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TWRS PRIVATIZATION PHASE 1 ROADS AND RAIL SYSTEM MODIFICATIONS ENGINEERING STUDY

R. J. Parazin
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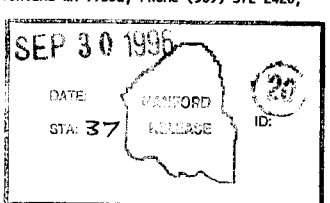
Abstract: The DOE-RL is pursuing a new business strategy of hiring private contractors for treatment of Hanford Site tank wastes. This strategy is called privatization and includes design, permitting , construction, operation and deactivation of facilities for tank waste treatment. The TWRS Privatization Infrastructure Project is part of the first phase of the initiative. It consists of several sub-projects which will provide key physical interfaces and services needed to support the privatization mission. One sub-project is to establish transport system changes needed to support the privatization initiative. Specifically, this study identifies the road and rail system modifications needed to service the privatization site in 200E; an area previously developed and characterized for Grout Disposal.



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ENGINEERING STUDY

TWRS PRIVATIZATION PHASE I

ROADS AND RAIL SYSTEM MODIFICATIONS

WORK ORDER E23378

Prepared for

Westinghouse Hanford Company

September 1996

Subcontract WHC 380393

Prepared by

ICF Kaiser Hanford Company
Richland, Washington

ENGINEERING STUDY

TWRS PRIVATIZATION PHASE I

ROADS AND RAIL SYSTEM MODIFICATIONS

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for

Westinghouse Hanford Company

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ABBREVIATIONS

DOE	U.S. Department of Energy
DOE-RL	U.S. Department of Energy, Richland Operations Office
HLW	High Level Waste
IP	Infrastructure Project
LAW	Low Activity Waste
PC	Privatization Contractor
Purex	Plutonium-uranium extraction
RFP	Request for Proposal
TWRS	Tank Waste Remediation System
WHC	Westinghouse Hanford Company

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ENGINEERING STUDY

TWRS PRIVATIZATION PHASE I

ROADS AND RAIL SYSTEM MODIFICATIONS

1.0 INTRODUCTION

1.1 PURPOSE

The purpose of this study is to establish requirements for roads and rail system modifications, develop alternatives that meet these requirements and determine the preferred alternatives to support TWRS Privatization Phase 1.

1.2 BACKGROUND

The DOE-RL is pursuing a new business strategy of hiring private contractors for treatment of Hanford Site tank wastes. This strategy is called privatization and includes design, permitting, construction, operation and deactivation of equipment and facilities for treatment of tank wastes. Phase I of the privatization includes supernatant pretreatment, low activity waste (LAW) immobilization, and an optional high-level waste (HLW) immobilization by two competing vendors. The TWRS Privatization Infrastructure Project (IP) is a part of the first phase of the privatization initiative. The IP consists of several sub-projects which will provide key physical interfaces and services needed to support the privatization mission. This sub-project is to establish roads and rail system modifications.

In conjunction with preparation of the TWRS RFP (RL, 1996) for the solicitation of Privatization Contractors (PC), a location was selected for the Phase I facilities (Shord, 1996). The area selected was previously developed and characterized for the Grout Disposal Site. The area selected is east of the major 200E road and rail network, thus will require modifications and additions to the existing transportation corridors.

1.3 SCOPE

This study documents alternative routings for roads and rail and makes recommendations for the best alternatives. Schedules and estimates for the design and construction of the recommended alternative are also included in this study.

1.4 ASSUMPTIONS

After final review, the Site Development Engineering Study will conclude that the orientation for the PC sites will be substantially the same as shown on sketches ES-E23378-C-002 or -C-003.

2.0 SUMMARY AND CONCLUSIONS

2.1 SUMMARY

Two alternative routings and improvements of roads from Route 4S to the site are considered and evaluated, as are two alternatives from the north off Canton Ave with a variation of one of the alternatives. A connecting road is necessary between roads from Route 4S and from the north. Alternative internal roads for delivery of the product canisters to the existing grout vaults are considered. If direct rail access to the site is required, four possible routings are considered. If direct rail access is not required, the use of existing sidings is considered.

2.2 CONCLUSIONS

Alternative 1 as shown on sketch ES-E23378-C-001 from Route 4S to the site is clearly superior to alternative 2.

