

FOR	NAME	THOSE LISTED	DATE	1-10-86
	ADDRESS		<input type="checkbox"/> Drafts	<input type="checkbox"/> M. S.
Fold here for return				
FROM	NAME	J.E. BRANCH	EXTENSION	6387
	ADDRESS	W3D 213 C-K	<input type="checkbox"/> Drafts	<input type="checkbox"/> M. S.

wmm
Please file
in notebook

KWB

KIF - HYDRATED LIME FEED SYSTEM

COST ESTIMATE - MEETING

F&HPR has requested OE provide a cost estimate for the subject modification. A meeting is scheduled for 9:30 am on January 13, 1986 in room W3A60 C-K to review the work scope and establish the schedule for completing the estimate.

Attached is a draft copy of the CER, work scope, organizational responsibilities, and forms for submitting cost estimate input. You and/or your representative are requested to attend the meeting.

R.G. Johnson, W3A8 C-K

R.E. Harris, W2D 220 C-K

W.A. Grobicki, W3D 223 C-K

cc: J.A. Benedict, W3D 216 C-K

TVA 450 (OS-9-80) INTEROFFICE MAILING SLIP

KWB } Please attend.
RWJ }

- ① JEB would like Est for materials & m-l by Friday 1-17-86
- ② there will be two lime trucks per week bringing lime to the silo
- ③

KWB's copy

TENNESSEE VALLEY AUTHORITY
OFFICE OF ENGINEERING
COST ESTIMATE REQUEST (CER)
No. FEP KIF 86-0101

TO: Those listed below
FROM: O.P.Thornton, W3D224 C-K
DATE:
PROJECT: KINGSTON STEAM PLANT

Feature: HYDRATED LIME FEED SYSTEM

Scope of Estimate: For scope of work, organizational responsibilities, and special instructions for providing estimate input see Attachments A, B, and C respectively.

Requested by: O.P.Thornton Date of Request: January 13, 1986

Reference Memo (if any): J.T.Thompson to O.P.Thornton dated November 19, 1985

Type of Estimate:	Order-of-Magnitude	_____	Detail	_____
(Check one. See	Preliminary	_____	Comparison	_____
Attachment 1 of OEP-03.)	Authorization	<u>X</u>	Other	_____

Dates:

Design:	Construction:
Start <u>2/86</u>	Start <u>4/86</u>
Complete <u>11/86</u>	Complete <u>11/86</u>

Project Coordinator: <u>J.E.BRANCH, W3D213 C-K</u>	Extension <u>6387</u>
Lead Project Engineer: <u>R.G. JOHNSON, W3A8 C-K</u>	Extension <u>2565</u>

Submit input data to J.E.BRANCH, W3D213 C-K by: JANUARY 17, 1986

Final estimate required from Division Services Staff by: JANUARY 29, 1986

Project Code: DAR (MISC CODE 032)

Account No. for OE personnel preparing estimate: 767-68-01,XXX-032

Activity No. for OE personnel preparing estimate: D-DAR-E032-13 EN 032

Project Control Technician: R.L. TUCKER Extension: 4719

Comments: Cost Estimate kickoff meeting scheduled for 9:30 am on January 13, 1986 in room W3A60 C-K. Please be represented.

Those listed:

- | | | |
|-------|-------|---------------------------|
| * | ** | |
| * | _____ | R.G. Johnson, W3A8 C-K |
| * | _____ | R.E. Harris, W2D220 C-K |
| * | _____ | W.A. Grobicki, W3D223 C-K |
| * | _____ | W.D. Hall, W12C62 E-K |
| _____ | _____ | |
| _____ | _____ | |

Attachments
cc (Attachments):
RIMS, SL26 C-K

*Estimate data required
**Information only; no input required

(M57 85 114 803)

F Hydrated lime system

SCOPE

smb 1-9-86

Purpose: The purpose of this system is to correct the pH of the out fall from the ash pond stilling pool to the Clinch River. This system is required to be operational by December 1, 1986.

