FELLSMERE
WATER CONTROL DISTRICT
WATER CONTROL PLAN
OCTOBER 1, 2000

DISTRICT OFFICE MAILING ADDRESS:
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Fellsmere, FL 32948

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Secretary/Superintendent of Operation:
Rodney Tillman

PREPARED BY

CARTER ASSOCIATES, INC.
CONSULTING ENGINEERS AND LAND SURVEYORS
1708 21st Street
Vero Beach, FL 32960

TABLE OF CONTENTS

FELLSMERE WATER CONTROL DISTRICT

WATER CONTROL PLAN

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INTRODUCTION

This Water Control Plan is submitted pursuant to the recent revisions to Chapter 298 of the Florida Statutes as specifically setforth in Section 298.225.

Development of the lands within what is now the Fellsmere Water Control District (F.W.C.D.) began in 1910. Early attempts to provide adequate drainage failed from time to time through several unusual major storm events.

Fellsmere Water Control District (formerly known as Fellsmere Drainage District) was created in 1919 to better facilitate improved drainage for the area.

To prevent some confusion within this plan, it should be noted that at the time the F.W.C.D. was created it was located in St. Lucie County. The District now lies within Indian River County, which was created in June of 1925.

SECTION 1

STATUTORY POWERS AND RESPONSIBILITIES

STATUTORY POWER AND RESPONSIBILITIES

The Fellsmere Water Control District (formerly known as the Fellsmere Drainage District) was created April 8, 1919 under the General Drainage Laws of the State of Florida, by a Circuit Court proceeding (St. Lucie County, Case No. RED 533) and currently operates under Chapter 298 of the Florida Statutes, and amendments thereto, as an Independent Single Purpose Special District. The District was created and is responsible for the drainage, flood protection and control of surface waters within its' geographical boundaries.

SECTION 2

DISTRICT
LEGAL BOUNDARIES

FELLSMERE WATER CONTROL DISTRICT
DISTRICT LEGAL BOUNDARIES

SEE ATTACHED DOCUMENTS AS FOLLOWS:

1. Decree Incorporating Drainage District

2. Legal Description of District Boundary

3. Report of Plan of Reclamation of the Fellsmere Drainage District (April 14, 1920)

4. Fellsmere Water Control District Boundary Map (Sheet "B" – Attached separately)

DECREE INCORPORATING DRAINAGE DISTRICT

[illegible] Circuit Court of the Fif-
[illegible] Judicial Circuit, in and
[illegible] St. Lucie County, Florida.

In re

Fellsmere Drainage

District

Decree Incorporating Drainage
District

[illegible] OF FLORIDA, } ss.
[illegible] OF ST. LUCIE
This instrument of writing was filed for record in
the office of the Clerk of the Circuit Court on the
9 day of April A.D. 19[illegible]
and the same has been duly recorded in [illegible]
[illegible] page 673
Witness my hand and the seal of the Circuit Court
9 day of April
A.D. 19[illegible]
P B Eldred
Clerk Circuit Court
By Jessie Parker
Deputy Clerk

RECORD VERIFIED

FREDERICK L. HEMMINGS
LAWYER
FORT PIERCE, FLORIDA

Indexed

In the Circuit Court of the Fifteenth Judicial Circuit, in and for St.Lucie County, Florida.

In re)
)
Fellsmere Drainage)
)
District)

DECREE INCORPORATING DRAINAGE DISTRICT

This cause coming on this day to be heard upon the petition of Charles H. Piffard; D. H. Saunders; Fellsmere Company, a corporation organized and existing under the Laws of the State of Florida; C. W. Talmadge; C. M. Jameson; E.A. Conkling Nurseries Company, a corporation organized and existing under the Laws of the State of Florida; John Humbargar, Henry Shomber; James T. DuBois; Ed Nelson; P. E. Mudge, Florida Plantations Company, a corporation organized and existing under the Laws of the State of Florida; and E. H. Every; praying that a contiguous body of wet and overflowed lands and lands subject to overflow, situated in the County of St. Lucie and State of Florida with boundaries as described in said petition, and which boundaries are hereinafter fully set forth, be declared and incorporated as a Drainage District under the provisions of Chapter 6458 of the Laws of Florida (Acts of 1913), Approved June 9, 1913, said Drainage District to be known by the name of "FELLSMERE DRAINAGE DISTRICT", and to continue for ninety-nine years; and the Court finding that said petition is in due and regular form and was filed in the office of the Clerk of the Circuit Court of St. Lucie County, Florida, on February 17, 1919; and the Court further finding from the sworn evidence submitted to the Court that the persons signing said petition are the holders and owners of a majority in acreage of the lands embraced in said Drainage

District; and the Court further finding from the sworn evidence submitted to the Court that the lands embraced within said Drainage District constitute a contiguous body of wet and over-flowed lands and lands subject to over-flow, and that it is necessary and proper that said body of land should be formed into a Drainage District for the purpose of having such lands reclaimed and protected from the effects of water, for agricultural purposes, by drainage; and the Court further finding from the certificate of the Clerk of the Circuit Court of St. Lucie County, Florida, and from the sworn affidavit of A. K. Wilson, that due and regular notice in accordance with law was given by the Clerk of the Circuit Court of St. Lucie County, Florida, to all persons interested in the lands embraced within said drainage district to appear on the 7th day of April, 1919, to show cause, if any there be, why said Drainage District as set forth in said petition shall not be organized as a public corporation of the State of Florida; and the Court further finding from the certificate of said Clerk and from said affidavit that said notice in the form provided by law, was published in The Fellsmere Tribune, a newspaper of general circulation published and circulated in St. Lucie County, Florida, for four consecutive weeks, to-wit: February 22, 1919; March 1, 1919; March 8, 1919; and March 15, 1919; and the Court further finding that no objections have been filed either with the Clerk of the Circuit Court of St. Lucie County, Florida, or with the Judge of this Circuit Court, by any owner of the lands in said proposed district or by any person whomsoever resisting the organization and incorporation of said District or stating any reason why his lands or any part thereof should not be included within said Drainage District; or denying any of the statements in said petition; and the Court being of the opinion that the establishment of said Drainage District and the improvements

to be made therein will be to the advantage of the owners of the real property therein and that the same will be in the interest of the public health, convenience and welfare, and the Court finding it has jurisdiction of this cause and of the subject matter thereof and of the parties thereto and further finding that all the proceedings and steps preliminary to the making of this decree, have been duly and regularly performed in accordance with the laws of the State of Florida, and the Court being fully advised in the premises.

IT IS THEREFORE ORDERED, ADJUDGED, DECREED AND DECLARED that the body of lands situated within the County of St. Lucie and State of Florida, and embraced within the following boundary lines, to-wit:

Beginning at a point on the East line of Tract 1114 in Township 32 South of Range 36 East, said line being also the West right-of-way line of Lateral Q, said point being distant 200 feet Southerly from the Northeast corner of said Tract 1114; thence running Northerly, along the said West right-of-way line of Lateral Q, about three and three-fourths miles to a point on the East line of Tract 2014, in Township 31 South of Range 36 East, said point being distant two hundred and fifty feet Southerly from the Northeast corner of said tract 2014; thence running Westerly in a straight line, across Tracts 2014, 2013, 2012 and 2011, across a fifty-foot road right-of-way and across part of Tract 2010, all in Township 31 South of Range 36 East, parallel with and two hundred and fifty feet distant Southerly from the North line of said Tracts, about one and one-tenth miles to a point distant two hundred fifty feet Westerly from the East line of said Tract 2010; thence running Northerly in a straight line, across part of said Tract 2010, across a fifty foot ditch and road right-of-way and across part of Tract 1910, all in Township 31 South of Range 36 East, parallel with and two hundred fifty feet distant Westerly from the East line of said Tracts, about one-fourth mile to a point distant two hundred fifty feet Southerly from the North line of said Tract 1910; thence running Westerly in a straight line, across part of said Tract 1910, across Tracts 1909, 1908 and 1907 and across the right-of-way of Lateral M, all in Township 31 South of Range 36 East, parallel with and two hundred fifty feet distant Southerly from the North line of said Tracts, about one mile to a point on the West right-of-way line of said Lateral M; thence running Northerly, along the said West right-of-way line of Lateral M and continuing in the same course across the right-of-way of the Main Canal, about four and one-half miles to a point on the County Line between St. Lucie and Brevard Counties, said County line being also the North line of Township 31 South of Range 36 East; thence running Easterly along the said County Line, about nine and four-tenths miles to a point at the intersection of said County Line and the Southwesterly line of Fleming Grant; thence running Southeasterly along the Southwesterly line of Fleming Grant, about

one and two-tenths miles to a point at the intersection of said Southwesterly line of Fleming Grant, and the East line of Township 31 South of Range 37 East; thence running Southerly along the said East line of Township 31 South of Range 37 East and continuing along the East line of Township 32 South of Range 37 East, about seven and seven-tenths miles to a point on the East line of Tract 1123 in said Township 32 South of Range 37 East, said point being distant two hundred feet Southerly from the Northeast corner of said Tract 1123; thence running Westerly in a straight line, parallel with and two hundred feet distant, Southerly from the South line of a fifty foot ditch and road right-of-way, about eight and fifteen one-hundredths miles to the point of beginning; said description being given according to Fellsmere Farms Company plats of said Townships, recorded in the office of the Clerk of the Circuit Court of St. Lucie County, Florida.

Be and the same are hereby constituted, organized and incorporated into a public corporation of the State of Florida under the provisions of Chapter 6458 of the Laws of Florida, (Acts of 1913) Approved June 9, 1913, and all amendments thereto, and said corporation shall be known by the name of "Fellsmere Drainage District" and said Drainage District shall continue as such public corporation for a period of ninety-nine years from and after the date of this decree.

DONE AND ORDERED at Chambers at Fort Pierce, Florida, this 5th day of April, 1919.

Circuit Judge

LEGAL DESCRIPTION OF DISTRICT

IT IS THEREFORE ORDERED, ADJUDGED, DECREED AND DECLARED that the body of lands situated within the County of St. Lucie and State of Florida, and embraced within the following boundary lines, to-wit:

Beginning at a point on the East line of Tract 1114 in Township 32 South of Range 36 East, said line being also the West right-of-way line of Lateral Q, said point being distant 200 feet Southerly from the Northeast corner of said Tract 1114; thence running Northerly, along the said West right-of-way line of Lateral Q, about three and three-fourths miles to a point on the East line of Tract 2014, in Township 31 South of Range 36 East, said point being distant two hundred and fifty feet Southerly from the Northeast corner of said tract 2014; thence running Westerly in a straight line, across Tracts 2014, 2013, 2012 and 2011, across a fifty-foot road right-of-way and across part of Tract 2010, all in Township 31 South of Range 36 East, parallel with and two hundred and fifty feet distant Southerly from the North line of said Tracts, about one and one-tenth miles to a point distant two hundred fifty feet Westerly from the East line of said Tract 2010; thence running Northerly in a straight line, across part of said Tract 2010, across a fifty foot ditch and road right-of-way and across part of Tract 1910, all in Township 31 South of Range 36 East, parallel with and two hundred fifty feet distant Westerly from the East line of said Tracts, about one-fourth mile to a point distant two hundred fifty feet Southerly from the North line of said Tract 1910; thence running Westerly in a straight line, across part of said Tract 1910, across Tracts 1909, 1908 and 1907 and across the right-of-way of Lateral M, all in Township 31 South of Range 36 East, parallel with and two hundred fifty feet distant Southerly from the North line of said Tracts, about one mile to a point on the West right-of-way line of said Lateral M; thence running Northerly, along the said West right-of-way line of Lateral M and continuing in the same course across the right-of-way of the Main Canal, about four and one-half miles to a point on the County Line between St. Lucie and Brevard Counties, said County line being also the North line of Township 31 South of Range 36 East; thence running Easterly along the said County Line, about nine and four-tenths miles to a point at the intersection of said County Line and the Southwesterly line of Fleming Grant; thence running Southeasterly along the Southwesterly line of Fleming Grant, about

one and two-tenths miles to a point at the intersection of said Southwesterly line of Fleming Grant, and the East line of Township 31 South of Range 37 East; thence running Southerly along the said East line of Township 31 South of Range 37 East and continuing along the East line of Township 32 South of Range 37 East, about seven and seven-tenths miles to a point on the East line of Tract 1123 in said Township 32 South of Range 37 East, said point being distant two hundred feet Southerly from the Northeast corner of said Tract 1123; thence running Westerly in a straight line, parallel with and two hundred feet distant, Southerly from the South line of a fifty foot ditch and road right-of-way, about eight and fifteen one-hundredths miles to the point of beginning; said description being given according to Fellsmere Farms Company plats of said Townships, recorded in the office of the Clerk of the Circuit Court of St. Lucie County, Florida.

Be and the same are hereby constituted, organized and incorporated into a public corporation of the State of Florida under the provisions of Chapter 6458 of the Laws of Florida, (Acts of 1913) Approved June 9, 1913, and all amendments thereto, and said corporation shall be known by the name of "Fellsmere Drainage District" and said Drainage District shall continue as such public corporation for a period of ninety-nine years from and after the date of this decree.

DONE AND ORDERED at Chambers at Fort Pierce, Florida, this 9th day of April, 1919.

E. B. Donnell [signature]
Circuit Judge

REPORT OF THE PLAN OF RECLAMATION OF THE FELLSMERE DRAINAGE DISTRICT

FELLSMERE WATER
CONTROL DISTRICT
P. O. Box 438
FELLSMERE, FLORIDA 32948
(407) 571-0640

AFFIDAVIT

STATE OF FLORIDA
COUNTY OF INDIAN RIVER

Before me this day personally appeared Joyce L. Hertel who, being duly sworn, deposed and say, that I Joyce L. Hertel as Secretary of the Fellsmere Water Control District affirm that the attached pages to this affidavit, pages 36 through 47 are exact copies of the Fellsmere Water Control Districts Minute Book One.

Corporate Seal

Joyce L. Hertel

(Signature of person making affidavit)

Sworn to and subscribed before me this 14 day of February, A.D., 1991.

Jerry R. Tillman

Notary Public
State of Florida

My Commission expires

Notary Public, State of Florida
My Commission Expires May 18, 1991
Bonded Thru Troy Fain- Insurance Inc.

Report on the Plan of Reclamation,

of the Fellsmere Drainage District

St. Lucie County, Florida,

April 14, 1920.

COPY

To Mr. W. H. Tallis,
Mr. Wm. K. Jackson,
Mr. Ernest H. Every,

Board of Supervisors,
Fellsmere Drainage District.

Gentlemen:

Having been appointed Chief Engineer for the Fellsmere Drainage District on May 12,1919, and having been instructed on that day to prepare the "Plan of Reclamation" for the District, I herewith submit my report, formed in accordance with and under the authority of Chapter 6458, Laws of Florida, Acts of 1913.

My report is composed of the following:

(1) A description of the lands of the District, their location, accessibility, character etc.

(2) Information in regard to ownership and tract areas.

(3) A description of the Existing Canal System.

(4) Explanatory Statement showing the object of the organization of the Drainage District.

(5) The Plan of Reclamation - General Description.

(6) The Plan of Reclamation in detail.

(7) Quantities, Estimates, Schedules.

(1) The lands included in the Fellsmere Drainage District lie within Townships 31 and 32 South, Ranges 36 and 37 East, St Lucie County, State of Florida, and are all embraced within what is known as the "Leveed Area", the boundaries of which are described in the Decree, dated April 8, 1919, forming the District as follows:

> Beginning at a point on the East line of tract 1114 in Township 32 South of Range 36 East, said line being also the West right-of-way line of Lateral Q, said point being distant 200 feet Southerly from the Northeast corner of said tract 1114; thence running Northerly, along the said West right-of-way line of Lateral Q, about three and three fourths miles to a point on the East line of Tract 2014, in Township 31 South of Range 36 East, said point being distant two hundred and fifty feet Southerly from the Northeast corner of said Tract 2014; thence running Westerly in a straight line, across Tracts 2014, 2013, 2012 and 2011, across a fifty-foot road right-of-way and across part of tract 2010, all in Township 31 South of Range 36, parallel with and two hundred and fifty feet distant Southerly from the North line of said Tracts, about one and one-tenth miles to a point distant two hundred and fifty feet Westerly from the East line of said Tract 2010; thence running Northerly in a straight line, across part of said Tract 2010, across a fifty foot ditch and road right-of-way and across part of tract 1910, all in Township 31 South of Range 36 East, parallel with and two hundred and fifty feet distant Westerly from the East line of said tracts, about one fourth mile to a point distant two hundred and fifty feet Southerly from the North line of said tract 1910; thence running Westerly in a straight line, across part of said tract 1910, across tracts 1909, 1908 and 1907 and across

the right-of-way of Lateral M, all in Township 31 South of Range 36 East parallel with and two hundred and fifty feet distant from Southerly from the North line od said tracts, about one mile to a point on the West right-of-way line of said Lateral M; thence running Northerly along the said West right-of-way line of Lateral M and continueing in the same course across the right-of-way of the Main Canal, about four and one half miles to a point on the County line between St Lucie and Brevard Counties, said County line being also the North line of said Township 31 South of Range 36 East; thence running Easterly along the said County line, about nine and four-tenths miles to a point at the intersection of said County line and the Southwesterly line of Fleming Grant; thence running Southeasterly along the Southwesterly line of Fleming Grant, about one and two-tenths miles to a point at the intersection of said Southwesterly line of Fleming Grant, and the East line of Township 31 South of Range 37 East; thence running Sotherly, along the said East line of Township 31 South of Range 37 East and continuing along the East line of Township 32 South of Range 37 East, about seven and seven-tenths miles to a point on the Esat line of Tract 1123 in said Township 32 South of Range 37 East, said point being distant two hundred feet Southerly from the Northeast corner of said tract 1123; thence running Westerly in a straight line, parallel with and two hundred feet distant, Southerly from the South line of a fifty foot ditch and road roght-og-way, about eight and fifteen one-hundredths miles to the point of beginning, said description being given according to Fellsmere Farms Company Plats of said Townships, recorded in the office of the Clerk of the Circuit Court of St Lucie County, Florida.

The "Leveed Area" is approximately a rectangular tract containing some 50,000 acres of generally level land which was formerly without any natural drainage; it averages about eight miles from North to South and about nine miles from East to West; it's North line is the North line of St Lucie County and it's East line is approximately nine miles from Indian River.

The District lies within the famous Indian River Section of Florida. It's lands are among the most fertile in the State, consisting of muck land with an average depth of about five feet in the Western part of the District at a genaral elevation of 22 feet above sea level and of sandy loam prairies and flatwood pine land in the Eastern part, varying generally in elevation from 22 to 25 feet above sea level, the prevailing subsoil being marl or clay at varying depths.

Many of the lands are in a high state of cultivation - there are some seventy improved and occupied farms - and, when the canal system now existing has been improved and completed, the entire area will be available for cultivation. Existing citrus groves, bearing fruit equal in quality to the finest produced in the Indian River Section, show the adaptability of many of the lands to that industry, while flourishing Sugar Cane, Corn, Grasses, Fodder, Cotton and Truck crops have already proved the fertility of the soils. The broad level stretches of muck land are ideal for the development of the sugar industry and stock farms.

The entire District is within the Artesian Water belt and flowing wells are obtainable at a depth of from 375 to 450 feet: many such wells already exist.

Transportation is furnished by the Fellsmere Railroad, a standard gauge road, connecting with the Florida East Coast Railroad at Sebastian, 215 miles south of Jacksonville. The Fellsmere Railroad penetrates the District a little north of its Central line to within two and one-half miles of its western boundary. Hard surfaced roads connect the Town of Fellsmere with the Dixie Highway at Sebastian and traverse the lands of the District in several directions - eighteen miles being already completed and others in course of construction.

(2) There are approximately 1,100 owners in the District. The lands in Township 31 South, Range 37 East are subdivided into 10 acre tracts, and the balance of the lands in the District into 40 acre tracts - the plats of these sub-divisoins all being on record.

(3) The "Leveed Area" has a partially completed canal system, which was commenced in 1911 and brought to its present state in 1917 and is protected by levees against overflow from without, except for approximately 3-½ miles along the North end of its Eastern boundary, where a natural ridge makes a levee unnecessary. The present partially completed canal system consists of some 200 miles of sub-lateral ditches, one quarter of a mile apart, discharging into dredged canals

called Laterals. These Laterals, of which some 32 miles have been constructed, are located approximately two miles apart and they in turn discharge into the main Canal, which flows from West to East along the North boundary of the "Leveed Area", into the Outlet Canal at Station 0, and after leaving the District at its Northeast corner its waters are taken for a distance of about 3-1/2 miles through a continuation of the Outlet Canal and discharged into a natural gulch or draw, leading to tidewater approximately one mile from the point of discharge. This present partially completed system, even if brought to completion on the lines originally laid out, has been proven to be inadequate to afford thorough drainage. This existing system, including the Control Gate, located on the Main Canal and the Rights-of-way of all canals and ditches within the District and the existing Right-of-way of the Outlet Canal outside the District, has been donated to the District by the Fellsmere Company.

(4) In order to make an adequate and efficient Canal System and to provide a proper method of upkeep, the Fellsmere Drainage District was organized in April, 1919. To revise, perfect and complete the Canal System, surveys to determine the requirements have been made. The existing Canals, Laterals, and Sub-laterals have been cross- sectioned to ascertain their present condition, surveys have been made of proposed new ditches and profiles and cross-sections have been plotted. These surveys, together with the surveys already in existance have furnished the data on which I have developed the Plan of Reclamtion. As Chief Engineer, for over five years, of the Company which constructed the existing canal system, my familiarity with the lands in the District and general local conditions has been of great help in the preparation of my recommendations and through the courtesy of the Fellsmere Company, I have had access to much valuable data, accumulated prior to and during the construction work already done.