Alternative 1 as shown on sketch ES-E23378-C-002 is the best routing for access from the north.

If direct rail access to the site is required, Alternative 1 as shown on sketch ES-E23378-C-004 is the only feasible routing. Also, the existing rail siding that could best serve the site is shown on that same sketch.

3.0 DESCRIPTION OF ALTERNATIVES

3.1 CRITERIA

The concept of privatization requires that the Privatization Contractors (PC) selected should be free to develop and operate its facilities with little impact from existing activities. The site evaluation report (Shord, 1996) and road assessment report (Trost, 1996) emphasized this concept by recommending access to the PC sites from Route 4S with minimal interference with existing road traffic.

Preliminary studies for development of the site indicate the two Phase I PC should be oriented as close as possible to the west boundary of the site as shown on sketches ES-E23378-C-002 and -C-003. Access to each PC site should be as equal as possible. Additionally, a separate access should be required for safety if the access from Route 4S is blocked for any reason. Access is also needed for transportation of LAW product canisters (Burbank, 1996) and HLW product canisters (Calmus, 1996) to sites at Hanford.

Criteria for roads include primary access to be from Route 4S with minimal interference with existing traffic, design of road for 300 to 400 vehicles per day and access to each PC site be as equal as possible (Trost, 1996). For additional criteria, see Section 4.0 of this report. Traffic count for the north access should be less than 50% of that estimated for access from Route 4S, but the same paving and shoulder dimensions will be utilized.

The TWRS RFP (RL, 1996) offers use of the existing rail network only and direct rail access to the PC site is not included. If however, extension of the rail service network to the PC site is negotiated as a part of Phase I, design of rail should conform to *Railroad Design Criteria* (Ruben, 1996). For purposes of this study, the critical requirements for a process track are a maximum grade of 1% and a minimum radius of curvature of 291.2 meter(955.37 ft.)

3.2 ALTERNATIVES CONSIDERED

3.2.1 Roads

3.2.1.1 South Road Access. Sketch ES-E23378-C-001 shows two alternative routes to access the site from Route 4S. Alternative 1 includes improving access to Canton Ave. from Route 4S by addition of a 457 meter (1,500 ft.) acceleration lane for egress from Canton Ave. to the east, a 183 meter(600 ft.) acceleration lane to the west and a 183 meter (600 ft) left turn to the west. With these changes there will be full access to and from Canton Ave to Route 4S. Presently, there is access only from 4S to Canton Ave and about 200 vehicles per day use this route to reach Purex and the East Tank Farms. Minor grading and widening of

Canton Ave. from 4S to 1st St. would be required (see PHOTO 1, Appendix A). Canton Ave. would be widened from 6 meter (20 ft.) to 7.3 meter (24 ft.) pavement width and be overlaid with asphalt for about 598 meter (1960 ft.) to the junction with the East-West road to the site. Access from Canton Ave. to this road would require about 30 meter (100 ft.) of new road with provisions for a right turn lane from Canton Ave. Additionally, one power pole would have to be removed and replaced (see PHOTO 2). New lighting would be required at the intersections of Canton Ave. and Route 4S and Canton and the East-West road to the site.

The existing 1 000 meter (3300 ft.) road that ends just inside the Grout Disposal Site fence would be widened 6 meter (20 ft.) paving with 0.6 meter (2 ft.) shoulders to 7.3 meter (24 ft.) paving with 1.2 meter (4 ft.) shoulders (see PHOTO 3). Widening would be to the north side only since the existing berm to the south should be retained.

Alternative 2 shown on the same sketch would be a new road constructed from Route 4S to intersect the existing road into the grout site. This new road would be located to meet sight distance requirements to the 200 East Hill on Route 4S. The existing slow traffic lane for the 200 East Hill would be extended to the new intersection for a deceleration and right turn lane. Additional lanes as noted for Alternative 1 would be required for complete access from the new road to Route 4S. The new road would cross about 700 meter (2300 ft.) of rolling terrain which would require considerable excavation and grading. This road would have 7.3 meter (24 ft.) paving with 1.2 meter (4 ft.) shoulders. This alternative would include widening the existing paved road for about 76 meter (250 ft.) into the site. Lighting would be required at the intersection of the new road and Route 4S.

