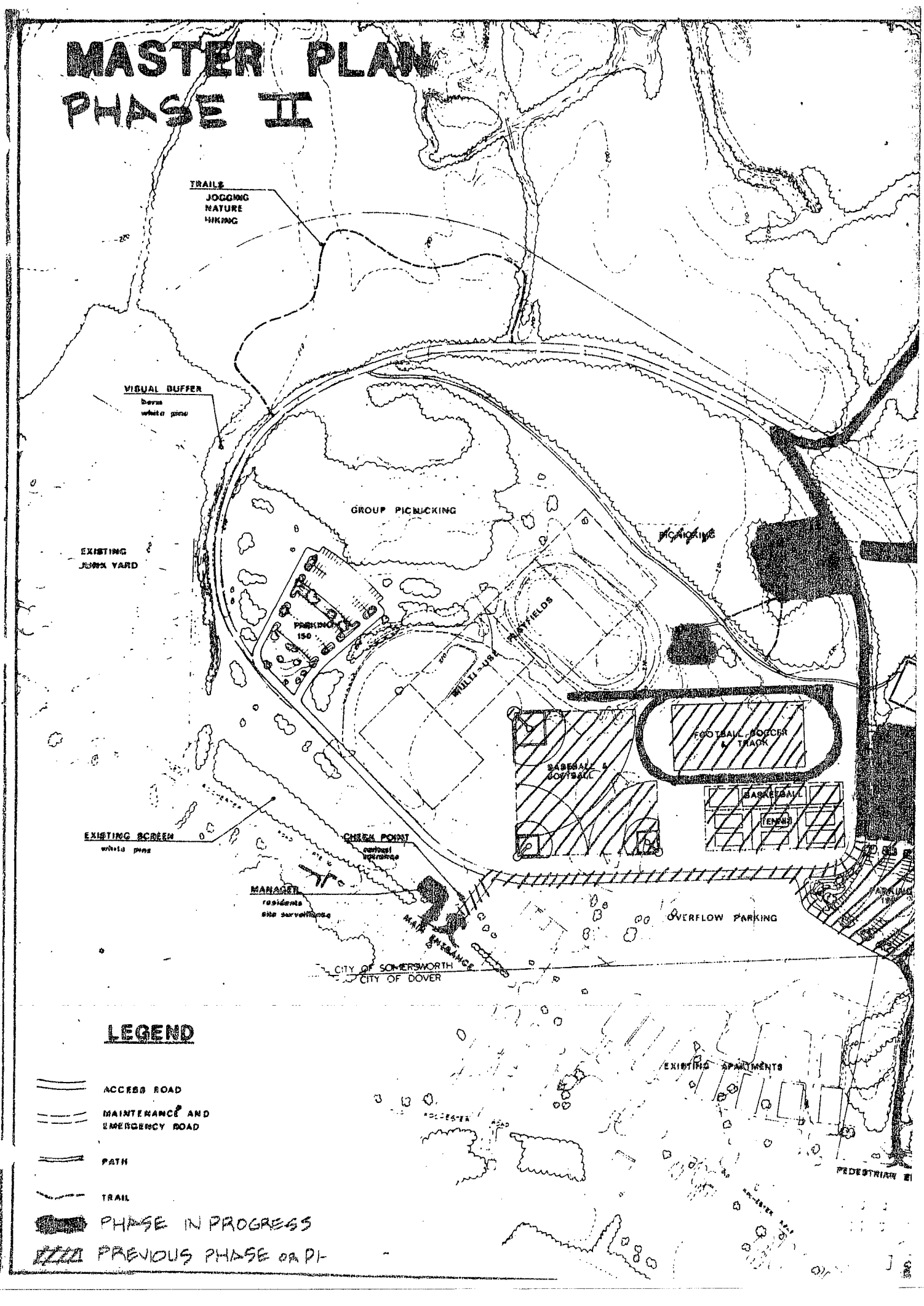
The most widely used recreational facilities in Dover and Somersworth are playfield and outdoor courts. The users vary from neighborhood kids to organized adult groups. Competition for the use of playfields and outdoor courts brought on arguments and even fights.

For these reasons Phase I shall consist of:

— Baseball fields

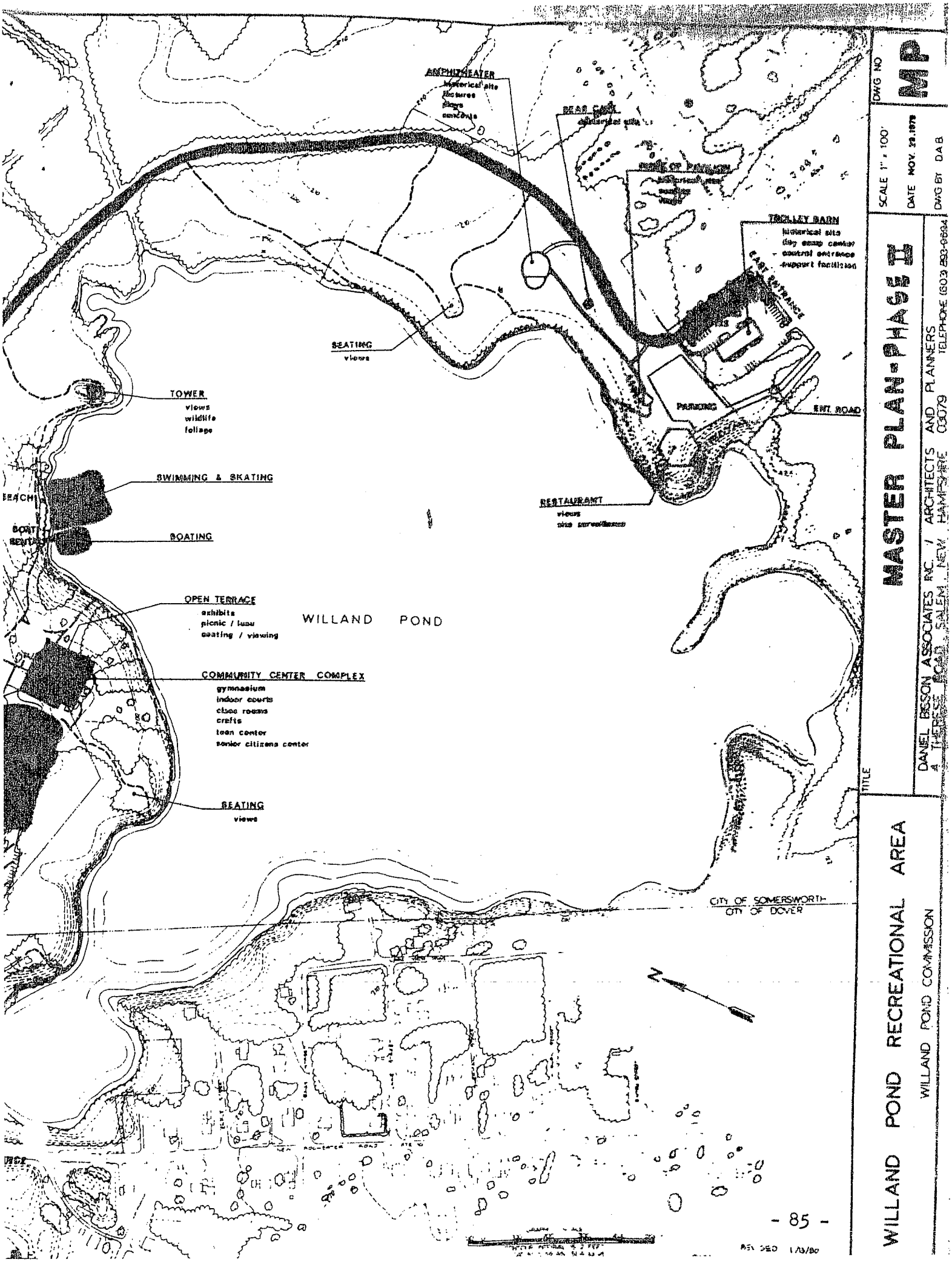
— Football field

MASTER PLAN
PHASE II



LEGEND

- ACCESS ROAD
- MAINTENANCE AND EMERGENCY ROAD
- PATH
- TRAIL
- PHASE IN PROGRESS
- PREVIOUS PHASE OR PI-


AMPHITHEATER
historical site
lectures
plays
concerts
BEAR CAMP
historical site
TROLLEY BARN
historical site
day camp center
central entrance
support facilities
EAST ENTRANCE
SEATING
views
TOWER
views
wildlife
foliage
PARKING
ENT. ROAD
SWIMMING & SKATING
BEACH
BOAT RENTAL
BOATING
RESTAURANT
views
nite surveillance
OPEN TERRACE
exhibits
picnic / lunch
seating / viewing
WILLAND POND
COMMUNITY CENTER COMPLEX
gymnasium
indoor courts
class rooms
crafts
teen center
senior citizens center
SEATING
views
CITY OF SOMERSWORTH
CITY OF DOVER
WILLAND POND RECREATIONAL AREA
WILLAND POND COMMISSION
MASTER PLAN-PHASE II
DANIEL BISSON ASSOCIATES INC. / ARCHITECTS AND PLANNERS
A THERESE ROAD, SALEM, NEW HAMPSHIRE 03079
TELEPHONE (603) 893-6694
SCALE 1" = 100'
DATE NOV. 28, 1979
DWG BY DAB
DWG NO
MP
TITLE
REVISED 1/13/80

—— Basketball and tennis courts.

To support these activities:

—— Main entrance road from Rte. 16 to the 180 cars parking area.

—— Site work of clearing and grubbing existing roads and paths for emergency vehicle access.

—— Picnic area close to playfields area with tables and cooking facilities.

9.2 PHASE II

(Master Plan Phase II)

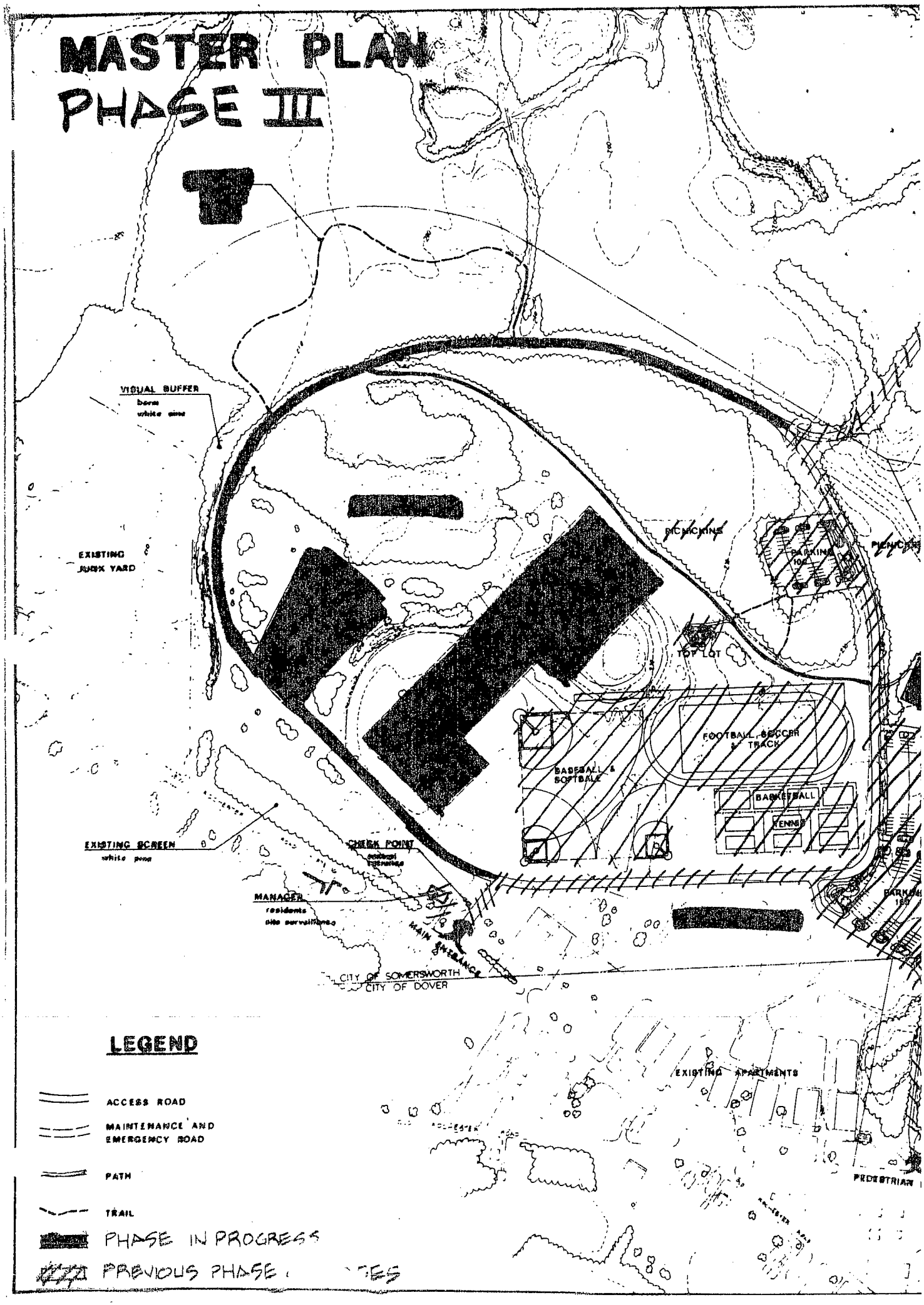
Another widely used facility are the swimming areas in Dover. Somersworth has none and many use Dover facilities which are over crowded every warm day during the summer.

Boating has been extremely popular in this area during the past 10 years. Many without boats rarely have an opportunity to do some boating. Willand Pond offers a calm body of water with viewing for supervision.

All of this requires a place for bathers to dress and shower and at this point the playfields would need scheduling. The first portion of the Community Center Complex would be constructed.

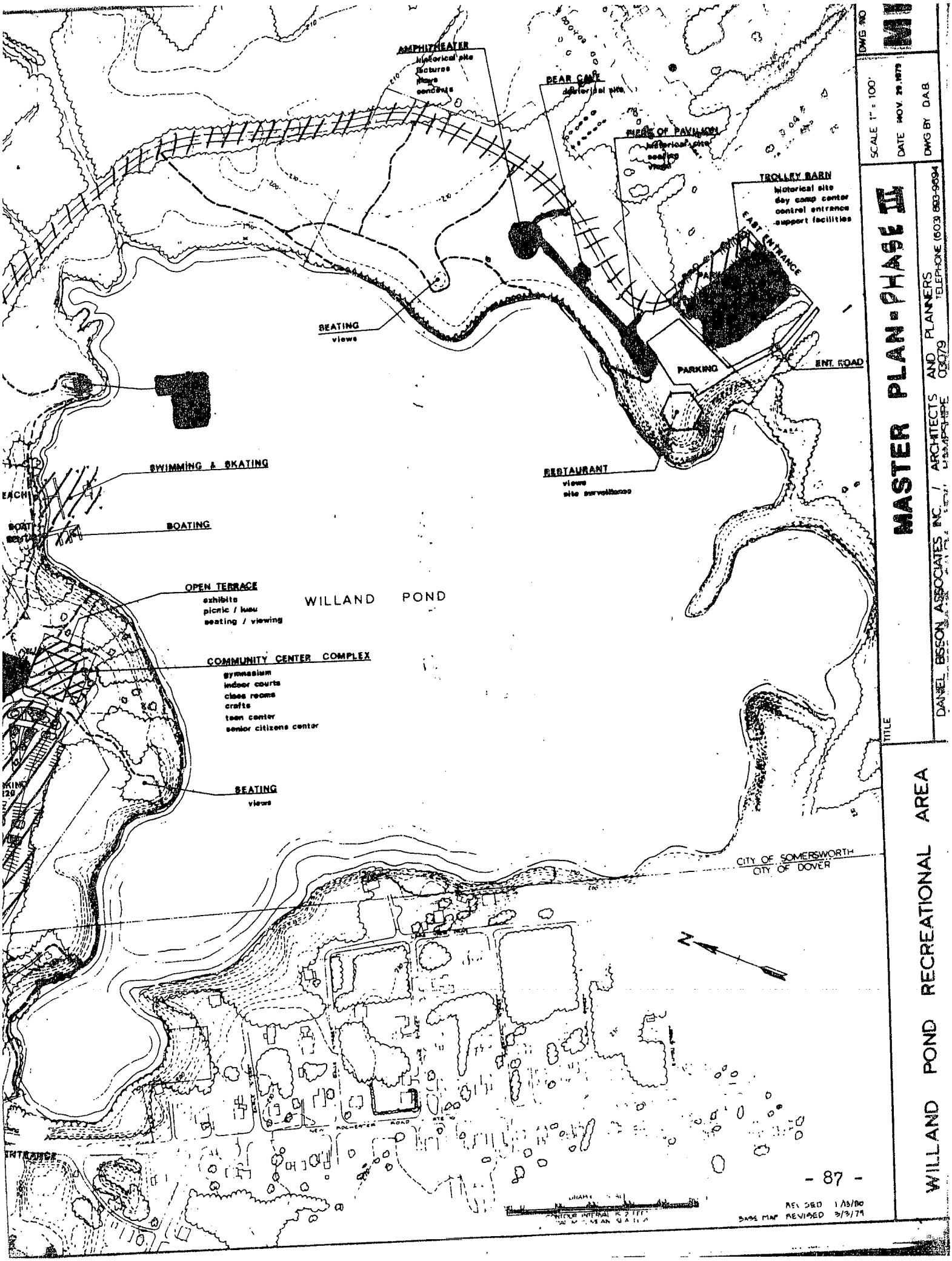
There has been some thought about the phasing of the complex. It was decided that the complex would be done in two phases.