(5) In the Plan of Reclamation I have used the established letters and numbers in use for the various units of the present system. In determining what run-off should be provided for the District, I have made a careful study of all rainfall records existing in this Section of Florida, of conditions from 1910 to the present time, of the topography, of the evaporation, and of the storage capacity of the soils. It is proper in this connection, to point out that it is ecomomically impracticable to construct a Canal System in a District so nearly level as this, capable of carrying off the waters of maximum storms so as to prevent occasional temporary excess of water. My purpose has been to prepare for the District a Plan of Reclamation which will at the same time justify the expense and provide effective and ecnomical drainage for all parts of the District and to accomplish this a rain-fall of five inches in 24 hours has been provided for. In designing the capacity of the Canals, Laterals and Sub-laterals, the Elliott and Harmon Run-off formula has been used:

$$D = C\ 0.6\ \sqrt{P\ 2F}\ \frac{M^{0.7}}{M}\ P$$

in which,

D = depth of run-off in inches per 24 hours.
C = ratio of run-off to rainfall as affected by absorptive properties of the land, temperature and vegetation.
P = depth of rainfall in inches per 24 hours.
F = general slope of watershed surface in feet per mile.
M = drainage area in square miles.

In this formula the following values have been used: C = 0.25, F = 0.5 ft and P = 5 inches.

Following is a table giving the results as calculated from the above;

Run-off through Ditches from a 5-inch Rainfall

Area drained Square Miles	Depth of run-off inches	Rate of run-off per 24 hours Second Feet per Square Mile
2	1.36	36.58
4	1.11	29.86
6	.98	26.36
8	.90	24.21
10	.84	22.60
15	.74	19.91
20	.68	18.29
30	.60	16.14
40	.55	14.80
60	.49	13.18
80	.45	12.11

From an inspection of this table, it is seen that the smaller the area drained the greater drainage capacity is required in the ditch, a fact well recognised in practice.

One feature in this District requiring careful investigation is the problem of the shrinkage or settlement of muck lands. Measurements of settlement, made in 1916 and 1917 by Engineers of the Federal Division of Drainage and in June of last year by myself indicate quite conclusively that, after drainage and cultivation a shrinkage or settlement of at least two feet must be provided for. An adjustment of the existing canal system to meet this condition is therefore necessary.

The Plan I recommend is to deepen and enlarge where necessary - as later described in detail - the present Main, Lateral and Sub-lateral Canals and Ditches, to strengthen and raise the levees where needed, to excavate new Sub-laterals in certain parts and to otherwise add to or improve the present system, including the Railroad Canal. I recommend that the Existing Outlet for the Canal System of the District be used, and that it be deepened in accordance with my recommendations, Certain additional rights-of-way, as stated later, will be required, both inside and outside the District. The construction of certain bridges is recommended.

There are presented herewith and made a part of this report:

1 - A general plan - "Plat of Fellsmere Drainage District".
2 - Profile of Outlet Canal, including Outlet Extension.
3 - Profile of Main Canal.
4 - Profile of Park Lateral.
5 - Profile of Lateral U.
6 - Profile of Lateral S.
7 - Profile of Lateral Q.
8 - Plan showing additional right-of-way for Outlet Canal and Outlet Extension in the Fleming Grant.
9 - Plan showing additional right-of-way for Main Canal and Outlet Canal (inside of District)
10 - Plan showing additional right-of-way for Park Lateral.
11 - Plan showing right-of-way for North and South Diversion Ditches.

There are also on file in the office of the District Cross-sections of all the above mentioned Canals, Profiles and Cross-sections of all the Sub-laterals, East of Lateral U, Profiles and Cross-sections of Levee where repair work is recommended, Profiles and Cross-sections of the Railroad Canal.

The drainage areas used in calculating the size of each Lateral are indicated on the general plan. Had this been entirely new work the drainage areas would have as a rule divided half way between Laterals, but in order to take the best advantage of the capacity of the Laterals as they at present exist the areas indicated have been used.

(6) There follows a detailed description of the work to be done:

(A) Outlet Canal: This Canal is to be deepened about 6-1/4 feet throughout its entire length and the present side slopes will not be changed but extend down to the new bottom. The material excavated is to be put on the South side to the South of the existing spoil bank and additional right-of-way must be acquired for this purpose.

(B) Outlet Extension: From its present East end, the Outlet Canal is to be extended to sea level, a distance of about one mile. Some additional right-of-way must be acquired for this Outlet Extension.

(C) Main Canal: This Canal East of the Park Lateral is to be deepened about 6-1/4 feet, from the Park Lateral to Lateral U about 5-1/2 feet, from Lateral U to Lateral S about 5 feet, and from Lateral S to Lateral Q about 3 feet. Throughout its entire length the present side slopes will not be changed but extended down to the new bottom. From the Control Gate easterly to Station 0 (at the junction with the Outlet Canal) the material excavated is to be put on the South side to the South of the existing spoil bank, and additional right-of-way must be acquired for this purpose.

(D) Park Lateral: The grade of the Park Lateral from the Main Canal to to the Railroad has been flattened, making a deepening at the Main Canal of about one foot and at the Railroad of about 2-3/4 feet below the original grade; from the Railroad to its present end, the average deepening is 1-1/4 feet below the original grade.

This Lateral is badly filled in from the Main Canal to Sub-lateral 15 and from this point to its present end there are bars at each sub-lateral entrance. There is very little widening to be done. This lateral is to be extended from its present end South of Sub-lateral 26 a distance of 2100 feet to Sub-lateral 28. Additional right-of-way must be acquired from the Railroad to Sub-lateral 28. The Park Lateral enters the Main Canal about 7 feet above the grade of the Main Canal. It is probable that some protection will be needed here, and I have provided in the estimate for a concrete spillway at this point.

To avoid carrying water a distance of four miles, through Sub-laterals 30 and 32, from the East boundary of the District into Lateral U, I have provided for a new ditch, designated "South Park Lateral", to be dug, using the present Park Lateral right-of-way, from Sub-lateral 30 to Canal 34. This new ditch will carry the water coming from the East through Sub-laterals 30 and 32 into Canal 34, through which Canal the water will be delivered into Lateral U.

(E). Lateral U: The grade of this Lateral has been flattened, making a deepening at the Main Canal of about 5 feet and at Canal 34 of about 6-1/3 feet. There is practically no widening to be done.

(F) Lateral S: This Lateral is to be deepened about 6.5 feet and widened approximately 6 feet throughout its entire length.

(G) Lateral Q: This Lateral is to be deepened 5 feet below the original grade throughout its entire length. From the Main Canal to the Railroad no widening is required, from the Railroad to the Zig-Zag Canal it is to be widened approximately 12 feet, and from the Zig-Zag Canal to Canal 34 no widening is required.

(H) Levees: The Levees are generally in good condition. There are places in the Main Canal levee, Lateral M levee, the Zig-Zag Canal levee and Canal 34 levee, which need building up. These places are indicated on the General Plan.

(I) Sub-laterals: On account of the sub-division into 10-acre tracts in Township 31, Range 37, it has been considered advisable to follow the original plan of having the Sub-laterals 1/4-mile apart; throughout the remainder of the District where the tracts are 40 acres, the Sub-laterals are to be dug 1/2-mile apart. As shown on General Plan and by tables attached the Sub-laterals are divided into two classes - new work and cleanout work.

(J) Diversion Ditches: In order to improve the drainage of the Town of Fellsmere, I have figured on two Diversion Ditches, as shown on the General Plan, along the East Line of the Town. The North Diversion Ditch will take the water from Sub-laterals 14 and 15 East of the Town into the Railroad Ditch and through it into the Park Lateral, and the South Diversion Ditch from Sub-laterals 16 and 17 East of the Town into Sub-lateral 18 and through it into the Park Lateral. Right-of-way for these two Diversion Ditches must be acquired.

(K) Equalizing Canals and Sub-laterals:

1. Railroad Canal - To the North of the Fellsmere Company's Railroad is a Canal known as the "Railroad Canal", extending from about 1/3-mile West of the Park Lateral to the West Levee of the District at Lateral M. This Canal was dug solely for the purpose of throwing up the embankment for the railroad and from its East end to Lateral S is located mainly on the Railroad right-of-way and from Lateral S to the West Levee entirely on the Railroad right-of-way. An agreement should be made between Fellsmere Company (owner of the Railroad) and the Drainage District whereby the District may have the use of this Canal, as an equalizing Canal, which will afford additional protection in times of heavy local rains not uniform over the entire District. This agreement should include the right of the District to at any time do such clean out work as might be deemed advisable by the District, At present the only work necessary is the widening and deepening for a distance of about 300 feet from Lateral U West, which I have included in the estimate.

2. Canal 34, along the South line of the District, will also serve as an Equalizing Canal.

3. I also recommend that all Q^E Sub-laterals be cut through into Lateral S for the same purpose.

(L) Gates: The Control Gate, located in the Main Canal between the Park Lateral and Lateral U is to be used during construction, for the purpose of holding the water at a level which will allow floating dredges to operate above this gate. On account of the lowering of the grade of the Main Canal it will be necessary to remove this Gate, and I recommend that it not be rebuilt. An estimate for its removal is included.

In Lateral U, forming part of the Canal 34 Levee, there is a gate. Lateral U was originally dug to a point about 3-1/4 miles South of the District. I recommend leaving this Gate in as at times of drouth it may be deemed advisable to let water through this Gate into Canal System of the District, in order to keep up a current in the Canals, thereby retarding the growth of weeds and grass in them.

(M) Bridges: Bridges over the Main Laterals are recommended at the following locations:

Park Lateral	at	Roads	1,	4,	8,	12,	16,	20,	and	24.		
Lateral U	at	Roads	1,	4,	8,	12,	16,	20,	24,	28	and	32.
Lateral S	at	Roads	1,	4,	8,	12,	16,	20,	24,	28	and	32.
Lateral Q	at	Roads	1,	4,	8,	12,	16,	and	19.			

These locations should not be taken as absolutely fixed but may be varied to suit conditions as the work progresses. Bridges already exist at some of these points, a number of which will have to be removed to allow a dredge to pass during the canal construction.

Three Railroad open culverts will be required over the P.L. - R.R. Ditch.

Bridges over Sub-laterals will be required where travelled roads cross. I recommend that bridges be built only as needed.

(7) Following are Tables of Each Canal, Lateral and Sub-lateral, giving the estimated yardage to be excavated and an estimate of the cost of the work.

Table No 1.

Outlet and Main Canals.

	Elevations					Excavation	
Station	Water Surface	Ditch Bottom	% Grade	Base	Side Slopes	Rock Cu.Yds.	Earth Cu.Yds.
Outlet Extension 292		3.63		25	2:1		
Outlet Canal 238	12.47	1.77	.10	25	"		45,000
Main Canal 0	14.85	4.15	.01	25	"	15,000	221,400
Main Canal 17 (Park Lat.)	15.02	4.32 5.12	.01	25 26	"		20,600
Main Canal 42 (Control Gate)	15.27	5.37	.01	26	"		22,000
Main Canal 105 (Lat.U)	15.90	6.00 6.50	.01	26 32	"		47,000
Main Canal 211 (Lat.S)	16.43	7.03 9.03	.005	32 35	"		75,000
Main Canal 323(Lat.Q)	16.99	9.59	.005	35	"		23,000
Totals						15,000	454,000

Table No. 2

Park Lateral.

Station	Mile	Elevations Water Surface	Elevations Ditch Bottom	% Grade	Base	Side Slopes	Excavation Cu. Yds.
0		19.50	11.70		16	1½:1	
24				.01	16	"	
50				.01	15 15	"	
52 + 80	1			.01	14 14	"	12,100
77				.01	14	"	
103				.01	13 13	"	
105 + 60	2			.01	12 12	"	17,700
116				.01	12	"	
143				.01	11 11	"	
158 + 40	3			.01	10 10	"	17,900
170		21.20	13.40 13.70	.01	10	"	
210		21.60	14.10 14.60	.01	10	"	
211 + 20	4			.01	10	"	20,400
235		21.85	14.85 15.35	.01	10	"	
262		22.12	15.62 16.12	.01	10	"	
264	5			.01	10	"	7,800
288		22.38	16.38 16.88	.01	10	"	
315		22.65	17.15 17.65	.01	10	"	
316 + 80	6			.01	10	"	2,000
345		22.95	17.95 18.95	.01	10	"	
346 (Pres end of canal)	6½			.01	10	"	500
367	7	23.17	19.17	.01	10	"	7,600
				Total			86,000

Table No. 3

Lateral U

Station	Mile	Elevations Water Surface	Elevations Ditch Bottom	% Grade	Base	Side Slopes	Excavation Cu. Yds.
0		19.00	9.00		16	1:1	
52 + 80	1			.005	"	"	25,300
105 + 60	2			"	"	"	19,300
158 + 40	3			"	"	"	19,000
211 + 20	4			"	"	"	22,000
264	5			"	"	"	24,700
316 + 80	6			"	"	"	25,200
369 + 60	7			"	"	"	29,800
422 + 40	8			"	"	"	24,900
447 + 31.2	8½	21.24	11.24	"	"	"	11,800
				Total			202,000

1903

Table No. 4

Lateral S

Station	Mile	Water Surface	Ditch Bottom	% Grade	Base	Side Slopes	Excavation Cu. Yds.
0		18.00	8.00		16	1:1	
52 ± 80	1			.005	"	"	29,400.
105 ± 60	2			"	"	"	23,300.
158 ± 40	3			"	"	"	25,800.
211 ± 20	4			"	"	"	23,800.
264	5			"	"	"	27,000.
316 ± 80	6			"	"	"	25,500.
369 ± 60	7			"	"	"	26,100.
422 ± 40	8			"	"	"	28,400.
447 ± 21.5	8½	20.24	10.24	"	"	"	15,700.
				Total			225,000.

Table No. 5 - Lateral Q

Station	Mile	Water Surface	Ditch Bottom	% Grade	Base	Side Slopes	Excavation Cu. Yds.
0		18.00	10.00		36	1:1	
20				.005	36	"	
47				"	34	"	
52 ± 80	1			"	32	"	22,700.
74				"	32	"	
100				"	30	"	
105 ± 60	2			"	28	"	17,600.
127				"	28	"	
154				"	26	"	
158 ± 40	3			"	24	"	15,500.
182				"	24	"	
209				"	20	"	
211 ± 20	4			"	18	"	32,600.
235				"	18	"	
264	5			"	16	"	33,200.
316 ± 80	6			"	16	"	17,900.
369 ± 60	7			"	16	"	16,600.
422 ± 40	8			"	16	"	10,000.
466 ± 37.7	8½	20.23	12.23	"	16	"	1,900.
				Total			168,000.

Table No. 6

Summary - Laterals

Lateral	Miles	Excavation Cu. Yds.
Park Lateral	7	86,000.
Lateral U	8½	202,000.
Lateral S	8½	225,000.
Lateral Q	8½	168,000.
Totals	32½	681,000.

Table No. 7. P. L.- Sub-laterals

Sub-laterals	Miles Uncut	Partially dug	Total	Base	Slopes	Excavation Cu. Yds.
P. L. - 1		1.71	1.71	4	1:1	8,700.
2		1.97	1.97	"	"	8,000.
3		2.22	2.22	"	"	9,800.
4		2.33	2.33	"	"	7,200.
5		2.33	2.33	"	"	8,700.
6		2.33	2.33	"	"	6,800.
7		2.33	2.33	"	"	4,600.
8	0.33	2.00	2.33	"	"	7,000.
9		2.33	2.33	"	"	5,700.
10	0.30	2.03	2.33	"	"	9,300.
11	0.12	2.21	2.33	"	"	8,600.
12		2.33	2.33	"	"	1,700.
13	0.04	2.29	2.33	"	"	5,300.
R.R. Ditch		1.64	1.64	4-6	"	5,200.
D. D. - 14		1.00	1.00	4	"	2,800.
P. L. - 14		1.33	1.33	"	"	1,700.
D. D. - 15		1.00	1.00	"	"	2,200.
P. L. - 15		1.37	1.37	"	"	3,600.
N. Div. Ditch	0.37		0.37	"	"	2,000.
S. Div. Ditch	0.50		0.50	"	"	3,200.
D. D. - 16		1.00	1.00	"	"	700.
P. L. - 16		1.47	1.47	"	"	1,600.
D. D. - 17		1.00	1.00	"	"	2,600.
P. L. - 17		1.36	1.36	"	"	3,400.
PL-18 E of Div. Ditch		1.00	1.00	"	"	1,800.
PL-18 W of Div. Ditch		1.33	1.33	"	"	9,900.
P. L. - 19		2.33	2.33	"	"	8,000.
20		2.33	2.33	"	"	2,200.
21		2.33	2.33	"	"	7,000.
22		2.33	2.33	"	"	7,100.
23		2.33	2.33	"	"	11,300.
24		2.33	2.33	"	"	8,800.
26		2.33	2.33	4-8	"	16,100.
28		2.33	2.33	"	"	15,800.
Totals	1.66	60.55	62.21			208,300.

Table No. 8. U - Sub-laterals

Sub-lateral	Miles Uncut	Partially dug	Total	Base	Side Slopes	Excavation Cu. Yds.
U - 1		1.67	1.67	4	1:1	9,200.
2		1.67	1.67	"	"	6,000.
3		1.67	1.67	"	"	5,300.
4		1.67	1.67	"	"	3,500.
5		1.67	1.67	"	"	4,900.
6		1.67	1.67	"	"	4,000.
7		1.67	1.67	"	"	5,000.
8		1.67	1.67	"	"	3,700.
9		1.67	1.67	"	"	3,700.
10		1.67	1.67	"	"	4,300.
11		1.67	1.67	"	"	4,100.
12		1.67	1.67	"	"	4,900.
13		0.42	0.42	"	"	1,000.
13½ and R.R. Ditch		1.67	1.67	"	"	6,300.
14		1.67	1.67	"	"	2,800.
15		1.67	1.67	"	"	5,700.
16		1.67	1.67	"	"	5,900.
17		1.67	1.67	"	"	5,200.
18		1.67	1.67	"	"	4,800.
19		1.67	1.67	"	"	4,500.
20		1.67	1.67	"	"	3,100.
21		1.67	1.67	"	"	5,400.
22		1.67	1.67	"	"	4,700.
23		1.67	1.67	"	"	5,700.
24		1.67	1.67	"	"	9,700.
26		1.67	1.67	4-6	"	10,000.
28		1.67	1.67	"	"	9,400.
30		1.67	1.67	"	"	9,200.
32	1.67		1.67	"	"	14,700.
S. P.L. - 30		2.33	2.33	4-8	"	17,700.
32	2.33		2.33	"	"	21,600.
South Park Lat	1.02		1.02	5-12	"	13,600.
Totals	5.02	47.84	52.86			219,600.

Table No. 9.

S - Sub-laterals

Sub-laterals	Miles Uncut	Miles Partially dug	Miles Total	Base	Slopes	Average Depth	Excavation Cu. Yds.
S - 1		2.	2.	4	1:1	4	8,600.
2		2.	2.	"	"	"	8,600.
3		2.	2.	"	"	"	8,600.
4		2.	2.	"	"	"	8,600.
5		2.	2.	"	"	"	8,600.
6		2.	2.	"	"	"	8,600.
7		2.	2.	"	"	"	8,600.
8		2.	2.	"	"	"	8,600.
9		2.	2.	"	"	"	8,600.
10		2.	2.	"	"	"	8,600.
11		2.	2.	"	"	"	8,600.
12		2.	2.	"	"	"	8,600.
13½	0.37	1.63	2.	"	"	"	9,400.
14	0.08	1.92	2.	"	"	"	8,800.
15	2.		2.	"	"	"	12,600.
16	2.		2.	"	"	"	12,600.
17	2.		2.	"	"	"	12,600.
18	2.		2.	"	"	"	12,600.
19	2.		2.	"	"	"	12,600.
20	2.		2.	"	"	"	12,600.
21	2.		2.	"	"	"	12,600.
22	2.		2.	"	"	"	12,600.
23	2.		2.	"	"	"	12,600.
24	2.		2.	"	"	5	17,600.
26	2.		2.	"	"	"	17,600.
28	2.		2.	"	"	"	17,600.
30	2.		2.	"	"	"	17,600.
32	2.		2.	"	"	"	17,600.
Totals	28.45	27.55	56.				322,800.

Table No. 10

Q^E Sub-laterals

Sub-laterals	Miles Uncut	Miles Partially dug	Miles Total	Base	Slopes	Average Depth	Excavation Cu. Yds.
Q^E - 2	0.65	1.47	2.12	5	1:1	5	18,100.
4		2.12	2.12	"	"	"	16,200.
6		2.12	2.12	"	"	"	16,200.
8		2.12	2.12	"	"	"	0.
10	1.60	0.52	2.12	"	"	"	19,600.
12		2.12	2.12	"	"	"	16,200.
14	2.12		2.12	"	"	"	20,700.
16	2.12		2.12	"	"	"	20,700.
18	2.12		2.12	"	"	"	20,700.
20	2.12		2.12	"	"	"	20,700.
22	2.12		2.12	"	"	"	20,700.
24	2.12		2.12	"	"	"	20,700.
26	2.12		2.12	"	"	"	20,700.
28	2.12		2.12	"	"	"	20,700.
30	2.12		2.12	"	"	"	20,700.
32	2.12		2.12	"	"	"	20,700.
Totals	23.45	10.47	33.92				293,300.

Table No. 11.

Q^W Sub-laterals

Sub-lateral	Miles: Uncut	Miles: Partially dug	Miles: Total	Base	Side Slopes	Average Depth	Excavation Cu. Yds.
							Cu. Yds.
Q^W - 2		2.12	2.12	5	1:1	5	16,000.
4		2.12	2.12	"	"	"	16,000.
6		2.12	2.12	"	"	"	16,000.
8		2.12	2.12	"	"	"	0.
10		2.12	2.12	"	"	"	16,000.
12		2.12	2.12	"	"	"	16,000.
14	2.12		2.12	"	"	"	20,500.
16	2.12		2.12	"	"	"	20,500.
18	2.12		2.12	"	"	"	20,500.
Totals	6.36	12.72	19.08				141,500.

Table No. 12.

Summary - Sub-laterals

Sub-laterals	Miles: Uncut	Miles: Partially dug	Miles: Total	Excavation Cu. Yds.
P. L.	1.66	60.55	62.21	208,300.
U	5.02	47.84	52.86	219,600.
S	28.45	27.55	56.	322,800.
Q^E	23.45	10.47	33.92	293,300.
Q^W	6.36	12.72	19.08	141,500.
Totals	64.94	159.13	224.07	1,185,500.

Note - Included in above table and classified for digging as practically new work:

Sub-laterals	Miles	Excavation Cu. Yds.
U	5.02	49,900.
S	56.	322,800.
Q^E	31.80	293,300.
Q^W	16.96	141,500.
Totals	109.78	807,500.

