May 18, 1994

K. W. Burnett

KINGSTON FOSSIL PLANT - COAL YARD RAINFALL RUNOFF STUDY - PHASE I INPUT TRANSMITTAL

Per your request, we have enclosed input to the subject estimate. We have enclosed a phase II scope, a resource loaded phase II schedule, a phase II drawing list, and a preliminary phase III scope and schedule. If you have any questions or comments, please call Ron Purkey at 4820.

L. A. Nash
Manager, Structural Engineering
SP 2G-C

KINGSTON FOSSIL PLANT
COAL YARD RAINFALL RUNOFF STUDY

STRUCTURAL ENGINEERING INPUT

PHASE II SCOPE OF WORK:

1. PROVIDE DESIGN CALCULATIONS AND A DRAWING FOR A CONCRETE ENCLOSURE AND BASE SLAB IN THE GROUND FOR THE POLYETHYLENE TANK SUPPORT. THE TANK IS FOR THE COAL YARD DRAINAGE SUMP.

2. PROVIDE DESIGN CALCULATIONS AND DRAWINGS FOR THE PUMP SUPPORT AND ACCESS PLATFORM.

PHASE II SCHEDULE AND MANHOURS:

START: 01JUL94 FINISH: 01OCT94 175 MANHOURS REQUIRED

PHASE III PRELIMINARY SCOPE:

1. PROVIDE SUPPORT FOR THE ENTIRE CONSTRUCTION EFFORT FROM THE DESIGN OFFICE.

2. PROVIDE 1 FIELD VERIFICATION TRIP (4 MH ON SITE, 8 MH CHARGED TO THE JOB).

3. PROVIDE AS CONSTRUCTED DRAWING REVISIONS.

PHASE III PRELIMINARY SCHEDULE AND MANHOURS:

START: 01NOV94 FINISH: 01JUN95 20 MANHOURS REQUIRED

KINGSTON FOSSIL PLANT
COAL YARD RAINFALL RUNOFF STUDY

PHASE II DRAWING LIST

DRAWING NUMBER	DESCRIPTION
10W325-1, RO	CONCRETE AND MISC STEEL/PUMP SUPPORT AND SUMP ENCLOSURE
10W325-2, RO	DO DO DO

ENGINEERING COST INPUT SHEET

FISCAL YEAR: 1994
PHASE: 2

PROJECT: KINGSTON FOSSIL PLANT

FEATURE: COAL YARD RAINFALL RUNOFF STUDY

CER: PCN:

PREPARED BY: R. E. PURKEY

ENGG SVCS GROUP: select one
_X_FOSSIL ENGINEERING SERVICES
___HYDRO ENGINEERING SERVICES
___PROJECT ENGINEERING SERVICES
___CLEAN AIR PROGRAM
___OTHER ORGANIZATION: _____
Est'g, Proj Ctrls, etc.

MAN-HOURS	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
STRUCTURAL ENGINEERING										50	75	50	175

Section Name

TRAVEL : NO. OF PERSON TRIPS

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
RUCTURAL ENGINEERING													0

OTHER DOLLARS (A/E Engineering Work, Est'd M-H's, Quote, Other Basis)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
													0
													0
													0
													0
													0
	0	0	0	0	0	0	0	0	0	0	0	0	0

NOTES:

Approved by: _____

FILE: IN_FORM.WR1

Date: _____

TVA 5198 (OE-[redacted])

