0032675

Mr. John Grantham
State of Washington
Department of Ecology
Nuclear & Mixed Waste Program
P. O. Box 47600
Olympia, WA 98504-7600

FLUOR DANIEL, INC.

Date: May 19, 1993

Reference: Hanford Waste Vitrification Plant
DOE Contract DE-AC06-86RL10838
Fluor Contract 8457

Transmittal No.:WDOE-437R1
REVISION JUNE 4, 1993

Dear Mr. Grantham:

TRANSMITTAL

We enclose 2 copy of the items listed below. These are issued per US-DOE request.

Response due to Fluor: N/A
Responds to: N/A

NUMBER	REV	DATE	TITLE
----------	-----	04/19/93	A920-R1 CR-0881 COST STUDY FOR THE RAIL SPUR ACCESS TO THE FAB SHOP. PLEASE REPLACE REPORT SENT ON MAY 19, 1993 WITH ENCLOSED REPORT. NEW COPIES HAVE COVERS AND ARE SPIRAL BOUND.

Distribution:
Reference:FRP-948R1, FUP-473R1
R. L. Long: DOE-RL, w/0
TWP/AME Corresp Cntrl Cntr, MSIN A5-10
(A920 PACKAGE), w/0
P. Felise, WHC-RL (MSIN G6-16), w/1
Environmental Data Management Center
(MSIN H6-08), w/1
D. Duncan, US EPA, Region X, w/0

Very truly yours,

Rosalie Cadenas for
R. S. Poulter
Project Director

RSP:MJY:lh

DEC 1993
RECEIVED
EDMC

U.S. DEPARTMENT OF ENERGY
RICHLAND FIELD OFFICE
RICHLAND, WASHINGTON

A920-R1 CR-0881 COST STUDY FOR THE RAIL SPUR ACCESS TO THE FAB SHOP

APRIL 19, 1993

HANFORD WASTE VITRIFICATION PLANT

FLUOR DANIEL

DOE CONTRACT NO.
DE-AC06-PPRL10838

CONTRACT NO. 8457

U. S. DEPARTMENT OF ENERGY
Hanford Waste Vitrification Plant
Richland, Washington
DOE Contract DE-AC06-86RL10838

FLUOR DANIEL, INC.
Advanced Technology Division
Fluor Contract 8457

U.S. DEPARTMENT OF ENERGY
RICHLAND, WASHINGTON
HANFORD WASTE VITRIFICATION PLANT

A920-R1 CR-0881
COST STUDY FOR THE RAIL SPUR ACCESS TO THE FAB SHOP

APRIL 19, 1993

BY:
FLUOR DANIEL, INC.
3333 MICHELSON DRIVE
IRVINE, CA 92730

*04-23.HC#32

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ENCLOSURE:
SKETCH OF FOUNDATION FOR THE MELTER ASSEMBLY
ALTERNATES 1 THROUGH 4
ALTERNATE 5 EXHIBIT "A' AND "B"

INTRODUCTION

The CR-0881 is to relocate the Fab Shop to the east of railroad tracks to facilitate rail loading/unloading for jumper and melter materials, and provide a cost study to add rail spur access to the melter bay.

WHC has identified the need for relocation of the Fab Shop building to allow loading of melter assemblies directly from the rail car. Relocating the building next to east side of the railroad track will not only allow a better route for parts and materials into building, but will facilitate melter loading to the railroad using an external crane.

WHC requested to explore the potential for further reductions in melter loading costs by extending a rail spur into the melter bay and also requested that the current rail siding to remain unchanged, with the option to side load the melter from it. This criteria determined the building location for this study.

The existing rail siding is designed for the purpose of engine maneuvering (switching from pulling and pushing) operations and loading/unloading to the GFE Warehouse receiving and storage dock. The existing siding was not intended for parking of a rail car at any time. The design complies with the American Railway Engineering Association (AREA) standards, requiring the siding to remain at the same grade as the main track.

The Fab Shop building elevation which was set at 704.00 as suggested by WHC, was determined based on the existing rail system. The analyses for flood protection and mitigation for the safety class 4 and safety class 1 have been incorporated in the design and provided with the construction drawings.

This cost study explores this potential, describes the design of the railroad spur to the Fab Shop building, and examines the impact to the A180 Railroad Spur system. Exhibit "A" shows the rail spur layout configuration with the existing rail system and the Fab Shop building location. Exhibit "B" shows the final rail spur layout for future consideration.

No impact to the rail system operation for the A180 was found.

STUDY SCOPE

The Fab Shop railroad spur design is governed by the American Railway Engineering Association (AREA) 1991 Manual for railway engineering. The position of the spur and the Fab Shop creates a new option for melter construction and delivery. With the spur, massive melter parts may now be delivered and assembled on a rail car similar to the one employed at the Vit Building. This car remains on the spur inside the Fab Shop high bay area as the melter is worked on. When the melter is ready, it can then be delivered by rail to the Vit Building for use.

DESIGN PARAMETERS

In order to meet the design criteria and retain the facility functionality, certain parameters must be maintained. The service track rail spur to the Fab Shop layout is designed according to the AREA Manual and the Standard Design Criteria for Railroads, Hanford Plant Standards Section 3.1.

The point of switch for this spur is at STA 13+62.69 of the A180 package "A" Track as a result of plan geometry and most economical length of rail.

Parameters: Design Frog No. 8
Horizontal curve radius = 573.69 feet
Maximum grade on track = 1.0%

Starting at point of switch (station 0+00.00) elevation 694.53, with the rail at 1% grade to the face of Fab Shop Building (station 4+78.76), the spur elevation at the top of rail is to be 698.00 (see EXHIBIT "A").

The rail car dimensions for the melter delivery to the Vit Building are 46' long, 9' wide and 4'-4 1/4" high from the top of rail. The rail car for use inside the Fab Shop should be equal to accommodate future delivery to the Vit Building.

The preferred working environment at the Fab Shop would be such that the top of the rail car would flush with the finished floor. The current elevation of the Fab Shop finish floor is at 704.00. Therefore the best elevation on the top of rail inside the Fab Shop shall be 700.00. In order to accomplish this, several alternates were developed.

SUMMARY OF ALTERNATES

ALTERNATE 1

OPTION Move Fab Shop southerly such that the melter assembly area faces east directly to GFE Warehouse receiving and storage dock, where the track rail is level and at elevation 700.00.

CONFLICT Storm drainage and flooding mitigation not feasible.
South side of the building encroached the road.

ALTERNATE 2

OPTION Align the south face of Fab Shop with GFE Warehouse building face

CONFLICT Storm drainage and flooding mitigation not feasible.
Need to modify building configuration to offset rail spur.

ALTERNATE 3

OPTION Rotate Fab Shop 90 degrees.

CONFLICT Need to modify building configuration.
Must redesign/restudy functional building tasks (access and delivery).
East of building encroaching sanitary sewer septic tank.
Must reroute sewer pipeline.

ALTERNATE 4

OPTION Reconfigure Fab Shop and add loading dock across from GFE warehouse receiving & storage dock area.

CONFLICT Diminishing working space from the original intent.
The "A" Track loading and unloading area became heavily congested.

ALTERNATE 5

OPTION Considering the present proposed location.

CONFLICT Requires pre-arrangement and permission from the Railroad Group for the design grade to be 1.5%.

With pre-arrangement and permission of the Railroad Group, the design grade can be increased up to 2%. Such practice has been applied in the past mainly for rail spurs with infrequent usage and not being a main track. Thus if a design grade of 1.5% is applied, the spur would easily be designed to achieve an elevation of 700.00 at a location 100 feet before it reach the Fab Shop building face. (see EXHIBIT "B")

Future option for loading and unloading for other equipments, parts or materials can also be achieved with the addition of a loading dock located directly in front of the receiving & storage area of GFE Warehouse, where track "A" is already level at elevation 700.00.