No matter what alternative route is chosen either from the south or the north a connector road would be required as shown on sketch ES-E23378-C-001. Length of this connector road would be about 550 meter (1800 ft.) (see PHOTO 4).

3.2.1.2 North Road Access. Alternative 1 for the access road to the north as shown on sketch ES-E23378-C-002 would require an intersection with Canton Ave. (see PHOTO 5), but no special turning lanes would be required since Canton Ave. at this point has limited traffic at low speeds. This road right-of-way traverses generally level grade to Snows Canyon (216-A-29 Ditch) where a 4.5 meter (15 ft.) high fill with an approximate volume of 7 650 cubic meters (10,000 cubic yards) would be required. Remainder of the road to the junction with the connector road would be essentially level. Length of this alternative would be approximately 815 meter (2670 ft.). Road right-of-way and fill would be a corridor for various utilities (see Engineering Studies, *TWRS Privatization Phase I, Raw and Potable Water Service,* WHC-SD-TWR-ES-002 and *TWRS Privatization Phase I, Liquid Effluent Transfer Systems,* WHC-SD- WM-ES-396).

Alternative 2 as shown on sketch ES-E23378-C-003 would have less of an impact on the characterization and remediation activities necessary for the clean up of Snows Canyon. This alternative uses the right-of-way of an existing gravel road just north of the fence on the north side of the grout facility (see PHOTO 6). The existing road could be used as a sub-base to which a road base and pavement could be added with little disturbance of the potentially contaminated soil in this area. Length of this alternative is about 870 meter (2850 ft.). Alternative 2A, a variation on Alternative 2, would change access to PC parcel "A" to the south from the north as shown for alternatives 1 and 2. Estimated length of this alternative is 810 meter (2660 ft.).

3.2.1.3 Site Interior Roads and Phased Construction. The draft report for interim storage of immobilized low level waste (Burbank, 1996) recommends the four existing empty grout vaults just west of the PC sites be used for interim storage of the LAW canisters produced by the PC. The proposed interior roads as shown on sketches ES-E23378-C-002 and -C-003 would allow access from both PC sites (see PHOTO 7). The proposed interior roads could be gravel with a dust suppressant surface, and be 6.1 meter (20 ft.) wide. There would be about 1 000 meter (3,600 ft.) for layout shown on -C-002 and about 1 meter (3,500 ft.) for the layout shown on -C-003.

The draft report also noted a possible need for additional interim storage. Sketches ES-E23378-C-002 and -C-003 show possible outline of this additional storage vault, required excavation areas and construction road access to the bottom of the excavation.

To protect new and upgraded roads from rough construction traffic and to minimize significant capital expenditures early in the project, existing roads should be utilized as much as possible during most of the construction period. Alternative 1 from Route 4S to Canton Ave. to the site. would be constructed as outlined above except that widening and resurfacing Canton Ave. and the East-West road to the site would be deferred. None of the connecting road would be constructed, instead existing gravel roads would be used for access to the PC sites. To the north about 60 meter (200 ft.) of new gravel road would be constructed on the right-of-way for Alternative 1 to the existing gravel road from Canton Ave. Then the existing gravel road that leads to the gate into the Grout Disposal Site as shown on sketch ES-23378-C-002 would be utilized. The road is rough so regrading and additional gravel may be needed. This road is about 490 meter (1600 ft.) long. Right-of-way for Alternative 1 to the north may be cleared, rough graded and fill placed over Snows Canyon early in the project to support installation of raw and sanitary water and liquid effluent lines.

3.2.2 Rail

Sketch ES-E23378-C-004 shows possible rail alternatives to the site. Alternative 1 routing meets the criteria of a maximum 1% grade and a minimum radius of curvature of

291.2 meter (955.37 ft.). This proposed process track would begin at the siding that serves the 200 East steam plant for coal unloading, proceed south to just north of 1st St., east to south of Purex disposal tunnel, thence northeasterly across Canton Ave.to just south of the existing road to the Grout Disposal Site. This routing could also serve the west and south sides of the proposed Privatization Phase II site (Shord, 1996). Length of this process track would be 3.3 km (2.06 miles).

Alternative 2 from Purex spurs to the site does not meet either the grade or curvature requirements in an already crowded corridor.