OFFICE OF ENGINE[redacted]NG COST ESTIMATE

Fossil Engineering — BRANCH/PROJECT

Structural — SECTION

PROJECT Kingston Steam Plant

DESCRIPTION Coal Yard Sump

ESTIMATE NO. KIF93-1218-PO

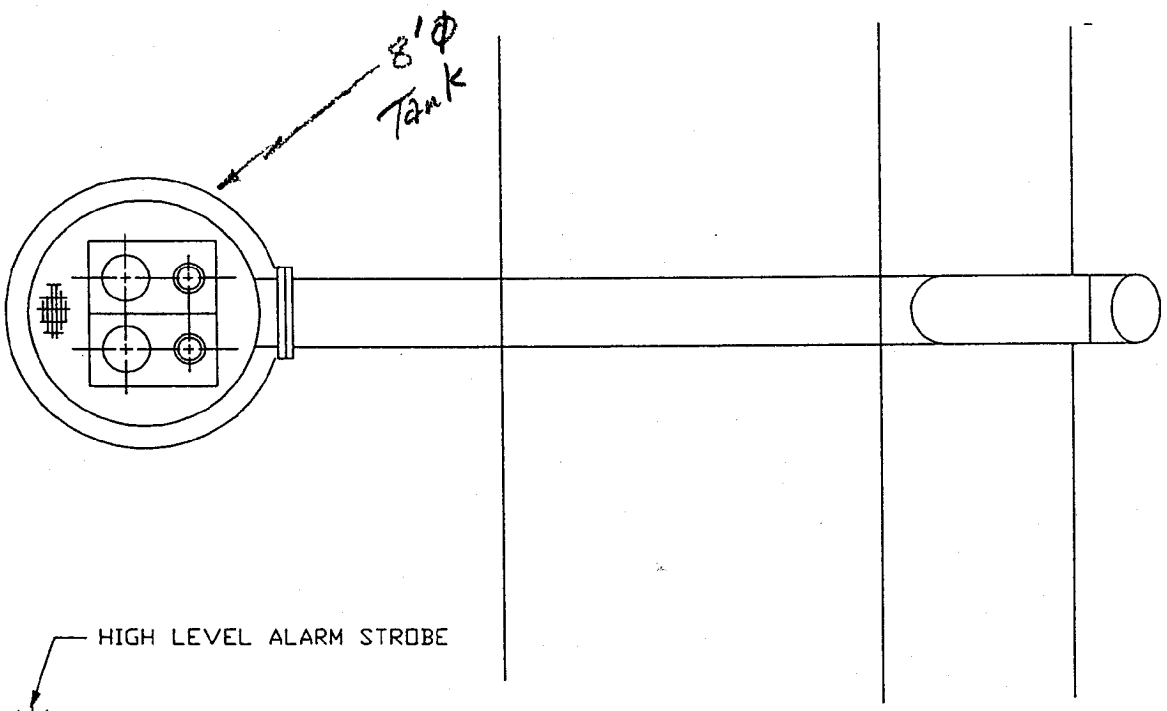
SHEET No. 1 of 5

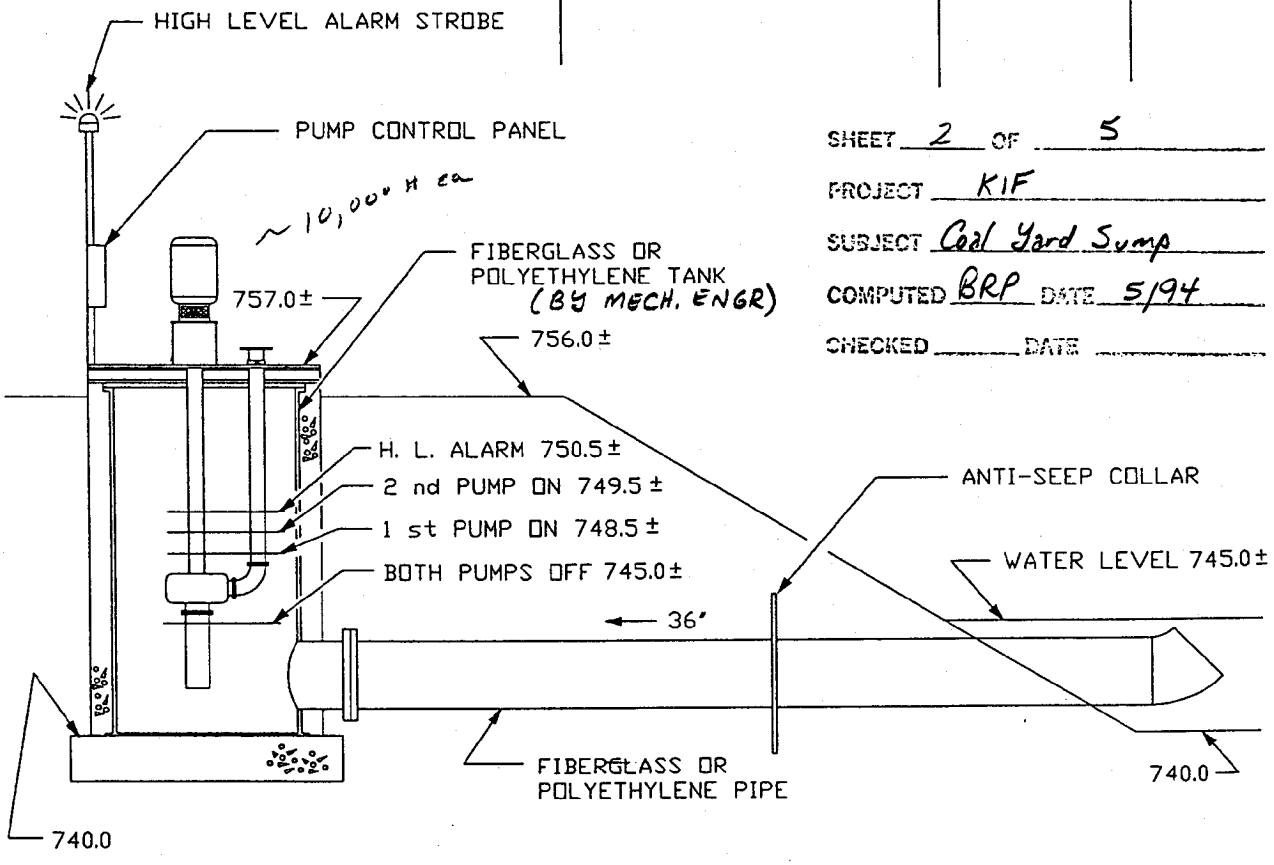
ACCOUNT NO. ØØØ R3Q4

DATE 5/94

QUANTITIES BY Bryan R. Partin — CHECKED BY _____ — PRICED BY _____ — APPROVED _____

Item / UNID Sys. No.	Description	Quantity	Unit	Rate	Material	Labor	Total Amounts
#1	ASTM A36 steel - W14X26 Beams	0.75	TONS				
#2	1½" x 3/16" Galv Bar Grating	125	SQ FT				
#3	ASTM A36 steel - L 3X3X 5/16	10	LF				
#4	TRW Nelson Studs 3/4"Ø x 4 3/16 or equal	24	EA				
#5	3000 psi - Normal Wt Concrete	60	CU YD				
#6	ASTM A615- Deformed Reinforcement	4.4	TONS				
#7	Excavation - Earth	810	CU YD				
#8	Backfill - 1" Crushed Stone	340	CU YD				
#9	PVC Sch 40 - 4"Ø pipe	10	LF				
#10	ASTM A36 Steel - PL 3/4 x 1'-0" x 1'-2"	6	EA				
#11	Backfill- Earth	470	CU YD				





