DESIGN MEMORANDUM NUMBER 1 C

MASTER PLAN

FOR

DEVELOPMENT AND MANAGEMENT

OF

B. A. STEINHAGEN LAKE

AND

TOWN BLUFF DAM

NECHES RIVER, TEXAS

U. S. ARMY ENGINEER DISTRICT FORT WORTH, TEXAS

DECEMBER 1971 COPY NUMBER 43

TABLE OF CONTENTS

APPENDIX

LIST OF CHARTS

LIST OF TABLES

LIST OF PLATES

NECHES RIVER BASIN, TEXAS

'DESIGN MEMORANDUM NO. 1C (REVISED DECEMBER 1971)

REVISED MASTER PLAN
FOR B. A. STEINHAGEN LAKE
NECHES RIVER, TEXAS

This report, prepared by the Master Planning Task Force, Fort Worth District, has been coordinated with the Engineering Division, the Real Estate Division and the Operations Division and is recommended for approval.

D. L. Orendorff — 7 Jan 72
Chief, Engineering Division — Date

John B. Beardsley
Chief, Real Estate Division — Date

Allie J. Mathis — 7 Jan 1972
Chief, Operations Division — Date

DESIGN MEMORANDUM NO. 1C

B. A. STEINHAGEN LAKE
NECHES RIVER, TEXAS

DECEMBER 1971

REVISIONS

DATE	NEW PAGES OR DRAWINGS

INTRODUCTION

The objective of resource planning is to obtain an orientation towards proper utilization and adequate stewardship of resources in their operation, maintenance and management. Accomplishment of this objective through sound planning principles, coupled with proper resource and operational management plans - natural, created, and human - will enable public use of the resource while preserving the qualities of the environment.

The Institute for Water Resources recently stated four environmental objectives for the Corps of Engineers. These have now been incorporated into Engineer Regulation 1165-2-500. These objectives form a foundation for master planning and resource management philosophy and will be implemented to the fullest extent possible. They are:

"1. To preserve unique and important ecological, aesthetic, and cultural values of our national heritage.

2. To conserve and use wisely the natural resources of our Nation for the benefit of present and future generations.

3. To enhance, maintain, and restore the natural and man-made environment in terms of productivity, variety, spaciousness, beauty, and other measures of quality.

4. To create new opportunities for the American people to use and enjoy their environment."

All resources will be managed for multiple use in accordance with current policy (ER 1130-2-400) and other applicable regulations. These resources are the property of both present and future generations. Given these valuable resources, it is our duty as stewards to protect and provide proper management while they are in our care. Proper management is defined as planning, organizing, directing and controlling the use of project resources. Measures such as limiting or denying the use of all or part of a resource will become part of the management program when such use becomes detrimental or permanently damaging to that resource.

"Ecological" management of both natural and created resources will become the goal of all personnel involved in the management program. In seeking this goal, managers at both the field and district level should recruit professional personnel and provide continued in-service training in resource management principles in order that the objectives outlined above are attained. Management at all levels must be alert to changing technology, new management methods, and changing user preferences as they may affect the development and use of the resource. Through the application of this general philosophy we can insure that short-term uses or gains shall not take the place of long-term goals.

I. BACKGROUND INFORMATION

1-01 Pertinent Data

A. Authority

	TYPE	AUTHORITY	DATE
1.	Project	River & Harbor Act	2 Mar 1945
		changed to Town Bluff Dam and B. A. Steinhagen Lake (Public Law 90-46)	4 Jul 1967
2.	Recreation	Sec 4 Flood Control Act (Public Law 534) 78th Congress, 2nd Session	22 Dec 1944
		Amended by: Flood Control Act (Public Law 526) 79th Congress, 2nd Session	24 Jul 1946
		Sec 209 Flood Control Act	3 Sep 1954
3.	Fish & Wildlife	F&WL Coordination Act Amended by Public Law 85-624 (72 Stat 563)	1958
4.	Land Acquisition	Approved Public Law 14	2 Mar 1945
		Design Memo approved OCE to SWD	30 Sep 1948
5.	Permits	SWDR 1130-2-7	25 Sep 1968
		FWDR O&M Manual	
		ER 405-1-830	24 Mar 1964
6.	Leasing	ER 405-2-835	24 Mar 1964
		Amended	9 Nov 1964
		Amended	30 Aug 1965
		ER 405-1-830	24 Mar 1964
7.	Cost Sharing	Implementation of the Federal Water Project Recreation Act Public Law 89-72	2 Aug 1965
8.	Vegetation	Public Law 86-717	6 Sep 1960
		Public Law 89-298 Sect 302	27 Oct 1965

B. History

1. Definite Project Report:

The report presenting the definite project plan for B. A. Steinhagen Lake* was transmitted to the Chief of Engineers, Department of the Army, Washington, D. C. by letter dated 22 September 1947, subject:

* Previously called Dam B Dam and Reservoir.

"Neches and Angelina Rivers, Texas, Definite Project Report". This report is in agreement with the design approved by the Board of Consultants and is based on the assumption that Sam Rayburn* Reservoir would be built prior to or concurrently with B. A. Steinhagen Lake**. However, this report does not present the current design of B. A. Steinhagen Lake which is based on a subsequent decision to enlarge and build Town Bluff Dam first in order to meet more quickly the immediate water needs of the lower Neches River Valley area.

2. Master Plan:

The "Master Plan for Recreational and Land Use, Dam "B" Dam and Reservior, Neches River, Texas", was transmitted to the Chief of Engineers, by letter dated December 1951, and was approved by the Chief of Engineers, dated 16 July 1952.

3. Status of Project:

Construction of B. A. Steinhagen Lake** was started on 22 March 1947 and deliberate impoundment was started on 16 April 1951. Construction of the dam was completed in June 1953. On 4 July 1967, as directed by Public Law 90-46, the title Dam "B" Dam and Reservoir was changed to Town Bluff Dam and B. A. Steinhagen Lake. To date $639,500 has been spent for recreational facilities.

C. Scope

1. Project Purpose:

The purpose of B. A. Steinhagen Lake, as stated in the definite project report is to regulate the intermittent power releases from the Sam Rayburn and Rockland*** Power Plans providing head for diversion into a water supply canal and storage from which water will be released for the benefit of rice culture, salinity control, pollution

* Previously called McGee Bend Reservoir.
** Previously called Dam B Dam and Reservoir.
*** To date, Rockland Lake has not been constructed.

abatement, navigation, and municipal and industrial uses. The lake and adjacent areas are being developed for recreational purposes and the conservation of natural resources.

2. Purpose of the Master Plan:

The purpose of the Master Plan is to provide a comprehensive plan concerned with effective conservation, protection, development, use, enhancement, and management of visitors, water, land, vegetation, wildlife, and other project operations in the broad public interest encompassing all existing and contemplated Federal, State, and local public recreation and conservation developments within the region.

3. Purpose of This Revised Master Plan:

This design memorandum presents a Revised Master Plan for development and management of the resources at B. A. Steinhagen Lake. The concepts of the plan are to optimize the overall project management objectives, obtain the optimum utilization of the project area for public use, and provide proper stewardship of the natural resources.

4. Purpose of the Plans of Development:

The purpose of the plans of development are:

(a) to indicate the planned development for the next five years;

(b) to list the accomplished development to date;

(c) to indicate areas in need of upgrading such as: vegetation, soil conditions, facilities, etc.

The plans, cost estimates and recreational analyses will be reviewed and updated annually. Revised drawings, estimates and pages of the text will be submitted for approval to SWD and OCE and insertion in the basic Revised Master Plan document herein.

The field personnel will receive a detailed site plan of the proposed use areas to aid them in any construction for which funds

are allocated. For no reason will a use area be developed past its optimum carrying capacity. Also, it will not be developed without (1) approval of SWD and OCE and (2) coordinating with district personnel.

D. Regional Utilization:

1. Region Served:

East Texas is the major area which attracts visitors to B. A. Steinhagen Lake.

2. Transportation:

The primary mode of transportation of visitors to the lake is vehicular.

3. Population:

See 3-06, A, for population data.

4. Economy:

The areas within the two zones of influence are devoted primarily to lumbering and agricultural pursuits. The area is rich in natural resources, the more important being petroleum, petroleum by-products, timber, iron ore, gravel, and brick clay.

5. Related Recreation Areas:

There are four National forests, four state parks, including Martin Dies, Jr. State Park, and several privately owned forests and lakes within the 100 mile radial zone of influence. (See Table 1, pages 8 and 9). Plate 1.1 (following page 12) shows the location of recreational areas within the 100 mile radial zone of influence as well as others beyond this zone. Sam Rayburn Reservoir, a very popular recreation site, is approximately 15 miles northeast of the project. Two other recently completed lakes within the 100 mile radial zone are Toledo Bend and Lake Livingston. Nineteen years of operation have shown that the recreation development at this project definitely complements rather than competes with the other recreational areas referred to in Table 1. This

same relationship is expected to continue under the development plans included in Section III, Plan of Development.

6. Local Recreation Habits and Interest:

A recreation survey taken in 1969 indicated that the main recreational activity on the lake is fishing, followed by sightseeing, camping, picnicking, and swimming, in that order. Other occasional activities include pleasure boating, water skiing and hunting.

TABLE 1
REGIONAL RECREATIONAL AREAS

	Name	County	Approximate Distance from B. A. Steinhagen Lake Miles	Administering Agency	Purpose	Available Recreational Facilities: Fishing	Swimming	Boating	Picnicking	Camping
11	Sam Houston National Forest	San Jacinto Walker Montgomery Liberty	70 SW	United States Forest Service	Multi-purpose					
12	Sam Houston State Park	Calcasieu	70 SE	State of Louisiana	Recreation				X	X
13	Washington On-the-Brazos State Park	Washington	125 SW	State of Texas	Historic					

TABLE 1
REGIONAL RECREATIONAL AREAS

	Name	County	Approximate Distance from B. A. Steinhagen Lake Miles	Administering Agency	Purpose	Available Recreational Facilities: Fishing	Swimming	Boating	Picnicking	Camping
16	Laccassine National Wildlife Refuge	Cameron	100 SE	Bureau of Sports Fishery & Wildlife	Wildlife Refuge					
9	Longfellow Evangeline State Park	St. Martin	145 SE	State of Louisiana	Recreation				X	X
14	Mansfield Battle State Park	DeSoto	95 NNE	State of Louisiana	Historic					
15	Martin Dies, Jr. State Park	Jasper	0 E	State of Texas	Recreation	X	X	X	X	X
4	Mission Tejas State Park	Houston	100 WNW	State of Texas	Historic					X
17	Sabine National Wildlife Refuge	Cameron	90 S	Bureau of Sports Fishery & Wildlife	Wildlife Refuge					
10	Sabine National Forest	Shelby San Augustine Sabine	60 N	United States Forest Service	Multi-purpose					

TABLE 1
REGIONAL RECREATION AREAS

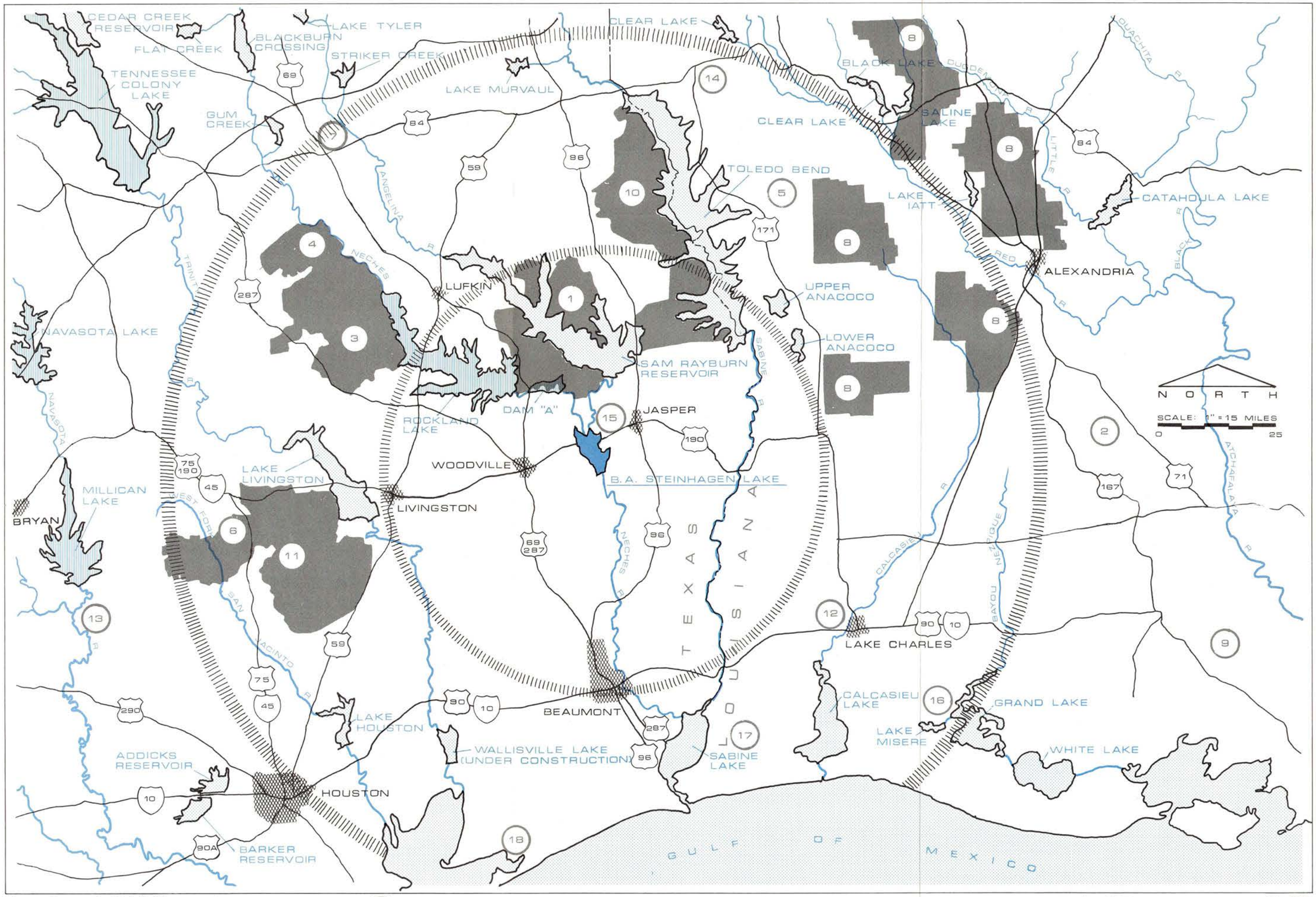
	Name	County	Approximate Distance from B. A. Steinhagen Lake Miles	Administering Agency	Purpose	Available Recreational Facilities				
						Fishing	Swimming	Boating	Picnicking	Camping
1	Angelina National Forest	Angelina Nacogdoches San Augustine Jasper	30 N	United States Forest Service	Multi-purpose					
2	Chicot State Park	Evangeline	130 E	State of Louisiana	Recreation			X	X	X
3	Davy Crockett National Forest	Houston Trinity	80 WNW	United States Forest Service	Multi-purpose					
5	Fort Jessup State Park	Sabine	100 NE	State of Louisiana	Historic					
6	Huntsville Sat State Park	Walker	90 WSW	State of Texas	Recreation				X	X
7	Jim Hogg State Park	Cherokee	110 NW	State of Texas	Historic					
8	Kisatchie National Forest	Vernon Rapides Grant Winn Nacogdoches	60-100 NE	United States Forest Service	Multi-purpose				X	X

TABLE 1
REGIONAL RECREATIONAL AREAS

Name	County	Approximate Distance from B. A. Steinhagen Lake Miles	Administering Agency	Purpose	Available Recreational Facilities: Fishing	Swimming	Boating	Picnicking	Camping
Sam Rayburn Reservoir	Jasper Angelia Sabine Nacogdoches San Augustine	20 NE	Corps of Engineers	Flood Control Power Municipal Industry Irrigation Recreation	X	X	X	X	X
Striker Lake	Rusk Cherokee	90 N	Angelina and Nacogdoches W.C. & I.C. No. 1	Municipal Industry	X	X	X	X	X
Toledo Bend Reservoir	Newton Panola Sabine Shelby	40 NE	Sabine River Authority	Municipal Industry Irrigation Power Recreation	X	X	X	X	X
Land Oriented									
Anahuac National Wildlife Refuge	Chambers	90 S	Bureau of Sports Fishery and Wildlife	Wildlife Refuge					

TABLE 1
REGIONAL RECREATIONAL AREAS

Name	County	Approximate Distance from B. A. Steinhagen Lake Miles	Administering Agency	Purpose	Available Recreational Facilities: Fishing	Swimming	Boating	Picnicking	Camping
Water Oriented									
Houston County Lake	Houston	100 NW	Houston County W.C. & I.C. No. 1	Municipal Industry	X	X	X	X	X
Houston Lake	Harris	80 SW	City of Houston	Municipal Industry Irrigation Mining Recreation	X	X	X	X	X
Jacksonville Lake	Cherokee	100 NW	City of Jacksonville	Municipal Recreation	X	X	X	X	X
Livingston Lake	Polk San Jacinto Trinity Walker	55 W	City of Houston Trinity River Authority	Municipal Industry Irrigation	X	X	X	X	X
Murvaul Lake	Panola	80 N	Panola County Fresh Water Supply Dist. No. 1	Municipal Industry Recreation	X	X	X	X	X



U. S. ARMY
ENGINEER DISTRICT
FORT WORTH
FT. WORTH, TEXAS

MASTER PLAN LAKE
EXISTING
PROPOSED

4 POINTS OF INTEREST (SEE TABLE FACING PAGE)
NATIONAL FOREST
RIVERS

10 INTERSTATE HIGHWAY
75 U. S. HIGHWAY

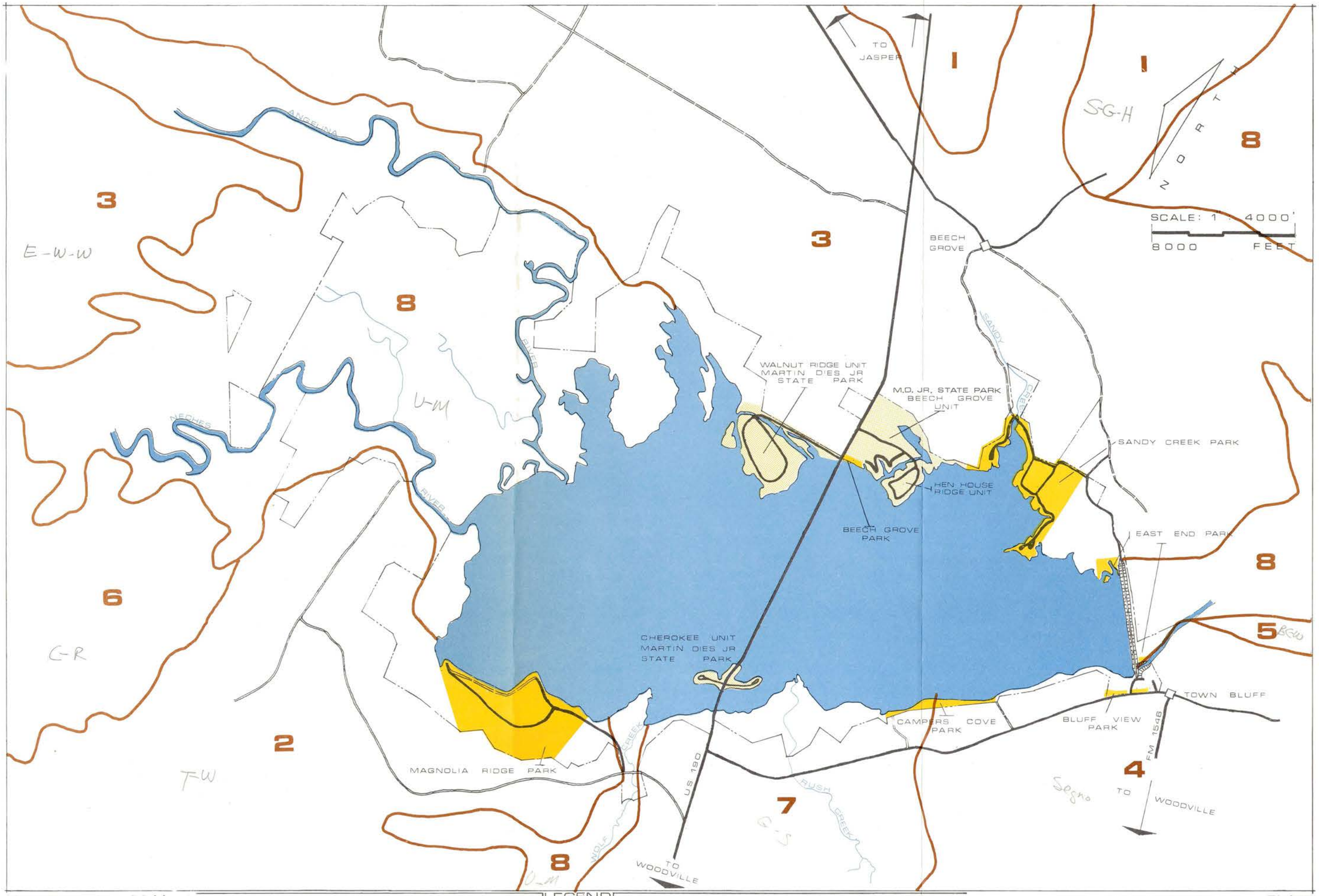
AREA OF INFLUENCE (50 & 100 MILE RADII)
CITIES

B. A. STEINHAGEN LAKE

REGIONAL RECREATION MAP

PLATE **1.1**

DATED: DECEMBER 1971



U. S. ARMY
ENGINEER DISTRICT
FORT WORTH
FT. WORTH, TEXAS

LEGEND

2 7 5 — SOIL TYPE BOUNDARY
SOIL TYPE AREA
SEE NARRATIVE FOR DESCRIPTION

PARK (CORPS)
PARK (OTHER)
SPECIAL USE AREA

WATER AREA
ROADS (PAVED)
ROADS (OTHER)
GOV'T. FEE LINE

B. A. STEINHAGEN LAKE

GENERAL SOILS MAP

DATED DECEMBER 1971

PLATE 1.2

1-02 Project Description

A. General

1. Location and Physical Data:

B. A. Steinhagen Lake is located on the Neches River in the east-central and west-central portion of Tyler and Jasper Counties, respectively. The dam site is about 113.7 river miles above the mouth of the Neches River and 12.4 miles below the confluence of the Neches and Angelina Rivers, approximately 0.5 mile north of Town Bluff, Texas. Location of the project is shown on Plate 1.1, following page 12.

2. Accessibility

a. Roads:

U. S. Highway 190, extending in an east-west direction, crosses the lake area approximately 4 miles above the dam site between Woodville and Jasper, Texas. State Highway 92 from Silsbee, Texas, passes in front of the project office at the west end of the dam.

b. Railroads

A branch line of the Texas and New Orleans Railroad passes through Woodville approximately 14 miles west of the dam site. A branch line of the Gulf, Colorado, and Santa Fe Railroad passes through Jasper about 17 miles to the northeast of the lake.

c. Air:

Jasper County Airport is located approximately 9 miles east of the dam site off U. S. Highway 190.

3. Lake Watershed Provisions:

The drainage area above the Town Bluff Dam is approximately 7,585 square miles. The water level at B. A. Steinhagen Lake will be maintained at elevation 83, as far as practicable. With the water surface at elevation 83, the width of the lake near the dam is about 1 mile

and gradually increases to a maximum width of approximately 4 miles about 5 miles above the dam. At this elevation, the shoreline is approximately 160 miles. For additional information see Table 2, below, and Pool Elevation-Probability and Duration Curves, page 15.

TABLE 2

POOL ELEVATIONS, AREAS, AND STORAGES

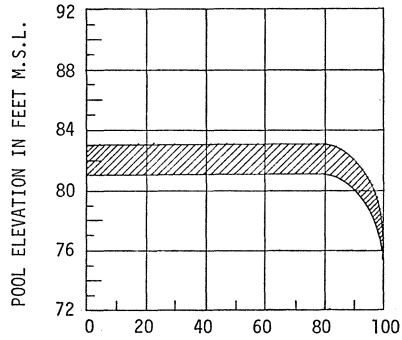
	Elevation feet m.s.l.	Reservoir area (acres)	Reservoir Capacity (acre-feet)
Top of dam	95.0*	30,800	365,500
Top pool at design water surface	93.0	28,210	306,400
Overflow weir crest and top of gates	85.0	16,830	124,700
Normal pool	83.0	13,700	94,200
Gate sill	50.0		
Average pool elevation during peak recreation season	81.0		
5 Year pool level	83.0		
10 Year Drawdown	78.5		

* On right bank

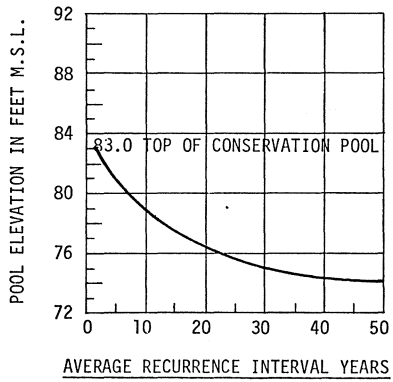
Note: All elevations in this report refer to Mean Sea Level Datum of 1929.

CHART 1

POOL ELEVATION-PROBABILITY AND DURATION CURVES



B. A. Steinhagen is operated between elevations 81.0 and 83.0 to re-regulate power releases from Sam Rayburn Reservoir. Drawdowns below 81.0 occur whenever demands exceed inflows.



Sufficient gate capacity is provided to permit discharging flood flows up to the 50 year frequency while maintaining the lake level at elevation 83.0

4. Climate:

B. A. Steinhagen Lake lies in a region characterized by comparatively hot, humid summers and moderate winters. Winter temperatures are generally mild with cold periods seldom prevailing for more than a few days. The mean annual temperature over the watershed is about 67 degrees Fahrenheit. January, the coldest month, has an average minimum daily temperature of 40 degrees. August, the warmest month, has an average maximum daily temperature of 94 degrees. Temperatures in the watershed have ranged from 112 degrees to minus 8 degrees Fahrenheit. The prevailing winds are from the south during the spring, summer, and fall months. Northerly winds prevail during the winter months. (See the Wind Rose Chart, page 35, for wind characteristics.) The average length of the growing seasons between killing frost is approximately 250 days. The mean annual precipitation over the upper watershed is 49 inches.

B. Project Features

1. Parks:

Six Corps parks and one state park are located at B. A. Steinhagen Lake. See Plate 2.2 (following page 30).

2. Structures:

B. A. Steinhagen structures comprise the following principal features:

a. Gated Spillway:

Concrete apron and gate sills
Stilling basin
Right and left spillway abutments
Six tainter gates and operating machinery
Spillway catwalk

b. Bulkhead Handling Equipment:

15-ton overhead crane

c. Non-Overflow Section of Earth Dam:

The non-overflow section of the dam between the face of the spillway abutment and the bank of the stream has been constructed to elevation 95.0.

d. Submersible Dike:

The left spillway abutment is flanked on the east by a submersible dike extending across the flood plain for a distance of 6,100 feet.

3. Archeological Resources:

Reference is made to "Archeological Survey of Dam "B" Reservoir, Jasper and Tyler Counties, Texas" dated August, 1949, prepared by River Basin Survey, Smithsonian Institute stating that all sites of any archeological interest were located and recorded. During the survey seven archeological sites were discovered which were affected by the lake.

Any further archeological excavation of historical sites will be administered in accordance with ER 405-1-875. The National Park Service will coordinate such actions. Their address is as follows:

National Park Service
Arizona Archeological Center
University of Arizona
Post Office Box 49008
Tucson, Arizona 85717

4. Special Features

a. Concessionaires:

There is one concessionaire at B. A. Steinhagen located in Beech Grove Park. At this time limited commercial services are available. However, with new recreation development and increased visitation, additional services need to be developed. Concession leases will be granted in a fair and impartial manner by advertising and awarding the

lease in accordance with ER 405-1-830. The concession prices to be charged for commodities and services will be subject to approval of the District Engineer. For concessionaire management concepts see Appendix, Part I, paragraph D.3, page 98.

b. Primitive Group Camps:

Six primitive group camps have been proposed. One is located in East End Park and five in Magnolia Ridge Park. User access will be by hiking trail only. A service road will be provided for maintenance and will be barricaded except during use by maintenance crews.

c. Group and Private Club Areas:

These areas will be administered and managed in accordance with ER 1130-2-400, ER 405-1-830, ER 405-2-835, SWDR 1130-2-7, and the Operation and Maintenance Manual. Churches, Scouts and other organizations with compatible recreation programs will be encouraged to share available sites to insure that the sites will be effectively utilized by the greatest number of persons. This will result in greater utilization of project lands and, at the same time, reduce the cost of development, maintenance, and operation of the areas for these organizations. There are no plans for private club areas at B. A. Steinhagen Lake.

d. Fish Hatchery:

There is a state operated fish hatchery between B. A. Steinhagen and Sam Rayburn Lake off FM 1747. The major species raised are indigenous game fish including bass and catfish.

C. Resources

1. General:

Natural resources are identified as those assets of nature such as: water, soil, vegetation, wildlife, scenic areas, etc. The development of resources constitute improvements to better facilitate their use. The development of the natural resources is most important toward

reaching the carrying capacity of the lake and its surrounding lands for public use. The degree of carrying capacity at a project are: Ultimate and Desired. The Ultimate Carrying Capacity is the final stage of development of the natural resources at a project which will enable the most people to visit, use, and enjoy the resources at that project but not necessarily protect the natural resources. The Desired Carrying Capacity is the development and management of the natural resources which will enable the most people to visit, use, and enjoy the resources without endangering the natural resources at the project. For greater detail, see Section III, Part 3-06, B and C, page 34.

2. Natural

a. Soils

(1) General Conditions:

Soil conditions within this area lend themselves to moderate use. However, care should be taken to provide rest periods for vegetative growth when deemed necessary. The optimum carrying capacity of this project is based on the soil series; its ability to endure certain uses as determined by the Soil Conservation Service; the slope of the land, and a Soil Conservation Service interpretative report relating these aspects to a carrying capacity for each use area.

(2) Specifics:

(a) Soils Table 3, pages 23, 24, and 25.

(b) Soils Map, Plate 1.2 following page 25.

b. Vegetation:

Vegetation consists of both land and water plants. Considering both types we can better analyze and manage this resource with respect to the project needs.

(1) Land Plants

(a) Grasses:

Ground cover on lands not in cultivation consists of grasses such as bermuda, broomsedge, little bluestem and several species of panic and paspalum grasses, as well as many kinds of weeds. A good ground cover naturally develops on the land when it is retired from cultivation, except on the steeper slopes that are subject to erosion. In the wooded areas the natural ground cover consists of forest grasses, seedlings and reproductive forms of the trees and shrubs, plus the duff of leaves, moss and woods litter. In cut-over areas there is a modification of the woodland conditions due to the increased amount of sunlight reaching the natural vegetation.

(b) Woody Vegetation:

Woody plants native to the area include:

American Hornbeam
Baldcypress
Blackberry
Cottonwood
Dewberry
Dogwood
Eastern Hophornbeam
French Mulberry
Grape
Hackberry
Haws
Holly
Laurel
Mayapple
Mulberry
Muscadine
Myrtle
Persimmon
Redbud
Red maple
Sassafras
Sycamore
Sugarberry
Sumac

Oak
- Water
- Willow
- Live
- Cow
- Southern Red
- Post
- Overcup
- Burr
- Blackjack
- White

Pine
- Shortleaf
- Longleaf
- Loblolly

Gum
- Black
- Sweet
- Tupelo

Hickory
- Shagbark
- Mackernut
- Pecan
- Bitternut

Elms
- Red
- Cedar

Slash pine has been introduced by the Forest Service.

(2) Water Plants:

Aquatic plants are over abundant in the lake and restrict water use. The principal species in the area include: water hyacinth, duckweed, alligatorweed, elodea, coontail, and parrotfeathers. Alligatorweed is the more dominate water plant and will require the most control. See Appendix, Part I, C.4.c, page 88.

c. Fish and Wildlife

(1) Fish:

The important species are black bass, channel catfish, blue catfish, yellow catfish, goggle-eye, bowfin, gar, and crappie. The Texas Parks and Wildlife Department has stocked the lake with large mouth bass, channel catfish, longear sunfish and black crappie. The lake has continued to be one of the better fishing lakes in spite of, or because of, the normal summer drawdowns. These drawdowns are required by the lower Neches Valley Authority which permit the aeration of bottom muds, the profilic growth of vegetation, the desication of aquatic vegetation and the predation of small fishes. The fishermen of the area plan their trips according to the reservoir elevation and the positioning of the gates - open or closed.

(2) Wildlife:

Wildlife at B. A. Steinhagen include such species as gray squirrels, fox squirrels, white-tailed deer, raccoons, gray foxes, red wolves, cottontails, swamp rabbits, skunks, coyotes, bobcats, opposums, nutria, armadillos, wood ducks, mallards, woodcocks, bobwhites, and alligators. Present populations support a moderate hunting pressure. A general management plan is given in greater detail in the Appendix under Part I, C.2.b, page 84. Specific management plans will be made following an on-site survey.

d. Pocket Wilderness:

The area located between the Neches and Angelina Rivers is currently within the limits of a lease to the Texas Parks and Wildlife Department. The State of Texas is currently considering a proposal to designate this area as "State Scientific Area Number 1". Until a decision is made by the state on this proposed land use, as stewards of the resource this plan proposes an interim designation of "Pocket Wilderness" for management purposes. Because of its unique beauty and the possibility that the area may contain endangered wildlife species, the Corps will make every effort to protect the area through this designation until a final determination is made by the State. This area is characterized by back-water bayous, dense swamps, and heavy forest cover. It is prime habitat for the alligator and may contain the endangered ivory-billed woodpecker. Though compatible uses will continue, access will be by foot or water only. The area will be excluded from vehicular traffic, grazing, or collateral uses, camping, hunting, and other activities not in keeping with its designation. It will form a study area for the natural evolution of vegetation and wildlife without management of either forest or game. Camping and similar uses will be limited to those areas outside the pocket wilderness. See Appendix under Part I, C.1, page 82 for additional information.

e. Water:

Surface waters, with specific and limited exceptions, should be suitable for water body contact sports and other human uses in recreation activities not involving significant risks of ingestion. Lakes receive the most concentrated and varied recreational use of any waters and provide enjoyment to a great number of people. Lakes serve as settling basins which intensify the many problems associated with water and water use. They are the center of many divergent and conflicting interests and desires. Competition is increasing for the pursuit of such water sports as fishing, waterfowl hunting, skin diving, skiing, swimming and pleasure boating. The quality of the lake water at B. A. Steinhagen Lake is acceptable for recreational purposes according to the United States Public Health Service standards based on chemical analysis run twice annually and monthly profiles of dissolved oxygen and temperature.

TABLE 3

LIMITATIONS OF SOILS FOR RECREATIONALDEVELOPMENT

Soil Association	Dominant Soil and Proportion of Association	Septic Tank Filter Field	Picnic Areas	Camp Sites	Playgrounds	Paths & Trails	Woodlands	50 Year Growth
8 Urbo-Mantachie	Urbo 50%	Severe- very slowly permeable; subject to flooding	Moderate- wetness and flooding	Severe- Permeability and flooding	Severe- permeability and flooding	Moderate- wetness and flooding	Oak Sweetgum	99' 98'
	Mantachie 40%	Severe- high water table and flooding	Moderate- wetness and flooding	Severe- flooding	Severe- flooding	Moderate- wetness and flooding	Loblolly Sweetgum	98' 100'

VALUES FOR RATING DEGREE OF LIMITATION OF SOILS FOR SPECIFIED USES:

None to slight: The soil has no limitation or no more than some limitation. The limitation is not serious and is easy to overcome.

Moderate: The soil has moderate limitation to use. The limitation needs to be recognized, but it can be overcome or corrected by means that in general are practical.

Severe: The soil has severe limitation. Use of the soil is questionable because the limitation is difficult to overcome.

TABLE 3
LIMITATIONS OF SOILS FOR RECREATIONAL DEVELOPMENT

Soil Association	Dominant Soil and Proportion of Association	Septic Tank Filter Field	Picnic Areas	Camp Sites	Playground	Paths & Trails	Woodland	50 Year Growth
4 Segno	Segno 55%	Severe-moderately slowly permeable	None to slight	None to slight	None to slight 0-2% slopes Moderate-2-6% slopes	None to slight	Loblolly Shortleaf Longleaf	90' 77' 76'
5 Bienville-Cart-Wrightsville		Slight-moderate if subject to flooding	Moderate-poor traction when dry	Moderate-poor traction when dry. areas may flood	Moderate-somewhat subject to blowing when dry	Moderate-poor traction when dry	Loblolly Shortleaf Longleaf	90' 85' 80'
6 Corrigan-Rayburn		Severe-wetness and permeability	Severe-wetness and permeability	Severe-wetness and permeability	Severe-wetness and permeability	Severe-wetness and permeability	Shortleaf Longleaf	70' 60' to 70'
7	Garner 50%	Severe-very slowly permeable	Severe-wetness, clay texture	Severe-wetness, clay texture	Severe-wetness, clay texture	Severe-wetness, clay texture	Shortleaf Longleaf	65' 70'
Garner-Susquehanna	Susquehanna 30%	Severe-very slowly permeable	Moderate-slope and wetness	Moderate-permeability and wetness	Moderate-0-6% slopes Severe-over 6% sl.	Moderate-wetness	Loblolly Shortleaf	80' 70'

VALUES FOR RATING DEGREE OF LIMITATION OF SOILS FOR SPECIFIED USES:

None to slight: The soil has no limitation or no more than some limitation. The limitation is not serious and is easy to overcome.

Moderate: The soil has moderate limitation to use. The limitation needs to be recognized, but it can be overcome or corrected by means that in general are practical.

Severe: The soil has severe limitation. Use of the soil is questionable because the limitation is difficult to overcome.

TABLE 3
LIMITATIONS OF SOILS FOR RECREATIONAL DEVELOPMENT

Soil Association	Dominant Soil and Proportion of Association	Septic Tank Filter Field	Picnic Areas	Camp Sites	Playground	Paths & Trails	Woodland	50 Year Growth
1		Severe-very slowly permeable	Moderate-slow wetness	Moderate-permeable wetness	Moderate-permeability limiting factor 0-6% slopes	Moderate-wetness	Shortleaf Loblolly	70' 80'
Susquehanna-Garner-Houston								
2	Tehran 50%	None to slight	Moderate-texture of surface	Moderate-texture of surface	Severe-surface texture	Severe-texture of surface	Loblolly Shortleaf	80' 50'
Tehran-Wagram	Wagram 30%	Moderate-slopes	Moderate-surface texture	Moderate-texture of surface	Severe-slopes	Severe-texture of surface	Loblolly Shortleaf	88' 77'
3	Enro 30%	Severe-permeability and high water table	Slight to Moderate-wetness	Moderate-wetness and permeability	Moderate-wetness and permeability	None to slight	Loblolly Shortleaf	90' 80'
Enro-Woden-Wrightsville	Woden 25%	None to slight	None to slight	None to slight	None to slight	None to slight	Loblolly Shortleaf Sweetgum	90' 80' 90'
	Wrightsville 20%	Severe-slowly permeable; high water table	Severe-wetness	Severe-wetness	Severe-wetness	Severe-wetness	Loblolly Sweetgum Water oak	80' 80' 80'

VALUES FOR RATING DEGREE OF LIMITATION OF SOILS FOR SPECIFIED USES:

None to slight: The soil has no limitation or no more than some limitation. The limitation is not serious and is easy to overcome.

Moderate: The soil has moderate limitation to use. The limitation needs to be recognized, but it can be overcome or corrected by means that in general are practical.

Severe: The soil has severe limitation. Use of the soil is questionable because the limitation is difficult to overcome.

II. LAND AND WATER USE PLANNING

2-01 General:

The basic objective of land planning is to provide proper stewardship of the land and its resources through protection, development, and management. To help meet present and future needs in consonance with the land capability and aesthetics of the area, lands will be allocated as changing needs and priorities dictate. All current Federally owned governement project lands are considered necessary to meet the current and future needs of the project. Woodland areas and desirable grasses will not be disturbed unless a more desirable vegetative type will benefit the area. Improvements and revegetation will be accomplished through lease agreements and comprehensive vegetative management plans and practices. Erosion and revegetative practices will be in accordance with the Resource Management Plans required by ER 1130-2-400 and in cooperation with Federal, State, and local governments.

Water areas are planned for specific activities to minimize safety hazards allowing maximum utilization of the water areas available. The areas will be marked for their intended use.

2-02 Types of Usage

A. Water Planning:

A water planning map showing the various water planned areas is shown on Plate 2.1 following page 29. Descriptions of these areas are printed in Table 4, page 29.

B. Land Planning

1. General Planning:

A general land planning map indicating the various types of usage is shown on Plate 2.2 following page 30. Descriptions of these areas are printed in Table 5, page 30.

2. Park Planning:

A more detailed plan is shown on an individual Park Plate. A description of the areas, indicating their usage and amount of development -existing and proposed - is shown on the page preceeding the individual park Plate. See Plates 3.2, 3.3, 3.4, 3.4A, 3.5, 3.6, and 3.7 following pages 51, 54, 58, 59, 61, 65, and 68.

3. Outgrants

a. General:

The Resource Manager will maintain an up-to-date listing of all outgrants and their locations which will be readily available at the Project office.

b. Interim Use:

The Land Use Planning Map, Plate 2.2, indicates the proposed land allocation. Lands may be leased for programs for management of fish and wildlife, project operations, non-profit group organizations, and soil and vegetative restoration.

c. Easements:

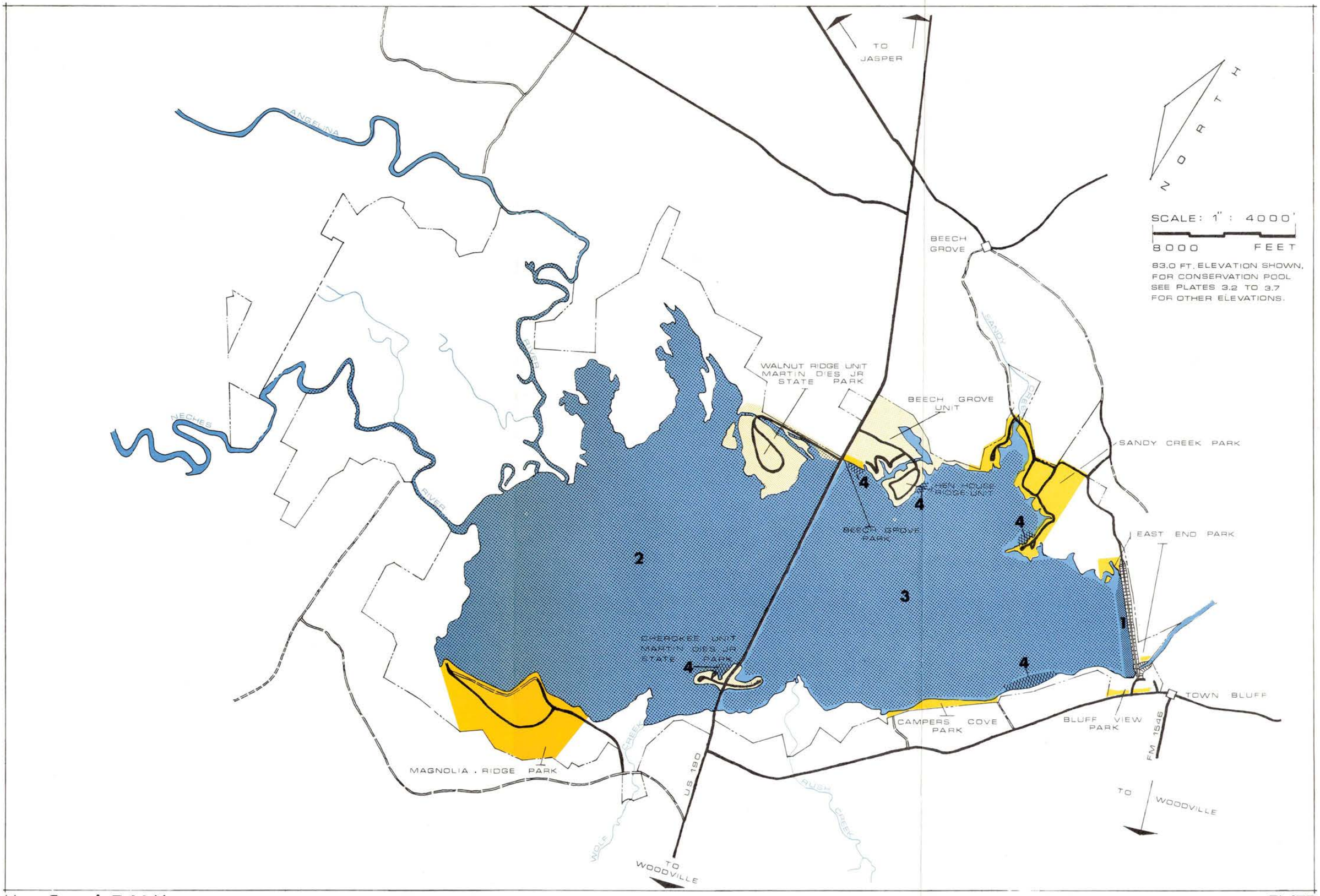
All outgrants, including easements for roads and utility lines, will be processed on an individual case basis through the Project Resource Manager with final approval granted at the District Office. The policy of attempting to have roads and utility lines located on privately owned lands where feasible to minimize any adverse aesthetic efforts on Government-owned lands will be adhered to.

TABLE 4

WATER USE PLANNING

USE	DESCRIPTION	REFERENCE LOCATION
Swimming	These areas are located on the east and west sides of the lake. Swimming and related activities are allowed. No boating or fishing will be permitted.	4
Skiing and Power Boating	Area that has sufficient amount of depth and clear of debris to provide the necessary space for these activities. Fishing is restricted from sunrise to sunset.	3
Fishing and Low Power Boating	Boating activity limited to sail boats, canoes, and less than 10 HP power boats will be allowed in these areas.	2 & 3
Restricted Areas	Dam and pertinent works and area in front of the dam. No recreationist will be allowed around the gates of the spillway. Wildlife management area restricted from skiing and high powered boats.	
	Total water surface acres	13,700 **

** Conservation Pool Elevation 83 Feet M.S.L.



U. S. ARMY
ENGINEER DISTRICT
FORT WORTH
FT. WORTH, TEXAS

LEGEND

RESTRICTED AREA
RESTRICTED USE AREA
REFERENCE NUMBER
SWIMMING AREA 4
PARK (CORPS)
PARK (OTHER)
WATER AREA
ROADS (PAVED)
ROADS (OTHER)
GOV'T. FEE LINE

B. A. STEINHAGEN LAKE

WATER USE PLANNING

PLATE 2.1

DATED DECEMBER 1971

NUMBER

TABLE 5

LAND USE PLANNING

USE	DESCRIPTION	REFERENCE LOCATION	ACRES
Recreational Areas	A high intensity use area by the public with a variety of activities and physical development. A concessionaire is located in Beech Grove Park.	2, 6	1,723
Aesthetic Areas and Multiple Use Recreational Areas	Natural areas under forest and wildlife management protection and limited recreational activities with unimproved swimming areas. Hunting is permitted.	4, 5	2,930
Pocket Wilderness	Primitive area characterized by solitude, unmodified natural conditions, no influences of civilization and accessible only by hiking. Hunting is not permitted.	3	3,230
Operation and Maintenance	Pertinent works and area directly below the dam to the government property line. This area is heavily wooded. A canoe launch area is located below the dam on government land and private land for float trips down the Neches River. Bank fishing is permitted in this area.	1	176
	Land Use Acreage		8,059
	Water Use Acreage		13,700 **
	Total Fee Acreage		21,759 *
Flowage Easement	Flowage easement acquired provides for periodic inundation by reservoir waters and no building for human habitation to be constructed on flowage easement lands.	7	1,041 *
	Total Acreage		22,800 *

** Conservation Pool Elevation 83 Feet M.S.L.

* Acreage shown is in accordance with GSA Form 1166, dated 30 June 1971.

