Value Engineering Study

FINAL REPORT

Cousins Pumping Station Complex
Jefferson Parish, Louisiana
Study Date: December 14 - 18, 1998
Control No. CEMVN-VE-98-OA
for
U.S. Army Corps of Engineers
New Orleans District

February 12, 1999

DCM GROUP
DAMES & MOORE
A DAMES & MOORE GROUP COMPANY

CEMVN-PM-E 1 March 99

MEMORANDUM FOR Chief, Engineering Division

SUBJECT: Value Engineering (VE) Study for the West Bank, Vicinity of New Orleans, LA Hurricane Protection Project - Cousins Pump Station Complex

1. Enclosed is the subject VE report for your use.

2. The proposals and design comments contained in the report should be fully considered in the current project design and implementation.

3. The study identifies individual proposals that list cost savings in excess of $1 million. Corps regulations require division approval to reject any such proposal. We therefore request that you review the proposals and provide rationale for any rejections immediately, if such decisions are made.

4. Please provide us a status report NLT, March 23, 1999.

5. POC is Mr. Waguespack, Ext. 2503.

Gerald J. Dicharry Jr.

ENCL Gerald J. Dicharry, Jr.
Senior Project Manager

COUSINS PUMPING STATION COMPLEX
JEFFERSON PARISH, LOUISIANA

VALUE ENGINEERING STUDY
for
U. S. Army Corps of Engineers
New Orleans District

Study Date: December 14 - 18, 1998

Control No. CEMVN - VE - 98 - OA

Final Report

February 12, 1999

Dames & Moore, Inc.
A Dames & Moore Group Company

EXECUTIVE SUMMARY

This project documents the results of a value engineering study on Cousins Pumping Station Complex, Hurricane Protection Project, West Bank of the Mississippi River, Jefferson Parish, Louisiana. The major document available to the value engineering team was Design Memorandum No. 3, Volume 1, dated September 1998. The value engineering study team was from the firm of Dames and Moore. The project design was under the direction of the US Army Corps of Engineers.

The value engineering team analyzed the project using value engineering methodology in a five-day workshop. The purpose of the team's effort was to identify potential alternatives for achieving the required functions, which would reduce cost, consistent with project criteria and project quality. The overall goal of the VE effort was to add project value to the extent possible.

The Project

The proposed project plan consists of modifications to the Cousins Pumping Station to accommodate an additional 2,000 cfs. The outfall canal will be enlarged and diverted to discharge adjacently to a navigable floodgate. Culverts will be constructed under Lapalco Bridge through which the outfall discharge will be routed. Parallel protection along the outfall canal will be provided. The connecting canal (First Avenue Canal) between the Harvey and Cousins Pumping Stations will be enlarged. The Destrehan Avenue Bridge will be extended by one span (60') to accommodate the enlargement of Cousins outfall canal. Roller gates will be constructed on either side of the Destrehan Avenue Bridge to facilitate closing the bridge during flood conditions.

Estimate of Construction Cost

The total estimated budget cost estimate for the project, as detailed in Design Memorandum #1, is $36,321,000, including Contingencies, Engineering and Design, Construction E & D, and Construction Administration.

Recommendations.

Recommendations for change to the design are put forth in this report. These recommendations represent, in the opinion of the study team, changes that will improve the overall project. A detailed writeup of each recommendation can be found in Section 3. Section 3 also includes a table that summarizes all recommendations.

Savings From Recommendations.

The study generated 14 ideas, of which 10 were developed as recommendations to be submitted for consideration by the owner and design team. The total dollar amount of first cost savings represented by all 10 recommendations was $14,955,308, of which two recommendations involved added cost of $305,000, and seven recommendations involved a reduction in cost of

$13,426,308. All listed recommendations cannot be accepted together (dollar impact added together) as some are mutually exclusive of others. The value engineering team developed the following lists of combinations of mutually additive recommendations which are described as follows:

The three key recommendations are 8, 9 and 12. Recommendation 8 pertains to relocation of the channel under Lapalco Bridge; Recommendations 9 and 12 pertain to redesign of the closure wall. Recommendation 8 provides the greater cost savings, but requires a small acquisition of right-of-way to accommodate. All three are good, sound recommendations that increase the project value. The remaining recommendations, 5, 6, 7, 10, 11, 13 and 14 are "standalone" recommendations that will work with recommendations 8, 9 or 12. The total combination of Life Cycle Savings available with these possibilities is as follows:

Acceptance of	**8**	**9**	**12**
Life Cycle Savings	$5,321,000	$4,468,968	$1,814,000
Life Cycle Savings of other recommendations 5, 6, 7, 10, 11, 13 and 14	$1,822,340	$1,822,340	$1,822,340
Combination of available possible savings	$7,143,340	$6,291,308	$3,636,340

ACKNOWLEDGMENTS

The value engineering team was supported administratively throughout the study by Frank Vicidomina, Value Engineering Officer for the Corps of Engineers, and other Corps' staff members who provided information and answered questions for the team. This assistance added greatly to the success of the value engineering project.

VALUE ENGINEERING TEAM

Catherine Correro	Administrative Assistant
Walter Frey, Jr., PE	Structural Engineer
Walter Frey, Sr., PE	Civil/Hydraulic Engineer
Michael Ruck, PE	Mechanical Engineer
Windle Sholar, PE	Estimator
Frank Vicidomina, PE	Value Engineering Officer/Civil Engineer
Joe Waits, PE, CVS	Value Engineering Team Leader

*See Appendix A for addresses, telephone and fax numbers

TABLE OF CONTENTS

SECTION 1 - INTRODUCTION

This report documents the results of a value engineering study of the Cousins Pumping Station Complex, in Jefferson Parish, Louisiana. The study workshop was held in the offices of Walk-Haydel Associates, in New Orleans, LA, during the period of December 14 - 18, 1998. The basic design document for the study was the 75% and 95% Design Memorandum #3, Cousins Pumping Station, produced by the project design firm West Jefferson Engineering Services, a joint venture. The study team consisted of team members from the design firm of Walk-Haydel, the Corps of Engineers, and a PE/CVS team leader from Dames & Moore.

The Job Plan.
The study followed a five-step job plan endorsed by SAVE International, the professional organization of value engineers.

Value Engineering
The following is a note to those persons unfamiliar with value engineering. Because there is a value engineering study, and because recommendations for changes to the design have been made, one should not assume that there is a problem with the existing design.

The value engineering team is called primarily to look for ways to add value to the project by suggesting alternatives that the team believes will lead to improvement. It must be understood that a VE team works from a different perspective than does the design team. The value engineering team uses the value engineering methodology to identify functions and develop alternatives to provide the same functions, but at less cost.

The VE recommendations presented herein represent the result of the value engineering study, and are presented for the owners further consideration and implementation, if proven feasible by the Corps of Engineers and the design team.

Cost Estimate.
The current estimate of construction cost was used as a base line for study. For the study to be valid, the base line estimate must be reasonable. Not only must there be a reasonable estimate of total cost of construction, but there must also be a true breakdown of intermediate parts of the estimate. Most VE recommendations compare the life cycle cost of the recommendation to the life cycle cost of the corresponding part of the existing design. To show a realistic comparison between the cost of the recommendation, and the cost of the part of the design being altered, it is

important that the cost breakdown in the existing estimate, for this design part, reflect a true picture of the part.

Ideas and Recommendations.
Part of the value methodology is to generate as many ideas as is practical, and to then evaluate each idea and select as candidates for further development, only those ideas that offer added value to the project. Recommendations represent only those ideas that are proven, to the team's satisfaction.

Full documentation of all VE recommendations developed in this study can be found in Section 3 of this report. A full list of all VE ideas generated in this study can be found in Appendix C.

Design Comments.
Some ideas that did not make the selection for development as recommendations were, never-the-less, judged worthy of further consideration. These ideas have been written up as "Design Comments." Documentation of all design comments can be found in Section 4.

Summary of Decisions.
At the end of this report, in Appendix E, there is a place to record the owner and designer's response to recommendations put forth in this study. As decisions regarding recommendations are made, these decisions can be recorded here for future reference, thus making this report complete in that it contains both the recommendations, and the response to those recommendations.

SECTION 2 - PROJECT DESCRIPTION

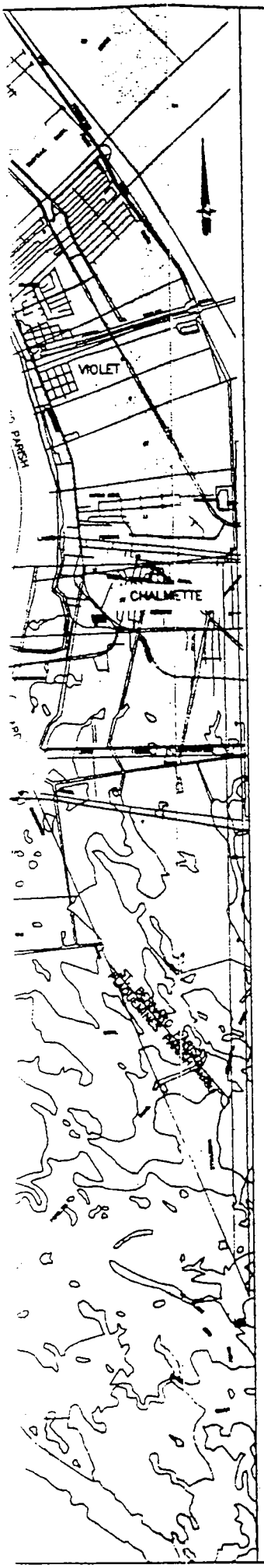
The Cousins Pumping Station Complex portion of the East of Harvey Hurricane Protection features of the West Bank of the Mississippi River project, is located in southeast Louisiana in Jefferson Parish, on the west bank of the Mississippi River.

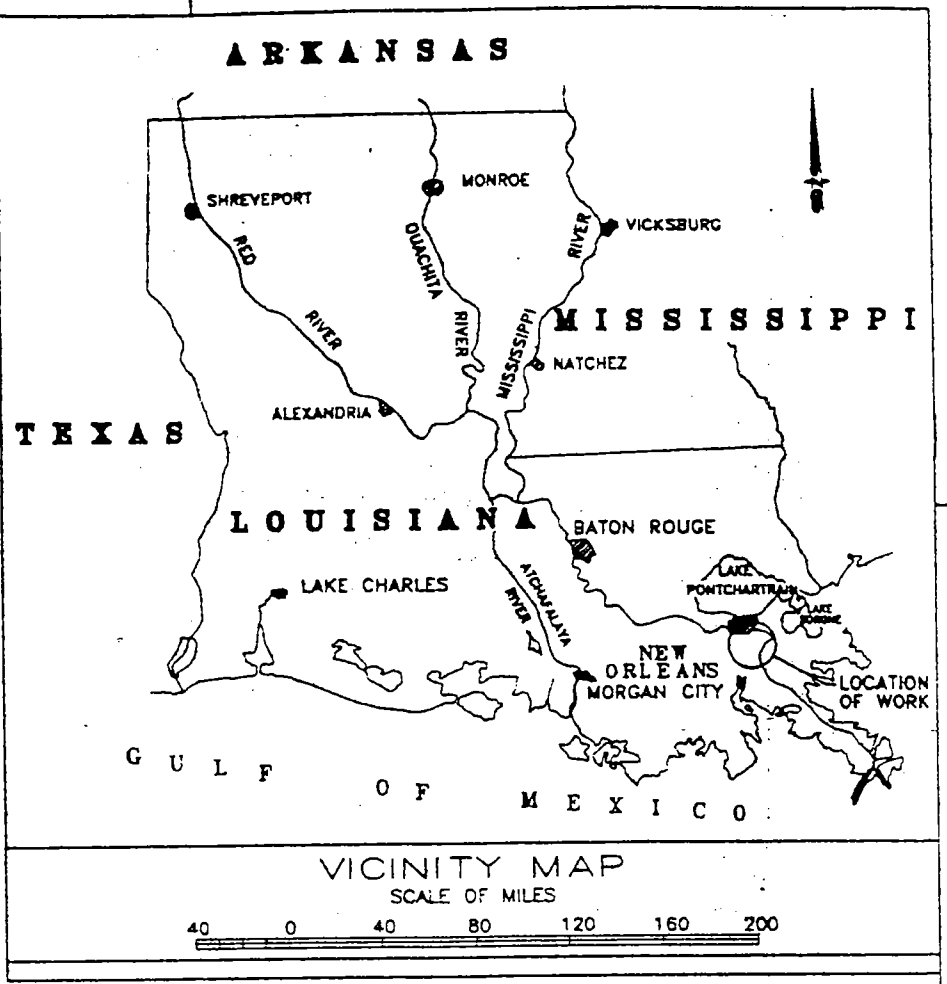
The project work will consist of raising the flood protection along the Cousins Outfall Canal to the standard project hurricane level. Both the First Avenue Canal and the Cousins Pumping Station will be enlarged to accommodate an additional 2,000 cfs. A frontal protection T-wall will be provided on the discharge side of the Cousins Pumping Station. The outfall canal will be enlarged, and parallel protection I-walls will be provided. The Destrehan Avenue Bridge will be lengthened by one (1) sixty-foot span, and floodgates will be constructed at each end of the bridge. A required closure wall in the existing outfall canal will route the outfall discharge through required culverts under the Lapalco Bridge into the Harvey Canal.

The authorized plan called for the addition of 1,000 cfs pumping capacities at the Cousins Pumping Station and modification of First Avenue Canal to accommodate an additional 1,000 cfs. Addition of another 1,000 cfs of pumping capacity was authorized under the Southeast Louisiana Project.

The Standard Project Hurricane (SPH) represents the most severe combination of hurricane parameters that is reasonably characteristic of the area, excluding extremely rare combinations. Based on the SPH, predicted surge height for 50-yr. future conditions is 9.3 NGVD and elevation for protected structures is +11.5 NGVD.

The estimated cost of the project, including Engineering and Design, and Contract Administration, is $36,321,000, based upon Design Memorandum No. 3, dated September 1998.





VICINITY MAP

SCALE OF MILES

40 0 40 80 120 160 200

C·A·D

WEST BANK OF THE MISSISSIPPI RIVER IN THE VICINITY OF NEW ORLEANS
EAST OF HARVEY CANAL HURRICANE PROTECTION

FEATURE DESIGN MEMORANDUM NO. 3

COUSINS PUMPING STATION COMPLEX

JEFFERSON PARISH, LOUISIANA

PROJECT LOCATION MAP—VICINITY MAP

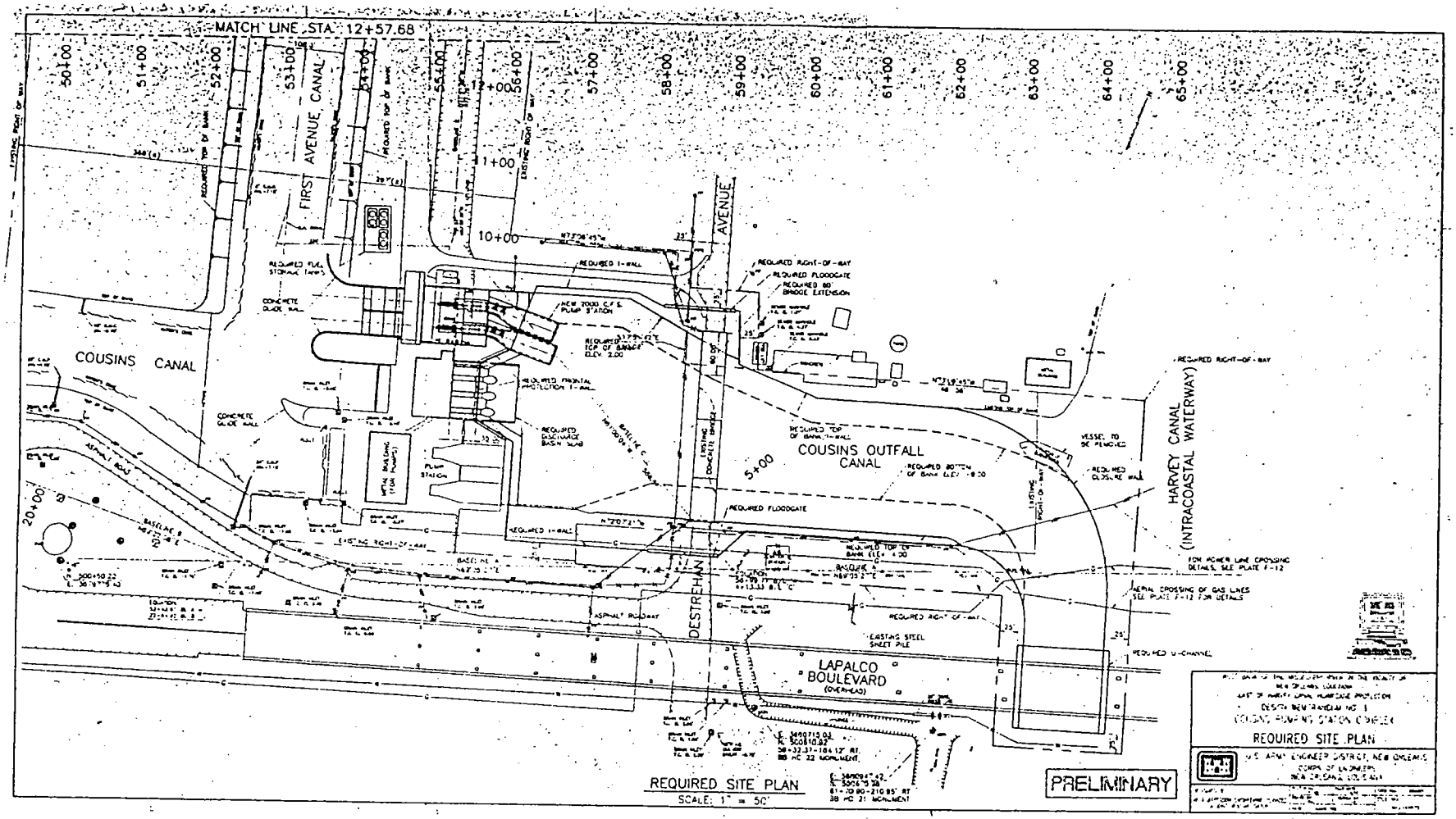
U.S. ARMY ENGINEER DISTRICT, NEW ORLEANS
CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA

