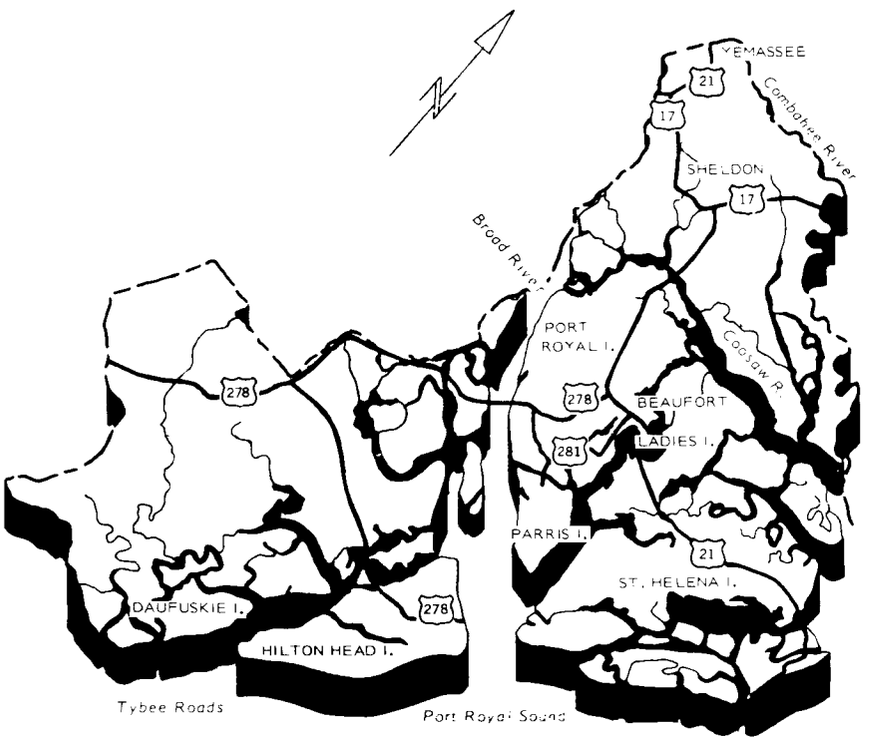
FEASIBILITY STUDY OF REQUIREMENTS FOR MAIN DRAINAGE CANALS



BEAUFORT COUNTY SOUTH CAROLINA

Prepared under sponsorship of
BEAUFORT COUNTY
COUNTY COUNCIL OF BEAUFORT COUNTY
and
BEAUFORT COUNTY SOIL AND WATER CONSERVATION DISTRICT
in cooperation with the
U. S. Department of Agriculture
Soil Conservation Service

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HOW TO USE THE "ENGINEERING AND DESIGN DATA" SHEETS

In order to easily find information on any Main or Lateral Canal contained in this Drainage Feasibility Study, the following steps should be taken:

1. The approximate location of the area involved should be known.

2. Refer to figure number 3 - "INDEX TO MAP SHEETS" and locate the area on this map.

3. This map will refer to the number of the "Map showing the drainage plan" in the back of the book.

4. Turn to the map sheet number shown and locate the area desired on this map. When this has been done, the map will show the "Planning Area Number" and, also, the Canal Number such as M-1, M-2, L-1, L-2, etc.

5. Turn to this planning area number in the ENGINEERING AND DESIGN DATA sheets and locate canal desired on this sheet.

It must be kept in mind that the information given in the "ENGINEERING AND DESIGN DATA" sheets begins at the upper end of each watershed and proceeds, in order, to the outlet. Each time a lateral canal enters the main canal, the main canal is broken into a section at this point. Laterals are also broken into sections where additional laterals enter them. This was necessary for design purposes. Also, it was necessary to break mains and laterals into sections at state and county road crossings in order to design the proper size culverts and bridges at these ponts.

EXAMPLE: To find information for Huspah Creek where it is crossed by U.S. Route 17 and 21, approximately one mile west of the community of Gardens Corner, refer to Figure 3, "Index to Map Sheets." The index indicates that the point where Huspah Creek is crossed by the highway can be found on Sheet 1 of the maps at the back of the report.

Sheet 1 designates Huspah Creek as Main Canal No. 10, (M-10) of Planning Area Number 1. It also shows Lateral No. L-4, (L-4), to be the last lateral entering M-10 upstream from the highway crossing.

A general description of Planning Area Number 1 is found on page 11 of the report and the detailed Engineering and Design Data Table is on page 23.

Beginning at the upstream end of M-10 in the table for Area 1 on page 23, and proceeding downward toward its outlet end, it is found that M-10 is crossed by the highway 3500 feet downstream from the point where L-4 enters M-10. The various criteria for engineering and design may be obtained from the table at this line.

Foreword

The inter-relationship of man, water, and land has always been an important factor in the development and growth of any community. In Beaufort County, South Carolina, the absence of a well defined drainage pattern has hampered the proper development of this relationship.

Beaufort County, bounded on the south by the Atlantic Ocean, is made up almost entirely of lowlying islands. It contains an area of 637 square miles. The topography is generally flat.

The first inhabitants used the higher areas for farming operations leaving the low, wet lands in their natural state. As the need for more farm land arose, it was necessary to install some type of drainage system on individual farms. The drainage systems, usually constructed with slave labor, were small and inadequate and only partially met the drainage needs. No thought was given to the drainage of entire watersheds.

With the advent of modern construction machinery such as the bulldozer, dragline, and power shovel, it is economically feasible to construct the large canals needed for adequate drainage.

The Feasibility Study of Requirements for Main Drainage Canals in Beaufort County is the outgrowth of interest on the part of county authorities and the Beaufort County Soil and Water Conservation District supervisors, who, through their foresight, saw the need of such a plan in order to enhance the potential development of the county. This plan, as developed, is a direct result of such foresight. It is the first step towards solving the drainage needs of the county, which is recognized by all concerned as a problem of first priority. Agencies at all levels of government - local, county, state, and federal - as well as private enterprise and numerous individuals, cooperated in the development of the plan. The Beaufort County delegation appropriated funds for the local share cost of the plan, including the publication of this report. Technical assistance was furnished by the Soil Conservation Service, using funds furnished by the Lowcountry Resource Conservation and Development Project. This study is project measure No. 149 in the Lowcountry Project Plan and has received high priority by both the Commissioners and Beaufort County RC&D Group.

The plan will provide a firm basis for action by county officials in determining needed legislation and methods of financing the necessary drainage improvements as well as establishing priorities of work. The cooperation of other agencies, groups, and individuals in the use of the plan also will be encouraged.

CONTENTS

Text

Figures

Tables

FEASIBILITY STUDY
OF REQUIREMENTS FOR MAIN DRAINAGE CANALS
BEAUFORT COUNTY, SOUTH CAROLINA

Introduction and Scope

The Feasibility Study of Requirements for Main Drainage Canals in Beaufort County is the logical first step toward solving the excess water problem. The purpose of the study is to point out the extent and severity of the drainage problem in the county and to furnish a guide to determine the physical feasibility and the estimated cost of the needed improvements. To accomplish this purpose, a system of main drainage canals has been developed for the major watersheds of the county and a discussion of some of the principal criteria used in design given.

The data in this report is based on reconnaissance surveys, information presently available, and on knowledge gained by long experience in planning and establishing drainage facilities in the county. The data is adequate for the purpose of determining preliminary design and cost estimates, but is not adequate for the preparation of final construction plans, designs, and costs. The data herein presented, however, can be used by qualified engineers as guides in securing detailed information for these purposes. Included, also are technical references which can supply information for the final engineering investigations, plans, and designs.

The use of most of the land in Beaufort County is highly dependent on adequate drainage. The lack of drainage is the principal detriment to the development of the land resources of the county. It results in frequent and costly crop damage on agricultural land and to property damage and disruption of facilities, both public and private, in urban and industrial areas. The need to reduce flooding through improvement of drainage

PROJECT SPONSORS - These persons were directly responsible for development and publication of the 'Feasibility Study of Requirements for Main Drainage Canals in Beaufort County'. Left to right - top row: James M. Waddell, Jr., State Senator, District 13; James P. Harrelson, State Senator, District 13; Colden M. Battey, Jr., Chairman, County Council of Beaufort County; W. Brantley Harvey, Jr., Representative, Beaufort County. Bottom row: J. Wilton Graves, Representative, Beaufort County; H. E. McCracken, Vice-Chairman, Beaufort-Jasper Soil and Water Conservation District; A. T. Chalk, State Conservationist, Soil Conservation Service.

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canals is recognized as a problem of first priority.

Factors Affecting Drainage

The location of Beaufort County along the Atlantic Seaboard and its physical features result in complex drainage problems. The physical features that contribute to these problems are topography, high tidal ranges, rainfall, soils, and land use changes. All of these are inter-related. A brief discussion of how the physical features affect drainage follows.

Topography

Topography is a severely limiting factor affecting drainage. The land is generally level with slight undulations. Sharp breaks in topography occur along tidal streams and marshes. Elevations in the county range from mean sea level to 40 feet above mean sea level, with most of the drainage problems occurring between the 5-to 30-foot contour. The entire county outlets into tidal creeks and rivers which are subject to tidal fluctuations. The natural interior drains in most cases, outlet into these streams. The natural drains are broad, have flat grades, and are heavily vegetated. In their natural state, little or no channel exists, causing extreme ponding in depressed areas.

During periods of excessive rain and high tides many unimproved and paved roads are flooded to a degree that they are impassible.

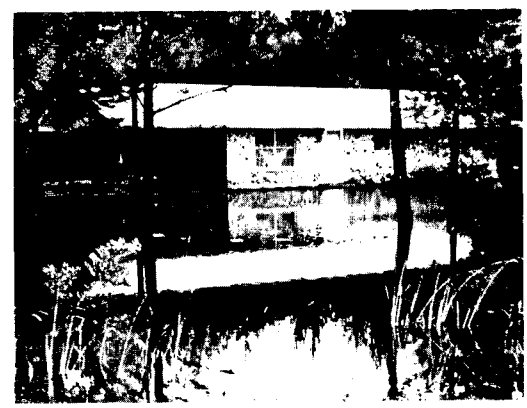
Tidal Ranges

The tidal effects along creeks and rivers of the county are very complex, and highly variable, dependent on the velocity direction, and duration of winds and other weather events occurring seaward. Predicted or normal range of tides above mean low water, with no consideration of wind effects is 7.4 feet, with spring tides ranging to 8.7 feet. However, daily tide records maintained by the U. S. Weather Bureau, Charleston, South Carolina, show that there is considerable variation between the predicted and actual tide ranges due to wind. Generally, tide heights have a departure of 1.0 to 1.5 feet below normal. Storm tides, which occur when sustained winds along the coast exceed 40 miles per hour, have a departure from normal of 2.0 to 3.0 feet above normal. A thorough knowledge of tidal action is essential in proper planning and design of drainage systems and supporting structures.

Tide Gates and Pump Drainage

No recommendations have been made in this study for the installation of tide gates or pump drainage due to varying conditions and the degree of protection desired. In many cases draining to mean low water is all that is necessary to furnish the desired protection.

Pump drainage may be necessary in some locations to achieve the desired protection from flood waters.



Residential Flooding - Causing property damage in many areas.

In other cases, tide gates may be necessary to eliminate the daily inflow of tide water. In urban, industrial, and other areas where the maximum protection is desirable, it may be necessary to install a combination of tide gates and pump drainage.

A more detailed study and survey would have to be made and a thorough knowledge of the planned use of the land in each individual watershed would have to be known in order to make a reasonable accurate recommendation for the installation of these structures.

Rainfall

U. S. Weather Bureau Records, Table No. 1, show monthly and yearly rainfall records for Beaufort, South Carolina. The average yearly rainfall of 46.78 inches would not cause a serious drainage problem if it were evenly distributed. The most serious drainage problem in areas along the tidal creeks is created by the high intensity, short duration rain storms occurring during periods of high tides and prevailing winds. The design of drainage systems and supporting structures is related to the amount of runoff that can be expected from storms of differing intensities and durations.

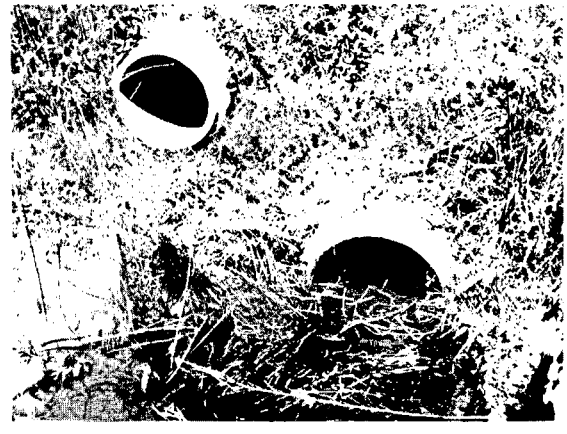
Soils

Soils have characteristics which decidely influence the need for, and the degree of, drainage. Some of the more important characteristics are depth, infiltration, permeability, texture, structure, water-holding capacity, water-table depth, and slope. A knowledge of these characteristics, as well as of the engineering properties of soils, is essential in planning, designing, and constructing an adequate drainage system. Fine (clayey) textured soils have little or no sub-surface water movement and can be drained only by removal of surface water by means of shallow surface ditches. Sandy soils, having high water tables or fluctuating watertables, respond to subsurface drainage, but present problems in the design of open ditches. Thes problems include: (a) side slope sloughing, which limits depth of cuts; (b) limitation of the velocity of flow; and (c) sedimentation.

Culverts

Culverts for road and railroad drainage generally lack capacity to handle runoff from high intensity storms and are frequently installed with invert elevations too high. They are a serious bottleneck to the rapid disposal of runoff and cause local flooding. The problem is less severe on primary roads than on secondary roads. Culverts are predominantly inadequate on unpaved and farm roads.

Drainage structures in driveways paralleling streets and roads in established subdivisions are critical factors contributing to poor local drainage. Head losses alone, resulting from widespread use of underdesigned culverts in residential areas, create local flooding conditions.



Highway culvert on right installed below original culvert, on left, to obtain adequate drainage for a newly constructed canal.

Urbanization

Urbanization of areas on Port Royal Island, Beaufort County, South Carolina, is having an adverse effect on drainage. Some of the drainage facilities now in use were established to handle the agricultural needs of the area. They are not adequate to handle runoff resulting from urbanization. Roof tops, paved roads, parking areas,compaction, raised water tables resulting from septic tanks and tile field installations, grading and elimination of some ditches during urban

TABLE NO. I
RAINFALL DATA - U. S. WEATHER BUREAU
BEAUFORT COUNTY, SOUTH CAROLINA

TOTAL PRECIPITATION

Year	Jan.	Feb.	March	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1931	2.47	1.54	2.72	1.37	2.45	6.09	3.85	2.52	3.27	.50	.20	2.13	29.11
1932	1.55	1.43	3.35	.58	2.19	13.33	1.30	9.68	3.63	3.60	3.73	1.73	46.10
1933	4.40	6.88	1.13	2.01	2.03	3.76	5.77	8.86	6.61	3.30	1.06	-	-
1934	.79	1.66	1.12	1.06	5.20	1.04	1.50	2.65	2.82	1.78	1.37	1.28	22.27
1935	2.48	2.41	1.07	1.27	1.40	2.56	9.66	9.65	12.20	-	-	-	-
1936	3.33	3.59	3.11	2.50	.41	2.35	4.18	6.38	4.23	4.25	1.40	4.39	40.12
1937	3.76	4.40	2.44	5.73	1.52	9.67	6.73	5.40	4.56	2.42	4.23	.87	51.73
1938	.95	.74	.83	2.37	4.30	4.87	6.53	4.01	9.16	2.14	2.00	2.05	39.95
1939	1.38	7.40	2.19	3.61	3.63	7.18	5.43	11.92	.79	.30	1.10	2.40	47.33
1940	3.42	5.02	3.55	1.73	.91	4.30	5.81	14.51	1.86	T	1.46	3.67	46.24
1941	1.22	1.89	3.37	1.01	.44	11.34	3.23	3.27	1.01	.91	1.10	5.49	34.28
1942	3.97	3.14	4.58	.56	1.73	7.70	7.08	3.60	5.57	.02	1.30	3.24	42.49
1943	4.15	.75	7.39	2.31	2.68	5.41	7.05	7.23	.24	T	1.45	3.82	42.48
1944	4.10	5.30	9.75	7.28	2.13	1.74	3.95	9.30	4.13	5.00	1.56	.76	55.00
1945	2.03	3.32	1.49	4.04	2.03	3.84	7.40	5.10	18.00	1.69	1.01	4.94	54.89
1946	3.56	1.94	1.80	2.21	6.01	3.24	8.39	6.94	1.13	4.62	3.89	.81	44.54
1947	2.11	.31	6.66	3.60	3.35	6.39	2.60	5.77	11.32	3.06	5.39	7.91	58.47
1948	3.83	2.72	9.31	4.45	5.55	4.26	-	2.30	8.86	3.02	4.94	-	-
1949	.92	3.45	-	2.54	6.43	5.02	5.52	11.63	.48	-	.78	1.10	-
1950	1.19	.50	4.63	1.64	3.96	1.70	9.17	5.17	7.18	3.09	.65	4.19	43.07
1951	1.03	-	4.44	.90	1.26	3.11	7.32	2.48	5.54	3.44	2.05	2.89	-
1952	1.45	4.34	3.55	1.44	8.54	1.60	5.05	9.44	5.58	1.38	1.35	1.63	45.35
1953	2.19	5.66	8.39	1.09	2.23	4.50	4.35	3.92	10.93	T	1.34	5.71	50.31
1954	.70	1.44	1.06	1.35	6.67	2.32	5.57	1.51	4.73	2.70	2.35	3.05	33.45
1955	5.57	1.86	.37	3.51	2.77	5.71	2.26	4.73	5.12	.47	.85	.50	33.72
1956	1.94	2.63	2.25	3.08	.83	2.40	5.92	2.64	5.25	1.65	.44	1.24	30.27
1957	.47	2.12	4.09	2.66	12.01	5.31	11.89	2.24	4.49	2.11	4.74	1.89	54.02
1958	4.16	2.83	6.65	6.42	3.63	3.64	5.98	5.40	1.20	3.04	.55	1.61	45.11
1959	3.76	3.80	7.67	1.39	3.95	2.43	7.43	6.12	12.00	9.10	1.35	1.27	60.27
1960	5.61	4.59	3.27	2.51	4.19	1.58	15.25	2.81	5.72	1.17	.68	1.50	48.88
1961	2.35	3.85	6.27	5.07	3.75	5.60	6.70	13.83	2.92	T	.80	2.27	53.41
1962	3.83	1.26	6.28	3.63	3.84	13.64	3.03	4.80	4.26	2.02	2.24	1.73	50.56
1963	2.80	5.17	.70	3.05	3.34	16.26	3.60	5.81	4.49	.40	3.21	1.75	50.58
1964	6.78	6.66	3.54	2.80	4.89	5.84	22.69	9.83	7.16	6.09	1.59	3.68	81.55
1965	1.09	5.14	9.12	2.50	2.30	7.45	6.38	5.26	6.59	3.67	1.86	1.89	53.25
1966	6.12	3.87	5.10	1.67	10.32	5.45	9.59	7.96	1.32	1.01	.27	2.45	55.13
1967	7.40	3.33	1.03	2.20	6.83	3.71	12.41	6.67	2.85	0.30	1.89	3.14	51.76
1968	3.83	1.11	1.12	2.11	4.39	7.69	6.32	4.72	1.42	7.73	3.46	4.05	47.95
Average Rainfall	2.97	3.19	3.93	2.61	3.79	5.37	6.67	6.21	5.23	2.69	1.88	2.66	46.78

In the above table information shown from January 1931 to December 1968 was taken from Beaufort, S. C. Station, U. S. Weather Bureau.

- No record available.

T Trace - not measurable.

4-29142

TABLE NO. 1 (continued)

PRECIPITATION EXTREMES

	Maximun Monthly	Year	Minimum Monthly	Year
January	7.40	1967	0.47	1957
February	7.40	1939	0.31	1947
March	9.75	1944	0.37	1955
April	7.28	1944	0.58	1932
May	12.01	1957	0.41	1936
June	16.26	1963	1.04	1934
July	22.69	1964	1.30	1932
August	14.51	1940	1.51	1954
September	18.00	1945	0.24	1943
October	9.10	1959	T*	1940
October	-	-	T	1943
October	-	-	T	1953
October	_	_	T	1961
November	5.39	1947	0.20	1931
December	7.91	1947	0.50	1955

* T means Trace - not enough to measure.