SHEET 2 OF 5

PROJECT KIF

SUBJECT Coal Yard Sump

COMPUTED BRP DATE 5/94

CHECKED _____ DATE _____

KINGSTON FOSSIL PLANT

COAL YARD DRAINAGE SUMP

FILE: KCOALYD

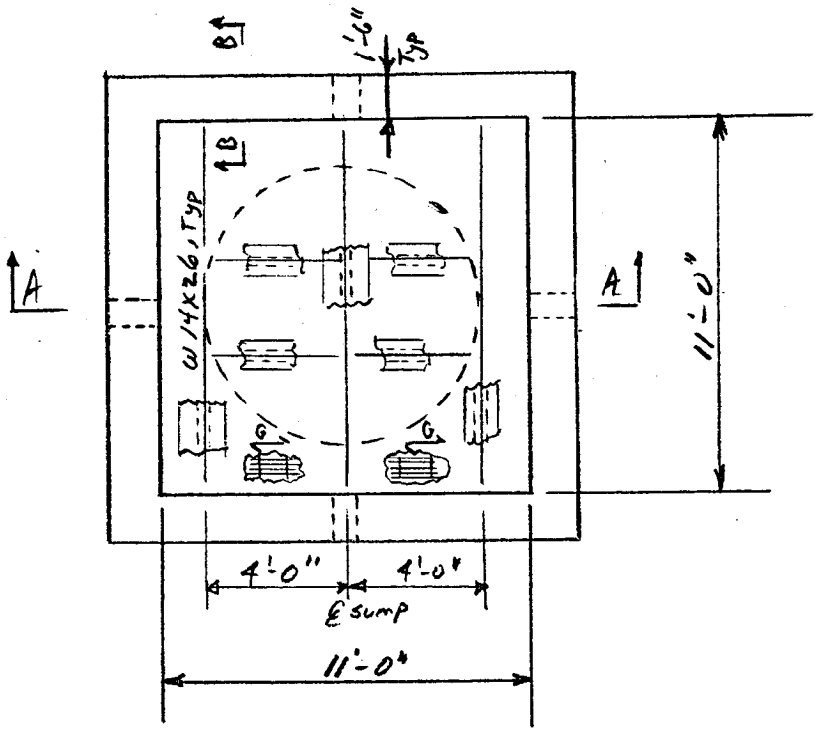
Coal Yard Sump

SHEET 3 OF 5

KIF

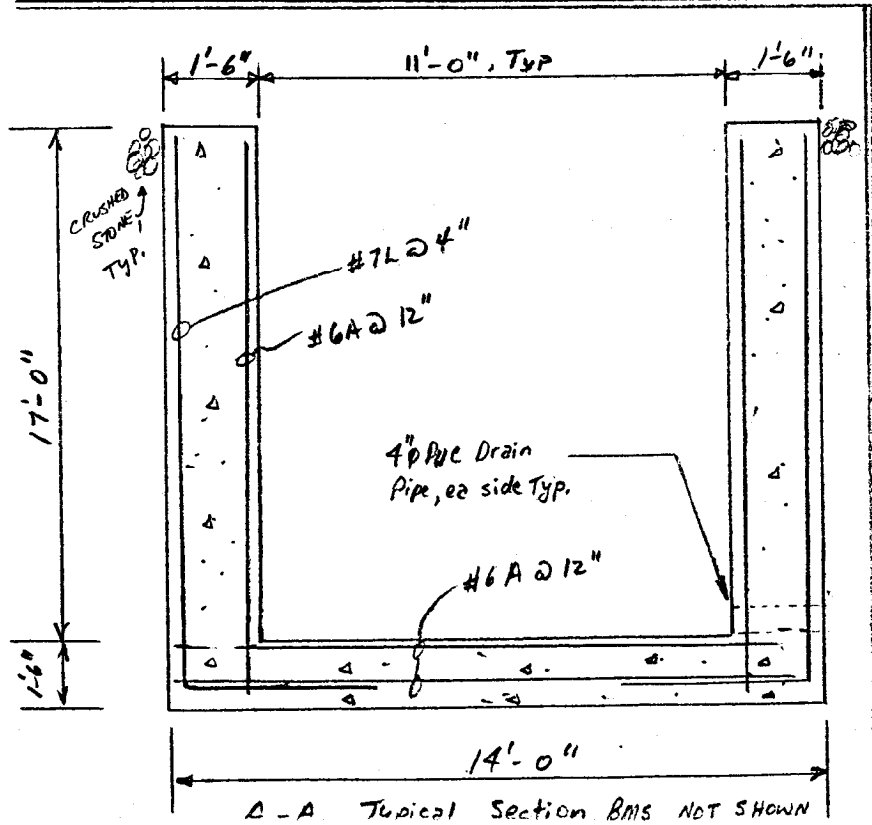
COMPUTED BRP DATE 5/94

CHECKED _____ DATE _____

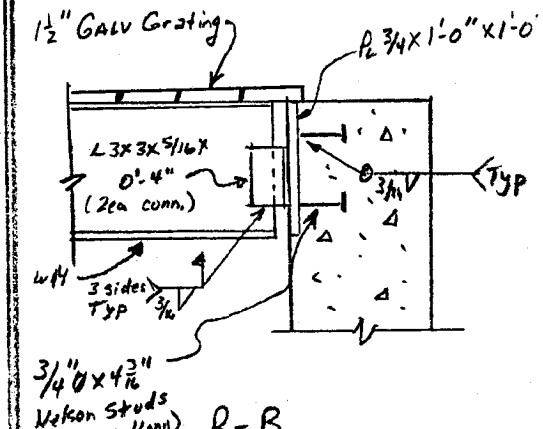


PLAN - SUMP W/PLATFORM

NTS



Δ - Δ Typical Section BMS NOT SHOWN



B-B

Typical Bm to Wall Connection

6 Req'd

VA 11030 (WM-7-75)