DESIGNED BY:
WEST JEFFERSON ENGINEERING SERVICES
- A JOINT VENTURE GROUP -

FILE NO.
N-2-44970

4


MISSISSIPPI RIVER
ORLEANS PARISH
JEFFERSON PARISH
ALGIERS
GRETNA
TERRYTOWN
HARVEY
MARRERO
PROJECT LOCATION
BELLE CHASSE
ALGIERS CANAL (INTRACOASTAL WATERWAY-ALTERNATE ROUTE)
ALGIERS CANAL
HARVEY CANAL
SCARS
Safety is a Part of Your Contract
5
PROJECT LOCATION
SCALE: 1" = 3000'


MATCH LINE STA. 12+57.68
FIRST AVENUE CANAL
COUSINS CANAL
COUSINS OUTFALL CANAL
HARVEY CANAL (INTRACOASTAL WATERWAY)
DESTREHAN AVENUE
LAPALCO BOULEVARD (OWEN-KOS)
REQUIRED FLOODGATE
REQUIRED I-WALL
REQUIRED RIGHT-OF-WAY
REQUIRED FLOODGATE
REQUIRED 60' BRIDGE EXTENSION
EXISTING STEEL SHEET PILE
REQUIRED U-CHANNEL
REQUIRED SITE PLAN
SCALE: 1" = 50'
PRELIMINARY
REQUIRED SITE PLAN

SECTION 3 - VE RECOMMENDATIONS

This section contains the complete team writeups of all recommendations to come out of this study. Each "recommendation" is marked by a unique identification number. This number is assigned from the Creative Idea List and is used throughout the report to uniquely refer to a given recommendation. The parent idea, from which the recommendation began can be determined from the Creative Idea List, where the recommendation number is shown adjacent to the corresponding parent idea.

Acceptance of Single Issues

An attempt has been made to develop each recommendation around a single issue. This simplifies the acceptance or rejection of the recommendation, and gives added flexibility to the implementation of the recommendations, in that several single issue recommendations can be combined as needed to achieve a desired result. When evaluating a recommendation, each part of the recommendation should be reviewed on an independent basis. There is no need to discard an entire recommendation because one part of the recommendation is unacceptable. It is not necessary to accept or reject a recommendation in total. A recommendation can be accepted in part, or accepted with a specified partial modification.

Combining Recommendations.

Usually all recommendations cannot be simultaneously accepted or combined. This is because some recommendations are mutually exclusive of one another, and the acceptance of one recommendation will automatically preclude the acceptance of certain others.

The team has developed one suggested combination of mutually additive recommendations. This suggested combination of recommendations can be found by referring to the final column of the table "Summary of Recommendations" on page 9. All recommendations flagged in this column make up the suggested combination of recommendations. This combination represents the team's suggestion as to their choice of recommendations that will give maximum benefit to the project.

Summary of Recommendations.

The reader will find a table titled "Summary of Recommendations" on page 9. This table offers a convenient overview of all recommendations along with economic data associated with each.

Organization of Recommendations.

The recommendations presented on the following pages are organized numerically by identification number. Each recommendation is documented by a separate writeup that includes a description of the recommendation, a list of advantages and disadvantages, sketches where appropriate, calculations, cost estimate, and the economic impact of the recommendation on the life cycle project in terms of savings or added cost.

TABLE ES-1. SUMMARY OF RECOMMENDATIONS

Project: COUSINS PUMPING STATION COMPLEX
Location: JEFFERSON PARISH, LOUISIANA
Study Date: December 14 - 18, 1998

DESCRIPTION		PRESENT WORTH AMOUNT					Workable Combination of Recommendations		
Rec .#	Recommendation Title / Description	1st cost of original design	1st cost of recommen-dation	resulting 1st cost savings (or cost)	O & M savings (or cost)	total LCC savings (or cost)			
5	Do not Widen Channel	$470,970	$165,360	$305,610	-0-	$305,610	X	X	X
6	Eliminate Rip-Rap	$505,411	$348,091	$157,320	-0-	$157,320	X	X	X
7	Extend Sheet Piles and Eliminate Concrete Flume	$1,580,610	$229,200	$1,351,410	($69,000)	$1,282,410	X	X	X
8	Relocate Discharge Canal Under Lapalco Bridge	$6,362,000	$1,041,000	$5,321,000	-0-	$5,321,000	X		
9	Modify Design for Closure Wall	$5,717,088	$1,248,120	$4,468,968	-0-	$4,468,968		X	
10	Add Additional Generator; Use All Electrical Vacuum Pumps	-0-	$228,000	($228,000)	-0-	($228,000)	X	X	X

DESCRIPTION		PRESENT WORTH AMOUNT					Workable Combination of Recommendations		
Rec .#	Recommendation Title / Description	1st cost of original design	1st cost of recommen-dation	resulting 1st cost savings (or cost)	O & M savings (or cost)	total LCC savings (or cost)			
11	Install Two Control Rooms	$221,000	$298,000	($77,000)	-0-	($77,000)	X	X	X
12	Use Cell Wall Discharge Channel	$5,606,000	$3,792,000	$1,814,000	-0-	$1,814,000			X
13	Use Catenary in lieu of Climber Type Bar Screens	$1,080,000	$720,000	$360,000	($108,000)	$252,000	X	X	X
14	Eliminate Outside Crane	$126,000	-0-	$126,000	$4,000	$130,000	X	X	X

VALUE ENGINEERING RECOMMENDATION #5

PROJECT: COUSINS PUMPING STATION COMPLEX
LOCATION: JEFFERSON PARISH, LOUISIANA
STUDY DATE: December 14 - 18, 1998

DEVELOPED BY: Michael Ruck
IDENTIFICATION NUMBER: 5
FUNCTION OF COMPONENT BEING CHANGED: Conduct Discharge Water
DESCRIPTIVE TITLE OF RECOMMENDATION: Do not Widen Channel

ORIGINAL DESIGN:

The discharge canal is widened from new 2,000 cfs pump station through the Destrehan Ave. Bridge. The added width at the bridge is approximately sixty feet, necessitating addition of a sixty-foot span to lengthen the bridge.

RECOMMENDED CHANGE:

Maintain the existing top of bank canal width at the Destrehan Avenue Bridge, eliminating the need for lengthening the bridge. Extend the top of the bank of the widened canal in a straight line from a point just west of bridge to the north edge of the new pump station discharge tube. Approximately 175' of a sheet pile wall will be required to provide a vertical canal side near the discharge tube.

SUMMARY OF COST ANALYSIS			
	First Cost	O & M Costs (Present Worth)	Total LC Cost (Present Worth)
ORIGINAL DESIGN	$470,970	-0-	$470,970
RECOMMENDED DESIGN	$165,360	-0-	$165,360
ESTIMATED SAVINGS OR (COST)	$305,610	-0-	$305,610

VALUE ENGINEERING RECOMMENDATION #5

ADVANTAGES:

- Eliminates bridge work
- Reduces excavation
- Shortens construction time
- Eliminates closure of Destrehan Ave.

DISADVANTAGES:

- May create hydraulic restriction
- May require additional model test
- Requires channel side wall

JUSTIFICATION:

If disadvantages can be overcome, this recommendation would eliminate the need to widen the Destrehan Avenue Bridge and close traffic during the construction and would expedite construction.

VALUE ENGINEERING RECOMMENDATION #5

FORM: 23 MARCH 1998

COST ESTIMATE - FIRST COST

Cost Item	Units	Unit Cost		Original Design		Recommended Design	
		$/Unit	Source Code	Num of Units	Total $	Num of Units	Total $
Bridge Extension	ea.	$300,000	1	1	$300,000		
Canal Excavation	cy	$6.75	1	13,700	$92,475		
Sheet Pile Wall	sf	$15	1			7,000	$105,000
Coating	sf	$2	1			8,750	$17,500
Conc. Pile Cap	cy	$300	1			26	$7,800
Conc. Dead Man	cy	$300	1			10	$3,000
Tie Back Rods 1-1/2" x 30'	ea	$500	1			9	$4,500
SUBTOTAL					$392,475		$137,800
Contingency (20%)					$78,495		$27,560
TOTAL					$470,970		$165,360

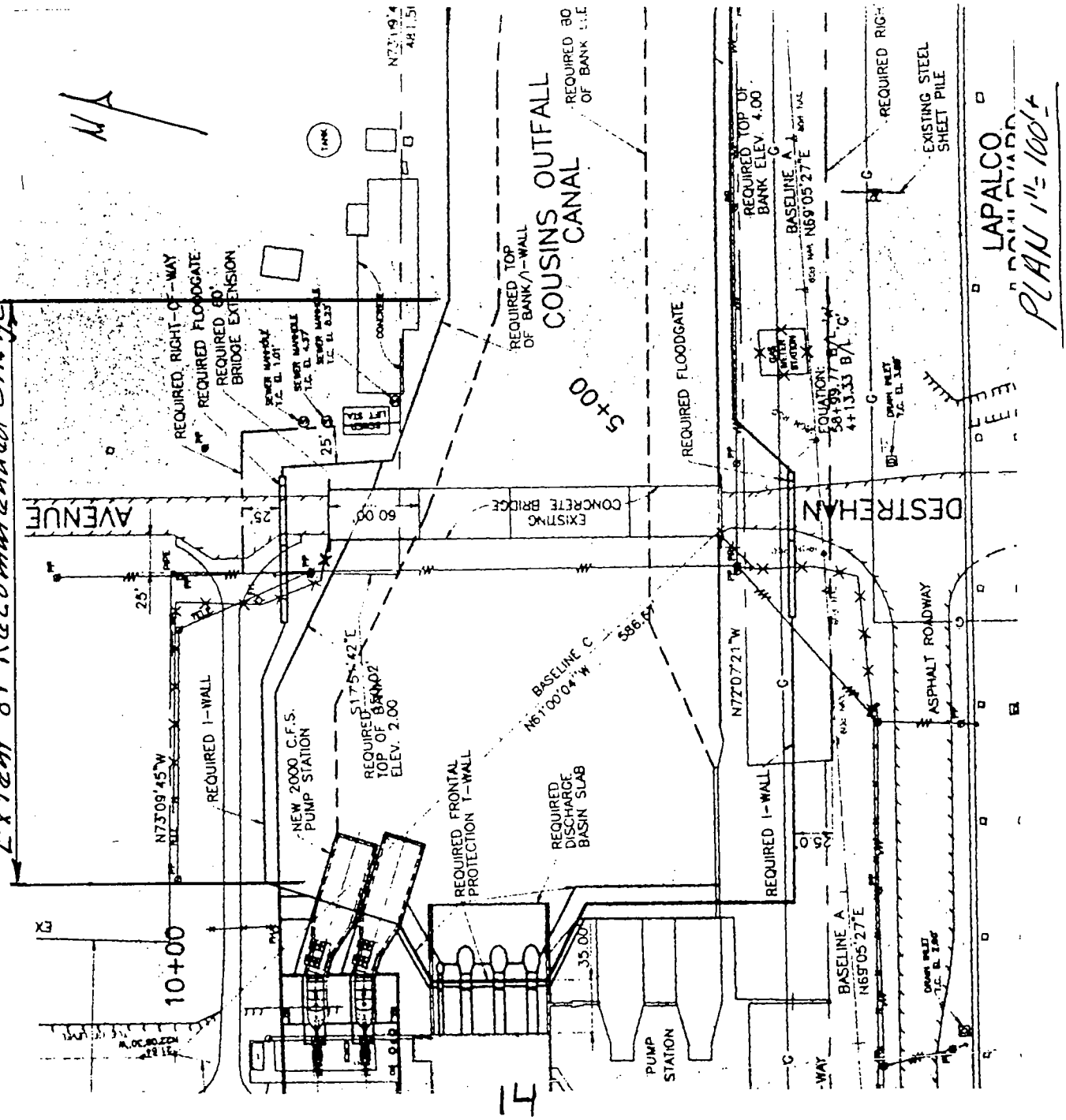
SOURCE CODE:
1 Project Cost Estimate
2 CES Data Base
3 CACES Data Base
4 Means Estimating Manual
5 Richardson's
6 Vendor Lit or Quote (list name / details)
7 Professional Experience (List job if applicable)
8 Other Sources (specify)

VALUE ENGINEERING RECOMMENDATION

FORM: 20 DEC 1966

SKETCH OF ORIGINAL DESIGN

IDENTIFICATION NUMBER: 5

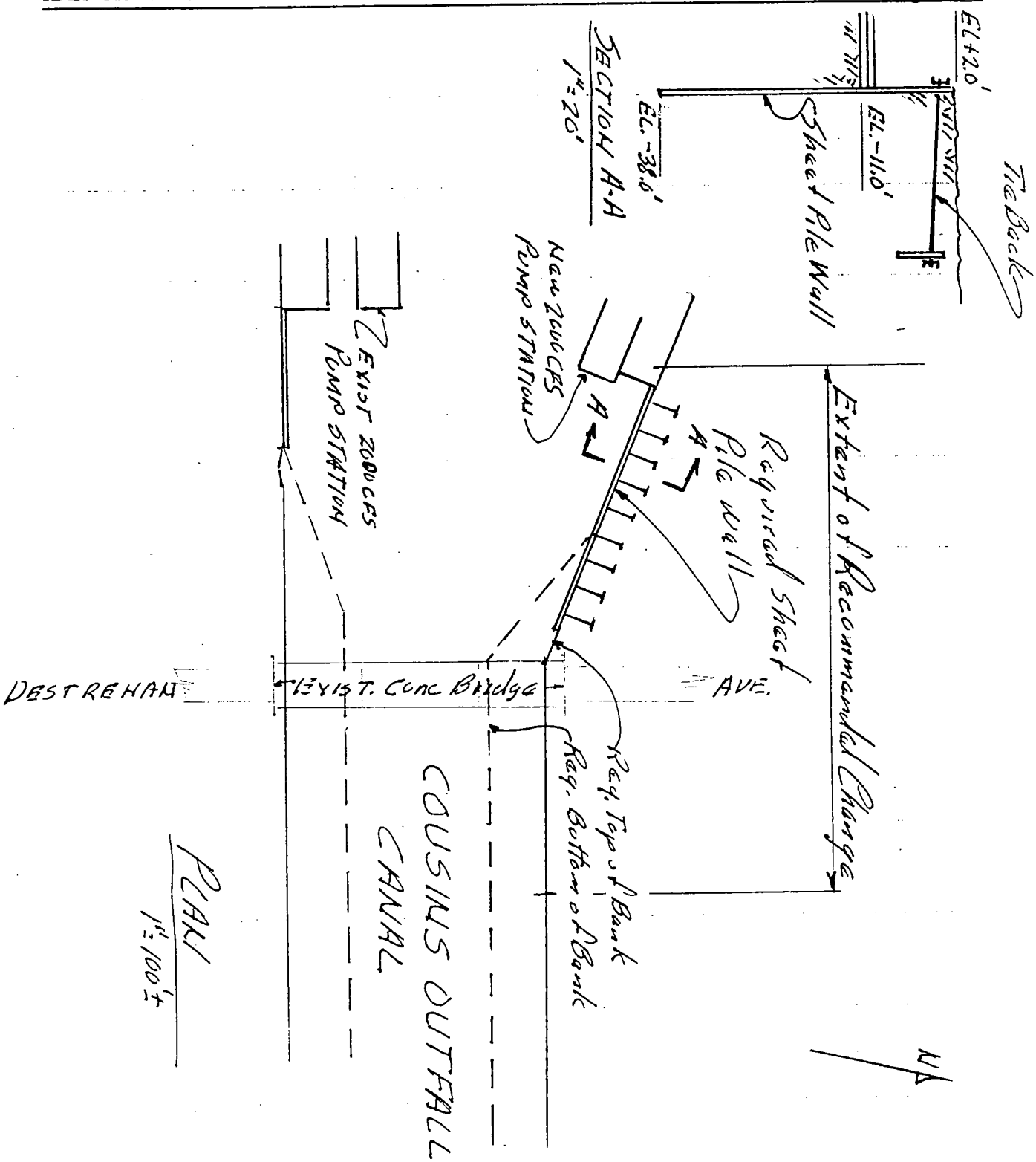


VALUE ENGINEERING RECOMMENDATION

FORM: 20 DEC 1966

SKETCH OF RECOMMENDED DESIGN

IDENTIFICATION NUMBER: 5



VALUE ENGINEERING RECOMMENDATION #6

PROJECT: COUSINS PUMPING STATION COMPLEX

LOCATION: JEFFERSON PARISH, LOUISIANA

STUDY DATE: December 14 - 18, 1998

DEVELOPED BY: Walter Frey, Jr.