Major Components: Hydrated lime feed system consisting of storage silo with dust collection, relief port, level indication (local and contacts for remote interface), self contained aeration system or vibrating system, manual isolation slide valve, and variable lime feeder; mixing tank including local level indication, hinged access lid, inlet nozzles for water intake and drain nozzles for slurry transport; lime slurry feed pumps controllable from pH controller/monitors, piping systems for lime slurry transport with a flushing arrangement; water feed pumps including all piping and provisions for flush water for total system flushing; control room enclosure to house all instrumentation including heating and ventilation as required, (enclosure is to be separate from silo and feed equipment to allow a dust free environment); safety equipment including a self contained eyewash station and fire extinguishers; pH controls and monitors (reading in the ash pond and at the stilling pool out fall).

System Requirements: This system is required to maintain the pH of the out fall from the stilling pond to a range of 6.0 to 8.0. Present pH is between 4.5 and 6.5. The system is to be automatic and have the capacity to feed lime at a rate of 5 tons/day and store at least a 7 day supply. Redundancies will be only in spare lime and water feed pumps. (Redundant pumps will start automatically and sound a local alarm). The system must have remote indication of lime level in the silo and pH leaving the stilling pond.

Cost Estimate Requirements: This is to be a +/- 10% estimate based upon a operable date of 1 Dec 86. Estimate is to include mh's and equipment cost as noted. This estimate is required by 17 Jan 86.

Responsibilities:

MEB (JWD) Provide system specifications for total major components, all contract administration and internal interfaces. Provide input for start up and testing document and participate in testing. Provide power and structural load requirements for this estimate. (Manhours, equipment cost, and delivery schedule)

MEB (WMP) Provide preparation of environmental regulatory review documents, construction permit requirement and schedule impact for this estimate. (Manhours)

Meeting Notes for KIF hydrated lime system Dec 24, 1985

SMBrown

Don Blind (MEB)
 Steve Brown (FEP-M)
 Bob Sneed (Plant Result Section)
 Nance Ogozalek (F&H Power Chatt.)

- 1) Estimate should be based on 5 ton/day lime consumption rate allowing for a 7 day storage.
- 2) No EPA involvement from Pearse's group
- 3) Purchasing already requested notice in CDB
- 4) No CSB work - All work will be done by Plant Personnel
- 5) Schedule (desired):
 - Earthwork and foundations (by Plant)... in April 86
 - Contract award...in March 86
 - Large Major equipment delivery...in July 86
 - In Service...by Sept 86
 - Lime delivery...in Sept/Oct 86
 - Start-up and testing...Nov 86
 - Operational...Dec. 1, 86 (This date is critical) *can be met*
- 6) Redundancy to include extra slurry and water feed pumps only
- 7) Control bldg to be adjacent to silo assembly to remove from dust
- 8) Flushing to be provided using Ash Pond water
- 9) Gravity feed for slurry if possible
- 10) System to be automatic requiring only a man to attend once a day
- 11) pH monitors to be (7084 Microprocess or pH Analyzer/Control)
 - requires two installed, one in center of stilling pond and one at the out fall. Each to be retrievable for maintenance and cleaning.
- 12) System will be used only during the winter months
- 13) Need cost estimate by mid-Jan
- 14) Concerns:
 - * physical size of area available (dike width approx. 40 ft)
 - * possibility of dike raising at a future date
 - * distance for gravity feed 400 ft to far
 - * dike soil support capabilities (special support considerations)
 - * adequate room for construction (ie cranes and heavy equipment)
 - * adequate room for O&M truck access in winter (lime delivery)
 - * award to delivery forces waive of dwg approval
 - * time for civil & electrical design completion to tight must have interface info submitted with bid

FEP-M (DAK) Provide project co-ordination, procurement arrangement drawings, specification input and review, final arrangement drawing, design input for ash pond water pumps floating platform and pH monitor mounting installation, environmental scope and engineering plan, vendor drawing review, and operation and maintenance manual if so requested (not included in this estimate) (Manhours)