MASTER PLAN
PHASE III

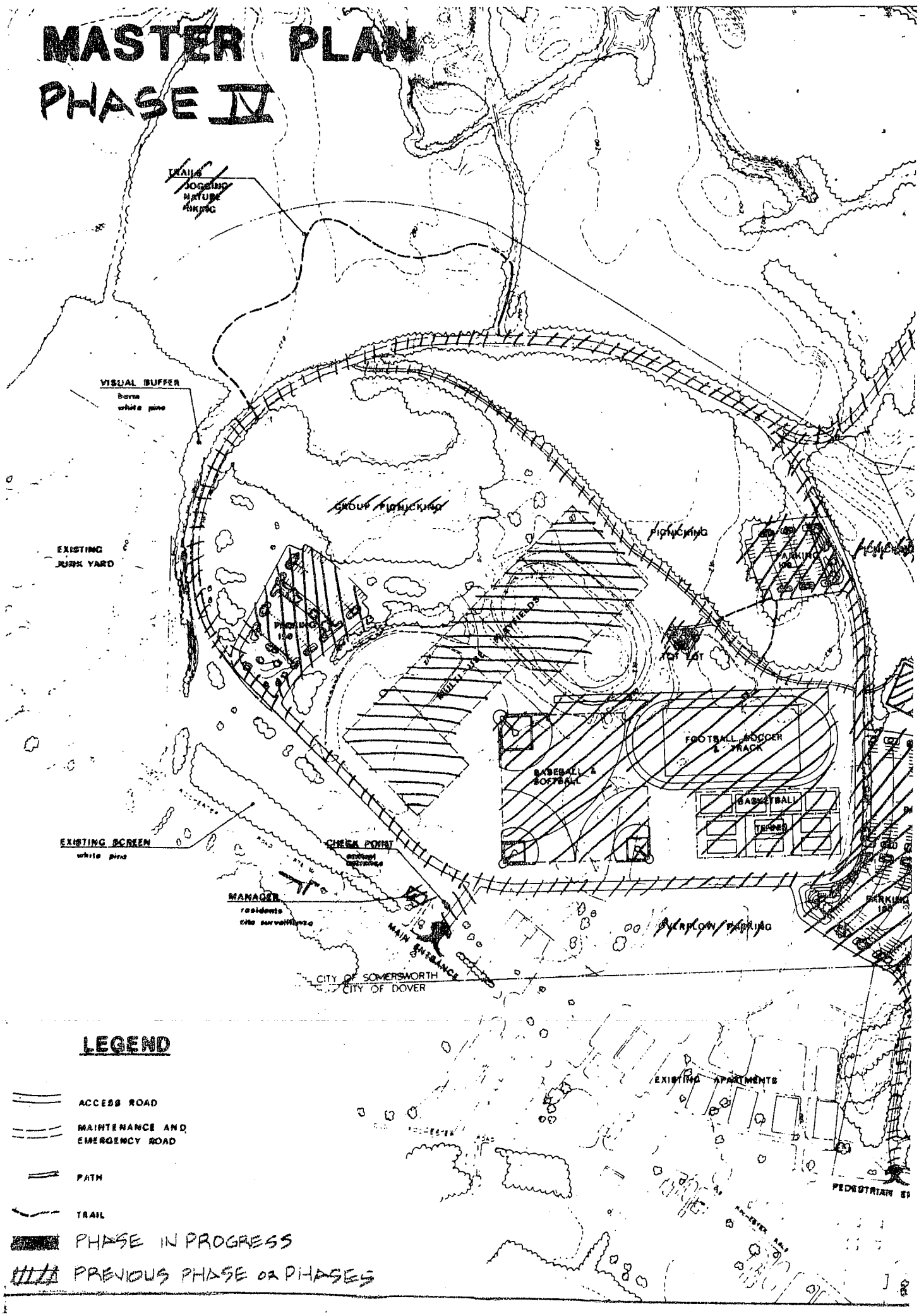


LEGEND

- ACCESS ROAD
- MAINTENANCE AND EMERGENCY ROAD
- PATH
- TRAIL
- PHASE IN PROGRESS
- PREVIOUS PHASE

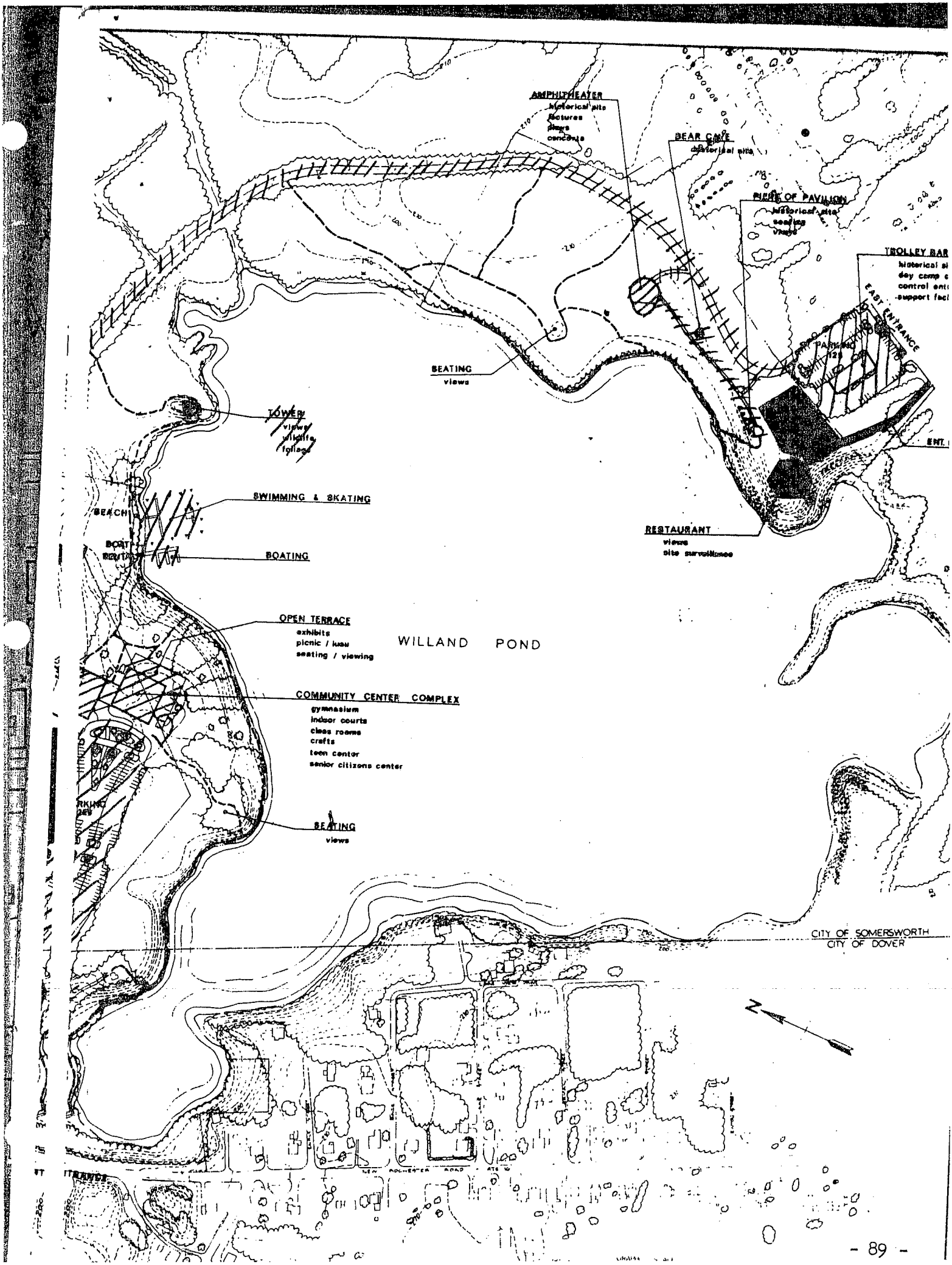

AMPHITHEATER
historical site
features
stage
concessions
BEAR CAVE
historical site
SITE OF PAVILION
historical site
seating
views
TROLLEY BARN
historical site
day camp center
central entrance
support facilities
EAST ENTRANCE
PARKING
ENT. ROAD
SEATING
views
SWIMMING & SKATING
BOATING
RESTAURANT
views
site surveillance
OPEN TERRACE
exhibits
picnic / luau
seating / viewing
WILLAND POND
COMMUNITY CENTER COMPLEX
gymnasium
indoor courts
class rooms
crafts
teen center
senior citizens center
SEATING
views
CITY OF SOMERSWORTH
CITY OF DOVER
N
MASTER PLAN - PHASE II
DANIEL BISSON ASSOCIATES INC. / ARCHITECTS AND PLANNERS
TELEPHONE (603) 883-9694
SCALE 1" = 100'
DATE NOV. 29, 1979
DWG BY DAB
DWG NO
TITLE
WILLAND POND RECREATIONAL AREA
REVISED 1/15/80
BASE MAP REVISED 3/3/79

MASTER PLAN
PHASE IV



LEGEND

- ACCESS ROAD
- MAINTENANCE AND EMERGENCY ROAD
- PATH
- TRAIL
- PHASE IN PROGRESS
- PREVIOUS PHASE OR PHASES


AMPHITHEATER
historical site
features
stage
concrete
BEAR CAVE
historical site
PIERS OF PAVILION
historical site
seating
views
TROLLEY BAR
historical si
day camp c
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EAST ENTRANCE
PARKING
129
ENT.
SEATING
views
TOWER
views
wildlife
lookout
SWIMMING & SKATING
BEACH
BOAT
RENTAL
BOATING
RESTAURANT
views
site surveillance
OPEN TERRACE
exhibits
picnic / luau
seating / viewing
WILLAND POND
COMMUNITY CENTER COMPLEX
gymnasium
indoor courts
class rooms
crafts
teen center
senior citizens center
SEATING
views
CITY OF SOMERSWORTH
CITY OF DOVER
N
NEW ROCHESTER ROAD

The trolley barn entrance would be needed to control that end at the site and would be able to support the amphitheater activities.

Phase III shall consist of:

— Trolley barn renovations.

— Amphitheater renovations.

— The Community Center Complex high area and link. (Main lobby, gym, gymnastics, handball, weight room).

— Multi-use playfields.

— Viewing tower.

— Historical sites clarified and marked.

To support these activities:

— 150 car parking area to the north.

— Overflow parking area to the west.

— Paths and jogging trails to the north cleared and suitable for use.

— Picnic areas with tables and outdoor cooking facilities.

9.4 PHASE IV

(Master Plan Phase IV)

After the completion of the Willand Pond Recreational Area a design for the restaurant is to be selected. The reason for the restaurant being the last Phase is that a developer for the restaurant would see the Willand Pond Recreational Area in full

operation. This would give the developer a clear understanding of the passive activities that would surround the restaurant site.

The restaurant should conform to the basic configuration or geography of the site and shall be appropriately design within the natural setting. Emphasis shall be placed towards the Willand Pond views and bleed in with the passive activities within the restaurant area.

X. FINANCIAL AND TECHNICAL RESOURCES

10.0 RESOURCE LIST

Frequently, local governments and recreational commissions work towards goals and objectives without being totally aware of, or seeking to the fullest, the potential financial and professional assistance available to them. This is a list of available financial and technical assistance. By no means is this list the only resources available, check with other community, state, federal and private agencies.

FINANCES

LAND AND WATER CONSERVATION FUND: provides Federal aid through the Heritage conservation and Recreation Service (formerly the Bureau of Outdoor Recreation) for planning, acquisition and development of outdoor recreation lands and facilities. Grants are available on a 50-50 matching basis, and may be matched by town funds, donations of property, Community Development grants and other funds. This is one of the major sources of financial assistance for New Hampshire communities.

The State Office of Recreation Services, the administrator of New Hampshire's share of these funds, suggests that a first step in planning for community recreation needs is to contact that office for a description of the many services which they can

provide in project guidance.

Office of Recreation Services, Div. of Parks and Rec.,
State House Annex, Concord, N.H. Tel: 271-3627

HOUSING AND COMMUNITY DEVELOPMENT ACT - 1974:

under this program, New Hampshire communities may seek grants to help provide decent housing, a suitable living environment, and expanded economic opportunities for persons of low and moderate income. Recreation development and services, open space, and conservation are eligible items under this program.

Department of Housing and Urban Development (HUD)
Director of Community Development and Planning
1230 Elm St., Manchester, N.H. Tel: 669-7011 ext. 7641

COMMUNITY EDUCATION PROGRAM GRANTS: available to local education agencies for establishing and maintaining educational recreational and cultural community - oriented programs. Park and recreation agencies can be direct recipients of these grants if they are able, under State or Federal law, to perform a service function to public schools.

State Dept. of Education, Mr. Robby Fried
64 North Main St., Concord, N.H. Tel: 271-3330 or
U.S. Office of Education, Community Education Program,
Regional Office Bldg. 3, Room 5622, 7th and D St., SW,
Washington, D.C. 20202

PUBLIC WORKS EMPLOYMENT ACT: provides up to 100% or supplemental federal grants to local governments for construction of local public works projects. Recreational facilities are eligible for funding.

Economic Development Admin, Mr. William Cannon, Rm. 204
55 Pleasant Street, Concord, N.H. Tel: 225-0450 or
Atlantic Regional Director, Federal Bldg., 600 Arch St.,
Philadelphia, Penn. 19106

STATE AID TO EDUCATION: recreation facilities built on school property may be eligible for 30% funding from the state. This could include tennis courts, swimming pools, tracks, ballfields, playgrounds, etc. Funds may also be available for the operation of recreation education programs.

State Department of Education, Administrative Services,
Room 410, State House Annex,
Concord, N.H. 03301 Tel: 271-3620

NEW HAMPSHIRE CHARITABLE FUND AND AFFILIATED TRUST: may provide grants for various programs providing human services, including recreation.

N.H. Charitable Trust Division, 1 South Street,
Concord, New Hampshire Tel: 225-6641 or 271-3591

NATIONAL ENDOWMENT FOR THE ARTS: Many different types of grants available to cities, towns, private groups generally on a 50 - 50 matching basis for the development of cultural arts (dramatics, music, theater, etc.)