RAINFALL IN INCHES FOR SELECTED DURATIONS*

	30 Min.	1 Hour	2 Hours	3 Hours	6 Hours	12 Hours	24 Hours
1 year	1.4	1.8	2.2	2.3	2.7	3.2	3.7
2 years	1.6	2.2	2.5	2.7	3.2	3.8	4.5
5 years	2.0	2.6	3.1	3.5	4.2	5.0	5.8
10 years	2.3	2.9	3.6	4.0	4.8	5.8	6.8
25 years	2.6	3.3	4.1	4.6	5.6	6.8	7.8
50 years	2.9	3.7	4.6	5.2	6.3	7.5	8.6
100 years	3.1	4.0	5.2	5.7	7.0	8.3	9.9

* U. S. Weather Bureau Technical Paper No. 40 - "Rainfall Frequency Atlas of the United States."

4-29142

development, have created conditions approaching 100 percent runoff. As urbanization continues, the present drainage facilities will become increasingly inadequate to handle runoff.

There is a need for regulations to insure that adequate drainage canals and drainage structures are installed as these areas develop.

Bridge Washout - Caused by period of intensive rainfall and lack of an adequate channel.

Existing Drainage System

With the exception of some recently excavated canals, drainage systems in rural and urban areas are generally inadequate in depth and capacity and have very flat grades. An important additional factor contributing to this problem is the lack of legal authority to secure adequate rights-of-way for proper ditch design, spoil management, and access for maintenance. Rights-of-way, in the past, were usually limited to the width which the landowner was willing to donate, which, in most cases, was less than 30 feet.

Existing flat grades are the results of discharging canals - (1) into tidal marshes at mean sea level elevation rather than at mean low water elevation, or (2) discharging into swamps which are not adequate outlets in their present state since they generally pond water for long periods of time following heavy rainfall.

Existing canals are usually located in natural water courses. However, in many instances, alignment is poor since attempts were made to accommodate the canals to existing property lines or other physical features inconsistent with good channel flow conditions.

Maintenance

Lack of maintenance in the past resulted in dense growth of trees on high spoil banks adjacent to channels; some enlargements were completed in the 1930's, leaving vertical side slopes. Dense tree growth, high spoil banks and absence of legal easements for access has eliminated machine maintenance. Continuous spoil banks existing on both sides of channel has eliminated side drainage.

Drainage Principles

This plan designates the location and needed capacities of main drainage canals. This is, however, only the first step in the establishment of a complete drainage system. Drainage systems are divided into two broad categories -- surface drainage, and subsurface drainage.

Surface Drainage

Surface drainage removes excess water, by gravity, from the land surface to an outlet. The important functions of the surface drainage system is:

(1) To insure movement of surface water to the outlet without ponding.

(2) Collect water and convey it to natural outlets in constructed channels.

Surface drainage is necessary for successful crop growth on soils having slow permeability rates.

Sub-surface Drainage

Sub-surface drainage lowers the water table beneath the surface of the soil by facilities which create a difference in hydraulic head. The resulting hydraulic head causes water to move through the soil

to an outlet. Sub-surface drainage may be accomplished by open ditch drains and or tile drains. Open ditch drains have an added advantage because they can also collect and remove surface water. Tile drains require very little maintenance, and with certain precautions, can remove surface water by simulating small storm sewer systems.

The purpose of sub-surface drainage is to lower the water table to a point where it will not interfere with plant growth or the use of the land for residential or other purposes. The minimum depth below the surface at which water tables should be maintained depends on the use of the land. Water tables, fluctuating upward to or near the surface, may not be as great a problem in agricultural areas as they would be in populated areas.

The Drainage System

The components of a drainage system are as follows:

The Collection System - is that part of the drainage system which first picks up water from the land. It may consist of:
(1) Shallow trapezoidal ditches, having flat side slopes.
(2) V or W-type ditches.
(3) Bedding.
(4) Grading the land surface in urban areas.

This part of the drainage system cannot be neglected if the system is to perform adequately.

The Disposal System - receives water from the collection system and conveys it in a channel to an outlet.

The Outlet - is the end point of any segment of a drainage system beyond which the ditch, storm sewer, or the system no longer guides or controls the water it discharges. Generally, this report concerns itself with "The Disposal System."

Drainage Requirements

The drainage system should be designed so that flooding will not occur in critical parts of the watershed for a period of time sufficient to cause damage or disrupt utilities and services. For urban areas, design should provide for the removal of runoff from the design storm with a minimum of flooding. In agricultural areas, the degree of protection required by crops varies considerably, depending on their tolerance to the amount and duration of excess water. Truck crops are the most susceptible to damage from excess surface water, with damage occurring to some when flooded for the relatively short period of 24 hours or less. General crops such as corn and grain are less susceptible, with pasture being the least subject to water damage. Woodland areas are the least subject to damage from flooding for prolonged periods.

Poorly drained soils adversely affect the use of the land for most purposes. On agricultural land, high water tables restrict root penetration; soil temperature is lowered, air circulation is severely limited, dependent on the degree of soil saturation. Wet spots in the field delay farm operations and shorten the growing season.

Flooding caused by heavy rainfall and lack of adequate drainage channel.

Water Ponding In Corn Field - Caused by lack of proper drainage.

Design Criteria

The design of drainage systems and supporting structures is based on hydrology and hydraulics and this report will limit itself to the application of these sciences as they apply to the solution of such problems. References for more detailed information on design of open channels, closed conduits, culverts, and other engineering structures ultimately involved in establishing a drainage system are listed on pages

Drainage Coefficients

The drainage coefficient is the rate of removal of runoff to provide a specific degree of drainage protection to an area. Land use, soils, topography and rainfall intensifies and duration determine the selection of drainage coefficients. A series of five curves have been developed from which required drainage capacities of open ditches were computed, dependent on the land use. (See Figure No. 1.)

The highest curve is for urban use followed in descending order for crops. improved pasture, and woodland.

The use of these curves provides for the removal, in 24 hours time, of the following amounts of runoff:

Urban curve	- 4.39 inches
Truck crops	- 3.33 inches
General crops	- 1.67 inches
Improved pasture	- 0.93 inches
Woodland	- 0.37 inches

The curve for urban areas reflects a peak runoff for a 10-year frequency rain - 100-year frequency rains may be designed for if needed.

Velocity

Soil characteristics, the shape of the channel, and available means for stabilization of the soil after construction, determine the maximum safe velocity. The optimum velocity for channels, based on soil conditions in Beaufort County, is approximately two feet per second. The soils are predominantely fine sands. Sedimentation occurs when velocities are less than 1.5 feet per second which is frequently caused by vegetative growth.

Erosion will occur in most soils at velocities in excess of 3.0 feet per second. Design of channels in the fine, water-bearing sands must consider the need for checking erosion and bank sloughing that will occur immediately following construction when water tables are high.

Velocities should be designed after a thorough investigation of soil conditions to the depth of proposed channels.

Channel Cross Section

Values of Roughness Coefficient "n".

All channel cross sections were computed by use of Manning's formula for determining velocities.

This is: $$V = \frac{1.486}{n} \times r^{2/3} \times s^{1/2}$$

where: n = Roughness coefficient
r = Hydraulic radius
s = Slope in feet per foot along ditch

The proper design of a ditch cross section requires the selection of the proper value of "n". Side slopes of the ditch, as well as depth and allowable velocities, are fixed primarily by soil conditions and proposed maintenance methods.

The following tabulations were used for selection of values of "n" for Manning's formula in the design of main canals with good alignment:

Hydraulic Radius*	"n"
Less than 2.5	.045
2.5 to 4.0	.040
4.0 to 5.0	.035
over 5.0	.030

*The hydraulic radius is obtained by dividing the proposed area of channel cross section by its wetted perimeter.

In newly dug channels the roughness coefficient is lower and velocities higher. A realistic roughness coefficient was selected anticipating flow retardance features, such as vegetative growth and sediment several years after construction.

4-29142

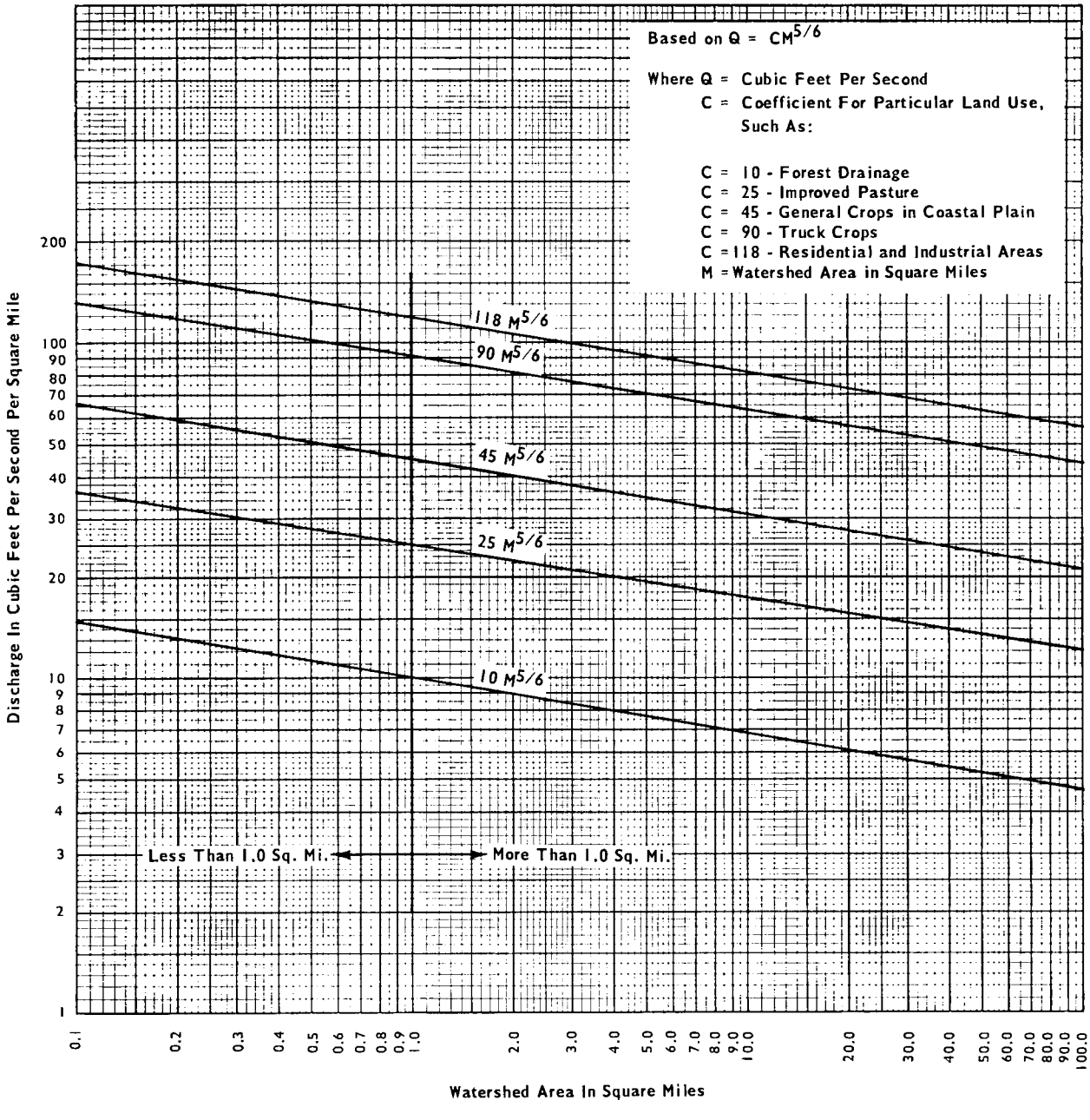


Figure No. 1 - Drainage Coefficient Curves

4-29142

Channel Depth and Width

Depth of channel is an important design consideration. The channel must be deep enough to tap and provide for the escape of ground water, and to provide for the safe entrance of the longer lateral ditches and tile drains. Other considerations favoring a deeper channel with a resulting narrower bottom width are: less right-of-way is required, vegetative growth on the wetted perimeter is reduced, and conditions are less favorable for the formation of sandbars. A channel roughly as deep as its bottom width, within economic limits will remain effective for a longer period because it has most favorable hydraulic characteristics.

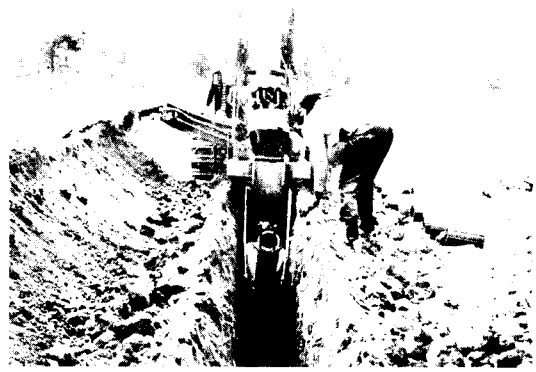
A minimum bottom width of 3.0 feet was designed for main channels, which conforms to a bucket width of small dragline excavating equipment; bottom widths were selected as narrow as design and construction criteria would permit so as to obtain higher velocities which, in many instances, due to low gradients were not high enough to prevent formation of sediment islands and growth of vegetation in channel bottoms.

Lateral Canal - This canal shows importance of good construction, alignment, spoil management, and erosion control on side slopes.

Side Slopes

Maintenance methods, soil characteristics, and a need for adequate but economic minimum rights-of-way determined the side slopes of channels. Side slopes of 1 to 1 for main channels were used to satisfy these conditions.

In fine sands having high water tables, sloughing of side slopes may be expected immediately after excavation. Sloughing will continue until the water table becomes established at the lower level. The problem can be controlled somewhat in wide channels by requiring initial construction of a pilot channel to lower the water table, followed by final construction when the channel has been stabilized; or, by requiring a maintenance operation to restore design cross section soon after the channel has been stabilized.



Tile Drainage - This is a tile machine in the process of installing farm drain tile lines. The demand is greater each year for these underground drainage systems.

Design at Culverts

Culverts obstruct the flow of water in ditches and cause a loss in head. This was considered in designing main channels. The hydraulic gradient, in most cases, was set low enough to keep the profile of the water surface at the culvert during design flow well within the channel cross section in all critical areas.

Talbot's formula was used in determining culvert sizes. Talbot's formula is as follows:

where: $A = C \sqrt[4]{M^3}$

where: A = Necessary waterway in sq. ft.
M = Area drained in acres
C = Coefficient (.2 used)

Where culvert sizes exceed 60 inches in diameter, it was usually found more economical to use 15-foot bridges.

4-29142

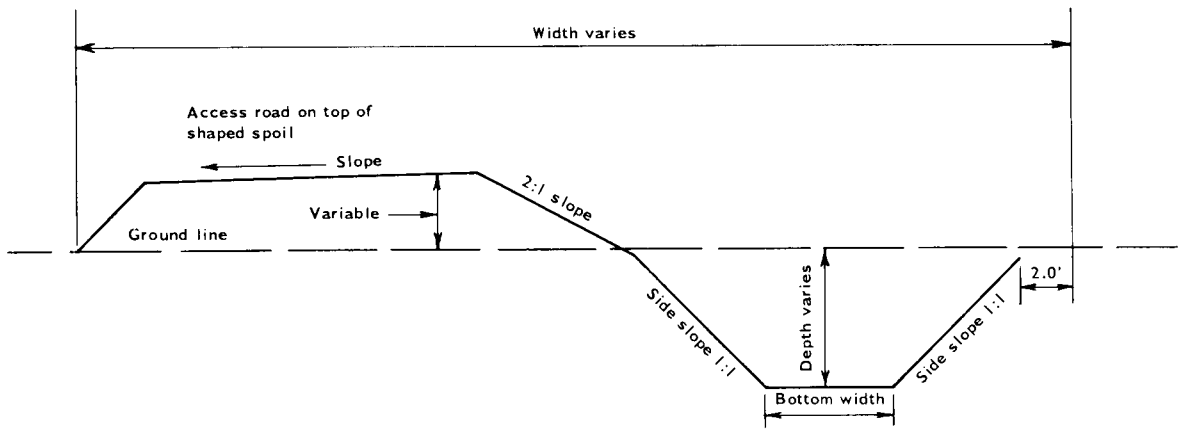


Figure No. 2 - Typical Main Ditch Cross-Section Showing Basis For Determining Right-Of-Way Width

Right-of-way Requirement-Spoil Bank Management

Factors governing width of rights-of-way can best be understood by consulting Figure No. 2. The principal requirements for spoil bank management includes a right-of-way wide enough for placement of spoil and shaping of spoil into roadway to provide a way for travel by maintenance equipment. No berm widths are needed where the spoil is to be spread and shaped to establish a roadway on top of it.

Right-of-Way Clearing for main drainage canal.

Description of Areas

The county was divided into 7 areas to delineate the drainage needs peculiar to these areas and to facilitate planning. A brief description of drainage problems associated with each area follows:

Area 1 - Yemassee - Sheldon - Lobeco

This area is bounded on the north by Hampton County line and the Combahee River; on the west by the Pocotaligo River and the Jasper County line; on the south by Whale Branch and the eastern boundary begins at Sugar Hill Creek on the north and extends in a southernly direction to Whale Branch.

A large portion of this areas is owned by large land owners. Farming operations are cattle, row crops, woodland, and wildlife. The remaining acreage is devoted to intensified truck crops. Principal truck crops are cucumbers, tomatoes, snapbeans, and leafy vegetables.

During periods of heavy rainfall a very large portion of this area is subject to excessive flooding due to inadequate outlets

and water-control structures.

A wide range of soils and soil conditions occur in this area. They range from well drained loamy sands to poorly drained clays. The majority of the soils are productive sandy loams that require moderate to intensive drainage for most land use. Most of the soils have a high site index for timber production, but removal of excess water in low-lying areas is necessary for the establishment and management of the desired species of trees.

Area 2 - Big Estate - Gardens Corner - Dale

Area 2 is bounded on the north and east by the Combahee River, on the south by Coosaw River, and on the west by Sugar Hill Creek extending in a southernly direction for approximately 10 miles to Whale Branch.

Approximately 25% of the area is devoted to truck crops such as tomatoes, cucumbers, snapbeans, squash, and leafy vegetables. Also, general row crops comprise about 25% of the area. The remainder of the area is being used for timber production, pasture, and wildlife. Of the last three mentioned, woodland is the most important and largest of the three. The soils have a high site index for timber growth, but removal of excess water is necessary for the management and the establishment of desired species.

There is a wide range of soils and soil conditions within the area. They range from well drained loamy sands to poorly drained clays. The larger portion of the soils are productive sandy loams that require moderate to intensive drainage for most land use.

Area 3 - Port Royal Island

Area 3 is bounded on the north by Whale Branch and Coosaw River; on the east by Beaufort River; and on the south and west by Port Royal Sound.

This area includes the majority of the population of the county. It includes the city of Beaufort, Port Royal, U. S. Naval Hospital, U. S. Marine Corps Air Station, and Capehart Housing Project. A rapid change from agricultural to urban and industrial use is taking place in a large portion of Port Royal Island. It is a trend that is expected to continue. Most of the existing drainage on Port Royal Island was installed to take care of the agricultural needs of the island, and not for urban or industrial development. As urbanization and industrialization continues in this area, the need for drainage improvements will become more and more critical. These improvements should anticipate expected developments which can now be established without too much difficulty and at a more reasonable cost.

The agronomic work in this area is devoted primarily to intensive truck crops such as tomatoes, cucumbers, snapbeans, and squash.

Soils in this area are dominately sands and loamy sands. Areas of finer textured soils occur in the vicinity of Seabrook, as well as other small areas throughout Area 3. These soils range from well drained to very poorly drained, with a large majority requiring some degree of drainage for most land users. Wind erosion on the larger well drained sandy soils is a moderate problem under certain conditions.

Area 4 - Ladies Island - St. Helena Island

This area is located in the southeastern portion of Beaufort County. Area 4 is bounded on the north and east by Coosaw River and St. Helena Sound; on the south by Harbor River and Station Creek; on the west by Port Royal Sound and Beaufort River. The small privately-owned islands, south and east of Station Creek and Harbor River, were excluded from this study.

This area contains a number of large and small truck farms. Good drainage is essential to the production of truck crops. Most truck farms are located along tidal creeks where better drained soils, well suited to truck crops, are found, and where outlets into tidal creeks are readily available. Farms located further inland require main drains to tidewater for disposal of runoff. The topography is flat with some large depressions which pond water.

A great portion of the high land is in a rotation of truck crops and general crops.

Truck crops grown are tomatoes, cucumbers, squash, snapbeans, and some leafy vegetables. Due to the long growing season, ease of tillage and other favorable factors, this area is well suited to truck crops. Other crops grown are corn, soybeans, and small grain. Some of the area is being used for pasture land, woodland, wildlife, and recreation.

