TRINITY RIVER BASIN, TEXAS

DESIGN MEMORANDUM NO. 1C
(REVISED)

UPDATED MASTER PLAN
FOR GRAPEVINE LAKE
DENTON CREEK, TEXAS

U. S. ARMY ENGINEER DISTRICT, FORT WORTH
CORPS OF ENGINEERS
FORT WORTH, TEXAS

SEPTEMBER 1971

(Army-Fort Worth, Texas)

Scanned Dec 02

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

SWFED-P

22 September 1971

SUBJECT: Grapevine Dam and Lake, Denton Creek, Texas, Design Memorandum No. 1C, Updated Master Plan

THRU: Division Engineer, Southwestern

TO: Chief of Engineers

1. Design Memorandum No. 1C, updated master plan for the development and management of the Grapevine project, Denton Creek, Texas, is submitted for review and approval.

2. The updated plan includes existing and planned development at the project and is in compliance with previous indorsements.

3. A "Youth Group Camp" will be provided according to multiple teletype, 2 August 1971, SWDPD-124, par 4C, and ENGCW-PV/RL/OR, 4 August 1971, subject, Supplemental Information Required for Code 710-Construction-General Appropriation Justification, FY 73. The proposed location for this development is the southern portion of Walnut Grove Park, plate 30. The focal attraction of this development will be the Indian Council Rings, which are a historical site and should be preserved. Planned picnic area no. 3 will not be developed if monies are appropriated for the Youth Group Camp development.

Floyd H. Henk

1 Incl(9 copies)
as

FLOYD H. HENK
Colonel, CE
District Engineer

TRINITY RIVER BASIN, TEXAS

DESIGN MEMORANDUM NO. 1C (REVISED SEPTEMBER 1971)

UPDATED MASTER PLAN
FOR GRAPEVINE LAKE
DENTON CREEK, TEXAS

This report, prepared in the Planning Branch of the Engineering Division, Fort Worth District, has been coordinated with the Real Estate Division and the Operations Division and is recommended for approval.

Chief, Real Estate Division

Chief, Operations Division

TRINITY RIVER BASIN, TEXAS

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FOR GRAPEVINE LAKE
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TRINITY RIVER BASIN, TEXAS

DESIGN MEMORANDUM NO. 1C (REVISED SEPTEMBER 1971)

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FOR GRAPEVINE LAKE
DENTON CREEK, TEXAS

I - INTRODUCTION

1-01. Authority for the project.- Congressional authority for the construction of Grapevine Lake, a unit in the plan for improvements in the Trinity River Basin, is contained in the Rivers and Harbors Act approved 2 March 1945 (Public Law 14, 79th Congress, 1st Session).

1-02. Authority for recreational program.- Congressional authority for the recreational program at reservoir projects under the control of the Department of the Army is contained in the Flood Control Act approved 22 December 1944 (Public Law 534, 78th Congress, 2d Session) as amended by subsequent acts.

1-03. Authority for fish and wildlife program.- Congressional authority for the fish and wildlife program at reservoir projects under the control of the Department of the Army is contained in the Fish and Wildlife Coordination Act of 1958, as amended, Public Law 85-624 (72 Stat. 563).

1-04. Federal Water Project Recreation Act (PL 89-72).- The above referenced law is not applicable to this project; however, the cost sharing requirements set forth in ER 1120-2-404, Appendix I, Category A, do apply. Facilities and improvements may be made available without cost to non-Federal entities for operation, maintenance and further development at their expense. Further development of old areas may be accomplished with 711 funds without the cost sharing provisions of the act until 30 June 1976.

1-05. Scope of this report.- This design memorandum presents an updated master plan for recreation development and other water and land uses at the Grapevine Lake project. The concept of this plan is to obtain the optimum utilization of the project resources for public use and recreational activities, and provide proper stewardship of the water and land areas.

II - DESCRIPTION AND CHARACTERISTICS OF THE PROJECT

2-01. Project purposes.- Grapevine Lake is a flood control and water conservation project. The cities of Dallas, Park Cities (Highland Park and University Park), and Grapevine have acquired conservation storage rights in the project for municipal and industrial uses.

2-02. Location.- Grapevine Dam is located on Denton Creek 11.7 river miles above the confluence of Denton Creek with Elm Fork of the Trinity River, about 2.7 miles northeast of the city of Grapevine, about 20 miles northwest of the city of Dallas, and about 20 miles northeast of the city of Fort Worth. The reservoir occupies portions of Tarrant and Denton Counties, Texas.

2-03. Accessibility.-

a. Roads.- U. S. Highway 377 crosses Denton Creek near the upper reaches of the lake to the northwest. State Highway 114 parallels the southwestern shoreline of the lake, and State Highway 121 crosses Denton Creek downstream from the dam. State FM Highway 1171 and hard surfaced county roads also provide access to the reservoir. The proposed freeways which will provide rapid access to the new regional airport will also improve access to the lake area. These new access routes will support a commercial-residential buildup in the Grapevine vicinity.

b. Railroads.- The main line of the St. Louis-Southwestern Railroad passes through the city of Grapevine. A secondary main line of the Texas and Pacific Railroad passes through Roanoke and across the upper reaches of the project.

2-04. Reservoir area.- The valley throughout the reservoir area is flanked by fairly steep, irregular hills. At conservation pool level, elevation 535.0, the inundated area is about 7,380 acres. The lake is more than 10 miles long, with a maximum width of about three miles, and has a shoreline of about 60 miles. Prior to the construction of the dam, most of the reservoir area was cultivated or was used for grazing, and about 3 percent of the area was covered with a growth of fairly dense timber and brush. Gravel was mined in the river valley from several gravel deposits.

2-05. Project structures.- Grapevine Dam consists of an earthen embankment 12,850 feet long, including a 500-foot uncontrolled concrete spillway and an outlet works. The maximum height of the embankment above streambed is 137 feet. The concrete outlet works consists of two 6.5-foot gated inlets with invert at elevation 475.0, discharging through a 13-foot-diameter conduit into a stilling basin. The low flow outlet consists of two 30-inch valve controlled steel pipes paralleling the flood control conduit. General plan of the dam is shown in plate 1. The reservoir has a controlled storage capacity of 435,500 acre-feet, including 238,250 acre-feet of flood control storage, 161,250 acre-feet of conservation storage, and 36,000 acre-feet of sedimentation storage. Pertinent data regarding elevations, areas and capacities are shown in table 1.

TABLE 1

PERTINENT FEATURES OF THE PROJECT

Feature	Elevation (feet msl)	Area (acres)	Capacity (acre-feet)
Top of dam	588.0	-	-
Maximum design water surface	581.0	19,420	768,800
Top of flood control pool and spillway crest	560.0	12,740	435,500
Five-year frequency reservoir level	542.0	8,700	244,760
Top of conservation pool	535.0	7,380	188,550
Top of projected conservation pool	556.0	11,740	386,500
Five-year frequency reservoir drawdown	526.0	5,900	129,290
Ten-year frequency reservoir drawdown	521.0	5,220	101,490
Streambed (original)	451.0		
Shoreline at conservation pool level - 60 miles			

2-06. Status of project.- Construction of the project was initiated in January 1948, and completion of the closure section was made in June 1952. Deliberate impoundment of water was initiated on 3 July 1952. Prior to fiscal year 1959, only $22,900 was appropriated for recreational development at Grapevine Lake. During fiscal years 1959-1971, a total of $1,002,800 was authorized for recreation development and was used in providing basic recreation facilities such as gravel and bituminous surface roads and parking areas, boat launching ramps, sanitary facilities, potable water supply, picnicking and camping facilities, clearing and brushing, and park and directional signs. The Flood Control Act of 1965 (Public Law 89-298 dated 27 October 1965) authorized the construction of Roanoke Lake and the modification of Grapevine Lake. This modification, a unit in the comprehensive plan for the development of the Trinity River Basin, provides for a reallocation of storage in Grapevine Lake. This reallocation will be accomplished on completion of construction of Roanoke Lake. The modification will result in a 21-foot increase in the conservation pool level, to elevation 556.0. During reconveyance proceedings, consideration was given to the effect of raising the conservation pool to elevation 556.0 on recreation areas. (See paragraph 4-01). Since funds have not been appropriated for preconstruction modification planning, provisions have not been made in this report for construction of facilities at the higher conservation pool elevation except for the toilet facilities and other expensive types of development. Additional land for public use will be needed when the pool is raised.

See Plate 5

2-07. Fluctuation of pool.- The top of the conservation pool is at elevation 535.0, and crest of the uncontrolled spillway is at elevation 560.0. A hypothetical operation of the reservoir during the period November 1923 through July 1952 indicates a fluctuation in water surface level of about 40 feet, with a low elevation of 519.5 and a high elevation of 560.0. Actual reservoir operation began with the deliberate impoundment of water on 3 July 1952. The conservation pool filled on 4 May 1957, and the reservoir reached a maximum elevation of 560.8 on 6 June 1957. Since then, the reservoir has varied from a high of 551.0 in May 1958 to a low of 523.3 on 6 March 1964. The mean pool elevation is 534.7. The pool elevation frequency and duration curves are shown in plate 2. Water depths in the reservoir at the top of conservation storage, elevation 535.0, are shown in plate 3.

2-08. Lands.- The Federal Government has acquired fee title to 15,662 acres and flood easement rights on 2,175 acres in the project area. The fee title land consisted of all lake land below elevation 565.0 and lands lying between elevations 565.0 and 581.0 where topographical conditions were favorable for development of lakeshore camps and other recreational facilities. Flood easements were acquired from elevation 565.0 to the maximum design water surface where such easements would result in savings to the Government over fee purchase. Under Public Law 85-500, lands not needed for project purposes, public use and recreation development were offered for reconveyance to former owners. This program, completed in 1961, resulted in the reconveyance of 1,849 acres, of which the Government retained a flood easement interest in 1,498 acres.

2-09. Archeological and paleontological resources.- A survey was made of the reservoir area in July 1948 under the direction of the Smithsonian Institution of the archeological and paleontological features that would be adversely affected by the reservoir. Ten archeological sites were found, but none were deemed significant to warrant further investigation. No paleontological sites were reported at the project.

III - RECREATIONAL RESOURCES

3-01. General.- Grapevine Lake is located in the densely populated Dallas-Fort Worth urban area, a region of heavy industrial and commercial development. Leapfrogging suburbanization is rapidly converting the Grapevine area from an agrarian past history into a residential bedroom community servicing the Dallas-Fort Worth metropolitan centers. While many areas remain in pasturage at present, most of these lands are slated to become residential sections of the communities of Flower Mound, Southlake or Westlake. The Fort Worth-Dallas Regional Airport and its labor market demand will also significantly affect the land use development pattern of the environment immediately adjoining Grapevine Lake. All of these factors will affect future visitation on Grapevine Lake. This popular lake has become an important urban water resource, providing an

541,000 in 1953
2,807,200 in 1967

attractive water body of 7,380 acres. Attendance at the project increased from 541,000 in 1953 (first year of record) to a peak recorded attendance of 2,807,200 in 1967. Factors which have influenced the popularity of the project include the mild climate; the urban population concentration; the variety and interest of terrain, vegetation, and shoreline; and the abundance of fish and wildlife in the region. There are 12 areas at the project which have been designated for recreational use for the general public. Seven of these areas have been partially developed, and five have no development. The development program includes facilities for picnicking, camping, boating, fishing and other recreation activities.

3-02. Existing facilities.- Facilities on Grapevine Lake have been heavily utilized over the years since the project initiation. The state of their existence reflects this heavy use. Boat ramps, picnic units, and toilets need to be improved or replaced. The provision of new facilities will alleviate this problem, but maintenance will also be important.

3-03. Climate.- Grapevine Lake lies in a region characterized by a relatively mild climate. Summers are long with high day and moderate night temperatures. Normally, the winter periods are short and comparatively mild, but occasional high winds from the northwest produce short periods of freezing temperatures. In spring, summer, and fall, prevailing winds are from the south and southeast. The mean annual temperature in the vicinity of the dam site is 65 degrees. January is the coldest month, with an average of 45 degrees, while July is the hottest month, with an average of 84 degrees. The maximum and minimum temperatures recorded at Denton are 113 degrees and 3 degrees below zero, respectively. The growing season between killing frosts is normally from the latter part of March to the first part of November. The mean annual precipitation over the Denton Creek Basin above Grapevine Dam is about 32 inches. About 69 percent of the mean annual precipitation occurs during the growing season. The mild climate of the region reflects a positive incentive for outdoor recreation activities. The recreation visitation is not hampered by climate except for a few cold days in winter months; thus the visitation is free to increase with the impact of new development in the area.

3-04. Method of computation of recreation demand and visitation estimates.-

a. In formulating the estimated recreation visits, the population within the day-use market area was projected through year 2020. The population projections for Grapevine Lake are based on a Series C population projection. The day-use market area (the geographical area from which over 80 percent of the daytime users originate) was determined to be 25 miles. The population projections for the market area are as follows:

POPULATION PROJECTIONS FOR THE MARKET AREA
(SERIES C PROJECTIONS)

1970	1980	1990	2000	2010	2020
2,111,342	2,726,693	3,446,726	4,213,236	5,072,476	6,009,855

The per capita use rate for Grapevine's 25-mile zone was computed for 1970 and was adjusted through 2020. The per capita use rate was computed to be 1.13. The 25-mile zone was the only zone used because 94% of the project's visitation is coming from this zone.

The per capita rate increases 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 6 percent of total visitation, the total projected participation demand was computed. The total projected recreational needs at Grapevine Lake based on the above population projections and per capita use participation rates are as follows:

TOTAL PROJECTED RECREATIONAL NEEDS

1970	1980	1990	2000	2010	2020
2,538,102	3,974,010	5,866,768	8,202,364	10,935,240	14,129,553

b. A combination of related aspects which concern the ability of the project resources to sustain intense use were studied to determine a maximum carrying capacity. This maximum capacity is estimated to be 4,650,000. This figure is a reflection of the aspects of size, location, sustained ecological balance, and other characteristics of the project. At Grapevine Lake, the projected participation demand is far greater than the carrying capacity of the project resources.

c. The projected project visitation at Grapevine Lake from 1971 to 1981 is as follows:

1971	2,576,925	1977	2,801,475
1972	2,614,350	1978	2,838,900
1973	2,651,775	1979	2,876,325
1974	2,689,200	1980	2,913,750
1975	2,726,625	1981	2,951,175
1976	2,764,050		

d. Current and projected recreation visitation was broken into activities such as camping, picnicking, swimming and boating. For facility requirements computations, see tables 2, 3 and 4.

3-05. Related recreation areas.- Table 5 presents data on parks and lakes within a 50-mile radius of the dam site.

IV - PLAN OF DEVELOPMENT

4-01. General.- All public access areas and their related facilities are located on lands purchased in fee title for this project, which is under the jurisdiction of the Corps of Engineers. The plan of development presented herein is intended to provide the optimum recreational development that can be offered at Grapevine Lake for the benefit of the general public. It provides criteria for use of the lake through principles of land use and site planning. Provisions are included in the plan for providing recreational facilities for current and projected design loads. The success of the provided facilities will be enhanced by the provision of sufficient services to meet visitors' needs and demands. The planned development is intended to meet immediate demands, as well as those eventually proposed once the projected conservation pool level change is accomplished in 1990. The general development plan is presented as plate 5.

4-02. Basis for selection of areas.- Factors considered in selecting the areas for recreational development as presented in the preliminary master plan were as follows:

a. Circulation and access to existing roads.

b. Topography of the area.

c. Existing vegetation in the area.

d. The existence of aesthetically scenic areas with pleasing vistas and corridors.

e. Availability of shoreline access for recreational activities.

f. Degree of shelter for protection of boats.

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

4-03. Recreational facilities.- The recreational facilities developed at this project will be based on approved plans. The facilities include, but are not limited to, roads, parking areas, boat launching ramps, sanitary facilities, potable water supplies, public camping and picnic areas, interpretive services including visitor and nature centers, signs, both informational and directional, and essential safety measures required in connection with such facilities. Development by others is contained in table 6.

4-04. Recreational and commercial activities.-

a. Table 6 presents pertinent data on authorized and recommended outgrants pertaining to recreational and commercial activities.

b. Reference is made to Project Operations Manual, SWDR 1130-2-7, for instructions on awarding additional recreational and commercial outgrants as follows:

(1) Chapter 15 for parks and recreation grants

(2) Chapter 16 for commercial concessions.

(3) Chapter 17 for boats with cabins.

4-05. Fees.- Recreational fees will be charged in accordance with existing legislation and directives in park areas that meet minimum standards as set forth in current EC's and ER's.

4-06. Design criteria.- The following design criteria will be utilized in the planning and construction of the proposed development.

a. Structures.- Structures such as permanent concession buildings, waterborne toilets, etc. which would be damaged by flooding will be constructed at or above the 50-year flood elevation, 560.0 feet msl. Approved plans will be used in the construction of all facilities.

b. Roads and parking areas.- Existing state and county roads which provide access to the various sites will be used. The counties and the state should receive encouragement to continually improve existing county roads that provide access to the public use areas. All necessary rights-of-way which have been purchased or will be purchased by the Corps of Engineers to provide access from existing roads to public use areas will be 100 feet in width. Existing roads within public use areas are to be utilized and well maintained at all times. Access roads connecting recreation roads with existing public use recreation areas will vary from 18 to 20 feet in width with 3-foot shoulders. Service roads will vary from 10 to 12 feet in width with

Can we update this per park?

TABLE 2

RECREATION ANALYSIS

Project: Grapevine

Total annual attendance: 2,540,000 (present)

Design load computations: 32,385

Design day load

2,540,000 total annual attendance x 51% visits during summer months x 65% which occurs on weekends = 842,010 total number of weekend users.
Total number of weekend users ÷ 26 weekend days = 32,385 design day load.

Picnicking

Design day load x 23% of total are picnickers = number of picnickers
No. of picnickers x 40% of picnickers requiring facilities = number of picnickers requiring facilities
No. of picnickers requiring facilities ÷ turnover rate of 2 ÷ 3 persons per unit = 497 picnic units required.

Camping

Design day load x 9% of total are campers = number of campers
No. of campers ÷ 3 persons per unit = 971 camping units required.

Boat ramps

Design day load ÷ load factor of 3 = number of vehicles
No. of vehicles x 22% of vehicles with boats = number of boats
No. of boats ÷ 60 launchings per day = 40 boat launching ramps required.

Beaches

Design day load x 42% swimmers = number of swimmers
No. of swimmers x 60% swimmers on beach = number of beach users
No. of beach users ÷ turnover rate of 3 = number of users on beach at any one time
No. of users on beach at same time x 50 sq ft of beach per person = 3.12 acres of land area required for sand beach.

No. of swimmers x 30% are swimmers in water = number of swimmers in water
No. of swimmers in water ÷ turnover rate of 3 = number of swimmers in the water at any one time
No. of swimmers in the water at any one time x 100 sq ft of water surface per user = 3.12 acres water surface required.

10% of swimmers need no additional land.

Projected 54 attendance

TABLE 3

RECREATION ANALYSIS

Project: Grapevine

Total annual attendance: 2,800,000 (1976)

Design load computations: 35,700

Design day load

2,800,000 total annual attendance x 51% visits during summer months x 65% which occurs on weekends = 928,200 total number of weekend users
Total number of weekend users ÷ 26 weekend days = 35,700 design day load.

Picnicking

Design day load x 23% of total are picnickers = number of picnickers
No. of picnickers x 40% of picnickers requiring facilities = number of picnickers requiring facilities
No. of picnickers requiring facilities ÷ turnover rate of 2 ÷ 3 persons per unit = 547 picnic units required.

Camping

Design day load x 9% of total are campers = number of campers
No. of campers ÷ 3 persons per unit = 1,071 camping units required.

Boat ramps

Design day load ÷ load factor of 3 = number of vehicles
No. of vehicles x 22% of vehicles with boats = number of boats
No. of boats ÷ 60 launchings per day = 44 boat launching ramps required.

Beaches

Design day load x 42% swimmers = number of swimmers
No. of swimmers x 60% swimmers on beach = number of beach users
No. of beach users ÷ turnover rate of 3 = number of users on beach at any one time
No. of users on beach at same time x 50 sq ft of beach per person = 3.44 acres of land area required for sand beach

No. of swimmers x 30% are swimmers in water = number of swimmers in water
No. of swimmers in water ÷ turnover rate of 3 = number of swimmers in the water at any one time
No. of swimmers in the water at any one time x 100 sq ft of water surface per user = 3.44 acres water surface required.

10% of swimmers need no additional land.

Projected prop - ultimate attendance

TABLE 4

RECREATION ANALYSIS

Project: Grapevine

Total annual attendance: 4,650,000 (ultimate)

Design load computations: 59,288

Design day load

4,650,000 total annual attendance x 51% visits during summer months x 65% which occurs on weekends = 1,541,475 total number of weekend users
Total number of weekend users ÷ 26 weekend days = 59,288 design day load.

Picnicking

Design day load x 23% of total are picnickers = number of picnickers
No. of picnickers x 40% of picnickers requiring facilities = number of picnickers requiring facilities
No. of picnickers requiring facilities ÷ turnover rate of 2 ÷ 3 persons per unit = 904 picnic units required.

Camping

Design day load x 9% of total are campers = number of campers
No. of campers ÷ 3 persons per unit = 1,770 camping units required.

Boat ramps

Design day load ÷ load factor of 3 = number of vehicles
No. of vehicles x 22% of vehicles with boats = number of boats
No. of boats ÷ 60 launchings per day = 72 boat launching ramps required.

Beaches

Design day load x 42% swimmers = number of swimmers
No. of swimmers x 60% swimmers on beach = number of beach users
No. of beach users ÷ turnover rate of 3 = number of users on beach at any one time
No. of users on beach at same time x 50 sq ft of beach per person = 5.68 acres of land area required for sand beach

No. of swimmers x 30% are swimmers in water = number of swimmers in water
No. of swimmers in water ÷ turnover rate of 3 = number of swimmers in the water at any one time
No. of swimmers in the water at any one time x 100 sq ft of water surface per user = 5.68 acres water surface required.

10% of swimmers need no additional land.

Up date

TABLE 5

PARKS AND RESERVOIRS WITHIN 50 MILES OF THE DAM SITE

Name	County	Approximate distance (miles from dam)	Administering agency	Project purpose
Lewisville Lake	Denton	6 northeast	Corps of Engineers	Flood control
Benbrook Lake	Tarrant	35 southwest	Corps of Engineers	Navigation
Bardwell Lake	Ellis	50 south	Corps of Engineers	Flood control
Lavon Lake	Collin	40 east	Corps of Engineers	Flood control
Lake Ray Hubbard	Dallas, Rockwall, Kaufman	40 southeast	City of Dallas	Water supply
Bridgeport Lake	Wise	50 northwest	Tarrant County Water Control and Improvement District	Water supply
Eagle Mountain Lake	Tarrant	25 west	"	Water supply
Lake Worth	Tarrant	28 southwest	City of Fort Worth	Water supply
Lake Arlington	Tarrant	25 south	City of Arlington	Water supply
Mountain Creek Lake	Dallas	19 south	Dallas Power and Light Company	Cooling
Lake Weatherford	Parker	35 west	City of Weatherford	Water supply
Lake Pat Cleburne	Johnson	50 south	City of Cleburne	Water supply
White Rock Lake	Dallas	20 southeast	City of Dallas	Water supply
Acton State Park	Somervell	50 southwest	State of Texas	Historical
Black Creek National Grasslands		30 northwest	U. S. Department of Agriculture	Reestablishment of grasslands
North Lake	Dallas	6 southeast	Dallas Power and Light Company	Industrial

TABLE 6

OUTGRANTS FOR RECREATIONAL AND COMMERCIAL ACTIVITIES

Issued	Park or site	Type of outgrant	Activity or purpose	Issued to	Period of time			Acreage land & water	Type of development	Estimated cost
					Years	Begin	End			
1	Meadowmere Park	Lease	Commercial concession	Midway Camp, Inc.	19	1 Jul 70	30 Jun 89	62.7	Cafe, boat storage, sale of supplies	$ 59,513.09
2	Oak Grove Park	Lease	Commercial concession	Hart Boat and Motor Service, Inc.	19	1 Jul 70	30 Jun 89	60	Boat storage, sale of supplies, boat rental and repair	136,669.01
3	Murrell Park	Lease	Commercial concession	Marinas, Inc.	16	1 Jul 70	30 Jun 86	100	Cafe, boat storage, sale of supplies, boat rental and repair	153,126.90
4	Silver Lake Park	Lease	Commercial concession	The Anchor	20	1 Jul 65	30 Jun 75	2.5	Cafe	
5	Silver Lake Park	Lease	Commercial concession	Silver Lake Enterprises, Inc.	20	1 Jul 70	20 Jun 90	71	Boat storage, sale of supplies, boat rental	270,105.06
6	West of Rocky Point Park	Lease	Nonprofit	Arlington Boys' Clubs, Inc.	25	1 Apr 67	31 Mar 92	17	Group camping and day use	
7	West of Walnut Grove Park	Lease	Nonprofit	Park Cities Lions Club	19	1 Jan 57	31 Dec 76	25	Group camping and day use	

2-foot shoulders. Except for roads leading to the launching ramps, all roads and parking areas, where practicable, will be kept at least three feet above the proposed conservation pool, elevation 556.0 feet msl. Bituminous surfacing will be used for roads and parking areas. Locally available suitable materials will be used for surfacing. Parking spaces for automobiles will be 10 x 20 feet. In order not to destroy the vegetation in areas to be cleared for large parking areas, it is planned initially to provide parking spaces for two cars at intervals to be determined in the field by the location of existing trees. This will provide desired privacy to family groups and save existing tree growth. The two-car parking spaces can be connected in the future to provide additional parking space as the need warrants. Excessive clearing will be prohibited on road rights-of-way in trailer and tent camping areas and parking areas. In some areas, one-way drives 12 feet wide will be used for short loops in camping areas. Car-trailer spaces will be 10 x 40 feet for 90-degree head-in parking and 10 x 35 feet for 45-degree parking with 25-foot-wide aisles or access lanes. Hand clearing will be specified in camping areas and in parking spaces for these areas.

c. Water supply.- Potable water in each public use area has generally been provided from a well and hydropneumatic system. It may be necessary in the interest of economy to provide water filtration and treating plants using lake water in some areas because of undependable water bearing formations. Municipal water will be used wherever practical.

d. Sanitary facilities.- These facilities will vary with the location and extent of development. The following criteria are to determine the type of facility use.

(1) Many existing toilets are of the vault type, and it is proposed that these units be converted to waterborne facilities. For new toilets in service buildings and change shelters, waterborne units will be provided. These permanent structures are located above the 50-year flood frequency elevation wherever possible. Waterborne units below the 50-year flood frequency will require uphill pumpage facilities.

(2) Sanitary sewage dump stations to serve self contained mobile campers are proposed at strategic points in designated public use areas. The locations of these proposed stations are shown on the respective park maps.

e. Power.- The lake area is served by several electric power companies. The lines can be extended when necessary to supply the electric power required. Power lines will be buried wherever practicable.

f. Waterfront facilities.- Boat launching ramps will be 14 feet, or multiples of 14 feet, in width, with the length governed by

the slope of the land and estimated water level fluctuations. The upper and lower vertical limits and the slope of ramps will be in accordance with paragraph 3a of ER 1130-2-312, Appendix I, wherever practicable. Boat ramps will be constructed of concrete according to approved plans and will be located so as to offer a minimum hazard to boating operations. Ramps will be provided with riprap protection as required. Courtesy docks will be provided at boat ramps and along the shoreline in camping areas. In order to provide adequate protection, boat basins and storage facilities are located in embayments or tributary arms with sufficient water depth.

g. Plans.- Approved plans will be used in the construction of recreation facilities; therefore, their inclusion in this design memorandum is not considered necessary.

h. Vegetative improvements.- A vegetative management plan prepared in accordance with Public Law 86-717 will be submitted when completed.

i. 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 preceding criteria.

j. Clearing for road right-of-way in public access areas.- The clearing limits of the park roads 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 roads 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 on-the-site analysis.

4-07. Public use areas.- A brief description of each public use area is presented in the following subparagraphs.

a. Rockledge Park.- (Plate 6 and aerial mosaic plate 7). This park is located adjacent to the north end of the embankment and the uncontrolled spillway near the dam. The park consists of 37 acres above the present conservation pool, 535.0 feet msl, and approximately ~~25 acres above the proposed conservation pool, 556.0 feet msl~~. The terrain within the park is rolling, and the tree cover is sparse over most of the area. The addition of new plant material is desirable in the form of both tree cover and turfing. The area is well worn by use, and the revegetation of the site will make it more usable and enjoyable to the visitor. Access to this park is provided by State Highway No. 114.

This park is developed primarily for picnicking, but an area has been designated along the shoreline vegetation strip to the northwest of the park as a motorcycle activity area.

b. Murrell Park.- (Plates 8 and 10 and aerial mosaic plates 9 and 11). This park is located on the north shore of the lake about two miles west of the dam. The park contains 510 acres above the present conservation pool, 535.0, and approximately 225 acres above the proposed conservation pool, 556.0. The terrain varies from rolling to relatively level, and the vegetation varies from dense to sparse. Access to the area is available over hard surfaced and graveled county roads which connect to State FM Road 2499. Well worn motorcycle trails exist here, along with some of the other open areas, that will require vegetation improvements. The park is designated primarily for usage divided between camping and picnicking. A commercial concessionaire has provided services in this park including cafe, boat storage, boat repair, service sales, and boat rental.

c. Twin Coves Park.- (Plate 12 and aerial mosaic plate 13). This park is located on the north shore of the lake about four miles west of the dam. The park contains 243 acres above the present conservation pool, 535.0, and approximately 150 acres above the proposed conservation pool, 556.0. The terrain is rolling, and the vegetation is generally dense. This park is also crossed with motorcycle trails and needs vegetative improvements. A portion of the land at present is inaccessible by vehicle. Existing access is over a county road. The park is planned principally for camping, with some picnicking included.

d. Rocky Point Park.- (Plate 14 and aerial mosaic plate 15). This area consists of 165 acres above the present conservation pool and approximately 100 acres above the proposed conservation pool. Its location is five miles west of the dam. Access to the area is available over county roads connecting to State FM Road 1171. The vegetation is moderate to dense in rolling terrain. Facilities provided for this park consist of camping areas and boat ramps. A concession site is planned for this park to provide marina and basic services.

e. Knob Hills Park.- (Plate 16 and aerial mosaic plate 17). The location of this park is on the north shore of the lake about one and one-half miles east of U. S. Highway 377. FM Road 1171 connects the park with U. S. Highway 377. The area contains about 225 acres above the present conservation pool level, and the proposed conservation pool level will decrease this to about 90 acres. The terrain varies from relatively flat to rolling, and the vegetation varies from sparse to moderate. The park will provide camping areas and boat launching facilities. Vegetative improvements are necessary.

f. North Shore Park.- (Plate 18 and aerial mosaic plate 19). This park is located in the upper reaches of the project area adjacent to the U. S. Highway 377 crossing of Denton Creek. The park contains 64

acres above the present conservation pool level and approximately 25 acres above the proposed conservation pool. The terrain is rolling, and the vegetation is sparse. The park will be developed primarily for fishing access.

g. Roanoke Park.- (Plate 18 and aerial mosaic plate 19). This 21-acre park is located on the south side of the lake between U. S. Highway 377 and the Texas and Pacific Railroad right-of-way. This park does not provide access to the lake. The site will be used for an overnight camping area with camping facilities provided. The vegetation is moderate on the park site, and the terrain is gently rolling.

h. Marshall Creek Park.- (Plates 20, 22, 24, 26 and aerial mosaic plates 21, 23, 25 and 27). This park is located on the southern shore of the lake about eight miles west of the dam. Access to the area is over county roads which connect with U. S. Highway 377 and State Highway 114. The park contains 804 acres above the present conservation pool and approximately 200 acres above the proposed conservation pool. The terrain is gently rolling and the vegetation from dense to sparse. Certain areas require vegetation improvements because of vehicle traversing. The park will generally provide new access, camping, picnicking and boat launching facilities.

i. Walnut Grove Park.- (Plates 28 and 30 and aerial mosaic plates 29 and 31). This park is located on the south shore of the lake about five and one-half miles west of the dam. Access to the area is available over county roads that connect to U. S. Highway 377 and State Highway 114. The park contains 448 acres above the present conservation pool level, and it will contain approximately 200 acres at projected conservation pool of 556.0 feet. The terrain in this park is rolling, and the vegetation is dense to sparse. Vehicle trails over once vegetated land requires that a vegetation program be initiated. This park will be developed primarily for picnicking.

j. Meadowmere Park.- (Plate 32 and aerial mosaic plate 33). This park is located on the south shore of the lake about four miles west of the south end of the dam. Access is available over county roads which connect with State Highway 114. The terrain is gently rolling to virtually flat, and the vegetation varies from dense to sparse. A vegetation program will be required in this park. The park contains 250 acres at the present conservation pool, ~~and it will contain approximately 75 acres at the new conservation pool~~. This park will be developed principally for picnicking, swimming, and other day uses. A concessionaire who has leased a portion of this park provides the following services: cafe, boat storage, sale of basic services, and boat rental.

k. Oak Grove Park.- (Plates 34, 36, 38 and 40, and aerial mosaic plates 35, 37, 39 and 41). This park is located on the south

shore of the lake about one and one-half miles west of the south end of the dam. Access to the area is available over existing county roads that connect to State Highway 114. The park contains 785 acres above the present conservation pool level, and it will contain approximately 400 acres above the projected conservation pool. The terrain in this park varies from rolling to gently rolling. The vegetation varies from moderate to sparse. The park will be developed primarily for picnicking. Because of motorcycle trails within the park, vegetation will be required to replace that which has been destroyed. The concessionaire provides the following services: boat storage, boat repair, sale of basic facilities, and boat rental.

1. Silver Lake Park.- (Plates 42 and 44 and aerial mosaic plates 43 and 45). This park is located on the south shore of the lake adjacent to the south end of the dam. Access to the area is available over county roads which connect to State Highways 114 and 121. The terrain is rolling, and the vegetation varies from dense to moderate. The park contains 311 acres above elevation 535.0, the present conservation pool. It will contain approximately 150 acres above the proposed conservation pool elevation, 556.0 This park will be developed for picnicking, hiking trails, and open play areas. A revegetation program will be required for this park. Two concessionaires in this park provide the following: cafe, boat storage, sale of basic supplies, and boat rentals.

m. The acres in park areas at elevation 535 (present conservation pool) and elevation 556 (ultimate conservation pool) are as follows:

Park	Acres, elevation 535	Acres, elevation 556
Rockledge	37	25
Murrell	510	225
Twin Coves	243	150
Rocky Point	165	100
Knob Hills	225	90
North Shore	64	25
Roanoke	21	21
Marshall Creek	804	200
Walnut Grove	448	200
Meadowmere	250	75
Oak Grove	785	400
Silver Lake	311	150
Total	3,863	1,661

n. Noncommercial recreation area.- The Park Cities Lions Club of Dallas, Texas, and the Arlington Boys Club have a license on 25 acres and 17 acres of land, respectively, for noncommercial recreation purposes. This land is located on the south shore of the lake adjacent to the western boundary of Walnut Grove Park. The area is used for group outings, overnight camping, and day use.

V - LAND MANAGEMENT

5-01. General.- The land use maps (plates 46 through 54), as indicated by the legend, show the Grapevine Lake lands necessary for operation of the project, park areas, wildlife and nature study areas, nonprofit group areas, and land to enhance the esthetics of the project area. The updated master plan dated May 1966 was approved by the Chief of Engineers on 16 October 1969. This plan designates lands for project purposes, public use, and the reconveyance program. The land use acreage tabulated in table 7 is in accordance with the planned development. The acreage tabulation is in accordance with GSA Form 1166 dated 30 June 1971.

5-02. Natural vegetation and public use esthetics will be encouraged and preserved as may be practicable to control soil erosion, enhance wildlife habitat, and to render the shoreline esthetically pleasing. Restrictions placed upon the use of the land because of operational requirements will include any regulations necessary to prevent interference with the project operation and maintenance.

5-03. Allocations and discussions.- The maps designated as the land use maps (see plates 46 through 54 included in Appendix A) show the allocations of uses, either existing or proposed for the project lands. There has been considerable development of both residential and weekend cottage type structures adjacent to the lake boundary. The Dallas-Fort Worth Regional Airport and the planned new city of Flower Mound will intensify the lake use and land use. Allocations made to the recreational priorities are consistent with operation and maintenance requirements; these allocations assume the maximum sustained benefits for project purposes, wildlife, nature study, park areas, and nonprofit group areas as outlined in the following subparagraphs.

a. Project use.- The land use map plates and table 7 show the lands designated for project use, public use, and other uses which include esthetic areas to complement public use areas.

b. Public use and esthetics.- Areas shown on the land use map for public use and esthetic areas are above the conservation pool level, elevation 535. Priority 1 areas are reserved for use by the general public and are to be developed and administered for park and recreational purposes.

c. Wildlife and nature study area.- The wildlife and nature study area designated on the land use map is intended to provide, through proper management, suitable habitat for the propagation and preservation of the native wildlife species and to promote a greater variety of species. The wildlife and nature study area is proposed for a habitat improvement program to provide special day use areas for bird watchers, nature groups, dog trainers, scout and campfire groups. This area is located above the Texas & Pacific Railroad area. The area is fairly well covered in timber with pecan, oak, elm, ash, cedar, and underbrush.

TABLE 7

LAND USE ACREAGE

Project use	
Permanent pool	7,380
Dam and operational purposes	600
Total	7,980
Public use	
Park area	3,863
Nonprofit group area	17
Nonprofit group functioning in public interest	25
Yacht clubs	0
Total	3,905
Other land use	
Esthetics	3,778
Total	3,778
Total fee	15,663
Total flowage easement	2,166
TOTAL	17,829

The total acreage is in accordance with GSA Form 1166 dated 30 June 1971.

The open areas consist of native and introduced grasses. Access will be provided by foot trails. The boundaries will be marked with signs and fencing. Detailed management plans and cost estimates will be added to the master plan as a supplement after the areas are surveyed and a rough trail laid out to the various points of interest to be developed.

d. Nonprofit group areas.- This land was selected for use by a nonprofit organization or agency for the purpose of rendering a public recreational educational service of a charitable or character building nature on a nonexclusive basis. Consideration was given to scenic beauty, tree cover, adaptability, access to water's edge, sheltered water for boat protection and swimming, and open water for other sports. There is one site at this project. At present, this area is occupied by the Arlington Boys Club under a 25-year lease ending 31 March 1992.

e. Nonprofit group functioning in public interest.- These lands are available to accommodate the need for nonprofit organizations or agencies providing public recreational opportunity. There is one site in this plan. This site is utilized by Park Cities Lions Club under a lease ending 31 December 1976.

f. Any future group areas or nonprofit groups will be satisfied by granting interim co-use permits within the general recreation areas.

g. Private club areas.- This area provides for private yacht clubs if facilities for sailboats are not available within existing commercial concessions. Docking, storage and servicing requirements for power boat club activities will be accommodated in conjunction with the operation of established marina concessions. Under no circumstances will human habitation be permitted in building on project land or associated with yacht club use. At the present time, there are no sites planned for use by private clubs. However, there are presently four private clubs at the project which are operating as a result of the consolidation of individual courtesy or boat dock permits issued by the project office. These clubs are in or adjacent to public use areas. Appropriate actions will be taken to eliminate this unauthorized use of project areas by these clubs.

h. Easements.- All outgrants, including easements for roads and utility lines, will be processed on an individual basis. The policy of attempting to have roads and utility lines located on privately owned lands will be adhered to. Flowage easement acquired provides for periodic inundation, and no buildings for human habitation will be constructed on these lands. The written consent of the District Engineer shall be obtained for the type and location of any structure and for appurtenances thereto now existing or to be erected or constructed on flowage easement lands.

5-04. Collateral and interim use.- This plan proposes to continue to offer lands available for grazing purposes until such time as a higher priority category develops for the reservoir lands. Leases will provide for cooperation in programs for management and improvements of fish and wildlife in furtherance thereof. The leased premises will be subject to free public use for hunting and fishing. It is proposed that all Government lands formerly cultivated be planted and maintained to a permanent vegetative cover. This restriction is considered advisable in order to prevent excessive siltation of the reservoir. Formerly cultivated lands should be planted to permanent vegetative cover in 50-foot strips every 300 feet. This would prevent siltation of the lake and encourage the natural successing of native vegetation between the strips, thus improving the wildlife habitat. Protection of desirable trees and native grasses will be encouraged so as to augment the natural beauty and improve the land. Any land use practices in the outleased program will be prepared with the cooperation of the U. S. Department of Agriculture representatives.

VI - RESOURCE ANALYSIS

6-01. General.- Below the existing conservation pool elevation, there are 7,380 acres inundated. Above the present conservation pool, the project contains 8,289 acres, with 3,862 acres designated for public parks. There are 42 acres leased to nonprofit organizations. The existing public use areas reflect the tremendous impact of the nearby mass of population existing and expanding in the Fort Worth-Dallas metropolitan area. The new regional airport and the development of cities such as Flower Mound on the periphery of the lake reveal the future demand for public recreation use acreage in the area. There is a distinct possibility that because of the potential visitation, the resources that exist could be impaired by over-use without proper planning and maintenance. At present, the future visitation, population movement, and land value escalation all reflect a real need for more public land than that which exists for recreational purposes at Grapevine Lake. Although some of the Government land is not developed at present, the future projections reveal that among primary needs at this project, the need for more land must be voiced. Other primary needs include improvement, development, and proper management to control erosion, improve the vegetative cover, improve wildlife habitat, and provide for high quality public use.

6-02. Soils.- Most of the soils within the reservoir area are alluvial varieties with the Frio Series being the major soil covered by the water body. The major soils associated with the surrounding project lands include the Bonti Series, Exray Series, and in smaller amounts, the Bastrop Series, Stidham Series and Altoga Series. These soils are associated with general site characteristics, including the lowlands, the East Cross Timbers, the stream terraces, and the uplands.

a. Lowland.- The principal series within this group is the Frio Series, which is a well drained, moderately slowly permeable,

calcareous clay. It is dark brown to gray color, and is associated with slopes of mainly less than 1 percent. It exists mainly in the original streambed and the lakebed at the Grapevine project.

b. East Texas Cross Timbers.- The region within which the project lies consists mainly of this heavily timbered vegetative grouping. The shoreline vegetation is generally associated with this group where dense tree growth occurs on both sides of the lake. The soils associated with this generally heavy timbered region include the Bonti and Exray Series. They are generally well drained, moderately slowly permeable, brown fine sandy loams with red clay loam subsoils over brownish yellow sandstone. These soils are associated with slopes which range from 1 to 10 percent.

c. Stream terraces.- The principal soil associated with this group is the Bastrop Series. It exists on the west and south in association with gravel pits and stream terraces. The soil is a moderately permeable soil with a brown fine sandy loam surface and a red sandy clay loam subsoil. This soil is associated with slopes from 1/2 to 6 percent. A second soil exists on the north and west portions of the lake in areas of calcareous high terraces which exist on rough slopes. This soil series is the Altoga Series, which is a well drained, high lime, light colored, silty clay. It is associated with slopes which range from 1 to 12 percent.

d. Uplands.- On the south side of the project area, there are open uplands where fewer trees exist and more grasses. The soil associated with this area is the Stidham Series. It is a deep, well drained, nearly level, brown loamy fine sand with a light yellowish brown or yellow sandy clay loam. The associated slope ranges from 0 to 3 percent.

e. Characteristics.- The soil characteristics present slight to severe limitations for recreation development, engineering, and land management (see table 8). Soils will support introduced and native grasses, shrubs, and trees for protection, development, and beautification of the area.

6-03. Vegetation.-

a. Grasses.- The principal grasses native to this region called East Texas Cross Timbers and its associated soils include big and little bluestem, switchgrass, indiangrass, wild ryes, lovegrasses, and purpletop. Where the climax grasses have been overgrazed, annual weeds, less desirable grasses, forbs, and woody plants are growing. In some areas, the impact on sites by visitation requires replanting. Some suggested species which are appropriate for replanting are improved varieties of bermudagrass and bluestem and also weeping lovegrass. King Ranch Bluestem has been found especially appropriate for the replacement of native climax grasses and other grasses which have decreased because of overuse or overgrazing.

b. Woody plants.- The principal tree species associated with the East Texas Cross Timbers area include post oak, blackjack, pecan, elm, and mesquite. Supplemental plantings and some thinning of trees are required to facilitate the use of public use areas for recreation access.

6-04. Fisheries.- An appropriate fishery management program is necessary to provide a constant, well balanced fish population. Ways and means need to be found to control the rough fish population, increase the game fish population, and increase the harvest of both.

6-05. Wildlife.- An appropriate wildlife management program is necessary to provide the greatest number of species for observation by nature groups and to provide huntable populations of game species. To accomplish such a program, the habitat will be improved to provide the necessary food and cover. Any new wildlife area designations will be chosen by criteria relating to the best lands available for land uses most beneficial to the public and long term usage of the reservoir area.

6-06. Archeological and historical.- Prior to construction of Grapevine Lake (July 1948), the Smithsonian Institute investigated and inventoried all archeological resources. Since that date no new investigation has taken place in the lake area. Historical factors were not investigated.

VII - RESOURCE DEVELOPMENT

7-01. General.- The objective of resource development is the improvement and management of the project resources for the best use and proper stewardship for the highest benefit to the general public. This will be accomplished by decreasing soil erosion, enhancing the vegetative cover for erosion control, providing wildlife habitat and improving fish and wildlife stocking, and providing for high quality public use. A management plan will be provided for managing the land resource and improving the vegetative cover. Also, a management plan will be developed for improving and managing the wildlife habitat. The improvement of vege-tative cover, including both grasses and woody plants, and the wildlife habitat will be initiated as soon as possible.

7-02. Soils.- Improvement and development of the soil resources will be accomplished by controlling erosion on graded and disturbed areas, stabilizing gullies, establishing and maintaining desirable vegetative cover.

7-03. Vegetation.- The basic objective is to provide excellent stewardship of the resources through protection, development, and management of the vegetative cover. A secondary objective is to meet future needs in consonance with the land capability and aesthetics of

LIMITATIONS OF SOILS FOR RECREATIONAL DEVELOPMENT
DENTON AND TARRANT COUNTIES, TEXAS

Soil Series	Recreation: Soil ratings and adverse features affecting: Sewage disposal: Filter fields	Sewage disposal: Lagons	Construction	Traffic-ways	Intensive camp and play area	Picnic areas	Paths and trails	Potential vertical rise (PVR)	Corrosion potential
Frio	Severe; percolation rate; shrink-swell potential; flood hazard	Slight permeability rate; flood hazard	Severe; shrink-swell potential; corrosion potential; flood hazard	Moderate; flood hazard; shrink-swell; traffic supporting capacity	Severe; permeability; texture; flood hazard	Moderate; flood hazard; texture	Moderate; texture	Moderate; 1.25 to 2.0 inches	Moderate
Altoga	Moderate; permeability	Moderate; permeability	Moderate; shrink-swell	Severe; traffic supporting capacity	Severe; soil texture; slope	Severe; soil texture; slope	Severe; soil texture	Moderate; 1.25 to 2.0 inches	Moderate
Exray	Severe; depth to bedrock; permeability	Severe; depth to bedrock; permeability	Severe; shrink-swell	Severe; depth to bedrock; shrink-swell; traffic supporting capacity	Moderate; slope	Moderate; slope	Slight; depth to bedrock	Severe; greater than 2.0 inches	Severe
Bonti	Severe; permeability; depth bedrock	Severe; depth to bedrock	Severe; slope depth to bedrock	Severe; depth to bedrock; traffic supporting capacity	Moderate; slope	Slight; slope	Slight; depth to bedrock	Severe; greater than 2.0 inches	Severe

TABLE 8 (continued)

LIMITATIONS OF SOILS FOR RECREATIONAL DEVELOPMENT
DENTON AND TARRANT COUNTIES, TEXAS

Soil Series	Recreation: Soil ratings and adverse features affecting: Sewage disposal: Filter fields	Sewage disposal: Lagons	Construction	Traffic-ways	Intensive camp and play area	Picnic areas	Paths and trails	Potential vertical rise (PVR)	Corrosion potential
Bastrop	Slight; permeability	Severe; permeability	Slight	Moderate; traffic supporting capacity	Slight	Slight	Slight	Moderate; 1.25 to 2.0 inches	Moderate
Stidham	Slight; permeability	Severe; permeability	Slight	Slight; traffic supporting capacity	Moderate; surface soil texture	Moderate; surface soil texture	Severe; surface soil texture	Slight; 0.5 to 1.25 inches	Slight

NOTE: The information contained in this table was received from the Soil Conservation Service in Denton, Texas

the area. Areas in woods and desirable grasses will not be disturbed unless a more desirable plant can be planted to benefit the area. Plantings and simple drainage features will be used to control rainfall runoff. Suitable tree species will be planted along the shoreline, where desirable, and on public use areas where needed as shown by vegetation deterioration. These plantings will be coordinated with other land use improvements. Where clearing is needed for the change in conservation pool, esthetically desirable and water tolerant trees will be left. Desirable trees will be selected to remain before clearing. Areas above the upper clearing contour with an ample tree cover will not be disturbed except to conform to the game management objectives in local areas selected by the district biologist for improvement of the overall game habitat. Planting and maintenance of vegetation will be accomplished for erosion control, public use, wildlife needs, and esthetics. Improvements and revegetation will be accomplished through lease agreements where practicable and feasible. On the remaining acres requiring treatment, improvement and revegetation will be accomplished by the Government.

7-04. Fisheries.- Improvement of the game fish population is the primary objective of fisheries resource development. Such a program should include methods of controlling pollution and the rough fish population, consideration of stocking additional game or predatory species, and the buoying of known and created fish concentration points to facilitate their harvest by anglers.

7-05. Wildlife.- The primary objective in developing the wildlife resource will be to attract the greatest variety of species and to produce huntable populations of game species where feasible. To accomplish this objective, the following methods will be used: a cover restoration program using plants which will provide both food and cover, creating edge conditions, using grazing as a management tool, and providing good plots and nesting aids if necessary. Because of the developing nature of the Grapevine area, hunting and shooting will need to be restricted when the nearby urban development and the heavy park usage lessen the space requirements between hunters and other park users.

VIII - SPECIAL FEATURES

8-01. General.- There are specific project features that require special consideration because of their relationship to recreation and resource development. These features are discussed in this chapter.

8-02. Project clearing requirements for recreation and resource development.- The features considered were requirements for shoreline stabilization, esthetics, vistas, safety, health, beach and marina development, and fish and wildlife. Clearing criteria contained in ER 415-2-1 and paragraph 5d(1) of ER 1130-2-400 for multiple purpose reservoirs cover most of the requirements. However, additional requirements were necessary, as shown below.

a. Water tolerant species of trees should be left above the top of the conservation pool.

b. Trees in boat harbors should be cut close to the ground line.

c. Stumps in the beach areas should be removed.

d. Forest products available for disposal will be utilized by the Corps for firewood, etc.

8-03. Protection of sites and resources during construction.- Construction contracts will contain statements to the effect that trees and other vegetation will not be subjected to unnecessary mechanical, chemical or fire damage with penalty clauses for violation. Hired labor forces will be given instruction and proper supervision to protect critical sites and endangered resources. Access roads terminating in the reservoir will be properly marked with signs prior to opening them to public use. Before construction is commenced on new recreation facilities, the contracting officer and district personnel, along with project personnel, will set the limits of the construction area. Any resource within the construction site will be protected when considered necessary.

8-04. Monumentation.- Monuments have been set along the Government's fee acquisition line and concrete monuments at the corners of the flowage easement line in order to improve administration of the lands over which the Government has acquired fee title or a lesser interest. These boundary line markers should be checked periodically by field personnel to ascertain if any changes have been made to the location of markers or boundary lines either by accident or impropriety. Boundaries and markers should be readily identifiable at all times.

8-05. Fencing.- Fencing will be provided where necessary for safety purposes.

8-06. Subimpoundments.- Many small subimpoundments exist on Grapevine project lands which have good potential for recreation and wildlife purposes. The development of these impoundment sites will be considered with park area developments. Construction of new impoundments will be considered with concern for their value for recreation and wildlife use.

8-07. Beautification.- Enhancement will be the major objective in facility design, relocation, excavation, clearing, landscaping and planting plans. Plant species utilized in planting along the shoreline within the project area will be water tolerant and should be selected preferably from the species indigenous in the project area. Plant material utilized in planting within the project area should be resistant to cotton root rot. Also, for some types of plants it may be necessary to reduce the alkalinity to obtain desirable growth.

IX - ADMINISTRATION AND MANAGEMENT

9-01. General.- The policies regarding the administration and management of the project are formulated to make the majority of the lake and the Government owned land available to the visiting public to the fullest extent compatible with an orderly and planned development. These policies control the administration, management and development of the project area but will not conflict with the operation of the project for its authorized purposes. They will be based on legislation enacted by federal, state and local governmental agencies and experience gained in the operation and development of similar projects, public parks, etc. The administration and management of the project are accomplished jointly through the district office and field personnel of the Fort Worth District.

a. District office.- District office personnel are principally concerned with the project's operation and management in accordance with purposes for which the project was authorized; the nature, location, construction codes, and requirements of development and improvements; coordination and reconciliation of activities relative to policies and regulations; coordination with representatives of other agencies and individuals; processing of leases, licenses, and permits not delegated to field personnel for issuance; and public relations.

b. Field office.- Field office personnel assigned to the project are concerned with direct operation, maintenance, and management of the project; supervision of all activities conducted on the impounded water and land over which the Government acquires fee title or a lesser interest; protection and maintenance of Government properties and interests; and requirement of high standards of public health and safety. The field personnel are trained in the rudiments of fire and mosquito control. Sufficient materials and equipment are available at the project for the field personnel to conduct these activities when the conditions demand. The reservoir manager has entered into cooperative agreements with local governmental agencies for participating in fire suppression when the need arises without cost to the Federal Government. The reservoir manager has been delegated as much authority as is practicable in order to maintain expeditious and beneficial administration and management of the project. He has been furnished with copies of all rules and regulations pertaining to maintenance and management of the project, including a manual outlining his procedures, policies, responsibilities, and duties.

9-02. Public use areas.- The public use areas, which include 12 park areas, will be administered and managed in accordance with EM 1130-2-400, ER 405-2-835, ER 405-1-830, SWDR 1130-2-7, and the Operation and Maintenance Manual to provide the greatest feasible safe use of the areas.

9-03. Group and private club areas.- These areas will be administered and managed in accordance with EM 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. At present there are no plans for private club areas.

9-04. Commercial sites and services.- With the construction of new recreation areas, additional commercial sites may be required. 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 the approval of the District Engineer.

9-05. Soils.- Use and management of the soil resources will be planned to maintain and improve the resources through proper use, erosion control, and establishment and improvement of vegetative cover. Management practices will include the following and will be accomplished in accordance with guidance and instructions of district specialists, i.e., agriculturist, agronomist, biologist, forester, and landscape architect.

a. Shaping borrow, spoil and other disturbed areas and establishing desirable vegetative cover.

b. Stabilizing cultivated fields by establishing desirable vegetative cover.

c. Shaping and stabilizing gullies by using diversion terraces and desirable vegetation.

d. Maintaining seeding, sodding and landscape plantings by proper watering, fertilizing, mowing and pruning.

e. All agriculture and grazing leases will be based on approved plans and coordinated with the Soil Conservation Service, U. S. Department of Agriculture.

9-06. Vegetative cover.-

a. Selection of planting areas will be coordinated with the appropriate district personnel, i.e., agriculturist, biologist, forester, agronomist and landscape architect to insure that the plantings will be protected in the initial stages of new development. Protection will be accomplished by fencing and coordination of the leasing program with the planting program. Qualified personnel under the direction of the appropriate district personnel will supervise the planting operation and selection of species.

b. Those areas within the boundaries of extensive tree cover will be treated as necessary to maintain effective ground cover and to promote desirable wildlife habitat. Management will include cutting in some areas to promote browse production and possibly planting to provide cover. These activities will be done by project personnel under the direction of the district forester and biologist.

c. Selection of trees to be saved inside the clearing area will be made by project personnel under the supervision of the district forester and landscape architect. The aesthetic arrangement and selection of ornamental plantings in park areas and around facilities will be designed and selected by the district landscape architect. The implementation of planting plans will be done by contract, hired labor, or project personnel under the direction and supervision of the district landscape architect.

9-07. Fisheries.- A fisheries management program is provided for the purpose of increasing benefits from the fisheries resource. While such a program is essentially the responsibility of the Texas Parks and Wildlife Department, the considerable burden imposed upon the Department by the increasing number of Corps of Engineers projects requires that the Fort Worth District supply all possible aid and assistance to secure an adequate management program. The Corps of Engineers will solicit the assistance of and coordinate the efforts of the U. S. Fish and Wildlife Service and the Texas Parks and Wildlife Department. The management program will be carried out under the supervision and guidance of the district biologist.

9-08. Wildlife.- A wildlife management program will be provided for the purpose of deriving maximum benefits from the wildlife resource and conservation of species. The responsibility for such a program rests primarily with the Texas Parks and Wildlife Department. However, since these areas do not meet the state's criteria for wildlife management areas, the Corps of Engineers will initiate a cover restoration program to insure an adequate habitat management plan. The Corps of Engineers has and will continue to solicit the assistance of and coordinate the efforts of the U. S. Fish and Wildlife Service, the Soil Conservation Service, and the Texas Parks and Wildlife Department. The management program will be carried out under the supervision and guidance of the district biologist.

9-09. Archeological and historical.- Any further investigation concerning excavation or historical study will be administered in accordance with ER 405-1-875. The District Engineer is authorized to permit only the National Park Service to use directly or through its cooperating agents such portions of Army properties under his jurisdiction which are available for historical sites and archeological excavations. Other applicants will be so advised, so that the National Park Service may make such arrangements with the applicant as authorized.