Alternative 3 from "B " plant spur could not meet grade or curvature requirements because grade changes would require 1.9 km (1.2 miles). of track though an area crowded with contaminated cribs.

Alternative 4 from the main line into the site could not meet the grade or alignment requirements. Maintaining the 1% maximum grade would require more than 5.8 km (3.6 miles of track). Additionally, "B" plant and treated effluent ponds are in the way of a direct routing.

If direct rail access to the site is not required, existing sidings could be used for unloading equipment and materials for both construction and operation by the PC. Hauling oversized loads on existing and proposed roads could be coordinated with other road users. A siding to be useful should be near to the site, with good road access, grade near track level and at nearly same elevation as the track, room for at least six railcars and room for spotting a crane and semi-truck.

None of the sidings into Purex meet all of the above criteria. Sketch ES-E23378- C-004 shows siding that served for unloading grout materials and is no longer needed for that purpose, does meet all of the criteria (see PHOTO 8). Additionally a car puller is available as is the unloading facility,both of which may be useful. Road access is good, but best access may be to use Baltimore Ave. and Route 4S instead of the more direct but crowded corridor through the East Tank Farms. Privatization Phase II site study (Shord, 1996) indicates that this siding would be removed as part of Phase II site development. At that time, another siding could be used.

4.0 IDENTIFICATION OF PREFERRED ALTERNATIVES

4.1 EVALUATION OF ALTERNATIVES

4.1.1 Roads from Route 4S

Criteria	Alternative 1	Alternative 2
Ecology, Natural resource	All improvements in existing, disturbed right of way .	Road right-of- way traverses 700 meter (2300 ft.) of unfragmented, high quality, late successional, sage brush steppe habitat. Estimate 2.1 ha (5.2 acres) will be disturbed.
Road Safety	Will share route with up to 200 vehicles per day to PUREX and East Tank Farms. Can mitigate with right turn lane from Canton to the east, with Canton traffic from the north being required to yield.	New route will be used exclusively by PC.
Cost	Capital- $535,000 Maintenance/yr- $5,000	Capital $ 554,000 Maintenance/yr $4,000
Risk	Low- all improvements within existing rights-of way.	High- added costs and time for Environmental Assessment and habitat replacement.

4.1.2 Roads from the North

Criteria	Alternative 1	Alternative 2 and 2A
Ecology, Natural Resources	Road right-of-way traverses about 490 meter (1600 ft.) of medium sized sage brush steppe, fragmented between cribs and Snows Canyon. Estimated 0.6 ha (1.5 acres) will be disturbed. Fill will cover about 1860 sq. meter (20,000 sq. ft) of area within Snows Canyon.	Road right-of-way traverses about 182 meter (600ft.) of same area as Alternative 1. Estimated 0.33 ha (0.8 acres) will be disturbed. Road work effects about 372 sq. meter (4,000 sq.ft.) of area within Snows Canyon.
Traffic Safety	New intersection should have little effect on low speed and sparse traffic on Canton Ave. New road level and nearly straight.	Same effect as Alternative 1 on Canton Ave. Reduced speed through Snows Canyon area since shoulder width is narrowed. Alternative 2A would require movement of product canisters across road.
Cost	Capital $ 516,000 Alt.1 plus $185,000 for connector road. Total $ 701,000. Maintenance/yr $4500	Capital Alt. 2 $481,000 plus $185,000 for connector road. Total $666,000. Maintenance/ yr $5,000. Alt. 2A $372,000 plus $185,000 for connector road. Total $ 557,000. Maintenance/yr $4,000
Risk	Medium- characterization and remediation of area under fill may require removal of some or all of the fill. Environmental Assessment (EA) probably required.	Medium- Characterization and remediation effects a relatively small area. EA probably not required. Right-of-way for Alternative 2A would interfere with LAW feed lines.

4.2 PREFERRED ALTERNATIVES

4.2.1 South Road Access

Alternative 1 is clearly the preferred alternative from Route 4S to the site with the only negative being a slightly increased risk of traffic accidents because of mixed traffic on Canton Ave. New route will be made primary route with traffic on Canton required to yield.