IDENTIFICATION NUMBER: 6

FUNCTION OF COMPONENT BEING CHANGED: Control Erosion

DESCRIPTIVE TITLE OF RECOMMENDATION: Eliminate Rip-Rap

ORIGINAL DESIGN:

A 2'-0" thick bed of rip-rap is used throughout the discharge channel. The rip-rap covers the embankments and the channel bottom.

RECOMMENDED CHANGE:

Remove the rip-rap between the Destrehan Avenue Bridge and the beginning of the closure wall.

SUMMARY OF COST ANALYSIS			
	First Cost	O & M Costs (Present Worth)	Total LC Cost (Present Worth)
ORIGINAL DESIGN	$505,411	-0-	$505,411
RECOMMENDED DESIGN	$348,091	-0-	$348,091
ESTIMATED SAVINGS OR (COST)	$157,320	-0-	$157,320

ADVANTAGES:

- Eliminates this phase of the construction.
- Improve maintenance since periodic dredging of this area is anticipated.

DISADVANTAGES:

- None noted.

JUSTIFICATION:

Scour velocities or turbulence are not anticipated along the discharge channel straight away. Therefore, erosion should not be a problem. With regular channel velocities less than 1 FPS and maximum at about 3 FPS, net shoaling/sedimentation would be expected here. The presence of rip-rap would be a hindrance to maintenance dredging.

VALUE ENGINEERING RECOMMENDATION #6

CALCULATIONS

IDENTIFICATION NUMBER: 6

Rip-Rap Volume:

Assume section @ Sta. 4+65 on Plate CH-8

L≅ 300' of cross-section

A = 2' x l

$l = 2 \times (14^2 + 42^2)^{1/2} + 100 \cong 190'$

A = 2 x 190 = 380 ⌀

$V = \frac{300 \times 380}{3^3} = 4222$ Cu. Yd.

Assume 100 pcf

$WT = \frac{300 \times 380}{2000} \times 100 = 5700$ Tons

VALUE ENGINEERING RECOMMENDATION #6

COST ESTIMATE - FIRST COST

Cost Item	Units	Unit Cost		Original Design		Recommended Design	
		$/Unit	Sou-rce Code	Num of Units	Total $	Num of Units	Total $
Rip-Rap	1	$23	1	18,312	$421,176	12,612	$290,076
Subtotal					$421,176		$290,076
Contingency (20%)					$84,235		$58,015
TOTAL					$505,411		$348,091

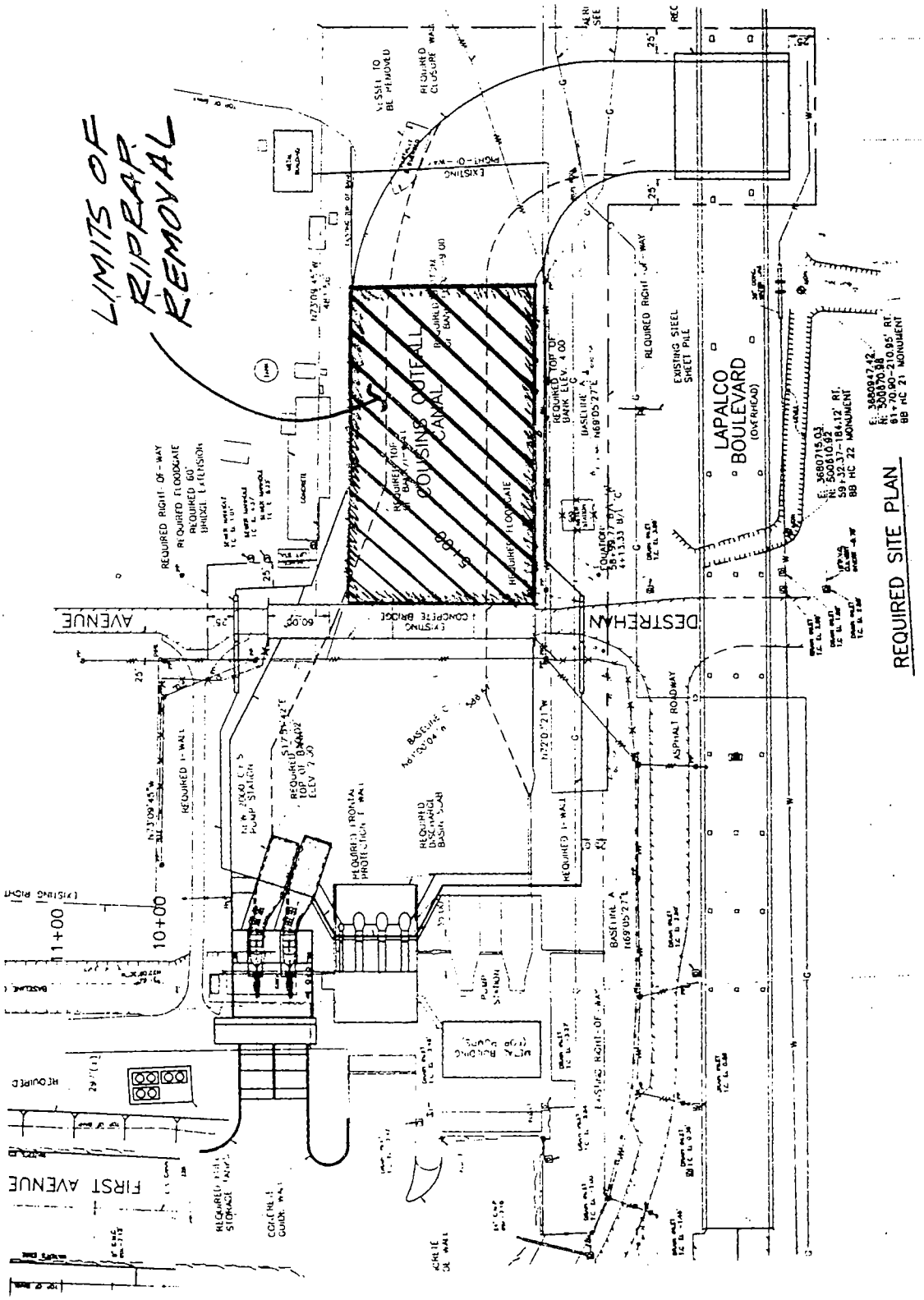
SOURCE CODE:
1 Project Cost Estimate
2 CES Data Base
3 CACES Data Base
4 Means Estimating Manual
5 Richardson's
6 Vendor Lit or Quote (list name / details)
7 Professional Experience (List job if applicable)
8 Other Sources (specify)

VALUE ENGINEERING RECOMMENDATION

FORM: 20 DEC 1966

SKETCH OF RECOMMENDED DESIGN

IDENTIFICATION NUMBER:



VALUE ENGINEERING RECOMMENDATION #7

PROJECT: COUSINS PUMPING STATION COMPLEX
LOCATION: JEFFERSON PARISH, LOUISIANA
STUDY DATE: December 14 - 18, 1998

DEVELOPED BY: Michael Ruck
IDENTIFICATION NUMBER: 7
FUNCTION OF COMPONENT BEING CHANGED: Contain Water
DESCRIPTIVE TITLE OF RECOMMENDATION: Use Sheet Piles with Tie-backs

ORIGINAL DESIGN:

The discharge channel passing under Lapalco Bridge is an open top precast concrete flume which will be floated into place on a site prepared by dredging between tied back sheet pile walls at the bridge piers. The sheet piles also serve as cutoff walls.

RECOMMENDED CHANGE:

Eliminate the concrete flume and attain flood protection elevation by extending the sheet piles up to the required elevation and tieing the walls across the channel.

SUMMARY OF COST ANALYSIS			
	First Cost	O & M Costs (Present Worth)	Total LC Cost (Present Worth)
ORIGINAL DESIGN	$1,580,610	-0-	$1,580,610
RECOMMENDED DESIGN	$229,200	$69,000	$298,200
ESTIMATED SAVINGS OR (COST)	$1,351,410	($69,000)	$1,282,410

ADVANTAGES:

- Eliminate need for the flume.
- Decreases construction time

DISADVANTAGES:

- Not as aesthetically pleasing as concrete, but is located in an industrial area.
- Would require periodic painting.

JUSTIFICATION:

The function of containing water can be accomplished by extending the sheet piles and not using a concrete flume.

TIE-BACK

$T = 1.25^{K/FT}$
$L = 130^{\circ}$
$SPC = 12^{\circ}$

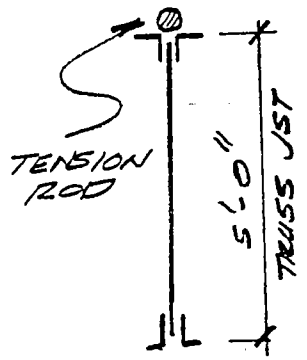
USE GODLH12
$L_{MAX} = 120'$
$WT = 31$ PLF
W/ MC12x31
$I = 203\ in^3$
SEE VULCRAFT STEEL JOIST JOIST GIRDERS, 1979

$T_{ROD} = 1.25 \times 12 = 15^{K}$

W/ $F_E = 0.6 \times F_y = 21{,}000$ PSI

$A = 15/21 = 0.7143\ in^2$

$r = \sqrt{A/\pi} = 0.48$ in



USE 1" ϕ ROD
WT = 2.7 PLF

TIE-BACK (MATERIAL EST.)

$L = 112^{0}$

SPC = 12^{0} O.C.

$N = 112 \div 12 \cong 10$ TIE-BACKS

ITEM	LENGTH	UNIT WT	WT
60DLH12	130'	31 PLF	4030
MC12x31	130'	31 PLF	4030
1"ϕ ROD	130'	2.7 PLF	351
			8411 #

TOTAL = 10 x 8411 = 84110 #

VALUE ENGINEERING RECOMMENDATION #7

COST ESTIMATE - FIRST COST

Cost Item	Units	Unit Cost		Original Design		Recommended Design	
		$/Unit	Source Code	Num of Units	Total $	Num of Units	Total $
Concrete Gravity Structure	LS	838,600	1	1	838,600		
24" Connector Piles	LF	210	1	2160	453,600		
Excavation	CY	6.75	1	3700	24,975		
Sheet Piles	SF	15	1			1,560	23,400
Coating	SF	2	1			23,000	46,000
Splice Piles	LF	150	7			250	37,500
Tie Back Struct.	LBS	1	7			84,100	84,100
Subtotal					1,317,175		191,000
Contingency (20%)					263,435		38,200
TOTAL					1,580,610		229,200

SOURCE CODE: 1 Project Cost Estimate 4 Means Estimating Manual 7 Professional Experience
2 CES Data Base 5 Richardson's (List job if applicable)
3 CACES Data Base 6 Vendor Lit or Quote (list name / details) 8 Other Sources (specify)

VALUE ENGINEERING RECOMMENDATION #7

CALCULATIONS

IDENTIFICATION NUMBER: 7

Add O & M for painting every 10 years.

Cost = $3/sf x 23,000 sf = $69,000

Interval 10, 20, 30, 40, 50 years

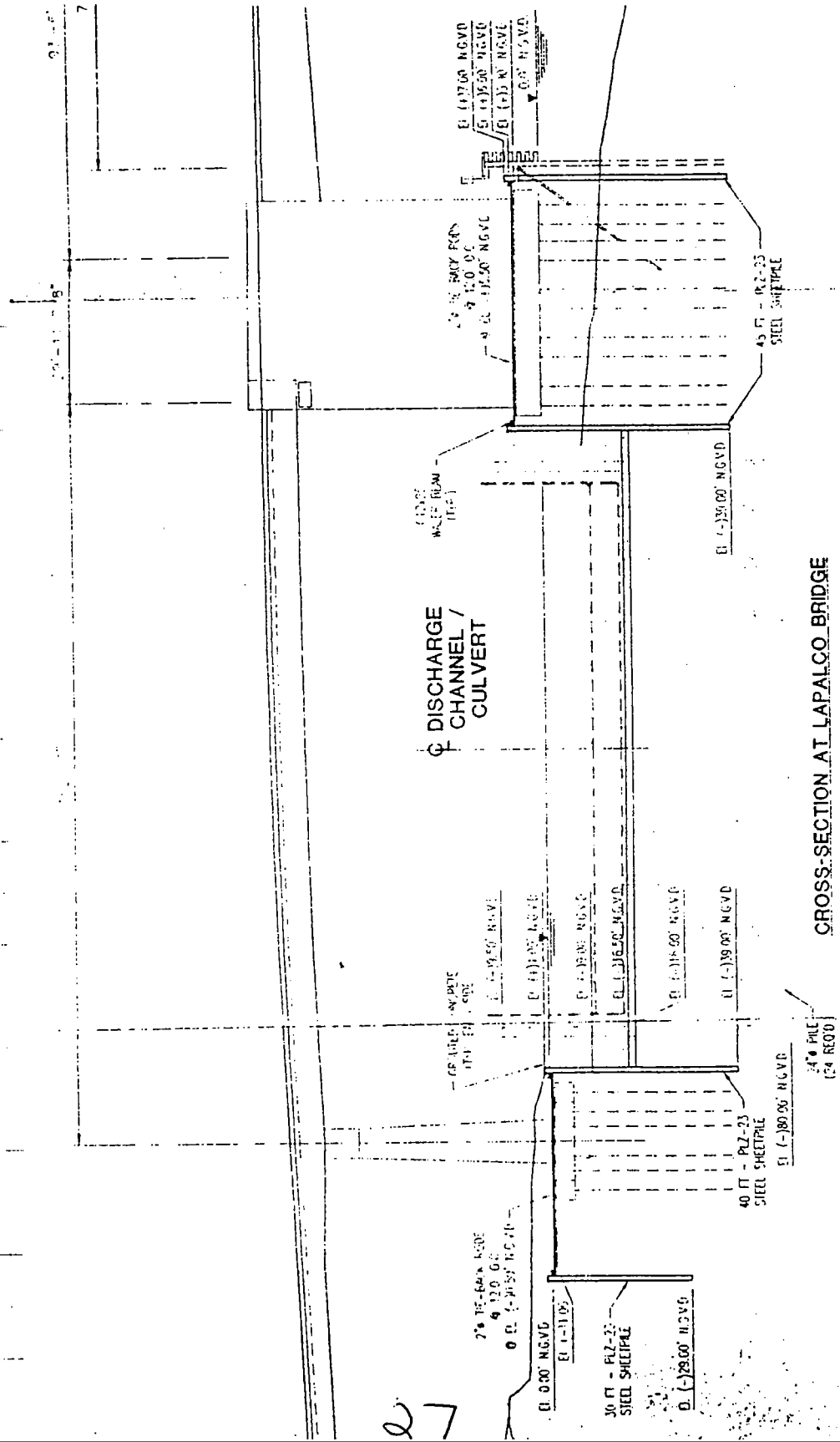
PW	=	$69,000	(P/F, 7%, 10)	=	
			.51		
	+	$69,000	.26 20	=	
	+	$69,000	.13 30	=	
	+	$69,000	.07 40	=	
	+	$69,000	.03 50	=	
Total					$69,000