N.H. Commission on the Arts, 40 North Main Street,
Concord, N.H. 03301 Tel: 271-2789

NATIONAL PRESERVATION FUNDS: Federal grants are available on a 50% matching basis for the acquistion and restoration of historic sites. The grants may be also used for the "recycling" of old buildings to contemporary uses, such as the conversion of an old schoolhouse into a community center.

State Historic Preservation Office,
Dept. of Resources and Economic Development, P.O. Box 856
Concord, N.H. 03301 Tel: 271-3483

SENIOR CITIZENS PROGRAM: federal grants, awarded through the N.H. State Council on Aging, for the delivery of services to senior citizens, including recreation. Money available (up to 90%) for personnel, operation, equipment and maintenance.

N.H. State Council on Aging, P.O. Box 786,
14 Depot Street, Concord, N.H. Tel: 271-2751

SENIOR COMMUNITY SERVICE EMPLOYMENT PROGRAM: provides part-time community service jobs for persons 55 and older. Employment could

be with parks and recreation facilities and programs. The Federal Government assures 100% of the salary.

Senior Community Aids, attn: Gary Locke,
15 North Main Street, Concord, N.H. Tel: 271-2614

DEVELOPMENT DISABILITY GRANTS: provides funds for the development or improvement of recreation activities for the handicapped based on state plan priorities.

Dept. of Health and Welfare, Office of Mental Retardation,
105 Pleasant St., Concord, N.H. Tel: 271-2671

JUVENILE DELINQUENCY: Law Enforcement Assistance Admin. provides funds to operate programs which aid in crime control and the prevention of juvenile delinquency. First year grants provide up to 90% of the costs of operation, maintenance and equipment for recreation services, including teen centers.

Governor's Commission on Crime and Delinquency
169 Manchester St., Concord, N.H. Tel: 271-3627

FEDERAL SURPLUS PROPERTY: is available to public recreation agencies. A revision in the law makes it easy to acquire surplus equipment, such as trucks, lights, jeeps, etc.

New Hampshire Distributing
12 Hills Ave.
Concord, N.H. 03301 Tel: 271-2602

AGENCIES

REGIONAL PLANNING COMMISSIONS: can provide aid in developing master plans for recreation and open space. Each serves as a primary resource agency for all planning data and can often provide low cost technical assistance in site design. Commissions can be the link between towns and state and federal agencies when applying for funding and other assistance. They conduct required reviews for certain federal grants.

Regional Planning Commission in your area

HERITAGE CONSERVATION AND RECREATION SERVICE: provides advice in planning, developing, financing and managing outdoor recreation programs. Publishes periodic and special literature relating to outdoor recreation, including "Outdoor Recreation Action" -- no charge!

Bureau of Outdoor Recreation, Technical Services Div.,
Northeast Region, 600 Arch Street,
Philadelphia, Penn. Tel: 215-597-2284

NEW HAMPSHIRE MUNICIPAL ASSOCIATION: provides assistance pertaining to municipal functions, with information on legal affairs, financing, operation of community government.

N.H. Municipal Association
193 N. Main Street
Concord, N.H. Tel: 1-800-852-3358

SOCIETY FOR THE PROTECTION OF NEW HAMPSHIRE FORESTS: this non-profit organization can provide detailed technical advice on the acquistion and preservation of open space including funding, easements, donations of land, etc.

Society for the Preservation of N.H. Forests
5 South State Street, Concord, N.H. 03301
Tel: 224-9945

BOOKS

SMALL TOWN RECREATION: study of 10 N.H. town recreational projects and RECREATION PLANNING:a guide for New Hampshire towns.

Director of Community Recreation,
Office of Recreation Services, Dept. of Resources and Economic Development
State House Annex, Concord, N.H. 03301

1975 NEW HAMPSHIRE OUTDOOR RECREATION PLAN:

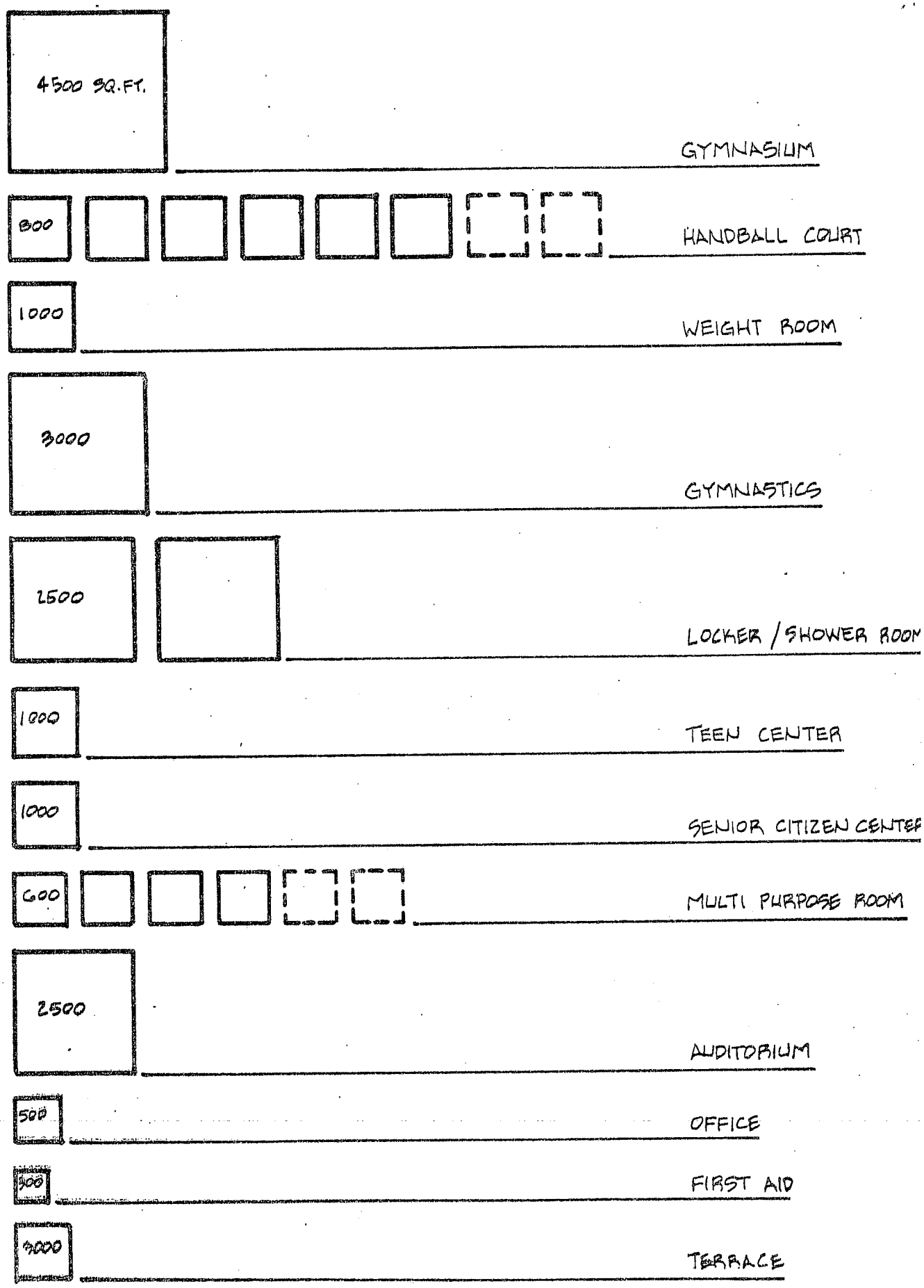
Office of Comprehensive Planning
Dept. of Resources & Economic Development
State of New Hampshire

RESOURCES FOR PARKS, RECREATION, CONSERVATION:

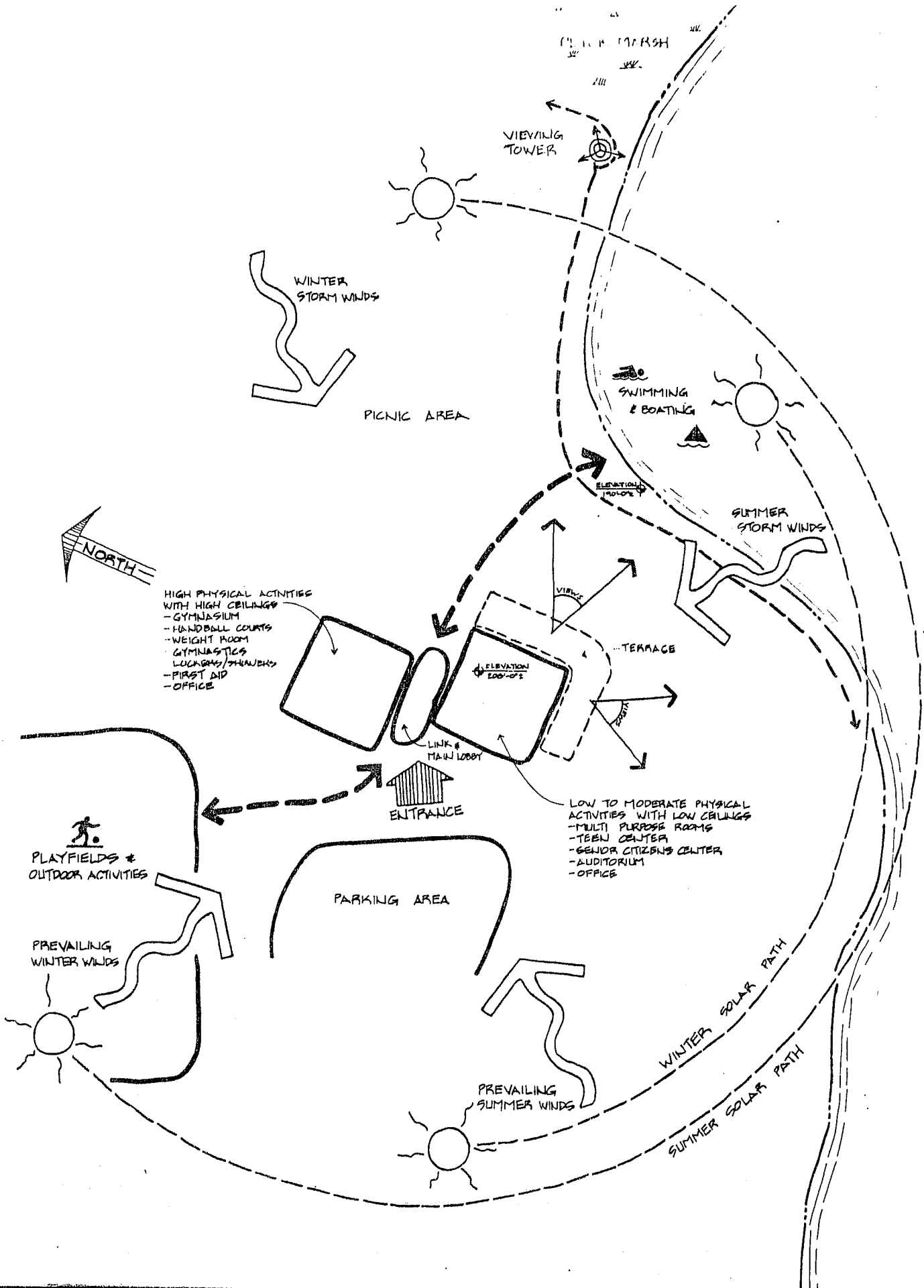
Office of Community Recreation Service
Room 301, State House Annex
Concord, N.H. 03301

COMMUNITY CENTER COMPLEX

SCHEMATIC DESIGN



1-21-80	COMMUNITY CENTER COMPLEX WILLARD PARK RECREATIONAL AREA	PROGRAM



1"=30'-0"	COMMUNITY CENTER COMPLEX WILAND PUBLIC RECREATIONAL AREA	SITE BUBBLE DIAGRAM

COMMUNITY CENTER COMPLEX

SCHEMATIC DESIGN

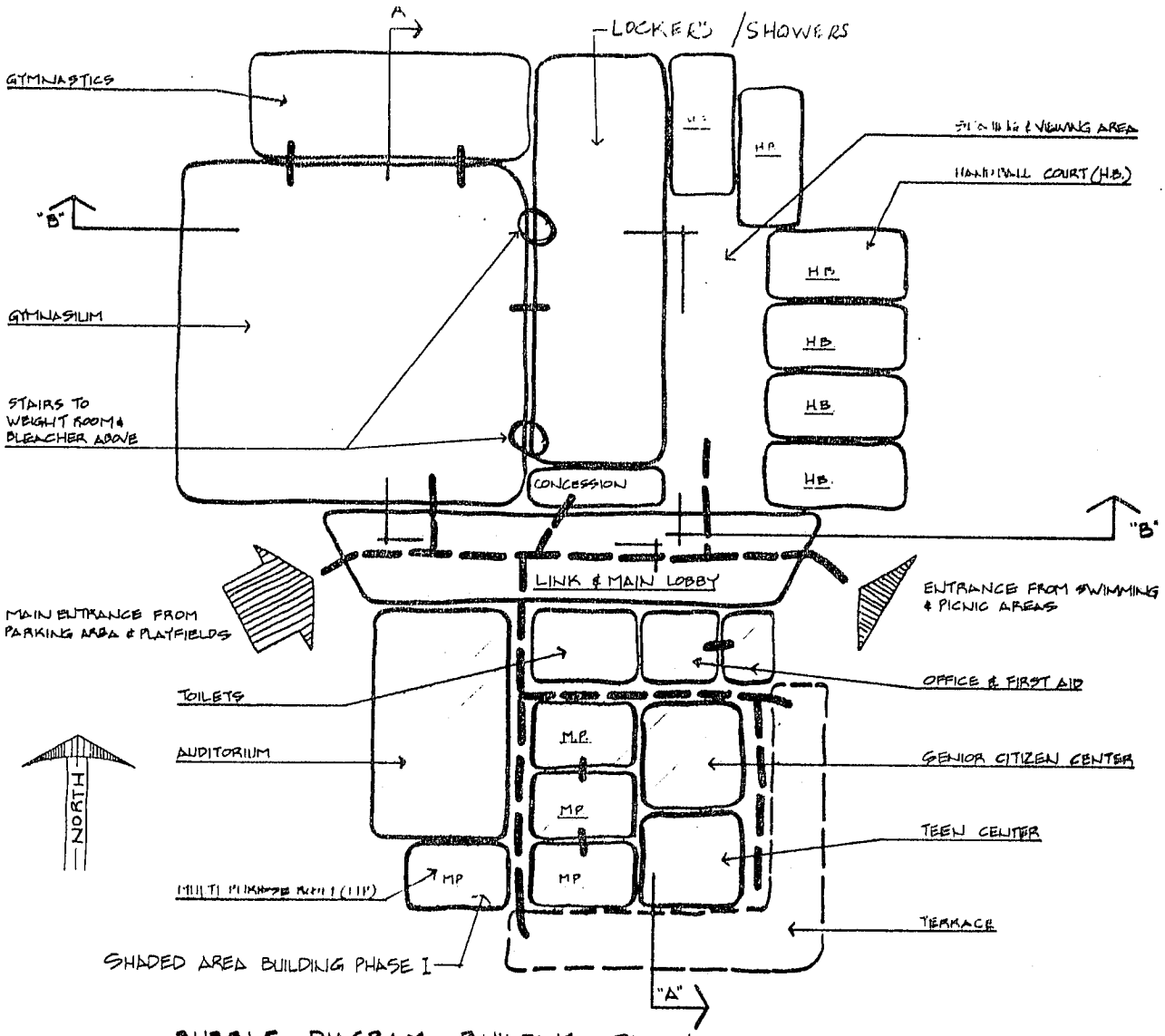
I. PROGRAM
(Drawing 1)

The Master Plan Program as been developed in a series of steps discussed in Chapter VII. These steps investigated the attitudes of recreation in the area, a selection of preliminary goals and intents of future recreational needs and a selection of goals and intents for the Willand Pond Site. All steps were reviewed with the Directors of the Park and Recreation Department of Dover and Somersworth and other key people.

Drawing 1 give a graphic representation of the activities in square feet. This is helpful in relating the activities relationship among each other and gives some direction in grouping or separating activities. These scaled bubbles are also helpful in organizing similar shapes into a workable grid or structural bay system in the early stages of schematic design.