TO JASPER

NORTH

SCALE: 1" : 4000'

8000 FEET

83.0 FT ELEVATION SHOWN FOR CONSERVATION POOL SEE PLATES 3.2 TO 3.7 FOR OTHER ELEVATIONS

ANGELINA

NECHES

SANDY

BEECH GROVE

WALNUT RIDGE UNIT MARTIN DIES JR STATE PARK

MARTIN DIES JR STATE PARK BEECH GROVE UNIT

SANDY CREEK PARK

HEN HOUSE RIDGE UNIT MARTIN DIES JR STATE PARK

BEECH GROVE PARK

EAST END PARK

CHEROKEE UNIT MARTIN DIES JR STATE PARK

TOWN BLUFF

CAMPERS COVE PARK

BLUFF VIEW PARK

FM 1546

MAGNOLIA RIDGE PARK

US 190

TO WOODVILLE

TO WOODVILLE

U. S. ARMY
ENGINEER DISTRICT
FORT WORTH
FT. WORTH, TEXAS

LEGEND

WILDLIFE AREA
AESTHETIC / RECREATION AREA
O & M AREA
FLOWAGE EASEM'T.
REFERENCE NO. 5
PARK (CORPS)
PARK (OTHER)
SPECIAL USE AREA
WATER AREA
ROADS (PAVED)
ROADS (OTHER)
GOV'T. FEE LINE

B. A. STEINHAGEN LAKE

LAND USE PLANNING

DATED DECEMBER 1971

PLATE 2.2

NUMER

III. PLAN OF DEVELOPMENT

3-01 General:

The plan is designed to be flexible enough to meet variable conditions and changing needs. It is to serve as a guide for the comprehensive management and development of the lake through sound planning principles and basic site design criteria. Appropriate provisions are included in the plan for providing recreational facilities for current and projected design loads. It is also proposed to provide sufficient services to meet the visitor's needs and demands within the desired carrying capacity of the resource.

3-02 Ecological Considerations:

Areas designated for public use as well as those designated for other land uses should be continually observed by project personnel to detect ecological imbalances, for example: soil erosion, vegetative wear due to heavy foot and/or vehicular traffic. Areas in question should be referred to qualified personnel at project level or District level as appropriate.

3-03 Environmental Statement:

Reference is made to the requirement set forth in the National Environmental Policy Act of 1969 (Public Law 91-190). Environmental Impact Statements are not required by law but are to be prepared in the future in accordance with SWD and OCE guidance previously received.

3-04 Methodology:

Factors considered in selecting the areas for recreational development as presented in this Revised Master Plan are as follows:

A. Access to existing roads.

B. Topography of the area.

C. Scenery.

D. Location of the area with respect to the usable exposure of water for recreational activities.

E. Degree of shelter for protection.

F. Water depths in coves where marinas are located or proposed.

G. Existing land use.

H. Drainage.

I. Soils surveys.

J. Wind - velocity and direction.

3-05 Recreation Facilities:

The following concepts were used in this plan:

A. Provide adequate facilities to handle the annual visitation - present and future.

B. Limit the development of recreational facilities to the ultimate carrying capacity of the area for protection of the resources.

3-06 Analyses:

Analyses were conducted to determine visitation projection, desired carrying capacity, ultimate carrying capacity, and facilities required.

A. Visitation Projection Analysis:

In formulating the estimated recreation visits the population within the day-use market area was projected through the year 2020. The population projections for B. A. Steinhagen Lake are based on a Series C population projection. The day-use market area (the geographical area from which 80 percent of the daytime users originate) was determined to be 100 miles. The population projection for the market area are as follows:

POPULATIONS PROJECTIONS FOR THE MARKET AREA
(SERIES C POPULATIONS)

1970	1980	1990	2000	2010	2020
2,249,228	2,901,857	3,585,843	4,310,260	5,112,156	5,983,976

The per capita use rates for B. A. Steinhagen's 100 mile zone were computed for 1970 and were adjusted through 2020. The per capita use rates are as follows:

Zone	Radius (mile)	Existing per capita Use Rate
I	0-10	4.30
II	11-20	4.02
III	21-30	1.07
IV	21-40	.28
V	41-50	.17
VI	51-75	.35
VII	76-100	.07

* The per capita rate factors used to adjust the per capita use rate through 2020 are listed below:

1970	1.00
1980	1.22
1990	1.42
2000	1.62
2010	1.80
2020	1.96

The per capita use rate was then applied to the population projections to arrive at the estimated visitation expected to originate from the day-use market area. Then, by adding the additional projected visitation which originates beyond the day-use market area, which amounts to 20 percent of the total visitation, the total projected participation demand was computed.

The projected annual visitation at B. A. Steinhagen Lake, based on the above population projections and per capita use participation rates, are as follows:

* Project Area Evaluation 1/ by Recreation Section, Sacremento District, dated November 1968.

Year	Projected Annual Visitation
1972	720,400
1976	800,000
1980	884,338
1990	1,193,370
2000	1,517,541
2010	1,934,391
2020	2,352,890

1,500,000 = Maximum capacity

B. Ultimate Carrying Capacity:

A combination of related aspects which concern the ability of the project resources to sustain intense use were studied to determine an ultimate carrying capacity. This ultimate capacity is estimated to be 1,500,000. This figure is a reflection of the aspects of size, location, sustained ecological balance, and other characteristics of the project. At B. A. Steinhagen Lake, the projected participation demand is far greater than the carrying capacity of the project resources.

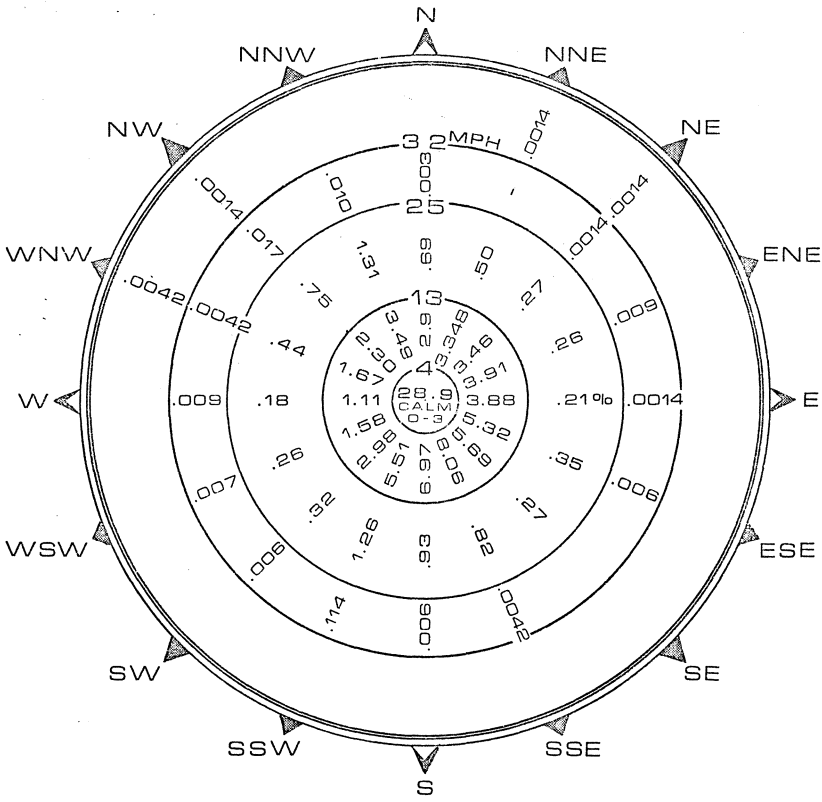
C. Desired Carrying Capacity:

The lands adjacent to the lake have a definite capacity for recreational use. The impact of influencing factors on each site should be evaluated in accordance with the following guidelines:

1. Access
2. Slope
3. Existing vegetation
4. Ecological consideration
5. Existing land use
6. Esthetics
7. Views
8. Drainage and soil types
9. Orientation - sun and wind (See Wind Rose Index)
10. Social Interaction Zones

CHART 2

WIND ROSE INDEX



WIND ROSE INDEX

This wind rose index represents the approximate regional conditions only, and is taken from data representing the nearest U. S. Weather Bureau data collection location.

Airport: Angelina County

Location: Lufkin, Texas

Source : U. S. Weather Bureau

Period: 8-48 to 7-56

D. Facilities Analysis:

Current and projected recreation visistion was broken into the following activities:

1. Design day load
2. Picnicking
3. Camping
4. Boat ramps for boating, fishing, and skiing
5. Beaches for swimming

For facility requirement computations see the following: Tables 6, 7, 8, 9, 10, and 11, pages 37 through 42.

TABLE 6

FACILITY REQUIREMENTS

Project: B. A. Steinhagen

Total annual attendance: 720,400 1972

Design load computations: 7,314

Design day load

720,400 total annual attendance x .44 visits during summer months x .60 which occurs on weekends = 190,185 total number of weekend users. Total number of weekend users ÷ 26 weekend days = 7,314 design day load.

Picnicking

Design day load x .10 of total are picnickers = number of picnickers.
Number of picnickers x .40 of picnickers requiring facilities = number of picnickers requiring facilities.
Number of picnickers requiring facilities ÷ turnover rate of 2 ÷ 3 persons per unit = 48 picnic units required.

Camping

Design day load x .23 of total are campers = number of campers.
Number of campers ÷ 4 persons per unit = 420 camping units required.

Boat ramps

Design day load ÷ load factor of 3 = number of vehicles.
Number of vehicles x .20 of vehicles with boats = number of boats.
Number of boats ÷ 60 launchings per day = 8 boat launching ramps required.

Beaches

Design day load x .10 swimmers = number of swimmers.
Number of swimmers x .60 swimmers on beach = number of beach users.
Number of beach users ÷ turnover rate of 3 = number of users on beach at any one time.
Number of users on beach at same time x 50 square feet of beach per person = .17 acres of land area required for sand beach.

Number of swimmers x .30 are swimmers in water = number of swimmers in water.
Number of swimmers in water ÷ turnover rate of 3 = number of swimmers in water at any one time.
Number of swimmers in the water at any one time x 100 square feet of water surface per user = .17 acres water surface required.

10% of swimmers need no additional land.

TABLE 7

FACILITY REQUIREMENTS

Project: B. A. Steinhagen

Total annual attendance: 740,400 1973

Design load computations: 7,517

Design day load

740,400 total annual attendance x .44 visits during summer months x .60 which occurs on weekends = 195,465 total number of weekend users.
Total number of weekend users ÷ 26 weekend days = 7,517 design day load.

Picnicking

Design day load x .10 of total are picnickers = number of picnickers.
Number of picnickers x .40 of picnickers requiring facilities = number of picnickers requiring facilities.
Number of picnickers requiring facilities ÷ turnover rate of 2 ÷ 3 persons per unit = 5 picnic units required.

Camping

Design day load x .23 of total are campers = number of campers.
Number of campers ÷ 4 persons per unit = 432 camping units required.

Boat ramps

Design day load ÷ load factor of 3 = number of vehicles.
Number of vehicles x .20 of vehicles with boats = number of boats.
Number of boats ÷ 60 launchings per day = 8 boat launching ramps required.

Beaches

Design day load x .10 swimmers = number of swimmers.
Number of swimmers x .60 swimmers on beach = number of beach users.
Number of beach users ÷ turnover rate of 3 = number of users on beach at any one time.
Number of users on beach at same time x 50 square feet of beach per person = .17 acres of land area required for sand beach.

Number of swimmers x .30 are swimmers in water = number of swimmers in water.
Number of swimmers in water ÷ turnover rate of 3 = number of swimmers in water at any one time.
Number of swimmers in the water at any one time x 100 square feet of water surface per user = .17 acres water surface required.

10% of swimmers need no additional land.

TABLE 8

FACILITY REQUIREMENTS

Project: B. A. Steinhagen

Total annual attendance: 760,440 1974

Design load computations: 7,721

Design day load

760,440 total annual attendance x .44 visits during summer months x .60 which occurs on weekends = 200,756 total number of weekend users.
Total number of weekend users ÷ 26 weekend days = 7,721 design day load.

Picnicking

Design day load x .10 of total are picnickers = number of picnickers.
Number of picnickers x .40 of picnickers requiring facilities = number of picnickers requiring facilities.
Number of picnickers requiring facilities ÷ turnover rate of 2 ÷ 3 persons per unit = 51 picnic units required.

Camping

Design day load x .23 of total are campers = number of campers.
Number of campers ÷ 4 persons per unit = 443 camping units required.

Boat ramps

Design day load ÷ load factor of 3 = number of vehicles.
Number of vehicles x .20 of vehicles with boats = number of boats.
Number of boats ÷ 60 launchings per day = 9 boat launching ramps required.

Beaches

Design day load x .10 swimmers = number of swimmers.
Number of swimmers x .60 swimmers on beach = number of beach users.
Number of beach users ÷ turnover rate of 3 = number of users on beach at any one time.
Number of users on beach at same time x 50 square feet of beach per person = .18 acres of land area required for sand beach.

Number of swimmers x .30 are swimmers in water = number of swimmers in water.
Number of swimmers in water ÷ turnover rate of 3 = number of swimmers in water at any one time.
Number of swimmers in the water at any one time x 100 square feet of water surface per user = .18 acres water surface required.

10% of swimmers need no additional land.

TABLE 9

FACILITY REQUIREMENTS

Project: B. A. Steinhagen

Total annual attendance: 780,400 1975

Design load computations: 7,924

Design day load

780,400 total annual attendance x .44 visits during summer months x .60 which occurs on weekends = 206,025 total number of weekend users.
Total number of weekend users ÷ 26 weekend days = 7,924 design day load.

Picnicking

Design day load x .10 of total are picnickers = number of picnickers.
Number of picnickers x .40 of picnickers requiring facilities = number of picnickers requiring facilities.
Number of picnickers requiring facilities ÷ turnover rate of 2 ÷ 3 persons per unit = 53 picnic units required.

Camping

Design day load x .23 of total are campers = number of campers.
Number of campers ÷ 4 persons per unit = 455 camping units required.

Boat ramps

Design day load ÷ load factor of 3 = number of vehicles.
Number of vehicles x .20 of vehicles with boats = number of boats.
Number of boats ÷ 60 launchings per day = 9 boat launching ramps required.

Beaches

Design day load x .10 swimmers = number of swimmers.
Number of swimmers x .60 swimmers on beach = number of beach users.
Number of beach users ÷ turnover rate of 3 = number of users on beach at any one time.
Number of users on beach at same time x 50 square feet of beach per person =0.18 acres of land area required for sand beach.

Number of swimmers x .30 are swimmers in water = number of swimmers in water.
Number of swimmers in water ÷ turnover rate of 3 = number of swimmers in water at any one time.
Number of swimmers in the water at any one time x 100 square feet of water surface per user = .20 acres water surface required.

10% of swimmers need no additional land.

TABLE 10

FACILITY REQUIREMENTS

Project: B. A. Steinhagen

Total annual attendance: 800,500 1976

Design load computations: 8,128

Design day load

800,500 total annual attendance x .44 visits during summer months x .60 which occurs on weekends = 211,332 total number of weekend users.
Total number of weekend users ÷ 26 weekend days = 8,128 design day load.

Picnicking

Design day load x .10 of total are picnickers = number of picnickers.
Number of picnickers x .40 of picnickers requiring facilities = number of picnickers requiring facilities.
Number of picnickers requiring facilities ÷ turnover rate of 2 ÷ 3 persons per unit = 54 picnic units required.

Camping

Design day load x .23 of total are campers = number of campers.
Number of campers ÷ 4 persons per unit = 467 camping units required.

Boat ramps

Design day load ÷ load factor of 3 = number of vehicles.
Number of vehicles x .20 of vehicles with boats = number of boats.
Number of boats ÷ 60 launchings per day = 9 boat launching ramps required.

Beaches

Design day load x .10 swimmers = number of swimmers.
Number of swimmers x .60 swimmers on beach = number of beach users.
Number of beach users ÷ turnover rate of 3 = number of users on beach at any one time.
Number of users on beach at same time x 50 square feet of beach per person = .18 acres of land area required for sand beach.

Number of swimmers x .30 are swimmers in water = number of swimmers in water.
Number of swimmers in water ÷ turnover rate of 3 = number of swimmers in water at any one time.
Number of swimmers in the water at any one time x 100 square feet of water surface per user = .18 acres water surface required.

10% of swimmers need no additional land.

TABLE 11

FACILITY REQUIREMENTS

Project: B. A. Steinhagen

Total annual attendance: 1,500,000 (ultimate)

Design load computations: 15,230

Design day load

1,500,000 total annual attendance x .44 visits during summer months x .60 which occurs on weekends = 396,000 total number of weekend users.
Total number of weekend users ÷ 26 weekend days = 15,230 design day load.

Picnicking

Design day load x .10 of total are picnickers = number of picnickers.
Number of picnickers x .40 of picnickers requiring facilities = number of picnickers requiring facilities.
Number of picnickers requiring facilities ÷ turnover rate of 2 ÷ 3 persons per unit = 100 picnic units required.

Camping

Design day load x .23 of total are campers = number of campers.
Number of campers ÷ 4 persons per unit = 875 camping units required.

Boat ramps

Design day load ÷ load factor of 3 = number of vehicles.
Number of vehicles x .20 of vehicles with boats = number of boats.
Number of boats ÷ 60 launchings per day = 17 boat launching ramps required.

Beaches

Design day load x .10 swimmers = number of swimmers.
Number of swimmers x .60 swimmers on beach = number of beach users.
Number of beach users ÷ turnover rate of 3 = number of users on beach at any one time.
Number of users on beach at same time x 50 square feet of beach per person = .34 acres of land area required for sand beach.

Number of swimmers x .30 are swimmers in water = number of swimmers in water.
Number of swimmers in water ÷ turnover rate of 3 = number of swimmers in water at any one time.
Number of swimmers in the water at any one time x 100 square feet of water surface per user = .34 acres water surface required.

10% of swimmers need no additional land.

3-07 Development

A. General Planning Considerations

1. Selection of Areas:

New areas were selected and some old areas were designated or redesignated for camping, picnicking, and other uses based on site characteristics, recreation demands, and resource management objectives. These objectives include but are not limited to:

a. Control visitor use

b. Separate non-compatable uses
(day use - overnight use)

c. Define activity - areas.

d. Manage and control each area as a separate unit.

e. Utilize screened or buffered areas

2. Road Developments:

New area circulation roads have been proposed while some existing roads are scheduled to be deleted. The objectives in constructing new interior circulation roads and deleting some of the old roads are:

a. To provide uniform and defined traffic flow.

b. To provide vehicular access to existing and proposed camp or picnic units via means of individual pullouts.

c. To prevent excessive through-traffic.

The area circulation roads should be laid out in the field. The centerlines of these roads are secondary in importance to the preservation of existing tree cover.

3. Sanitary Facilities:

To conform with state sanitation codes, all existing concrete vault type toilets are scheduled to be converted to water borne facilities. Additional sanitary facilities are proposed to meet visitor needs and demands. Criteria used in determining the number of sanitary facilities considered two basic concepts:

a. Anticipated visitors use of each area.

b. Accessibility by visitors within an area.

4. Additional Picnic and Camp Units:

The number of additional picnic and camp units were based on the recreation analysis in conjunction with a five year development program with respect to the desired carrying capacity of the lake resource. Each area's site characteristics and existing development were considered before any additional units were scheduled. The number of units proposed is lower than that required by the visitation computations due to site characteristics and the influencing social interaction zone.

5. Traffic Control Gates:

Traffic control gates are proposed at strategic locations. These gates are to be used as a management tool and have the following functions:

a. Define and separate areas.

b. Provide visitors direction and control.

c. Provide a means of closing areas during construction, revegetation, and revitalization periods.

6. Courtesy Docks:

Courtesy docks have been incorporated in the development of public use areas. These facilities are to be located adjacent to boat launching sites and at selected sites within activity areas. Courtesy docks are to be used only for loading or unloading passengers and gear. No boats will be allowed to anchor to the piers except when loading. Appropriate signs will be placed at the piers informing visitors of this restriction.

7. Boat Launching Sites:

One new boat launching site is proposed as part of development in this revised plan. Some existing boat launching sites are proposed to be deleted because of poor site characteristics

and their relationship to adjacent areas or if these particular sites could better be used for other activities. Proposed development in this revised plan include additional launching lanes at sites having optimum characteristics.

8. For conceptual drawings, see Facilities Design Concepts drawings, Part C, 3.b (3), page 71.

B. Project Works Area:

No new development is planned for this portion of the Master Plan.

C. Parks

1. General Description:

There are six Corps' parks and one state park at B. A. Steinhagen Lake, encompassing 1,695 acres adjacent to approximately 40 percent of the lake's 160 mile shoreline. All parks are characterized by a gently rolling terrain with a dense growth of forest. These parks were designated with consideration given to the factors listed in Part 3-04.

2. Specific Parks:

The following pages illustrate public use areas indicating planned development, present status and future requirements of each park. An updated Master Plan for Martin Dies, Jr. State Park is not available at the present time; however, the Texas Parks and Wildlife Department's existing development was taken into consideration during this revision. The state's Master Plan will be incorporated within this Master Plan when it is made available.

The location of a planned management area is specified by a numbered bubble. No specific facility locations are shown because environmental, vegetation, and visitation conditions change constantly. However, planned development has been determined based on field reconnaissance and studies to assure that the proper site can accommodate the planned facilities. Specific locations will be laid out on the site by qualified personnel prior to construction.

NORTH

SCALE: 1" : 4000'

8000 FEET

ANGELINA

NECHES

RIVER

SANDY

BEECH GROVE UNIT

BEECH GROVE PARK

WALNUT RIDGE UNIT

PLATE 3.5

PLATE 3.6

PLATE 3.7

SANDY CREEK PARK

EAST END PARK

HEN HOUSE RIDGE UNIT

MARTIN DIES JR. STATE PARK

PLATE 3.2

MAGNOLIA RIDGE PARK

CHEROKEE UNIT

PLATE 3.4

PLATE 3.3

CAMPERS COVE PARK

BLUFF VIEW PARK

WOLF CREEK

RUSH CREEK

U. S. ARMY
ENGINEER DISTRICT
FORT WORTH
FT. WORTH, TEXAS

LEGEND

PLATE 3 — PLATE IDENTIFICATION

PARK MASTER PLAN PLATES LOCATION, COVERAGE, AND ORIENTATION ARE SHOWN BY HEAVY BROKEN LINE.

PARTIAL PLATE COVERAGE — PLATE 9

PARK (CORPS)
PARK (OTHER)

WATER AREA
ROADS (PAVED)
ROADS (OTHER)
GOV'T. FEE LINE

B. A. STEINHAGEN LAKE

PARK PLATES KEY MAP

DATED DECEMBER 1971

PLATE 3.1 OF 11

TABLE 12

DETAILED ESTIMATE OF COST FOR ADDITIONAL RECREATIONAL FACILITIES

PROJECT B.A.STEINHAGEN

PUBLIC AREA EAST END PARK

(AMOUNTS IN THOUSANDS OF DOLLARS)

ITEM	UNIT	UNIT COST	F.Y.73 BUDGET COSTS QUANTITY	F.Y.73 BUDGET COSTS COST	QUANTITIES BY FISCAL YEARS 74	75	76	77	TOTAL QUAN. F.Y.73 THRU F.Y.77	TOTAL COST
1 ROADS	MILE									
A PARK ROADS (BIT)		$ 75,000	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
B PAVE EXIST. GRAVEL PK. RD.		$ 60,000	0.3	$ 18.0	0.0	0.0	0.0	0.0	0.3	$ 18.0
C AREA CIRCULATION ROAD(BIT.)		$ 11,000	0.1	$ 1.1	0.0	0.0	0.0	0.0	0.1	$ 1.1
D GRAVEL		$ 11,000	0.1	$ 1.1	0.0	0.0	0.0	0.0	0.1	$ 1.1
2 PARKING AREAS	SQ.Y.									
A PAVED (BIT)		$ 0.005	1888.0	$ 9.4	0.0	0.0	0.0	0.0	1888.0	$ 9.4
B PAVE EXIST.GRAVEL		$ 0.005	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
3 BOAT LAUNCHING RAMPS (CONC)	S.Y.									
A 1-LANE 14 FT.WIDE		$ 0.045	233.0	$ 10.5	0.0	0.0	0.0	0.0	233.0	$ 10.5
B 2-LANES 32 FT.WIDE		$ 0.045	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
C 3-LANES 50 FT.WIDE		$ 0.045	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
D 4-LANES 68 FT.WIDE		$ 0.045	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
E EXTENSIONS		$ 0.045	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
4 WATER SUPPLY SYSTEMS	EACH									
A WELLS (PRESSURE TYPE)		$ 8,500	1.0	$ 8.5	0.0	0.0	0.0	0.0	1.0	$ 8.5
B LAKE PUMP AND FILTER										
C DRINKING FOUNTAINS		$ 0.200	3.0	$ 0.6	0.0	0.0	0.0	0.0	3.0	$ 0.6
5 SANITARY FACILITIES	EACH									
A MASONRY WATERBORNE TOILETS		$ 35,000	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
B CONVERT TO WATERBORNE TOILETS		$ 15,000	1.0	$ 15.0	0.0	0.0	0.0	0.0	1.0	$ 15.0
C MASONRY CONC.VAULT TOILETS		$ 10,000	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
D SERVICE BLG.(WITH TOILETS, SHOWERS,LAUNDRY FACILITIES)		$ 45,000	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
E BATHHOUSE WITH TOILETS		$ 43,000	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
F BATHHOUSE NO TOILETS		$ 8,000	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
G SANITARY DUMP STA.(TRAILER)		$ 2,500	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
H SANITARY DUMP STA.(MARINE)										
I WASTE TREATMENT PLANTS		$100,000	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
J WASTE DISPOSAL PLANTS		$ 25,000	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
K FRAME TOILETS (CONC.VAULT)		$ 2,500	2.0	$ 5.0	0.0	0.0	0.0	0.0	2.0	$ 5.0
6 UTILITIES	JOB									
A WATER DISTRIBUTION LINES		$ 2,600	1.0	$ 2.6	0.0	0.0	0.0	0.0	1.0	$ 2.6
B ELECTRIC SERVICE LINES		$ 2,500	1.0	$ 2.5	0.0	0.0	0.0	0.0	1.0	$ 2.5
C LIGHT STANDARDS ETC.		$ 0.500	1.0	$ 0.5	0.0	0.0	0.0	0.0	1.0	$ 0.5
7 PICNIC AND CAMPING UNITS	EACH									
A PICNIC UNITS		$ 0.365	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
B CAMP UNITS										
(1 UNIT=1-TABLE,1-COOKER,AND 1-TRASH CAN)		$ 0.365	6.0	$ 2.2	0.0	0.0	0.0	0.0	6.0	$ 2.2
8 TABLE SHELTERS	EACH									
A SINGLE (1-TABLE)		$ 0.300	6.0	$ 1.8	0.0	0.0	0.0	0.0	6.0	$ 1.8
B GROUP (3-TABLES)		$ 3.500	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
9 OBSERVATION SHELTERS	EACH									
A WITH WATERBORNE TOILETS										
B NO TOILETS										
10 FLOATING DOCKS	EACH									
A COURTESY (BOATING)		$ 2,000	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
B FISHING										
11 SWIMMING BEACHES	EACH									
A IMPROVED		$ 6,000	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
B UNIMPROVED										
12 SIGNS - BUOYS	JOB									
A PARK ENTRANCE SIGNS										
B DIRECTIONAL SIGNS		$ 0.670	1.0	$ 0.7	0.0	0.0	0.0	0.0	1.0	$ 0.7
C BULLETIN BOARDS,REG.BOOTHS										
D BUOYS - ANCHOR		$ 1,500	1.0	$ 1.5	0.0	0.0	0.0	0.0	1.0	$ 1.5
13 SITE IMPROVEMENT	JOB									
A UNDERBRUSHING		$ 2,600	1.0	$ 2.6	0.0	0.0	0.0	0.0	1.0	$ 2.6
B GRADING-DRAINAGE										
C REFORESTATION										
D SEEDING										
E CHANNEL EXCAV.		$ 3,000	1.0	$ 3.0	0.0	0.0	0.0	0.0	1.0	$ 3.0
14 LANDSCAPING	JOB									
15 GATES	EACH									
A TRAFFIC CONTROL GATES		$ 0.500	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
16 TRAILS	MILE									
A HIKING TRAILS		$ 1,000	0.4	$ 0.4	0.0	0.0	0.0	0.0	0.4	$ 0.4
TOTALS				$ 87.0						$ 87.0

EAST END PARK

(25 Acres)

This area, divided into two parcels, is located on the project access road which serves the east side of the dam. One part is located immediately upstream from the east end of the submersible dike. This area is well suited for camping, picnicing, primitive camping, and hiking. The proposed primitive area is an area of seclusion and solitude for nature's best offerings.

The second part is located downstream from the dam and adjacent to the stilling basin. Frequent flooding of this area makes the construction of an access road or other facilities undesirable. This area (accessible only by trail) is planned for bank fishing, canoe launching, hiking, and nature studying.

The East End Park attendance has increased from year to year based primarily upon the excellent bank fishing, both below the dam and along the east shore of the lake. The terrain is gently sloping to flat, covered with dense to very dense hardwoods.

EAST END PARK

(25 Acres)

Area	5-Year Improvement Plan	Existing Conditions
1	**Overnight Use Area**	
	6 camping units w/shelters	6 tables w/shelters
	6 paved pullouts	6 cookers or grills
	Convert existing toilet to waterborne	1 masonry pit toilet
	Remove existing boat ramp	1 single lane boat ramp
	1 one lane boat ramp	
	Channel excavation, buoys	
	Pressurize existing artesian well	1 water well (artesian)
	3 drinking fountains	2 drinking fountains
2	**Overnight Use Area** (Primitive Camp)	
	0.4 mile hiking trail	None
	1 campfire circle	
	4 fireplaces	
	8 tent pads	
	2 frame toilets (concrete vault)	
3	**Day Use Area** (Bank fishing)	None

Additional Supporting Facilities (Total)

1,888 square yards paved parking	
0.3 mile pave existing gravel road	0.21 mile gravel road
0.1 mile gravel road	
0.1 paved park road	

TABLE 13

DETAILED ESTIMATE OF COST FOR ADDITIONAL RECREATIONAL FACILITIES

PROJECT B.A.STEINHAGEN

PUBLIC AREA BLUFF-VIEW

(AMOUNTS IN THOUSANDS OF DOLLARS)

ITEM	UNIT	UNIT COST	F.Y.73 BUDGET COST: QUANTITY	F.Y.73 BUDGET COST: COST	CLANTITIES BY FISCAL YEARS: 74	75	76	77	TOTAL QUAN. F.Y.73 THRU F.Y.77	TOTAL COST
ROADS	MILE									
A PARK ROADS (BIT)		$ 75,000	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
B PAVE EXIST. GRAVEL PK. RD.		$ 60,000	0.2	$ 12.0	0.0	0.0	0.0	0.0	0.2	$ 12.0
C AREA CIRCULATION ROAD(BIT.)		$ 11,000	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
D GRAVEL		$ 11,000	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
PARKING AREAS	S.Y.									
A PAVED (BIT)		$ 0.005	666.0	$ 3.3	0.0	0.0	0.0	0.0	666.0	$ 3.3
B PAVE EXIST.GRAVEL		$ 0.005	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
BOAT LAUNCHING RAMPS (CONC)	S.Y.									
A 1-LANE 14 FT.WIDE		$ 0.045	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
B 2-LANES 32 FT.WIDE		$ 0.045	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
C 3-LANES 50 FT.WIDE		$ 0.045	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
D 4-LANES 68 FT.WIDE		$ 0.045	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
E EXTENSIONS		$ 0.045	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
WATER SUPPLY SYSTEMS	EACH									
A WELLS (PRESSURE TYPE)		$ 8,500	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
B LAKE PUMP AND FILTER										
C DRINKING FOUNTAINS		$ 0.200	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
SANITARY FACILITIES	EACH									
A MASONRY WATERBORNE TOILETS		$ 35,000	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
B CONVERT TO WATERBORNE TOILETS		$ 15,000	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
C MASONRY CONC.VAULT TOILETS		$ 10,000	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
D SERVICE BLG.(WITH TOILETS, SHOWERS,LAUNDRY FACILITIES)		$ 45,000	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
E BATHHOUSE WITH TOILETS		$ 43,000	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
F BATHHOUSE NO TOILETS		$ 8,000	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
G SANITARY DUMP STA.(TRAILER)		$ 2,500	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
H SANITARY DUMP STA.(MARINE)										
I WASTE TREATMENT PLANTS		$100,000	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
J WASTE DISPOSAL PLANTS		$ 25,000	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
K FRAME TOILETS (CONC.VAULT)		$ 2,500	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
5 UTILITIES	JOB									
A WATER DISTRIBUTION LINES										
B ELECTRIC SERVICE LINES										
C LIGHT STANDARDS ETC.										
7 PICNIC AND CAMPING UNITS	EACH									
A PICNIC UNITS		$ 0.365	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
B CAMP UNITS (1 UNIT=1-TABLE,1-COOKER,AND 1-TRASH CAN)		$ 0.365	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
8 TABLE SHELTERS	EACH									
A SINGLE (1-TABLE)		$ 0.300	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
B GROUP (3-TABLES)		$ 3,500	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
9 OBSERVATION SHELTERS	EACH									
A WITH WATERBORNE TOILETS										
B NO TOILETS										
0 FLOATING DOCKS	EACH									
A COURTESY (BOATING)		$ 2,000	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
B FISHING										
1 SWIMMING BEACHES	EACH									
A IMPROVED		$ 6,000	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
B UNIMPROVED										
2 SIGNS - BUOYS	JOB									
A PARK ENTRANCE SIGNS										
B DIRECTIONAL SIGNS										
C BULLETIN BOARDS,REG.BOOTHS										
D BUOYS - ANCHOR										
3 SITE IMPROVEMENT	JOB									
A UNDERBRUSHING		$ 0.570	1.0	$ 0.6	0.0	0.0	0.0	0.0	1.0	$ 0.6
B GRADING-DRAINAGE										
C REFORESTATION										
D SEEDING										
E CHANNEL EXCAV.										
4 LANDSCAPING	JOB									
5 GATES	EACH									
A TRAFFIC CONTROL GATES		$ 0.508	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
6 TRAILS	MILE									
A HIKING TRAILS		$ 1,000	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
TOTALS				$ 15.9						$ 15.9

BLUFF VIEW PARK

(16 Acres)

This area is located adjacent to and north of the headquarters area and consists of about 11 acres which incuudes the area known as Bluff View Observation Point in the original Master Plan, plus about 5 additional acres which is well situated for recreational development. The terrain is gently sloping to flat. The tree cover within the park has been cleared except for those surrounding picnic units and some on the east side of the park area. State (Farm-Market) Highway 92 borders the entire west side of the park and access to the park ground is provided at five points along this highway. This park has been developed primarily for picnicing.

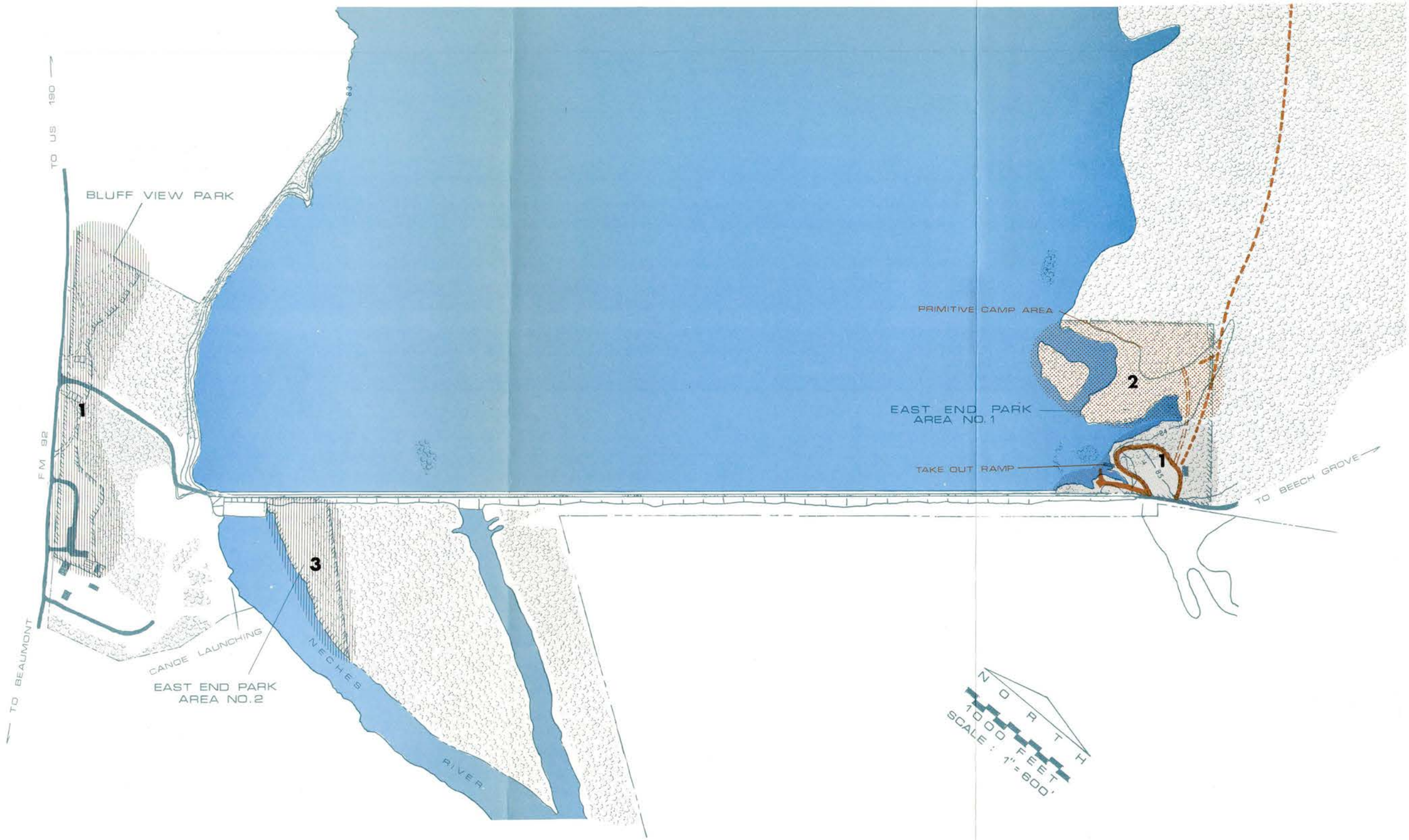
To prevent the destruction of vegetation and erosion of the soils, the existing gravel roads and parking areas are proposed to be paved. By paving these areas, dust will be controlled making picnicing more pleasant and uniform use of the park will occur. Safety within the park will be enhanced as paved roads are safer.

This park is limited in size. However, it is very popular because of its scenic view and its access to the water above and below the dam.

BLUFF VIEW PARK

(16 Acres)

Area	5-Year Improvement Plan	Existing Conditions
1	Day Use Area	
		17 tables 11 table shelters 12 cookers or grills 1 masonry waterborne toilet 1 water well (pressure) 1 drinking fountain
Additional Supporting Facilities (Total)		
	666 square yards paved parking 0.2 mile pave existing gravel road	827 square yards paved parking 3,426.3 square yards gravel parking 0.1 mile paved park road 0.16 mile gravel road



U. S. ARMY
ENGINEER DISTRICT
FORT WORTH
FT. WORTH, TEXAS

MANAGEMENT AREAS

	OVERNIGHT	DAY
EXISTING		
PROPOSED		

ALL PROPOSED ROADS, TRAILS, AND OTHER TYPES OF DEVELOPMENT WILL BE SHOWN IN THIS COLOR.

LEGEND

REFERENCE NO. 9
ROAD (PAVED)
ROAD (OTHER)
LAUNCH SITE
SWIMMING SWIM.
PARK LIMIT
TRAIL
DUMP STATION
BUILDING
WATER AREA
TREES
CONTOURS 76
GOV'T. FEE LINE

PARK MASTER PLAN

B. A. STEINHAGEN LAKE
EAST END & BLUFF VIEW PARKS
TOWN BLUFF, TEXAS

DATED DECEMBER 1971

PLATE
3.2
NUMBER

TABLE 14

DETAILED ESTIMATE OF COST FOR ADDITIONAL RECREATIONAL FACILITIES

PROJECT B.A.STEINHAGEN

PUBLIC AREA CAMPERS COVE

(AMOUNTS IN THOUSANDS OF DOLLARS)

ITEM	UNIT	UNIT COST	FY,73 BUDGET COST QUANTITY	FY,73 BUDGET COST COST	QUANTITIES BY FISCAL YEARS 74	75	76	77	TOTAL QUAN, F,Y,73 THRU F,Y,77	TOTAL COST
1 ROADS	MILE									
A PARK ROADS (BIT)		$ 75,000	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
B PAVE EXIST, GRAVEL PK, RD,		$ 60,000	0.0	$ 0.0	0.8	0.0	0.0	0.0	0.8	$ 48.0
C AREA CIRCULATION ROAD(BIT,)		$ 11,000	0.0	$ 0.0	0.4	0.0	0.0	0.0	0.4	$ 4.4
D GRAVEL		$ 11,000	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
2 PARKING AREAS	SYY,									
A PAVED (BIT)		$ 0.005	0.0	$ 0.0	1343.0	0.0	0.0	0.0	1343.0	$ 6.7
B PAVE EXIST,GRAVEL		$ 0.005	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
3 BOAT LAUNCHING RAMPS-(CONC)	SYY,									
A 1-LANE 14 FT,WIDE		$ 0.045	0.0	$ 0.0	233.0	0.0	0.0	0.0	233.0	$ 10.5
B 2-LANES 32 FT,WIDE		$ 0.045	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
C 3-LANES 50 FT,WIDE		$ 0.045	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
D 4-LANES 68 FT,WIDE		$ 0.045	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
E EXTENSIONS		$ 0.045	0.0	$ 0.0	132.0	0.0	0.0	0.0	132.0	$ 5.9
4 WATER SUPPLY SYSTEMS	EACH									
A WELLS (PRESSURE TYPE)		$ 8,500	0.0	$ 0.0	1.0	0.0	0.0	0.0	1.0	$ 8.5
B LAKE PUMP AND FILTER										
C DRINKING FOUNTAINS		$ 0.200	0.0	$ 0.0	6.0	0.0	0.0	0.0	6.0	$ 1.2
5 SANITARY FACILITIES	EACH									
A MASONRY WATERBORNE TOILETS		$ 35,000	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
B CONVERT TO WATERBORNE TOILETS		$ 15,000	0.0	$ 0.0	1.0	0.0	0.0	0.0	1.0	$ 15.0
C MASONRY CONC,VAULT TOILETS		$ 10,000	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
D SERVICE BLD,(WITH TOILETS, SHOWERS,LAUNDRY FACILITIES)		$ 45,000	0.0	$ 0.0	1.0	0.0	0.0	0.0	1.0	$ 45.0
E BATHHOUSE WITH TOILETS		$ 43,000	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
F BATHHOUSE NO TOILETS		$ 8,000	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
G SANITARY DUMP STA,(TRAILER)		$ 2,500	0.0	$ 0.0	1.0	0.0	0.0	0.0	1.0	$ 2.5
H SANITARY DUMP STA,(MARINE)										
I WASTE TREATMENT PLANTS		$100,000	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
J WASTE DISPOSAL PLANTS		$ 25,000	0.0	$ 0.0	1.0	0.0	0.0	0.0	1.0	$ 25.0
K FRAME TOILETS (CONC,VAULT)		$ 2,500	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
6 UTILITIES	JOB									
A WATER DISTRIBUTION LINES		$ 4,000	0.0	$ 0.0	1.0	0.0	0.0	0.0	1.0	$ 4.0
B ELECTRIC SERVICE LINES		$ 10,000	0.0	$ 0.0	1.0	0.0	0.0	0.0	1.0	$ 10.0
C LIGHT STANDARDS ETC,		$ 1,400	0.0	$ 0.0	1.0	0.0	0.0	0.0	1.0	$ 1.4
7 PICNIC AND CAMPING UNITS	EACH									
A PICNIC UNITS		$ 0.365	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
B CAMP UNITS (1 UNIT=1-TABLE,1-COOKER,AND 1-TRASH CAN)		$ 0.365	0.0	$ 0.0	14.0	0.0	0.0	0.0	14.0	$ 5.1
8 TABLE SHELTERS	EACH									
A SINGLE (1-TABLE)		$ 0.300	0.0	$ 0.0	14.0	0.0	0.0	0.0	14.0	$ 4.2
B GROUP (3-TABLES)		$ 3,500	0.0	$ 0.0	1.0	0.0	0.0	0.0	1.0	$ 3.5
9 OBSERVATION SHELTERS	EACH									
A WITH WATERBORNE TOILETS										
B NO TOILETS										
10 FLOATING DOCKS	EACH									
A COURTESY (BOATING)		$ 2,000	0.0	$ 0.0	1.0	0.0	0.0	0.0	1.0	$ 2.0
B FISHING										
11 SWIMMING BEACHES	EACH									
A IMPROVED		$ 6,000	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
B UNIMPROVED										
12 SIGNS - BUOYS	JOB									
A PARK ENTRANCE SIGNS										
B DIRECTIONAL SIGNS		$ 1,000	0.0	$ 0.0	1.0	0.0	0.0	0.0	1.0	$ 1.0
C BULLETIN BOARDS,REG,BOOTHS										
D BUOYS - ANCHOR		$ 1,500	0.0	$ 0.0	1.0	0.0	0.0	0.0	1.0	$ 1.5
13 SITE IMPROVEMENT	JOB									
A UNDERBRUSHING		$ 1,075	0.0	$ 0.0	1.0	0.0	0.0	0.0	1.0	$ 1.1
B GRADING-DRAINAGE										
C REFORESTATION										
D SEEDING										
E CHANNEL EXCAV,		$ 3,000	0.0	$ 0.0	1.0	0.0	0.0	0.0	1.0	$ 3.0
14 LANDSCAPING	JOB									
15 GATES	EACH									
A TRAFFIC CONTROL GATES		$ 0.500	2.0	$ 1.0	0.0	0.0	0.0	0.0	2.0	$ 1.0
16 TRAILS	MILE									
A HIKING TRAILS		$ 1,000	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
TOTALS				$ 1.0						$ 210.5

CAMPERS COVE PARK

(81 Acres)

This area is located on the west shore of the lake about two miles north of the dam and about two and one-half miles south of U.S. Highway 190. It is accessible by two gravel county roads which connect to State (Farm-Market) Highway 92, paralleling the west side of the park at a distance of about on-half mile. These gravel roads are especially bad on steep slopes.

Limited access into this park is due to the steep slope on the west side which furnishes a natural barrier from wind and seclusion from private development. These factors, as well as the readily available commercial facilities, and its scenic beauty contribute to this park's high use rate as a camping site. However, space for development is limited due to the steep slopes. Access to the water's edge at its normal pool elevation is good; but during periods of low water, access to the water's edge needs to be improved. For this reason, channel excavation is proposed.

CAMPERS COVE PARK

(81 Acres)

Area	5-Year Improvement Plan	Existing Conditions
1	Overnight Use Area	
	4 camping units w/shelter	17 tables w/shelter
	4 paved pullouts	16 grills or cookers
	Convert existing toilet to waterborne	1 masonry pit toilet
	1 service building w/showers	
	Pressurize existing artesian well	1 water well (artesian)
	1 additional launching lane	1 one lane ramp
	1 courtesy dock	
	Channel excavation	
	Extend existing boat ramp	
	1 waste disposal plant	
	1 traffic control gate	11 electrical hookups
	3 drinking fountains	2 drinking fountains
2	Overnight Use Area	
	10 camping units w/shelters	8 tables w/shelters
	10 paved pullouts	8 cookers or grills
	1 group shelter	
	1 traffic control gate	
	1 sanitary dump station	
	Remove existing ramp	1 one lane ramp
	3 drinking fountains	1 drinking fountain
		4 electrical hookups
	Additional Supporting Facilities (Total)	
	1,343 square yards paved parking	451 square yards paved parking
	0.4 mile area circulation road	0.95 mile paved park road
	0.8 mile pave existing gravel road	0.77 mile gravel road

U. S. ARMY
ENGINEER DISTRICT
FORT WORTH
FT. WORTH, TEXAS

MANAGEMENT AREAS
OVERNIGHT DAY
EXISTING
PROPOSED

ALL PROPOSED ROADS, TRAILS, AND OTHER TYPES OF DEVELOPMENT WILL BE SHOWN IN THIS COLOR.