FEP-C (~~MM~~^{KWB}) Provide for dike modifications to include widening and increased elevation (approx. 5'), addition of riprap in the area of the silo, co-ordinate foundation and support requirements. (Manhours)

FEP-C (RWJ) Provide complete engineering and design for all concrete foundations, a floating platform for the ash pond water pumps, review vendor drawings. Indicate any schedule impact for this estimate. (Manhours)

FEP-E (WAB) Provide all power and I & C interface requirements to and from the electrical building provided by the vendor, powerhouse control room monitoring of silo elevation and pH indication (at the stilling pond out fall), review specification, vendor drawings, and start up and testing document. Indicate any procurement schedule impacts that could effect total system schedule. (Manhours)

FEP-E (RDB) Provide all engineering and design of wiring and conduit required for system, specification and drawing review. (Manhours)

PLANT PERSONNEL will be responsible for all construction and installation.

CSB will establish the initial IQT contract for the hydrated lime delivery.

ATTACHMENT C
SPECIAL INSTRUCTIONS

Please provide the following information for your input:

1. Verification of your overall scope of work. Note any additions or deletions.
2. Your assumptions.
3. List of activities, activity descriptions, all drawing numbers (new and revised) for each activity, and estimated start, duration, and completion dates for each activity.
4. Man-hours by task for each activity. Include the man-hours required for preparing this estimate. List drafting man-hours separately.

(Use the attached Activity Level Estimate Worksheet to submit information for items 3 & 4 above.)

5. Material estimate for each design activity using attached TVA form 5198.
6. Summary of man-hour estimate using attached Section Estimate Summary Sheet.