9-10. Rules and regulations.- For maximum public benefit with equal opportunity for all to enjoy the recreational resources and facilities available at the project, the establishment of certain rules and regulations has been necessary. Basic rules and regulations governing public use of this lake area were prescribed by the Secretary of the Army and published in the Federal Register dated 21 October 1959. They are incorporated as Title 36, Chapter III, Part 311, Code of Federal Regulations. Supplements to these regulations have been added by the District Engineer. Printed copies of the rules and regulations and project pamphlet maps are readily available at the project office. (See Chapter 29 and Exhibit A of SWDR 1130-2-7).

9-11. Law enforcement.- Enforcement of civil and criminal laws at the reservoir will remain the responsibility of duly constituted officers of federal, state and local governmental agencies. The Corps of Engineers, through field personnel, has cooperated fully with all law enforcement officers responsible for the enforcement of laws relative to civil actions, game and fish conservation, public health and sanitation, boating, and prevention of pollution.

9-12. Fire control.- A fire control plan has been developed by the reservoir manager, and agreements have been made with local fire departments to assist in suppressing fires. Burning will not be authorized or permitted on the project lands without the reservoir manager's approval and supervision.

9-13. Vector control.- The potential malaria hazard was evaluated prior to construction by the U. S. Public Health Service in a report which was included as Appendix VIII-B to the original master plan. The report recommended several preventive measures, including surveillance and a yearly spraying program. Efforts have continued over the years to prevent an outbreak of malaria or encephalitis which could be attributed to the existence of the lake. Vector surveillance and control programs are conducted under the supervision and guidance of the district biologist in cooperation with the federal and state health units.

9-14. Noxious weed control.- Noxious weeds have not created a problem to date due, in part, to periods of freezing weather each winter and the natural turbidity of the water. Should they become a problem, a weed control program will be initiated.

9-15. Land and water zoning.-

a. The land area has been zoned for allocation to the various priority uses.

b. The water area has been zoned and buoys placed which limit the speed of watercraft to five miles per hour at the spillway,

commercial docks, and other sites where safety is required. Buoys are being installed at designated swimming beaches.

c. Zoning for special events of short duration will be permitted after approval from the reservoir manager.

9-16. Interim use.- Lands not required for immediate or near future use for public use, fish and wildlife, and project operations may be leased for nonprofit group activities, grazing purposes, designated for hunting, or left idle for soil restoration through native plant succession. Grazing will be used as a management tool.

9-17. Mooring policy.- In order to (1) prevent the despoilment of the natural scenic beauty of the shoreline and preserve the shoreline area in as near the natural state as possible, (2) protect the public interest in the project from the standpoint of fire control and navigational safety, (3) safeguard the public health by an effective program of water pollution control, and (4) provide for the general public use, in lieu of private use, of project lands and waters, no new permits will be issued nor will existing permits be transferred on private boathouses. The objective is to phase out private boathouses as soon as practicable.

Individuals who desire to store and moor boats, barges, and other vessels on the reservoir for periods in excess of three (3) days at any one time shall arrange for such storage in selected storage areas leased to concessionaires. Such concessionaires shall be responsible for the care and protection of vessels stored with them when not in use, and for the movement of such vessels in case of fluctuation of the lake level, and in other emergencies. Permits will not be issued by the Corps of Engineers for the construction of permanent piers and docks, or for the permanent mooring of any individual boats, boat docks, boathouses, barges, houseboats, or other vessels on Grapevine Lake waters and project lands, at locations other than those included in concession lease areas.

When justified need for boat storage and vessel mooring facilities develops at various locations throughout the reservoir area, the Corps of Engineers will attempt to provide for these facilities.

Written requests from county authorities or other governmental agencies for authority to construct access roads to reservoir waters, and build boat launching facilities and parking areas at the ends of such roads in order to serve adjoining real estate developments will be considered for approval.

Bona fide yacht clubs will, upon written request, be given consideration to lease certain land and water areas for the purpose of providing collective multiple storage facilities for vessels belonging to members of the club.

9-18. Access by adjacent property owners.- Owners of land adjacent to the project will be allowed reasonable access to the lake in accordance with SWDR 1130-2-7 dated 25 September 1968. This does not mean that the adjacent owners are conveyed any rights to Government-owned lands, nor does it mean that these owners have any private rights for lease thereof for access or recreational purposes. Consents to tie into Government-owned roads located on land on which the Government owns only a road easement will be obtained in accordance with SWDR 405-2-9 dated 20 April 1965. Consents to tie into Government-owned roads located on fee-owned land will require the approval of the Secretary of the Army, who must find that the grant will not be against the public interest.

9-19. Safety measures.- Safety programs and measures are administered in accordance with SWDR 1130-2-7 dated 25 September 1968 and the Operation and Maintenance Manual.

9-20. Health and sanitation.- The development and use of the reservoir are planned for the public interest and the utmost consideration has been given to the maintenance of high standards of public health and safety. The state health laws, rules and regulations are applicable to all facilities constructed and provided at the project. Commercial operators and licensees are also required to abide by the state health laws, rules and regulations. Disposal of waste, trash and debris will not be permitted on Government land without authorization and then only in accordance with state laws and at designated locations.

9-21. Protection of biological resources of project lands and waters.- A biological management program for Grapevine Lake is planned for the purpose of deriving maximum benefits from fish and wildlife resources associated with the project. The Corps of Engineers will solicit the assistance of and coordinate the efforts of the U. S. Fish and Wildlife Service, the Environmental Protection Agency, the U. S. Public Health Service, the Texas Parks and Wildlife Department, and the Texas Department of Health in the implementation of this program.

9-22. Boating.- Boat permits are required for some floating craft. (See chapter 5 of SWDR 1130-2-7).

X - COORDINATION WITH OTHER AGENCIES

10-01. General.- Section 4 of the Flood Control Act approved 22 December 1944, as amended, provides that development of lake areas controlled by the Department of the Army shall be concerned with the public interest and that preference shall be given to federal, state and local governmental agencies for use of areas suitable for recreational purposes. Federal, state and local governmental agencies were contacted during the planning stage of the original master plan, and the plan has been coordinated with their desires.

10-02. This updated plan of development will be submitted to other federal, state or local governmental agencies for review and comment. It is considered that the updated plan is in consonance with the policies and comments stated by these agencies. Liaison is maintained with these agencies to insure that recreational development at the project is in accordance with the State Comprehensive Outdoor Recreation Plan.

10-03. Recreation.- Planning for recreational development was coordinated with the Texas Parks and Wildlife Department's State Comprehensive Outdoor Recreation Plan, the Bureau of Outdoor Recreation survey and recreation trends, the needs for the handicapped furnished by the State Department of Mental Health and Mental Retardation and the Texas Education Agency.

10-04. Soils.- Planning for protection, development, and management of soil resources and their effects upon recreational development and construction was coordinated with the Soil Conservation Service. Their survey data and guidance were utilized in developing the plan.

10-05. Vegetative cover.- Same coordination as for soil resources. Coordination will continue through development and management programs in reference to the Memorandum of Understanding, 27 March 1963, between the Secretaries of the Department of Defense and the Department of Agriculture for the conservation of forests, vegetative cover, soil, and water on lands administered by the Department of Defense.

10-06. Archeological and historical.- Planning for development and protection of archeological resources and their effects upon recreation development and construction was coordinated with the National Park Service. Development of historical resources will be accomplished by initiating a historical research program conducted by competent historians. The program will be coordinated with state universities, state historical commissions and societies.

10-07. National Park Service.- During December 1946, representatives of the National Park Service and the Corps of Engineers surveyed the recreation potential of the Grapevine project. As a result of this survey, the National Park Service submitted a report entitled, "Recreational Use and Development, Grapevine Reservoir Project," a copy of which is incorporated in the definite project report as Appendix VIII-C, Exhibit I. Conclusions reached by the National Park Service are: (1) Grapevine Lake should be comparatively choice for recreational use; (2) the importance of the project for such use will be greatly enhanced by the proximity of a very large and rapidly growing population and by unusually satisfactory access afforded by existing highways; (3) it will be especially important to provide developments by means of which the maximum recreational and related benefits inherent in the project can be derived; and (4) a master recreational plan should be prepared.

10-08. Fish and Wildlife Service.- In March 1966, the Bureau of Sport Fisheries and Wildlife of the U. S. Fish and Wildlife Service submitted a followup report to the initial report of August 1950, concerning the state of fish and wildlife resources of the Grapevine Lake project. A copy of this report is incorporated in Design Memorandum No. 1C as Appendix A.

10-09. Public Health Service.- In February 1946, the Public Health Service submitted a report entitled, "Reconnaissance Malaria Control Survey Report on the Proposed Grapevine Reservoir near Grapevine, Texas," a copy of which is incorporated in the definite project report as Appendix VIII-B.

10-10. State agencies.- The master plan for the Grapevine Lake project was discussed with representatives of the Texas State Parks Board and the Texas Game and Fish Commission (both agencies now combined into the Texas Parks and Wildlife Department) and the Texas State Department of Health. These agencies did not offer any adverse criticism to the plan. The Game and Fish Commission expressed an interest in the establishment of a biological station at the project by Southern Methodist University. The State Parks Board indicated a preference that the local governmental agencies license the areas and develop them for public use. The Texas Parks and Wildlife Department was contacted in regard to a park area at Grapevine Lake. They are interested in an area but with their limited funds are unable to assume responsibility at this time.

10-11. Other agencies.-

a. Nearby cities.- All prior agreements with nearby cities have been terminated by amicable agreement. Any future proposals by local interests will be considered on a case by case basis.

b. Park Cities Lions Club.- The Park Cities Lions Club has a lease on 25 acres of land adjacent to Walnut Grove Park. This area is operated on a noncommercial recreation basis.

c. Arlington Boys Club, Inc..- The Arlington Boys Club, Inc. has a lease on 17 acres of land adjacent to Rocky Point Park.

10-12. Organizations.- Several applications were received from quasi-public, religious, and educational organizations and private clubs for areas to be developed for recreational purposes. For various reasons, none of the organizations were granted use of land at the project. Allocation of land for such purposes will be in accordance with policies of the Secretary of the Army whereby the general public receives the maximum benefits.

10-13. Public hearing.- A public hearing was held at Grapevine, Texas, on 15 April 1952, to inform the public of the proposed recreation

plan. The hearing was also held to obtain expressions of public sentiment in regard to the plan and to obtain information relative to the extent non-Federal governmental agencies would participate in the development of recreational activities. The plan was favorably received by those present.

XI - JUSTIFICATION FOR DEVELOPMENT

11-01. Economic effect.- Grapevine Lake has been in operational status since July 1952. During its 14-year operational period, the project has been one of the prime recreation attractions of north central Texas. The proximity of the project to the densely populated Dallas-Fort Worth urban area has been an instrumental factor in the heavy visitation. Subdivision development is quickly inclosing the reservoir area, and with the development of new towns such as Flower Mound, and with the development of the regional airport, the impact will be heavy on the reservoir project area. The existence of this water and recreation resource has been one of the principal contributing factors to the economic prosperity of the entire area.

11-02. Benefits.- The benefits that will be derived by the visiting public from the use of the Government-owned land and the facilities developed for recreational activities will be in the form of pleasure and relaxation. Recreational benefits may have a higher monetary value to certain individuals than others, depending upon individual recreational interests, and ability and willingness to pay for recreational activities.

11-03. Development and management.- The plan of development and management as presented herein complies with the requirements of the Flood Control Act of 22 December 1944, as amended, existing policies adopted and instructions issued by higher authority. Facilities presented in this plan were derived from the computation of the design day load at the project and in accordance with ER 1130-2-312. See tables 2, 3, and 4 for details of this computation.

11-04. Personnel requirements.- The full or part time services of the personnel shown in the following tabulation will be required for recreation and resource management.

Reservoir manager, GS-11
Clerk-typist, GS-05

Operation and maintenance

Reservoir maintenance worker foreman, WS-07
2 Reservoir maintenance workers, WG-08
3 Reservoir maintenance workers, WG-05

Public use

Outdoor recreation planner, GS-09
Supervisory reservoir ranger, GS-09
Reservoir ranger, GS-07
4 Reservoir rangers, GS-05

XII - COST ESTIMATES

12-01. The estimated total cost for the construction of the proposed additional facilities is $6,921,000, including engineering and design and supervision and administration, as shown in table 10. The estimated cost of the planned recreational facilities under column (2) of tables 11 through 21 is for those facilities that are proposed for construction during FY 1972 through FY 1977. The estimated cost of the planned recreational facilities under column (3) is for those facilities proposed for construction during FY 1978 and subsequent years on a cost sharing basis as prescribed in Public Law 89-72. Table 9 presents the estimated cost for each area, showing existing cost (through FY 1971) and the estimated cost of the facilities proposed by the Corps of Engineers.

a. A summary of estimate of cost for the entire development program is shown in table 10 of the cost estimate. The funds required for operation and maintenance are shown in table 22.

b. Allocations and expenditures of funds.- A resume of allocations and expenditures to date, and a schedule of funds by fiscal years for the recreational development are presented in table 9. Existing facilities include all work constructed through fiscal year 1971. The total project cost of $7,923,800 for all recreational facilities would be an increase of $2,236,800 over the total project cost, including engineering and design and supervision and administration, shown in Design Memorandum No. 1C.

c. Explanations of changes in cost.- The increase in cost is due to additional recreational facilities which are considered necessary in the long range plan to accommodate general public use of the project, and an increase in unit prices to more accurately reflect July 1971 prices.

12-02. Analysis of cost.- The following tabulation presents a summary of the costs and percentages for planned development.

Item	Total planned development Estimate of cost	Percent of cost
Roads (including paving)	$1,242,400	21
Parking areas (including paving)	617,600	10
Sanitary facilities (includes service buildings and sanitary dump stations)	2,229,500	37
Picnic facilities (including tables and shelters in picnic and camping areas)	1,023,500	17
Water systems (including underground service lines and drinking fountains)	240,800	4
Miscellaneous (includes site improvement, service docks, signs, buoys, beach improvement, change shelters, electric service lines, and boat ramps)	664,800	11
Total	$6,018,600*	100

*Engineering and design and supervision and administration not included.

TABLE 9

Park area	Estimated costs in thousands of dollars: Existing development thru FY 71	Planned FY 72-FY 77	Planned FY 78 & thereafter	Total planned development
Rockledge Park	$ 66.9	$ 61.4	$	$ 61.4
Murrell Park	147.5	1,468.3	198.5	1,666.8
Twin Coves Park	25.9	647.2		647.2
Marshall Park	36.3	735.6	489.4	1,225.0
Meadowmere Park	92.1	244.0	59.1	303.1
Oak Grove Park	265.4	1,451.8	6.7	1,458.5
Silver Lake Park	162.3	636.1	20.5	656.6
Subtotal	$ 796.4	$5,244.4	$774.2	$6,018.6
E&D	91.8	472.0	69.3	541.3
S&A	114.6	314.6	46.5	361.1
Total	$1,002.8	$6,031.0	$890.0	$6,921.0

Note: Cost estimates for wildlife areas and nature study areas will be added as a supplement to the master plan when the detailed management plan is added.

New Public Use Areas to be Developed
(on 50-50 cost sharing basis)

Park area	Estimated cost
Rocky Point Park	$ 853,500
Knob Hills Park	550,300
North Shore and Roanoke Parks	90,300
Walnut Park	1,054,000
Subtotal	$2,548,100
E&D	229,300
S&A	152,600
Total	$2,930,000

Note: The cost estimates for the four new park areas were not included in the summary of cost (table 10).

UNIT COSTS FOR PLANNED DEVELOPMENT

Item	Unit	Unit cost
a. Roads:		
Paved (new primary)	Mile	$50,000.00
Hiking trail	Mile	1,000.00
b. Parking areas:		
Paved (new)	S.F.	.53
c. Boat launching ramps (concrete):		
One-lane	L.F.	30.00
Two-lane	L.F.	50.00
Four-lane	L.F.	80.00
d. Toilets:		
Masonry double unit (waterborne)	Each	35,000.00
e. Water supply system:		
Water wells (pressure type)	Each	9,000.00
Waterline extension	L.F.	2.00
Drinking fountains	Each	200.00
f. Picnic and camping units	Each	365.00
g. Picnic shelters:		
1-table shelters	Each	500.00
Group shelters	Each	3,500.00
h. Site improvement:		
Underbrushing and cleanup - average $50.00 per picnic/camp unit.		
i. Signs:		
Park entrance signs	Each	500.00
Directional signs, etc.	Each	100.00
j. Electric service lines (underground)	L.F.	3.00
k. Buoys (includes cable and anchor)	Each	100.00
l. Beach improvement	L.S.	5,000.00
m. Change shelters (with showers and toilets)	Each	35,000.00
n. Overlook shelter	None	
o. Registration booth	None	
p. Service building	Each	45,000.00
q. Sanitary dump station	Each	2,500.00
r. Courtesy dock	Each	2,000.00

TABLE 10

SUMMARY OF ESTIMATE OF COST
FOR DEVELOPMENT - PUBLIC USE AREAS

Acct No.	Item	Unit	Existing Development (1) Quantity	Existing Development (1) Funds Allotted	Planned Development (2) Quantity	Planned Development (2) Cost	Planned Development (3) Quantity	Planned Development (3) Cost	Total Planned Development Quantity	Total Planned Development Cost
14 & 711.	RECREATIONAL FACILITIES									
	a. Roads:									
	Paved (new primary)	Mile	16.3	$ 287,900	20.3	$1,015,000	4.5	$225,000	24.8	$1,240,000
	Gravel	Mile	10.9	103,800	0	0	0	0	0	0
	Paved (existing gravel)	Mile	0	0	0	0	0	0	0	0
	Paved (new secondary)	Mile	0	0	0	0	0	0	0	0
	Trails	Mile	0	0	1.3	1,300	1.1	1,100	2.4	2,400
	b. Parking areas:									
	Paved (new)	S.F.	41,470	30,000	523,500	278,300	31,200	16,400	554,700	294,700
	Gravel	S.F.	37,986	8,900	0	0	0	0	0	0
	Paved (existing gravel)	S.F.	0	0	0	0	0	0	0	0
	c. Boat launching sites:									
	Boat ramps (concrete)	Each	13	7,300	54	269,100	4	24,700	58	293,800
	Turnarounds and trailer parking (paved)	S.F.	0	0	558,852	296,500	49,850	26,400	609,302	322,900

TABLE 10 (continued)

Acct No.	Item	Unit	Existing Development (1) Quantity	Existing Development (1) Funds Allotted	Planned Development (2) Quantity	Planned Development (2) Cost	Planned Development (3) Quantity	Planned Development (3) Cost	Total Planned Development Quantity	Total Planned Development Cost
14 & 711.	RECREATIONAL FACILITIES (continued)									
	d. Toilets:									
	Masonry double unit (concrete vault type)	Each	18	$ 82,300	0	$ 0	0	$ 0	0	$ 0
	Frame single unit (concrete vault type)	Each	0	0	0	0	0	0	0	0
	Masonry double unit (waterborne)	Each	1	14,000	27	945,000	7	245,000	34	1,190,000
	Convert to waterborne	Each	0	0	15	109,500	0	0	15	109,500
	e. Water supply system:									
	Water wells (pressure type)	Each	16	44,600	6	54,000	2	18,000	8	72,000
	Lake pump and filter	Each	0	0	0	0	0	0	0	0
	Waterline extension	L.F.	12,700	17,600	67,150	134,300	2,406	17,500	75,900	151,800
	Drinking fountains	Each	27	5,200	79	15,800	6	1,200	85	17,000
	f. Picnic and camping units	Each	235	52,600	980	357,700	150	54,800	1,130	412,500
	One unit consists of one table, one fireplace, and one trashcan.									
	Picnic tables (wood)	Each	0	0	0	0	0	0	0	0

TABLE 10 (continued)

Acct No.	Item	Unit	Existing Development (1) Quantity	Existing Development (1) Funds Allotted	Planned Development (2) Quantity	Planned Development (2) Cost	Planned Development (3) Quantity	Planned Development (3) Cost	Total Planned Development Quantity	Total Planned Development Cost
14 & 711.	RECREATIONAL FACILITIES (continued)									
	g. Picnic shelters:									
	1-table shelters	Each	111	$ 35,500	980	$ 490,000	150	$ 75,000	1,130	$ 565,000
	Group shelters	Each	0	0	4	14,000	4	14,000	8	28,000
	Group campers	Each	0	0	9	13,500	3	4,500	12	18,000
	h. Site improvement:									
	Underbrushing and cleanup	L.S.	Job	84,500	Job	49,900	Job	7,600	Job	57,500
	Tree planting and seeding	Acre	0	0	0	0	0	0	0	0
	i. Signs	L.S.	Job	9,100	Job	6,900	Job	1,700	Job	8,600
	j. Elec service lines	L.S.	Job	500	Job	129,600	Job	26,300	Job	155,900
	k. Buoys	L.S.	Job	12,600	Job	3,000	0	0	Job	3,000
	l. Beach improvement	L.S.	0	0	Job	15,000	Job	5,000	Job	20,000
	m. Change shelter	Each	0	0	6	48,000	1	8,000	7	56,000
	n. Overlook shelter	Each	0	0	0	0	0	0	0	0
	o. Registration booths	Each	0	0	0	0	0	0	0	0

TABLE 10 (continued)

Acct No.	Item	Unit	Existing Development (1) Quantity	Existing Development (1) Funds Allotted	Planned Development (2) Quantity	Planned Development (2) Cost	Planned Development (3) Quantity	Planned Development (3) Cost	Total Planned Development Quantity	Total Planned Development Cost
14 & 711.	RECREATIONAL FACILITIES (continued)									
	p. Service building (includes water-borne toilets, shower and laundry facilities)	Each	0	$ 0	20	$ 900,000	0	$ 0	20	$ 900,000
	q. Sanitary stations	Each	0	0	12	30,000	0	0	12	30,000
	r. Courtesy docks	Each	0	0	34	68,000	1	2,000	35	70,000
	Subtotal			$ 796,400		$5,244,400		$774,200		$6,018,600
30.	E&D			91,800		472,000		69,300		541,300
31.	S&A			114,600		314,600		46,500		361,100
	Total			$1,002,800		$6,031,000		$890,000		$6,921,000

(1) Existing development provided through FY 1971.
(2) Planned development proposed for FY 1972 through FY 1977.
(3) Planned development proposed for FY 1978 and thereafter.

TABLE 11

DETAILS OF ESTIMATE OF COST
FOR DEVELOPMENT - PUBLIC USE AREAS

Acct No.	Item	Unit	Existing Development (1) Quantity	Existing Development (1) Funds Allotted	Planned Development (2) Quantity	Planned Development (2) Cost	Planned Development (3) Quantity	Planned Development (3) Cost	Total Planned Development Quantity	Total Planned Development Cost
14 & 711.	RECREATIONAL FACILITIES									
	Rockledge Park									
	a. Roads:									
	Paved (new primary)	Mile	0.8	$14,100	0	$ 0	0	$ 0	0	$ 0
	Gravel	Mile	1.0	9,500	0	0	0	0	0	0
	Paved (existing gravel)	Mile	0	0	0	0	0	0	0	0
	Paved (new secondary)	Mile	0	0	0	0	0	0	0	0
	b. Parking areas:									
	Paved (new)	S.F.	1,427	1,100	8,200	4,800	0	0	0	0
	Gravel	S.F.	2,700	700	0	0	0	0	0	0
	Paved (existing gravel)	S.F.	0	0	0	0	0	0	0	0
	c. Boat launching sites:									
	Boat ramps (concrete)	Each	0	0	4	19,500	0	0	4	19,500
	Turnarounds and trailer parking (paved)	S.F.	0	0	25,025	13,300	0	0	25,025	13,300

TABLE 11 (continued)

Acct No.	Item	Unit	Existing Development (1) Quantity	Existing Development (1) Funds Allotted	Planned Development (2) Quantity	Planned Development (2) Cost	Planned Development (3) Quantity	Planned Development (3) Cost	Total Planned Development Quantity	Total Planned Development Cost
14 & 711.	RECREATIONAL FACILITIES (continued)									
	d. Toilets:									
	Masonry double unit (concrete vault type)	Each	2	$ 9,100	0	$ 0	0	$ 0	0	$ 0
	Frame single unit (concrete vault type)	Each	0	0	0	0	0	0	0	0
	Masonry double unit (waterborne)	Each	0	0	0	0	0	0	0	0
	Convert to waterborne	Each	0	0	2	14,600	0	0	2	14,600
	e. Water supply system:									
	Water wells (pressure type)	Each	2	5,500	0	0	0	0	0	0
	Lake pump and filter	Each	0	0	0	0	0	0	0	0
	Waterline extension	L.F.	0	0	0	0	0	0	0	0
	Drinking fountains	Each	3	600	0	0	0	0	0	0
	f. Picnic and camping units	Each	42	9,400	10	3,700	0	0	10	3,700
	One unit consists of one table, one fireplace, and one trashcan.									
	Picnic tables (wood)	Each	0	0	0	0	0	0	0	0

TABLE 11 (continued)

Acct No.	Item	Unit	Existing Development (1) Quantity	Existing Development (1) Funds Allotted	Planned Development (2) Quantity	Planned Development (2) Cost	Planned Development (3) Quantity	Planned Development (3) Cost	Total Planned Development Quantity	Total Planned Development Cost
14 & 711.	RECREATIONAL FACILITIES (continued)									
	g. Picnic shelters:									
	1-table shelters	Each	30	$ 9,600	10	$ 5,000	0	$ 0	10	$ 5,000
	Group shelters	Each	0	0	0	0	0	0	0	0
	h. Site improvement:									
	Underbrushing and cleanup	L.S.	Job	5,700	Job	500	0	0	Job	500
	Tree planting and seeding	Acre	0	0	0	0	0	0	0	0
	i. Signs	L.S.	Job	1,200	0	0	0	0	0	0
	j. Elec service lines	L.S.	Job	100	0	0	0	0	0	0
	k. Buoys	L.S.	Job	300	0	0	0	0	0	0
	l. Beach improvement	L.S.	0	0	0	0	0	0	0	0
	m. Change shelter	Each	0	0	0	0	0	0	0	0
	n. Overlook shelter	Each	0	0	0	0	0	0	0	0
	o. Registration booths	Each	0	0	0	0	0	0	0	0

TABLE 11 (continued)

Acct No.	Item	Unit	Existing Development (1) Quantity	Existing Development (1) Funds Allotted	Planned Development (2) Quantity	Planned Development (2) Cost	Planned Development (3) Quantity	Planned Development (3) Cost	Total Planned Development Quantity	Total Planned Development Cost
14 & 711.	RECREATIONAL FACILITIES (continued)									
	p. Service building (includes waterborne toilets, shower and laundry facilities)	Each	0	$ 0	0	$ 0	0	$ 0	0	$ 0
	q. Sanitary stations	Each	0	0	0	0	0	0	0	0
	r. Courtesy docks	Each	0	0	0	0	0	0	0	0
	Total			$66,900		$61,400		$ 0		$61,400

(1) Existing development provided through FY 1971.
(2) Planned development proposed for FY 1972 through FY 1977.
(3) Planned development proposed for FY 1978 and thereafter.

TABLE 12

DETAILS OF ESTIMATE OF COST
FOR DEVELOPMENT - PUBLIC USE AREAS

Acct No.	Item	Unit	Existing Development (1) Quantity	Existing Development (1) Funds Allotted	Planned Development (2) Quantity	Planned Development (2) Cost	Planned Development (3) Quantity	Planned Development (3) Cost	Total Planned Development Quantity	Total Planned Development Cost
14 & 711.	RECREATIONAL FACILITIES									
	Murrell Park									
	a. Roads:									
	Paved (new primary)	Mile	3.1	$ 54,800	8.4	$420,000	0.3	$ 15,000	8.7	$435,000
	Gravel	Mile	2.1	20,000	0	0	0	0	0	0
	Paved (existing gravel)	Mile	0	0	0	0	0	0	0	0
	Paved (new secondary)	Mile	0	0	0	0	0	0	0	0
	b. Parking areas:									
	Paved (new)	S.F.	600	500	125,200	66,600	4,000	2,100	129,200	68,700
	Gravel	S.F.	9,300	2,100	0	0	0	0	0	0
	Paved (existing gravel)	S.F.	0	0	0	0	0	0	0	0
	c. Boat launching sites:									
	Boat ramps (concrete)	Each	1	400	8	48,100	4	24,700	12	72,800
	Turnarounds and trailer parking (paved)	S.F.	0	0	90,200	47,800	49,850	26,400	140,050	74,200

TABLE 12 (continued)

Acct No.	Item	Unit	Existing Development (1) Quantity	Existing Development (1) Funds Allotted	Planned Development (2) Quantity	Planned Development (2) Cost	Planned Development (3) Quantity	Planned Development (3) Cost	Total Planned Development Quantity	Total Planned Development Cost
14 & 711.	RECREATIONAL FACILITIES (continued)									
	d. Toilets:									
	Masonry double unit (concrete vault type)	Each	5	$ 22,800	0	$ 0	0	$ 0	0	$ 0
	Frame single unit (concrete vault type)	Each	0	0	0	0	0	0	0	0
	Masonry double unit (waterborne)	Each	0	0	9	315,000	1	35,000	10	350,000
	Convert to waterborne	Each	0	0	3	21,900	0	0	3	21,900
	e. Water supply system:									
	Water wells (pressure type)	Each	4	11,200	0	0	0	0	0	0
	Lake pump and filter	Each	0	0	0	0	0	0	0	0
	Waterline extension	L.F.	1,149	1,600	25,700	51,400	2,100	4,200	27,800	55,600
	Drinking fountains	Each	5	1,000	33	6,600	2	400	35	7,000
	f. Picnic and camping units	Each	28	6,300	260	94,900	85	31,000	345	125,900
	One unit consists of one table, one fireplace, and one trashcan.									
	Picnic tables (wood)	Each	0	0	0	0	0	0	0	0

TABLE 12 (continued)

Acct No.	Item	Unit	Existing Development (1) Quantity	Existing Development (1) Funds Allotted	Planned Development (2) Quantity	Planned Development (2) Cost	Planned Development (3) Quantity	Planned Development (3) Cost	Total Planned Development Quantity	Total Planned Development Cost
14 & 711.	RECREATIONAL FACILITIES (continued)									
	g. Picnic shelters:									
	1-table shelters	Each	14	$ 4,500	260	$130,000	85	$ 42,500	345	$172,500
	Group shelters	Each	0	0	1	3,500	1	3,500	2	7,000
	Group camping	Each	0	0	7	10,500	2	3,000	9	13,500
	h. Site improvement:									
	Underbrushing and cleanup	L.S.	Job	18,200	Job	13,000	Job	4,300	Job	17,300
	Tree planting and seeding	Acre	0	0	0	0	0	0	0	0
	i. Signs	L.S.	Job	2,000	Job	2,700	Job	200	Job	2,900
	j. Elec service lines	L.S.	Job	100	Job	26,800	Job	4,200	Job	31,000
	k. Buoys	L.S.	Job	2,000	0	0	0	0	0	0
	l. Beach improvement	L.S.	0	0	0	0	0	0	0	0
	m. Change shelter	Each	0	0	1	8,000	0	0	1	8,000
	n. Overlook shelter	Each	0	0	0	0	0	0	0	0
	o. Registration booths	Each	0	0	0	0	0	0	0	0

TABLE 12 (continued)

Acct No.	Item	Unit	Existing Development (1) Quantity	Existing Development (1) Funds Allotted	Planned Development (2) Quantity	Planned Development (2) Cost	Planned Development (3) Quantity	Planned Development (3) Cost	Total Planned Development Quantity	Total Planned Development Cost
14 & 711.	RECREATIONAL FACILITIES (continued)									
	p. Service building (includes water-borne toilets, shower and laundry facilities)	Each	0	$ 0	4	$ 180,000	0	$ 0	4	$ 180,000
	q. Sanitary stations	Each	0	0	3	7,500	0	0	3	7,500
	r. Courtesy docks	Each	0	0	7	14,000	1	2,000	8	16,000
	Total			$147,500		$1,468,300		$198,500		$1,666,800

(1) Existing development provided through FY 1971.
(2) Planned development proposed for FY 1972 through FY 1977.
(3) Planned development proposed for FY 1978 and thereafter.

TABLE 13

DETAILS OF ESTIMATE OF COST
FOR DEVELOPMENT - PUBLIC USE AREAS

Acct No.	Item	Unit	Existing Development (1) Quantity	Existing Development (1) Funds Allotted	Planned Development (2) Quantity	Planned Development (2) Cost	Planned Development (3) Quantity	Planned Development (3) Cost	Total Planned Development Quantity	Total Planned Development Cost
14 & 711.	RECREATIONAL FACILITIES									
	Twin Coves Park									
	a. Roads:									
	Paved (new primary)	Mile	0	$ 0	2.3	$115,000	0	$ 0	2.3	$115,000
	Gravel	Mile	1.0	9,500	0	0	0	0	0	0
	Paved (existing gravel)	Mile	0	0	0	0	0	0	0	0
	Paved (new secondary)	Mile	0	0	0	0	0	0	0	0
	Trails	Mile	0	0	0.8	800	0	0	0.8	800
	b. Parking areas:									
	Paved (new)	S.F.	0	0	81,800	43,400	0	0	81,800	43,400
	Gravel	S.F.	0	0	0	0	0	0	0	0
	Paved (existing gravel)	S.F.	0	0	0	0	0	0	0	0
	c. Boat launching sites:									
	Boat ramps (concrete)	Each	0	0	4	19,500	0	0	4	19,500
	Turnarounds and trailer parking (paved)	S.F.	0	0	23,025	12,200	0	0	23,025	12,200

TABLE 13 (continued)

Acct No.	Item	Unit	Existing Development (1) Quantity	Existing Development (1) Funds Allotted	Planned Development (2) Quantity	Planned Development (2) Cost	Planned Development (3) Quantity	Planned Development (3) Cost	Total Planned Development Quantity	Total Planned Development Cost
14 & 711.	RECREATIONAL FACILITIES (continued)									
	d. Toilets:									
	Masonry double unit (concrete vault type)	Each	1	$ 4,600	0	$ 0	0	$ 0	0	$ 0
	Frame single unit (concrete vault type)	Each	0	0	0	0	0	0	0	0
	Masonry double unit (waterborne)	Each	0	0	1	35,000	0	0	1	35,000
	Convert to waterborne	Each	0	0	1	7,300	0	0	1	7,300
	e. Water supply system:									
	Water wells (pressure type)	Each	1	2,800	1	9,000	0	0	1	9,000
	Lake pump and filter	Each	0	0	0	0	0	0	0	0
	Waterline extension	L.F.	600	800	4,400	8,800	0	0	4,400	8,800
	Drinking fountains	Each	1	200	9	1,800	0	0	9	1,800
	f. Picnic and camping units	Each	12	2,700	149	54,400	0	0	149	54,400
	One unit consists of one table, one fireplace, and one trashcan.									
	Picnic tables (wood)	Each	0	0	0	0	0	0	0	0

TABLE 13 (continued)

Acct No.	Item	Unit	Existing Development (1) Quantity	Existing Development (1) Funds Allotted	Planned Development (2) Quantity	Planned Development (2) Cost	Planned Development (3) Quantity	Planned Development (3) Cost	Total Planned Development Quantity	Total Planned Development Cost
14 & 711.	RECREATIONAL FACILITIES (continued)									
	g. Picnic shelters:									
	1-table shelters	Each	0	$ 0	149	$ 74,500	0	$ 0	149	$ 74,500
	Group shelters	Each	0	0	0	0	0	0	0	0
	Group camping	Each	0	0	2	3,000	0	0	2	3,000
	h. Site improvement:									
	Underbrushing and cleanup	L.S.	Job	4,900	Job	7,600	0	0	Job	7,600
	Tree planting and seeding	Acre	0	0	0	0	0	0	0	0
	i. Signs	L.S.	Job	200	Job	1,400	0	0	Job	1,400
	j. Elec service lines	L.S.	Job	200	Job	13,500	0	0	Job	13,500
	k. Buoys	L.S.	0	0	0	0	0	0	0	0
	l. Beach improvement	L.S.	0	0	0	0	0	0	0	0
	m. Change shelter	Each	0	0	0	0	0	0	0	0
	n. Overlook shelter	Each	0	0	0	0	0	0	0	0
	o. Registration booths	Each	0	0	0	0	0	0	0	0

TABLE 13 (continued)

Acct No.	Item	Unit	Existing Development (1) Quantity	Existing Development (1) Funds Allotted	Planned Development (2) Quantity	Planned Development (2) Cost	Planned Development (3) Quantity	Planned Development (3) Cost	Total Planned Development Quantity	Total Planned Development Cost
14 & 711.	RECREATIONAL FACILITIES (continued)									
	p. Service building (includes water-borne toilets, shower and laundry facilities)	Each	0	$ 0	5	$225,000	0	$ 0	5	$225,000
	q. Sanitary stations	Each	0	0	2	5,000	0	0	2	5,000
	r. Courtesy docks	Each	0	0	5	10,000	0	0	5	10,000
	Total			$ 25,900		$647,200		$ 0		$647,200

(1) Existing development provided through FY 1971.
(2) Planned development proposed for FY 1972 through FY 1977.
(3) Planned development proposed for FY 1978 and thereafter.

TABLE 14

DETAILS OF ESTIMATE OF COST
FOR DEVELOPMENT - PUBLIC USE AREAS

Acct No.	Item	Unit	Existing Development (1) Quantity	Existing Development (1) Funds Allotted	Planned Development (2) Quantity	Planned Development (2) Cost	Planned Development (3) Quantity	Planned Development (3) Cost	Total Planned Development Quantity	Total Planned Development Cost
14 & 711.	RECREATIONAL FACILITIES									
	Rocky Point Park									
a.	Roads:									
	Paved (new primary)	Mile	0	$ 0	0	$ 0	4.2	$210,000	4.2	$210,000
	Gravel	Mile	0	0	0	0	0	0	0	0
	Paved (existing gravel)	Mile	0	0	0	0	0	0	0	0
	Paved (new secondary)	Mile	0	0	0	0	0	0	0	0
b.	Parking areas:									
	Paved (new)	S.F.	0	0	0	0	108,600	57,600	108,600	57,600
	Gravel	S.F.	0	0	0	0	0	0	0	0
	Paved (existing gravel)	S.F.	0	0	0	0	0	0	0	0
c.	Boat launching sites:									
	Boat ramps (concrete)	Each	0	0	0	0	4	23,400	4	23,400
	Turnarounds and trailer parking (paved)	S.F.	0	0	0	0	46,850	24,800	46,850	24,800

TABLE 14 (continued)

Acct No.	Item	Unit	Existing Development (1) Quantity	Existing Development (1) Funds Allotted	Planned Development (2) Quantity	Planned Development (2) Cost	Planned Development (3) Quantity	Planned Development (3) Cost	Total Planned Development Quantity	Total Planned Development Cost
14 & 711.	RECREATIONAL FACILITIES (continued)									
	d. Toilets:									
	Masonry double unit (concrete vault type)	Each	0	$ 0	0	$ 0	0	$ 0	0	$ 0
	Frame single unit (concrete vault type)	Each	0	0	0	0	0	0	0	0
	Masonry double unit (waterborne)	Each	0	0	0	0	4	140,000	4	140,000
	e. Water supply system:									
	Water wells (pressure type)	Each	0	0	0	0	2	18,000	2	18,000
	Lake pump and filter	Each	0	0	0	0	0	0	0	0
	Waterline extension	L.F.	0	0	0	0	11,400	22,800	11,400	22,800
	Drinking fountains	Each	0	0	0	0	16	3,200	16	3,200
	f. Picnic and camping units	Each	0	0	0	0	144	52,600	144	52,600
	One unit consists of one table, one fireplace, and one trashcan.									
	Picnic tables (wood)	Each	0	0	0	0	0	0	0	0

TABLE 14 (continued)

Acct No.	Item	Unit	Existing Development (1) Quantity	Existing Development (1) Funds Allotted	Planned Development (2) Quantity	Planned Development (2) Cost	Planned Development (3) Quantity	Planned Development (3) Cost	Total Planned Development Quantity	Total Planned Development Cost
14 & 711.	RECREATIONAL FACILITIES (continued)									
	g. Picnic shelters:									
	1-table shelters	Each	0	$ 0	0	$ 0	144	$ 73,500	144	$ 73,500
	Group shelters	Each	0	0	0	0	1	3,500	1	3,500
	h. Site improvement:									
	Underbrushing and cleanup	L.S.	0	0	0	0	Job	7,200	Job	7,200
	Tree planting and seeding	Acre	0	0	0	0	0	0	0	0
	i. Signs	L.S.	0	0	0	0	Job	1,500	Job	1,500
	j. Elec service lines	L.S.	0	0	0	0	Job	19,900	Job	19,900
	k. Buoys	L.S.	0	0	0	0	0	0	0	0
	l. Beach improvement	L.S.	0	0	0	0	0	0	0	0
	m. Change shelter	Each	0	0	0	0	0	0	0	0
	n. Overlook shelter	Each	0	0	0	0	0	0	0	0
	o. Registration booths	Each	0	0	0	0	0	0	0	0

TABLE 14 (continued)

Acct No.	Item	Unit	Existing Development (1) Quantity	Existing Development (1) Funds Allotted	Planned Development (2) Quantity	Planned Development (2) Cost	Planned Development (3) Quantity	Planned Development (3) Cost	Total Planned Development Quantity	Total Planned Development Cost
14 & 711.	RECREATIONAL FACILITIES (continued)									
	p. Service building (includes waterborne toilets, shower and laundry facilities)	Each	0	$ 0	0	$ 0	4	$180,000	4	$180,000
	q. Sanitary stations	Each	0	0	0	0	3	7,500	3	7,500
	r. Courtesy docks	Each	0	0	0	0	4	8,000	4	8,000
	Total			$ 0		$ 0		$853,500		$853,500

(1) Existing development provided through FY 1971.
(2) Planned development proposed for FY 1972 through FY 1977.
(3) Planned development proposed for FY 1978 and thereafter.

TABLE 15

DETAILS OF ESTIMATE OF COST
FOR DEVELOPMENT - PUBLIC USE AREAS

Acct No.	Item	Unit	Existing Development (1) Quantity	Existing Development (1) Funds Allotted	Planned Development (2) Quantity	Planned Development (2) Cost	Planned Development (3) Quantity	Planned Development (3) Cost	Total Planned Development Quantity	Total Planned Development Cost
14 & 711.	RECREATIONAL FACILITIES									
	Knob Hills Park									
	a. Roads:									
	Paved (new primary)	Mile	0	$ 0	0	$ 0	2.5	$125,000	2.5	$125,000
	Gravel	Mile	0	0	0	0	0	0	0	0
	Paved (existing gravel)	Mile	0	0	0	0	0	0	0	0
	Paved (new secondary)	Mile	0	0	0	0	0	0	0	0
	b. Parking areas:									
	Paved (new)	S.F.	0	0	0	0	16,800	8,900	16,800	8,900
	Gravel	S.F.	0	0	0	0	0	0	0	0
	Paved (existing gravel)	S.F.	0	0	0	0	0	0	0	0
	c. Boat launching sites:									
	Boat ramps (concrete)	Each	0	0	0	0	6	98,800	6	98,800
	Turnarounds and trailer parking (paved)	S.F.	0	0	0	0	81,550	43,200	81,550	43,200

TABLE 15 (continued)

Acct No.	Item	Unit	Existing Development (1) Quantity	Existing Development (1) Funds Allotted	Planned Development (2) Quantity	Planned Development (2) Cost	Planned Development (3) Quantity	Planned Development (3) Cost	Total Planned Development Quantity	Total Planned Development Cost
14 & 711.	RECREATIONAL FACILITIES (continued)									
	d. Toilets:									
	Masonry double unit (concrete vault type)	Each	0	$ 0	0	$ 0	0	$ 0	0	$ 0
	Frame single unit (concrete vault type)	Each	0	0	0	0	0	0	0	0
	Masonry double unit (waterborne)	Each	0	0	0	0	5	175,000	5	175,000
	e. Water supply system:									
	Water wells (pressure type)	Each	0	0	0	0	2	18,000	2	18,000
	Lake pump and filter	Each	0	0	0	0	0	0	0	0
	Waterline extension	L.F.	0	0	0	0	6,450	12,900	6,450	12,900
	Drinking fountains	Each	0	0	0	0	7	1,400	7	1,400
	f. Picnic and camping units	Each	0	0	0	0	44	16,100	44	16,100
	One unit consists of one table, one fireplace, and one trashcan.									
	Picnic tables (wood)	Each	0	0	0	0	0	0	0	0

TABLE 15 (continued)

Acct. No.	Item	Unit	Existing Development (1) Quantity	Existing Development (1) Funds Allotted	Planned Development (2) Quantity	Planned Development (2) Cost	Planned Development (3) Quantity	Planned Development (3) Cost	Total Planned Development Quantity	Total Planned Development Cost
14 & 711.	RECREATIONAL FACILITIES (continued)									
	g. Picnic shelters:									
	1-table shelters	Each	0	$ 0	0	$ 0	44	$ 22,000	44	$ 22,000
	Group shelters	Each	0	0	0	0	2	7,000	2	7,000
	h. Site improvement:									
	Underbrushing and cleanup	L.S.	0	0	0	0	Job	2,200	Job	2,200
	Tree planting and seeding	Acre	0	0	0	0	0	0	0	0
	i. Signs	L.S.	0	0	0	0	Job	1,000	Job	1,000
	j. Elec service lines	L.S.	0	0	0	0	Job	18,800	Job	18,800
	k. Buoys	L.S.	0	0	0	0	0	0	0	0
	l. Beach improvement	L.S.	0	0	0	0	0	0	0	0
	m. Change shelter	Each	0	0	0	0	0	0	0	0
	n. Overlook shelter	Each	0	0	0	0	0	0	0	0
	o. Registration booths	Each	0	0	0	0	0	0	0	0

TABLE 15 (continued)

Acct. No.	Item	Unit	Existing Development (1) Quantity	Existing Development (1) Funds Allotted	Planned Development (2) Quantity	Planned Development (2) Cost	Planned Development (3) Quantity	Planned Development (3) Cost	Total Planned Development Quantity	Total Planned Development Cost
14 & 711.	RECREATIONAL FACILITIES (continued)									
	p. Service building (includes water-borne toilets, shower and laundry facilities)	Each	0	$ 0	0	$ 0	0	$ 0	0	$ 0
	q. Sanitary stations	Each	0	0	0	0	0	0	0	0
	r. Courtesy docks	Each	0	0	0	0	0	0	0	0
	Total			$ 0		$ 0		$550,300		$550,300

(1) Existing development provided through FY 1971.
(2) Planned development proposed for FY 1972 through FY 1977.
(3) Planned development proposed for FY 1978 and thereafter.

TABLE 16

DETAILS OF ESTIMATE OF COST
FOR DEVELOPMENT - PUBLIC USE AREAS

Acct No.	Item	Unit	Existing Development (1) Quantity	Existing Development (1) Funds Allotted	Planned Development (2) Quantity	Planned Development (2) Cost	Planned Development (3) Quantity	Planned Development (3) Cost	Total Planned Development Quantity	Total Planned Development Cost
14 & 711.	RECREATIONAL FACILITIES									
	North Shore and Roanoke Parks									
	a. Roads:									
	Paved (new primary)	Mile	0	$ 0	0	$ 0	0.4	$ 25,600	0.4	$ 25,600
	Gravel	Mile	0	0	0	0	0	0	0	0
	Paved (existing gravel)	Mile	0	0	0	0	0	0	0	0
	Paved (new secondary)	Mile	0	0	0	0	0	0	0	0
	b. Parking areas:									
	Paved (new)	S.F.	0	0	0	0	0	0	0	0
	Gravel	S.F.	0	0	0	0	0	0	0	0
	Paved (existing gravel)	S.F.	0	0	0	0	0	0	0	0
	c. Boat launching sites:									
	Boat ramps (concrete)	Each	0	0	0	0	0	0	0	0
	Turnarounds and trailer parking (paved)	S.F.	0	0	0	0	0	0	0	0

TABLE 16 (continued)

Acct No.	Item	Unit	Existing Development (1) Quantity	Existing Development (1) Funds Allotted	Planned Development (2) Quantity	Planned Development (2) Cost	Planned Development (3) Quantity	Planned Development (3) Cost	Total Planned Development Quantity	Total Planned Development Cost
14 & 711.	RECREATIONAL FACILITIES (continued)									
	d. Toilets:									
	Masonry double unit (concrete vault type)	Each	0	$ 0	0	$ 0	0	$ 0	0	$ 0
	Frame single unit (concrete vault type)	Each	0	0	0	0	0	0	0	0
	Masonry double unit (waterborne)	Each	0	0	0	0	0	0	0	0
	e. Water supply system:									
	Water wells (pressure type)	Each	0	0	0	0	1	9,000	1	9,000
	Lake pump and filter	Each	0	0	0	0	0	0	0	0
	Waterline extension	L.F.	0	0	0	0	200	400	200	400
	Drinking fountains	Each	0	0	0	0	0	0	0	0
	f. Picnic and camping units	Each	0	0	0	0	11	4,000	11	4,000
	One unit consists of one table, one fireplace, and one trashcan.									
	Picnic tables (wood)	Each	0	0	0	0	0	0	0	0

TABLE 16 (continued)

Acct No.	Item	Unit	Existing Development (1) Quantity	Existing Development (1) Funds Allotted	Planned Development (2) Quantity	Planned Development (2) Cost	Planned Development (3) Quantity	Planned Development (3) Cost	Total Planned Development Quantity	Total Planned Development Cost
14 & 711.	RECREATIONAL FACILITIES (continued)									
	g. Picnic shelters:									
	1-table shelters	Each	0	$ 0	0	$ 0	11	$ 5,500	11	$ 5,500
	Group shelters	Each	0	0	0	0	0	0	0	0
	h. Site improvement:									
	Underbrushing and cleanup	L.S.	0	0	0	0	Job	600	Job	600
	Tree planting and seeding	Acre	0	0	0	0	0	0	0	0
	i. Signs	L.S.	0	0	0	0	Job	200	Job	200
	j. Elec service lines	L.S.	0	0	0	0	0	0	0	0
	k. Buoys	L.S.	0	0	0	0	0	0	0	0
	l. Beach improvement	L.S.	0	0	0	0	0	0	0	0
	m. Change shelter	Each	0	0	0	0	0	0	0	0
	n. Overlook shelter	Each	0	0	0	0	0	0	0	0
	o. Registration booths	Each	0	0	0	0	0	0	0	0

TABLE 16 (continued)

Acct No.	Item	Unit	Existing Development (1) Quantity	Existing Development (1) Funds Allotted	Planned Development (2) Quantity	Planned Development (2) Cost	Planned Development (3) Quantity	Planned Development (3) Cost	Total Planned Development Quantity	Total Planned Development Cost
14 & 711.	RECREATIONAL FACILITIES (continued)									
	p. Service building (includes water-borne toilets, shower and laundry facilities)	Each	0	$ 0	0	$ 0	1	$45,000	1	$45,000
	q. Sanitary stations	Each	0	0	0	0	0	0	0	0
	r. Courtesy docks	Each	0	0	0	0	0	0	0	0
	Total			$ 0		$ 0		$90,300		$90,300

(1) Existing development provided through FY 1971.
(2) Planned development proposed for FY 1972 through FY 1977.
(3) Planned development proposed for FY 1978 and thereafter.

TABLE 17

DETAILS OF ESTIMATE OF COST
FOR DEVELOPMENT - PUBLIC USE AREAS

Acct No.	Item	Unit	Existing Development (1) Quantity	Existing Development (1) Funds Allotted	Planned Development (2) Quantity	Planned Development (2) Cost	Planned Development (3) Quantity	Planned Development (3) Cost	Total Planned Development Quantity	Total Planned Development Cost
14 & 711.	RECREATIONAL FACILITIES									
	Marshall Park									
	a. Roads:									
	Paved (new primary)	Mile	0	$ 0	2.5	$125,000	3.4	$170,000	5.9	$295,000
	Gravel	Mile	1.1	10,500	0	0	0	0	0	0
	Paved (existing gravel)	Mile	0	0	0	0	0	0	0	0
	Paved (new secondary)	Mile	0	0	0	0	0	0	0	0
	Trails	Mile	0	0	0	0	0.9	900	0.9	900
	b. Parking areas:									
	Paved (new)	S.F.	150	100	65,600	34,700	22,800	12,000	88,400	46,700
	Gravel	S.F.	900	200	0	0	0	0	0	0
	Paved (existing gravel)	S.F.	0	0	0	0	0	0	0	0
	c. Boat launching sites:									
	Boat ramps (concrete)	Each	0	0	6	41,600	0	0	6	41,600
	Turnarounds and trailer parking (paved)	S.F.	0	0	66,600	35,300	0	0	66,600	35,300

TABLE 17 (continued)

Acct No.	Item	Unit	Existing Development (1) Quantity	Existing Development (1) Funds Allotted	Planned Development (2) Quantity	Planned Development (2) Cost	Planned Development (3) Quantity	Planned Development (3) Cost	Total Planned Development Quantity	Total Planned Development Cost
14 & 711.	RECREATIONAL FACILITIES (continued)									
	d. Toilets:									
	Masonry double unit (concrete vault type)	Each	0	$ 4,600	0	$ 0	0	$ 0	0	$ 0
	Frame single unit (concrete vault type)	Each	0	0	0	0	0	0	0	0
	Masonry double unit (waterborne)	Each	0	0	7	245,000	6	210,000	13	455,000
	Convert to waterborne	Each	0	0	1	7,300	0	0	1	7,300
	e. Water supply system:									
	Water wells (pressure type)	Each	1	2,800	2	18,000	2	18,000	4	36,000
	Lake pump and filter	Each	0	0	0	0	0	0	0	0
	Waterline extension	L.F.	120	200	9,400	18,800	6,350	12,700	15,750	31,500
	Drinking fountains	Each	2	400	10	2,000	3	600	13	2,600
	f. Picnic and camping units	Each	18	4,000	139	50,700	36	13,200	175	63,900
	One unit consists of one table, one fireplace, and one trashcan.									
	Picnic tables (wood)	Each	0	0	0	0	0	0	0	0

TABLE 17 (continued)

Acct No.	Item	Unit	Existing Development (1) Quantity	Existing Development (1) Funds Allotted	Planned Development (2) Quantity	Planned Development (2) Cost	Planned Development (3) Quantity	Planned Development (3) Cost	Total Planned Development Quantity	Total Planned Development Cost
14 & 711.	RECREATIONAL FACILITIES (continued)									
	g. Picnic shelters:									
	1-table shelters	Each	7	$ 2,200	139	$ 69,500	36	$ 18,000	175	$ 87,500
	Group shelters	Each	0	0	0	0	3	10,500	3	10,500
	h. Site improvement:									
	Underbrushing and cleanup	L.S.	Job	11,000	Job	6,800	Job	1,800	Job	8,600
	Tree planting and seeding	Acre	0	0	0	0	0	0	0	0
	i. Signs	L.S.	Job	300	Job	700	Job	800	Job	1,500
	j. Elec service lines	L.S.	0	0	Job	24,200	Job	20,900	Job	45,100
	k. Buoys	L.S.	0	0	0	0	0	0	0	0
	l. Beach improvement	L.S.	0	0	0	0	0	0	0	0
	m. Change shelter	Each	0	0	0	0	0	0	0	0
	n. Overlook shelter	Each	0	0	0	0	0	0	0	0
	o. Registration booths	Each	0	0	0	0	0	0	0	0

TABLE 17 (continued)

Acct No.	Item	Unit	Existing Development (1) Quantity	Existing Development (1) Funds Allotted	Planned Development (2) Quantity	Planned Development (2) Cost	Planned Development (3) Quantity	Planned Development (3) Cost	Total Planned Development Quantity	Total Planned Development Cost
14 & 711.	RECREATIONAL FACILITIES (continued)									
	p. Service building (includes waterborne toilets, shower and laundry facilities)	Each	0	$ 0	1	$ 45,000	0	$ 0	1	$ 45,000
	q. Sanitary stations	Each	0	0	2	5,000	0	0	2	5,000
	r. Courtesy docks	Each	0	0	3	6,000	0	0	3	6,000
	Total			$36,300		$735,600		$489,400		$1,225,000

(1) Existing development provided through FY 1971.
(2) Planned development proposed for FY 1972 through FY 1977.
(3) Planned development proposed for FY 1978 and thereafter.