Practically new work	807,500.
Partially completed or clean out work	378,000.
Total	1,185,500.

F-705

Estimate of Cost

	Stations		Cu. Yds.			
Outlet Exetnsion	292 to 238	Earth Excavation	45,000	@	$0.25	$ 11,250.00
Outlet Canal	238 to 0	" "	221,400	"	.50	110,700.00
		Rock "	15,000	"	.70	10,500.00
Main Canal	0 to 42	Earth "	42,600	"	.50	21,300.00
	42 to 323	" "	145,000	"	.20	29,000.00
Park Lateral	0 to 367	" "	86,000	"	.25	21,500.00
Lateral U	0 to 447 ± 31.2	" "	202,000	"	.20	40,400.00
Lateral S	0 to 447 ± 21.5	" "	225,000	"	.20	45,000.00
Lateral Q	0 to 446 ± 37.7	" "	168,000	"	.20	33,600.00
Sub-laterals		" "	378,000	"	.35	132,300.00
		" "	807,500	"	.18	145,350.00
Railroad Canal		" "	700	"	.25	175.00
Levee, Main Canal		" Embankment	2,600	"	.20	520.00
Lateral M		" "	1,600	"	.20	320.00
Zig-Zag Canal		" "	4,000	"	.20	800.00
Canal 34		" "	7,200	"	.20	1,440.00
Total			2,351,600			$ 604,155.00
Spillway at outlet of Park Lateral						1,500.00
Removal of Control Gate						500.00
Protection of Sub-lateral Outlets						10,000.00
Bridges over Laterals		1,600 lin. ft.		@	$10.	16,000.00
Bridges over Sub-laterals		170 bridges		"	75.	12,750.00
Railroad open culverts						450.00
Additional right-of-way Main Canal and Outlet Canal (inside of District)		24.55 Acres		"	100.	2,455.00
Additional right-of-way Outlet Canal and Outlet Extension in Fleming Grant		95.13 "		"	25.	2,378.25
Additional right-of-way Park Lateral		25.11 "		"	150.	3,766.50
Right-if-way North and South Diversion Ditches		6.05 "				2,374.50
						$ 656,329.25
Engineering, Supervision and Contingencies						93,670.75
Total						$ 750,000.00

Respectfully submitted,

(signed) I.S.Lhoyd,

Chief Engineer.
Registered in State of Florida
May 12, 1919, No. 198.

Approved:

ELLIOTT & HARMON ENGINEERING COMPANY

By (signed) C. G. Elliott,

SECTION 3

LAND USE WITHIN FELLSMERE WATER CONTROL DISTRICT

LAND USE WITHIN FELLSMERE WATER CONTROL DISTRICT

The Fellsmere Water Control District (F.W.C.D.) contains approximately 50,000 acres (78 square miles, more or less) per its original Plan of Reclamation. The F.W.C.D. lies within, or a portion thereof, Township 31 South, Ranges 36 and 37 East, and Township 32 South, Ranges 36 and 37 East, Indian River County, Florida.

The original platted "Town of Fellsmere", and earlier annexations immediately adjacent thereto, lie totally within the limits of the F.W.C.D. boundaries, and is one of the oldest communities in the area. Recently, a 3750 acre parcel lying east of and adjacent to the City of Fellsmere (and outside the limits of F.W.C.D.) has been annexed into the City of Fellsmere. This annexed parcel lies east of the east boundary of the F.W.C.D., south of County Road 512, and west of Interstate Highway 95 (I-95), is referred to as "Pine Grove", and is contained within the limits of Vero Lakes Water Control District. The two water control districts are separated by the east boundary levee of the F.W.C.D. with no drainage interconnection.

The "Pine Grove" annexed parcel is owned by RO-ED Corp., a Florida corporation. The RO-ED Corp. has entered into an agreement with the City of Fellsmere to pay the cost of an updated and amended Comprehensive Land Use Plan for the City of Fellsmere with the inclusion of the "Pine Grove" parcel. It is contemplated by the parties, that the full development of "Pine Grove" will extend over twenty years or perhaps longer, and may be developed by a variety of development interests.

A copy of the existing City of Fellsmere zoning map of that portion of the city lying within the F.W.C.D. is attached herewith.

Generally, little change from existing residential and commercial uses within that portion of the City of Fellsmere lying within the F.W.C.D. is expected except in the area around the Mesa Park area. The addition of hotel, motel, restaurant, etc., associated with the entertainment facilities at Mesa Park, is expected.

The future development of "Pine Grove" annexation parcel is expected to include a commercial related node of development, and other mixed uses, within its plan.

Residential development is expected to continue in the Homewood Subdivision and remaining rural residential area south of, and around, the city limits of Fellsmere.

A tentatively approved development plan (Willow Lake Subdivision), within that portion of Homewood Subdivision annexed into the City of Fellsmere, containing 43.46 gross acres, indicates a total of 35 lots surrounding a 12.20 acre lake (former mining operation) to be utilized as a stormwater management tract for this development.

The remaining Homewood Subdivision outside of the City of Fellsmere has an L-1 land use designation allowing up to 3 units per acre. Indian River County and S.J.R.W.M.D. are working with the primary landowners of this property in the proposed residential utilization/development.

The remaining rural residential properties around the City of Fellsmere have a land use designation of AG-1 (1 unit/5 acres) and AG-2 (1 unit/10 acres).

Appropriate stormwater management facilities, discharge and flood plain displacement limitations should be established for these areas in order to prevent further adverse cumulative effect of the quality and quantity of stormwater discharge.

Major flooding within the F.W.C.D. and within the Town of Fellsmere has been greatly reduced with implementation of the Upper St. Johns River Basin Project

(U.S.J.R.B.P.) including the re-diversion of stormwater discharge of a major portion of the F.W.C.D. into the U.S.J.R.B.P., greatly reducing the area drained, and quantity of stormwater discharging through the Main Outfall Canal to tidewater.

Moderate flooding conditions have, and will, occur during major storm events, which exceed the capacity of the existing drainage facilities of the F.W.C.D.

A study and determination of the capacity of the existing drainage system of the F.W.C.D. needs to be made and a hydrologic model of the system developed and calibrated. This would provide a means to evaluate the existing system and would be used as a tool to develop future planning and design improvements within the system, and for the establishment of design limitations and regulations for new development within the F.W.C.D. to adequately manage, treat and store stormwater runoff.

The Town of Fellsmere although still a predominately rural community, has become more progressive and diverse in recent years. The five (5) and ten (10) acre tracts around the city's borders are being sold off and many rural and ranchette type homes are being built.

Rodney Tillman, Superintendent of the F.W.C.D., has prepared a basic land use map of the District and a copy is attached herewith. This map reflects existing (2000) land uses except for the area in the rural residential category, which is largely undeveloped at this time.

The most current and available "official" data source for identifying and quantifying existing land uses within the F.W.C.D. appears to be the 1995 Land Use/Land Cover Maps generated by the S.J.R.W.M.D. (See attached 1995 Land Use/Land Cover Map and Acreage Tables acquired from S.J.R.W.M.D., which excludes a portion of the lands acquired by S.J.R.W.M.D. within the F.W.C.D.).

In the mid 1980's, S.J.R.W.M.D. purchased approximately 6500 acres from landowners and the F.W.C.D. along the western portion of the District. This area has been developed into the St. Johns Water Management Area as part of the implementation of the S.J.R.W.M.D. and U.S.A.C.E. Upper St. Johns River Basin Project. See copy of map of Upper St. Johns River Basin Project attached herewith.

In 1999, the S.J.R.W.M.D. purchased some 1,955 acres of land from Berry Groves and the F.W.C.D. within the southeast corner of the District for proposed new water management area, which should be developed within the next eight (8) years.

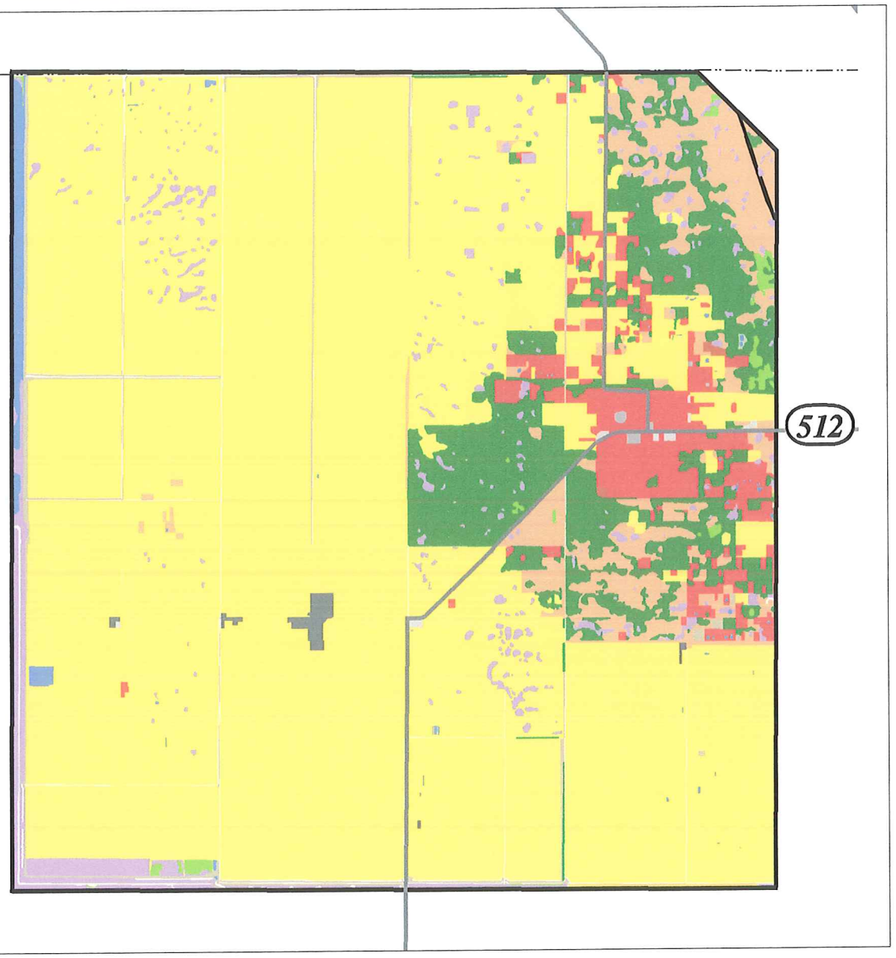
In 1999, the S.J.R.W.M.D. together with the State of Florida and Indian River County purchased approximately 2,359 acres from the Carson Platt Estate and F.W.C.D. within the northeast corner of F.W.C.D. for conservation and recreation purposes as part of the St. Sebastian River State Buffer Preserve.

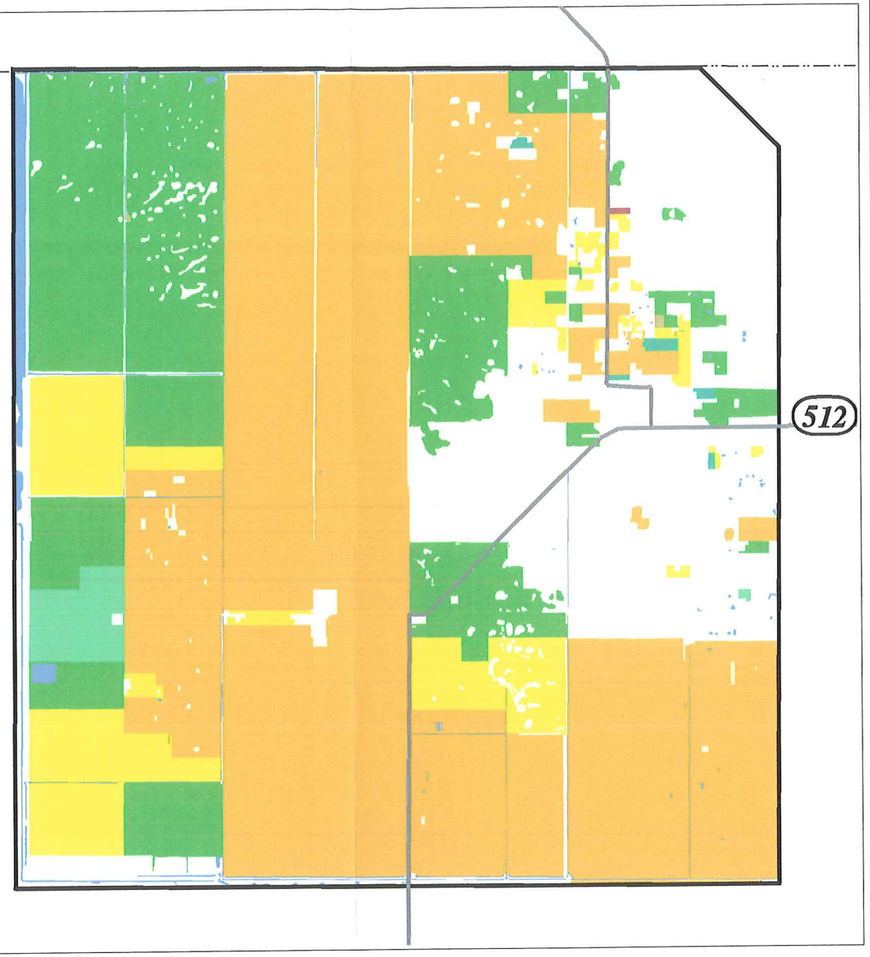
Little change in the more intense agricultural usage within the District is anticipated during the next five (5) years. More rural/ranchette type (5 to 10-acre home-sites) residential growth is expected in the less intense and open areas around the City of Fellsmere and within the limits of the F.W.C.D.

FELLSMERE WATER CONTROL DISTRICT
1995 LAND USE/LAND COVER ACREAGE
DEVELOPED BY S.J.R.W.M.D.

Lucode	Count	Lucodedesc	Sum_acres	
1100	82	Residential, low density - less than 2 dwelling units/	1391.2000	Residential
1200	5	Residential, medium density - 2-5 dwelling units/acre	444.8000	
1300	1	Residential, high density - 6 or more dwelling units/a	19.4000	
1410	7	Retail sales and services	38.5000	Commercial
1430	2	Professional services	4.3000	
1510	4	Food processing	111.6000	Industrial
1550	1	Other light industrial	6.6000	
1700	5	Institutional	27.2000	Institutional
1850	2	Parks and zoos	22.1000	Active recreational
2110	29	Improved pastures (monocult, planted forage crops)	8180.1000	Pastures (improved, unimproved and woodland)
2120	6	Unimproved pastures	163.1000	
2130	3	Woodland pastures	25.5000	
2140	2	Row crops	564.4000	Row crops
2150	21	Field crops	3523.3000	Field crops
2210	17	Citrus groves	19928.0000	Citrus groves and abandoned tree crops
2240	4	Abandoned tree crops	48.2000	
2310	1	Cattle feeding operations	2.6000	other agriculture (cattle feeding operations and horse farms)
2430	1	Ornamentals	10.2000	Ornamentals
2510	1	Horse farms	8.2000	
2540	5	Aquaculture	74.8000	Aquaculture
2610	1	Fallow cropland	6.2000	Fallow cropland
3100	40	Herbaceous range	379.3000	Rangeland
3200	62	Shrub and brushland (wax myrtle or saw palmetto, occas	1300.3000	
3300	15	Mixed rangeland	687.5000	
4110	52	Pine flatwoods	3166.4000	Upland forests
4200	2	Upland hardwood forests	16.6000	
4340	44	Upland mixed coniferous/hardwood	798.5000	
4370	3	Australian pine	3.9000	
5100	51	Streams and waterways	427.6000	Lakes, streams and waterways
5200	8	Lakes	7.8000	
5300	2	Reservoirs - pits, retention ponds, dams	319.7000	Reservoirs
5340	68	Reservoirs less than 10 acres	77.0000	
6150	2	River/lake swamp (bottomland, may include cypress)	3.7000	Forested wetlands
6170	6	Mixed wetland hardwoods	79.2000	
6200	3	Wetland coniferous forests	42.1000	
6220	3	Depressional pine	9.9000	
6300	11	Wetland forested mixed	35.3000	
6410	193	Freshwater marshes	691.5000	Vegetated non-forested wetlands
6430	186	Wet prairies	418.2000	
6440	8	Emergent aquatic vegetation	6.0000	
6460	81	Mixed scrub-shrub wetland	482.1000	
7400	1	Disturbed land - use level II class. code for rural la	2.5000	Disturbed land
7410	5	Rural land in transition without positive indicators o	28.2000	
7430	9	Spoil areas	729.2000	
8320	2	Electrical power transmission lines	29.0000	Electric power transmission lines

Fellsmere Water Control District





1:100000

1995 Land Use / Land Cover Mapping

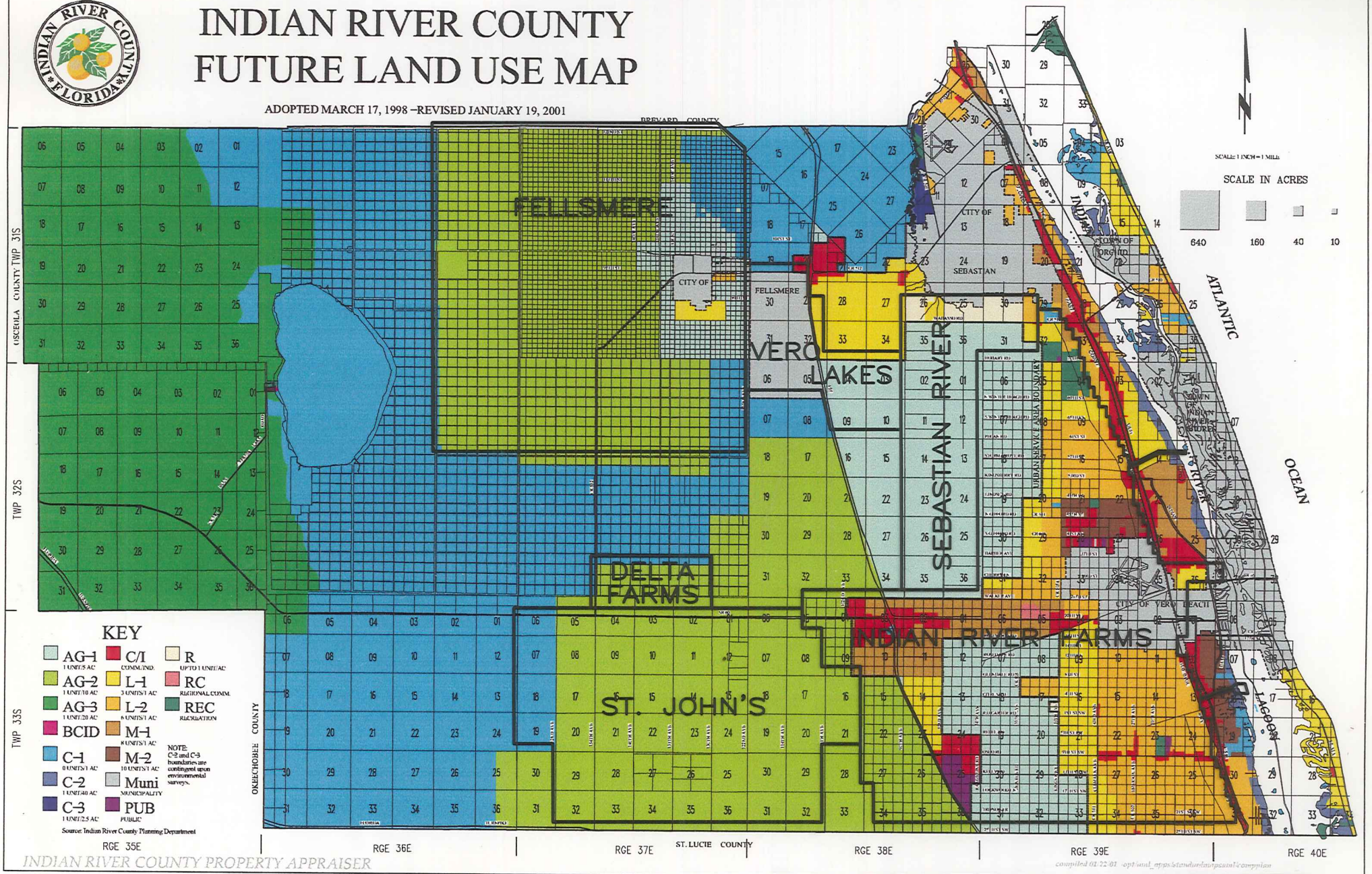
- Residential
- Active Recreation
- Commercial
- Institutional
- Industrial
- Transportation, Communications & Utilities
- Disturbed Land
- Agriculture (see map on right for subcategories)
- Rangeland
- Upland Forests
- Forested Wetlands
- Vegetated Non-Forested Wetlands
- Reservoirs, Lakes, Streams, & Waterways

Land Cover / Land Use	Acres
Active Recreation	22.1000
Aquaculture	74.8000
Citrus Groves & Abandoned Tree Crops	19976.2000
Commercial	42.8000
Disturbed Land	759.9000
Fallow Cropland	6.2000
Field Crops	3523.3000
Forested Wetlands	170.2000
Industrial	118.2000
Institutional	27.2000
Lakes, Streams & Waterways	435.4000
Ornamentals	10.2000
Other Agriculture (cattle feeding operations and horse fa	10.8000
Pastures (improved, unimproved & woodland)	8368.7000
Rangeland	2367.1000
Reservoirs	396.7000
Residential	1855.4000
Row Crops	564.4000
Transportation, Comunications & Utilities	29.0000
Upland Forests	3985.4000
Vegetated Non-Forested Wetlands	1597.8000

- Aquaculture
- Citrus Groves & Abandoned Tree Crops
- Ornamentals
- Fallow Cropland
- Field Crops
- Row Crops
- Other Agriculture (cattle feeding operations and horse farms)
- Pastures (improved, unimproved & woodland)
- Reservoirs, Lakes, Streams, & Waterways