LEGEND

REFERENCE NO. 9
ROAD (PAVED)
ROAD (OTHER)
LAUNCH SITE
SWIMMING SWIM.
PARK LIMIT
TRAIL
DUMP STATION
BUILDING
WATER AREA
TREES
CONTOURS 75
GOV'T. FEE LINE

PARK MASTER PLAN PLATE
B. A. STEINHAGEN LAKE
CAMPERS COVE PARK 3.3
TOWN BLUFF, TEXAS
DATED DECEMBER 1971 NUMBER

TABLE 15

DETAILED ESTIMATE OF COST FOR ADDITIONAL RECREATIONAL FACILITIES

PROJECT B.A.STEINHAGEN

PUBLIC AREA MAGNOLIA RIDGE

(AMOUNTS IN THOUSANDS OF DOLLARS)

ITEM	UNIT	UNIT COST (F.Y.73 BUDGET COST)	QUANTITY	COST	(QUANTITIES BY FISCAL YEARS) 74	75	76	77	TOTAL QUAN. F.Y.73 THRU F.Y.77	COST
1 ROADS	MILE									
A PARK ROADS (BIT)		$ 75,000	0.0	$ 0.0	0.0	0.0	0.1	0.0	0.1	$ 7.5
B PAVE EXIST. GRAVEL PK. RD.		$ 60,000	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
C AREA CIRCULATION ROAD(BIT.)		$ 11,000	0.0	$ 0.0	0.1	1.5	0.0	0.0	1.6	$ 17.6
D GRAVEL		$ 11,000	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
2 PARKING AREAS	SQ.Y.									
A PAVED (BIT)		$ 0.005	0.0	$ 0.0	12.0	308.0	222.0	0.0	543.0	$ 2.7
B PAVE EXIST.GRAVEL		$ 0.005	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
3 BOAT LAUNCHING RAMPS (CONC)	SQ.Y.									
A 1-LANE 14 FT.WIDE		$ 0.045	0.0	$ 0.0	0.0	0.0	233.0	0.0	233.0	$ 10.5
B 2-LANES 32 FT.WIDE		$ 0.045	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
C 3-LANES 50 FT.WIDE		$ 0.045	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
D 4-LANES 68 FT.WIDE		$ 0.045	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
E EXTENSIONS		$ 0.045	0.0	$ 0.0	0.0	132.0	0.0	0.0	132.0	$ 5.9
4 WATER SUPPLY SYSTEMS	EACH									
A WELLS (PRESSURE TYPE)		$ 8,500	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
B LAKE PUMP AND FILTER										
C DRINKING FOUNTAINS		$ 0.200	0.0	$ 0.0	0.0	2.0	1.0	0.0	3.0	$ 0.6
5 SANITARY FACILITIES	EACH									
A MASONRY WATERBORNE TOILETS		$ 35,000	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
B CONVERT TO WATERBORNE TOILETS		$ 15,000	0.0	$ 0.0	0.0	1.0	2.0	0.0	3.0	$ 45.0
C MASONRY CONC.VAULT TOILETS		$ 10,000	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
D SERVICE BLG.(WITH TOILETS, SHOWERS, LAUNDRY FACILITIES)		$ 45,000	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
E BATHHOUSE WITH TOILETS		$ 43,000	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
F BATHHOUSE NO TOILETS		$ 8,000	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
G SANITARY DUMP STA.(TRAILER)		$ 2,500	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
H SANITARY DUMP STA.(MARINE)										
I WASTE TREATMENT PLANTS		$100,000	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
J WASTE DISPOSAL PLANTS		$ 25,000	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
K FRAME TOILETS (CONC.VAULT)		$ 2,500	0.0	$ 0.0	2.0	4.0	0.0	0.0	6.0	$ 15.0
6 UTILITIES	JOB									
A WATER DISTRIBUTION LINES		$ 5,300	0.0	$ 0.0	0.0	1.0	1.0	0.0	2.0	$ 5.3
B ELECTRIC SERVICE LINES		$ 4,000	0.0	$ 0.0	0.0	1.0	1.0	0.0	2.0	$ 4.0
C LIGHT STANDARDS ETC.		$ 1,000	0.0	$ 0.0	0.0	1.0	1.0	0.0	2.0	$ 1.0
7 PICNIC AND CAMPING UNITS	EACH									
A PICNIC UNITS		$ 0.365	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
B CAMP UNITS (1 UNIT=1-TABLE,1-COOKER,AND 1-TRASH CAN)		$ 0.365	0.0	$ 0.0	0.0	4.0	0.0	0.0	4.0	$ 1.5
8 TABLE SHELTERS	EACH									
A SINGLE (1-TABLE)		$ 0.300	0.0	$ 0.0	0.0	4.0	0.0	0.0	4.0	$ 1.2
B GROUP (3-TABLES)		$ 3,500	0.0	$ 0.0	2.0	0.0	0.0	0.0	2.0	$ 7.0
9 OBSERVATION SHELTERS	EACH									
A WITH WATERBORNE TOILETS										
B NO TOILETS										
10 FLOATING DOCKS	EACH									
A COURTESY (BOATING)		$ 2,000	0.0	$ 0.0	0.0	1.0	1.0	0.0	2.0	$ 4.0
B FISHING										
11 SWIMMING BEACHES	EACH									
A IMPROVED		$ 6,000	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
B UNIMPROVED										
12 SIGNS - BUOYS	JOB									
A PARK ENTRANCE SIGNS										
B DIRECTIONAL SIGNS		$ 2,000	0.0	$ 0.0	1.0	1.0	1.0	0.0	3.0	$ 6.0
C BULLETIN BOARDS,REG,BOOTHS										
D BUOYS - ANCHOR		$ 3,000	0.0	$ 0.0	0.0	1.0	1.0	0.0	2.0	$ 3.0
13 SITE IMPROVEMENT	JOB									
A UNDERBRUSHING		$ 3,450	0.0	$ 0.0	1.0	1.0	0.0	0.0	2.0	$ 3.4
B GRADING-DRAINAGE										
C REFORESTATION										
D SEEDING										
E CHANNEL EXCAV.										
14 LANDSCAPING	JOB									
15 GATES	EACH									
A TRAFFIC CONTROL GATES		$ 0.500	1.0	$ 0.5	0.0	0.0	0.0	0.0	1.0	$ 0.5
16 TRAILS	MILE									
A HIKING TRAILS		$ 1,000	0.0	$ 0.0	1.7	2.0	0.2	0.0	3.9	$ 3.9
TOTALS				$ 0.5						$ 145.6

MAGNOLIA RIDGE PARK

(570 Acres)

This area is located on the west shore of the lake about two miles north of U.S. Highway 190. The terrain is gently sloping to flat. Tree cover, predominately pine, is fairly dense to very dense resulting in a very attractive area. At present, access is by a county road which connects to U.S. Highway 190. This park will be developed primarily for camping. An additional 176 acres will be redesignated as park land.

The day use area is readily accessible and is protected from other activities by a natural barrier of pines and hardwoods. Adjacent to this area are:

1. a free flowing creek which will be developed for a nature trail, and
2. an open area to the west which is adaptable for open sport recreation such as baseball, touch football, badminton, volleyball, etc.

The overnight use area will be developed primarily for land oriented recreation. Due to the serene atmosphere, enhanced by scenic aquatic and land vegetation, the dense stands of hardwoods and pines, and the limited access to the lake as a result of the shallow water with numerous stumps and drifts; this area lends itself to primitive type development. When the lake is at or above conservation pool elevation 83, this area is one of the better fishing areas on the lake.

Area	5-Year Improvement Plan	Existing Conditions
7	Overnight Use Area (1 Primitive Camp Unit)	
	1 campfire circle	5 tables
	4 fireplaces	3 shelters
	8 tent pads	5 cookers or grills
	2 wood frame vault type toilets	
	2 miles hiking trail	
	1 courtesy dock	
	Extend existing ramp	1 one lane ramp
	1 drinking fountain	3 drinking fountains
		5 electrical hookups
	Additional Supporting Facilities (Total)	
	543 square yards paved parking	8,087 square yards paved parking
	1.0 mile paved park road	3.39 miles paved park road
	1.6 miles circulation road	
		1 mile gravel road
		389 square yards gravel parking

MAGNOLIA RIDGE PARK

(570 Acres)

Area	5-Year Improvement Plan	Existing Conditions
1	Day Use Area	
	0.2 mile hiking trail	
	Convert existing toilet to waterborne	1 masonry concrete vault toilet
	1 traffic control gate	1 one lane ramp
	1 drinking fountain	6 tables
		5 shelters
		6 cookers or grills
		3 electrical hookups
		3 drinking fountains
2	Day Use Area	
	None	1 sanitary dump station
3	Overnight Use Area	
	Convert existing toilet to waterborne	1 masonry concrete vault toilet
	1 additional launching lane	1 lane ramp
	1 group shelter	14 tables
	1 courtesy dock	11 shelters
		14 cookers or grills
	Pressurize existing artesian well	1 water well (artesian)
		3 drinking fountains
		8 electrical hookups
4	Overnight Use Area (2 Primitive Camp Units)	
	2 campfire circles	None
	8 fireplaces	
	16 tent pads	
	2 wood vault type toilets	
5	Overnight Use Area	
	4 camping units w/shelter	6 tables
	1 group shelter	2 shelters
		4 cookers or grills
	Convert existing toilet to waterborne	1 masonry concrete vault toilet
	Pressurize existing artesian well	1 water well (artesian)
	1 drinking fountain	1 drinking fountain
		4 electrical hookups
6	Overnight Use Area (2 Primitive Camp Units)	
	2 campfire circles	None
	8 fireplaces	
	16 tent pads	
	2 wood frame vault type toilets	
	1.7 miles hiking trail	

U. S. ARMY
ENGINEER DISTRICT
FORT WORTH
FT. WORTH, TEXAS

MANAGEMENT AREAS

	OVERNIGHT	DAY
EXISTING		
PROPOSED		

ALL PROPOSED ROADS, TRAILS, AND OTHER TYPES OF DEVELOPMENT WILL BE SHOWN IN THIS COLOR.

LEGEND

REFERENCE NO. 9
ROAD (PAVED)
ROAD (OTHER)
LAUNCH SITE
SWIMMING SWIM.
PARK LIMIT
TRAIL
DUMP STATION
BUILDING
WATER AREA
TREES
CONTOURS 76
GOV'T. FEE LINE

PARK MASTER PLAN

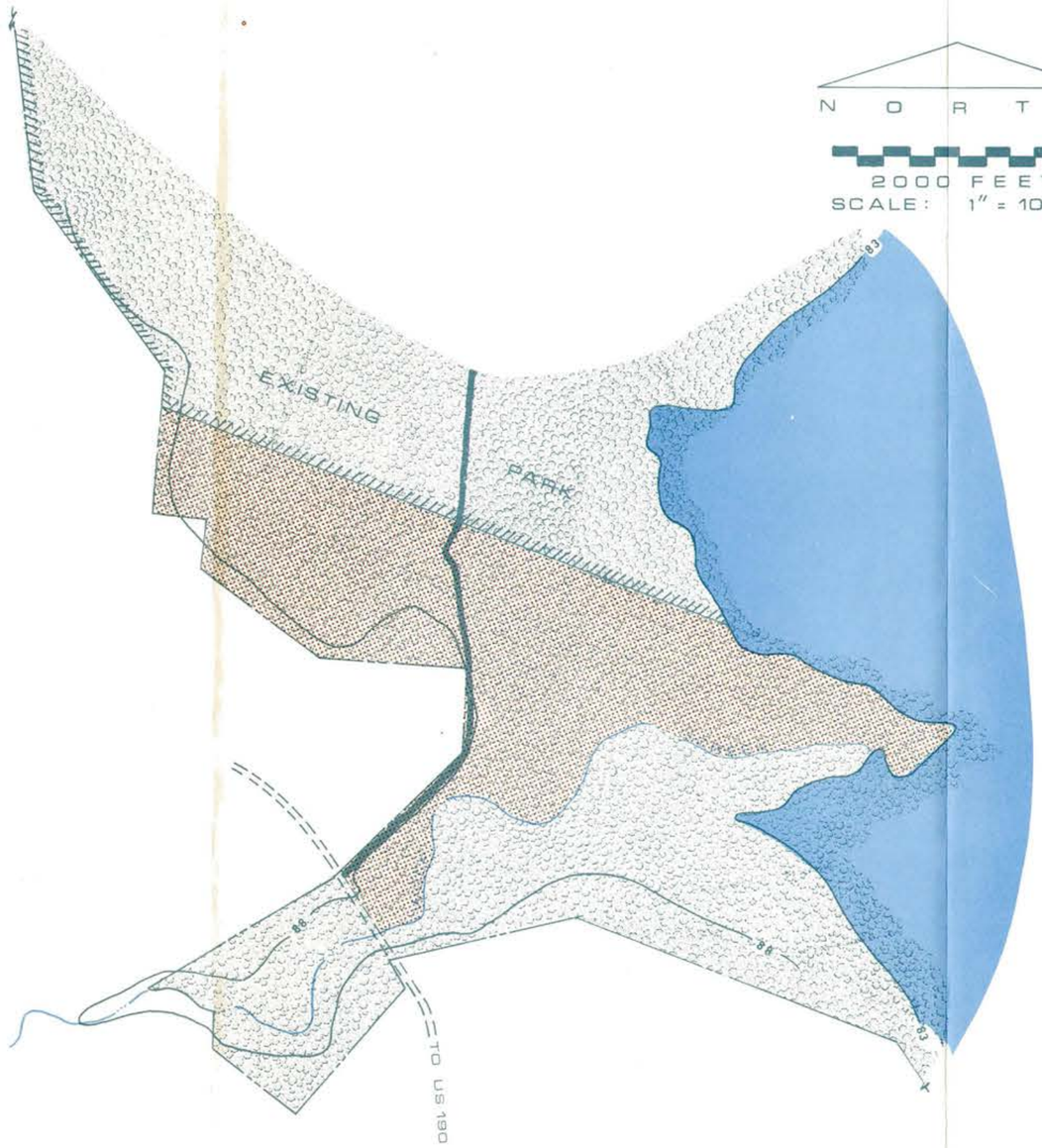
B. A. STEINHAGEN LAKE
MAGNOLIA RIDGE PARK
TOWN BLUFF, TEXAS
DATED DECEMBER 1971

PLATE NUMBER 3.4

MAGNOLIA RIDGE PARK

PROPOSED ADDITION

At the present time, government owned lands outside of Magnolia Ridge Park are being utilized for picnicking and other recreational purposes. This parcel of 176 acres, located adjacent to the park and lying along the park entrance road, has three existing picnic tables. The general features are the same as in Magnolia Ridge Park and the area has a moderate to dense tree cover. In order to more easily facilitate proper management of existing park acreage and its use, it is proposed that these 176 acres be redesignated and be included within the limits of Magnolia Ridge Park.



U. S. ARMY
ENGINEER DISTRICT
FORT WORTH
FT. WORTH, TEXAS

PROPOSED ADDITION

LEGEND

REFERENCE NO. 3
ROAD (PAVED)
ROAD (OTHER)
LAUNCH SITE
SWIMMING SWIM.
PARK LIMIT
TRAIL
DUMP STATION
BUILDING
WATER AREA
TREES
CONTOURS 76
GOV'T. FEE LINE

PROPOSED ADDITION TO
MAGNOLIA RIDGE PARK
B. A. STEINHAGEN LAKE
TOWN BLUFF, TEXAS
DATED DECEMBER 1971

PLATE
3.4
A
NUMBER

MARTIN DIES, JR. STATE PARK

CHEROKEE UNIT

(27 Acres)

This unit, primarily used for picnicing and fishing, is located on the north and south sides of U.S. Highway 190 on the west side of the lake. It is readily accessible from U.S. Highway 190 at about the middle of the area. The terrain is flat and tree cover is moderately dense.

5-Year Improvement Plan	Existing Facilities
Not available	0.56 mile paved road 9,468 square yards paved parking 3 boat ramps 2 masonry waterborne toilets 1 water well, pressure 56 picnic units 49 grills or cookers 9 table shelters 2 registration booths 39 buoys 1 swimming beach Signs 2 piers Drinking fountains

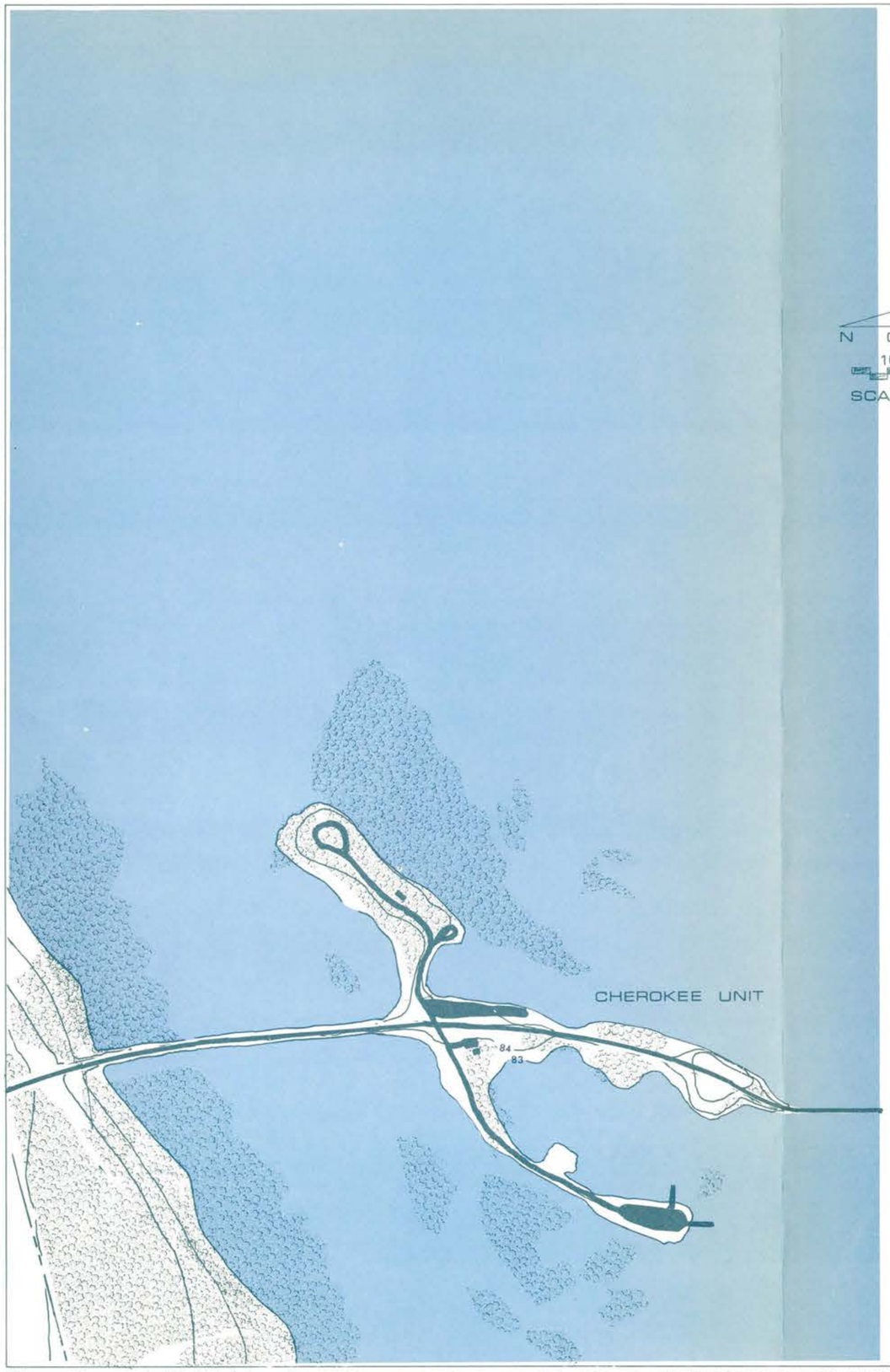
MARTIN DIES, JR. STATE PARK

WALNUT RIDGE UNIT

(309 Acres)

This unit lies north of and adjacent to U.S. Highway 190 on the east side of the lake, part of which is on an island. This unit is primarily used for camping, fishing, and boating. The terrain is gently sloping to flat and tree cover is dense.

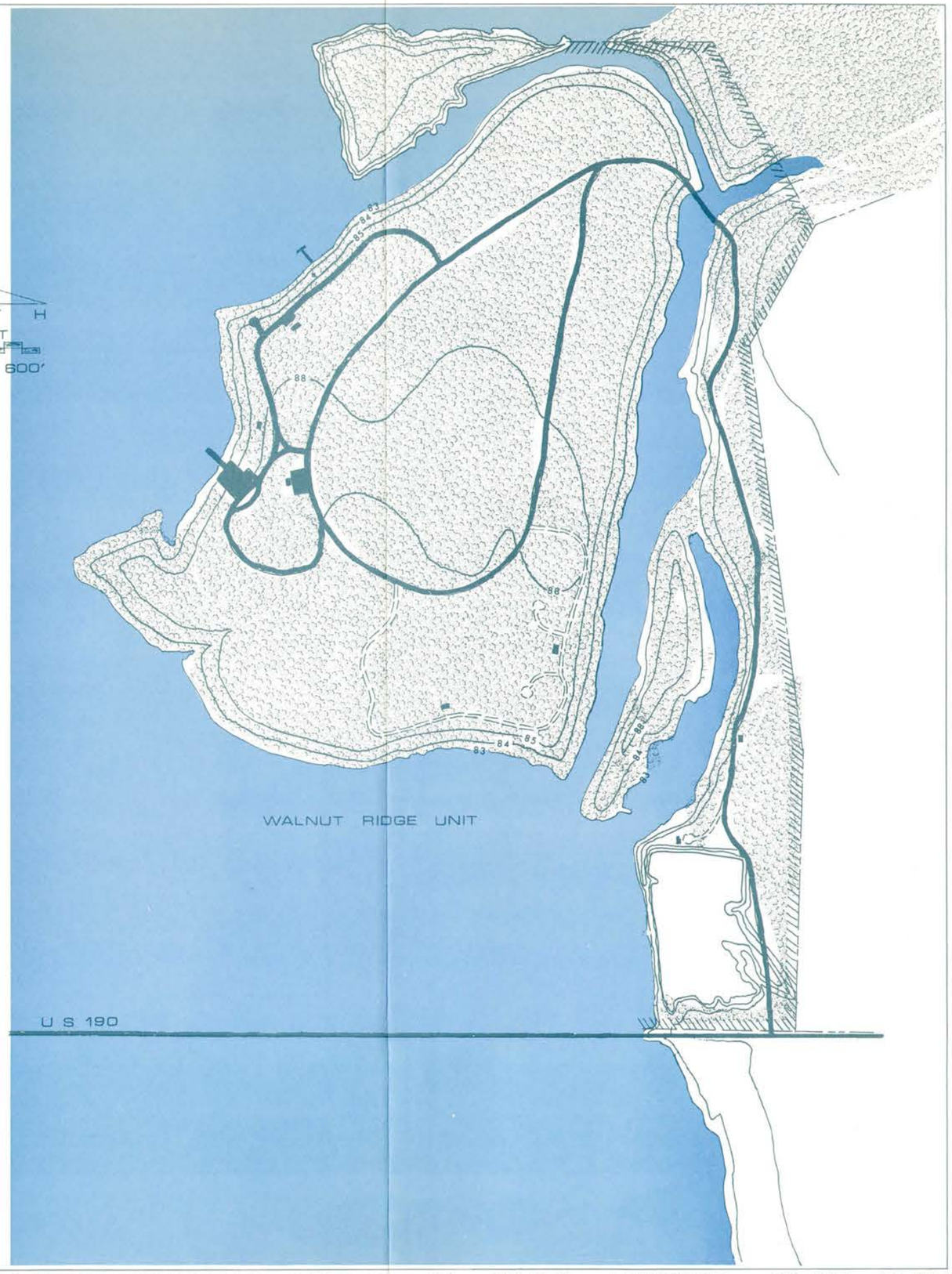
5-Year Improvement Plan	Existing Facilities
Not available	3.37 miles paved road 1.19 miles gravel road 4,049 square yards paved parking 547 square yards gravel parking 1 boat ramp 3 masonry waterborne toilets 1 water well, pressure 120 camping units 52 table shelters 25 other camping units (not masonry) 112 grills or cookers 1 registration booth 25 screened shelters 2 fish cleaning houses 1 fishing pier 1 concession building Signs Drinking fountains



N O R T H

1000 FEET

SCALE : 1" = 600'



U. S. ARMY
ENGINEER DISTRICT
FORT WORTH
FT. WORTH, TEXAS

MANAGEMENT AREAS

	OVERNIGHT	DAY
EXISTING		
PROPOSED	NONE	

LEGEND

REFERENCE NO.	9	PARK LIMIT	
ROAD (PAVED)		TRAIL	
ROAD (OTHER)		DUMP STATION	
LAUNCH SITE		BUILDING	
SWIMMING	SWIM.	WATER AREA	
TREES			
CONTOURS	76		
GOV'T. FEE LINE			

PARK MASTER PLAN

CHEROKEE & WALNUT RIDGE UNITS

MARTIN DIES JR. STATE PARK

DATED DECEMBER 1971

PLATE NUMBER 3.5

MARTIN DIES, JR. STATE PARK

HEN HOUSE RIDGE AND BEECH GROVE UNIT

(283 Acres)

This area lies south of and adjacent to U.S. Highway 190 on the east side of the lake. In the original Master Plan, this area was under lease to Jasper County; however, Jasper County requested that part of this area be reverted back to the Corps. On 17 April 1964, 283 acres of the County's lease were reverted to the state and this area is now referred to as the Beech Grove and Hen House Ridge Units of Martin Dies, Jr. State Park. The latter two units were consolidated in order to facilitate the administration of the Martin Dies, Jr. State Park license. The park is accessible from U. S. Highway 190 which forms the north side of the area. Tree cover is dense and the terrain is very sloping to flat. The state has developed some very adequate camping areas in the park.

5-Year Improvement Plan

Not available

Existing Facilities

3.15 mile paved road
0.1 mile gravel road
35 tent and trailer pads
4,480 square yards paved parking
1,063 square yards gravel parking
4 waterborne toilets
1 sanitary dump station
1 water well
121 camping units
121 grills or cookers
1 registration booth
20 screened shelters
2 fish cleaning houses
1 fishing pier
Signs
Drinking fountains

TABLE 16

DETAILED ESTIMATE OF COST FOR ADDITIONAL RECREATIONAL FACILITIES

PROJECT B.A.STEINHAGEN

PUBLIC AREA BEECH GROVE

(AMOUNTS IN THOUSANDS OF DOLLARS)

ITEM	UNIT	UNIT COST	F.Y.73 BUDGET COST QUANTITY	F.Y.73 BUDGET COST COST	(QUANTITIES BY FISCAL YEARS) 74	75	76	77	TOTAL QUAN. F.Y.73 THRU F.Y.77	TOTAL COST
1 ROADS	MILE									
A PARK ROADS (BIT)		$ 75,000	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
B PAVE EXIST. GRAVEL PK. RD.		$ 60,000	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
C AREA CIRCULATION ROAD(BIT.)		$ 11,000	0.3	$ 3.3	0.0	0.0	0.0	0.0	0.3	$ 3.3
D GRAVEL		$ 11,000	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
2 PARKING AREAS	S.Y.									
A PAVED (BIT)		$ 0.005	293.0	$ 1.5	0.0	0.0	0.0	0.0	293.0	$ 1.5
B PAVE EXIST.GRAVEL		$ 0.005	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
3 BOAT LAUNCHING RAMPS (CONC)	S.Y.									
A 1-LANE 14 FT. WIDE		$ 0.045	233.0	$ 10.5	0.0	0.0	0.0	0.0	233.0	$ 10.5
B 2-LANES 32 FT. WIDE		$ 0.045	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
C 3-LANES 50 FT. WIDE		$ 0.045	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
D 4-LANES 68 FT. WIDE		$ 0.045	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
E EXTENSIONS		$ 0.045	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
4 WATER SUPPLY SYSTEMS	EACH									
A WELLS (PRESSURE TYPE)		$ 8,500	1.0	$ 8.5	0.0	0.0	0.0	0.0	1.0	$ 8.5
B LAKE PUMP AND FILTER										
C DRINKING FOUNTAINS		$ 0.200	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
5 SANITARY FACILITIES	EACH									
A MASONRY WATERBORNE TOILETS		$ 35,000	1.0	$ 35.0	0.0	0.0	0.0	0.0	1.0	$ 35.0
B CONVER. D WATERBORNE TOILETS		$ 15,000	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
C MASONRY CONC.VAULT TOILETS		$ 10,000	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
D SERVICE BLDG.(WITH TOILETS, SHOWERS, LAUNDRY FACILITIES)		$ 45,000	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
E BATHHOUSE WITH TOILETS		$ 43,000	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
F BATHHOUSE NO TOILETS		$ 8,000	1.0	$ 8.0	0.0	0.0	0.0	0.0	1.0	$ 8.0
G SANITARY DUMP STA.(TRAILER)		$ 2,500	1.0	$ 2.5	0.0	0.0	0.0	0.0	1.0	$ 2.5
H SANITARY DUMP STA.(MARINE)										
I WASTE TREATMENT PLANTS		$100,000	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
J WASTE DISPOSAL PLANTS		$ 25,000	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
K FRAME TOILETS (CONC.VAULT)		$ 2,500	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
6 UTILITIES	JOB									
A WATER DISTRIBUTION LINES		$ 2,000	1.0	$ 2.0	0.0	0.0	0.0	0.0	1.0	$ 2.0
B ELECTRIC SERVICE LINES		$ 3,000	1.0	$ 3.0	0.0	0.0	0.0	0.0	1.0	$ 3.0
C LIGHT STANDARDS ETC.		$ 0.500	1.0	$ 0.5	0.0	0.0	0.0	0.0	1.0	$ 0.5
7 PICNIC AND CAMPING UNITS	EACH									
A PICNIC UNITS		$ 0.365	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
B CAMP UNITS (1 UNIT=1-TABLE,1-COOKER,AND 1-TRASH CAN)		$ 0.365	16.0	$ 5.8	0.0	0.0	0.0	0.0	16.0	$ 5.8
8 TABLE SHELTERS	EACH									
A SINGLE (1-TABLE)		$ 0.300	16.0	$ 4.8	0.0	0.0	0.0	0.0	16.0	$ 4.8
B GROUP (3-TABLES)		$ 3,500	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
9 OBSERVATION SHELTERS	EACH									
A WITH WATERBORNE TOILETS										
B NO TOILETS										
10 FLOATING DOCKS	EACH									
A COURTESY (BOATING)		$ 2,000	1.0	$ 2.0	0.0	0.0	0.0	0.0	1.0	$ 2.0
B FISHING										
11 SWIMMING BEACHES	EACH									
A IMPROVED		$ 6,000	1.0	$ 6.0	0.0	0.0	0.0	0.0	1.0	$ 6.0
B UNIMPROVED										
12 SIGNS - BUOYS	JOB									
A PARK ENTRANCE SIGNS										
B DIRECTIONAL SIGNS		$ 1,500	1.0	$ 1.5	0.0	0.0	0.0	0.0	1.0	$ 1.5
C BULLETIN BOARDS,REG.BOOTHS										
D BUOYS - ANCHOR		$ 3,000	1.0	$ 3.0	0.0	0.0	0.0	0.0	1.0	$ 3.0
13 SITE IMPROVEMENT	JOB									
A UNDERBRUSHING		$ 1,600	1.0	$ 1.6	0.0	0.0	0.0	0.0	1.0	$ 1.6
B GRADING-DRAINAGE										
C REFORESTATION										
D SEEDING										
E CHANNEL EXCAV.		$ 3,000	1.0	$ 3.0	0.0	0.0	0.0	0.0	1.0	$ 3.0
14 LANDSCAPING	JOB									
15 GATES	EACH									
A TRAFFIC CONTROL GATES		$ 0.500	1.0	$ 0.5	0.0	0.0	0.0	0.0	1.0	$ 0.5
16 TRAILS	MILE									
A HIKING TRAILS		$ 1,000	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
TOTALS				$ 103.0						$ 103.0

BEECH GROVE PARK

(17 Acres)

It is recommended that this area, previously part of Jasper County Park, be named Beech Grove Park. This area lies south of and adjacent to U.S. Highway 190 on the east side of the lake. Until 20 May 1971 this park was under a third party lease to a concessionaire. This concessionaire presently has a direct commercial concession lease on 2.5 acres with the Corps of Engineers.

Access to Highway 190, and the concessionaire adjacent to this park make it an ideal location for camping. Tree cover is predominately pint with some hardwoods. However, the grass cover is in need of revegetation, expecially in the heavily used areas near the water's edge. Also, the shoreline is highly adaptable for beach use.

BEECH GROVE PARK

(17 Acres)

Area	5-Year Improvement Plan	Existing Conditions
1	16 camping units w/shelters	
	16 paved pullouts	
	1 masonry waterborne toilets	
	1 sanitary dump station	
	1 courtesy dock	
	1 swimming beach, buoys	
	1 bath house without toilets	
	1 additional launching lane	1 one lane ramp
	Extend existing ramp	
	Channel excavation	
	Pressurize existing artesian well	1 water well (artesian)
	1 traffic control gate	

Additional Supporting Facilities (Total)

293 square yards paved parking	
0.3 mile area circulation road	0.2 mile paved park road

1000 FEET
SCALE : 1" = 600'

NORTH

JASPER

US 60

GATE

MARTIN DIES JR. STATE PARK

GATE

BIKE TRAIL

BEECH GROVE UNIT

HEN HOUSE RIDGE UNIT

88
85
84
83

SWIMMING
SWIMMING BEACH

BEECH GROVE PARK

CONCESION

U. S. ARMY
ENGINEER DISTRICT
FORT WORTH
FT. WORTH, TEXAS

MANAGEMENT AREAS

	OVERNIGHT	DAY
EXISTING		
PROPOSED		

ALL PROPOSED ROADS, TRAILS, AND OTHER TYPES OF DEVELOPMENT WILL BE SHOWN IN THIS COLOR.

LEGEND

REFERENCE NO. 9
ROAD (PAVED)
ROAD (OTHER)
LAUNCH SITE
SWIMMING SWIM.
PARK LIMIT
TRAIL
DUMP STATION
BUILDING
WATER AREA
TREES
CONTOURS 75
GOV'T. FEE LINE

PARK MASTER PLAN

B. A. STEINHAGEN LAKE
BEECH GROVE PARK
TOWN BLUFF, TEXAS

DATED DECEMBER 1971

PLATE NUMBER 3.6

TABLE 17

DETAILED ESTIMATE OF COST FOR ADDITIONAL RECREATIONAL FACILITIES

PROJECT B.A.STEINHAGEN

PUBLIC AREA SANDY CREEK

(AMOUNTS IN THOUSANDS OF DOLLARS)

ITEM	UNIT	F.Y.73 BUDGET COST UNIT COST	F.Y.73 BUDGET COST QUANTITY	F.Y.73 BUDGET COST COST	(QUANTITIES BY FISCAL YEARS) 74	75	76	77	TOTAL QUAN. F.Y.73 THRU F.Y.77	TOTAL COST F.Y.73 THRU F.Y.77
1 ROADS	MILE									
A PARK ROADS (BIT)		$ 75,000	1.7	$ 127.5	0.0	0.0	0.0	0.0	1.7	$ 127.5
B PAVE EXIST. GRAVEL PK. RD.		$ 60,000	1.1	$ 66.0	0.0	0.0	0.0	0.0	1.1	$ 66.0
C AREA CIRCULATION ROAD(BIT.)		$ 11,000	1.0	$ 11.0	0.0	0.0	0.0	0.0	1.0	$ 11.0
D GRAVEL		$ 11,000	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
2 PARKING AREAS	SQ.Y.									
A PAVED (BIT)		$ 0.005	3646.0	$ 18.2	0.0	0.0	0.0	0.0	3646.0	$ 18.2
B PAVE EXIST.GRAVEL		$ 0.005	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
3 BOAT LAUNCHING RAMPS (CONC)	SQ.Y.									
A 1-LANE 14 FT. WIDE		$ 0.045	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
B 2-LANES 32 FT. WIDE		$ 0.045	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
C 3-LANES 50 FT. WIDE		$ 0.045	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
D 4-LANES 68 FT. WIDE		$ 0.045	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
E EXTENSIONS		$ 0.045	133.0	$ 6.0	0.0	0.0	0.0	0.0	133.0	$ 6.0
4 WATER SUPPLY SYSTEMS	EACH									
A WELLS (PRESSURE TYPE)		$ 8,500	2.0	$ 17.0	0.0	0.0	0.0	0.0	2.0	$ 17.0
B LAKE PUMP AND FILTER										
C DRINKING FOUNTAINS		$ 0.200	10.0	$ 2.0	0.0	0.0	0.0	0.0	10.0	$ 2.0
5 SANITARY FACILITIES	EACH									
A MASONRY WATERBORNE TOILETS		$ 35,000	1.0	$ 35.0	0.0	0.0	0.0	0.0	1.0	$ 35.0
B CONVERT TO WATERBORNE TOILETS		$ 15,000	4.0	$ 60.0	0.0	0.0	0.0	0.0	4.0	$ 60.0
C MASONRY CONC.VAULT TOILETS										
D SERVICE BLG.(WITH TOILETS, SHOWERS,LAUNDRY FACILITIES)		$ 45,000	1.0	$ 45.0	0.0	0.0	0.0	0.0	1.0	$ 45.0
E BATHHOUSE WITH TOILETS		$ 43,000	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
F BATHHOUSE NO TOILETS		$ 8,000	1.0	$ 8.0	0.0	0.0	0.0	0.0	1.0	$ 8.0
G SANITARY DUMP STA.(TRAILER)		$ 2,500	1.0	$ 2.5	0.0	0.0	0.0	0.0	1.0	$ 2.5
H SANITARY DUMP STA.(MARINE)										
I WASTE TREATMENT PLANTS		$100,000	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
J WASTE DISPOSAL PLANTS		$ 25,000	1.0	$ 25.0	0.0	0.0	0.0	0.0	1.0	$ 25.0
K FRAME TOILETS (CONC.VAULT)		$ 2,500	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
6 UTILITIES	JOB									
A WATER DISTRIBUTION LINES		$ 5,900	1.0	$ 5.9	0.0	0.0	0.0	0.0	1.0	$ 5.9
B ELECTRIC SERVICE LINES		$ 9,000	1.0	$ 9.0	0.0	0.0	0.0	0.0	1.0	$ 9.0
C LIGHT STANDARDS ETC.		$ 2,000	1.0	$ 2.0	0.0	0.0	0.0	0.0	1.0	$ 2.0
7 PICNIC AND CAMPING UNITS	EACH									
A PICNIC UNITS		$ 0.365	0.0	$ 0.0	0.0	0.0	0.0	0.0	0.0	$ 0.0
B CAMP UNITS										
(1 UNIT=1-TABLE,1-COOKER,AND 1-TRASH CAN)		$ 0.365	33.0	$ 12.0	0.0	0.0	0.0	0.0	33.0	$ 12.0
8 TABLE SHELTERS	EACH									
A SINGLE (1-TABLE)		$ 0.300	33.0	$ 9.9	0.0	0.0	0.0	0.0	33.0	$ 9.9
B GROUP (3-TABLES)		$ 3.500	2.0	$ 7.0	0.0	0.0	0.0	0.0	2.0	$ 7.0
9 OBSERVATION SHELTERS	EACH									
A WITH WATERBORNE TOILETS										
B NO TOILETS										
10 FLOATING DOCKS	EACH									
A COURTESY (BOATING)		$ 2,000	1.0	$ 2.0	0.0	0.0	0.0	0.0	1.0	$ 2.0
B FISHING										
11 SWIMMING BEACHES	EACH									
A IMPROVED		$ 6,000	1.0	$ 6.0	0.0	0.0	0.0	0.0	1.0	$ 6.0
B UNIMPROVED										
12 SIGNS - BUOYS	JOB									
A PARK ENTRANCE SIGNS										
B DIRECTIONAL SIGNS		$ 2,160	1.0	$ 2.2	0.0	0.0	0.0	0.0	1.0	$ 2.2
C BULLETIN BOARDS,REG.BOOTHS										
D BUOYS - ANCHOR		$ 3,000	1.0	$ 3.0	0.0	0.0	0.0	0.0	1.0	$ 3.0
13 SITE IMPROVEMENT	JOB									
A UNDERBRUSHING		$ 2,655	1.0	$ 2.7	0.0	0.0	0.0	0.0	1.0	$ 2.7
B GRADING-DRAINAGE										
C REFORESTATION										
D SEEDING										
E CHANNEL EXCAV.		$ 3,000	1.0	$ 3.0	0.0	0.0	0.0	0.0	1.0	$ 3.0
14 LANDSCAPING	JOB									
15 GATES	EACH									
A TRAFFIC CONTROL GATES		$ 0.500	2.0	$ 1.0	0.0	0.0	0.0	0.0	2.0	$ 1.0
16 TRAILS	MILE									
A HIKING TRAILS		$ 1.000	1.0	$ 1.0	0.0	0.0	0.0	0.0	1.0	$ 1.0
TOTALS				$ 489.9						$ 489.9

SANDY CREEK PARK

(395 Acres)

For administrative reasons, the areas referred to in the original Master Plan as Sandy Creek Park and Smithfield Point have been combined to form this park which lies on the east side of the lake near the point where Sandy Creek enters the lake. The terrain varies from fairly steep to flat. It is accessible by a county road which connects to FM 777 and state roads in Jasper Connty. At present, many visitors are using a private forest road to enter the park because it is shorter and in better condition during wet periods than the designated access road. Because of the poor condition and excessive length of the present access roads, a new road is proposed for access into the park.

The day use area nestled within pines, hardwoods, and a dense understory, is a popular bank fishing area - especially since Sandy Creek flows into the lake within this area.

The overnight use areas are located near the shoreline monopolizing on the exposure and scenery of the lake. All but the southern portion of the park contains a good stand of hardwoods and pines.

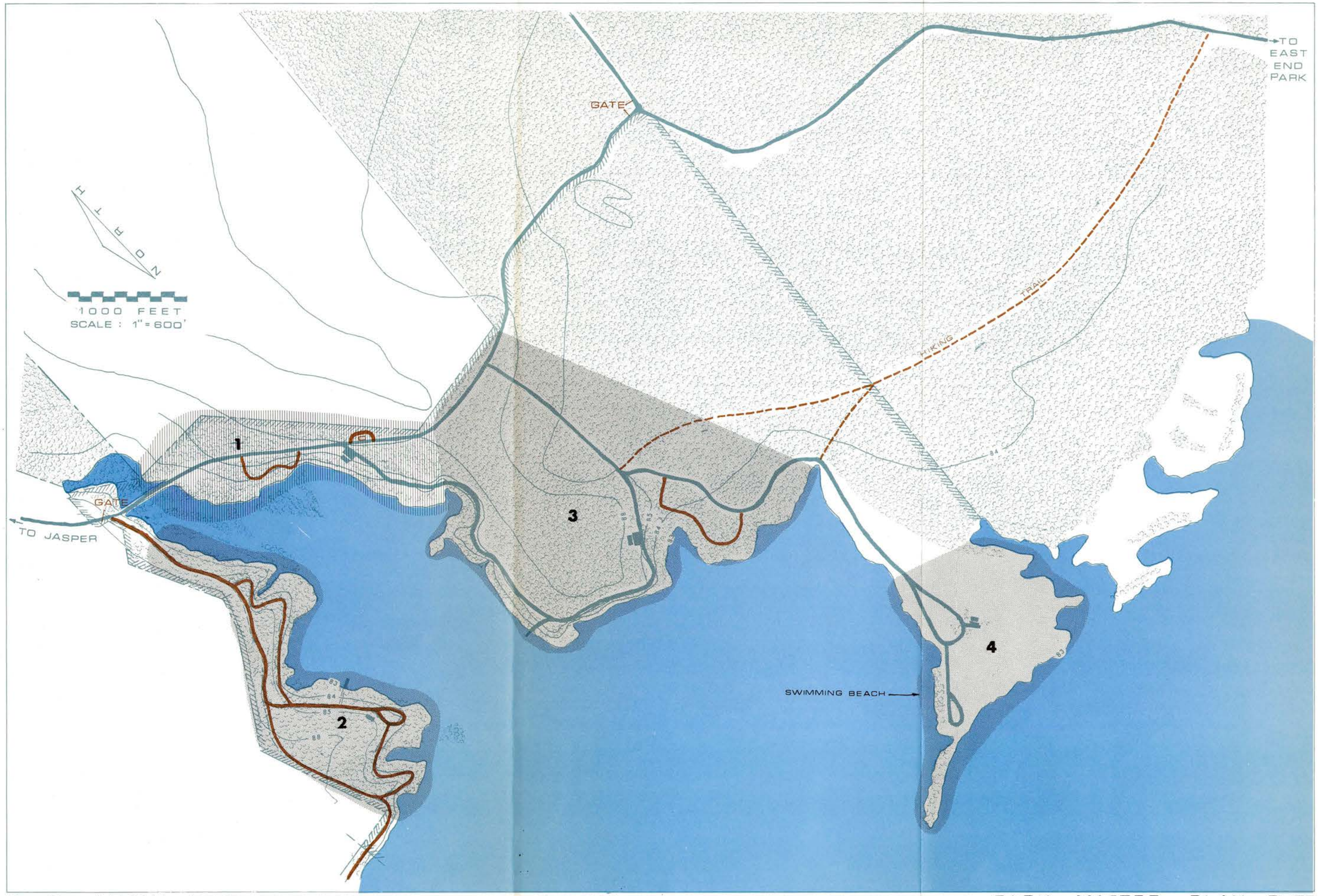
At present, this park has the best year-round launching facility. Also, this park includes natural areas, which facilitate hiking, nature study, and open play area activities.

SANDY CREEK PARK

(395 Acres)

Area	5-Year Improvement Plan	Existing Conditions
1	Day Use Area	
	Convert existing toilet to waterborne	1 masonry concrete vault toilet
	1 courtesy dock	
	2 drinking fountains	2 drinking fountains
		14 tables w/shelters
		14 cookers or grills
		8 electrical hookups
2	Overnight Use Area	
	1 waterborne toilet	
	Convert existing toilet to waterborne	1 masonry concrete vault toilet
	27 camping units w/shelters	10 tables w/shelters
	1 group shelter	10 cookers or grills
	1 courtesy dock	1 one lane ramp
	Pressurize existing well	1 water well (artesian)
	6 drinking fountains	3 drinking fountains
3	Overnight Use Area	
	6 camping units w/shelters	11 tables w/shelters
	1 group shelter	11 cookers or grills
	1 service building	1 one lane ramp
	Convert existing toilet to waterborne	1 masonry concrete vault toilet
		3 drinking fountains
		1 courtesy dock
		6 electrical hookups
4	Overnight Use Area	
	Swimming beach	10 tables w/shelters
	1 bath house without toilets	10 cookers or grills
	Convert existing toilet to waterborne	1 masonry concrete vault toilet
	Pressurize existing well	1 water well (artesion)
		11 electrical hookups
	2 drinking fountains	2 drinking fountains

Additional Supporting Facilities (Total)	
3,646 square yards paved parking	948 square yards paved parking
1.1 miles area circulation road	304 square yards gravel parking
1.0 mile pave existing gravel road	3.05 miles paved road
1.7 miles paved park road	0.24 mile gravel road



U. S. ARMY
ENGINEER DISTRICT
FORT WORTH
FT. WORTH, TEXAS

MANAGEMENT AREAS

	OVERNIGHT	DAY
EXISTING		
PROPOSED		

ALL PROPOSED ROADS, TRAILS, AND OTHER TYPES OF DEVELOPMENT WILL BE SHOWN IN THIS COLOR.

LEGEND

REFERENCE NO. 9
ROAD (PAVED)
ROAD (OTHER)
LAUNCH SITE
SWIMMING SWIM.
PARK LIMITS
TRAIL
DUMP STATION
BUILDING
WATER AREA
TREES
CONTOURS 76
GOV'T. FEE LINE

PARK MASTER PLAN PLATE

B. A. STEINHAGEN LAKE
SANDY CREEK PARK
TOWN BLUFF, TEXAS

3.7

DATED DECEMBER 1971 NUMBER

3. Facilities Design Concepts

a. Planning For An Indigenous Character

(1) Environment:

The recreational environment will endeavor to maintain an indigenous character which will compliment the existing environment. Before a structure is designed for any location, a physiographical analysis of the land shall be performed to include the guidelines mentioned in Section III, paragraph 3-06, C.

Each of these processes interact with the other and has implications which can affect facility design solutions.

(2) The design of any structure shall blend into the natural environment using indigenous materials which best relate to the character of the region.

b. Standard Construction Methods

(1) General Guidelines

(a) Flexibility:

Any design shall be able to adapt to various sizes as local needs dictate. Buildings and shelters shall be scaled to human beings. Interchangable building components which are mobile and adaptable to a variety of construction types should be considered.