VALUE ENGINEERING RECOMMENDATION # 7

FORM: 20 DEC 1966

SKETCH OF ORIGINAL DESIGN

IDENTIFICATION NUMBER: 7

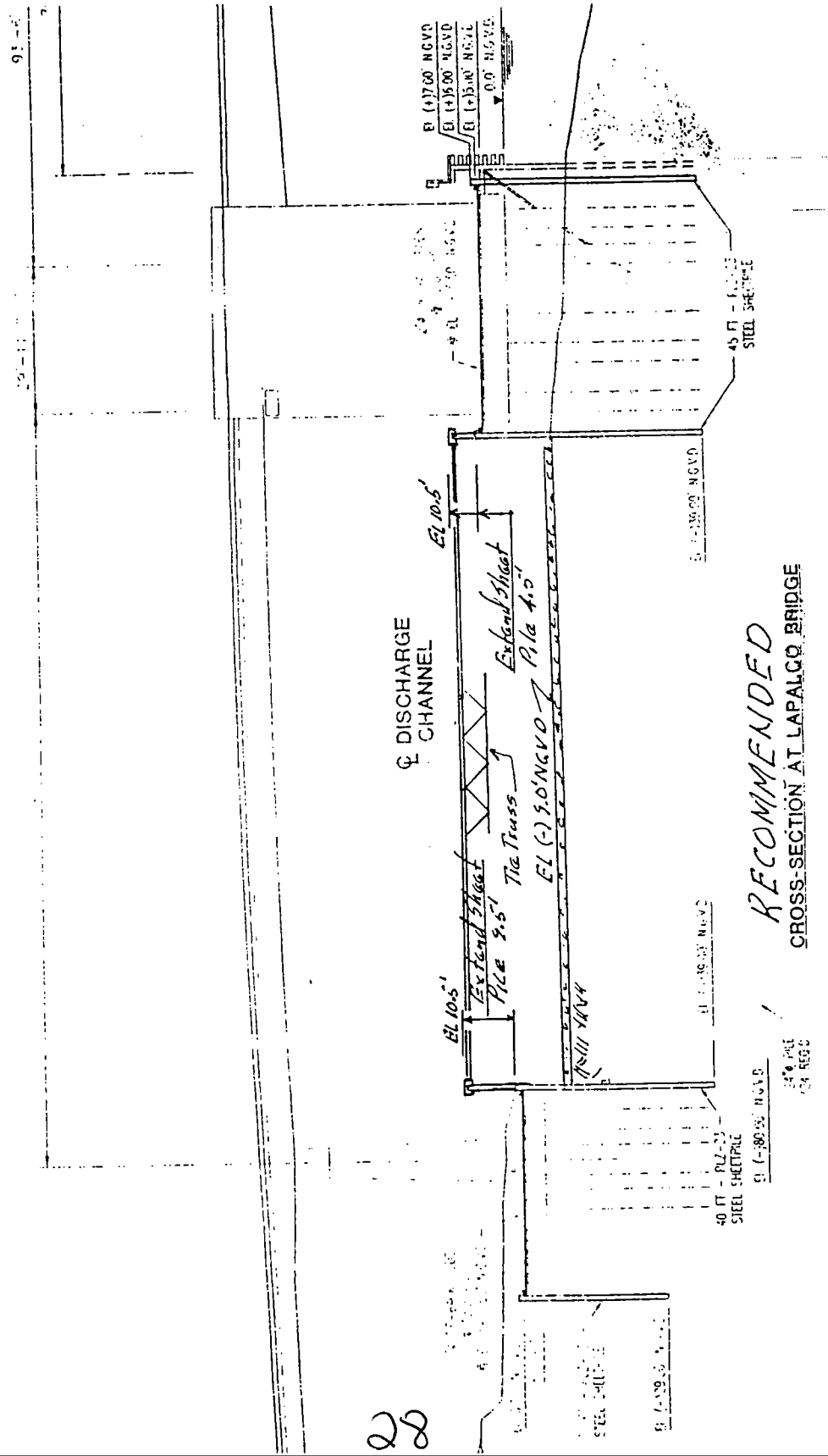


VALUE ENGINEERING RECOMMENDATION # 7

FORM: 20 DEC 1966

SKETCH OF RECOMMENDED DESIGN

IDENTIFICATION NUMBER: 7



VALUE ENGINEERING RECOMMENDATION #8

PROJECT: COUSINS PUMPING STATION COMPLEX
LOCATION: JEFFERSON PARISH, LOUISIANA
STUDY DATE: December 14 - 18, 1998

DEVELOPED BY: Walter Frey, Sr.
IDENTIFICATION NUMBER: 8
FUNCTION OF COMPONENT BEING CHANGED: Discharge Storm Water
DESCRIPTIVE TITLE OF RECOMMENDATION: Relocation of Discharge Channel Under Lapalco Bridge

ORIGINAL DESIGN:

The discharge canal flows east from the station and turns south under Lapalco Bridge along the edge of the Harvey Canal. This location provides no earthen protection for the flood wall and/or the closure wall.

RECOMMENDED CHANGE:

Relocate discharge canal under Lapalco bridge one bay to the west. Replace the pipe/sheetpile closure wall with a sheetpile I-wall.

SUMMARY OF COST ANALYSIS			
	First Cost	O & M Costs (Present Worth)	Total LC Cost (Present Worth)
ORIGINAL DESIGN	$6,362,000	-0-	$6,362,000
RECOMMENDED DESIGN	$1,041,000	-0-	$1,041,000
ESTIMATED SAVINGS OR (COST)	$5,321,000	-0-	$5,321,000

VALUE ENGINEERING RECOMMENDATION #8

ADVANTAGES:

- Shorten length of flood wall
- Offers earthen protection for the flood wall
- Change closure wall from double 84" pilings to I-wall.
- Much easier construction and maintenance

DISADVANTAGES:

- Additional R/W requirements

JUSTIFICATION:

The substantial savings from the reduced length of flood wall combined with the availability of earthen protection for the flood wall and the changing of the closure wall to an I-wall, far out weigh the potential cost of additional R/W requirements.

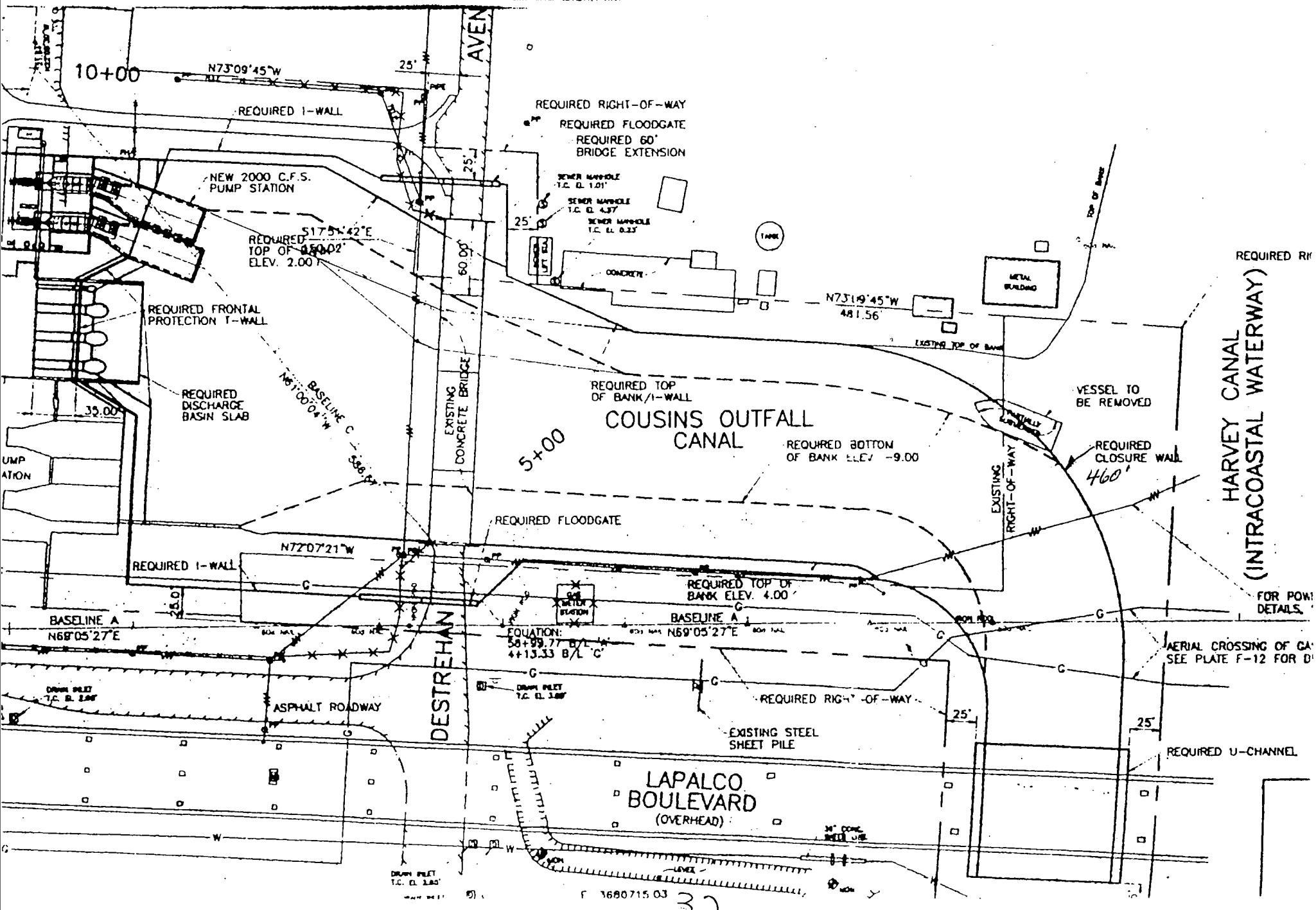
Far more important, however, is that this design change takes the flood protection out of harm's way in the heavily traveled Harvey Canal. The potential consequences of an untimely collision, breaching this flood barrier are enormous and should be avoided.

VALUE ENGINEERING RECOMMENDATION #8

COST ESTIMATE - FIRST COST

Cost Item	Units	Unit Cost		Original Design		Recommended Design	
		$/Unit	Sou-rce Code	Num of Units	Total $	Num of Units	Total $
Flood Wall	LF	$600	1	650	$390,000	550	$330,000
Excavation	CY	$6.50	1	48,000	$312,000	40,000	$260,000
Closure Wall	LF	$10,000	1	460	$4,600,000	-0-	-0-
Replace with I-wall	LF	$600	1	-0-	-0-	460	$276,000
Subtotal					$5,302,000		$866,000
Contingency (20%)					$1,060,000		$175,000
TOTAL					$6,362,000		$1,041,000

SOURCE CODE: 1 Project Cost Estimate 4 Means Estimating Manual 7 Professional Experience
2 CES Data Base 5 Richardson's (List job if applicable)
3 CACES Data Base 6 Vendor Lit or Quote (list name / details) 8 Other Sources (specify)

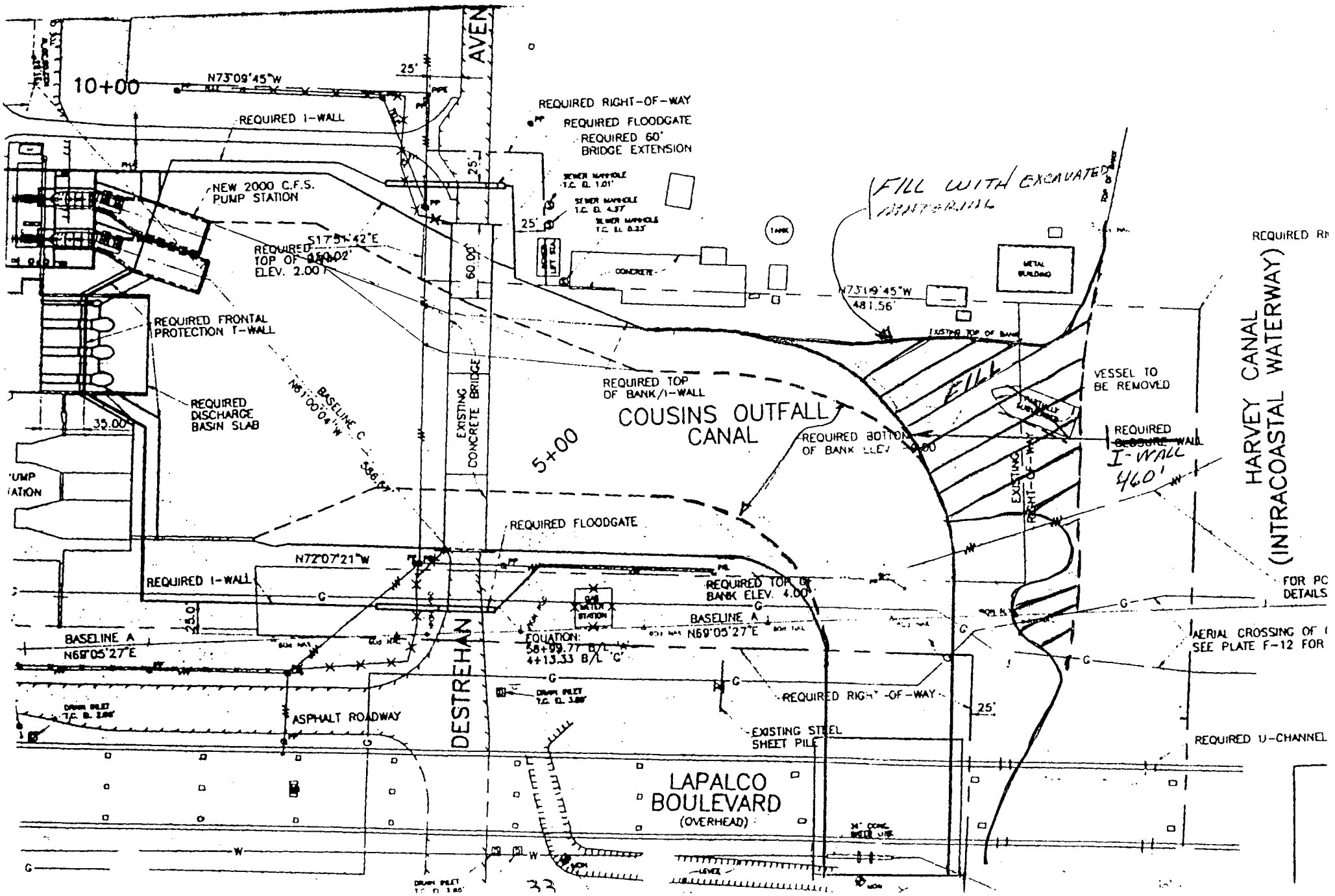

10+00
N73°09'45"W
25'
REQUIRED I-WALL
REQUIRED RIGHT-OF-WAY
REQUIRED FLOODGATE
REQUIRED 60' BRIDGE EXTENSION
NEW 2000 C.F.S. PUMP STATION
S17°54'42"E
REQUIRED TOP OF BANK ELEV. 2.00
60.00'
REQUIRED FRONTAL PROTECTION T-WALL
REQUIRED DISCHARGE BASIN SLAB
35.00'
BASELINE C
N61°00'04"W
EXISTING CONCRETE BRIDGE
REQUIRED TOP OF BANK/I-WALL
COUSINS OUTFALL CANAL
5+00
REQUIRED BOTTON OF BANK ELEV -9.00
N73°09'45"W
481.56'
EXISTING TOP OF BANK
VESSEL TO BE REMOVED
REQUIRED CLOSURE WALL
460'
EXISTING RIGHT-OF-WAY
HARVEY CANAL (INTRACOASTAL WATERWAY)
REQUIRED FLOODGATE
N72°07'21"W
REQUIRED I-WALL
REQUIRED TOP OF BANK ELEV. 4.00
BASELINE A
N68°05'27"E
EQUATION:
58+99.77 B/L 'A'
4+13.33 B/L 'C'
BASELINE A
N69°05'27"E
DESTREHAN
AERIAL CROSSING OF GA
SEE PLATE F-12 FOR D
ASPHALT ROADWAY
REQUIRED RIGHT-OF-WAY
25'
EXISTING STEEL SHEET PILE
LAPALCO BOULEVARD
(OVERHEAD)
REQUIRED U-CHANNEL
1680715.03
30

VALUE ENGINEERING R OMMENDATION

FORM 20 DEC 1966

SKETCH OF RECOMMENDED DESIGN

IDENTIFICATION NUMBER: V.E-8



VALUE ENGINEERING RECOMMENDATION #9

PROJECT: COUSINS PUMPING STATION COMPLEX
LOCATION: JEFFERSON PARISH, LOUISIANA
STUDY DATE: December 14 - 18, 1998

DEVELOPED BY: Walter Frey, Jr.
IDENTIFICATION NUMBER: 9
FUNCTION OF COMPONENT BEING CHANGED: Contain Water
DESCRIPTIVE TITLE OF RECOMMENDATION: Use Lighter Construction for Closure Wall

ORIGINAL DESIGN:

A double row of 84" ⌀ concrete piles filled with sand and driven to a tip elevation of -109.0 ft. Sheet pile is driven to an elevation of -27.5 ft on the protected side and both the sheet pile and concrete piles are topped with a 4-foot thick concrete cap.

RECOMMENDED CHANGE:

Use the anchored sheet pile diversion wall detailed in Enclosure #9 of the letter dated 2/10/98 from Eustis Engineering. Design includes sheet pile driven to an elev. of -52 ft with a battered anchor pile. See Design Memorandum No. 3, Vol. II. For impact protection an earthen barrier is built from dredged material and placed between the flood gate guide walls and the closure wall.

SUMMARY OF COST ANALYSIS			
	First Cost	O & M Costs (Present Worth)	Total LC Cost (Present Worth)
ORIGINAL DESIGN	$5,717,088	-0-	$5,717,088
RECOMMENDED DESIGN	$1,248,120	-0-	$1,248,120
ESTIMATED SAVINGS OR (COST)	$4,468,968	-0-	$4,468,968

VALUE ENGINEERING RECOMMENDATION #9

ADVANTAGES:

- Reduced wall construction
- Reduced construction time
- Reduced dredging disposal
- Provide earthen protection for flood wall.

DISADVANTAGES:

- Effects of setting fill material adjacent to the proposed wall must be addressed/mitigated.

JUSTIFICATION:

Protection is provided by the guide walls proposed for the new Harvey Canal flood gates and the proposed earthen barrier. This removes the need for the 84" ⌀ piles. See plate F-11 of Design Memorandum No. 3, Vol. I. Significant cost savings along with providing much improved impact protection is achieved with this design change.

CLOSURE WALL

USE ENCLOSURE #9, OF EUSTIS LETTER DATED 10 FEB 1998, DESIGN MEMORANDUM Nº 3, VOL II

1. CONCRETE CAP :

SEE "TYP. I-WALL & CANT. SHT. PILE WALL" - F10

$A = 2.0 \times 2.5 = 5.0\ \#$

SEE "CLOSURE WALL PLAN" - F11

$L = 1/4 \times 2\pi \times 250 + 70 \cong 460'$

$V = \frac{5.0 \times 460}{3^3} \cong \underline{86\ cuyd}$

2. SHT. PILE :

$h = 62'$,

$L = 460'$

$A = 62 \times 460 = \underline{28520\ ft^2}$

CLOSURE WALL

USE ENCLOSURE #11 OF EUSTIS LETTER 10 FEB 98, DES. MEM. Nº 3, VOL II

3. BATTER PILES:

ASSUME 1:3 BATTER

V_{max} = 80 TONS = 160^K @ (-)80^{FT} TIP ELEV.