CONCLUSION

ALTERNATE 5 EXHIBIT "B" is the best option of all and should be implemented for the design and construction for the future rail spur to the Fab Shop building.

The difference between EXHIBIT "A" and EXHIBIT "B" is the design grade, the length of the rail spur and the finished elevation of the top of rail inside the Fab Shop building.

OTHER TOPICS

Adequate provision shall be made for drainage of the roadbed and rail spur crossing. It is suggested that a detailed drainage study for the area to be considered before future rail spur construction, drainage structure and/or device shall be adequately provided.

WHC must provide operation scheduling for melter/VIT Building operations to avoid conflict with melter/Fab Shop and GFE Warehouse shipping and receiving operations.

COST IMPACTS TBD
DRAFT COMMENTS

1.

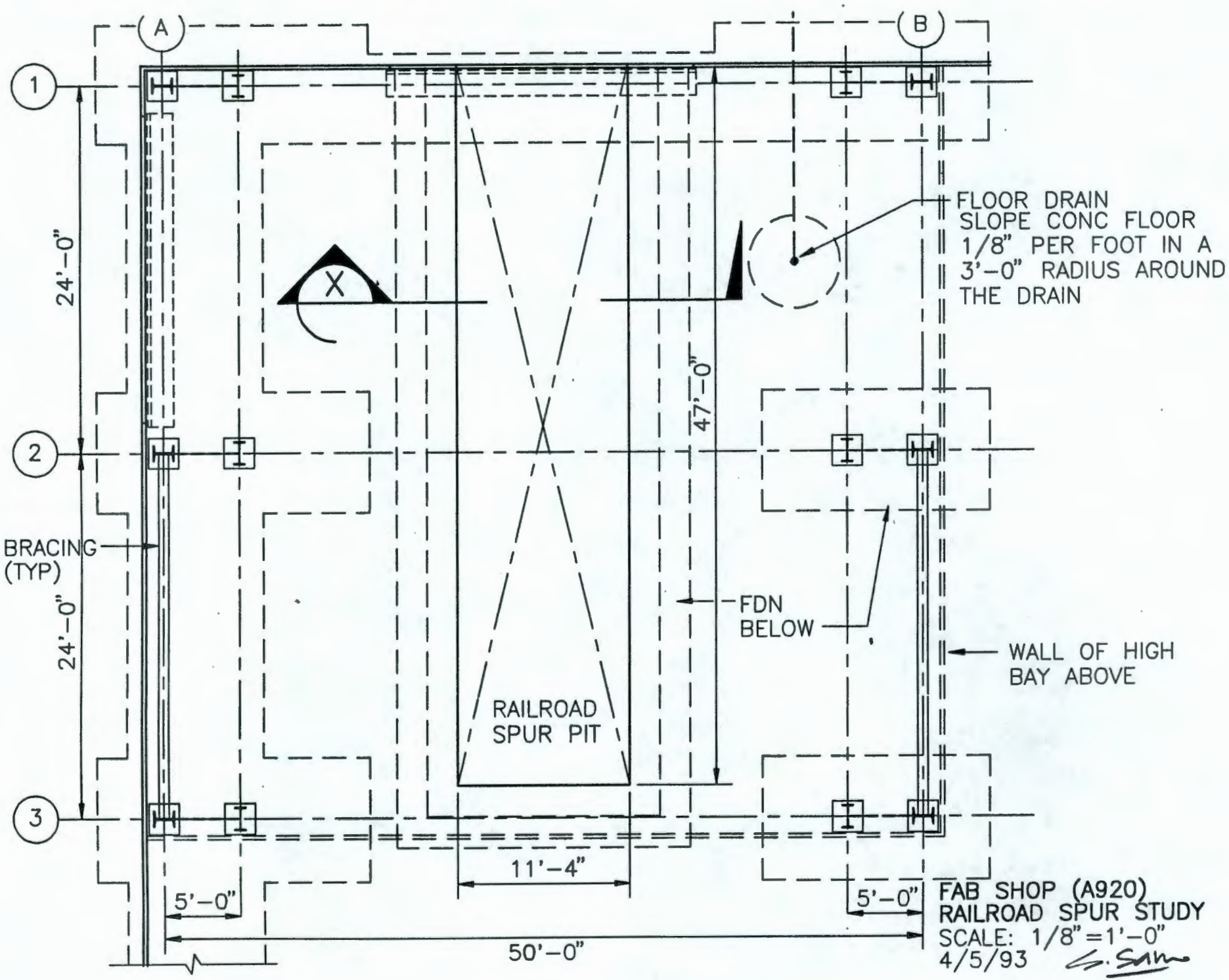
Engineering and Construction cost to execute prior to construction. Including change/revision to A180 package to add rail spur design/const drawings.

$ 200,000.00 (excludes engineering)

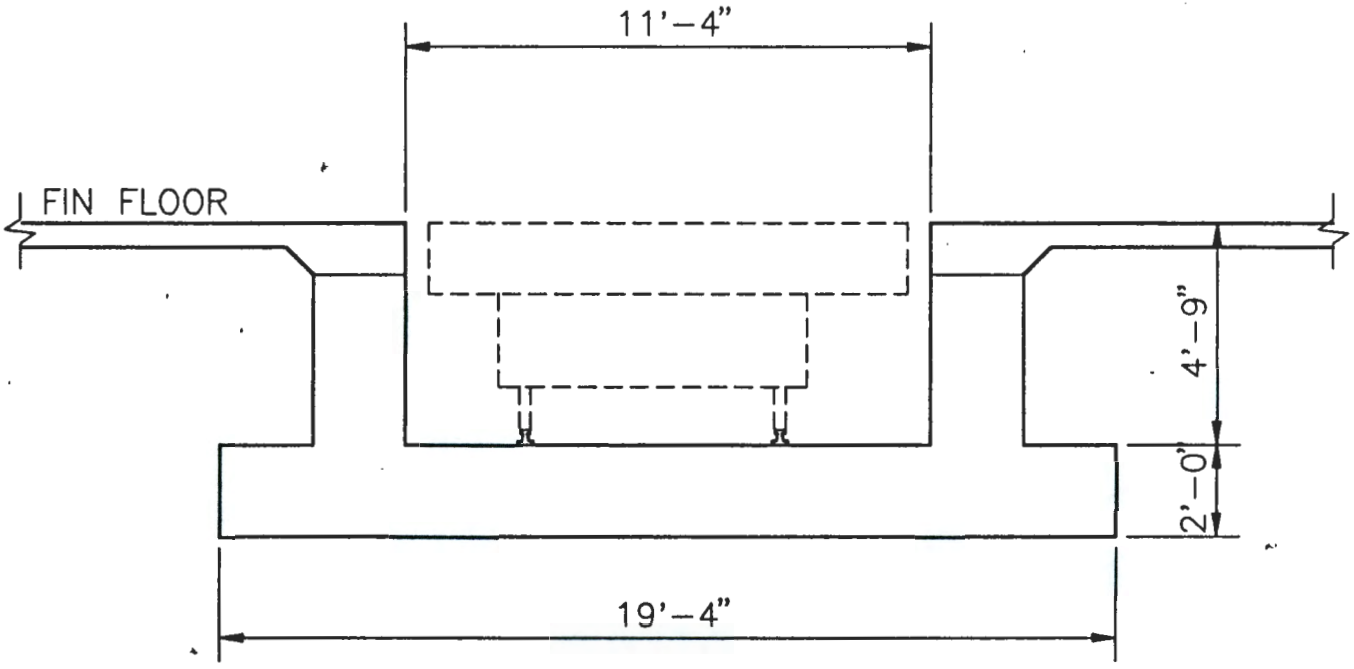
2.