(b) Simplicity:

Any proposed design shall be harmonous with its surroundings and simple to build. Good recreation planning and design principles shall be employed to assure that appropriate designs are developed: i.e. austerity does not degrade designs or standardization does not result in stereotyped facilities, and facilities blend into natural habitat.

(2) Facilities Descriptions:

ER's 1165-2-400, 1110-2-400, 1120-2-400, 1130-2-400, and the following comments shall be used only as guides to planning new facilities. Every effort shall be made to meet program requirements and preserve natural resource qualities.

(a) Roads and Rights-of-Way:

Clearing for road rights-of-way in public access areas will be confined within the top of the back slope and/or the toe of the fill as far as practicable. In order to prevent the needless destruction of desirable trees and shrubs, the back slope shall be warped around such growth. Excessive ditching, when not needed, will be eliminated in order that vegetation may grow as close to the road as possible. Selective clearing will be performed to encourage desirable growth on the back slopes. Selective clearing will be performed or supervised by trained District personnel by an on-the-site analysis.

Area circulation roads, except in extreme instances, will conform to the following general practices in order to lessen their impact on the park environment:

Use no cuts or fills

Follow lay of land

Natural drainage patterns to continue across roads

Maximum width will be 12 feet (10 feet minimum) with no shoulders

These roads will compliment units and facilities and will be designed to make these facilities accessable via vehicular traffic, rather than merely for the purpose of moving traffic. Consequently, site designs with specific unit locations will determine where access is needed. Determination of road centerlines will take place at that time. Site designs will also determine relocation of existing units to conform to new or proposed road patterns in order to prevent possible management problems such as multiple access, clustering, etc.

(b) Controlled Access Ways:

Means will be developed to control the access routes into the project areas, for example; vegetation programs, physical barriers using indigenous materials (berms, wooden posts, fence, rock out-croppings).

(3) Facilities Concept Drawings:

Below is a list of the concepts included in the Revised Master Plan. These drawings follow page 79.

C 1	Picnic/camp unit shelter
C 2	Waterborne toilet facility (A)
C 3	Waterborne toilet facility (B)
C 4	Bath house (with toilets)
C 5	Bath house (without toilets)
C 6	Camper service building
C 7	Group campfire circle
C 8	Traffic control gates
	Signs
	Area circulation road
	Trailer dump station
C 9	Fishing pier
	fish cleaning house
C 10	Well house
	Pit toilet (primitive)
C 11	Waste treatment plant

4. Summary of Cost Estimates

(a) General:

The cost estimates for the planned development used in the Cost Estimates Tables are based on:

(1) July 1970 price levels

(2) Experienced cost of similar facilities

(3) Estimated cost of facilities not previously constructed.

The project cost for all recreational facilities thru FY 77 under this plan is an increase of $1,179,600 over the total project cost estimate in the Updated Master Plan approved by the Chief of Engineers, dated 25 May 1962. The increase in cost is due to the following conditions:

(1) Additional recreational facilities needed to accommodate the general public use of the project as indicated in the Facilities Analysis under Section III of this plan.

(2) Upgrading of basic facilities to current standards.

(3) Inclusion of waterborne sanitary facilities to meet state health requirements.

(4) Increase in unit prices to reflect 1970 price levels.

(b) The planned development cost for FY 73 is shown in Table 18, page 73. The planned development cost thru FY 77 is shown in Table 19, page 74. A summary of cost by park is shown in Table 20, page 75.

(c) In accordance with the Federal Water Recreation Act (Public Law 89-72), recreation facilities and improvements installed at this project after 30 June 1976 will be on a 50-50 cost sharing basis. To date, there has been no interest shown by any outside agency toward development on a cost sharing basis. This plan does not include development after fiscal year 1976.

(d) Funds required for operation and maintenance at B. A. Steinhagen Lake are shown in Table 21, page 76.

TABLE 18

SUMMARY OF FACILITIES PLANNED FOR FY 73

Item No.	Item	Unit	Planned Facilities FY 73 Quantity	Cost
1.	Roads:	Mile		
	a. Park roads (Bit.)	do	1.7	127,500.
	b. Pave exist. gravel pk. rd.	do	1.6	96,000.
	c. Area circultation rd. (Bit)	do	1.4	15,400.
	d. Gravel	do	0.1	1,100.
2.	Parking Areas:	Sq.Yd.		
	a. Paved (Bit)	do	6,493.0	32,465.
	b. Pave exist. gravel	do	0.0	0.
3.	Boat Launching Ramps: (Conc)	Sq.Yd.		
	a. 1-Lane, 14 ft. wide	do	466.0	20,970.
	b. 2-Lanes, 32 ft. wide	do	0.0	0.
	c. 3-Lanes, 50 ft. wide	do	0.0	0.
	d. 4-Lanes, 68 ft. wide	do	0.0	0.
	e. Extensions	do	133.0	5,985.
4.	Water Supply Systems:	Each		
	a. Wells (pressure type)	do	4.0	34,000.
	b. Lake pump and filter	do	0.0	0.
	c. Drinking fountains	do	13.0	2,600.
5.	Sanitary Facilities:	Each		
	a. Masonry waterborne toilets	do	2.0	70,000.
	b. Convert to waterborne toilets	do	5.0	75,000.
	c. Masonry conc. vault toilets	do	0.0	0.
	d. Service bldg. (with toilets, showers, laundry facilities)	do	1.0	45,000.
	e. Bathhouse with toilets	do	0.0	0.
	f. Bathhouse without toilets	do	2.0	16,000.
	g. Sanitary dump sta. (trailers)	do	2.0	5,000.
	h. Sanitary dump sta. (marine)	do	0.0	0.
	i. Waste treatment plants	do	0.0	0.
	j. Waste disposal plants	do	1.0	25,000.
	k. Frame toilets (conc. vault)	do	2.0	5,000.
6.	Utilities:	Job		
	a. Water distribution lines	do	3.0	10,500.
	b. Electric service lines	do	3.0	14,500.
	c. Light standards, etc.	do	3.0	3,000.
7.	Picnic and Camping Units	Each		
	a. Picnic units	do	0.0	0.
	b. Camp units (1 unit = 1 cooker and 1 trash can)	do	55.0	20,075.
8.	Table Shelters:	Each		
	a. Single (1 table)	do	55.0	16,500.
	b. Group (3 tables)	do	2.0	7,000.
9.	Observation Shelters:	Each		
	a. With waterborne toilets	do	0.0	0.
	b. No toilets	do	0.0	0.
10.	Floating Docks:	Each		
	a. Courtesy (boating)	do	2.0	4,000.
	b. Fishing	do	0.0	0.
11.	Swimming Beaches:	Each		
	a. Improved	do	2.0	12,000.
	b. Unimproved	do	0.0	0.
12.	Signs and Buoys:	Job		
	a. Park entrance signs	do	0.0	0.
	b. Directional signs	do	3.0	4,330.
	c. Bulletin Boards, reg. booths	do	0.0	0.
	d. Buoys and anchor	do	3.0	7,500.
13.	Site Improvement:	Job		
	a. Underbrushing	do	4.0	7,425.
	b. Grading-drainage	do	0.0	0.
	c. Reforestation	do	0.0	0.
	d. Seeding	do	0.0	0.
	e. Channel Excav.	do	3.0	9,000.
14.	Landscaping:	Job		
15.	Gates:	Each		
	a. Traffic control gates	do	6.0	3,000.
16.	Trails:	Mile		
	a. Hiking trails	do	1.4	1,400.
			TOTAL DIRECT COST	$ 697,250.
			ENGINEERING AND DESIGN	62,752.
			SUPERVISION AND ADMINISTRATION	41,835.
			TOTAL	$ 801,837.

TABLE 19

TOTAL EXISTING AND PLANNED FACILITIES

Item No.	Item	Unit	Existing Fac. thru FY 1971 Quantity	Planned Facilities Quantity	Planned Facilities Cost
1.	Roads:	Mile			
	a. Park roads (Bit)	do	7.77	1.8	$ 135,000.
	b. Pave exist. gravel park road	do		2.4	144,000.
	c. Area circulation road (Bit)	do		3.4	37,400.
	d. Gravel	do	2.13	0.1	1,100.
2.	Parking Areas:	Sq.Yd.			
	a. Paved (Bit)	do	10,313		
	b. Pave exist. gravel	do		0.0	41,895.
	c. Gravel	do	4,119	0.0	0.
3.	Boat Launching Ramps:(Con)	Sq.Yd.			
	a. 1-Lane, 14 ft. wide	do	9.0	932.0	41,940
	b. 2-Lanes, 32 ft wide	do	0.0	0.0	0.
	c. 3-Lanes, 50 ft. wide	do	0.0	0.0	0.
	d. 4-Lanes, 68 ft. wide	do	0.0	0.0	0.
	e. Extensions	do	0.0	397.0	17,865.
4.	Water Supply Systems:	Each			
	a. Wells (pressure type)	do	12.0	5.0	42,500.
	b. Lake pump and filter	do	0.0	0.0	0.
	c. Drinking fountains	do	26.0	22.0	4,400.
5.	Sanitary Facilities:	Each			
	a. Masonry waterborne toilets	do	1.0	2.0	70,000.
	b. Convert to waterborne toilets	do	0.0	9.0	135,000.
	c. Masonry Conc. vault toilets	do	9.0	0.0	0.
	d. Service bldg.(with toilets showers, laundry fac.)	do	0.0	2.0	90,000.
	e. Bathhouse w/toilets	do	0.0	0.0	0.
	f. Bathhouse, no toilets	do	0.0	2.0	16,000.
	g. Sanitary dump sta. (trailers)	do	1.0	3.0	7,500.
	h. Sanitary dump sta. (marine)	do	0.0	0.0	0.
	i. Waste treatment plants	do	0.0	0.0	0.
	j. Waste disposal plants	do	0.0	2.0	50,000.
	k. Frame toilets (conc.va)	do	0.0	8.0	20,000.
6.	Utilities:	Job			
	a. Water distribution line	do	14,045	6.0	19,800.
	b. Electric service line	do	0.0	6.0	28,500.
	c. Light standards, etc.	do	0.0	6.0	5,400.
7.	Picnic & Camping Units:	Each			
	a. Picnic units	do	49.0	0.0	0.
	b. Camp units (1 unit = 1 table, 1 cooker, and 1 trash can)	do	141.0	73.0	26,645.
8.	Table Shelters:	Each			
	a. Single (1 table)	do	119.0	73.0	21,900.
	b. Group (3 tables)	do	0.0	5.0	17,500.
9.	Observation Shelters:	Each			
	a. W/waterborne toilets	do	0.0	0.0	0.
	b. No toilets	do	0.0	0.0	0.
10.	Floating Docks:	Each			
	a. Courtesy (boating)	do	0.0	5.0	10,000.
	b. Fishing	do	0.0	0.0	0.
11.	Swimming Beaches:	Each			
	a. Improved	do	0.0	2.0	12,000.
	b. Unimproved	do	0.0	0.0	0.
12.	Signs and Buoys:	Job			
	a. Park entrance signs	do	As req'd	0.0	0.
	b. Directional signs	do	As req'd	7.0	11,330.
	c. Bulletin boards, reg. booths	do	0.0	0.0	0.
	d. Buoys and anchors	do	As req'd	6.0	12,000.
13.	Site Improvements:	Job			
	a. Underbrushing	do	As req'd	7.0	11,950.
	b. Grading-drainage	do	0.0	0.0	0.
	c. Reforestation	do	0.0	0.0	0.
	d. Seeding	do	0.0	0.0	0.
	e. Channel excav.	do	0.0	4.0	12,000.
14.	Landscaping:	Job			
15.	Gates:	Each			
	a. Traffic control gates	do	0.0	6.0	3,000.
16.	Trails:	Mile			
	a. Hiking trails	do	0.0	5.3	5,300.
				TOTAL DIRECT COST	$ 1,051,925.
				ENGINEERING AND DESIGN	94,673.
				SUPERVISION AND ADMINISTRATION	64,115

TABLE 20

Account Number	Park Areas	Estimated Cost
711	Recreational Facilities	
	Bluff-View	$ 15,900.
	Campers Cove	210,500.
	Magnolia Ridge	145,600.
	East End Park	87,000.
	Sandy Creek	489,900.
	Beech Grove	103,000.
	TOTAL DIRECT COST	$ 1,052,000.
30	Engineering and Design	94,700.
31	Supervision and Administration	63,100.
	TOTAL	$ 1,210,000.

TABLE 21

FUNDS REQUIRED FOR OPERATION AND MAINTENANCE

B. A. STEINHAGEN LAKE

1. The estimated annual cost of operation and maintenance and real estate management is listed below:

Recreation facilities	
Operation and maintenance of facilities (includes contract cleanup, mowing, grading and maintenance of roads, repair of structures, nature areas, etc.)	$ 213,000.
Project Office (S&A)	6,000.
District Office staff functions	10,000.
Subtotal	$ 229,000.
Real Estate Management services	
Real Estate records, reports, audits, and Federal jusisdiction	$ 1,000.
Compliance inspections	1,500.
Utilization	1,000.
Outgrants	5,000.
Crops, timber and gravel	1,500.
Other	1,000.
Subtotal	$ 11,000.
Total	$ 240,000.

2. The above breakdown is based on the past actual cost. For planned recreational development, the average annual estimate is based on the facilities for FY 1977.

3-08 Coordination With Other Agencies:

Coordination with interested agencies is imperative during the plan of development and the management planning at B. A. Steinhagen Lake. This effort enables both interested agencies and the Corps to exchange thoughts aimed at developing and managing the project resources in the best interest of the public. Below is listed the organizations contacted and a summary of their contribution to this Master Plan.

A. National Park Service:

Prior to construction of the dam, the National Park Service submitted a report -- "Recreational Use and Development - Dam B Reservoir Project" -- which was incorporated in the Definite Project Report as Appendix VIII-C, Exhibit 1. The Golden Eagle Fee Program was implemented and later dissolved.

B. Federal and State Health Services:

In June 1946, the U. S. Public Health Service and the Texas State Board of Health submitted a cooperative report -- "Reconnaissance Malaria Survey Report" -- which was incorporated in the Definite Project Report as Appendix VIII-B. Within recent years, the Environmental Protection Agency has inspected all sanitary facilities and has found them to be adequate.

The Texas State Health Department makes a monthly water sample check for bacteriological matter. They perform a chemical analysis annually or bi-annually according to the source (surface waters are analyzed bi-annually, while well waters are analyzed annually). They also approve all sanitary facilities designs.

C. The Texas Water Quality Board:

The Texas Water Quality Board regulates the issuance of permits for all sewage systems. The Corps supplies to them the quantity of ground water pumpage on the project lands.

D. Texas A & M Extension Service:

The Corps coordinates with Texas A & M Extension Service regarding insect and rodent control.

E. Texas Forest Service:

The Corps coordinates with the Texas Forest Service regarding the control of the Southern Pine Beetle and the fire control plan. The Corps pays for implementation of beetle control work.

F. Department of Agriculture:

The Corps coordinates with the Department of Agriculture regarding weed control. The Soil Conservation Service provided the Corps with soils maps and pertinent information used as an aid in development of Corps parks and lands.

G. Federal Aviation Administration:

The Corps coordinates with the Federal Aviation Administration for approval of all aerial applications for weed control.

H. Texas Parks and Wildlife Department:

The Texas Parks and Wildlife Department has leased 14,264 acres of land and water at this project. All request for development of the parks within this lease must be sent to the Resource Manger for his approval or for District approval. They conduct annual test-nettings checking for fish imbalances and contact the Corps for assistance if any problems occur.

I. Texas Department of Public Safety:

The Corps coordinates with the Texas Department of Public Safety concerning law enforcement problems and practices.

IV. SUMMARY

4-01 Analysis:

This Revised Master Plan incorporates recent concepts and eliminates some existing information included in past updated Master Plans. This was done in an effort to make this Revised Master Plan a more comprehensive and workable plan.

4-02 Estimate of the Situation:

It is felt that B. A. Steinhagen is in need of additional recreational facilities so that its parks will adequately accommodate its visitors. A means for controlling the use of recreation areas will eventually need to be implemented so that the resources of the project do not deteriorate. Control measures will need to be implemented immediately to avoid deterioration of valuable resources.

4-03 Conclusions:

It was found that B. A. Steinhagen Lake is a valuable resource and is in need of comprehensive resource management plans. The conceptual resource management plans included herein are to be used as guides until more detailed plans are developed. The plan of development and planning studies were made with the best information avialable and will be periodically evaluated.

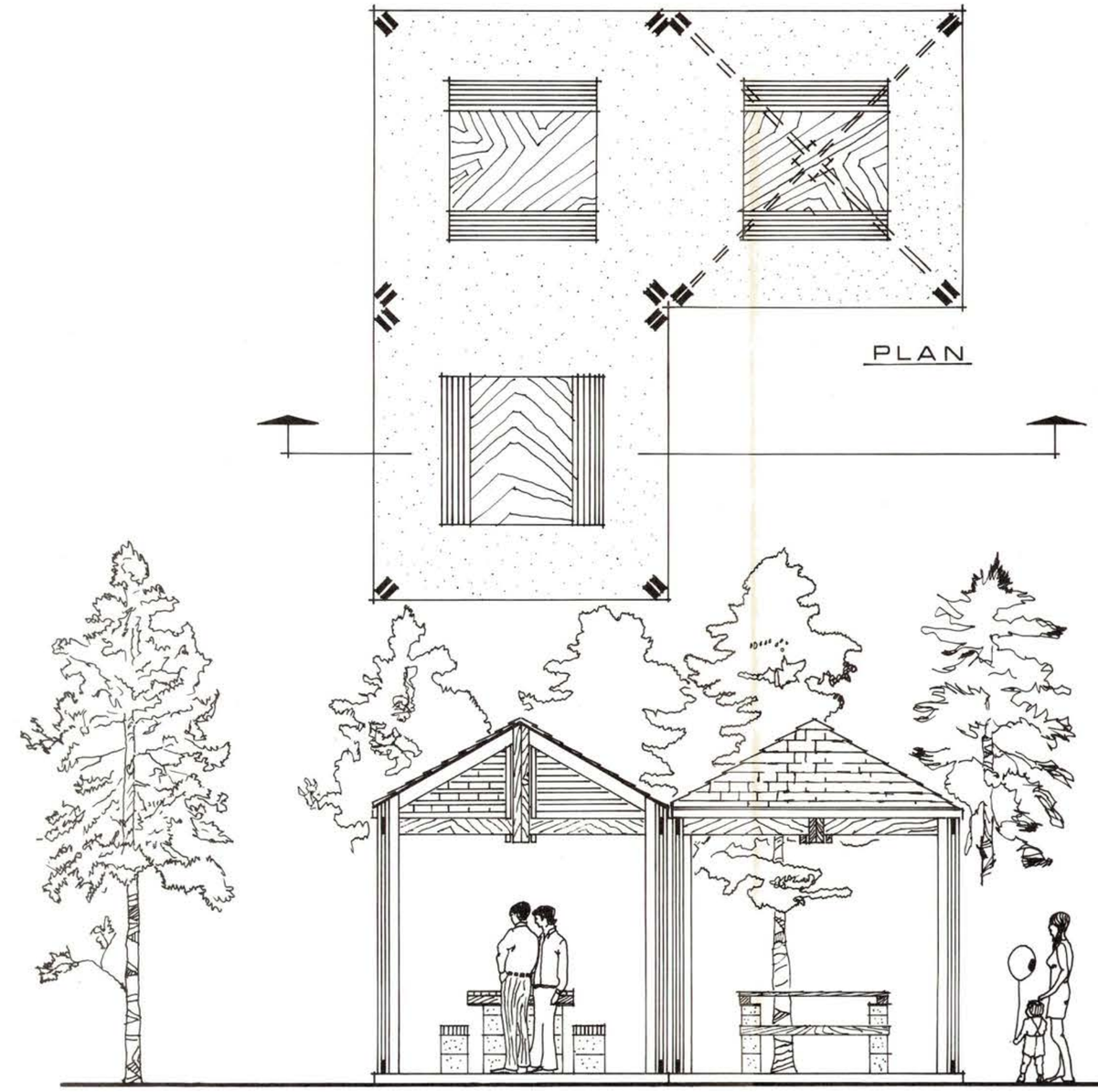
Vegetation and soil types and their management are the controlling factors in the development of this project to its ultimate carrying capacity. Lands may be redesignated in future updates according to project resources and public needs and demands.

4-04 Recommendations:

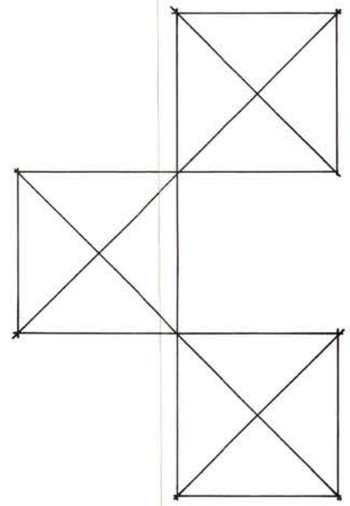
It is recommended that the planned development as indicated within this Revised Master Plan be implemented.

4-05 Submittal for Approval:

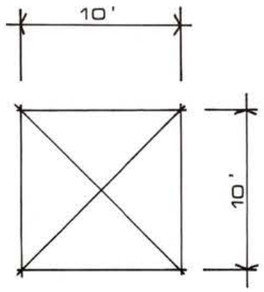
This Revised Master Plan for B. A. Steinhagen Lake involving development for public use and resource management is submitted for approval.



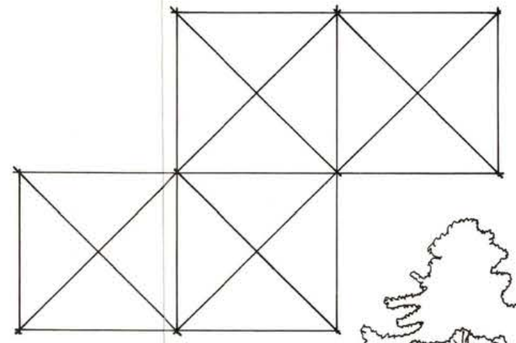
PLAN



COMBINATIONS



SINGLE



GROUP

SECTION

ELEVATIONS

PICNIC & CAMP SHELTERS

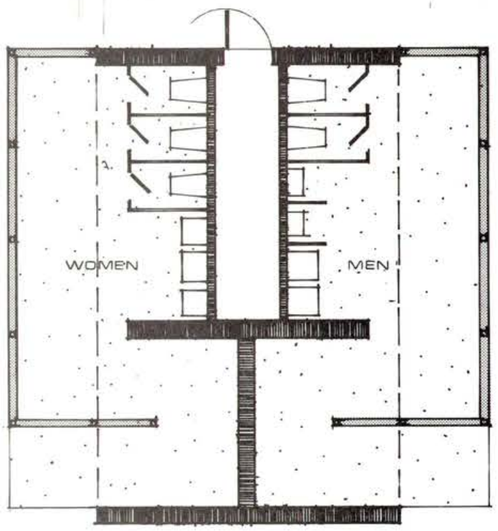
SCALE : 1 5 10

PLATE

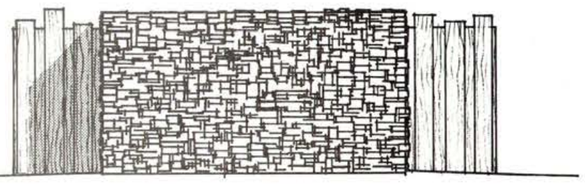
U. S. ARMY
ENGINEER DISTRICT
FORT WORTH
FT. WORTH, TEXAS

FACILITIES CONCEPT **C 1**

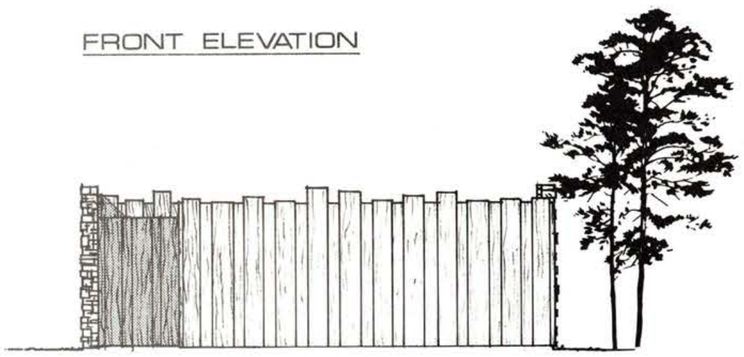
NUMBER



FLOOR PLAN

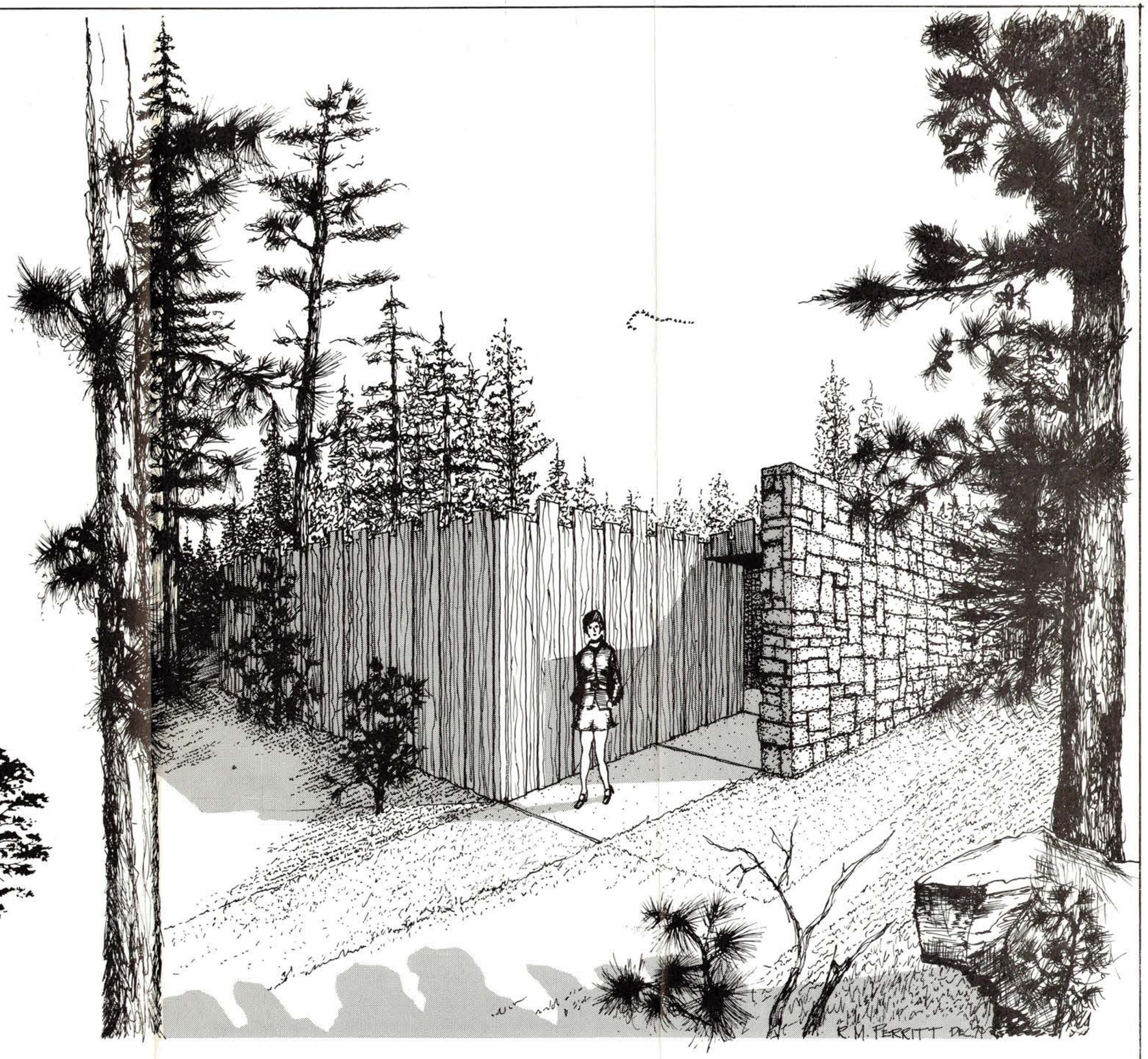


FRONT ELEVATION



SIDE ELEVATION

SCALE: 1 5 10

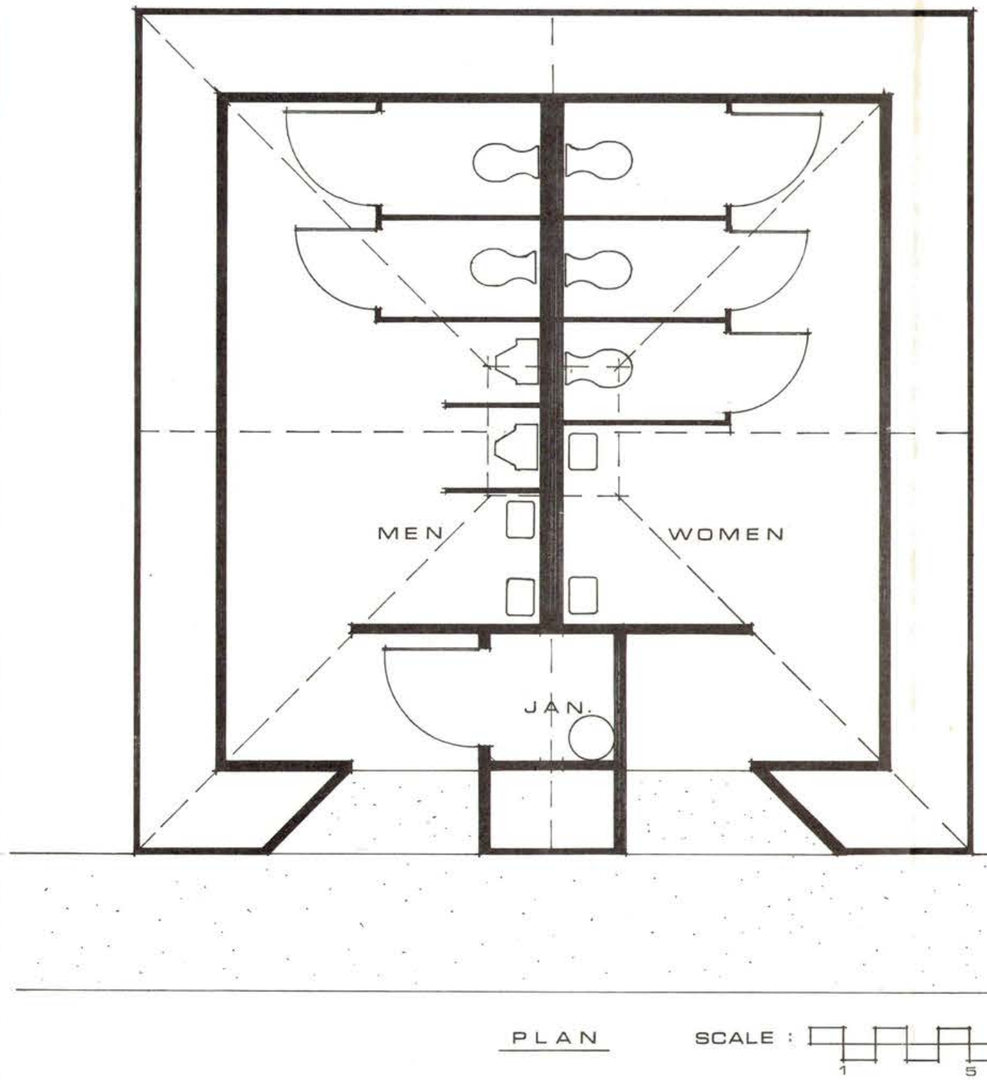


TOILET / CHANGE SHELTER FACILITY

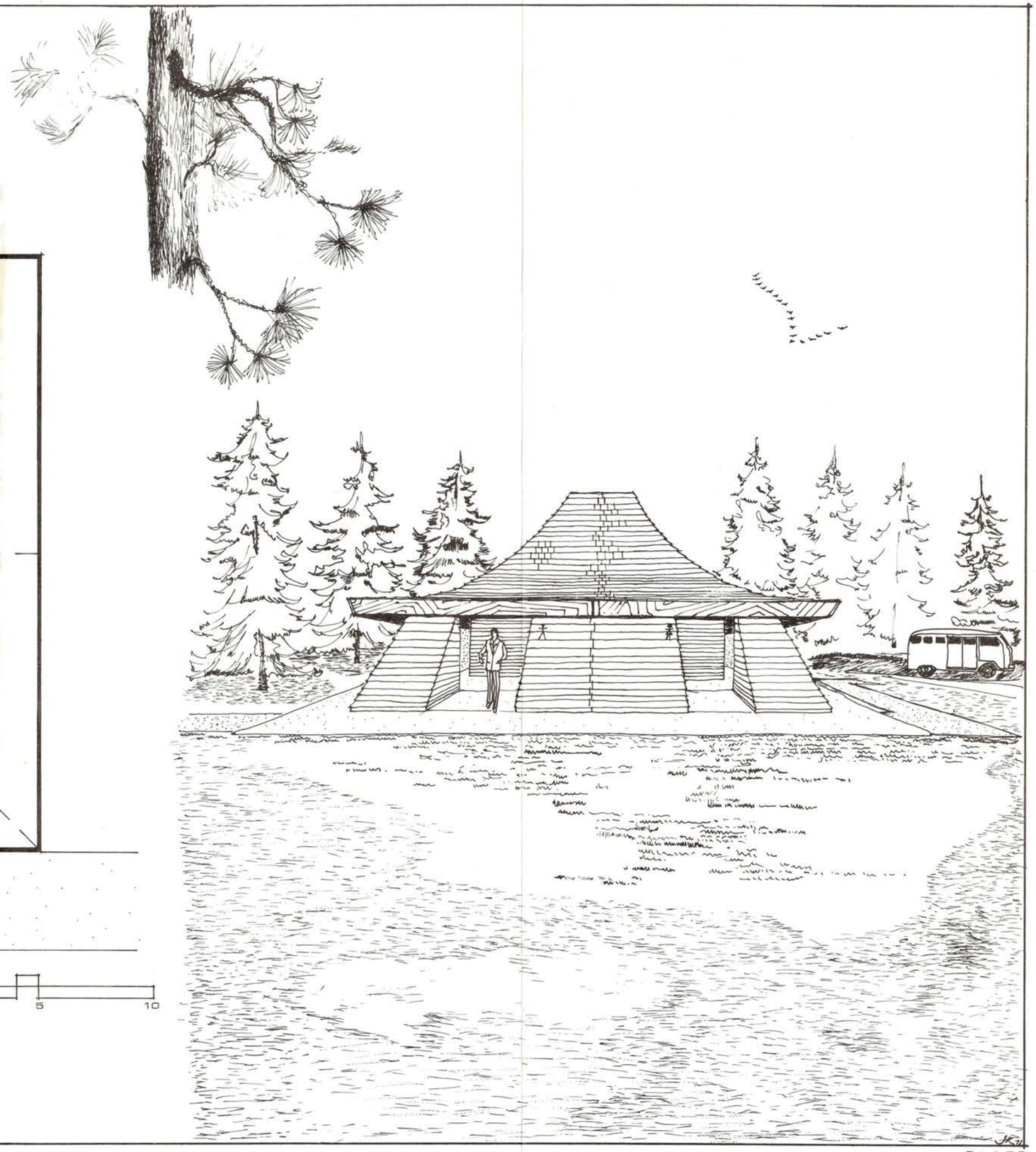
U. S. ARMY
ENGINEER DISTRICT
FORT WORTH
FT. WORTH, TEXAS

FACILITIES CONCEPT

PLATE
C2
NUMBER



PLAN SCALE : 1 5 10



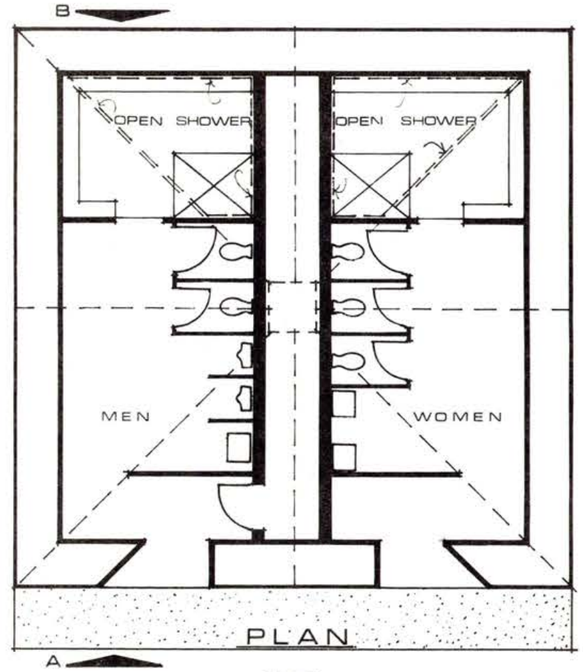
RESTROOM FACILITY

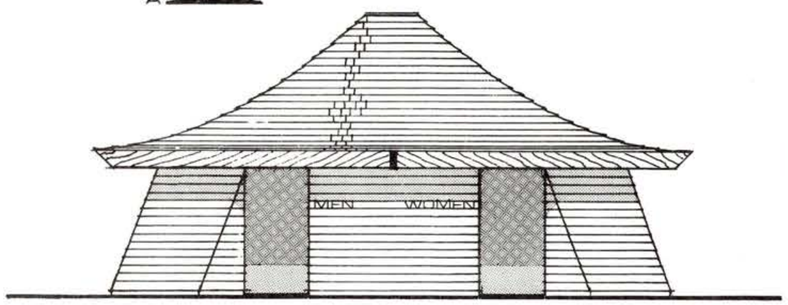
U. S. ARMY
ENGINEER DISTRICT
FORT WORTH
FT. WORTH, TEXAS

PLATE

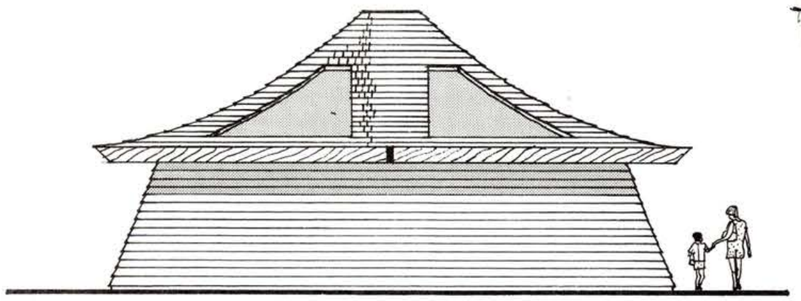
FACILITIES CONCEPT **C3**

NUMBER





ELEVATION A



ELEVATION B

SCALE : 1 5 10 20

TOILET / CHANGE SHELTER FACILITY

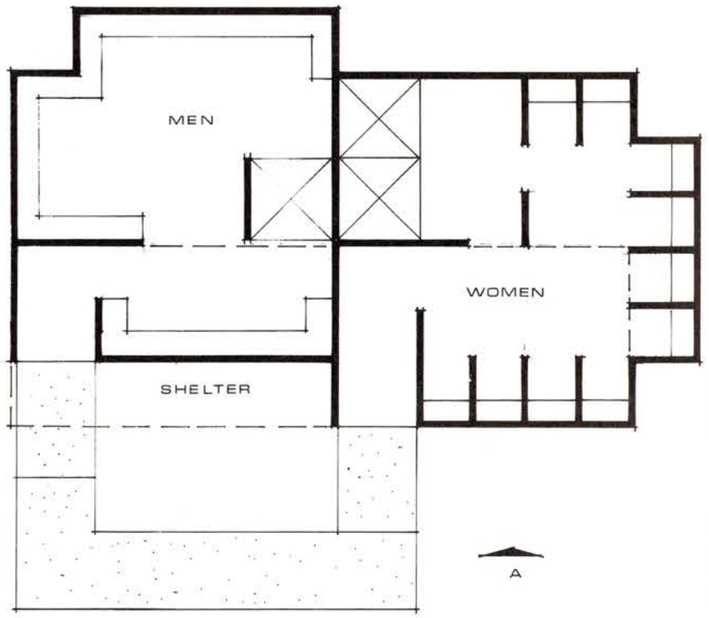
U. S. ARMY
ENGINEER DISTRICT
FORT WORTH
FT. WORTH, TEXAS

PLATE

FACILITIES CONCEPT

C4

NUMBER



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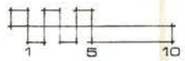

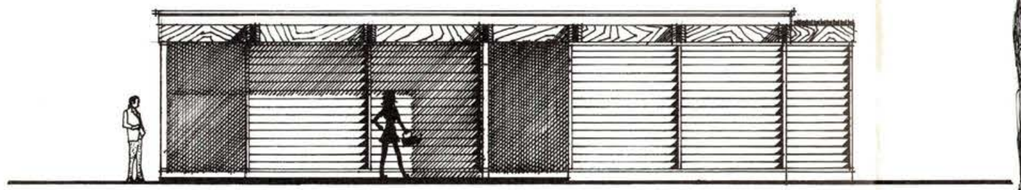

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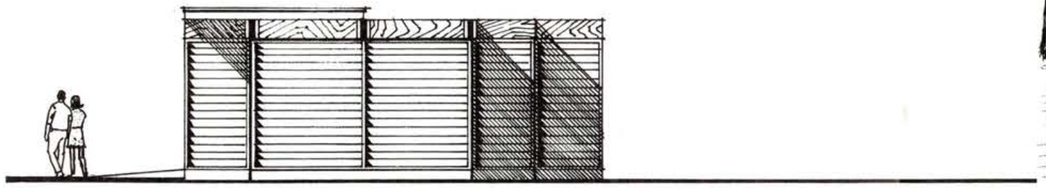

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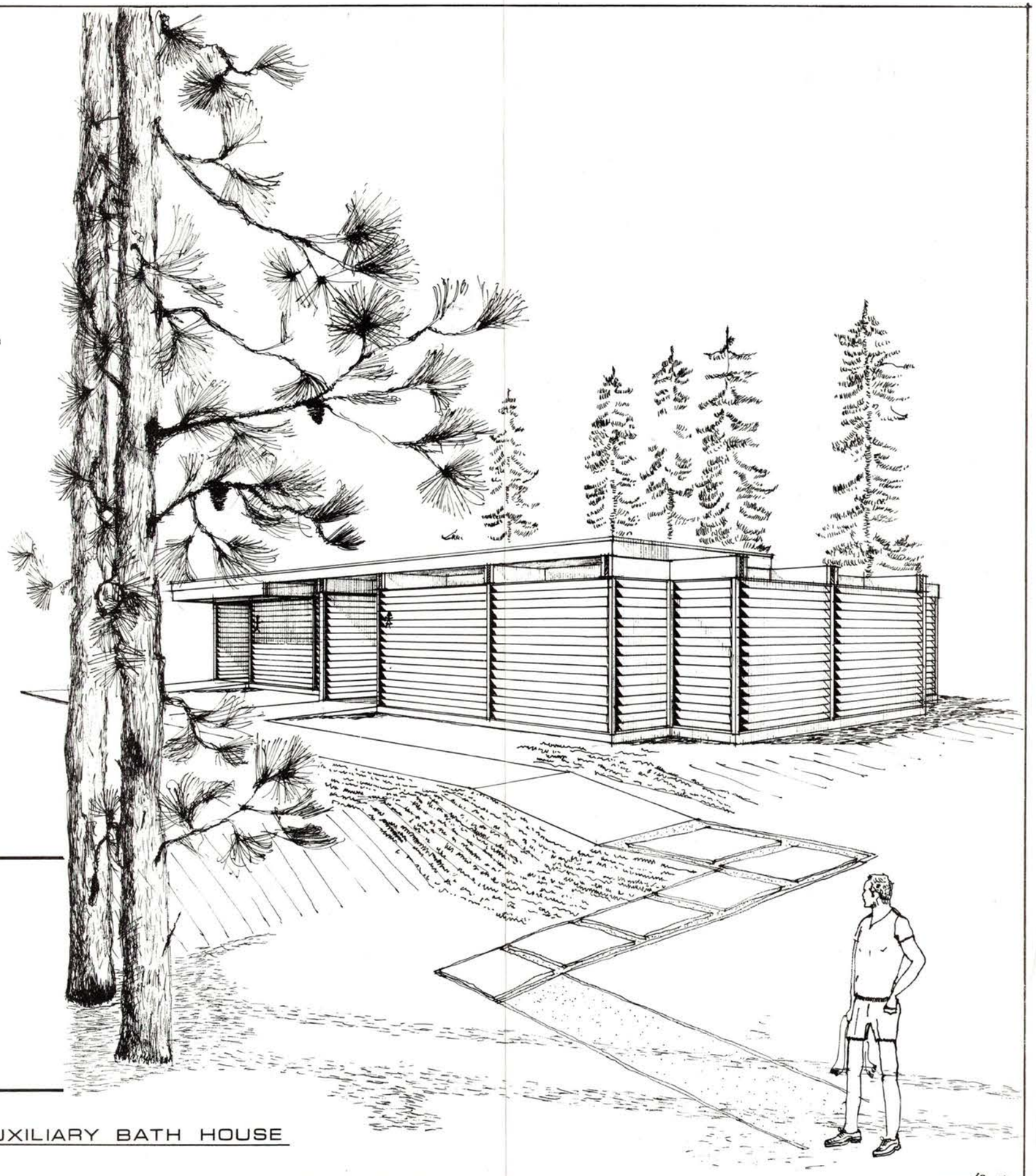


AUXILIARY BATH HOUSE

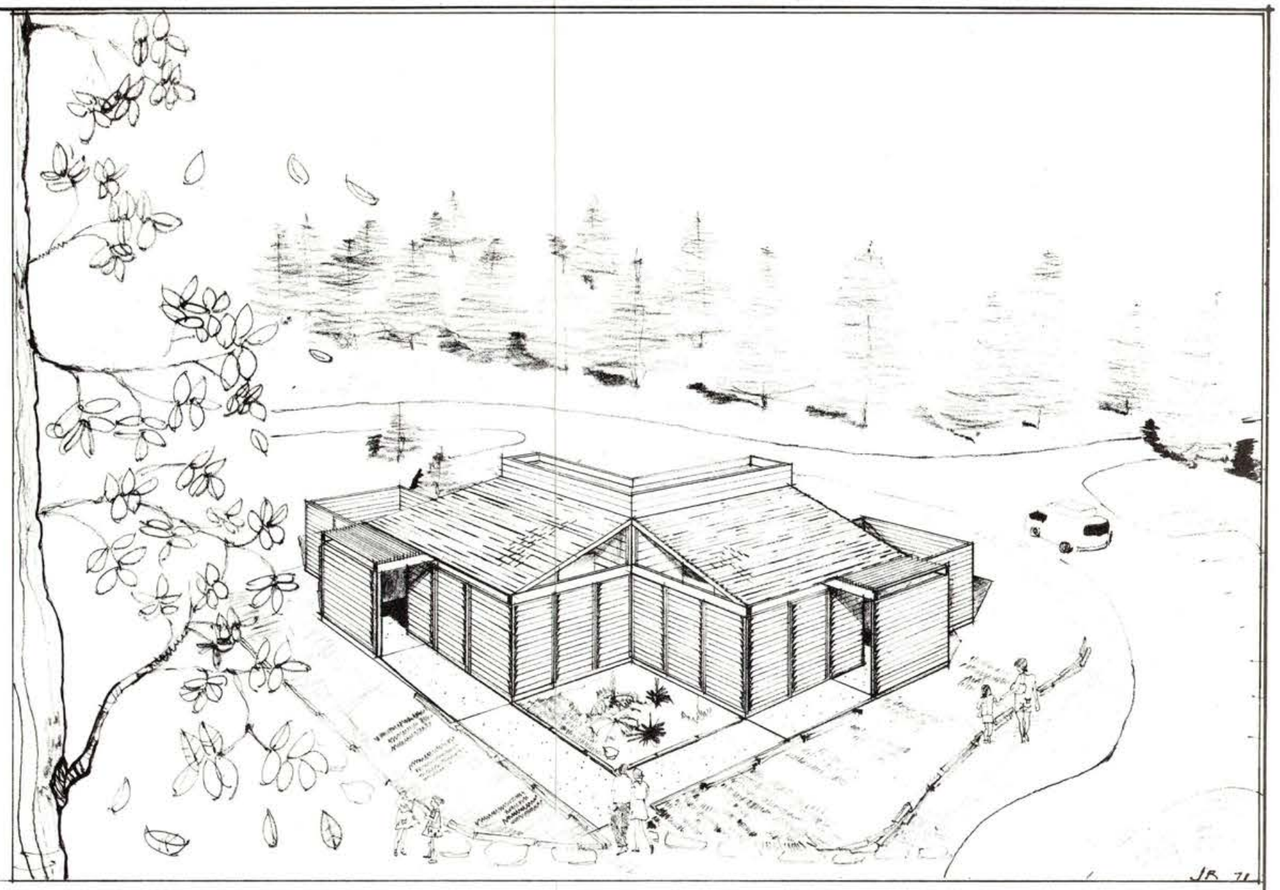
JR 71

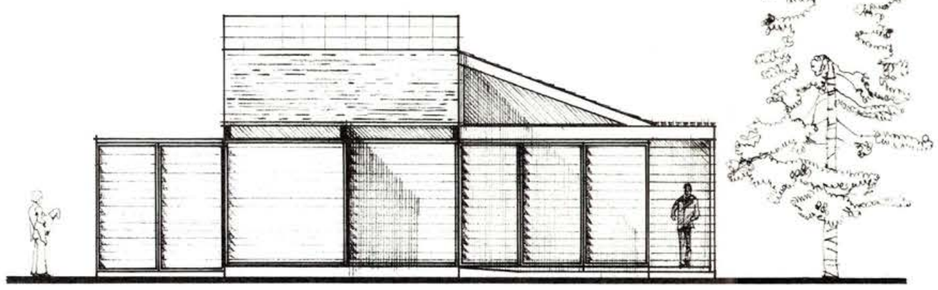
U. S. ARMY
ENGINEER DISTRICT
FORT WORTH
FT. WORTH, TEXAS