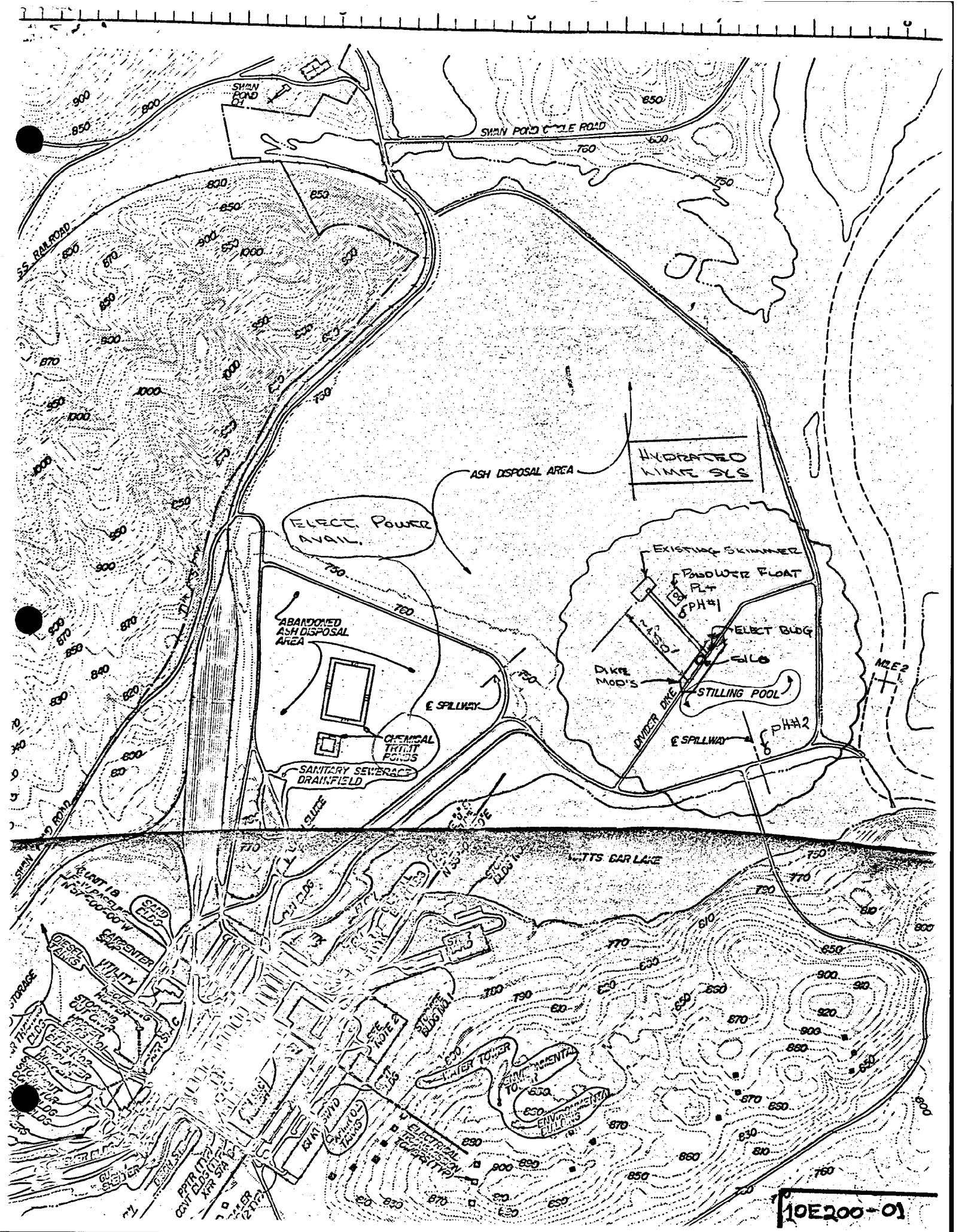
A: CER-INSTR

ORGANIZATIONAL RESPONSIBILITIES

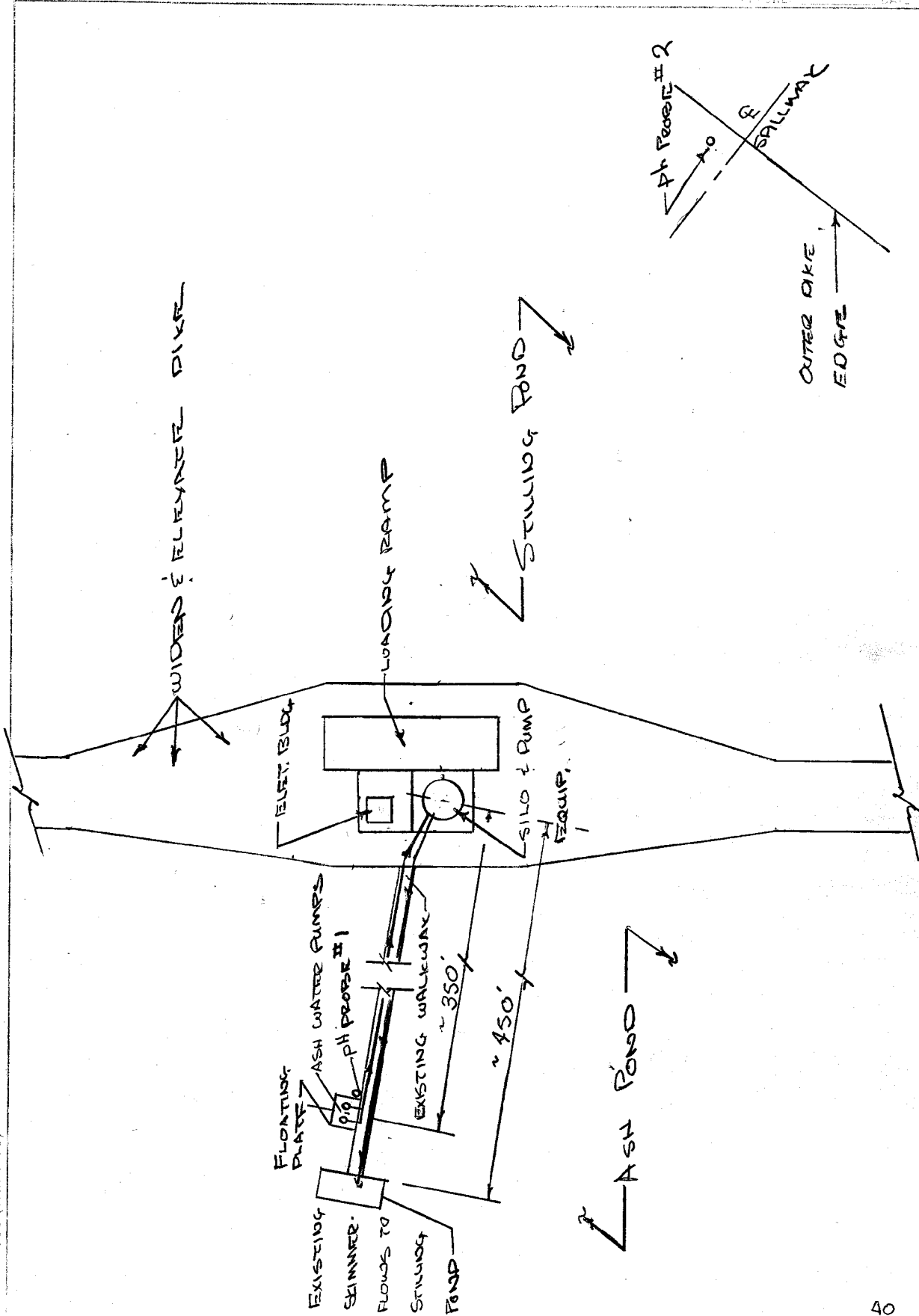
WBS ITEM NO.	ITEM	FEP C	FEP E	FEP M	SEP	A. B	CEB	EEB	MEB	KIF PLANT
1.	MAJOR COMPONENTS (TURNKEY CONTRACT)									
A.	Prepare technical specifications		X	X					D	
B.	Prepare equipment procurement drawing			D					X	
C.	Contract administration			X					CA	
D.	Vendor drawing review	X	X	X					X	
E.	Testing and startup support		X	X					X	
F.	Prepare final equipment arrangement dwg.			D						
(OPTION) G.	Prepare "total system" O&M manual		X	D					X	
2.	TVA INTERFACE ITEMS (In-House)									
A.	Design divider dike modifications	D								P/c
B.	Design of foundations for vendor supplied equipment.	D		X						P/c
C.	Design of pH controls/monitor interface		D							P/c
D.	Design of power feed interface		D							P/c
E.	Design pH controls/monitor equipment mounting arrangement.		X	D						P/c
F.	Prepare construction permit and other required regulatory agency documents.	X		X					D	

SYMBOL DEFINITIONS

- C - CONSTRUCTION
- D - DETAILED DESIGN
- P - PROCUREMENT
- CA - CONTRACT ADMINISTRATION
- X - MINOR INPUT/INVOLVEMENT



1 VA 11030 (WM-7-75)



SECTION ESTIMATE SUMMARY SHEET

Date _____

DCR/ECN No. _____ Acct. No. 767-68-01.XXX-032 Project Code DAR
Section Supervisor K.W. BURNETT Branch or Project FEP/CIVIL MISC CODE 032
Cost Estimate Request No. FEPKJF86-0101 WBS Item No. 2.A.

Drawings, Bills of Material, etc.
Engineering

40 MH

Procurement Request (Attach bills of material, form TVA 5198.)