Engineering and Construction cost to execute after construction of Railroad/building. Including engineering changes to bay prior to building construction.

$ 250,000.00 (excludes engineering)

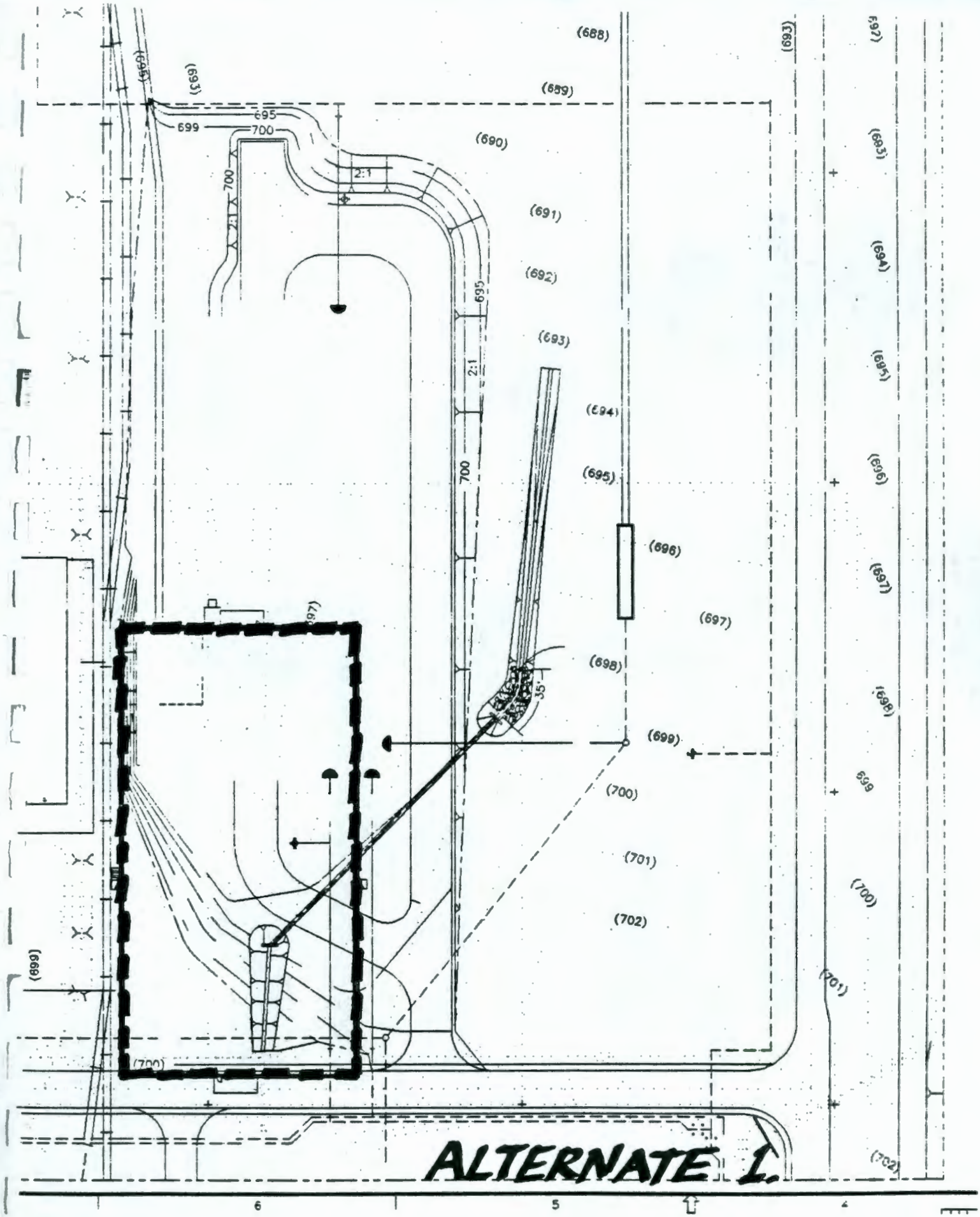


FAB SHOP (A920)
RAILROAD SPUR STUDY
SCALE: 1/8"=1'-0"
4/5/93



SECTION X

FAB SHOP (A920)
RAILROAD SPUR STUDY
SCALE: 1/4"=1'-0"
4/5/93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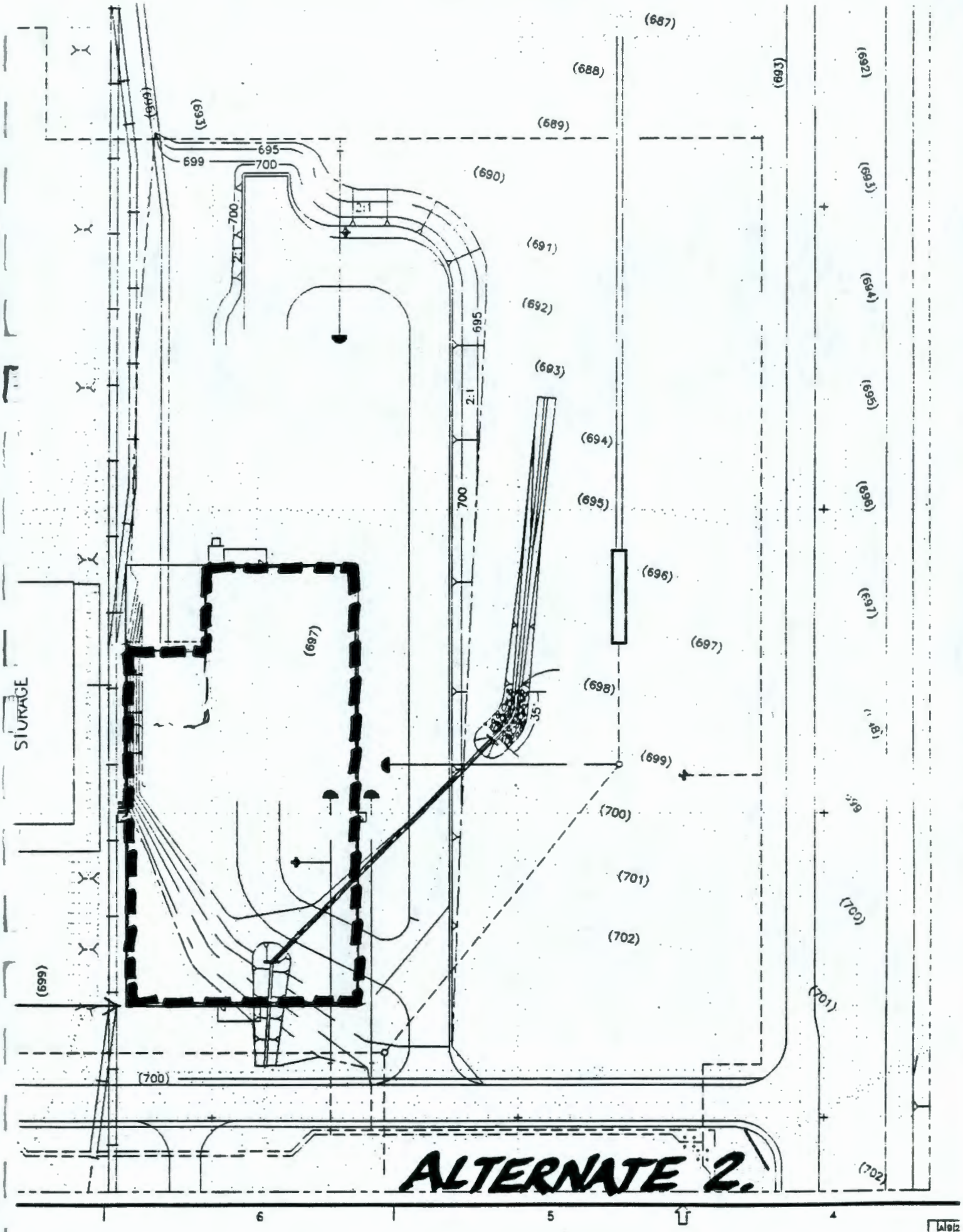