INDIAN RIVER COUNTY
FUTURE LAND USE MAP

ADOPTED MARCH 17, 1998 –REVISED JANUARY 19, 2001



INDIAN RIVER COUNTY PROPERTY APPRAISER

compiled 01/22/01 opt/aml_apps/standardmapsaml/compmap

INDIAN RIVER COUNTY WATER CONTROL DISTRICTS

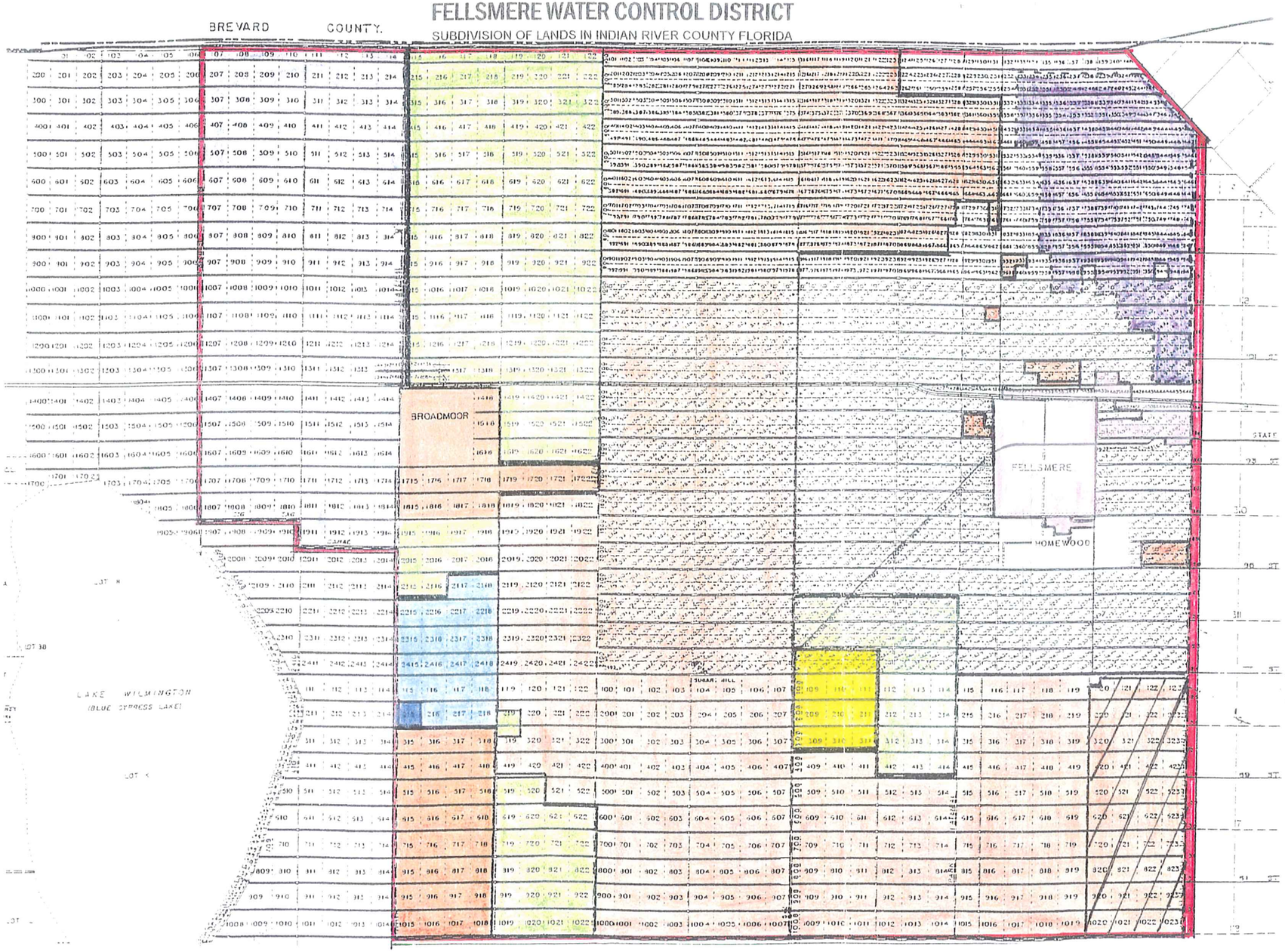
FELLSMERE WATER CONTROL DISTRICT

SUBDIVISION OF LANDS IN INDIAN RIVER COUNTY FLORIDA

BREVARD COUNTY.

DISTRICT BOUNDARY

City of Fellsmere	1,042 Ac
Citrus	19090 Ac
Citrus Future Reservoir	1,957 Ac
Conservation Recreational	2277 Ac
Urban 5 & 10 acre Homesites	5697 Ac
Pasture	7974 Ac
Sod	1,860 Ac
SJWMA Reservoir	6,300 Ac
Vegetables	600 Ac
Water Cress	655 Ac
Water	40 Ac



SECTION 4

FELLSMERE WATER CONTROL DISTRICT
CANAL SYSTEM/BASIN DESCRIPTIONS/ WATER MANAGEMENT SYSTEM
CROSS-SECTIONS OF THE MAIN OUTFALL CANAL

BASIN DESCRIPTIONS/WATER MANAGEMENT SYSTEM IN THE FELLSMERE WATER CONTROL DISTRICT

The land area within the F.W.C.D. draining by gravity via the Main Outfall Canal to the Sebastian River and Indian River Lagoon (I.R.L.) has been greatly reduced with the implementation of the Upper St. Johns River Basin Project. However, the District boundaries have not been changed formally to reflect these changes. Therefore, we have included a basin map (see attached Sheet "C"), which depicts the basin boundaries and the following basin drainage descriptions to note the changes.

I. Major Basins

A. St. Johns Water Management Area (S.J.W.M.A. – 6,500 acres, more or less)

This basin is owned by the St. Johns River Water Management District and is part of their "Upper St. Johns River Basin Project". The S.J.W.M.A. is surrounded by levees (L-75, L-76 & Fellsmere Grade) and any flow of surface water into it from F.W.C.D. is through gated culverts in the L-75 levee or via the B.C.W.M.A. and C-65 Canal.

B. Fellsmere Joint Venture (24,000 acres, more or less)

This basin is an agricultural area consisting mainly of citrus grove and also containing improved pasture/cattle, vegetable and sod producing areas. The majority of the runoff from this basin is pumped into the St. Johns Water Management Area via major flow way collector canals on the north, west and south perimeter of the basin. The main lateral collector canals and respective pump stations are as follows:

1) "Railroad Canal" discharges through F.J.V. Pump Station No. 1 (capacity = 120,000 G.P.M.) into the Main Canal.
2) Lateral "S" Canal discharges at its northern terminus through F.J.V. Pump Station No. 2 (capacity = 125,000 G.P.M.) into the Main Canal, and at its southern terminus through F.J.V. Pump Station No. 6 (capacity 150,000 G.P.M.) into C-65 Canal.
3) "Mile Canal" discharges through F.J.V. Pump Station No. 3 (capacity = 105,000 GPM) into the Main Canal.
4) Canal "Q-13" discharges through F.J.V. Pump Station No. 4 (capacity = 125,000 G.P.M.) into the S.J.W.M.A.
5) Canal "Q-30" discharges through F.J.V. Pump Station No. 5 (capacity = 100,000 G.P.M.) into C-65 Canal.
6) F.J.V. Pump Station No. 7 (capacity = 50,000 G.P.M.) pumps from Canal "U-34" and intersecting unnamed internal north-south canal into B.C.W.M.A. at a point approximately 7/8 of a mile east of County Road 512.

Note that a plug has been constructed in the Main Canal west of Lateral "U" (east of "Railroad Canal") and that all pumped discharges are directed west into the S.J.W.M.A. and C-65 flow way, or south into B.C.W.M.A. A small portion of runoff can gravity discharge into Lateral "U" via a 54" gated culvert structure located in Lateral "U" Canal near Ditch "U-20". These pump stations and the gravity discharge structure are owned and maintained by the Fellsmere Joint Venture. The sub-lateral ditches and lateral canals, which are on District rights-of-way, are maintained by the District.

C. Berry Groves, Inc. (4,000 acres, more or less)

This basin is an agricultural area consisting entirely of citrus grove. The Berry Groves' basin drains by a combination of gravity discharge and pumped discharge. The pump station has a permitted capacity of 73,540 G.P.M. and is located in the southwest corner of the basin. The pump station discharges water into the Blue Cypress Water Management Area East and is either retained or directed northward to the St. Johns River via the network of water management, marsh conservation areas and flow ways, which together form a portion of the "Upper St. Johns River Basin Project". The gravity discharge structure is a 60" diameter culvert with a sluice gate and is located in Park Lateral near Ditch "PL-24" (as shown on Sheet "A" attachment) and discharges into Park Lateral. The pump station and the gravity discharge structure are owned and maintained by Berry Groves, Inc. The sub-lateral ditches and lateral canals, which are on District rights-of-way, are maintained by the District. With the purchase, by S.J.R.W.M.D., of the easterly 1,955 acres of this basin, modifications to this basin are expected within the next eight years.

D. Gravity Drainage Area (15,000 acres, more or less)

This area represents the remaining portion of the Fellsmere Water Control District, which drains entirely by gravity. The City of Fellsmere is included in this drainage basin.

This gravity drainage basin/area also contains the 2358.62 acres (lying within the F.W.C.D.) purchased from the Carson Platt Estate and F.W.C.D. by the State of Florida, S.J.R.W.M.D. and Indian River County for inclusion in the St. Sebastian River State Buffer Preserve. With proposed efforts to rehydrate this area to more natural conditions, modifications to the F.W.C.D. facilities, within this portion of the preserve, will occur over the next few years.

The Fellsmere Water Control District maintains the sub-lateral ditches (1/4 mile on center), Park Lateral, Lateral "U" and the Main Outfall Canal.

II. Control Structures

The District does not own or maintain any control structures within its system and has no means to control discharge water levels within the remaining gravity flow system.

The F.W.C.D., and major landowners within the water control district, have worked closely with the S.J.R.W.M.D. in the implementation of the U.S.J.R.B.P. The F.W.C.D. coordinates with the S.J.R.W.M.D. on its withdrawals and discharge of water and the timing and placement of water within the S.J.W.M.A., B.C.W.M.A. and B.C.M.C.A., to help further the water management goals of the U.S.J.R.B.P., and looks forward to participating in the planning and implementation of the proposed projects for the Berry Grove and Carson Platt Estate parcels.

FELLSMERE WATER CONTROL DISTRICT CANAL SYSTEM

The creation of the Fellsmere Drainage District (now known as Fellsmere Water Control District) authorized the engineering evaluation of an existing drainage system and the preparation of the 1920 Plan of Reclamation (P.O.R.). This plan proposed major improvements to the pre-existing levee and canal system.

A plat of the original Plan of Reclamation is shown on Sheet "A" of attachments to this water control plan and described in the "Report on the Plan of Reclamation of the Fellsmere Drainage District" (April 14, 1920) included in Section 2 herewith.

The 1920 P.O.R. proposed the construction or modification to the surrounding levees, Main Outfall Canal, lateral canals, sub-lateral canals, equalizing canals and diversion ditches to improve drainage within the F.W.C.D. and the City of Fellsmere.

The "Report of the Plan of Reclamation of the Fellsmere Drainage District" states that the system was designed to accommodate runoff from a rainfall of five inches in 24 hours. However, final construction of the project never provided this magnitude of discharge from the drainage system.

The implementation of the S.J.R.W.M.D. and U.S.A.C.E. Upper St. Johns River Basin Project has resulted in further modification to the system constructed and modified under the 1920 Plan of Reclamation, and some facilities owned and operated by landowners within the F.W.C.D., including S.J.R.W.M.D., are currently part of the system of water management improvements in the F.W.C.D.

The canal system was originally designed strictly as a gravity flow system. The natural slope of lands within the District slopes gently from the highest ground it its' northeast corner in a southwesterly direction to the lowest lands within the District in its' southwest corner.

Reference is made to Sheets "A" and "C" of attachments showing location of sub-lateral and lateral canals. See also copy of map of the Upper St. Johns River Basin Project attached in Section 3.

Under the 1920 P.O.R., the sub-lateral canals retained an east-west alignment and were spaced at ¼ mile intervals. The sub-lateral canals flow westerly into intercepting lateral canals, which currently include Park Lateral, Lateral "U", "Railroad Canal", Lateral "S" and "Mile Canal". The "Railroad Canal" and "Mile Canal" are not owned by the F.W.C.D.

As a borrow ditch for the construction of County Road 512, Lateral "U" Canal extends south of F.W.C.D. where it is submerged in the Blue Cypress Water Management Area (B.C.W.M.A.) in the U.S.J.R.B.P. and used for drainage by the Delta Farms Water Control District (D.F.W.C.D.) at its southern extremity. For protection of the endangered Snail Kite, no irrigation water withdrawal is permitted from the B.C.W.M.A.

A gated culvert structure extends through the south levee into that portion of Lateral "U" (submerged in B.C.W.M.A. – East) south of the F.W.C.D. This structure was originally installed to provide a source of water supply for freeze protection within the F.W.C.D.

Although no documented use of this structure is available, combined consumptive use withdrawals for freeze protection from the B.C.W.M.A. – East can only occur as long as withdrawals are regulated by the following conditions:

1) The water level in the B.C.W.M.A. – East must be above 23.5 feet (1929 N.G.V.D.) when withdrawal occurs.
2) Water levels should not decline more than six (6) inches during any single freeze event.
3) A volume of water equal to the withdrawal for the freeze season must be returned to the B.C.W.M.A. – East under permitted specific time frames and water quality limitations.

The Lateral "Q" Canal was largely submerged and the "Q"-West Sub-lateral canals were completely submerged when the St. Johns Water Management Area (S.J.W.M.A.) in the U.S.J.R.B.P. was developed. The Lateral "M" Canal is located west of the S.J.W.M.A. submerged in the Blue Cypress Marsh Conservation Area (B.C.M.C.A.). The remaining lateral canals flow north into the Main Canal along the northern boundary of the F.W.C.D. (immediately south of and parallel to the Fellsmere Grade and S.J.R.W.M.D. C-54 Canal).

The Main Canal has an east-west alignment along the north boundary of the F.W.C.D. An earthen plug has been constructed in the Main Canal west of Lateral "U" Canal, just east of the "Railroad Canal" intersection into the Main Canal.

From this plug the Main Canal flows east (through the "Ten Mile Ridge") and originally discharged some three miles or so east of the east boundary of the F.W.C.D., into the west prong of the Sebastian River. The Main Canal now ties into C-54 Canal through a fixed weir structure (weir elevation 2.25, more or less) at a point downstream of Structure (S-157) located within C-54 Canal. This weir structure is located within the C-54 Canal right-of-way and is maintained by S.J.R.W.M.D.

Park Lateral and Lateral "U" Canals are the only two remaining lateral canals that gravity discharge into the Main Canal east of the earthen plug.

The "Railroad Canal", Lateral "S" and "Mile Canal" all discharge through pump stations into the Main Canal west of the earthen plug, and flows westerly into the S.J.W.M.A.

In the original construction of the system, levees were built along the north side of the Main Canal ("Fellsmere Grade") and extended westerly to the East Side of Lateral "M" Canal; thence south along the East Side of Lateral "M" to the north side of the "Zig-Zag" Canal; thence easterly along the north side of "Zig-Zag" Canal to the west side of Lateral "Q"; thence south along Lateral "Q" to the south boundary of the District; thence east along the south boundary of the District to the east boundary thereof; thence north along the east boundary of the F.W.C.D. until it intersects with the "Ten Mile" Ridge at about Ditch No. 8 (PL-8 as shown on P.O.R. – Sheet "A" attachment).

This original "outside" levee had a top width of 8 to 10 feet, generally, a 1½ to 1 foot side slope and a top elevation of 30 feet, more or less.

The original levees along the F.W.C.D.'s western and southern boundary east to the Lateral "S" Canal were improved and incorporated into the U.S.J.R.B.P. (L-76). A new levee (L-75) extending down the eastern side of the former Lateral "Q" Canal and along the F.W.C.D.'s southern boundary (north of and parallel to L-76) and continued east to, thence south along, County Road 512, also was constructed as part of the project.

An inside borrow ditch/canal exists along the West Side of the east boundary levee from the southeast corner of the F.W.C.D. northerly to approximately Sub-lateral

PL-8 as shown on the original P.O.R. (see Attachment "A"). This borrow ditch serves as an equalizing canal between those intersecting sub-lateral ditches that connect to it.

The levees along the western and southern boundary of the District (L-76 and L-75) have been acquired by S.J.R.W.M.D. and have been greatly improved with the development of their Upper Basin Plan and are now maintained by S.J.R.W.M.D.

The improvement and construction of L-76 and L-75 resulted in the creation of flow way/C-65 Canal connecting the northwest corner of B.C.W.M.A. to the southeast corner of S.J.W.M.A. through Structure S-96D/S-3.

FELLSMERE WATER CONTROL DISTRICT

CROSS-SECTIONS OF MAIN CANAL

Observed by William E. Powell, P.S.M.
of
Herrera, Williams & Powell, Architects – Engineers – Surveyors – Planners

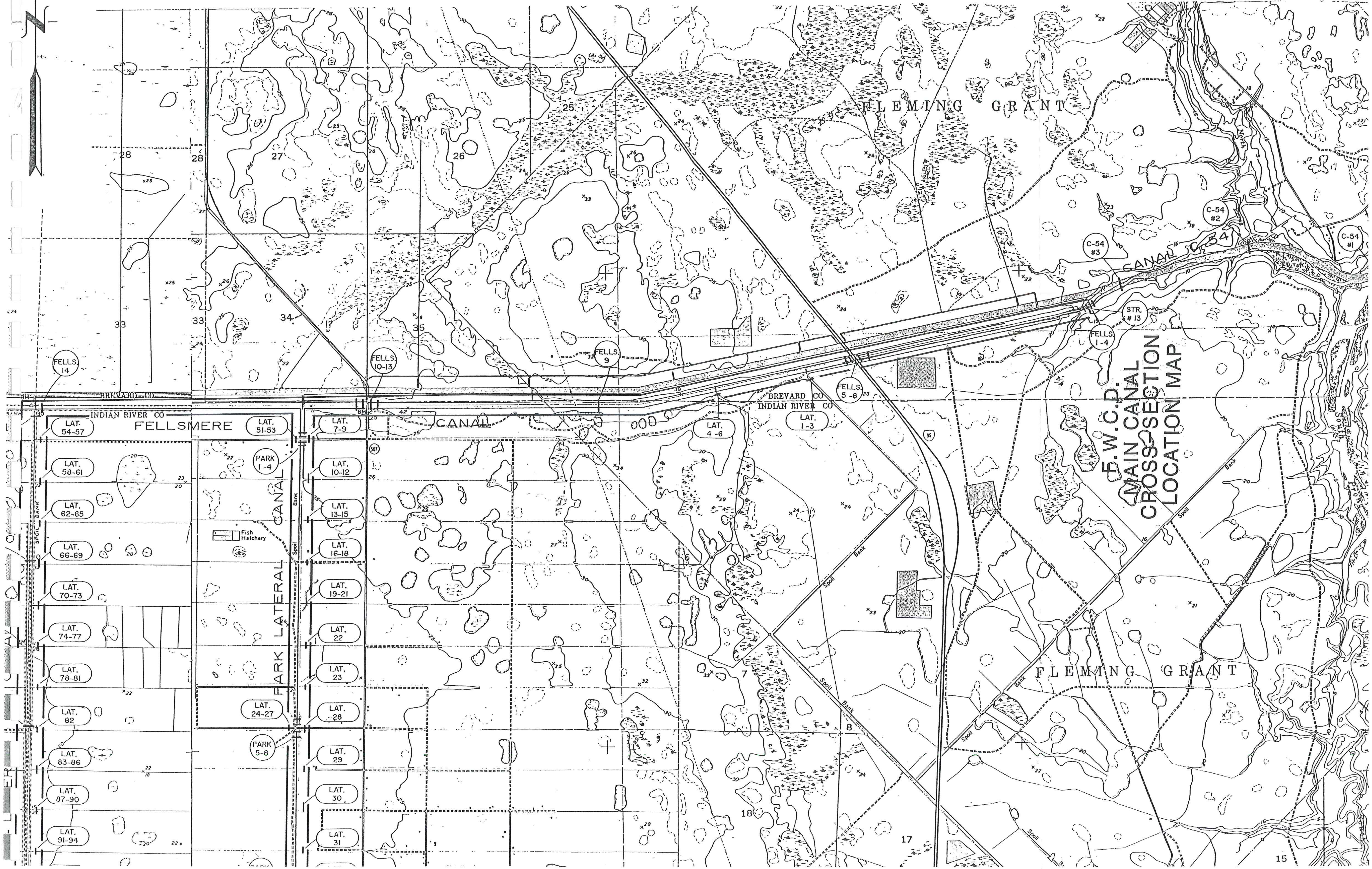
Under Contract Services with St. Johns River Water Management District

for

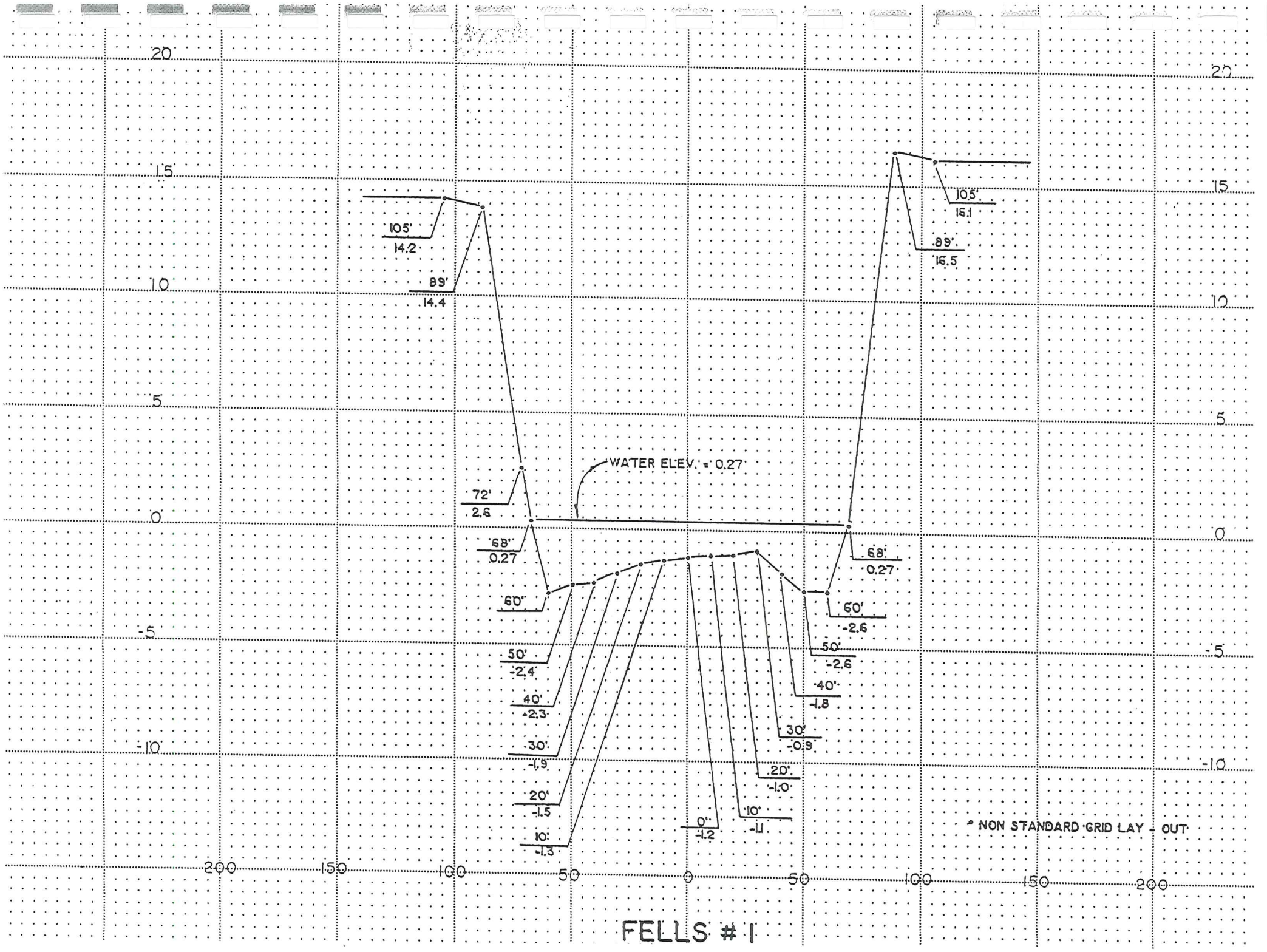
Canal Cross-Sections in Sebastian River Basin