TABLE 18

DETAILS OF ESTIMATE OF COST
FOR DEVELOPMENT - PUBLIC USE AREAS

Acct No.	Item	Unit	Existing Development (1) Quantity	Existing Development (1) Funds Allotted	Planned Development (2) Quantity	Planned Development (2) Cost	Planned Development (3) Quantity	Planned Development (3) Cost	Total Planned Development Quantity	Total Planned Development Cost
14 & 711.	RECREATIONAL FACILITIES									
	Walnut Park									
	a. Roads:									
	Paved (new primary)	Mile	0	$ 0	0	$ 0	6.3	$315,000	6.3	$315,000
	Gravel	Mile	0	0	0	0	0	0	0	0
	Paved (existing gravel)	Mile	0	0	0	0	0	0	0	0
	Paved (new secondary)	Mile	0	0	0	0	0	0	0	0
	b. Parking areas:									
	Paved (new)	S.F.	0	0	0	0	57,000	30,200	57,000	30,200
	Gravel	S.F.	0	0	0	0	0	0	0	0
	Paved (existing gravel)	S.F.	0	0	0	0	0	0	0	0
	c. Boat launching sites:									
	Boat ramps (concrete)	Each	0	0	0	0	8	39,700	8	39,700
	Turnarounds and trailer parking (paved)	S.F.	0	0	0	0	93,700	49,600	93,700	49,600

TABLE 18 (continued)

Acct No.	Item	Unit	Existing Development (1) Quantity	Existing Development (1) Funds Allotted	Planned Development (2) Quantity	Planned Development (2) Cost	Planned Development (3) Quantity	Planned Development (3) Cost	Total Planned Development Quantity	Total Planned Development Cost
14 & 711.	RECREATIONAL FACILITIES (continued)									
	d. Toilets:									
	Masonry double unit (concrete vault type)	Each	0	$ 0	0	$ 0	0	$ 0	0	$ 0
	Frame single unit (concrete vault type)	Each	0	0	0	0	0	0	0	0
	Masonry double unit (waterborne)	Each	0	0	0	0	7	245,000	7	245,000
	e. Water supply system:									
	Water wells (pressure type)	Each	0	0	0	0	3	27,000	3	27,000
	Lake pump and filter	Each	0	0	0	0	0	0	0	0
	Waterline extension	L.F.	0	0	0	0	14,250	28,500	14,250	28,500
	Drinking fountains	Each	0	0	0	0	14	2,800	14	2,800
	f. Picnic and camping units	Each	0	0	0	0	162	59,300	162	59,300
	One unit consists of one table, one fireplace, and one trashcan.									
	Picnic tables (wood)	Each	0	0	0	0	0	0	0	0

TABLE 18 (continued)

Acct No.	Item	Unit	Existing Development (1) Quantity	Existing Development (1) Funds Allotted	Planned Development (2) Quantity	Planned Development (2) Cost	Planned Development (3) Quantity	Planned Development (3) Cost	Total Planned Development Quantity	Total Planned Development Cost
14 & 711.	RECREATIONAL FACILITIES (continued)									
	g. Picnic shelters:									
	1-table shelters	Each	0	$ 0	0	$ 0	162	$ 81,000	162	$ 81,000
	Group shelters	Each	0	0	0	0	2	7,000	2	7,000
	h. Site improvement:									
	Underbrushing and cleanup	L.S.	0	0	0	0	Job	8,000	Job	8,000
	Tree planting and seeding	Acre	0	0	0	0	0	0	0	0
	i. Signs	L.S.	0	0	0	0	Job	1,600	Job	1,600
	j. Elec service lines	L.S.	0	0	0	0	Job	46,800	Job	46,800
	k. Buoys	L.S.	0	0	0	0	Job	1,500	Job	1,500
	l. Beach improvement	L.S.	0	0	0	0	Job	5,000	Job	5,000
	m. Change shelter	Each	0	0	0	0	1	8,000	1	8,000
	n. Overlook shelter	Each	0	0	0	0	0	0	0	0
	o. Registration booths	Each	0	0	0	0	0	0	0	0

TABLE 18 (continued)

Acct No.	Item	Unit	Existing Development (1) Quantity	Existing Development (1) Funds Allotted	Planned Development (2) Quantity	Planned Development (2) Cost	Planned Development (3) Quantity	Planned Development (3) Cost	Total Planned Development Quantity	Total Planned Development Cost
14 & 711.	RECREATIONAL FACILITIES (continued)									
	p. Service building (includes waterborne toilets, shower and laundry facilities)	Each	0	$ 0	0	$ 0	2	$ 90,000	2	$ 90,000
	q. Sanitary stations	Each	0	0	0	0	0	0	0	0
	r. Courtesy docks	Each	0	0	0	0	4	8,000	4	8,000
	Total			$ 0		$ 0		$1,054,000		$1,054,000

(1) Existing development provided through FY 1971.
(2) Planned development proposed for FY 1972 through FY 1977.
(3) Planned development proposed for FY 1978 and thereafter.

TABLE 19

DETAILS OF ESTIMATE OF COST
FOR DEVELOPMENT - PUBLIC USE AREAS

Acct No.	Item	Unit	Existing Development (1) Quantity	Existing Development (1) Funds Allotted	Planned Development (2) Quantity	Planned Development (2) Cost	Planned Development (3) Quantity	Planned Development (3) Cost	Total Planned Development Quantity	Total Planned Development Cost
14 & 711.	RECREATIONAL FACILITIES									
	Meadowmere Park									
a.	Roads:									
	Paved (new primary)	Mile	3.0	$ 53,000	0.9	$ 45,000	0.4	$ 20,000	1.3	$ 65,000
	Gravel	Mile	1.4	13,300	0	0	0	0	0	0
	Paved (existing gravel)	Mile	0	0	0	0	0	0	0	0
	Paved (new secondary)	Mile	0	0	0	0	0	0	0	0
b.	Parking areas:									
	Paved (new)	S.F.	330	300	27,400	14,600	3,600	1,900	31,000	16,500
	Gravel	S.F.	900	200	0	0	0	0	0	0
	Paved (existing gravel)	S.F.	0	0	0	0	0	0	0	0
c.	Boat launching sites:									
	Boat ramps (concrete)	Each	0	0	4	22,100	0	0	170' 4	22,100
	Turnarounds and trailer parking (paved)	S.F.	0	0	17,850	9,500	0	0	17,850	9,500

TABLE 19 (continued)

Acct No.	Item	Unit	Existing Development (1) Quantity	Existing Development (1) Funds Allotted	Planned Development (2) Quantity	Planned Development (2) Cost	Planned Development (3) Quantity	Planned Development (3) Cost	Total Planned Development Quantity	Total Planned Development Cost
14 & 711.	RECREATIONAL FACILITIES (continued)									
	d. Toilets:									
	Masonry double unit (concrete vault type)	Each	1	$ 4,600	0	$ 0	0	$ 0	0	$ 0
	Frame single unit (concrete vault type)	Each	0	0	0	0	0	0	0	0
	Masonry double unit (waterborne)	Each	0	0	2	70,000	0	0	2	70,000
	Convert to waterborne	Each	0	0	1	7,300	0	0	1	7,300
	e. Water supply system:									
	Water wells (pressure type)	Each	1	2,800	0	0	0	0	0	0
	Lake pump and filter	Each	0	0	0	0	0	0	0	0
	Waterline extension	L.F.	1,711	2,400	3,500	7,000	300	600	3,800	7,600
	Drinking fountains	Each	4	800	8	1,600	1	200	9	1,800
	f. Picnic and camping units	Each	18	4,000	50	18,200	24	8,800	74	27,000
	One unit consists of one table, one fireplace, and one trashcan.									
	Picnic tables (wood)	Each	0	0	0	0	0	0	0	0

TABLE 19 (continued)

Acct No.	Item	Unit	Existing Development (1) Quantity	Existing Development (1) Funds Allotted	Planned Development (2) Quantity	Planned Development (2) Cost	Planned Development (3) Quantity	Planned Development (3) Cost	Total Planned Development Quantity	Total Planned Development Cost
14 & 711.	RECREATIONAL FACILITIES (continued)									
	g. Picnic shelters:									
	1-table shelters	Each	5	$ 1,600	50	$ 25,000	24	$ 12,000	74	$ 37,000
	Group shelters	Each	0	0	0	0	0	0	0	0
	h. Site improvement:									
	Underbrushing and cleanup	L.S.	Job	7,500	Job	2,500	Job	1,200	Job	3,700
	Tree planting and seeding	Acre	0	0	0	0	0	0	0	0
	i. Signs	L.S.	Job	600	Job	200	Job	200	Job	400
	j. Elec service lines	L.S.	0	0	Job	9,000	Job	1,200	Job	10,200
	k. Buoys	L.S.	Job	1,000	0	0	0	0	0	0
	l. Beach improvement	L.S.	0	0	0	0	Job	5,000	Job	5,000
	m. Change shelter	Each	0	0	1	8,000	1	8,000	2	16,000
	n. Overlook shelter	Each	0	0	0	0	0	0	0	0
	o. Registration booths	Each	0	0	0	0	0	0	0	0

TABLE 19 (continued)

Acct No.	Item	Unit	Existing Development (1) Quantity	Existing Development (1) Funds Allotted	Planned Development (2) Quantity	Planned Development (2) Cost	Planned Development (3) Quantity	Planned Development (3) Cost	Total Planned Development Quantity	Total Planned Development Cost
14 & 711.	RECREATIONAL FACILITIES (continued)									
	p. Service building (includes water-borne toilets, shower and laundry facilities)	Each	0	$ 0	0	$ 0	0	$ 0	0	$ 0
	q. Sanitary stations	Each	0	0	0	0	0	0	0	0
	r. Courtesy docks	Each	0	0	2	4,000	0	0	2	4,000
	Total			$92,100		$244,000		$59,100		$303,100

(1) Existing development provided through FY 1971.
(2) Planned development proposed for FY 1972 through FY 1977.
(3) Planned development proposed for FY 1978 and thereafter.

TABLE 20

DETAILS OF ESTIMATE OF COST
FOR DEVELOPMENT - PUBLIC USE AREAS

Acct No.	Item	Unit	Existing Development (1) Quantity	Existing Development (1) Funds Allotted	Planned Development (2) Quantity	Planned Development (2) Cost	Planned Development (3) Quantity	Planned Development (3) Cost	Total Planned Development Quantity	Total Planned Development Cost
14 & 711.	RECREATIONAL FACILITIES									
	Oak Grove Park									
	a. Roads:									
	Paved (new primary)	Mile	6.7	$118,300	4.6	$230,000	0	$ 0	4.6	$230,000
	Gravel	Mile	2.2	21,000	0	0	0	0	0	0
	Paved (existing gravel)	Mile	0	0	0	0	0	0	0	0
	Paved (new secondary)	Mile	0	0	0	0	0	0	0	0
	Trail	Mile	0	0	0	0	0.2	200	0.2	200
	b. Parking areas:									
	Paved (new)	S.F.	20,734	14,900	162,600	86,400	800	400	163,400	86,800
	Gravel	S.F.	21,800	5,100	0	0	0	0	0	0
	Paved (existing gravel)	S.F.	0	0	0	0	0	0	0	0
	c. Boat launching sites:									
	Boat ramps (concrete)	Each	10	5,900	16	58,500	0	0	16	58,500
	Turnarounds and trailer parking (paved)	S.F.	0	0	167,077	88,500	0	0	167,077	88,500

TABLE 20 (continued)

Acct No.	Item	Unit	Existing Development (1) Quantity	Existing Development (1) Funds Allotted	Planned Development (2) Quantity	Planned Development (2) Cost	Planned Development (3) Quantity	Planned Development (3) Cost	Total Planned Development Quantity	Total Planned Development Cost
14 & 711.	RECREATIONAL FACILITIES (continued)									
	d. Toilets:									
	Masonry double unit (concrete vault type)	Each	5	$ 22,800	0	$ 0	0	$ 0	0	$ 0
	Frame single unit (concrete vault type)	Each	0	0	0	0	0	0	0	0
	Masonry double unit (waterborne)	Each	0	0	6	210,000	0	0	6	210,000
	Convert to waterborne	Each	0	0	4	29,200	0	0	4	29,200
	e. Water supply system:									
	Water wells (pressure type)	Each	4	11,200	3	27,000	0	0	3	27,000
	Lake pump and filter	Each	0	0	0	0	0	0	0	0
	Waterline extension	L.F.	1,484	2,100	17,450	34,900	0	0	17,450	34,900
	Drinking fountains	Each	6	1,100	10	2,000	0	0	10	2,000
	f. Picnic and camping units	Each	75	16,800	269	98,200	5	1,800	274	100,000
	One unit consists of one table, one fireplace, and one trashcan.									
	Picnic tables (wood)	Each	0	0	0	0	0	0	0	0

TABLE 20 (continued)

Acct No.	Item	Unit	Existing Development (1) Quantity	Existing Development (1) Funds Allotted	Planned Development (2) Quantity	Planned Development (2) Cost	Planned Development (3) Quantity	Planned Development (3) Cost	Total Planned Development Quantity	Total Planned Development Cost
14 & 711.	RECREATIONAL FACILITIES (continued)									
	g. Picnic shelters:									
	1-table shelters	Each	32	$ 10,200	269	$134,500	5	$ 2,500	274	$137,000
	Group shelters	Each	0	0	3	10,500	0	0	3	10,500
	Group camp site	Each	0	0	0	0	1	1,500	1	1,500
	h. Site improvement:									
	Underbrushing and cleanup	L.S.	Job	24,600	Job	14,300	Job	300	Job	14,600
	Tree planting and seeding	Acre	0	0	0	0	0	0	0	0
	i. Signs	L.S.	Job	3,700	Job	1,300	0	0	Job	1,300
	j. Elec service lines	L.S.	0	0	Job	43,500	0	0	Job	43,500
	k. Buoys	L.S.	Job	7,700	Job	1,500	0	0	Job	1,500
	l. Beach improvement	L.S.	0	0	Job	10,000	0	0	Job	10,000
	m. Change shelter	Each	0	0	3	24,000	0	0	3	24,000
	n. Overlook shelter	Each	0	0	0	0	0	0	0	0
	o. Registration booths	Each	0	0	0	0	0	0	0	0

TABLE 20 (continued)

Acct No.	Item	Unit	Existing Development (1) Quantity	Existing Development (1) Funds Allotted	Planned Development (2) Quantity	Planned Development (2) Cost	Planned Development (3) Quantity	Planned Development (3) Cost	Total Planned Development Quantity	Total Planned Development Cost
14 & 711.	RECREATIONAL FACILITIES (continued)									
	p. Service building (includes water-borne toilets, shower and laundry facilities)	Each	0	$ 0	7	$ 315,000	0	$ 0	7	$ 315,000
	q. Sanitary stations	Each	0	0	5	12,500	0	0	5	12,500
	r. Courtesy docks	Each	0	0	10	20,000	0	0	10	20,000
	Total			$265,400		$1,451,800		$6,700		$1,458,500

(1) Existing development provided through FY 1971.
(2) Planned development proposed for FY 1972 through FY 1977.
(3) Planned development proposed for FY 1978 and thereafter.

TABLE 21

DETAILS OF ESTIMATE OF COST
FOR DEVELOPMENT - PUBLIC USE AREAS

Acct No.	Item	Unit	Existing Development (1) Quantity	Existing Development (1) Funds Allotted	Planned Development (2) Quantity	Planned Development (2) Cost	Planned Development (3) Quantity	Planned Development (3) Cost	Total Planned Development Quantity	Total Planned Development Cost
14 & 711.	RECREATIONAL FACILITIES									
	Silverlake Park									
	a. Roads:									
	Paved (new primary)	Mile	2.7	$ 47,700	1.6	$ 80,000	0.4	$ 20,000	2.0	$100,000
	Gravel	Mile	2.1	20,000	0	0	0	0	0	0
	Paved (existing gravel)	Mile	0	0	0	0	0	0	0	0
	Paved (new secondary)	Mile	0	0	0	0	0	0	0	0
	Trails	Mile	0	0	0.5	500	0	0	0.5	500
	b. Parking areas:									
	Paved (new)	S.F.	18,229	13,100	52,700	27,800	0	0	52,700	27,800
	Gravel	S.F.	2,386	600	0	0	0	0	0	0
	Paved (existing gravel)	S.F.	0	0	0	0	0	0	0	0
	c. Boat launching sites:									
	Boat ramps (concrete)	Each	2	1,000	12	59,800	0	0	12	59,800
	Turnarounds and trailer parking (paved)	S.F.	0	0	169,075	89,900	0	0	169,075	89,900

TABLE 21 (continued)

Acct No.	Item	Unit	Existing Development (1) Quantity	Existing Development (1) Funds Allotted	Planned Development (2) Quantity	Planned Development (2) Cost	Planned Development (3) Quantity	Planned Development (3) Cost	Total Planned Development Quantity	Total Planned Development Cost
14 & 711.	RECREATIONAL FACILITIES (continued)									
	d. Toilets:									
	Masonry double unit (concrete vault type)	Each	3	$ 13,800	0	$ 0	0	$ 0	0	$ 0
	Frame single unit (concrete vault type)	Each	0	0	0	0	0	0	0	0
	Masonry double unit (waterborne)	Each	1	14,000	2	70,000	0	0	2	70,000
	Convert to waterborne	Each	0	0	3	21,900	0	0	3	21,900
	e. Water supply system:									
	Water wells (pressure type)	Each	3	8,300	0	0	0	0	0	0
	Lake pump and filter	Each	0	0	0	0	0	0	0	0
	Waterline extension	L.F.	7,636	10,500	6,700	13,400	0	0	6,700	13,400
	Drinking fountains	Each	6	1,100	9	1,800	0	0	9	1,800
	f. Picnic and camping units	Each	42	9,400	103	37,600	0	0	103	37,600
	One unit consists of one table, one fireplace, and one trashcan.									
	Picnic tables (wood)	Each	0	0	0	0	0	0	0	0

TABLE 21 (continued)

Acct No.	Item	Unit	Existing Development (1) Quantity	Existing Development (1) Funds Allotted	Planned Development (2) Quantity	Planned Development (2) Cost	Planned Development (3) Quantity	Planned Development (3) Cost	Total Planned Development Quantity	Total Planned Development Cost
14 & 711.	RECREATIONAL FACILITIES (continued)									
	g. Picnic shelters:									
	1-table shelters	Each	23	$ 7,400	103	$ 51,500	0	$ 0	103	$ 51,500
	Group shelters	Each	0	0	0	0	0	0	0	0
	h. Site improvement:									
	Underbrushing and cleanup	L.S.	Job	12,600	Job	5,200	0	0	Job	5,200
	Tree planting and seeding	Acre	0	0	0	0	0	0	0	0
	i. Signs	L.S.	Job	1,500	Job	600	Job	500	Job	1,100
	j. Elec service lines	L.S.	Job	100	Job	12,600	0	0	Job	12,600
	k. Buoys	L.S.	Job	1,200	Job	1,500	0	0	Job	1,500
	l. Beach improvement	L.S.	0	0	Job	5,000	0	0	Job	5,000
	m. Change shelter	Each	0	0	1	8,000	0	0	1	8,000
	n. Overlook shelter	Each	0	0	0	0	0	0	0	0
	o. Registration booths	Each	0	0	0	0	0	0	0	0

TABLE 21 (continued)

Acct No.	Item	Unit	Existing Development (1) Quantity	Existing Development (1) Funds Allotted	Planned Development (2) Quantity	Planned Development (2) Cost	Planned Development (3) Quantity	Planned Development (3) Cost	Total Planned Development Quantity	Total Planned Development Cost
14 & 711.	RECREATIONAL FACILITIES (continued)									
	p. Service building (includes waterborne toilets, shower and laundry facilities)	Each	0	$ 0	3	$135,000	0	$ 0	3	$135,000
	q. Sanitary stations	Each	0	0	0	0	0	0	0	0
	r. Courtesy docks	Each	0	0	7	14,000	0	0	7	14,000
	Total			$162,300		$636,100		$20,500		$656,600

(1) Existing development provided through FY 1971.
(2) Planned development proposed for FY 1972 through FY 1977.
(3) Planned development proposed for FY 1978 and thereafter.

TABLE 22

FUNDS REQUIRED FOR OPERATION AND MAINTENANCE

GRAPEVINE RESERVOIR

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

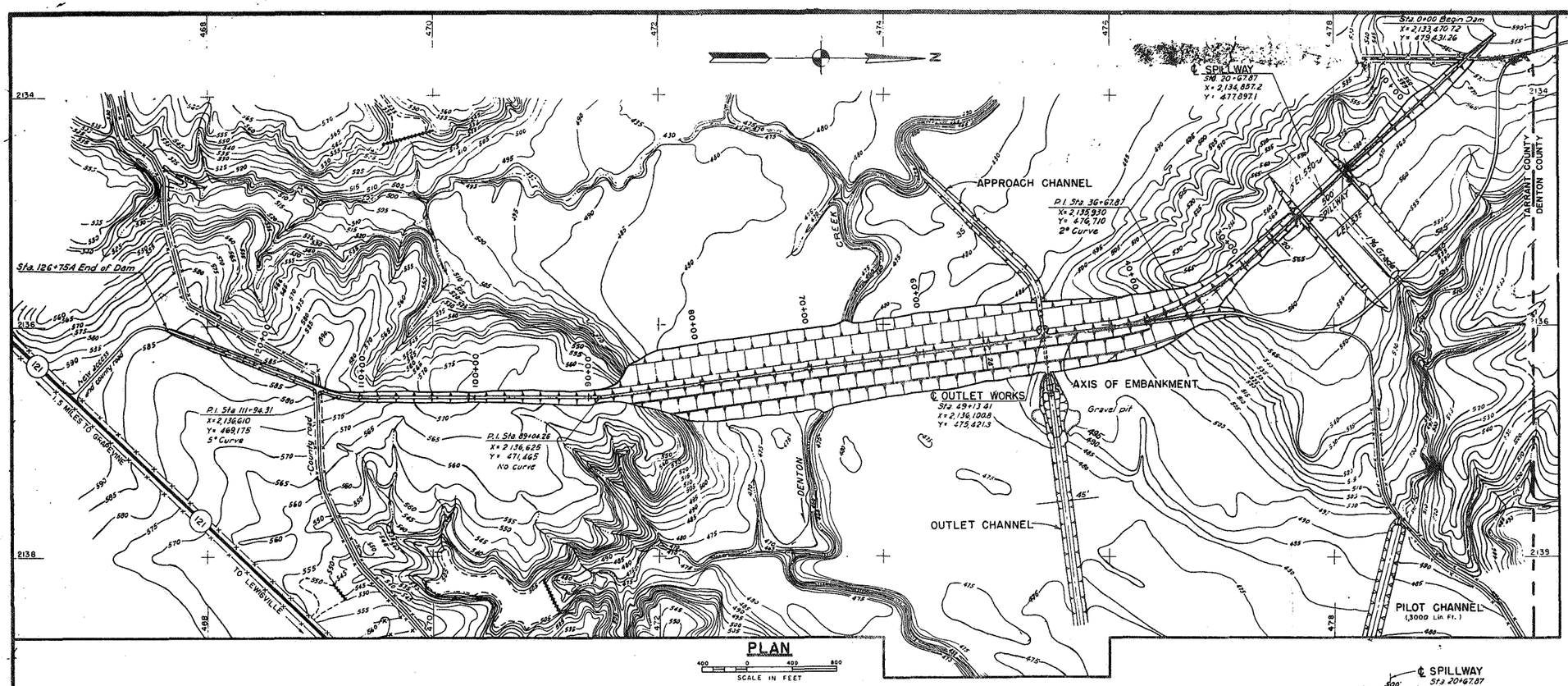
Recreation facilities	
Operation and maintenance of facilities (includes contract cleanup, mowing, grading and maintenance of roads, repair of structures, nature areas, etc.)	
Project office	308.0
District office staff functions	16.0
Subtotal	324.0
Real Estate management services	
Real Estate records, reports, audits, and Federal jurisdiction	
Compliance inspections	13.0
Utilization	3.0
Outgrants	12.0
Crops, timber and gravel	1.0
Other	8.0
Subtotal	37.0
Total	361.0

2. The above breakdown is based on the past three years of actual cost. For ultimate recreational development, the average annual estimate would be based on an additional 7 percent of the capital outlay of the facilities for FY 1978 and thereafter.

XIII - CONCLUSIONS AND RECOMMENDATIONS

13-01. Conclusions.- The plan of development presented herein has the concurrence and support of local government agencies and the general public, as evidenced by existing lease agreements and annual visitation to the project.

13-02. Recommendations.- It is recommended that this updated master plan for Grapevine Lake involving development for public use and land management be approved as proposed herein.



TRINITY RIVER AND TRIBUTARIES, TEXAS

GRAPEVINE DAM AND RESERVOIR

DENTON CREEK- ELM FORK TRINITY RIVER

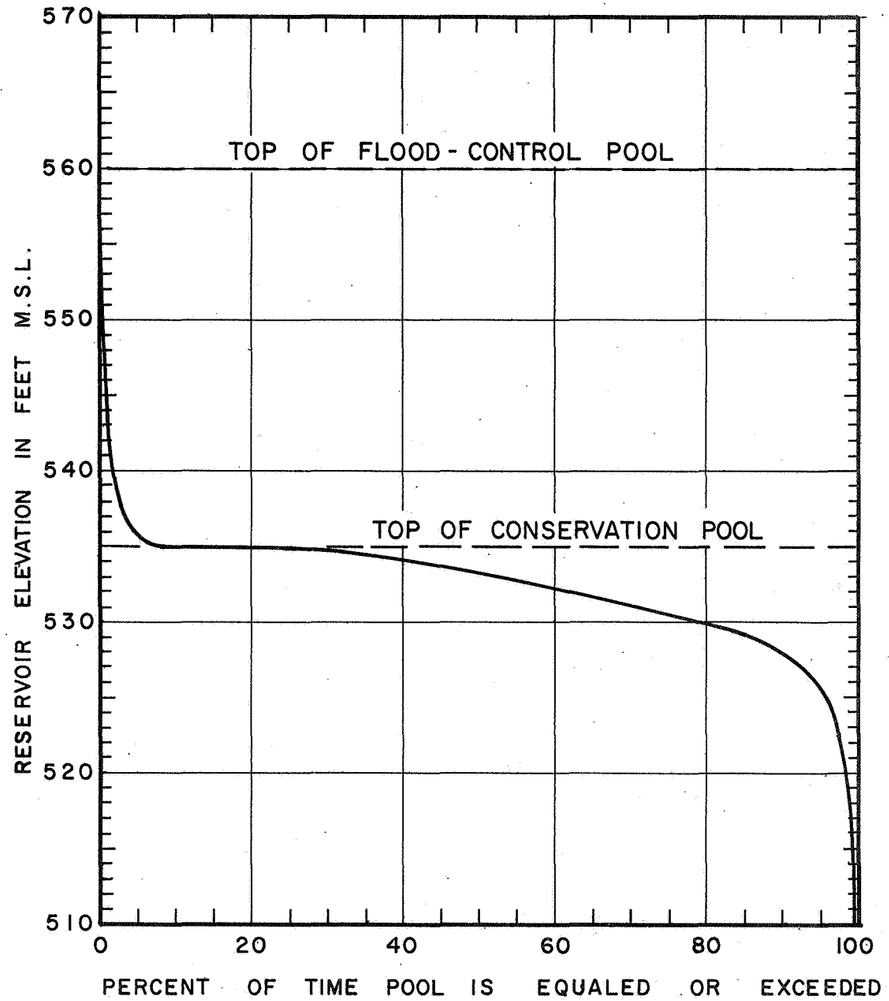
GENERAL PLAN OF DAM
PROFILE AND SECTION

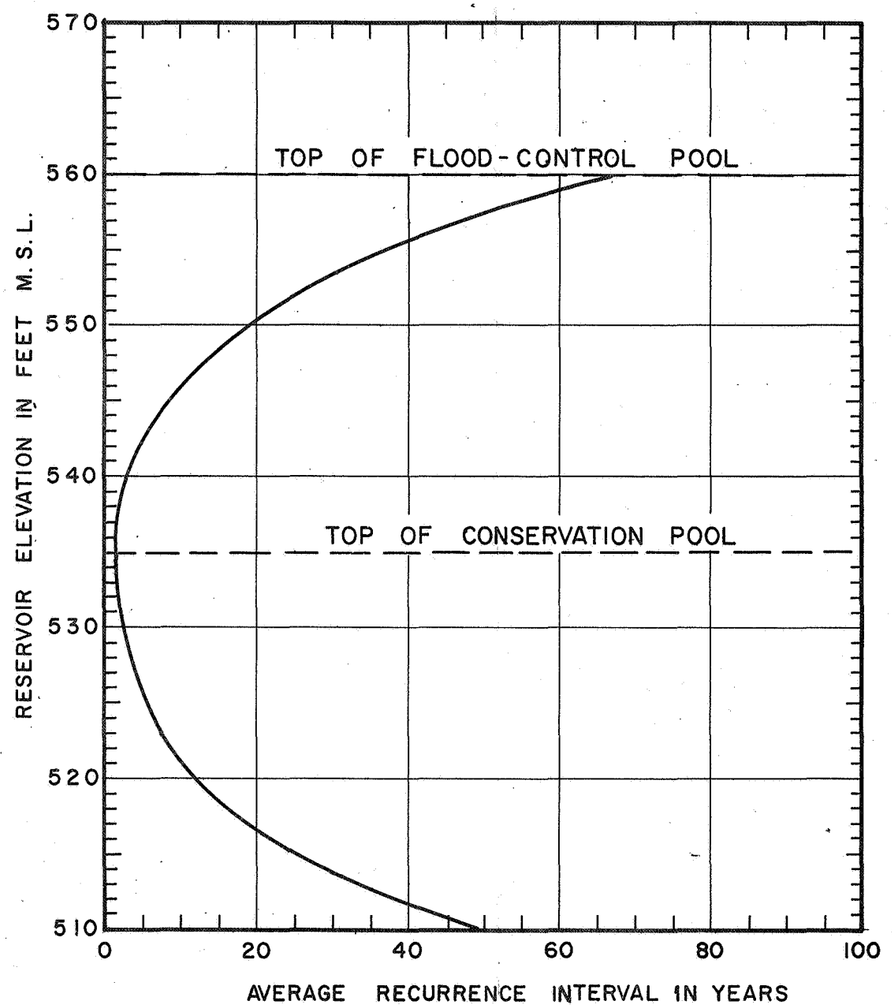
SCALE AS SHOWN

FORT WORTH DISTRICT FORT WORTH, TEXAS AUGUST 1971

TO ACCOMPANY DESIGN MEMORANDUM NO. 1C (UPDATED)

FILE: TRIN. 268-17 PLATE 1





NOTE:
CURVES BASED ON HYPOTHETICAL RESERVOIR ROUTING DURING PERIOD OF RECORD NOV. 1923 THROUGH JULY 1952.

TRINITY RIVER AND TRIBUTARIES, TEXAS
GRAPEVINE RESERVOIR
DENTON CREEK ELM FORK, TRINITY RIVER

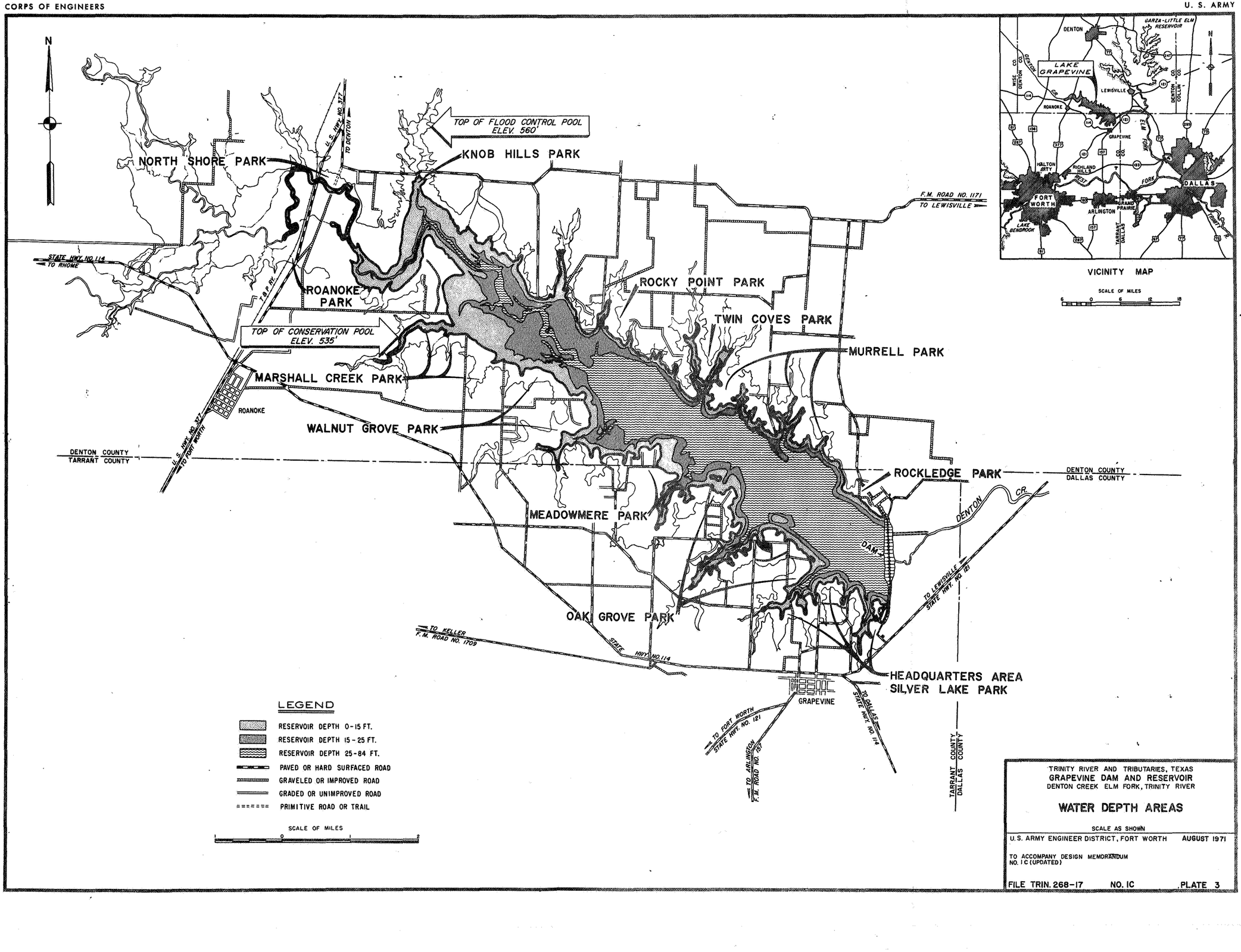
POOL ELEVATION FREQUENCY AND DURATION CURVES

SCALES AS SHOWN
U.S.ARMY ENGINEER DIST., FT.WORTH AUGUST 1971

TO ACCOMPANY DESIGN MEMORANDUM NUMBER 1C (UPDATED)

FILE: TRIN. 268-17 PLATE 2

L.D.R.



TRINITY RIVER AND TRIBUTARIES, TEXAS
GRAPEVINE DAM AND RESERVOIR
DENTON CREEK ELM FORK, TRINITY RIVER

WATER DEPTH AREAS

SCALE AS SHOWN

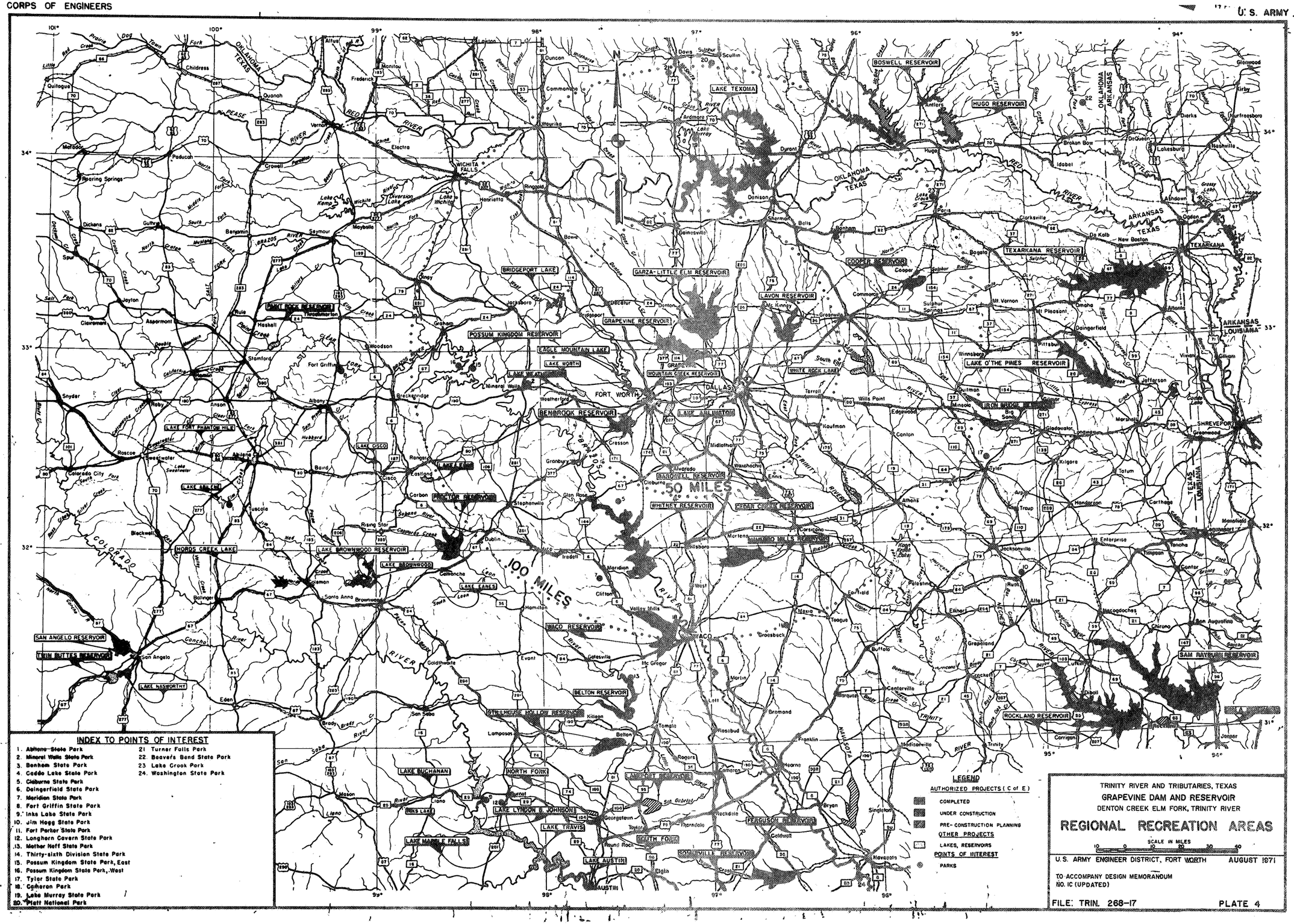
U.S. ARMY ENGINEER DISTRICT, FORT WORTH AUGUST 1971

TO ACCOMPANY DESIGN MEMORANDUM NO. 1C (UPDATED)

FILE TRIN. 268-17 NO. 1C PLATE 3

CORPS OF ENGINEERS

U.S. ARMY



INDEX TO POINTS OF INTEREST

1. Abilene State Park
2. Mineral Wells State Park
3. Bonham State Park
4. Caddo Lake State Park
5. Cleburne State Park
6. Daingerfield State Park
7. Meridian State Park
8. Fort Griffin State Park
9. Inks Lake State Park
10. Jim Hogg State Park
11. Fort Parker State Park
12. Longhorn Cavern State Park
13. Mother Neff State Park
14. Thirty-sixth Division State Park
15. Possum Kingdom State Park, East
16. Possum Kingdom State Park, West
17. Tyler State Park
18. Cameron Park
19. Lake Murray State Park
20. Platt National Park
21 Turner Falls Park
22. Beavers Bend State Park
23 Lake Crook Park
24. Washington State Park

TRINITY RIVER AND TRIBUTARIES, TEXAS

GRAPEVINE DAM AND RESERVOIR

DENTON CREEK ELM FORK, TRINITY RIVER

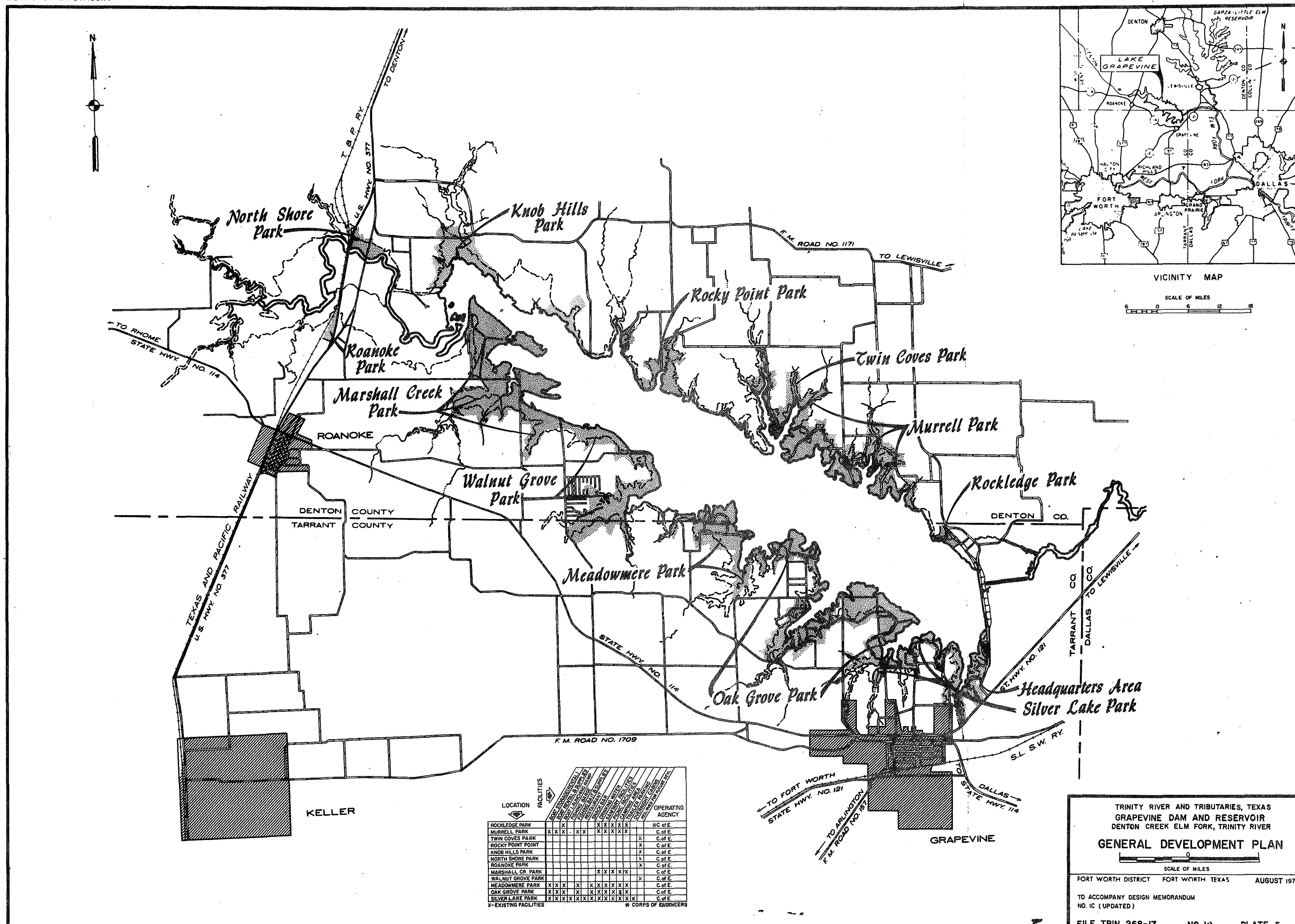
REGIONAL RECREATION AREAS

U.S. ARMY ENGINEER DISTRICT, FORT WORTH AUGUST 1971

TO ACCOMPANY DESIGN MEMORANDUM
NO. IC (UPDATED)

FILE: TRIN. 268-17

PLATE 4



LOCATION	BOAT STORAGE (RENTAL)	BOAT RENTAL & SUPPLIES	BOAT LAUNCHING RAMP	FISHING BARGE	FISHING BAIT & SUPPLIES	RESTAURANT	SNACK BAR	DRINKING WATER	SANITARY FACILITIES	PICNIC FACILITIES	CAMPING AREA	TRAILER PARKING	OVERNIGHT CABINS	RESERVED FOR FUTURE DEVL.	OPERATING AGENCY
ROCKLEDGE PARK			X					X	X	X	X	X			*C of E.
MURRELL PARK	X	X	X	.	X	X		X	X	X	X	X			C. of E.
TWIN COVES PARK														X	C. of E.
ROCKY POINT POINT														X	C. of E.
KNOB HILLS PARK														X	C. of E.
NORTH SHORE PARK														X	C. of E.
ROANOKE PARK														X	C. of E.
MARSHALL CR. PARK								X	X	X	X	X			C. of E.
WALNUT GROVE PARK														X	C. of E.
MEADOWMERE PARK	X	X	X		X		X	X	X	X	X	X			C. of E.
OAK GROVE PARK	X	X	X		X		X	X	X	X	X	X			C. of E.
SILVER LAKE PARK	X	X	X	X	X	X	X	X	X	X	X	X	X		C. of E.

X - EXISTING FACILITIES * CORPS OF ENGINEERS

TRINITY RIVER AND TRIBUTARIES, TEXAS
GRAPEVINE DAM AND RESERVOIR
DENTON CREEK ELM FORK, TRINITY RIVER

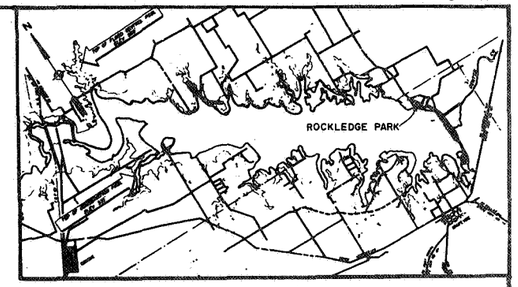
GENERAL DEVELOPMENT PLAN

SCALE OF MILES

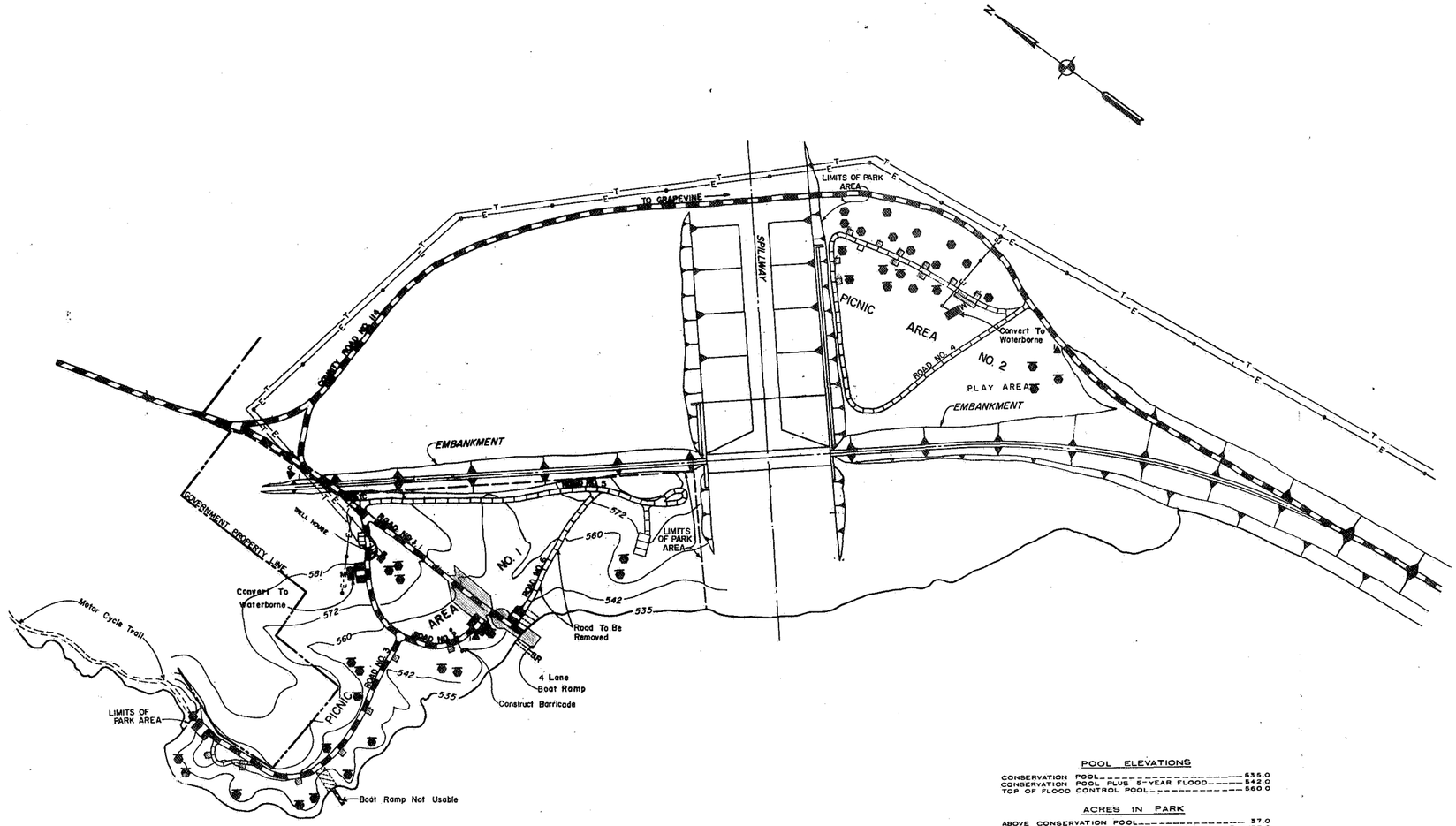
FORT WORTH DISTRICT FORT WORTH TEXAS AUGUST 1971

TO ACCOMPANY DESIGN MEMORANDUM NO. IC (UPDATED)

FILE TRIN. 268-17 NO. IC PLATE 5



KEY MAP



LEGEND

	EXISTING BY C OF E	EXISTING BY OTHERS	PLANNED BY C OF E
GRAVEL ROADS			
PAVED ROADS			
SECONDARY ROADS			
GRAVEL PARKING AREAS			
PAVED PARKING AREAS			
FRAME TOILETS (CONCRETE VAULT)	F(C)	F(C)	F(C)
FRAME TOILETS (PIT TYPE)	F(E)	F(E)	F(E)
MASONRY TOILETS (CONCRETE VAULT)	M	M	M
MASONRY TOILETS (WATER BORNE)	MWB	MWB	MWB
BOAT RAMPS	BR	BR	BR
BUILDING STRUCTURE (AS DESIGNATED)			
WATER WELLS (SUPPLY)			
WATER LINES	W	W	W_{PL}
ELECTRIC SERVICE LINES			
RESERVOIR INFORMATION SIGNS	RI	RI	RI
PARK ENTRANCE SIGNS	PE	PE	PE
DIRECTIONAL SIGNS	D	D	D
BUOYS			
REGISTRATION BOOTH	RB	RB	RB
TREE COVER			
TRAFFIC COUNTERS	TC	TC	TC
SWIMMING BEACH			
LIMITS OF CONCESSION AREAS			
LIMITS OF LICENSE OR LEASE AREAS			
UPPER LIMITS (FLOWAGE EASEMENT)			
GOVERNMENT PROPERTY LINE			
INITIAL DEVELOPMENT (FY71 THRU FY76)			

POOL ELEVATIONS

CONSERVATION POOL	535.0
CONSERVATION POOL PLUS 5-YEAR FLOOD	542.0
TOP OF FLOOD CONTROL POOL	560.0

ACRES IN PARK

ABOVE CONSERVATION POOL	37.0
ABOVE CONSERVATION POOL PLUS 5-YEAR FLOOD	55.0
ABOVE FLOOD CONTROL POOL	22.0

PICNIC FACILITIES

PICNIC AREA NO.	ITEM	EXISTING BY C OF E	EXISTING BY OTHERS	PLANNED BY C OF E	PLANNED BY OTHERS
1	TABLES	81		6	
	FIREPLACES	51		6	
	TRASH CANS	81		6	
	SHELTERS	61		6	
2	TABLES	87		4	
	FIREPLACES	87		4	
	TRASH CANS	87		4	
	SHELTERS	8		4	
3	TABLES				
	FIREPLACES				
	TRASH CANS				
	SHELTERS				
4	TABLES				
	FIREPLACES				
	TRASH CANS				
	SHELTERS				
5	TABLES				
	FIREPLACES				
	TRASH CANS				
	SHELTERS				
6	TABLES				
	FIREPLACES				
	TRASH CANS				
	SHELTERS				

TRINITY RIVER AND TRIBUTARIES, TEXAS
GRAPEVINE DAM AND RESERVOIR
DENTON CREEK ELM FORK, TRINITY RIVER

ROCKLEDGE PARK

SCALE OF FEET
200 0 200 400

U.S. ARMY ENGINEER DISTRICT, FORT WORTH AUGUST 1971

TO ACCOMPANY DESIGN MEMORANDUM NO. 1C (UPDATED)

FILE TRIN. 268-17 NO. 1C PLATE 6

DATE FLOWN 9 JULY 1939
WATER ELEVATION 534.71

TRINITY RIVER AND TRIBUTARIES, TEXAS
LAKE GRAPEVINE
DENTON CREEK ELM FORK, TRINITY RIVER

ROCKLEDGE PARK

SCALE OF FEET
200 0 200 400

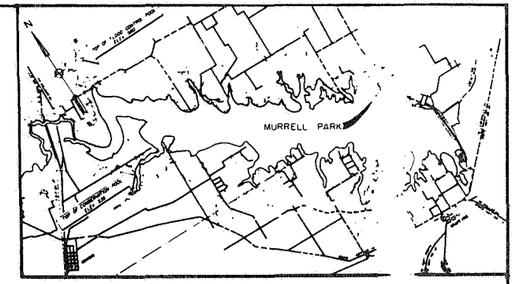
U.S. ARMY ENGINEER DISTRICT, FORT WORTH 1971

TO ACCOMPANY DESIGN MEMORANDUM
NO. 1C (UPDATED)

FILE TRIN 268-17 NO. 1C PLATE 7

LEGEND

	EXISTING BY C OF E	EXISTING BY OTHERS	PLANNED BY C OF E
GRAVEL ROADS			
PAVED ROADS			
SECONDARY ROADS			
GRAVEL PARKING AREAS			
PAVED PARKING AREAS			
FRAME TOILETS (CONCRETE VAULT)	F(C)	F(C)	F(C)
FRAME TOILETS (PIT TYPE)	F(E)	F(E)	F(E)
MASONRY TOILETS (CONCRETE VAULT)	M	M	M
MASONRY TOILETS (WATER BORNE)	WB	WB	WB
BOAT RAMPS	BR	BR	BR
BUILDING STRUCTURE (AS DESIGNATED)			
WATER WELLS (SUPPLY)			
WATER LINES	W	W	W
ELECTRIC SERVICE LINES			
RESERVOIR INFORMATION SIGNS	RI	RI	RI
PARK ENTRANCE SIGNS	PE	PE	PE
DIRECTIONAL SIGNS	D	D	D
BUOYS			
REGISTRATION BOOTH	RB	RB	RB
TREE COVER			
TRAFFIC COUNTERS	TC	TC	TC
SWIMMING BEACH			
LIMITS OF CONCESSION AREAS			
LIMITS OF LICENSE OR LEASE AREAS			
UPPER LIMITS (FLOWAGE EASEMENT)			
GOVERNMENT PROPERTY LINE			
INITIAL DEVELOPMENT (FY71 THRU FY76)			



KEY MAP

GROUP CAMPS (9 Unit)
- 1 CAMPFIRE CIRCLE
- 4 FIRE PLACES
- 8 TENT PADS
- 1 WOODEN VAULT TYPE TOILET

CAMPING FACILITIES

CAMP AREA NO.	ITEM	EXISTING BY C OF E	EXISTING BY OTHERS	PLANNED BY C OF E	PLANNED BY OTHERS
1	TABLES FIREPLACES TRASH CANS SHELTERS				
2	TABLES FIREPLACES TRASH CANS SHELTERS	9 9 9			
3	TABLES FIREPLACES TRASH CANS SHELTERS			31 31 31	
4	TABLES FIREPLACES TRASH CANS SHELTERS				
5	TABLES FIREPLACES TRASH CANS SHELTERS				
6	TABLES FIREPLACES TRASH CANS SHELTERS				

PICNIC FACILITIES

PICNIC AREA NO	ITEM	EXISTING BY C OF E	EXISTING BY OTHERS	PLANNED BY C OF E	PLANNED BY OTHERS
1	TABLES FIREPLACES TRASH CANS SHELTERS			20 20 20	
2	TABLES FIREPLACES TRASH CANS SHELTERS			20 20 20	
3	TABLES FIREPLACES TRASH CANS SHELTERS	4 4 4		44 44 44	
4	TABLES FIREPLACES TRASH CANS SHELTERS			32 32 32	
5	TABLES FIREPLACES TRASH CANS SHELTERS			8 8 8	
6	TABLES FIREPLACES TRASH CANS SHELTERS	8 8 8			

POOL ELEVATIONS

CONSERVATION POOL	535.0
CONSERVATION POOL PLUS 5-YEAR FLOOD	542.0
TOP OF FLOOD CONTROL POOL	632.0

ACRES IN PARK (SHEETS 1 & 2)

ABOVE CONSERVATION POOL	510.0
ABOVE CONSERVATION POOL PLUS 5-YEAR FLOOD	413.0
ABOVE FLOOD CONTROL POOL	188.0

TRINITY RIVER AND TRIBUTARIES, TEXAS
GRAPEVINE DAM AND RESERVOIR
DENTON CREEK ELM FORK, TRINITY RIVER

MURRELL PARK

IN 2 SHEETS SCALE OF FEET 200 0 200 400 SHEET NO. 1

U S ARMY ENGINEER DISTRICT, FORT WORTH AUGUST 1971

TO ACCOMPANY DESIGN MEMORANDUM NO. 1C (UPDATED)