4.2.2 North Road Access

Alternative 1 is the preferred routing from Canton Ave. on the north. It is slightly more expensive than Alternative 2A, however, it has advantages such as reduced risk of traffic accidents because of the narrow shoulders at the Snows Canyon crossing and product canisters crossing the road near the PC sites. This route is the most direct and avoids conflicts with routing LAW feed lines to Parcel A. Also, this route will share rights-of-way with raw and potable water (Fort, 1996) and liquid effluent (Palit, 1996), whereby development costs (EA, RCRA issues, etc.) for crossing of Snows Canyon will be shared.

Should the preferred site development strategy change, the preferred access from the north could favor Alternative 2A.

4.2.3 Rail Access

Alternative 1 of the rail alternatives appears to be the only feasible route for direct rail access to the site. Although other rail sidings may be available, the siding identified on sketch ES-E23378-C-004 meets all the criteria well.

4.2.4 Road and Rail Maintenance

A study of the road network for the Hanford Site (Messinger, 1996) concluded that Route 4S would continue to be the primary road access for the entire site and as such would be maintained at a high level for years to come. Maintenance of the approximate 3.4 km (2.1 miles) of new and upgraded roads to the Privatization Phase 1 site must be continued for the expected period of use through the year 2011. In addition to routine maintenance this road would probably require a chip seal coating at least once during its life. Maintenance of Canton Ave. to the north should continue at a high level because of all the tank farm activity in the area. Continued operation and maintenance of the rail network is the subject of a recent report (Trost, 1995). The report concludes that maintenance of the mainline of the rail network should continue well beyond the year 2000.

4.3 UNCERTAINTIES

Routing of roads from the north, through the site and interior roads could change considerably if the location of the PC sites change significantly from that assumed by this study.

Extent of maintenance for the rail network is subject to continuing review, but maintenance of the railway into 200 East should have the highest priority.

5.0 IMPLEMENTATION RECOMMENDATIONS

The alternatives previously identified as preferred should be constructed to serve the Privatization Phase 1 site for the roads. If rail service to the site is required, the alternative identified is the only feasible choice, with a preferred siding also identified.

Road access from the south to Route 4S, which is the primary road connections to the Hanford Site (Messinger, 1996) is direct with little interference with existing intra-site traffic. Secondary access to the north should be compatible with future uses.

Rail system is under utilized at this time (Trost, 1995), so any use by the Privatization Phase I PC would be a plus.

6.0 REFERENCES

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APPENDIX A

PHOTOS

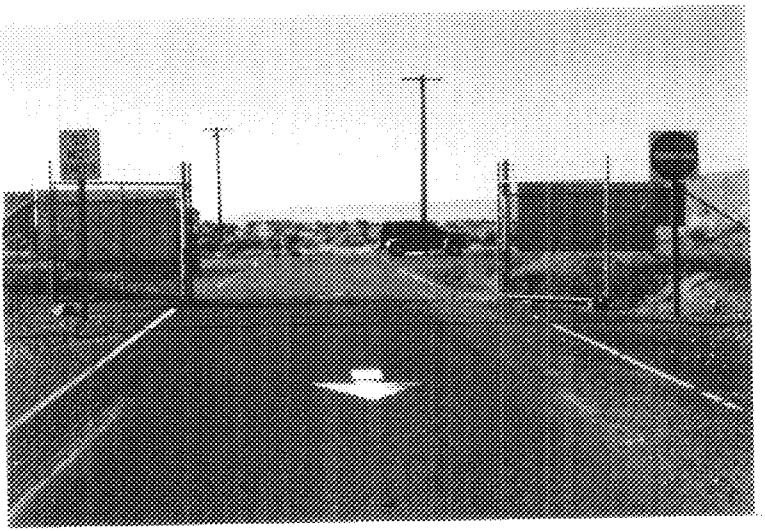

PHOTO 1. Canton Ave. looking south to Route 4S. Road and opening in gate will be widened.