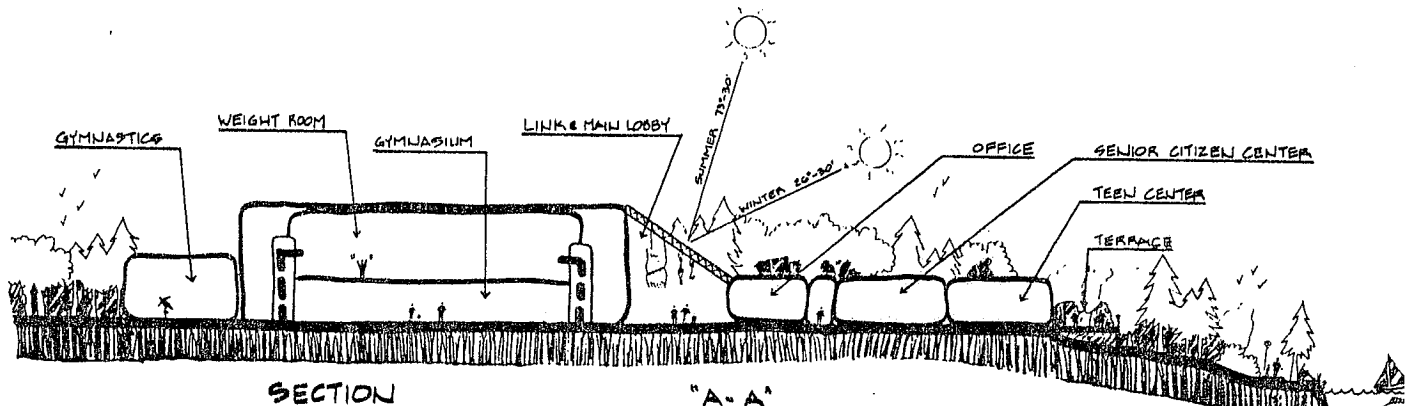
II. SITE BUBBLE DIAGRAM
(Drawing 2)

Information shown on drawing 2 has already been discussed in previous chapters. The intent is to orientate the Community Center Complex with accessibility from the parking area, playfields and swimming area.

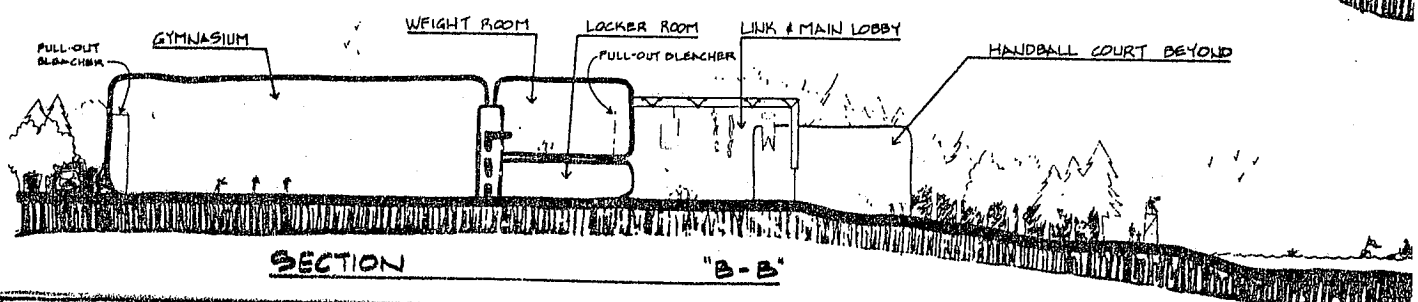


BUBBLE DIAGRAM BUILDING PLAN

SCHEME I

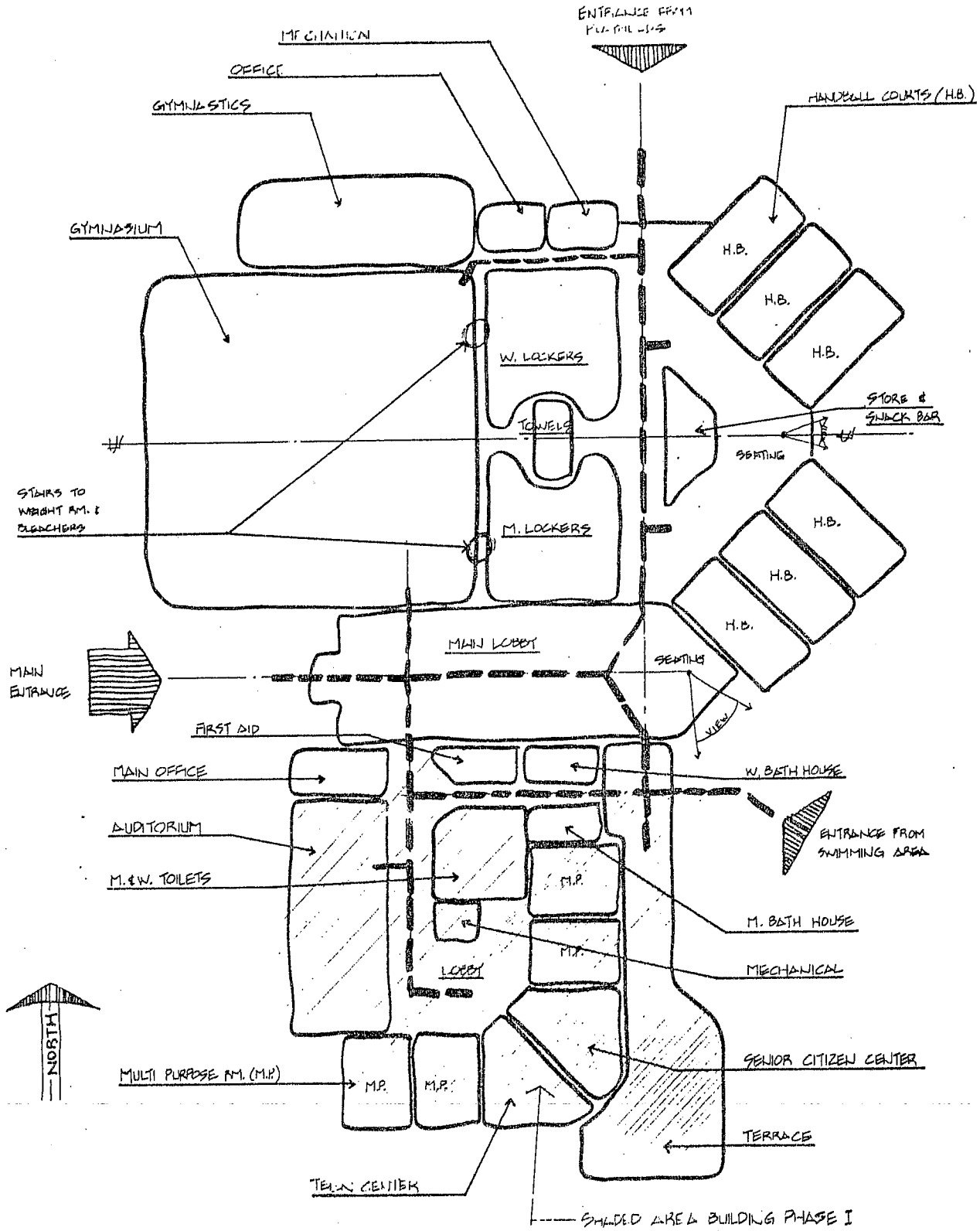


SECTION "A-A"



SECTION "B-B"

B	2-2-80	COMMUNITY CENTER COMPLEX WILLARD POND RECREATIONAL AREA	BUILDING BUBBLE DIAGRA SCHEME I



BUBBLE DIAGRAM BUILDING PLAN - SCHEME II

4-3-80	COMMUNITY CENTER COMPLEX WILLAND POND RECREATIONAL AREA	BUILDING BUBBLE DIAG SCHEME II

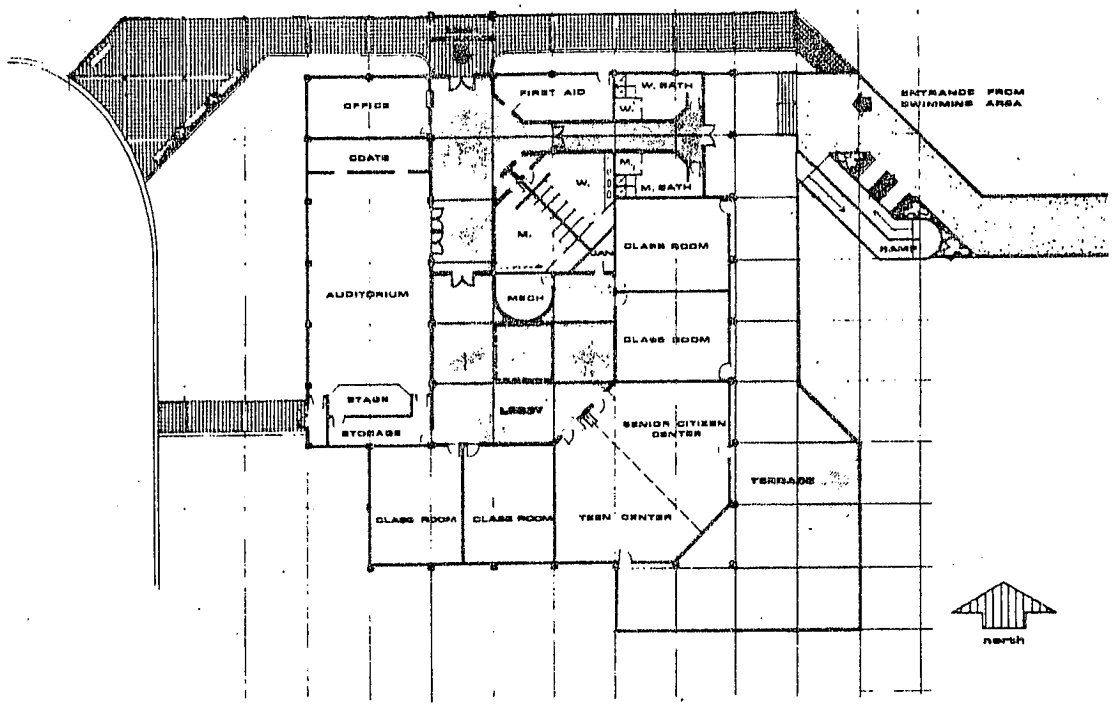
Other concerns are solar exposure, protection from winter winds, capturing summer breezes, taking advantage of views, and the natural surroundings.

The main concept of the complex is to divide the building into two areas connected together with a lighter element which is the main lobby and hub of all circulation. To the South, the structure shelters low to moderate physical activities with basically low ceiling requirements. To the north, the structure shelters strenuous physical activities with basically high ceiling requirements. The link in the center is a greenhouse structure containing the main lobby and entrances. The terrace on the east side takes advantage of solar exposure and the views of the pond and swimming area.

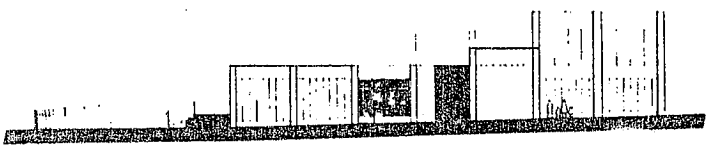
III. BUILDING BUBBLE DIAGRAM
(Drawing 3 & 4)

As shown on Drawing 3 the main entrance enters into the link, the focal point of the complex. This become the gathering area and major hub of circulation.

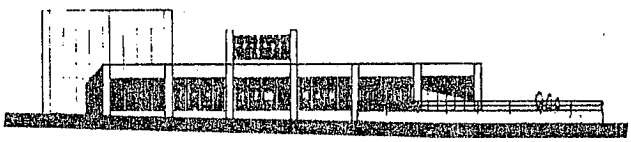
Looking at the north section, the locker and shower areas acts as the core from which surrounding activities have close access to. At the south section, corridors lead to the multi-purpose rooms, teen and senior citizen center, office and first aid areas. The terrace open up at the end of the corridors providing sun and views.



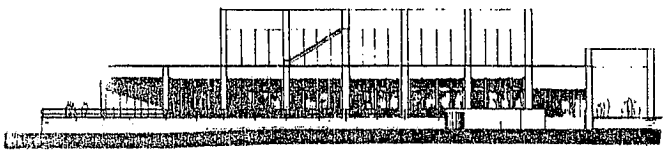
PLAN - BUILDING PHASE I



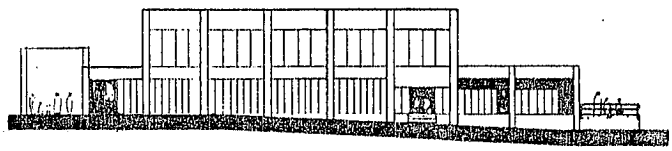
NORTH ELEVATION



SOUTH ELEVATION



EAST ELEVATION



WEST ELEVATION

BO | COMMUNITY CENTER COMPLEX
WILLAND POND RECREATIONAL AREA | PLAN AND ELEVATIONS BUILDING PHASE I

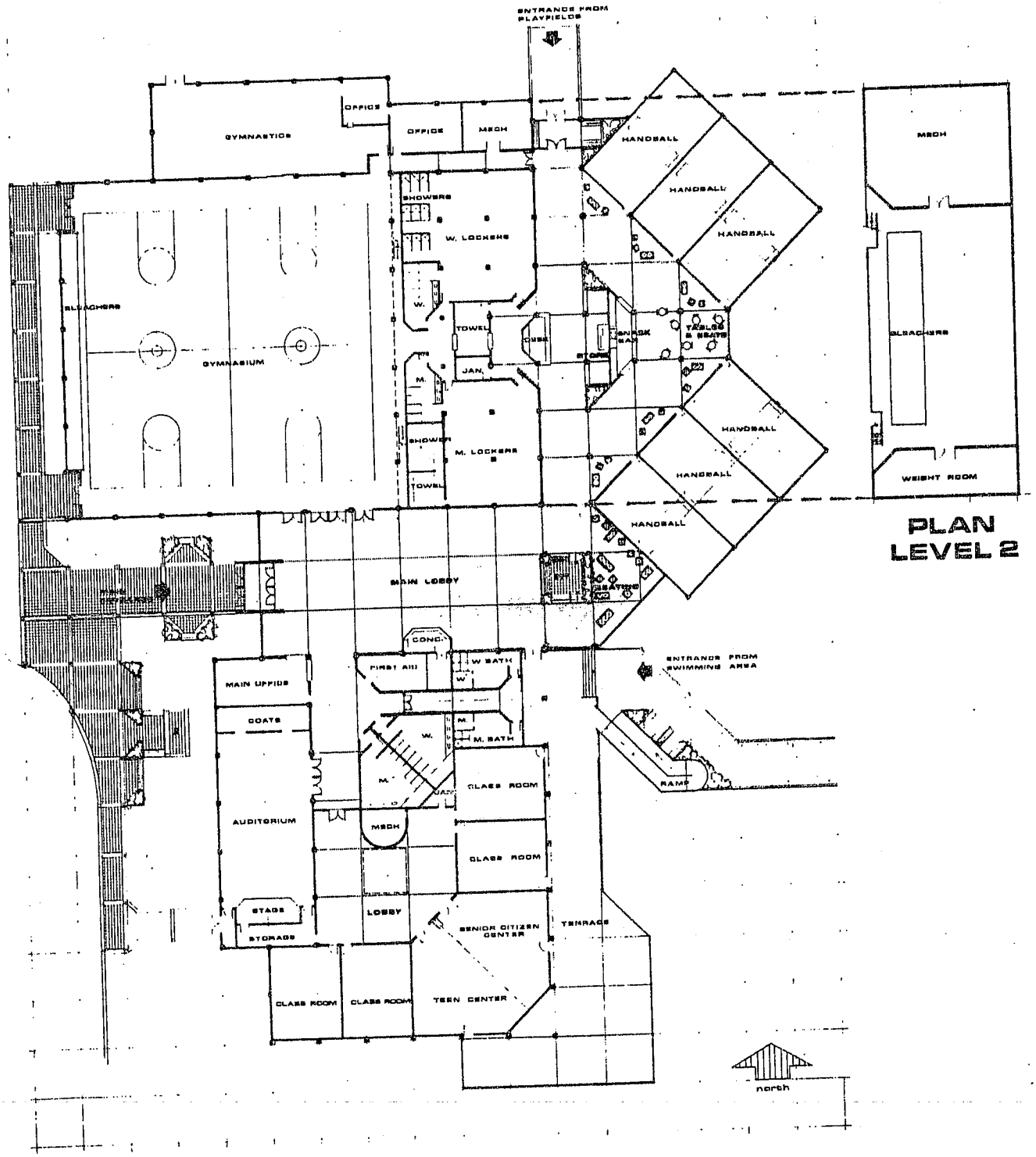
Drawing 4 has further developed the circulation patterns making the complex accessible from the parking area, swimming area and playfields with the link (or main lobby) as the hub. The multi-purpose rooms, teen and senior citizen centers has a separate lobby secluding these activities from the more boisterous activities at the north end of the complex. Other emphasis are views from seating areas, access to terrace and bathouse, office location acts as information station and controls entrance.