MH

Squadcheck Review and Coordination
TVA Drawings/Data
Vendor Drawings/Data

20 MH

MH

Lead Engineer (Include SC-4 and M-5 review time)

10 MH

MH

Procurement Activity: Contract Administration
Requisition
Award

MH

MH

MH

Source inspection hours
Hours required to make estimate
Clerk/Secretarial hours

MH

MH

MH

Analysis: Type _____

MH

MH

MH

Constructibility Walkdown
Total Drafting Hours

30 MH

MH

Other: Civil P.E. (REH)

(100)

MH

MH

Computer Costs
Contracts for Engineering
Travel Costs
Other

\$ _____
\$ _____
\$ _____
\$ _____

SCOPE OF WORK

CONFIRM LOCATION OF UNIT INSTALLATION AND CONSTRUCTION OF LOCAL GRADING AND SURFACING. REVISION OF DWG'S TO INCLUDE LOCATION, NOTES, DETAILS & SECTIONS

ASSUMPTION: 1) SURFACING OF THIS DIKE IS REQUIRED UNDER NORMAL ACCESS CRITERIA, THEREFORE ONLY LOCAL SURFACING IS INCLUDED IN THIS ESTIMATE.

2) ESTIMATE ASSUMES INSTALLATION AT EXISTING SURFACE ELEVATION (765')

Design Duration _____ Procurement Duration _____

Contracts for Engineering Duration _____

ACTIVITY LEVEL ESTIMATE WORKSHEET

Project KIF-SCHEME - I (At Exist. Elev.) Feature HYDRATED Lime Feed System CER Number FEP KIF 86 - 0101

Branch/Project FEP/CIVIL Section Supervisor K. W. BURNETT Project Code DAR

MISC CODE 03R

Prepared By DRG Date 1-15-86

A. Design Items

WBS Item No.	Activity Number	Drawing Number	Start Date	Finish Date	Man-hours by Task				Detailed Description of Activity
					AD	EN	DF	DR	
2. A.	?	104420 104421 MISC			30	30	10	10	SHOW LOCATION SHOW DETAILS, SECTION'S NOTES

KIF - HYDRATED LIME FEED

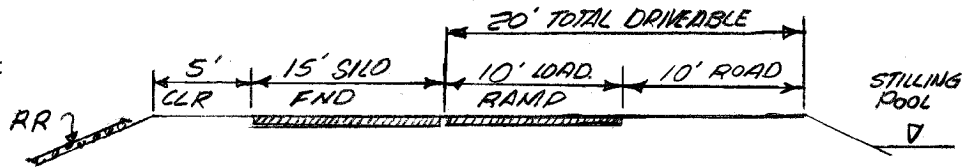
COMPUTED DRS DATE 1-15-86

CHECKED WMW DATE Jan 87

SCHEME I - PRESENT DIKE EL (76.5')

EXISTING WIDTH = 40'

REQ'D WIDTH :



QUANTITIES

1.) LOCAL MACHINING GRADING (SHOULD BE DONE UNDER CONSTRUCTION DRESS-UP) 1/2 ACRE

2. CRUSHED STONE SURFACING :

$$\frac{(Ea. Wt.)}{c.f.} \times 40 \times 100 \frac{ft}{12} \times \frac{6'}{12} \times \frac{TON}{2000} = 100 TON \times 2 = 200 T$$

(NOTE: CR. STN. SURF. ON DIVIDER DIKE SHOULD BE MAINTAINED UNDER NORMAL ACCESS CONDITIONS, THEREFORE TOTAL SURFACING IS NOT CONSIDERED.)

3. RIPRAP: $75' \times 10' \times \frac{1'}{27} = 30 C.Y.$ (EL 76.5')

4. FILTER BLANKET :

$$75' \times 0.5' \times 10' \times \frac{100}{2000} = 20 TONS$$

SECTION ESTIMATE SUMMARY SHEET

Date _____

DCR/ECN No. _____ Acct. No. 767-68-01,XXX-032 Project Code DAR

Section Supervisor K.W. BURNETT Branch or Project FEP-CIVIL MISC CODE 032

Cost Estimate Request No. FEPKIF86-0101 WBS Item No. 2.A.