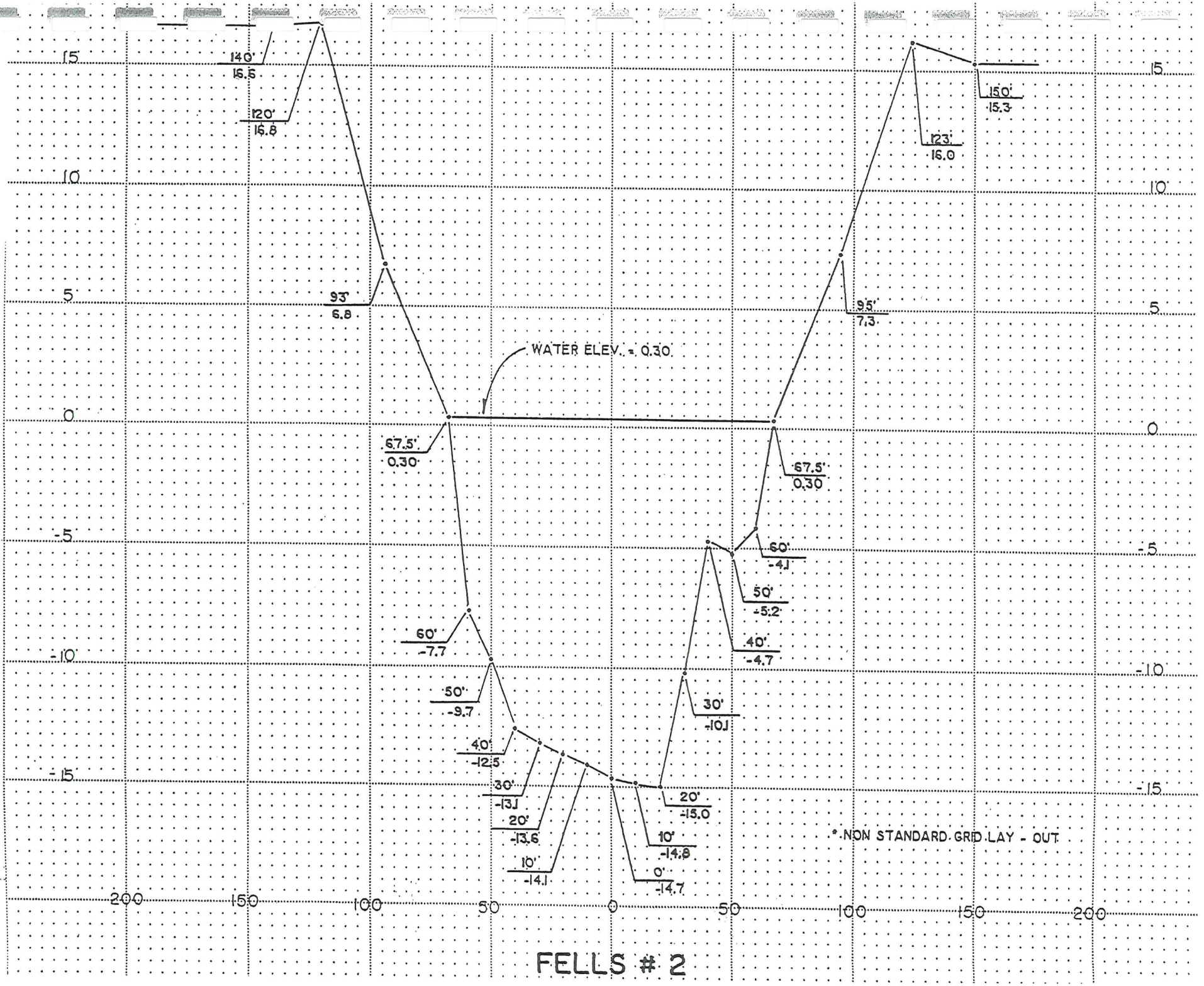
Date of Work: December 1989 to March 1990

Elevations Based on 1929 N.G.V.D.



F.W.C.D.
MAIN CANAL
CROSS-SECTION
LOCATION MAP
FLEMING GRANT
FLEMING GRANT
CANAL C-54
C-54 #1
C-54 #2
C-54 #3
STR. #13
FELLS. 1-4
FELLS. 5-8
FELLS. 9
FELLS. 10-13
FELLS. 14
BREVARD CO
INDIAN RIVER CO
FELLSMERE CANAL
PARK LATERAL CANAL
PARK 1-4
PARK 5-8
LAT. 1-3
LAT. 4-6
LAT. 7-9
LAT. 10-12
LAT. 13-15
LAT. 16-18
LAT. 19-21
LAT. 22
LAT. 23
LAT. 24-27
LAT. 28
LAT. 29
LAT. 30
LAT. 31
LAT. 51-53
LAT. 54-57
LAT. 58-61
LAT. 62-65
LAT. 66-69
LAT. 70-73
LAT. 74-77
LAT. 78-81
LAT. 82
LAT. 83-86
LAT. 87-90
LAT. 91-94
Fish Hatchery
Spoil Bank


20
15
10
5
0
-5
-10
200
150
100
50
0
50
100
150
200
105'
14.2
89'
14.4
72'
2.6
68'
0.27
60'
50'
-2.4
40'
-2.3
30'
-1.9
20'
-1.5
10'
-1.3
0'
-1.2
10'
-1.1
20'
-1.0
30'
-0.9
40'
-1.8
50'
-2.6
60'
-2.6
68'
0.27
WATER ELEV. = 0.27
105'
16.1
89'
16.5
* NON STANDARD GRID LAY - OUT
FELLS # 1


15
10
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-5
-10
-15
200
150
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50
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50
100
150
200
140'
16.6
120'
16.8
93'
6.8
67.5'
0.30
WATER ELEV. = 0.30
60'
-7.7
50'
-9.7
40'
-12.5
30'
-13.1
20'
-13.6
10'
-14.1
0'
-14.7
10'
-14.8
20'
-15.0
30'
-10.1
40'
-4.7
50'
-5.2
60'
-4.1
67.5'
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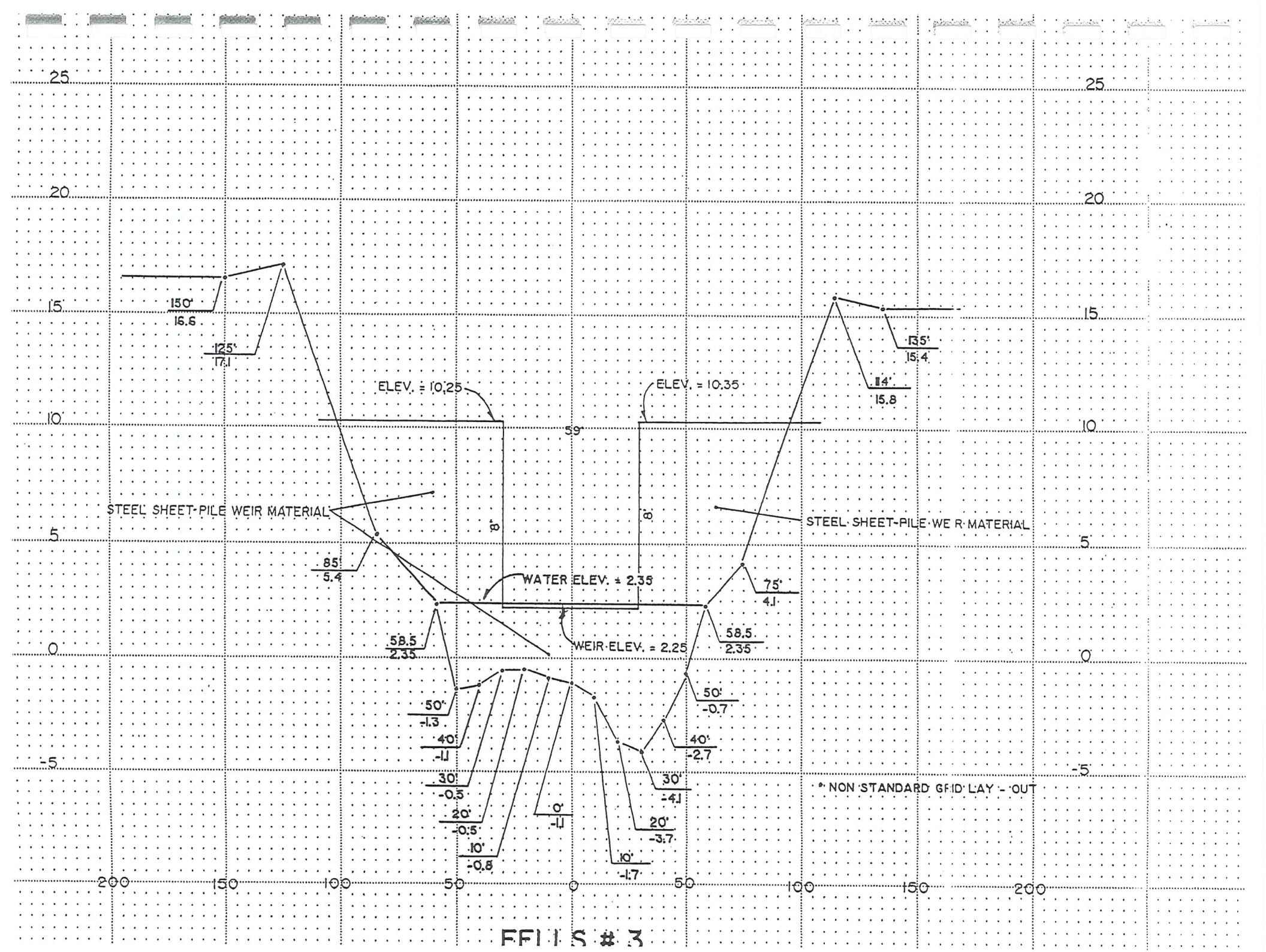
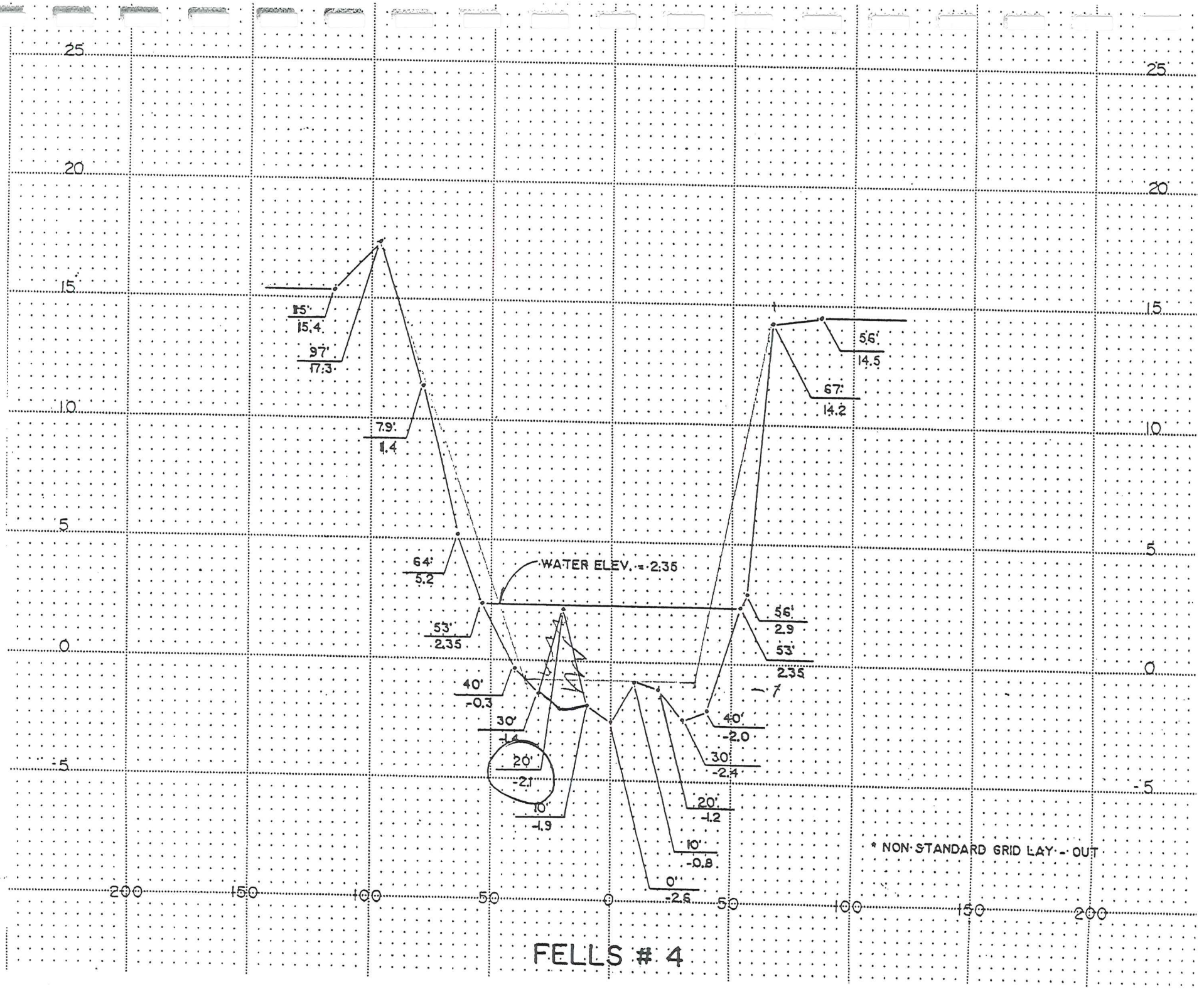
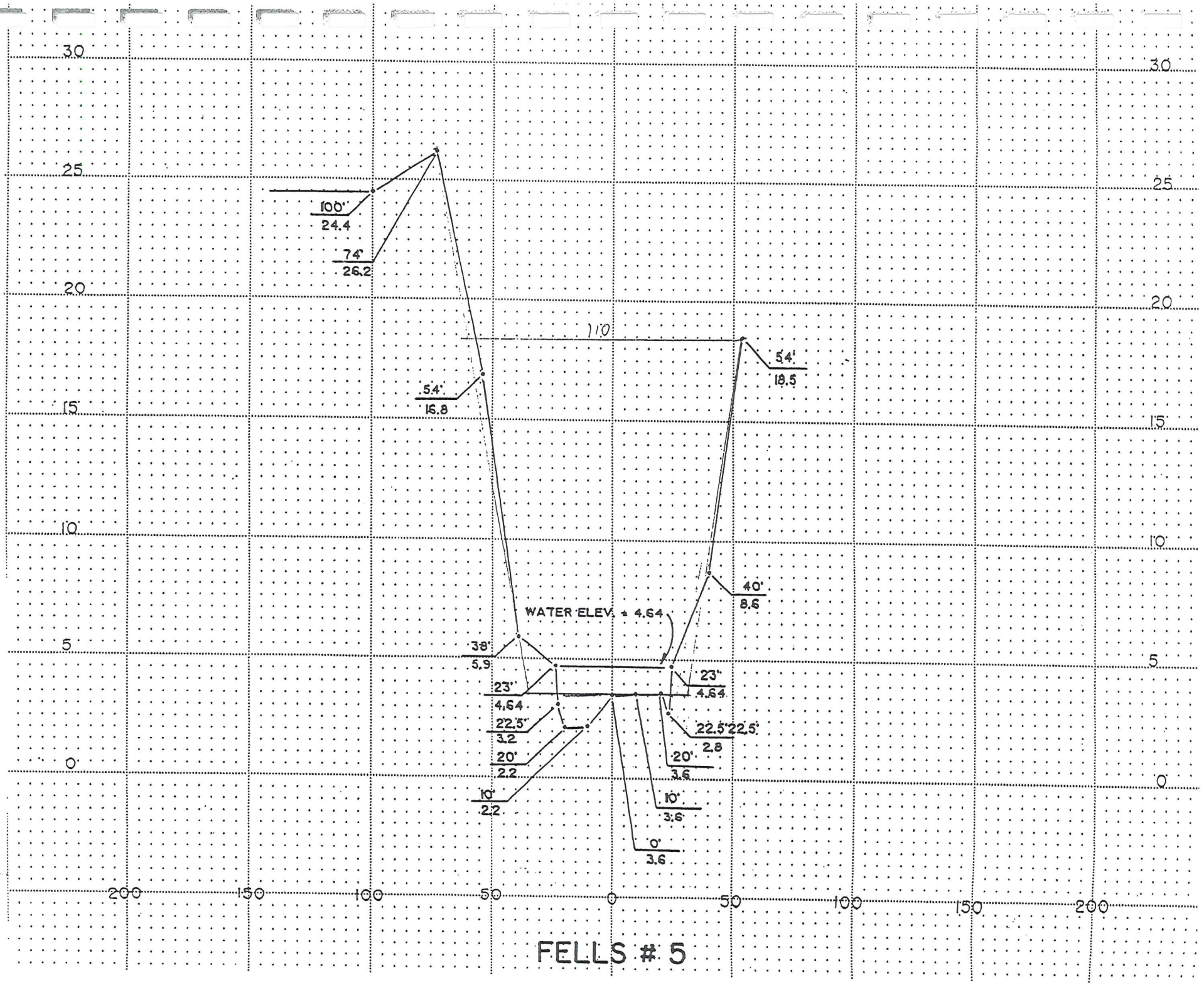
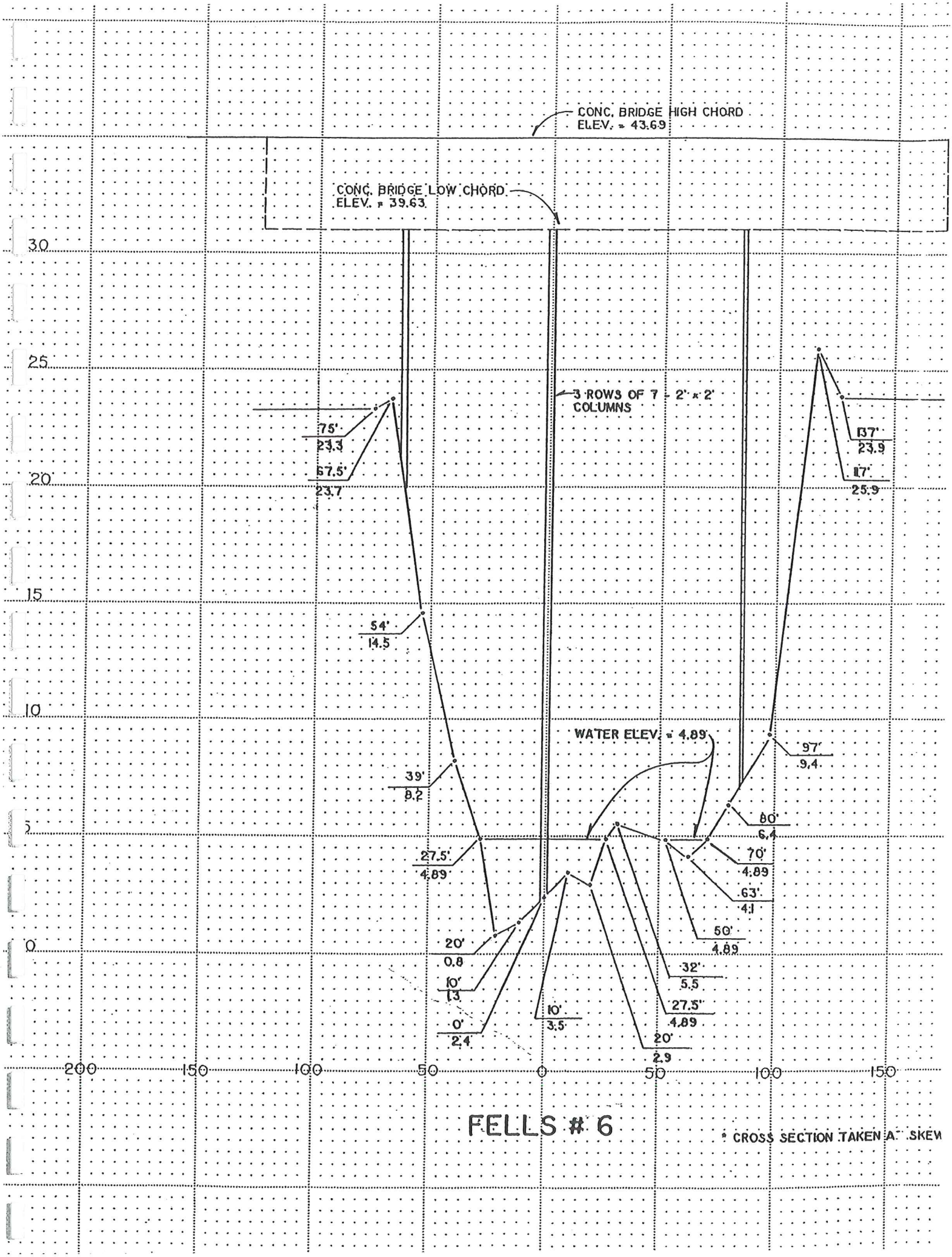
95'
7.3
123'
16.0
150'
15.3
* NON STANDARD GRID LAY - OUT
FELLS # 2