Coal Yard Sump

SHEET 4 OF 5

KIF

COMPUTED BRP DATE 5/94

CHECKED _____ DATE _____

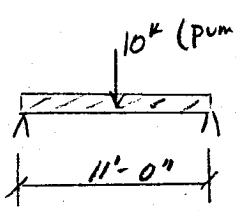
I) Use $1\frac{1}{2}$" Grate (Galv):

assume platform 30psf

$w = 30psf \times 4' = .120 k/f$

$+ 100psf \times 4' = .400 k/f$

$.52 k/f$



$m = \frac{10^k(11')}{4} = 27.5^{k-1}$

$+ \quad m = \frac{.52(11)^2}{8} = 7.9^{k-1}$

$\varepsilon = 35.4^{k-1}$

Say 36^{k-1}

Use W14 X26 eq. Bm

Total Length of Bms: $11' \times 3 ea = 33'$

$4' \times 4 ea = 16'$

$49' \times 26^{lb/ft} / 2000 = .64^{TONS}$

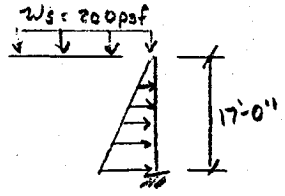
Say .75 TONS

II) GRT: $11' \times 11' = 121 ft^2$

III) CLIP ANGLES: USE L3 X 3 X 5/16 ea side 10.4^k ALLOWABLE

Length $\frac{4"}{12} \times 2 \times 14 ea = 9.3'$ Say 10'

WALL DESIGN



use gravel backfill to drain (no water pressure)

$\gamma_{gravel} = 135^{lb/ft^3}$ (compacted)

Convert surcharge to soil: $h_s = \frac{w_s}{\gamma_{soil}} = \frac{200^{\#/ft^2}}{135^{\#/ft^3}} = 1.50'$

surcharge soil pressure: $w h_s K_o = 135^{\#/ft^3} \times 1.5' \times 0.5 = 102^{\#/'}$

$H_s = 102^{\#/'} \times 17' = 1734^{\#} = 1.7^k$

$p_{r\,soil} = \gamma H = 135^{\#/ft^3} \times 17' = 2300^{\#/ft^2}$

$H_{soil} = \frac{1}{2}(2300)(0.5)(1')(17') = 19.6^k$

Use 18" thick wall

Floor slab - Temp Steel

VA 11030 (WM-7-75)

Coal Yard Sump

SHEET 5 OF 5

KIF

COMPUTED BRP DATE 5/94

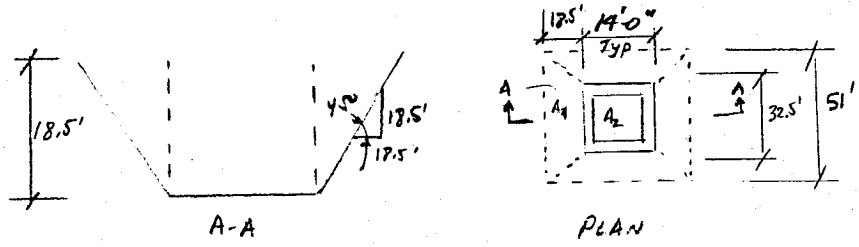
CHECKED _____ DATE _____

V Conc vol : 17' x 1.5' x 12.5' x 4ea = 1275 ft³ (walls)
14.0' x 1.5' x 14.0' x 1ea = 294 ft³ (floor)
1569 ft³

$1569\ ft^3 \times \frac{yd}{27} = 59\ cu\ yd$ say 60

VI) Reinforcing : $59\ yd^3 \times 150\#/yd^3 = 4.4$ TONS

VII) Excavation :



$A_2 = 14^2 = 196\ ft^2$, $A_1 = ((18.5 \times 2) * 14)^2 = 51^2 = 2601\ ft^2$, $A_1 \times A_2 = 509796$
h = 18.5'

$V = \frac{h}{3}(A_1 + A_2 + \sqrt{A_1 A_2}) = \frac{18.5}{3}(2601 + 196 + \sqrt{509796})$

Vol = 21651 /27 = 802 yd³ say 810 yd³

VIII Backfill (Gravel) = 810 yd³ - (14 x 18.5 x 14 /27) = 6.76 say 680 yd³
680/2 = 340 yd³

IX : DRAIN PIPE Sch 40 PVC 10'-0"

X : PL for Nelson Studs : PL 3/4 x 1'-0" x 1'-2" ⇒ 6ea

XI : Backfill earth : 810 - 340 = 470 yd³

TVA 11030 (WM-7-75)