$H_{max} = \frac{80}{3} \times 2 = 54^K$

W/ 10^K/FT HORIZ ANCHOR LOAD

$S = 54/10 \cong 5'-0''$ O.C.

$L = 460'$

$N = 460 \div 5 = 92$

$\ell_{PILE} = \sqrt{90^2 + 30^2} = 95$ FT

VERTICAL RANGE
EL +10.0
EL -80.0

USE 16" SQ x 95 FT CONC PILE

N = 92

CLOSURE WALL

USE FIGURE #24 OF EUSTIS LETTER DATED 7 OCT. 1998, DES. MEM. NO 3 VOL II AND ENCLOSURE # 10 OF EUSTIS LETTER DATED 10 FEB 98

4. SHT. PILE UPLIFT

W/ BATTER = 1:3

PILE SPC. = 5'-0"

H = 50^{K}

V = 3x50 = 150^{K}

SHT PILE = 6.5 x 5.0 x 2 = 65^{K} @ -52^{F}

TENSION PILE = 46 x 2 = 92^{K} @ 14in SQ x 85^{F}

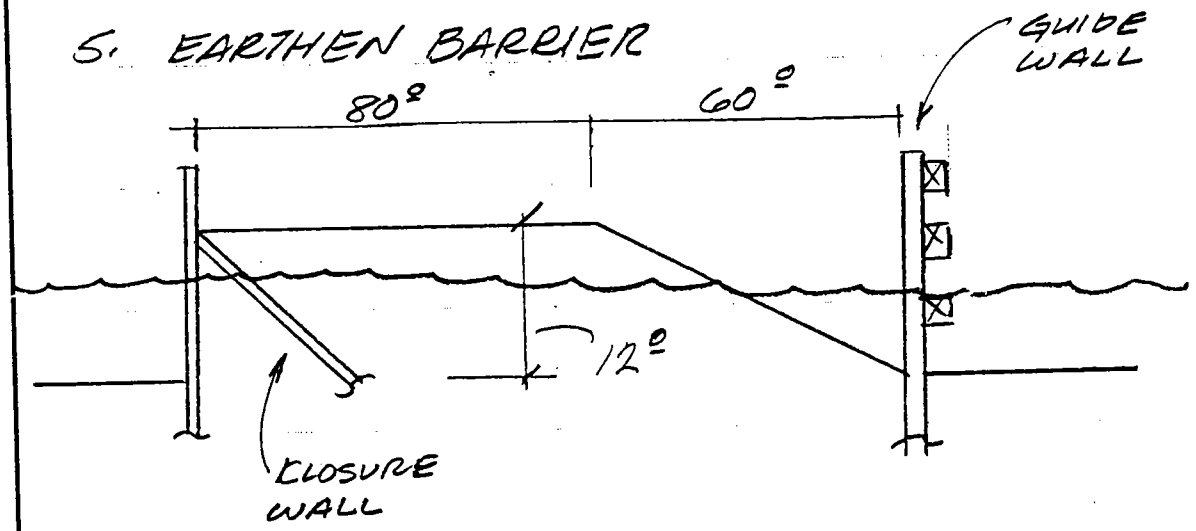
TOTAL = 157^{K} ≅ 150^{K}

USE 14in SQ x 85^{F} @ 5'-0"

(N = 92, SEE PG. 4)

CLOSURE WALL

5. EARTHEN BARRIER



$L = 460'$

$A = 1/2 \times 60 \times 12 + 80 \times 12 = 1320 \#$

$V = \frac{460 \times 1320}{27} = 22489 \text{ cuyd} \sim 25000$

VALUE ENGINEERING RECOMMENDATION #9

COST ESTIMATE - FIRST COST

Cost Item	Units	Unit Cost		Original Design		Recommended Design	
		$/Unit	Source Code	Num of Units	Total $	Num of Units	Total $
Sheet Piling		$15.0	1	16,416	$246,240	28,520	$427,800
Concrete Cap		$375.0	1	1,216	$456,000	86	$32,250
84" ⌀ Pile		$250.0	1	15,600	$3,900,000	-	-0-
16" sq. Pile (batter)		$30.0	1	-	-0-	8,740	$262,200
Concrete Walers		$375.0	1	-	-0-	86	$32,250
14" sq. Pile (tension)		$30.0	1	-	-0-	7,820	$234,600
Excavation Disposal		$6.50	1	25,000	$162,000	-	-0-
Excavation Placement		$2.00	1	-	-0-	25,000	$50,000
Subtotal					$4,764,240		$1,040,100
Contingency (20%)					$952,848		$208,020
TOTAL					$5,717,088		$1,248,120

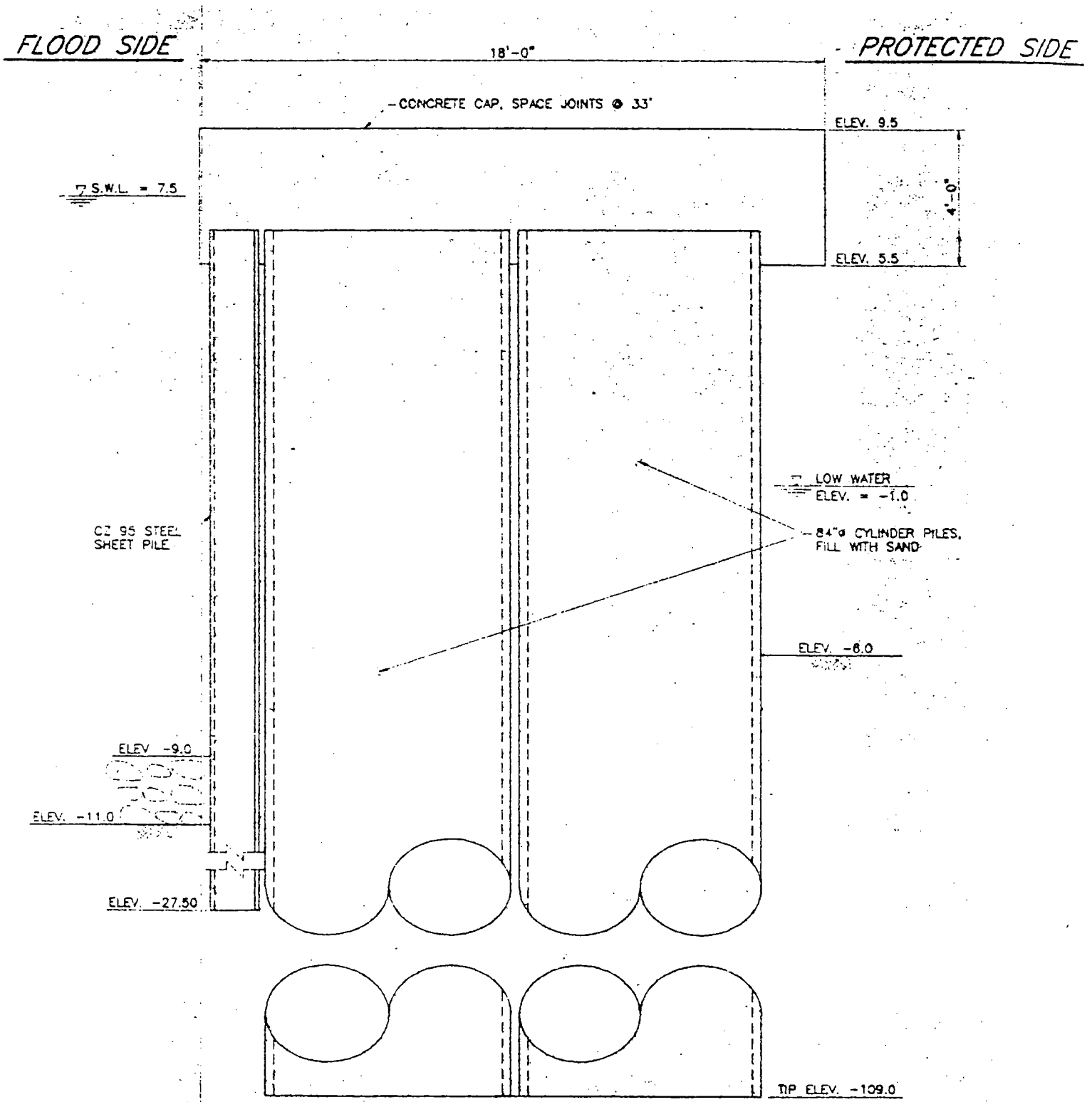
SOURCE CODE: 1 Project Cost Estimate 4 Means Estimating Manual 7 Professional Experience
2 CES Data Base 5 Richardson's (List job if applicable)
3 CACES Data Base 6 Vendor Lit or Quote (list name / details) 8 Other Sources (specify)

VALUE ENGINEERING RECOMMENDATION

FORM: 20 DEC 1966

SKETCH OF ORIGINAL DESIGN

IDENTIFICATION NUMBER: 9



CLOSURE WALL SECTION

SCALE: 1/2" = 1'-0"

EUSTIS ENGINEERING COMPANY, INC.
GEOTECHNICAL ENGINEERS
CONSTRUCTION QUALITY CONTROL & MATERIALS TESTING
3011 28th Street • Metairie, Louisiana 70002 • 504-834-0157 / Fax 504-834-0354 / E-mail EustisEngr@aol.com

10 February 1998

West Jefferson Engineering Services
A Joint Venture
615 Fourth Street
Westwego, Louisiana 70094

Attention Mr. Oscar Pena

Gentlemen:

Supplemental Geotechnical Information
West Jefferson Levee District
Cousins Pumping Station to First Avenue Canal
Harvey, Louisiana

Reference is made to our report dated 7 October 1997 entitled "Geotechnical Investigation, West Jefferson Levee District, Cousins Pumping Station at First Avenue Canal, Harvey, Louisiana." As requested, Eustis Engineering Company, Inc., has made additional analyses of I-walls, T-walls, and floodgates for the subject project. These additional analyses assume a static storm water level at el 9.5 (NGVD) rather than el 7.5. We have also developed designs for features not previously analyzed.

Design methods and parameters, as well as other pertinent assumptions, are described in our previous report. This letter includes revised figures for our report. These revised figures provide the results of reviewed engineering analyses for a static storm water level at el 9.5 and are summarized in the following table.

ENCLOSURE NUMBER	FIGURE NUMBER FROM REVISED REPORT	DESCRIPTION
1	34	I-Wall Design, Cousins Pump Station Discharge to Destrehan Avenue Bridge
2	35	I-Wall Design, North Bank of Discharge Canal, East of Destrehan Avenue Bridge
3	36	I-Wall Design, South of Lapalco Boulevard
4	37	T-Wall Stability Analysis, Cousins Pump Station Discharge to Destrehan Avenue Bridge
5	38	T-Wall Stability Analysis, North Bank of Discharge Canal, East of Destrehan Avenue Bridge
6	39	Floodgate Stability Analysis, Destrehan Avenue

Additional Analyses

Furnished Information. Beneath the Lapalco Boulevard bridge, a prefabricated barge will be installed to serve as a flume. A diversion wall will tie into the floodwall on the north side of the discharge canal and curve toward the south to tie into the east wingwall of the flume. The diversion wall will continue south of the bridge from the flume wingwall to a sector gate in the Harvey Canal.

East of the Destrehan Avenue Bridge, a floodwall will be constructed on the south bank of the discharge canal. The alignment of the wall will curve toward the south to tie into the west wingwall of the flume structure. The floodwall will continue to the south of the Lapalco Boulevard bridge. It will be tied into the west wingwall of the flume structure and continue south and west to tie into the existing levee system on the west side of the Harvey Canal.

The discharge channel flume barge will be installed beneath the Lapalco Boulevard bridge. The ground surface varies from el 0 on the west side to el -9 on the east. A descriptive plan and elevation view of the barge are shown on Enclosure 12.

Anchored sheetpile walls will be installed along the west and east side of the barge site for installation of the barge. This sheetpile system will be designed by others. An excavation will then be made to el -18. At that time, a 2-ft thick crushed stone bed will be placed as a leveling bed.

The barge structure will be 126.67 feet long by 110.67 feet wide and will be 7 feet high. Wingwalls will extend 20.5 feet above the top side of the barge section. The barge structure will be constructed of lightweight concrete panels and will displace approximately 5.25 feet of water without any ballast. The barge will be floated into place and slowly flooded and sunk to bear on the crushed stone pad at el -16.

After installation, the east and west sheetpile walls will be left in place and used to provide seepage cutoff along the east and west edges of the barge. High density cement grout will be placed between the sheetpiles and barge hull to block off potential seepage coming up from the crushed stone pad beneath the barge. Flood protection walls will tie directly into the wingwalls of the barge.

I-Walls Analyses. Analyses of an I-wall applicable to the south bank of the discharge canal east of Destrehan Avenue Bridge is presented on Enclosure 7. This analysis assumes a 1 vertical to 3.5 horizontal slope (or flatter) exists on the flood side of the wall from el 4.

An additional I-wall analysis was performed for the I-wall near the entrance and exit areas of the flume. For this analysis, the ground surface elevation on the flood side of the wall was assumed to be at el -9. This I-wall analysis is shown on Enclosure 8. Two design cases were analyzed. The first case assumes high water flood conditions and the second case assumes short term and long term low water conditions. The results of the analyses indicate flood conditions govern the design of the wall.

Diversion Wall Analyses. The diversion wall is intended to be an anchored wall. A summary of our analyses for this structure is presented on Enclosure 9. The analyses assume the ground surface on the protected and flood sides are el -11 and -9, respectively, and the static storm water level at el 9.5. The low water level on the protected side was assumed at el -1. These analyses assume a horizontal anchor on the wall at el 10.5. The anchor reaction will be provided by batter piles. The analyses indicate the wall bottom elevation should penetrate to at least el -52. Maximum anchor force, moment, and scaled deflection are also given on Enclosure 9.

The diversion anchor wall must be supported by a horizontal reaction from the battered anchor piles. During loading, the battered anchor piles will be subjected to compressive horizontal and vertical components. The anchored wall must provide adequate uplift capacity to balance the vertical component in the battered anchor pile system. Assuming the wall is a PA 36-18 section, we have calculated the allowable vertical uplift capacity for the diversion wall. Results of the analyses are presented on Enclosure 10. A factor of safety of 2 is incorporated into the analyses to provide the allowable uplift loads.

We have also developed allowable pile load capacities for 14 and 16-in. square, precast prestressed concrete piles that may be used as batter piles for support of the wall. Results of the analyses are presented on Enclosure 11. Axial capacity above el -35 has been ignored and a factor of safety of 2 has been incorporated into the analyses to provide the allowable compressive loads. Our analyses assume a batter of 3 vertical to 1 horizontal or less (i.e., 2 vertical to 1 horizontal). The allowable compressive loads presented are for vertical piles. Axial and horizontal resistance of batter piles can be determined following Figure 25 of our referenced report.

Flume Barge Analyses. Once the barge is flooded, we understand the anticipated bearing pressure at the base of the flume barge will vary between 155 and 175 psf. The ultimate bearing capacity of foundation soils is estimated to be 1,200 psf. Therefore, the factor of safety against a bearing failure is above acceptable limits. Assuming a sustained bearing pressure of 175 psf, we estimate the barge will experience long term settlement of approximately 1 to 1.5 inches due to consolidation of underlying clay strata.

Crushed stone used to construct the pad should also be used as backfill along the north and south ends of the barge to promote good hydraulic connection with the barge bottom. The crushed stone should have a minimum apparent specific gravity of at least 2.71. A suitable gradation for the crushed stone bedding is as follows. Other gradations may be acceptable but should be reviewed by Eustis Engineering.

U.S. SIEVE	PERCENT PASSING
1.5-In.	95 to 100
0.75-In.	40 to 85
No. 4	0 - 15

The sheetpile walls on the east and west side will be designed by others for construction. However, permanent control of underseepage and piping is a design consideration for these sheetpiles. Using the Harr method of analysis, our analyses indicate the sheets should penetrate to at least el -32 to provide a desirable factor of safety of 4 against piping.

High density grout will be placed between the barge and the east and west sheetpile walls. The grout will provide a seal against water leakage during storm conditions. The grout column must be designed to withstand a water pressure head of 12.5 feet of water which is 780 psf. The total weight of the grout column should exceed 1.5 times 780 psf per foot of area. In addition, the grout should be a non-shrink grout.

West Jefferson
Engineering Services

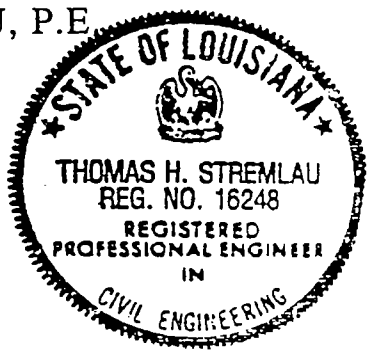
10 February 1998

If you have any questions regarding the enclosed information, please do not hesitate to contact us.

Yours very truly,

EUSTIS ENGINEERING COMPANY, INC.

THOMAS H. STREMLAU, P.E.