FILE TRIN. 268-17 NO. 1C PLATE 8

DATE FLOWN 9 JULY 1969
WATER ELEVATION 534.71

TRINITY RIVER AND TRIBUTARIES, TEXAS
LAKE GRAPEVINE
DENTON CREEK ELM FORK, TRINITY RIVER

MURRELL PARK

IN 2 SHEETS SHEET 1

SCALE OF FEET
200 0 200 400

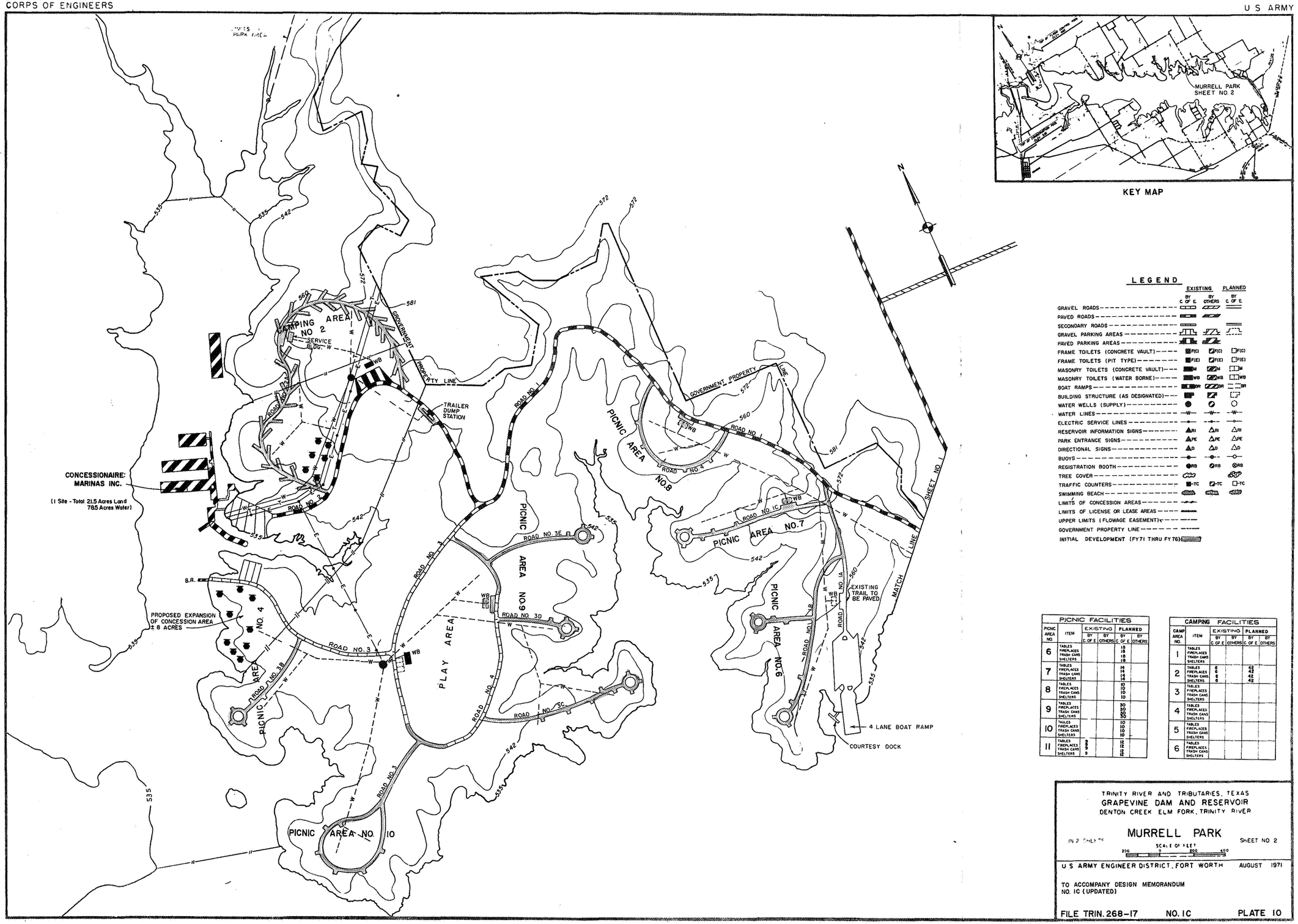
U.S. ARMY ENGINEER DISTRICT, FORT WORTH 1971

TO ACCOMPANY DESIGN MEMORANDUM
NO. 1 C (UPDATED)

FILE TRIN. 268-17 NO. 1C PLATE 9

CORPS OF ENGINEERS

U S ARMY



KEY MAP

LEGEND

	EXISTING BY C OF E	EXISTING BY OTHERS	PLANNED BY C OF E
GRAVEL ROADS			
PAVED ROADS			
SECONDARY ROADS			
GRAVEL PARKING AREAS			
PAVED PARKING AREAS			
FRAME TOILETS (CONCRETE VAULT)	F(C)	F(C)	F(C)
FRAME TOILETS (PIT TYPE)	F(E)	F(E)	F(E)
MASONRY TOILETS (CONCRETE VAULT)	M	M	M
MASONRY TOILETS (WATER BORNE)	WB	WB	WB
BOAT RAMPS	BR	BR	BR
BUILDING STRUCTURE (AS DESIGNATED)			
WATER WELLS (SUPPLY)			
WATER LINES	W	W	W
ELECTRIC SERVICE LINES			
RESERVOIR INFORMATION SIGNS	RI	RI	RI
PARK ENTRANCE SIGNS	PE	PE	PE
DIRECTIONAL SIGNS	D	D	D
BUOYS			
REGISTRATION BOOTH	RB	RB	RB
TREE COVER			
TRAFFIC COUNTERS	TC	TC	TC
SWIMMING BEACH			

LIMITS OF CONCESSION AREAS

LIMITS OF LICENSE OR LEASE AREAS

UPPER LIMITS (FLOWAGE EASEMENT)

GOVERNMENT PROPERTY LINE

INITIAL DEVELOPMENT (FY71 THRU FY76)

PICNIC FACILITIES

PICNIC AREA NO.	ITEM	EXISTING BY C OF E	EXISTING BY OTHERS	PLANNED BY C OF E	PLANNED BY OTHERS
6	TABLES			18	
	FIREPLACES			18	
	TRASH CANS			18	
	SHELTERS			18	
7	TABLES			14	
	FIREPLACES			14	
	TRASH CANS			14	
	SHELTERS			14	
8	TABLES			10	
	FIREPLACES			10	
	TRASH CANS			10	
	SHELTERS			10	
9	TABLES			30	
	FIREPLACES			30	
	TRASH CANS			30	
	SHELTERS			30	
10	TABLES			10	
	FIREPLACES			10	
	TRASH CANS			10	
	SHELTERS			10	
11	TABLES	28		12	
	FIREPLACES	9		12	
	TRASH CANS	9		12	
	SHELTERS			12	

CAMPING FACILITIES

CAMP AREA NO.	ITEM	EXISTING BY C OF E	EXISTING BY OTHERS	PLANNED BY C OF E	PLANNED BY OTHERS
1	TABLES				
	FIREPLACES				
	TRASH CANS				
	SHELTERS				
2	TABLES	6		42	
	FIREPLACES	6		42	
	TRASH CANS	6		42	
	SHELTERS	6		42	
3	TABLES				
	FIREPLACES				
	TRASH CANS				
	SHELTERS				
4	TABLES				
	FIREPLACES				
	TRASH CANS				
	SHELTERS				
5	TABLES				
	FIREPLACES				
	TRASH CANS				
	SHELTERS				
6	TABLES				
	FIREPLACES				
	TRASH CANS				
	SHELTERS				

TRINITY RIVER AND TRIBUTARIES, TEXAS

GRAPEVINE DAM AND RESERVOIR

DENTON CREEK ELM FORK, TRINITY RIVER

MURRELL PARK

IN 2 SHEETS

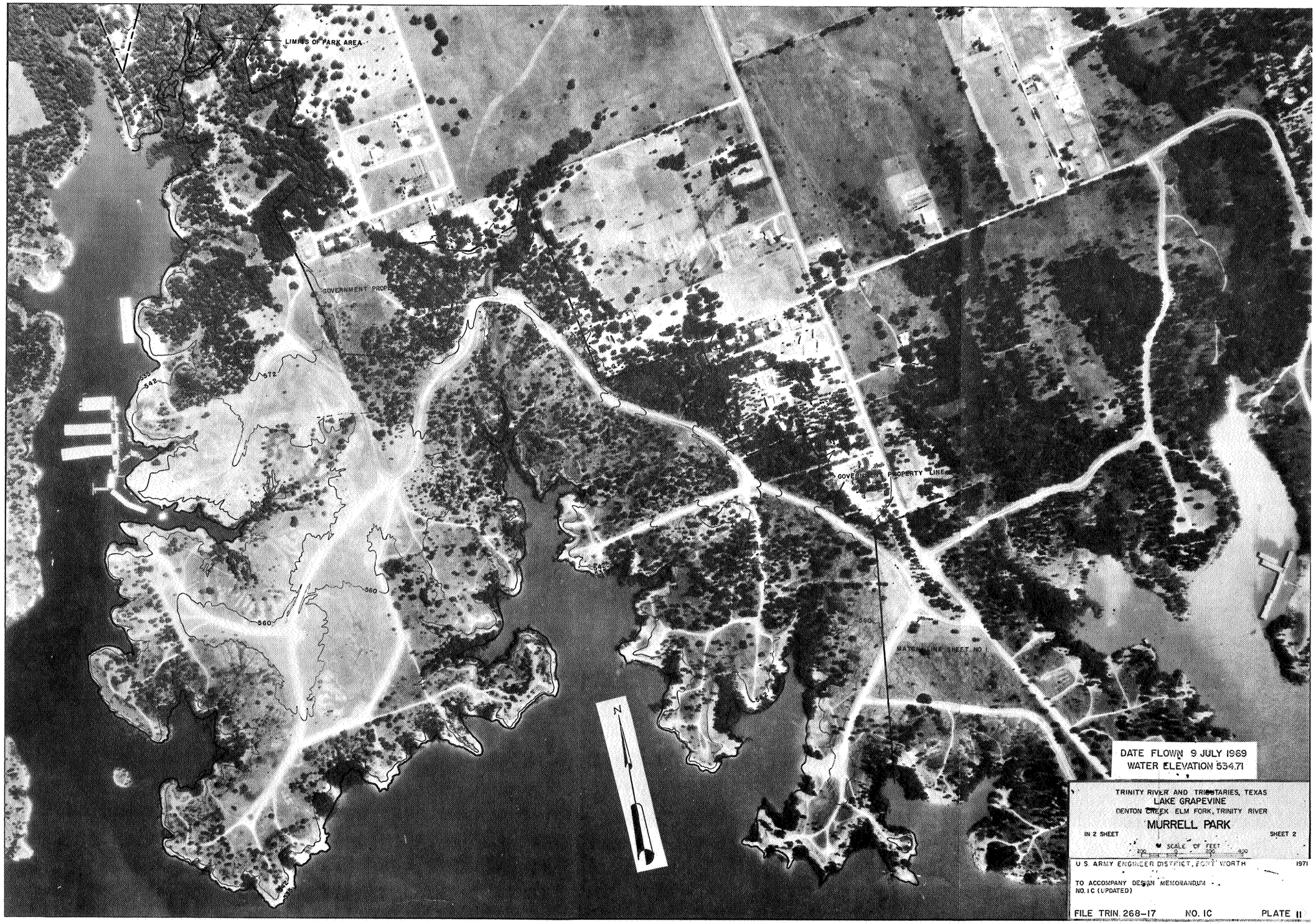
SCALE OF FEET 200 0 200 400

SHEET NO. 2

U S ARMY ENGINEER DISTRICT, FORT WORTH AUGUST 1971

TO ACCOMPANY DESIGN MEMORANDUM NO. 1C (UPDATED)

FILE TRIN. 268-17 NO. 1C PLATE 10



TRINITY RIVER AND TRIBUTARIES, TEXAS
LAKE GRAPEVINE
DENTON CREEK ELM FORK, TRINITY RIVER
MURRELL PARK
IN 2 SHEET SHEET 2
SCALE OF FEET

U.S. ARMY ENGINEER DISTRICT, FORT WORTH 1971

TO ACCOMPANY DESIGN MEMORANDUM NO. IC (UPDATED)

FILE TRIN. 268-17 NO. IC PLATE II

CORPS OF ENGINEERS

U S ARMY

LIMITS OF PARK AREA

GOVERNMENT PROPERTY LINE

581 572 560 535 542 560

572 Foot Trails

GROUP CAMP
1 CAMPFIRE CIRCLE
4 FIRE PLACES
8 TENT PADS
1 WOODEN VAULT TYPE TOILET

GROUP CAMP
1 CAMPFIRE CIRCLE
4 FIRE PLACES
8 TENT PADS
1 WOODEN VAULT TYPE TOILET

PICNIC AREA NO. 1

Convert To Waterborne

Service Building

CAMPING AREA NO. 2

ROAD 1

Courtesy Dock

CAMPING AREA NO. 3

Service Building

Trailer Dump Station

4 Lane Boat Ramp

Courtesy Dock

Courtesy Dock

GOVERNMENT PROPERTY LINE

581 572 560 542 535

ROAD NO. 1

PICNIC AREA NO. 2

WB

PICNIC AREA NO. 3

ROAD NO. 1

GOVERNMENT PROPERTY LINE

Service Building

CAMPING AREA NO. 1

Trailer Dump Station

Service Building

Courtesy Dock

LIMITS OF PARK AREA

560 572 542

TWIN COVES PARK

KEY MAP

N

POOL ELEVATIONS

CONSERVATION POOL	535.0
CONSERVATION POOL PLUS 5-YEAR FLOOD	542.0
TOP OF FLOOD CONTROL POOL	560.0

ACRES IN PARK

ABOVE CONSERVATION POOL	243.0
ABOVE CONSERVATION POOL PLUS 5-YEAR FLOOD	317.0
ABOVE FLOOD CONTROL POOL	158.0

PICNIC FACILITIES

PICNIC AREA NO.	ITEM	EXISTING BY C OF E	EXISTING BY OTHERS	PLANNED BY C OF E	PLANNED BY OTHERS
1	TABLES	4			
	FIREPLACES	4			
	TRASH CANS	4			
	SHELTERS				
2	TABLES			8	
	FIREPLACES			8	
	TRASH CANS			8	
	SHELTERS				
3	TABLES	1			
	FIREPLACES	1			
	TRASH CANS	1			
	SHELTERS				
4	TABLES				
	FIREPLACES				
	TRASH CANS				
	SHELTERS				
5	TABLES				
	FIREPLACES				
	TRASH CANS				
	SHELTERS				
6	TABLES				
	FIREPLACES				
	TRASH CANS				
	SHELTERS				

CAMPING FACILITIES

CAMP AREA NO.	ITEM	EXISTING BY C OF E	EXISTING BY OTHERS	PLANNED BY C OF E	PLANNED BY OTHERS
1	TABLES			75	
	FIREPLACES			75	
	TRASH CANS			75	
	SHELTERS				
2	TABLES	1		38	
	FIREPLACES	1		38	
	TRASH CANS	1		38	
	SHELTERS				
3	TABLES			27	
	FIREPLACES			27	
	TRASH CANS			27	
	SHELTERS				
4	TABLES				
	FIREPLACES				
	TRASH CANS				
	SHELTERS				
5	TABLES				
	FIREPLACES				
	TRASH CANS				
	SHELTERS				
6	TABLES				
	FIREPLACES				
	TRASH CANS				
	SHELTERS				

LEGEND

	EXISTING BY C OF E	EXISTING BY OTHERS	PLANNED BY C OF E
GRAVEL ROADS			
PAVED ROADS			
SECONDARY ROADS			
GRAVEL PARKING AREAS			
PAVED PARKING AREAS			
FRAME TOILETS (CONCRETE VAULT)	F(C)	F(C)	F(C)
FRAME TOILETS (PIT TYPE)	F(E)	F(E)	F(E)
MASONRY TOILETS (CONCRETE VAULT)	M	M	M
MASONRY TOILETS (WATER BORNE)	WB	WB	WB
BOAT RAMPS	BR	BR	BR
BUILDING STRUCTURE (AS DESIGNATED)			
WATER WELLS (SUPPLY)			
WATER LINES	W	W	W
ELECTRIC SERVICE LINES			
RESERVOIR INFORMATION SIGNS	RI	RI	RI
PARK ENTRANCE SIGNS	PE	PE	PE
DIRECTIONAL SIGNS	D	D	D
BUOYS			
REGISTRATION BOOTH	RB	RB	RB
TREE COVER			
TRAFFIC COUNTERS	TC	TC	TC
SWIMMING BEACH			
LIMITS OF CONCESSION AREAS			
LIMITS OF LICENSE OR LEASE AREAS			
UPPER LIMITS (FLOWAGE EASEMENT)			
GOVERNMENT PROPERTY LINE			
INITIAL DEVELOPMENT (FY71 THRU FY76)			

TRINITY RIVER AND TRIBUTARIES, TEXAS
GRAPEVINE DAM AND RESERVOIR
DENTON CREEK ELM FORK, TRINITY RIVER

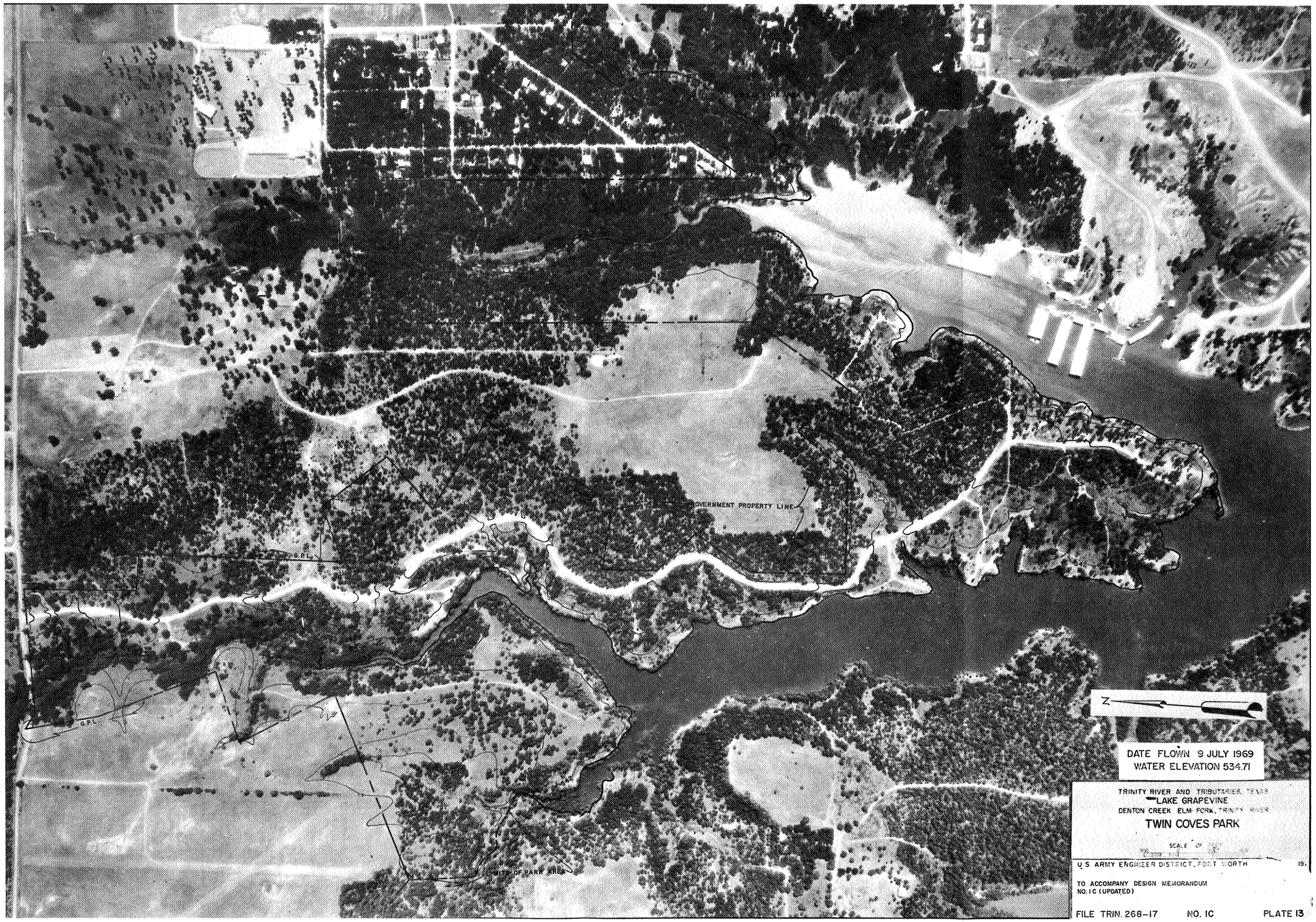
TWIN COVES PARK

SCALE OF FEET
200 0 200 400

U S ARMY ENGINEER DISTRICT, FORT WORTH AUGUST 1971

TO ACCOMPANY DESIGN MEMORANDUM
NO. 1C (UPDATED)

FILE TRIN. 268-17 NO. 1C PLATE 12



DATE FLOWN 9 JULY 1969
WATER ELEVATION 534.71

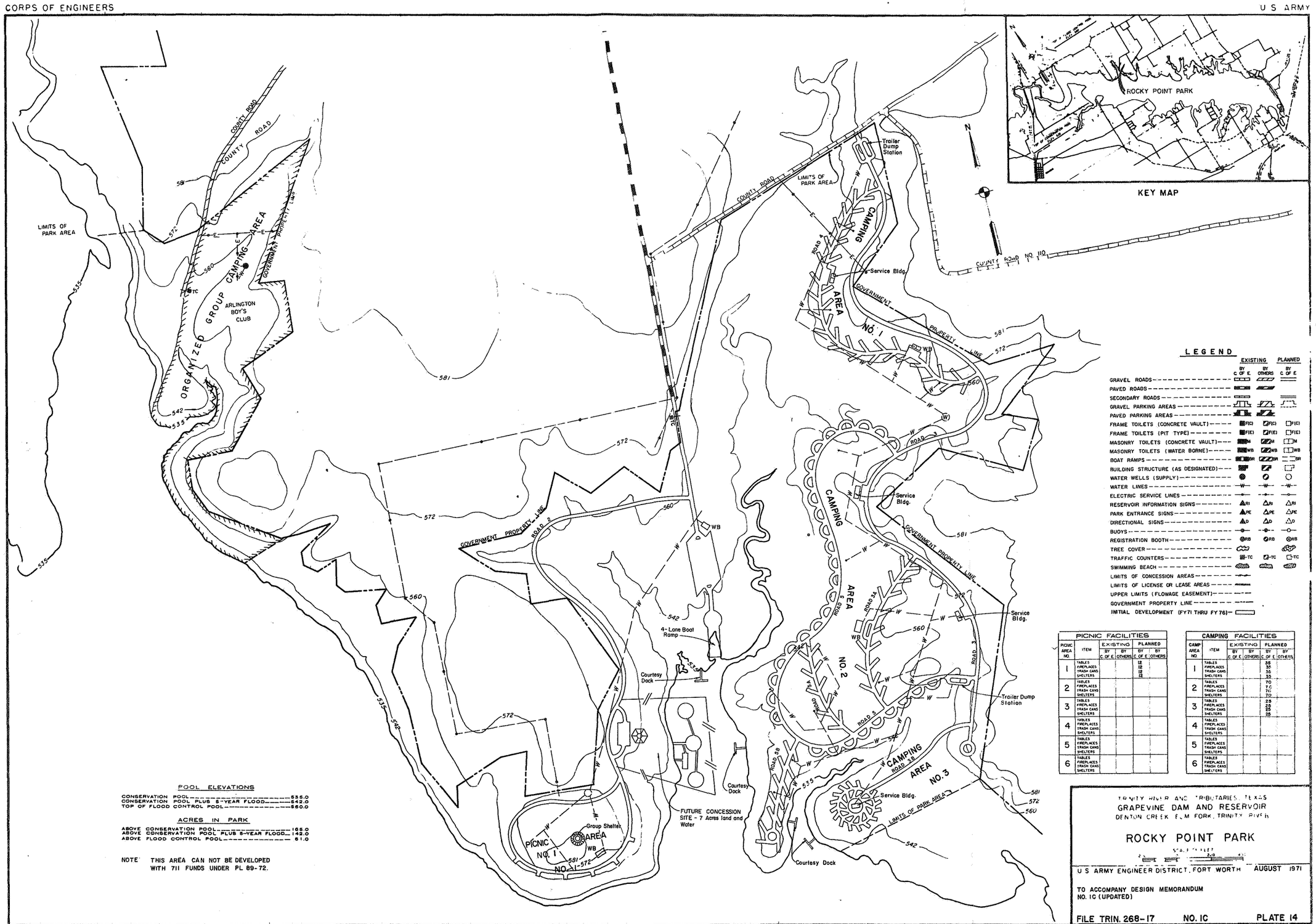
TRINITY RIVER AND TRIBUTARIES, TEXAS
LAKE GRAPEVINE
DENTON CREEK ELM FORK, TRINITY RIVER
TWIN COVES PARK

SCALE OF

U.S. ARMY ENGINEER DISTRICT, FORT WORTH 19

TO ACCOMPANY DESIGN MEMORANDUM
NO. 1C (UPDATED)

FILE TRIN. 268-17 NO. 1C PLATE 13



LEGEND

	EXISTING BY C OF E	EXISTING BY OTHERS	PLANNED BY C OF E
GRAVEL ROADS			
PAVED ROADS			
SECONDARY ROADS			
GRAVEL PARKING AREAS			
PAVED PARKING AREAS			
FRAME TOILETS (CONCRETE VAULT)	F(C)	F(C)	F(C)
FRAME TOILETS (PIT TYPE)	F(E)	F(E)	F(E)
MASONRY TOILETS (CONCRETE VAULT)	M	M	M
MASONRY TOILETS (WATER BORNE)	WB	WB	WB
BOAT RAMPS	BR	BR	BR
BUILDING STRUCTURE (AS DESIGNATED)			
WATER WELLS (SUPPLY)			
WATER LINES	W	W	W
ELECTRIC SERVICE LINES			
RESERVOIR INFORMATION SIGNS	RI	RI	RI
PARK ENTRANCE SIGNS	PE	PE	PE
DIRECTIONAL SIGNS	D	D	D
BUOYS			
REGISTRATION BOOTH	RB	RB	RB
TREE COVER			
TRAFFIC COUNTERS	TC	TC	TC
SWIMMING BEACH			
LIMITS OF CONCESSION AREAS			
LIMITS OF LICENSE OR LEASE AREAS			
UPPER LIMITS (FLOWAGE EASEMENT)			
GOVERNMENT PROPERTY LINE			
INTIAL DEVELOPMENT (FY71 THRU FY 76)			

POOL ELEVATIONS

CONSERVATION POOL	535.0
CONSERVATION POOL PLUS 5-YEAR FLOOD	542.0
TOP OF FLOOD CONTROL POOL	560.0

ACRES IN PARK

ABOVE CONSERVATION POOL	185.0
ABOVE CONSERVATION POOL PLUS 5-YEAR FLOOD	142.0
ABOVE FLOOD CONTROL POOL	61.0

NOTE: THIS AREA CAN NOT BE DEVELOPED WITH 711 FUNDS UNDER PL 89-72.

PICNIC FACILITIES

PICNIC AREA NO.	ITEM	EXISTING BY C OF E	EXISTING BY OTHERS	PLANNED BY C OF E	PLANNED BY OTHERS
1	TABLES			12	
	FIREPLACES			12	
	TRASH CANS			12	
	SHELTERS			12	
2	TABLES				
	FIREPLACES				
	TRASH CANS				
	SHELTERS				
3	TABLES				
	FIREPLACES				
	TRASH CANS				
	SHELTERS				
4	TABLES				
	FIREPLACES				
	TRASH CANS				
	SHELTERS				
5	TABLES				
	FIREPLACES				
	TRASH CANS				
	SHELTERS				
6	TABLES				
	FIREPLACES				
	TRASH CANS				
	SHELTERS				

CAMPING FACILITIES

CAMP AREA NO.	ITEM	EXISTING BY C OF E	EXISTING BY OTHERS	PLANNED BY C OF E	PLANNED BY OTHERS
1	TABLES			35	
	FIREPLACES			35	
	TRASH CANS			35	
	SHELTERS			35	
2	TABLES			70	
	FIREPLACES			70	
	TRASH CANS			70	
	SHELTERS			70	
3	TABLES			25	
	FIREPLACES			25	
	TRASH CANS			25	
	SHELTERS			25	
4	TABLES				
	FIREPLACES				
	TRASH CANS				
	SHELTERS				
5	TABLES				
	FIREPLACES				
	TRASH CANS				
	SHELTERS				
6	TABLES				
	FIREPLACES				
	TRASH CANS				
	SHELTERS				

TRINITY RIVER AND TRIBUTARIES, TEXAS
GRAPEVINE DAM AND RESERVOIR
DENTON CREEK, E.M. FORK, TRINITY RIVER

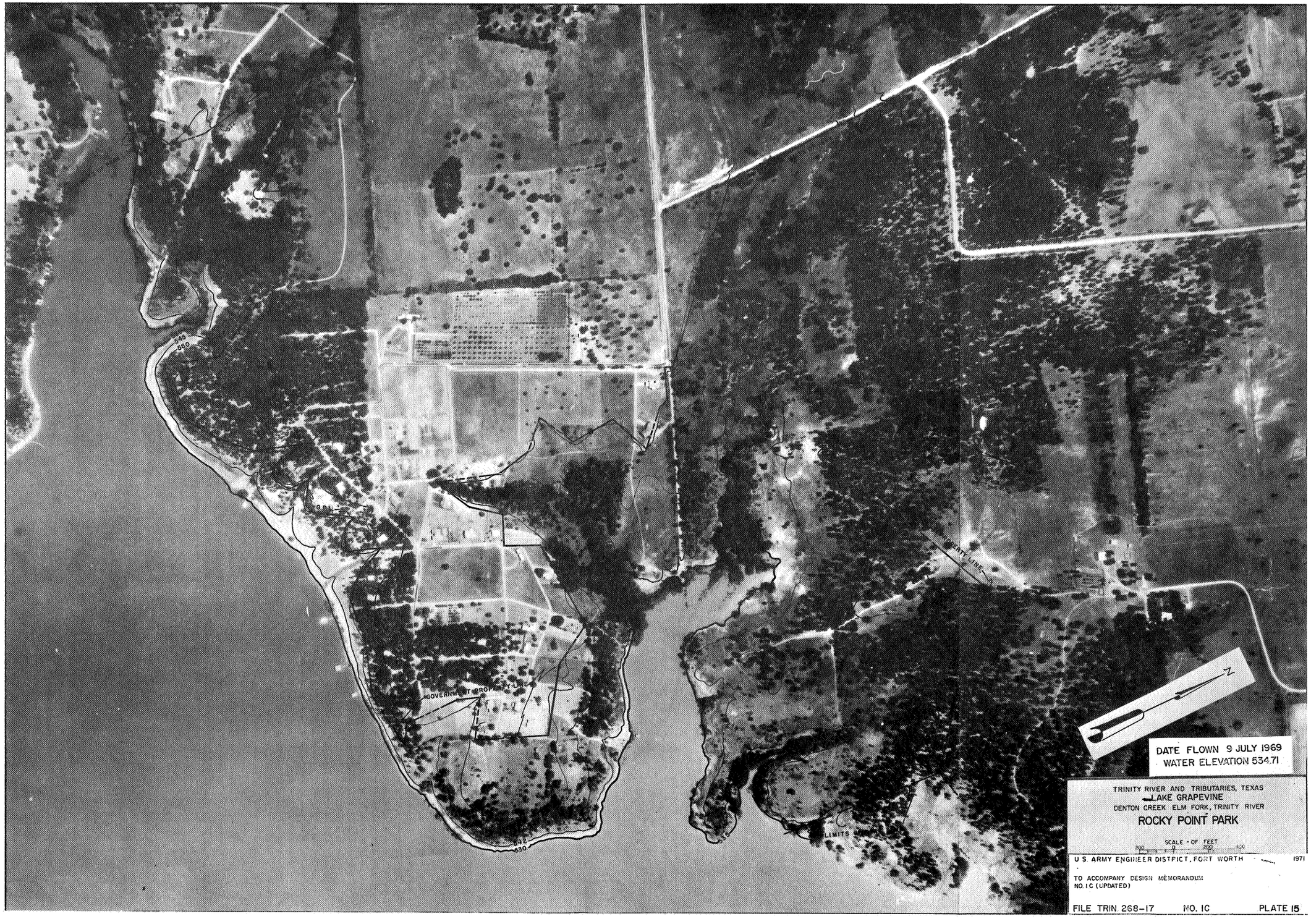
ROCKY POINT PARK

SCALE IN FEET 0 200 400

U S ARMY ENGINEER DISTRICT, FORT WORTH AUGUST 1971

TO ACCOMPANY DESIGN MEMORANDUM NO. 1C (UPDATED)

FILE TRIN. 268-17 NO. 1C PLATE 14



TRINITY RIVER AND TRIBUTARIES, TEXAS

LAKE GRAPEVINE

DENTON CREEK ELM FORK, TRINITY RIVER

ROCKY POINT PARK

SCALE - OF FEET

0 200 400 600

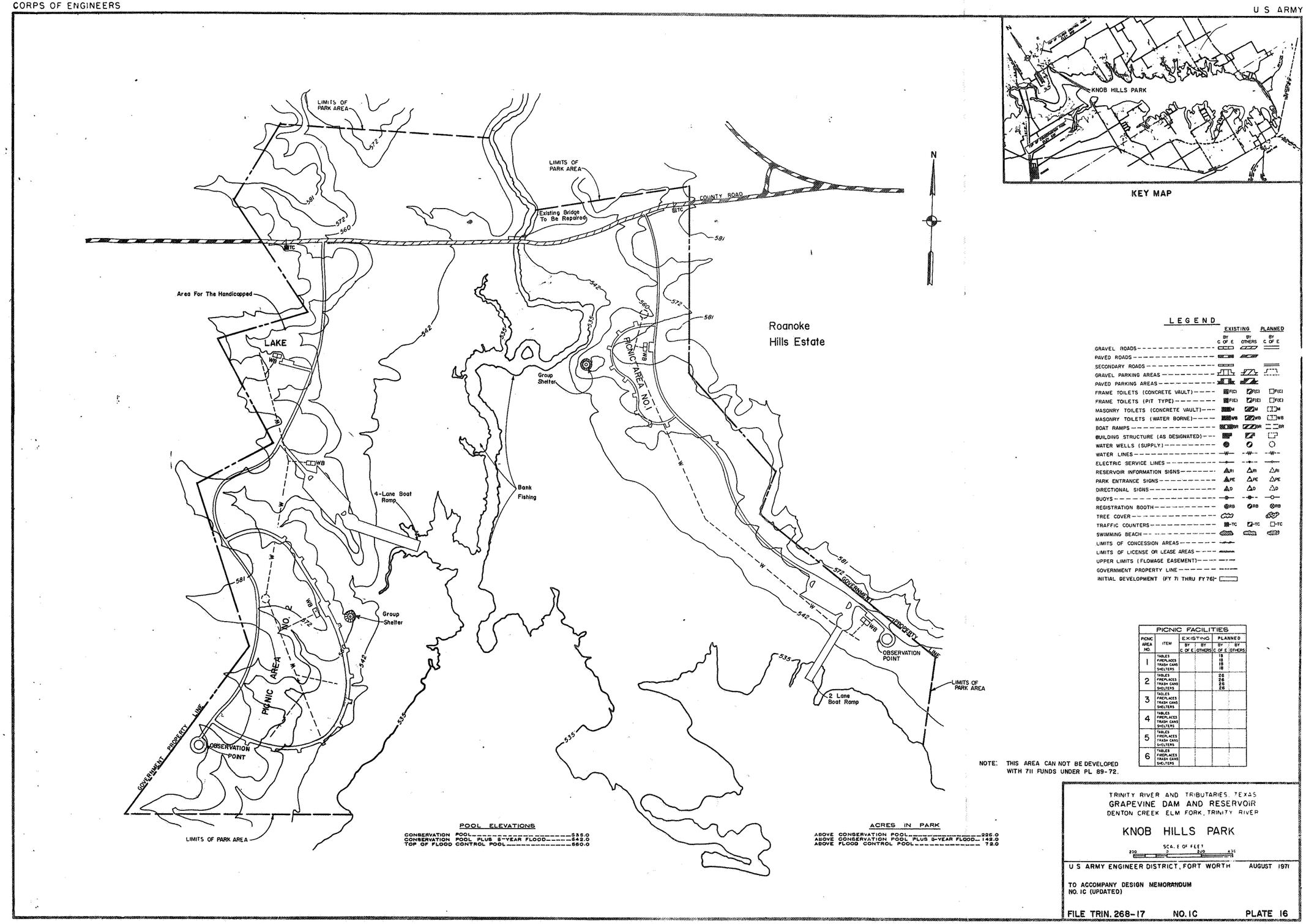
U.S. ARMY ENGINEER DISTRICT, FORT WORTH — 1971

TO ACCOMPANY DESIGN MEMORANDUM NO. 1C (UPDATED)

FILE TRIN 268-17 NO. 1C PLATE 15

CORPS OF ENGINEERS

U S ARMY



KEY MAP

LEGEND

	EXISTING BY C. OF E.	EXISTING BY OTHERS	PLANNED BY C. OF E.
GRAVEL ROADS			
PAVED ROADS			
SECONDARY ROADS			
GRAVEL PARKING AREAS			
PAVED PARKING AREAS			
FRAME TOILETS (CONCRETE VAULT)	F(C)	F(C)	F(C)
FRAME TOILETS (PIT TYPE)	F(E)	F(E)	F(E)
MASONRY TOILETS (CONCRETE VAULT)	M	M	M
MASONRY TOILETS (WATER BORNE)	WB	WB	WB
BOAT RAMPS	BR	BR	BR
BUILDING STRUCTURE (AS DESIGNATED)	B	B	B
WATER WELLS (SUPPLY)			
WATER LINES	W	W	W
ELECTRIC SERVICE LINES			
RESERVOIR INFORMATION SIGNS	RI	RI	RI
PARK ENTRANCE SIGNS	PE	PE	PE
DIRECTIONAL SIGNS	D	D	D
BUOYS	RB	RB	RB
REGISTRATION BOOTH			
TREE COVER			
TRAFFIC COUNTERS	TC	TC	TC
SWIMMING BEACH			

LIMITS OF CONCESSION AREAS

LIMITS OF LICENSE OR LEASE AREAS

UPPER LIMITS (FLOWAGE EASEMENT)

GOVERNMENT PROPERTY LINE

INITIAL DEVELOPMENT (FY 71 THRU FY 76)

POOL ELEVATIONS

CONSERVATION POOL	535.0
CONSERVATION POOL PLUS 6-YEAR FLOOD	642.0
TOP OF FLOOD CONTROL POOL	560.0

ACRES IN PARK

ABOVE CONSERVATION POOL	226.0
ABOVE CONSERVATION POOL PLUS 6-YEAR FLOOD	142.0
ABOVE FLOOD CONTROL POOL	72.0

PICNIC FACILITIES

PICNIC AREA NO.	ITEM	EXISTING BY C. OF E.	EXISTING BY OTHERS	PLANNED BY C. OF E.	PLANNED BY OTHERS
1	TABLES			18	
	FIREPLACES			18	
	TRASH CANS			18	
	SHELTERS			18	
2	TABLES			26	
	FIREPLACES			26	
	TRASH CANS			26	
	SHELTERS			26	
3	TABLES				
	FIREPLACES				
	TRASH CANS				
	SHELTERS				
4	TABLES				
	FIREPLACES				
	TRASH CANS				
	SHELTERS				
5	TABLES				
	FIREPLACES				
	TRASH CANS				
	SHELTERS				
6	TABLES				
	FIREPLACES				
	TRASH CANS				
	SHELTERS				

NOTE: THIS AREA CAN NOT BE DEVELOPED WITH 711 FUNDS UNDER PL 89-72.

TRINITY RIVER AND TRIBUTARIES, TEXAS

GRAPEVINE DAM AND RESERVOIR

DENTON CREEK ELM FORK, TRINITY RIVER

KNOB HILLS PARK

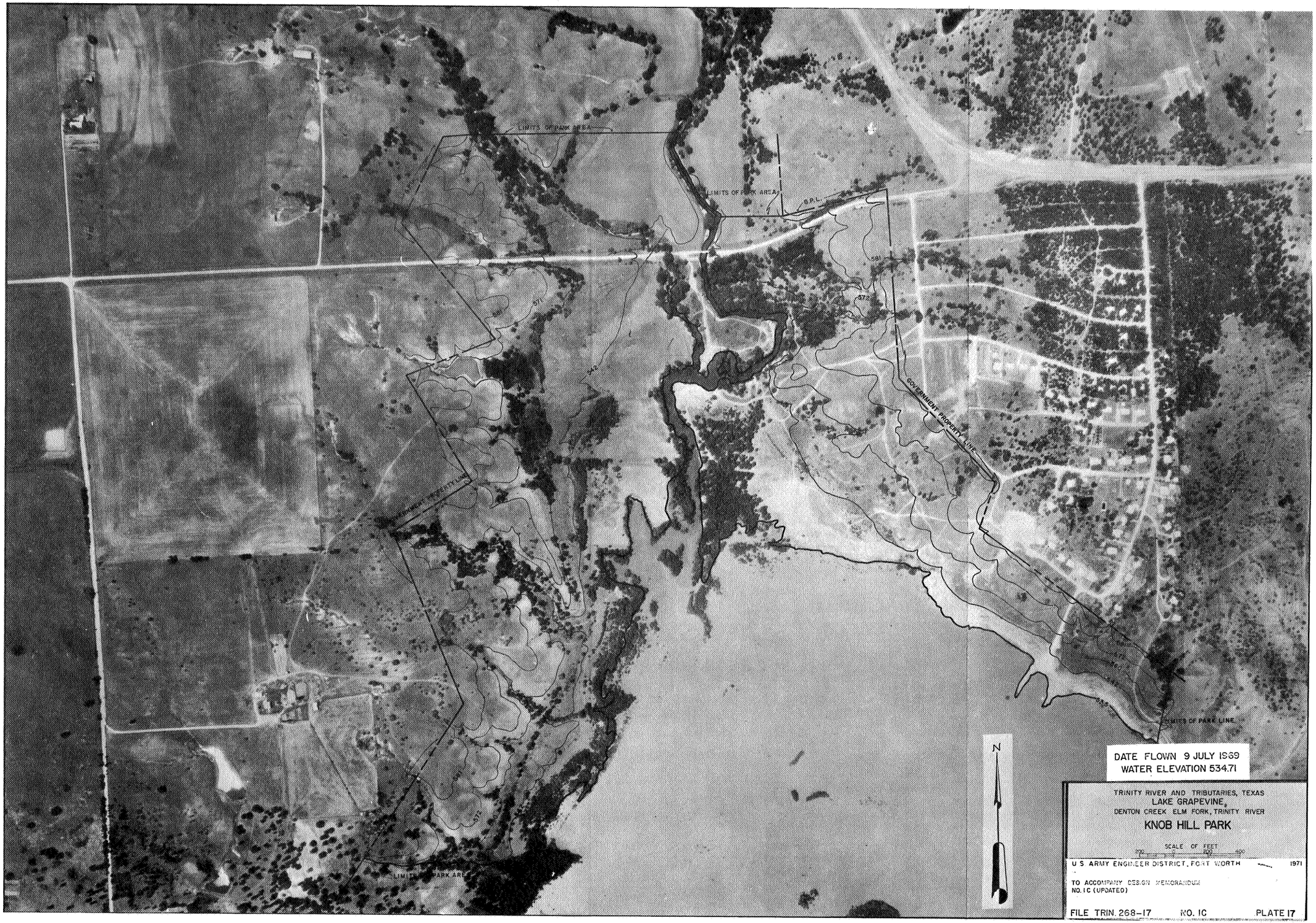
SCALE OF FEET

250 0 250 500

U S ARMY ENGINEER DISTRICT, FORT WORTH AUGUST 1971

TO ACCOMPANY DESIGN MEMORANDUM NO. 1C (UPDATED)

FILE TRIN. 268-17 NO. 1C PLATE 16



DATE FLOWN 9 JULY 1969
WATER ELEVATION 534.71

TRINITY RIVER AND TRIBUTARIES, TEXAS
LAKE GRAPEVINE,
DENTON CREEK ELM FORK, TRINITY RIVER

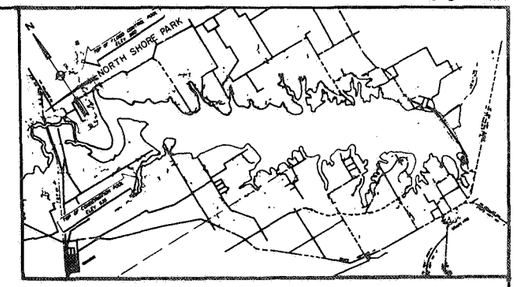
KNOB HILL PARK

SCALE OF FEET

U S ARMY ENGINEER DISTRICT, FORT WORTH — 1971

TO ACCOMPANY DESIGN MEMORANDUM
NO. 1C (UPDATED)

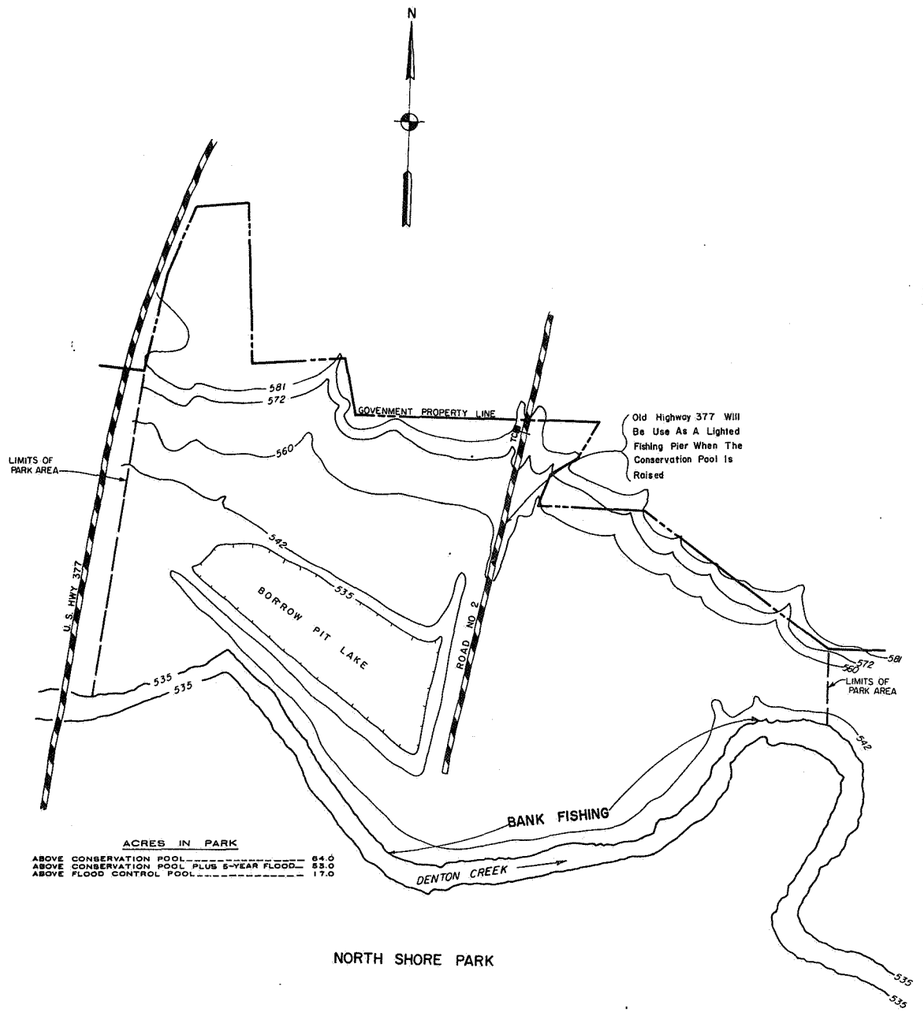
FILE TRIN. 268-17 NO. 1C PLATE 17



KEY MAP

POOL ELEVATIONS

CONSERVATION POOL	535.0
CONSERVATION POOL PLUS 5-YEAR FLOOD	542.0
TOP OF FLOOD CONTROL POOL	560.0



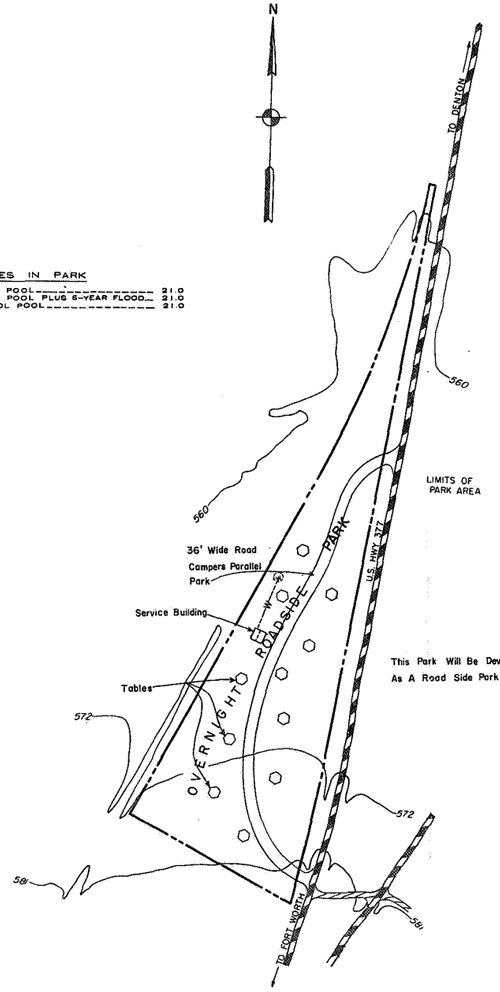
ACRES IN PARK

ABOVE CONSERVATION POOL	64.0
ABOVE CONSERVATION POOL PLUS 5-YEAR FLOOD	83.0
ABOVE FLOOD CONTROL POOL	17.0

NORTH SHORE PARK

ACRES IN PARK

ABOVE CONSERVATION POOL	21.0
ABOVE CONSERVATION POOL PLUS 5-YEAR FLOOD	21.0
ABOVE FLOOD CONTROL POOL	21.0



This Park Will Be Developed As A Road Side Park

ROANOKE PARK

LEGEND

	EXISTING BY C OF E	EXISTING BY OTHERS	PLANNED BY C OF E
GRAVEL ROADS			
PAVED ROADS			
SECONDARY ROADS			
GRAVEL PARKING AREAS			
PAVED PARKING AREAS			
FRAME TOILETS (CONCRETE VAULT)	F(C)	F(C)	F(C)
FRAME TOILETS (PIT TYPE)	F(E)	F(E)	F(E)
MASONRY TOILETS (CONCRETE VAULT)	M	M	M
MASONRY TOILETS (WATER BORNE)	MWB	MWB	MWB
BOAT RAMPS	BR	BR	BR
BUILDING STRUCTURE (AS DESIGNATED)			
WATER WELLS (SUPPLY)			
WATER LINES	W	W	W
ELECTRIC SERVICE LINES			
RESERVOIR INFORMATION SIGNS	RI	RI	RI
PARK ENTRANCE SIGNS	PE	PE	PE
DIRECTIONAL SIGNS	D	D	D
BUOYS			
REGISTRATION BOOTH	RB	RB	RB
TREE COVER			
TRAFFIC COUNTERS	TC	TC	TC
SWIMMING BEACH			
LIMITS OF CONCESSION AREAS			
LIMITS OF LICENSE OR LEASE AREAS			
UPPER LIMITS (FLOWAGE EASEMENT)			
GOVERNMENT PROPERTY LINE			
INITIAL DEVELOPMENT (FY 71 THRU FY 76)			

NOTE: THESE TWO AREAS CAN NOT BE DEVELOPED WITH 711 FUNDS UNDER PL 89-72

TRINITY RIVER AND TRIBUTARIES, TEXAS
GRAPEVINE DAM AND RESERVOIR
DENTON CREEK ELM FORK, TRINITY RIVER

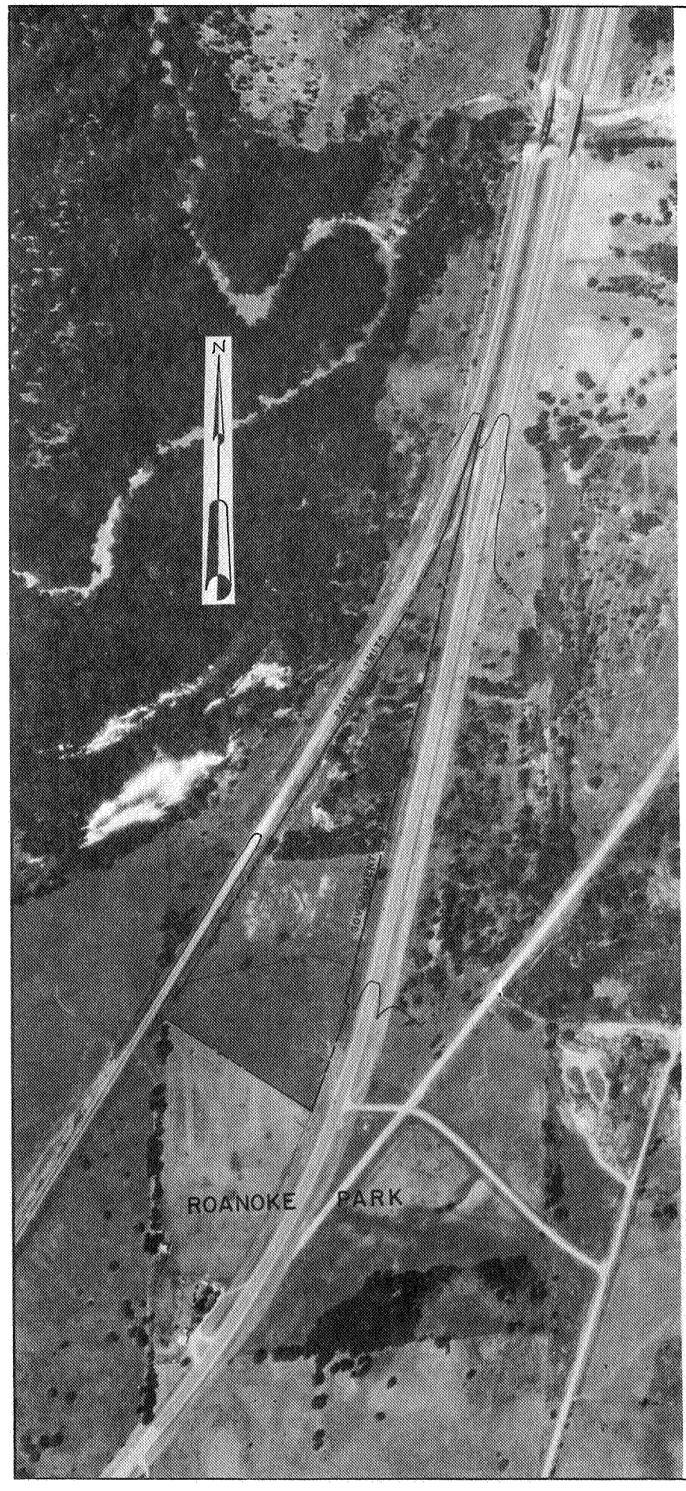
NORTH SHORE PARK
ROANOKE PARK

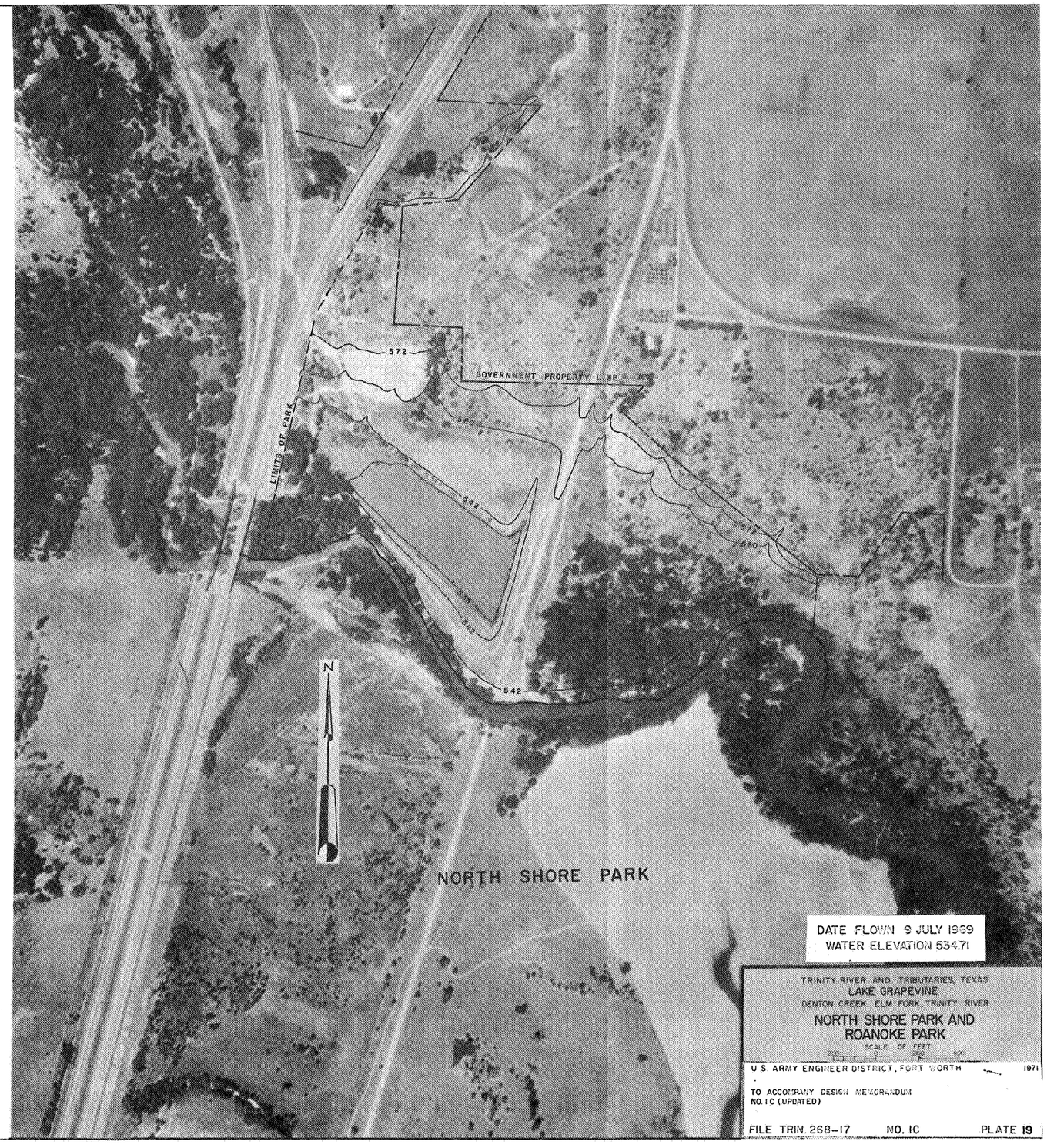
SCALE IN FEET
200 0 200 400

U S ARMY ENGINEER DISTRICT, FORT WORTH AUGUST 1971

TO ACCOMPANY DESIGN MEMORANDUM NO. 1C (UPDATED)