IV. BUILDING PLAN - PHASE I
(Drawing 5)

Drawing 5 is the first phase in constructing the Community Center Complex. This portion of the complex has the basic needs to support the activities in Master Plan Phase II. These needs are the office: to organize and control activities, a first aid station, bath house, class rooms, teen and senior citizen centers. These activities do not require any special building contruction, such as a gym or handball court, and would be the least expensive portion of the complex to construct.

Shown on drawing 5 the entrance is accessible from all activities on the site with the office controlling all traffic entering the building.

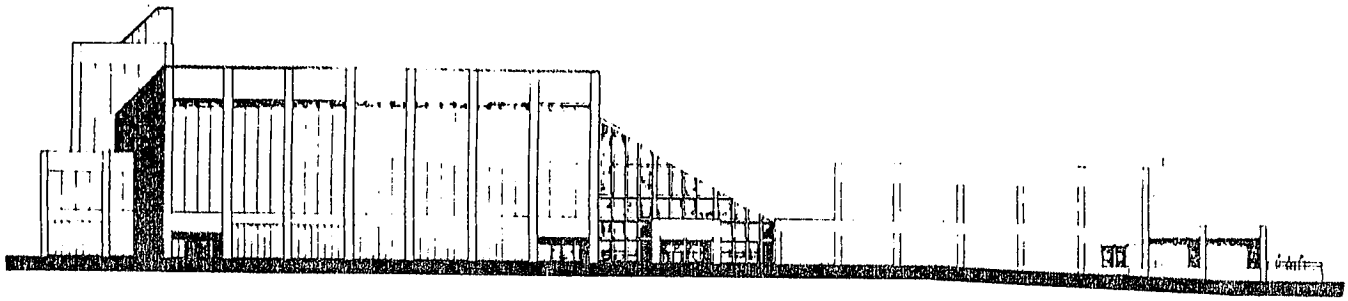
The structure would be framed by a wide span structural system with minimal interior columns such as a Butler Building Systems. This would accommodate a variety of exterior profiles and flexibility of interior partitions.



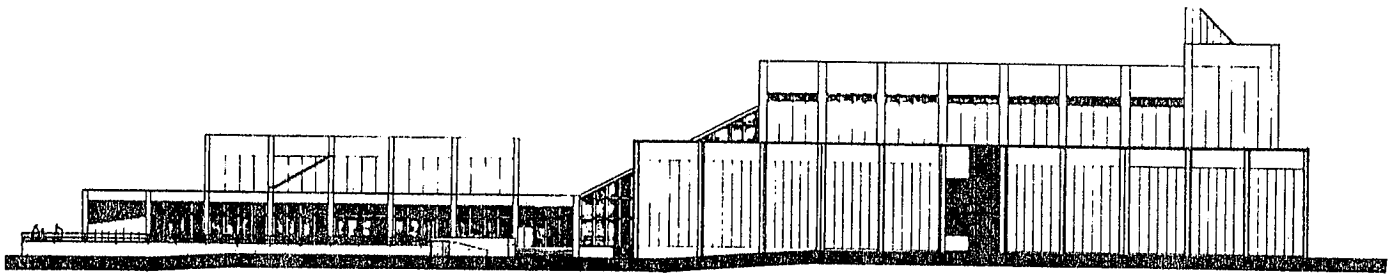
PLAN LEVEL 2

PLAN - BUILDING PHASE II

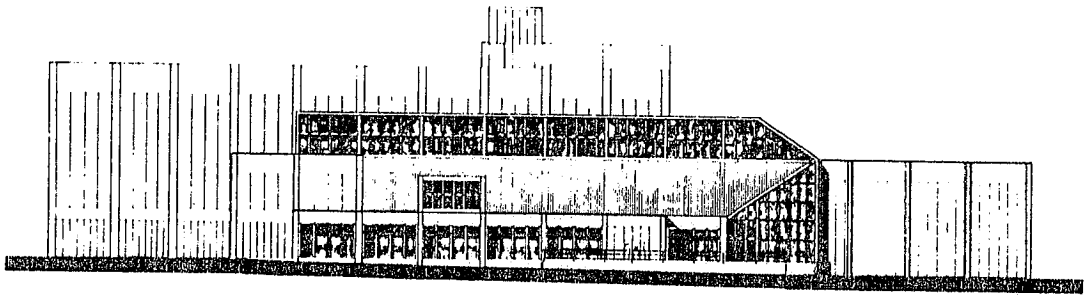
10-80	COMMUNITY CENTER COMPLEX WILLAND POND RECREATIONAL AREA	PLAN BUILDING PHASE II



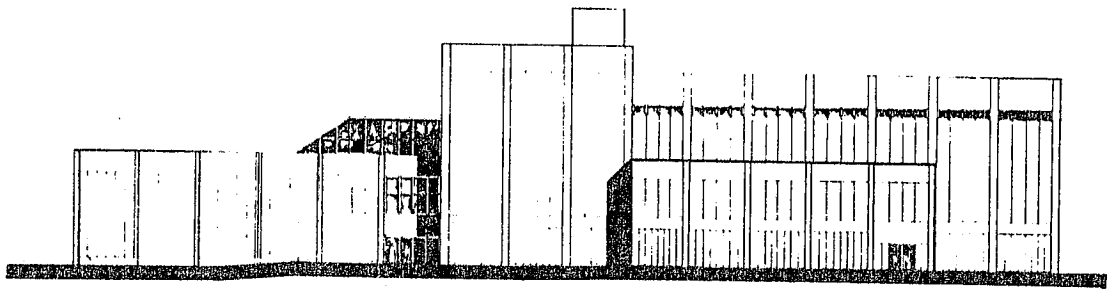
WEST ELEVATION



EAST ELEVATION



SOUTH ELEVATION



NORTH ELEVATION

4-10-80	COMMUNITY CENTER COMPLEX WILLARD POND NATIONAL AREA	ELEVATIONS BUILDING PHASE II

V. BUILDING PLAN - PHASE II

(Drawing 6 & 7)

Drawing 6 plan shows the Community Center Complex as the finish building. It maintains the Building Plan - Phase I in its entirety connected by the main lobby to the rest of the complex.

Access to the complex from the parking area is through the lobby with a focal point to a seating area at the opposite end of the lobby. This is also a focal point when entering from the swimming area and play-fields which acts as a hub of circulation. This is further emphasized by a seating pit.

The main entrance as direct access to the office where all information pertaining to the Willand Pond Recreational Area and programmed events. From this point one has access to the gymnasium, auditorium, class rooms, teen and senior citizen centers, handball courts and terrace.

The main lobby with its green house structure above permits sunlight to filter down. This lobby is used as the gathering area for all major events at the complex. It can also be used as exhibits space in connection with the terrace, gym and auditorium.

The structure would be framed by a series wide span structural systems with minimal interior columns such as the Butler Building Systems. The major structural system would be the gymnasium with smaller systems over the gymnastic area and locker rooms. The handball courts would be separatly constructed with open web joists framing between courts

and locker rooms. The grid that is outlined on the plan would also be used in the exterior elevation design as shown on drawing 7. The Plans and Elevations are design within this grid giving the building a structural order and a rational approach in solving the schematic design.

EXHIBIT B

ER/SOMERSWORTH WILLAND POND CONSERVATION COMMISSION:

REAS: The cities of Dover and Somersworth desire to provide for a conservation and passive recreation area in and about the vicinity of Willand Pond for the mutual benefit of its citizens, and

REAS: Property surrounding Willand Pond is both publicly and privately owned, and

REAS: It is necessary to protect the public as well as private interests of the land owners in the vicinity of Willand Pond,

, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF DOVER AND SOMERSWORTH THAT:

There be and hereby is established the Dover/Somersworth Willand Pond District Commission, said Commission to be comprised of a City Council-member from each community, a Conservation Commission member, a Recreation Commission member, and a private citizen from each community interested in Willand Pond, and a ninth member who may reside in either Somersworth or Dover to be selected as may be mutually agreeable between the aforementioned appointees. The purposes of the Dover/Somersworth Willand Pond Commission shall be to provide for the long term conservation of the area as a natural area, to protect the existing rights and interests of both communities in the use of Willand Pond, and to provide for the passive recreational use of the Willand Pond area by the citizens of Dover and Somersworth. The Commission shall adopt such rules and regulations as it deems feasible to accomplish its intended purposes. Said rules and regulations shall become effective upon adoption in ordinance form by the communities of Dover and Somersworth respectively. The Commission shall adopt a set of by-laws

staff support from the Strafford Regional Planning Commission

which shall provide for the conduct of the Commission's business. Said Commission shall meet at least quarterly. The Dover/Somersworth Willand Pond Conservation Commission shall develop a workable plan to provide for the maintenance of the Willand Pond conservation area to be participated in equally by the two municipalities. The Commission shall also provide for the expansion of the Willand Pond Conservation and Recreation Area by the acquisition of additional properties, the method of financing to be determined with each acquisition and the execution of a conservation agreement with private landowners, or other lawful method as may be mutually acceptable between the municipalities.

In consideration of the above mutual covenants, the City of Dover shall retain title, but permit the use of its property surrounding Willand Pond for the purposes stipulated above by Dover and Somersworth residents, and shall permit utilization of the waters in Willand Pond for fire protection purposes only. For its part, the City of Somersworth agrees to waive the annual revenue in lieu of taxes paid by the City of Dover Water Department to the City of Somersworth and agrees that any land which it owns may be used by Dover residents under the terms and conditions of this Agreement. This Agreement shall remain in force and effect for ten consecutive years from the date of adoption and shall continue year after year thereafter except as may be amended by mutual agreement of the parties from time to time. A one year's notice of cancellation shall be provided for either of the parties to independently sever and terminate this agreement. Said notice shall be directed to the municipal officers of each community and a copy placed on file with each City Clerk.

Nov. Dec. 1977

EXHIBIT B

WILLAND POND MASTER PLAN

*GOAL: It is the goal of the Dover/Somersworth Willand Pond Conservation Commission to develop a master plan with objectives, policies, and activities to protect the natural, historic, recreational, and aesthetic values of Willand Pond and its shores for the citizens of Dover and Somersworth and future generations.

The Dover/Somersworth Willand Pond Conservation Commission will implement this master plan in cooperation with the city councils and water boards of Dover and Somersworth. It will also consult with the groups and agencies below for technical assistance.

OBJECTIVE A: To protect and enhance water quality through sound land use policies and implementation activities.	PRIORITY	GROUP OR AGENCY
POLICIES:		
I. Promote forest management policies which will enhance the woodland experience, prevent accelerated erosion and sedimentation and contamination of the water.	II	Strafford County Conservation District, Strafford County Forester
II. Work with the New Hampshire Special Board to regulate dredging, filling, and shoreland alteration to prevent water pollution.	I	N.H. Special Board
III. Promote sound septic system for pondfront houses and businesses.	II	N.H. Water Supply and Pollution Control, City of Dover
ACTIVITIES:		
I. Institute a 250 foot wide protection area which would include all areas within 250 feet of the normal high water line by	I	
a) designating a shoreland zoning district for the purpose of regulating activities in this sensitive area and	I	Planning Boards and City Councils of Dover and Somersworth

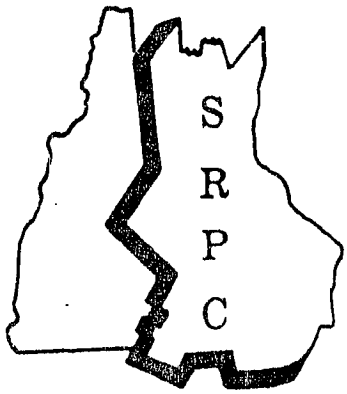
Passed in June 1978 by 3-1 both city councils

	PRIORITY	GROUP OR AGENCY
b) negotiating conservation easements between landowners and the Dover/Somersworth Willand Pond Conservation Commission or the conservation commissions of the respective cities.	II	Society for the Protection of the N.H. Forests, Dover and Somersworth Conservation Commission
II. Acquire land through gift or purchase.	II	Dover and Somersworth Conservation Commissions, Salmon Falls River Watershed Association
III. Investigate grant sources.	II	
IV. Develop graphic representation of land use policies.	I	
V. Develop memorandum of understanding between the Dover Water Board and the Dover/Somersworth Willand Pond Conservation Commission.	I	
OBJECTIVE B: To protect and enhance historic buildings, remnants and site the Burgett (Central) Park.		
POLICY:		
I. Establish management guidelines.	I	Dover Historic District Commission, Somersworth Historical Society
ACTIVITIES:		
I. Identify historic structures, remnants, and sites.	I	
II. Apply for the National Registry designation, establish historic district.	I	
III. Develop educational materials.	II	

		PRIORITY	GROUP OR AGENCY
OBJECTIVE C:	To promote forms of recreation and educational activities which are appropriate to the natural, historic, and aesthetic values of Willand Pond.		
POLICIES:			
I.	Encourage walking, cross-country skiing and bird watching.	II	Dover and Somersworth Parks and Recreation
II.	Encourage environmental education and coordinate it with different groups.	II	Dover and Somersworth Public Schools
ACTIVITIES:			
I.	Establish entrances in both Dover and Somersworth at a) Route 16A, b) Willand Pond Road, and c) N.H. Route 16.	II	
II.	Designate gravel or grass parking areas and vehicle controls at a) Route 16A entrance and b) N.H. Route 16 entrance.	II	Dover and Somersworth Parks and Recreation
III.	Establish a trail system with a porous surface (compacted dirt, bark chips, or substitute).	I	Dover and Somersworth Parks and Recreation
OBJECTIVE D:	To protect the aesthetic values of Willand Pond and its shores through landscape improvements and maintenance.		
POLICIES:			
I.	Acquire funding for regularly scheduled maintenance program.	I	

ACTIVITIES:	PRIORITY	GROUP OR AGENCY
I. Clean up debris.	I	Volunteers
II. Reinforce existing vegetation with native flowering trees, shrubs, and groundcovers.	II	Strafford County Conservation District
III. Heighten views of pond with selective pruning.	III	County Forester

EXHIBIT C



Strafford Regional Planning Commission

90 Washington Street, Dover, New Hampshire 03820 Tel. 603-742-2523

September 5, 1978

Dan Bisson
4 Therese Road
Salem, New Hampshire 03078

Dear Dan:

As staff support for the Dover/Somersworth Willand Pond Conservation Commission, I request you to conduct a recreation and conservation study of Willand Pond and its environs.

It is understood that you will present your findings to the commission upon completion of your study and that you will conduct it free of charge.

In response to your request for information about the 87-acre property adjacent to the pond, I discovered that two people own it. Paul Garibidian (the spelling of his last name may be incorrect) is one of them. He lives in Salem, New Hampshire.

Thank you very much for your help.