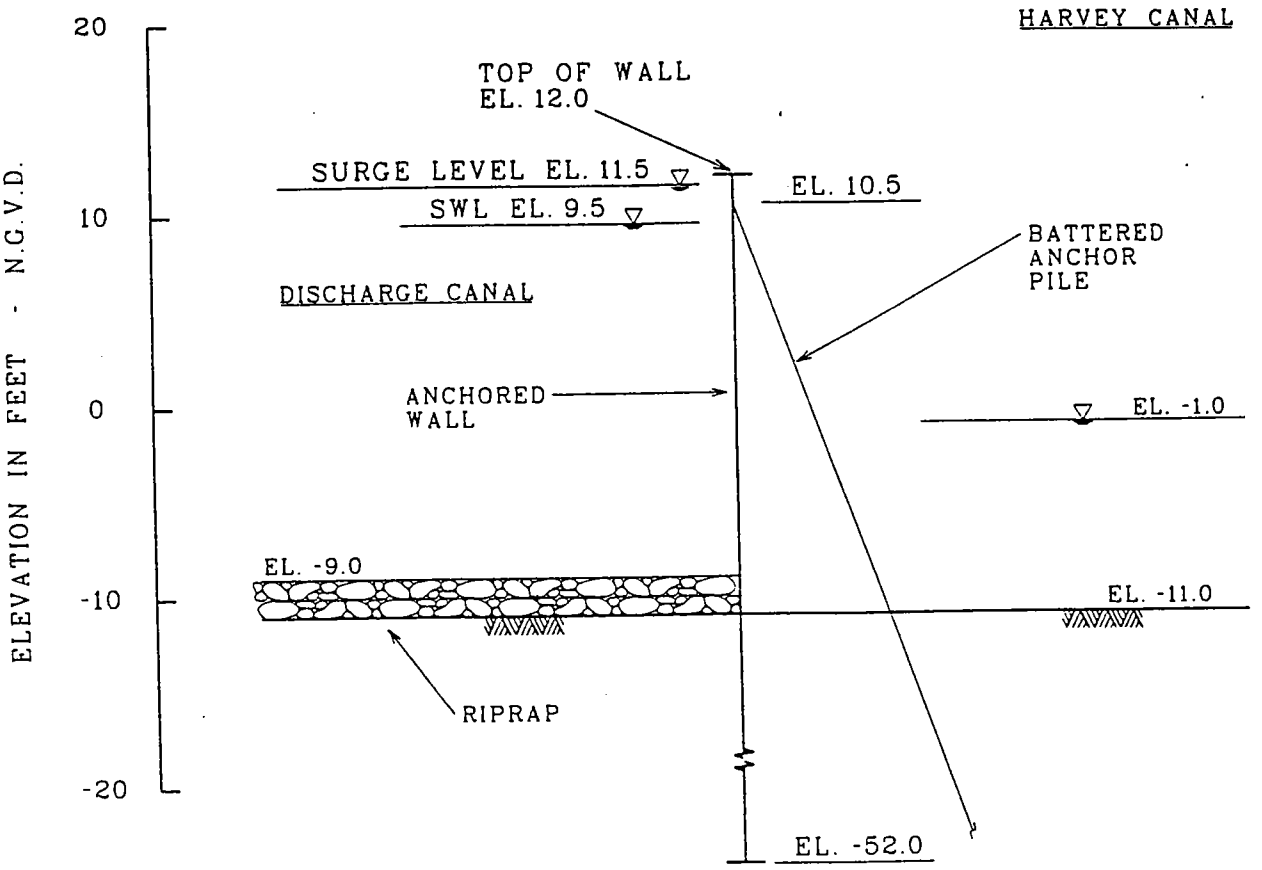
THS:aln/mcp

Enclosures 1 through 12
Appendix (Computer Output)

Copy to:
Design Engineering, Inc.
3330 West Esplanade Avenue
Metairie, Louisiana 70002
Attention Mr. John Holtgreve

Burk-Kleinpeter, Inc.
4176 Canal Street
New Orleans, Louisiana 70119-5994
Attention Mr. Jens Nielsen, Jr.

EE 14149



DESIGN SUMMARY

FACTOR OF SAFETY	MAXIMUM MOMENT FT-KIPS	WALL BOTTOM ELEVATION NGVD	MAXIMUM SCALED DEFLECTION LB-IN^3 x10^{10}	HORIZONTAL ANCHOR FORCE KIPS/FT OF WALL	FLOOD SIDE WATER ELEVATION NGVD	PROTECTED SIDE WATER ELEVATION NGVD
1.5	127.2	-52.0	7.45 @ EL. -17.0	9.6	+9.5	-1.0
1.0	123.0	-42.0	5.2 @ EL. -13.0	10.6	+11.5	-1.0

1) ANCHOR LOADS AND MAXIMUM MOMENTS SHOULD BE CONSIDERED UNFACTORED. THE STRUCTURAL ENGINEER SHOULD USE A SUITABLE FACTOR OF SAFETY WHEN SIZING THE COMPONENTS.

2) DIVIDE SCALED DEFLECTION BY MODULUS OF ELASTICITY IN PSI TIMES PILE MOMENT OF INERTIA IN INCHES TO THE 4TH POWER TO OBTAIN DEFLECTION IN INCHES.

3) SOIL PARAMETERS ARE TAKEN FROM B-3 OF EUSTIS ENGINEERING COMPANY, INC. REPORT DATED OCTOBER 7 1997.

4) USING THE HARR METHOD OF ANALYSIS. THE FACTOR OF SAFETY AGAINST PIPING IS LEAST 7 OR MORE.

5) SEE COMPUTER OUTPUT ANALYSIS IN APPENDIX.

ANCHOR SHEETPILE DIVERSION WALL

WEST JEFFERSON LEVEE DISTRICT
COUSINS PUMP STATION TO FIRST AVENUE CANAL
HARVEY, LOUISIANA

WEST JEFFERSON LEVEE DISTRICT
COUSINS PUMP STATION TO FIRST AVENUE CANAL
HARVEY, LOUISIANA

ALLOWABLE VERTICAL UPLIFT CAPACITY
DIVERSION WALL SHEETPILES

WALL SECTION	SHEETPILE TIP EMBEDMENT ELEVATION (NGVD)	ESTIMATED ALLOWABLE UPLIFT CAPACITY IN TONS/FT OF WELL FACTOR OF SAFETY ≈ 2
PA 36-18	-52	6.5
	-62	8.5
	-73	14
	-78	17
	-86	24

NOTES:
1) Used Boring 3 soil parameters from Eustis Engineering's report dated 7 October 1997.

2) Mudline is assumed to be at el -11.

WEST JEFFERSON LEVEE DISTRICT
COUSINS PUMP STATION TO FIRST AVENUE CANAL
HARVEY, LOUISIANA

ALLOWABLE PILE LOAD CAPACITIES
ANCHOR PILES FOR DIVERSION WALL

PILE DESCRIPTION	PILE TIP EMBEDMENT ELEVATION (NGVD)	ESTIMATED ALLOWABLE SINGLE PILE COMPRESSION LOAD CAPACITY IN TONS FACTOR OF SAFETY ≈ 2
14-In. Square, Precast Prestressed Concrete	-62 -73 -78 -83	19* 37* 54* 66*
16-In. Square, Precast Prestressed Concrete	-62 -73 -78 -83	22* 43* 64* 79*

NOTES:
1) Used Boring 3 soil parameters from Eustis Engineering's report dated 7 October 1997.
2) Mudline is assumed to be at el -11.
3) Axial capacity above el -35 has been ignored.
4) The above allowable pile capacities are for vertical piles. Axial and horizontal resistance of batter piles can be determined following Figure 25 of Eustis Engineering's 7 October 1997 report.

VALUE ENGINEERING RECOMMENDATION #10

PROJECT: COUSINS PUMPING STATION COMPLEX

LOCATION: JEFFERSON PARISH, LOUISIANA

STUDY DATE: December 14 - 18, 1998

DEVELOPED BY: Frank Vicidomina

IDENTIFICATION NUMBER: 10

FUNCTION OF COMPONENT BEING CHANGED: Back up Power

DESCRIPTIVE TITLE OF RECOMMENDATION: Add Additional Generator; Use All Electric Vacuum Pumps

ORIGINAL DESIGN:

Tie into existing 400 kw generator which would service the entire 5,000 cfs facility.

RECOMMENDED CHANGE:

Add one additional generator (400 kw) for redundancy. Use two electric vacuum pumps in lieu of one electric and one diesel driven unit.

SUMMARY OF COST ANALYSIS			
	First Cost	O & M Costs (Present Worth)	Total LC Cost (Present Worth)
ORIGINAL DESIGN	-0-	-0-	-0-
RECOMMENDED DESIGN	$228,000	-0-	$228,000
ESTIMATED SAVINGS OR (COST)	($228,000)	-0-	($228,000)

VALUE ENGINEERING RECOMMENDATION #10

ADVANTAGES:

- Adds significant reliability to overall station (virtually 100%)
- Enables use of all electric vacuum pumps

DISADVANTAGES:

- Slight increase to project cost.

JUSTIFICATION:

There is a strong correlation between major storm events and electric service disruptions. The performance of the backup operators are critical to pump operation (cooling system and other systems). These two items would appear to dictate that some redundancy is warranted in the backup power system. Under the current design, the loss of one 400 kw would either result in the loss of total facility capacity. A relatively small added investment would provide a redundancy that appears to be warranted. Additionally, this redundancy would permit use of all electric systems. This would allow use of two electric vacuum pumps in lieu of one electric and one diesel which is both slightly cheaper and allows better normal operation.

VALUE ENGINEERING RECOMMENDATION #10

COST ESTIMATE - FIRST COST

Cost Item	Units	Unit Cost		Original Design		Recommended Design	
		$/Unit	Sou-rce Code	Num of Units	Total $	Num of Units	Total $
400 kw Generator		$175,000		7		1	$175,000
Switchgear		$25,000		7		1	$25,000
Electric Driven Vacuum Pump		$40,000		7		1	$40,000
Diesel Driven Vacuum Pump		$50,000		1	$50,000		
Added First Cost = $190,000							
with Contingency (20%) = $228,000							

SOURCE CODE:
1 Project Cost Estimate
2 CES Data Base
3 CACES Data Base
4 Means Estimating Manual
5 Richardson's
6 Vendor Lit or Quote (list name / details)
7 Professional Experience (List job if applicable)
8 Other Sources (specify)

THIS WILL BE A COST ADD

VALUE ENGINEERING RECOMMENDATION #11

PROJECT: COUSINS PUMPING STATION COMPLEX

LOCATION: JEFFERSON PARISH, LOUISIANA

STUDY DATE: December 14 - 18, 1998

DEVELOPED BY: Frank Vicidomina

IDENTIFICATION NUMBER: 11

FUNCTION OF COMPONENT BEING CHANGED: Control Operation

DESCRIPTIVE TITLE OF RECOMMENDATION: Install Two Control Rooms in lieu of One Centralized Unit

ORIGINAL DESIGN:

Use one centralized control room to operate entire facility (three stations).

RECOMMENDED CHANGE:

Use two control rooms (one in south 2,000 cfs building to operate south 2,000 and center 1,000 cfs stations and one room to control proposed (north) 2,000 cfs station).

SUMMARY OF COST ANALYSIS			
	First Cost	O & M Costs (Present Worth)	Total LC Cost (Present Worth)
ORIGINAL DESIGN	$221,000	-0-	$221,000
RECOMMENDED DESIGN	$298,000	-0-	$298,000
ESTIMATED SAVINGS OR (COST)	($77,000)	-0-	($77,000)

VALUE ENGINEERING RECOMMENDATION #11

ADVANTAGES:

- Enables significantly better overall operation control of facility.

DISADVANTAGES:

- Slight cost increase

JUSTIFICATION:

Operations staff appeared to vehemently oppose the concept of operating the south facility from a very remote location; i.e., the proposed central control room in the proposed north station. They firmly believe that frequent physical inspection of the running units is necessary. A better approach would appear to be two control rooms, one in the south station where both the station and the center 1,000 cfs station would share a control room. The proposed 2,000 cfs north station would have its own control room. The proposed change would require two operators. The current design, however, would also require a second operator to physically monitor the south and center stations while the other operator mans the controls in the north station.

VALUE ENGINEERING RECOMMENDATION #11

COST ESTIMATE - FIRST COST

Cost Item	Units	Unit Cost		Original Design		Recommended Design	
		$/Unit	Source Code	Num of Units	Total $	Num of Units	Total $
Single Control Room	SF	$40	1	4600	$184,000		
Two Control Rooms	SF	$40	1			6,200	$248,000
First Cost Difference							$64,000
							added cost
With Contingency (20%)							$77,000

SOURCE CODE: 1 Project Cost Estimate 4 Means Estimating Manual 7 Professional Experience
2 CES Data Base 5 Richardson's (List job if applicable)
3 CACES Data Base 6 Vendor Lit or Quote (list name / details) 8 Other Sources (specify)

VALUE ENGINEERING RECOMMENDATION#12

PROJECT: COUSINS PUMPING STATION COMPLEX

LOCATION: JEFFERSON PARISH, LOUISIANA

STUDY DATE: December 14 - 18, 1998

DEVELOPED BY: Frank Vicidomina

IDENTIFICATION NUMBER: 12

FUNCTION OF COMPONENT BEING CHANGED: Provide Tidal Surge Barrier

DESCRIPTIVE TITLE OF RECOMMENDATION: Use Cell Wall Discharge Channel

ORIGINAL DESIGN:

The discharge channel outer barrier wall consists of dual 84-inch diameter concrete pile piling and one row of steel sheet piling.

RECOMMENDED CHANGE:

Construct a discharge channel outer barrier wall using sheet pile - earthen fill cells.

SUMMARY OF COST ANALYSIS			
	First Cost	O & M Costs (Present Worth)	Total LC Cost (Present Worth)
ORIGINAL DESIGN	$5,544,000	-0-	$5,544,000
RECOMMENDED DESIGN	$1,888,000	-0-	$1,888,000
ESTIMATED SAVINGS OR (COST)	$3,656,000	-0-	$3,656,000

ADVANTAGES:

- Provides a better impact barrier (less change of containment failure if hit)
- Provides a better flood barrier regardless of impact (2 rows locked sheet piling with 20 feet of earthen fill)
- Provides disposal location for a portion of dredge fill
- Much easier construction (plumb installation of 84-inch piles is not likely)
- Much easier repair if impact damaged disadvantages

DISADVANTAGES:

- Stability of this design must be evaluated.

JUSTIFICATION:

Filled cell walls are a much more commonly constructed structure than the proposed large diameter pipe - pile wall. This design appears to be significantly easier to construct and repair if and when necessary. The cell wall also appears to be a better water barrier as compared to the existing design given two rows if locked sheet piling plus ten feet of fill versus one row if locked sheet piling with 84-inch piling that will have significant gaps.

CALCULATIONS

IDENTIFICATION NUMBER: 12

Quantities of Recommended Design:

Sheet Piling = 50 x 90 = 4,500 sf per 10 lf
or 450 sf/lf

Fill = 52 x 12 ÷ 27 = 23.1 cy/lf

Fabric = 82 sf/lf

Totals / 460 LF:

Fabric = 460 x 82 = 37,720 sf
(4,400 sy)

Sheet Piling = 460 x 450 = 208,000 sf

Fill = 460 x 23.1 = 10,800 cy

VALUE ENGINEERING RECOMMENDATION #12

COST ESTIMATE - FIRST COST

Cost Item	Units	Unit Cost		Original Design		Recommended Design	
		$/Unit	Source Code	Num of Units	Total $	Num of Units	Total $
Sheet Piling	sf	$15	1	16,416	$246,000	208,000	$3,120,000
Concrete Cap	cy	$375	1	1,216	$456,000	-	-
84-inch Piling	lf	$250	1	15,600	$3,900,000	-	-
Filter Fabric	sy	$3.00	1	-	-	4,400	$13,000
Excavation/Disposal	cy	$6.50	1	10,800	$70,000	-	-
Excavation/Fill	cy	$2.50	1	-	-	10,800	$27,000
Total					$4,672,000		$3,160,000
Savings = 1,512,000							
with Contingency (20%) = 1,814,000							