FILE TRIN.268-17 NO. 1C PLATE 18





DATE FLOWN 9 JULY 1969
WATER ELEVATION 534.71

TRINITY RIVER AND TRIBUTARIES, TEXAS
LAKE GRAPEVINE
DENTON CREEK ELM FORK, TRINITY RIVER

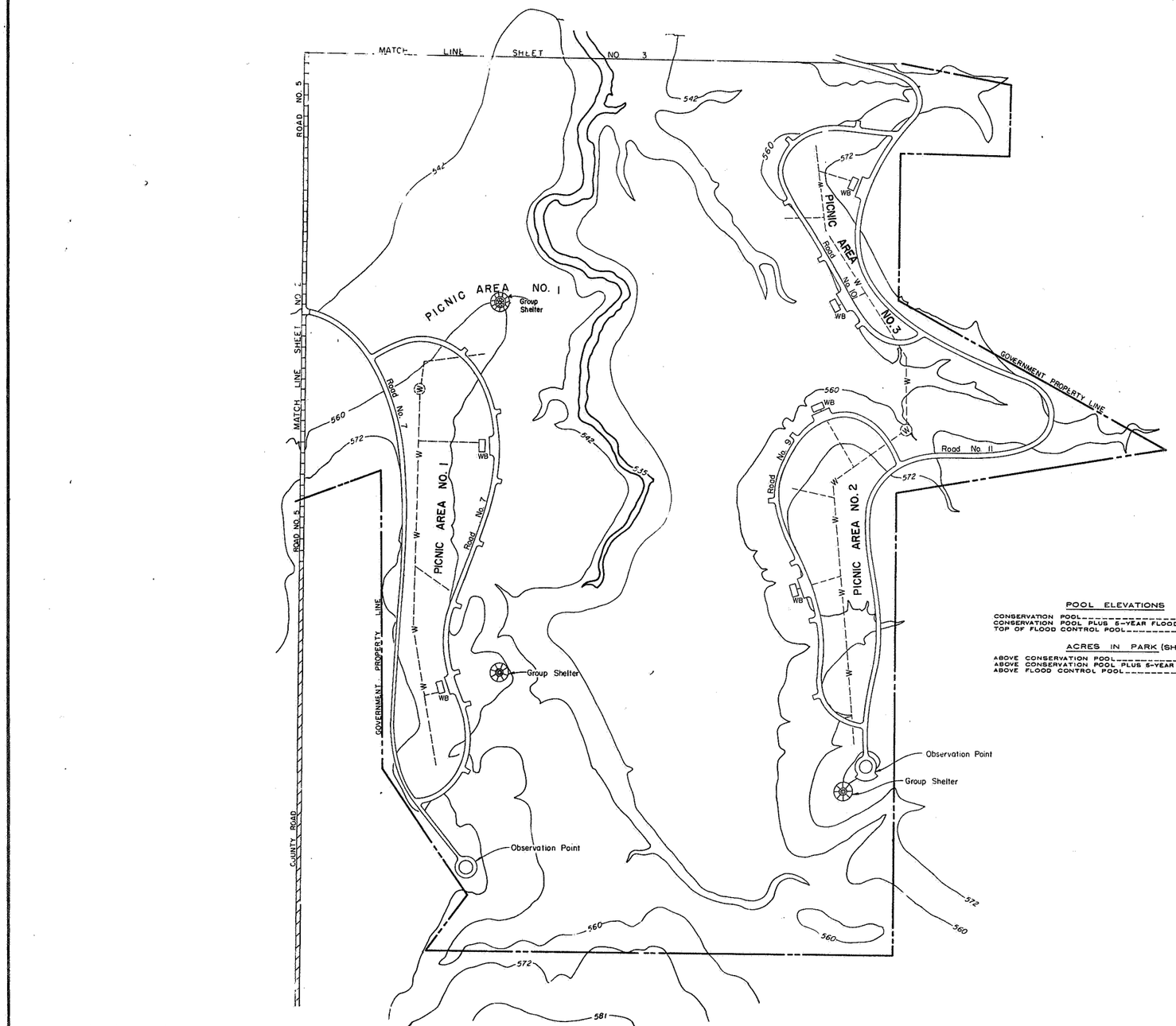
NORTH SHORE PARK AND ROANOKE PARK

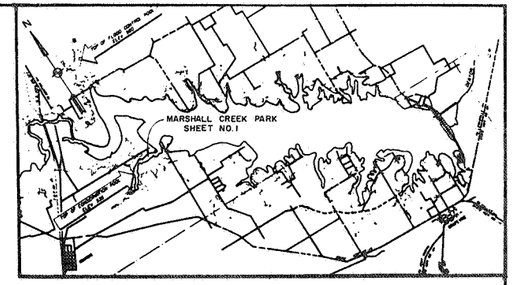
SCALE OF FEET

U S ARMY ENGINEER DISTRICT, FORT WORTH — 1971

TO ACCOMPANY DESIGN MEMORANDUM
NO. 1C (UPDATED)

FILE TRIN. 268-17 NO. 1C PLATE 19





KEY MAP

POOL ELEVATIONS

CONSERVATION POOL	535.0
CONSERVATION POOL PLUS 6-YEAR FLOOD	542.0
TOP OF FLOOD CONTROL POOL	560.0

ACRES IN PARK (SHEETS 1 THRU 4)

ABOVE CONSERVATION POOL	806.0
ABOVE CONSERVATION POOL PLUS 6-YEAR FLOOD	470.0
ABOVE FLOOD CONTROL POOL	157.0

PICNIC FACILITIES

PICNIC AREA NO	ITEM	EXISTING BY C OF E	EXISTING BY OTHERS	PLANNED BY C OF E	PLANNED BY OTHERS
1	TABLES			16	
	FIREPLACES			16	
	TRASH CANS			16	
	SHELTERS			16	
2	TABLES			10	
	FIREPLACES			10	
	TRASH CANS			10	
	SHELTERS			10	
3	TABLES			10	
	FIREPLACES			10	
	TRASH CANS			10	
	SHELTERS			10	

LEGEND

	EXISTING BY C OF E	EXISTING BY OTHERS	PLANNED BY C OF E
GRAVEL ROADS			
PAVED ROADS			
SECONDARY ROADS			
GRAVEL PARKING AREAS			
PAVED PARKING AREAS			
FRAME TOILETS (CONCRETE VAULT)	F(C)	F(C)	F(C)
FRAME TOILETS (PIT TYPE)	F(E)	F(E)	F(E)
MASONRY TOILETS (CONCRETE VAULT)	M	M	M
MASONRY TOILETS (WATER BORNE)	WB	WB	WB
BOAT RAMPS	BR	BR	BR
BUILDING STRUCTURE (AS DESIGNATED)			
WATER WELLS (SUPPLY)			
WATER LINES	W	W	W
ELECTRIC SERVICE LINES			
RESERVOIR INFORMATION SIGNS	RI	RI	RI
PARK ENTRANCE SIGNS	PE	PE	PE
DIRECTIONAL SIGNS	D	D	D
BUOYS			
REGISTRATION BOOTH	RB	RB	RB
TREE COVER			
TRAFFIC COUNTERS	TC	TC	TC
SWIMMING BEACH			

LIMITS OF CONCESSION AREAS
LIMITS OF LICENSE OR LEASE AREAS
UPPER LIMITS (FLOWAGE EASEMENT)
GOVERNMENT PROPERTY LINE
INITIAL DEVELOPMENT (FY 71 THRU FY 76)

TRINITY RIVER AND TRIBUTARIES, TEXAS
GRAPEVINE DAM AND RESERVOIR
DENTON CREEK ELM FORK, TRINITY RIVER

MARSHALL CREEK PARK

IN 4 SHEETS SHEET NO 1

SCALE OF FEET 0 200 400

U S ARMY ENGINEER DISTRICT, FORT WORTH AUGUST 1971

TO ACCOMPANY DESIGN MEMORANDUM NO. 1C (UPDATED)

FILE TRIN. 268-17 NO. 1C PLATE 20

DATE FLOWN 9 JULY 1969
WATER ELEVATION 534.71

TRINITY RIVER AND TRIBUTARIES, TEXAS
LAKE GRAPEVINE
DENTON CREEK ELM FORK, TRINITY RIVER

MARSHALL CREEK PARK

IN 3 SHEETS SHEET 1

SCALE OF FEET

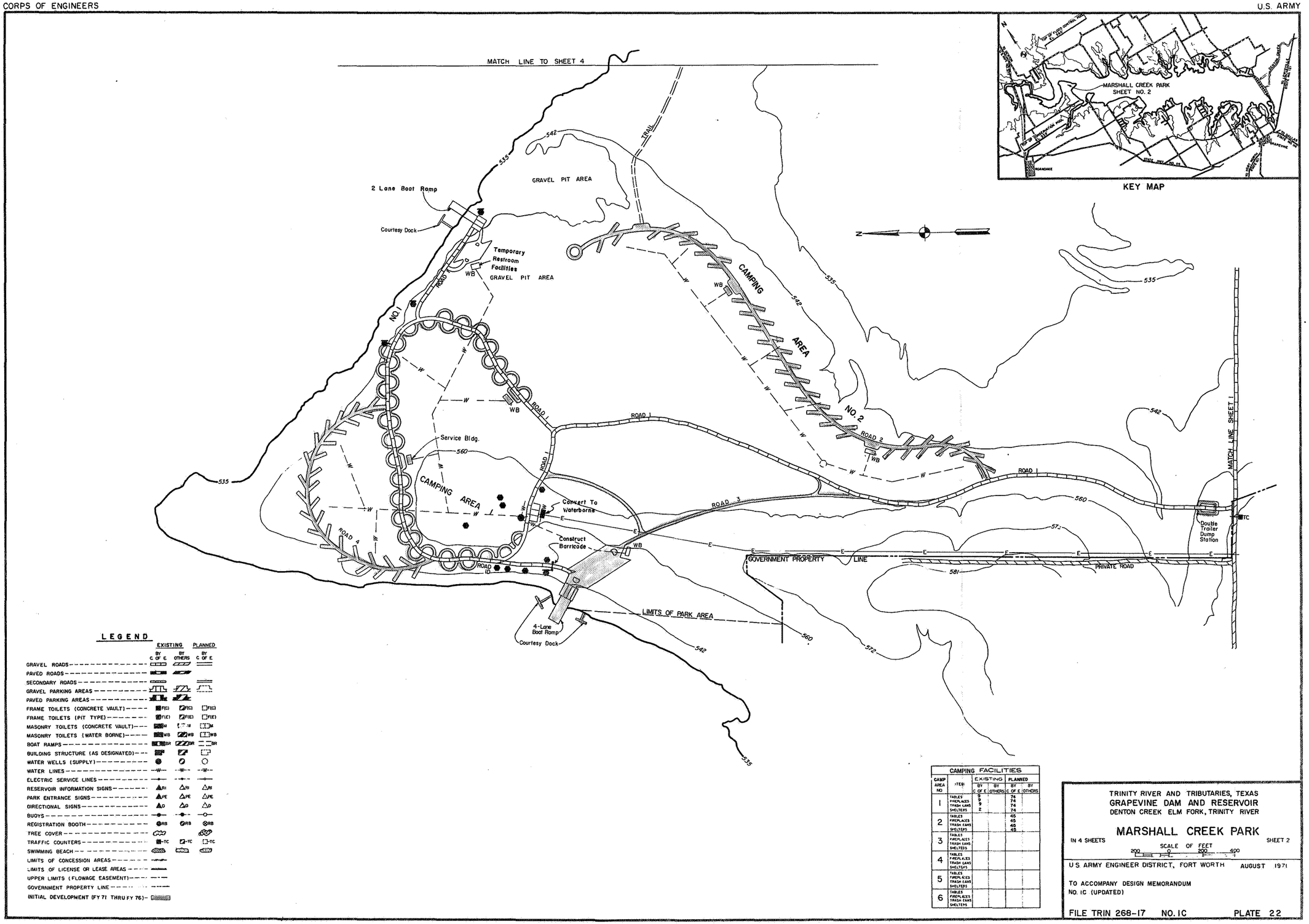
U S ARMY ENGINEER DISTRICT, FORT WORTH 1971

TO ACCOMPANY DESIGN MEMORANDUM NO. 1C (UPDATED)

FILE TRIN. 268-17 NO. 1C PLATE 21

CORPS OF ENGINEERS

U.S. ARMY



KEY MAP

LEGEND

	EXISTING BY C OF E	EXISTING BY OTHERS	PLANNED BY C OF E
GRAVEL ROADS			
PAVED ROADS			
SECONDARY ROADS			
GRAVEL PARKING AREAS			
PAVED PARKING AREAS			
FRAME TOILETS (CONCRETE VAULT)	(FTC)	(FTC)	(FTC)
FRAME TOILETS (PIT TYPE)	(FTE)	(FTE)	(FTE)
MASONRY TOILETS (CONCRETE VAULT)	M	M	M
MASONRY TOILETS (WATER BORNE)	WB	WB	WB
BOAT RAMPS	BR	BR	BR
BUILDING STRUCTURE (AS DESIGNATED)			
WATER WELLS (SUPPLY)			
WATER LINES	W	W	W
ELECTRIC SERVICE LINES			
RESERVOIR INFORMATION SIGNS	RI	RI	RI
PARK ENTRANCE SIGNS	PE	PE	PE
DIRECTIONAL SIGNS	D	D	D
BUOYS			
REGISTRATION BOOTH	RB	RB	RB
TREE COVER			
TRAFFIC COUNTERS	TC	TC	TC
SWIMMING BEACH			
LIMITS OF CONCESSION AREAS			
LIMITS OF LICENSE OR LEASE AREAS			
UPPER LIMITS (FLOWAGE EASEMENT)			
GOVERNMENT PROPERTY LINE			
INITIAL DEVELOPMENT (FY 71 THRU FY 76)			

CAMPING FACILITIES

CAMP AREA NO	ITEM	EXISTING BY C OF E	EXISTING BY OTHERS	PLANNED BY C OF E	PLANNED BY OTHERS
1	TABLES	9		74	
	FIREPLACES	9		74	
	TRASH CANS	9		74	
	SHELTERS	2		74	
2	TABLES			45	
	FIREPLACES			45	
	TRASH CANS			45	
	SHELTERS			45	
3	TABLES				
	FIREPLACES				
	TRASH CANS				
	SHELTERS				
4	TABLES				
	FIREPLACES				
	TRASH CANS				
	SHELTERS				
5	TABLES				
	FIREPLACES				
	TRASH CANS				
	SHELTERS				
6	TABLES				
	FIREPLACES				
	TRASH CANS				
	SHELTERS				

TRINITY RIVER AND TRIBUTARIES, TEXAS
GRAPEVINE DAM AND RESERVOIR
DENTON CREEK ELM FORK, TRINITY RIVER

MARSHALL CREEK PARK

IN 4 SHEETS SHEET 2

SCALE OF FEET
200 0 200 400

U.S. ARMY ENGINEER DISTRICT, FORT WORTH AUGUST 1971

TO ACCOMPANY DESIGN MEMORANDUM
NO. 1C (UPDATED)

FILE TRIN 268-17 NO. 1C PLATE 22

TRINITY RIVER AND TRIBUTARIES, TEXAS
LAKE GRAPEVINE
DENTON CREEK, ELM FORK, TRINITY RIVER

MARSHALL CREEK PARK

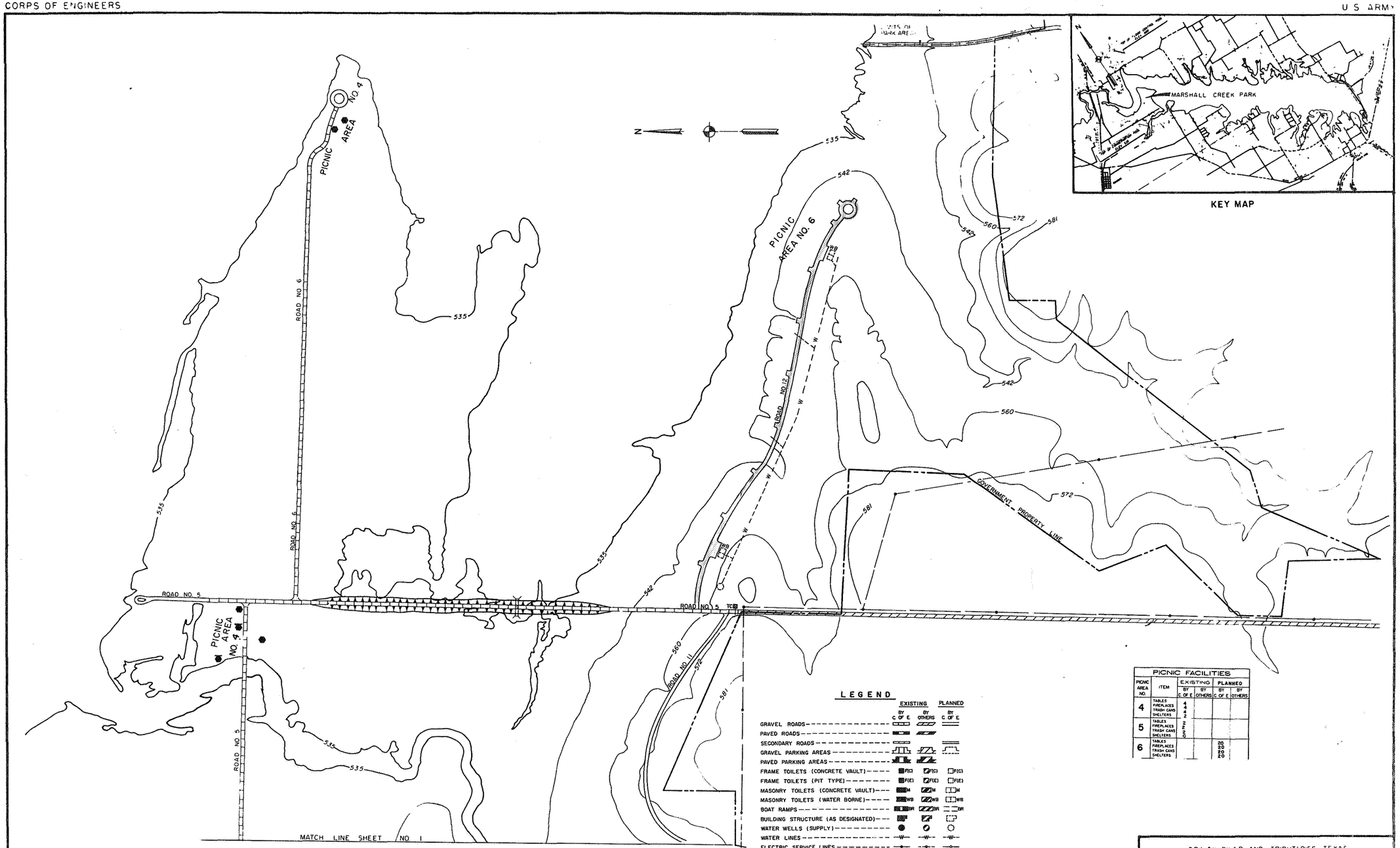
IN 3 SHEETS SHEET 2

SCALE OF FEET
200 0 200 400

U.S. ARMY ENGINEER DISTRICT, FORT WORTH 1971

TO ACCOMPANY DESIGN MEMORANDUM
NO. 1C (UPDATED)

FILE TRIN 268-17 NO. 1C PLATE 23



PICNIC FACILITIES					
PICNIC AREA NO.	ITEM	EXISTING BY C OF E	EXISTING BY OTHERS	PLANNED BY C OF E	PLANNED BY OTHERS
4	TABLES	4			
	FIREPLACES	4			
	TRASH CANS	4			
	SHELTERS	2			
5	TABLES	2			
	FIREPLACES	2			
	TRASH CANS	2			
	SHELTERS	0			
6	TABLES			20	
	FIREPLACES			20	
	TRASH CANS			20	
	SHELTERS			20	

LEGEND

	EXISTING BY C OF E	EXISTING BY OTHERS	PLANNED BY C OF E
GRAVEL ROADS			
PAVED ROADS			
SECONDARY ROADS			
GRAVEL PARKING AREAS			
PAVED PARKING AREAS			
FRAME TOILETS (CONCRETE VAULT)	F(C)	F(C)	F(C)
FRAME TOILETS (PIT TYPE)	F(E)	F(E)	F(E)
MASONRY TOILETS (CONCRETE VAULT)	M	M	M
MASONRY TOILETS (WATER BORNE)	WB	WB	WB
BOAT RAMPS	BR	BR	BR
BUILDING STRUCTURE (AS DESIGNATED)	B	B	B
WATER WELLS (SUPPLY)			
WATER LINES	W	W	W
ELECTRIC SERVICE LINES			
RESERVOIR INFORMATION SIGNS	RI	RI	RI
PARK ENTRANCE SIGNS	PE	PE	PE
DIRECTIONAL SIGNS	D	D	D
BUOYS			
REGISTRATION BOOTH	RB	RB	RB
TREE COVER			
TRAFFIC COUNTERS	TC	TC	TC
SWIMMING BEACH			
LIMITS OF CONCESSION AREAS			
LIMITS OF LICENSE OR LEASE AREAS			
UPPER LIMITS (FLOWAGE EASEMENT)			
GOVERNMENT PROPERTY LINE			
INITIAL DEVELOPMENT (FY 71 THRU FY 76)			

TRINITY RIVER AND TRIBUTARIES, TEXAS
GRAPEVINE DAM AND RESERVOIR
DENTON CREEK ELM FORK, TRINITY RIVER

MARSHALL CREEK PARK

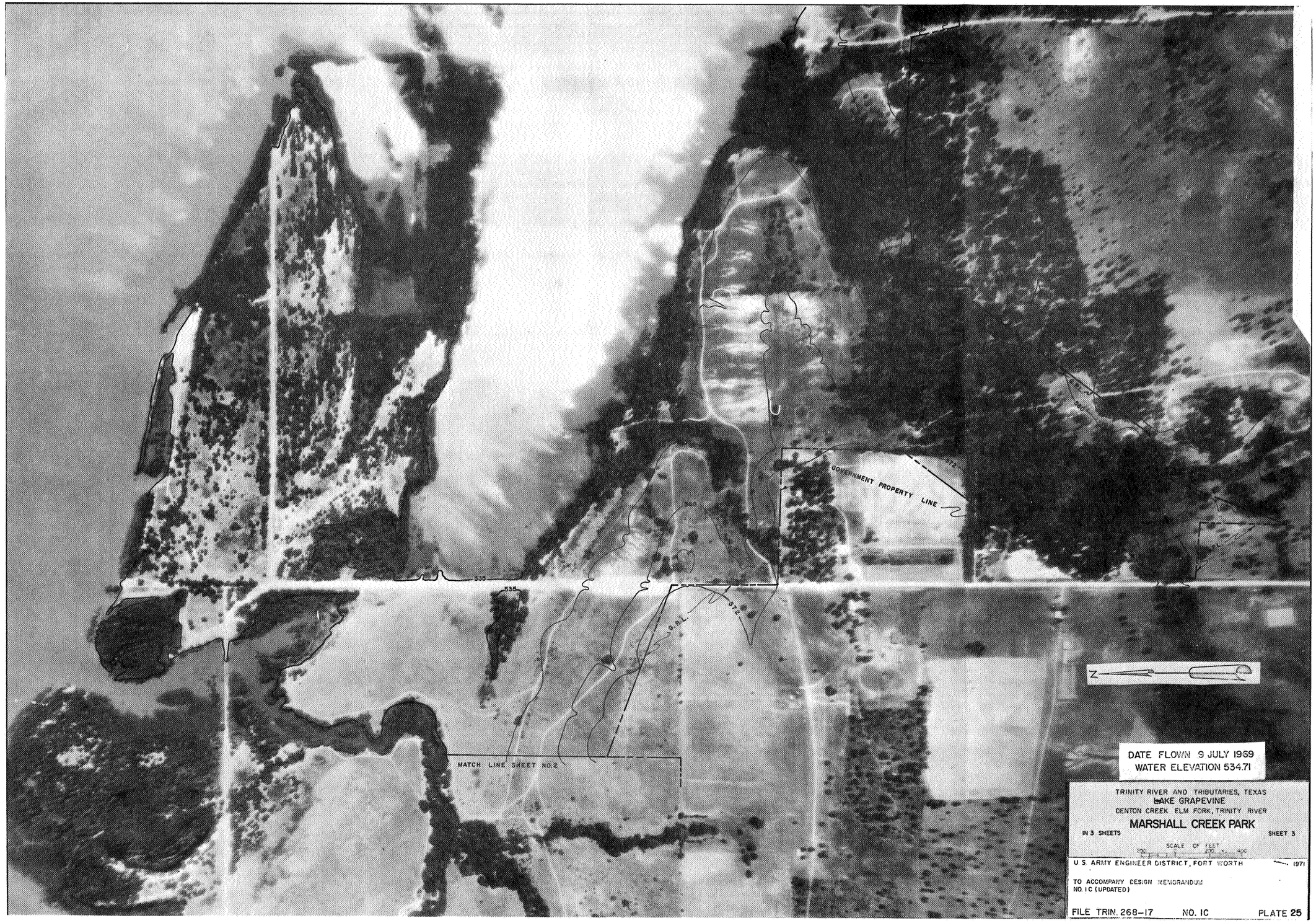
IN 4 SHEETS SHEET NO 3

SCALE 1" = 200'

U S ARMY ENGINEER DISTRICT, FORT WORTH AUGUST 1971

TO ACCOMPANY DESIGN MEMORANDUM NO 1C (UPDATED)

FILE TRIN. 268-17 NO. 1C PLATE 24



DATE FLOWN 9 JULY 1969
WATER ELEVATION 534.71

TRINITY RIVER AND TRIBUTARIES, TEXAS
LAKE GRAPEVINE
DENTON CREEK ELM FORK, TRINITY RIVER

MARSHALL CREEK PARK

IN 3 SHEETS SHEET 3

SCALE OF FEET

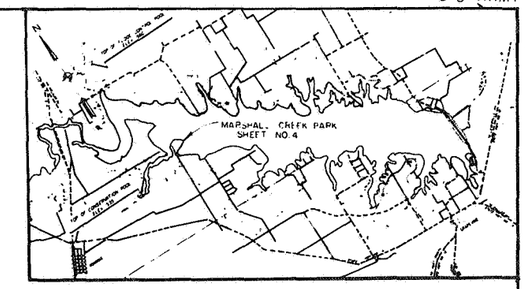
U.S. ARMY ENGINEER DISTRICT, FORT WORTH 1971

TO ACCOMPANY DESIGN MEMORANDUM NO. 1C (UPDATED)

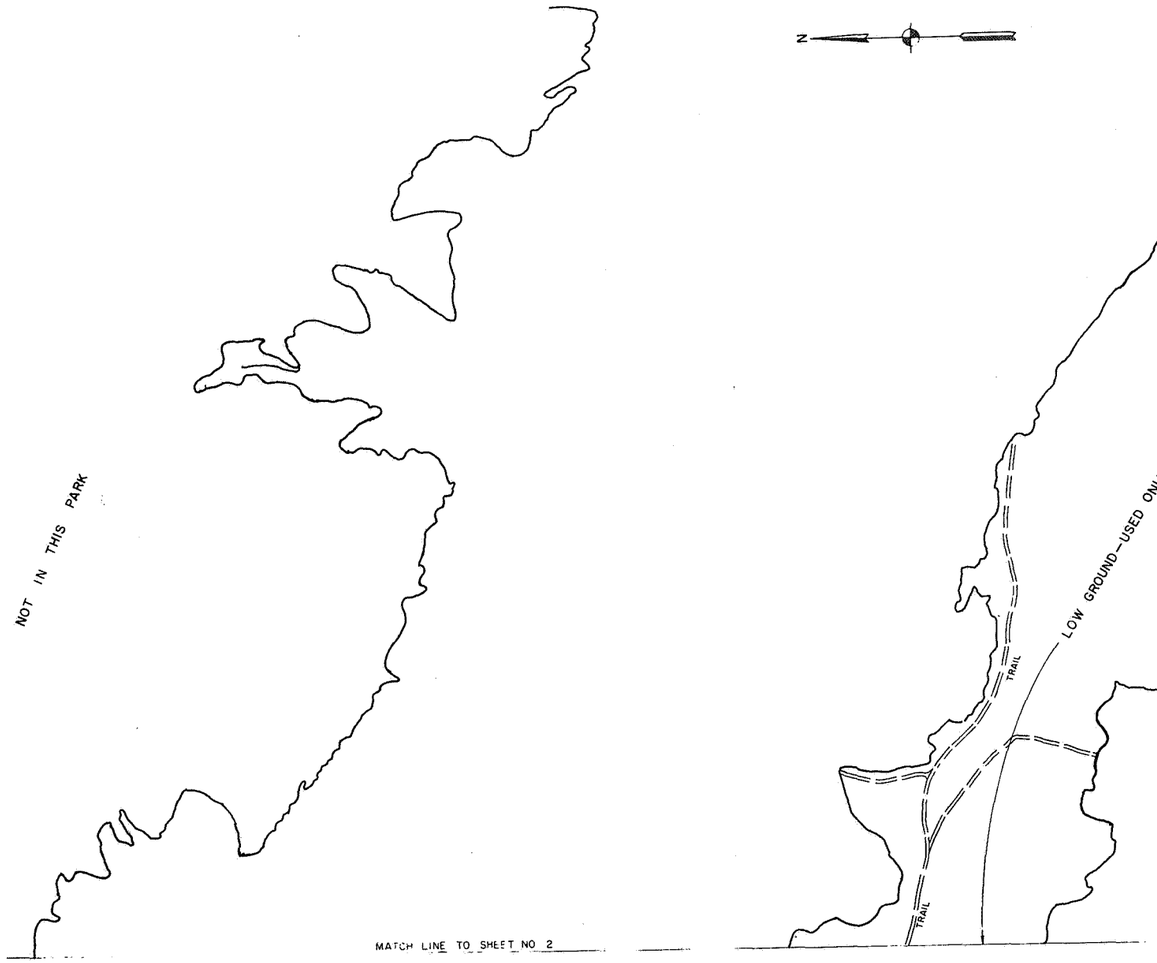
FILE TRIN. 268-17 NO. 1C PLATE 25

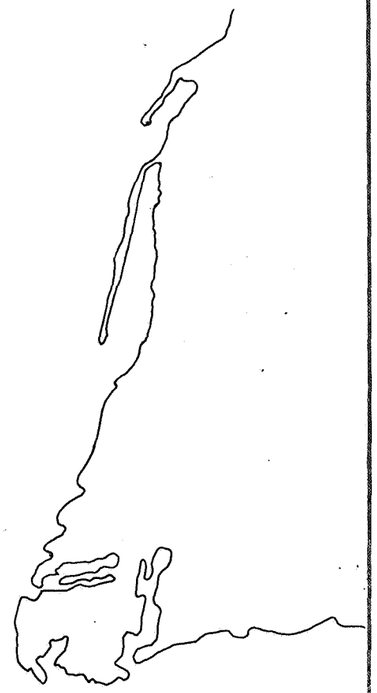
CORPS OF ENGINEERS

U S ARMY



KEY MAP





LEGEND

	EXISTING BY C OF E	EXISTING BY OTHERS	PLANNED BY C OF E
GRAVEL ROADS			
PAVED ROADS			
SECONDARY ROADS			
GRAVEL PARKING AREAS			
PAVED PARKING AREAS			
FRAME TOILETS (CONCRETE VAULT)	F(C)	F(C)	F(C)
FRAME TOILETS (PIT TYPE)	F(E)	F(E)	F(E)
MASONRY TOILETS (CONCRETE VAULT)	M	M	M
MASONRY TOILETS (WATER BORNE)	WB	WB	WB
BOAT RAMPS	BR	BR	BR
BUILDING STRUCTURE (AS DESIGNATED)			
WATER WELLS (SUPPLY)			
WATER LINES	W	W	W
ELECTRIC SERVICE LINES			
RESERVOIR INFORMATION SIGNS	RI	RI	RI
PARK ENTRANCE SIGNS	PE	PE	PE
DIRECTIONAL SIGNS	D	D	D
BUOYS			
REGISTRATION BOOTH	RB	RB	RB
TREE COVER			
TRAFFIC COUNTERS	TC	TC	TC
SWIMMING BEACH			
LIMITS OF CONCESSION AREAS			
LIMITS OF LICENSE OR LEASE AREAS			
UPPER LIMITS (FLOWAGE EASEMENT)			
GOVERNMENT PROPERTY LINE			
INITIAL DEVELOPMENT (FY 71 THRU FY76)			

TRINITY RIVER AND TRIBUTARIES, TEXAS
GRAPEVINE DAM AND RESERVOIR
DENTON CREEK ELM FORK, TRINITY RIVER

MARSHALL CREEK PARK

IN 4 SHEETS

SCALE OF FEET

SHEET NO. 4

U S ARMY ENGINEER DISTRICT, FORT WORTH AUGUST 1971

TO ACCOMPANY DESIGN MEMORANDUM
NO. 1C (UPDATED)

FILE TRIN. 268-17 NO. 1C PLATE 26

NOTE: AERIALS FOR PLATES 24 & 26 ARE UNITED AS AERIAL NO. 25

TRINITY RIVER AND TRIBUTARIES, TEXAS

GRAPEVINE DAM AND RESERVOIR

DENTON CREEK ELM FORK, TRINITY RIVER

MARSHALL CREEK PARK

SCALE OF FEET

200 0 200 400

U.S. ARMY ENGINEER DISTRICT, FORT WORTH AUGUST. 1971

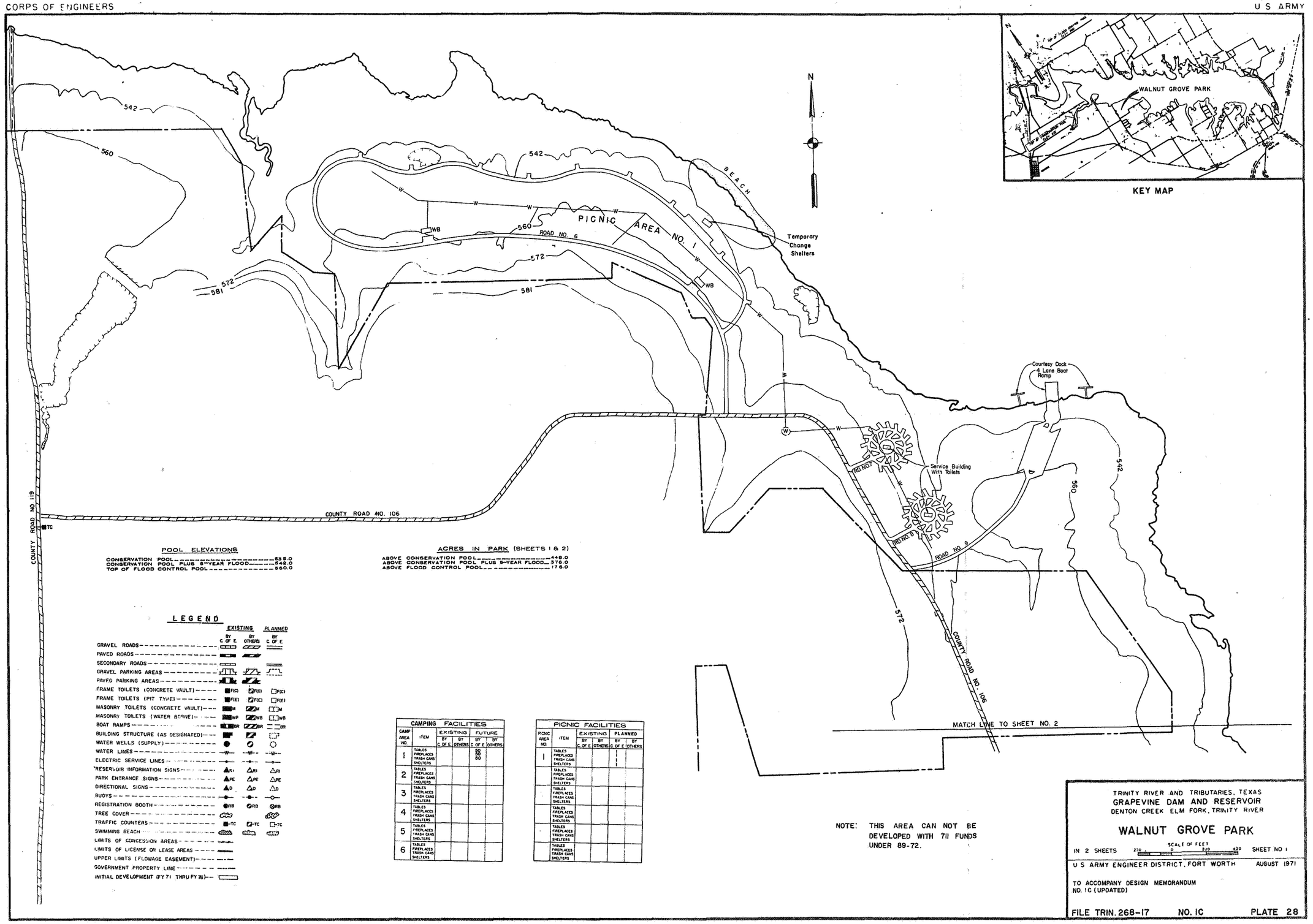
TO ACCOMPANY DESIGN MEMORANDUM
NUMBER 1C -MASTER PLAN (UPDATED)

FILE: TRIN.268-17 NO. 1-C PLATE 27

CORPS OF ENGINEERS

U S ARMY

KEY MAP



POOL ELEVATIONS

CONSERVATION POOL	525.0
CONSERVATION POOL PLUS 5-YEAR FLOOD	542.0
TOP OF FLOOD CONTROL POOL	560.0

ACRES IN PARK (SHEETS 1 & 2)

ABOVE CONSERVATION POOL	448.0
ABOVE CONSERVATION POOL PLUS 5-YEAR FLOOD	376.0
ABOVE FLOOD CONTROL POOL	176.0

LEGEND

	EXISTING BY C. OF E.	EXISTING BY OTHERS	PLANNED BY C. OF E.
GRAVEL ROADS			
PAVED ROADS			
SECONDARY ROADS			
GRAVEL PARKING AREAS			
PAVED PARKING AREAS			
FRAME TOILETS (CONCRETE VAULT)	F(C)	F(C)	F(C)
FRAME TOILETS (PIT TYPE)	F(E)	F(E)	F(E)
MASONRY TOILETS (CONCRETE VAULT)	M	M	M
MASONRY TOILETS (WATER BORNE)	WB	WB	WB
BOAT RAMPS	BR	BR	BR
BUILDING STRUCTURE (AS DESIGNATED)			
WATER WELLS (SUPPLY)			
WATER LINES	W	W	W
ELECTRIC SERVICE LINES			
RESERVOIR INFORMATION SIGNS	RI	RI	RI
PARK ENTRANCE SIGNS	PE	PE	PE
DIRECTIONAL SIGNS	D	D	D
BUOYS			
REGISTRATION BOOTH	RB	RB	RB
TREE COVER			
TRAFFIC COUNTERS	TC	TC	TC
SWIMMING BEACH			
LIMITS OF CONCESSION AREAS			
LIMITS OF LICENSE OR LEASE AREAS			
UPPER LIMITS (FLOWAGE EASEMENT)			
GOVERNMENT PROPERTY LINE			
INITIAL DEVELOPMENT (FY 71 THRU FY 76)			

CAMPING FACILITIES

CAMP AREA NO.	ITEM	EXISTING BY C. OF E.	EXISTING BY OTHERS	FUTURE BY C. OF E.	FUTURE BY OTHERS
1	TABLES FIREPLACES TRASH CANS SHELTERS			50 50 50	
2	TABLES FIREPLACES TRASH CANS SHELTERS				
3	TABLES FIREPLACES TRASH CANS SHELTERS				
4	TABLES FIREPLACES TRASH CANS SHELTERS				
5	TABLES FIREPLACES TRASH CANS SHELTERS				
6	TABLES FIREPLACES TRASH CANS SHELTERS				

PICNIC FACILITIES

PICNIC AREA NO.	ITEM	EXISTING BY C. OF E.	EXISTING BY OTHERS	PLANNED BY C. OF E.	PLANNED BY OTHERS
1	TABLES FIREPLACES TRASH CANS SHELTERS			1 1 1	
	TABLES FIREPLACES TRASH CANS SHELTERS				
	TABLES FIREPLACES TRASH CANS SHELTERS				
	TABLES FIREPLACES TRASH CANS SHELTERS				
	TABLES FIREPLACES TRASH CANS SHELTERS				
	TABLES FIREPLACES TRASH CANS SHELTERS				

NOTE: THIS AREA CAN NOT BE DEVELOPED WITH 71I FUNDS UNDER 89-72.

TRINITY RIVER AND TRIBUTARIES, TEXAS

GRAPEVINE DAM AND RESERVOIR

DENTON CREEK ELM FORK, TRINITY RIVER

WALNUT GROVE PARK

IN 2 SHEETS — SCALE OF FEET 200 0 200 400 — SHEET NO 1

U S ARMY ENGINEER DISTRICT, FORT WORTH — AUGUST 1971

TO ACCOMPANY DESIGN MEMORANDUM NO. 1C (UPDATED)

FILE TRIN. 268-17 NO. 1C PLATE 28

DATE FLOWN 9 JULY 1969
WATER ELEVATION 534.71

TRINITY RIVER AND TRIBUTARIES, TEXAS
LAKE GRAPEVINE
DENTON CREEK ELM FORK, TRINITY RIVER

WALNUT GROVE PARK

IN 2 SHEETS SHEET 1

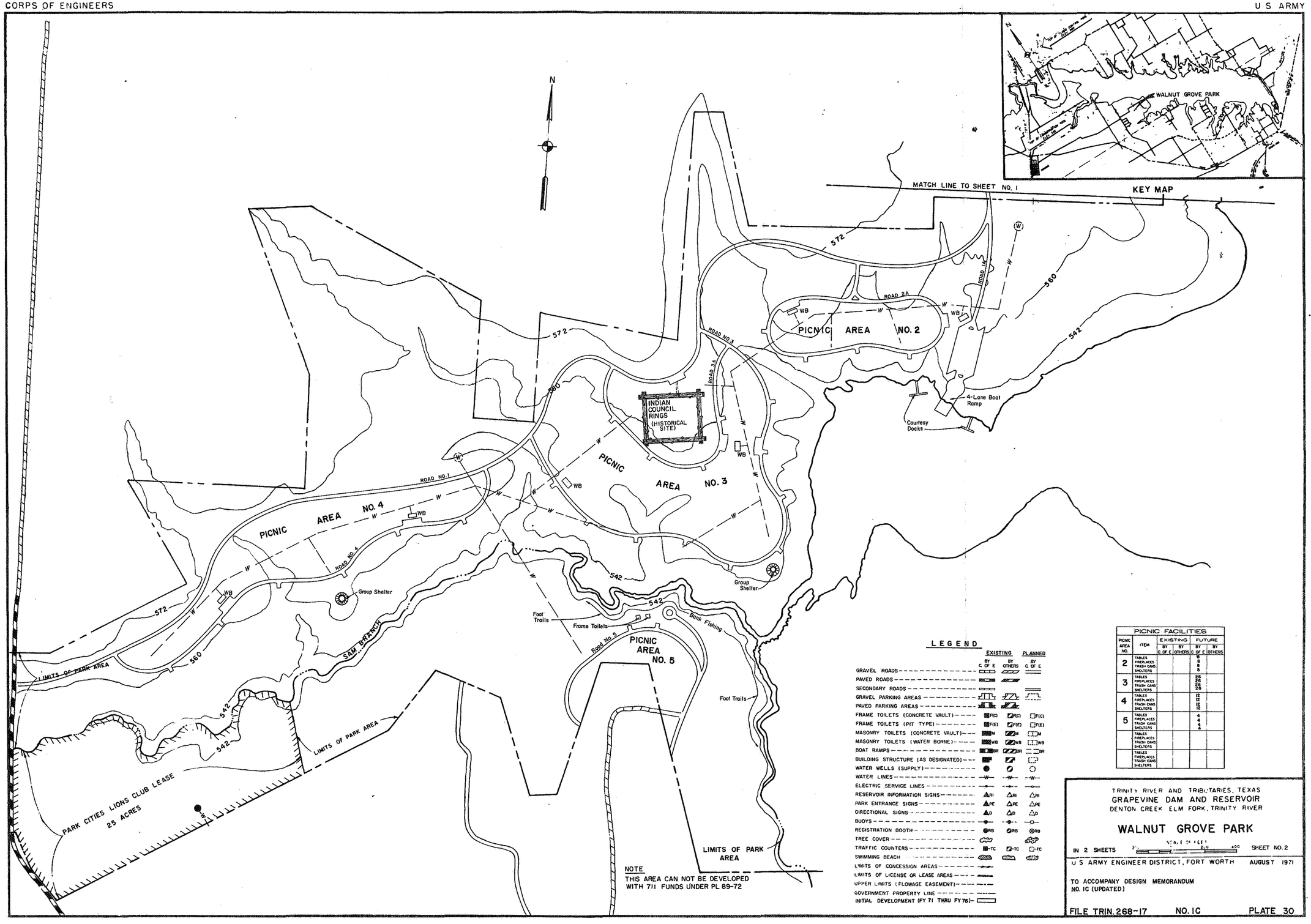
U.S. ARMY ENGINEER DISTRICT, FORT WORTH 1971

TO ACCOMPANY DESIGN MEMORANDUM
NO. 1C (UPDATED)

FILE TRIN. 268-17 NO. 1C PLATE 29

CORPS OF ENGINEERS

U S ARMY



LEGEND

	EXISTING BY C OF E	EXISTING BY OTHERS	PLANNED BY C OF E
GRAVEL ROADS			
PAVED ROADS			
SECONDARY ROADS			
GRAVEL PARKING AREAS			
PAVED PARKING AREAS			
FRAME TOILETS (CONCRETE VAULT)	F(C)	F(C)	F(C)
FRAME TOILETS (PIT TYPE)	F(E)	F(E)	F(E)
MASONRY TOILETS (CONCRETE VAULT)	M	M	M
MASONRY TOILETS (WATER BORNE)	WB	WB	WB
BOAT RAMPS	BR	BR	BR
BUILDING STRUCTURE (AS DESIGNATED)			
WATER WELLS (SUPPLY)			
WATER LINES	W	W	W
ELECTRIC SERVICE LINES			
RESERVOIR INFORMATION SIGNS	RI	RI	RI
PARK ENTRANCE SIGNS	PE	PE	PE
DIRECTIONAL SIGNS	D	D	D
BUOYS			
REGISTRATION BOOTH	RB	RB	RB
TREE COVER			
TRAFFIC COUNTERS	TC	TC	TC
SWIMMING BEACH			

LIMITS OF CONCESSION AREAS

LIMITS OF LICENSE OR LEASE AREAS

UPPER LIMITS (FLOWAGE EASEMENT)

GOVERNMENT PROPERTY LINE

INITIAL DEVELOPMENT (FY 71 THRU FY 76)

PICNIC FACILITIES

PICNIC AREA NO.	ITEM	EXISTING BY C OF E	EXISTING BY OTHERS	FUTURE BY C OF E	FUTURE BY OTHERS
2	TABLES			8	
	FIREPLACES			8	
	TRASH CANS			8	
	SHELTERS			8	
3	TABLES			26	
	FIREPLACES			26	
	TRASH CANS			26	
	SHELTERS			26	
4	TABLES			12	
	FIREPLACES			12	
	TRASH CANS			12	
	SHELTERS			12	
5	TABLES			4	
	FIREPLACES			4	
	TRASH CANS			4	
	SHELTERS			4	
	TABLES				
	FIREPLACES				
	TRASH CANS				
	SHELTERS				
	TABLES				
	FIREPLACES				
	TRASH CANS				
	SHELTERS				

TRINITY RIVER AND TRIBUTARIES, TEXAS

GRAPEVINE DAM AND RESERVOIR

DENTON CREEK ELM FORK, TRINITY RIVER

WALNUT GROVE PARK

IN 2 SHEETS

SCALE OF FEET 0 200 400

SHEET NO. 2

U S ARMY ENGINEER DISTRICT, FORT WORTH

AUGUST 1971

TO ACCOMPANY DESIGN MEMORANDUM NO. 1C (UPDATED)

FILE TRIN. 268-17

NO. 1C

PLATE 30

MATCH LINE SHEET 1

GOVERNMENT PROPERTY LINE

572

560

540

N

DATE FLOWN 9 JULY 1969
WATER ELEVATION 534.71

TRINITY RIVER AND TRIBUTARIES, TEXAS
LAKE GRAPEVINE
DENTON CREEK ELM FORK, TRINITY RIVER
WALNUT GROVE PARK
IN 2 SHEETS SHEET 2
SCALE OF FEET

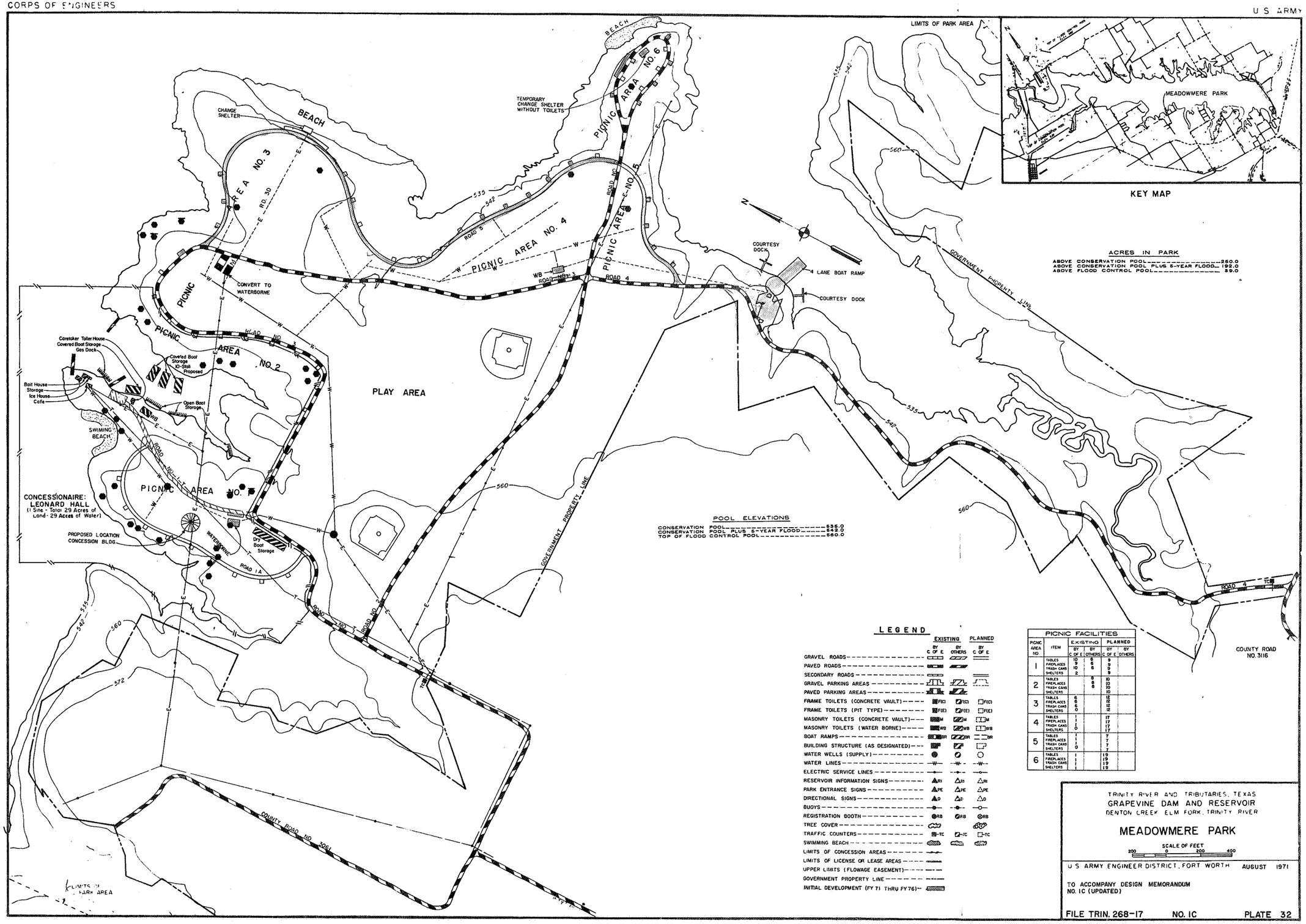
U S ARMY ENGINEER DISTRICT, FORT WORTH 1971

TO ACCOMPANY DESIGN MEMORANDUM
NO. 1C (UPDATED)

FILE TRIN. 268-17 NO. 1C PLATE 31

CORPS OF ENGINEERS

U S ARMY



ACRES IN PARK

ABOVE CONSERVATION POOL	250.0
ABOVE CONSERVATION POOL PLUS 6-YEAR FLOOD	192.0
ABOVE FLOOD CONTROL POOL	39.0

POOL ELEVATIONS

CONSERVATION POOL	535.0
CONSERVATION POOL PLUS 6-YEAR FLOOD	542.0
TOP OF FLOOD CONTROL POOL	560.0

LEGEND

	EXISTING BY C. OF E	EXISTING BY OTHERS	PLANNED BY C. OF E
GRAVEL ROADS			
PAVED ROADS			
SECONDARY ROADS			
GRAVEL PARKING AREAS			
PAVED PARKING AREAS			
FRAME TOILETS (CONCRETE VAULT)	F(C)	T(C)	F(C)
FRAME TOILETS (PIT TYPE)	F(E)	T(E)	F(E)
MASONRY TOILETS (CONCRETE VAULT)	M	M	M
MASONRY TOILETS (WATER BORNE)	WB	WB	WB
BOAT RAMPS	BR	BR	BR
BUILDING STRUCTURE (AS DESIGNATED)			
WATER WELLS (SUPPLY)			
WATER LINES	W	W	W
ELECTRIC SERVICE LINES			
RESERVOIR INFORMATION SIGNS	RI	IS	RI
PARK ENTRANCE SIGNS	PE	PE	PE
DIRECTIONAL SIGNS	D	D	D
BUOYS			
REGISTRATION BOOTH	RB	FB	RB
TREE COVER			
TRAFFIC COUNTERS	TC	TC	TC
SWIMMING BEACH			
LIMITS OF CONCESSION AREAS			
LIMITS OF LICENSE OR LEASE AREAS			
UPPER LIMITS (FLOWAGE EASEMENT)			
GOVERNMENT PROPERTY LINE			
INITIAL DEVELOPMENT (FY 71 THRU FY 76)			

PICNIC FACILITIES

PICNIC AREA NO	ITEM	EXISTING BY C. OF E	EXISTING BY OTHERS	PLANNED BY C. OF E	PLANNED BY OTHERS
1	TABLES	10	6	9	
	FIREPLACES	9	6	9	
	TRASH CANS	10	6	9	
	SHELTERS	2		9	
2	TABLES		8	10	
	FIREPLACES		8	10	
	TRASH CANS		8	10	
	SHELTERS			10	
3	TABLES	6		12	
	FIREPLACES	6		12	
	TRASH CANS	6		12	
	SHELTERS	0		12	
4	TABLES	1		17	
	FIREPLACES	1		17	
	TRASH CANS	1		17	
	SHELTERS	0		17	
5	TABLES	1		7	
	FIREPLACES	1		7	
	TRASH CANS	1		7	
	SHELTERS	0		7	
6	TABLES	1		19	
	FIREPLACES	1		19	
	TRASH CANS	1		19	
	SHELTERS	1		19	

TRINITY RIVER AND TRIBUTARIES, TEXAS
GRAPEVINE DAM AND RESERVOIR
DENTON CREEK ELM FORK, TRINITY RIVER

MEADOWMERE PARK

SCALE OF FEET
200 0 200 400

U S ARMY ENGINEER DISTRICT, FORT WORTH AUGUST 1971

TO ACCOMPANY DESIGN MEMORANDUM NO. 1C (UPDATED)