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STORAGE
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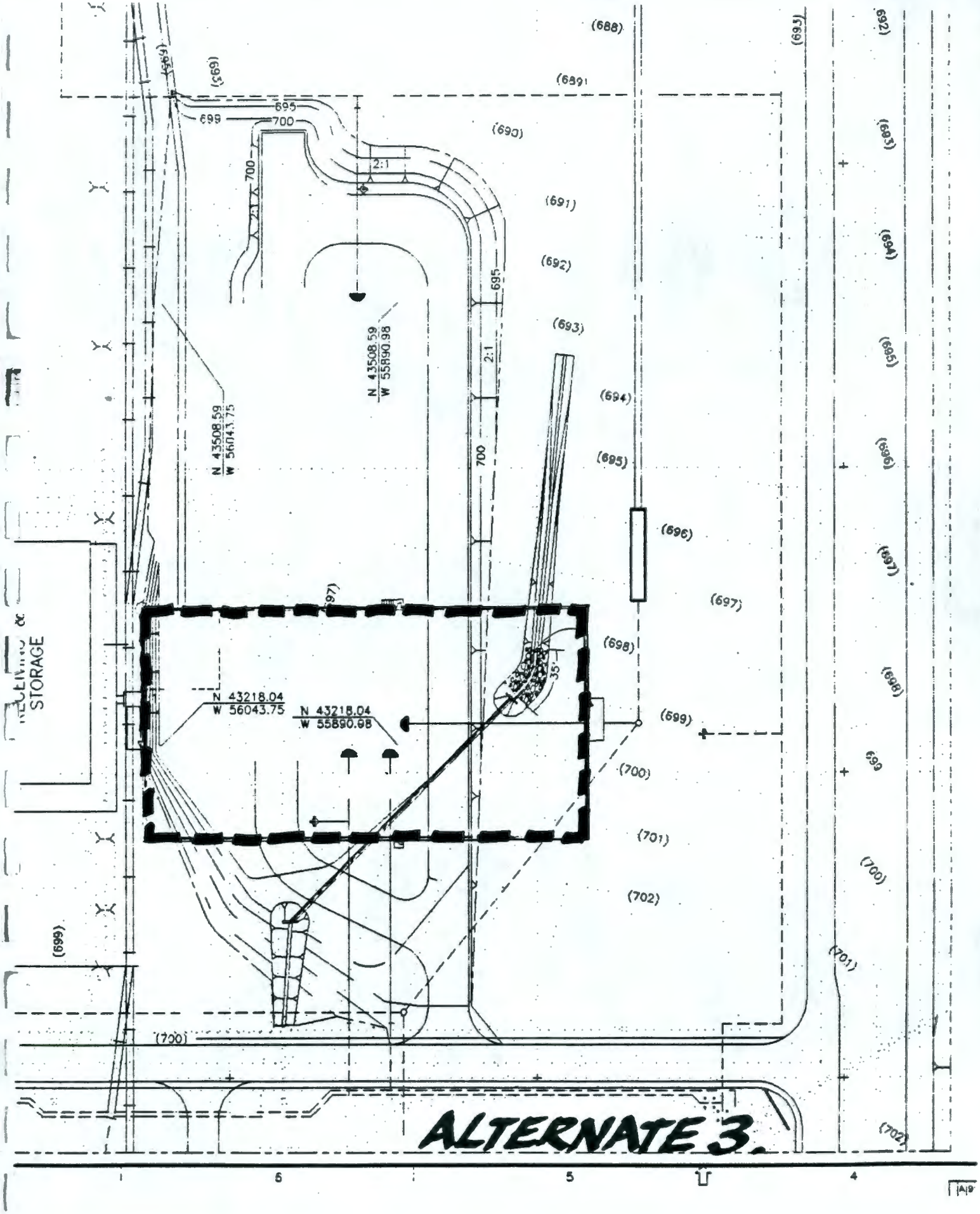
ALTERNATE 3.
STORAGE
N 43508.59
W 56043.75
N 43508.59
W 55890.98
N 43218.04
W 56043.75
N 43218.04
W 55890.98
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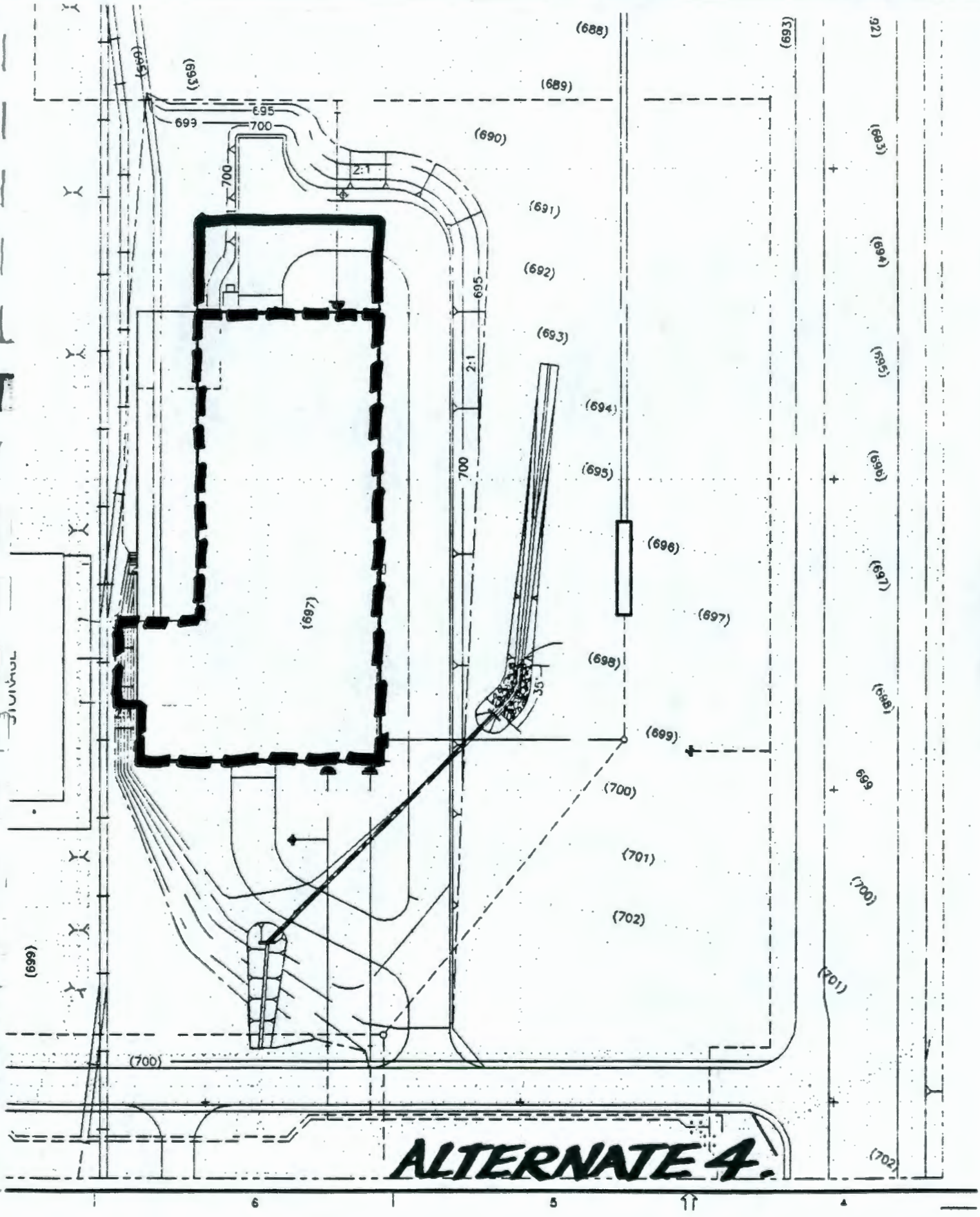
ALTERNATE 4.
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CONSTRUCTION COSTS
SUMMARY
TOTAL ESTIMATED COSTS
($1,000)