Soils in this area are dominately sands and loamy sands, with small areas of soils underlain by sandy clay loams. These soils range from excessively drained to very poorly drained. The natural drainageways generally parallel the coast. Well planned drainage programs are needed to enhance both the agricultural and residential potential of the area.

Area 5 - Camp St. Mary - Okatie - Pinckney Colony - Victora Port

Area 5 is bounded on the north by Jasper County line and Broad River; on the east by Broad River, Port Royal Sound, and Mackays Creek; on the south by a line from Mackays Creek westward to Great Swamp; and on the west by Jasper County line.

The greater part of this area is devoted to timber production, with several large tracts of land owned by a Paper and Pulp Company. Most of the agronomic practices are devoted to livestock production. Crops grown to support livestock production are hay and pasture. Also, some general row crops are grown.

Wildlife is also an important management practice. With an abundance of turkey, deer, and squirrel, some income is derived by the landowners leasing their lands to hunting clubs.

Soils range from well drained droughty sands to poorly drained fine sandy loams with an appreciable acreage of organic hardpan. The soils along the northwest boundary of this area are underlain with sandy clay loams. In general, the Sea Islands are sandy and surrounded by large areas of tidal marsh.

Area 6 - Hilton Head Island

Hilton Head Island is bounded on the north by Port Royal Sound; on the east and south by the Atlantic Ocean; and on the west by Calibogue Sound and Mackays Creek.

This area is rapidly being developed into an exclusive year-round resort and urban area. It is a trend that is expected to continue. There is an opportunity on Hilton Head Island to install adequate drainage facilities and related engineering structures before the island becomes totally urbanized. This work can now be accomplished at less cost and with a minimum of difficulty in acquiring rights-of-way. Encroachment of developments on areas exposed to storm tides makes special protective measures such as dikes, tide gates, and pumps necessary. Much of the drainage needed is already being installed by large real estate developers in the area.

The limited amount of agronomic work is truck crops such as tomatoes, cucumbers, and butterbeans.

This area is composed of Sea Islands, with Hilton Head Island dominating the area. Soils are dominantly sands, ranging from excessively to very poorly drained sands. The poorly drained sands are often underlain with organic hardpans. In almost every instance the drainage pattern parallels the ocean.

Area 7 - Prichardville - Bluffton - Daufuskie Island

This area is bounded on the north by a line running from Great Swamp easterly to Mackay Creek; on the east by Mackay Creek and Calibogue Sound; on the south by the Atlantic Ocean and Intra Coastal Waterway; and on the west by New River.

There are several large tracts of land in this area owned by paper and pulp companies which are managed for timber production and wildlife. Livestock production is the main agronomic practice in this area. Crops grown to support livestock production are hay and pasture. Also, some general row crops are grown.

Wildlife is also an important management practice within this area. With an abundance of turkey, deer, and squirrel, some income is derived by the landowners leasing their lands to hunting clubs.

The major portion of the soils are sands, ranging from excessively drained to very

poorly drained. A large portion of the poorly drained sands have an organic hardpan. A small area along New River is underlain with sandy clay loams or clays. A significant portion of the area is tidal marshland.

Factors Considered in Preparation of Plan

The Drainage Feasibility Study was prepared by engineers of the Soil Conservation Service with the assistance of the Beaufort County Council and County Supervisor's office. On-site investigations were made of the outlets for each main canal, and the factors affecting drainage within the watershed, such as tidal ranges, river stages, flooding and the time of year in which flooding occurs, were studied.

Present land use and anticipate future land use was considered in preparing the design of drainage canals. Engineering information available through the Beaufort County Work Unit office of the Soil Conservation Service was also used, particularly that pertaining to drainage investigations.

U. S. Geological Survey Topographic Maps were used to determine the general topography within each watershed and to assist in delineation of watersheds. A limited amount of instrument surveying was made to secure detailed information in critical areas.

Aerial photographs, scale 1"=1320', flown in 1965, were used in recording field data and for the preparation of the drainage plan.

Agencies and commercial concerns, having knowledge of specific drainage problems were consulted in making the final decisions in certain areas. Also, maps, surveys, and plans available from these agencies were used.

In most instances, mains were located along natural drains with modifications in alignment to improve the flow and the collection of water. All needed laterals within the watersheds were not located since the purpose of the study is to locate and design only the main canals which will furnish the means of disposal of runoff from all parts of the watershed. All mains are terminated in tidal creeks or natural outlets at a point where they have adequate capacity and depth.

No attempt was made to locate underground utilities such as cables, gas pipelines, water mains, and conduits as a part of this study. However, due consideration must be given to the location of these underground utilities during the preparation of the final plans.

In general, the drainage plan was limited to areas considered as "high lands" - that is, five feet or more above mean low water.

Watersheds draining into the county from adjoining counties were determined for the purpose of designing main canals. The mains, however, are shown beginning at the county line. Due attention was given to possible land use changes which would affect runoff within the portion of these watersheds in adjacent counties.

Engineering Considerations

Engineering considerations for planning, design, construction, maintenance, and other matters pertinent to the Main Drainage Canals Feasibility Study are listed below:

Design

1. The plan presented herewith is a Feasibility Study to estimate the cost and the extent of needed main drainage facilities and the physical practicability of drainage in the county. Detailed engineering surveys and designs will be required before any part of the proposed plan is constructed. All improvements should be made continuous, beginning at the lower or outlet end of the watershed.

2. Plans and designs contained in this report do not include a complete study of underground storm sewers found in Areas 1, 3, 6, and 7, due to the fact that these are not considered as mains. Also, there is a lack of information on original surveys and designs showing size, depth, and location. Detailed studies will be needed to determine the present condition of these storm sewers and their additional needs.

3. Culverts at railroad and road crossings were designed to satisfy the minimum requirements based on expected flow. Increases in size of these structures may be desirable to provide an added safety factor for passing runoff in excess of designed flow; especially where presently unforeseen improvements are made in the vicinity.

4. The South Carolina Wildlife Resources Department should be consulted when fish and wildlife may be affected by the construction of main drainage canals.

Acquisition of Rights-of-way

The means for and the acquisition of adequate rights-of-way for the installation of main canals is absolutely essential. The right-of-way must be adequate to take care of width requirements for channel section, berm, spoil management and access. (See Figure No. 2)

Maintenance of Channels

A well organized and adequately financed maintenance program is essential to maintain design capacity in all canals. Provision for annual maintenance or periodic reconstruction to maintain the effectiveness of the channel must be considered prior to construction. The failure of many drainage enterprises to function as designed can be directly attributed to an inadequate maintenance program. Maintenance of designed depth of channels is one of the most important items in a maintenance program. The cost of maintenance may be reduced considerably if provision is made in channel designs for easy access, stabilization of side slopes, and other silt-contributing areas such as road fills and road drainage immediately following construction.

Obstructions

Construction of fences, walks, and other structures, that may retard channel flow, should not be permitted except as approved by the responsible agency of the County Government. Other structures such as culverts, bridge piers, trestles, etc., should be designed so as to cause minimum interference with the channel flow. Dumping trash, garbage, and other debris in channels should be prohibited.

Definition of Terms

Brief descriptions of terms used in this report are listed below in alphabetical order:

c.f.s. - Abbreviation for cubic feet per second; an unit of water-flow sometimes called "second feet."

Infiltration - The entrance of water into surface of soil.

Internal Drainage - The movement of water through the soil profile. The rate is affected by the texture of the surface soil and of the subsoil and by the height of the water table. A wet, deep sand may have slow internal drainage when the water table is high, and rapid internal drainage when the water table is low. A plastic, sandy clay soil may have slow internal drainage regardless of water table height.

Lateral Ditch - A major ditch in a drainage system which serves as a link between the main ditch and the collection system in a segment of the watershed.

Main Canal (Ditch or Channel) - The principal channel which conducts the drainage water from the watershed to the outlet.

Permeability Rate - The rate of movement of water through the soil.

Profile, Soil - A vertical section of the soil through all its horizons and extending into the parent material.

Reach - A length of channel selected for use in hydraulic computations.

Relief - The elevations, or inequalities, of a land surface considered collectively.

Runoff, Surface - Total rainfall minus losses from interception, infiltration, evaporation, and surface storage; that which moves across the ground to a stream or depression.

Runoff, Subsurface - Water that infiltrates the soil and reappears as seepage or spring flow.

Soil Drainage - (1) The rapidity and extent of the removal of water from the soil by runoff and flow through the soil to underground spaces, (2) As a condition of the soil, the frequency and duration of periods when the soil is free of saturation - for example: in well drained soils, the water is removed readily but not rapidly; in poorly drained, the root zone is waterlogged for long periods and the roots of ordinary crop plants cannot get enough oxygen; and in excessively drained soils, the water is removed so completely that most crop plants are damaged by lack of water.

Definition of Terms (continued)

Soil Structure - The arrangement of the individual grains and aggregates that make up the soil mass; may refer to the natural arrangements of the soil when in place and undisturbed, or to the soil at any degree of distrubance.

Subsoil - In soils with weak profile development, the subsoil can be defined as the soil below the plowed soil (or its equivalent of surface soil) in which roots normally grow.

Surface Soil - The soil ordinarily moved in tillage or the equivalent in uncultivated soil about six to ten inches in thickness.

Terrace (Geological) - An old alluvial plain ordinarily flat or undulating, bordering a river, lake, or the sea. Stream terraces are frequently called second bottoms, as contrasted to flood plains, and are seldom subject to overflow. Marine terraces were deposited by the sea and are generally wide.

Texture, Soil - The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportions of fine particles, are as follows: sand, loamy sand, sandy loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay, and clay. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse", "fine", or "very fine". A coarse-textured soil is one high in sand content; a fine-textured soil is one high in clay content.

Tide Data

Mean Range - Difference between mean high water and mean low water.

Spring Range - The average range which occurs semi-monthly as a result of the moon's being full or new.

Mean Tide Level (Half tide level) - is a plane midway between mean low water and mean high water.

High Water - The maximum height reached by each rising tide.

Water-holding Capacity - The ability of a soil to hold water. The capacity (or ability) of soil to hold water against gravity.

Watershed - An area of land from which all water that falls within the area, converges toward and discharges past a designated point.

4-29142

TABLE NO. 2
SUMMARY OF ENGINEERING AND DESIGN DATA BY AREAS

Area Number	Length of Canals Feet	Excavation Cubic Yards	Right-of-way Clearing Acres	Estimated Total Cost Dollars /1
1	310,900	567,130	152.4	326,963.80
2	171,400	332,412	132.2	190,623.00
3	208,750	392,971	162.8	240,357.60
4	396,700	602,505	299.0	313,906.30
5	298,900	481,371	220.9	236,853.30
6	165,800	291,383	133.2	151,742.10
7	440,400	714,738	344.4	344,084.40
Sub-Totals	1,992,850	3,382,510	1,444.9	1,804,530.50
Plus 15% added for contingencies-				270,679.57
County Totals	1,992,850	3,382,510	1,444.9	2.075,210.07

1/ Based on 1969 prices.

4-29142

Technical References

C. E. Ramser - FLOW OF WATER IN DRAINAGE CHANNELS - U. S. Department of Agriculture - Technical Bulletin No. 129 - U. S. Government Printing Office - Washington, D. C.

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War Department, Corps of Engineers - HYDRAULIC TABLES - U. S. Government Printing Office, Washington, D. C.

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U. S. Department of Agriculture, Soil Conservation Service - FIELD DRAINAGE GUIDE FOR SOUTH CAROLINA.

U. S. Department of Commerce, Weather Bureau - TECHNICAL PAPER NO. 40 - RAINFALL, FREQUENCY ATLAS OF THE UNITED STATES - U. S. Government Printing Office - Washington, D. C.

U. S. Department of Agriculture, Soil Conservation Service - NATIONAL ENGINEERING HANDBOOK - HYDROLOGY - Section 4.

FEASIBILITY STUDY FOR MAIN DRAINAGE CANALS in Colleton County.

Authority and Acknowledgement

Authorization for preparation of the Feasibility Study of Requirements for Main Drainage Canals for Beaufort County is the result of a cooperative agreement entered into on March 10, 1967, by:

Beaufort County - J. M. Waddell, Jr., State Senator
J. Wilton Graves, Member of House of Representatives
W. Brantley Harvey, Member of House of Representatives

County Council of Beaufort County -

Colden R. Battey, Jr., Chairman
Arthur B. Horne, Jr., Vice-Chairman
Leroy E. Brown
John P. Dennis
David Jones
Omar D. Horton
Jerry H. Reeves, III
Grady D. Thames
Booker T. Washington
A. R. McAfee, Administrative Officer

Beaufort Soil and Water Conservation District

Soil Conservation Service - A. T. Chalk, State Conservationist

Administrative supervision for Soil Conservation Service - W. Lee Colburn, Area Conservationist.

4-29142

Authority and Acknowledgement (continued)

Direct responsibility for preparation of plans, designs, and final report was as follows:

C. C. Allen, Civil Engineer, Soil Conservation Service
A. C. Utsey, Jr., Engineering Technician, Soil Conservation Service
C. C. Haigh, Beaufort County Supervisor

Special technical assistance during all phases of the preparation of this report was given by:

S. Taylor Currin, State Conservation Engineer, Soil Conservation Service
W. M. Stuck, Soil Scientist, Soil Conservation Service
R. E. McLin, District Conservationist, Soil Conservation Service

Other who furnished data, information, or services used in the preparation of this report are as follows:

U. S. Weather Bureau

South Carolina Highway Department

U. S. Marine Corps

Union Camp and Paper Company

Cartography and Printing - Fort Worth Cartographic Unit, Soil Conservation Service

Explanation of Engineering Data Tables

The following Engineering Data Tables contain information, by areas, for each main canal and lateral, by watersheds.

An explanation of each column in the Engineering Data sheets is as follows:

Column 1 CANAL NUMBER
Numbering of main canals begin with M-1 and laterals with L-1, in each area.

Column 2 LENGTH IN FEET
The stationing of all mains and laterals begins at the upper end (headwaters) and continues toward the outlet. The mains and laterals are shown in reaches or sections in the data tables for design purposes. Each reach or section reflects a change in water concentration resulting from the entrance of lateral drainage.

Column 3 WATERSHED IN ACRES
See definition of terms.

Column 4 DISCHARGE-CUBIC FEET PER SECOND
From appropriate drainage coefficient curves dependent on the land use.

Column 5 TOP WIDTH IN FEET
Self explanatory

Column 6 BOTTOM WIDTH IN FEET
Self explanatory

Column 7 AVERAGE DEPTH IN FEET
Self explanatory

Column 8 EXCAVATION IN CUBIC YARDS
Self explanatory

Column 9 RIGHT-OF-WAY CLEARING IN ACRES
Self explanatory

Column 10 REQUIRED RIGHT-OF-WAY WIDTH IN FEET
Based on minimum requirements for channel cross section, spoil management, berm width, and access road for maintenance equipment.

Column 11 CULVERTS, LOWERING-LENGTH AND SIZE
Refers to the existing in-place culverts which are to be re-used.

Column 12 CULVERTS, BRIDGES, AND TRESTLES NEW - LENGTH AND SIZE
Refers to additional culverts, bridges, and trestles required to handle design discharge. Design of culverts is based on round concrete pipe.

R. C. Br. - Reinforced concrete bridge
C. T. Br. - Creosoted timber bridge
U. T. Br. - Untreated timber bridge
C. T. Tres. - Creosoted timber trestle

Column 13 TOTAL ESTIMATED COST IN DOLLARS
Total costs shown include only the estimated construction costs and do not include engineering costs, and the cost of acquiring required right-of-way. When preparing the final cost estimates these engineering costs and right-of-way costs should be included in the total cost of the project. Total estimated costs, as shown, are based on the following unit prices prevailing in Beaufort County in 1969.

EXCAVATION
Rural Area-High Ground - $0.30 per cu.yd.
Urban - $0.60 per cu.yd.
Marsh - $0.60 per cu.yd.

RIGHT-OF-WAY CLEARING AND GRUBBING
Rural area - $300.00 per acre
Urban area - $500.00 per acre

LOWERING EXISTING CULVERTS
Labor and equipment costs only.

NEW CULVERT AND CONDUIT COSTS
Based on present cost of circular concrete pipe.

BRIDGES
Three types of bridges were used for design purposes:
1. Precast reinforced concrete bridges were used under main highways and secondary roads.

4-29142

Explanation of Engineering Data Tables (continued)

2. Pressure-treated creosoted timber bridges were used under county roads.

3. Untreated timber bridges were used on farm and private roads.

PREVAILING COST OF BRIDGES

Reinforced concrete bridges - $100.00 per linear foot

Creosoted timber bridges - $ 50.00 per linear foot

Untreated timber bridges - $ 33.00 per linear foot

Creosoted timber trestles - $100.00 per linear foot

4-29142

ENGINEERING AND DESIGN DATA

Area 1 - Yemassee-Sheldon-Lobeco

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
M-1A	4700	224	19	13	3	5	6956	3.5	38	- - -	- - -	
Total - 1	4700						6956	3.5				3,136.80
M-2A	3900	192	16	13	3	5	5772	2.9	38	- - -	30' - 24"	
L-1A	2500	56	6	13	3	5	3700	1.8	38	- - -	- - -	
M-2B	4600	400	30	13	3	5	6808	3.4	38	- - -	40' - 42"	
Total - 2	11,000						16,280	8.1				8,205.00
M-3A	2700	336	26	13	3	5	3996	-	38	40' - 36"	40' - 36"	
M-3B	7500	876	59	16	6	5	15,300	-	38	- - -	- - -	
L-1A	7200	448	33	13	3	5	10,656	5.3	38	- - -	- - -	
M-3C	5300	1524	93	19	9	5	13,727	6.0	55	- - -	15' R.C. Br.	
L-2A	5500	344	27	13	3	5	8140	4.0	38	- - -	20' - 24"	
											40' - 24"	
M-3D	1400	1904	112	22	12	5	4410	1.8	62	- - -	- - -	
Total - 3	29,600						56,229	17.1				30,565.50
M-4A	4800	228	19	13	3	5	7104	3.5	38	- - -	- - -	
Total - 4	4800						7104	3.5				3,181.20
M-5A	4600	516	38	13	3	5	6808	-	38	- - -	- - -	
M-5B	5800	1364	85	18	8	5	13,978	-	52	- - -	15' U.T. Br.	
L-1A	6100	340	26	13	3	5	9028	4.5	38	- - -	20' - 24"	
											20' - 42"	
M-5C	8900	2680	149	26	16	5	34,621	-	73	- - -	20' - 42"	
L-2A	1300	84	8	13	3	5	1924	1.0	38	- - -	30' - C.T. Br.	
L-3A	2100	112	11	13	3	5	3108	1.5	38	- - -	- - -	
L-2B	1600	244	20	13	3	5	2368	1.2	38	- - -	- - -	
L-2C		820	Present canal as constructed is considered adequate							- - -	30' - 48"	
										- - -	20' - 48"	
M-5D	2600	3600	191	30	20	5	12,038	-	84	- - -	15' - C.T. Br.	
Total -5	33,000						83,873	8.2			- - -	52,463.40
M-6A		72	Present canal as constructed is considered adequate							- - -	- - -	
L-1A		76	Present canal as constructed is considered adequate							- - -	- - -	
M-6B		872	Present canal as constructed is considered adequate							- - -	- - -	
L-2A		172	Present canal as constructed is considered adequate							- - -	- - -	
M-6C		1660	Present canal as constructed is considered adequate							- - -	- - -	
Total-6	- - -						- - -	- - -				- - -