FILE TRIN. 268-17 NO. 1C PLATE 32

DATE FLOWN 9 JULY 1969
WATER ELEVATION 534.71

TRINITY RIVER AND TRIBUTARIES, TEXAS
LAKE GRAPEVINE
DENTON CREEK ELM FORK, TRINITY RIVER

MEADOWMERE PARK

SCALE OF FEET

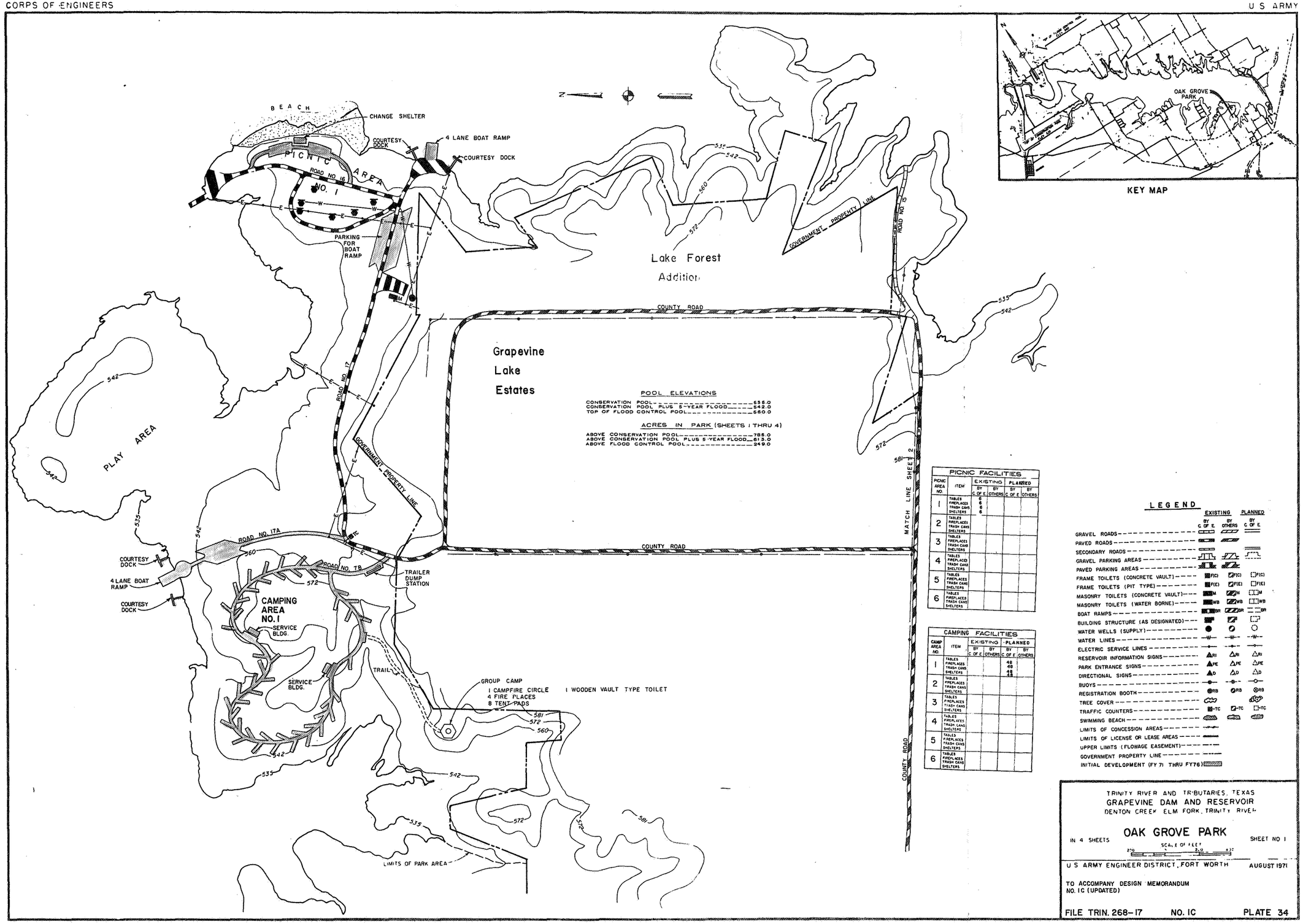
U.S. ARMY ENGINEER DISTRICT, FORT WORTH 1971

TO ACCOMPANY DESIGN MEMORANDUM
NO. I C (UPDATED)

FILE TRIN. 268-17 NO. IC PLATE 33

CORPS OF ENGINEERS

U S ARMY



KEY MAP

POOL ELEVATIONS

CONSERVATION POOL	535.0
CONSERVATION POOL PLUS 5-YEAR FLOOD	542.0
TOP OF FLOOD CONTROL POOL	560.0

ACRES IN PARK (SHEETS 1 THRU 4)

ABOVE CONSERVATION POOL	785.0
ABOVE CONSERVATION POOL PLUS 5-YEAR FLOOD	813.0
ABOVE FLOOD CONTROL POOL	249.0

PICNIC FACILITIES

PICNIC AREA NO.	ITEM	EXISTING BY C OF E	EXISTING BY OTHERS	PLANNED BY C OF E	PLANNED BY OTHERS
1	TABLES	6			
	FIREPLACES	6			
	TRASH CANS	6			
	SHELTERS	6			
2	TABLES FIREPLACES TRASH CANS SHELTERS				
3	TABLES FIREPLACES TRASH CANS SHELTERS				
4	TABLES FIREPLACES TRASH CANS SHELTERS				
5	TABLES FIREPLACES TRASH CANS SHELTERS				
6	TABLES FIREPLACES TRASH CANS SHELTERS				

CAMPING FACILITIES

CAMP AREA NO.	ITEM	EXISTING BY C OF E	EXISTING BY OTHERS	PLANNED BY C OF E	PLANNED BY OTHERS
1	TABLES			46	
	FIREPLACES			46	
	TRASH CANS			46	
	SHELTERS			46	
2	TABLES FIREPLACES TRASH CANS SHELTERS				
3	TABLES FIREPLACES TRASH CANS SHELTERS				
4	TABLES FIREPLACES TRASH CANS SHELTERS				
5	TABLES FIREPLACES TRASH CANS SHELTERS				
6	TABLES FIREPLACES TRASH CANS SHELTERS				

LEGEND

	EXISTING BY C OF E	EXISTING BY OTHERS	PLANNED BY C OF E
GRAVEL ROADS			
PAVED ROADS			
SECONDARY ROADS			
GRAVEL PARKING AREAS			
PAVED PARKING AREAS			
FRAME TOILETS (CONCRETE VAULT)	F(C)	F(C)	F(C)
FRAME TOILETS (PIT TYPE)	F(E)	F(E)	F(E)
MASONRY TOILETS (CONCRETE VAULT)	M	M	M
MASONRY TOILETS (WATER BORNE)	WB	WB	WB
BOAT RAMPS	BR	BR	BR
BUILDING STRUCTURE (AS DESIGNATED)			
WATER WELLS (SUPPLY)			
WATER LINES	W	W	W
ELECTRIC SERVICE LINES			
RESERVOIR INFORMATION SIGNS	RI	RI	RI
PARK ENTRANCE SIGNS	PE	PE	PE
DIRECTIONAL SIGNS	D	D	D
BUOYS			
REGISTRATION BOOTH	RB	RB	RB
TREE COVER			
TRAFFIC COUNTERS	TC	TC	TC
SWIMMING BEACH			
LIMITS OF CONCESSION AREAS			
LIMITS OF LICENSE OR LEASE AREAS			
UPPER LIMITS (FLOWAGE EASEMENT)			
GOVERNMENT PROPERTY LINE			
INITIAL DEVELOPMENT (FY 71 THRU FY76)			

TRINITY RIVER AND TRIBUTARIES, TEXAS

GRAPEVINE DAM AND RESERVOIR

DENTON CREEK ELM FORK, TRINITY RIVER

OAK GROVE PARK

IN 4 SHEETS

SHEET NO 1

SCALE OF FEET 200 0 200 400

U S ARMY ENGINEER DISTRICT, FORT WORTH — AUGUST 1971

TO ACCOMPANY DESIGN MEMORANDUM NO. 1C (UPDATED)

FILE TRIN. 268-17 — NO. 1C — PLATE 34

TRINITY RIVER AND TRIBUTARIES, TEXAS
LAKE GRAPEVINE
DENTON CREEK ELM FORK, TRINITY RIVER

OAK GROVE PARK

IN 4 SHEETS SHEET 1

SCALE OF FEET

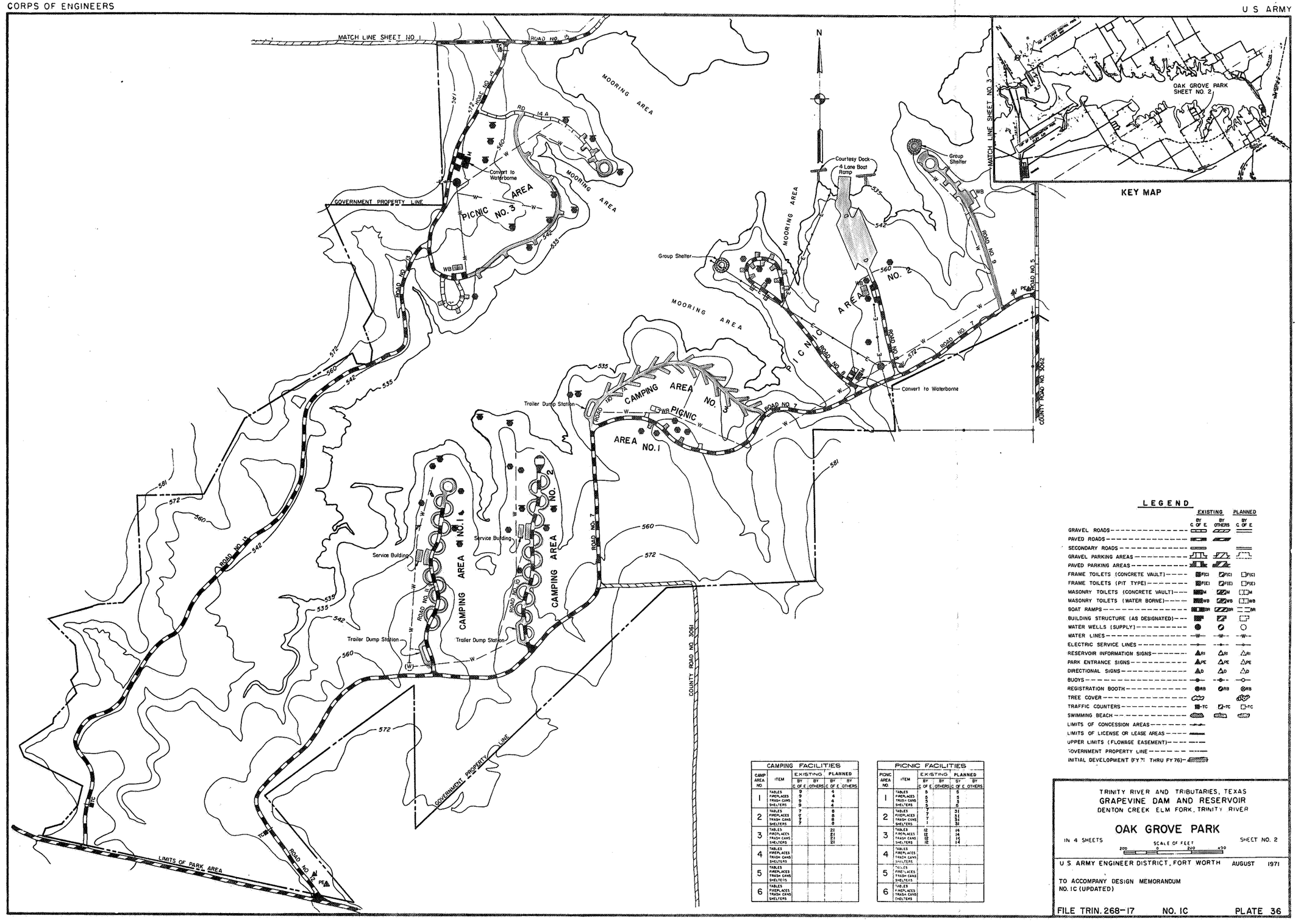
U S. ARMY ENGINEER DISTRICT, FORT WORTH 1971

TO ACCOMPANY DESIGN MEMORANDUM
NO. 1C (UPDATED)

FILE TRIN. 268-17 NO. 1C PLATE 35

CORPS OF ENGINEERS

U S ARMY



CAMPING FACILITIES					
CAMP AREA NO	ITEM	EXISTING BY C OF E	EXISTING BY OTHERS	PLANNED BY C OF E	PLANNED BY OTHERS
1	TABLES	9		4	
	FIREPLACES	9		4	
	TRASH CANS	9		4	
	SHELTERS	9		4	
2	TABLES	7		8	
	FIREPLACES	7		8	
	TRASH CANS	7		8	
	SHELTERS	7		8	
3	TABLES			21	
	FIREPLACES			21	
	TRASH CANS			21	
	SHELTERS			21	
4	TABLES				
	FIREPLACES				
	TRASH CANS				
	SHELTERS				
5	TABLES				
	FIREPLACES				
	TRASH CANS				
	SHELTERS				
6	TABLES				
	FIREPLACES				
	TRASH CANS				
	SHELTERS				

PICNIC FACILITIES					
PICNIC AREA NO	ITEM	EXISTING BY C OF E	EXISTING BY OTHERS	PLANNED BY C OF E	PLANNED BY OTHERS
1	TABLES	5		5	
	FIREPLACES	5		5	
	TRASH CANS	5		5	
	SHELTERS	5		6	
2	TABLES	7		31	
	FIREPLACES	7		31	
	TRASH CANS	7		31	
	SHELTERS	7		31	
3	TABLES	10		14	
	FIREPLACES	10		14	
	TRASH CANS	10		14	
	SHELTERS	10		14	
4	TABLES				
	FIREPLACES				
	TRASH CANS				
	SHELTERS				
5	TABLES				
	FIREPLACES				
	TRASH CANS				
	SHELTERS				
6	TABLES				
	FIREPLACES				
	TRASH CANS				
	SHELTERS				

LEGEND

	EXISTING BY C OF E	EXISTING BY OTHERS	PLANNED BY C OF E
GRAVEL ROADS			
PAVED ROADS			
SECONDARY ROADS			
GRAVEL PARKING AREAS			
PAVED PARKING AREAS			
FRAME TOILETS (CONCRETE VAULT)	F(C)	F(C)	F(C)
FRAME TOILETS (PIT TYPE)	F(E)	F(E)	F(E)
MASONRY TOILETS (CONCRETE VAULT)	M	M	M
MASONRY TOILETS (WATER BORNE)	WB	WB	WB
BOAT RAMPS	BR	BR	BR
BUILDING STRUCTURE (AS DESIGNATED)			
WATER WELLS (SUPPLY)			
WATER LINES	W	W	W
ELECTRIC SERVICE LINES			
RESERVOIR INFORMATION SIGNS	RI	RI	RI
PARK ENTRANCE SIGNS	PE	PE	PE
DIRECTIONAL SIGNS	D	D	D
BUOYS			
REGISTRATION BOOTH	RB	RB	RB
TREE COVER			
TRAFFIC COUNTERS	TC	TC	TC
SWIMMING BEACH			
LIMITS OF CONCESSION AREAS			
LIMITS OF LICENSE OR LEASE AREAS			
UPPER LIMITS (FLOWAGE EASEMENT)			
GOVERNMENT PROPERTY LINE			
INITIAL DEVELOPMENT (FY71 THRU FY76)			

TRINITY RIVER AND TRIBUTARIES, TEXAS
GRAPEVINE DAM AND RESERVOIR
DENTON CREEK ELM FORK, TRINITY RIVER

OAK GROVE PARK

IN 4 SHEETS

SCALE OF FEET
200 0 200 400

SHEET NO. 2

U S ARMY ENGINEER DISTRICT, FORT WORTH AUGUST 1971

TO ACCOMPANY DESIGN MEMORANDUM
NO. 1C (UPDATED)

FILE TRIN. 268-17 NO. 1C PLATE 36

DATE FLOWN 9 JULY 1969
WATER ELEVATION 534.71

TRINITY RIVER AND TRIBUTARIES, TEXAS
LAKE GRAPEVINE
DENTON CREEK · ELM FORK, TRINITY RIVER
OAK GROVE PARK
IN 4 SHEET SHEET 2

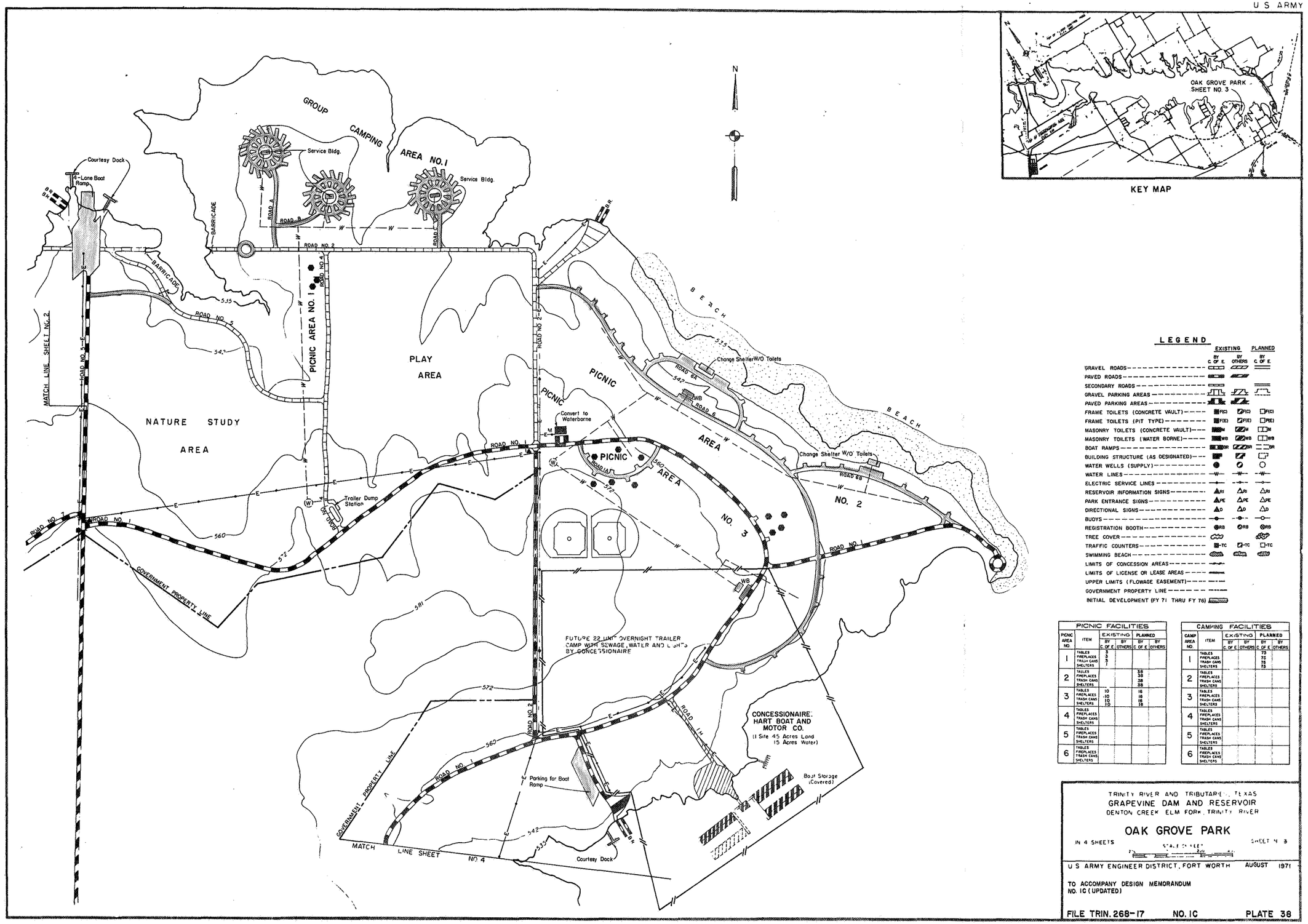
SCALE OF FEET
0 200 400

U.S. ARMY ENGINEER DISTRICT, FORT WORTH 1971

TO ACCOMPANY DESIGN MEMORANDUM
NO. 1C (UPDATED)

FILE TRIN. 268-17 NO. 1C PLATE 37

U S ARMY



KEY MAP

LEGEND

	EXISTING BY C OF E	EXISTING BY OTHERS	PLANNED BY C OF E
GRAVEL ROADS			
PAVED ROADS			
SECONDARY ROADS			
GRAVEL PARKING AREAS			
PAVED PARKING AREAS			
FRAME TOILETS (CONCRETE VAULT)	F(C)	F(C)	F(C)
FRAME TOILETS (PIT TYPE)	F(E)	F(E)	F(E)
MASONRY TOILETS (CONCRETE VAULT)	M	M	M
MASONRY TOILETS (WATER BORNE)	WB	WB	WB
BOAT RAMPS	BR	BR	BR
BUILDING STRUCTURE (AS DESIGNATED)			
WATER WELLS (SUPPLY)			
WATER LINES	W	W	W
ELECTRIC SERVICE LINES			
RESERVOIR INFORMATION SIGNS	RI	RI	RI
PARK ENTRANCE SIGNS	PE	PE	PE
DIRECTIONAL SIGNS	D	D	D
BUOYS			
REGISTRATION BOOTH	RB	RB	RB
TREE COVER			
TRAFFIC COUNTERS	TC	TC	TC
SWIMMING BEACH			
LIMITS OF CONCESSION AREAS			
LIMITS OF LICENSE OR LEASE AREAS			
UPPER LIMITS (FLOWAGE EASEMENT)			
GOVERNMENT PROPERTY LINE			
INITIAL DEVELOPMENT (FY 71 THRU FY 76)			

PICNIC FACILITIES

PICNIC AREA NO.	ITEM	EXISTING BY C OF E	EXISTING BY OTHERS	PLANNED BY C OF E	PLANNED BY OTHERS
1	TABLES	3			
	FIREPLACES	3			
	TRASH CANS	3			
	SHELTERS	1			
2	TABLES			58	
	FIREPLACES			58	
	TRASH CANS			58	
	SHELTERS			58	
3	TABLES	10		16	
	FIREPLACES	10		16	
	TRASH CANS	10		16	
	SHELTERS	10		16	
4	TABLES				
	FIREPLACES				
	TRASH CANS				
	SHELTERS				
5	TABLES				
	FIREPLACES				
	TRASH CANS				
	SHELTERS				
6	TABLES				
	FIREPLACES				
	TRASH CANS				
	SHELTERS				

CAMPING FACILITIES

CAMP AREA NO.	ITEM	EXISTING BY C OF E	EXISTING BY OTHERS	PLANNED BY C OF E	PLANNED BY OTHERS
1	TABLES			73	
	FIREPLACES			73	
	TRASH CANS			73	
	SHELTERS			73	
2	TABLES				
	FIREPLACES				
	TRASH CANS				
	SHELTERS				
3	TABLES				
	FIREPLACES				
	TRASH CANS				
	SHELTERS				
4	TABLES				
	FIREPLACES				
	TRASH CANS				
	SHELTERS				
5	TABLES				
	FIREPLACES				
	TRASH CANS				
	SHELTERS				
6	TABLES				
	FIREPLACES				
	TRASH CANS				
	SHELTERS				

TRINITY RIVER AND TRIBUTARIES, TEXAS
GRAPEVINE DAM AND RESERVOIR
DENTON CREEK ELM FORK, TRINITY RIVER

OAK GROVE PARK

IN 4 SHEETS

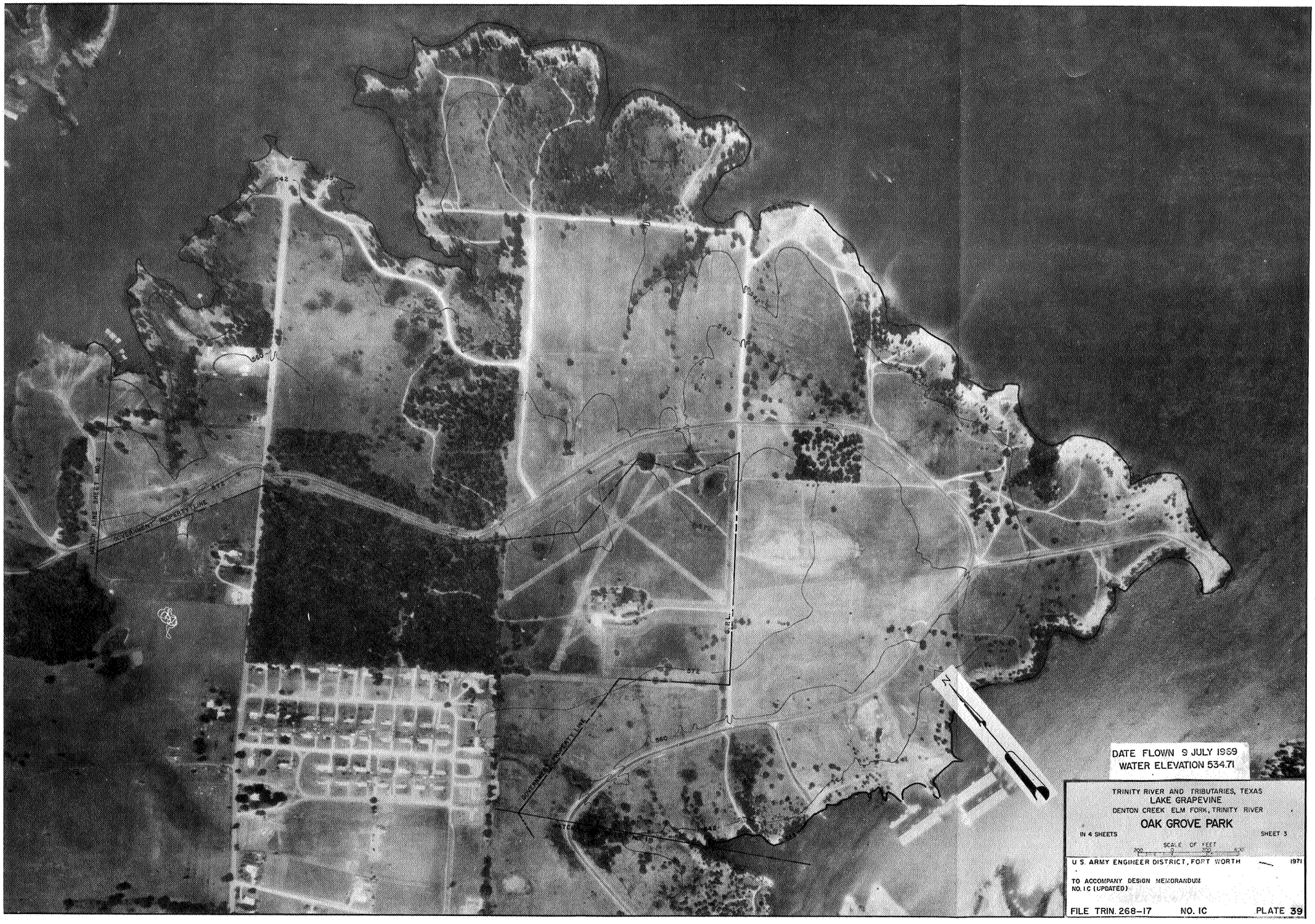
SCALE IN FEET 0 200 400

SHEET N. 3

U S ARMY ENGINEER DISTRICT, FORT WORTH AUGUST 1971

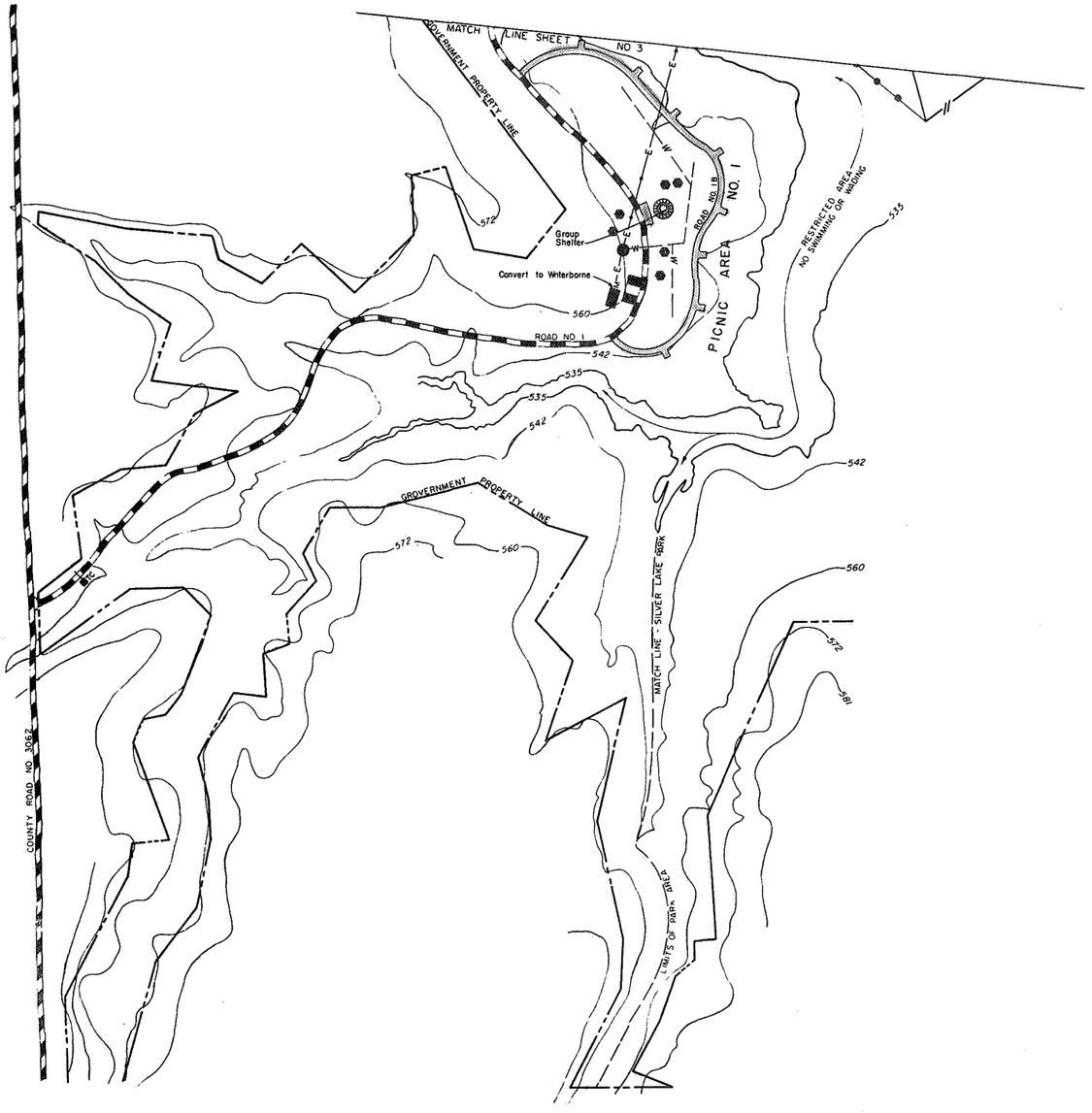
TO ACCOMPANY DESIGN MEMORANDUM NO. 1C (UPDATED)

FILE TRIN. 268-17 NO. 1C PLATE 38

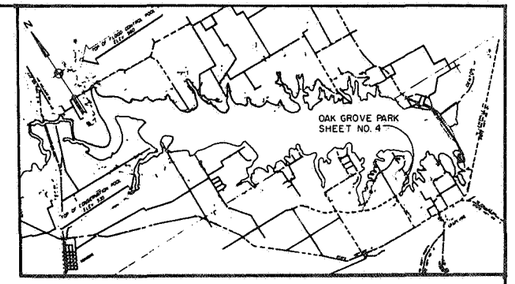

DATE FLOWN 9 JULY 1969
WATER ELEVATION 534.71
TRINITY RIVER AND TRIBUTARIES, TEXAS
LAKE GRAPEVINE
DENTON CREEK ELM FORK, TRINITY RIVER
OAK GROVE PARK
IN 4 SHEETS
SHEET 3
SCALE OF FEET
U.S. ARMY ENGINEER DISTRICT, FORT WORTH
1971
TO ACCOMPANY DESIGN MEMORANDUM
NO. 1C (UPDATED)
FILE TRIN. 268-17
NO. 1C
PLATE 39

CORPS OF ENGINEERS

U S ARMY



N



KEY MAP

LEGEND

	EXISTING BY C OF E	EXISTING BY OTHERS	PLANNED BY C OF E
GRAVEL ROADS			
PAVED ROADS			
SECONDARY ROADS			
GRAVEL PARKING AREAS			
PAVED PARKING AREAS			
FRAME TOILETS (CONCRETE VAULT)	F(C)	F(C)	F(C)
FRAME TOILETS (PIT TYPE)	F(E)	F(E)	F(E)
MASONRY TOILETS (CONCRETE VAULT)	M	M	M
MASONRY TOILETS (WATER BORNE)	MWB	MWB	MWB
BOAT RAMPS	BR	BR	BR
BUILDING STRUCTURE (AS DESIGNATED)			
WATER WELLS (SUPPLY)			
WATER LINES	W	W	W
ELECTRIC SERVICE LINES			
RESERVOIR INFORMATION SIGNS	RI	RI	RI
PARK ENTRANCE SIGNS	PE	PE	PE
DIRECTIONAL SIGNS	D	D	D
BUOYS			
REGISTRATION BOOTH	RB	RB	RB
TREE COVER			
TRAFFIC COUNTERS	TC	TC	TC
SWIMMING BEACH			
LIMITS OF CONCESSION AREAS			
LIMITS OF LICENSE OR LEASE AREAS			
UPPER LIMITS (FLOWAGE EASEMENT)			
GOVERNMENT PROPERTY LINE			
INITIAL DEVELOPMENT (FY71 THRU FY76)			

PICNIC FACILITIES

PICNIC AREA NO	ITEM	EXISTING BY C OF E	EXISTING BY OTHERS	PLANNED BY C OF E	PLANNED BY OTHERS
1	TABLES	8		10	
	FIREPLACES	8		10	
	TRASH CANS	8		20	
	SHELTERS			10	
2	TABLES				
	FIREPLACES				
	TRASH CANS				
	SHELTERS				
3	TABLES				
	FIREPLACES				
	TRASH CANS				
	SHELTERS				
4	TABLES				
	FIREPLACES				
	TRASH CANS				
	SHELTERS				
5	TABLES				
	FIREPLACES				
	TRASH CANS				
	SHELTERS				
6	TABLES				
	FIREPLACES				
	TRASH CANS				
	SHELTERS				

TRINITY RIVER AND TRIBUTARIES, TEXAS

GRAPEVINE DAM AND RESERVOIR

DENTON CREEK ELM FORK, TRINITY RIVER

OAK GROVE PARK

IN 4 SHEETS

SHEET NO 4

U S ARMY ENGINEER DISTRICT, FORT WORTH AUGUST 1971

TO ACCOMPANY DESIGN MEMORANDUM NO. 1C (UPDATED)

FILE TRIN. 268-17 NO. 1C PLATE 40

DATE FLOWN 9 JULY 1969
WATER ELEVATION 534.71

TRINITY RIVER AND TRIBUTARIES, TEXAS
LAKE GRAPEVINE
DENTON CREEK ELM FORK, TRINITY RIVER

OAK GROVE PARK

IN 4 SHEETS SHEET 4

SCALE OF FEET
0 100 200 400

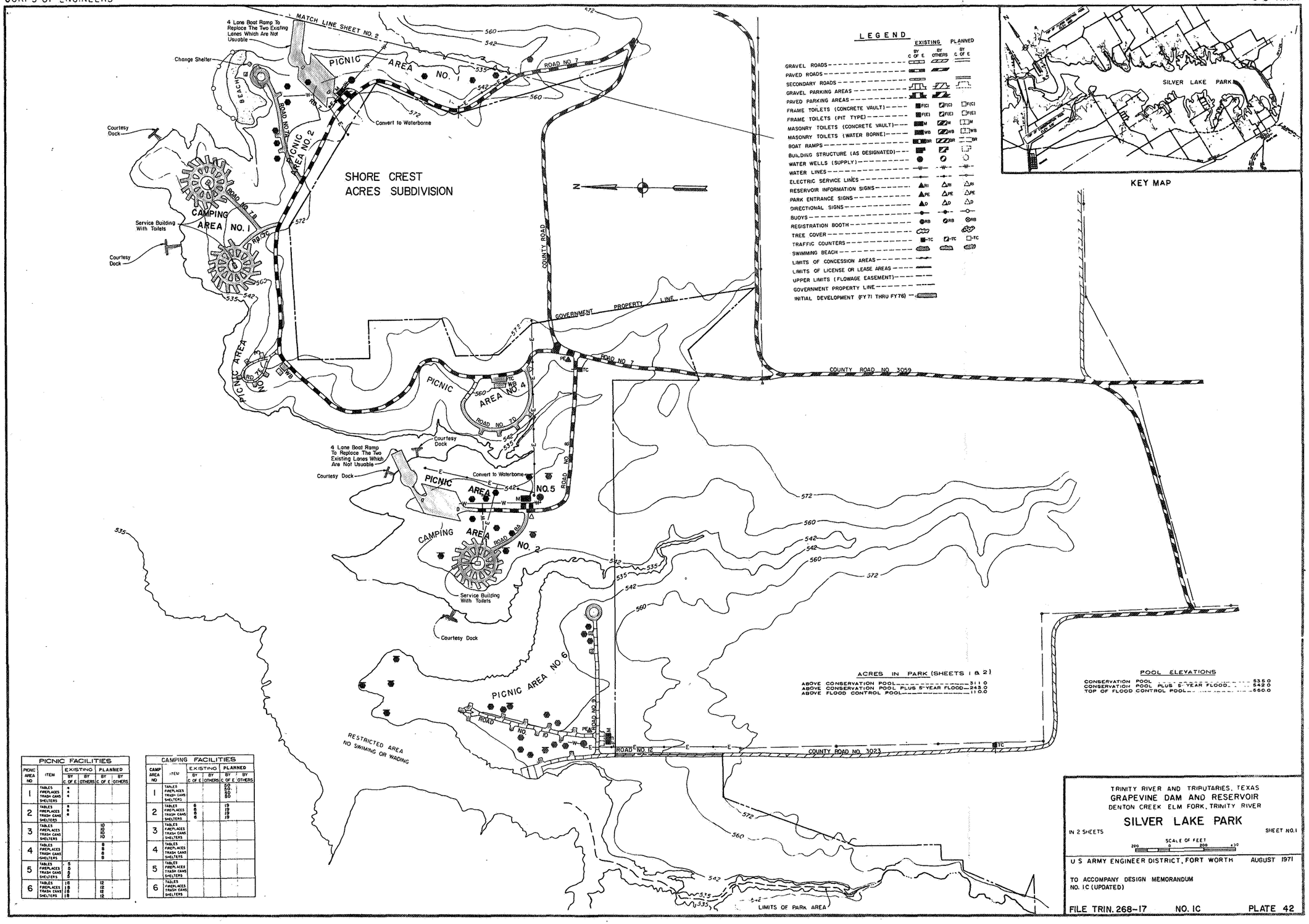
U.S. ARMY ENGINEER DISTRICT, FORT WORTH 1971

TO ACCOMPANY DESIGN MEMORANDUM NO. 1C (UPDATED)

FILE TRIN. 268-17 NO. 1C PLATE 41

CORPS OF ENGINEERS

U S ARMY



PICNIC FACILITIES

PICNIC AREA NO	ITEM	EXISTING BY C OF E	EXISTING BY OTHERS	PLANNED BY C OF E	PLANNED BY OTHERS
1	TABLES	4			
	FIREPLACES	4			
	TRASH CANS	4			
	SHELTERS				
2	TABLES	8			
	FIREPLACES	8			
	TRASH CANS	8			
	SHELTERS				
3	TABLES			20	
	FIREPLACES			20	
	TRASH CANS			10	
	SHELTERS				
4	TABLES			8	
	FIREPLACES			8	
	TRASH CANS			8	
	SHELTERS			8	
5	TABLES	5			
	FIREPLACES	5			
	TRASH CANS	5			
	SHELTERS	5			
6	TABLES	16		12	
	FIREPLACES	18		12	
	TRASH CANS	18		12	
	SHELTERS	18		12	

CAMPING FACILITIES

CAMP AREA NO	ITEM	EXISTING BY C OF E	EXISTING BY OTHERS	PLANNED BY C OF E	PLANNED BY OTHERS
1	TABLES			50	
	FIREPLACES			50	
	TRASH CANS			50	
	SHELTERS			50	
2	TABLES	6		19	
	FIREPLACES	6		19	
	TRASH CANS	6		19	
	SHELTERS	6		19	
3	TABLES				
	FIREPLACES				
	TRASH CANS				
	SHELTERS				
4	TABLES				
	FIREPLACES				
	TRASH CANS				
	SHELTERS				
5	TABLES				
	FIREPLACES				
	TRASH CANS				
	SHELTERS				
6	TABLES				
	FIREPLACES				
	TRASH CANS				
	SHELTERS				

TRINITY RIVER AND TRIBUTARIES, TEXAS
GRAPEVINE DAM AND RESERVOIR
DENTON CREEK ELM FORK, TRINITY RIVER

SILVER LAKE PARK

IN 2 SHEETS

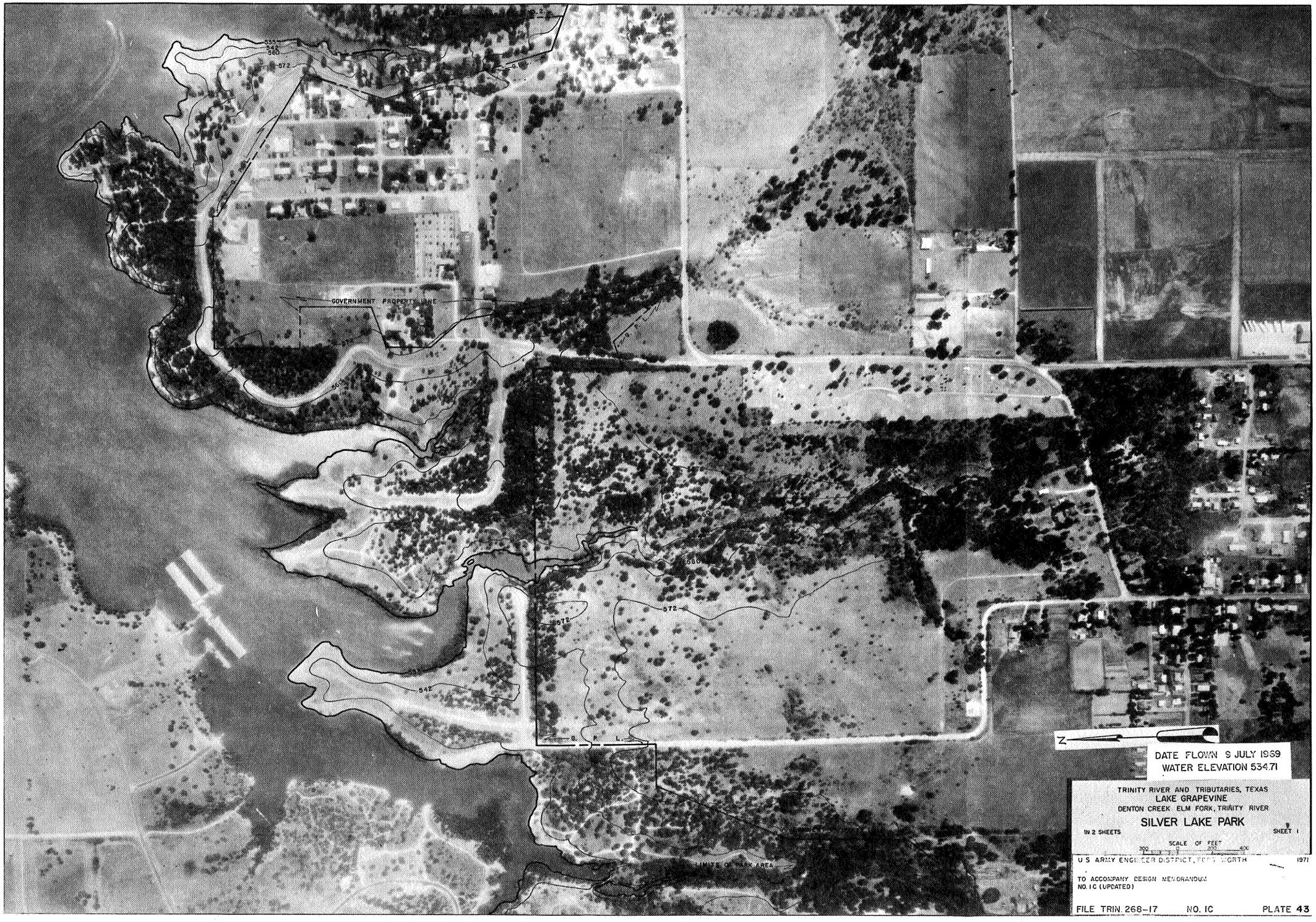
SHEET NO. 1

SCALE OF FEET
200 0 200 400

U S ARMY ENGINEER DISTRICT, FORT WORTH AUGUST 1971

TO ACCOMPANY DESIGN MEMORANDUM NO. 1C (UPDATED)

FILE TRIN. 268-17 NO. 1C PLATE 42



DATE FLOWN 9 JULY 1969
WATER ELEVATION 534.71

TRINITY RIVER AND TRIBUTARIES, TEXAS
LAKE GRAPEVINE
DENTON CREEK ELM FORK, TRINITY RIVER

SILVER LAKE PARK

IN 2 SHEETS SHEET 1

SCALE OF FEET
200 0 200 400

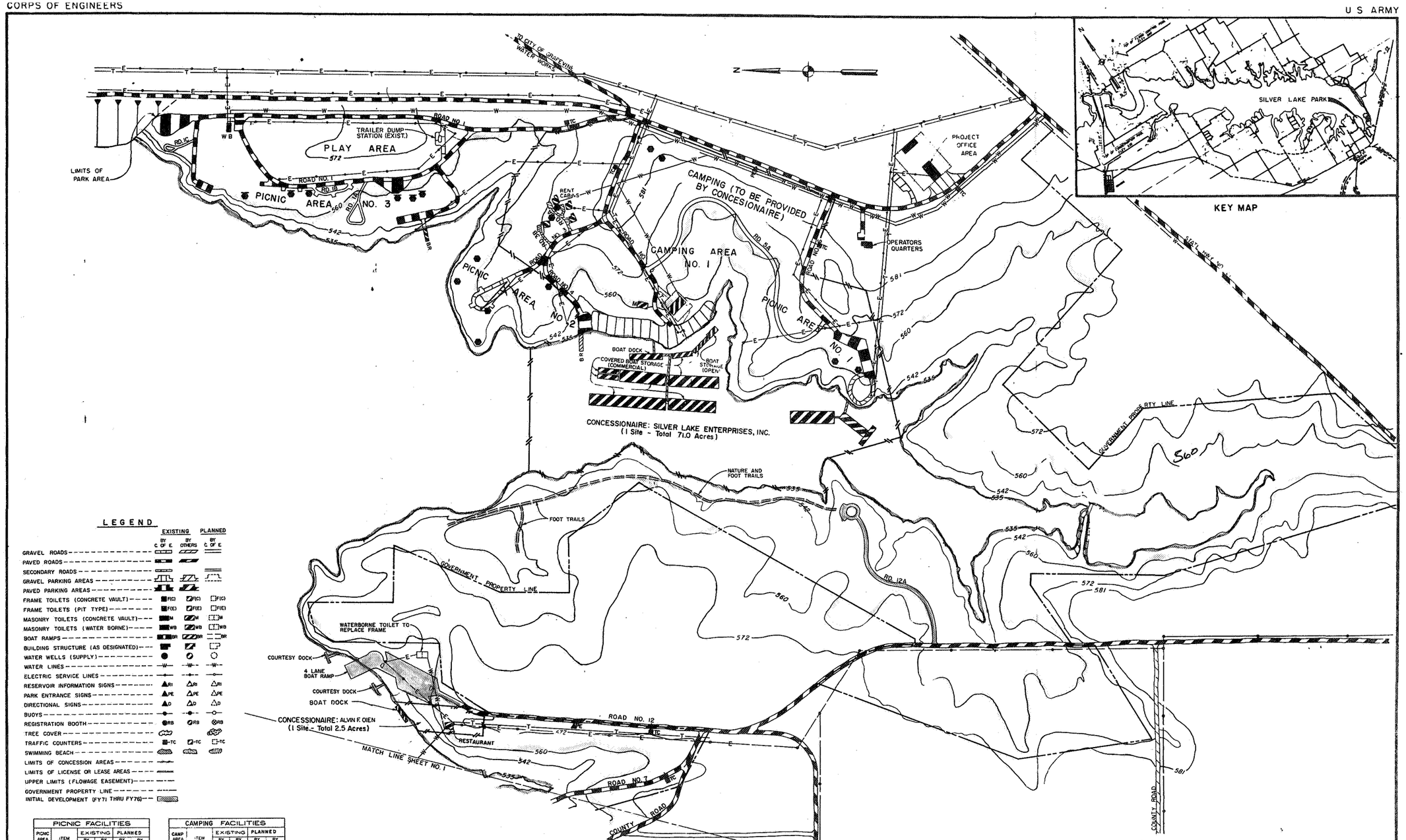
U S ARMY ENGINEER DISTRICT, FORT WORTH 1971

TO ACCOMPANY DESIGN MEMORANDUM
NO. 1C (UPDATED)

FILE TRIN. 268-17 NO. 1C PLATE 43

CORPS OF ENGINEERS

U S ARMY



LEGEND

	EXISTING BY C OF E	EXISTING BY OTHERS	PLANNED BY C OF E
GRAVEL ROADS			
PAVED ROADS			
SECONDARY ROADS			
GRAVEL PARKING AREAS			
PAVED PARKING AREAS			
FRAME TOILETS (CONCRETE VAULT)	FR(C)	FR(C)	FR(C)
FRAME TOILETS (PIT TYPE)	FR(E)	FR(E)	FR(E)
MASONRY TOILETS (CONCRETE VAULT)	M	M	M
MASONRY TOILETS (WATER BORNE)	WB	WB	WB
BOAT RAMPS	BR	BR	BR
BUILDING STRUCTURE (AS DESIGNATED)			
WATER WELLS (SUPPLY)			
WATER LINES	W	W	W
ELECTRIC SERVICE LINES			
RESERVOIR INFORMATION SIGNS	RI	RI	RI
PARK ENTRANCE SIGNS	PE	PE	PE
DIRECTIONAL SIGNS	D	D	D
BUOYS			
REGISTRATION BOOTH	RB	RB	RB
TREE COVER			
TRAFFIC COUNTERS	TC	TC	TC
SWIMMING BEACH			
LIMITS OF CONCESSION AREAS			
LIMITS OF LICENSE OR LEASE AREAS			
UPPER LIMITS (FLOWAGE EASEMENT)			
GOVERNMENT PROPERTY LINE			
INITIAL DEVELOPMENT (FY 71 THRU FY 76)			

PICNIC FACILITIES

PICNIC AREA NO.	ITEM	EXISTING BY C OF E	EXISTING BY OTHERS	PLANNED BY C OF E	PLANNED BY OTHERS
1	TABLES		2		
	FIREPLACES		2		
	TRASH CANS		2		
	SHELTERS				
2	TABLES		7		
	FIREPLACES		7		
	TRASH CANS		7		
	SHELTERS				
3	TABLES	6		4	
	FIREPLACES	6		4	
	TRASH CANS	6		4	
	SHELTERS	6		4	
4	TABLES				
	FIREPLACES				
	TRASH CANS				
	SHELTERS				
5	TABLES				
	FIREPLACES				
	TRASH CANS				
	SHELTERS				
6	TABLES				
	FIREPLACES				
	TRASH CANS				
	SHELTERS				

CAMPING FACILITIES

CAMP AREA NO.	ITEM	EXISTING BY C OF E	EXISTING BY OTHERS	PLANNED BY C OF E	PLANNED BY OTHERS
1	TABLES	2			
	FIREPLACES	2			
	TRASH CANS	2			
	SHELTERS				
2	TABLES				
	FIREPLACES				
	TRASH CANS				
	SHELTERS				
3	TABLES				
	FIREPLACES				
	TRASH CANS				
	SHELTERS				
4	TABLES				
	FIREPLACES				
	TRASH CANS				
	SHELTERS				
5	TABLES				
	FIREPLACES				
	TRASH CANS				
	SHELTERS				
6	TABLES				
	FIREPLACES				
	TRASH CANS				
	SHELTERS				

TRINITY RIVER AND TRIBUTARIES, TEXAS
GRAPEVINE DAM AND RESERVOIR
DENTON CREEK ELM FORK, TRINITY RIVER

SILVER LAKE PARK

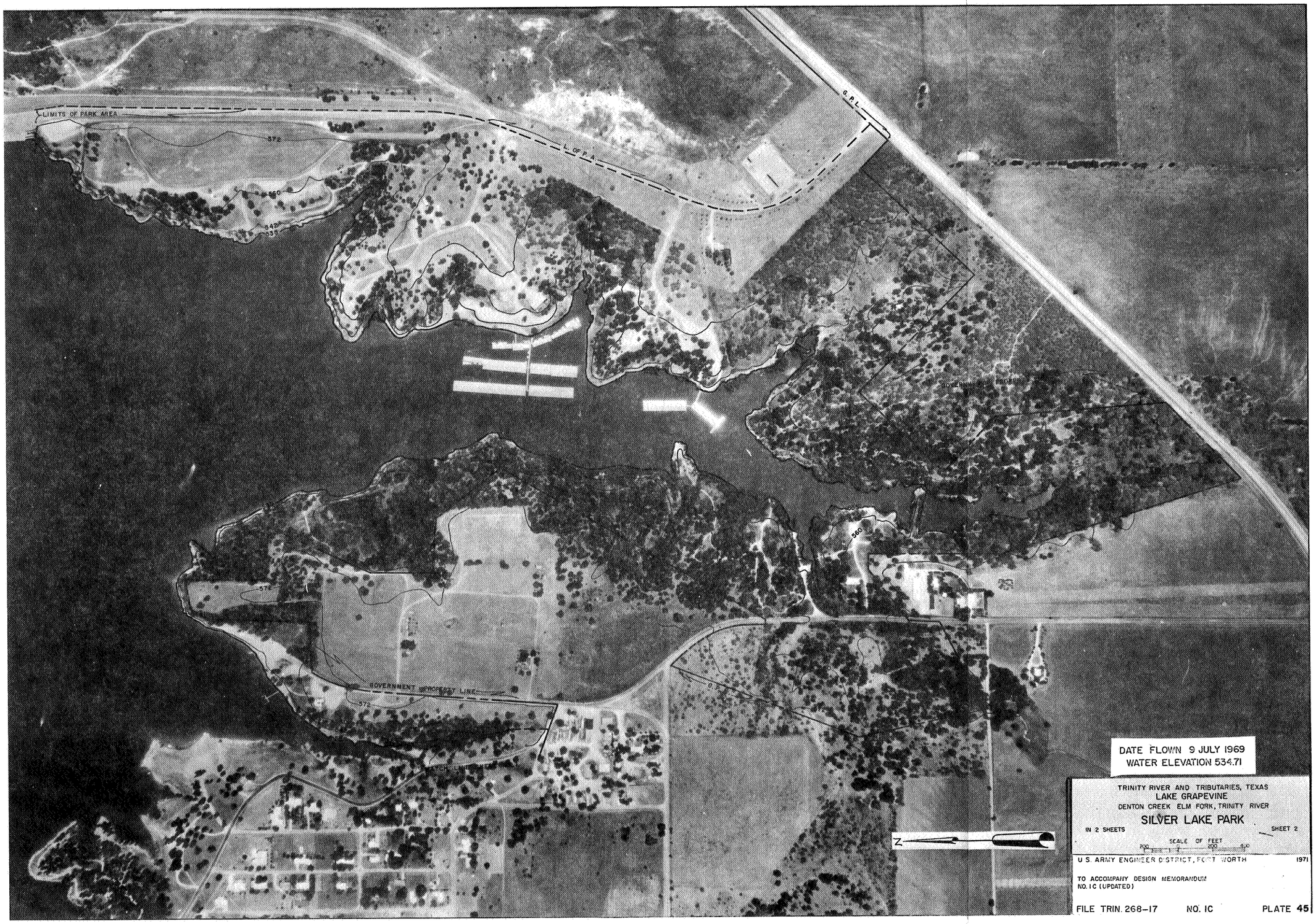
IN 2 SHEETS — SHEET NO 2

SCALE OF FEET
300 0 200 400

U S ARMY ENGINEER DISTRICT, FORT WORTH AUGUST 1971

TO ACCOMPANY DESIGN MEMORANDUM
NO. 1C (UPDATED)