Sincerely,

Nina Brown

Nina Brown, Staff Support
Dover/Somersworth Willand
Pond Conservation Commission

NB/vs

EXHIBIT D

ANALYSIS OF REGIONAL RECREATION DEMAND

Staff Report

Strafford Rockingham Regional Council

December, 1974

Preface

This report was written by the staff of the Strafford Rockingham Regional Council as part of its effort to describe recreation in that region. Primary responsibility for the report was borne by Otis E. Perry, Assistant Planning Director, Southeastern New Hampshire Regional Planning Commission. Contributors to the report were Michael Kulka, Director, Strafford Regional Planning Commission, Jon Gilmore, Regional Planner, Southern Rockingham Regional Planning District Commission, Alice Estill and Patricia Bristol, Planning Interns.

The preparation of this report was funded in part by the Department of Interior, Land and Water Conservation Fund.

I. Introduction: In July of 1974, the Strafford Rockingham Council conducted a mail survey of attitudes of the regional residents towards the recreation opportunities in the region. The survey forms are attached as Appendix A of this report. The surveys were mailed to 2,000 households in the region and 323 forms were returned in time to be included in the analysis.

In general, the results showed that there is a wide variety of recreation opportunities within the region and that people do take advantage of them. There is, however, some dissatisfaction with these opportunities. Most respondents to question 2, measuring satisfaction with recreation opportunities, indicated that while they were satisfied, desired recreation facilities were not always available.

The rest of this section is an explanation of the survey technique and exhibits of the results.

II. Survey Technique

The survey was mailed randomly to 2,000 households within the region. The addresses were chosen from the telephone book. The total mailing size of 2,000 was chosen arbitrarily as the largest mailing that could be done economically. The number of questionaires sent to each municipality was based upon the ratio of that municipality's population to the total regional population. (The population figures used were the 1973 Estimates of Population prepared by the New Hampshire Office of Comprehensive Planning, July, 1973). For example, Atkinson's population was 1.4 per cent of the regional total so 28 questionaires were sent to households in that community. The addresses were chosen from the telephone book in a way that distributed the households over the entire telephone using population of the muni pality.

This sampling method was not perfect. By using the telephone book those people who did not have telephones were automatically excluded, thus biasing the sample to those people with income enough to afford a telephone. This was not considered a serious drawback, for two reasons. First, the use of a telephone is no longer considered a luxury but a necessity. Thus there are not many households which did not have a chance to be in the sample. Second, the other group of people who would be excluded were those with unlisted numbers. This group was considered to be quite small and thus was expected to have little impact on the results. Both of these considerations, however, must be kept in mind as minor limiting assumptions on the results.

III. Characteristics of the Population

Before considering the results of the survey and their implications on recreation planning, it is necessary to look at the characteristics of the population responding. In the first place the age/sex characteristics of the respondents were much different than the total regional population. The respondents were mainly young and middle aged males: 55% between the ages of twenty-five and forty-four and 75% male. While the regional population, using the 1970 census figures, is only 50% male and 24% aged twenty-five to forty-four, this skewing is likely due to heads of households being listed in the telephone book and subsequently filling out the form.

Table I shows a comparison between the total population of the region and the sample in education level completed. It can be readily seen that the respondents to the survey are a much better educated group than the general population. Whether this means that better educated people do more recreation, (because they have high-

er incomes and more leisure) or that they are more willing to respond to questionaires of this nature, cannot be positively determined from the data.

However, there is some evidence that the former is the major reason for the high number of college graduates in the respondents. An attempt to cross-correlate education with a recreation activity index showed no significant difference between education levels for each level of activity. This suggests that the respondents were the people most interested in recreation regardless of education.

The above described characteristics of the population must be considered in evaluating the responses of the survey. The regional population was not proportionately represented by the returned questionaire. However, it is fair to say that the differences are not the result of the sampling method and thus have significance for recreation planning for whatever the reason. The better educated (thus presumably higher paid) people, because they are more vocal and have more leisure to engage in recreation, will have more impact upon recreation facilities in the region.

TABLE I.

Comparison of Sample and Population: Education

Years of School Completed	Sample (Total Size 317)		Population* (94108)	
	%	Number	%	Number
8	2.5	8	7	6233
9-11	2.5	8	10	9021
12	14.8	47	20	19,151
1-3 College	20.5	65	7	6932
4 College	24.0	76	4	3305
5+ College	21.5	68	1	1152

* From 1970 Census

IV. Data

The survey attempted to measure those activities which were most often done and, the places where the activities took place. In addition, questions were asked about the respondents' satisfaction with recreational opportunities in the region and an open ended question was asked requesting the respondents' opinion of what local officials could do to improve local recreational opportunities. The remaining questions were demographic in nature so that a profile of the respondents could be constructed.

Because of the large number of activities and places considered it would not be practical to discuss each activity individually here. Table II shows the activities ranked by the number of times it was picked as either a frequent or occasional activity. Surprisingly, even after the gas shortages this winter, driving for pleasure was the most common activity. Predictably, swimming was very high on the list. A new entry, though expected, was bicycling, indicating that recreation planners should be working on bicycle facilities, especially considering the ages of the respondents. Outdoor tennis out-polled golf though neither were very high. An interesting sidelight is that five of the ten highest ranking activities were passive pursuits such as driving or sunbathing. This is an interesting result in a survey of outdoor recreation activities which one might expect to primarily involve invigorating physical exercise.

In order to further simplify the analysis each respondent was given an activity rating. This rating was calculated from the responses to question 1. Classes of activity were designed by plotting the activity ratings on a normal curve. The five classes and the number of respondents in them are shown in Table III.

TABLE II.

Activities Ranked By Frequency
(Number of times done frequently and occasionally)

Activity	Rank*	Activity	Rank*
Driving for pleasure	69.3	Water skiing	23.5
Freshwater swimming	67.5	Sailing	22.6
Saltwater swimming	67.8	Basketball	21.1
Visiting museums, zoos & historical sites	66.3	Backpacking	21.0
Picnicking	63.5	Target shooting (rifle, traps, archery)	20.7
Bicycling	63.5	Miniature golf	20.1
Sun bathing	62.5	Jogging, track	19.2
Day hiking or walking for pleasure	53.3	Vehicle camping	18.6
Ice skating	51.7	Horse shows	18.0
Boston area activities	50.8	Badmitton	14.9
Craft & art fairs, antique shows, auctions	48.6	Snow mobiling	14.9
Freshwater fishing	48.3	Horseback riding	14.6
Pool swimming	44.3	Snow-shoeing	13.9
Nature observation (tide pool, marshes, forest)	44.0	Volleyball	13.6
Motor boating	43.0	Hockey	13.6
Live ball and hockey games	42.7	Motorcycling	13.3
Saltwater fishing	42.1	Indoor tennis	10.8
Tent camping	35.9	Flying	9.3
Sledding and tobagganing	34.1	Roller skating	9.0
Bird-watching	33.7	Dog shows	8.4
Outdoor tennis	32.2	Stock and sports car racing	7.7
Golf	30.3	Scuba diving	5.6
Canoeing	29.5	Soccer	5.3
Skiing (downhill & cross country)	28.5	Surfing	2.5
Farm animal shows	28.0	Dog racing	0.6
Outdoor concerts & plays	27.9	Horse racing	0.6
Hunting	26.0	Sky diving	0.6
Baseball	23.8		

* Percent activity was chosen as done whether frequently or occasionally.

TABLE III.

Activity Classes of Resident Recreation Survey

Class	Definition	No. Cases
Very Active	Greater than 2 standard deviations above the mean	12
Moderately Active	Between 1-2 standard and deviations above the mean	47
Active	+1 standard deviation	211
Moderately Innactive	Between 1-2 standard and deviations below the	48
Very Innactive	Greater than 2 standard deviations below mean	0

These activity indices were compared with other variables from the questionaire.

V. Results

Table II summarizes the results of Question 1 concerning the frequency of each activity. The information on where each activity took place is so voluminous that it cannot be listed here. It is available at the offices of the Council. The most important questions in the survey were number 2 and 3. Question 2 was designed to assess the respondents satisfaction with his recreation opportunities. Table IV shows the responses to that question. Table V shows the relationship between gender and recreation satisfaction. If "does not matter" and "do not go out" are considered to be negative or at least neutral indications of satisfaction, then women are markedly less satisfied with their recreational opportunities than men.

TABLE IV.

Responses to Question 2.

No. of Respondents	Response*
15	Extremely happy
81	Satisfied
154	Something missing
22	Not satisfied
9	Does not matter
28	Do not go out

* For complet[illegible]t of response see the survey schedule in Appendix A.

TABLE V.

Recreation Satisfaction By Percent Male and Female

	Male	Female
Extremely happy	6.5%	0.0%
Satisfied	29.1	17.3
Something missing	47.4	58.0
Not satisfied	6.5	8.6
Does not matter	2.6	3.7
Do not go out	7.8	12.3

Table VI shows the relationship between recreation satisfaction and activity index. It is clear that the very active people are not more satisfied with their opportunities. The moderately active people are more satisfied but still find something missing. In fact, the only group that seems satisfied with it's recreational opportunities are those who do not use them often.

TABLE VI.

Activity Index and Satisfaction With Recreational Opportunity (Percent)

Satisfaction	Very Active	Moderately Active	Active	Moderately Inactive
Extremely happy	0%	8.3%	3.8%	6.8%
Satisfied	16.7	27.1	25.5	31.8
Something missing	75.0	60.4	52.4	20.5
Not satisfied	8.3	4.2	8.7	2.3
Does not matter	0.0	0.0	1.0	15.9
Do not go out	0.0	0.0	8.7	22.7
	100.0	100.0	100.0	100.0

Table VII shows the relationship between gender and activity index. There is little difference in the activity indexes for male and females. What difference there is shows a higher percentage of women in the more active classes then men.

TABLE VII.

Activity Index By Gender (Per cent)

	Male	Female
Very Active	3.4	4.9
Moderately Active	14.3	17.1
Active	65.5	68.3
Moderately Inactive	16.8	9.8
	100.0	100.0

TABLE VIII.

COMMENTS BY RESIDENTS CONCERNING RECREATION*

No.	
40	More tennis facilities (indoor, outdoor, lights)
20	More bike trails and facilities
15	More swimming pools (indoor, outdoor, meets, lessons)
13	More ice skating rinks (indoor, w/hockey facilities)
12	More park areas (state, w/wide variety of activities)
9	Facilities adequate
9	More camping and tenting areas
9	More fish stocking and game stocking
9	More cultural activities and exhibits
9	Limit horsepower allowed on certain bodies of water
8	More advertising of recreational activities and facilities
8	Snowmobile trails (groomed, in cities)
7	More picnic areas
7	Acquire more land for parks (state, local), beaches and other future recreational expansion (on rivers)
6	Need more facilities (indoor, outdoor, public)
6	More organized sports programs (men & women, children, year round)
6	More water pollution control
6	Insure more access to water (fresh and salt)
5	Bug control
5	More playgrounds (in every town)
5	More nature reserves and trails
5	Horse trails or bridle paths
5	More boating facilities (salt and fresh water, in Rye Harbor, docking, etc.)
5	More public open space for recreation
5	More activities for children
5	Improve recreational areas and sports facilities

* Responses to Question 3 of Resident Recreation Questionaire.

Question 3 was an open-ended question whose purpose was to let the respondents let off some steam against the local officials. Table VIII shows the most frequently given responses. Not all res-

ponses were worded exactly alike but if the sense of a response was similar to one already existing, they were counted together. The five most mentioned comments all concern capital intensive development. Two of the five are related to activities which ranked high on the activity frequency list (Table II).

VI. Conclusion

The results may be used to begin to describe the perception of recreation opportunities of the residents and those activities which should be considered in future recreation development.

One point that may be made reasonably convincingly, is, that there are differences in the opportunities for men and women. Table VII shows that there are relatively more women active in recreation than men; while Table V shows that more women are disatisfied or only moderately happy with their recreation activities. Perhaps there is some sex discrimination in recreation.

It seems clear from other data in the study that the residents of the region are not completely satisfied with their opportunities and that those people who wish to use the facilities the most are the least satisfied. It seems also that this lack of satisfaction is in the area of capital intensive development which requires a large tax money imput to satisfy. It is also important to note that the facilities most wanted are those whose primary use is by individuals and not for organized team or league sports. In Table VII, the five most common comments are requests for more facilities, only one of which might be thoughtof as primarily for organized team sports (skating rinks). In Table II, baseball, the highest ranking team recreation activity, is twenty-seventh out of fifty-seven activities. Not very high for a staple of municipal recreation

programs throughout the country. It seems, from this survey at least, that we should be spending more money on non-competitive individual recreation pursuits. Unfortunately those activities cost more to provide.

1. What kinds of recreational activities have you and/or the other members of your household done during the past year? For each activity listed below please circle letters A, B, or C corresponding to how often you do it. Circle letter D if you would like to do the activity if the facilities were available. Then please specify the <u>town</u> and <u>state</u> where you do it <u>most often</u>.

A. Frequently
B. Occasionally
C. Never

D. Would like to

ACTIVITY	FREQUENCY	PLACE (TOWN AND STATE)
WATER-RELATED:		
water skiing	A B C D	
motor boating	A B C D	
canoeing	A B C D	
freshwater fishing	A B C D	
saltwater fishing	A B C D	
freshwater swimming	A B C D	
saltwater swimming	A B C D	
pool swimming	A B C D	
surfing	A B C D	
scuba diving	A B C D	
sailing	A B C D	
nature observation (tide-pool, marshes, forests)	A B C D	
CAMPING-RELATED:		
tent camping	A B C D	
vehicle camping	A B C D	
backpacking	A B C D	
day hiking or walking for pleasure	A B C D	
picnicking	A B C D	

A. Frequently
B. Occasionally
C. Never
D. Would like to

ACTIVITY	FREQUENCY	PLACE (TOWN AND STATE)
hunting	A B C D	
bird-watching	A B C D	
target shooting(rifle, traps, archery)	A B C D	
ORGANIZED:		
baseball	A B C D	
basketball	A B C D	
soccer	A B C D	
volleyball	A B C D	
badmitton	A B C D	
hockey	A B C D	
VEHICLE-RELATED:		
motorcycling	A B C D	
snow mobiling	A B C D	
bicycling	A B C D	
stock or sports car racing	A B C D	
flying	A B C D	
sky diving	A B C D	
driving for pleasure	A B C D	
INDIVIDUAL:		
ice skating	A B C D	
jogging, track	A B C D	
horseback riding	A B C D	
tennis, outdoors	A B C D	
tennis, indoors	A B C D	

A. Frequently
B. Occasionally
C. Never
D. Would like to

ACTIVITY	FREQUENCY	PLACE (TOWN AND STATE)
golf	A B C D	_____
minature golf	A B C D	_____
snow-shoeing	A B C D	_____
sledding and tobogganning	A B C D	_____
skiing (downhill & cross country)	A B C D	_____
roller skating	A B C D	_____
sun bathing	A B C D	_____
SPECTATOR:		
horse shows	A B C D	_____
dog shows	A B C D	_____
farm animal shows	A B C D	_____
craft & art fairs, antique shows, auction	A B C D	_____
visiting museums, zoos historical sites	A B C D	_____
live ball & hockey games	A B C D	_____
outdoor concerts & plays	A B C D	_____
Boston area activities	A B C D	_____
other: _____	A B C D	_____

PLEASE TURN PAGE OVER.

2. Which of the following statements best expresses your feelings about southeastern New Hampshire's recreation? (Please check only one.)

_____ We are extremely happy with recreation in this area. It has been better than we expected.

_____ We are satisfied. We can do everything we want to do.

_____ We are satisfied, but some kinds of things are missing.

_____ We are not satisfied. The activities we can do here are not what we want to do.

_____ We do not care much for outdoor recreation. It does not matter one way or the other to us.

_____ We do care about outdoor recreation, but we do not go out much.

3. What kinds of things, if any, should New Hampshire's local and state officials do to improve outdoor recreational opportunities in southeastern New Hampshire.

4. How long have you lived in New Hampshire? _____

Think back to before you moved here. Were New Hampshire's recreational opportunities among your reasons for moving here?