CLIENT WESTINGHOUSE
PROJECT HWVP
LOCATION RICHLAND, WASH.
DESCRIPTION Fab Shop Rail Spur Demo - Door Replacement

C.R. NO.
CONTRACT 845734
PREPARED BY PCA
DATE 4/22/93
APPROVED BY

WBS	IEST WBS FACIL CODE	IEST WBS WK PKG	IEST WBS SYST	DESCRIPTION	DIRECT COST $	INDIRECT COST $	% ESCAL	ESCAL $	TOTAL ESCALATED COST $	% CONT	CONTING'Y $	TOTAL ESTIMATED COST $
		920		Demolition (Concrete)	17		4.13	1	18	18	3	21
		920		Rolling Door (Replacement)	7		4.13	—	7	18	1	8
				Total	24			1	25		4	29
				To Include Siding Repair, etc (Excludes Engineering)					Call			50

REV. DATE CHKD. BY DATE PAGE NO. 1 of

FILE: C:\1[illegible]\LB\CCPCA.WK3

CLIENT Westinghouse/DOE
PROJECT HWVP
LOCATION Hanford
DESCRIPTION Fab Shop
Rolling Door

CONSTRUCTION COSTS

WORK ORDER
CONTRACT
PREPARED BY RCA
DATE 4/21/93
APPROVED BY

A/C NO.	ITEM AND DESCRIPTION	QUANTITY	UNIT	MANHOURS PER UNIT	MANHOURS TOTAL	MANHOURS RATE	COST/UNIT LABOR	COST/UNIT CONTR.	COST/UNIT MATL	COSTS LABOR	COSTS SUBCONTRACT	COSTS MATERIAL	COSTS TOTAL
											EU		
	Rolling Door (12'x20'high)												
	(Means Pg 212-1993)									1100	400	2300	3800
	Demo Old Door									1100	400		1500
	Sub Total									2200	800	2300	5300
	Indirects %									(42.7)	(6.5)	(6.5)	
	Cost									900	100	200	1200
	Total									3100	900	2500	6500

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FORM E-153A REV. 1/89

CLIENT Westinghouse/DOE
PROJECT HWVP
LOCATION Hanford
DESCRIPTION Fab Shop Rail Spur Demo

CONSTRUCTION COSTS

WORK ORDER
CONTRACT
PREPARED BY FCA
DATE 4/21/93
APPROVED BY

A/C NO.	ITEM AND DESCRIPTION	QUANTITY	UNIT	MANHOURS PER UNIT	MANHOURS TOTAL	MANHOURS RATE	COST/UNIT LABOR	COST/UNIT CONTR.	COST/UNIT MATL	COSTS LABOR	COSTS SUBCONTRACT	COSTS MATERIAL	COSTS TOTAL
								EU			EU		
	Floor Slab (Concrete)												
	34' x 55' x 8"												
	= 34 x 55 x 0.67 = 1253 ft³												
	1253/27 = 46.4 CY												
	Call	50	CY										
							$	$					
	Square Ft = 34 x 55 = 8" Thick	1870	ft				5.65	1.04	–	10,600	2000		12,600
	(Means – Pg. 33 – (1993))												
	Indirects %									(42.7)	(6.5)		
	Cost									4500	100		4600
	Total									15100	2100		17200

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FORM E-153A REV. 1/89

CONSTRUCTION COSTS
SUMMARY
TOTAL ESTIMATED COSTS
($1,000)

CLIENT WESTINGHOUSE
PROJECT HWVP
LOCATION RICHLAND, WASH.
DESCRIPTION Fab Shop Rail Spur (Construction)

C.R. NO.
CONTRACT 845734
PREPARED BY PCA
DATE 4/21/93
APPROVED BY

WBS	IEST WBS FACIL CODE	IEST WBS WK PKG	IEST WBS SYST	DESCRIPTION	DIRECT COST $	INDIRECT COST $	% ESCAL	ESCAL $	TOTAL ESCALATED COST $	% CONT	CONTING'Y $	TOTAL ESTIMATED COST $
		180A		R.R. Spur	85		9.47	8	93	18	17	110
		920		Concrete	60		4.13	2	62	18	11	73
				Total	145			10	155		28	183
									Call			200
				(Excludes Engineering)								

REV. _____ DATE _____ CHKD. BY _____ DATE _____ PAGE NO. 4 of 5

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CONSTRUCTION COSTS

CLIENT: Westinghouse/DOE
PROJECT: HWVP
LOCATION: Hanford
DESCRIPTION: Fab Shop Rail Spur RR Trackage

WORK ORDER:
CONTRACT:
PREPARED BY: PCA
DATE: 4/20/93
APPROVED BY:

A/C NO.	ITEM AND DESCRIPTION	QUANTITY	UNIT	MANHOURS PER UNIT	MANHOURS TOTAL	MANHOURS RATE	COST/UNIT LABOR	COST/UNIT ~~CONTR.~~	COST/UNIT MATL	COSTS LABOR	COSTS ~~SUBCONTRACT~~	COSTS MATERIAL	COSTS TOTAL
								EU			Equip. Usage		
1804	R.R Spur												
	Trackage	680	ft	1.0	680	24^{21}		1^{94}	50^{86}	16,500	1300	34,600	52,400
	Switch (Turnout)	1	EA	96	96	24^{20}		1^{94}	15,600	2300	200	15600	18,100
	Car Bumper	1	EA	24	24	20^{20}		1^{96}		600	100	2300	3000
										19,400	1600	52,500	73500
	Indirects %									(42.7)	(6.5)	(6.5)	
	Cost									8300	100	3400	11800
	Total									27700	1700	55900	85,300

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FORM E-153A REV. 1/89

CONSTRUCTION COSTS

CLIENT Westinghouse/DOE
PROJECT HWVP
LOCATION Hanford
DESCRIPTION Fab Shop, Rail Spur Concrete/Excav.