FACILITIES CONCEPT

PLATE
C5
NUMBER

PLAN





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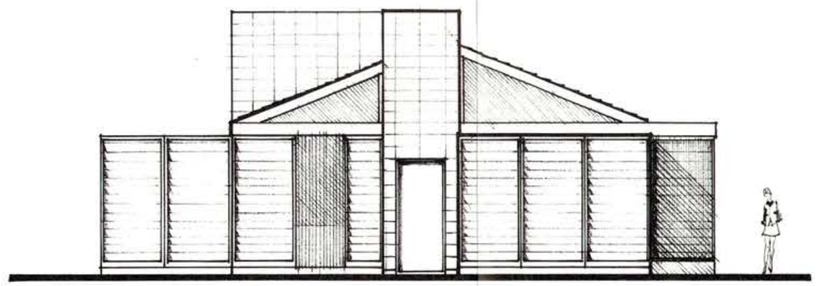


ELELVATION B

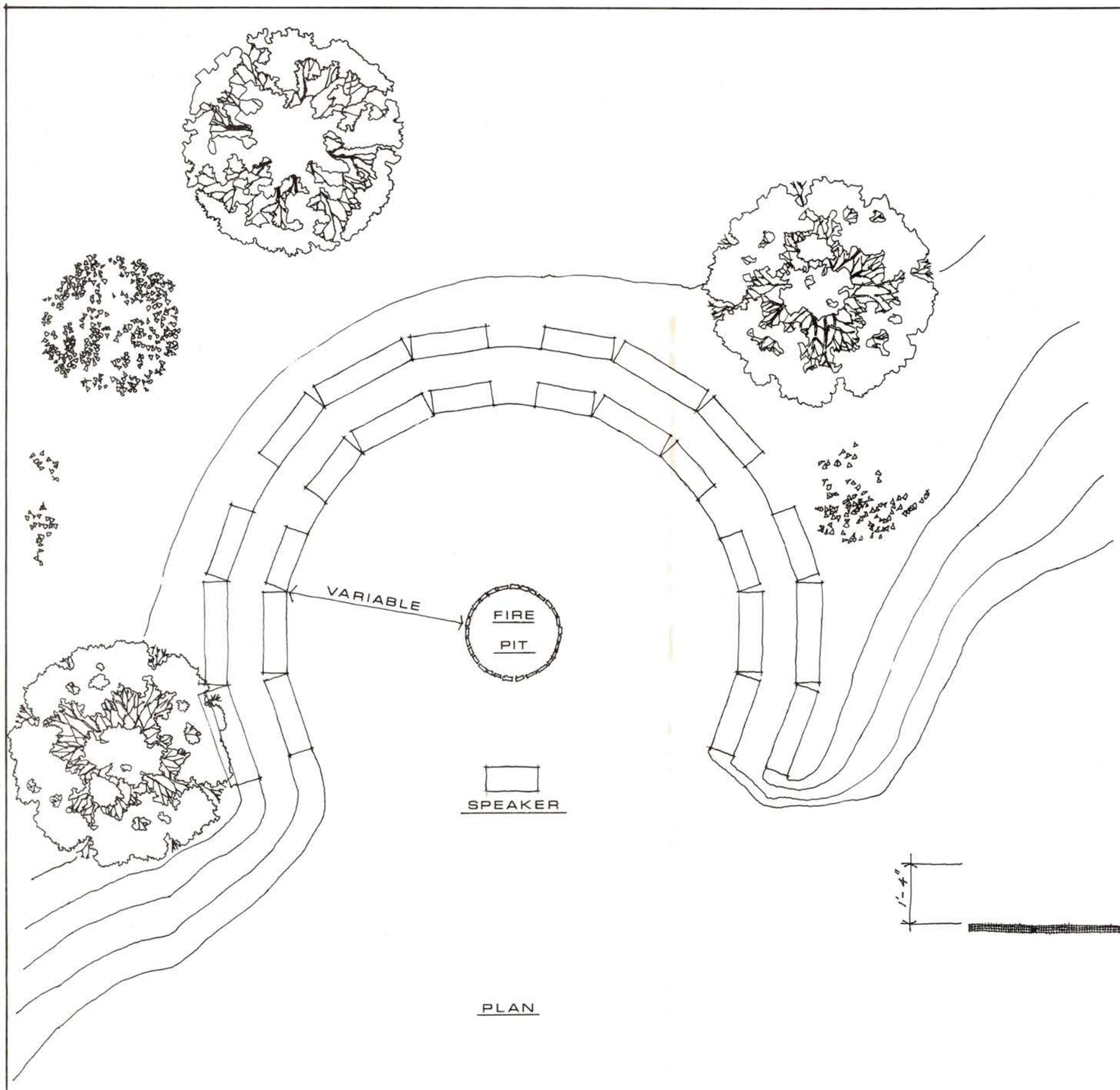
CAMPER SERVICE BUILDING

SCALE: 1 5 10 20

U. S. ARMY
ENGINEER DISTRICT
FORT WORTH
FT. WORTH, TEXAS

FACILITIES CONCEPT

PLATE
C6
NUMBER



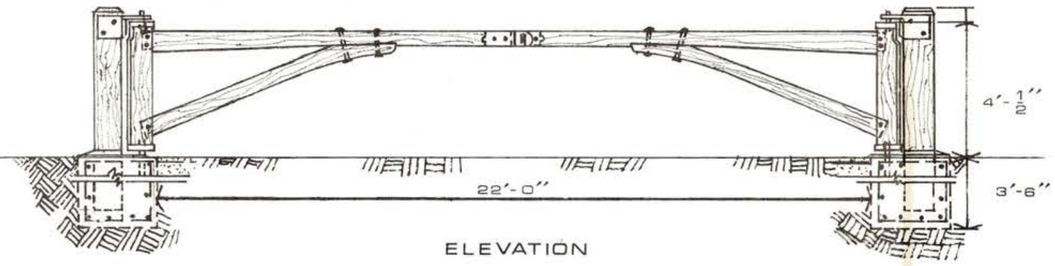
GROUP CAMPFIRE CIRCLE

N.T.S.

U. S. ARMY
ENGINEER DISTRICT
FORT WORTH
FT. WORTH, TEXAS

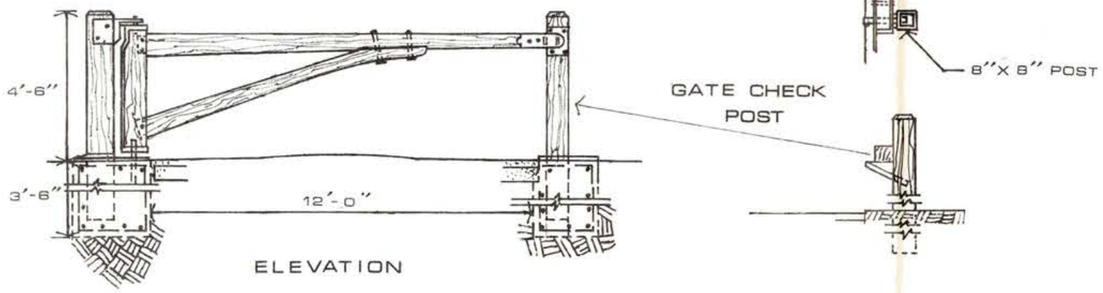
FACILITIES CONCEPT

PLATE
C7
NUMBER



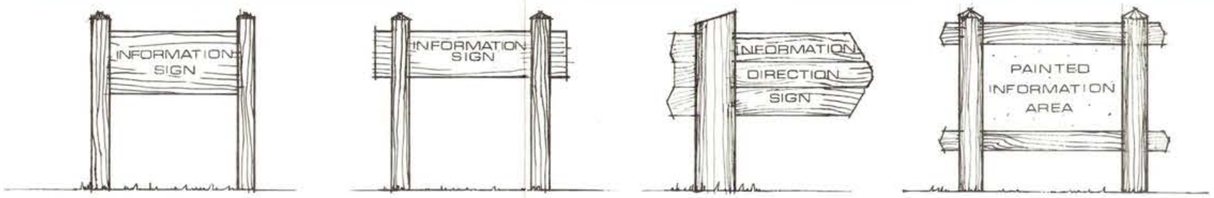
ELEVATION

PLAN

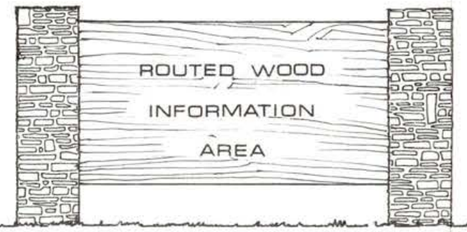


ELEVATION

TRAFFIC CONTROL GATE

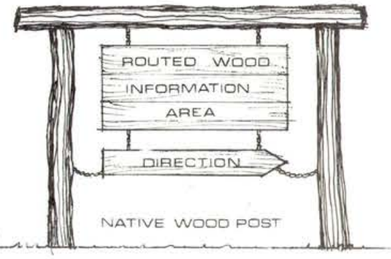


ROUTED LETTER SIGNS ——— WITH STAINED ROT RESISTANT OR TREATED WOOD



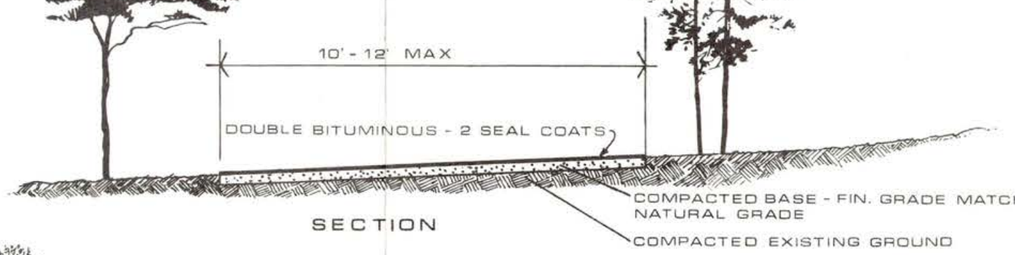
INFORMATION AND ENTRANCE

TRAILS & PATHS



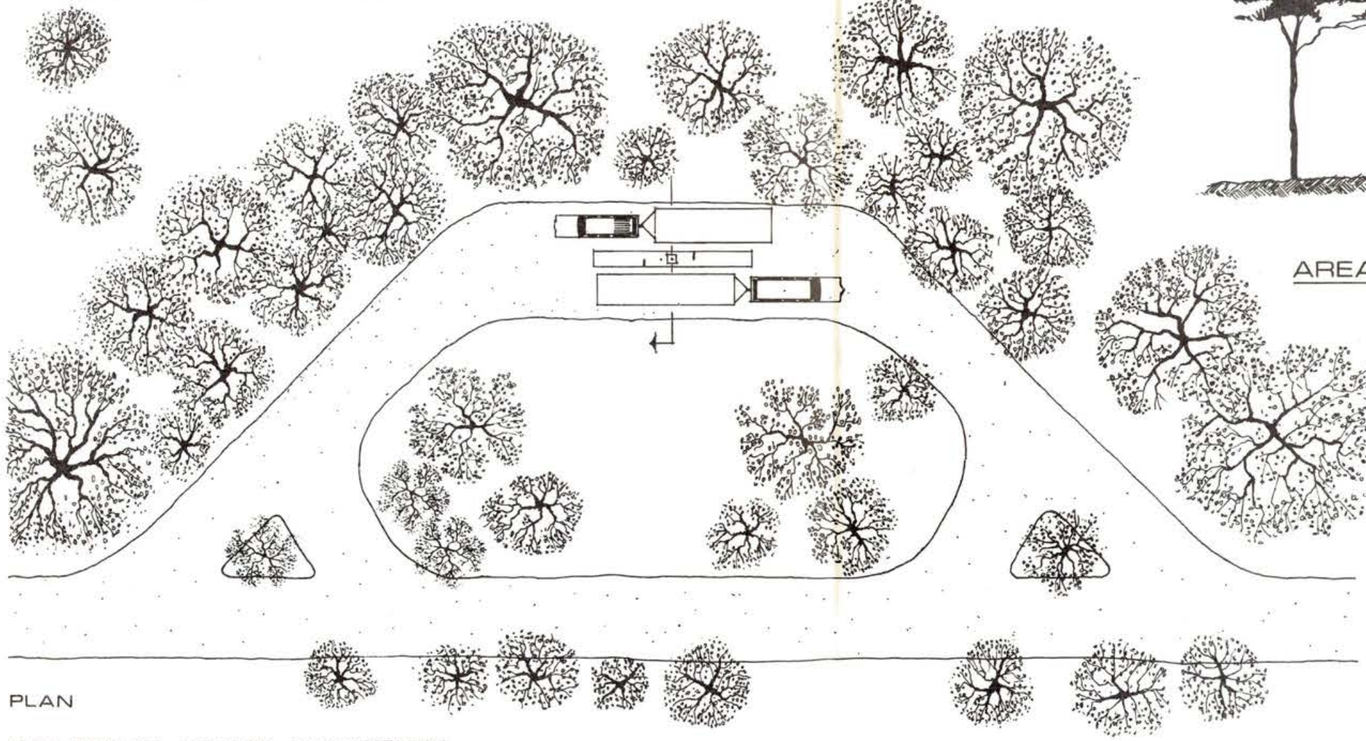
INFORMATION & DIRECTION

SIGN CONCEPTS



SECTION

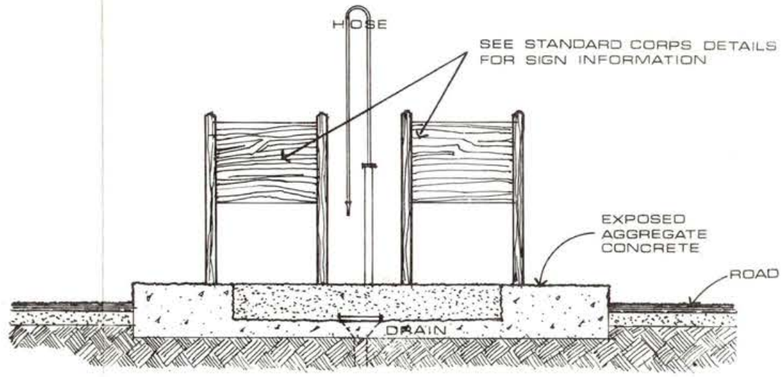
AREA CIRCULATION ROAD



PLAN

SANITARY DUMP STAYTION

N.T.S.

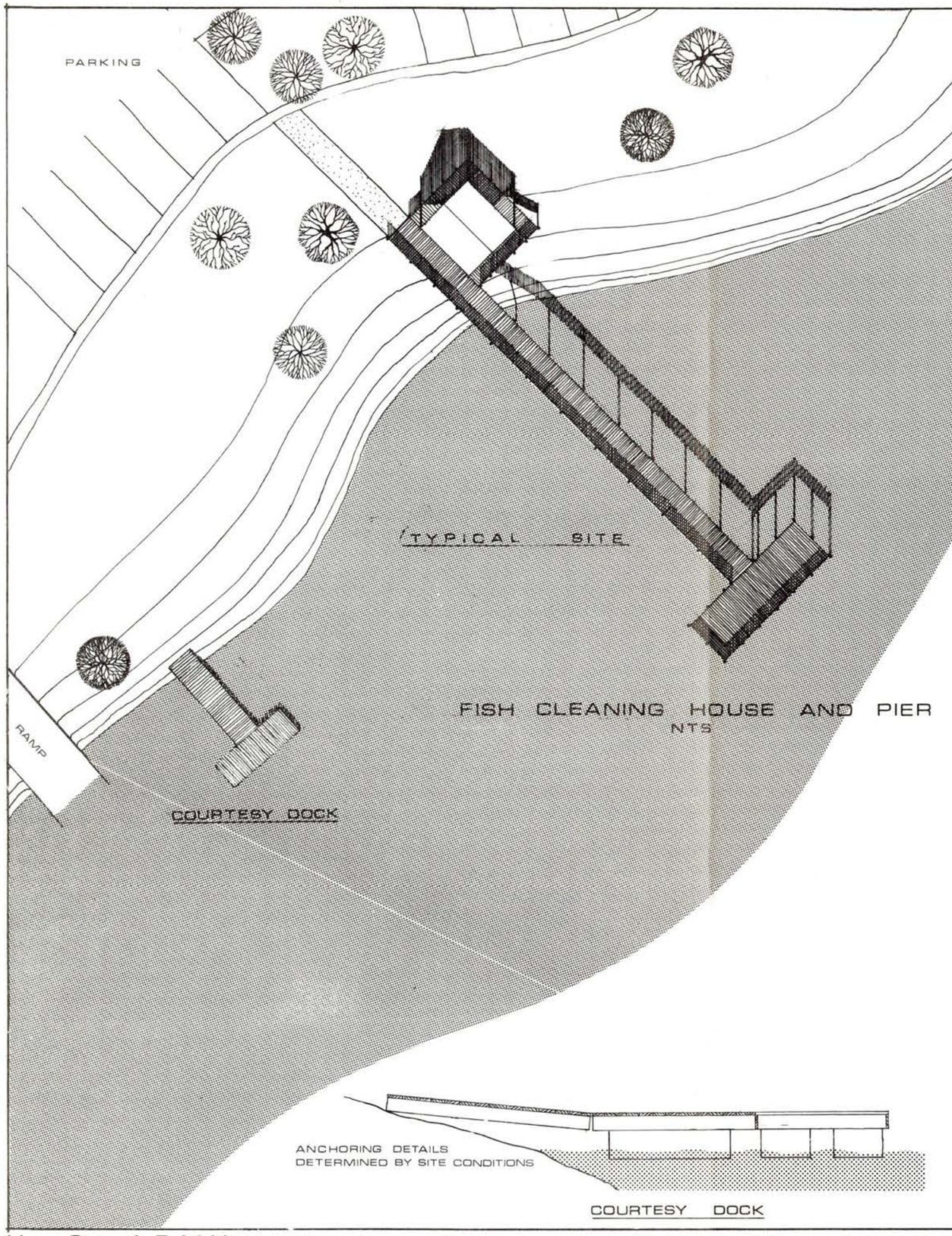


DUMP STATION SECTION

U. S. ARMY
ENGINEER DISTRICT
FORT WORTH
FT. WORTH, TEXAS

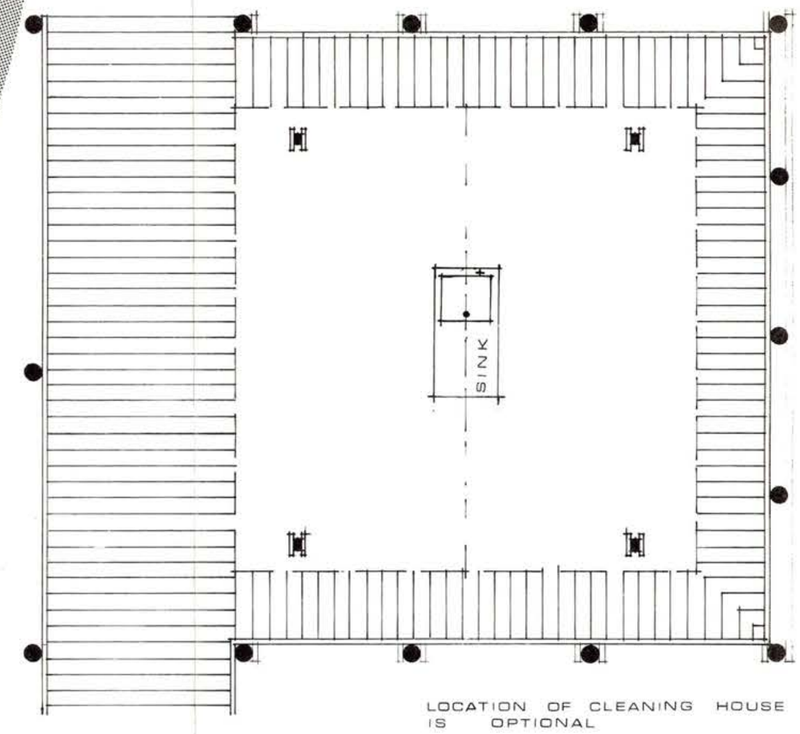
FACILITIES CONCEPT

PLATE NUMBER C 8



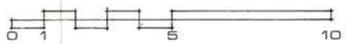
FISH CLEANING HOUSE AND PIER
NTS

COURTESY DOCK

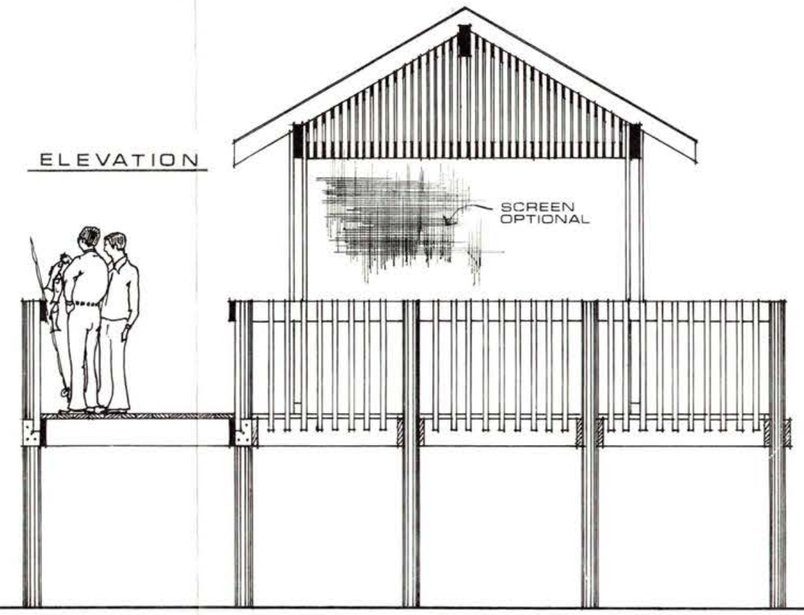


LOCATION OF CLEANING HOUSE IS OPTIONAL

PLAN



ELEVATION



U. S. ARMY
ENGINEER DISTRICT
FORT WORTH
FT. WORTH, TEXAS

FACILITIES CONCEPT

PLATE
C9
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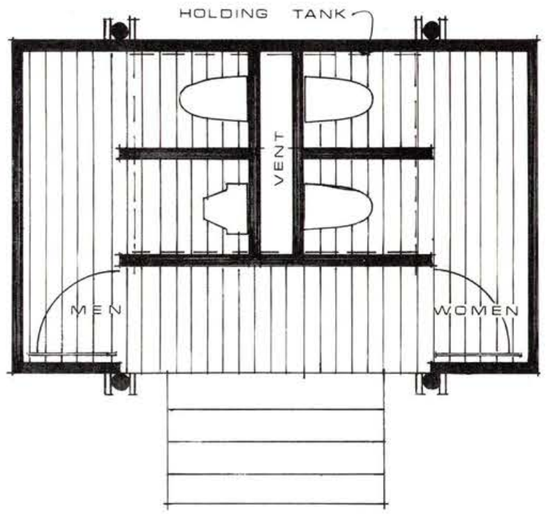

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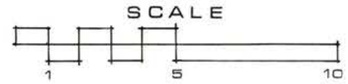
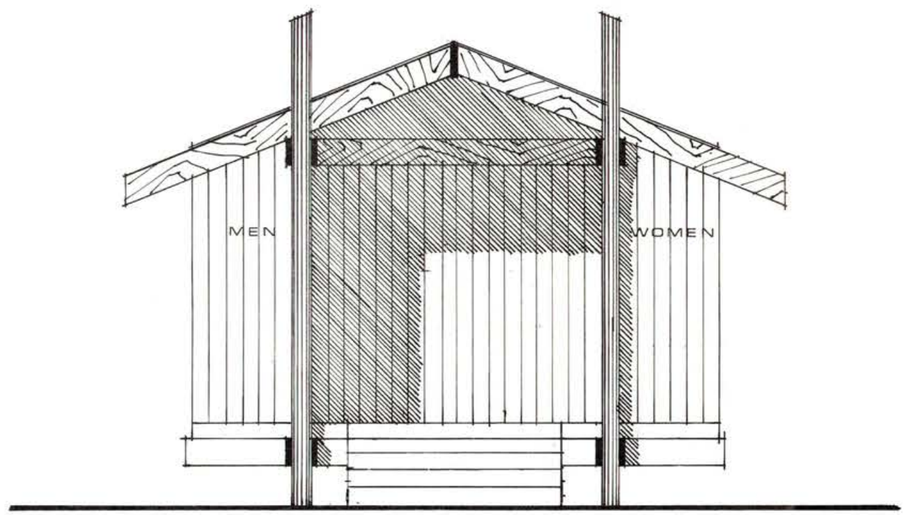
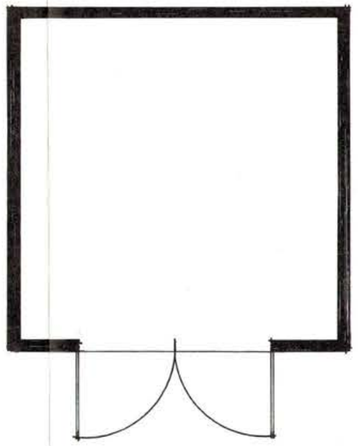




ELEVATION

PRIMITIVE CAMP TOILET



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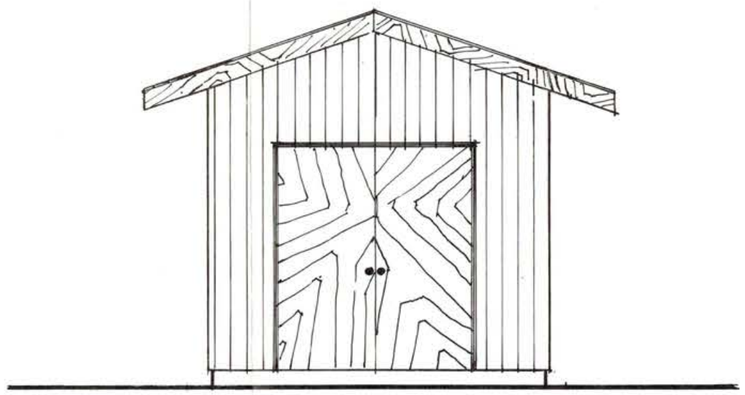


ELEVATION

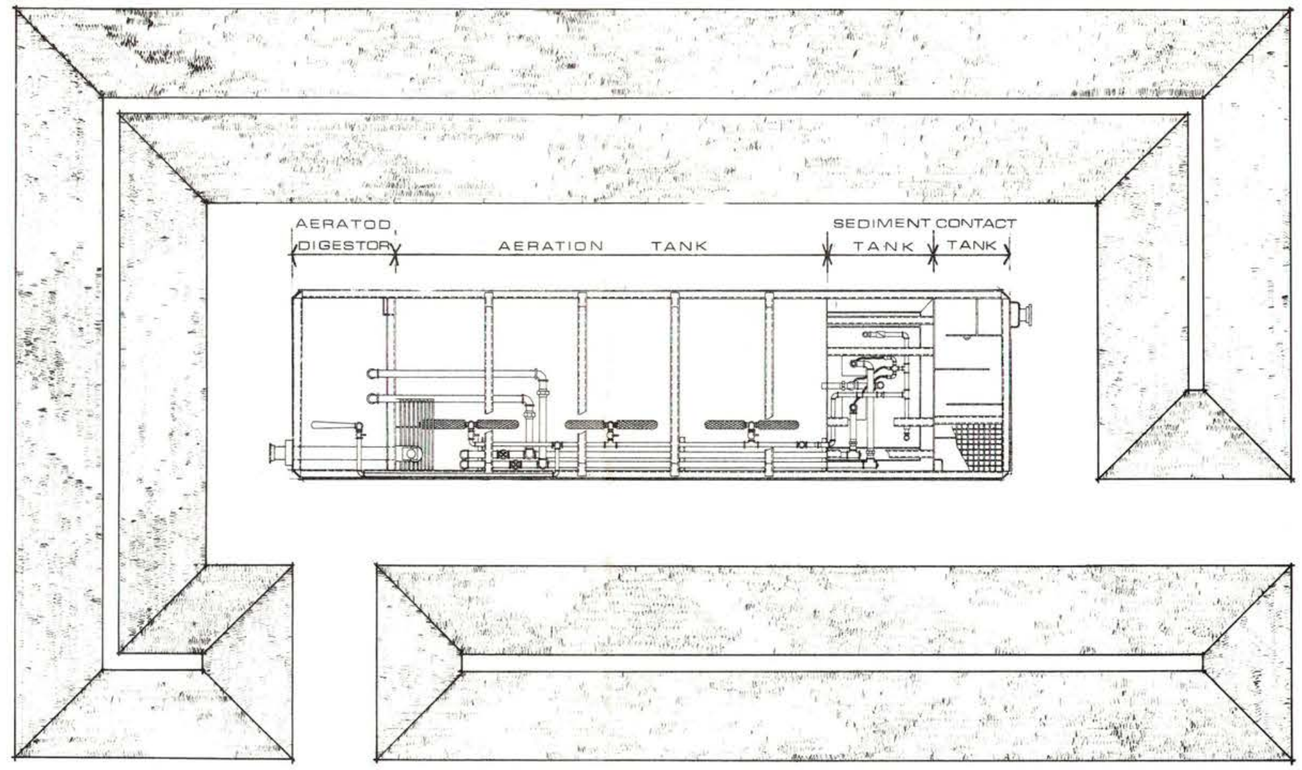
PUMP HOUSE

U. S. ARMY
ENGINEER DISTRICT
FORT WORTH
FT. WORTH, TEXAS

PLATE

FACILITIES CONCEPT **C10**

NUMBER



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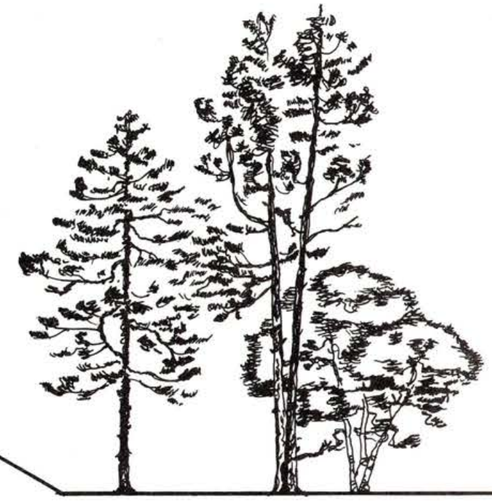

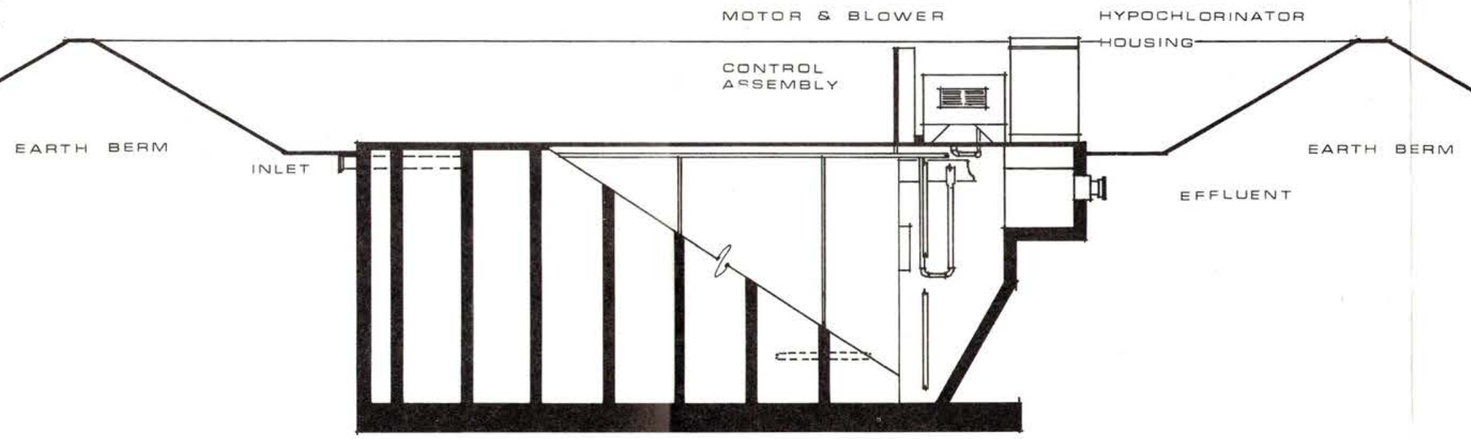

SECTION

WASTE TREATMENT PLANT

NTS

U. S. ARMY
ENGINEER DISTRICT
FORT WORTH
FT. WORTH, TEXAS

PLATE

FACILITIES CONCEPT **C11**

APPENDICES

I. MANAGEMENT CONCEPTS

A. General:

The protection and enhancement of natural and created resources will receive equal consideration to other project purposes. The key to successful use and upkeep of project resources is proper resource management. With this in mind these concepts are furnished as initial and interim guidance for Resource Managers and are to be used within the context of FWDR 1130-2-61 and SWDR 1130-2-7 and applicable ER's until such time as detailed management plans required by ER 1130-2-400 are prepared and published by the FWD Operations Division.

B. Human Resources

1. District Level:

The recruitment of additional resource specialists to serve as consultants for problems encountered on the project and development of proper resource management plans are essential to provide proper guidance for project operation.

2. Project Level:

Proper implementation of the Revised Master Plan and the resource management plans is necessary to insure adequate use of the project resources. Protective measures include protection not only from natural elements (fire, flood, etc.) but also from overuse by the visiting public. This plan shall be a guide for such protection in addition to the resource management plan and ER 1130-2-400. Individual protective measures shall include but not be limited to such items as: one, prevent the deterioration or destruction of resources through overuse (i.e., close public use areas to allow for revegetation); two, reduce mowing to allow for propogation of a younger growth of trees (clearing only those individual areas for camping facilities leaving a vegetative barrier between camp site), etc.

Each year an annual questionnaire will be forwarded by the district to the project for completion by the Resource Manager. The purpose of the questionnaire is to provide a means for the Resource Manager to express himself on visitor management, new trends in public use at the project, management problems encountered during the year, current project needs, and other resource management problems. Information from this survey will be used in conjunction with user surveys to make adjustments in management programs and shall be reflected in the update of the project Master Plan. To accomplish the objectives of this report, Project level personnel required for the proper operation of facilities and for the management of the resources are:

TABLE 22

PERSONNEL REQUIREMENTS

Administration

Title	Present Grade	Optimum Grade
1 Resource Manager	GS-10	GS-11
1 General Clerk	GS-05	GS-07

Public Use

1 Supervisory Resource Ranger	None	GS-09
2 Resource Rangers	None	GS-05
2 Resource Rangers	GS-05	GS-07

Operations and Maintenance

1 Maintenance Worker Foreman	WS-07	WS-08
3 Maintenance Workers	WG-08	WG-09
3 Maintenance Workers	None	WG-05
2 Laborers	WG-03	WG-04
6 Laborers	None	WG-03
3 Ranger Aids (Seasonal)		
Seasonal laborers as needed		

3. Required Inspections:

To insure management objectives and goals are being attained at project level, routine and random inspections of licensed areas, leased

areas, and outgrants should be made by project personnel. The frequency and responsibility of the inspections shall be determined in the field by the Resource Manager. Inspections required, the frequency involved, and the personnel responsible are given in Table 23.

TABLE 23

REQUIRED INSPECTIONS

TYPE	FREQUENCY	PURPOSE	RESPONSIBILITY
Project Inspections	Annual	To determine the condition of Project structures.	Operations and Engineering Divisions
Maintenance Inspections	Monthly	To inspect dam.	Resource Manager
Distress Inspections	Daily	To detect abnormal conditions.	Resource Manager
Stilling Basin Inspections	To be scheduled	To insure conditions of the Stilling Basin	Chief, Operations Division
Compliance Inspections	Annual	To insure compliance with lease, licenses, easements, and regulations.	Real Estate, Operations Divisions
Utilization Inspections	Annual	Inspection of all project lands and facilities	Real Estate, Operations Divisions

C. Natural Resource Management Concepts

1. Pocket Wilderness:

Nestled between the Neches and Angelina rivers there is an environmental jewel - a forest of river bottom hardwoods that comprises a pocket-sized wilderness. In reality, it is an irreplaceable, living museum that must be officially designated as a "pocket wilderness" to assure perpetuation. We need it just as it is because no one can duplicate its complexity. Giving it the status of a "pocket wilderness" carries the stipulations of no roads, no vehicles, no off-the-road vehicles, no

trails, no campers, no management for forestry or game, no hunting, and no grazing. The natural functions of this ecosystem must not be impaired by human tampering of any kind.

Preservation of this pocket wilderness does not prevent using it for scientific studies. Proposed studies will be restricted in number and reviewed by disinterested experts to reduce and prevent disruptive imports to the area. Scientific studies will not include the collection of any plant or animal specimens. Records of data and specimens must be limited to observation, written notes, drawings and photographs.

We need this pocket wilderness because man cannot recreate it once it is dismantled. We need it to measure the impact of our use on other lands contributing to the area economy. We need it as a refuge compatible to the needs of those wild plants and animals that man has evicted from his intensively used landscape. And in summation, we need it as a sanctuary whose primitive nature is priceless and nearly unobtainable elsewhere.

2. Fish and Wildlife Management Concepts:

a. Fish Management:

An appropriate fish management program is necessary to provide a constant, well balanced fish population. While such a program is essentially the responsibility of the State Parks and Wildlife Department considerable burden imposed upon the Department by the increasing number of Corps of Engineers lakes require that the Corps of Engineers supply all such aid and assistance as is possible in order to secure an adequate management program for the project. This aid may be accomplished through Public Law 89-72 of the Federal Water Project Recreation Act of 1965.

The Parks and Wildlife Department management plan consists of establishing creel and size limits and seasons. The lake is test-netted four times a year, every other year, to determine species composition and relative abundance. Contract fishermen, commercial fishermen, and renovation are methods used to control rough fish populations.

The Corps of Engineers can assist the Commission by writing specifications for concessionaire agreements which will insure the furnishing of fishing aids and services needed by the public, devising ways and means of increasing the harvest by anglers, conducting creel census studies to determine fishing pressure and harvest, and by any other form of authorized aid or cooperation the Commission may request. At present, B. A. Steinhagen has one concessionaire.

b. Wildlife Management:

(1) Game Species:

The major game species on B. A. Steinhagen project land are gray squirrels, fox squirrels, white-tailed deer, raccoons, wood ducks, and mallards. Less important to hunters are bobwhites, mourning doves, cottontails, swamp rabbits, gray foxes and woodcocks. Wildlife of interest to recreationists and species adding to the aesthetic value of B. A. Steinhagen include a variety of woodpeckers, (including the ivory-billed woodpecker) warblers, water birds, and alligators.

There are no harvest data for game species at B. A. Steinhagen but project personnel reported that hunters generally exert heavy pressure on gray squirrels, deer and waterfowl.

(2) Requirements for Game Species:

Bottomland hardwood forest flora dominate the landscape at B. A. Steinhagen. In the overstory; oaks, hickories, gums, elms, ashes, beech and mulberries produce acorns, nuts, seeds or fruits. Some of the more common plants and important food sources in the understory are ironwood, American hornbeam, haws, hollies, grapes and rattan. Low shrubs of food and/or cover value include sumacs, wax-myrtle, French mulberry, huckleberry, berry brambles, and palmetto. Honeysuckle vines and mushrooms are common on the ground layer. Due to the great diversity of forest flora a large volume of native foods is produced each year. For this reason, planted crops are not considered as a management measure.

(3) Habitat Improvements:

Woodcock and gray squirrel habitat should not be disturbed because the present stage is well balanced ecologically. Fluctuation in water levels permit natural waterfowl food production of grasses and weeds in the upper part of the lake. Bobwhite and mourning dove forb foods can be increased at Magnolia Ridge Park by disking two strips parallel to the tree edge. One strip will be disked in March 1972 and 1974 and an alternate strip disked parallel to it in March 1973 and 1975, etc., in the years thereafter. Management measures set forth for squirrels, etc., will suffice for woodpeckers and warblers.

(4) General Management Measures

(a) Pocket Wilderness Area:

The pocket wilderness area is to be left alone as indicated previously. See page 82 for additional information.

(b) Fireguards and Firebreaks:

Develop fireguards and firebreaks by disking or plowing in grass or weed areas; and by road patrol or bulldozer in shrubs or tree cover. These measures are for protection against "wildfires" and are supplements to the project plan for fighting fires after they have started. Fireguards and firebreaks should be patterned to restrict wildfires to small areas before fire fighters can get there.

(c) Livestock Control:

Livestock control must be carried out to reduce or eliminate food losses to free-ranging swine or cattle. Surveillance should be carried out once each week. Intruding livestock can be removed by experienced men working with trained dogs. It may be necessary to give public notice of plans for control by news releases in public media.

(d) Timber Management:

Timber management aimed at producing commercial products will be dropped. Management of all forest species must be designed

to maintain the ecological relationships of game animals and non-game wildlife. Tree killing and cutting must be restricted to that necessary to effect game management plans and to control the Southern Pine Beetle. In cooperation with district foresters, specific management plans will be formulated to perpetuate, or increase the diversity of woody speicies and the interspersion of uneven-aged stands.

The district will inform the Texas Parks and Wildlife Department of these new management plans and request their active participation in effecting them on their licensed lands at B. A. Steinhagen.

(e) Game Management:

Game management for specific animals by habitat improvements will require standard mapping of vegetative species, classification of land use and wetlands, locating key habitats for each species of wildlife and application of measures tailored to improve them quality-wise. Application of game management measures will maintain, perpetuate, or increase populations of most common and unusual species of wildlife at B. A. Steinhagen.

(f) Wildlife Management:

Wildlife management includes use by hunters, naturalists, and photographers. It also implies that wildlife species will be manipulated so as to contribute an additional aesthetic value to the area. Hunting with shotguns should be in accordance with Texas Parks and Wildlife Department and Corps of Engineers regulations. Nature trails should be marked in forest areas adjacent to State and Federal park camp sites. Maps at the project office should be marked to locate and identify areas of specific wildlife interest for naturalists and photographers.

(5) Coordination and Cooperation:

(a) Cooperative agreements with the Texas Forest Service and Texas Parks and Wildlife Department are covered in the Master Plan under Section III, paragraph 3-08, page 77.

(b) Coordination of wildlife management and vegetative management plans will be affected in cooperation with Corps of Engineers Biologists and Foresters, Fort Worth District.

(6) Endangered Species:

At B. A. Steinhagen project, endangered or rare species of wildlife may include the ivory-billed woodpecker, the red-cockaded woodpecker, the Texas red wolf, the Mississippi Valley red wolf, the American alligator and the Southern bald eagle. These species are protected by Federal law and management plans herein will contribute to their protection and perpetuation.

3. Soil Management Concepts:

The soils in this area are predominately undultic palendults. These soils have a thick clay horizon without many weatherable minerals and are formed on gently sloping terrains. Soil in the basic factor used in determining the carrying capacity of the resource: therefore, soil protection and stabilization is the most important consideration of resource management The best protection for these soils is a good vegetative cover.

4. Vegetative Management Concepts

a. General:

In the recreational areas to be revitalized, vegetation that can withstand or resist overuse will be favored in order to preserve the beauty of the recreation areas.

b. Grasses:

Grasses are broken into three catagories: Climax Decreasers, Increasers, and Invaders.

Climax is defined as the highest vegetative types supported on this earth by nature determined by soils, topography, and climate. An Increaser is a plant that increases in number temporarily due to climate or man-made events such as fire, cutting, grazing, bulldozing, slashing, etc.

A Decreaser is a plant that decreases in number due to climate or man-made events. An Invader is a plant that enters and spreads into an area to which it is not native by means of wind, animals, humans, etc. See Table 24 for a list of the grasses found at B. A. Steinhagen Lake.

TABLE 24

GRASSES AT B. A. STEINHAGEN LAKE

Native Climax Grasses That Decrease From Overuse	Native Grasses that Increase From Overuse	Vegetation That Invades From Overuse
Big bluestem	Sand dropseed	Three-awn
Little bluestem	Fall witch	Halls panicum
Indiangrass	Meadow dropseed	Mat sandbur
Switchgrass	Dallis grass	Tumble windmill
Canada wildrye	Carpetgrass	
Virginia wildrye	Broomsedge bluestem	
Pinehill bluestem	Purple lovegrass	
Splitbeard bluestem	Scribner panicum	
	Fringeleaf paspalum	
	Brownseed paspalum	
	Pineywood dropseed	
	Purpletop	

Bermuda and johnsongrass have been introduced by man.

c. Aquatic Weeds:

Aquatic weeds are plants growing in or near water, which in excessive amounts are undesirable or interfere with the intended usage of the area. Aquatic plant control is important for all aspects of water use including irrigation, recreation, and public health. The principal species in this area include: water hyacinth, duckweed, alligatorweed, elodea, coontail, and parrotfeather.

Aquatic weeds have long been a problem at this lake due to the shallow water (average depth of 7 feet at 83.0 feet pool elevation), the long growing season, the high rainfall, nutrient in-flow, and humidity.

Aquatic weeds have reached the point where they are restricting the recreational use by choking the swimming areas, boat ramps, fishing piers and blocking access to the sloughs. They are endangering the public health by increasing the mosquito breeding areas and degrading the water quality. They also are threatening the life of the lake by increasing siltation and the loss of water through evaporation and translocation.

While most aquatic plants provide some food and shelter for some of the fish and wildlife, the overall effect in most situations is bad. When over abundant, they make so much cover for the small fish that the predators cannot catch them and this hastens overcrowding and stunting of the population. They smother spawning areas, tie up nutrients which would otherwise grow fish foods and tend to deplete the oxygen in the areas under the dense mats.

The plant infestations are located in the shallow areas of the sloughs, the upper end of the coves and around much of the shoreline. An eradication program is not currently in effect and the management program has been limited to controlling the vegetation in areas where it interferes with other project uses. Project personnel, with the use of boat spray rigs and mechanical equipment, have attempted to keep the swimming areas, boat ramps, docks, and fishing piers clear of the infestation. Contracts should be let for helicopter applications in remote areas to keep the access to the many sloughs open for the hunters and fishermen and to keep the infestation from spreading to the recreation areas. A comprehensive aquatic weed control program for eradication of plant infestation is essential and will be prepared at a later date. Specific areas will be designated for priority treatment in the interim.

d. Woody Vegetation

(1) General:

Woody vegetation consists of three ecological stages: Pioneer, Sub-Climax, and Climax.

The pioneer stage refers to indivudual species or group species of woody plants originally growing on a specific site within a natural physiographic area. The sub-climax refers to individual or group species of woody plants which replace the pioneer types on a specific site within a natural physiographic area. The climax stage refers to the final individual or group species of woody plants which replace the sub-climax species or types on a specific site within a natural physiographic area. The climax stage may be delayed by natural catastrophes or by man altering a perpetuation of site and physiographic conditions. (Variations of primary climax species or types within a geographic region occur because of edaphic and topographic differences). See Table 25 on page 91 for a list of the woody plants broken into their respective stages.