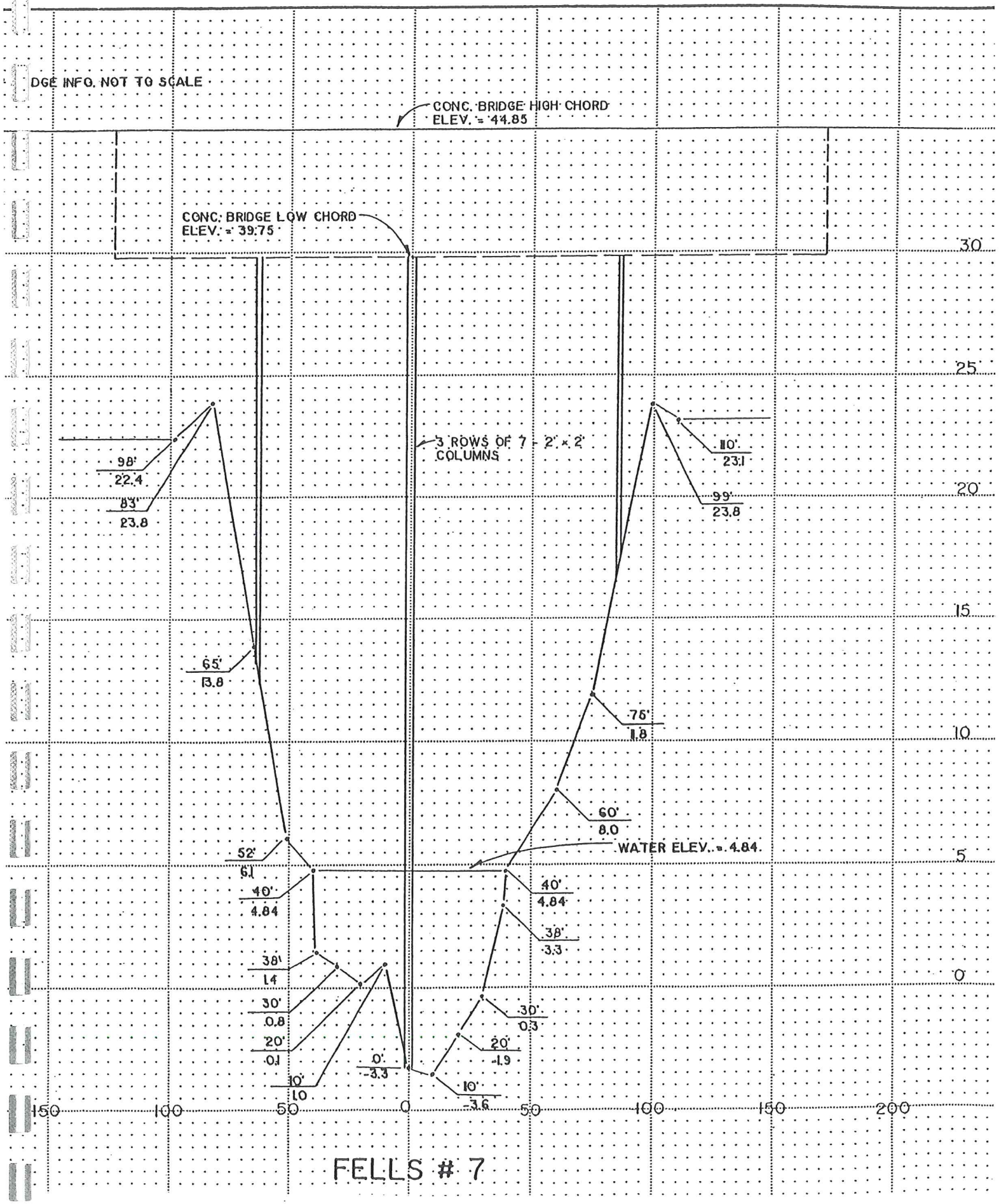

25
20
15
10
5
0
-5
200
150
100
50
0
50
100
150
200
150'
16.6
125'
17.1
ELEV. = 10.25
ELEV. = 10.35
59'
135'
15.4
14'
15.8
STEEL SHEET-PILE WEIR MATERIAL
STEEL SHEET-PILE WEIR MATERIAL
8'
8'
85'
5.4
WATER ELEV. = 2.35
75'
4.1
58.5
2.35
WEIR ELEV. = 2.25
58.5
2.35
50'
-1.3
50'
-0.7
40'
-1.1
40'
-2.7
30'
-0.5
30'
-4.1
20'
-0.5
0'
-1.1
20'
-3.7
10'
-0.8
10'
-1.7
* NON STANDARD GRID LAY - OUT
FFIIS #3


25
20
15
10
5
0
-5
200
150
100
50
0
50
100
150
200
115'
15.4
97'
17.3
79'
1.4
64'
5.2
53'
2.35
40'
-0.3
30'
-1.6
20'
-2.1
10'
-1.9
0'
-2.6
WATER ELEV. = 2.35
56'
14.5
67'
14.2
56'
2.9
53'
2.35
40'
-2.0
30'
-2.4
20'
-1.2
10'
-0.8
* NON-STANDARD GRID LAY-OUT
FELLS # 4

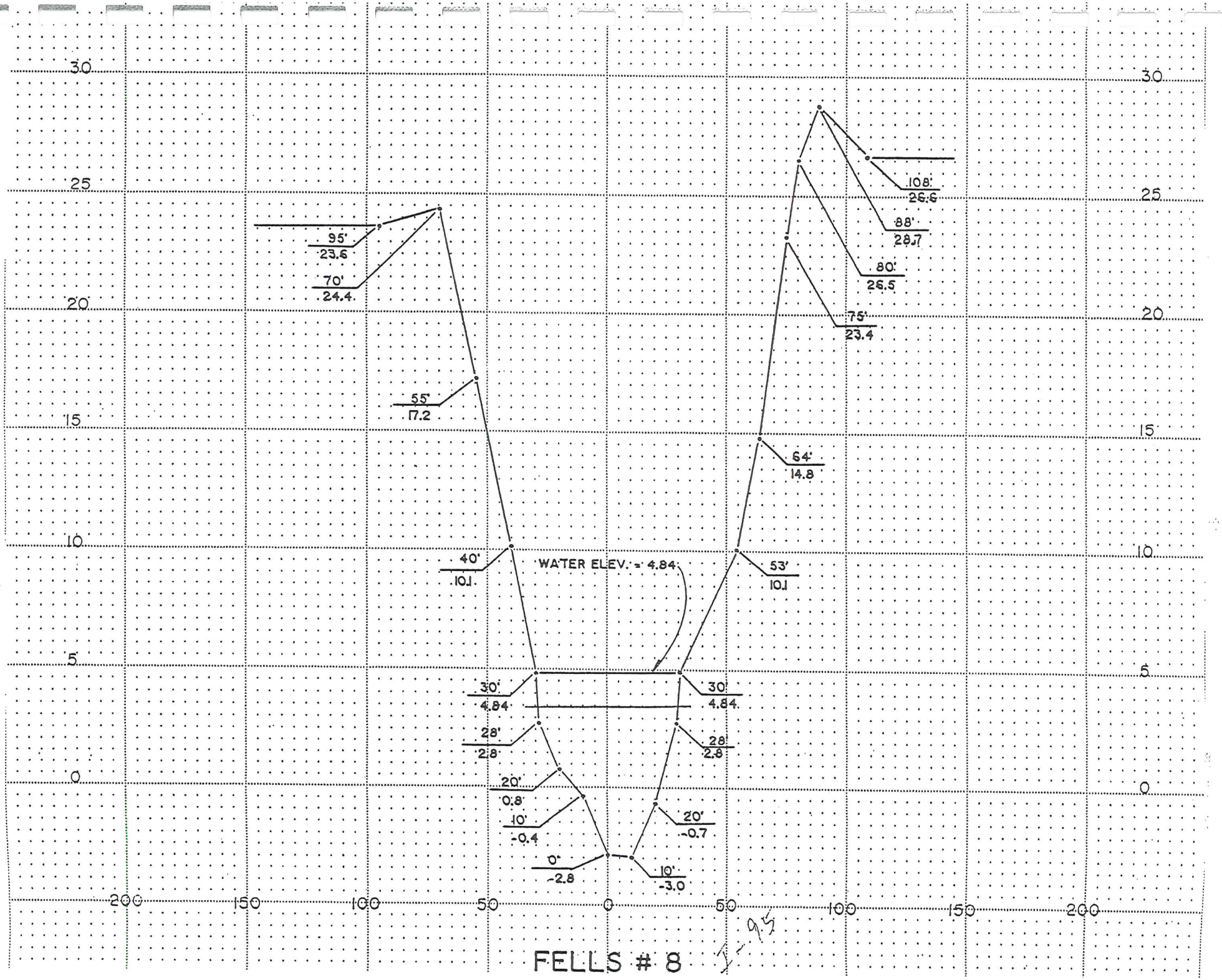

30
25
20
15
10
5
0
200
150
100
50
0
50
100
150
200
100'
24.4
74'
26.2
110
54'
18.5
54'
16.8
40'
8.6
WATER ELEV. = 4.64
38'
5.9
23'
4.64
23'
4.64
22.5'
3.2
22.5'
2.8
20'
2.2
20'
3.6
10'
2.2
10'
3.6
0'
3.6

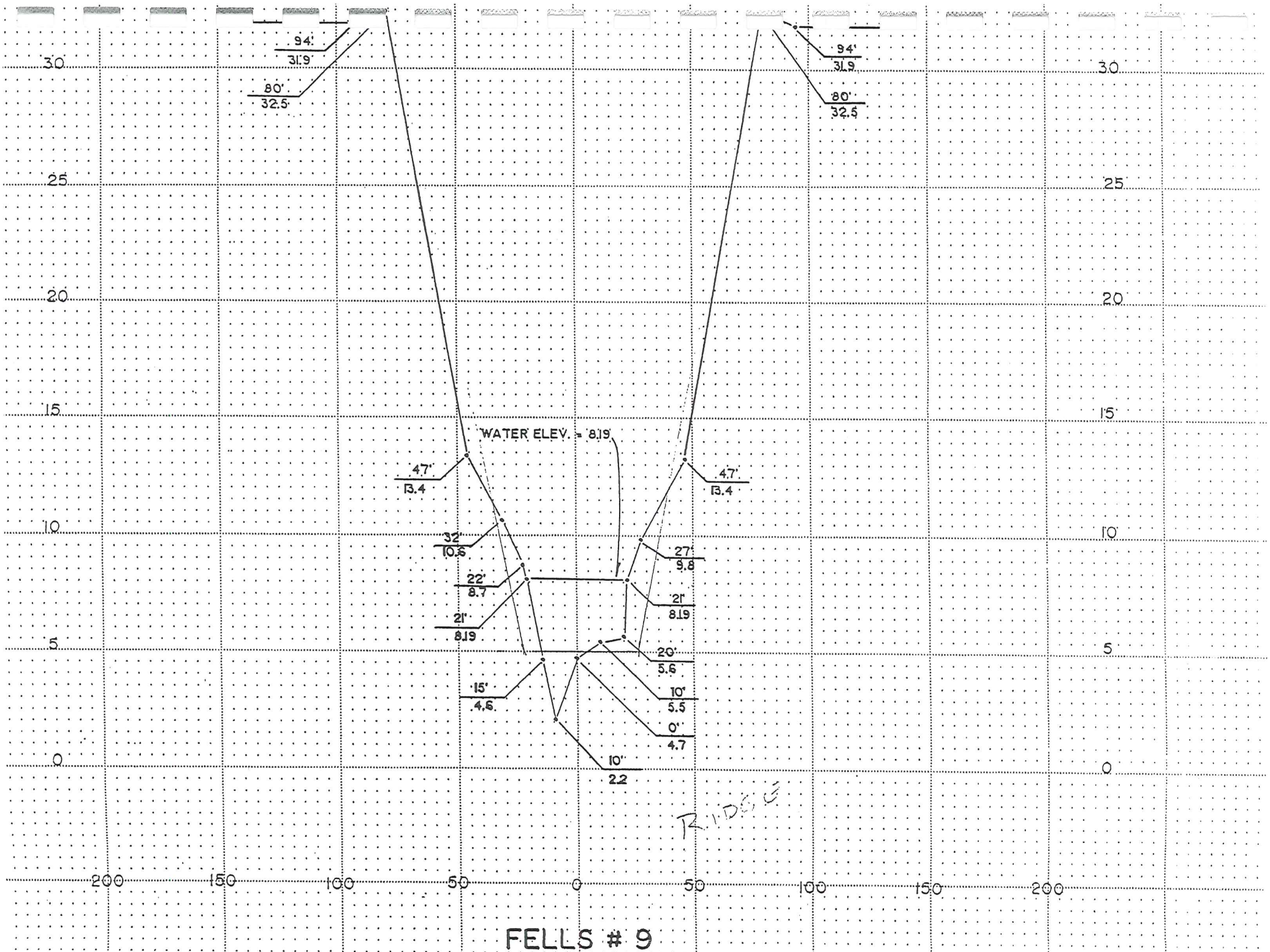
FELLS # 5


CONC. BRIDGE HIGH CHORD
ELEV. = 43.69
CONC. BRIDGE LOW CHORD
ELEV. = 39.63
3 ROWS OF 7 - 2' x 2'
COLUMNS
WATER ELEV. = 4.89
75'
23.3
67.5'
23.7
54'
14.5
39'
8.2
27.5'
4.89
20'
0.8
10'
1.3
0'
2.4
10'
3.5
20'
2.9
27.5'
4.89
32'
5.5
50'
4.89
63'
4.1
70'
4.89
80'
6.4
97'
9.4
117'
25.9
137'
23.9
30
25
20
15
10
5
0
200
150
100
50
0
50
100
150
FELLS # 6
* CROSS SECTION TAKEN AT SKEW

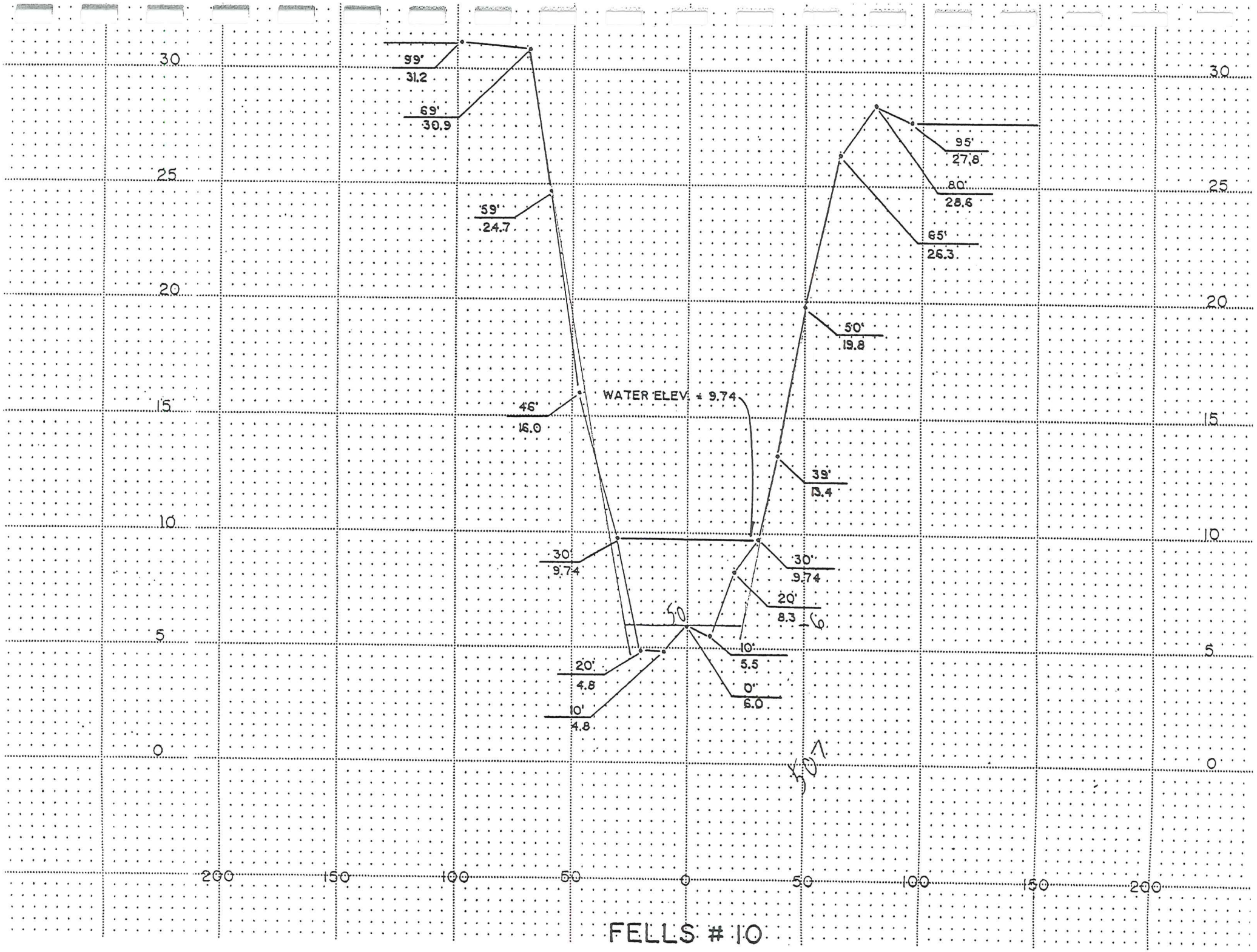

DGE INFO. NOT TO SCALE
CONC. BRIDGE HIGH CHORD
ELEV. = 44.85
CONC. BRIDGE LOW CHORD
ELEV. = 39.75
3 ROWS OF 7 - 2' x 2'
COLUMNS
98'
22.4
83'
23.8
65'
13.8
52'
6.1
40'
4.84
38'
1.4
30'
0.8
20'
0.1
10'
1.0
0'
-3.3
10'
-3.6
20'
-1.9
30'
0.3
38'
-3.3
40'
4.84
60'
8.0
WATER ELEV. = 4.84
76'
1.8
110'
23.1
99'
23.8
30
25
20
15
10
5
0
150
100
50
0
50
100
150
200

FELLS # 7

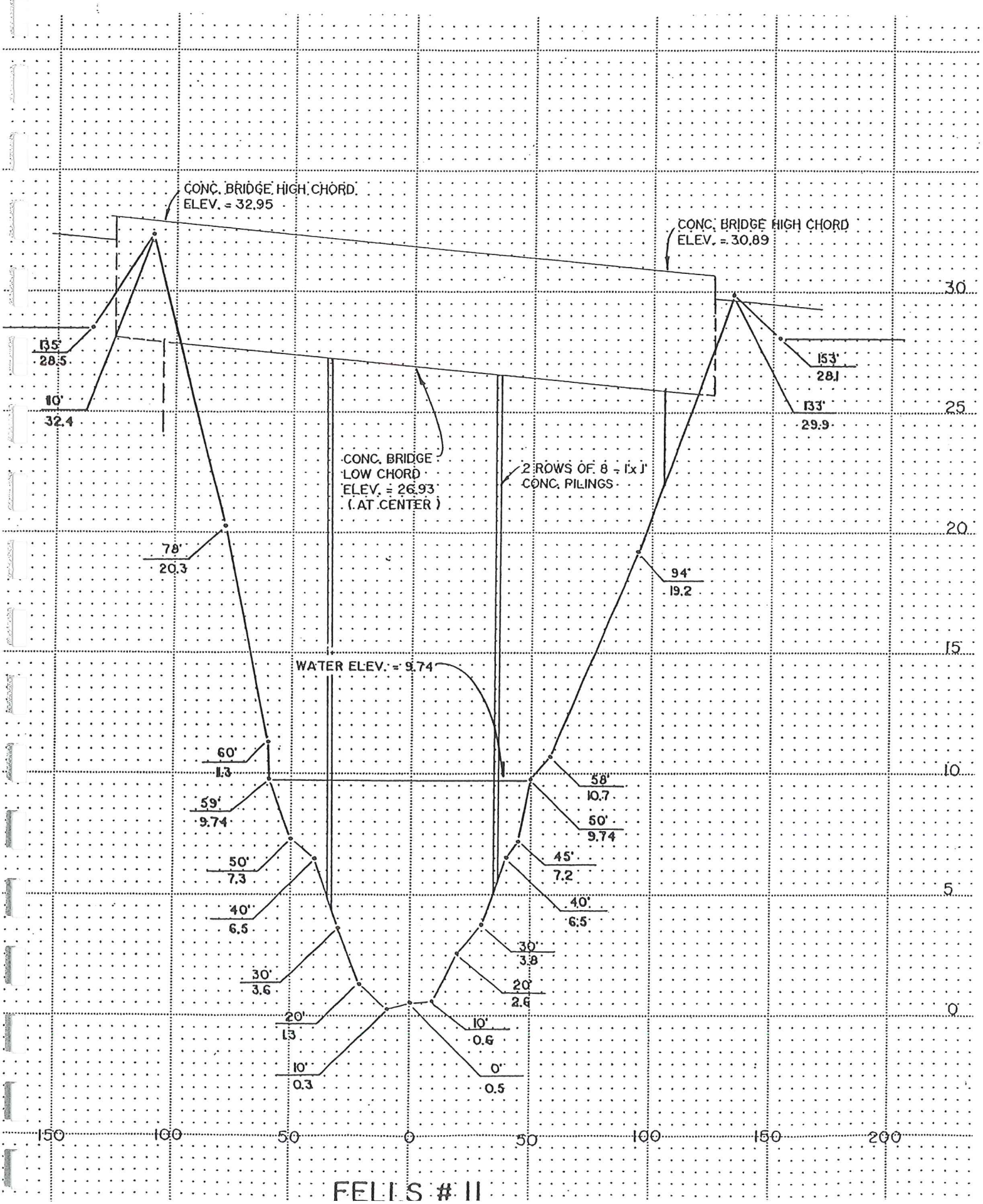

30
25
20
15
10
5
0
200
150
100
50
0
50
100
150
200
95'
23.6
70'
24.4
55'
17.2
40'
10.1
WATER ELEV. = 4.84
30'
4.84
30'
4.84
28'
2.8
28'
2.8
20'
0.8
10'
-0.4
0'
-2.8
10'
-3.0
20'
-0.7
53'
10.1
64'
14.8
108'
26.6
88'
28.7
80'
26.5
75'
23.4
FELLS # 8