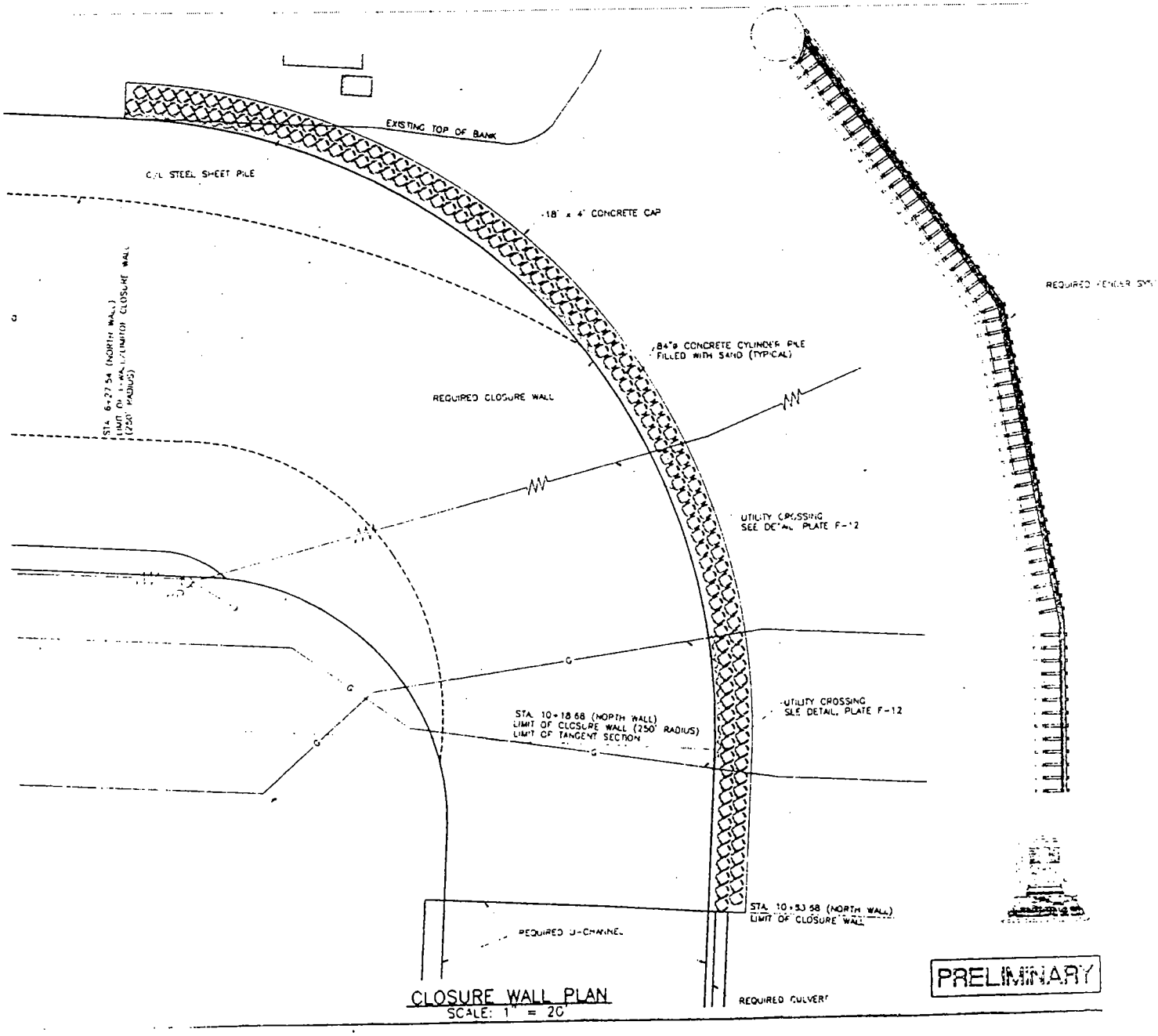
SOURCE CODE:
1 Project Cost Estimate
2 CES Data Base
3 CACES Data Base
4 Means Estimating Manual
5 Richardson's
6 Vendor Lit or Quote (list name / details)
7 Professional Experience (List job if applicable)
8 Other Sources (specify)

VALUE ENGINEERING RECOMMENDATION

FORM: 20 DEC 1966

SKETCH OF ORIGINAL DESIGN

IDENTIFICATION NUMBER: 12



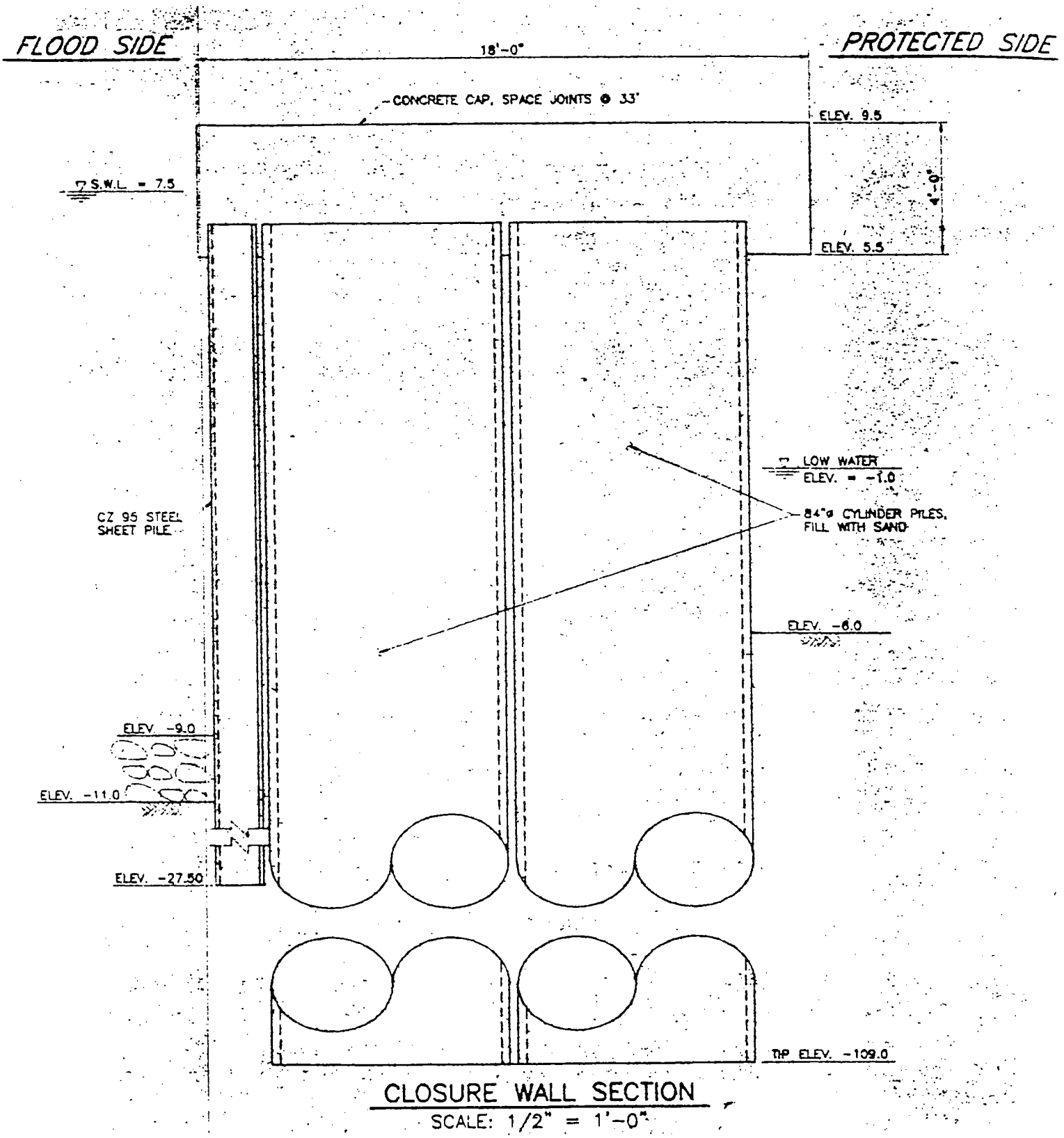
CLOSURE WALL PLAN
SCALE: 1" = 20'

VALUE ENGINEERING RECOMMENDATION

FORM: 20 DEC 1966

SKETCH OF ORIGINAL DESIGN

IDENTIFICATION NUMBER: 12



CLOSURE WALL SECTION

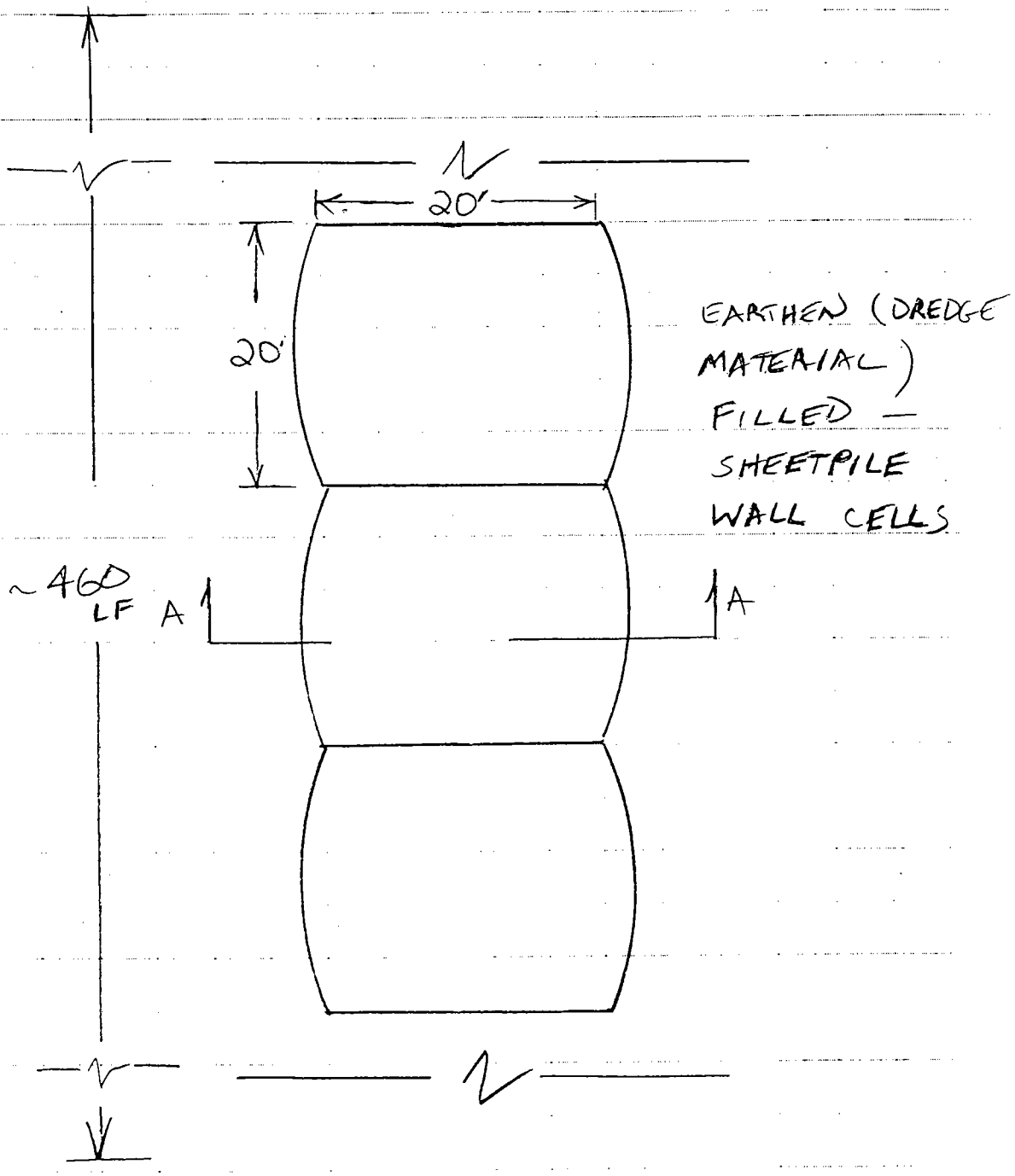
SCALE: 1/2" = 1'-0"

VALUE ENGINEERING RECOMMENDATION

FORM: 20 DEC 1966

SKETCH OF RECOMMENDED DESIGN

IDENTIFICATION NUMBER: 12

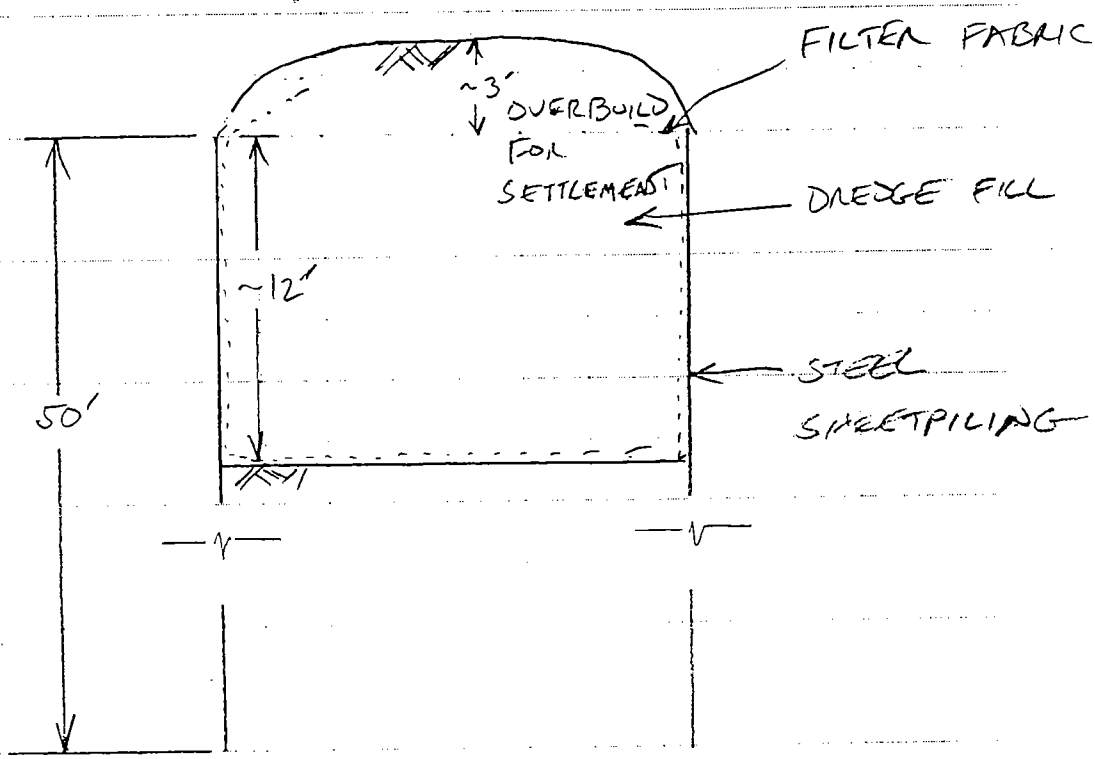


VALUE ENGINEERING RECOMMENDATION

SKETCH OF RECOMMENDED DESIGN

FORM: 20 DEC 1966

IDENTIFICATION NUMBER: 12



A - A

VALUE ENGINEERING RECOMMENDATION #13

PROJECT: COUSINS PUMPING STATION COMPLEX

LOCATION: JEFFERSON PARISH, LOUISIANA

STUDY DATE: December 14 - 18, 1998

DEVELOPED BY: Frank Vicidomina

IDENTIFICATION NUMBER: 13

FUNCTION OF COMPONENT BEING CHANGED: Self-Cleaning Screens

DESCRIPTIVE TITLE OF RECOMMENDATION: Use Catenary in lieu of Climber Type Bar Screens

ORIGINAL DESIGN:

Current design calls for two 30 foot wide climber screen units.

RECOMMENDED CHANGE:

Use catenary type units.

SUMMARY OF COST ANALYSIS			
	First Cost	O & M Costs (Present Worth)	Total LC Cost (Present Worth)
ORIGINAL DESIGN	$1,080,000	-0-	$1,080,000
RECOMMENDED DESIGN	$720,000	$108,000	$828,000
ESTIMATED SAVINGS OR (COST)	$360,000	($108,000)	$252,000

VALUE ENGINEERING RECOMMENDATION #13

ADVANTAGES:

- Uniformity, consistent construction and operational procedures with other two stations.

DISADVANTAGES:

- Higher operating cost (requires at least one additional crew member for the entire facility operation).
- Less reliable than climber type system.

JUSTIFICATION:

There is a significant first cost difference between the climber and catenary type bar screen cleaning units. This cost difference is offset by a lower manpower requirement for the operation of the climbers and the increased reliability the premium climber units offer. Since the existing two stations have catenary units, a full screen operations crew will be on site anyway. Only one additional man would be required if catenary units are installed in the new north station. This limited increase in operation cost would not appear to warrant use of the significantly more expensive climber units although some degree of improved reliability would also be lost.

VALUE ENGINEERING RECOMMENDATION #13

CALCULATIONS

IDENTIFICATION NUMBER: 13

Present worth of additional operator

~ 50 events/year X 8 hours/shift avg.
X $20/hour X 13.5 pwf = $108,000

VALUE ENGINEERING RECOMMENDATION #13

FORM: 23 MARCH 1998

COST ESTIMATE - FIRST COST

Cost Item	Units	Unit Cost		Original Design		Recommended Design	
		$/Unit	Sou-rce Code	Num of Units	Total $	Num of Units	Total $
Climber Screen Units	ea.	$450,000	1	2	$900,000		
Catenary Screen Units	ea.	$300,000	7			2	$600,000
Savings = $300,000							
with Contingency (20%) = $360,000							

SOURCE CODE:
1 Project Cost Estimate
2 CES Data Base
3 CACES Data Base
4 Means Estimating Manual
5 Richardson's
6 Vendor Lit or Quote (list name / details)
7 Professional Experience (List job if applicable)
8 Other Sources (specify)

VALUE ENGINEERING RECOMMENDATION #14

PROJECT: COUSINS PUMPING STATION COMPLEX

LOCATION: JEFFERSON PARISH, LOUISIANA

STUDY DATE: December 14 - 18, 1998

DEVELOPED BY: Frank Vicidomina

IDENTIFICATION NUMBER: 14

FUNCTION OF COMPONENT BEING CHANGED:

DESCRIPTIVE TITLE OF RECOMMENDATION: Eliminates outside crane

ORIGINAL DESIGN:

Install fixed unit 25 ton crane

RECOMMENDED CHANGE:

Eliminate fixed installation; rent a mobile crane as needed

SUMMARY OF COST ANALYSIS			
	First Cost	O & M Costs (Present Worth)	Total LC Cost (Present Worth)
ORIGINAL DESIGN	$105,000	$29,000	$134,000
RECOMMENDED DESIGN	-0-	$25,000	$25,000
ESTIMATED SAVINGS OR (COST)	$105,000	-0-	$109,000
WITH MARKUPS (20%)			$130,000

ADVANTAGES:

- Eliminates first cost and O & M of crane.