USDA SCS FORT WORTH, TEX. 1967

ENGINEERING AND DESIGN DATA

Area 1 - Yemasse - Sheldon - Lobeco

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
M-7A	5900	868	58	16	6	5	12,036	-	46	- - -	- - -	
M-7B	2500	1600	97	19	9	5	6475	-	55	- - -	15' U.T. Br.	
M-7C	4800	2364	134	24	14	5	16,896	-	68	- - -	30' R.C. Br.	
Total -7	13,200						35,407	-			30' R.C. Br.	27,744.20
M-8A	5100	296	23	13	3	5	7548	3.7	38	- - -	- - -	
L-1A	3400	236	19	13	3	5	5032	2.5	38	- - -	- - -	
M-8B		940	Present	canal	as constructed	is	considered	adequate		- - -	40' - 60"	
Total-8	8500						12,580	6.2				6,778.00
M-9A	3500	332	26	13	3	5	5180	2.6	38	- - -	- - -	
L-1A	3500	340	26	13	3	5	5180	-	38	- - -	50' - 42"	
L-2A	3300	80	8	13	3	5	4884	2.4	38	- - -	- - -	
L-3A	900	16	2	13	3	5	1332	0.7	38	- - -	- - -	
L-2B	3900	308	24	13	3	5	5772	2.9	38	- - -	40' - 42"	
M-9B	3100	1160	74	17	7	5	6882	-	49	- - -	- - -	
L-4A	3300	216	18	13	3	5	4884	2.4	38	- - -	40' - 24"	
M-9C	4500	1672	100	20	10	5	12,510	-	57	- - -	15' U. T. Br. 40' - 60"	
M-9D	1200	1872	110	22	12	5	3780	1.5	62	- - -	- - -	
Total-9	27,200						50,404	12.5				29,690.80
M-10A	3700	308	24	13	3	5	5476	2.7	38	- - -	- - -	
L-1A	2400	216	18	13	3	5	3552	1.8	38	- - -	- - -	
M-10B	1900	584	41	14	4	5	3173	1.5	41	- - -	40' - 42"	
L-2A	1800	264	21	13	3	5	2664	-	38	- - -	- - -	
M-10C	5900	1196	76	17	7	5	13,098	-	49	- - -	40' - 42" 15' U.T. Br.	
L-3A	6200	368	28	13	3	5	9176	4.6	38	- - -	40' - 36"	
M-10D	3900	1816	107	20	10	5	10,842	-	57	- - -	15' R.C. Br.	
M-10E	3200	2124	123	22	12	5	10,080	-	62	- - -	- - -	
L-4A	3100	256	21	13	3	5	4588	2.3	38	- - -	- - -	
L-5A	2000	224	19	13	3	5	2960	-	38	- - -	- - -	
L-4B	5100	988	64	16	6	5	10,404	-	46	- - -	15' R.C. Br.	
L-4C	2100	1056	68	16	6	5	4284	-	46	- - -	- - -	
M-10F	3500	3592	190	30	20	5	16,205	-	84	- - -	- - -	
Total-10	44,800						96,502	12.9				59,385.70
M-11A	7100	372	28	13	3	5	10,508	2.6	38	- - -	- - -	
Total-11	7100						10,508	2.6				5,584.80

USDA-S.C.S.-FT. WORTH, TEX. 1967

ENGINEERING AND DESIGN DATA

Area 1 - Yemassee - Sheldon - Lobeco

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
M-12A	3700	180	15	13	3	5	5476	2.7	38	- - -	- - -	
L-1A	2600	348	27	13	3	5	3848	1.9	38	- - -	- - -	
M-12B	900	612	43	14	4	5	1503	-	41	- - -	- - -	
Total-12	7200						10,827	4.6				5,079.00
M-13A	2700	148	13	13	3	5	3996	2.0	38	- - -	50' - 30"	
M-13B	1700	212	18	13	3	5	2516	1.2	38	- - -	- - -	
Total-13	4400						6512	3.2				3,423.60
M-14A	3100	104	20	13	3	5	4588	2.3	38	- - -	- - -	
L-1A	2000	56	12	13	3	5	2960	1.5	38	- - -	- - -	
M-14B	2800	264	43	13	3	5	4144	2.1	38	- - -	50' - 36"	
M-14C	2400	352	54	15	5	5	4440	2.1	44	- - -	- - -	
Total-14	10,300						16,132	8.0				7,939.60
M-15A	1900	60	6	13	3	5	2812	1.4	38	- - -	- - -	
L-1A	1500	152	13	13	3	5	2220	1.1	38	- - -	- - -	
M-15B	1500	280	22	13	3	5	2220	1.1	38	- - -	20' - 36"	
Total-15	4900						7252	3.6				3,535.60
M-16A	4900	92	9	13	3	5	7252	3.6	38	- - -	40' - 24"	
L-1A	1100	48	5	13	3	5	1628	0.8	38	- - -	- - -	
M-16B	1700	240	20	13	3	5	2516	1.2	38	- - -	30' - 30"	
L-2A	2400	56	6	13	3	5	3552	1.8	38	- - -	- - -	
L-3A	2500	140	13	13	3	5	3700	-	38	- - -	- - -	
M-16C	1500	496	36	13	3	5	2220	-	38	- - -	40' - 54"	
L-4A	4500	344	27	13	3	5	6660	-	38	- - -	30' - 36"	
M-16D	2200	900	60	16	6	5	4488	-	46	- - -	- - -	
L-5A	3500	140	13	13	3	5	5180	2.6	38	- - -	30' - 30"	
M-16E	1400	1080	70	17	7	5	3108	-	49	- - -	- - -	
Total-16	25,700						40,304	10.0				23,409.20
M-17A	4400	340	52	13	3	5	6512	3.2	38	- - -	50' - 30"	
Total-17	4400						6512	3.2				3,423.60
M-18A	2100	120	11	13	3	5	3108	1.5	38	- - -	- - -	
L-1A	2800	172	15	13	3	5	4144	-	38	- - -	40' - 30"	
M-18B	2900	400	30	13	3	5	4292	-	38	- - -	- - -	
M-18C		748	Present canal as constructed is considered adequate							- - -	- - -	
Total-18	7800						11,544	1.5				6,852.00

4-29142

USDA SCS-FORT WORTH, TEX 1967

ENGINEERING AND DESIGN DATA

Area 1 - Yemasse - Sheldon - Lobeco

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
M-19A	1700	80	8	13	3	5	2516	1.2	38	- - -	- - -	
L-1A	1300	64	7	13	3	5	1924	1.0	38	- - -	- - -	
M-19B	1700	200	17	13	3	5	2516	1.2	38	- - -	- - -	
L-2A	2800	120	11	13	3	5	4144	2.1	38	- - -	- - -	
M-19C	1900	396	30	13	3	5	2812	-	38	- - -	30' - 42"	
Total-19	9400						13,912	5.5				7,171.20
M-20A	3200	104	10	13	3	5	4736	2.4	38	- - -	- - -	
L-1A	1400	144	13	13	3	5	2072	1.0	38	- - -	- - -	
M-20B	1400	280	22	13	3	5	2072	1.0	38	- - -	- - -	
L-2A	4500	240	20	13	3	5	6660	3.3	38	- - -	- - -	
M-20C	800	584	41	13	3	5	1184	-	38	- - -	- - -	
Total-20	11,300						16,724	7.7				7,682.40
M-21A	4000	240	20	13	3	5	5920	2.9	38	- - -	30' - 42"	
L-1A	3100	156	13	13	3	5	4588	2.3	38	- - -	30' - 24"	
L-2A	2500	96	9	13	3	5	3700	1.8	38	- - -	30' - 24"	
M-21B	1800	552	40	13	3	5	2664	1.3	38	- - -	15' U.T. Br.	
Total-21	11,400						16,872	8.3				8,993.60
M-22A	2500	108	10	13	3	5	3700	1.8	38	- - -	30' - 18"	
L-1A	2400	36	4	13	3	5	3552	1.8	38	- - -	- - -	
M-22B	1300	224	19	13	3	5	1924	1.0	38	- - -	40' - 36"	
											80' - 30"	
Total-22	6200						9176	4.6				5,646.80
M-23A	1700	52	5	13	3	5	2516	1.2	38	- - -	- - -	
Total-23	1700						2516	1.2				1,114.80
M-24A	2100	56	6	13	3	5	3108	1.5	38	- - -	- - -	
Total-24	2100						3108	1.5				1,382.40
M-25A	2200	64	7	13	3	5	3256	1.6	38	- - -	40' - 24"	
Total-25	2200						3256	1.6				1,748.80
M-26A	2300	84	8	13	3	5	3404	1.7	38	- - -	- - -	
L-1A	1400	48	5	13	3	5	2072	1.0	38	- - -	- - -	
M-26B	2800	200	17	13	3	5	4144	2.1	38	- - -	60' - 24"	
											40' - 24"	
Total-26	6500						9620	4.8				5,086.00

USDA SCS FORT WORTH TEX 1967

ENGINEERING AND DESIGN DATA

Area 1 - Yemassee - Sheldon - Lobeco

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
M-27A	2900	56	6	13	3	5	4292	2.1	38	- - -	- - -	
Total-27	2900						4292	2.1				1,917.60
M-28A	1200	44	5	13	3	5	1776	0.9	38	- - -	30' - 18"	
L-1A	1200	24	3	13	3	5	1776	0.9	38	- - -	- - -	
M-28B	900	78	8	13	3	5	1332	0.7	38	- - -	- - -	
Total-28	3300						4884	2.5				2,353.20
M-29A	3300	128	23	13	3	5	4884	2.4	38	- - -	40' - 18" 30' - 30"	
L-1A	1600	64	13	13	3	5	2368	1.2	38	- - -	30' - 24"	
M-29B	400	200	33	13	3	5	592	0.3	38	- - -	- - -	
Total-29	5300						7844	3.9				3,469.00
Area 1 Grand Total	310,900						567,130	152.4				326,963.80

4-29142

USDA SCS FORT WORTH, TEX. 1967

ENGINEERING AND DESIGN DATA

Area 2 - Big Estate - Gardens Corner - Dale

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
M-1A	2900	300	24	13	3	5	4292	2.1	38	- - -	- - -	
L-1A	4800	228	19	13	3	5	7104	3.5	38	- - -	30' - 30"	
L-2A	5300	180	15	13	3	5	7844	3.9	38	- - -	30' - 30"	
											40' - 36"	
L-1B	3000	548	40	13	3	5	4440	2.2	38	- - -	15' R.C. Br.	
M-1B	3400	1016	66	16	6	5	6936	3.1	46	- - -	- - -	
L-3A	1900	60	6	13	3	5	2812	1.4	38	- - -	- - -	
M-1C	800	1140	72	16	6	5	1632	0.7	46	- - -	- - -	
L-4A	3300	80	8	13	3	5	4884	2.4	38	- - -	30' - 18"	
											30' - 30"	
M-1D	7700	1788	106	19	9	5	19,943	8.7	55	- - -	- - -	
L-5A	7200	744	51	14	4	5	12,024	5.8	41	- - -	- - -	
L-6A	3200	152	13	13	3	5	4736	2.4	38	- - -	- - -	
L-5B	1200	924	61	15	5	5	2220	1.0	44	- - -	- - -	
L-7A	3300	124	11	13	3	5	4884	2.4	38	- - -	30' - 18"	
											30' - 30"	
L-5C	2800	1264	79	17	7	5	6216	2.8	49	- - -	40' - 48"	
L-8A	2400	228	19	13	3	5	3552	1.8	38	- - -	40' - 30"	
											30' - 42"	
L-8B	5700	496	36	13	3	5	8436	4.2	38	- - -	50' - 54"	
L-5D	1900	1892	112	20	10	5	5282	2.2	57	- - -	- - -	
M-1E	1400	3724	196	28	18	5	5964	2.3	78	- - -	30' R.C. Br.	
M-1F	2800	3856	202	30	20	5	12,964	5.0	84	- - -	- - -	
L-9A	1400	40	4	13	3	5	2072	1.0	38	- - -	- - -	
M-1G	3800	4192	216	30	20	5	17,594	6.8	84	- - -	30' R.C. Br.	
M-1H	1500	4264	218	30	20	5	6945	2.7	84	- - -	- - -	
L-10A	5400	340	26	13	3	5	7992	4.0	38	- - -	- - -	
L-11A	3800	368	28	13	3	5	5624	2.8	38	- - -	40' - 18"	
L-10B	4700	1224	77	16	6	5	9588	4.3	46	- - -	15' C.T. Br.	
L-10C	2800	1448	89	18	8	5	6748	3.0	52	- - -	- - -	
M-1I	2300	5872	286	38	28	5	14,053	-	105	- - -	- - -	
M-1J	3300	6060	294	38	28	5	20,163	-	105	- - -	45' C.T. Br.	
Total-1	94,000						216,944	82.5				115,909.00
M-2A	5300	384	29	13	3	5	7844	3.9	38	- - -	40' - 48"	
Total-2	5300						7844	3.9				4,355.20
M-3A	4300	464	34	13	3	5	6364	3.2	38	- - -	- - -	
M-3B	3200	692	48	14	4	5	5344	2.6	41	- - -	15' R.C. Br.	
M-3C	1900	732	50	14	4	5	3173	1.5	41	- - -	- - -	
Total-3	9400						14,881	7.3				8,154.30
M-4A	6200	432	33	13	3	5	9176	4.6	38	- - -	- - -	

ENGINEERING AND DESIGN DATA

Area 2 - Big Estate - Gardens Corner - Dale

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
M-4B	3500	544	39	13	3	5	5180	2.6	38	- - -	15' R.C. Br. 15' R.C. Br.	
M-4C	1800	576	41	13	3	5	2664	-	38	- - -	- - -	
Total-4	11,500						17,020	7.2				11,065.20
M-5A		240	Present	canal	as constructed is		considered	adequate		- - -	- - -	
L-1A	3900	192	16	13	3	5	5772	2.9	38	- - -	- - -	
M-5B		604	Present	canal	as constructed is		considered	adequate			15' R.C. Br.	
Total-5	3900						5772	2.9				4,101.60
M-6A	6700	392	30	13	3	5	9916	4.9	38	- - -	40' - 48" 40' - 42" 60' - 42"	
L-1A	6200	696	49	14	4	5	10,354	5.0	41	- - -	- - -	
M-6B	3400	1204	76	16	6	5	6936	3.1	46	- - -	15' C.T. Tres.	
M-6C	3000	1344	83	17	7	5	6660	-	49	- - -	15' R.C. Br.	
Total-6	19,300						23,950	8.1				21,569.80
M-7A	2000	400	61	15	5	5	3700	1.7	44	- - -	30' - 54" 50' - 54"	
M-7B	3700	656	93	18	8	5	8917	3.9	52	- - -	30' - 48" 30' - 48"	
Total-7	5700						12,617	5.6				8,593.10
M-8A	4700	184	32	13	3	5	6956	3.5	38	- - -	- - -	
Total-8	4700						6956	3.5				3,136.80
M-9A	1700	28	5	13	3	5	2516	1.2	38	- - -	- - -	
L-1A	1500	44	9	13	3	5	2220	1.1	38	- - -	- - -	
M-9B	700	82	16	13	3	5	1036	0.5	38	- - -	40' - 30"	
L-2A	3000	124	22	13	3	5	4440	2.2	38	- - -	40' - 15"	
M-9C	2000	290	46	14	4	5	3340	1.6	41	- - -	- - -	
Total-9	8900						13,552	6.6				6,597.60
M-10A	6300	284	22	13	3	5	9324	4.6	38	- - -	40' - 48"	
M-10B	2400	348	27	13	3	5	3552	-	38	- - -	- - -	
Total-10	8700						12,876	4.6				7,140.40
Area 2 Grand Total	171,400						332,412	132.2				190,623.00

ENGINEERING AND DESIGN DATA

Area 3 - Port Royal Island

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
M-1A	4700	180	31	13	3	5	6956	-	38	- - -	30' - 18"	
											30' - 24"	
Total-1	4700						6956	-				4,530.60
M-2A	2700	72	14	13	3	5	3996	-	38	- - -	40' - 24"	
											40' - 24"	
Total-2	2700						3996	-				2,981.00
M-3A	2800	140	25	13	3	5	4144	2.1	38	- - -	30' - 24"	
											30' - 30"	
											30' - 30"	
											30' - 36"	
L-1A	1700	36	13	13	3	5	2516	1.2	38	- - -	30' - 18"	
M-3B	2900	224	37	13	3	5	4292	2.1	38	- - -	30' - 36"	
Total-3	7400						10,952	5.4				6,714.60
M-4A	2900	172	30	13	3	5	4292	2.1	38	- - -	30' - 24"	
											30' - 36"	
Total-4	2900						4292	2.1				2,556.60
M-5A	4300	160	28	13	3	5	6364	3.2	38		40' - 36"	
L-1A	1700	40	13	13	3	5	2516	1.2	38	40' - 18"	- - -	
M-5B	2800	240	40	13	3	5	4144	2.1	38	- - -	- - -	
Total-5	8800						13,024	6.5				6,509.20
M-6A	2500	120	11	13	3	5	3700	1.8	38	- - -	40' - 24"	
											40' - 30"	
M-6B	2800	340	26	13	3	5	4144	2.1	38		40' - 30"	
Total-6	5300						7844	3.9				4,631.20
M-7A	6900	376	29	13	3	5	10,212	5.1	38	- - -	30' - 30"	
											30' - 42"	
											40' - 54"	
											40' - 54"	
											40' - 48"	
M-7B	3100	448	33	13	3	5	4588	2.3	38	- - -	40' - 48"	
Total-7	10,000						14,800	7.4				11,014.00

USDA-SCS FORT WORTH, TEX. 1967

ENGINEERING AND DESIGN DATA

Area 3 - Port Royal Island

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
M-8A	4800	196	17	13	3	5	7104	3.5	38	- - -	40' - 18" 40' - 18" 40' - 36" 40' - 36"	
Total-8	4800						7104	3.5				4,669.20
M-9A	4400	360	27	13	3	5	6512	3.2	38	- - -	- - -	
M-9B	7000	688	48	15	5	5	12,950	6.1	44	- - -	- - -	
L-1A	6900	396	30	13	3	5	10,212	5.1	38	- - -	- - -	
L-2A	1200	64	7	13	3	5	1776	0.9	38	- - -	- - -	
L-1B	2000	524	38	13	3	5	2960	1,5	38	- - -	15' C.T. Br.	
M-9C	2600	1352	84	18	8	5	6266	2.7	52	- - -	- - -	
M-9D	2200	1700	101	20	10	5	6116	2.6	57		30' R.C. Br. 30' R.C. Br.	
Total-9	26,300						46,792	22.1				27,417.60
M-10A		380	Present canal as constructed is considered adequate							- - -	- - -	
M-10B	6100	772	105	16	6	5	12,444	5.6	46	- - -	40' - 48" 50' - 24" 50' - 30"	
M-10C	6000	1188	152	20	10	5	16,680	7.0	57	- - -	50' - 36"	
Total-10	12,100						29,124	12.6				14,924.20
M-11A	3000	108	20	13	3	5	4440	2.2	38	- - -	40' - 24" 40' - 30"	
M-11B	5400	300	48	13	3	5	7992	4.0	38	- - -	- - -	
Total-11	8400						12,432	6.2				6,289.60
M-12A	4000	208	35	13	3	5	5920	2.9	38	- - -	- - -	
L-1A	1400	72	14	13	3	5	2072	1.0	38	- - -	- - -	
M-12B	1100	540	78	15	5	5	2035	1.0	44	- - -	40' - 42"	
M-12C	6600	1028	134	18	8	5	15,906	7.0	52	- - -	40' - 48"	
M-12D	1600	1224	155	20	10	5	4448	-	57	- - -	- - -	
Total-12	14,700						30,381	11.9				15,522.70
M-13A	3800	300	48	14	4	5	6346	3.1	41	- - -	40' - 48"	
L-1A	1900	280	45	14	4	5	3173	1.5	41	- - -	- - -	
M-13B	3600	912	121	22	12	5	11,340	4.6	62	- - -	- - -	
L-2A	5600	248	41	13	3	5	8288	4.1	38	- - -	40' - 24"	
M-13C	5800	2056	238	36	26	5	33,292	12.4	99	- - -	30' R.C. Br.	
Total-13	20,700						62,439	25.7				30,565.70

ENGINEERING AND DESIGN DATA

Area 3 - Port Royal Island

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
M-14A	4800	128	23	13	3	5	7104	3.5	38	- - -	40' - 18"	
Total-14	4800						7104	3.5				3,365.20
M-15A	4400	188	32	13	3	5	6512	3.2	38	- - -	- - -	
Total-15	4400						6512	3.2				2,913.60
M-16A	4800	332	52	15	5	5	8880	4.2	44	- - -	40' - 24"	
M-16B	2400	496	73	17	7	5	5328	2.4	49	- - -	- - -	
Total-16	7200						14,208	6.6				6,534.40
M-17A	3300	236	39	13	3	5	4884	2.4	38	- - -	60' - 18"	
											30' - 30"	
L-1A	2100	64	13	13	3	5	3108	1.5	38	- - -	- - -	
M-17B	3100	428	64	16	6	5	6324	2.8	46	- - -	40' - 42"	
Total-17	8500						14,316	6.7				7,558.80
M-18A	3000	188	32	13	3	5	4440	2.2	38	- - -	30' - 42"	
M-18B	2300	496	72	14	4	5	3841	1.9	41	- - -	- - -	
M-18C	2500	556	80	15	5	5	4625	-	44	- - -	- - -	
Total-18	7800						12,906	4.1				6,993.30
M-19A	2800	70	14	13	3	5	4144	2.1	38	- - -	40' - 24"	
											40' - 24"	
											40' - 24"	
											40' - 24"	
L-1A	3500	132	32	13	3	5	5180	2.6	38	40' - 36"	40' - 24"	
M-19B	1000	262	55	15	5	5	1850	0.9	44	- - -	40' - 42"	
L-2A	1700	112	28	13	3	5	2516	1.2	38	- - -	30' - 18"	
											70' - 18"	
M-19C	2400	434	85	18	8	5	5784	-	52	- - -	40' - 48"	
											40' - 42"	
Total-19	11,400						19,474	6.8				13,993.40
M-20A	3900	316	49	15	5	5	7215	3.4	44	- - -	60' - 30"	
											40' - 30"	
L-1A	2300	224	37	13	3	5	3404	1.7	38	- - -	30' - 24"	
M-20B	1200	592	85	18	8	5	2892	1.3	52	- - -	40' - 48"	
M-20C	3500	1084	139	24	14	5	12,320	5.0	68	- - -	30' R.C. Br.	
M-20D	2100	1148	145	26	16	5	8169	-	73	- - -	30' R.C. Br.	
Total-20	13,000						34,000	8.0				24,141.70