Drawings, Bills of Material, etc. Engineering	<u>100</u>	MH
Procurement Request (Attach bills of material, form TVA 5198.)		MH
Squadcheck Review and Coordination TVA Drawings/Data	<u>20</u>	MH
Vendor Drawings/Data		MH
Lead Engineer (Include SC-4 and M-5 review time)	<u>20</u>	MH
Procurement Activity: Contract Administration		MH
Requisition		MH
Award		MH
Source inspection hours		MH
Hours required to make estimate		MH
Clerk/Secretarial hours		MH
Analysis: Type _____		MH
_____		MH
_____		MH
Constructibility Walkdown		MH
Total Drafting Hours	<u>80</u>	MH
Other: <u>Civil P.E. (REH)</u>	<u>(220)</u>	MH
_____		MH
Computer Costs	\$ _____	
Contracts for Engineering	\$ _____	
Travel Costs	\$ _____	
Other	\$ _____	

SCOPE OF WORK

PROVIDE DESIGN DETAILS FOR RAISING LOCAL AREA 5 FEET IN ELEVATION
IMMEDIATELY OVER EXISTING DIKE. DESIGN WILL INCLUDE ALL THE REQUIRED GRADING
DETAILS, SECTIONS, PROFILES AND NOTES TO EFFECT THE PROPER PLACEMENT OF THE
FILL MATERIAL. (SCHEME II)

NOTE: THE PRESENT PLANT POND OPERATION (INTERIOR PONDING AND STACKING) AND
FUTURE OPERATIONAL PROJECTIONS WOULD SUGGEST ANY RAISING OF THIS DIKE
WOULD BE UNLIKELY.

Design Duration _____ Procurement Duration _____

Contracts for Engineering Duration _____

ACTIVITY LEVEL ESTIMATE WORKSHEET

Project KIF Feature HYDRATED Lime Feed System CBR Number FEP KIF 86 - 0101
 Branch/Project FEP - CIVIL Section Supervisor K. W. BURNETT Project Code DAR
 Prepared By DRS Date 1-15-86 Misc Code 032

A. Design Items

WBS Item No.	Activity Number	Drawing Number	Rev	Start Date	Finish Date	Man-hours by Task			Detailed Description of Activity
						AD	EN	DF DR	
2. A.		420	✓			40	20		
		42X	✓			80	60		
		MISC.				20			

SCHEME II (5' RAISING)

REF: ATTACHED SHEET

QUANTITIES

$$1.) \text{ BOTTOM ASH: } \left[(300' \times 75') + \frac{(300' + 0')(200')}{2} \right] \frac{1}{27} \times 0.85 \approx 2300 \text{ C.Y.}$$

$$2.) \text{ EARTH BORROW: } 150' \left(75' + \frac{200'}{2} \right) \frac{1}{27} \times 0.8 \approx 1500 \text{ C.Y.}$$

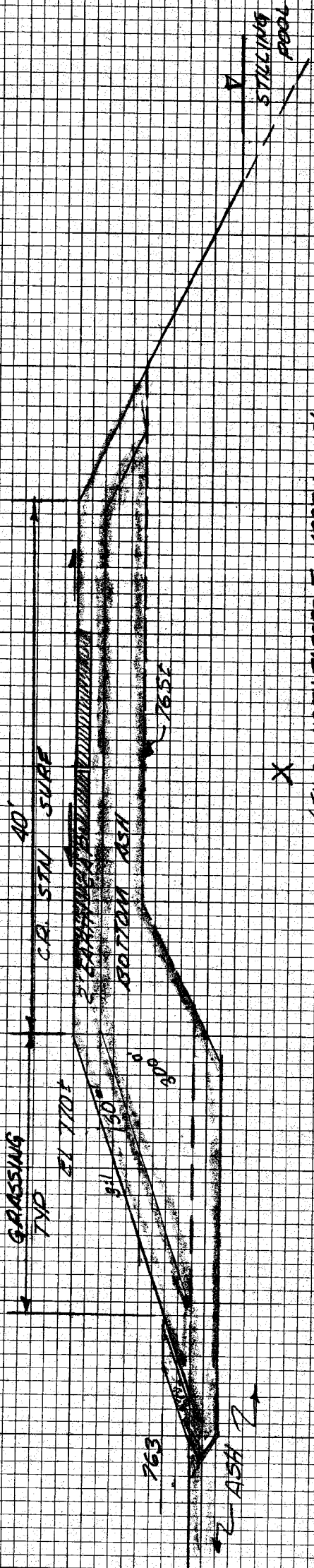
$$3.) \text{ RIPRAP: } (1') \frac{4 \sqrt{10} (100') (1')}{27} \approx 50 \text{ C.Y.}$$