DISADVANTAGES:

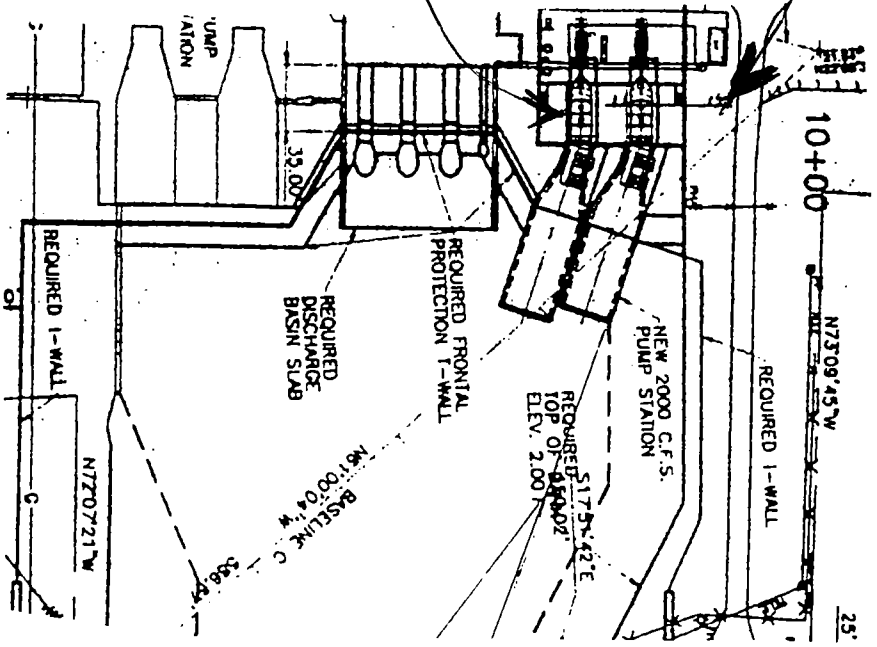
- Requires crane rental as needed.
- Loss of convenience of an on-site unit.

JUSTIFICATION:

For most pump station installations, it is very difficult (almost impossible at some locations) to access outside equipment with a mobile crane. This will not be the case with this station since it is relatively narrow (only two pumps) and will be relatively accessible. The loss of convenience of an on-site unit does not appear to warrant the extra cost since use of this crane would likely be only part of a major maintenance operation that would be planned in advance.

FIXED CRANE LOCATION (CURRENT PLAN)

MOBILE CRANE ACCESS (PROPOSED CHANGE)



Assume: Crane rental needed for unforseen repairs one (1) week every ten years, and, rental needed for major maintenance work twelve (12) weeks every twenty-five (25) years; also, assume fixed unit O & M @ 2% of first cost annually.

(Fixed Unit)

Present worth of O & M (7%I)

= .02 ($105,000) (13.8) = $29,000

(P/A, 7%, 50 yrs.)

(Rentals)

Crane rental @ $6,000/week

Year	Cost		Present Worth Factor		PW
10	$6,000	X	0.57	=	$3,000
20	$6,000	X	0.26	=	$2,000
25	$72,000	X	0.18	=	$13,000
30	$6,000	X	0.13	=	$1,000
40	$6,000	X	0.07	=	<$500
50	$72,000	X	0.07	=	$5,000
50	$6,000	X	0.07	=	<$500

VALUE ENGINEERING RECOMMENDATION #14

COST ESTIMATE - FIRST COST

Cost Item	Units	Unit Cost		Original Design		Recommended Design	
		$/Unit	Source Code	Num of Units	Total $	Num of Units	Total $
Fixed crane	ea.	$105,000		1	$105,000		
O&M Present Worth					$29,000		
SUBTOTAL					$134,000		
Crane rental							
1 week every 10 years (Present Worth)							$7,000
12 weeks every 25 years (Present Worth)							$18,000
SUBTOTAL							$25,000
NET SAVINGS							$109,000
MARK-UPS - 20%							$21,000
TOTAL SAVINGS							$130,000

SOURCE CODE: 1 Project Cost Estimate 4 Means Estimating Manual 7 Professional Experience
2 CES Data Base 5 Richardson's (List job if applicable)
3 CACES Data Base 6 Vendor Lit or Quote (list name / details) 8 Other Sources (specify)

SECTION 4 - DESIGN SUGGESTIONS and COMMENTS

Design Suggestions and Comments are presented in this section.

Design Suggestions are ideas that were, in the opinion of the team, good ideas, but were, for any of several reasons, not selected for development and writeup as a formal recommendation. Design Suggestions, by definition, have not been developed (proven) through team development and writeups. The team presents these ideas for further consideration by the owner and designer.

Design Comments are notes to the designer. These notes document various thoughts that come up during the course of the study. Some refer to possible problems. Some are suggested items that might need further study. Some are questions that the designer might want to explore. Many of these comments will most likely be things of which the designer is already aware. Because the study is done on a design in progress, there is never any way of knowing for sure the designer's intent. The comments are presented, in any event, with the thought that there might be a few comments that aid the designer in some way.

DESIGN COMMENTS

1. Provide Safety Feature for Fuel Supply - The current design does not include a sprinkler system or any other type of fire suppression system. The study recommends a timer for the fuel transfer pump. This timer will limit the operation time of the fuel transfer pump. Hence, should there be a leak in the fuel system, this timer would prevent the entire fuel supply (60,000 gallons) from being pumped into any of the stations.

2. Incorporate UPS in Relay Logic - A UPS system is placed in the design to provide relay power in the event of loss of AC power. If AC power is momentarily lost, it deactivates critical relays which affect pump operation. A UPS is provided to time delay, this loss of relay power. This relay logic is to prevent this occurrence.

3. Add driver Motors to Proposed (3) Butterfly Valves (Old Station) - The project calls for the additions of three butterfly valves (for storm surge protection with pumps off) on the over wall discharge extension of the old (center) station. Parish staff have indicated that the manual operation of these valves is both difficult and time consuming. Such time loss (reported as 45 minutes) could be critical in the operation effectiveness of the station. The addition of driver motors would significantly improve operability.

4. Consider Swing or overhead Track Flood Gates (in lieu of Roller) - The current design calls for bottom roller/track flood gates across both ends of Destrehan Avenue where it intersects the flood protection line. While these types of gates may be slightly cheaper than other options, operation and maintenance issues should be considered. Pulling equipment is necessary to close these gates while swing or overhead track can be manually closed by a three-man crew. While all gates require maintenance, wheel rusting and bottom track damage can be nuisance problems with the current design selection. These factors should be reaffirmed with the West Jefferson Levee District.

5. Revisit Screen Design - The current design calls for two 30 foot wide climber type trash screens and a 72 foot (+1-) wide suction approach bay. There appears to be two possible deficiencies. First is that local experience indicates that the practical maximum width for the alignment control problem that will significantly affect operation. The second item of concern is that given a design suction water depth of about 11 feet, approach velocity significantly exceeds the 2 feet per second maximum criteria. Given the above, it appears that an additional screen bay and approach basin widening may be needed.

APPENDICES

The appendices in this report contain backup information supporting the body of the report, and the mechanics of the workshop. The following appendices are included:

CONTENTS

APPENDIX A .
Participants

Appendix A documents those persons who participated in the workshop by name, organization and telephone number. Also included is a listing of team members and the attendance sheets.

Workshop Attendance

Attendees				Participation							
				Meetings			Study Sessions				
Name	Organization and Address	Telephone number and FAX	Role in wk shop	Intro	Mid Wk Rev	Out Brief	Day 1	Day 2	Day 3	Day 4	Day 5
Catherine Correro Admin Assistant	Walk Haydel & Assoc. 600 Carondelet Street New Orleans, LA 70130	(504)586-8111 Fax - 599-5003	Technical Recorder					x	x	x	
Walter Frey, Jr. Structural Engineer	Walk Haydel & Assoc. 600 Carondelet Street New Orleans, LA 70130	(504) 586-8111 Fax - 599-5003	Team Member	x			x	x	x	x	
Walter Frey, Sr. Senior Structural Engineer.	Walk Haydel & Assoc. 600 Carondelet Street New Orleans, LA 70130	(504) 586-8111 Fax - 599-5003	Team Member	x			x	x	x	x	
Michael Ruck Senior Structural Engineer.	Walk, Haydel & Assoc. 600 Carondelet Street New Orleans, LA 70130	(504) 586-8111 Fax - 595-6322	Team Member	x			x	x	x	x	
Windle Sholar Estimator	Walk, Haydel & Assoc. 600 Carondelet Street New Orleans, LA 70130	(504) 586-8111 Fax - 599-5088	Estimator						x	x	
Frank Vicidomina Value Engineering Officer/ Civil Engineer	Corps of Engineers U.S. Army Engineer District, New Orleans Foot of Prytania Street at Leake Avenue New Orleans, LA 70118	(504) 862-1251 Fax - 862-1785	Team Member	x			x		x	x	
Joe Waits Value Engineering Team Leader	Dames & Moore Mobile, AL		VE Leader	x			x	x	x	x	

Attendees Role in this workshop (column 4 of the form). Use more than one description if appropriate.

C = Consultant D = Designer DM = Design Manager
FM = Facility Manager FO = Facility Operator Ob = Observer
Ow = Owner PM = Project Manager PrM = Program Manager TM = Team Member U = User

APPENDIX B
List of Study Materials

BIBLIOGRAPHY OF STUDY MATERIALS

Design Memorandum No. 3 (3-ring hard cover binder)
Cousins Pumping Station Complex, 75% Completion Submittal, Volume II
Department of the Army, New Orleans District, Corps of Engineers,
New Orleans, Louisiana, April 1998

Design Memorandum No. 3 (bound - no cover)
Cousins Pumping Station Complex, 95% Completion Submittal, Volume I
Department of the Army, New Orleans District, Corps of Engineers,
New Orleans, Louisiana, September 1998
includes 47 blue line drawings (11 x 17)

Xerox Drawings (11 x 17) (1 color cover sheet - 11 black & white)
West Jefferson Engineering Services - A Joint Venture
East of Harvey Canal Hurricane Protection
W. J. L. D. Sector Gate Site and Alignment

APPENDIX C
Analysis

Functions:

(Basic function is to remove water)

WHY

maintain lifestyle

prevent damage

prevent flooding

remove water

lift water

a) redirect flow

b) nonstructural

c) change elevation

d) relocate station

HOW

pump water

collect water

screen water -- remove debris

feed pump

create vacuum

discharge water

dispose water

FUNCTION ANALYSIS

	VERB	NOUN	COST	WORTH	C/W
PUMP STATION	lift	water	15.0	13.5	1.11
BRIDGE EXT.	widen improve maintain	canal hydraulic traffic	1.1	.5	2.2
CANALS/ CHANNELS	channel	water	3.4	3.0	1.13
FLOOD WALLS	contain	water	2.2	2.2	1.0
CULVERT	contain	water	2.5	.5	5:0
CLOSURE WALL	contain	water	5.5	2.75	2.0

Cost: Estimates cost of the item, per the project cost estimate.

Worth: Lowest cost the team believes is possible for the item.

C/W: Value index. Cost divided by worth. Higher numbers indicate potential areas for value improvement.

The high cost areas selected for team emphasis are:

1. Bridge extension
2. Culvert
3. Closure Wall

CREATIVE IDEA LIST

PUMPING STATION

1. Move station south of gate
2. Line up screens
3. Eliminate bridge cranes
4. Attach day tanks to wall

BRIDGES

5. Do not widen channel

CANALS/CHANNELS

6. Eliminate some rip-rap

FLOOD WALLS

none

CULVERT

7. Use sheet pile with tie-backs
8. Relocate channel one bay west

CLOSURE WALL

9. Use lighter construction

GENERAL

10. Add generator / Use vacuum pumps
11. Install two control rooms in lieu of one
12. Use cell walls for discharge channel
13. Use Catenary screens

As a result of the analysis phase of the value engineering study, the team determined the following disposition of ideas from the creative phase.

Disposition of Ideas

Number	Title	Disposition
1.	Move station south of gate	Discontinue development
2.	Line up screen	Discontinue development
3.	Eliminate bridge cranes	Design Comment
4.	Attach day tanks to wall	Design Comment
5.	Do not widen channel	Develop
6.	Eliminate some rip-rap	Develop
7.	Use sheet pile with tie-backs	Develop
8.	Relocate channel one bay west	Develop
9.	Use lighter construction	Develop
10.	Add generator / Use vacuum pumps	Develop
11.	Install two control rooms in lieu of one	Develop
12.	Use cell walls for discharge	Develop
13.	Use Catenary screens	Develop

APPENDIX D
Project Briefing/Presentation

VE STUDY BRIEFING
CORPS OF ENGINEERS
December 14, 1998

NAME	ORGANIZATION	TELEPHONE
Carl E. Anderson	Corps of Engineers Project Engineer SELA	(504) 862-2610
Pam Deloach	Corps of Engineers Project Engineer EOH	(504) 862-2621
Carolyn Earl	Corps of Engineers PPPMD	(504) 862-2773
Walter G. Frey, Jr.	Walk Haydel	(504) 599-5271
Al Pirsaleh	Jefferson Parish Pump Station	(504) 736-6730
Michael Ruck	Walk Haydel	(504) 595-6366
Randall Schexnayder	BCG	(504) 736-6780
Frank Vicidomina	Corps of Engineers VED	(504) 862-1251
Les Waguespack	Corps of Engineers PPPMD	(504) 862-2503
Joe Waits	Dames & Moore	(334) 666-5892

VE STUDY BRIEFING/SITE VISIT

The VE study project briefing was held on Monday, Dec. 15, 1998, in the Corps of Engineers District Office, New Orleans, Louisiana.

The meeting was opened by Mr. Frank Vicidomina, who introduced attendees and explained the VE process to be followed in the week long study.

A general discussion of project details ensued, with the questions of the VE team answered and project background explored.

Key Discussion Issues:

- Pumps are already purchased for the project.
- The "climber" type screen system is preferred because they are less labor intensive in cleanup of debris. The present type screens have a tendency to "jump" off of gears during operation. Also, debris has a tendency to accumulate adjacent to edge of collection basin, creating a maintenance problem.
- The present "cutters" are not a desired feature.
- The present project will add 2000 cfs to the existing 3000 cfs at Cousins Pumping Station.
- Roller gates and possible alternatives, such as overhead rolling gates, or swing gates were discussed.
- There is a gas line crossing to be relocated.
- Storage tanks will be relocated.

At the conclusion of the briefing, the VE team was taken on a tour of the project site.

APPENDIX E

Response to Recommendations

This appendix provides a place in the report to document the response to the recommendations. Included is a summary sheet of all recommendations. The summary sheet includes space to record responses from both the project owner and the project designer, along with the final decision as to implementation of the recommendation.

There is a code at the bottom of the summary sheet for use in recording the responses.

SUMMARY OF DECISIONS

Project: COUSINS PUMPING STATION COMPLEX
Location: JEFFERSON PARISH, LOUISIANA
Study Date: December 14 - 18, 1998

RECOMMENDATION		SAVINGS (or cost) of RECOMMENDATION (In Present Worth Amount Dollars)			BEST	DECISION		
Rec #	Recommendation Title / Description	resulting 1st cost savings (or cost)	O & M savings (or cost)	total LCC savings (or cost)	suggested best selec-tion or combin - ation	designer decision	owner decision	final decision
5	Do not Widen Channel	$305,610	-0-	$305,610				
6	Eliminate Rip-Rap	$157,320	-0-	$157,320				
7	Extend Sheet Piles and Eliminate Concrete Flume	$1,351,410	-0-	$1,351,410	X			
8	Relocate Discharge Canal Under Lapalco Bridge	$5,321,000	-0-	$5,321,000	X			

SAVINGS LEGEND
LCC = life cycle cost = 1st cost + all use-costs (O&M) over the life of the project.
LCC savings = 1st cost savings (or adds) + all O&M cost savings (or adds) over the life of the project.
Note: savings in parentheses "()" = negative savings = an added cost.

DECISION LEGEND
A = Accepted Recommendation as-is
AP = Accepted only a Part or Parts of Recommendation
AM = Accepted Recommendation with Modification
FS = Further Study Required
LD = Tabled Recommendation for Later Decision
R = Recommendation Rejected in total

SUMMARY OF DECISIONS

Project: COUSINS PUMPING STATION COMPLEX
Location: JEFFERSON PARISH, LOUISIANA
Study Date: December 14 - 18, 1998

RECOMMENDATION		SAVINGS (or cost) of RECOMMENDATION (In Present Worth Amount Dollars)			BEST	DECISION		
Rec #	Recommendation Title / Description	resulting 1st cost savings (or cost)	O & M savings (or cost)	total LCC savings (or cost)	suggested best selec-tion or combin - ation	designer decision	owner decision	final decision
9	Modify Design for Closure Wall	$4,468,968	-0-	$4,468,968				
10	Add Additional Generator; Use All Electrical Vacuum Pumps	($228,000)	-0-	($228,000)				
11	Install Two Control Rooms	($77,000)	-0-	($77,000)				
12	Use Cell Wall Discharge Channel	$3,656,000	-0-	$3,656,000				
13	Use Catenary in lieu of Climber Type Bar Screens	$360,000	($108,000)	$252,000				

END OF REPORT

This report was compiled by:
Joe Waits, PE, CVS
Dames & Moore
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