(2) Forest Management:

Since completion of B. A. Steinhagen Lake, no timber management or timber stand improvement work has been done except for some salvage operations. Prior to Government land acquisition, timber cutting had apparently been made with little regard to the perpetuation and betterment of wildlife conditions. It is evident that without a long range plan of forest management, much of the present and potential value of the future resource may be lost.

The forest management plan is a plan of action designed to produce a forest stand of healthy trees while at the same time coordinating the use of the land with wildlife habitat enhancement, recreation (multiple use), and aesthetic values.

This plan covers the wooded area above elevation 83 (msl) on the east and west shorelines of B. A. Steinhagen Lake except that which extends about 3 miles northward from the confluence of the Angelina and Neches Rivers (between the two rivers) designated as a Pocket Wilderness. For the purpose of this plan, this land is broken roughly into two separate areas designated park and aesthetic areas and wildlife areas.

TABLE 25

WOODY PLANTS AT B. A. STEINHAGEN LAKE

Pioneer Stage	Sub-Climax Stage	Climax Stage
Pine (Southern) *	Pine (Southern) *	Oaks
Sweet gum	Oaks	Live
Red maple *	Water	Cow
Cottonwood	Willow	Southern red
Willow	Post	Burr *
Sassafras	Burr *	Blackjack *
Eastern hophornbeam	Blackjack *	Overcup
Haws	Red elm	White
Sumac	Cedar elm	Hickories
Dewberry *	Hackberry	Shagbark
Blackberry *	Sugarberry	Pecan
Blackcherry	Red maple *	Bitternut
Red cedar	American hornbeam	Mockernut
	Green ash	Dogwood
	Sycamore	Redbud
	Black gum	Holly
	Persimmons *	Mayapple
	Myrtle	Beech
	Hackelberry	Baldcypress
	Dewberry *	Tupelo gum
	Blackberry *	Persimmons *
	Grape	Sourwood *
	Muscadine	
	French mulberry	
	Magnolia	
	Blackcherry *	
	Yaupon	
	Sourwood *	
	Cucumbertree	
	Greenbrier	

* Appears in more than one stage.

(a) Designated Park and Aesthetic Areas:

Designated park and aesthetic areas encompass all Government shoreline property as shown on Plate 2.2, page 30. It includes Magnolia Ridge Park, Cherokee Unit, Campers Cove Park, and Bluff View Park on the west shoreline and Walnut Ridge Unit, Beech Grove Unit, Hen House Ridge Unit, Beech Grove Park, Sandy Creek Park, and East End Park on the east shoreline, and all lands lying between the designated park areas. The Texas Parks and Wildlife Department manages land areas which include Walnut Ridge Unit, Hen House Ridge Unit, Beech Grove Unit, and Cherokee Unit of Martin Dies, Jr. State Park. Aesthetic and recreation values will be the primary consideration on the park areas.

The objective of all timber harvesting restrictions in designated park and aesthetic areas is to develop and/or preserve a natural growth of trees of all ages. Removal of all vegetation, living or dead, will be approved by District Resource specialists only when justified by urgent disease or insect control for safety reasons and for utilization of recreational facilities. Financial maturity, over-maturity, or high commercial value are insufficient reasons to remove large trees. In park areas, small salvage operations will be carried out by project personnel to reduce safety or fire hazards. In all cases where accessible, woods will be used for project purposes or will be stocked in designated camping areas for firewood. Where salvage may be extensive, its operation will be conducted under the supervision of a District Resource Specialist.

(b) Wildlife Area:

This area encompasses all woodlands above elevation 83 (msl) not covered by paragraph (a) above. This plan does not have a rotation or cutting cycle for timber production. Objectives of this program are to enhance wildlife and recreation values and to promote natural ecological conditions by following accepted conservation practices. Guidance for all forest management activities will be in accordance with ER 1130-2-400.

Timber salvage in all areas of the lake will be advertized and sold only when the extent of loss justifies the sale, and only where there are existing roads or easy access without clearing or cutting access to the salvage site. In cases where there is no access, timber will be cut by hired labor and will lie where felled. Salvage will not take place in unaccessable areas where the timber does not present a safety or fire hazard. Where possible, forest products should be used by the project or made available for visitor use within the park; for example, as firewood.

Only when justified will timber be sold, and then only after prior marking with paint. In the case of separate sales of walnut logs, sales may be made by designation. Sales will be made on the basis of measurements made at the time of marking. Determination of salvage sales will be made in conjunction with District Office Resource Management Specialists.

An outline for the development of a Forest Management Plan for B. A. Steinhagen Lake follows:

* * * * * * * * *

I. Introduction

A. Forest Management Objectives of B. A. Steinhagen

1. Multi-culture uneven age stands
2. Wildlife habitat improvement
3. Protection of rare and endangered plant and animal communities
4. Maintenance of an eco-system balance

B. Relationship to Other Purposes of the Project

1. Recreation - shade, beauty
2. Fish and Wildlife - green tree reservoir - den trees
3. Conservation and Aesthetics -large species, old stands
4. Scientific study areas
5. Pocket Wilderness area
6. Conservation pool fluctuation
7. Range Management

II. Forest Inventory

A. Description of Existing Plant Community

1. Species index - including commercial and non-commercial
2. Parent plant community
3. Climax

B. Timber Stand Delineation

1. Location
2. Size
3. Types
4. Age class
5. Stocking - by species, including non-commercial

C. Forest Management Practices

1. Continuous forest inventory
2. Salvage practices
3. Insect control - Corps programs
4. Fire control - Corps programs - prescribed burning
5. Harvesting - select cut method - thinning
6. Reforestation and rehabilitation
   a. Recreation areas
   b. Wildlife habitat improvement
   c. Aesthetics and beautification
   d. Stocking

* * * * * * * * *

5. Water Management Concepts:

The water area has been zoned. Buoys and markers will be placed to control various activities and the speed of watercraft at the gated spillway, boat ramps, commercial docks, and other sites. During peak periods of visitation a patrol boat will be used to provide necessary control and help maintain water safety.

a. Control of Floating Debris:

A continual check on floating debris will be made for water safety purposes. Cleanup measures will be taken where necessary.

b. Mooring Policy:

In order to (a) prevent the despoilment of the natural scenic beauty of the shoreline; (b) preserve the shoreline area in as near the natural state as possible; (c) protect the public interest in the project from the standpoint of fire control and navigational safety; (d) safeguard the public health by an effective program of water pollution control; and (e) provide for general public use in lieu of private use of project lands and waters, the storage and/or mooring of houseboats, boats, barges, and other vessels on lake waters for periods in excess of three days will be confined to the areas leased to concessionaires.

c. Harzardous Markings:

Areas where obstruction occurs presenting a hazard to boating, skiing, fishing, etc., will be marked to indicate the hazard involved.

d. Other Uses:

Other uses of water will be regulated by the Neches River Authority (i.e. human uses, irrigation, industrial uses, etc.).

D. Created Resources

1. Dam and Pertinent Works:

The operation and maintenance manual (FWDR 1130-2-66) contains technical data on operation and maintenance procedures on structures and equipment.

2. Park Areas

a. General:

These areas will be generally administered and managed in accordance with ER 1130-2-400, ER 405-1-830, ER 405-2-835, SWDR 1130-2-7, and the Operation and Maintenance Manual.

b. Inspection of Areas:

Park areas shall be continually monitored to detect problem areas, changes in use trends, performance of proper maintenance of facilities, and to manage visitors.

c. Recreational Attitude:

The maintenance and operation of public use areas will reflect an attitude conducive to proper public service. Accomplishment will be through ranger presence, good sanitation measures, continual cleanup of areas and constant evaluation of maintenance procedures. Project personnel will continually offer aid to the visitors. They will also inform the visiting public of their misuse as well as commend them on their good practices: for example, boating habits, camping habits, trash disposal practices, water sport safety habits, etc. Training will be provided project personnel who have contact with the public, in such areas as listed in Appendix B, paragraph 3, of the new Safety Regulation, FWDR 385-1-90.

d. Park Evaluation:

Each park will be evaluated on a continuing basis to determine usage needs; public trends, public demands; and the conditions of soil, vegetation, and facilities. Based on these evaluations, overused parks may be closed for revitalization.

User surveys shall be conducted at the project at least once each quarter, and more often during heavy use periods. Detailed guidance will be furnished the project by Operations Division. The surveys will establish user trends by providing data that can be used to:

(1) Analyze recreational attendance
(2) Estimate facility design loads
(3) Estimate future recreational use
(4) Estimate optimum use levels
(5) Determine (analyze) visitor preference and needs
(6) Determine visitor socio-economic characteristics
(7) Determine visitor reactions to local and district management actions.

e. Boundary Marking

(1) Marked Areas:

Land areas will be marked according to corresponding land uses on the Land Planning plan with signs appropriate to the purpose. Examples: Conservation Area, Nature Trails, Wildlife Conservation Areas, Picnic Areas, Camping Areas, Beaches, Boat Launching Areas, etc. Hazardous areas will be marked for the safety of the visiting public.

Water areas will be marked with buoys according to corresponding uses, restrictions, and rules indicated on the Water Planning plan. Buoys will be marked to specify type, use, size, and speed of boats and restricted areas. Hazardous areas will be marked to awaken the public to any area where caution is to be taken. A monthly check of the condition and location of buoys will be made.

(2) Monumentation and Signs

(a) Signs:

Signs will be installed in accordance with instructions outlined in ER 1130-2-312 and the Handbook on Signs issued by the Southwestern Division. Signs presently in use will be kept, but the signs which must be replaced for maintenance reasons and the new signs which are installed should comply with the preceeding criteria.

(b) Monumentation:

Monuments have been set out along the Government's fee acquisition line and iron pins at strategic locations along the flowage easement line in order to improve administration of the lands over which the Government has acquired fee title or a lesser interest. The Government property lines should be clearly marked to cut down on encroachments. Clearing of any overgrowth which obstructs the monuments should be done regularly.

f. Vandalism Control:

If necessary, vandalism will be curbed by providing ranger presence on a 24-hour basis. Contact with local law enforcement officials by rangers should be maintained by radio where possible.

3. Commercial Concession Management:

A commercial concession, although privately owned, is a public service located on Federally owned land and must be managed to insure that it fulfills their purpose in a safe and functional manner.

Paragraph 4 of the Commercial Lease Agreement states in part, "the leasee shall keep the premises in good order and in a clean, sanitary and safe condition and shall at all times maintain all structures and equipment in a condition satisfactory to the District Engineer".

Although Real Estate Division is required to conduct compliance inspections of the lease area at least annually, it is the Resource Manager's responsibility to ensure that the concession is continually operated in a condition which reflects satisfactorily upon the Corps of Engineers.

Therefore, Resource Managers should preform periodic inspections of grounds and facilities. Visits as frequent as weekly would be conceivable, should the condition of the facility warrant. Insuring the safety of the visitors should be one of the main objectives of the inspections.

A standard checklist for project use in recording results of visits or inspections will be developed in the near future. See Table 26,

for typical items to be included on the checklist.

TABLE 26

CONCESSIONAIRE CHECK LIST

Pricelist posted in a conspicuous location.

Nondiscrimination notice posted in a conspicuous location.

Commercial advertising signs on lease area in accordance with SOP No. 26

Land and water areas in the lease area free from litter.

Suitable trash receptacles provided.

Facilities in a good state of repair.

Roof and decking properly maintained.

Soft drink bottles neatly stored.

Trailers and boats stored on shore are neatly arranged.

Replacement flotation materials stored out of travel paths.

Merchandise and supplies are stored or displayed in an orderly manner.

Nonserviceable boats, except ones left for repair, removed from area.

Rental boats properly marked, clean, and in good repair.

Grass kept mowed or equipment on grounds moved when project personnel are mowing in the area.

Cables, anchoring devices, and other hazards to pedestrians, including exposed weights, are prominently marked.

All handrails are secure.

Walkways and gangplanks are free of obstructions.

Electric lines and facilities operated per National Electric Code.

Lines leading to the dock allow for safe travel beneath them.

Extra electric service line is stored in a safe location.

Gas pumps and gas and oil storage areas have "No Smoking" signs.

Fire extinguishers available.

No insect nests (wasp, spider, etc.) on dock.

Sanitary facilities clean and well maintained.

Leasee is complying with all safety requirements.

Boat cushions, life jackets, and running lights are serviceable.

Results of inspections shall be forwarded by the Resource Manager to the Chief, Operations Division, who shall furnish copies to other District elements having an interest.

4. Fee Management:

The Land and Water Conservation Fund Act of 1965 (Public Law 88-578) included the Corps of Engineers under the Golden Eagle Entrance Permit program. The Corps of Engineers withdrew from the program in 1968 in compliance with Section 210 of the Flood Control Act of 1968 (Public Law 90-483) which prohibits the use of entrance fees. EC 1130-2-73, Reservoir Projects Users Fees, dated 8 April 1970, established criteria for the imposition of user fees. It is the policy of the Corps of Engineers to charge user fees for highly developed camping areas and where special services are provided. B. A. Steinhagen does have areas meeting the Class "B" criteria for user fees and did participate in the Golden Eagle Entrance Permit program in 1966, 1967, and 1968. Since 1968 the Corps of Engineers has not participated in this permit program. If necessary, Magnolia Ridge Park can initiate a user fee program. However, no user fee areas are proposed since all the state park units at this lake charge both user and entrance fees.

II. SPECIAL ACTIVITIES

A. Safety:

A project safety plan will be developed for each park or separate facility under the responsibility of the Resource Manager. This plan should include, but is not limited to: construction, maintenance, public use areas, visitor protection, equipment operation, office operation, safety education programs for both visitors and project personnel and enforcement proceedings. Under this plan, the Resource Manager is required to identify common recurring hazards or unsafe conditions in each major phase or area of his operation. Once hazardous situations have been identified, the Resource Manager will indicate the precautionary actions to be taken to prevent, reduce, or control such hazards. This plan will be coordinated with the District Safety Office for review and recommendations prior to approval and will become an item of interest on safety surveys and inspections.

B. Fire Protection:

1. A fire protection plan has been coordinated with the Department of Agriculture, U. S. Forest Service, and the Texas Forest Service.

2. A fire control plan for headquarters and the lake area has been developed by the project office. Private contractors, State Highway Departments, County Commissioners and Texas and Federal Forest Services have tractors with plows, bulldozers, maintainers, and other equipment to use in suppressing fires. Burning will not be authorized or permitted on Government lands without the Resource Manager's approval and supervision, except as provided in Title 36. The Fire Control Plan for Headquarters and the Lake Area follows:

* * * * * * * * *

It is difficult to predict which employees may be in the vicinity at the time of a fire, but the succession of command serving as fire chief will be as follows:

Resource Manager	Fire Chief
Maintenance Worker Foreman . . .	1st Alternate
Resource Ranger	2nd Alternate
Maintenance Worker	3rd Alternate

Other employees will act as fire fighters under the supervision of the fire chief.

In case of fire in the headquarters area or the outlet structure area during the regular working hours, the employee discovering the fire will immediately push the fire horn located near the east door to the administration building or the Klaxon horn at the structure. The fire alarm consists of five short blasts. All available employees will report to the scene of the fire upon sounding of the horn. If the fire is at the project building, the clerk will remove valuable files from the office if they are in danger of being destroyed.

Should the fire occur when only one employee is on duty in the headquarters area, he will try to contact the nearest vehicle by radio and the Woodville Fire Department by telephone and then proceed to the fire.

If the fire is in electrical equipment, the master switch will be thrown and only CO_2 fire extinguishers will be used to fight the fire. The following fire fighting equipment is available:

1. CO_2 extinguishers located in administration building and warehouses.
2. Fire hose boxes west of office, east of garage, and west of warehouses.
3. Garden hose outlets east and west sides of administration building and east and west of lawn.
4. CO_2 bank located in generator house.

If an employee on maintenance notices a fire in the resource area, he will immediately make an investigation of the location and extent of the fire and report by radio to the Resource Manager or Clerk.

The following equipment is available at the project office for fighting fires in the resource area:

1. Two hand-operated sprays of 4-gallon capacity.
2. One farm tractor with front-end loader and blade.
3. One crawler type tractor with dozer blade.
4. One 2-inch gasoline pump.
5. Empty 55-gallon drums.
6. Burlap bags and hand tools.

Sam Rayburn Project Office and Texas Forest Service have fire fighting equipment available. Jasper and Tyler County Commissioners and major timber companies in the area have tractor equipment and fire plows available. The approval of the district office would be required before renting equipment to fight fires.

* * * * * * * * *

C. Public Health

1. General:

Public health protection is one of the primary responsibilities of the O&M program. All visitors must obey all Federal and State laws and regulations. State Health Department approval of all water and sewage systems to be installed on Government property is required. Bacteriological analysis of public water supplies are conducted monthly and chemical analysis either annually or semi-annually dependent on the source. Liquid and solid wastes are collected on schedule and disposed of in approved manner. Camping, picnic and sanitary facilities are cleaned and serviced on regular schedules. The insect and rodent control programs are designed to protect the health and well being of the visitors. Project personnel are trained in the principles of first aid and will participate actively in water safety programs.

2. Sanitation:

Sanitation or good housekeeping, is the most effective and economical method of protecting the public health. Therefore, good sanitation programs are stressed and Federal and State rules and regulations are adhered to in design, construction, and servicing.

3. Insect and Rodent Control

a. Insect

(1) Control Problem:

Undesirable insects, besides attacking man, attack his supplies, materials, structures, and both ornamental and natural vegetation. They are detrimental to his health and adversely affect his morale. It is therefore imperative that the projects maintain a satisfactory degree of control of undesirable species.

(2) Management:

Project personnel will make routine inspections for insect damage and initiate control programs on an "as needed, where needed" basis. Control programs on private property adjacent to Government land or where extensive areas must be treated, will be accomplished in cooperation with the appropriate local, state or federal agencies having authority or interest in the problem.

b. Rodents

(1) Control Problem:

Rodents may serve as disease carriers, destroy supplies and materials, damage structures, cause fire losses, and damage grasses and shrubs. Their burrows may even cause erosion problems. For these reasons, the projects must maintain a satisfactory degree of control.

(2) Management:

The most effective and economical management plan is a preventive program to avert possible outbreaks which could cause serious losses. Project personnel will make routine inspections for signs of rodents and initiate control programs when necessary.

D. Law Enforcement:

Enforcement of civil and criminal laws at the lake on Government land and water remains the responsibility of duly constituted officers of Federal, State, and local governmental agencies. The Corps of Engineers, through field personnel, will cooperate fully with all officers responsible for the enforcement of laws relative to civil actions, game and fish conservation, public health and sanitation, boating, and prevention of pollution.

Where practicable, Resource Managers will provide rangers to man selected park areas on a 24-hour basis during peak recreation periods to provide visitor protection and reduce vandalism. The project manager will attempt to gain passage of local ordinances or laws which will encompass all Corps rules and regulations.

DESIGN MEMORANDUM NUMBER 1C

REVISED MASTER PLAN

APPENDIX (A)

PROJECT RESOURCE MANAGEMENT PLAN

FOR

B. A. STEINHAGEN LAKE

AND

TOWN BLUFF DAM

NECHES RIVER, TEXAS

U S ARMY ENGINEER DISTRICT FORT WORTH, TEXAS

JULY 1972

SWDCO-OR (SWFOD-M 4 Aug 72) 1st Ind
SUBJECT: Project Resource Management Plans, Appendix (A), Design Memorandum No. 1C, Revised Master Plan, for B.A. Steinhagen Lake and Town Bluff Dam, Neches River, Texas

DA, Southwestern Division, Corps of Engineers, 1114 Commerce Street, Dallas, Texas 75202 10 August 1973

TO: District Engineer, Fort Worth, ATTN: SWFOD-M

1. The subject appendix is approved subject to the following comments:

a. Para IIA. Pool fluctuations will probably continue after the proposed upstream projects on the Neches River are completed.

b. Para IIC. The discussion of the problems with mowing and cleanup contracts should be followed with positive corrective measures in contract administration.

c. Para IID. Statements concerning the 1972 and 1973 spraying contracts, limit the appendix in time.

d. Para IIIA.

(1) The discussion of land acquisition dealing with questions of whether the 54.9 acres of land are excess should be deleted.

(2) This section should be expanded to include a description of extent and location of additional lands required over the life of the project for recreation-resource management purposes. The adequacy of the land to support a fee program should also be discussed.

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(1) Control of traffic

(2) Periodic closing of the area for maintenance or economy of forces.

(3) Over use of the area

(4) Overflow areas

(5) If a portion of the area is leased, then the agreement should be cited indicating the total number of acres, expiration date and any unusual features of the agreement.

(6) A tabulated listing of the facilities provided and by whom would be helpful.

f. Para V.

(1) With the present limitation of spaces, the establishment of a sign shop is disapproved. More emphasis should be placed on obtaining signs by contract.

(2) Large items of replacement and repair to facilities are not accomplished by negotiating a contract.

g. Para VII. Expansion of the administration facilities will have to be submitted for approval in accordance with SWDR 1125-2-3.

h. Para VIII.

(1) The number of rangers and maintenance personnel required for seasonal work should be indicated.

(2) Some explanation of the asterisks should be given.

(3) The "Reservoir Maintenance Workers" should be WG grades.

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j. Para X. In addition to the Texas Parks and Wildlife Department, it is believed that there are other agencies with which the project has cooperative activities, i.e., the Neches River Authority Jasper County and the Health Department.

k. Para XII. This paragraph should include the procedures a ranger will follow in exercising citation authority. A discussion of the training, the authority to be exercised in leased areas, contacts to be made with other law enforcement agencies, and local Magistrate instructions should be included.

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submitted for approval every five years.

FOR THE DIVISION ENGINEER:

George W. Staples

GEORGE W. STAPLES
Chief, Construction-Operations Division

wd all incl

CF: w incl
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DEPARTMENT OF THE ARMY
FORT WORTH DISTRICT, CORPS OF ENGINEERS
P. O. BOX 17300
FORT WORTH, TEXAS 76102

SWFOD-M 4 August 1972

SUBJECT: Project Resource Management Plans, Appendix (A), Design Memorandum No. 1C, Revised Master Plan, for B. A. Steinhagen Lake and Town Bluff Dam, Neches River, Texas

Division Engineer, Southwestern
Attention: SWDCO-OR

1. Reference Engineer Regulation 1130-2-400 dated 28 May 1971, SWDPL-R letter dated 8 March 1972, subject, Recreation Resource Planning and Management and 2nd Indorsement thereto dated 17 May 1972.

2. In accordance with schedules previously furnished, nine copies of Appendix (A), Project Resource Management Plans, Revised Master Plan for B. A. Steinhagen Lake and Town Bluff Dam is forwarded for approval.

FOR THE DISTRICT ENGINEER:

ALLIE J. MAJORS
Chief, Operations Division

1 Incl
Appendix (A), Design Memorandum
No. 1C, Revised Master Plan
B. A. Steinhagen Lake and
Town Bluff Dam (9 copies)

TABLE OF CONTENTS

TABLES

APPENDIX A

RESOURCE MANAGEMENT PLAN

I. AUTHORIZED PURPOSE OF THE PROJECT:

Town Bluff Dam, B. A. Steinhagen Lake (formerly Dam B), is for the purpose of regulating intermittent power releases from Sam Rayburn Dam and Reservoir (formerly McGee Bend) and Rockland Lake (not yet constructed) power plants to provide head for diversion into a water supply canal and storage from which water will be released for the benefit of rice culture, salinity control, pollution abatement, navigation, and municipal and industrial uses. B. A. Steinhagen Lake is located on the Neches River in the east-central and west-central portions of Tyler and Jasper Counties respectively. The dam site is about 114 river miles above the mouth of the Neches River and 12.4 river miles below the confluence of the Neches and Angelina Rivers. Congressional authority for the construction of Town Bluff Dam is contained in the Rivers and Harbor Act as approved 2 March 1945 and revised by Public Law 90-46, 4 July 1967, to change the name from "Dam B" to Town Bluff Dam and B. A. Steinhagen Lake. Basic legislation relating to the development of lake area for recreational purposes is contained in Section 4 of the Flood Control Act approved 22 December 1944 and amended 22 July 1946 and 3 September 1954. The prime purpose of recreation development is to provide an opportunity for the American public to use and enjoy their environment and its natural resources.

II. OPERATIONAL CONCEPT:

A. The Lower Neches Valley Authority contributed $2,000,000 toward construction of Town Bluff Dam for which they are authorized to draw a maximum of 2,000 cfs as the need arises. Since the lake is generally shallow when at conservation pool elevation 83.00 feet msl and because of the nearly level topography of the inundated area, large segments are affected by the pool fluctuation caused by these discharges. Pool fluctuation is a constant feature of this lake and will continue to be until all proposed upstream projects on the Neches River are completed. Water oriented activities are seriously hampered or eliminated during drawdowns of five feet or more because boat ramps and beaches are unusable. Drawdowns of this nature are almost an annual occurrence. Although recreation was not an original project purpose, the public demand placed on project resources in pursuit of outdoor recreation has been great and is expected to continue to increase. Therefore, the use of a development guide for future use is a must to prevent destruction of irreplaceable natural resources.

B. Guidance for operation of the project is contained in the following publications:

Engineer Regulation 1130-2-400 Project Operation - Resource Management of Civil Works Water Resource Projects

Southwestern Division Regulation 1130-2-7 Project Operation - Administration of Reservoir Lands and Waters

Fort Worth District Regulation 1130-2-10 Project Operation - Reservoir Regulations

Fort Worth District Regulation 1130-2-61 Reservoir Operation and Maintenance

Fort Worth District Regulation 1130-2-66 Operation and Maintenance Manual (Town Bluff - Formerly Dam B)

C. Present recreational facilities have been developed in accordance with the Master Plan, but the Master Plan was outdated and did not provide for development consistent with current public use. The Corps of Engineers operated parks have extensive development aimed at day use activities but are lacking in facilities for the overnight users' needs and providing protection of natural resources. The project Master Plan was revised in December 1971 to place emphasis on features where public demand is the greatest and provide proper guidance for all future development. Project signs, shelters, waste receptacles, and maintenance equipment are maintained as required by project personnel. Minor repairs of roads are accomplished by project forces, however, contracts are awarded, as needed, for major road and parking area maintenance. Recreational facilities are inspected weekly, and all major repairs scheduled during inclement weather periods or recreation off seasons. This program has proven successful. Mowing and cleaning of recreation areas are performed by contracts. In the past, contractors have been troublesome and required constant surveillance to assure acceptable performance. Specifications were revised for the 1972 contracts in an attempt to receive bids from more competent contractors. Waste pits are maintained in accordance with state health department requirements on lake lands by project personnel.

D. The shallow lake and frequent fluctuation of pool stimulate aquatic growth. This growth without proper control creates problems in recreation areas, but once under control it will be an asset by providing food and cover for fish and waterfowl in remote areas of the lake. Control is accomplished by annual aerial spraying contracts using a helicopter to apply a water-in-oil emulsion and four pounds per gallon of 2, 4, 5 trichloro-phenoxy propionic acid applied at a rate of two pounds of acid per acre. The 1972 contract was for 750 acres, and funds are budgeted for 1,000 acres in FY 73.

E. Insufficient access has been detrimental to the use of Magnolia Ridge, Campers Cove, and Sandy Creek Parks. The only access to these parks is over county dirt roads, which are usually in bad condition and sometimes impassable during the wet season. Steps are being taken to correct this problem. Meetings with the County Commissioners have been held to expedite the planning of a proposed state farm to market road to serve Magnolia Ridge Park, and a study will be made by the state to determine the feasibility of providing a state maintained road to Campers Cove. A new access road was planned for Sandy Creek Park in the Revised Master Plan since a state road would not be feasible in the near future. The new road will be provided by the Government on existing project lands. With appropriation of sufficient local and project funds the access problem in all these areas will be eliminated, and the parks will attract their share of recreational use.

III. LAND ACQUISITION

A. Land was purchased in fee to an elevation equal to five feet above the spillway crest together with additional lands to prevent excessive severance damages. This initial acquisition totaled 21,759 acres with a flowage easement being taken on 1,041 additional acres. Engineer Manual 402-2-835, dated 10 June 1960, recommended land not needed for project purposes, public use, or recreational development be disposed. After allocation of lands for the approved uses in 1960, 54.9 acres of land were determined not to be needed. This land is located around the perimeter of the lake, consisting of small parcels varying in size. Due to the small irregular portions of excess land, it was recommended that this land not be disposed of. Under current management proposals all land is considered necessary to accomplish effective control and management of the project resources.

B. Project operations use require 13,876 acres of land including 13,700 acres which is inundated at conservation pool elevation and 176 acres of land adjacent to the dam and appurtenances necessary for proper project operation and maintenance.

C. Public recreation areas with intensive use and a variety of activities and development utilize 1,723 acres of land. An additional 2,930 acres is available and suitable for multiple recreational use activities not requiring facility development. These lands are very condusive to observation, study, and photographic activities. B. A. Steinhagen Lake lands provide an outstanding opportunity for varied recreational activities. Intensified resource management will increase available recreational opportunities.

D. The Texas Parks and Wildlife Department has a 25 year license covering 13,445 acres of land and water, which include the major portion of the area north of U.S. Highway 190 (except for Cherokee and Magnolia Ridge public use areas). The area is being used by the department as a wildlife observation and study area. In January 1972 the Parks and Wildlife Department accepted a proposal to designate 4,045 acres of this area as a "State Scientific Area". This is the same area that is designated "Pocket Wilderness" in the Revised Master Plan. The district Real Estate Division is reviewing the accepted proposal and will rework it to incorporate into the lease some of the restrictions and protection outlined in the Revised Master Plan. The new lease will require the Parks and Wildlife Department participation in management of the area and control of all activities by the lessee. Project personnel will continue to emphasize the "Scientific Area" because it has some unique and irreplaceable qualities which should be preserved for future generations.

IV. PUBLIC USE AREAS:

There are nine parks at B. A. Steinhagen Lake - Bluff View, Campers Cove, Magnolia Ridge, Cherokee, Walnut Ridge, Beech Grove, Hen House Ridge, Sandy Creek, and East End. Three of these parks are under lease agreement to the Texas Parks and Wildlife Department.

A. Bluff View Park:

This area consists of 16 acres located adjacent to and north of the headquarters area. Eleven acres are better known as Bluff View Observation Point. The park is accessible at five points from State Farm to Market Road 92, which borders the park on its westerly side. Access through the area known as Bluff View Observation Point is by a single hard surface, blacktop road. Access through the remaining five acres is by a number of gravel roads. Existing recreational developments by the Corps of Engineers consist of paved and gravel roads, water system, picnicking facilities, sanitary facilities, and park and directional signs. Recreational development plans for the next five years consist of the construction of a day use area, 666 square yards paved parking, and the paving of 0.2 mile of existing gravel road. In 1953 (first year of record) the park attracted 57,400 visitors. This figure increased to 152,000 visitors in 1960, which was 13% of total visitation to the project. Due to the popularity of other near-by lakes, the visitation dropped to 29,190 visitors in 1970, which is 5% of the total project visitation. However, the visitation is expected to increase to 52,508 visitors by 1990. The park, located on a hill overlooking the dam, offers a beautiful view of the lake. For this reason, Bluff View Park is a favorite of sightseers and picnickers. Many visitors stop here for a panoramic view of the lake before entering the camping areas. This area is particularly suitable for an information center. An interpretative shelter is proposed in FY 1976 at an approximate cost of $5,000.

B. Campers Cove Park:

This park contains 81 acres located on the west shore of the lake, about two miles north of the dam and about 2.5 miles south of U.S. Highway 190. The park area is accessible by two gravel roads, maintained by the county, which connects with State FM Road 92 that parallels the west side of the park at a distance of about one-half mile. Due to the high visitation in this park, these two access roads are in need of paving. Existing recreation development by the Corps of Engineers consists of picnicking, sanitary facilities, drinking water, camping facilities, paved and gravel roads, paved parking area, boat launching ramps, and park and recreational signs. Proposed additions for the next five years by the Corps of Engineers consist of two overnight use areas, which will have camping units with shelters, paved pullouts, waterborne toilets and showers, waste treatment plant, traffic control gate, group shelter, and courtesy dock. Non-federal development by concessionaires consists of two courtesy docks and provisions for boat rentals. The two docks have been returned to the Government and maintenance is being performed by the project personnel. In 1954 (first year of record) attendance at the park was about 1,200 and attendance increased to about 119,100 visitors in 1960, which was 7% of the total visitation to the project. In 1971 visitation dropped to 117,917, which represents 19% of the total visitation. This drop in visitation was due to construction of two other lakes in the area. The scenic beauty and available commercial facilities of the park make it a high use camping area. There is a private development adjacent to the northwest edge of the park consisting of a small supply store and several private dwellings. Development of new facilities and improvement of existing facilities should attract even a greater number of visitors in the future.

C. Magnolia Ridge Park:

This park consists of 570 acres located on the west shore of the lake about two miles north of U. S. Highway 190. The park is accessible by a single unpaved county road that connects U. S. Highway 190 to the only entrance into the park. Heavy use by logging trucks keeps the county road in poor condition. Travel within the parks is readily available by a network of hard surfaced park roads and a few sandy roads. The terrain of the area is gently sloping to flat with an occasional flowing stream. Tree cover, predominately pine, is fairly dense to very dense, resulting in a very attractive area. Existing recreational development by the Corps of Engineers consists of paved and gravel access and secondary roads, water systems and fountains, picnicking and camping facilities, sanitary facilities, and park and directional signs. Extensive development is planned for the next five years. The construction of two day use areas and five overnight use areas is included in the 5-year recreational development plan. The day use areas will consist of some existing facilities along with a series of hiking trails, converted waterborne toilets, and drinking fountains. The overnight use areas will provide waterborne toilets, launching lanes, group shelters, campfire circles, fireplaces, tent pads, drinking fountains, courtesy docks, and a network of nature and hiking trails. In 1960 (first year of record) the park attracted some 3,000 visitors. By 1971, due to continued development of park facilities, annual visitation rose to 41,754, which is 7% of the total project visitation for that year. As the popularity of the park continues to grow and as more facilities are installed, visitation is expected to increase to well over 120,000 by 1990. Magnolia Ridge Park, with its many species of trees and plant life, is especially colorful throughout the year and is a favorite of sightseers and camera enthusiast. Because of its fast growing popularity and increased development, it should rank high in total visitation.

D. Cherokee Park:

This park, which is located on the north and south sides of U.S. Highway 190 on the west side of the lake, consisting of 27 acres. The area is accessible from U.S. Highway 190, which crosses (east and west) in the approximate center of the area. Existing recreational development by the Corps of Engineers consists of picnicking and sanitary facilities, boat launching ramps, and paved parking areas. This area is leased to the Texas Parks and Wildlife Department, and their development of the area consists of swimming, drinking fountains, piers, waterborne sanitary facilities, park signs, buoys, and registration booths. The lease with the Texas Parks and Wildlife Department is a 50 year lease which began 1 April 1964. Future development by the Corps of Engineers is not planned for this park. The Texas Parks and Wildlife Department does have plans for the maintenance of the area although future development is not included in these plans. The Cherokee Park visitation has increased from 62,500 visitors in 1953 (first year of record) to about 664,800 visitors in 1960. In 1960 the park had about 40% of total visitation of the project. In 1971 the visitation dropped to 68,875 or 9% of the total visitors at the project. This large drop in visitation was due to construction of other lakes and parks in the area. Because of the drop in visitation and expenditures by the state, the administration of this park may be returned to the Corps of Engineers. This park has two fishing piers and a swimming area marked by buoys and because of these features is a favorite spot for day use visitors. With the existing facilities, this park will adequately serve the future needs of park visitors.

E. Walnut Ridge Park:

This park consists of 309 acres adjacent to and north of U.S. Highway 190 on the east side of the lake, part of which is on an island. The Texas Parks and Wildlife Department has a 50 year lease, which began 1 April 1964. The park is accessible by Texas Park Road 48, which connects the park

to U. S. Highway 190. Travel through the park is by Park Road 48 and by a network of sand roads. The park was initially developed by the Corps of Engineers. There are masonry picnic tables and a water well. When the area was leased to the Texas Parks and Wildlife Department all existing facilities were transferred to the State of Texas. The Texas Parks and Wildlife Department then undertook an extensive recreation development program for the area which has now become one of the most heavily used parks within the lake area. Facilities include paved and sandy roads, water system and extensions, picnicking and camping, boat ramps, screened shelters, waterborne toilets, shower facilities, fishing pier, fish cleaning house, and concession building as well as park and directional signs. This park has been developed to meet the demands of the future, therefore, no new development is planned. The Texas Parks and Wildlife Department plans to continue to improve the existing facilities. Visitation to Walnut Ridge Park has increased from 3,000 in 1960 to 105,592 in 1971. Effective control of the area by the Texas Parks and Wildlife Department has helped to increase wildlife population within the park. This, coupled with the high quality of facilities, seems to be the drawing point that attracts so many people to the park.

F. Beech Grove Park:

Beech Grove Park contains 17 acres which were originally leased to Jasper County. In 1971 Jasper County requested that this area be reverted to the Corps of Engineers. There is presently a concession lease on 2.5 acres in this park. The area lies south of and adjacent to U.S. Highway 190 on the east side of the lake. The park area is accessible by one paved road which connects to U. S. Highway 190. Existing recreational development includes one boat launching ramp, one water well, and 0.2 mile of paved park road. Services and facilities provided by the concessionaire consist of boat rental and a general supply store. The Corps of Engineers' five year recreational development plan consists of camping units, paved pullouts, waterborne toilets, courtesy dock, swimming beach with buoys,

and traffic control gate. At present, the area is a day use area, but when the proposed facilities are completed, the park will become suitable for overnight use. There are no visitation records of the Beech Grove Park available. In the future, this area should become a favorite of campers because of its easy access and availability of camping supplies.

G. Hen House Ridge Park:

This park consists of 283 acres adjacent to and south of U.S. Highway 190 on the east side of the lake. The Texas Parks and Wildlife Department has a 50 year lease, which began 1 April 1964. The park is accessible by Texas Park Road 48, which connects the park to U.S. Highway 190. Initially the park was partially developed by the Corps of Engineers who installed 11 masonry tables, 2 water wells, and 1 masonry pit toilet. In 1964, when the lease to the Texas Parks and Wildlife Department was signed, all existing Corps of Engineers facilities in the park was transferred to the State of Texas. The Texas Parks and Wildlife Department then began an extensive development program. Because of their efforts, the park is the most popular and most used park of the entire lake. Facilities provided include paved roads, water system and extensions, picnicking and camping facilities, tent and trailer pads, screened shelters, waterborne toilets, shower facilities, fishing pier, fish cleaning house, boat ramp, and park directional signs. The park is developed to meet the maximum utilization of the area and the future demands of the public. Because the area has been developed to the maximum, no future development is planned. The Texas Parks and Wildlife Department plans to continually improve the existing facilities and upgrade the quality of their maintenance throughout the park. In 1953, when development was at a minimum, the park provided needed recreation to 34,400 visitors. This figure rose to over 196,700 visitors in 1960. Visitation decreased in 1971 to 146,084 visitors, which is 23% of the total visitation of the lake. As the present demand for recreation continued to increase, it is expected that visitation for the year 1990 will reach 363,977. An abundance of small wildlife

thrives in the park. The wildlife and excellent swimming beach, as well as camping facilities, attract people to this park.

H. East End Park:

This park consists of 25 acres divided into two parcels located on the project access road which serves the east side of the dam. One area of the park is immediately upstream from the east end of the submersible dike and the second part is located downstream from the dam and adjacent to the stilling basin. Access to the upstream area is on a surfaced project access road, which serves the east side of the dam. Access to the area located downstream from the dam and adjacent to the stilling basin is by trail only, and construction of an access road or other facilities is undesirable because of frequent flooding. The park was developed by the Corps of Engineers, and existing facilities consist of picnic units, masonry pit toilet, boat launching ramp, and water well. Additional development by the Corps of engineers is planned for the next five years. Development includes camping units, paved pullouts, conversion of existing toilets to waterborne, tent pad, and hiking trails. Paved parking is also in the development plans which would accommodate fishermen using the stilling basin. Visitation in the park was 11,400 in 1953 (first year of record), and visitation increased to 32,900 by 1960. In 1970 visitation dropped to 19,994 which accounted for 3% of the total project visitation. By 1990 visitation is expected to reach 48,928. When the development plan is completed, the park will provide an enjoyable area for all visitors.

I. Sandy Creek Park:

The area consists of 395 acres on the east side of the lake near the point where Sandy Creek enters the lake. The park is accessible by means of three sandy roads which are in extremely poor condition. One is a timber company road, and the other two are county roads. The timber road connects to a county road on one end and into U.S. Highway 190 on the other

end. The county road in turn joins the park entrance. Both county roads lead to Farm-Market Road 777, which joins U.S. Highway 190. Existing recreational development by the Corps of Engineers consists of paved and gravel roads and parking areas, picnicking and camping facilities, sanitary facilities, courtesy dock, boat launching ramps drinking fountains, and park directional signs. The Five Year Improvement Plan includes conversion of existing toilets to waterborne, swimming beach, bath house, group shelter, and upgrading existing facilities. In 1953, when this park was first opened to the public, visitation was 21,700. Visitation in this park has steadily increased. In 1960 visitation reached 38,700 and in 1970 was 83,565 or 13% of total visitation of the lake. This park has become increasingly popular with campers and day use visitors, and by 1990 attendance is expected to reach 103,332. Sandy Creek Park offers one of the highest recreation potentials of any park on the lake because it is a popular fishing area. The point where Sandy Creek flows into the lake is located within the park area. The park also draws a great number of visitors because of its exposure to the large open area of the lake, which can be utilized for power boating and unlimited number of water sports. With existing recreation development and completion of future development plans, the park will adequately serve the needs of park visitors.

V. MAINTENANCE FACILITIES:

Town Bluff Project has no specific area designated as a paint shop, sign shop, carpenter shop, or mechanics shop. All tools for these features are stored in the warehouse building where the appropriate items of work are accomplished. Equipment available for each of these jobs is adequate to accomplish present everyday operation of the project. However, with the increased demand for wooden signs consideration will be given to establishing a project sign shop. Special tools available at the project include a sandblasting machine, steam cleaner, and tow-motor fork lift. Ordinary maintenance equipment, such as metal cutting and welding equipment, power saws, and assorted handtools, are utilized for project maintenance needs. Project personnel are trained and equipped to perform routine maintenance including repairs on recreation facilities, prime structure, and project operating equipment. Large items of replacement and repairs of facilities are best accomplished by negotiating a contract or equipment rental. Such a contract is planned for FY 1973 to rebuild portions of public use area roads. Wood routed signs are used in all park areas for directional and information purposes. Traffic control signs are enamel on metal, which are purchased from the Little Rock District sign shop. Wooden signs are made by project personnel with equipment borrowed from Sam Rayburn or by sending personnel to Sam Rayburn project to use routing equipment. This arrangement is satisfactory, but as the demand for signs increases it will be necessary to establish a local sign shop. Signs are constructed of 2" X 6", Number 1 pine, with routed white painted letters on a brown painted background. This makes a sign that is compatible with the natural environment, relatively vandal proof, and inexpensive to make.

VI. STORAGE FACILITIES:

Project office and related storage facilities are surrounded by a 6-foot chain link fence with a 3-strand barbed wire climb barrier on top. Fenced area is of irregular shape encompassing 85,914 square feet. Administrative and storage buildings consist of approximately 6,835 square feet and a 10,898 square feet area is grassed with the remainder paved. Approximately 2,000 square feet of paved parking is reserved for project visitors area. Inclosed storage at Town Bluff project consists of two metal warehouse buildings (2,364 square feet), one portable wood and metal building (240 square feet), metal paint and oil storage building (96 square feet), and a metal garage building (416 square feet) remaining for project living facilities - all located inside the fenced area. Approximately 2,875 square feet in the administration building is devoted to storage of project vehicles and operative supplies. The metal warehouse buildings are used for storage of project equipment and shop work area. Building No. 1 (24' X 60') has a store room (24' X 11') with work benches, storage bins for bolts, tool boards, and shelves for portable power tools, and a portion (20' X 24') is kept open for shop and repair work. The remainder of the building is used for tractor and hand tool storage. Building No. 2 (24' X 40') is used for storage of lumber, cable, garden tools, and all motorized project equipment that would deteriorate if left exposed to the elements. The paint and oil storage building is solely for flammable or toxic material and is isolated away from other project facilities. The metal garage building (16' X 26') is utilized to store project boat, trailer, outboard motors, project signs, and spare tires. All project vehicles, motor powered equipment, and items which will deteriorate are stored inside. Present storage facilities are adequate. If and when it becomes necessary for a project sign shop to be set up, an additional building will be required.

VII. OFFICE AND ADMINISTRATIVE FACILITES:

Approximately 700 square feet of the project headquarters building are devoted to administrative activities and facilities. This includes office space for the Reservoir Manager, Reservoir Rangers, Clerk, and Maintenance Foreman, and space for visitors to the project office. Included also are spaces for project maps, cabinets, bookshelves, and the necessary file space to accommodate project publications, reference material, and supplies. It will be necessary to expand the office and administrative facilities to accommodate additional personnel as outlined in the Revised Master Plan.

VIII. STAFFING AND ORGANIZATION:

The present staff and future staff requirements and ultimate grades are shown below:

No.	Title	Present Grade	Ultimate Grade
	Administration		
1	Reservoir Manager	GS-10	GS-11
1	General Clerk	GS-05	GS-06
	Public Use		
1 *	Supervisory Reservoir Ranger	None	GS-09
2	Reservoir Rangers	GS-05	GS-07
1 *	Reservoir Ranger	None	GS-07
	Operation and Maintenance		
1	Reservoir Maintenance Worker Foreman	WS-07	WS-07
3	Reservoir Maintenance Workers	WS-08	WS-08
2 *	Reservoir Maintenance Workers	None	WS-05
2	Laborers	WG-03	WG-03

The present staff is adequate in number with the exception of a supervisor for public use work to assist the Reservoir Manager in implementing strict resource management practices to protect abused natural resources. This position will be filled as soon as personnel space and properly trained personnel are available. The Ranger Aids will be college students majoring in recreation resource management, natural resource management, or related fields. Permanent Reservoir Rangers will be college graduates majoring in the fields listed above. Seasonal Ranger Aids will be utilized at project level to administer the future user fee program at B. A. Steinhagen Lake. Increased surveillance from 0800 to 2300 hours during the peak recreational season will be accomplished with additional resource rangers. Rangers will be assigned boat patrols during peak water activitie periods to promote safety and public relations. The additional reservoir maintenance workers and laborers will be required for proper maintenance of facilities as required in the Revised Master Plan.

IX. USER FEE AREA:

There are no user fee areas at B. A. Steinhagen Lake at the present time. However, the Revised Master Plan directs the updating of facilities in all parks where overnight use is designated to meet Chief of Engineer criteria for user fee areas. Funds have been requested in the FY 1973 Code 711 program, and when these funds are made available, facilities will be updated. Establishing fee areas will provide park entrance control, increased surveillance of recreational activities, and reduce the abuse of project resources, all of which are needed at B. A. Steinhagen Lake.

X. COOPERATIVE ACTIVITIES WITH OTHER AGENCIES:

Texas Parks and Wildlife Department is the only agency associated with the project. Prior association with Jasper County was terminated in FY 1971 at their request. The Parks and Wildlife Department has provided extensive development of facilities in their leased area. They have developed the area to its optimum and are continuing to better the facilities with a good maintenance program. The State of Texas has a one dollar entrance permit requirement plus facility user fee in all their areas. Entrance gates are manned from 0600 to 2200 hours during peak visitation periods. Our association with the Texas Parks and Wildlife Department has established good public relations and provided outstanding opportunities for outdoor recreation on B. A. Steinhagen Lake.

XI. RANGER ACTIVITIES:

The Reservoir Ranger holds a key position at the project he serves. His duties constantly place him in direct contact with the public, and he represents the District Engineer in upgrading the image of the Corps of Engineers in the field. The Ranger's attitude, actions, efficiency, appearance and his willingness to be helpful to those he meets does much in creating this image. The Ranger must have a good working knowledge of a wide variety of subjects. He must be conservation minded and deeply concerned with the protection and management of public resources. The Ranger is required to possess a vast knowledge of rules and regulations relating to administration, conservation, environmental protection, and enhancement of Government property. Land activities include but are not limited to inspections of leases, licenses and permits or concession contracts including private buildings, building construction by private or commercial leases, and recreation facilities including reevaluation of mowing and cleaning contracts. The Ranger also patrols project lands for the purpose of detecting encroachments, unauthorized use, construction, timber cutting, vandalism, forest fire detection, pollution problems, and theft. The Ranger recommends placement of additional recreation facilities in recreational areas in connection with the Revised Master Plan. The Ranger promotes good public relations by responding to inquiries relating to available recreation facilities, history of the project, wildlife, weather, facts about flora and fauna, and visitor interpretative programs. A Ranger performs surveywork as needed for construction of roads and other recreation facilities. Boundaries for leases and reservoir lands are located to insure encroachments do not occur on project lands. Data for many recreational reports such as the annual reservoir report required by the Chief of Engineers is gathered by the Rangers. Water activities include but are not limited to patrolling lake area to enforce rules and regulations, promoting water safety by furnishing safety regulations, advising as to hazards of lake, and giving information regarding state and federal regulations relating to water safety laws, and

fishing and hunting. In the event of a disaster, the Ranger takes charge or lends assistance in rescuing persons in distress and renders first aid to the injured. Currently, B. A. Steinhagen has two Rangers enrolled in the Ranger Training Program conducted by the District Office.