_____ Yes

_____ No, I came for other reasons.

_____ No, I was born here.

PLEASE TURN TO NEXT PAGE.

The following questions concern you and your household. This means all those people, both related and unrelated, who live with you at this address.

5. What is your age? _____ Your sex? (Check one) ____ Male ____ Female

6. Are you retired? (Check one) ____ Yes ____ No

7. What is your occupation? (If you are retired, please give your last permanent occupation.)

_____

8. How many people are living in your household including yourself? _____

9. What is the age, sex, relation to you, and occupation of each member of your household?

	AGE	SEX	RELATION TO YOU (Such as brother, wife, roomate)	OCCUPATION (If any)
a.				
b.				
c.				
d.				
e.				
f.				
g.				

10. In what city or town is your usual place of residence? _____

11. Do you own or often rent a second or vacation residence? ____ Yes ____ No

If so, in what town and state is it located? _____

12. Do you own or have access to a car? (Check one) ____ Yes ____ No

PLEASE TURN PAGE OVER.

13. What is the highest grade you have completed in school? (Check one)

_____ 7th grade
_____ 8th grade
_____ 9th grade
_____ 10th grade
_____ 11th grade
_____ 12th grade

_____ Some college
_____ Complete college
_____ Graduate school or more
_____ Vocational/Technical school or Apprenticeship program

THANK YOU FOR YOUR COOPERATION.

EXHIBIT E

WILLAND POND INVENTORY I-A FOR PROGRAM DEVELOPMENT

Interviewed: Richard L. Sirois - Somersworth Date: 11/15/78
Willand Pond Commission

I- Do you feel that your community could use further recreational facilities? Absolutely

II- What type of facilities are needed most?
Jogging trails, walking trails, picnic areas and communicating with nature areas.

III- Are you familiar with the Willand Pond area? Yes

IV- What type of facilities do you feel that Willand Pond area can support?
All of # II

V- Are you familiar with the Willand Pond history and do you feel that it's landmarks should be preserved?
absolutely

VI- Can you see a year round use in the Willand Pond area?
Yes

VII- What kind of management would be required for such an area? Depending on the extent of activities, a management team comprising a joint effort between Dover and Somersworth would be necessary.

REMARKS:

WILLAND POND INVENTORY I-A FOR PROGRAM DEVELOPMENT

Interviewed: Arnold Peters Date: 11/10/78
Willand Pond Commission
Willand Pond neighbor

I- Do you feel that your community could use further recreational facilities? Yes, minimal

II- What type of facilities are needed most?
Parks are balanced in Dover
Activities are established and maintenance

III- Are you familiar with the Willand Pond area?
Yes

IV- What type of facilities do you feel that Willand Pond area can support?
Walking, picnic, boating, fishing, future civic & family recreational. No large active recreation don't like swimming, fear it will pollute.

V- Are you familiar with the Willand Pond history and do you feel that it's landmarks should be preserved? Yes, point out, value of showing the past history

VI- Can you see a year round use in the Willand Pond area?
Yes, skating, ice fishing, cross country, no snow due to destroying weeds.

VII- What kind of management would be required for such an area?
a management group by both cities

REMARKS:

WILLAND POND INVENTORY I-A FOR PROGRAM DEVELOPMENT

Interviewed: Joseph Descutel - Somerworth. Date: 11/4/78
Willand Pond Commission - Willand Pond resident

I- Do you feel that your community could use further recreational facilities?
Yes

II- What type of facilities are needed most?
Park area, family recreational area

III- Are you familiar with the Willand Pond area?
yes

IV- What type of facilities do you feel that Willand Pond area can support?
Picnic area, playfields, trails, great place for family get together, swimming

V- Are you familiar with the Willand Pond history and do you feel that it's landmarks should be preserved?
Yes, fix up amphitheater keep the bear cave good for memories.

VI- Can you see a year round use in the Willand Pond area?
Ice fishing, cross country skiing, and snow shoeing

VII- What kind of management would be required for such an area?
Yes, keep drinking and vandals out, need control and surveilance.

REMARKS: Lived at Willand Pond 10 years. Feel pond need to be use, at present its uncontrolled and being destroyed. Notice that water level of pond has risen over the years. Where little pond meets large pond could cross with a 10 ft log. Has point well 15' down, many neighbor have the same. Recalls boxing in Central Park 1930's, also baseball field with Professional teams. Concern for fires by kids and adult use could lead to destruction of the pond site. Not [illegible]

WILLAND POND INVENTORY I-A FOR PROGRAM DEVELOPMENT

Interviewed: Ashton R. Hallett Date: 11-17-78
Dove Conservation Comission

I- Do you feel that your community could use further recreational facilities? Passive facilities - yes; active facilities - no.

II- What type of facilities are needed most?
Open space and walking trails; places where people can be alone or with their families to enjoy the natural world.

III- Are you familiar with the Willand Pond area?
yes

IV- What type of facilities do you feel that Willand Pond area can support?
Same as above — Open space & walking trails

V- Are you familiar with the Willand Pond history and do you feel that it's landmarks should be preserved? yes - Some familiar with Willand Pond history landmarks should be preserved, but only in a general way such as plaques, maps, sign designation, etc.

VI- Can you see a year round use in the Willand Pond area?
Yes - but only as a place to walk and observe the natural world and the changing seasons.

VII- What kind of management would be required for such an area? Signs designating types of trees, flowers, or land group. Perhaps an occasional sign to make one aware of a landmark.

REMARKS:

Essentially passive though with only guidance for further interest and personal research.

Skating and skiing is a great winter use.

Canoeing should be investigated and history should be highlighted.

WILLAND POND INVENTORY I-A FOR PROGRAM DEVELOPMENT

Interviewed: James Youngren Date: 11/2/78

Willand Pond Commission

I- Do you feel that your community could use further recreational facilities? NO

II- What typeof facilities are needed most?

None

III- Are you familiar with the Willand Pond area?

Yes

IV- What type of facilities do you feel that Willand Pond area can support?

Nature walks

Cross country skiing

V- Are you familiar with the Willand Pond history and do you feel that it's landmarks should be preserved?

Yes

VI- Can you see a year round use in the Willand Pond area?

Yes

VII- What kind of management would be required for such an area? Originally, I was in favor of development of Willand Pond Area for recreational purpose. Now I feel my support was a mistake. The development of the area because of the way it is broken up causes encroachment upon abbuttors. We are having great numbers after midnight swimmers, bonfires, and usage during time that it should not be use, but what they wait on the outskirts and return. Obviously land like this is nice to possess, but we had fewer problems before it was advertised as an open space and is being used as nighttime rendezvous. Frankly I don't think it would be safe to go there alone after dark in the summer. Therefore an area likes this (1) must be patrolled or be patrolable. (2) must have designated entrance (3) must have containers for trash. Should be one piece receptacles do not encroach on private property. (5) must have good buffer between private + public property. (6) Should have rules for use "open space" terms in the "open space."

REMARKS: The police have difficulty patroling it. They chase people

EXHIBIT F

Water Supply and Pollution Control Commission
Prescott Park
P.O. Box 95—105 Loudon Road
Concord 03301

January 29, 1979

Daniel A. Bisson
17 Nash Parkway
Somersworth, New Hampshire 03878

Subject: LABORATORY ANALYSIS # 86821
DATE COLLECTED 1-6-79

Dear Mr. Bisson:

The results of the sample submitted by you from Willand Pond indicate satisfactory water for swimming. However, at one time this pond was retained as a stand-by drinking water source for Dover and as long as that status remains (it may have been abolished) swimming would not be permitted.

Yours very truly,

Stephen W. Leavenworth, P.E.
Chief,
Water Supply Division

SWL/jtl

EXHIBIT G

Geological Survey Water Supply Paper 1695

Willand Pond Site is totally surrounded by an ice-contact deposits which are bodies of stratified drift built in contact with the ice. They are classified primarily on the basis of distinctive landforms, which include kames, kame plains, kame terraces, crevasse fillings, and eskers. These landforms are characterized by ice-contact slopes, collapsed surfaces, and kettles. A kame is a small hill or mound and at places is grouped with others to form a kame field. A kame terrace is a flat-topped feature abutting a valley wall on one side and bordered on the other side by an ice-contact slope dipping toward the valley floor. A kame plain also is flat-topped, but it is isolated by ice-contact slopes. Crevasse fillings and eskers are sinuous clongate ridges bordered by ice-contact slopes on both sides and generally ranging from a few tens to a few hundreds of feet in width.

Ice-contact deposits are the source of the larger ground water supplies. Because of their generally large permeability and specific yield, they are capable of yielding large amounts of water and of transmitting it rapidly. Properly constructed wells in these deposits produce several hundred gallons per minute. For example, wells Dover 5 were pumped continuously in 1956 and 1957 at rates of about 700 gpm. Other wells, including Dover 6, Hampton 7, Madbury 14, and Somersworth 1, reportedly have been pumped at rates greater than 600 gpm, although not continuously. (See Figure G-1)

* Geology and Ground Water Resources of Southeaster New Hampshire Prepared in co-operation with the N.H. Water Resources Board 1964.

The water table in the ice-contact deposits ranges from less than 1 foot to about 60 feet below the land surface. The depth to water is greatest in ice-contact features that are topographical high with respect to adjacent landforms.

A large kame plain underlies much of Somersworth and extends into Dover and Rollinsford on the south and Rochester on the north. At the northern end of the kame plain the saturated thickness of the ice-contact deposits is 50 feet or more. Well logs show that at the southern end the saturated thickness is as much as 75 feet. (See Figure G-1 Dover 25, and 80). The deposits are thin in the east-central part of the kame plain in the area northwest of Willand Pond (Somersworth 6 and 7), and possibly elsewhere.

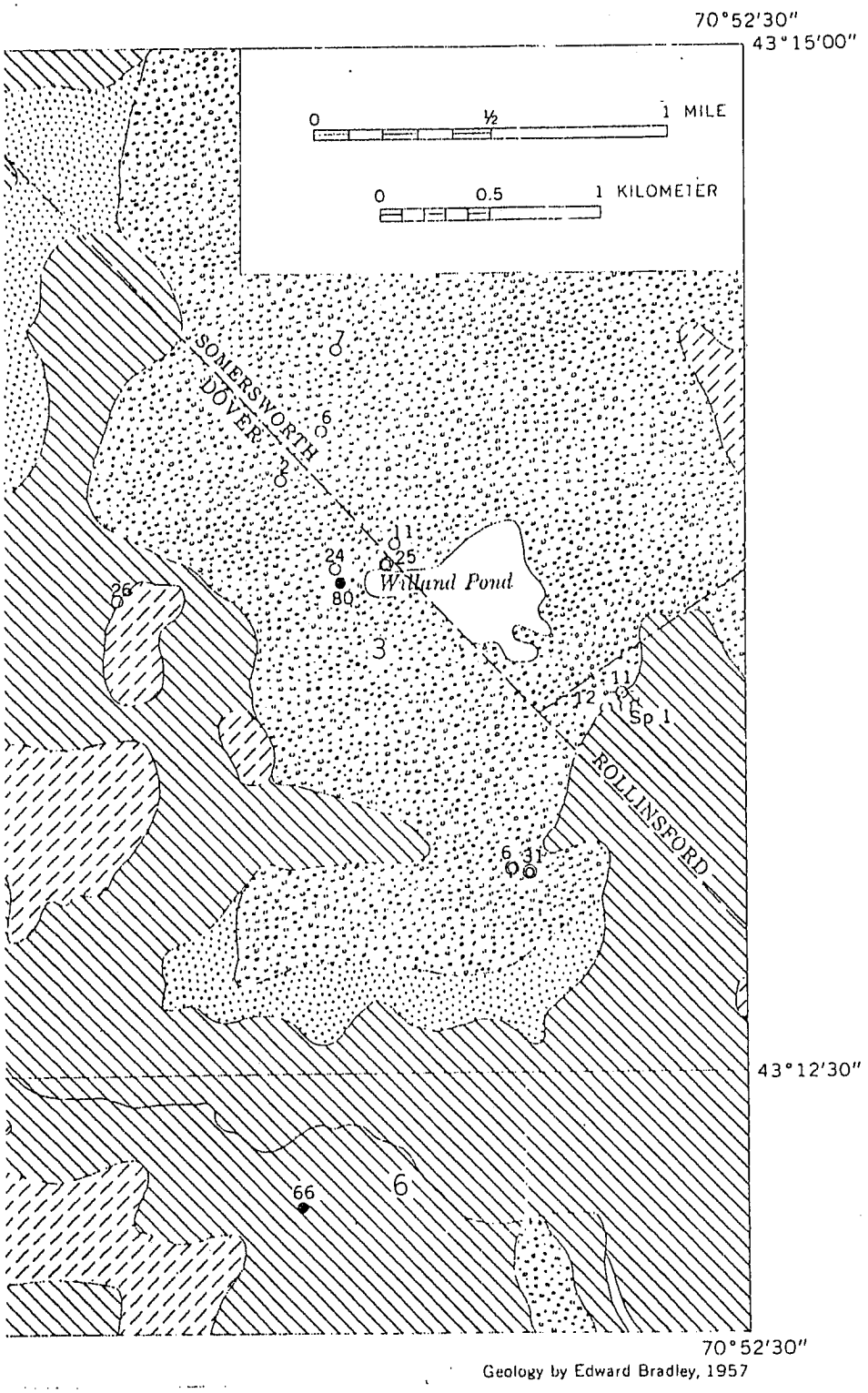
The city of Dover has three wells in the Willand Pond area, which is at the southern end of the Somersworth kame Dover 6, which yields about 700,000 gpd. is pumped at a rate of about 650 gpm. Dover 31, which is used intermittently when Dover 6 is not used, is pumped at a rate of about 625 gpm. and Dover 25 is pumped continuously at about 235 gpm. Several decades ago Dover obtained most of its water from Hussey springs (Rollinsford sp 1) about one-fourth of a mile southeast of Willand Pond. These springs flow at about 500 gpm. In the Willand Pond area, the ground water in the ice-contact deposits is hydraulically interconnected with the water in Willand Pond, and the storage capacity of the pond may, therefore, supplement that of the ground water reservoir.

The quality of the ground water from the wells in the Willand Pond area is good, except for excessive quantities of iron reported in the water from heavily-pumped wells.

As noted in the first paragraph of this statement, the deposits in part of the east central section of the kame plain and northwest of Willand Pond are known to be thin; however, much of the kame plain remains to be explored.

Wells and Test Boarings
(Figure

This paper logged many wells and test boarings in Southeastern New Hampshire. The following tables have selective logs of wells and test boaring in and around the Willand Pond Site. Following pages are the results of the wells and boarings.



Geology by Edward Bradley, 1957

EXPLANATION

Recent
- Alluvium
- Outwash and shore deposits

Pleistocene
- Marine deposits
- Ice-contact deposits
- Till

QUATERNARY

- Well
- Public-supply well
- Test hole
- Spring
- Bedrock well

Location of Area B shown on Plate 2

LOCATION OF TEST WELLS & BOARINGS

Figure G-1

Logs of Selected Wells and Test Holes

STRAFFORD COUNTY

	Thickness (Feet)	Depth (Feet)
Dover 6. Alt. 180 feet		
Ice-contact deposits:		
Soil and disturbed material. . . .	5	5
Sand, fine	25	30
Sand, fine to coarse	20	50
Sand, coarse, and gravel	35	85
Till:		
Sand and clay.	5	90
Dover 80. Alt. 203 feet		
Ice-contact deposits:		
Sand and gravel.	90	90
Bedrock	505	595
Dover 25. Alt. 203 Feet		
Ice-contact deposits:		
Sand, coarse, brown.	5	5
Sand, fine, brown.	5	10
Sand, fine, gray	5	15
Sand, Fine, Brown.	10	25
Gravel, coarse	3	28

Cont.