$$4.) \text{ FILTER BLANKET: } \left(\frac{6''}{12} \right) \frac{4 \sqrt{10} (100') (100')}{2000} = 35 \text{ TONS}$$

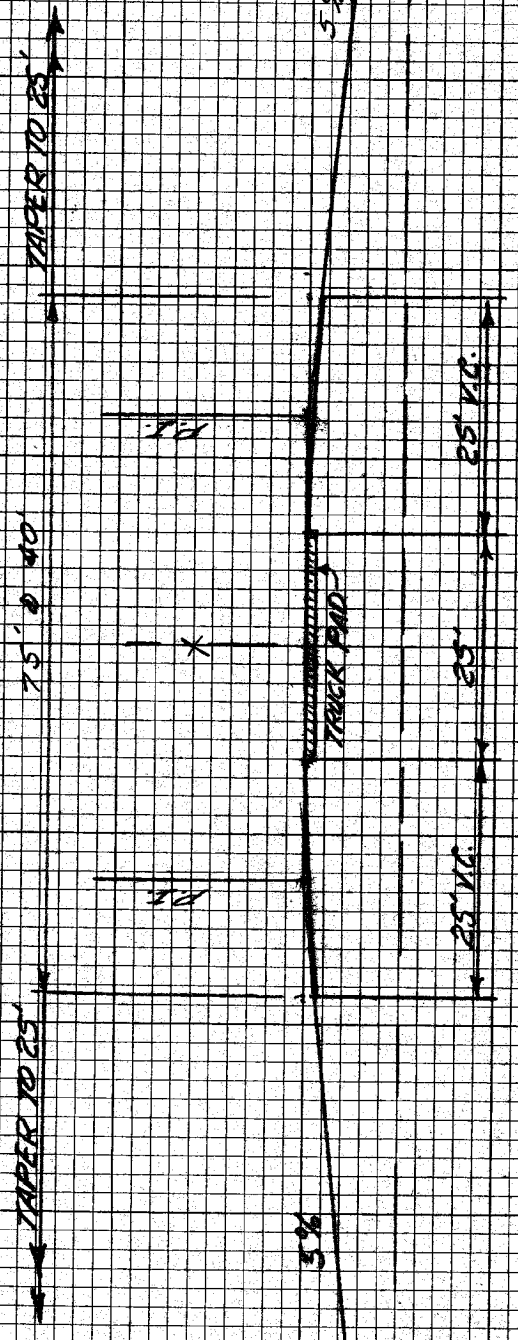
$$5.) \text{ CRUSHED STN SURF: } \left[(40' \times 75') + \frac{40' + 25' (200')}{2} \right] \frac{100'}{2000} \left(\frac{6''}{12} \right) \\ = 250 \text{ TONS}$$

$$6.) \text{ GRASSING: } \left[(35' \times 75') + \frac{(35' + 0')(200')}{2} \right] \frac{1}{9} = 700 \text{ S.Y.}$$

NOTE: MODIFICATION OF CATWALK WILL PROBABLY BE REQUIRED
DUE TO OVERLAP OF MAT' PLACEMENT.



X
 (THIS WIDTH TAPERS TO APPROX 2.5'
 AS INDICATED ON PROFILE)



1" = 20' HORIZ
 1" = 10' VERT

SCHEME II (5' RAINFALL)

KINGSTON S.P.