XII. LAW ENFORCEMENT ARRANGEMENTS AND PROCEDURES:

The Tyler County and Jasper County Sheriff Departments provide patrols for all parts of the lake as extensively as their workload will permit. These patrols are not always adequate, and due to personnel shortages in the respective departments, an increase is impossible. The water safety and fish and wildlife laws are enforced by the Game Management Officer of the Texas Parks and Wildlife Department. Rangers assist local enforcement personnel in patrolling park areas and report all suspicious activities to proper authorities. The Corps of Engineers' Reservoir Manager's vehicle is equipped with a two-way radio for contact with County Sheriff Departments. When funds are available, consideration will be given to purchasing another radio to equip the ranger vehicle with a local unit. This cooperative activity between the Corps of Engineers and local law enforcement agencies has helped reduce vandalism and visitors' complaints. Jasper County has employed a trash patrolman to patrol the county to stop illegal dumping. The County has assured the project that we will be included in this program. Meetings have been held with County Commissioners to discuss a resolution to be presented to the local Commissioners Courts for adoption. The resolution would request the Texas State Parks and Wildlife Game Management Officers to enforce the prohibition of swimming, boating, fishing, and excessive speed of boats in certain designated areas. Before such a resolution can be presented, the designated area must be clearly marked and buoyed. The citation authority will reduce rowdyism and provide resource protection. It will also be used as a public educational device. A good run-about patrol boat will be needed to enforce water safety laws in accordance with Title 36.

XIII. SAFETY - VISITOR AND EMPLOYEE:

A. The Safety of the visiting public is a prime responsibility of the Reservoir Manager. All facilities provided by the Goverment are maintained in a good, safe condition at all times. Project personnel continually inspect concession establishments and facilities for unsafe practices or violations of public health codes. Concessionaires are promptly advised to correct any deficiency. Questionable health conditions are reported to state health agencies. A continual surveillance of the lake and project lands is conducted for potential hazards to visitors. Appropriate signs, buoys, and barricades are installed to warn visitors of unsafe conditions. Special problems requiring a large outlay of funds are referred to Chief, Operations Division, for guidance. Funds were requested in the Revised Master Plan for buoys and signs to mark existing beaches. Capsule type buoys (alternating white and orange) with a connecting cable will be installed to restrict boats from entering the beach areas. Fort Worth District Regulation 385-1-90, dated 3 November 1971, establishes guidelines for conducting project and recreation safety programs to enhance the safety of project personnel and the general public while in attendance at the lake. A project water safety program was submitted 2 February 1972 for Safety Officer's approval. The prime objectives of this program are to:

1. Establish cooperation with water safety councils in the vicinity of the lake.

2. Establish and train a recreational Safety Ranger.

3. Establish a lake Safety Patrol.

4. Provide coordination of activities with State agencies.

B. Appendix E, Project Safety Plan, will be prepared to supplement the Master Plan. This plan will identify hazards to safety, prescribe preventive measures, and state the quality and type of safety equipment to be used. Coordination agreements with the local and state officials will be a part of the plan. This plan will be referred to the District Safety Office for review and recommendations prior to approval.

C. Guidance for project safety is also contained in the following publications:

Engineer Regulation 385-1-1

Engineer Manual 385-1-1

Fort Worth District Regulation 1130-2-61

Title 36, Chapter III, Code of Federal Regulations

XIV. CONCESSIONAIRE ACTIVITIES:

At the present time there are only two concession operations on this lake with license agreements with the Corps of Engineers. Dam B Tidelands has a license to 2.5 acres in Beech Grove Park. Development in this area includes a facility which offers boat and motor rental, groceries, ice house, gasoline, fishing equipment, and camping supplies. The location of this facility (Dam B Tidelands) in Beech Grove Park and along U.S. Highway 190 provides excellent access for park users on the east side of the lake. Management of Dam B Tidelands is being improved since cleanup activities around the facility is being upgraded. The other concession operation with license agreement with the Corps of Engineers is located in Walnut Ridge Park. The Texas Parks and Wildlife Department has the license agreement to run the concession operation. The development consists of a snack bar, bait and tackle shop, fuel for boats and automobiles, and grocery supplies. There is also a third party agreement with H & H Boat Docks for rental of boats and motors. This concession operation is only open during the summer months during peak visitation periods. The location of the area is well situated since it is easily accessible by visiting public. Management of these facilities has been adequate and no problems have occurred. Although there are only two license agreements with the Corps of Engineers for concessions, there are a number of private developments adjacent to park areas which offer supplies to the visiting public. At the intersection of U.S. Highway 190 and F-M Road 92 there are several private developments which offer groceries, bait, tackle, boat rental, fuel, cafes, trailer space and cottages for rent. The location of these facilities is only a few minutes drive from any of the parks on the lake. Private supply stores are adjacent to East End Park and Campers Cove Park.

XV. ENCROACHMENTS:

No encroachments of major concern have occurred on B. A. Steinhagen Lake. One hundred percent of the project boundary has been surveyed and marked distinctly. This aides in curtailing the number of encroachments that occur. In an effort to keep our boundary lines clearly marked, an annual underbrushing and repainting is necessary. Problems of land owners adjacent to the Government property creating their own access roads have occurred and continues to be a problem. These are handled on an individual basis, roads are either closed with guard posts or fenced off and the land owners notified. We anticipate that this problem will continue as well as increase since many of these roads were in use prior to the acquisition of the project lands. In some cases, areas where roads are concentrated, fencing of the entire area may be required. Other minor problems, such as cattle on Government property and unauthorized mooring of boats on the lake, are dealt with on an individual basis by whatever means is most expeditious to solving the problem at hand. The problem of unauthorized mooring of boats on the lake will continue to be a problem until an area is designated as a mooring area on the lake. Future plans call for such an area to be designated and progress has been made toward this goal. Camping and the building of permanent camps on Government property not designated as a camping area is a problem of much concern although not of major importance. The area commonly known as the forks of the river, or as a pocket wilderness as it is referred to in the Revised Master Plan, is continually subdued by pressures placed on it by campers who build permanent structures. Campers of this kind are dealt with on an individual basis. An effort to educate the public is the best solution to the problem at hand and a conscientious effort is being made toward that end.

XVI. IN-SERVICE TRAINING PROGRAM:

The in-service training for Reservoir Rangers is a continuing program. The training instructor at the project is the Reservoir Manager. Training coverage follows the outline for Phase II Reservoir Rangers training program (orientation and basic training). Training coverage is as follows: General Orientation and Briefing, Office of Administration, Project Administration and Maintenance Operations. Rotational training is conducted in the District Office and at selected field offices. District Office training consists of briefing and orientation by Personnel, Office of Counsel, Office of Administrative Services, Supply, Public Affairs Office, Safety Office, Security Office, and Operations Division. Training is also given pertaining to the normal and abnormal conditions that arise in the field. Field training is enhanced by the assignment of trainee to work related to his field. The District training program is presently being revised and updated to include courses available from colleges and universities. Other project personnel are encouraged to participate in local courses given by educational and publis service groups. All employees are encouraged to participate in U.S. Army correspondence courses available from Fort Belvoir, Virginia.

XVII. VISITOR EDUCATION AND INTERPRETATION:

This is an area that has been broadened in the last decade to include area such as Corps of Engineers lakes. And it is a field where the public is almost demanding action. A project overlook is located in Bluff View Park without any type of information center. A covered bulletin board may be used to strengthen the project information program. Consideation will be given to constructing an interpretative shelter at the overlook site when there is sufficient public use. Project information signs are proposed on Highway 190 on the east and west approach to the lake to provide information concerning special features of B. A. Steinhagen Lake. At present, brochures, maps, Title 36, and other District publications are furnished the public at the project office or by the Rangers. Tours of the project are conducted for groups such as Boy Scouts, upon request. Project personnel will speak and conduct visual educational meetings in public use areas during high visitation periods to properly inform the public concerning the project. Personnel will also be available to fill speaking engagements on the programs of local civic clubs.

TABLE 1

COST ESTIMATE FOR
PROPOSED FACILITIES OUTLINED IN RESOURCE MANAGEMENT PLAN

Item	Total Cost	Year Work Proposed FY 74	FY 75	FY 76
Project Sign Shop	$ 5,000.			$ 5,000.
Alteration of Project Administration Building to Provide More Office Space	$ 5,000	$ 5,000.		
Additional Office Furniture	$ 600.	$ 600.		
Patrol Boat	$ 4,000.	$ 4,000.		
Buoy Existing Beaches	$ 3,000		$ 3,000.	
Bulletin Board (Covered)	$ 1,000.		$ 1,000.	
Information Signs Highway 190	$ 1,500.			$ 1,500.
Interpretative Shelter	$ 5,000.			$ 5,000.
TOTAL	$ 25,100.	$ 9,600.	$ 4,000.	$11,500.

DESIGN MEMORANDUM NUMBER 1C

REVISED MASTER PLAN

APPENDIX (B)

VEGETATIVE MANAGEMENT PLAN

FOR

TOWN BLUFF DAM
B.A. STEINHAGEN LAKE

NECHES RIVER, TEXAS

U.S. ARMY ENGINEER DISTRICT FORT WORTH, TEXAS

MARCH 1975

COPY NUMBER

14

SWDCO-R (SWFOD-M 10 Mar 75) 1st Ind
SUBJECT: Vegetative Management Plan, Appendix B to Design Memorandum No. 1C, Town Bluff Dam and B. A. Steinhagen Lake, Neches River Texas

DA, Southwestern Division, Corps of Engineers, 1114 Commerce Street, Dallas, TX 75202 8 April 1975

TO: District Engineer, Fort Worth
ATTN: SWFOD-M

1. Appendix B, Vegetative Management Plan, for Town Bluff Dam and B. A. Steinhagen Lake, is approved subject to the following comments or inclusions, whichever is appropriate.

a. Paragraph 3.02, Wildlife. It is suggested the words in the second sentence "cooperative lease agreement" be deleted and the word "license" inserted in lieu thereof.

b. Paragraph 3.02. The plants Hop-hornbeam and Hornbeam are misspelled and should be corrected in future updates of the narrative.

c. Paragraph 3.02. In view of discussion in paragraph 3.06, particularly as amended in accordance with comment d, reference to the scientific area should be deleted.

d. Paragraph 3.06. The paragraph should be revised to briefly describe the area and the plan under which it is managed.

e. Paragraph 3.06. It is suggested the word "lease" in the second sentence be deleted and word "license" be inserted in lieu thereof.

f. Paragraph 4.01. The second sentence should be revised as follows: "For management of project lands, three categories of inventory are desirable; soil, forest, and wildlife."

g. Paragraph 4.02E. The fencing requirements should be submitted in the plan before being constructed.

h. Paragraph 4.02. The use of Kudzu as an erosion control plant is not desirable due to its spreading and climbing habits. Serica Lespedeza probably would serve as well and would produce wildlife food as a side benefit. The black Locust for erosion control has been generally unsuccessful in the South, due largely to attacks of Locust Borers. Its usefulness here is questionable unless it is known to be successful in the area.

SWDCO-R (SWFOD-M 10 Mar 75) 1st Ind 8 April 1975
SUBJECT: Vegetative Management Plan, Appendix B to Design Memorandum No. 1C, Town Bluff Dam and B. A. Steinhagen Lake, Neches River, Texas

i. Paragraph 4.04A. Open end contract obligates the Government, and could have an adverse effect if the contractor was not available due to other commitments to remove the infested timber within a short period of time.

j. Paragraph 4.02f. The statement that insect and disease control will not be used until epidemic proportions are reached is questionable. The district should begin control measures at an early stage when the disease or insect has the potential of causing widespread damage, as in the case of Southern Pine Beetle. The discussion should be revised accordingly.

k. Paragraph 4.03. Pine Needle Rust is caused by fungi of the Coleosporium, not Cronartium. The name in the heading should be corrected.

l. Paragraph 4.05. The species name of Turpentine Beetle is misspelled and should be corrected in future updates.

m. Paragraph 4.09. The discussion of prescribed burning should be more thorough, specifically, it should mention that prescribed fire is not recommended for use in hardwood management. In addition to the uses mentioned, prescribed burning may be useful in maintaining wildlife openings.

2. Appendix B should be a detail plan for implementing the project's forest or vegetative program. Future appendix B's should be in more detail; specifically, what will be done and where. Maps and aerial photos are excellent exhibits that should be used to supplement the plan.

FOR THE DIVISION ENGINEER:

George W. Staples

wd all incl

GEORGE W. STAPLES
Chief, Construction-
Operations Division

CF: w/incl
HQDA (DAEN-CWO-R) 2 cys

DEPARTMENT OF THE ARMY
FORT WORTH DISTRICT, CORPS OF ENGINEERS
P. O. BOX 17300
FORT WORTH, TEXAS 76102

REPLY TO
ATTENTION OF:

SWFOD-M

10 March 1975

SUBJECT: Vegetative Management Plan, Appendix B to Design Memorandum No. 1C, Town Bluff Dam and B.A. Steinhagen Lake, Neches River, Texas

Division Engineer, Southwestern
ATTN: SWDCO-OR

1. Reference Engineer Regulation 1130-2-400 dated 28 May 1971, SWDPL-R letter dated 8 March 1972, subject: Recreation Resource Planning and Management, and 2nd Indorsement thereto dated 17 May 1972.

2. In accordance with schedules previously furnished, seven copies of Appendix B, Vegetative Management Plan for Town Bluff Dam and B.A. Steinhagen Lake, Neches River, Texas are submitted for approval.

FOR THE DISTRICT ENGINEER:

Allie J. Majors

1 Inclosure (7 cys)
As stated

ALLIE J. MAJORS
Chief, Operations Division

AMERICAN REVOLUTION BICENTENNIAL 1776-1976

APPENDIX B

VEGETATIVE MANAGEMENT PLAN

TOWN BLUFF DAM
B.A. STEINHAGEN LAKE

REVISIONS AND UPDATES

Date	Page

TABLE OF CONTENTS

APPENDIX B

APPENDIX B

VEGETATIVE MANAGEMENT PLAN

I. INTRODUCTION

1.01 Objectives of Management Program:

This management plan is to establish basic guidelines for a vegetative management program that will increase the value of the project land for recreation and wildlife, and promote natural ecological conditions by following conservation practices. Consideration will be given to establish and maintain a diversity of plant species of uneven age where practical and to minimize the possibility of complete loss by natural causes. Management is oriented toward aesthetic, ecological and recreation values, because management of project lands for commercial forest land is not justified. Management techniques will be applied to all Government fee land above elevation 83 feet M.S.L. (8,060 acres). No attempt is made to include any acreage below the 83 contour because this area is subject to frequent flooding.

1.02 Authority:

The Vegetative Management Plan is part of the updated master plan and complies with requirements of ER-1130-2-400 dated 28 May 1971.

1.03 History:

Town Bluff Dam, B.A. Steinhagen Lake (formerly Dam "B") is a unit in the plan of development by Corps of Engineers on the Neches-Angelina River Basin. The project was authorized by the River and Harbor Act approved March 2, 1945 with construction starting in 1947 and impoundment of lake was initiated in 1951. The project is located on the Neches River approximately 1/2 mile north of Town Bluff, Texas. Prior to Government land acquisition, no vegetative management plans had been prepared and timber cutting of the region was made with little regard for perpetuation of high quality timber stands, or enhancement of wildlife habitat. After Government acquisition, timber below

elevation 83 feet M.S.L. was cleared. Timber sales made since that time include a small amount of timber salvaged from trees infested by southern pine beetle. To date, there has been no established program for vegetation improvement at B.A. Steinhagen Lake. A forest management plan was approved in 1964 for Dam "B" Reservoir, but this plan was never implemented. This forest management plan prescribed principles and practices to be applied for the maximum production of commercial timber products. This plan is now outdated since the objective is the improvement of aesthetic values rather than maximum production of timber.

II. PHYSICAL AND ECOLOGICAL CHARACTERISTICS

2.01 Soil Types and Conditions:

There are many different soil types at B.A. Steinhagen Lake comprised of Urbo, Mantachie, Segno, Bienville, Wrightsville, Garner, Susquehanna, Houston, Tehran, Wagram, Enro, Woden, Cart, Corrigan and Rayburn. The soils at the project are predominantly fine textured and are moderate to deep soils. Most soils in the region have a relative high potential productivity for timber production. A table is presented as Exhibit A giving general characteristics of major soils at B.A. Steinhagen. Complete soil information is given in the Master Plan on Pages 23, 24, 25 and Plate 1.2.

2.02 Topography:

The management area is characterized by flat topography with poor drainage containing many sloughs and areas covered by water during the wet months of November, December, January, April and May. Project lands are located in the Neches River Basin and shoreline slopes in the lake area is generally less than 5 percent.

2.03 Erosion:

Most project lands are in an uneroded state due to the gently sloping topography that dominates project lands. Most areas have a very dense vegetative growth thus little or none of the original surface layer has been lost. The only significant erosion occurs along isolated areas of shoreline, stream banks, and bluff on north and east side of Headquarters.

2.04 Description of Existing Plant Communities:

B.A. Steinhagen Lake is located in the Gulf Coastal Plains Region of the United States. Approximately 95% of project lands are forested and major forest types present are pine; pine-hardwood; oak-hickory. The present pine forest occurs on approximately 10 percent of the project lands. It consists of native loblolly pine, Pinus taeda. These pine stands occur in relative small

groups and have developed in old fields that were once clear cut for agriculture purposes. The understory species in these areas consist of sassafras, muscadine grape, yaupon and dogweed. The pine-hardwood forest that occurs constitutes approximately 35 percent of total forest area on the project. It occupies the better drained portions of the project lands. Loblolly pine is the only conifer which occurs in this mixture but there is a large variety of hardwoods. The dominant hardwoods in the mixture are: sweetgum, eastern hophornbeam, willow oak, magnolia, cow oak, hickory, dogwood and holly. These areas provide a colorful forest in Spring and Fall with many flower and leaf colors, contrasting with the green color of pine and holly. Associated species in the pine-hardwood forest consist of yaupon, blackberry, muscadine and sassafrass. The oak-hickory forest occurs on approximately 45 percent of the project lands. It is the climax forest over the majority of the area. The dominant species are white oak, cow oak, southern red oak, burr oak, willow oak, shagbark hickory, bitternut hickory, mockernut hickory, beech and magnolia. A number of small shade tolerant trees and shrubs survive in the understory. The best known are flowering dogwood, hornbeam, sassafrass, redbud, yaupon and sourwood. The pine forest, the pine-hardwood and the oak-hickory forest are the major associations of trees found in the region but it should be noted that pure stands of bald cypress and tupelo occur in some areas. These stands are found in small isolated sloughs and oxbow lakes that are located in the river bottom of Neches River. Stands of cypress and tupelo gum are usually small in size and contain no understory. Open or nonstocked land occurs on less than 5 percent of the project. These areas generally have a grass and weed cover. They are found on land that was cleared in the past for agriculture purposes and has not been restocked. The location of the above plant communities is located on the map, as Plate 1.

2.05 Meteorological Characteristics:

The climate of B.A. Steinhagen Lake is characterized by hot, humid summers and moderate winters. The average length of growing seasons between killing frost is approximately 250 days. The prevailing winds are from the south during Spring, Summer and Fall and northerly winds prevail during Winter

months. The mean annual precipitation on the project is 49 inches. Below is a table giving the average monthly precipitation and average monthly temperature:

Month	Average Precipitation (Inches)	Average Temperature
January	4.1	53.0
February	3.6	52.8
March	3.9	61.4
April	4.6	67.8
May	5.0	72.2
June	3.4	79.9
July	3.3	79.7
August	2.8	81.2
September	2.8	79.9
October	2.9	67.4
November	4.2	54.4
December	4.7	49.5

III. RELATIONSHIP TO OTHER PURPOSES OF PROJECT

3.01 Recreation:

Relating the vegetative management plan to recreation is very important since vegetative management is a controlling factor in developing recreation areas to their ultimate carrying capacity. Vegetation in the recreation areas will be managed intensively in order to insure development of land to its optimum recreation potential. The vegetative management plan for recreation areas will give ample consideration to aesthetics of project land and safety of visitors while present at B.A. Steinhagen Lake. Management procedures applied in recreation areas will include cutting, pruning and thinning of thick underbrush in specific recreation areas to improve visitor access to surrounding woodlands. Thinning and pruning of trees in recreation areas will improve air circulation and help control mosquito distribution. Selection of sites for cutting, pruning, planting, etc. will be coordinated to maintain aesthetics, recreational values and wildlife habitat. At present no extensive reforestation in recreation areas is planned. Natural reforestation if protected from summer mowing is expected to perpetuate the stand. Although a diversity of species is desired, a hardwood stand in recreation areas is favored because it provides better shade, supports greater variety of wildlife and can withstand more intensive use.

3.02 Wildlife:

Throughout the entire management area, wildlife will be given ample consideration to assure perpetuation of game species, non game, and endangered species. 4,042 acres of land and water is under a cooperative lease agreement with The Texas Park and Wildlife Department and given the status of Texas Scientific Area No. 1. Although The Texas Park and Wildlife Department will prepare an annual management plan for the Scientific Area, the District will inform the Department of the Vegetative Management Plan and request their active participation in implementing the program on their license lands at B.A. Steinhagen Lake. All project lands will be managed to establish and perpetuate an uneven aged climax bottomland hardwood forest.

This will provide a forest flora of oaks, hickories, gums, ash, beech, jophorbeam and horbeam. These species produce a large volume of native food for wildlife each year. Selected release cuttings for habitat improvement and food planting will be carried out by project personnel. There will be at least one food plot established per 80 acres of timberland. The typical opening will be 3/4 acre in size and contain plants to increase carrying capacity of deer, quail, turkey and rabbit. All plots are located on Plate 1. No den trees on project land will be cut unless they are hazardous to visitors or must be removed to control insects or disesse. Den trees act as "Hotels" for wildlife and help insure adequate cover and shelter. Wildlife is covered in greater detail in the Fish and Wildlife Plan, Appendix D of the Master Plan.

3.03 Conservation and Aesthetics:

If the basic guidelines of this report is used in the Vegetative Management Program, it will help increase and preserve social value of land at B.A. Steinhagen for use by present and future generations. Individual trees or plant communities of outstanding size or beauty will be protected and preserved. Management of vegetation by cutting, pruning, planting, etc. will enhance beauty of area and maintain healthy stands and growth rate by removing undesired vegetation and dead or dying timber. All operation in timber areas will be closely supervised to eliminate man caused eyesores. With these factors in mind, vegetative management will contribute to conservation of natural resources and add to aesthetics of project lands.

3.04 Pool Fluctuations:

The Lake, in its function for the control of floods, will fluctuate through a range of about 4 feet (from elevation 81.0 minimum top of conservation pool, to elevation 85.0, uncontrolled spillway crest). Since Vegetative Management is designed to cover land above 83 feet, there will be instances during extreme flood conditions when large areas of timber is inundated. Severe flood conditions usually last only a few days and there is no unfavorable or detrimental effects to vegetation on project lands.

3.05 Range Management:

The range resources on project lands is relatively unimportant. Suitable grazing areas occur in small isolated areas. Forest lands which comprise 95% of project lands are fully stocked, thus decreasing and in some areas suppressing palatable forage suitable for grazing. All land has been evaluated and management for grazing leases is not feasible. Presently there is no legal grazing on project lands and none is anticipated in the future.

3.06 Texas Scientific Area #1:

The Vegetative Management Plan for B.A. Steinhagen Lake does not apply to the Texas Scientific Area #1. The Texas Park and Wildlife Department obtained a 25 year lease on Texas Scientific Area #1 (1972-1997). This Department will submit annual management plans to the Corps of Engineers for concurrence prior to installation.

IV. MANAGEMENT PRACTICES

4.01 Inventory:

Before any management plan can be workable, an inventory should be made so the manager will have knowledge of the quality and quantity of the resource to be managed. For management of project lands, two categories of inventory are desirable, a forest inventory and a wildlife inventory. A soils inventory is complete and included in the Master Plan.

A. Forest Inventory:

A forest inventory will be made to give a description of the vegetation present at B.A. Steinhagen Lake. To obtain basic data, the inventory will combine the variable plot and fixed plot system of cruising. (5% cruise). Use of basal area factor ten will be used on the variable plot and tally trees of 5 inches or greater in diameter. A 1/5 acre fixed plot will be located in same location and tally trees under 5 inches in diameter. Data to be recorded at each plot will be:

1. species of tree
2. stem diameter
3. height
4. age

The data derived from these plots will be used to determine species composition, basal area, volume, growth rate, stand age, average height, and expected mortality. A local volume table shall be made from the information gathered. After this information is obtained, it will be included as an Exhibit to this Management Plan. Such information will be an asset in future planning and management.

B. Wildlife Inventory:

An inventory of wildlife species would complete the description of natural resources to be managed. Procedures for gathering information to establish an inventory of wildlife is outlined in the Wildlife Management Plan; Appendix D of the Master Plan; Section 3-05.

4.02 Planting and Rehabilitation:

Limited landscaping will be necessary in specific recreational areas. Transplanted saplings of native stock should be used around newly constructed facilities and to barricade unauthorized roads or trails. Use of vegetative barriers to control vehicles and foot traffic will add to beauty and aesthetics of the park. Native stock for transplanting includes sweet gum, loblolly pine, oak, hickory, dogwood, green ash, holly and magnolia. Reference should be made to Table 1 of this Report to determine if the species to be transplanted are adapted to the soil type.

A. Planting for Erosion Control:

Shoreline erosion is significant in some areas and can be controlled by either mechanical methods or vegetative management. If mechanical methods are not used, shoreline erosion from wave action may be reduced by planting water tolerant tree species such as bald cypress and water tupelo. Butt swell of these species will reduce to a minimum wave action along shorelines. Upland erosion should be controlled by planting legumes such as kudza or black locust trees: these legumes will establish on poor soils and stabilize soils by protective canopies and large root systems. If native stock is not available for transplanting, planting stock may be obtained from The Texas Forest Service Indian Mound Nursery near Alto. All planting operations shall be scheduled during the months of January, February and March. When economics are considered, there is no substitute for natural regeneration. Summer mowings have suppressed natural regeneration of woody species in park areas and no woody vegetation replacing that which dies from natural mortality. To remedy this situation, seedlings will be selected and marked or protected by mechanical barriers to reestablish desirable species of woody vegetation in park areas.

B. Thinning:

Release cuttings and thinnings will be used to create wildlife openings on project lands. For each 80 acres of timber land, a 3/4 acre

clearing will be made to stimulate a variety of wildlife grasses and forbs. These clearings will be cleared biannually in order to prevent the overtaking by trees and shrubs which readily sprout from roots and stumps. All clearing are shown on map as Plate 1.

C. Pruning:

The chief aims of pruning and trimming are: aid in air circulation, make trees more attractive by removal of disease branches, reduce breakage from outside source, and develop qualities of form and foliage. Pruning and trimming will be limited to park areas and will not exceed a 12 foot height limit. Woody vegetation in park areas will be trimmed annually. Most deciduous trees can be pruned when dormant. Pruning of conifers should be practiced just before new growth begins in Spring.

D. Wildlife Habitat Improvement:

Covered in Wildlife Management Plan, Appendix D of the Master Plan.

E. Grazing and Fencing:

Project usage is oriented toward recreation and wildlife and vegetative management plans are made to strengthen these uses. Leases for grazing are not contemplated in consideration of the factors listed below:

1. Potential overgrazing of the small amount of forage available in fully stocked stands of timber.
2. Grazing areas are too small and uneconomical to fence.
3. Livestock prevents regeneration of desired hardwoods.
4. Livestock damages existing trees by browsing.
5. Livestock compacts soil by trampling.

To control grazing encroachments and stop deterioration or destruction of vegetation by trespass of livestock will require regular patrols and eviction. It is highly desirable to exclude, by fencing, all livestock from project lands but available funds and cost of fencing make it unfeasible. Therefore, no fencing plans are included in this Plan. Any change in fencing require-

ments will be included as an Exhibit to and made a part of this Plan.

F. Insect and Disease Control:

A variety of insects and diseases attack timber stands at B.A. Steinhagen Lake. Insects and diseases seldom have the potential of killing trees until they reach epidemic proportions. Therefore, control measures will be used only when insects or disease have reached epidemic stages or when dealing with an individual tree of extreme value. When direct control measures are applied, full advantage should be taken of any assistance offered by the U.S. Forest Service and Texas Forest Service. A list of the major insects and diseases occurring in the region and a suggested method of control is given below.

4.03 Pine Needle Rust: (Cronartuim spp.)

Pine Needle Rust is noticeable on loblolly pine in Spring and early Summer. The principal symptom is appearance of small yellow blisters on needles which will give tree a brown and dying appearance at a distance. The alternate hosts are leaves of various flowering plants. The damage is rarely serious enough to warrant control in a natural forest.

4.04 Southern Pine Beetle: (Dendroctonus frontalis)

Presently the Southern Pine Beetle is the most destructive insect on project lands. Infestations of southern pine beetle have reached epidemic stages in recent years. These infestations occur randomly in loblolly pine and are often associated with lightning struck trees and dense stands of field pine. Small pitch tubes will be visible on trees attacked by the beetle. Needles of infested trees turn yellowish brown and numerous small holes appear in the bark when new beetles leave the trees. Control depends on early detection and salvage or utilization of infected trees. The Texas Forest Service makes routine aerial surveys and notifies the Corps of Engineers of infestations on project lands. When infestations are found, one of the following alternatives should be used:

A. Sale of Timber - Infested timber should be sold to a contractor if infested area is large enough to support a sale. An open end contract could be granted so speedy sale can be made throughout the year. All timber to be sold will be marked with paint by project personnel before sale.

B. Cut and burn - Small infested areas may be cut and then piled and burned by project personnel.

C. Chemical Controls - If burning in the beetle infested stand creates a fire hazard, chemical control is recommended. Infested trees will be cut and then sprayed with Lindane or Sevin. (1 pint Lindane mixed with 5 gallons diesel). All infested timber will be treated by one of the above methods and under no circumstances will infested areas be ignored.

4.05 Turpentine Beetles: (Dendroctonus terebrons)

Whenever these beetles are present, pitch tubes are noticeable near the base of infected pine trees. Although these beetle are capable of killing trees, they have not reached destructive stages on project lands; therefore, control of turpentine beetles at present is not considered necessary.

4.06 Insects and Diseases Attacking Hardwoods:

Deciduous species of trees are attacked by a variety of insects and diseases. Insects and diseases of hardwoods in the area cause relative little damage; therefore, no control measures are considered necessary unless in an epidemic situation.

4.07 Fire Control:

A fire protection plan will be initiated in Appendix C of the Master Plan. The fire danger rating on project lands is normally low throughout the entire year. A major wild fire on project lands would not likely occur due to a variety of factors listed below:

1. High annual precipitation
2. Low wind velocity
3. Flat topography
4. Moisture content of fuels are high because of relative humidity - dew point.

5. Existence of swamp areas and water table being near the surface.
6. Easy access to all areas by fire fighters.
7. The area has sufficient natural fuel breaks such as the lake, roads, creeks and sloughs.

Low fuel content in most areas.

The combination of these variables result in a low fire danger and no special protection measures are needed. Although fire danger is low, special coordination should be maintained with The Texas Forest Service for assistance in fire detection and suppression. In addition to assistance offered by The Texas Forest Service, Sam Rayburn Project Office has equipment and manpower available for fighting fire.

4.08 Salvage Procedures:

All disposal of timber by bids will be approved by the District in accordance to ER 405-23-912 and coordinated with Real Estate Division. All timber to be sold will be tallied and marked with paint by project personnel prior to bid advertisement. Payment for timber will be based on volume removed by contractor. Small isolated areas infested by southern pine beetle occurs frequently; therefore, providing there is little chance for competition, informal bids on unadvertised sales should be accepted by reservoir manager and/or ranger. All timber infested with southern pine beetle shall be removed within 10 days after notification of infestation whenever practical. There are several requirements set by the Reservoir Manager during harvesting operations which must be met by the contractor (location and width of access roads, slash removal, etc.). No salvage operations will take place during wet periods so soil compaction and road damage will be held to a minimum. Since most salvaged timber will be used for pulpwood, logging should be done in short logs and tree lengths logging will be prohibited except in special cases. Extreme care should be exercised in felling and skidding so there will be minimum damage to timber and vegetation left standing. All other special requirements as deemed necessary will be included in the contract. Small areas of timber to be salvaged will be marked by project personnel. Project personnel shall determine the volume

of timber to be sold at time of marking. For accuracy and quickness, local volume tables by species will be obtained from the U.S. Forest Service Office in Lufkin, Texas. These local volume tables have been prepared by extensive field work for use on National Forest in East Texas and are accurate enough for use at B.A. Steinhagen Lake.

4.09 Other Silviculture Treatments:

Prescribed burning, used correctly, is a very useful tool. Burning can be used to improve wildlife habitat, favor pine reproduction and reduce litter build up and fire hazards. In addition to burning, timber stand improvement (TSI) with herbicides can be an effective tool. Timber stand improvement should remove trees in overstocked stands, and used to create openings for wildlife and tree reproduction. Although prescribed burning and timber stand improvement have not been used in the past, they should be applied when the need arises.

V. IMPLEMENTATION

5.01 Administration:

Implementation of the program can be accomplished at project level. Presently there is one forester on the project to implement plans, and if additional guidelines are needed, information can be obtained from qualified district personnel. Operations Division foresters will prepare the following basic data: vegetation inventories, future management plans, maps and records, set timetables and schedules and oversee timber sales. Implementation of the plan cannot be measured in monetary terms since the desired end product is not commercial forest products. The management plan will enhance wildlife habitat area, and recreation values; thus can be measured only by intrinsic values.

5.02 Record System:

To successfully implement the vegetative management plan, records should be kept in a project record book. With complete set of records the revision of the management plan is much easier and more complete. When accurate records of various cost are kept and a cost-analysis of the operation made; allocation of funds can be better planned for future years. The following records shall be kept in the control book:

A. Maps and aerial photos of project lands.

B. Vegetation inventory data by areas.

C. Soil inventory data by areas.

D. Tree failure reports (Mortality).

E. Accounting of income from sales and etc.

F. Expenditures of operations to implement plan.

Examples of accounting forms and expenditure forms for recording data to be kept in project record book are shown as Exhibit E.

5.03 Cooperative Efforts With Other Agencies:

To aid in management of Government timber lands, aerial surveys are made by The Texas Forest Service at Woodville, Texas. If the presence of insects, disease or fire is noted on Government land, the Texas Forest Service contacts project personnel and measures are taken to protect project resources.

Although forest fire is not a serious problem, the Corps will continue to support the Texas Forest Service fire organization and in return receive support to suppress uncontrolled fires at B.A. Steinhagen Lake. The United States Soil Conservation Service offers their assistance and advice for determination of soil types and vegetation that is suitable for planting on project lands. Therefore close cooperation should be exercised with this agency when soil and erosion problems are encountered.

VI. SUMMARY AND RECOMMENDATIONS

Timber lands at B.A. Steinhagen Lake will be managed for the greatest public benefit. Management practices applied to project lands will be to increase food and cover for wildlife, protect soil and water values, and to develop recreation values to a optimum. Timber management practices based on economic benefits received from raw wood products is not justified. It is therefore recommended that :

A. Timber stands be managed for natural succession to attain a diversity of plant species.

B. Management techniques applied will be to increase aesthetic, ecological and recreation values.

C. Classes of trees to be removed will be in one or more of the following categories.

1. All trees creating an unsafe condition to visitors.
2. Salvage of merchantable trees - dead or dying, badly injured or infested by insects or disease.
3. Removal of trees to create wildlife openings.

D. Wildlife openings be established to increase game food plants and browse.

E. A forest inventory be made to give description of vegetation present on project.

F. Landscaping be used around newly constructed facilities.

G. Vegetation be used to control shoreline erosion.

H. Grazing be excluded from project lands.

I. Timber infested by insects be removed by sale as soon as possible.

J. A project record book be maintained.

K. Liaison be established and maintained with other agencies (Texas Forest Services, U.S. Forest Service, etc.) so a cooperative effort can be made in implementation, fire fighting, etc.

L. Annual changes will be made in the plan as needed.

TABLE 1

SPECIES ADAPTABILITY

Soils	Potential Productivity			Management Problems			Species Suitable For Planting	Soil Description
	Tree Species	Avg Site Index & Standard Deviation	Range of Site* Index	Erosion Hazard	Equipment Restrictions	Seedling Mortality		
Bienville 0-12% Slope	Loblolly Pine Longleaf Pine Shortleaf Pine	90+4 80 85	83-99 75-85 75-90	Slight	Moderate	Moderate	Slash Pine Loblolly Pine	Sandy soils with high potential productivity and best suited for southern pines
Garner 0-8% Slope	Loblolly Pine Water Oak Red Oak Sweet Gum White Oak Green Ash Tupelo Cypress	89 96 - - - 78 - -	82-95 90-101 - - - 70-80 - -	Slight	Moderate	Moderate	Loblolly Slash Sweet Gum	Clayey soil with high potential productivity and suitable for needle-leaf or broadleaf trees
Houston 0-12% Slope	Red Cedar	40	35-45	Slight	Moderate	Moderate	Red Cedar	Clayey soils with moderate potential productivity; suited for red cedar

TABLE 1

SPECIES ADAPTABILITY

Soils	Potential Productivity			Management Problems			Species Suitable For Planting	Soil Description
	Tree Species	Avg Site Index & Standard Deviation	Range of Site* Index	Erosion Hazard	Equipment Restrictions	Seedling Mortality		
Mantachie 0-5% Slope	Sweet Gum Loblolly Water Oak Cottonwood Green Ash Sycamore Red Oak White Oak	100+6 98+7 94+5 92 88+10 - - -	88-106 90-106 82-101 82-102 - - - -	Slight	Severe	Severe	Loblolly Slash Sycamore Oak Cottonwood	Excessively wet soils with high potential productivity suitable for water tolerant hardwoods & southern pines
Segno 0-8% Slope	Loblolly Longleaf Shortleaf Sweet Gum Red Oaks	90+7 75 77 90 80	82-97 - - -	Slight	Slight	Slight	Loblolly Slash Sweet Gum Sycamore	Loamy soils with high potential productivity and suitable for southern pines & hard-woods
Susquehanna 1-17% Slope	Loblolly Longleaf Shortleaf Red Oak	82+6 73+4 69+8 -	73-88 63-80 60-73 -	Moderate	Moderate	Moderate	Loblolly Slash	Clayey soils with moderately high potential productivity and suitable for southern pines

TABLE 1

SPECIES ADAPTABILITY

Soils	Potential Productivity			Management Problems			Species Suitable For Planting	Soil Description
	Tree Species	Avg Site Index & Standard Deviation	Range of Site* Index	Erosion Hazard	Equipment Restrictions	Seedling Mortality		
Wagram 0-17% Slope	Loblolly Longleaf	82±6 67±4	76-88 60-73	Slight	Moderate	Moderate	Slash Loblolly	Sandy soils with moderately high potential productivity and best suitable for southern pines
Wrightsville	Loblolly Sweet Gum Water Oak Tupelos	83 80 80 -	73-87 75-85 75-85 -	Slight	Severe	Moderate	Loblolly Slash Sweet Gum	Excessively wet soils with moderately high potential productivity and suitable for water tolerant hardwood and southern pines

* Site Index is the average height of dominant trees at age 30 for cottonwood, age 35 for sycamore and age 50 for all other species.

DESIGN MEMORANDUM NUMBER 1C

APPENDIX (C)

FIRE PROTECTION PLAN

REVISED MASTER PLAN

B.A. STEINHAGEN LAKE AND TOWN BLUFF DAM

NECHES RIVER, TEXAS

U.S. ARMY ENGINEER DISTRICT FORT WORTH, TEXAS

SEPTEMBER, 1974

SWDCO-R (SWFOD-M 5 Nov 74) 1st Ind
SUBJECT: Project Resource Management Plans, Appendix C to Design Memorandum No. 1C, B.A. Steinhagen Lake and Town Bluff Dam, Neches River, Texas

DA, Southwestern Division, Corps of Engineers, 1114 Commerce Street, Dallas, TX 75202 3 December 1974

TO: District Engineer, Fort Worth, ATTN: SWFOD-M

Appendix C, Fire Protection Plan to Design Memorandum No. 1C Master Plan for B.A. Steinhagen Lake and Town Bluff Dam, is approved subject to the following comments or inclusions at subsequent revisions, whichever is appropriate.

a. Section 1. An additional paragraph should be provided to present the history of fire occurrence and damage on the project.

b. Paragraph 2.02. The referenced agreement should be attached as stated.

FOR THE DIVISION ENGINEER:

wd all incl

GEORGE W. STAPLES
Chief, Construction-
Operations Division

CF: w/incl
HQDA (DAEN-CWO-R) 2 cy

DEPARTMENT OF THE ARMY
FORT WORTH DISTRICT, CORPS OF ENGINEERS
P. O. BOX 17300
FORT WORTH, TEXAS 76102

REPLY TO
ATTENTION OF:

SWFOD-M

5 November 1974

SUBJECT: Project Resource Management Plans, Appendix C to Design Memorandum No. 1C, B.A. Steinhagen Lake and Town Bluff Dam, Neches River, Texas

Division Engineer, Southwestern
ATTN: SWDCO-OR

1. Reference Engineer Regulation 1130-2-400 dated 28 May 1971, SWDPL-R letter dated 8 March 1972, subject: Recreation Resource Planning and Management, and 2nd Indorsement thereto dated 17 May 1972.

2. In accordance with schedules previously furnished, seven copies of Appendix C, Fire Protection Plan for B.A. Steinhagen Lake and Town Bluff Dam, Neches River, Texas are submitted for approval.

FOR THE DISTRICT ENGINEER:

1 Inclosure (7 cys)
As stated

ALLIE J. MAJORS
Chief, Operations Division

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George W. Staples
GEORGE W. STAPLES
Chief, Construction-Operations Division

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FOR THE DISTRICT ENGINEER:

Allie J. Majors

1 Inclosure (7 cys)
As stated

ALLIE J. MAJORS
Chief, Operations Division

TABLE OF CONTENTS

APPENDIX C

APPENDIX C

FIRE PROTECTION PLAN

TOWN BLUFF DAM AND B.A. STEINHAGEN LAKE

REVISIONS AND UPDATES

Date	Page

APPENDIX C

FIRE PROTECTION PLAN

I. INTRODUCTION

1.01 Purpose:

The purpose of this Fire Protection Plan is to establish policies and procedures necessary to protect the natural resources of Town Bluff Dam Project Office and B.A. Steinhagen Lake from wildfire. The Plan will also outline equipment, personnel, cooperative agreement and training available to accomplish the fire protection around B.A. Steinhagen Lake.

1.02 Authority:

This Appendix to the Town Bluff Dam, B.A. Steinhagen Lake Master Plan is prepared in accordance with ER 1130-2-400, dated 28 May 1971.

1.03 Location:

Town Bluff Dam is located on the Neches River 114 miles above the Gulf of Mexico and 12.4 miles below the confluence of the Neches and Angelina Rivers. B.A. Steinhagen Lake is located in a broad flat section of Neches River Valley in the East Central and West Central Portion of Tyler and Jasper Counties respectively.

1.04 Access:

B.A. Steinhagen Lake is readily accessible over paved State Highways and all weather County Roads. The Project Office is immediately adjacent to State Highway 92 five miles South of its intersection with U.S. Highway 190. U.S. Highway 190 crosses the Lake five miles above the dam on a route between Woodville and Jasper. State Farm Road 777 provides a major artery for traffic on the East side of the Lake. Project Park roads are connected with these main traffic arteries by a network of all weather County Roads.

1.05 Description of Project Area:

Town Bluff Dam is a re-regulating structure designed to accomplish uniform releases of intermitten power releases from Sam Rayburn Lake and Rockland Lakes (not yet constructed). The topography within the reservoir is nearly level with numerous sloughs and river bottom lakes. The general climate is damp and humid with moderate to heavy rainfall.

1.06 Forest Land:

The majority of project land is covered with dense mature stands of timber. It is predominately hardwood with scattered mixed pine plots. Open and cleared areas are sparse and nonexistant in many areas. Underbrush is nearly always present varying from thick to scattered.

II. FIRE PROTECTION

2.01 General:

Texas State Fire Law under Articles 1321a and 1321b of Vernon's Penal Code provides penalties for those persons willingly setting forest and/or range fires or allowing fire to get out of control.

2.02 Agreement:

A mutual agreement has been made whereby Corps employees will suppress fires on Corps-owned land at B.A. Steinhagen Lake and will be assisted by Texas Forest Service crews, if needed, and the Texas Forest Service will suppress all fires on private and company owned lands and will call on Corps personnel only if a threat exists to Corps lands. In the case of large wildfires in the area, Corps personnel will act as a back-up crew and furnish support to local firefighters. Copies of the cooperative agreement with Texas Forest Service and National Forest Service are attached as a portion of this Plan.

III. EQUIPMENT AND TOOLS

3.01 General:

Wildfire is a major enemy of woodlands. This Section includes plans for prevention and control of fire on forest land with emphasis on organized fire prevention, firefighting, selection of equipment and facilities needed.

3.02 Objectives:

The objective is to reduce the number of man-caused fires and acres burned to the lowest possible minimum on Corps lands and land adjoining Corps land.

3.03 Fire Detection:

Corps personnel will normally be notified by phone by the local volunteer fire departments, local residents, or the local commercial bait and tackle stores surrounding the Reservoir area as to the location of all fires on Corps land and those threatening Corps land. Project personnel will remain alert to the possibility of detecting fires, visually, off and on Corps land, and notify the proper authorities at once.

3.04 Fire Prevention:

All project personnel and contractors working on Government lands will be fire conscious, especially during fire season and assure that no Corps project develops into a wildfire. It will be the duty of each supervisor to properly instruct the employees working immediately under his supervision to maintain an effort toward the prevention of fires at all times. Special attention will be given to the following points:

a. Extinguish before leaving, any warming fires that may be built in cold weather.

b. Proper disposal of matches and smoking materials.

c. Caution campers, picnickers, fishermen, and other persons using the areas to be sure that fires are extinguished in camp fire-

places, prior to departure. Extinguish any fire left unattended by the public.

d. Unusual conditions will require special orders to be issued by the reservoir manager or his appointed representative. On extreme fire danger days, project personnel will orally warn visitors and may close certain dangerous areas.

e. Use will be made of the local news media in calling the public's attention to the danger of wildfires and the subsequent damage of these fires and in requesting their cooperation in preventing fires.

f. Campfires will be permitted only in outdoor fireplaces provided for picnickers, campers, and other purposes or in places designated for recreational purposes.

3.05 Preparedness - Organization:

The Project Area Fire Protection Organization will be composed of project personnel. Individual fire reports will be prepared, giving all particulars related to the cause, location, damage and effectiveness of control of all fires which occur on the Corps land. Fire incident reports will be kept to provide an indicator of increases or decreases in number of fires, acreages burned and changes in geographical locations of fire origins.

3.06 Firefighting Equipment:

Corps owned firefighting equipment consisting of the following will be kept in ready condition at all times:

1 farm tractor with blade and front end loader

1 fifty-gallon tank, forester firefighting outfit, mounted in 4x4 pickup
Hand tools and burlap bags
1 track mounted dozer with angle blade
Fire plugs located at administration and maintenance building
CO2 extinguishers, located in office, work boat, shop, spillway structure, and exterior of paint and oil storage building

3.07 Reporting:

A report will be made as to location, date, cause, area burned,

and suppression history of each fire occurring on Corps land.

3.08 Fire Crew Training:

Project personnel will participate in training courses offered in this locality by Texas A & M Extension Service to keep current on latest methods. Personnel will be trained by Reservoir Manager in the use of tools and equipment used in the control of wildfire.