ENGINEERING AND DESIGN DATA

Area 3 - Port Royal Island

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
M-21A	2300	112	28	13	3	5	3404	1.7	38	- - -	40' - 36" 40' - 42"	
L-1A	1200	28	(1200 ft. Storm drain necessary - detailed surveys required to determine grade, depth, and size)									
M-21B	250	148	(250 ft. Storm drain in place - detailed surveys required to determine grade, depth, and size)									
Total-21	3750						3404	1.7				4,124.40
M-22A	600	44	12	13	3	5	888	0.4	38	- - -	40' - 30"	
M-22B	2600	140	32	13	3	5	3848	1.9	38	- - -	40' - 36"	
M-22C	700	158	37	13	3	5	1036	0.5	38	- - -	- - -	
Total-22	3900						5772	2.8				5,831.20
M-23A	1500	44	12	13	3	5	2220	1.1	38	- - -	40' - 18" 40' - 30"	
M-23B	3600	120	29	13	3	5	5328	2.6	38	- - -	40' - 36"	
L-1A	4600	180	41	13	3	5	6808	3.4	38	40' - 30"	40' - 24"	
M-23C	1600	384	77	16	6	5	3264	1.5	46	- - -	40' - 42" 60' - 42"	
Total-23	11,300						17,620	8.6				18,068.00
M-24A	2300	256	55	15	5	5	4255	2.0	44	- - -	20' - 24" 40' - 24"	
M-24B	1600	320	66	16	6	5	3264	1.5	46	- - -	60' - 48"	
Total-24	3900						7519	3.5				7,947.40
M-25A		184	Present canal as constructed is considered adequate							- - -	40' - 36"	
M-25B		292	Present canal as constructed is considered adequate							- - -	- - -	
Total-25	- - -						- - -	-				560.00
Area 3 Grand Total	208,750						392,971	162.8				240,357.60

USDA SCS FT. WORTH, TEX. 1957

ENGINEERING AND DESIGN DATA

Area 4 - Ladies Island - St. Helena Island

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
M-1A	2000	56	15	13	3	5	2960	1.5	38	- - -	- - -	
L-1A	900	16	6	13	3	5	1332	0.7	38	- - -	30' - 18"	
L-2A	1100	44	12	13	3	5	1628	0.8	38	- - -	- - -	
M-1B	1700	172	39	13	3	5	2516	1.2	38	- - -	30' - 36"	
Total-1	5700						8436	4.2				6,724.80
M-2A	2500	80	21	13	3	5	3700	1.8	38	- - -	50' - 24"	
M-2B	2400	124	29	13	3	5	3552	1.8	38		40' - 24"	
											30' - 30"	
Total-2	4900						7252	3.6				7,114.20
M-3A	1300	32	9	13	3	5	1924	1.0	38	- - -	30' - 18"	
L-1A	1200	24	7	13	3	5	1776	0.9	38		30' - 18"	
M-3B	500	66	17	13	3	5	740	0.4	38		40' - 24"	
Total-3	3000						4440	2.3				4,382.00
M-4A	1100	16	6	13	3	5	1628	0.8	38	- - -	- - -	
L-1A	700	16	6	13	3	5	1036	0.5	38	- - -	- - -	
M-4B	1900	72	18	13	3	5	2812	1.4	38	- - -	30' - 24"	
											30' - 24"	
											30' - 30"	
											40' - 30"	
Total-4	3700						5476	2.7				5,787.60
M-5A	1200	32	7	13	3	5	1776	0.9	38	- - -	40' - 18"	
Total-5	1200						1776	0.9				986.80
M-6A	1200	40	8	13	3	5	1776	0.9	38	- - -	- - -	
L-1A	700	12	3	13	3	5	1036	0.5	38	- - -	- - -	
M-6B	2000	80	16	13	3	5	2960	1.5	38	- - -	40' - 24"	
Total-6	3900						5772	2.9				2,893.60
M-7A	1100	124	22	13	3	5	1628	0.8	38	- - -	20' - 30"	
											30' - 36"	
M-7B	5600	420	63	16	6	5	11,424	5.1	46	- - -	40' - 54"	
L-1A	3900	104	19	13	3	5	5772	2.9	38	- - -	40' - 30"	
M-7C	700	548	79	18	8	5	1928	0.7	52	- - -	- - -	
Total-7	11,300						20,752	9.5				11,047.60

ENGINEERING AND DESIGN DATA

Area 4 - Ladies Island - St. Helena Island

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
M-8A	1600	72	7	13	3	5	2368	1.2	38	- - -	- - -	
L-1A	1000	24	3	13	3	5	1480	0.7	38	- - -	- - -	
M-8B	1100	116	11	13	3	5	1628	0.8	38	- - -	- - -	
Total-8	3700						5476	2.7				2,452.80
M-9A	3100	104	10	13	3	5	4588	2.3	38	- - -	- - -	
Total-9	3100						4588	2.3				2,066.40
M-10A	3000	212	37	13	3	5	4440	2.2	38	- - -	- - -	
Total-10	3000						4440	2.2				1,992.00
M-11A	2600	100	10	13	3	5	3848	1.9	38	- - -	- - -	
L-1A	1800	40	4	13	3	5	2664	1.3	38	- - -	- - -	
L-2A	1700	48	5	13	3	5	2516	1.2	38	- - -	- - -	
L-1B	2800	156	14	13	3	5	4144	2.1	38	- - -	- - -	
L-3A	5500	224	19	13	3	5	8140	4.0	38	- - -	- - -	
M-11B	1300	496	37	13	3	5	1924	1.0	38	- - -	- - -	
L-4A	4100	144	13	13	3	5	6068	3.0	38	- - -	- - -	
M-11C	1300	700	49	14	4	5	2171	1.0	41	- - -	15' R.C. Br.	
Total-11	21,100						31,475	15.5				15,592.50
M-12A	2800	168	14	13	3	5	4144	2.1	38	- - -	40' - 36"	
M-12B	900	184	16	13	3	5	1332	0.7	38	- - -	- - -	
Total-12	3700						5476	2.8				3,042.80
M-13A	2300	80	8	13	3	5	3404	1.7	38	- - -	- - -	
Total-13	2300						3404	1.7				1,531.20
M-14A	1900	72	7	13	3	5	2812	1.4	38	- - -	40' - 18"	
											30' - 24"	
M-14B	1800	144	13	13	3	5	2664	1.3	38	- - -	- - -	
L-1A	2100	144	13	13	3	5	3108	1.5	38	- - -	40' - 30"	
M-14C	2800	432	33	13	3	5	4144	2.1	38	- - -	15' U.T. Br.	
Total-14	8600						12,728	6.3				7,019.40
M-15A	1200	36	8	13	3	5	1776	0.9	38	- - -	- - -	
L-1A	1600	56	12	13	3	5	2368	1.2	38	- - -	- - -	
L-2A	1300	36	8	13	3	5	1924	1.0	38	- - -	- - -	
M-15B	2400	248	41	13	3	5	3552	1.8	38	- - -	40' - 42"	

ENGINEERING AND DESIGN DATA

Area 4 - Ladies Island - St. Helena Island

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
Total-15	6500						9620	13.0			40' - 36"	6,142.00
M-16A	2800	84	16	13	3	5	4144	2.1	38	- - -	30' - 18"	
L-1A	2800	80	16	13	3	5	4144	2.1	38	- - -	40' - 18"	
											40' - 18"	
M-16B	1400	200	33	13	3	5	2072	1.0	38	- - -	- - -	
Total-16	7000						10,360	5.2				5,174.00
M-17A	2400	60	6	13	3	5	3552	1.8	38	- - -	40' - 24"	
Total-17	2400						3552	1:8				1,897.60
M-18A	1200	36	8	13	3	5	1776	0.9	38	- - -	- - -	
L-1A	900	20	4	13	3	5	1332	0.7	38	- - -	- - -	
M-18B	900	70	14	13	3	5	1332	0.7	38	- - -	- - -	
L-2A	1500	52	11	13	3	5	2220	1.1	38	- - -	- - -	
M-18C	600	128	23	13	3	5	888	0.4	38	- - -	- - -	
M-18D		152	Present canal as constructed is considered adequate									
Total-18	5100						7548	3.8				3,404.40
M-19A	2800	112	21	13	3	5	4144	2.1	38	- - -	- - -	
L-1A	1300	14	3	13	3	5	1924	1.0	38	- - -	- - -	
M-19B	1100	142	25	13	3	5	1628	0.8	38	- - -	- - -	
Total-19	5200						7696	3.9				3,478.80
M-20A	3700	140	13	13	3	5	5476	2.7	38	- - -	- - -	
Total-20	3700						5476	2.7				2,452.80
M-21A	3700	164	14	13	3	5	5476	2.7	38	- - -	- - -	
Total-21	3700						5476	2.7				2,452.80
M-22A	4900	236	19	13	3	5	7252	3.6	38	- - -	30' - 42"	
M-22B	900	284	22	13	3	5	1332	0.7	38	- - -	- - -	
Total-22	5800						8584	4.3				4,369.20
M-23A	2800	92	9	13	3	5	4144	2.1	38	- - -	30' - 30"	
M-23B	2300	168	14	13	3	5	3404	1.7	38	- - -	- - -	
L-1A	800	88	9	13	3	5	1184	0.6	38	- - -	30' - 30"	
L-1B	3200	184	16	13	3	5	4736	2.4	38	- - -	- - -	

ENGINEERING AND DESIGN DATA

Area 4 - Ladies Island - St. Helena Island

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
M-23C	2900	488	71	14	4	5	4843	2.3	41	- - -	15' U.T. Br.	
Total-23	12,000						18,311	9.1				9,335.30
M-24A	2400	52	11	13	3	5	3552	1.8	38	30' - 15"	- - -	
Total-24	2400						3552	1.8				1,713.60
M-25A	900	36	8	13	3	5	1332	0.7	38	- - -	40' - 18"	
M-25B	2000	76	15	13	3	5	2960	1.5	38	- - -	- - -	
Total-25	2900						4292	2.2				2,131.60
M-26A	1000	52	11	13	3	5	1480	0.7	38	- - -	- - -	
L-1A	900	24	6	13	3	5	1332	0.7	38	- - -	40' - 18"	
M-26B	700	84	16	13	3	5	1036	0.5	38	- - -	- - -	
Total-26	2600						3848	1.9				1,908.40
M-27A	1600	40	8	13	3	5	2368	1.2	38	- - -	30' - 18"	
Total-27	1600						2368	1.2				1,208.40
M-28A	600	24	6	13	3	5	888	0.4	38	- - -	- - -	
L-1A	1200	36	8	13	3	5	1776	0.9	38	- - -	- - -	
M-28B	2700	124	22	13	3	5	3996	2.0	38	- - -	- - -	
Total-28	4500						6660	3.3				2,988.00
M-29A	700	14	3	13	3	5	1036	0.5	38	- - -	- - -	
L-1A	1000	22	4	13	3	5	1480	0.7	38	- - -	- - -	
M-29B	700	44	9	13	3	5	1036	0.5	38	- - -	- - -	
L-2A	1600	24	6	13	3	5	2368	1.2	38	20' - 18"	- - -	
										50' - 18"	- - -	
M-29C	900	80	16	13	3	5	1332	0.7	38	- - -	40' - 18"	
Total-29	4900						7252	3.6				3,761.60
M-30A	1700	38	4	13	3	5	2516	1.2	38	- - -	30' - 18"	
Total-30	1700						2516	1.2				1,252.80
M-31A	2200	50	5	13	3	5	3256	1.6	38	- - -	30' - 18"	
											30' - 18"	
											30' - 18"	
Total-31	2200						3256	1.6				1,870.80

ENGINEERING AND DESIGN DATA

Area 4 - Ladies Island - St. Helena Island

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
M-32A	1800	36	4	13	3	5	2664	1.3	38	- - -	30' - 18" 50' - 18"	
Total-32	1800						2664	1.3				1,557.20
M-33A	1300	26	3	13	3	5	1924	1.0	38	- - -	30' - 18"	
Total-33	1300						1924	1.0				1,015.20
M-34A	1500	26	6	13	3	5	2220	-	38	- - -	- - -	
Total-34	1500						2220	-				1,332.00
M-35A	1600	24	6	13	3	5	2368	1.2	38	- - -	- - -	
L-1A	1000	28	6	13	3	5	1480	0.7	38	- - -	- - -	
M-35B	300	54	11	13	3	5	444	0.2	38	- - -	- - -	
Total-35	2900						4292	2.1				1,917.60
M-36A	1700	40	8	13	3	5	2516	1.2	38	- - -	- - -	
Total-36	1700						2516	1.2				1,114.80
M-37A	3600	80	16	13	3	5	5328	2.6	38	- - -	50' - 18"	
Total-37	3600						5328	2.6				2,608.40
M-38A	1600	52	11	13	3	5	2368	1.2	38	- - -	- - -	
Total-38	1600						2368	1.2				1,070.40
M-39A	1400	32	7	13	3	5	2072	1.0	38	- - -	- - -	
L-1A	1300	24	6	13	3	5	1924	1.0	38	- - -	- - -	
L-2A	1400	16	4	13	3	5	2072	1.0	38	- - -	- - -	
L-1B	900	62	13	13	3	5	1332	0.7	38	- - -	- - -	
M-39B	600	106	20	13	3	5	888	0.4	38	- - -	- - -	
Total-39	5600						8288	4.1				3,716.40
M-40A	2200	76	15	13	3	5	3256	1.6	38	- - -	- - -	
Total-40	2200						3256	1.6				1,456.80
M-41A	1600	36	8	13	3	5	2368	1.2	38	- - -	- - -	
Total-41	1600						2368	1.2				1,070.40

ENGINEERING AND DESIGN DATA

Area 4 - Ladies Island - St. Helena Island

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
M-42A	1200	20	4	13	3	5	1776	0.9	38	- - -	40' - 18"	
Total-42	1200						1776	0.9				986.80
M-43A	1200	20	2	13	3	5	1776	0.9	38	- - -	- - -	
L-1A	800	28	3	13	3	5	1184	0.6	38	- - -	- - -	
M-43B	1700	84	8	13	3	5	2516	1.2	38	- - -	- - -	
Total-43	3700						5476	2.7				2,452.80
M-44A	1500	48	5	13	3	5	2220	1.1	38	- - -	40' - 24"	
Total-44	1500						2220	1.1				1,288.00
M-45A	2500	200	17	13	3	5	3700	1.8	38	- - -	- - -	
L-1A	4200	220	18	13	3	5	6216	3.1	38	- - -	- - -	
M-45B	1500	496	37	13	3	5	2220	1.1	38	- - -	- - -	
L-2A	5000	180	15	13	3	5	8350	3.7	38	40' - 30"	- - -	
M-45C	800	672	47	14	4	5	1336	0.6	41	- - -	- - -	
Total-45	14,000						21,822	10.3				9,840.60
M-46A	1300	48	5	13	3	5	1924	1.0	38	- - -	- - -	
M-46B	3800	160	14	13	3	5	5624	2.8	38	- - -	40' - 36"	
Total-46	5100						7548	3.8				3,964.40
M-47A	4400	224	19	13	3	5	6512	3.2	38	40' - 24"	- - -	
L-1A	2200	84	8	13	3	5	3256	1.6	38	- - -	- - -	
M-47B	2900	392	30	13	3	5	4292	2.1	38	- - -	40' - 54"	
L-2A		216	Present canal as constructed is considered adequate							- - -	- - -	
M-47C		784	Present canal as constructed is considered adequate							- - -	40' - 36"	
Total-47	9500						14,060	6.9				7,934.00
M-48A	1900	52	11	13	3	5	2812	1.4	38	- - -	- - -	
L-1A	1600	24	6	13	3	5	2368	1.2	38	- - -	- - -	
L-2A	2700	84	16	13	3	5	3996	2.0	38	- - -	- - -	
M-48B	2800	224	37	13	3	5	4144	2.1	38	- - -	40' - 42"	
M-48C		280	Present canal as constructed is considered adequate							- - -	- - -	
L-3A		168	Present canal as constructed is considered adequate							- - -	- - -	
M-48D		454	Present canal as constructed is considered adequate							- - -	- - -	
Total-48	9000						13,320	6.7				6,678.00

ENGINEERING AND DESIGN DATA

Area 4 - Ladies Island - St. Helena Island

4-29142

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
M-49A	2200	148	26	13	3	5	3256	1.6	38	- - -	40' - 36"	
M-49B	3100	308	49	15	5	5	5735	2.7	44	- - -	40' - 36"	
M-49C		392	Present canal as constructed is considered adequate							- - -	- - -	
Total-49	5300						8991	4.3				5,107.30
M-50A	5000	184	32	13	3	5	7400	3.7	38	- - -	- - -	
L-1A	900	16	4	13	3	5	1332	0.7	38	- - -	- - -	
M-50B	2600	344	54	15	5	5	4810	2.3	44	- - -	40' - 36"	
Total-50	8500						13,542	6.7				6,632.60
M-51A	1700	36	4	13	3	5	2516	1.2	38	- - -	- - -	
L-1A	2100	32	4	13	3	5	3108	1.5	38	- - -	- - -	
L-2A	1400	40	4	13	3	5	2072	1.0	38	- - -	- - -	
M-51B	2400	168	14	13	3	5	3552	1.8	38	- - -	40' - 30"	
Total-51	7600						11,248	5.5				5,432.40
M-52A	2100	112	21	13	3	5	3108	1.5	38	- - -	40' - 30"	
M-52B	1300	132	24	13	3	5	1924	1.0	38	- - -	- - -	
M-52C		148	Present canal as constructed is considered adequate							- - -	- - -	
Total-52	3400						5032	2.5				2,667.60
M-53A	2300	152	27	13	3	5	3404	1.7	38	- - -	30' - 30"	
M-53B	3700	400	61	16	6	5	7548	-	46	- - -	40' - 30"	
Total-53	6000						10,952	1.7				6,774.00
M-54A	2000	64	13	13	3	5	2960	1.5	38	- - -	30' - 24"	
M-54B	4300	276	44	14	4	5	7181	3.5	41	- - -	40' - 42"	
L-1A		124	Present canal as constructed is considered adequate							- - -	- - -	
M-54C		652	Present canal as constructed is considered adequate							- - -	- - -	
L-2A	4200	232	38	13	3	5	6216	3.1	38	- - -	40' - 42"	
L-2B	4600	344	54	13	3	5	6808	3.4	38	- - -	15' U.T. Br.	
M-54D		1108	Present canal as constructed is considered adequate							- - -	- - -	
Total-54	15,100						23,165	11.5				11,790.50
M-55A	2500	36	6	13	3	5	3700	1.8	38	- - -	- - -	
L-1A	1700	20	4	13	3	5	2516	1.2	38	- - -	- - -	
L-2A	1000	20	4	13	3	5	1480	0.7	38	- - -	- - -	
M-55B	600	84	16	13	3	5	888	0.7	38	- - -	- - -	
Total-55	5800						8584	4.4				3,895.20