30
25
20
15
10
5
0
200
150
100
50
0
50
100
150
200
94'
31.9
80'
32.5
94'
31.9
80'
32.5
WATER ELEV. = 8.19
47'
13.4
47'
13.4
32'
10.5
27'
9.8
22'
8.7
21'
8.19
21'
8.19
20'
5.6
15'
4.6
10'
5.5
0'
4.7
10'
2.2
RIDGE

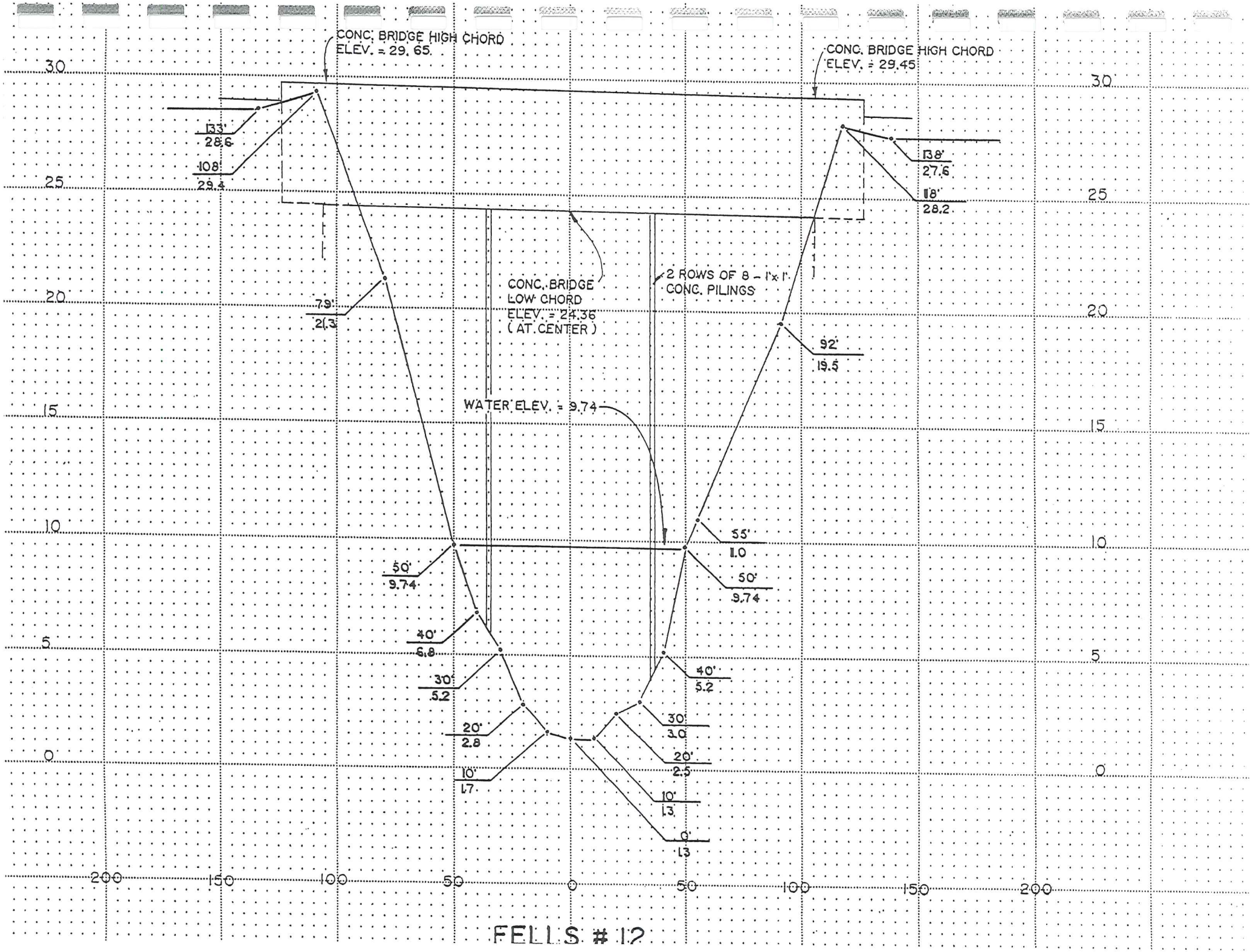
FELLS # 9


99'
31.2
69'
30.9
59'
24.7
46'
16.0
WATER ELEV. = 9.74
30
9.74
30'
9.74
20'
8.3
10'
5.5
0'
6.0
20'
4.8
10'
4.8
50
50
95'
27.8
80'
28.6
65'
26.3
50'
19.8
39'
13.4
30
25
20
15
10
5
0
200
150
100
50
0
50
100
150
200

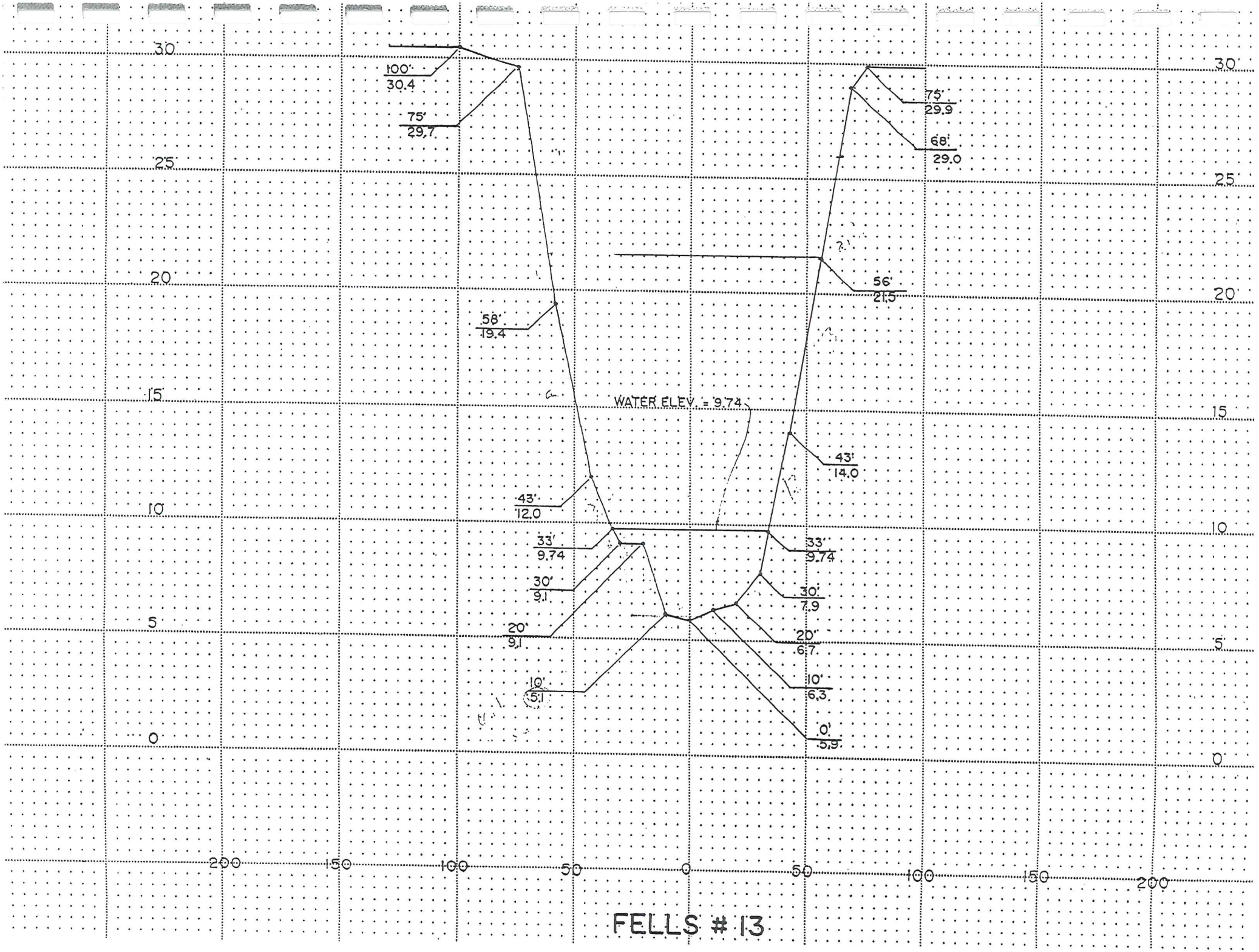
FELLS #10


CONC. BRIDGE HIGH CHORD
ELEV. = 32.95
CONC. BRIDGE HIGH CHORD
ELEV. = 30.89
CONC. BRIDGE
LOW CHORD
ELEV. = 26.93
(AT CENTER)
2 ROWS OF 8 - 1'x 1' CONC. PILINGS
WATER ELEV. = 9.74
135' 28.5
10' 32.4
78' 20.3
60' 11.3
59' 9.74
50' 7.3
40' 6.5
30' 3.6
20' 1.3
10' 0.3
10' 0.6
0' 0.5
30' 3.8
20' 2.6
45' 7.2
40' 6.5
58' 10.7
50' 9.74
94' 19.2
153' 28.1
133' 29.9
30
25
20
15
10
5
0
150
100
50
0
50
100
150
200

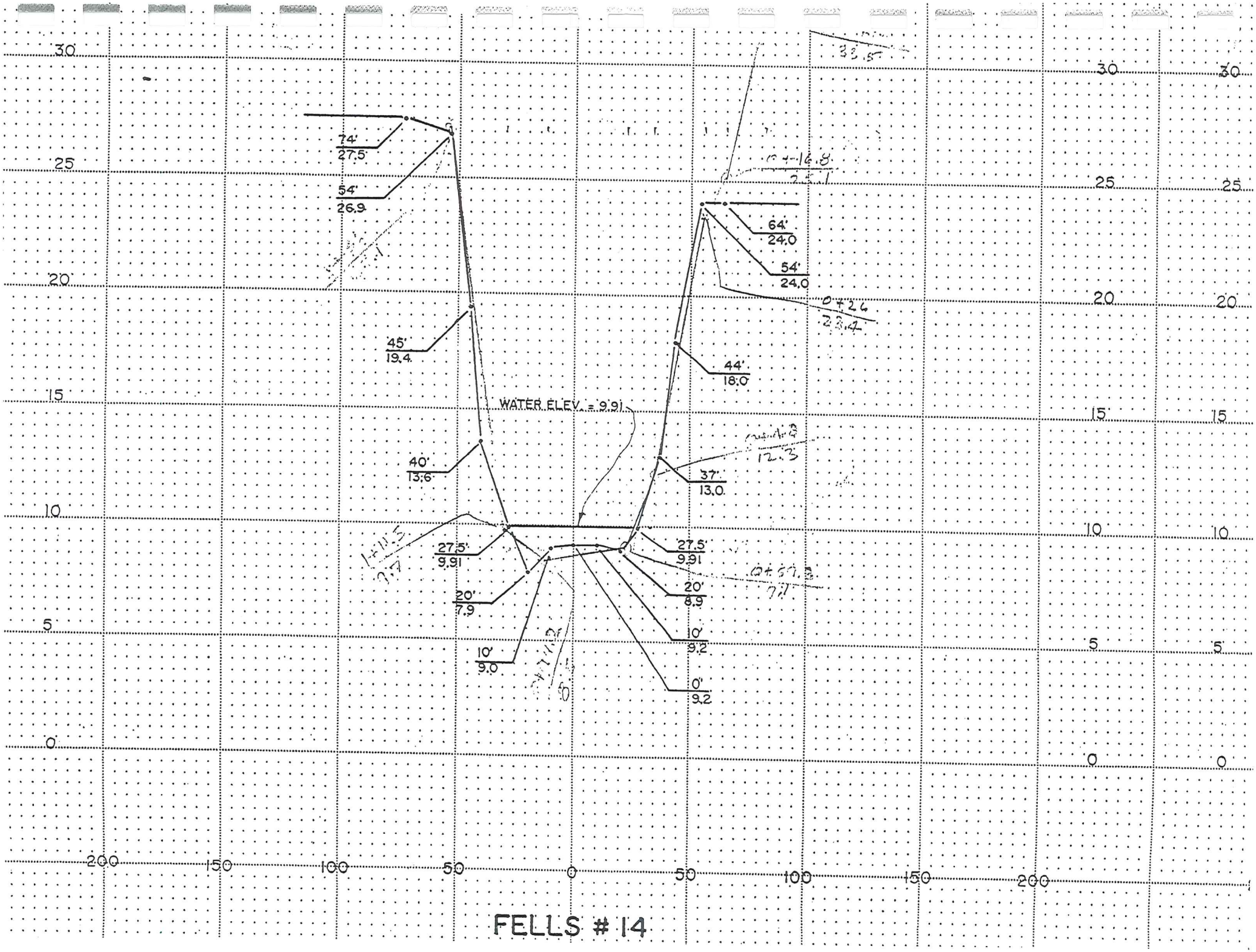
FELLS # II


CONC. BRIDGE HIGH CHORD
ELEV. = 29.65
CONC. BRIDGE HIGH CHORD
ELEV. = 29.45
133'
28.6
108'
29.4
138'
27.6
118'
28.2
CONC. BRIDGE
LOW CHORD
ELEV. = 24.36
(AT CENTER)
2 ROWS OF 8 - 1'x 1'
CONC. PILINGS
79'
21.3
92'
19.5
WATER ELEV. = 9.74
55'
1.0
50'
9.74
50'
9.74
40'
6.8
40'
5.2
30'
5.2
30'
3.0
20'
2.8
20'
2.5
10'
1.7
10'
1.3
0'
1.3
30
25
20
15
10
5
0
200
150
100
50
0
50
100
150
200

FELLS # 12


30
25
20
15
10
5
0
100'
30.4
75'
29.7
58'
19.4
43'
12.0
33'
9.74
30'
9.1
20'
9.1
10'
5.1
WATER ELEV. = 9.74
75'
29.9
68'
29.0
56'
21.5
43'
14.0
33'
9.74
30'
7.9
20'
6.7
10'
6.3
0'
5.9
200
150
100
50
0
50
100
150
200

FELLS # 13


74'
27.5
54'
26.9
45'
19.4
40'
13.6
WATER ELEV. = 9.91
27.5'
9.91
20'
7.9
10'
9.0
64'
24.0
54'
24.0
44'
18.0
37'
13.0
27.5'
9.91
20'
8.9
10'
9.2
0'
9.2
30
25
20
15
10
5
0
200
150
100
50
0
50
100
150
200
FELLS # 14

SECTION 5

WATER QUALITY AND ENVIRONMENTAL PROGRAM AQUATIC PLANT MANAGEMENT PROGRAM

WATER QUALITY AND ENVIRONMENTAL PROGRAM

Water quality in relation to the water management system in the F.W.C.D. has two dimensions: the chemical, physical and biological integrity of water in and discharging from the system, and the quantity and timing of discharges from the system, particularly into the estuarine Indian River Lagoon system.

As a means of determining, monitoring and establishing a baseline record of the quality of stormwater discharge from its system, the Fellsmere Water Control District began a quarterly water quality testing program in 1991. One grab sample is taken quarterly (every 3 months) from the Main Canal at its' intersection with County Road 512 downstream of the most easterly lateral canal discharge into the Main Canal.

Water quality parameters tested for are as follows:

Fecal Coliform, Col/100 mls
Total Iron, as Fe
Nitrate, N
Total Kjedahl Nitrogen
Total Phosphorus, as P
Total Ammonia, as N
Total Suspended Solids
Chloride, as CL
Nitrate, N
Orthophosphate
Turbidity
Total Dissolved Solids
Conductivity, UMHOS
Dissolved oxygen
PH, STD. Units Field
Water Temperature, c
Biochem Oxygen Demand
Unionized Ammonia, N
Air Temperature, f

These water quality analysis reports are maintained and available at the District's office.

The F.W.C.D. encourages all growers/farmers within the F.W.C.D. to acquire a conservation plan through the Indian River Soil and Water Conservation District and the local office of the U.S.D.A. Natural Resource Conservation Service (N.RC.S.). These conservation plans assist the grower/farmer in technical design and modifications of their system to conserve water, prevent soil erosion, and in the proper use, application and handling of fertilizers, herbicides and pesticides. These conservation plans are often mandatory in the permitting process and offer cost-share funding in the implementation of many of the best management practices (B.M.P.) recommended.

In issuing permits for discharge structures into its drainage facilities, the F.W.C.D. encourages the use of all appropriate and recommended B.M.P.'s. This includes the recently adopted "Water Quality/Quantity Best Management Practices for

Indian River Area Citrus Groves" document, which is a collection of B.M.P.'s that are directed at enhancing and protecting the water resources of the Indian River Lagoon and its' estuary watersheds.

From the initial conception of the U.S.J.R.B.P., the F.W.C.D. has cooperated with the S.J.R.W.M.D. throughout the land acquisitions, design, construction and implementation phases of the plan.

The F.W.C.D. has continued the support and cooperation with the S.J.R.W.M.D. in more recent land acquisitions within the limits of the F.W.C.D. including the Carson Platt Estate and Berry Grove parcels. F.W.C.D. anticipates participation in the proposed modifications and water management design conceptions planned for these parcels.

The proposed Berry Grove Water Management Area, which could easily provide an additional irrigation supply source, together with the proposed re-hydration and restoration of the Carson Platt Estate parcel as part of the St. Sebastian River State Buffer Preserve, will certainly reduce stormwater discharge and pollutant loadings to the B.C.W.M.A., Sebastian River and Indian River Lagoon.

The F.W.C.D. has donated to the City of Fellsmere a tract of land for the construction of a stormwater retention pond within the city limits in conjunction with community block, and other grants the city has been seeking for roadway and drainage improvements.

The City of Fellsmere is currently revising and updating their Comprehensive Land Use Plan. With the recent annexation of the proposed "Pine Grove" development (located within the Vero Lakes Water Control District, immediately adjacent and east of F.W.C.D.) proposed objectives and policies regarding stormwater and implementation of proposed stormwater improvements are currently being addressed. This plan should include provisions for a city-wide stormwater master plan (including consideration of a stormwater utility) identifying limitations, regulations and improvements necessary to maintain an adequate level of service standards for lands within the City of Fellsmere regarding both quantity and quality of stormwater discharge.

FELLSMERE WATER CONTROL DISTRICT
AQUATIC PLANT MANAGEMENT PROGRAM

The FELLSMERE WATER CONTROL DISTRICT is responsible for the maintenance of approximately 300 miles of drainage ditches and canals within its limits. Aquatic weeds became a problem, in these ditches, soon after they were constructed. This problem has been further increased with the introduction of exotic species into the United States.

The District aquatic weed control program is approved by the Florida Department of Environmental Protection (Permit #SF-98-53), see attached copy. All herbicides, approved for use, in the program, have been approved by the U.S. Environmental Protection Agency and Florida Department of Agriculture. All applicators, utilized in the program, are certified by the Florida Department of Agriculture in the aquatic and right-of-way categories.

Spray reports are maintained in the District office for areas treated, herbicides applied, aquatic plants treated and weather conditions for each day of operation. Copies of herbicide labels and material safety data sheets are also maintained in the District office. Techniques, of application, have been approved by regulatory agencies and have a minimal effect on the aquatic environment.

The Fellsmere Water Control District utilizes mechanical and chemical control procedures for the control of floating, emergent, submersed and ditchbank aquatic plants. Because of the design, of the District's canal system, biological control, of aquatic plants, is limited. It is not feasible to use the grass carp for control of submersed aquatic plants because of the fluctuating water levels in the smaller drainage laterals and the inability to contain the fish in the larger main canals of the District.

The District aquatic plant management program is a continual year around operation, using a combination of mechanical and herbicidal methods. The program is designed to keep the canals free of aquatic vegetation that may restrict water flow. Aesthetics, fishing and recreation are not a major emphasis of the aquatic management program.

Mechanical Control Procedures: Draglines or backhoes are used to remove dense growth of native and exotic aquatic and ditchbank plants. Vegetation, associated organic materials and trash is removed during this mechanical operation. Due to the large number of miles of sub-lateral ditches and canals, and the limited equipment owned and operated by the F.W.C.D., the regular mechanical control maintenance of a ditch or canal occur about once every five years. Emergency mechanical cleaning at specific sites is provided on an "as needed" basis. Trash and large debris is placed in dump trucks and transported to the Indian River County Landfill. In residential and business areas, of the district, aquatic vegetation is also transported to the landfill. When in farming and non-populous areas, the aquatic vegetation is placed on the canal berms to dry for removal later, as required. The sub-lateral ditches are constructed with elevated berms sloping

away from the top of bank of the canals/ditches to prevent over bank flow or discharge of water into the ditch/canal. Runoff from the surface of adjacent canal berms is into adjacent fields or citrus groves.

Small amounts, of sediment, in drainage canals, are removed by draglines or backhoes. This sediment frequently has originated from bank erosion or sloughing and when it is removed, the sediment, when possible, is placed back into the eroded site and stabilized. Sediment, that has entered District canals, from adjoining sites, may be placed on the berm or trucked to other sites in the District. Precautions are taken during removal of the sediment to reduce turbidity and that sediment is removed only to the original canal depth.