DESIGN MEMORANDUM NUMBER 1C

APPENDIX (E)

PROJECT SAFETY PLAN

REVISED MASTER PLAN

B.A. STEINHAGEN LAKE AND TOWN BLUFF DAM

NECHES RIVER, TEXAS

U.S. ARMY ENGINEER DISTRICT FORT WORTH, TEXAS

SEPTEMBER, 1974

TABLE OF CONTENTS

APPENDIX E

APPENDIX E

PROJECT SAFETY PLAN

B.A. STEINHAGEN LAKE (TOWN BLUFF DAM)

REVISIONS AND UPDATES

Date	Page

APPENDIX E

PROJECT SAFETY PLAN

I. INTRODUCTION

1.01 Purpose:

The purpose of this Project Safety Plan is to identify those commonly recurring hazards or unsafe conditions which are closely allied to recreation type operations. They include construction, maintenance, public use areas, visitor protection, equipment, and operations. The safety rules and regulations contained herein will maintain acceptable standards throughout the installation.

1.02 Authority:

The plan is prepared in accordance with the requirements of ER 1130-2-400 dated 28 May 1971.

1.03 Master Plan:

This Appendix is a part of the updated Master Plan for the development and management of B.A. Steinhagen Lake (Town Bluff Dam).

II. OPERATION AND MAINTENANCE FACILITIES

2.01 Office Area:

A. Housekeeping:

The office area shall be cleaned and the litter disposed of daily.

B. Trash Containers:

Trash containers shall be emptied daily.

C. Walkways:

All walkways shall be kept free from mud, grease, or any other material or obstruction which would render them unsafe to the persons using them.

D. Inside Electrical Outlets, Fuse Boxes, and Extension Cords:

1. All electrical outlets and extension cords shall be of the three-conductor type. All extension cords in use shall be kept clear of foot traffic areas.

2. Fuses and circuit breakers shall be of the proper rating for the circuit protected.

E. Outside Electrical Outlets:

All outside electrical fixtures and outlets shall be of the weatherproof type.

F. Lighting:

All rooms, halls, restrooms, and entrances shall be properly lighted.

G. Heating Plants:

1. Furnaces shall be separated from office by fireproof walls

and fireproof doors.

2. Supplies and materials will not be stored in furnace room.

H. Firefighting Apparatus:

1. Suitable fire extinguishers, of the proper size, shall be located in accordance with requirements of the Safety Manual, EM 385-1-1.

2. Fire extinguishers shall be inspected by schedule as required by EM 385-1-1. Project maintenance card system will be utilized to record inspections.

3. A cooperative agreement has been established with the Texas Forest Service for additional firefighting assistance.

I. First Aid Supplies:

A medicine cabinet, first aid kit, and respiratory equipment shall be available at the administration building.

J. Bulletin Board:

Safety posters shall be posted on office bulletin board.

2.02 Maintenance Compound:

A. Electrical Handtools:

1. All electrical tools, extension cords, receptacles, and male plugs shall be of the three-conductor type. All receptacles shall be protected with ground fault breakers.

2. Tools and equipment shall be serviced and maintained in a safe working condition.

B. Air Operated Handtools:

The use of all air operated handtools shall be in accordance with requirements of the Safety Manual, EM 385-1-1.

C. Face Shields and Eye Protection:

Proper shields, guards, goggles, and other required equipment shall be used in grinding, chipping, and welding operations.

D. Nonelectrical Handtools:

All handtools shall be used only for their intended purpose. Defective or broken tools shall be repaired or replaced immediately.

E. Ladders:

Wooden ladders confroming to the requirements of the Safety Manual, EM 385-1-1, shall be used for all repair work.

F. Hardhats:

Safety hats shall be furnished and worn by all employees in construction areas.

G. Tool Storage:

All tools shall be stored in designated racks or compartments.

H. Firefighting Apparatus:

Suitable fire extinguishers, of the proper size and contents, shall be strategically located throughout shops, storage buildings, and compound areas in accordance with requirements of the Safety Manual, EM 385-1-1. Fire extinguishers shall be inspected by schedule as required by EM 385-1-1.

I. Waste Containers:

Waste containers shall be emptied daily.

J. Storage of Flammables:

1. All gasoline, oil, diesel, paint, thinners, insecticides, herbicides, and other volatile materials shall be stored in an approved building.

2. Flammable liquids shall be stored in designated building and in approved-type safety containers which meet the requirements of the National Fire Protection Association.

3. Smoking shall be prohibited in all areas where flammable materials are stored. "No Smoking" signs shall be posted.

4. All rags and waste soiled by combustible or flammable materials shall be placed in tightly closed metal containers for daily disposal.

K. Warning Signs:

Safety signs shall be located near hazardous shop equipment to warn of danger when in operation.

L. Bulletin Board and Other Safety Information:

Safety posters shall be posted in various shop work areas and on the mechanic shop bulletin board.

M. Spray Painting:

All spray painting shall be done in a well ventilated area. Respirators shall be worn while spray painting.

N. Vehicle Operation:

All vehicles shall be operated in accordance with the requirements of the Safety Manual, EM 385-1-1.

O. Vehicle Storage:

All vehicles and equipment shall be parked or stored in predesignated areas to reduce congestion. Keys shall be removed at night and locked in the Administration Building.

P. Storage of Supplies:

Supplies shall be stored orderly in designated areas to conserve space and provide easy access.

Q. Lighting:

Yard area around headquarters shall be adequately lighted by mercury vapor lights.

R. First Aid Supplies:

A first aid kit shall be conveniently located in shop area. Each vehicle shall have a first aid kit.

2.03 Structure and Dam:

A. Walkways:

All walkways and steps shall be kept free from mud, grease, or any other material or obstruction which would render them unsafe to the persons using them.

B. Fencing:

A climb proof fence with locked gates has been installed and shall be maintained around the structure.

C. Signs:

Signs shall be posted around structure to inform visitors and employees of danger areas (dangerous currents, high voltage, falling rock, steep slope, etc.).

D. Siren:

A siren shall be sounded before opening gates to inform persons downstream of dangerous currents.

E. Visitors:

No visitors shall be allowed on structure unless escorted by authorized personnel.

F. Electrical Facilities:

1. All electrical outlets shall be of the three-conductor type.

2. Fuses and circuit breakers shall be of the proper rating for the circuit protected.

3. All outside electrical fixtures and outlets shall be weatherproof.

III. RECREATIONAL FACILITIES

3.01 Toilet Facilities:

A. Safety Rails for the Handicapped:

All toilets shall be provided with rails for the handicapped.

B. Lighting:

Restrooms shall be well lighted inside and outside and controlled by photoelectric cell. All ground area outside restrooms shall be adequately lighted by mercury vapor lights.

C. Disinfecting and Deodorizing:

Approved-type disinfectants and deodorants shall be applied during each cleaning operation.

D. Insecticides:

Insects shall be controlled with use of approved insecticides and supervised by certified operator. (Mr. Williams).

E. Walkways:

All walkways shall be free from mud, grease, or any other material or obstruction which would render them unsafe to the persons using them.

F. Electrical Facilities:

1. All electrical outlets shall be of the three-conductor grounded type.

2. Fuses and circuit breakers shall be of the proper rating for the circuit protected. All breaker boxes shall be kept locked.

3. All outside electrical fixtures and outlets shall be weatherproof.

3.02 Picnic Shelters:

A. Parking:

1. Parking areas shall be provided for ample vehicle parking.

2. Guard posts shall be set around parking areas where there is danger of vehicles rolling.

B. Electrical Facilities:

1. All electrical outlets shall be of the three-conductor grounded type.

2. Fuses shall have a safe current carrying capacity and circuit breakers shall be of the proper rating for the circuit protected.

3. All outside electrical fixtures and outlets shall be weatherproof.

4. Public use of outlets shall be monitored to assure safe use of extension cords.

5. Overhead distribution lines shall be carried on poles which provide safe clearance over roadways.

6. All breaker boxes shall be locked.

3.03 Concessions:

Project personnel shall make monthly inspections to insure that the premises are clean, sanitary, and in safe condition and EPA approved insecticides if any are in use and supervised. In accordance with the lease, the concessionaire shall correct deficiencies immediately.

3.04 Overlook Area:

A. Parking:

1. Parking areas shall be provided for ample vehicle parking.

2. Guard posts shall outline parking areas where there is danger of vehicles rolling.

B. Fencing:

A climb proof fence has been installed and shall be maintained along top of bluff at overlook area to insure visitors' safety.

IV. SANITATION

4.01 Testing Water Facilities:

Water samples from each well at the lake and at headquarters shall be submitted monthly to the Texas State Department of Health, Port Arthur, Texas, for testing. If a sample is found unsafe, the well shall be disinfected and resampled.

4.02 Sewage Facilities:

A. Masonry Vault Toilets:

Masonry vault toilets shall be inspected and pumped out when necessary.

B. Bacteria:

A bacteria compound shall be added to masonry vault toilets periodically to break down solid waste and control odors.

4.03 Solid Waste Disposal Facilities:

All solid waste shall be disposed of in Corps of Engineers aeration ponds in accordance with the Texas State Department of Health.

4.04 Insect Control:

A. Facilities:

All facilities will be kept neat and clean. No food substances will be allowed to remain as an attraction to insects or rodents.

B. Insect Control:

1. Mosquito surveillance shall be conducted from April through October to determine species present at project. If disease carrying mosquitoes are found, control with EPA approved use of insecticides shall be implemented.

2. Ant mounds occurring in public use areas shall be baited with Mirex 150.

C. Insecticides:

Use of insecticides shall be in accordance with ER 1130-2-332.

V. ACCESS

5.01 Roads:

A. Signs and Guard Posts:

Traffic control signs and guard posts have been installed and shall be maintained to assure safe travel. Guard posts shall be reflectorized on curves.

B. Road Widths, Grades, and Curves:

Camp roads and turnouts shall provide minimum despoilment of the terrain, yet provide safe grade, clearance, and visibility.

5.02 Parking Areas:

A. Toilet, Shelter, Launching, and Swimming Areas:

Parking areas shall be provided for ample vehicle parking at toilets, shelters, and launching and swimming areas. Barriers shall be set around parking areas where there is danger of vehicles accidentally rolling.

B. Camping and Picnic Areas:

Barriers shall be provided at the end of turnouts where danger exists of vehicles accidentally rolling.

5.03 Traffic Control:

A. Lake Warning Signs:

Warning signs are posted and maintained at all roads ending in the lake.

B. Control of Motorcycles and Motorbikes:

Motorcycles and motorbike riding shall be confined to use for access or egress from recreation areas and shall not be allowed to annoy or harass campers and picnickers. Cycles without mufflers shall not be permitted. (See Title 36, Section 311).

VI. PUBLIC USE FACILITIES

6.01 Camping and Picnic Areas:

A. Fireplaces:

Areas around fireplaces shall be kept cleared in order to prevent spread of fire.

B. Dead Trees and Limbs:

Dead trees or limbs in trees shall be removed from camping and picnic areas.

C. Garbage Cans:

Garbage cans shall be provided at campsites. They shall be cleaned as required and treated with insecticide.

D. Tripping Hazards:

Tables shall be landscaped and graded to eliminate tripping hazards.

6.02 Swimming Areas:

A. Signs:

At designated swimming areas, signs, "Swim at Own Risk," shall be maintained.

B. Buoyed Areas:

1. Capsule buoys connected with cables shall encircle major swimming areas that are provided by the Corps of Engineers.

2. Can buoys shall be marked with "Boats Keep Out" signs and symbols.

3. Buoys shall be adjusted and underwater hazards removed as lake elevation fluctuates.

6.03 Boat Ramps:

Ramps shall be grooved concrete to provide maximum traction. All ramps shall be adequately marked.

6.04 Lake Patrol:

A. Peak Season:

The lake will be patrolled during the peak season by game officers of the Texas Parks and Wildlife Department and Corps of Engineers reservoir rangers.

B. Rescue Operations:

Rescue operations shall be coordinated with game management officers of the Texas Parks and Wildlife Department, Jasper County Sheriff's Department, and Tyler County Sheriff's Department.

C. Boat Operators:

Two trained boat operators shall be in Corps of Engineers' boat at all times during use. Boat operators shall obtain a U.S. Coast Guard Motorboat Operator's License.

D. Floating Debris:

Cleanup of floating debris shall be made when necessary for water safety purposes.

VII. PUBLIC INFORMATION

7.01 Severe Weather Warnings:

Under severe weather conditions where there is a danger of flooding, the Reservoir Manager shall alert Government contractors and appropriate private interests in the area, furnishing latest reports of flood situation and predicted progress of flood stages.

7.02 Fireside Programs:

When time permits, night programs, safety talks, and slide programs shall be given by rangers during periods of high visitation.

7.03 Navigation Hazards:

A. Launching Areas:

Launching areas shall be marked with buoys to regulate speed in these areas.

B. Midchannel Buoys:

Midchannel buoys shall be strategically located in river channel of lake to help guide boaters.

7.04 Bulletin Boards:

Posters and bulletins on water and boating safety shall be provided by Corps of Engineers and displayed by concessionaires.

7.05 Safe Boating Week:

Special emphasis shall be placed on Safe Boating Week with additional signs, posters, broadcasts, and articles.

7.06 Radio and Television Broadcasts:

Radio and television broadcasts shall be used to inform and educate the public of water safety practices.

7.07 Newspaper Articles:

Newspaper articles shall be used periodically to inform the public of water safety practices.

7.08 Speaking Engagements:

When time permits, rangers or other employees shall speak to service clubs, churches, etc., to promote safety on the Corps' controlled lake.

7.09 Water Safety Program:

A. Purpose:

A water safety program has been established and shall be updated yearly to establish procedures and responsibility for accomplishing water safety objectives on the lake. A copy of this program is attached to and shall become a part of this Project Safety Plan.

B. Safety Rangers:

A safety ranger and alternate have been appointed to encourage the practice of good water safety habits. The safety ranger shall promote safety by utilization of these basic elements: Education, enforcement, and hazard identification.

C. Reporting:

Safety rangers shall report weekly to the Reservoir Manager all water safety incidents.

D. Coordination With Local Law Enforcement:

The water safety program will be coordinated with local law enforcement agencies to a maximum.

7.10 Location Signs:

Location signs shall be placed in the public use areas to inform visitors of areas of importance.

7.11 Designated Hunting Areas:

No hunting shall be allowed in park areas. Additional "No Hunting" areas shall be coordinated with the Texas Parks and Wildlife Department as this agency enforces the hunting regulations.

7.12 Emergency Information:

Emergency information shall be posted conspicuously in such places as the Reservoir Manager thinks necessary. This information shall contain the telephone numbers of the reservoir rangers, sheriffs' departments, and location of nearest telephone.

7.13 National Emergency:

A. During a national emergency, the Corps of Engineers shall work closely with the civil defense and assist the civil defense in issuing emergency information.

B. All project personnel shall be given radiological training by District Office at six-months intervals.

VIII. GENERAL

8.01 Crowd Control:

A. Ranger Patrols:

Rangers shall patrol the public use areas and have radio contact with officers of the county sheriff's office.

B. Two-way Radio:

Rangers shall use two-way radios as a means of communication to report on crowd control.

C. Local Law Enforcement Coordination:

The local police or sheriff's department shall be the law enforcing body. In cases of civil disturbances, all incidents relating to proposed or actual civil disturbances or demonstrations shall be promptly relayed by telephone to the District Engineer and to the local law enforcement officials. A chronological log of events or activities shall be maintained by the field installation for record and a following report on ENG Form 4337, Incident Report.

8.02 Health, Safety, and Welfare:

A. Monthly Safety Meetings:

Monthly safety meetings for all employees shall be conducted covering topics related to current operations and activities. Records of these meetings shall be maintained at the project office. The records shall include names of those present, the subject discussed, and time involved.

B. First Aid Training:

All project personnel shall be trained in principles of first aid.

C. First Aid Kits:

First aid kits shall be installed in vehicles, boats, and shops.

D. Safety Glasses:

Safety goggles shall be worn by all employees when subjected to eye hazards.

E. Safety Shoes:

Safety shoes shall be issued to employees when they are subject to foot hazards.

F. Lifeline:

Lifelines and belts shall be worn by employees when subject to falling hazards.

G. Safety Equipment:

1. All necessary safety equipment needed for various jobs shall be issued to employees as needed.

2. All boats shall be equipped with safety equipment as required by the Motor Boat Operators Manual issued by the Corps of Engineers.

H. Vehicle Safety:

All vehicles shall be furnished with seatbelts and their use enforced.

I. Rollover Protection System on Heavy Equipment:

All heavy equipment shall have rollover protection.

J. Machinery or Equipment:

Machinery or equipment will not be operated in a manner that will endanger persons or property.

K. Special Precautions:

Special precautions will be taken when mechanical equipment is used within a public use area.

L. Buddy System:

During hazardous working conditions, two or more employees shall work together on the buddy system.

TBPO
14 Feb 73

WATER SAFETY PROGRAM FOR B. A. STEINHAGEN

1. Reference. FWDR 385-1-90, Appendix D, Water Safety Program

2. Purpose. To prescribe the procedure, method, and responsibility for accomplishing water safety objectives on B. A. Steinhagen Lake. These objectives are:

a. To make the general public aware of the Corps' concern for their safety and well-being while they are visitors on the lake.

b. To educate the public in the area of water safety.

c. To make the public more safety conscious while using the lake.

d. To make the public aware of hazards associated with water oriented recreation on B. A. Steinhagen Lake.

3. Means of Accomplishment.

a. The program will be accomplished by continuous pursuit of three basic elements of safety: Education, enforcement, and hazard identification.

b. Project Safety Ranger, Thomas L. Halfmann, and alternate, Richard T. Freeman, will be scheduled for duty on lake during peak visitation months of May through August to get maximum exposure to the majority of public users. Rangers will patrol lake as a team, conducting close surveillance over activities on the water and offering assistance to those requiring help. Rangers will encourage the practice of good water safety habits, conduct water safety discussions, and call violations of good safety practices to visitors' attention.

c. Rangers will be familiar with state boating laws, and their patrols will be coordinated with Department of Parks and Wildlife enforcement personnel. All violations that cannot be corrected by constructive criticism, instructions, or citation authority will be reported to Game Management officers. Rangers will be available to assist Game Management officers if needed.

d. Rangers will prepare and present to the public water safety slide presentations, which will point out specific water hazards characteristic of B. A. Steinhagen Lake.

e. Hazard identification will be an emphasized feature of lake patrol, and corrective action insured personally by the reporting ranger.

4. Reporting of Water Safety Incidents.

a. All incidents, accidents, and severe hazards involving water safety will be reported at once to the Reservoir Manager. Reservoir Manager will conduct an immediate investigation and take appropriate action as allowed by regulations.

b. Safety rangers will submit to the Reservoir Manager weekly written reports covering all operations in the area of water safety.

5. Coordination with Local Law Enforcement. Project water safety program will involve and employ local law enforcement personnel to a maximum. All patrol schedules will be in conjunction with those made by local law enforcement personnel.

6. Facility Maintenance and Improvement.

a. Project signs, boat ramps, swimming beaches, and warning devices are inspected weekly by Maintenance Foreman to insure safe and proper working condition.

b. Boat ramps will be inspected for deterioration, obstructions in approach channels, areas of slippery footing, sharp objects, and proper posting of warning signs. Boat ramps will be kept free from plant material at all times in order to assure safer footing. Boat ramp approach channels will be buoyed for five mile per hour speed limit when funds and personnel permit.

c. Swimming beaches will be inspected for foreign objects such as broken bottles, cans, and tree roots which could be a tripping hazard. Beaches will be zoned and protected by buoys when project funds and workload permit.

d. During peak visitation periods, existing lake buoys will be inspected during water safety patrols. Present project buoys are being repaired. As project funds and workload permit, new buoys will be added in accordance with revised Master Plan dated December 1971.

7. Publicity.

a. Reservoir Manager will make full use of available press and radio to convey safety messages to the public. Special emphasis will be placed on safe boating week and other special dates pertaining to water oriented recreation.

b. Information in the form of posters and pamphlets made available by District will be distributed and posted to obtain maximum public exposure. Reservoir Rangers will verbally inform visitors of planned water safety slide presentations.

8. Water Safety Council. Such Council will not be formed for B. A. Steinhagen Lake, but the Reservoir Manager and Rangers will endeavor to participate in any area safety council and involve the project personnel.

9. Responsibility. The Reservoir Manager will accept responsibility for full implementation of project water safety program. All project employees will integrate water oriented accident prevention into daily operations and strive to create a safety conscious public.

SWDCO-RP (SWFOD-M 28 Jul 80) 1st Ind
SUBJECT: Supplemental Update, B.A. Steinhagen Lake and Town Bluff Dam Revised Master Plan, December 1971, Neches River, Texas, Design Memorandum No. 1C

DA, Southwestern Division, Corps of Engineers, Main Tower Building, 1200 Main Street, Dallas, TX 75202 20 AUG 1980

TO: District Engineer, Fort Worth

1. The subject supplement is approved subject to the following comment:

We do not concur in the boat launching ramp, parking areas and fishing pier being included in the concession lease area. Accordingly, the small tract including these facilities should be deleted from the proposed expansion. It is our understanding that this deletion has been discussed with the concessionaire and he agrees with this action.

2. Future submissions of this nature should include a revised plate(s) of the master plan (9 copies) for insertion into record copies. In this regard, all the plates listed in paragraph 2b do not require revision. Plate 3.6 shows the limits of lease and, accordingly, is the only one requiring the change.

FOR THE DIVISION ENGINEER:

A. P. HUTCHISON
Chief, Construction-Operations Division

2 Incl
nc

CF: w/basic & incl
DAEN-CWO-R (dupe)

DEPARTMENT OF THE ARMY
FORT WORTH DISTRICT, CORPS OF ENGINEERS
P. O. BOX 17300
FORT WORTH, TEXAS 76102

REPLY TO
ATTENTION OF:

SWFOD-M

28 JUL 1980

SUBJECT: Supplemental Update, B.A. Steinhagen Lake and Town Bluff Dam Revised Master Plan, December 1971, Neches River, Texas, Design Memorandum No. 1C

Division Engineer, Southwestern
Attn: SWDCO-R

1. Reference is made to SWDCO-R/SWDPL-R multiple letter dated 20 March 1978, Master Planning Activities, SWD and SWDCO-RR/SWDRE-M/SWDPL-R multiple letter dated 27 September 1979, Limits of Lease, Concession Areas-SWD.

2. In accordance with above references the following supplemental update request, if approved, should be incorporated into the B.A. Steinhagen Lake and Town Bluff Dam Revised Master Plan, December 1971, Neches River, Texas, Design Memorandum No. 1C. Concession lease DACW63-1-80-0616 , Dam B Tidelands, is being expanded in size from over two acres to 8.7 acres encompassing a major portion of Beech Grove Park. This is the only commercial concession on this project.

a. The concessionaire's plan of development consists of the following proposed features.

(1) Upgrade existing concession building.

(2) Construction of eleven camping trailer sites (roads, parking, tables, and electrical and water hookups).

(3) Install playground equipment.

(4) Install more security lighting.

(5) Construct area to store camper trailers.

(6) Construct restrooms and showers.

(7) Drill new well.

(8) Install washateria and TV lounge.

SWFOD-M 28 JUL 1980

SUBJECT: Supplemental Update, B.A. Steinhagen Lake and Town Bluff Dam Revised Master Plan, December 1971, Neches River, Texas, Design Memorandum No. 1C

This information will replace all the data on page 65 of the approved Master Plan.

b. The Corps-operated Beech Grove Park will be reclassified to a concession operated park on the following plates:

(1) Soils Map, Plate No. 1.2.

(2) Land Use Planning Map, Plate No. 2.2.

(3) Water Use Planning Map, Plate No. 2.1.

(4) Park Plates Key Map, Plate No. 3.1.

(5) Beech Grove Park Map, Plate No. 3.6.

3. The above changes will be inserted into the submission and approval section of the Master Plan. These changes will be incorporated into the Master Plan text on the next comprehensive update.

Michael B. Cottrell

MICHAEL B. COTTRELL
Chief, Real Estate Division

Allie J. Majors

ALLIE J. MAJORS
Chief, Operations Division

2 Incl
1. Proposed Lease Boundary Map
2. Lease Agreement

SUPPLEMENTAL AGREEMENT NO. 1
TO
DEPARTMENT OF THE ARMY
LEASE NO. DACW63-1-80-0616
BEECH GROVE PARK
FOR COMMERCIAL CONCESSION PURPOSES
TOWN BLUFF DAM (B. A. STEINHAGEN LAKE), TEXAS

This Supplemental Agreement No. 1 to Lease No. DACW63-1-80-0616 made between the Secretary of the Army, of the first part, and H. B. Neal, an individual, dba Dam "B" Tidelands, party of the second part;

W I T N E S S E T H:

WHEREAS, the Secretary of the Army heretofore on 11 July 1980 leased to the party of the second part, hereinafter referred to as the lessee, for a term of ten (10) years beginning 9 May 1980 and ending 8 May 1990, for commercial concession purposes, certain premises as described in said lease; and

WHEREAS, the lessee is desirous of adding approximately 7.2 acres of additional area to the leased premises, subject to the provisions and conditions of the lease and for the same purposes during the remainder of the lease term; and

WHEREAS, the Government is agreeable to granting the use of the 7.2 acres of additional land, said additional land area being shown colored in yellow on the map, marked Exhibit "A-1" attached hereto and made a part hereof;

NOW THEREFORE, by mutual agreement of the parties hereto, Lease DACW63-1-80-0616, is hereby supplemented in the following respects:

1. That the premises described in the original lease and the map accompanying the original lease and Exhibit "A" are hereby deleted and the following land description and new map, Exhibit "A-1" are hereby substituted therefor:

> A tract of land containing approximately 8.7 acres of land, together with the reasonable use of the adjacent water area, being a part of Tract A-2A and part of the Wyatt Hanks Survey (A-18), Town Bluff Dam and B. A. Steinhagen Lake, Jasper County, Texas being designated in yellow in Exhibit "A-1" attached hereto and made a part hereof.

Incl 2

2. That Condition No. 31 of the original lease is hereby modified to read as follows: "Transient trailer or campers referred to in Condition 3.a(7) will be allowed to remain in the camping area a maximum of 14 consecutive days, or 14 days total in any 30-day period."

3. That Condition 33 is added to the original lease and to read as follows:

'33. That as of the date of this lease, an Inventory and Condition Report of all personal property and improvements of the Government located on the premises shall be made by a representative of the Government and a representative of the lessee to reflect the condition of said property as of said date. A copy of said Inventory and Condition Report shall be attached hereto as Exhibit "F" and become a part hereof, as fully as if originally incorporated herein. At the expiration, revocation, or termination of this lease, a similar Inventory and Condition Report shall be prepared and submitted to the District Engineer, said Inventory and Condition Report to constitute the basis for settlement by the lessee with said officer for leased property shown to be lost, damaged, destroyed, and such property to be either replaced or restored to the condition required by Condition No. 23 of this lease, or at the election of the Government, reimbursement made therefor by the lessee at the then current market value thereof.'

Except for the addition of approximately 7.2 acres of land, Exhibit "A-1", Condition No. 33, and Survey Condition Report Exhibit "F", all provisions and conditions of the original lease remain unchanged and in full force and effect.

IN WITNESS WHEREOF, I have hereunto set my hand by authority of the Secretary of the Army this _____ day of _____ 1980.

_____
MICHAEL B. COTTRELL
Chief, Real Estate Division

This Supplemental Agreement No. 1, together with all provisions and conditions contained herein, is hereby accepted this _____day of _____1980.

DAM "B" TIDELANDS

BY:_____
H. B. NEAL

ATTEST:

_____

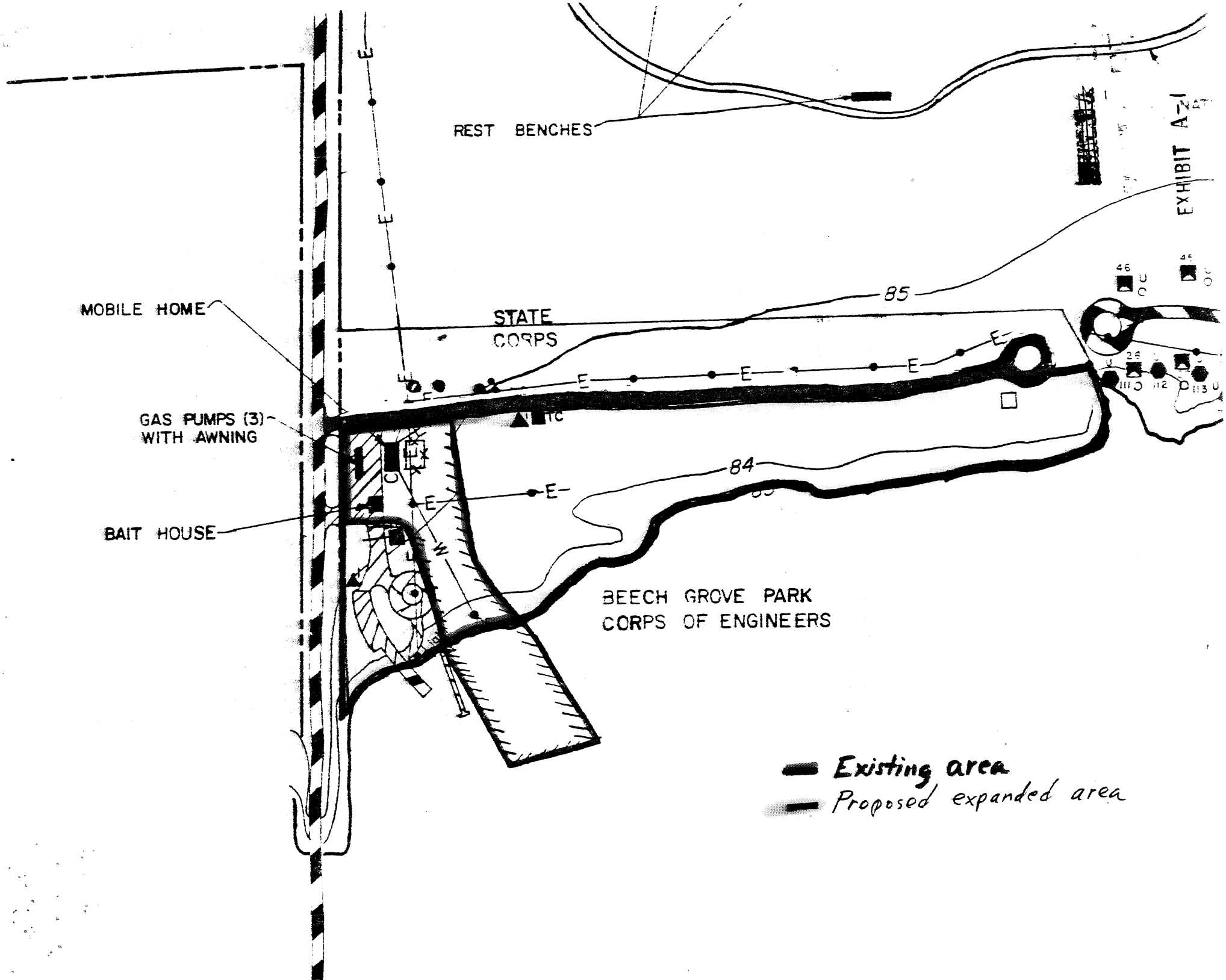
EXHIBIT A-1
REST BENCHES
MOBILE HOME
STATE
CORPS
85
GAS PUMPS (3)
WITH AWNING
84
BAIT HOUSE
BEECH GROVE PARK
CORPS OF ENGINEERS
Existing area
Proposed expanded area

JOINT SURVEY AND INSPECTION OF CONDITION OF GOVERNMENT LEASED PROPERTY

INSTRUCTIONS

1. It considered necessary, use a separate ENG Form 3143a for each room surveyed.

2. Additional sheets may be attached for physical characteristics of land and buildings; exterior and interior details of buildings; service facilities; inventory of machinery and equipment miscellaneous items and general remarks not otherwise covered in section II of this form or on ENG Form 3143a.

ADDED INSTRUCTIONS *(Overprint, if desired)*

SECTION I - PROPERTY DATA AND CONDITION AGREEMENT

DATE OF SURVEY	LEASE NO.	LEASE COMMENCEMENT DATE	DATE POSSESSION TAKEN

ACTIVITY	TOTAL LEASED BUILDING AREA *(Square feet)*

DESCRIPTION AND LOCATION OF PROPERTY

JOINT AGREEMENT ON THE CONDITION OF THE PROPERTY

We, the undersigned, jointly made a survey and inspection of the condition of the property mentioned above. We agree that as of the date of survey, the condition of the property is as described herein.

THE CONDITION OF THE EXTERIOR OF THE PROPERTY IS INDICATED ON THE REVERSE SIDE OF THIS FORM. ROOM CONDITIONS ARE INDICATED ON ATTACHED ENG FORM 3143A.	NO. OF ATTACHMENTS

NAME AND SIGNATURE OF ☐ OWNER ☐ LESSOR LESSEE ☐ AGENT	NAME, TITLE, AND SIGNATURE OF U.S. GOVERNMENT REPRESENTATIVE
ADDRESS	**ORGANIZATION**

EXHIBIT "F"

DEPARTMENT OF THE ARMY
FORT WORTH DISTRICT, CORPS OF ENGINEERS
P. O. BOX 17300
FORT WORTH, TEXAS 76102

SWFEX-T 20 January 1972

SUBJECT: Town Bluff Dam and B. A. Steinhagen Lake, Neches River, Texas, Design Memorandum No. 1C, Revised Master Plan

THRU: Division Engineer, Southwestern

TO: HQDA (DAEN-ZA)
Wash DC 20314

1. Design Memorandum No. 1C, revised master plan for the development and management of the B. A. Steinhagen project, Neches River, Texas, is submitted for review and approval.

2. As previously indicated in letter SWFEX dated 28 July 1971, subject: "Master Plan Updating", special emphasis has been given master plan updating by the Fort Worth District. The revised plan has been prepared by a Task Force formulated for the purpose of providing concerted effort to meet the current national emphasis on Resource Management and Recreational Activities within our society. Certain of the more significant objectives of the Fort Worth District and the Task Force in the updating process are as follows:

a. Develop a master plan document that will provide district managers, and higher authority with brief, concise management concepts, plans and techniques providing comprehensive coverage with minimum detail.

b. Provide sound yet flexible master planning for development of proposed facilities, i.e., planning within the context of broad master planning that will permit flexibility to adjust to changing trends and needs.

c. Provide project resource managers a document that will (1) truly be a plan of future development, (2) assist them in management of facilities and resources, and (3) provide a common basis for planning, budgeting and scheduling.

d. Provide a document that can be easily referred to in the field and which will take unusual treatment when being used on-site, exposed to abnormal elements.

e. Provide a document to accommodate changes and revisions with minimum wasted effort to previous planning and which can be placed in the document easily and quickly by mere insertion of revised sheets.

f. Develop cost estimating data based on computerized techniques and printouts.

g. Provide complete and usable facilities to the public, based on the priority of facilities development being accomplished by park areas.

h. Provide improved techniques and economy in drafting and printing.

i. Perform detailed analysis of the "main thrust" of recent new regulations addressed to Recreation and Resource Management and incorporate into the master plan.

3. The revised master plan includes existing and planned development at the project and is in compliance with previous endorsements. Conceptual management objectives and plans will be implemented immediately by the project resource manager and district personnel. Implementation of the proposed development will be held in abeyance pending approval of the revised master plan by OCE.

Floyd H. Henk

9 Copies

FLOYD H. HENK
Colonel, CE
District Engineer

SWDPL-R (SWFEX-T 20 Jan 72) 1st Ind
SUBJECT: Town Bluff Dam and B. A. Steinhagen Lake, Neches River, Texas, Design Memorandum No. 1C, Revised Master Plan

DA, Southwestern Division, Corps of Engineers, 1114 Commerce Street, Dallas, Texas 75202 21 MAR 1972

TO: HQDA (DAEN-CWP-V) WASH DC 20314

Forwarded recommending approval subject to the following:

a. Reference is made to letter SWDPL-R dated 28 Jan 72, subject: Town Bluff Dam - B. A. Steinhagen Lake, Neches River, Texas, Design Memorandum No. 1C, Revised Master Plan, which furnished five copies of the subject DM for your concurrent review.

b. The subject DM was prepared as a special task force effort to accomplish updating of master plans on an expedited basis. The decision to accomplish updating of master plans by a special task force was endorsed by this office and, as indicated by 1st Ind SWDPL-R to letter SWFEX dated 28 Jul 71, subject: Master Plan Updating, was discussed with representatives of OCE. Also, certain concepts for presentation of the updated master plans were agreed upon in the interest of expediting this essential work, necessary in the preparation of budgetary data and required as the basis of preparation of plans and specifications. It is considered that the subject DM adequately provides the basis required for continued recreation use, development and management of the subject project. It is recognized, as indicated by the comments below, that further refinement is needed which will be made in future updating of this plan and incorporated into subsequently submitted master plans as soon as practicable. Comments resulting from review of the subject plan, including those based on ER's received subsequent to preparation of the plan, are as follows:

(1) Narrative.

(a) Para 1-01, C4, page 5. Reference is made to para 12 of ER 1120-2-400 which states that "The master plan will describe in detail how all project lands, water, forests and other resources will be conserved, enhanced, developed, managed and used in the public interest throughout the life of the project." While the master plan is subject to a complete updating in five years in accordance with para 13 of ER 1120-2-400, this provides opportunity to reevaluate the plan and make adjustments as appropriate but does not justify omitting the long range plan. The subject plan, as submitted, provides an interim basis for development and management but future submittals should include the long range plan of development and management for the life of the project.

(b) Para 1-02, B3, page 17, Archeological Resources. Reference should be made to ER 1120-2-402 dated 12 Oct 70, subject: Archeological Investigations and Salvage Activities. Also, it is recommended that this paragraph be expanded to explain the Corps role in protection, preservation, restoration and administration of archeological sites found on project lands. In this respect, the historical resources should also be discussed in this plan, providing the same information required above.

(c) Para 1-02, B4b and c, page 18, Primitive Group Camps and Group and Private Club Areas. Reference should be made to ER 1120-2-400. These paragraphs should be located in the Land and Water Use Section or the Plan of Development Section. Also, the discussion should be expanded to include considerations provided in paragraphs 16 and 17 of the above ER.

(d) Para 1-02, C2a(1), page 19, General Conditions. The degrees of carrying capacity stated previously in the text are "ultimate" and "desired." In view of the above, the word "optimum" should be substituted to read "desired."

(e) Para 1-02, C2d, page 22, Pocket Wilderness. In view of the nature of the material presented in this paragraph, it is recommended that this paragraph be included in the Plan of Development or Land and Water Use Section. Also, reference should be made to Plate 2.2.

(f) Section II, Land and Water Use Planning. This section should be expanded to include the rationale or concepts for development and management of all project resources. For instance, in addition to the two items discussed under para 2-02B (General Planning and Park Planning), additional subparagraphs should be included pertaining to fish and wildlife conservation and management, historical and archeological sites, forest resources, natural, ecological areas, etc.

(g) Para 3-03, page 31, 2d sentence. The statement made here is not considered appropriate. Environmental statements are required by law for "major Federal actions significantly affecting the quality of the human environment." OCE has determined that environmental statements will be prepared on O&M projects. This sentence should be revised to read: "An environmental impact statement will be prepared for this project in accordance with current guidance."

SWDPL-R (SWFEX-T 20 Jan 72) 1st Ind 21 MAR 1972
SUBJECT: Town Bluff Dam and B. A. Steinhagen Lake, Neches River, Texas, Design Memorandum No. 1C, Revised Master Plan

(h) Tables 6, 7, 8, 9, 10 and 11, pages 37-42, Camping. The number of "persons per unit" appears high, particularly since the Recreation Use Data Summary for 1968 summer shows the number of persons per vehicle for this project to be 3.1. The data used here should be rechecked and revised as/if required.

(i) Para 3-07, A3, page 43, Sanitary Facilities. State sanitation codes do not prohibit the use of concrete vault type toilets. In this respect, it is considered that the use of vault type toilets may be appropriate under certain conditions and locations such as in remote areas in which use and cost would not justify a waterborne facility. Additional guidance concerning determination of the type of facility required is furnished in M/L SWDPL-R/SWDCO-O dated 12 Jul 67, subject: Environmental Pollution Control, Recreation Areas, Southwestern Division.

(j) Para 3-07, A4, page 44, Additional Picnic and Camp Units. The discussion concerning additional picnic units is not appropriate since no additional picnic units are planned. Also, this paragraph should include the basis for developing only additional camping units.

(k) Para 3-07, C3b(3), page 71, Facilities Concept Drawings. Recommended approval of the concept drawings is contingent upon the District submitting preliminary drawings and cost estimates to SWD for review and approval prior to preparation of final plans and specifications.

(2) Plates.

(a) Plate 3.4A. Upon approval, this area will be designated on the Land Use Plan, Plate 2.2 and on the Park Plates Key Map, Plate 3.1 and furnished for insertion into OCE record copies.

(b) Plate C8. Signs shall conform to those provided in the SWD Sign Handbook, particularly the entrance sign. This plate should be revised to reflect the above or justification furnished to support deviation from the Sign Handbook.

(3) Cost Estimates, general. Since the quantities shown for boat launching ramps are designated in square yards, there is no way to tell how many ramps are planned. It is recommended that this information be included here in some manner.

FOR THE DIVISION ENGINEER:

HOWARD R. BARE
Chief, Planning Division

1 Incl
wd 5 cys (prev furnished)

CF:
Fort Worth District

DAEN-CWP-V (20 Jan 72) 2nd Ind
SUBJECT: Town Bluff Dam and B. A. Steinhagen Lake, Neches River, Texas
Design Memorandum No. 1C, Revised Master Plan

DA, Office of the Chief of Engineers, Washington, D. C. 20314 21 Apr 72

TO: Division Engineer, Southwestern

1. The revised Master Plan for subject project is approved subject to comments of the Division Engineer in preceding indorsement with consideration of the following:

a. Wilderness Areas, as defined in P.L. 88-577 must include a minimum of 5,000 acres, and are established by Act of Congress. While there is no disagreement with management concepts recommended by the District Engineer, the term "wilderness" should not be employed to describe the area lying between the Neches and Angelina Rivers. Primitive Area or Scientific Reserve are suggested as terms more descriptive of this area. It is not clear whether or not this area is owned in fee, easement or any estate by the United States.

b. On Table 5 at page 30, the total fee acreage is given as 21,759 acres with flowage easements shown as 1,041 acres with a total therefore of 22,800 acres. Yet, on Table 2 on page 14, the acreage shown as "Top Pool at Design Water Surface" is 28,210 acres. Does this not indicate a top pool which would cover 5,410 acres more than acquired? Early in the report, possibly as a revised Table 2, the total fee and flowage acreage should be shown. This would give a clearer picture of the decreasing dry land area owned in fee as the lake filled to capacity. The elevation of the guideline for fee acquisition should also be stated and shown on all maps which are part of the report.

c. Nomenclature of "Pools." The plan shows 83' as the "Normal Pool"; it also shows 83' as "Top of Conservation Pool." Also, 83' is shown as "Five-Year Pool Level." This is confusing.

d. On page 28, the statement is made that "final approval" for easements, including roads, rests with the District office. This is simply not correct. Road easements are a very ticklish subject and can only be signed in the Office of the Assistant Secretary of the Army for Installations and Logistics. Before road easements are recommended for signature, the availability must be approved by the Operations Division of Civil Works. This paragraph should be rewritten.

e. The paragraph at the top of page 84 describes expertise which we doubt is available; suggest this paragraph be deleted.

f. While the concept of frequent checks on concession operations by project personnel is appropriate, it should be kept in mind that formal compliance inspections are the responsibility of Real Estate. Up to the point of a clear violation of lease conditions, minor items should be considered as falling under paragraph 4 of the standard lease form and corrective action taken by project personnel. Beyond this point, however, the matter becomes one of legal and policy determinations. In no event should the Project Manager or other project personnel write a letter to a concessionaire telling him to take corrective action by a certain date or his lease will be cancelled. It is not suggested that the Master Plan embody this detail, but a certain degree of caution is necessary in these matters and since the Plan will be used by new personnel at the project, a degree of rewrite is suggested.

g. Paragraph 2-02, B.3.b. Interim Use, page 27. It is unclear as to what project operations would require the leasing of lands unless this is a broad statement which includes leasing of lands for recreation development by other agencies. It is doubtful if lands would be leased specifically for soil and vegetative restoration. It appears that this would be a benefit accruing from other leasing programs.

h. Paragraph 2-02, B.3.c. Easements, page 28. The first sentence is in error in that all outgrants are not approved by the District office but are subject to approval by higher authority.

i. Paragraph 3-07, C.2. Specific Parks, page 45. The second sentence of the second paragraph is not concurred in. Sufficient data should be available to adequately locate recreation facilities with only minor adjustment in specific locations.

j. Appendices, paragraph I.D.2.e(2)(a), Signs, page 97. The referenced ER 1130-2-312 has been superseded by EM 1110-2-400 dated 1 September 1971.

2. Plates.

a. The proposed expansion of Magnolia Ridge Park shown on plate 3.4A should be shown on plate 2.2 and other applicable plates.

b. Facility concept drawings designs are not in accordance with paragraph 3-07, C.3.b(1)(b),Simplicity, page 69. This is especially true of facility concepts shown on plates C3, C4 and C6.

c. Plate C8. The use of exposed aggregate concrete at the sanitary dump station is not concurred with. The rough texture could create undesirable sanitary and maintenance problems resulting from sewage spills.

d. Plates 3.2 through 3.7. Individual recreation area plates. The development as depicted on the individual recreation area plates is not shown in sufficient detail to make a determination as to the adequacy of either design or long-range requirements. While there is no objection to the use of single line drawings to depict the proposed development to reduce drafting time, the proposed development should be more comprehensive in scope. The development required to meet the ultimate capacity estimated at 1,400,000 should be shown on the individual plates to provide for continuity of development and preclude segmented and poorly related development that might result from a five-year incremental master planning concept, predicated on constantly changing environmental, vegetation and visitation conditions which are inherent in any long-range development. To overcome this deficiency, another color separation (overlay) should be utilized to show ultimate development of the individual recreation areas. Tables 19 and 20, pages 74 and 75 respectively, should be revised by adding a column for the ultimate development shown on the new overlay.

e. Generally, roof design for the proposed structures should follow that of existing park structures. However, if there are no existing structures in an area where current plans call for construction, or if only a single recreation structure exists, then a change in architectural style may be appropriate. Costs for the alteration of the existing structure to conform to the new style of architecture should be included in the cost estimate for the new development. It is assumed that architectural style changes are included in the cost estimates (Tables 18 and 19, Item 5.b) for sanitary facilities to be modified.

f. The architectural style for roof designs of new structures should be similar. The wide variations indicated defeat the purpose of unity in architectural design of park structures throughout the project.

g. If the corral or open-roofed style shower facilities are to be retained in the camper service facility, careful consideration should be given to the location of the facility.

3. The length and detail of these comments should not be construed to reflect a high degree of criticism of what we consider a generally

DAEN-CWP-V 21 Apr 72

SUBJECT: Town Bluff Dam and B. A. Steinhagen Lake, Neches River, Texas
Design Memorandum No. 1C, Revised Master Plan

commendable planning effort. The extensive review and detailed comments reflect our view that maximum response should be given on this plan to assist in the revision of Master Plans for the other 16 projects in the Fort Worth District.

FOR THE CHIEF OF ENGINEERS:

Earle Jones
for IRWIN REISLER
Chief, Planning Division
Directorate of Civil Works

wd incl

SWDPL-R (20 Jan 72) 3rd Ind

DA, Southwestern Division, Corps of Engineers, 1114 Commerce Street, Dallas, Texas 75202

9 MAY 1972

TO: District Engineer, Fort Worth, ATTN: SWFEX-T

H.R.B.
for

CF:
(DAEN-CWP-V)

NECHES RIVER BASIN, TEXAS

DESIGN MEMORANDUM NO. 1C (REVISED DECEMBER 1971)

REVISED MASTER PLAN
FOR B. A. STEINHAGEN LAKE
NECHES RIVER, TEXAS

This report, prepared by the Master Planning Task Force, Fort Worth District, has been coordinated with the Engineering Division, the Real Estate Division and the Operations Division and is recommended for approval.

D. L. Overdorff — 7 Jan 72
Chief, Engineering Division — Date

John D. Bouchert
Chief, Real Estate Division — Date

Allen D. Mullins — 7 Jan 1972
Chief, Operations Division — Date

DESIGN MEMORANDUM NO. 1C

B. A. STEINHAGEN LAKE
NECHES RIVER, TEXAS

DECEMBER 1971

REVISIONS

DATE	NEW PAGES OR DRAWINGS