FILE TRIN. 268-17 NO. 1C PLATE 44



DATE FLOWN 9 JULY 1969
WATER ELEVATION 534.71

TRINITY RIVER AND TRIBUTARIES, TEXAS
LAKE GRAPEVINE
DENTON CREEK ELM FORK, TRINITY RIVER

SILVER LAKE PARK

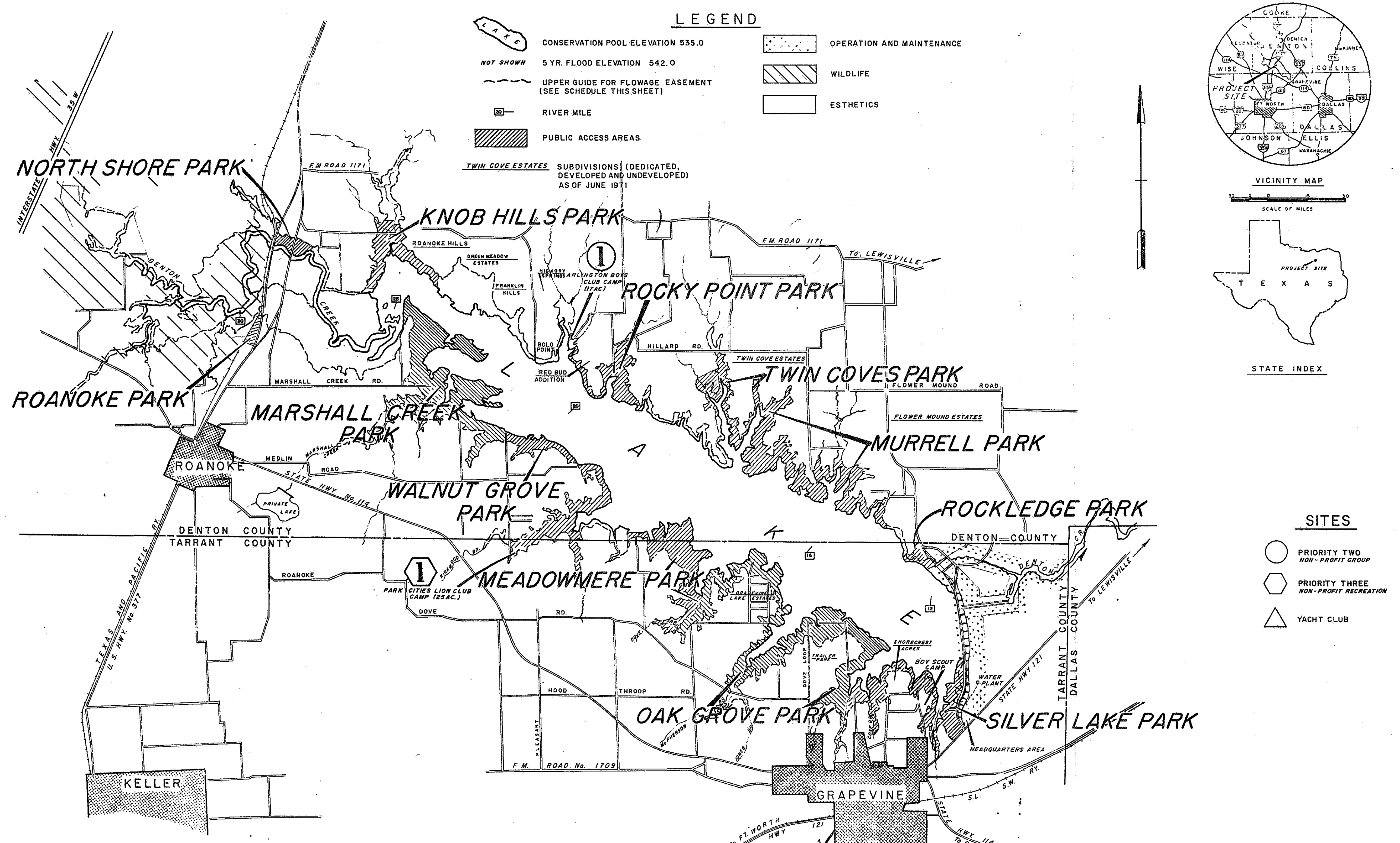
IN 2 SHEETS SHEET 2

SCALE OF FEET
200 0 200 400

U S. ARMY ENGINEER DISTRICT, FORT WORTH 1971

TO ACCOMPANY DESIGN MEMORANDUM
NO. IC (UPDATED)

FILE TRIN. 268-17 NO. IC PLATE 45



LEGEND
CONSERVATION POOL ELEVATION 535.0
NOT SHOWN 5 YR. FLOOD ELEVATION 542.0
UPPER GUIDE FOR FLOWAGE EASEMENT (SEE SCHEDULE THIS SHEET)
RIVER MILE
PUBLIC ACCESS AREAS
TWIN COVE ESTATES SUBDIVISIONS (DEDICATED, DEVELOPED AND UNDEVELOPED) AS OF JUNE 1971
OPERATION AND MAINTENANCE
WILDLIFE
ESTHETICS
NORTH SHORE PARK
KNOB HILLS PARK
ROCKY POINT PARK
ROANOKE PARK
MARSHALL CREEK PARK
TWIN COVES PARK
MURRELL PARK
WALNUT GROVE PARK
ROCKLEDGE PARK
MEADOWMERE PARK
OAK GROVE PARK
SILVER LAKE PARK
ROANOKE
KELLER
GRAPEVINE
DENTON COUNTY
TARRANT COUNTY
DALLAS COUNTY
L A K E
F.M. ROAD 1171
TO LEWISVILLE
HILLARD RD.
MARSHALL CREEK RD.
MEDLIN ROAD
STATE HWY No. 114
FLOWER MOUND ROAD
FLOWER MOUND ESTATES
TWIN COVE ESTATES
ROANOKE HILLS
GREEN MEADOW ESTATES
FRANKLIN HILLS
HICKORY SPRINGS
ARLINGTON BOYS CLUB CAMP (17AC)
BOLO POINT
RED BUD ADDITION
PRIVATE LAKE
CITIES LION CLUB CAMP (25 AC.)
DOVE RD.
HOOD
THROOP RD.
F.M. ROAD No. 1709
SHORECREST ACRES
BOY SCOUT CAMP
WATER PLANT
HEADQUARTERS AREA
STATE HWY 121
TO FT WORTH STATE HWY 121
F.M. ROAD No. 157 TO ARLINGTON
STATE HWY 114 TO DALLAS
INTERSTATE HWY 35W
TEXAS AND PACIFIC RY.
U.S. HWY. No. 377
DENTON CREEK
VICINITY MAP
SCALE OF MILES
STATE INDEX
PROJECT SITE
TEXAS
SITES
PRIORITY TWO NON-PROFIT GROUP
PRIORITY THREE NON-PROFIT RECREATION
YACHT CLUB

CONTROLLING ELEVATIONS FOR PROJECT ACQUISITION LINE	
BACKWATER EFFECT AND SEDIMENTATION	
RIVER MILE	STANDARD PROJECT FLOOD
DAMSITE 11.7	572'
25.0	572'
26.0	572'
28.0	572'
30.0	572'
31.0	573'
32.0	573'
33.0	574'
34.0	575'

TRINITY RIVER AND TRIBUTARIES, TEXAS — DENTON CREEK, TEXAS

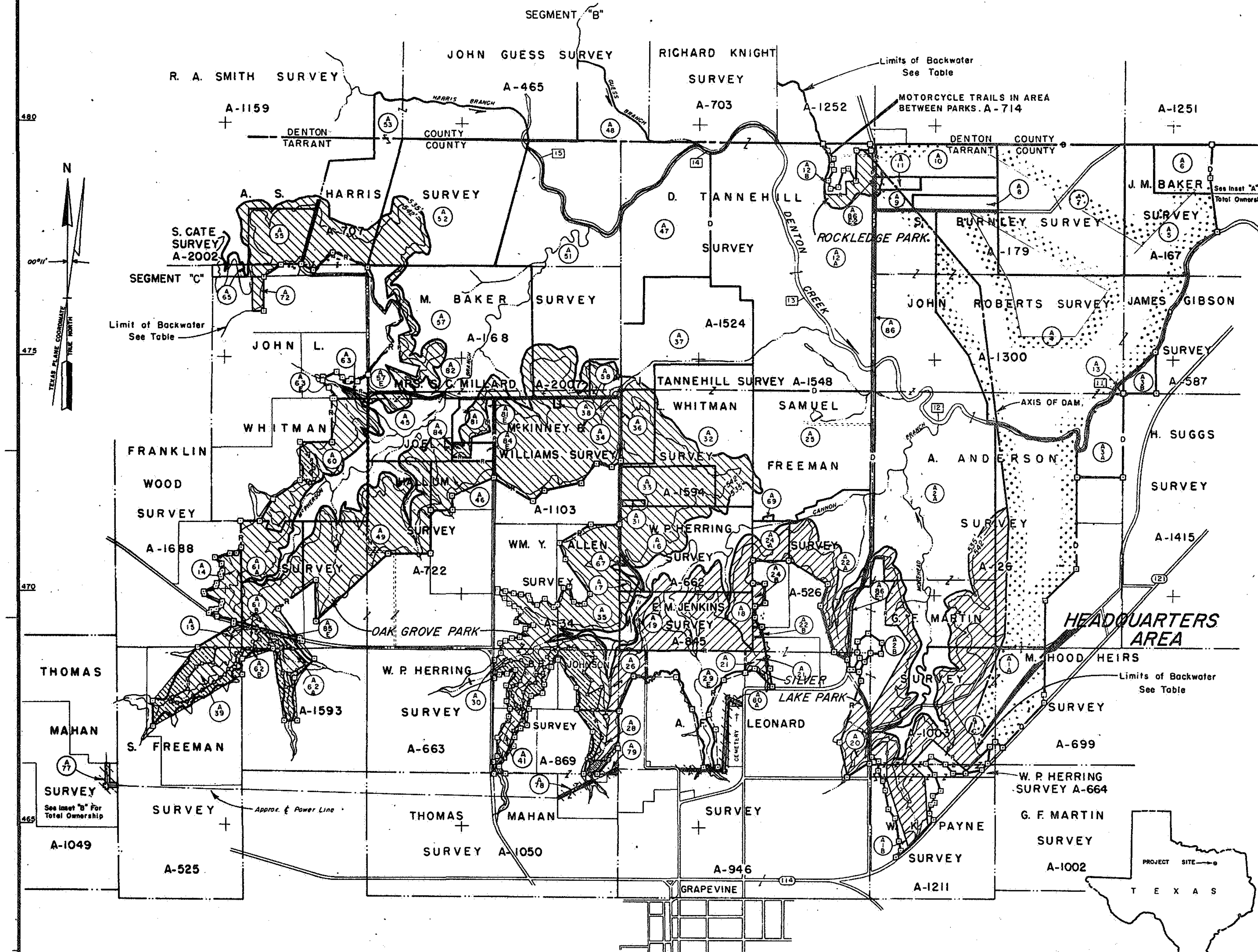
GRAPEVINE LAKE

LAND USE MAP

2000 0 2000 4000
SCALE OF FEET

U.S. ARMY ENGINEER DISTRICT, FORT WORTH TEXAS — JULY 1971

PLATE 46



CONTROLLING ELEVATIONS FOR PROJECT TAKING LINE (Backwater Effect and Sedimentation)	
River Mile	Standard Project Flood
DAMSITE 11.7	572
25.0	572
26.0	572
28.0	572
30.0	572
31.0	572
32.0	573
33.0	574
34.0	575

FEE: 4,932.14 Acres
LESS INT'S 568.99 Acres } IN TARRANT COUNTY

FEE: 10,730.32 Acres
LESS INT'S 1,597.11 Acres } IN DENTON COUNTY

OPERATION AND MAINTENANCE

1849.11 ACRES (78.08 ACRES) FEE QUITCLAIMED TO FORMER OWNERS PER PUBLIC LAW 85-500 RESERVING TO THE U.S. PERPETUAL FLOWAGE EASEMENT OVER 1497.77 ACRES (64.95 ACRES) (FOR INDIVIDUAL CONVEYANCES SEE "REMARKS" COLUMN OF THE ACQUISITION TRACT REGISTER)

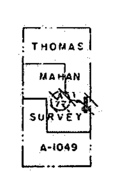
1.80 ACRES FEE CONVEYED TO THE CITY OF GRAPEVINE, TEXAS BY QUITCLAIM DEED DATED 6 JAN. 1956 RESERVING TO THE U.S. PERPETUAL FLOWAGE EASEMENT OVER 1.80 ACRES.

6.58 ACRES EASEMENT CONVEYED TO BRAZOS ELECTRIC POWER CO-OPERATIVE BY QUITCLAIM DEED DATED 25 JAN. 1957.

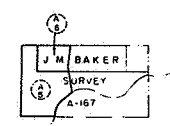
2.97 ACRES FEE CONVEYED TO THE STATE OF TEXAS BY QUITCLAIM DEED DATED 5 MAR 1956.

1.65 ACRES FEE REPORTED EXCESS ON S.F. 118 TO G.S.A. 9 MAY 1961 RESERVING TO THE U.S. PERPETUAL FLOWAGE EASEMENT OVER 0.08 ACRE, WHO CONVEYED 1.65 ACRES FEE TO WILLIAM WILKERSON BY DEED WITHOUT WARRANTY DATED 16 NOV. 1961 RESERVING TO THE U.S. PERPETUAL FLOWAGE EASEMENT OVER 0.08 ACRE

18.77 ACRES EASEMENT CONVEYED TO THE COUNTY OF DENTON BY QUITCLAIM DEED DATED 29 JULY 1963

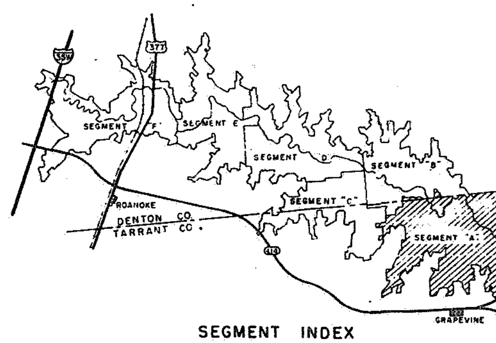


INSET "B"

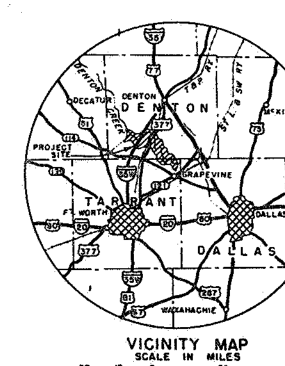


INSET "A"

SCALE IN FEET
1000 0 1000 2000



SEGMENT INDEX



VICINITY MAP
SCALE IN MILES

ACQUISITION TRACT REGISTER

	TRACT NO.	LAND OWNER	ACREAGE FEE	ACREAGE PERP. FLOW EASEMENT	REMARKS
182	A-1A	T. R. JONES, ET UX	320.50		
	A-1B	T. R. JONES, ET UX		8.10	C.A. 1461 D/T NO. 3 FILED 25 AUG. 1948
	A-1C	T. R. JONES, ET UX		13.20	C.A. 1461 D/T NO. 3 FILED 25 AUG. 1948
	A-2A	NANNIE V. BECKETT, ESTATE	487.70		
	A-2B	NANNIE V. BECKETT, ESTATE		46.80	C.A. 1461 D/T NO. 3 FILED 25 AUG. 1948
	A-3A	C. R. BROWN, ET UX	31.77		
	A-3B	C. R. BROWN, ET UX	9.46		
	A-4	FRANK T. ESTILL, ET AL	334.00		
	A-5	MARY FLAKE	83.10		
	A-6	C.K. SIMMONS, ET UX	25.30		
	A-7	MRS. F.P. WIEGERS, ET AL	160.00		
	A-8	R.F. MULLINS, ET UX	14.00		
	A-9	BILLIE ROSS MULLINS, ET UX	19.00		
	A-10	W.V. GRIFFIS, ET UX	40.00		
	A-11	EFFIE JAMES	7.00		
	A-12A	MANIE L. ROBERSON, ET AL	364.68		6.80 AC. IN DENTON COUNTY 357.88 AC. IN TARRANT COUNTY
	A-12B	MANIE L. ROBERSON, ET AL		4.22	C.A. 1461 D/T NO. 3 FILED 25 AUG. 1948
	A-13	C. R. BROWN, ET UX	0.63		
183	A-14	J.D. SINGLETON, ET UX	17.00		
	A-15	ROY C. MALONE, ET UX	6.10		
	A-16	RENA HALL	110.78		
	A-17	MRS. EMERSON F. CORBIN, ET AL	3.13		
	A-18	IRENE DUNN HOWELL, ET VIR	10.00		
	A-19	KATHLEEN SAUNDERS HALL, ET VIR	70.25		
	A-20	W.R. BOYD, ESTATE	18.20		
	A-21	TONY CRYSTAL, ET AL	7.20		
	A-22A	J.B. PERRY, ET UX	84.10		
	A-22B	J.B. PERRY, ET UX	1.00		
	A-23	COMBINED WITH A-24B	——		
183	A-24A	FRANK P. HOWELL, ET UX	14.20		
	A-24B	FRANK P. HOWELL, ET UX	3.10		
	A-25	R.H. STATON, ET UX	144.20		
	A-26	BESSIE BROCK	50.30		4.64 AC RECONVEYED TO [illegible] ET AL BY DEED DTD 3 MAY 1961 PERP. FLOW EASM'T RETAINED ON [illegible] AC
	A-27	COMBINED WITH A-26	——		
183	A-28	LAURA E. VILBIG, ET AL	18.30		[illegible] AC RECONVEYED TO LAURA E. VILBIG BY DEED DTD 5 DEC. 1960 PERP. FLOW EASM'T RETAINED ON [illegible]
	A-29E	ELWOOD CLUCK, ET UX		40.40	C.A. 2177 D/T FILED 28 JAN. 1952
	A-30	ALTON CORBIN, ET UX	48.70		13.22 AC. RECONVEYED BY DEED DATED 5 OCT. 1960 PERPETUAL FLOWAGE EASM'T RETAINED ON 11.12 AC.
	A-31	E.T. SIMMONS, ET AL	1.00		
	A-32	STANLEY D. BOWLES, ET UX	123.30		
	A-33	HOWELL P. CLARK, ET UX	37.17		
	A-34	LAY T. DUTCHER, ET UX	104.80		
	A-35	FLOSSIE G. CARPENTER, ET VIR	59.80		
	A-36	ZETA WALL CREWS, ET VIR	26.00		
	A-37	B.R. WALL, ET UX	115.41		
	A-38	LAY T. DUTCHER, ET UX	0.50		
	A-39	J. H. McPHERSON, ET AL	36.40		22.44 AC RECONVEYED TO [illegible] ET AL BY DEED DTD. 17 JAN 1961 PERP. FLOW EASM'T RETAINED ON [illegible] AC.
	A-40	DELETED	——		
183	A-41	SARAH A. HURST, ET AL	10.30		2.28 AC RECONVEYED BY DEED DATED 17 JAN. 1961 PERPETUAL FLOWAGE EASM'T RETAINED ON 1.74 AC.
	A-42 THRU A-44 DELETED		——		
183	A-45	O. F. JONES, ET UX	56.64		
	A-46	R.L. INMON, ET UX	22.10		
	A-47	H.Y. MURFF, ET UX	98.00		
	A-48	JOHN W. CARPENTER, ET UX	132.57		38.63 AC IN DENTON COUNTY 93.94 AC IN TARRANT COUNTY
	A-49	M.C. SMITH, ET AL	103.00		
	A-50	DELETED	——		
183	A-51	W.H. AKARD, ET UX	173.50		
	A-52	F.W. ANDERSON, ET UX	160.30		
	A-53	MRS. ORA AYRES RAMSEY, ET AL	132.40		55.80 AC. IN DENTON COUNTY 76.60 AC. IN TARRANT COUNTY
	A-54	COMBINED WITH B-101	——		
183	A-55	L.G. BLEVINS, ET UX	32.00		
	A-56	DELETED	——		
183	A-57	R.W. BLAIR, ET UX	185.00		
	A-57E	R.W. BLAIR, ET UX		23.30	C.A. 2115 D/T FILED 20 MAR 1951
	A-58	A.W. DAY, ET UX	13.25		
	A-59	DELETED	——		
183	A-60	G.U. PICKERING, ET UX	86.80		3.83 AC RECONVEYED BY DEED DATED 15 SEPT. 1960 PERPETUAL FLOWAGE EASM'T RETAINED ON 3.19 AC.
	A-61A	ETHEL GASKILL, ET VIR	61.90		
	A-61B	ETHEL GASKILL, ET VIR	8.80		4.51 AC. RECONVEYED BY DEED DATED 15 SEPT. 60 PERPETUAL FLOWAGE EASM'T RETAINED ON 3.84 AC
	A-62A	FLORENCE McPHERSON, ET AL	16.00		10.24 AC. RECONVEYED BY DEED DATED 5 DEC 1960 PERPETUAL FLOWAGE EASM'T RETAINED ON 7.48 AC.
	A-62B	FLORENCE McPHERSON, ET AL	1.60		1.30 AC RECONVEYED BY DEED DTD 5 DEC 1960 PERP. FLOW EASM'T RETAINED ON 1.30 AC. (ACTUAL SURVEY SHOWS 0.70 AC. RETAINED FLOW EASM'T.)
	A-63	E. D. REED, ET UX	2.00		
	A-63E	E. D. REED, ET UX		6.10	C.A. 2113 D/T FILED 22 JAN. 1952
	A-64	DELETED	——		
183	A-65	J H. HARTMAN, ET AL	7.00		
	A-66	COMBINED WITH C-209	——		
183	A-67	JOHN W. CARPENTER, ET UX	2.99		
	A-68	DELETED	——		
183	A-69	J B. PERRY, ET UX	0.60		
	A-70	DELETED	——		
	A-71	DELETED	——		
183	A-72	E.D REED, ET AL	3.50		
	A-73 THRU A-76 DELETED		——		
183	A-77	A.J. MUSICK, ET AL		* 0.97	*PERP. R-O-W EASM'T. FOR POWER LINE C.A. 1826 FROM 9 APR. 1951
	A-78	JOHN W. VILBIG, ET UX		* 1.18	*PERP. R-O-W EASM'T. FOR POWER LINE C.A. 1826 D/T FILED 21 AUG. 1950
	A-79	JOHN W. VILBIG, ET UX		* 0.43	*PERP. R-O-W EASM'T. FOR POWER LINE C.A. 1826 D/T FILED 21 AUG. 1950
	A-80A	MARTHA K. CLUCK, ET VIR		* 4.00	*PERP. R-O-W EASM'T. FOR POWER LINE C.A. 1826 D/T NO. 2 FILED 28 FEB. 1952.
	A-80B	COMBINED WITH A-80A	——		
183	A-81	J.L. TILLERY, ET UX	12.67		
	A-81E	J. L. TILLERY, ET UX		4.09	C.A. 2115 D/T FILED 20 MAR. 1951
	A-82	M.E. DALTON, ET AL	1.73		
	A-83	COMBINED WITH A-81	——		
183	A-84	A. F. JONES, ET UX	3.44		
	A-84E	A. F. JONES, ET UX		6.03	C.A. 2115 D/T FILED 20 MAR. 1951
	A-85E	TARRANT COUNTY, TEXAS		1.64	FROM 9 FEB. 1956
	A-86	TARRANT COUNTY, TEXAS	8.40		
	A-86E-1	TARRANT COUNTY, TEXAS		3.02	FROM 9 FEB. 1956
	A-86E-2	TARRANT COUNTY, TEXAS		1.40	FROM 9 FEB. 1956

TYPE FINAL

PROJECT OWNERSHIP MAP

STATE TEXAS
COUNTY DENTON & TARRANT
DIVISION SOUTHWESTERN
DISTRICT FORT WORTH
FOURTH ARMY AREA

— LOCATION OF PROJECT —

20 MILES NE OF FT. WORTH
20 MILES NW OF DALLAS

— TRANSPORTATION FACILITIES —

RAILROADS ST. L.-SW. RY., T. & P. RY.
STATE ROADS NOS. 114 & 121
FEDERAL ROADS U.S. NO. 377
AIRLINES NONE

— ACQUISITION —

FOR FLOOD CONTROL
TOTAL ACRES ACQUIRED 18,209.79
ACRES FEE 17,517.99
ACRES TRANSF'D.
ACRES LEASED
ACRES LESSER INTERESTS (54) EASM'T 691.80
1499.6? AC PERPETUAL FLOWAGE EASEMENT RESERVED IN FEE DISPOSAL.

— DISPOSAL —

BY
TOTAL ACRES DISPOSED OF 1880.88
ACRES SOLD FEE 4.77 EASM'T (15) 25.35
ACRES TRANSF'D.
ACRES RETRANSF'D. TO GOV'T. AGCY.
ACRES LEASES TERMINATED
ACRES LESSER INT'S. TERM.
ACRES TO FORMER OWNERS FEE 1,849.11
ACRES TO G.S.A. FEE 1.65

— LEGEND —

NOTE: USE SYMBOLS FROM FM-21-30 (WAR DEPT. BASIC FIELD MANUAL) PAGES 21 TO 27 INCL.

EXCEPT

RESERVATION LINE
RESERVATION LINE (ACTUAL SURVEY)
RESERVATION LINE (ACTUAL SURVEY INTERIOR)
DAM SITE (TAKING LINE)
RESERVOIR SITE (TAKING LINE)
RESERVOIR SITE (TAKING LINE INTERIOR)
CONSERVATION POOL
5 YEAR FLOOD ELEVATION
PUBLIC ACCESS AREA PRIORITY ONE
ESTHETICS
TRACT NUMBER

Note:
1. Basic land lines from G.L.O. plats of Denton and Tarrant Counties.
2. Topography from controlled aerial photographs and multiplex maps prepared by the Corps of Engineers, supplemented by contract field survey.
3. Taking line based on control established by contract field survey.
4. Interior tracts based on deeds of records in Denton and Tarrant Counties.
5. All severed acreages shown are those areas on which no interest has been acquired.
6. Tangents along 572' contour used in describing estate acquired.
7. Tangents along 572' contour used in describing estate reconveyed.
8. Reconveyance line based on 560' elevation.
9. Public Access Areas.

REVISIONS	DATE		BY
1.	5 JUNE 51	REVISED TAKING LINE TRACT A-30	A.W.S.
2.	[illegible]	REVISED MAP TO REFLECT REAL ESTATE LAND ACQUISITION POLICY DATED 12 OCT 1953	[illegible]
3.	27 SEPT. 61	REVISED MAP TO REFLECT PUBLIC LAW 85-500 DTD 3 JUL 1958	[illegible]
4.	12 APR. 65	DUE TO FINAL AUDIT	J.D.B.
5.	12 MAY 67	ADDED PUBLIC ACCESS AREAS	F.H.

DEPARTMENT OF THE ARMY
OFFICE OF THE FORT WORTH DISTRICT ENGINEER
SOUTHWESTERN DIVISION

GRAPEVINE LAKE
LANDUSE MAP
SEGMENT A

5.	COMMENT NO 3 O.C.E TO SWD DATED 6 SEPT 1962
4.	2ND. IND. O.C.E TO S.W.D. DATED 1 JUN 1961
3.	4TH. IND. O.C.E. TO S.W.D. DATED 23 SEPT. 1949
2.	2ND. IND. O.C.E. TO S.W.D. DATED 16 OCT. 1947
1.	PUBLIC LAW NO 14 DATED 2 MAR 1945

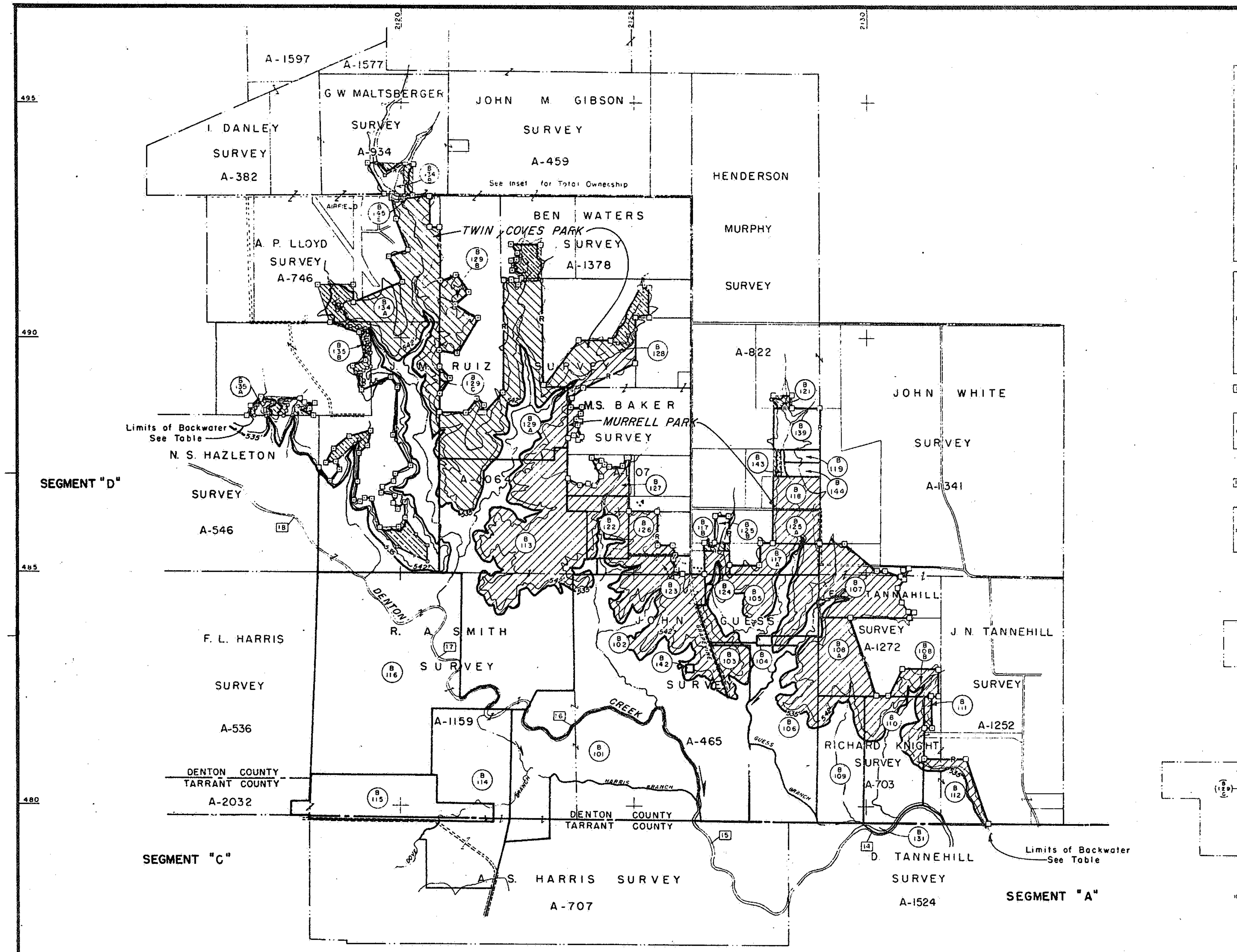
ACQUISITION AUTHORIZATION

OFFICE, CHIEF OF ENGINEERS, WASHINGTON, D. C.
AUDITED
INSTALLATION OR PROJECT NO. C-2110

SCALE IN FEET
1000 0 1000 2000

SHEET 1 OF 6 DRAWING NO.

PLATE 47



ACQUISITION TRACT REGISTER

TRACT NO	LAND OWNER	ACREAGE FEE	ACREAGE EASM'T	REMARKS
B-101	J. M. HAMILTON, ET AL	139.50		[illegible] AC IN DENTON COUNTY 8.9? AC IN TARRANT COUNTY
B-102	F. W. ANDERSON, ET UX	28.74		
B-103	LYDIA MAE FLANAGAN, ET AL	25.00		
B-104	JACK J. WENDEBORN, ET UX	16.25		
B-105	EDNA A. MEYERS, ET VIR	60.25		
B-106	JOHN H. WILLIAMS, ET UX	80.00		
B-107	M. T. PAINE, ET UX	54.00		
B-108A	MRS. MAE POWELL, ET AL	35.70		
B-108B	MRS. MAE POWELL, ET AL	1.90		
B-109	E. L. DYER, ET UX	60.00		
B-110	W. C. GREENER, ET AL	74.50		
B-111	NED S. ALEXANDER	2.70		
B-112	FARLANCE S. VAUGHAN, ET VIR	36.60		
B-113	RUSSELL HILLIARD, ET UX	316.20		
B-114	KENNETH B. MOORE, ET AL	140.60		81.47 AC. IN DENTON COUNTY 59.13 AC IN TARRANT COUNTY
B-115	B. C. JONES, ET UX	65.50		56.54 AC IN DENTON COUNTY 8.96 AC IN TARRANT COUNTY
B-116	J. W. JAGOE, JR., ET AL	301.75		
B-117A	E. R. CHEATUM, ET UX	22.00		
B-117B	E. R. CHEATUM, ET UX	1.60		[illegible] AC RECONVEYED BY DEED DATED [illegible] PERPETUAL FLOWAGE EASM'T RETAINED ON [illegible] AC
B-118	ASA L. DAVIS, ET UX	15.90		
B-119	E. E. FRANK, ET UX		4.70	PERPETUAL FLOWAGE EASEMENT C.A. 638 D/T FILED 26 JUNE 1951
B-120	DELETED	----		
B-121	JOHN V. GOODE, ET UX	2.50		2.50 AC RECONVEYED BY DEED DATED 5 DEC 1963 PERPETUAL FLOWAGE EASM'T RETAINED ON .65 AC
B-122	EARL SPROLES, ET UX	30.20		
B-123	G. C. McMURRAY	14.80		
B-124	F. E. BRODEN, ET UX	5.90		
B-125A	CLYDE E. SIMMONS	16.30		
B-125B	CLYDE E. SIMMONS	4.30		
B-126	CARL J. TROGDON, ET UX	14.50		
B-127	J. D. CAVANESS	14.60		
B-128	W. E. CULWELL, ET UX	46.70		9.86 AC RECONVEYED BY DEED DATED 15 SEPT 1960 PERPETUAL FLOWAGE EASM'T RETAINED ON 8.54 AC
B-129A	W. J. SCHNELLE, ET UX	139.90		9.60 AC RECONVEYED TO ELIZABETH B. SCHNELLE BY DEED DTD 20 DEC 1960 PERP FLOW EASM'T RETAINED ON 8.22 AC
B-129B	W. J. SCHNELLE, ET UX	20.00		
B-130	DELETED	----		
B-131	LILA GREENER, ET AL	3.00		
B-132	DELETED	----		
B-133	COMBINED WITH B-134A			
B-134A	FRIEDA LOU NOBLE LEEDS, ET VIR	259.00		25.49 AC RECONVEYED TO FRIEDA LOU NOBLE LEEDS BY DEED DATED 24 APR 1961 PERP FLOW EASM'T RETAINED ON 22.27 AC
B-134B	FRIEDA LOU NOBLE LEEDS, ET VIR	12.00		[illegible] AC RECONVEYED TO FRIEDA LOU NOBLE LEEDS BY DEED DTD 24 APR 1961 PERP FLOW EASM'T RETAINED ON [illegible] AC
B-135A	DR. R. L. TURNER, ET UX	11.30		6.96 AC RECONVEYED BY DEED DATED 17 JAN 1961 PERPETUAL FLOWAGE EASM'T RETAINED ON 2.49 AC
B-135B	DR. R. L. TURNER, ET UX	9.90		5.29 AC RECONVEYED BY DEED DATED 17 JAN 1961 PERPETUAL FLOWAGE EASM'T RETAINED ON 2.53 AC
B-136	DELETED	----		
B-137	COMBINED WITH B-134A	*		
B-138	DELETED	----		
B-139	BILLIE DEAN CULWELL, ET VIR	19.60		
B-140	DELETED	----		
B-141	DELETED	----		
B-142	MURRELL CEMETERY	0.66		
B-143	VIVIAN H. ORRILL, ET AL	3.80		2.26 AC RECONVEYED BY DEED DTD 28 JUNE 1962 PERP FLOWAGE EASM'T RETAINED ON 1.34 AC
B-144	RAYMOND STATON, ET UX	-	4.00	PERPETUAL FLOWAGE EASEMENT CA 638 D/T FILED 26 JUN 1951 AMEND D/T FILED 27 OCT 1952
B-129C	W. J. SCHNELLE, ET UX	1.48		
B-145E	DENTON COUNTY, TEXAS		0.40	PERPETUAL FLOWAGE EASEMENT C.A. 702 D/P FILED 18 JUN 1952

TYPE: FINAL

PROJECT OWNERSHIP MAP

STATE: TEXAS
COUNTY: DENTON & TARRANT
DIVISION: SOUTHWESTERN
DISTRICT: FORT WORTH
FOURTH ARMY AREA

— LOCATION OF PROJECT —

20 MILES NE OF FT. WORTH
20 MILES NW OF DALLAS

— TRANSPORTATION FACILITIES —

RAILROADS: ST. L.-SW. RY., T. & P. RY.
STATE ROADS: NOS. 114 & 121
FEDERAL ROADS: U. S. NO. 377
AIRLINES: NONE

— ACQUISITION —

FOR: FLOOD CONTROL
TOTAL ACRES ACQUIRED: SEE SEG. "A"
ACRES FEE
ACRES TRANSF'D.
ACRES LEASED
ACRES LESSER INTERESTS

— DISPOSAL —

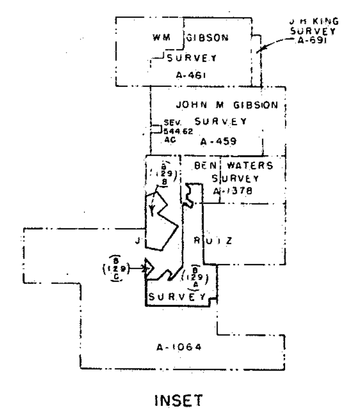
BY
TOTAL ACRES DISPOSED OF: SEE SEG. "A"
ACRES SOLD
ACRES TRANSF'D.
ACRES RETRANSF'D. TO GOV'T. AGCY.
ACRES LEASES TERMINATED
ACRES LESSER-INT'S. TERM.
ACRES TO

— LEGEND —

NOTE: USE SYMBOLS FROM FM-21-30 (WAR DEPT. BASIC FIELD MANUAL) PAGES 21 TO 27 INCL.

EXCEPT

RESERVATION LINE
RESERVATION LINE (ACTUAL SURVEY)
RESERVATION LINE (ACTUAL SURVEY INTERIOR)
DAM SITE (TAKING LINE)
RESERVOIR SITE (TAKING LINE)
RESERVOIR SITE (TAKING LINE INTERIOR)
CONSERVATION POOL ELEV. 535
5 YEAR FLOOD ELEV. 542
PUBLIC ACCESS AREA PRIORITY ONE
ESTHETICS
TRACT NUMBER (B 120)



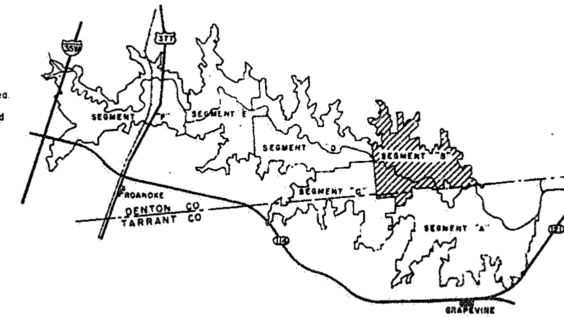
INSET

SCALE IN FEET 1000 0 1000 2000

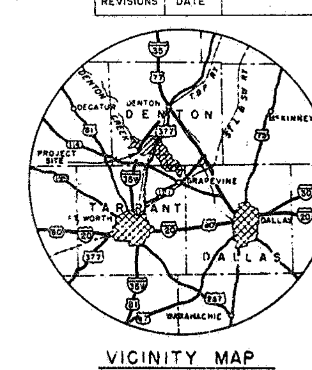
CONTROLLING ELEVATIONS FOR PROJECT TAKING LINE (Backwater Effect and Sedimentation)	
River Mile	Standard Project Flood
Damsite 11.7	572'
25.0	572'
26.0	572'
28.0	572'
30.0	572'
31.0	573'
32.0	573'
33.0	574'
34.0	575

Note:
1. Basic land lines from G.L.O. plats of Denton and Tarrant Counties.
2. Topography from controlled aerial photographs and multiplex maps prepared by the Corps of Engineers, supplemented by contract field survey.
3. Taking line based on control established by contract field survey.
4. Interior tracts based on deeds of records in Denton and Tarrant Counties.
5. All severed acreages shown are those areas on which no interest has been acquired.
6. Tangents along 572 contour used in describing estate acquired.
7. Tangents along 572 contour used in describing estate reconveyed.
8. Reconveyance line based on 560' elevation.
9. Public Access Areas

68.19 ACRES FEE QUITCLAIMED TO FORMER OWNERS PER PUBLIC LAW 85-500 RESERVING TO THE U.S. PERPETUAL FLOWAGE EASEMENT OVER 50.10 ACRES (FOR INDIVIDUAL CONVEYANCES SEE "REMARKS" COLUMN OF THE ACQUISITION TRACT REGISTER)



SEGMENT INDEX



VICINITY MAP

SCALE IN MILES

STATE INDEX

REVISIONS	DATE		BY
			F.R.
			J.D.S.

ACQUISITION AUTHORIZATION
3. 4TH IND. O.C.E. TO S.W.D. DATED 23 SEPT. 1949
PUBLIC LAW NO. 14 DATED 2 MAR. 1945

REVISIONS	DATE		BY
1	[illegible] JUNE 51	TAKE LINE CHANGE TRACTS NOS B-129A & B-134A	R.C.W.
2	27 JUNE 51	TAKE LINE CHANGE TRACT NO B-10? TRACT NO B-144 ADDED	J.H.R.
3	28 JUNE 51	TAKE LINE CHANGE TRACTS NOS B-127 & B-128	R.L.M.
4	30 JUNE 52	TAKE LINE CHANGE TRACTS NOS B-129A, B-129B & B-129C	E.L.B.
5	19 AUG 5?	REVISED MAP TO REFLECT REAL ESTATE LAND ACQUISITION POLICY DATED 12 OCT 1953	L.L.J.
6	27 SEPT 6?	REVISED MAP TO REFLECT PUBLIC LAW 85-500 DATED 3 JUL 1958	J.D.S.

DEPARTMENT OF THE ARMY
OFFICE OF THE FORT WORTH DISTRICT ENGINEER
SOUTHWESTERN DIVISION

GRAPEVINE LAKE

LAND USE MAP

SEGMENT B

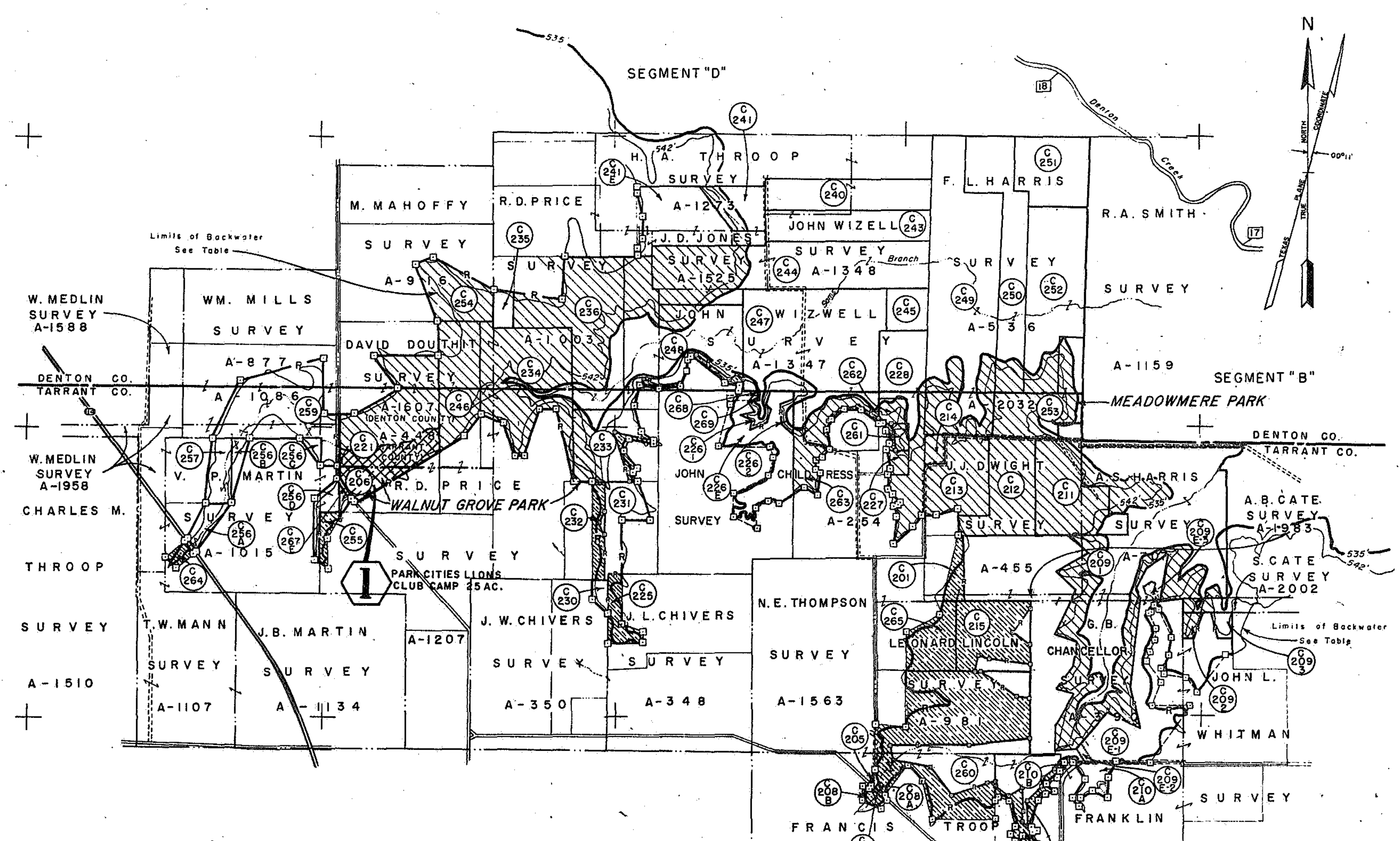
OFFICE CHIEF OF ENGINEERS, WASHINGTON, D. C.

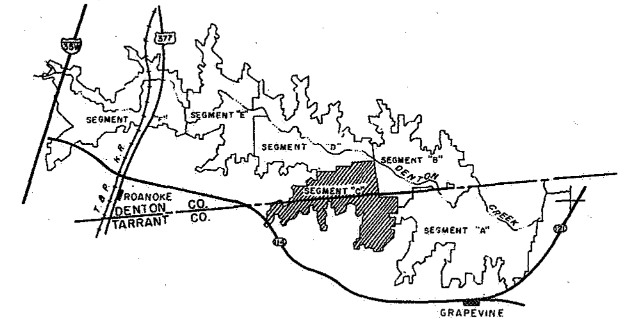
AUDITED.

INSTALLATION OR PROJECT NO. C-2110

SCALE IN FEET 1000 0 1000 2000

SHEET 2 OF 6 DRAWING NO.





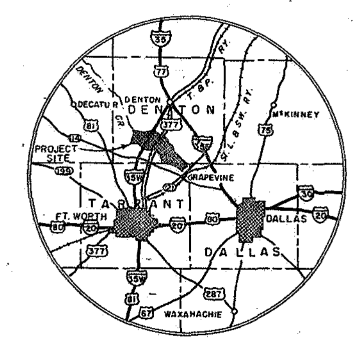
SEGMENT INDEX

NOTE:

1. Basic land lines from G.L.O. plat of Denton and Tarrant Counties.
2. Topography from controlled aerial photographs and multiplex maps prepared by the Corps of Engineers.
3. Taking line based on control established by contract field survey.
4. Interior tracts based on deeds of records in Denton and Tarrant Counties.
5. All severed acreages shown are those areas on which no interest has been acquired.
6. ⊡- - ⊡ Tangents along 572' contour used in describing estate acquired.
7. ⊡——⊡ Tangents along 572' contour used in describing estate reconveyed.
8. Reconveyance line based on 560' elevation.
9. [hatched] Public Access Areas.

CONTROLLING ELEVATIONS FOR PROJECT TAKING LINE (Backwater Effect and Sedimentation)	
River Mile	Standard Project Flood
Damsite 11.7	572'
25.0	572'
26.0	572'
28.0	572'
30.0	572'
31.0	573'
32.0	573'
33.0	574'
34.0	575'

[hatched] 178.12 ACRES FEE QUITCLAIMED TO FORMER OWNERS PER PUBLIC LAW 85-500 RESERVING TO THE U.S. PERPETUAL FLOWAGE EASEMENT OVER 145.43 ACRES. (FOR INDIVIDUAL CONVEYANCES SEE "REMARKS" COLUMN OF THE ACQUISITION TRACT REGISTER)



VICINITY MAP

SCALE IN MILES

SITES

○ PRIORITY TWO NON-PROFIT GROUP

⬡ PRIORITY THREE NON-PROFIT GROUP RECREATION

△ YACHT CLUB

ACQUISITION TRACT REGISTER

	TRACT NO.	LAND OWNER	ACREAGE FEE	ACREAGE PERP.FLOW. EASEMENT	REMARKS
183	C-201	J.A. MUSSLER, ET UX	5.00		5.. AC. RECONVEYED BY DEED DATED 19 SEPT 1960. PERPETUAL FLOWAGE EASM'T RETAINED ON 3.27 AC.
	C-202	DELETED			
	C-203	DELETED			
	C-204	DELETED			
183	C-205	JULIA TURNER	0.24		
	C-206	TILLMAN S. GRUBBS, JR., ET UX		1.00	CIVIL ACTION 2185 D/T FILED 6 JULY 1951.
	C-207	DELETED			
	C-208A	J.W. TANNER, ET UX	0.23		
	C-208B	J.W. TANNER, ET UX	2.28		2.28 AC. RECONVEYED BY DEED DATED 24 OCT 1960. PERPETUAL FLOWAGE EASM'T RETAINED ON 1.87 AC.
	C-209-1	DR. D.K. BARNES, ET UX	207.00		
	C-209-2	DR. D.K. BARNES, ET, UX	3.00		
	C-209-3	DR. D.K. BARNES, ET, UX	3.00		
	C-209E-1	DR. D.K. BARNES, ET, UX		140.00	CIVIL ACTION 1928 D/T FILED 10 APR. 1951.
183	C-209E-2	DR. D.K. BARNES, ET, UX		*	*PERPETUAL EASM'T FOR ACCESS ROAD C.A. 1928 D/T FILED 10 APR. 51. ENTIRE 0.82 ACRE INCLUDED IN TRACT NO. C-209E-1.
	C-209E-3	DR. D.K. BARNES, ET, UX		1.00	CIVIL ACTION 1928 D/T FILED 10 APR. 1951.
	C-210A	J.C. LIVINGSTON, ET UX	7.20		
	C-210B	J.C. LIVINGSTON, ET UX	0.10		
	C-211	R.T. WARREN, ET UX	45.45		
	C-212	TRAVIS J. ROBERTSON, ET UX	35.00		
	C-213	H.H. LAMASTER	30.00		
	C-214	HATTIE ALICE PARKER, ET AL	4.00		
	C-215	JAMES TORIAN	36.16		29.66 AC. RECONVEYED BY DEED DATED 5 DEC. 1960. PERPETUAL FLOWAGE EASM'T RETAINED ON 29.66 AC.
	C-216	DELETED			
	C-217	DELETED			
	C-218	DELETED			
	C-219	DELETED			
183	C-220	JAMES TORIAN	25.40		8.67 AC. RECONVEYED BY DEED DATED 5 DEC. 1960. PERPETUAL FLOWAGE EASM'T RETAINED ON 6.14 AC.
	C-221	WADE C. CUMMINGS, ET UX	64.00		11.46 AC. IN DENTON COUNTY. 52.54 AC. IN TARRANT COUNTY.
	C-222	DELETED			
	C-223	DELETED			
	C-224	DELETED			
	C-225	ANDREW ARON, ET UX	9.00		9.00 AC. RECONVEYED TO ANDREW ARON BY DEED DTD. 15 DEC. 1960. PERPETUAL FLOWAGE EASEMENT RETAINED ON 6.32 AC.
183	C-226E	STANLEY BURNEY, ET UX		29.00	C.A. ... INTO FEE ACQ. AS TRS. C-226-1, C-226-2, C-268 & C-269.
	C-227	J.C. BRIGGS, ET UX	3.50		
	C-228	W.C. HALBACK, ET UX	44.10		21.69 AC. IN DENTON COUNTY. 22.41 AC. IN TARRANT COUNTY.
	C-229	DELETED			
	C-230	L.R. RAGSDALE, ET UX	2.60		
	C-231	FERRELL HUSE, ET VIR	16.20		
	C-232	MAMIE FRYER, ET VIR	9.80		9.50 AC. RECONVEYED BY DEED DATED 9 AUG. 1960. PERPETUAL FLOWAGE EASM'T RETAINED ON 5.54 AC.
183	C-233	JINKS JONES, ET AL	30.60		2.27 AC. RECONVEYED BY DEED DATED 23 FEB. 1961. PERPETUAL FLOWAGE EASEMENT RETAINED ON 1.45 AC.
	C-234	H.R. GIBSON, ET UX	63.50		38.96 AC. IN DENTON COUNTY. 24.54 AC. IN TARRANT COUNTY.
	C-235	W.D. BURNS, ET AL		5.40	CIVIL ACTION 638 D/T FILED 26 JUNE 1951
	C-236	ALICE FRETWELL	68.30		61.85 AC. IN DENTON COUNTY. 6.45 AC. IN TARRANT COUNTY.
	C-237	DELETED			
	C-238	DELETED			
	C-239	DELETED			
	C-240	EMMA FRETWELL, ET VIR	36.00		
183	C-241	MRS. EUGIE THOMAS	20.00		
	C-241E	MRS. EUGIE THOMAS		33.70	CIVIL ACTION 611 D/T FILED 19 SEPT 1951.
	C-242	DELETED			
	C-243	ALICE FRETWELL	36.00		
	C-244	EMORY JONES, ET UX	97.50		
	C-245	E.W. HUSE, ET AL	10.00		
	C-246	A.P. SMITHY, ET UX	34.50		20.17 AC. IN DENTON COUNTY. 14.33 AC. IN TARRANT COUNTY.
	C-247	JINKS JONES, ET UX	111.60		93.13 AC.-DENTON CO. 18.47 AC.-TARRANT CO. 0.64 AC. RECON. BY DEED DTD. 5 DEC. 1960 PERPETUAL FLOWAGE EASEMENT RETAINED ON 0.48 AC.
	C-248	EMMA FRETWELL, ET VIR	72.80		71.18 AC.-DENTON CO. 1.62 AC.-TARRANT CO. 3.00 AC. RECONVEYED TO N.G. FRETWELL BY DEED DTD. 3 JAN. 1961 PERPETUAL FLOWAGE EASEMENT RETAINED ON 2.23 AC.
	C-249	J.W. HUDNALL, JR., ET UX	131.66		111.07 AC. IN DENTON COUNTY. 20.59 AC. IN TARRANT COUNTY.
	C-250	L.D. CATE, ET AL	60.00		
183	C-251	MRS. BESSIE L. FREEMAN	35.00		
	C-252	H.W. COOK, ET AL	65.00		
	C-253	T.M. CATE, ET UX	30.00		9.16 AC. IN DENTON COUNTY. 20.84 AC. IN TARRANT COUNTY.
	C-254	WILLIAM F. JONES	22.30		
	C-255	ETTA MILSON	4.30		4.30 AC. RECONVEYED BY DEED DATED 3 OCT 1960. PERPETUAL FLOWAGE EASM'T RETAINED ON 3.22 AC.
	C-256A	MRS. MAURINE P. WITT, ET AL		6.30	CIVIL ACTION 2185 D/T FILED 6 JULY 1951.
	C-256B	MRS. MAURINE P. WITT, ET AL		4.60	CIVIL ACTION 2185 D/T FILED 6 JULY 1951.
	C-256C	MRS. MAURINE P. WITT, ET AL		1.30	CIVIL ACTION 2185 D/T FILED 6 JULY 1951.
	C-256D	MRS. MAURINE P. WITT, ET AL		5.30	CIVIL ACTION 2185 D/T FILED 6 JULY 1951.
	C-256E	RENUMBERED C-264			
183	C-257	MRS. MAURINE P. WITT, ET AL		10.00	CIVIL ACTION 2185 D/T FILED 6 JULY 1951.
	C-258	DELETED			
	C-259	FRANCES REVELS, ET AL	51.40		9.47 AC. IN DENTON COUNTY. 41.93 AC. IN TARRANT COUNTY.
	C-260	LEONA TANNER	116.00		32.05 AC. RECONVEYED BY DEED DATED 2 NOV. 1960. PERPETUAL FLOWAGE EASM'T RETAINED ON 67.36 AC.
	C-261	CHESTER V. BREWER, ET UX	4.50		1.15 AC. RECONVEYED BY DEED DATED 25 JULY 1960. PERPETUAL FLOWAGE EASM'T RETAINED ON 0.68 AC.
	C-262	HOWARD H. WOERNER, ET AL	5.00		
183	C-263	FRANK H. AUSTIN, ET UX	9.70		
	C-264	G.D. CRAWFORD, ET UX	1.90		1.90 AC. RECONVEYED TO VIRGINIA L. CRAWFORD BY DEED DATED 14 DEC. 1960 PERPETUAL FLOWAGE EASM'T RETAINED ON 0.79 AC.
	C-265	L.D. CATE, ET UX	18.00		18.00 AC. RECONVEYED TO L.D. CATE BY DEED DTD. 17 APR 1961 PERPETUAL FLOWAGE EASM'T RETAINED ON 16.04 AC.
	C-266E	TARRANT COUNTY, TEXAS		0.44	FROM 9 FEB. 1956
	C-267E	TARRANT COUNTY, TEXAS		1.80	FROM 9 FEB. 1956
	C-226-1	STANLEY BURNEY, ET UX	3.44		ENTIRE AC. FORMERLY SHOWN AS PART OF TR. NO. C-226E.
1,383	C-226-2	STANLEY BURNEY, ET UX	2.08		ENTIRE AC. FORMERLY SHOWN AS PART OF TR. NO. C-226E.
	C-268	PAUL F. BRYANT, ET UX	0.12		ENTIRE AC. FORMERLY SHOWN AS PART OF TR. NO. C-226E.
	C-269	BOBBY G. JONES	0.26		ENTIRE AC. FORMERLY SHOWN AS PART OF TR. NO. C-226E.

TYPE FINAL

PROJECT OWNERSHIP MAP

STATE TEXAS

COUNTY DENTON & TARRANT

DIVISION SOUTHWESTERN

DISTRICT FORT WORTH

FOURTH ARMY AREA

— LOCATION OF PROJECT —

20 MILES NW OF DALLAS.

20 MILES NE OF FT. WORTH.

— TRANSPORTATION FACILITIES —

RAILROADS ST.L-S.W. & T.& P.

STATE ROADS NOS. 114 & 121

FEDERAL ROADS U.S. NO. 377

AIRLINES NONE

— ACQUISITION —

FOR FLOOD CONTROL

TOTAL ACRES ACQUIRED

ACRES FEE

ACRES TRANSF'D.