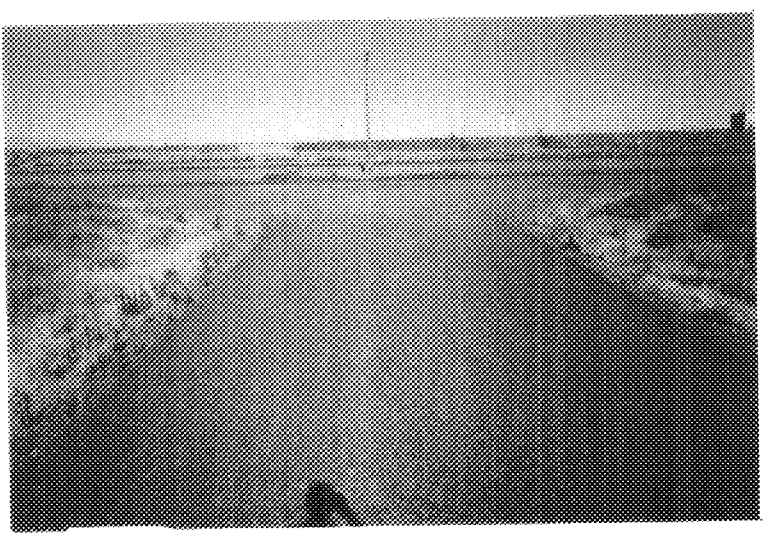

PHOTO 2. East-west access road to Grout Disposal Site looking west to Canton Ave. Pole would need to be moved and connecting road constructed.

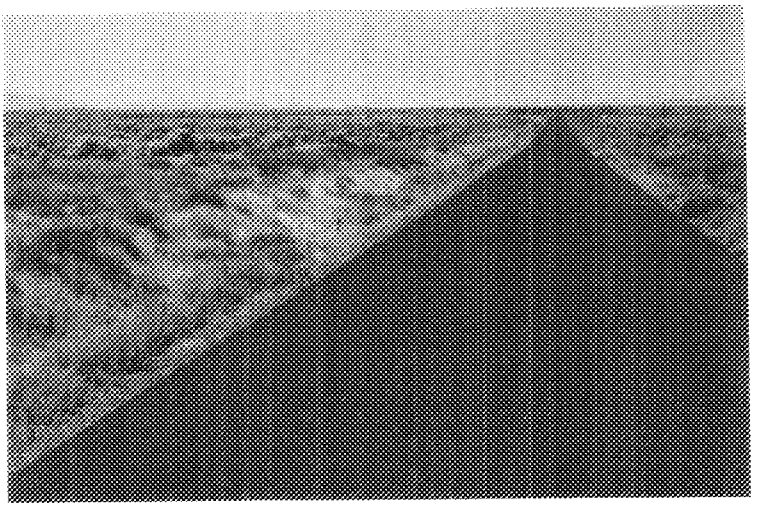

PHOTO 3. East-west access road to Grout Disposal Site looking west. Berm on left will be maintained.

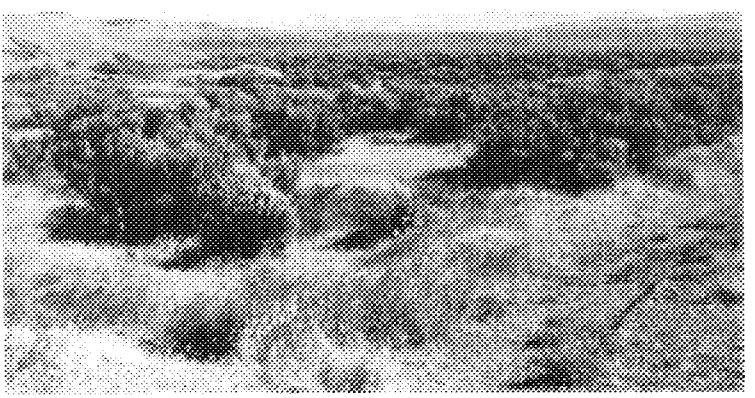

PHOTO 4. Route of connecting road looking north on east side of PC sites.

PHOTO 5. Looking west to Canton Ave. at location of junction with alternatives 1, 2 and 2A north access roads.