Sand, fine brown	2	30
Gravel, coarse, brown	8	38
Sand, fine, gray	2	40
Sand, coarse, gray	5	45
Sand, coarse, brown	5	50
Gravel, coarse, gray	10	60
Sand, dark brown	5	65
Sand, hard-packed.	5	70
Gravel, coarse	5	75
Sand, brown.	1	76
Gravel, coarse, brown.	2	78
Sand, coarse, gray	2	80
Till:		
Clay and sand, or hardpan. . . .	27	107
Bedrock		107

Chemical Analyses of Water Samples

Well no.	Dover # 6	Dover # 6	Dover # 11	Dover # 24	Dover # 25
Collected	9/24/52	5/14/54	5/13/54	5/3/54	4/21/55
Temperature (°F)	-	-	46.0	48.0	-
Silica	-	-	14.0	6.6	-
Dissolved iron	3.0	3.0	.1+	-	.1+
Total Iron	-	-	-	.08	-
Manganese	-	-	.01	.03	-
Calcium	-	-	3.5	3.9	-
Magnesium	-	-	.8	.5	-
Sodium	-	-	3.3	8.7	-
Potassium	-	-	-	-	-
Bicarbonate	-	-	14	4	-
Chloride	6.2	8.2	4.0	9.5	11
Sulfate	-	-	1.6	5.0	-
Fluoride	-	-	.0	.0	-
Nitrate	.0	.3	.4	11.0	.2
(Residue on evaporation at 180° C) Dissolved Solids	-	-	36.0	52.0	-
Hardness as $CaCO_3$: Calcium and magnesium	-	-	12.0	9.0	-
Hardness as $CaCO_3$: Noncarbonate	-	-	1.0	6.0	-
Specific conductance (micromhos at 25° C)	-	-	43.0	72.0	-
pH	6.4	6.3	7.0	6.0	6.1
Color	-	-	3.0	5.0	-

NOTE: ANALYZED BY NEW HAMPSHIRE STATE DEPT. HEALTH

EXHIBIT H

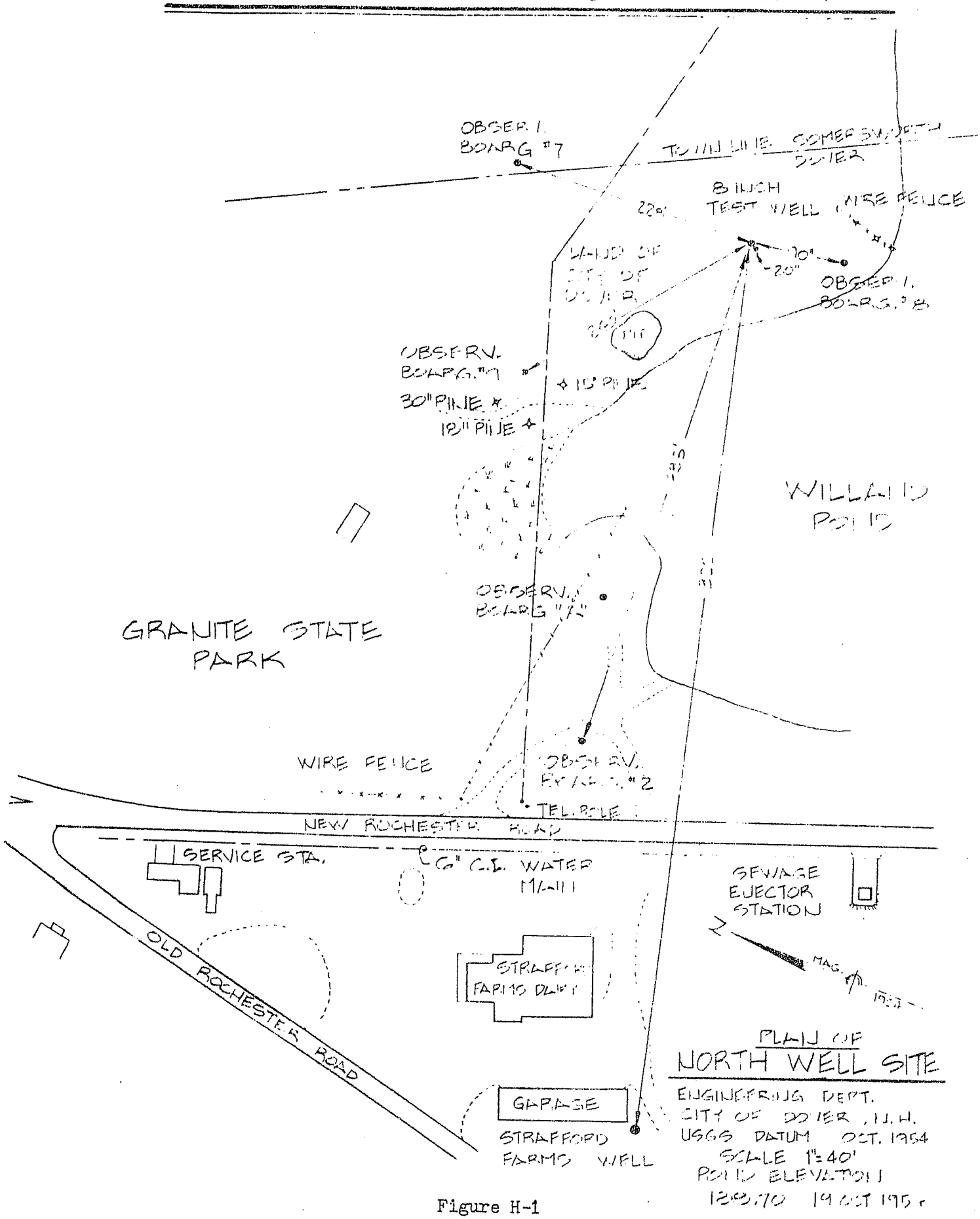

WILLAND POND WELL EXPLORATION
OBSERV. BORG #7
TOWN LINE SOMERSWORTH DOVER
8 INCH TEST WELL
WIRE FENCE
LAND OF CITY OF DOVER
OBSERV. BORG. #8
OBSERV. BORG. #1
15" PIPE
30" PIPE
18" PIPE
WILLAND POND
OBSERV. BORG #2
GRANITE STATE PARK
WIRE FENCE
TEL. POLE
NEW ROCHESTER ROAD
SERVICE STA.
6" C.I. WATER MAIN
SEWAGE EJECTOR STATION
MAG. N.
OLD ROCHESTER ROAD
STRAFFORD FARMS DAIRY
GARAGE
STRAFFORD FARMS WELL
PLAN OF
NORTH WELL SITE
ENGINEERING DEPT.
CITY OF DOVER, N.H.
USGS DATUM OCT. 1954
SCALE 1"=40'
POND ELEVATION
129.70 19 OCT 195

Figure H-1

In 1954 the Chas. T. Main, Inc. made a study to find a site for a well on th north side of Willand Pond. We have extracted the basic information from the study as follows.

Report on Explorations for North Willand Pond Well

Introduction - The Chas. T. Main, Inc. Report "Explorations For A New Well" dated July 27, 1954, suggested a program of explorations in the general area north of Willand Pond. Bids for making borings and test wells were received from four well drilling firms August 18, 1954 and a contract awarded to the Chapman Company of Oakdale, Mass., the low bidder. Finding of drilling are as follows:

8-Inch Test Well

On the basis of pumpage test results for the 2-inch boring, particularly W.T it was decided to install an 8-inch test well a short distance from the shor line of Willand Pond (Figure H-1). The drilling of the 8-inch test well sta on October 18th and was finished October 19th. The Log of the 8-inch test w was reported as follows:

From	To	Material
0'	5'	Coarse brown sand
5	10	Fine brown sand
10	15	Fine grey sand
15	25	Fine brown sand
25	28	Coarse gravel-Water bearing
28	30	Fine brown sand-Water bearing
30	38	Coarse brown gravel-Water bearing
38	40	Fine grey sand-Water bearing
40	45	Coarse grey sand-Water bearing
45	50	Coarse brown sand-Water bearing

Cont.

50	60	Coarse grey sand-Water bearing
60	65	Dark brown sand-Water bearing
65	70	Hard packed sand-Water bearing
70	75	Coarse gravel-Water bearing
75	76	Brown sand-Water bearing
76	78	Coarse brown gravel-Water bearing
78	80	Coarse grey sand-Water bearing
80	107	Clay-sand hard pan
107	109	Ledge

Pumpage Test of 8-Inch Test Well

The maximum drawdown, water level elevation, and time at which the drawdown was reached for the 8-inch test well and several borings may be summarized as follows:

Test Well & Borings	Static W.L. Elev.	Hours*	W.L. Elev. Max. D.D.	D.D. Feet	W.L. Elev. After 114.5 Hrs. Recovery
8-inch Test Well	189.54	3±	168.54	21.00	189.79
W.P. #8	188.85	4±	175.02	13.83	188.64
W.P. #5	188.78	7±	187.51	1.27	188.59
Willand Pond	188.70			No Effect	?
W.P. #9	189.13	11±	188.55	0.58	188.97
W.P. #7	190.03	7±	188.72	1.31	188.97
W.P. #2	189.08±	5±	188.95	No Effect	188.95
Strafford Farm**	189.20			No Effect**	?

* To reach W.L. Stabilization during pumping i.e. maximum drawdown.

** W.L. variations in Strafford Farm well ranged from Elev. 188.00 to Elev. 189.12 affected by operation of the well pump.

Test Borings

Boring W.P. #1 - W.P. #7 inclusive were jetted down by the two-inch jet rig in area along the north shore of Willand Pond east of New Rochester Road. The logs of these borings were reported as follows:

Boring	W.P. #1	W.P. #2	W.P. #3
Depth	28'	45'	45'
	0-28 Coarse Sand	0-20 Fine Sand	0-20 Coarse Sand
	28 Refusal	20-45 Coarse Gravel	20-45 Coarse Gravel

Cont.

W.P. #5	W.P. #4	W.P. #6	W.P. #7
41'	40'	25'	28'
0-10 Coarse 10-41 Coarse Gravel	Same as No. 5	0-10 Sand & Gravel 10-25 Coarse Gravel	0-28 Sand & Gravel 28 Refusal

*No. 7 on hill in goat pasture farthest from Shore of Willand Pond.

W. P. = Willand Pond

Pumpage Test of 2-Inch Borings -

Two of the 2-inch test borings were pumped for preliminary information as to probable water quantities in the water bearing strata. The results of these pumpage tests were as follows.

Test Boring	Date	Hours	Pumpage Rates GPM	Drawdown	Remarks
W.P. #2	9/23/54	2	50		
W.P. #5	9/22/54	3	100	11-1/2"	Recovery 11"in 1 min.

Water Analyses -

Two samples of water from the 8-inch test well were sent to the State Laboratory for analyses. The results of these analyses were as follows:

November 3, 1954	56633	56682

Cont.

	Well #1 8" pump	New Well
Collected	10/20/54	10/22/54
*Turbidity	2	Opal-1
*Sediment	C	0
*Odor	0	0
Color	25	15
Free ammonia nitorgen	.002	.002
Alb. ammonia "	.004	.002
Nitrite "	0.2	0.3
Nitrite "	-	-
Chlorine as chloride	13.8	12.0
Hardness	22	20
Iron	0.6	0.6
Coliform organisms in (0.01 c.c.		
(0.1 c.c.	Negative	
(1 c.c.	"	
(10 c.c.	" (5)	
M.P.M.B. coli per 100 c.c.	less than 2.0	
Alkalinity		5
pH	6.8	6.3

56633-carbon dioxide 7.0 ppm
56682- " " (calculated) 5ppm

It is significant that both of the water samples included 0.6 ppm of iron and 5 to 7 ppm of carbon dioxide. Thus, the iron content corresponds to the iron content which has been found in Willand Pond by a considerable number of water samples analyzed by the State Laboratories.

Cont.

The amount of CO_2 is sufficient to justify neutralization with an alkali. Since the indicated hardness was only 20-22 ppm, the amount of calcium in the water may be too low for best results with soda ash. Lime may be the more likely neutralizing alkali. Additional chemical analyses of the water together with stabilization experiments should be made to definitely determine whether lime or soda ash would be the most economical chemical to use for neutralizing the CO_2.

Records of selected wells and test holes

Well no.	Owner or user	Year completed	Alt. of land surface datum (feet)	Depth (feet)	Dia. of well (inches)	Geologic unit	Water level Depth	Water level Date	Reported yield (gpm)
2	Herbert D. Harriman	1952	210	23.0	1¼	Ice-contact deposits	16.12	10-8-53	
24	Strafford Farms Dairy	1953	203	30	96	do	16	-54	
25	Dover (Willand Pond)	1954	203.02	65	8	do	14.3	9- -54	Reported yield 220 gpm.
26	J. V. McCarthy	1900	183	25.0	36	Till	14.30	8-11-54	
31	Dover (Layne Well)	1931	180	85	18	Ice-contact deposits	25	-54	Reported yield 610 gpm.
80	Strafford Farms Dairy	1948	203	595	-	Bedrock	-	-	Report yield 5 gpm.
7	S. J. Merrill Estate	1936	220	86	10	do	20	-36	Report yield 4 gpm.
11	City of Dover	1954	205	28	2	-	15.73	1-11-55	

EXHIBIT J

SOIL TYPES AND DESCRIPTION

ON AND AROUND

THE WILLAND POND SITE

Source

Soil Survey of Strafford County

New Hampshire

United States Dept. of Agriculture

Soil Conservation Service

Issued March 1973

— Windsor loamy sand, 0 to 3 percent slopes (WdA)

The Windsor series consists of excessively drained, stone-free soils that formed in thick deposits of sands on plains and terraces. They are nearly level to gently sloping in most areas, but they are sloping to very steep on terrace breaks.

A representative profile of a Windsor soil in a cultivated area has a very dark grayish-brown loamy sand surface layer 6 inches thick. The upper part of the subsoil is dark-brown and yellowish-brown loamy sand that extends to a depth of about 16 inches. The lower part of the subsoil, to a depth of about 25 inches, is loose, yellowish-brown medium sand. The underlying material to a depth of about 68 inches is light yellowish-brown and light olive-brown loose sand and very friable loamy fine sand.

Windsor soils are rapidly permeable and have very low available water capacity. There are no serious limitations for most nonfarm uses.

— Hinckely loamy sand, 0 to 3 percent slopes (HaA)

— Hinckley loamy sand, 3 to 8 percent slopes (HaB)

— Hinckely loamy sand, 15 to 60 percent slopes (HbE)

The Hinckley series consists of excessively drained soils that formed in thick deposits of stratified sand and gravel. Cobbel-stones are common in some layers. These nearly level to very steep soils are on kames, terraces, and outwash plains.

A representative profile of a Hinckley soil in a plowed area has a dark-brown loamy sand surface layer 10 inches thick overlying a yellowish-brown loamy sand and gravelly loamy sand subsoil that extends to a depth of about 20 inches. Below this, the underlying material to a depth of about 40 inches is loose yellowish-brown to brownish-yellow very gravelly sand.

Permeability of these soils is rapid, and available water capacity is very low. Hinckley soils have few limitations for most nonfarm uses. There is danger of contamination of wells and streams from subsurface sewage disposal systems or sanitary landfill operations. Many areas of Hinckley soils are a source of sand and gravel for contruction work.

— Gravel and Borrow Pits (Gv)

Gravel and borrow pits (Gv) are open excavations from which gravel, sand, clay, and other materials have been removed. Typically, these excavations are located on plains, on terraces, and along streams.

— Muck and Peat (Mp)

Muck and peat (Mp) consists of organic matter in deposits that are 18 inches to more than 10 feet deep. In most places deposits are at least 3 feet deep. Forested areas produce red maple, alder, willow, hemlock, spruce, tamarack, and swamp white-cedar.

Muck and peat is in formerly ponded depressions on uplands, on sand plains, and on flood plains where plant remains have accumulated for a long time. The ground water is near enough to the surface to keep the plant remains saturated most of the year. This helps to preserve the remains. The depressions are frost pockets in which frost is likely to occur very late in spring and very early in fall. Some of the depressions are flooded by runoff from higher areas.

—— Made Land (Ma)

Made land (Ma) consists of areas that have been filled with various kinds of soil material or trash and then leveled. The soils can no longer be identified because the natural soil profile has been covered or destroyed by earthmoving operations.