ACRES LEASED

ACRES LESSER INTERESTS

SEE SEG. "A"

— DISPOSAL —

[hatched] BY

TOTAL ACRES DISPOSED OF

ACRES SOLD

ACRES TRANSF'D.

ACRES RETRANSF'D. TO GOV'T. AGCY.

ACRES LEASES TERMINATED

ACRES LESSER INT'S. TERM.

ACRES TO

SEE SEG. "A"

— LEGEND —

NOTE: USE SYMBOLS FROM FM-21-30 (WAR DEPT. BASIC FIELD MANUAL) PAGES 21 TO 27 INCL.

EXCEPT

RESERVATION LINE

RESERVATION LINE (ACTUAL SURVEY)

RESERVATION LINE (ACTUAL SURVEY INTERIOR)

DAM SITE (TAKING LINE)

RESERVOIR SITE (TAKING LINE)

RESERVOIR SITE (TAKING LINE INTERIOR)

CONSERVATION POOL ELEV. 535

5 YEAR FLOOD ELEVATION 542

PUBLIC ACCESS AREA PRIORITY ONE

TRACT NUMBER (C 207)

5. COMMENT NO. 3 O.C.E. TO S.W.D. DATED 6 SEPT. 1962
3. 4TH. IND O.C.E. TO S.W.D. DATED 23 SEPT. 1949
1. PUBLIC LAW NO. 14 DATED 2 MAR. 1945

ACQUISITION AUTHORIZATION

REVISIONS	DATE		BY
1.	12 MAR. 52	TAKING LINE CHANGE - TRACT C-226	M.E.M.
2.	19 AUG. 58	REVISED MAP TO REAL ESTATE LAND ACQUISITION POLICY DATED 12 OCT 1953	L.L.J.
3.	27 SEPT. 61	REVISED MAP TO REFLECT PUBLIC LAW 85-500 DATED 3 JUL. 1958	J.D.S.

OFFICE OF THE FORT WORTH DISTRICT ENGINEER
SOUTHWESTERN DIVISION

GRAPEVINE LAKE
LAND USE MAP

SEGMENT C

7.	16 MAY 67	ADDED PUBLIC ACCESS AREAS	F.H.
6.	12 APR. 65	DUE TO FINAL AUDIT.	J.D.S.
5.	25 OCT 62	ADDED TRS. NOS. C-268 & C-269. REVISED TR. NO. C-226-1.	C.B.
4.	6 OCT. 62	REVISED TR. NO. C-226E & ADDED TRS. NOS. C-226-1, & C-226-2.	J.D.S.
REVISIONS	DATE		BY

OFFICE CHIEF OF ENGINEERS WASHINGTON, D.C.

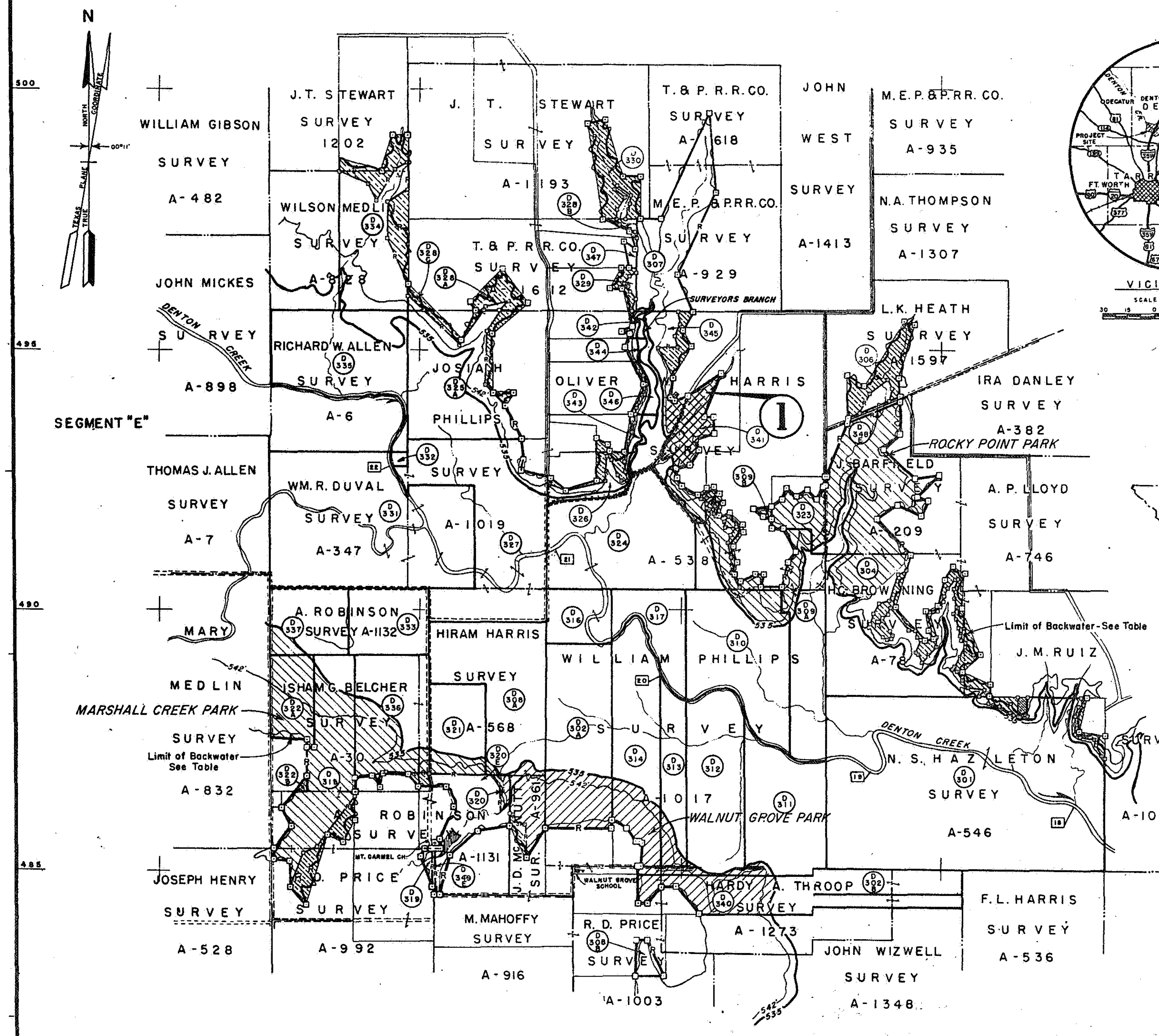
AUDITED

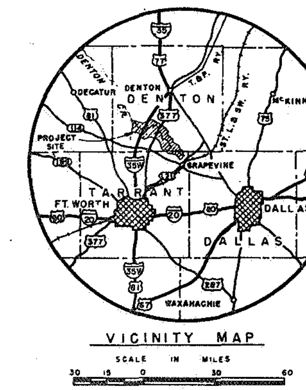
INSTALLATION OR PROJECT NO. C-2110

SCALE IN FEET 1000 0 1000 2000

SHEET 3 OF 6 DRAWING NO.

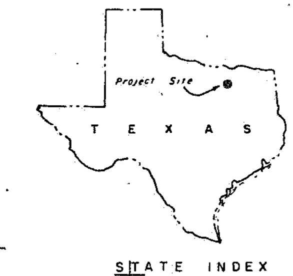
PLATE 49





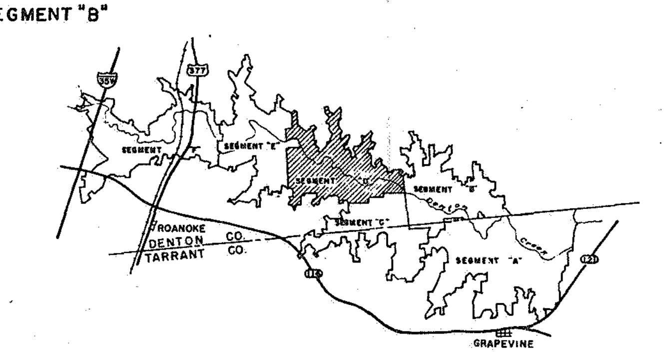
VICINITY MAP

SCALE IN MILES



STATE INDEX

SEGMENT "B"



SEGMENT INDEX

ACQUISITION TRACT REGISTER

	TRACT NO	LAND OWNER	ACREAGE FEE	ACREAGE EASM'T.	REMARKS
183	D-301	MRS. KATHERINE PRESTON	393.00		7.35 AC RECONVEYED BY DEED DATED 7 MAR 1961 PERPETUAL FLOWAGE EASEMENT RETAINED ON 4.72 AC
	D-302A	CARRIE JONES, ET AL	112.00		
	D-302B	CARRIE JONES, ET AL	46.90		
	D-303	DELETED	——		
183	D-304	E.O. RUSHING, ET UX	230.00		25.11 AC RECONVEYED BY DEED DATED 6 DEC 1960. PERPETUAL FLOWAGE EASM'T RETAINED ON 22.0 AC.
	D-305	DELETED	——		
183	D-306	E. L. HEATH, ET UX	22.60		18.85 AC RECONVEYED TO ETHEL L. HEATH BY DEED DTD 18 NOV 1960 PERPETUAL FLOWAGE EASEMENT RETAINED ON 17.42 AC.
	D-307	PAUL TABOR, ET UX	62.70		
	D-308A	ERNEST CLAY, ET UX	124.00		2.82 AC RECONVEYED BY DEED DATED 20 DEC 1960 PERPETUAL FLOWAGE EASM'T RETAINED ON 2.64 AC.
	D-308B	ERNEST CLAY, ET UX	6.00		
	D-309A	IRVIN W. WALLS, ET UX	106.00		6.06 AC RECONVEYED BY DEED DATED 6 DEC 1960 PERPETUAL FLOWAGE EASEM'T RETAINED ON 4.81 AC
	D-309B	IRVIN W. WALLS, ET UX	1.20		
	D-310	OSCAR STURDEVANT, ET UX	109.00		
	D-311	JESSE JONES, ET AL	77.00		
	D-312	EMORY JONES, ET UX	77.70		
	D-313	W.D. BURNS, ET AL	33.00		
	D-314	JINKS JONES, ET UX	80.40		
	D-315	DELETED	——		
183	D-316	CARRIE E. PIPPIN, ET VIR	29.00		
	D-317	WILL J. SCHNELLE, ET UX	38.00		
	D-318	ERNEST CLAY, ET AL	92.90		14.30 AC RECONVEYED TO ERNEST CLAY, ET UX BY DEED DTD 15 FEB 1961 PERPETUAL FLOWAGE EASEMENT RETAINED ON 11.66 AC.
	D-319	J. T. EVANS, ET UX	2.00		
	D-320	R. L. TAYLOE	3.18		
	D-321	J. T. EVANS, ET UX	45.93		
	D-322A	J. F. CRITES, ET UX	31.70		
	D-322B	J. F. CRITES, ET UX	1.10		
	D-323	J. HART WILLIS, ET AL	18.00		
	D-324	H. P. SHARP, ET AL	118.00		
	D-325A	INEZ VANDERPOOL, ET VIR	93.50		8.73 AC RECONVEYED TO INEZ VANDERPOOL, ET AL BY DEED DTD 8 DEC 1960 PERPETUAL FLOWAGE EASMT RETAINED ON 7.68 AC.
	D-325B	RENUMBERED D-342, D-343, D-344, D-346	——		
183	D-326	LOUIS M. BOURNE, ET AL	18.80		5.97 AC RECONVEYED BY DEED DATED 5 OCT 1960 PERPETUAL FLOWAGE EASM'T RETAINED ON 5.31 AC
	D-327	JOHN W. CARPENTER, ET AL	136.00		
	D-328A	E. HOUSTON CARLL, ET UX	12.30		11.39 AC RECONVEYED BY DEED DATED 3 OCT 1960 PERPETUAL FLOWAGE EASM'T RETAINED ON 6.37 AC.
	D-328B	E. HOUSTON CARLL, ET UX	2.30		0.88 AC RECONVEYED BY DEED DATED 3 OCT. 1960. PERPETUAL FLOWAGE EASM'T RETAINED ON 0.64 AC.
	D-328C	E. HOUSTON CARLL, ET UX	3.00		1.80 AC RECONVEYED BY DEED DATED 3 OCT 1960. PERPETUAL FLOWAGE EASM'T RETAINED ON 0.68 AC
	D-329	H. T. GEORGE, ET UX	5.90		3.82 AC RECONVEYED BY DEED DATED 3 OCT 1960 PERPETUAL FLOWAGE EASM'T RETAINED ON 3.44 AC.
	D-330	FLORENCE NELSON DRAGOO, ET AL	25.50		23.10 AC RECONVEYED TO JOSEPH B. DRAGOO, ET AL BY DEED DTD 9 JAN 1961 PERPETUAL FLOWAGE EASEMENT RETAINED ON 15.68 AC.
	D-331	MRS. MAUDIE STURDEVANT, ET AL	221.00		
	D-332	MRS. INEZ VANDERPOOL	1.50		
	D-333	J. F. CRITES, ET UX	46.00		
	D-334	N. L. WEBSTER, ET UX	90.00		26.08 AC RECONVEYED BY DEED DATED 20 DEC 1960. PERPETUAL FLOWAGE EASMT RETAINED ON 18.38 AC.
	D-335	E. HOUSTON CARLL, ET UX	96.00		
	D-336	JOHN W. CARPENTER, ET UX	77.30		2.58 AC RECONVEYED TO FLOSSIE G. CARPENTER BY DEED DATED 20 DEC 1960 PERPETUAL FLOWAGE EASEMENT RETAINED ON 2.22 AC.
	D-337	T. P. CRITES, ET AL	46.75		
	D-338	DELETED	——		
	D-339	DELETED	——		
183	D-340	VIRGIE EVANS, ET AL	69.70		
	D-341	LILLIAN VERA NEILSON, ET VIR	28.60		0.47 AC RECONVEYED BY DEED DATED 15 SEPT 1960 PERPETUAL FLOWAGE EASM'T RETAINED ON 0.32 AC
	D-342	HAROLD F. CLAYTON, ET UX	3.90		
	D-343	DAN C. WILLIAMS, ET UX	6.70		2.31 AC RECONVEYED BY DEED DATED 28 SEPT 1960 PERPETUAL FLOWAGE EASM'T RETAINED ON 0.80 AC.
	D-344	HERBERT A. ROGERS ET UX	4.30		
	D-345	E. F. DUSTON, ET UX	41.80		6.74 AC RECONVEYED BY DEED DATED 18 OCT 1960. PERPETUAL FLOWAGE EASM'T RETAINED ON 6.11 AC.
	D-346	J. K. THOMAS, ET AL	9.70		1.11 AC RECONVEYED TO J.K. THOMAS, ET UX BY DEED DTD 9 DEC 1960 PERPETUAL FLOWAGE EASEMENT RETAINED ON 0.86 AC.
	D-347	TED E. LOEHR, ET UX	2.20		
	D-320E	R.L. TAYLOE		37.12	PERP FLOW EASMT C.A. 638 D/T FILED 26 JUN. 1951.
	D-348E	DENTON COUNTY, TEXAS		1.00	PERP. FLOW EASMT. C.A. 762 D/T FILED 18 JUN. 1952.
	D-349E	DENTON COUNTY, TEXAS		0.86	PERP. FLOW EASMT. C.A. 762 D/T FILED 18 JUN. 1952.

TYPE FINAL

PROJECT OWNERSHIP MAP

STATE TEXAS

COUNTY DENTON

DIVISION SOUTHWESTERN

DISTRICT FORT WORTH

FOURTH ARMY AREA

— LOCATION OF PROJECT —

20 MILES N.W. OF DALLAS

20 MILES N.E. OF FT. WORTH

— TRANSPORTATION FACILITIES —

RAILROADS ST. L.-SW. & T.& P.

STATE ROADS NOS. 114 & 121

FEDERAL ROADS U.S. NO. 377

AIRLINES NONE

— ACQUISITION —

FOR FLOOD CONTROL

TOTAL ACRES ACQUIRED

ACRES FEE

ACRES TRANSF'D.

ACRES LEASED

ACRES LESSER INTERESTS

SEE SEG. "A"

— DISPOSAL —

BY

TOTAL ACRES DISPOSED OF

ACRES SOLD

ACRES TRANSF'D.

ACRES RETRANSF'D. TO GOV'T. AGCY.

ACRES LEASES TERMINATED

ACRES LESSER INT'S. TERM.

ACRES TO

SEE SEG. "A"

— LEGEND —

NOTE: USE SYMBOLS FROM FM-21-30 (WAR DEPT. BASIC FIELD MANUAL) PAGES 21 TO 27 INCL.

EXCEPT

RESERVATION LINE

RESERVATION LINE (ACTUAL SURVEY)

RESERVATION LINE (ACTUAL SURVEY INTERIOR)

DAM SITE (TAKING LINE)

RESERVOIR SITE (TAKING LINE)

RESERVOIR SITE (TAKING LINE INTERIOR)

CONSERVATION POOL ELEV. 535

5 YEAR FLOOD ELEVATION 542

PUBLIC ACCESS AREA PRIORITY ONE

TRACT NUMBER

ESTHETICS

SITES

PRIORITY TWO GROUP NON PROFIT

PRIORITY THREE NON-PROFIT GROUP RECREATION

YACHT CLUB

CONTROLLING ELEVATIONS FOR PROJECT TAKING LINE (Backwater Effect and Sedimentation)	
River Mile	Standard Project Flood
Damsite: 11.7	572'
25.0	572'
26.0	572'
28.0	572'
30.0	572'
31.0	573'
32.0	573'
33.0	574'
34.0	575'

169.48 ACRES FEE QUITCLAIMED TO FORMER OWNERS PER PUBLIC LAW 85-500 RESERVING TO THE U.S. PERPETUAL FLOWAGE EASEMENT OVER 133.74 ACRES (FOR INDIVIDUAL CONVEYANCES SEE "REMARKS" COLUMN OF THE ACQUISITION TRACT REGISTER)

1.65 ACRES FEE REPORTED EXCESS ON S.F. 118 TO G.S.A. 9 MAY 1961, RESERVING TO THE U.S. PERP. FLOW. EASMT. OVER 0.08 AC., WHO CONVEYED 1.65 ACRES FEE TO WILLIAM WILKERSON BY DEED WITHOUT WARRANTY DATED 16 NOV 1961, RESERVING TO THE U.S. PERPETUAL FLOWAGE EASEMENT OVER 0.08 ACRE.

REV.	DATE		BY
4	17 MAY 67	ADDED PUBLIC ACCESS AREAS	F.H.

NOTE.

1. Basic land lines from G.L.O. plat of Denton County.
2. Topography from controlled aerial photographs and multiplex maps prepared by the Corps of Engineers, supplemented by contract field survey.
3. Taking line based on control established by contract field survey.
4. Interior tracts based on deeds of records in Denton County.
5. All severed acreages shown are those areas on which no interest has been acquired.
6. Tangents along 572' contour used in describing estate acquired.
7. Tangents along 572' contour used in describing estate reconveyed.
8. Reconveyance line based on 560' elevation
9. Public Access Areas.

ACQUISITION AUTHORIZATION

3. 4TH. IND. O.C.E. TO S.W.D. DATED 23 SEPT. 1949
1. PUBLIC LAW NO. 14 DATED 2 MAR. 1945

REVISIONS	DATE		BY
3	12 APR. 65	DUE TO FINAL AUDIT	J.D.S.
2	27 SEPT 61	REVISED MAP TO REFLECT PUBLIC LAW 85-500 DATED 3 JUL. 1958	J.D.S.
1	19 AUG 56	REVISED MAP TO REFLECT REAL ESTATE LAND ACQUISITION POLICY DATED 12 OCT 1953.	L.L.J.

DEPARTMENT OF THE ARMY
OFFICE OF THE FORT WORTH DISTRICT ENGINEER
SOUTHWESTERN DIVISION

GRAPEVINE LAKE
LAND USE MAP
SEGMENT D

OFFICE, CHIEF OF ENGINEERS, WASHINGTON, D. C.

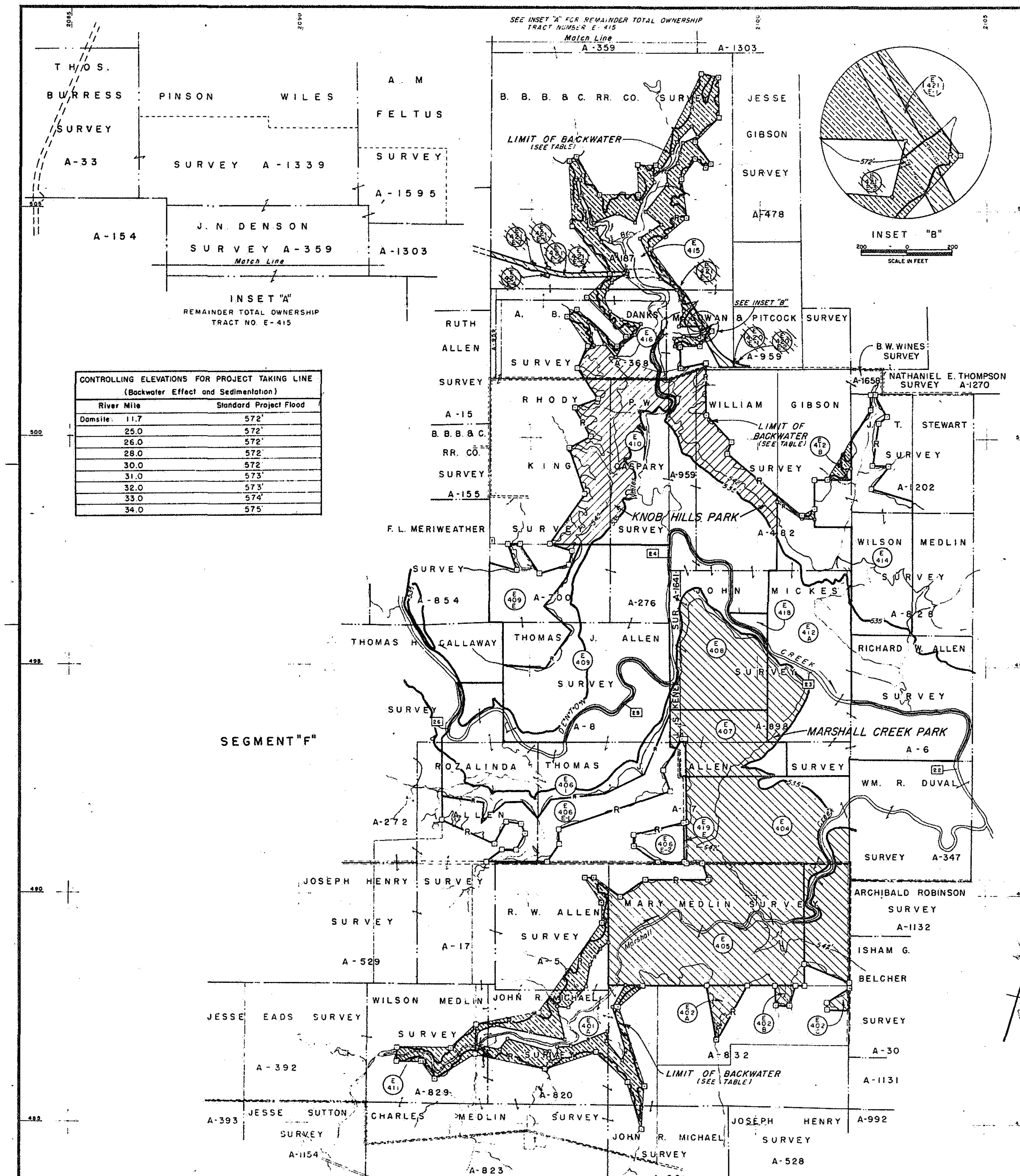
AUDITED

INSTALLATION OR PROJECT NO. C-2110

SCALE IN FEET 1000 0 1000 2000

SHEET 4 OF 6 DRAWING NO.

GR-225-G104.7 PLATE 50



CONTROLLING ELEVATIONS FOR PROJECT TAKING LINE (Backwater Effect and Sedimentation)	
River Mile	Standard Project Flood
Damsite: 11.7	572'
25.0	572'
26.0	572'
28.0	572'
30.0	572'
31.0	573'
32.0	573'
33.0	574'
34.0	575'

225.99 ACRES FEE QUITCLAIMED TO FORMER OWNERS PER PUBLIC LAW 85-500 RESERVING TO THE U.S. PERPETUAL FLOWAGE EASEMENT OVER 171.67 ACRES (FOR INDIVIDUAL CONVEYANCES SEE "REMARKS" COLUMN OF THE ACQUISITION TRACT REGISTER.)

12.41 ACRES EASEMENT CONVEYED TO THE COUNTY OF DENTON BY QUITCLAIM DEED DATED 29 JULY 1963

ACQUISITION TRACT REGISTER

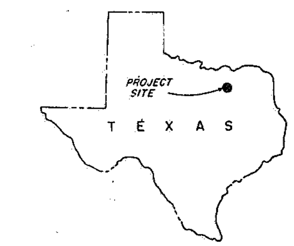
	TRACT NO.	LAND OWNER	ACREAGE FEE	ACREAGE EASM'T	REMARKS
183	E-401A	R. D. BUSBY, ET UX	134.40		78.68 AC RECONVEYED TO R D BUSBY BY DEED DTD 18 NOV 1960 PERPETUAL FLOWAGE EASEMENT RETAINED ON 63.03 AC.
	E-401B	DELETED	---		
183	E-402A	J. L. SHOCKEY, ET UX	12.00		
	E-402B	J. L. SHOCKEY, ET UX	4.20		
	E-402C	J. L. SHOCKEY, ET UX	3.80		
	E-403	COMBINED WITH E-404	---		
183	E-404	ROSE M. KING, ET AL	215.00		
	E-405	T. W. KING, JR., ET UX	240.00		
	E-406-1	A. P. McGINNIS, ET AL	210.00		
	E-406B	RENUMBERED E-406E-2			
183	E-407	H. G. KING, ET AL	69.40		
	E-408	MAE C. MC GINNIS, ET AL	32.60		
	E-409	MRS. ELIZABETH M. PACE, ET AL	243.00		
	E-410	RHINEHART E. ROUER, ET AL	342.00		
	E-411	ALVIN M. OWSLEY, ET UX	19.00		19.0 AC RECONVEYED BY DEED DATED 5 DEC 1960 PERPETUAL FLOWAGE EASM'T RETAINED ON 14.28 AC.
	E-412A	HERBERT DECKER, ET AL	290.00		7.64 AC RECONVEYED TO HERBERT H. DECKER, ET UX BY DEED DTD 13 DEC 1960 PERP FLOW EASM'T RETAINED ON 1.06 AC.
	E-412B	HERBERT DECKER, ET AL	5.50		4.89 AC RECONVEYED TO HERBERT H. DECKER ET UX BY DEED DTD 13 DEC 1960 PERP FLOW EASM'T RETAINED ON 2.76 AC.
	E-412C	DELETED	---		
	E-413	DELETED	---		
183	E-414	JOHN F. ROBBINS, ET UX	133.00		
	E-415	MARY METTA THORNTON, ET VIR	143.00		96.20 AC RECONVEYED TO R L THORNTON ET UX BY DEED DTD 9 DEC 1960 PERP FLOW EASM'T RETAINED ON 75.80 AC.
	E-416	R. L. THORNTON, ET UX	101.00		25.58 AC RECONVEYED BY DEED DATED 9 DEC 1960. PERPETUAL FLOWAGE EASM'T RETAINED ON 15.76 AC.
	E-417	DELETED	---		
183	E-418	RHINEHART E. ROUER, ET AL	7.60		
	E-406E-1	W. P. MC GINNIS, ET AL		91.00	PERP FLOW EASM'T C.A 650 D/T NO.3 FILED 26 APR 1952.
	E-406E2	W. P. MC GINNIS, ET AL		17.20	PERP FLOW EASM'T C.A 650 D/T NO.3 FILED 26 APR 1952.
	E-409E	MRS. ELIZABETH M. PACE, ET AL		75.10	PERP FLOW EASM'T C.A 650 D/T NO.2 FILED 29 NOV 1951.
	E-419E	DENTON COUNTY, TEXAS		3.83	PERP FLOW EASM'T C.A.762 O/P FILED 17 JUN 1952.
1,384	E-420E-1	J. B. NICHOLS, ET UX		0.22	PERP ROAD EASM'T. FROM 5 JUL. 1962.
	E-421E-1	FRANK A. SCHULTZ, ET AL		*5.68	PERP ROAD EASM'T. C.A. 1489 D/T FILED 5 APR. 1962.
	E-421E-2	FRANK A. SCHULTZ, ET AL		**6.03	PERP ROAD EASM'T. C.A. 1489 D/T FILED 5 APR. 1962.
	E-421E-3	FRANK A. SCHULTZ, ET AL		***0.01	PERP DITCH EASM'T. C.A. 1489 D/T FILED 5 APR. 1962.
	E-421E-4	FRANK A. SCHULTZ, ET AL		0.30	PERP DITCH EASM'T. C.A. 1489 D/T FILED 5 APR. 1962.
	E-421E-5	FRANK A. SCHULTZ, ET AL		0.05	PERP DITCH EASM'T C.A. 1489 D/T FILED 5 APR 1962.
	E-421E-6	FRANK A. SCHULTZ, ET AL		0.06	PERP DITCH EASM'T. C.A. 1489 D/T FILED 5 APR. 1952.
	E-421E-7	FRANK A. SCHULTZ, ET AL		0.03	PERP DITCH EASM'T. C.A. 1489 D/T FILED 5 APR. 1952
	E-420E2	J. B. NICHOLS, ET UX		0.03	PERP DITCH EASM'T. FROM 5 JUL. 1962.

* Additional 0.92 acre included in the 75.80 acres on which a flowage easement was retained when a portion of tract E-415 was reconveyed. Additional 0.92 acre included in the 15.76 acres on which a flowage easement was retained when a portion of tract no. E-416 was reconveyed.

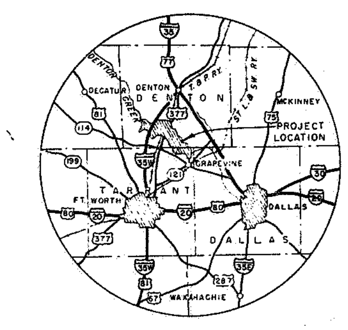
** Additional 0.92 acre included in the 75.80 acres on which a flowage easement was retained when a portion of tract E-415 was reconveyed.

*** Additional 0.02 acre included in the 15.76 acres on which a flowage easement was retained when a portion of tract E-416 was reconveyed.

NOTE:
1. Basic land lines from G.L.O. plats of Denton and Tarrant Counties.
2. Topography from controlled aerial photographs and multiplex maps prepared by the Corps of Engineers, supplemented by contract field survey.
3. Taking line based on control established by contract field survey.
4. Interior tracts based on deeds of records in Denton and Tarrant Counties.
5. All severed acreages shown are those areas on which no interest has been acquired.
6. Tangents along 572' contour used in describing estate acquired.
7. Tangents along 572 contour used in describing estate reconveyed.
8. Reconveyance line based on 560' elevation.
9. Public Access Areas

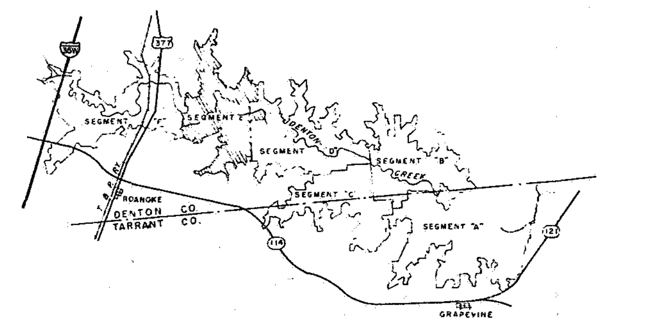


STATE INDEX



VICINITY MAP

SCALE IN MILES



SEGMENT INDEX

TYPE FINAL

PROJECT OWNERSHIP MAP

STATE TEXAS

COUNTY DENTON

DIVISION SOUTHWESTERN

DISTRICT FORT WORTH

FOURTH ARMY AREA

—LOCATION OF PROJECT—

20 MILES NW OF DALLAS

20 MILES NE OF FORT WORTH

—TRANSPORTATION FACILITIES—

RAILROADS T.&P. – ST. L.-SW.

STATE ROADS 114 & 121

FEDERAL ROADS 377

AIRLINES NONE

—ACQUISITION—

FOR FLOOD CONTROL

TOTAL ACRES ACQUIRED

ACRES FEE

ACRES TRANSF'D. SEE SEG. "A"

ACRES LEASED

ACRES LESSER INTERESTS

—DISPOSAL—

BY

TOTAL ACRES DISPOSED OF

ACRES SOLD

ACRES TRANSF'D. SEE SEG. "A"

ACRES RETRANSF'D. TO GOV'T. AGCY.

ACRES LEASES TERMINATED

ACRES LESSER INT'S. TERM.

ACRES TO

—LEGEND—

NOTE: USE SYMBOLS FROM FM-21-30 (WAR DEPT. BASIC FIELD MANUAL) PAGES 21 TO 27 INCL.

EXCEPT

RESERVATION LINE

RESERVATION LINE (ACTUAL SURVEY)

RESERVATION LINE (ACTUAL SURVEY) INTERIOR

DAM SITE (TAKING LINE)

RESERVOIR SITE (TAKING LINE)

RESERVOIR SITE (TAKING LINE INTERIOR)

CONSERVATION POOL ELEV. 535

5 YEAR FLOOD 542

PUBLIC ACCESS AREA PRIORITY ONE

ESTHETICS

4. 2ND IND O.C.E. TO S.W.D. DATED 1 JUN 1961
3. 4TH IND O.C.E. TO S.W.O. DATED 23 SEPT. 1949
1. PUBLIC LAW NO. 14 DATED 2 MAR. 1945

ACQUISITION AUTHORIZATION

TRACT NUMBER E 401

REVISIONS	DATE		BY
1	24 NOV 53	REVISED TRACT NO. E-401A CHANGED ACREAGE	L. J. A.
2	19 AUG 56	REVISED MAP TO REFLECT REAL ESTATE LAND ACQUISITION POLICY DATED 12 OCT. 1953	L. L. J.
3	23 FEB 61	ADD TRACTS NOS. E-420, E-421-1, & E-421-2	J. W.
4	7 JUNE 61	ESTATE ON TRS NOS E-420, E-421-1, & E-421-2 CHANGED FROM FEE TO EASM'T	R. G. K.
5	15 AUG 61	TR NO. E-420E REVISED & RENUMBERED TO TR NO E-420E-1. REVISED TRS NOS E-421E-1 & E-421E-2. ADDED TRS NOS E-420E-2, E-421E-3, E-421E-4, E-421E-5, E-421E-6 & E-421E-7	J. W.

REVISIONS	DATE		BY
8	17 MAY 67	ADDED PUBLIC ACCESS AREAS	F.H.
7	12 APR. 65	DUE TO FINAL AUDIT	J.D.S.
6	27 SEPT. 61	REVISED MAP TO REFLECT PUBLIC LAW 85-500 DATED 3 JUL. 1958	J.D.S.

DEPARTMENT OF THE ARMY
OFFICE OF THE FORT WORTH DISTRICT ENGINEER
SOUTHWESTERN DIVISION

GRAPEVINE LAKE

LAND USE MAP

SEGMENT E

OFFICE, CHIEF OF ENGINEERS, WASHINGTON, D. C.

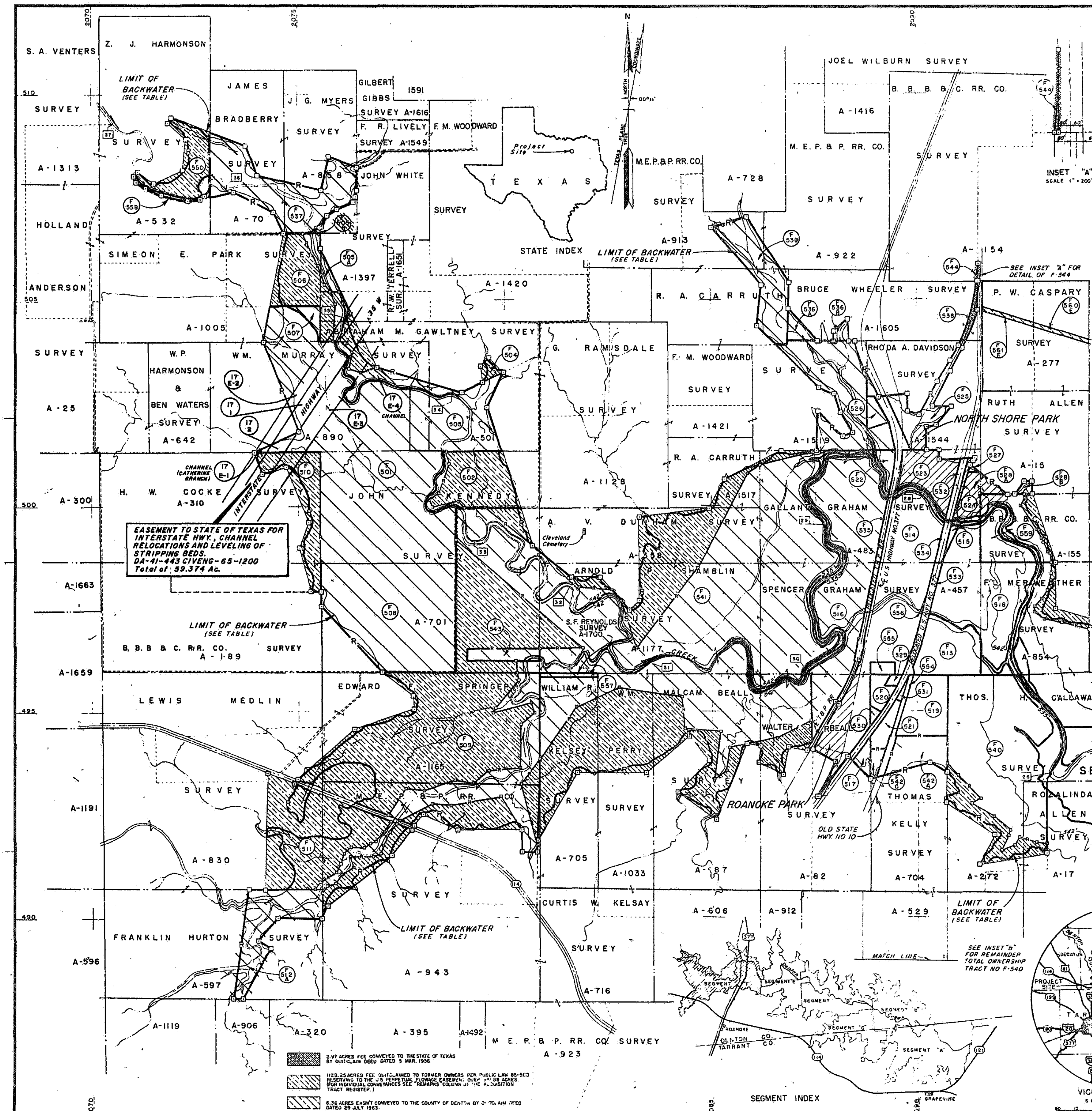
AUDITED

INSTALLATION OR PROJECT NO. C-2110

SCALE IN FEET 1000 0 1000 2000

SHEET 5 OF 6 DRAWING NO.

PLATE 51



2.97 ACRES FEE CONVEYED TO THE STATE OF TEXAS BY QUITCLAIM DEED DATED 5 MAR. 1956.

1129.25 ACRES FEE QUITCLAIMED TO FORMER OWNERS PER PUBLIC LAW 85-500 RESERVING TO THE U.S. PERPETUAL FLOWAGE EASEMENT OVER [illegible] ACRES (FOR INDIVIDUAL CONVEYANCES SEE "REMARKS" COLUMN OF THE ACQUISITION TRACT REGISTER.)

6.36 ACRES EASM'T CONVEYED TO THE COUNTY OF DENTON BY QUITCLAIM DEED DATED 29 JULY 1963.

ACQUISITION TRACT REGISTER

TRACT NO.	LAND OWNER	ACREAGE FEE	ACREAGE EASM'T	REMARKS
F-501	QUIXIE Q. ZUDERWEG, ET VIR	349.00		
F-502	MAMIE CLEVELAND	57.70		5.40 AC. RECONVEYED TO M.H. SMITH ET AL BY DEED DTD 24 APR 1961 PERP. FLOW. EASEMENT RETAINED ON 52.48 AC.
F-503	SALLIE BLANCHE STRADER ESTATE	69.60		
F-504	J. H. ELDER, ET UX	4.00		4.00 AC. RECONVEYED BY DEED DATED 20 DEC 1960 PERPETUAL FLOWAGE EASM'T RETAINED ON 2.52 AC.
F-505A	DAN G. ASHMORE, ET UX	6.10		1.58 AC. RECONVEYED BY DEED DATED 19 SEPT 1960 PERPETUAL FLOWAGE EASM'T RETAINED ON 0.88 AC.
F-505B	DAN G. ASHMORE, ET UX.	0.49		0.49 AC. RECONVEYED BY DEED DATED 19 SEPT 1960 PERPETUAL FLOWAGE EASM'T RETAINED ON 0.07 AC.
F-506	J. H. ELDER, ET UX	92.60		64.20 AC. RECONVEYED BY DEED DATED 20 DEC 60 PERPETUAL FLOWAGE EASM'T RETAINED ON 33.26 AC.
F-507	ZANNIE McQUINN	11.00		
F-508	W. B. LOVE, ET UX	171.20		
F-509	L. C. HEATH, ET UX	384.00		306.56 AC. RECONVEYED TO EMMA HEATH BY DEED DTD 18 APR 1961 PERP. FLOW. EASEMENT RETAINED ON 269.29 AC.
F-510	SAMUEL W. LEE, ET AL	47.40		47.40 AC. RECONVEYED TO L. J. LEE ET AL BY DEED DTD 15 SEPT 1960 PERP. FLOW. EASEMENT RETAINED ON 38.84 AC.
F-511	BYRON NELSON, ET UX	155.00		150.70 AC. RECONVEYED BY DEED DATED 5 DEC 1960 PERPETUAL FLOWAGE EASM'T RETAINED ON 75.40 AC.
F-512A	RUBY PEARL CHADWICK	53.10		
F-512B	DELETED	—		
F-513	GIFFORD HILL & CO. INC., ET AL	39.84		
F-514	GIFFORD HILL & CO., INC., ET AL	146.00		
F-515	GIFFORD HILL & CO. INC., ET AL	1.90		
F-516	GIFFORD HILL & CO. INC., ET AL	162.44		
F-517	GIFFORD HILL & CO. INC., ET AL	5.00		
F-518	W. L. DUNHAM	243.30		14.15 AC. RECONVEYED BY DEED DTD 5 DEC 1960 PERP. FLOWAGE EASM'T RETAINED ON 14.15 AC. (ACTUAL SURVEY SHOWS 6.57 AC. RETAINED FLOWAGE EASEMENT)
F-519	MRS. OLA WHEELER, ET AL	36.00		
F-520	MRS. OLA WHEELER, ET AL	6.00		
F-521	MRS. OLA WHEELER, ET AL	10.09		
F-522	PEARL PENCE, ET VIR	8.69		
F-523	PEARL PENCE, ET VIR	36.41		
F-524	PEARL PENCE, ET VIR	1.85		
F-525	FRANK NASH, ET UX	26.90		
F-526	MRS. LULA M. SLAUGHTER, ET AL	5.30		
F-527	FRANK NASH, ET UX	0.78		
F-528A	MARGARET BURROW, ET AL	16.80		
F-528B	MARGARET BURROW, ET AL	2.20		
F-529	O. W. WHEELER, JR., ET UX	2.00		
F-530	M. C. WHEELER, ET UX	2.34		
F-531	RACINE WHEELER, ET UX	1.00		
F-532	STATE OF TEXAS	6.55		
F-533	STATE OF TEXAS	17.70		
F-534	STATE OF TEXAS	3.93		
F-535	TEXAS & PACIFIC RY. CO.	29.99		
F-536A	W. H. HERRING, ET AL	5.90		
F-536B	W. H. HERRING, ET AL	3.20		
F-537	KEITH B. EDWARDS	88.70		
F-538	W. H. HERRING, ET AL	2.90		
F-539	HOMER DONALD, ET UX	54.80		
F-540	H. M. HOWE, ET UX	221.00		31.26 AC. RECONVEYED BY DEED DATED 6 JAN 1961 PERPETUAL FLOWAGE EASM'T RETAINED ON 21.40 AC.
F-541	A. L. SLAUGHTER, ET AL	1170.00		425.49 AC. RECONVEYED TO BETTY LU SLAUGHTER PERRYMAN ET AL BY DEED DTD 22 JUN 1961 PERP. FLOW. EASMT. RETAINED ON [illegible]
F-542A	WALTER E. ADAMS, ET UX		25.90	PERP. FLOW. EASM'T. C.A. 763 D/T FILED 17 JUN. 1952.
F-542B	COMBINED WITH F-521	—		
F-542C	WALTER E. ADAMS, ET UX		4.40	PERP. FLOW. EASM'T. C.A. 763 D/T FILED 17 JUN. 1952.
F-543	T. A. LEE, ET AL	11.88		
F-544	HOMER S. CURTIS, ET UX	0.07		
F-545	DELETED	—		
F-546	DELETED	—		
F-547	DELETED	—		
F-548	DELETED	—		
F-549	DELETED	—		
F-550	HOWARD GIBBS, ET UX	33.50		33.50 AC. RECONVEYED BY DEED DATED 3 OCT 1960 PERPETUAL FLOWAGE EASM'T RETAINED ON 27.78 AC.
F-551	DELETED	—		
F-552	DELETED	—		
F-553	COMBINED WITH F-541	—		
F-554	DENTON COUNTY, TEXAS, ET AL	4.30		
F-555	MARY OWEN, ET AL	4.00		
F-556	W. L. DUNHAM	0.16		
F-557	MRS. LULA MAE SLAUGHTER, ET AL	2.50		
F-558	W. LEE USTICK		5.80	PERP. FLOW. EASM'T. C.A. 702 D/T FILED 9 FEB. 1952.
F-559	W. R. DUNHAM, ET UX	57.90		7.30 AC. RECONVEYED TO HATTIE E. DUNHAM BY DEED DTD 3 OCT 1960 PERPETUAL FLOWAGE EASEMENT RETAINED ON 7.30 AC. (ACTUAL SURVEY SHOWS 2.71 AC. RETAINED FLOWAGE EASEMENT)
F-560E	W. L. DUNHAM, ET UX		3.24	PERP. ROAD R-O-W EASM'T. C.A. 1485 D/T FILED 5 APR. 1962
F-561E	MARARET E. BURROW, ET AL		3.12	PERP. ROAD R-O-W EASM'T FROM 26 JAN. 1962.

CONTROLLING ELEVATIONS FOR PROJECT TAKING LINE
(Backwater Effect and Sedimentation)

River Mile		Standard Project Flood
Damsite	11.7	572
	25.0	572
	26.0	572
	28.0	572
	30.0	572
	31.0	573
	32.0	573
	33.0	574
	34.0	575

REV	DATE		BY
7	17 MAY 67	ADDED PUBLIC ACCESS AREAS.	F.H.

NOTES
1. Basic land lines from G.L.O. plat of Denton county.
2. Topography from controlled aerial photographs and multiplex maps prepared by the Corps of Engineers suppemented by contract field survey.
3. Taking line based on control established by contract field survey.
4. Interior tracts based on deeds of records in Denton County.
5. All severed acreages shown are those areas on which no intrest has been acquired.
6. ☐- - -☐ Tangents along 572' contour used in describing estate acquired.
7. ☐——☐ Tangents along 572' contour used in describing estate reconveyed.
8. Reconveyance line based on 560' contour.
9. Public Access Areas.

INSET "B"
REMAINDER TOTAL OWNERSHIP TRACT NO F-540

4 2ND IND O.C.E. TO S.W.D. DATED 1 JUN. 1961
3 4TH IND O.C.E. TO S.W.D. DATED 23 SEPT 1949
1 PUBLIC LAW NO. 14 DATED 2 MAR 1945

ACQUISITION AUTHORIZATION

TYPE FINAL

PROJECT OWNERSHIP MAP

STATE TEXAS
COUNTY DENTON
DIVISION SOUTHWESTERN
DISTRICT FORT WORTH
FOURTH ARMY AREA

— LOCATION OF PROJECT —
20 MILES NW OF DALLAS
20 MILES NE OF FORT WORTH

— TRANSPORTATION FACILITIES —
RAILROADS T. & P. ST. L.-S.W.
STATE ROADS 114 & 121
FEDERAL ROADS 377
AIRLINES NONE

— ACQUISITION —
FOR FLOOD CONTROL
TOTAL ACRES ACQUIRED
ACRES FEE
ACRES TRANSF'D.
ACRES LEASED
ACRES LESSER INTERESTS
SEE SEG. "A"

— DISPOSAL —
BY
TOTAL ACRES DISPOSED OF
ACRES SOLD
ACRES TRANSF'D.
ACRES RETRANSF'D. TO GOV'T. AGCY.
ACRES LEASES TERMINATED
ACRES LESSER INT'S. TERM.
ACRES TO
SEE SEG. "A"

— LEGEND —
NOTE: USE SYMBOLS FROM FM-21-30 (WAR DEPT. BASIC FIELD MANUAL) PAGES 21 TO 27 INCL.

EXCEPT

RESERVATION LINE
RESERVATION LINE (ACTUAL SURVEY)
RESERVATION LINE (ACTUAL SURVEY INTERIOR)
DAM SITE (TAKING LINE)
RESERVOIR SITE (TAKING LINE)
RESERVOIR SITE (TAKING LINE INTERIOR)
CONSERVATION POOL ELEV.
5 YEAR FLOOD ELEVATION
PUBLIC ACCESS AREA PRIORITY ONE
ESTHETICS

TRACT NUMBER F 501

REVISIONS	DATE		BY
1	10-23-52	REVISED TAKING LINE TRACT NO. F-558	F.L.S.
2	15-AUG-58	REVISED MAP TO REFLECT REAL ESTATE LAND ACQUISITION POLICY DATED 12 OCT 1953	L.L.J.
3	23 FEB 61	ADDED TRACTS NOS. F-560 AND F-561	J.W.
4	6 JUNE 61	ESTATE ON TRS NOS. F-560 & F-561 CHANGED FROM FEE TO EASM'T	R.G.K.
5	27 SEPT 61	REVISED MAP TO REFLECT PUBLIC LAW 85-500 DATED 3 JUL. 1958	J.D.S.
6	12 APR 65	DUE TO FINAL AUDIT	J.D.S.

DEPARTMENT OF THE ARMY
OFFICE OF THE FORT WORTH DISTRICT ENGINEER
SOUTHWESTERN DIVISION

GRAPEVINE LAKE
LAND USE MAP
SEGMENT F

OFFICE, CHIEF OF ENGINEERS, WASHINGTON, D. C.
AUDITED
INSTALLATION OR PROJECT NO. C-2110

SCALE IN FEET
1000 0 1000 2000

SHEET 6 OF 6 DRAWING NO.

PLATE 52

WALNUT GROVE PARK

M. MAHOFFY

R.D. PRICE

J.D. JONES SURVEY A-1525

WM. MILLS SURVEY A-877

DAVID DOUTHIT SURVEY A-1607

A-916 SURVEY

A-1003

DENTON COUNTY

TARRANT COUNTY

A-1086

SURVEY A-448

SAM BRANCH

V. P. MARTIN SURVEY

R. D. PRICE SURVEY

TRACT 221

A-1015

A-1134

A-1207

A-350

A-348

STATE HWY No. 114

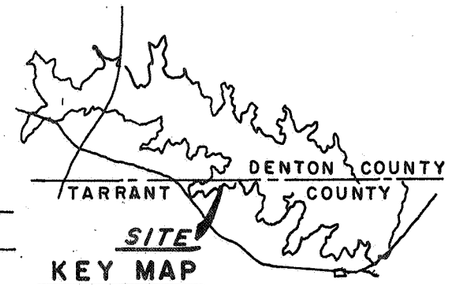
542

572

535

LIMIT OF BACKWATER ELEVATION 572
FOR ENTIRE AREA SHOWN ON THIS PLATE.

KEY MAP



LEGEND

535 CONSERVATION POOL ELEV. 535.0

542 5 YEAR FLOOD ELEV. 542

GOVERNMENT PROPERTY LINE

RECONVEYANCE

ESTHETICS

FLOWAGE EASEMENT

SITES

PRIORITY TWO.
NON-PROFIT GROUP

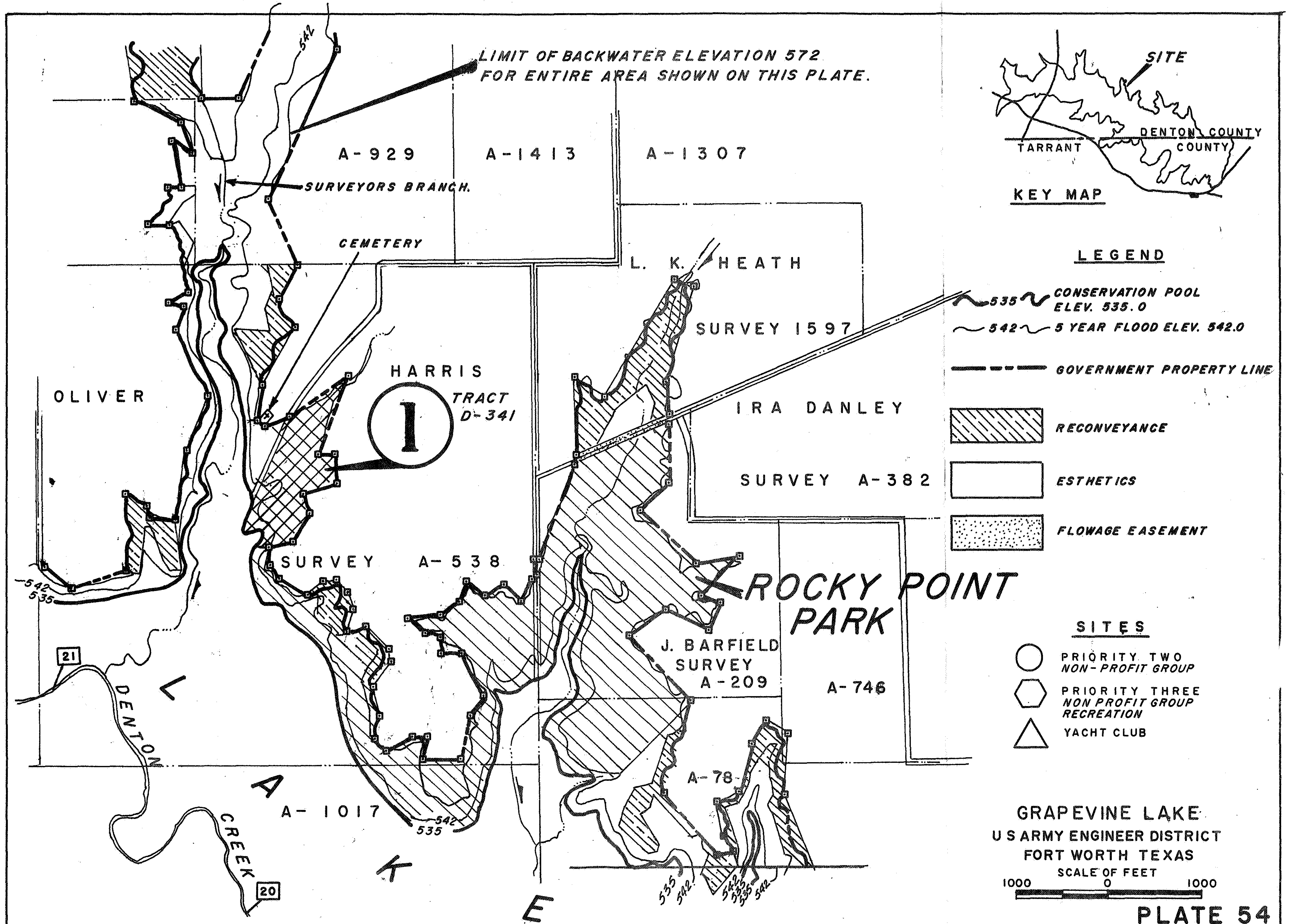
PRIORITY THREE
NON-PROFIT GROUP
RECREATION

YACHT CLUB

GRAPEVINE LAKE
U.S. ARMY ENGINEER DISTRICT
FORT WORTH, TEXAS

SCALE OF FEET
1000 0 1000

PLATE 53


LIMIT OF BACKWATER ELEVATION 572
FOR ENTIRE AREA SHOWN ON THIS PLATE.
A-929
A-1413
A-1307
SURVEYORS BRANCH.
CEMETERY
L. K. HEATH
SURVEY 1597
HARRIS
TRACT
D-341
1
OLIVER
IRA DANLEY
SURVEY A-382
SURVEY A-538
ROCKY POINT
PARK
J. BARFIELD
SURVEY
A-209
A-746
A-78
A-1017
DENTON
CREEK
21
20
L
A
K
E
542
535
KEY MAP
SITE
DENTON COUNTY
TARRANT COUNTY
LEGEND
535 CONSERVATION POOL ELEV. 535.0
542 5 YEAR FLOOD ELEV. 542.0
GOVERNMENT PROPERTY LINE
RECONVEYANCE
ESTHETICS
FLOWAGE EASEMENT
SITES
PRIORITY TWO
NON-PROFIT GROUP
PRIORITY THREE
NON PROFIT GROUP
RECREATION
YACHT CLUB
GRAPEVINE LAKE
U S ARMY ENGINEER DISTRICT
FORT WORTH TEXAS
SCALE OF FEET
1000 0 1000
PLATE 54