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ENGINEERING AND DESIGN DATA

Area 4 - Ladies Island - St. Helena Island

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
M-56A	1000	28	6	13	3	5	1480	0.7	38	- - -	- - -	
L-1A	1600	20	4	13	3	5	2368	1.2	38	- - -	- - -	
M-56B	2300	132	24	13	3	5	3404	1.7	38	- - -	- - -	
Total-56	4900						7252	3.6				3,255.60
M-57A	1200	84	16	13	3	5	1776	0.9	38	- - -	- - -	
L-1A	1400	56	12	13	3	5	2072	1.0	38	- - -	- - -	
M-57B	500	160	28	13	3	5	740	0.4	38	- - -	40' - 24"	
L-2A	1700	24	4	13	3	5	2516	1.2	38	- - -	- - -	
M-57C	500	192	33	13	3	5	740	0.4	38	- - -	40' - 24"	
L-3A	4000	136	24	13	3	5	5920	2.9	38	- - -	40' - 30"	
M-57D	1100	350	54	15	5	5	2035	1.0	44	- - -	- - -	
L-4A	2300	52	11	13	3	5	3404	1.7	38	- - -	- - -	
M-57E	300	406	61	16	6	5	612	0.3	46	- - -	- - -	
L-5A	2700	28	6	13	3	5	3996	2.0	38	- - -	- - -	
L-6A	2600	36	8	13	3	5	3848	-	38	- - -	- - -	
M-57F	500	476	70	17	7	5	1110	0.5	49	- - -	- - -	
Total-57	18,800						28,769	12.3				13,692.70
M-58A	3800	100	19	13	3	5	5624	2.8	38	- - -	- - -	
L-1A	1600	40	8	13	3	5	2368	1.2	38	- - -	- - -	
M-58B	800	168	29	13	3	5	1184	0.6	38	- - -	- - -	
L-2A	1000	20	4	13	3	5	1480	0.7	38	- - -	- - -	
M-58C	1500	204	35	13	3	5	2220	1.1	38	- - -	- - -	
Total-58	8700						12,876	6.4				5,782.80
M-59A	4200	228	38	13	3	5	6216	3.1	38	- - -	- - -	
L-1A	3200	196	33	13	3	5	4736	2.4	38	- - -	- - -	
M-59B	3700	508	74	14	4	5	6179	3.0	41	- - -	15' C.T. Br.	
Total-59	11,100						17,131	8.5				8,439.30
M-60A	2500	36	8	13	3	5	3700	1.8	38	- - -	- - -	
Total-60	2500						3700	1.8				1,650.00
M-61A	2800	38	8	13	3	5	4144	2.1	38	- - -	30' - 15"	
Total-61	2800						4144	2.1				1,981.20
M-62A	700	20	4	13	3	5	1036	0.5	38	- - -	- - -	
L-1A	1500	34	7	13	3	5	2220	1.1	38	- - -	40' - 15"	
M-62B	1700	86	16	13	3	5	2516	1.2	38	- - -	30' - 30"	

ENGINEERING AND DESIGN DATA

Area 4 - Ladies Island - St. Helena Island

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
M-62C	3700	158	28	13	3	5	5476	2.7	38	- - -	40' - 42"	
M-62D	1100	198	33	13	3	5	1628	0.8	38	- - -	40' - 36"	
Total-62	8700						12,876	6.3				7,434.80
M-63A	1300	36	8	13	3	5	1924	1.0	38	- - -	- - -	
Total-63	1300						1924	1.0				877.20
M-64A	2400	80	8	13	3	5	3552	1.8	38	- - -	- - -	
Total-64	2400						3552	1.8				1,605.60
M-65A	2500	92	9	13	3	5	3700	1.8	38	- - -	40' - 24"	
Total-65	2500						3700	1.8				1,942.00
M-66A	2100	48	11	13	3	5	3108	1.5	38	- - -	- - -	
Total-66	2100						3108	1.5				1,382.40
M-67A	3300	112	21	13	3	5	4884	2.4	38	- - -	- - -	
M-67B	2900	188	32	13	3	5	4292	2.1	38	- - -	- - -	
L-1A	1100	36	8	13	3	5	1628	0.8	38	- - -	- - -	
M-67C	2600	300	48	15	5	5	4810	2.3	44	50' - 24"	- - -	
										30' - 36"	- - -	
Total-67	9900						15,614	7.6				7,749.20
M-68A	1600	48	11	13	3	5	2368	1.2	38	- - -	- - -	
Total-68	1600						2368	1.2				1,070.40
M-69A	6700	192	33	13	3	5	9916	4.9	38	- - -	30' - 36"	
L-1A	4700	236	39	13	3	5	6956	3.5	38	- - -	40' - 24"	
											30' - 36"	
L-1B	1700	272	44	14	4	5	2839	1.4	41	- - -	50' - 42"	
M-69B	1400	544	79	18	8	5	3374	1.5	52	- - -	50' - 42"	
Total-69	14,500						23,085	11.3				13,127.50
M-70A	2000	60	12	13	3	5	2960	1.5	38	- - -	- - -	
L-1A	1500	40	8	13	3	5	2220	1.1	38	- - -	- - -	
M-70B	1700	122	22	13	3	5	2516	1.2	38	- - -	- - -	
Total-70	5200						7696	3.8				3,448.80

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ENGINEERING AND DESIGN DATA

Area 4 - Ladies Island - St. Helena Island

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
M-71A	700	6	1	13	3	5	1036	0.5	38	- - -	- - -	
L-1A	1400	20	4	13	3	5	2072	1.0	38	- - -	- - -	
M-71B	300	29	7	13	3	5	444	0.2	38	- - -	- - -	
L-2A	1600	14	3	13	3	5	2368	1.2	38	- - -	- - -	
M-71C	500	45	9	13	3	5	740	0.4	38	- - -	- - -	
Total-71	4500						6660	3.3				2,988.00
M-72A	1400	52	11	13	3	5	2072	1.0	38	- - -	- - -	
L-1A	2300	72	14	13	3	5	3404	1.7	38	- - -	30' - 30"	
M-72B	1100	140	25	13	3	5	1628	0.8	38	- - -	- - -	
L-2A	2600	60	12	13	3	5	3848	1.9	38	- - -	30' - 24"	
M-72C	1200	248	41	14	4	5	2004	1.0	41	- - -	30' - 36"	
Total-72	8600						12,956	6.4				6,751.80
M-73A	3900	84	16	13	3	5	5772	2.9	38	- - -	30' - 24"	
Total-73	3900						5772	2.9				2,820.60
M-74A	2200	32	7	13	3	5	3256	1.6	38	- - -	30' - 18"	
Total-74	2200						3256	1.6				1,694.80
M-75A	1100	12	3	13	3	5	1628	0.8	38	- - -	- - -	
L-1A	1300	24	6	13	3	5	1924	1.0	38	- - -	- - -	
M-75B	1500	80	16	13	3	5	2220	1.1	38	- - -	20' - 18"	
M-75C	2200	124	22	13	3	5	3256	1.6	38	- - -	30' - 30" 20' - 36"	
Total-75	6100						9028	4.5				4,736.40
M-76A	1500	28	6	13	3	5	2220	1.1	38	- - -	- - -	
Total-76	1500						2220	1.1				996.00
Area-4 Grand Total	396,700						602,505	299.0				313,906.30

ENGINEERING AND DESIGN DATA

Area 5 - Camp St. Mary - Okatie - Pinckney Colony - Victora Port

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	BOTTOM WIDTH Ft. (6)	AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
M-1A	3800	100	2	13	3	5	5624	2.8	38	- - -	20' - 24"	
L-1A	4800	152	3	13	3	5	7104	3.5	38	- - -	- - -	
M-1B	800	268	5	13	3	5	1184	0.6	38	- - -	- - -	
Total-1	9400						13,912	6.9				6,389.60
M-2A	2500	108	2	13	3	5	3700	1.8	38	- - -	30' - 30"	
Total-2	2500						3700	1.8				1,956.00
M-3A	4500	160	2	13	3	5	6660	3.3	38	- - -	30' - 24"	
Total-3	4500						6660	3.3				3,207.00
M-4A	1200	100	2	13	3	5	1776	0.9	38	- - -	30' - 30"	
											30' - 30"	
M-4B	1500	136	3	13	3	5	2220	1.1	38	- - -	- - -	
Total-4	2700						3996	2.0				2,410.80
M-5A	1000	36	1	13	3	5	1480	0.7	38	- - -	- - -	
L-1A	3900	176	3	13	3	5	5772	2.9	38	- - -	- - -	
M-5B	900	232	4	13	3	5	1332	0.7	38	- - -	- - -	
L-2A	3800	120	2	13	3	5	5624	2.8	38	- - -	- - -	
M-5C	1200	376	6	13	3	5	1776	0.9	38	- - -	30' - 54"	
Total-5	10,800						15,984	8.0				7,900.20
M-6A	1900	88	2	13	3	5	2812	1.4	38	- - -	30' - 24"	
Total-6	1900						2812	1.4				1,482.60
M-7A	1800	88	2	13	3	5	2664	1.3	38	- - -	30' - 24"	
											30' - 30"	
M-7B	1900	124	2	13	3	5	2812	1.4	38	- - -	- - -	
Total-7	3700						5476	2.7				2,977.80
M-8A	2100	72	2	13	3	5	3108	1.5	38	40' - 24"	- - -	
Total-8	2100						3108	1.5				1,674.40
M-9A	4100	312	5	13	3	5	6068	3.0	38	- - -	40' - 36"	
M-9B	3500	456	8	13	3	5	5180	2.6	38	- - -	- - -	
Total-9	7600						11,248	5.6				5,614.40

ENGINEERING AND DESIGN DATA

Area 5 - Camp St. Mary - Okatie - Pinckney Colony - Victora Port

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
M-10A	5100	304	5	13	3	5	7548	3.7	38	- - -	- - -	
L-1A	3900	188	4	13	3	5	5772	2.9	38	- - -	- - -	
M-10B	4000	728	11	13	3	5	5920	2.9	38	- - -	40' - 42"	
Total-10	13,000						19,240	9.5				9,294.00
M-11A	6700	232	4	13	3	5	9916	4.9	38	- - -	- - -	
Total-11	6700						9916	4.9				4,444.80
M-12A	3000	160	14	13	3	5	4440	2.2	38	- - -	40' - 24"	
M-12B	1800	248	20	13	3	5	2664	1.3	38	- - -	- - -	
L-1A	2800	104	10	13	3	5	4144	2.1	38	- - -	40' - 30"	
M-12C	3200	656	46	13	3	5	4736	2.4	38	- - -	- - -	
Total-12	10,800						15,984	8.0				7,895.20
M-13A	3700	512	37	13	3	5	5476	2.7	38	- - -	- - -	
M-13B	3200	824	55	14	4	5	5344	2.6	41	- - -	15' R.C. Br.	
M-13C	2600	912	60	15	5	5	4810	2.3	44	- - -	- - -	
Total-13	9500						15,630	7.6				8,469.00
M-14A	2000	80	8	13	3	5	2960	1.5	38	- - -	30' - 30"	
M-14B	5000	288	23	13	3	5	7400	3.7	38	- - -	- - -	
Total-14	7000						10,360	5.2				4,974.00
M-15A	2500	296	23	13	3	5	3700	1.8	38	- - -	- - -	
L-1A	3700	200	17	13	3	5	5476	2.7	38	- - -	- - -	
L-1B	1300	260	21	13	3	5	1924	1.0	38	- - -	40' - 42"	
M-15B	4700	992	65	16	6	5	9588	4.3	46	- - -	15' R.C. Br.	
M-15C	8000	1596	97	18	8	5	19,280	8.4	52	- - -	- - -	
Total-15	20,200						39,968	18.2				19,622.40
M-16A	3700	420	32	13	3	5	5476	2.7	38	- - -	40' - 54"	
M-16B	5700	756	52	14	4	5	9519	4.6	41	- - -	- - -	
Total-16	9400						14,995	7.3				7,628.50
M-17A	2100	224	19	13	3	5	3108	1.5	38	- - -	40' - 24"	
M-17B	2900	348	27	13	3	5	4292	2.1	38	- - -	40' - 42"	
M-17C	1300	540	39	13	3	5	1924	1.0	38	- - -	- - -	
Total-17	6300						9324	4.6				5,141.20

4-29142

ENGINEERING AND DESIGN DATA

Area 5 - Camp St. Mary - Okatie - Pinckney Colony - Victora Port

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
M-18A	2300	212	18	13	3	5	3404	1.7	38	- - -	40' - 24"	
M-18B	4800	414	33	13	3	5	7104	3.5	38	- - -	- - -	
M-18C	2700	540	39	13	3	5	3996	2.0	38	- - -	- - -	
L-1A	1100	36	4	13	3	5	1628	0.8	38	- - -	- - -	
L-2A	2700	112	11	13	3	5	3996	2.0	38	- - -	- - -	
L-1B	2000	332	26	13	3	5	2960	1.5	38	- - -	- - -	
M-18D	1100	1064	69	16	6	5	2244	1.0	46	- - -	- - -	
Total-18	16,700						25,332	12.5				11,641.60
M-19A	2900	260	21	13	3	5	4292	2.1	38	- - -	30' - 48"	
M-19B	1500	336	27	13	3	5	2220	1.1	38	- - -	- - -	
L-1A	3800	368	28	13	3	5	5624	2.8	38	- - -	- - -	
M-19C	2000	760	48	14	4	5	3340	1.6	41	- - -	- - -	
L-2A	2400	196	17	13	3	5	3552	1.8	38	- - -	- - -	
M-19D	2100	1016	66	16	6	5	4284	1.9	46	- - -	15' U.T. Br.	
M-19E	1300	1144	73	17	7	5	2886	1.3	49	- - -	15' U.T. Br.	
M-19F	6800	1556	95	19	9	5	17,612	7.6	55	- - -	15' U.T. Br.	
L-3A	3500	140	13	13	3	5	5180	2.6	38	- - -	30' - 30"	
M-19G	5900	2068	120	17	7	5	13,098	5.8	49	- - -	- - -	
L-4A	4500	196	17	13	3	5	6660	3.3	38	- - -	30' - 18"	
L-5A	3300	136	12	13	3	5	4884	2.4	38	- - -	30' - 30"	
L-4B	1300	396	30	13	3	5	1924	1.0	38	- - -	- - -	
M-19H	3800	2740	152	19	9	5	9842	4.3	55	- - -	- - -	
Total-19	45,100						8: 398	39.6				42,373.40
M-20A	3800	588	9	13	3	5	5624	2.8	38	- - -	- - -	
M-20B	1800	720	11	13	3	5	2664	1.3	38	- - -	15' U.T. Br.	
L-1A	3700	244	4	13	3	5	5476	2.7	38	- - -	30' - 30"	
M-20C	3500	1316	18	13	3	5	5180	2.6	38	- - -	- - -	
L-2A	3500	200	4	13	3	5	5180	2.6	38	- - -	20' - 24" 20' - 36"	
L-3A	4500	328	6	13	3	5	6660	3.3	38	- - -	20' - 54"	
L-2B	3000	744	11	13	3	5	4440	2.2	38	- - -	- - -	
M-20D	2000	2160	28	13	3	5	2960	1.5	38	- - -	- - -	
L-4A	8000	320	6	13	3	5	11,840	5.9	38	- - -	- - -	
M-20E	2200	2580	32	13	3	5	3256	1.6	38	- - -	- - -	
L-5A	6400	280	5	13	3	5	9472	4.7	38	- - -	30' - 54"	
L-5B	3000	412	7	13	3	5	4440	2.2	38	- - -	15' U.T. Br.	
L-5C	3300	516	8	13	3	5	4884	2.4	38	- - -	- - -	
M-20F	3300	3200	39	13	3	5	4884	2.4	38	- - -	- - -	
Total-20	52,000						76,960	26.2				37,455.00

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ENGINEERING AND DESIGN DATA

Area 5 - Camp St. Mary - Okatie - Pinckney Colony - Victora Port

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
M-21A	2000	132	3	13	3	5	2960	1.5	38	- - -	30' - 30"	
L-1A	2200	236	4	13	3	5	3256	1.6	38	- - -	- - -	
M-21B	4500	536	9	13	3	5	6660	3.3	38	- - -	- - -	
L-2A	2900	264	5	13	3	5	4292	2.1	38	- - -	30' - 48"	
L-2B	3400	492	8	13	3	5	5032	2.5	38	- - -	30' - 24"	
M-21C	2300	1184	17	13	3	5	3404	1.7	38	- - -	- - -	
Total-21	17,300						25,604	12.7				12,640.20
M-22A	1200	60	6	13	3	5	1776	0.9	38	- - -	40' - 18"	
M-22B	2400	168	15	13	3	5	3552	1.8	38	- - -	- - -	
Total-22	3600						5328	2.7				2,592.40
M-23A	2600	400	31	13	3	5	3848	1.9	38	- - -	40' - 24"	
Total-23	2600						3848	1.9				2,016.40
M-24A	3600	188	16	13	3	5	5328	2.6	38	- - -	30' - 24"	
Total-24	3600						5328	2.6				2,597.40
M-25A	1300	1544	94	18	8	5	3133	1.4	52	- - -	- - -	
L-1A	2100	140	13	13	3	5	3108	1.5	38	- - -	- - -	
M-25B	4300	1888	111	20	10	5	11,954	5.0	57	- - -	- - -	
Total-25	7700						18,195	7.9				7,828.50
M-26A	3200	304	24	13	3	5	4736	2.4	38	- - -	- - -	
L-1A	3100	84	8	13	3	5	4588	2.3	38	- - -	30' - 24"	
											30' - 30"	
M-26B	800	412	31	13	3	5	1184	0.6	38	- - -	15' U.T. Br.	
Total-26	7100						10,508	5.3				5,767.40
M-27A	1200	412	31	13	3	5	1776	0.9	38	- - -	- - -	
L-1A	6000	336	26	13	3	5	8880	4.4	38	- - -	- - -	
L-2A	1800	248	20	13	3	5	2664	1.3	38	- - -	- - -	
L-1B	1500	624	44	13	3	5	2220	1.1	38	- - -	15' R.C. Br.	
M-27B	1100	1068	69	14	4	5	1837	0.8	41	- - -	- - -	
Total-27	11,600						17,377	8.5				8,263.10
M-28A	1400	96	9	13	3	5	2072	1.0	38	- - -	40' - 24"	
M-28B	2100	208	18	13	3	5	3108	1.5	38	- - -	- - -	
Total-28	3500						5180	2.5				2,596.00

ENGINEERING AND DESIGN DATA

Area 5 - Camp St. Mary - Okatie - Pinckney Colony - Victora Port

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
Area-5 Grand Total	298,900						481,371	220.9				236,853.30

ENGINEERING AND DESIGN DATA

Area 6 - Hilton Head Island

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
M-1A	2100	108	10	13	3	5	3108	1.5	38	- - -	40' - 24"	
M-1B	700	124	11	13	3	5	1036	0.5	38	- - -	- - -	
Total-1	2800						4144	2.0				2,135.20
M-2A	1600	72	7	13	3	5	2368	1.2	38	- - -	40' - 18"	
M-2B	2000	152	13	13	3	5	2960	1.5	38	- - -	40' - 36"	
M-2C	1000	168	14	13	3	5	1480	0.7	38	- - -	- - -	
Total-2	4600						6808	3.4				3,806.40
M-3A	2100	132	12	13	3	5	3108	1.5	38	- - -	40' - 30"	
M-3B	1100	152	13	13	3	5	1628	0.8	38	- - -	- - -	
Total-3	3200						4736	2.3				2,518.80
M-4A	2000	80	8	13	3	5	2960	1.5	38	- - -	40' - 24"	
M-4B	900	112	10	13	3	5	1332	0.7	38	- - -	- - -	
Total-4	2900						4292	2.2				2,239.60
M-5A	1500	80	8	13	3	5	2220	1.1	38	- - -	- - -	
L-1A	1200	36	3	13	3	5	1776	0.9	38	- - -	- - -	
M-5B	1300	144	13	13	3	5	1924	1.0	38	- - -	40' - 30"	
Total-5	4000						5920	3.0				3,084.00
M-6A	3500	176	15	13	3	5	5180	2.6	38	- - -	- - -	
L-1A	2700	88	8	13	3	5	3996	2.0	38	- - -	- - -	
M-6B	1100	280	22	13	3	5	1628	-	38	- - -	40' - 42"	
Total-6	7300						10,804	4.6				5,781.60
M-7A	4400	504	36	13	3	5	6512	3.2	38	- - -	15' R.C. Br.	
M-7B	3700	636	45	13	3	5	5476	2.7	38	- - -	- - -	
Total-7	8100						11,988	5.9				6,866.40
M-8A	8400	676	47	14	4	5	14,028	6.7	41	- - -	- - -	
L-1A	5800	360	27	13	3	5	8584	4.3	38	- - -	- - -	
L-2A	4300	256	21	13	3	5	6364	3.2	38	- - -	- - -	
M-8B	1700	1384	86	17	7	5	3774	1.7	49	- - -	40' - 66"	
M-8C	3100	1584	96	18	8	5	7471	3.3	52	- - -	- - -	
Total-8	23,300						40,221	19.2				19,282.30