WORK ORDER
CONTRACT
PREPARED BY PCA
DATE 4/21/93
APPROVED BY

A/C NO.	ITEM AND DESCRIPTION	QUANTITY	UNIT	MANHOURS PER UNIT	MANHOURS TOTAL	MANHOURS RATE	COST/UNIT LABOR	COST/UNIT CONTR.	COST/UNIT MATL	COSTS LABOR	COSTS SUBCONTRACT	COSTS MATERIAL	COSTS TOTAL
Pkg													
920	Excav., Backfill				53					1400	3700		5,100
	Concrete				900					25300	2500	14000	41,800
					953					26700	6200	14000	46,900
	Indirects %									(42.7)	(6.5)	(65)	
	Cost									11,400	400	900	12,700
	Total									38,100	6600	14900	59,600

REV. _____ DATE _____ CHKD. BY _____ DATE _____ PAGE NO. 6 of

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FORM E-153A REV. 1/89

CONSTRUCTION COSTS

CLIENT: Westinghouse/DOE
PROJECT: HWVP
LOCATION: Hanford
DESCRIPTION: Fab Shop Rail Spur Excavation & Backfill 02

WORK ORDER:
CONTRACT:
PREPARED BY: PCA
DATE: 4/20/93
APPROVED BY:

A/C NO.	ITEM AND DESCRIPTION	QUANTITY	UNIT	MANHOURS PER UNIT	MANHOURS TOTAL	MANHOURS RATE	COST/UNIT LABOR	COST/UNIT ~~CONTR.~~ *	COST/UNIT MATL	COSTS LABOR	COSTS ~~SUBCONTRACT~~	COSTS MATERIAL	COSTS TOTAL
920	Machine Excavation	400	CY	.07	28	26^{23}		44^{09}		730	1230	—	1960
	Machine Backfill	310	CY	.07	22	26^{23}		109^{13}		580	2400	—	2980
	Haul & Dump	90	CY	.03	3	26^{23}		27^{84}		80	80	—	160
	Total				53					1390	3710		5100
	Call				53					1400	3700		5100

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FORM E-153A REV. 1/89

*Equip. Usage

CONSTRUCTION COSTS

CLIENT: Westinghouse/DOE
PROJECT: HWVP
LOCATION: Hanford
DESCRIPTION: Fab Shop Rail Spur Concrete 03

WORK ORDER:
CONTRACT:
PREPARED BY: PCA
DATE: 4/20/93
APPROVED BY:

A/C NO.	ITEM AND DESCRIPTION	QUANTITY	UNIT	MANHOURS PER UNIT	MANHOURS TOTAL	MANHOURS RATE	COST/UNIT LABOR	COST/UNIT ~~CONSTR.~~	COST/UNIT MATL	COSTS LABOR	COSTS ~~SUBCONTRACT~~	COSTS MATERIAL	COSTS TOTAL
	Railroad Spur Pit												
920	Concrete	90	CY	10	900	28.07		280	156	25,300	2500	14,000	41,800

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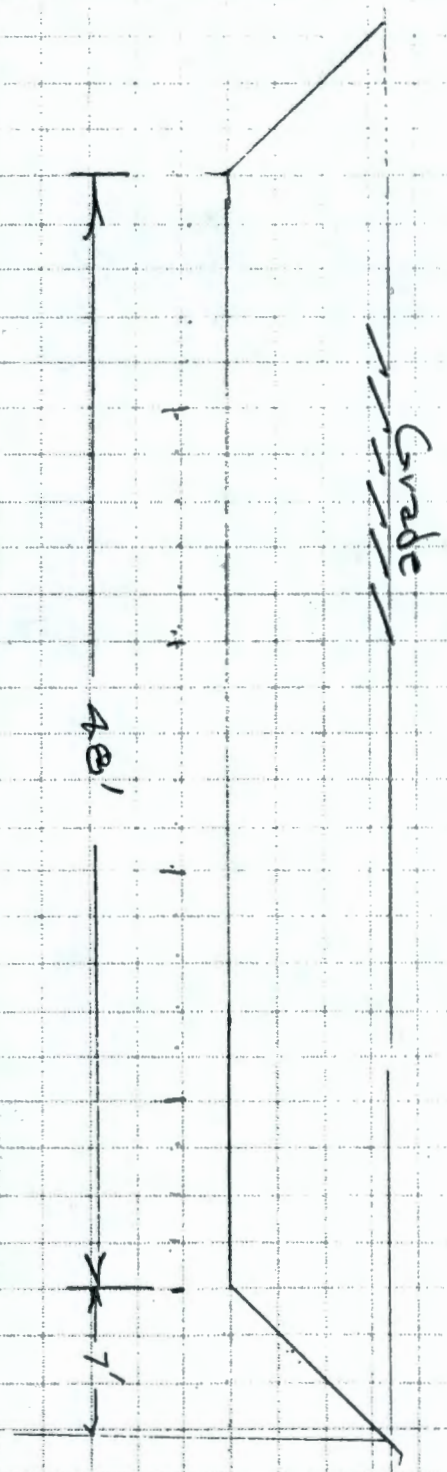
FORM E-153A REV. 1/89

FLUOR DANIEL

CALCULATIONS and SKETCHES

DATE 4/14/93
CONT. NO.
BY PCA CHK'D
SHEET NO. 9 of

Excavation & Backfill



Excavation Quantity

= 189#/Cross Section
For 55' Length

189 x 55 = 10,395 ft³

$\frac{10,395}{27}$ = 385 cu yds

Call 400 cu yds

FORM E-050 REV. 6/88
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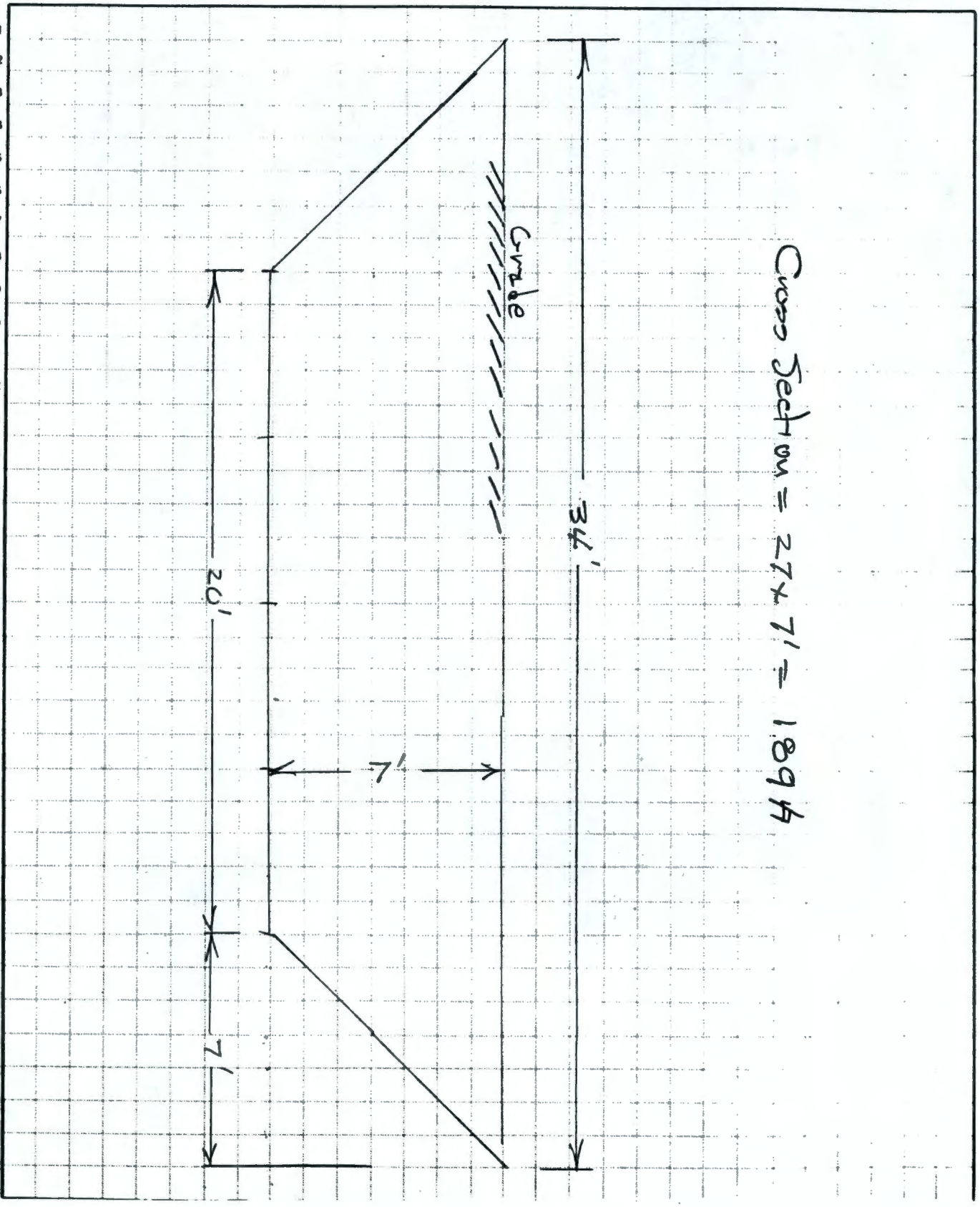
FLUOR DANIEL