Chemical Control Procedures: The District's canals are treated with herbicides twice yearly (spring and fall). The smaller drainage laterals are treated from the adjacent canal berm using a truck-mounted sprayer and the larger main canals by helicopter. All herbicides are applied as an invert or with polymers to prevent spray drift onto surrounding areas. The Florida Department of Environmental Protection has reviewed the District program and has issued a permit for aquatic plant control.

Only U.S. Environmental Protection Agency and The Florida Department of Agriculture approved herbicides are used in the aquatic plant control program. The following herbicides are currently approved for use by the Department of Environmental Protection:

RODEO
SONAR
AQUATHOL
2,4 – D

Rates applied and techniques of application, are based on label instruction. All herbicides are applied by state certified applicators.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BUREAU OF INVASIVE PLANT MANAGEMENT SOUTH FLORIDA REGION
3111-B13 FORTUNE WAY, WELLINGTON, FL 33414
561/791-4720

AQUATIC PLANT MANAGEMENT PERMIT

Fellsmere Water Control District
Jerry Tillman
Post Office Box 438
Fellsmere FL 32948
407-571-0640

Permit Number: SF-98-53
Expiration Date: 10/2/2001

Area of Operation: FWCD Canals
(Indian River County)

PLANT	ACRES	METHOD
Paragrass	150.00	Rodeo, Mechanical
Alligatorweed	37.00	Rodeo, 2,4-D, Mechanical
Salvinia	1.00	Diquat, Mechanical
Hydrilla	37.50	Diquat, Aquathol K, Sonar, Mechanical
Algae	1.25	Diquat, Mechanical, Copper, Hydrothol 191
Cattails	12.50	Rodeo, Mechanical
Waterlettuce	15.75	Rodeo, Diquat, Mechanical
Torpedograss	58.00	Rodeo, Mechanical
Pickerelweed	2.50	Rodeo, Mechanical
Duckweed	2.75	Diquat, Mechanical
Chara	11.25	Diquat, Mechanical, Copper, Hydrothol 191
Spatterdock	1.00	Rodeo, Mechanical
Pennywort	0.10	Diquat, Mechanical
Coontail	10.50	Diquat, Mechanical
Smartweed	1.00	Rodeo, Mechanical
Waterhyacinth	6.25	Rodeo, Diquat, 2,4-D, Mechanical
Azolla	0.50	Sonar, Mechanical
Common Arrowhead	1.75	Rodeo, Mechanical
Primrose Willow	11.50	Rodeo, 2,4-D, Mechanical
Parrots Feather	0.02	Diquat, Mechanical
Fragrant Waterlily	0.01	Rodeo, Mechanical
Hygrophila	27.00	Diquat, Aquathol K, Sonar, Mechanical

SUPPLEMENTAL CONDITIONS:

1) The permittee is responsible for reviewing and abiding by all conditions of this permit, including the General Conditions listed on the reverse side of this document.

RENEWAL

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BUREAU OF INVASIVE PLANT MANAGEMENT SOUTH FLORIDA REGION
3111-B13 FORTUNE WAY, WELLINGTON, FL 33414
561/791-4720

AQUATIC PLANT MANAGEMENT PERMIT

Permit Number: SF-98-53
Expiration Date: 10/2/2001

2) Permittee shall make a reasonable effort to notify potential users of the treated waters listing the types and lengths of any restrictions imposed by the label. Notifications shall be accomplished by public notices in newspaper.

3) The removal of aquatic plants is exempt from chapters 373 and 403 Florida Statutes, dredge and fill permitting requirements provided the activities are performed in compliance with the conditions of paragraph 403.813(2)®, Florida Statutes (copy attached).

4) Turbidity caused by aquatic plant control activities must be controlled on site so as to prevent violations of State water quality standards.

5) All aquatic vegetation physically removed pursuant to this permit shall be deposited on a self-contained upland site which shall be located so as to prevent the reintroduction of the removed vegetation into waters of the State.

6) Plant control conducted using Hydrothol 191 shall be conducted as a marginal or sectional treatment to avoid fish kills. No treatment greater than 1/10 of the lake acreage shall occur in any one application with Hydrothol 191. Shoreline treatments shall be conducted from the shore to open water to minimize impact to fish.

7) This permit supersedes all prior permits issued.

Jacqueline C Smith — Regional Biologist

24 Feb 99 — Date

RENEWAL

SECTION 6

FIVE-YEAR PLAN

FELLSMERE WATER CONTROL DISTRICT FIVE –YEAR PLAN

The original Plan of Reclamation (now to be called The Water Control Plan) of the District has long since been completed and the F.W.C.D. now acts as the operation and maintenance entity for the completed system of water management improvements as subsequently modified.

Over the past few years, the F.W.C.D. has worked closely with landowners within the District and the S.J.R.W.M.D. to help implement the Upper St. Johns River Basin Project.

The conversion of basins within the F.W.C.D. boundaries to direct stormwater discharging into the Upper St. Johns River Basin has greatly reduced the stormwater discharge to tidewater of the Sebastian River and Indian River Lagoon, and has further greatly reduced the flooding events occurring within the gravity flow discharge basin of the F.W.C.D.

Beyond the continued operations and maintenance responsibilities of the F.W.C.D. the District anticipates and expects to be involved in the following projects and programs over the next five years:

1. With the recent acquisition of the Carson Platt Estate property by the State of Florida, S.J.R.W.M.D. and Indian River County as part of the St. Sebastian River State Buffer Preserve (conservation and recreation) the F.W.C.D. will be working closely with S.J.R.W.M.D., and others, in the proposed modifications and re-hydration of this tract and its effect on the remaining F.W.C.D. system.

2. The Berry Grove parcel, located within and around the southeast corner of the F.W.C.D., by the S.J.R.W.M.D. is proposed to be developed into a water management area. The F.W.C.D. anticipates working closely with the S.J.R.W.M.D. in the development of this project, (including the possibility of providing an additional agricultural irrigation water source), and the possible further conversion of basins within the F.W.C.D. associated therewith.

3. Since both of the above proposed projects will involve modifications to F.W.C.D. facilities, this water control plan will be amended to incorporate the Carson Platt Estate and Berry Grove plan when completed.

4. F.W.C.D. will continue to work with and assist the City of Fellsmere in their capitol improvement programs and projects, particularly as they relate to the F.W.C.D. facilities.

5. Encourage and advise landowners within the District to acquire conservation plans, and on the use and application of best management practices, to improve the quality and address the quantity of stormwater discharges.

6. F.W.C.D. will continue to assist and cooperate with the S.J.R.W.M.D. in its implementation and operation of the U.S.J.R.B.P. and establish dialogue addressing the comprehensive and coordinated actions needed to reduce nutrient/sediment loadings and quantity of stormwater discharge from the F.W.C.D. system. Budget restrictions/limitations are a primary concern and funding needed for studies, planning, design and construction of appropriate improvements remains the initial and major issue to overcome. Operation, maintenance and protecting the integrity of the existing system to provide drainage and flood protection for the landowners remains the number one objective, within the law, and the primary purpose and function of the F.W.C.D.

SECTION 7

ADMINISTRATIVE STRUCTURE

ADMINISTRATIVE STRUCTURE

The District is governed by a three member Board of Supervisors who, in turn, elect a manager (superintendent), secretary and treasurer to administer the District, handle day to day operations and execute policy established by the Board. Board members, consisting of landowner representatives, serve staggered three-year terms and are elected, one supervisor per year, at an annual meeting of the members of the District as setforth in Florida Statutes Chapter 298.12. Membership is comprised of landowners, each of whom have one vote for each acre or fraction of an acre of property owned within the District. The District uses outside counsel, engineering and surveying services, and accounting services through retainer and consulting arrangements.

1. Three Elected Supervisors
   Currently: Raymond E. Johns, Chairman
   Mark Sanchez, Vice Chairman
   Patrick Leary

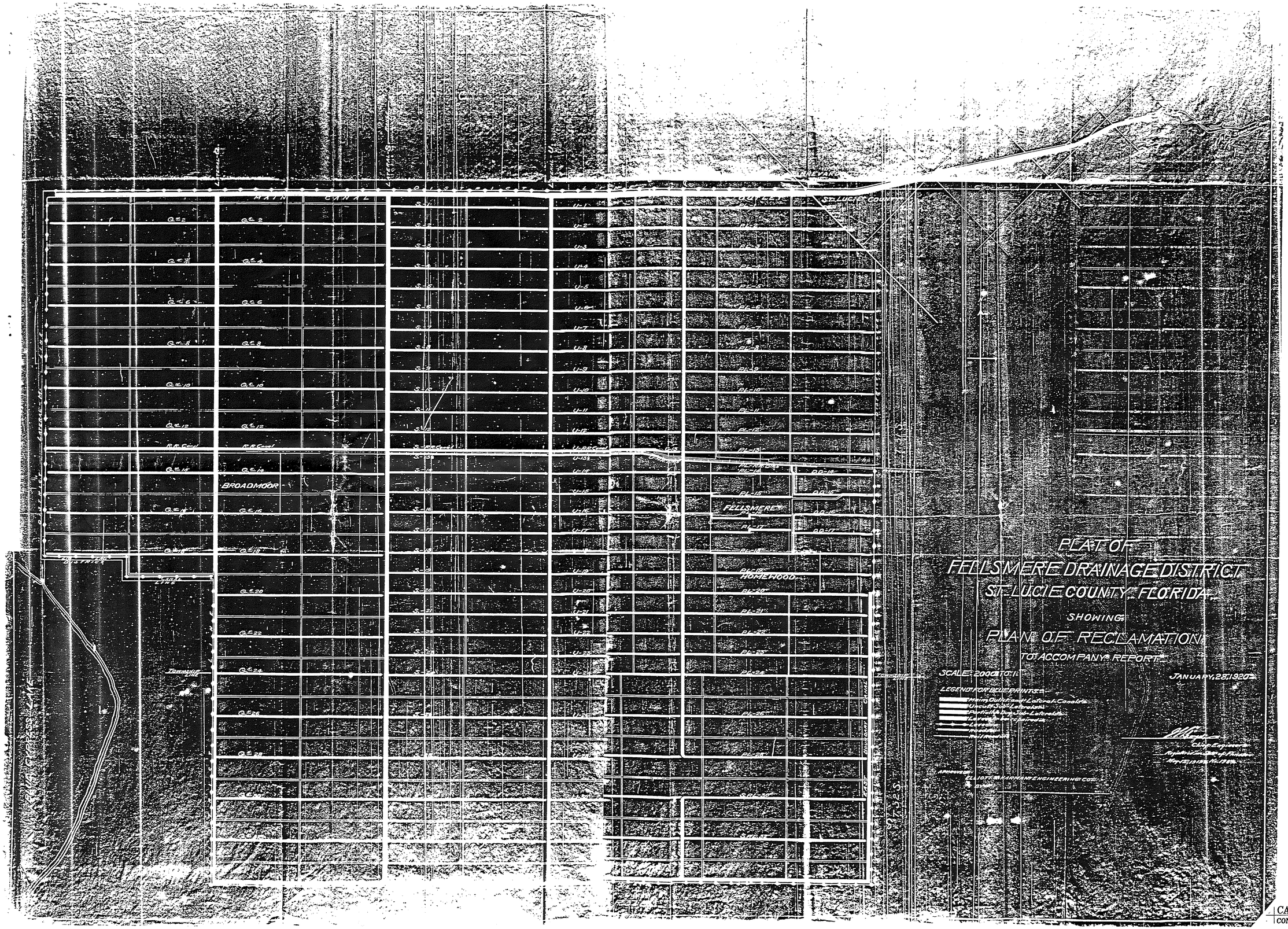
2. Superintendent/Treasurer
   Rodney Tillman

3. District Secretary
   Joyce Hertel

4. Attorney
   Theodore W. Herzog

5. Engineer
   Carter Associates, Inc.

6. Accountant
   O'Haire, Kmetz & Company, C.P.A.



FELLSMERE WATER CONTROL DISTRICT

WATER CONTROL PLAN

OCTOBER 1, 2000

SHEET A

CARTER ASSOCIATES, INC.
CONSULTING ENGINEERS AND LAND SURVEYORS
1708 21ST STREET
VERO BEACH, FLORIDA 32960-3472
561-562-4191 (TEL)
561-562-7160 (FAX)

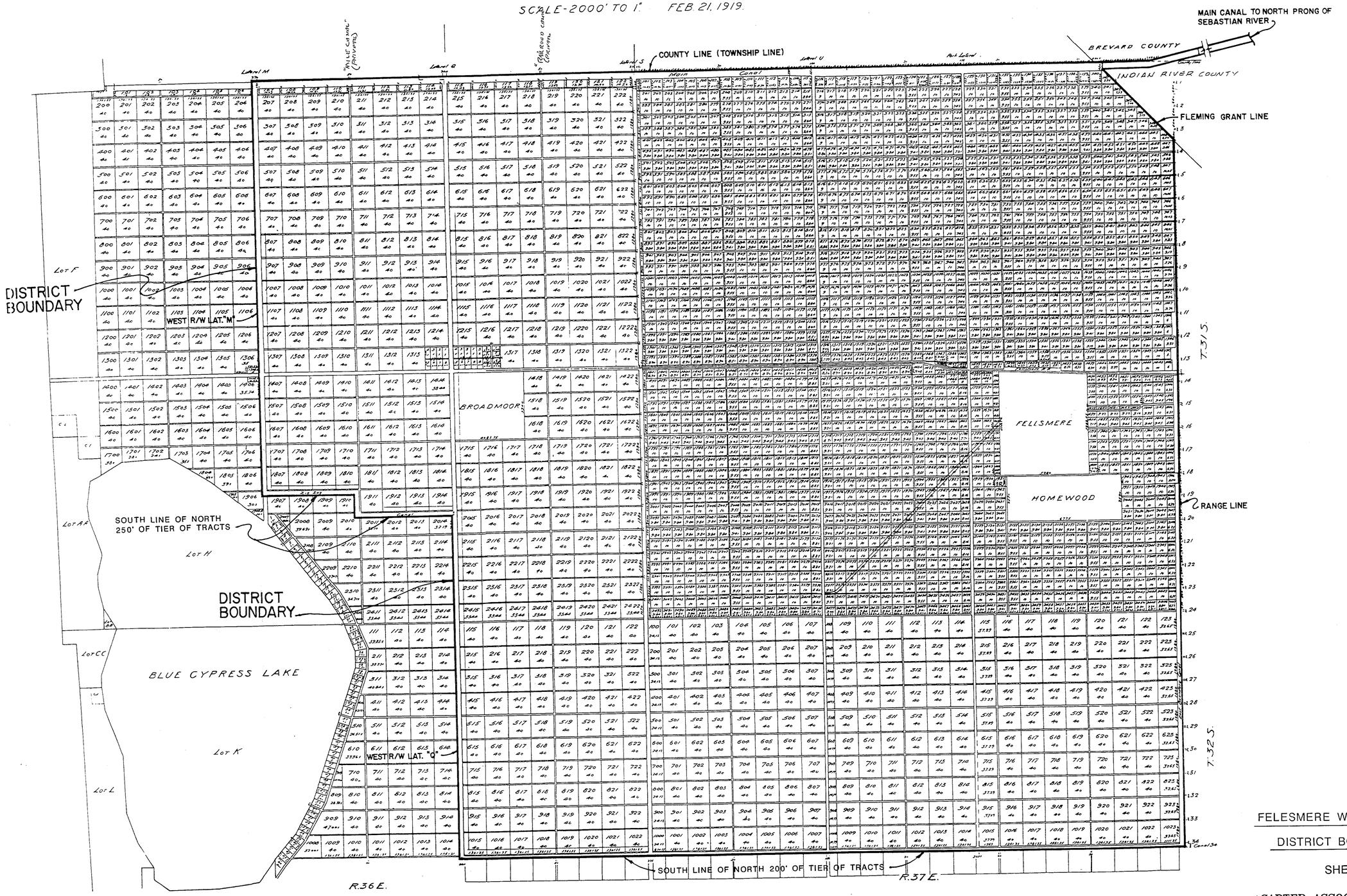
FELLSMERE WATER CONTROL DISTRICT

SUBDIVISION OF LANDS

IN

INDIAN RIVER COUNTY, FLORIDA

SCALE-2000' TO 1" FEB. 21. 1919.



FELESMERE WATER CONTROL

DISTRICT BOUNDARIES

SHEET B

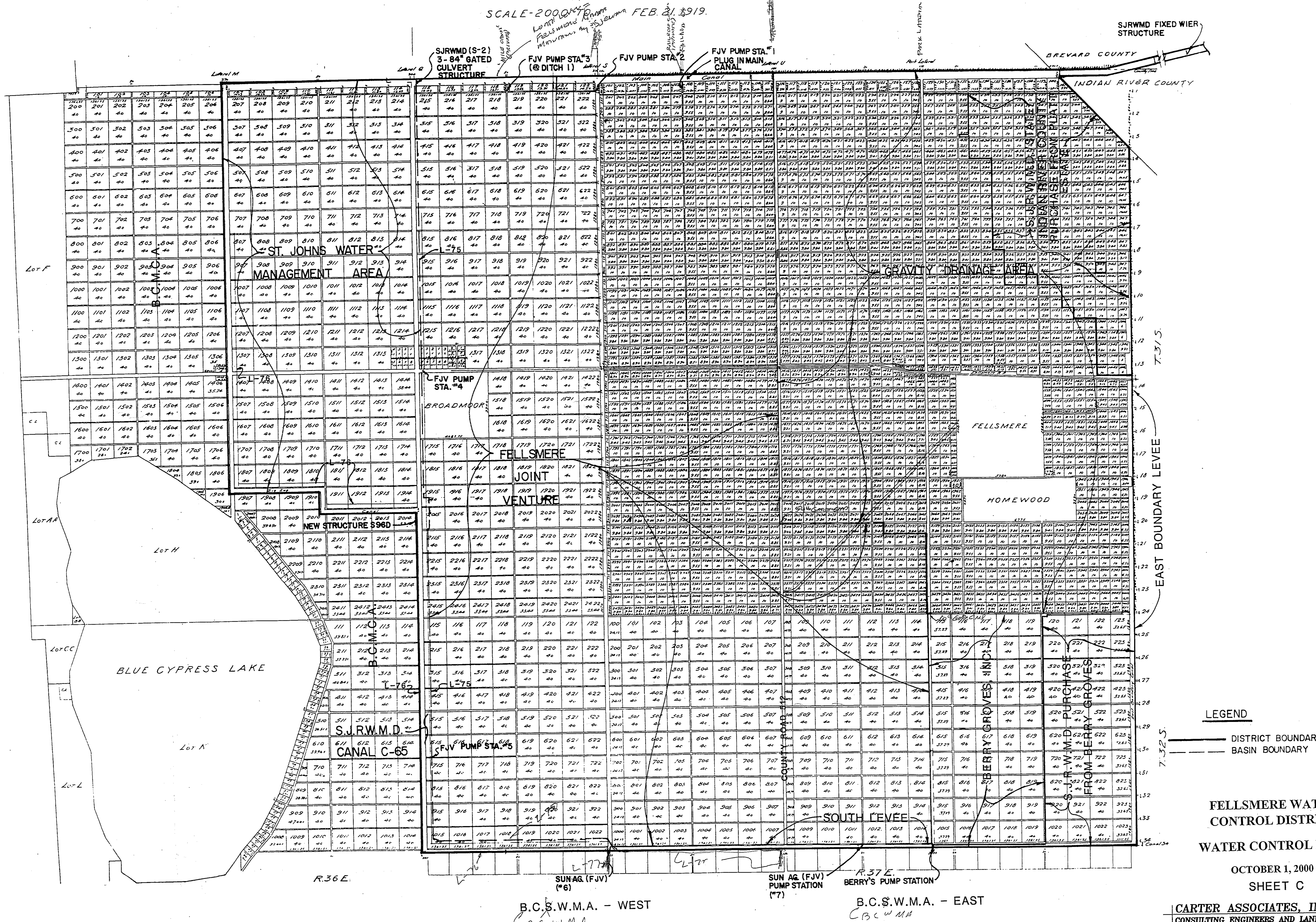
CARTER ASSOCIATES, INC.
CONSULTING ENGINEERS AND LAND SURVEYORS
1708 21ST STREET
VERO BEACH, FLORIDA 32960-3472
561-562-4191 (TEL)
561-562-7180 (FAX)

FELLSMERE WATER CONTROL DISTRICT

SUBDIVISION OF LANDS

IN

INDIAN RIVER COUNTY, FLORIDA



SCALE-2000 FEB. 21. 1919.
SJRWMD (S-2) 3-84" GATED CULVERT STRUCTURE
FJV PUMP STA. 3 (@ DITCH 1)
FJV PUMP STA. 2
FJV PUMP STA. 1 PLUG IN MAIN CANAL
SJRWMD FIXED WIER STRUCTURE
BREVARD COUNTY
INDIAN RIVER COUNTY
Main Canal
ST. JOHNS WATER MANAGEMENT AREA
B.C.M.C.A.
GRAVITY DRAINAGE AREA
S.J.R.W.M.D. PURCHASE FROM INDIAN RIVER COUNTY
FJV PUMP STA. 4
BROADMOOR
FELLSMERE JOINT VENTURE
FELLSMERE
HOMEWOOD
NEW STRUCTURE S96D
L-75
L-76
L-77
LOT F
LOT H
LOT K
BLUE CYPRESS LAKE
S.J.R.W.M.D. CANAL C-65
FJV PUMP STA. 5
COUNTY ROAD 512
SOUTH LEVEE
BERRY GROVES, INC.
S.J.R.W.M.D. PURCHASE FROM BERRY GROVES
EAST BOUNDARY LEVEE
T.31 S.
T.32 S.
R.36 E.
R.37 E.
SUN AG (FJV) (#6)
SUN AG (FJV) PUMP STATION (#7)
BERRY'S PUMP STATION
B.C.S.W.M.A. - WEST
B.C.S.W.M.A. - EAST
CBCWMA

LEGEND

— DISTRICT BOUNDARY

- - - BASIN BOUNDARY

FELLSMERE WATER CONTROL DISTRICT

WATER CONTROL PLAN

OCTOBER 1, 2000

SHEET C

CARTER ASSOCIATES, INC.
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