ENGINEERING AND DESIGN DATA

Area 6 - Hilton Head Island

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
M-9A	4600	296	23	13	3	5	6808	3.4	38	- - -	30' - 36"	
Total-9	4600						6808	3.4				3,482.40
M-10A	1600	308	24	13	3	5	2368	1.2	38	- - -	- - -	
L-1A	2200	100	9	13	3	5	3256	1.6	38	- - -	- - -	
M-10B	3300	556	40	13	3	5	4736	2.4	38	- - -	15' U.T. Br.	
Total-10	7100						10,360	5.2				5,168.00
M-11A	5400	272	22	13	3	5	7992	4.0	38	- - -	40' - 24"	
M-11B	2000	364	28	13	3	5	2960	1.5	38	- - -	30' - 54"	
M-11C	1600	404	30	13	3	5	2368	-	38	- - -	- - -	
Total-11	9000						13,320	5.5				6,643.00
M-12A	3200	148	13	13	3	5	4736	2.4	38	- - -	- - -	
L-1A	3700	132	12	13	3	5	5476	2.7	38	- - -	- - -	
M-12B	1300	412	31	13	3	5	1924	-	38	- - -	30' - 42"	
Total-12	8200						12,136	5.1				6,252.00
M-13A	1800	44	4	13	3	5	2664	1.3	38	- - -	- - -	
L-1A	2700	164	14	13	3	5	3996	2.0	38	- - -	40' - 36"	
L-1B	1500	224	19	13	3	5	2220	1.1	38	- - -	40' - 42"	
L-1C	1500	272	22	13	3	5	2220	1.1	38	- - -	40' - 42"	
M-13B	3500	480	35	13	3	5	5180	2.6	38	- - -	40' - 48"	
											30' - 48"	
M-13C		632	Present canal as constructed is considered adequate								40' - 54"	
Total-13	11,000						16,280	8.1				11,614.00
M-14A	1700	88	8	13	3	5	2516	1.2	38	- - -	40' - 24"	
M-14B	1800	144	13	13	3	5	2664	1.3	38	- - -	- - -	
L-1A	1500	144	13	13	3	5	2220	1.1	38	- - -	30' - 36"	
L-1B	1200	192	16	13	3	5	1776	0.9	38	- - -	- - -	
M-14C	5200	580	41	13	3	5	7696	3.8	38	- - -	40' - 54"	
Total-14	11,400						16,872	8.3				9,203.60
M-15A	5800	304	24	13	3	5	8584	4.3	38	- - -	40' - 42"	
Total-15	5800						8584	4.3				4,537.20
M-16A		500	Present canal as constructed is considered adequate							- - -	- - -	
M-16B		780	Present canal as constructed is considered adequate							- - -	20' - 42"	
											40' - 54"	

ENGINEERING AND DESIGN DATA

Area 6 - Hilton Head Island

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
M-16C		908	Present canal as constructed is considered adequate							- - -	50' - 48"	
Total-16	- - -						- - -	- - -				2,316.00
M-17A	3600	96	24	13	3	5	5328	2.6	38	- - -	30' - 18"	
											30' - 18"	
											30' - 18"	
											30' - 30"	
											30' - 30"	
											30' - 24"	
											30' - 24"	
M-17B	1800	152	35	13	3	5	2664	1.3	38	- - -	- - -	
M-17C	1400	168	38	13	3	5	2072	-	38	- - -	- - -	
L-1A	1400	64	17	13	3	5	2072	-	38	- - -	- - -	
M-17D	1000	248	52	15	5	5	1850	-	44	- - -	- - -	
Total-17	9200						8658	3.9				8,628.00
M-18A	2600	136	32	16	6	5	5304	2.4	40	- - -	- - -	
M-18B	2500	276	58	16	6	5	5100	2.3	40	- - -	- - -	
Total-18	5100						10,404	4.7				4,531.20
M-19A	2300	40	10	16	6	5	4692	2.1	40	- - -	40' - 18"	
L-1A	1200	72	18	16	6	5	2448	1.1	40	- - -	- - -	
L-2A	2100	76	20	16	6	5	4284	1.9	40	- - -	- - -	
M-19B	2000	252	53	16	6	5	4080	1.8	40	- - -	- - -	
L-3A	3400	188	42	16	6	5	6936	3.1	40	- - -	- - -	
L-4A	1200	48	14	16	6	5	2448	1.1	40	- - -	- - -	
L-3B	3100	364	74	17	7	5	6882	3.1	43	- - -	- - -	
L-5A	2600	116	28	16	6	5	5304	2.4	40	- - -	- - -	
M-19C	2100	792	126	24	14	5	7392	3.0	62	- - -	- - -	
L-6A	3300	92	23	16	6	5	6732	3.0	40	- - -	- - -	
L-7A	3000	148	35	16	6	5	6120	2.8	40	- - -	- - -	
M-19D	6200	1408	229	34	24	5	33,294	12.5	88	- - -	40' - 48"	
Total-19	32,500						90,612	37.9				39,569.60
M-20A	2000	88	8	13	3	5	2960	1.5	32	- - -	40' - 24"	
M-20B	3700	368	28	13	3	5	5476	2.7	32	- - -	- - -	
Total-20	5700						8436	4.2				4,082.80
Area-6 Grand Total	165,800						291,383	133.2				151,742.10

ENGINEERING AND DESIGN DATA

Area 7 - Prichardville - Bluffton - Daufuskie Island

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
M-1A	3900	180	15	13	3	5	5772	2.9	38	- - -	30' - 18"	
M-1B	900	192	16	13	3	5	1332	0.7	38	- - -	- - -	
Total-1	4800						7104	3.6				3,349.20
M-2A	3800	136	12	13	3	5	5624	2.8	38	- - -	30' - 30"	
L-1A	1300	148	13	13	3	5	1924	1.0	38	- - -	- - -	
L-2A	1900	64	7	13	3	5	2812	1.4	38	30' - 18"	- - -	
L-1B	1100	232	19	13	3	5	1628	0.8	38	- - -	- - -	
L-3A	3300	76	8	13	3	5	4884	2.4	38	- - -	30' - 15"	
L-1C	1200	336	26	13	3	5	1776	0.9	38	- - -	30' - 48"	
M-2B	4100	472	35	13	3	5	6068	3.0	38	- - -	- - -	
Total-2	16,700						24,716	12.3				12,211.80
M-3A	3000	116	11	13	3	5	4440	2.2	38	- - -	30' - 30"	
M-3B	3500	376	29	13	3	5	5180	2.6	38	- - -	- - -	
L-1A	2100	180	15	13	3	5	3108	1.5	38	- - -	- - -	
M-3C	3900	716	49	15	5	5	7215	3.4	44	- - -	15' U.T. Br.	
											15' U.T. Br.	
M-3D	2500	804	55	15	5	5	4625	2.2	44	- - -	- - -	
Total-3	15,000						24,568	11.9				12,246.40
M-4A	4000	236	19	13	3	5	5920	2.9	38	- - -	- - -	
M-4B	3900	372	28	13	3	5	5772	2.9	38	- - -	30' - 42"	
Total-4	7900						11,692	5.8				5,751.60
M-5A	2900	116	11	13	3	5	4292	2.1	38	- - -	30' - 24"	
											30' - 30"	
M-5B	4800	300	24	13	3	5	7104	3.5	38	- - -	- - -	
M-5C	2500	412	31	13	3	5	3700	1.8	38	- - -	- - -	
Total-5	10,200						15,096	7.4				7,273.80
M-6A	4000	344	27	13	3	5	5920	2.9	38	- - -	30' - 36"	
Total-6	4000						5920	2.9				3,066.00
M-7A	3200	148	13	13	3	5	4736	2.4	38	- - -	30' - 24"	
L-1A	1700	88	9	13	3	5	2516	1.2	38	- - -	- - -	
M-7B	2100	348	27	13	3	5	3108	1.5	38	- - -	- - -	
L-2A	4400	192	16	13	3	5	6512	3.2	38	- - -	30' - 36"	
M-7C	6100	856	58	15	5	5	11,285	5.3	44	- - -	- - -	
L-3A	7300	288	23	13	3	5	10,804	5.4	38	- - -	30' - 48"	

ENGINEERING AND DESIGN DATA

Area 7 - Prichardville - Bluffton - Daufuskie Island

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
M-7D	1500	1175	75	16	6	5	3060	1.4	46	- - -	- - -	
Total-7	26,300						42,021	20.4				19,989.30
M-8A	4900	464	34	13	3	5	7252	3.6	38	- - -	30' - 48"	
M-8B	2500	576	41	13	3	5	3700	1.8	38	- - -	- - -	
Total-8	7400						10,952	5.4				5,529.60
M-9A	4700	328	25	13	3	5	6956	3.5	38	- - -	20' - 54"	
M-9B	5900	608	43	13	3	5	8732	4.3	38	- - -	20' - 60"	
M-9C	3400	712	49	14	4	5	5678	2.7	41	- - -	- - -	
Total-9	14,000						21,366	10.5				10,601.80
M-10A	6100	292	23	13	3	5	9028	4.5	38	- - -	20' - 36"	
M-10B	3400	456	34	13	3	5	5032	2.5	38	- - -	- - -	
Total-10	9500						14,060	7.0				6,598.00
M-11A	2400	204	17	13	3	5	3552	1.8	38	- - -	30' - 42"	
M-11B	1000	296	23	13	3	5	1480	0.7	38	- - -	- - -	
Total-11	3400						5032	2.5				2,763.60
M-12A	3700	352	27	13	3	5	5476	2.7	38	- - -	- - -	
M-12B	4400	568	41	14	4	5	7348	3.2	38	- - -	- - -	
Total-12	8100						12,824	5.9				5,617.20
M-13A	4700	144	13	13	3	5	6956	3.5	38	- - -	- - -	
L-1A	3400	92	9	13	3	5	5032	2.5	38	- - -	- - -	
M-13B	6200	520	38	13	3	5	9176	4.6	38	- - -	30' - 36" 15' U.T. Br.	
M-13C	6600	840	56	15	5	5	12,210	5.8	44	- - -	- - -	
Total-13	20,900						33,374	16.4				15,852.20
M-14A	3400	304	24	13	3	5	5032	2.5	38	- - -	- - -	
L-1A	2200	136	12	13	3	5	3256	1.6	38	- - -	- - -	
M-14B	1900	492	36	13	3	5	2812	1.4	38	- - -	- - -	
Total-14	7500						11,100	5.5				4,980.00
M-15A	3200	304	24	13	3	5	4736	2.4	38	- - -	20' - 42"	
M-15B	4400	476	35	13	3	5	6512	3.2	38	- - -	- - -	
Total-15	7600						11,248	5.6				5,390.40

ENGINEERING AND DESIGN DATA

Area 7 - Prichardville - Bluffton - Daufuskie Island

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
M-16A	2700	160	14	13	3	5	3996	2.0	38	- - -	- - -	
L-1A	3400	200	18	13	3	5	5032	2.5	38	- - -	- - -	
M-16B	1700	460	34	13	3	5	2516	1.2	38	- - -	20' - 48"	
M-16C	1900	512	37	13	3	5	2812	1.4	38	- - -	- - -	
Total-16	9700						14,356	7.1				6,852.80
M-17A	1500	224	19	13	3	5	2220	1.1	38	- - -	- - -	
M-17B	4900	488	36	13	3	5	7252	3.6	38	- - -	40' - 60"	
M-17C	3300	572	41	13	3	5	4884	2.4	38	- - -	- - -	
Total-17	9700						14,356	7.1				7,580.80
M-18A	3500	564	40	13	3	5	5180	2.6	38	- - -	40' - 30"	
M-18B	4600	1128	72	17	7	5	10,212	4.5	49	- - -	- - -	
Total-18	8100						15,392	7.1				7,155.60
M-19A	2500	164	15	13	3	5	3700	1.8	38	- - -	- - -	
L-1A	2100	168	15	13	3	5	3108	1.5	38	- - -	30' - 30"	
M-19B	6000	976	64	16	6	5	12,240	5.5	46	- - -	- - -	
M-19C	2000	1060	69	16	6	5	4080	1.8	46	- - -	- - -	
L-2A	4400	652	46	14	4	5	7348	3.5	41	- - -	- - -	
L-3A	1200	120	11	13	3	5	1776	0.9	38	- - -	40' - 36"	
L-3B	4100	688	48	14	4	5	6847	3.3	41	- - -	- - -	
L-3C	4500	968	63	16	6	5	9180	4.1	46	- - -	- - -	
M-19D	5300	3176	172	26	16	5	20,617	8.2	73	- - -	- - -	
L-4A	3900	440	33	13	3	5	5772	2.9	38	- - -	- - -	
L-5A	6500	684	48	14	4	5	10,855	5.2	41	- - -	30' - 48"	
L-4B	6100	1612	98	18	8	5	14,701	6.4	52	- - -	40' - 60"	
L-4C	3000	1756	104	19	9	5	7770	3.4	55	- - -	- - -	
M-19E	2200	5008	251	34	24	5	11,812	4.4	94	- - -	- - -	
Total-19	53,800						119,806	52.9				54,293.80
M-20A	4400	448	33	13	3	5	6512	3.2	38	- - -	- - -	
M-20B	3500	740	51	14	4	5	5845	2.8	41	- - -	- - -	
L-1A	4600	312	25	13	3	5	6808	3.4	38	- - -	20' - 48"	
L-1B	5200	580	41	13	3	5	7696	3.8	38	- - -	- - -	
L-2A	3000	104	10	13	3	5	4440	2.2	38	- - -	- - -	
L-3A	2900	196	17	13	3	5	4292	2.1	38	- - -	- - -	
L-2B	1400	316	25	13	3	5	2072	1.0	38	- - -	- - -	
L-4A	2700	68	7	13	3	5	3996	2.0	38	- - -	- - -	
L-2C	900	396	30	13	3	5	1332	0.7	38	- - -	- - -	
L-5A	3000	88	9	13	3	5	4440	2.2	38	- - -	- - -	
L-1C	2700	1116	71	16	6	5	5508	2.5	46	- - -	15' U.T. Br.	

ENGINEERING AND DESIGN DATA

Area 7 - Prichardville - Bluffton - Daufuskie Island

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
M-20C	1200	1988	116	20	10	5	3336	1.4	57	- - -	30' U.T. Br.	
M-20D	2300	2088	121	22	12	5	7245	3.0	62	- - -	- - -	
Total-20	37,800						63,522	30.3				30,062.60
M-21A	2200	188	32	13	3	5	3256	1.6	38	- - -	40' - 30"	
M-21B	4400	468	69	14	4	5	7348	3.5	41	- - -	- - -	
Total-21	6600						10,604	5.1				5,119.20
M-22A	4200	100	25	13	3	5	6216	3.1	38	- - -	- - -	
Total-22	4200						6216	3.1				2,794.80
M-23A	3000	124	29	13	3	5	4440	2.2	38	40' - 36"		
L-1A	2900	152	36	13	3	5	4292	2.1	38	- - -	40' - 36"	
M-23B	2000	324	67	16	6	5	4080	1.8	46	- - -	100' - 36"	
Total-23	7900						12,812	6.1				7,913.60
M-24A	5700	340	26	13	3	5	8436	4.2	38	- - -	20' - 48"	
M-24B	2900	460	34	13	3	5	4292	2.1	38	- - -	40' - 54"	
											40' - 54"	
Total-24	8600						12,728	6.3				8,004.40
M-25A	2000	148	13	13	3	5	2960	1.5	38	- - -	- - -	
L-1A	2200	132	12	13	3	5	3256	1.6	38	- - -	- - -	
M-25B	3100	431	32	13	3	5	4588	2.3	38	- - -	40' - 36"	
Total-25	7300						10,804	5.4				5,421.20
M-26A	2700	120	11	13	3	5	3996	2.0	38	- - -	- - -	
L-1A	2200	124	11	13	3	5	3256	1.6	38	- - -	- - -	
M-26B	2300	300	24	13	3	5	3404	1.7	38	- - -	- - -	
Total-26	7200						10,656	5.3				4,786.80
M-27A	3900	164	14	13	3	5	5772	2.9	38	- - -	20' - 36"	
Total-27	3900						5772	2.9				2,881.60
M-28A	4700	156	13	13	3	5	6956	3.5	38	- - -	20' - 42"	
M-28B	2700	236	19	13	3	5	3996	2.0	38	- - -	20' - 42"	
L-1A	1600	60	6	13	3	5	2368	1.2	38	- - -	- - -	
M-28C	1100	316	25	13	3	5	1628	0.8	38	- - -	- - -	
Total-28	10,100						14,948	7.5				7,406.40

ENGINEERING AND DESIGN DATA

Area 7 - Prichardville - Bluffton - Daufuskie Island

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
M-29A	4400	192	16	13	3	5	6512	3.2	38	- - -	20' - 30"	
											20' - 42"	
M-29B	3000	304	24	13	3	5	4440	2.2	38	- - -	- - -	
Total-29	7400						10,952	5.4				5,445.60
M-30A	1900	120	11	13	3	5	2812	1.4	38	- - -	20' - 30"	
M-30B	4000	312	25	13	3	5	5920	2.9	38	- - -	- - -	
L-1A	2100	48	5	13	3	5	3108	1.5	38	- - -	20' - 24"	
L-1B	4100	188	16	13	3	5	6068	3.0	38	- - -	- - -	
M-30C	2300	552	40	14	4	5	3841	1.9	41	- - -	- - -	
Total-30	14,400						21,749	10.7				10,084.70
M-31A	2700	108	10	13	3	5	3996	2.0	38	- - -	- - -	
Total-31	2700						3996	2.0				1,798.80
M-32A	3000	132	12	13	3	5	4440	2.2	38	- - -	- - -	
Total-32	3000						4440	2.2				1,992.00
M-33A	4000	88	9	13	3	5	5920	2.9	38	- - -	- - -	
Total-33	4000						5920	2.9				2,646.00
M-34A	3400	52	5	13	3	5	5032	2.5	38	- - -	- - -	
Total-34	3400						5032	2.5				2,259.60
M-35A	3200	92	9	13	3	5	4736	2.4	38	- - -	- - -	
Total-35	3200						4736	2.4				2,140.80
M-36A	4000	80	8	13	3	5	5920	2.9	38	- - -	20' - 30"	
M-36B	900	96	9	13	3	5	1332	0.7	38	- - -	- - -	
L-1A	1200	28	3	13	3	5	1776	0.9	38	20' - 18"	- - -	
M-36C	2500	168	14	13	3	5	3700	1.8	38	- - -	20' - 36"	
Total-36	8600						12,728	6.3				6,238.40
M-37A	4600	248	20	13	3	5	6808	3.4	38	- - -	20' - 48"	
M-37B	4300	432	33	13	3	5	6364	3.2	38	- - -	30' - 42"	
Total-37	8900						13,172	6.6				6,851.60

ENGINEERING AND DESIGN DATA

Area 7 - Prichardville - Bluffton - Daufuskie Island

CANAL No. (1)	LENGTH Ft. (2)	WATERSHED Ac. (3)	DISCHARGE c.f.s. (4)	CHANNEL DIMENSIONS TOP WIDTH Ft. (5)	CHANNEL DIMENSIONS BOTTOM WIDTH Ft. (6)	CHANNEL DIMENSIONS AVERAGE DEPTH Ft. (7)	EXCAVATION Cu. Yds. (8)	RT. OF WAY CLEARING Ac. (9)	REQUIRED RT. OF WAY WIDTH Ft. (10)	CULVERTS LOWERING Length & Size (11)	CULVERTS & BRIDGES - NEW Length & Size (12)	TOTAL ESTIMATED COST Dollars (13)
M-38A	4000	188	16	13	3	5	5920	2.9	38	- - -	20' - 42"	
M-38B	3600	292	23	13	3	5	5328	2.6	38	- - -	20' - 48"	
M-38C	4100	420	32	13	3	5	6068	3.0	38	- - -	20' - 42"	
Total-38	11,700						17,316	8.5				8,832.80
M-39A	5800	216	18	13	3	5	8584	4.3	38	- - -	20' - 30"	
M-39B	2200	292	23	13	3	5	3256	1.6	38	- - -	- - -	
L-1A	2700	48	5	13	3	5	3996	2.0	38	- - -	- - -	
M-39C	1100	364	28	13	3	5	1628	0.8	38	- - -	30' - 48"	
Total-39	11,800						17,464	8.7				8,677.20
M-40A	1800	92	9	13	3	5	2664	1.3	38	- - -	- - -	
Total-40	1800						2664	1.3				1,189.20
M-41A	4200	124	11	13	3	5	6216	3.1	38	- - -	- - -	
Total-41	4200						6216	3.1				2,794.80
M-42A	2500	84	8	13	3	5	3700	1.8	38	- - -	- - -	
Total-42	2500						3700	1.8				1,650.00
M-43A	4500	168	14	13	3	5	6660	3.3	38	- - -	- - -	
Total-43	4500						6660	3.3				2,988.00
M-44A	6000	120	11	13	3	5	8880	4.4	38	- - -	20' - 30"	
Total-44	6000						8880	4.4				4,188.00
M-45A	4100	120	11	13	3	5	6068	3.0	38	- - -	20' - 18"	
Total-45	4100						6068	3.0				2,812.40
Area-7 Grand Total	440,400						714,738	344.4				344,084.40