CALCULATIONS and SKETCHES

DATE 4/13/93
CONT. NO.
BY PCA CHK'D
SHEET NO. 1 of

Excavation & Backfill



FORM E-050 REV. 6/88
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Concrete Yardage

Pg 1 of

$(11'-4'') \times 2' = 22.66$

$\left[(4 \times 2) + (1 \times 4'-9'')\right] \times 2 = 25.50$

$8 + 4.75$

$48.16\ ft^2$

$\times 48.00$

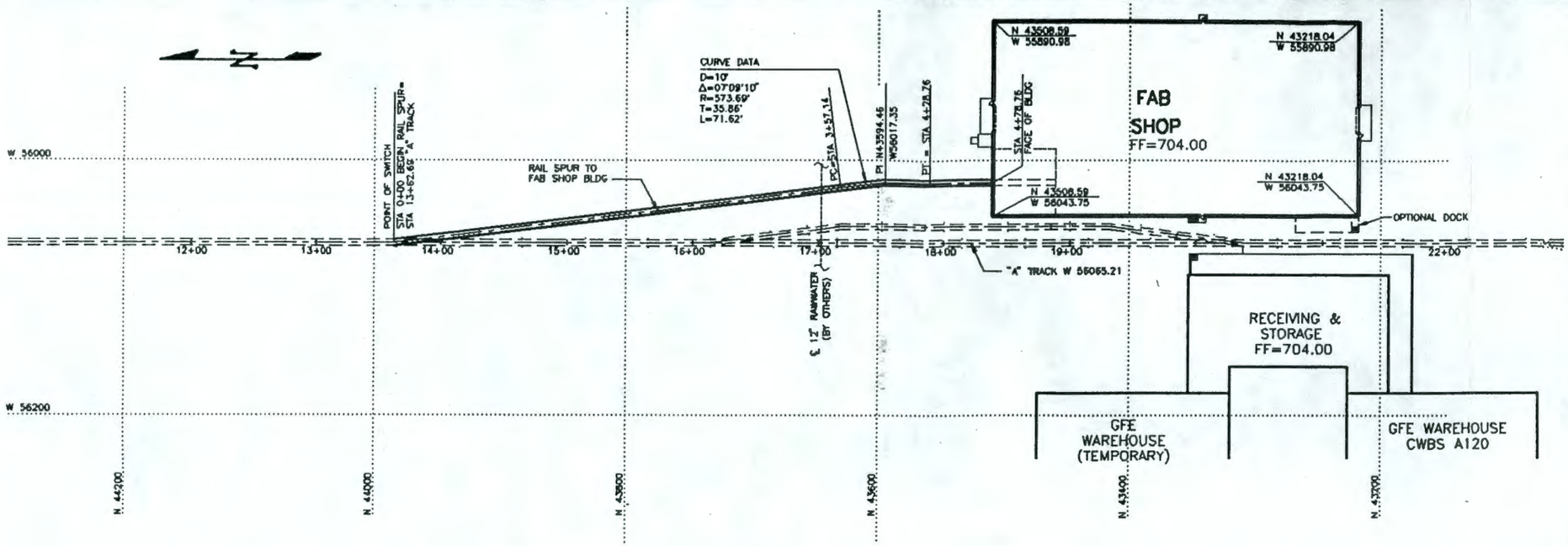
$2311.68\ ft^3$

call $2312\ ft^3$

$= \frac{2312}{27} = 85.63$ Cu Yards

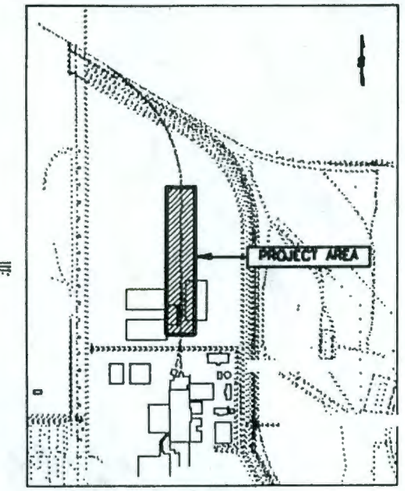
Use 90 Cubic Yds

4/13/93
Herman Chang
X-4211



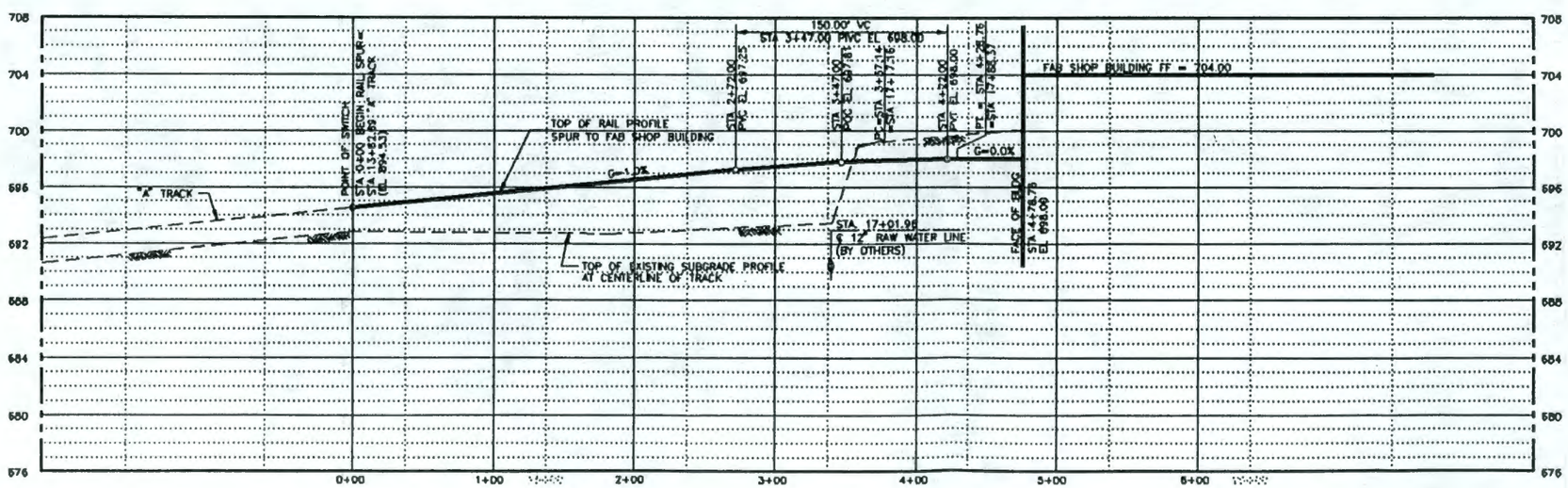
PLAN

SCALE: 1"=40'



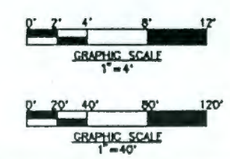
KEY PLAN

NO SCALE



TOP OF RAIL PROFILE - SPUR TO FAB SHOP BUILDING

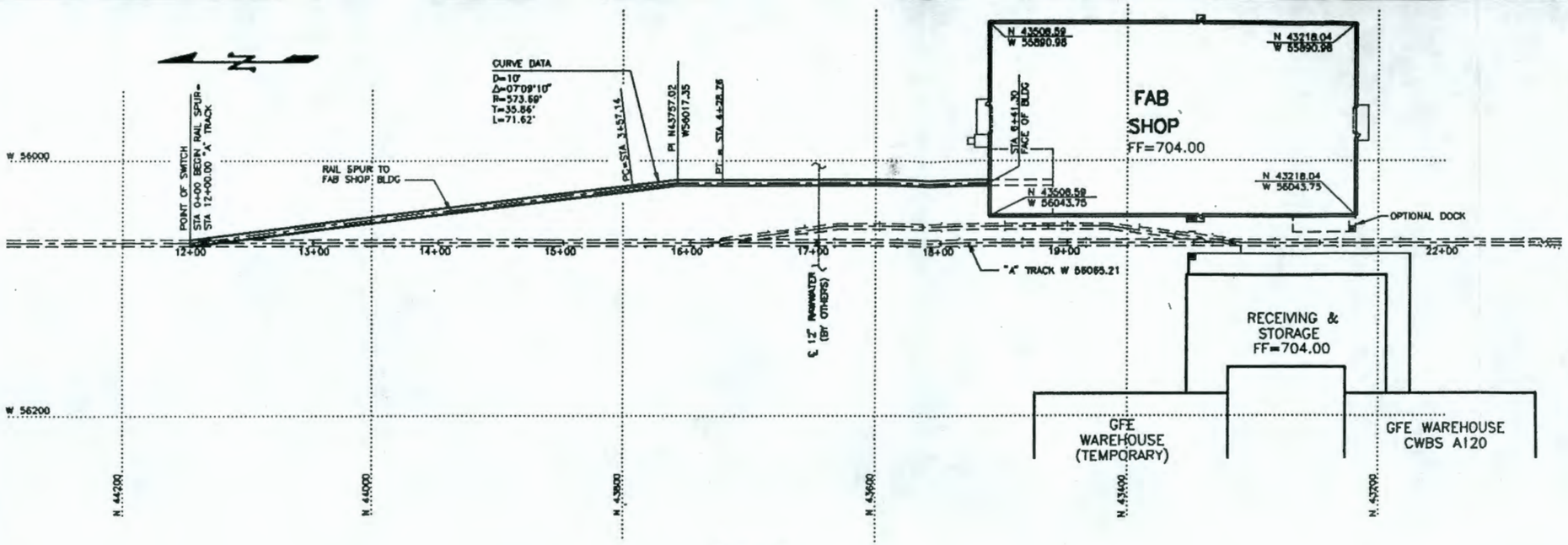
SCALE: HORIZ: 1"=40'
VERT: 1"=4'



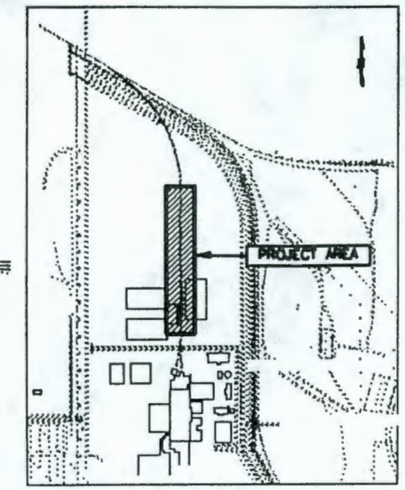
ALTERNATE 5
EXHIBIT "A"

CWBS A920
FAB SHOP RAIL SPUR

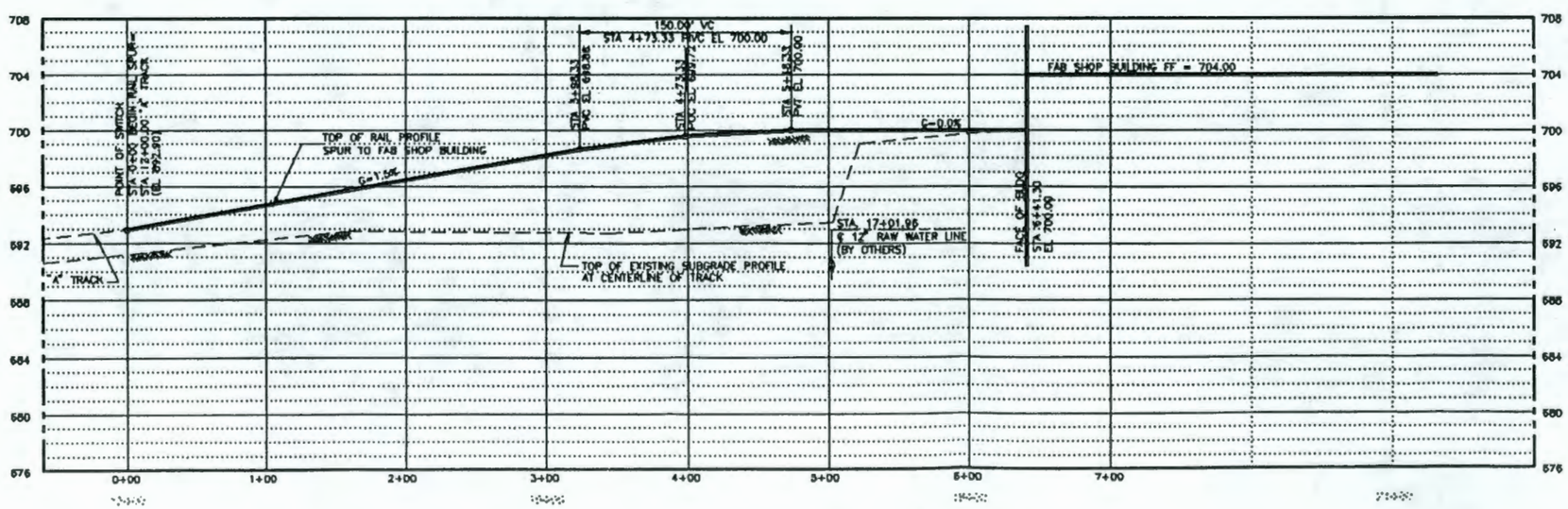
on Apr 13 09:51:02 1993 P_CAD2 Q:\PLL.3\PAA37HCA.PLT



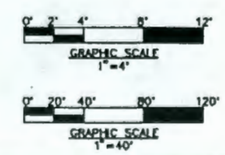
PLAN
SCALE: 1"=40'



KEY PLAN
NO SCALE



TOP OF RAIL PROFILE - SPUR TO FAB SHOP BUILDING
SCALE: HORIZ: 1"=40'
VERT: 1"=4'



ALTERNATE 5
EXHIBIT "B"

CWBS A920
FAB SHOP RAIL SPUR

Apr 09: 49: 51 1993 P_CAD2 Q:\PL S\PAA37HCB.PLT