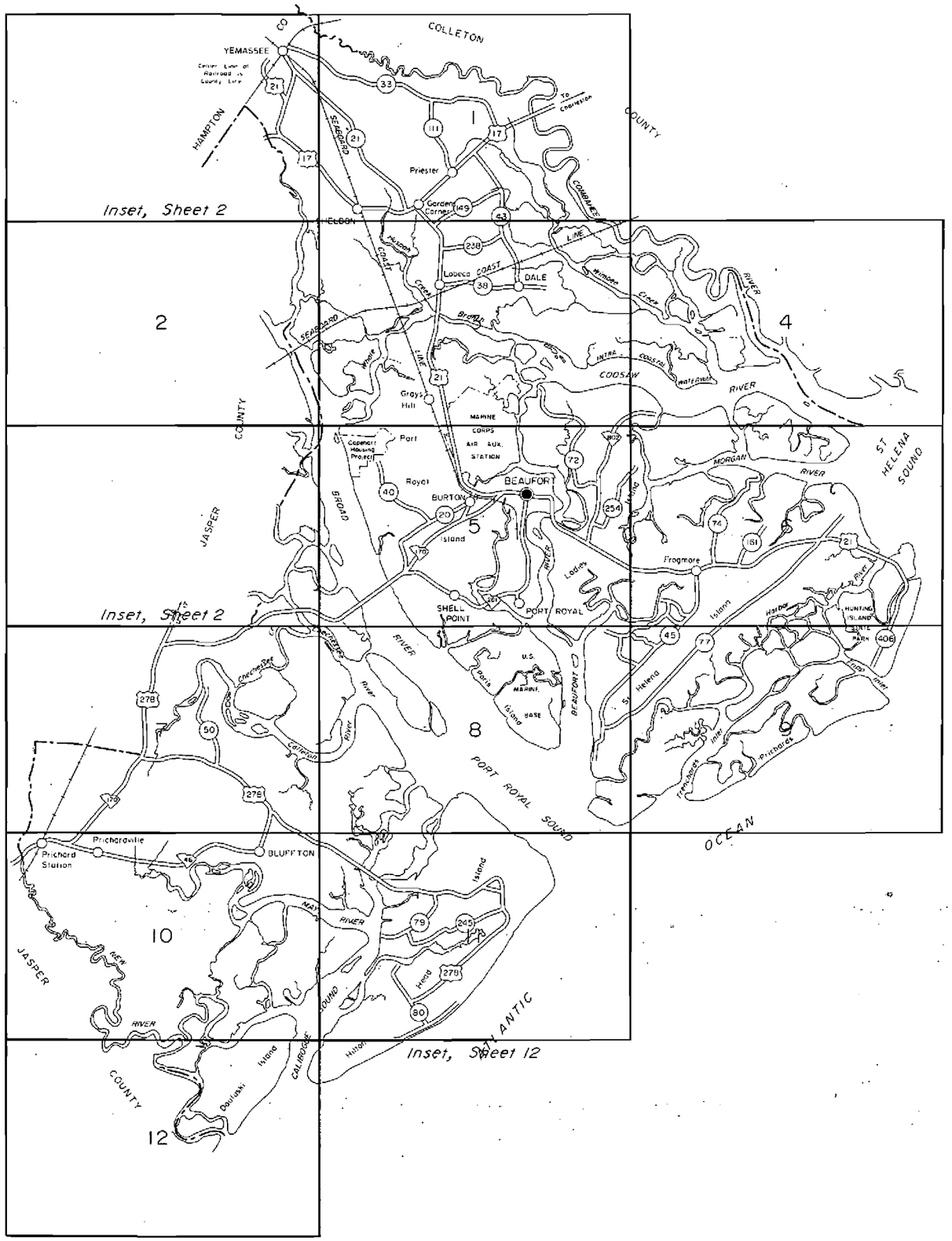

Figure No. 3

FEASIBILITY STUDY OF REQUIREMENTS FOR MAIN DRAINAGE CANALS
BEAUFORT COUNTY, SOUTH CAROLINA

0 5 10 MILES

INDEX TO MAP SHEETS

FEASIBILITY STUDY OF REQUIREMENTS FOR MAIN DRAINAGE CANALS IN BEAUFORT COUNTY, SOUTH CAROLINA

CONVENTIONAL SIGNS

- Primary Road System
- 15 — Federal Highway
- 61 — State Highway
- 45 — County Road
- School
- Church
- County Line
- 2 — Planning Unit Boundary and Number
- Watershed Boundary
- M-1 → Main
- L-1 → Lateral
- Indicates existing canals or natural drainage in swamp

FEASIBILITY STUDY OF REQUIREMENTS FOR MAIN DRAINAGE CANALS IN BEAUFORT COUNTY, SOUTH CAROLINA

(1)

N

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(Joins inset, sheet 2)

COLLETON COUNTY

Combahee River

TO CHARLESTON

M-2 M-3 M-4 M-5 M-7 M-8 M-9 M-10 M-11 M-12 M-16

L-1 L-2 L-3 L-4 L-5 L-7 L-8 L-9 L-10 L-11

SEABOARD COAST LINE RAILROAD

Sheldon Church Ruins

SHELDON

GARDENS CORNER

PRIESTER

1

2

33 21 17 43 149

0 1/2 1 Mile

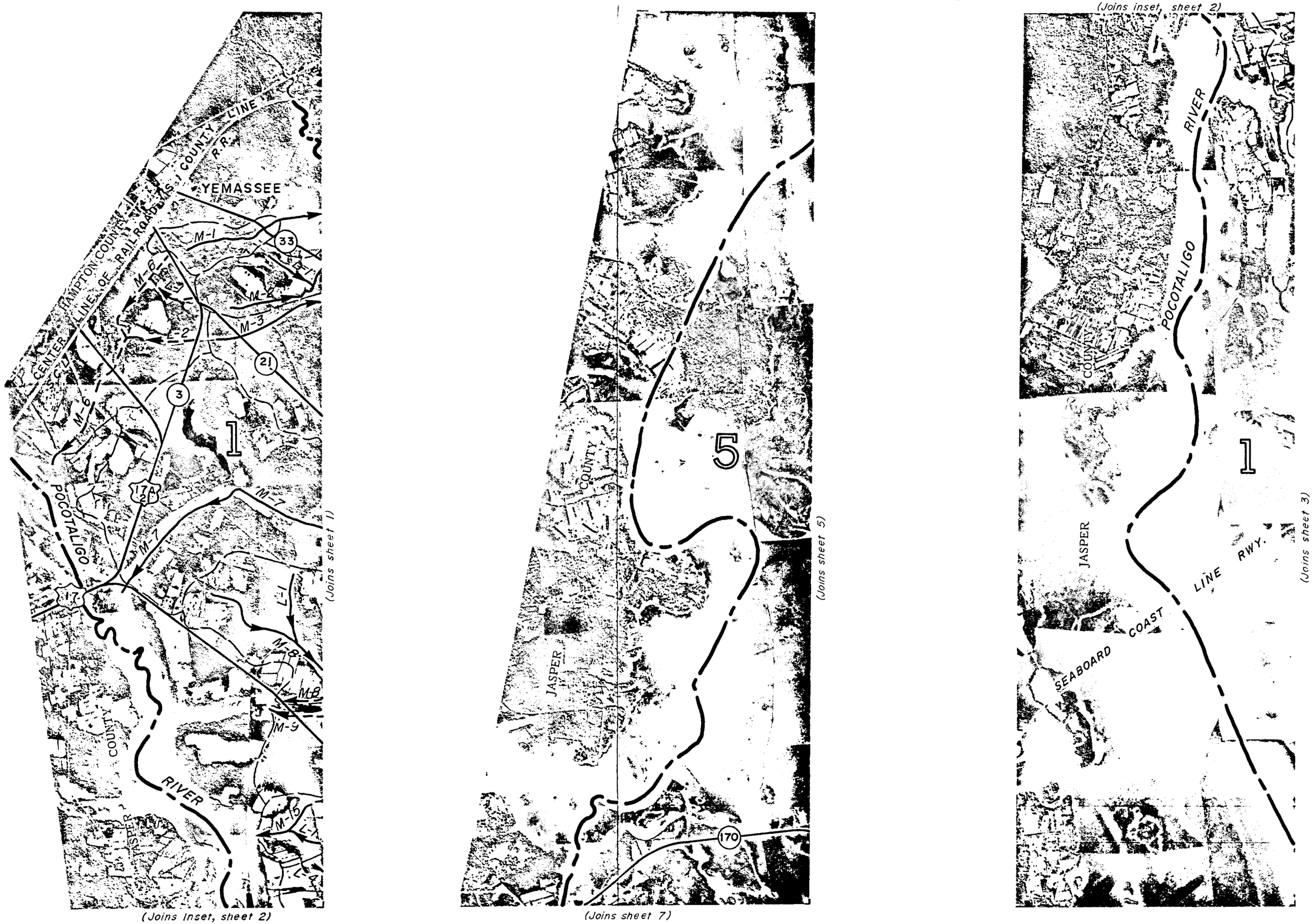
Scale 1:50 000 (Approximate)

0 5000 Feet

(Joins sheet 3)

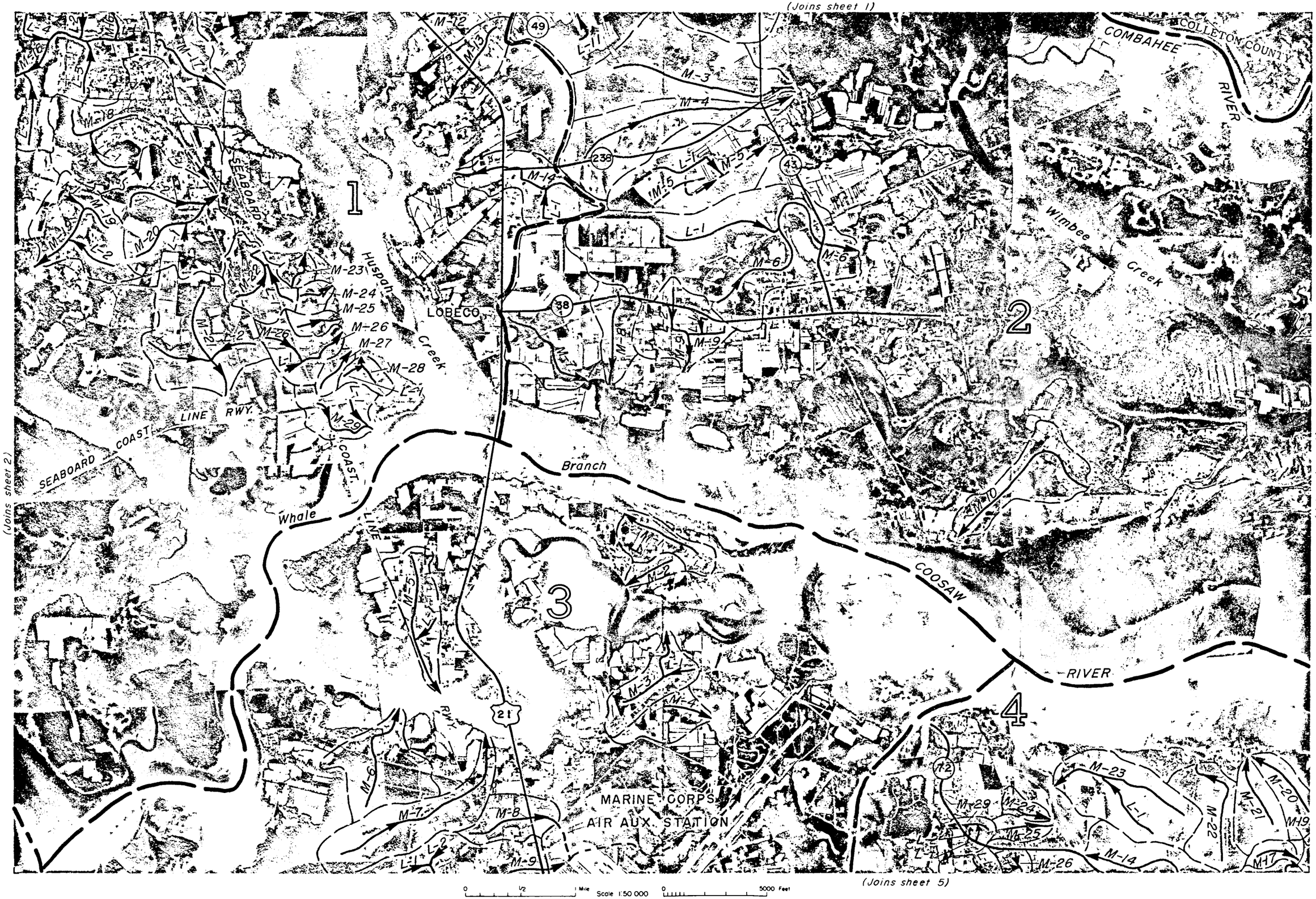
(2)

FEASIBILITY STUDY OF REQUIREMENTS FOR MAIN DRAINAGE CANALS IN BEAUFORT COUNTY, SOUTH CAROLINA



FEASIBILITY STUDY OF REQUIREMENTS FOR MAIN DRAINAGE CANALS IN BEAUFORT COUNTY, SOUTH CAROLINA

(Joins sheet 1)



(Joins sheet 2)

(Joins sheet 4)

(Joins sheet 5)

0 ½ 1 Mile Scale 1:50 000 (Approximate) 0 5000 Feet

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FEASIBILITY STUDY OF REQUIREMENTS FOR MAIN DRAINAGE CANALS IN BEAUFORT COUNTY, SOUTH CAROLINA

0 1/2 1 Mile Scale 1:50 000 (Approximate) 0 5000 Feet

FEASIBILITY STUDY OF REQUIREMENTS FOR MAIN DRAINAGE CANALS IN BEAUFORT COUNTY, SOUTH CAROLINA

(Joins sheet 3)

(Joins Inset, sheet 2)

(Joins sheet 6)

(Joins sheet 8)

Scale 1:50 000 (Approximate)

0 1/2 1 Mile

0 5000 Feet

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FEASIBILITY STUDY OF REQUIREMENTS FOR MAIN DRAINAGE CANALS IN BEAUFORT COUNTY, SOUTH CAROLINA

(Joins sheet 4)

6

N

M-62
M-31
M-30
M-9
M-8
M-42
M-41
M-40
M-62
M-61
M-65
M-60
M-64
M-63
M-66
M-67
M-59
M-58
M-57
M-56
M-55
M-54
M-53
M-52
M-51
M-50
M-49
M-76
M-75
M-74
M-73
M-72
M-71
M-70
M-69
M-68
M-39
M-38
M-37
M-36
M-35
L-1
L-2
L-3
L-4
L-5

4

MORGAN RIVER

ST. HELENA SOUND

HARBOR RIVER

ST. HELENA ISLAND

HUNTING ISLAND STATE PARK

FROGMORE

Penn Industrial Sch.

170
21
74
45
185
164
113
27
406

(Joins sheet 5)

(Joins sheet 9)

0 1/2 Mile
Scale 1:50 000 (Approximate)

0 5000 Feet

FEASIBILITY STUDY OF REQUIREMENTS FOR MAIN DRAINAGE CANALS IN BEAUFORT COUNTY, SOUTH CAROLINA

(Joins inset, sheet 2)

(Joins sheet 8)

(Joins sheet 10)

0 1/2 1 Mile
Scale 1:50 000 (Approximate)
0 5000 Feet

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FEASIBILITY STUDY OF REQUIREMENTS FOR MAIN DRAINAGE CANALS IN BEAUFORT COUNTY, SOUTH CAROLINA

(8)

(Joins sheet 5)

N

Chechessee River

Broad River

Beaufort River

3

4

5

6

U.S. MARINE (BASE)

PARRIS ISLAND

PORT ROYAL SOUND

ST. HELENA ISLAND

Colleton River

M-1

L-1

M-2

M-3

M-4

L-2

M-5

M-6

M-7

M-10

M-11

M-9

M-47

M-44

L-1

L-2

M-45

M-43

L-3

M-48

169

77

45

(Joins sheet 7)

(Joins sheet 9)

(Joins sheet 11)

0 1/2 1 Mile Scale 1:50 000 (Approximate) 0 5000 Feet

FEASIBILITY STUDY OF REQUIREMENTS FOR MAIN DRAINAGE CANALS IN BEAUFORT COUNTY, SOUTH CAROLINA

(Joins sheet 6)

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(Joins sheet 8)

FEASIBILITY STUDY OF REQUIREMENTS FOR MAIN DRAINAGE CANALS IN BEAUFORT COUNTY, SOUTH CAROLINA

(10)

N

(Joins sheet 7)

PRICHARD STATION

PRICHARDVILLE

BLUFFTON

46

170

JASPER COUNTY

NEW RIVER

MAY RIVER

7

(Joins sheet 11)

(Joins sheet 12)

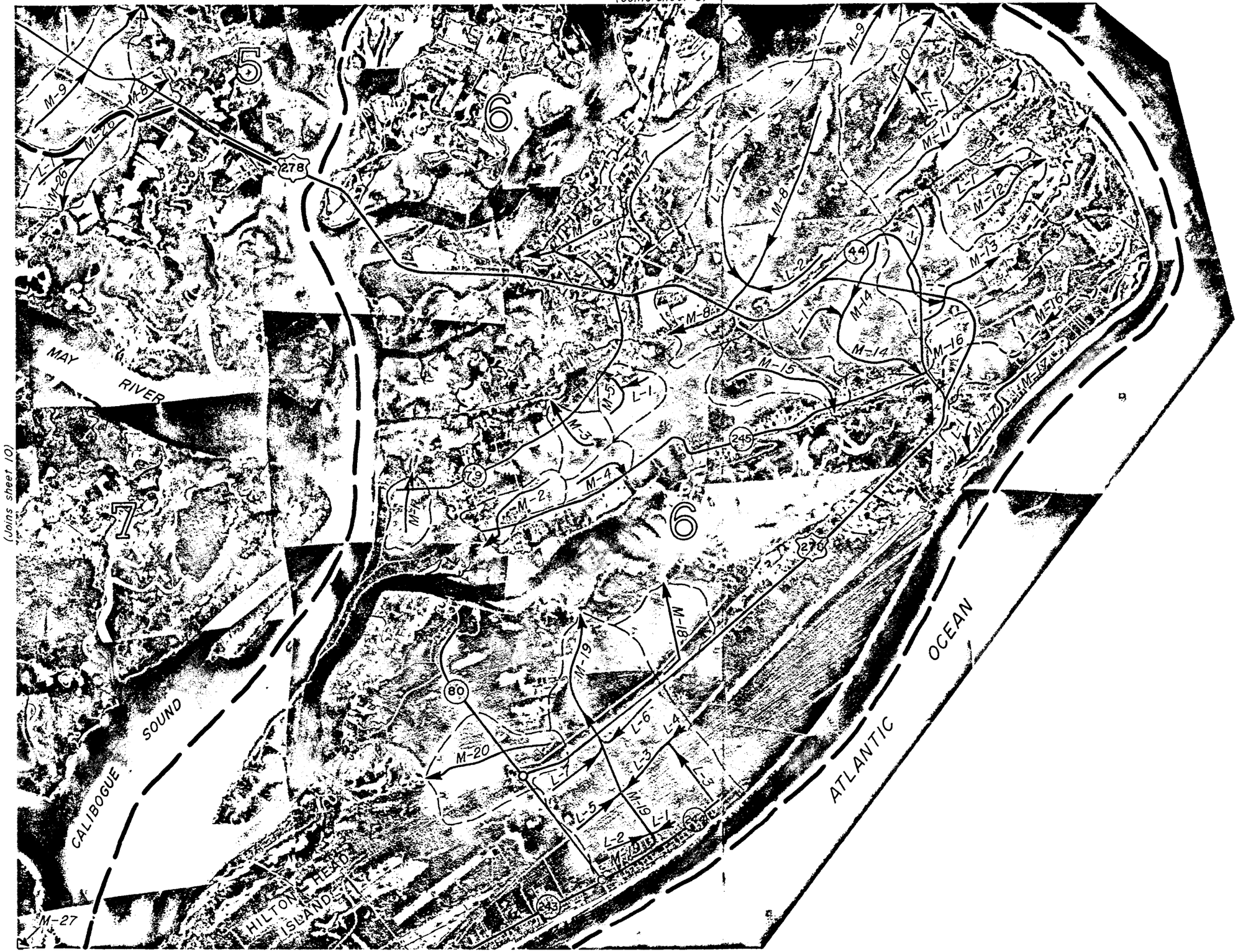
0 ½ 1 Mile

Scale 1:50 000 (Approximate)

0 5000 Feet

FEASIBILITY STUDY OF REQUIREMENTS FOR MAIN DRAINAGE CANALS IN BEAUFORT COUNTY, SOUTH CAROLINA

(Joins sheet 8)



(Joins sheet 10)

(Joins inset, sheet 12)

0 1/2 1 Mile Scale 1:50 000 (Approximate) 0 5000 Feet

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