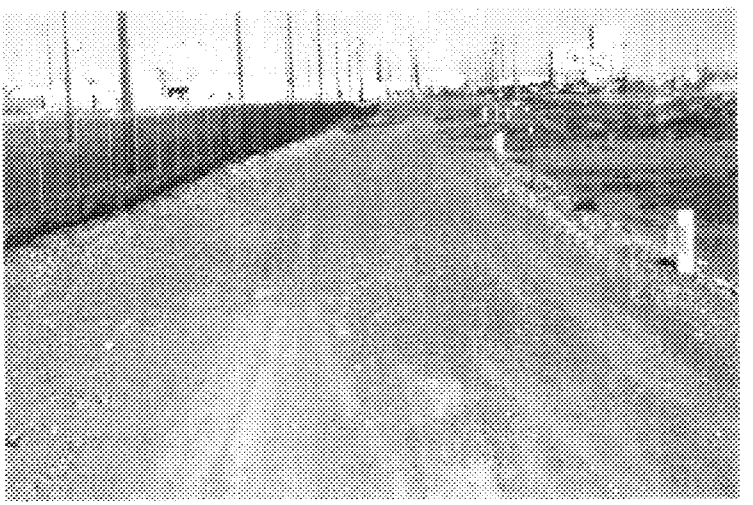

PHOTO 6. Route of north access roads alternative 2 and 2A through Snows Canyon looking west. Minimum clearance from fence to posts is 8.5m (28 ft.)

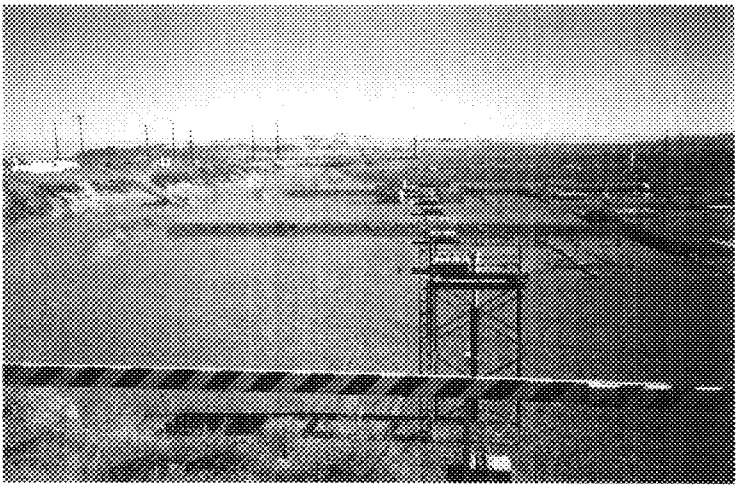

PHOTO 7 Existing buried grout vaults looking north. Access road for delivery of product canisters would be about where existing road is on the left.

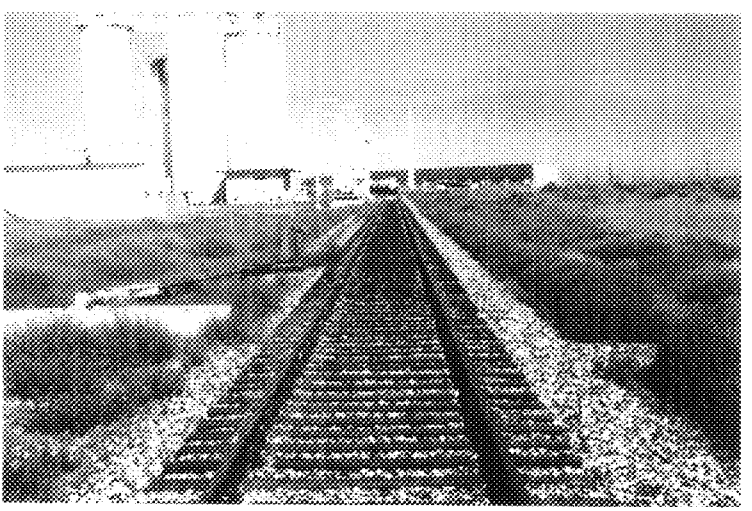

PHOTO 8. Preferred siding showing car puller on the left and unloading and storage facility in the background.

APPENDIX B

ESTIMATES

ESTIMATED COST OF ALTERNATIVES

Alternative	Base Constr. Cost	Definitive & Field Eng.x30%	Contingency x1.25	Add Total Constr. Cost	Total
1-South	281,365	84,409	105,512	429,082	534,594
2-South	291,565	87,470	109,337	444,637	553,974
N/S Conn.	97,190	29,157	36,446	148,215	184,661
1-North	271,700	81,510	101,888	414,343	515,231
2-North	252,930	75,879	94,849	385,718	480,567
2A-North	195,595	58,679	73,348	298,282	371,630

COST CODE	DESCRIPTION	ESCALATED TOTAL COST	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
460	IMPROVEMENTS TO LAND	3,076,000	25	769,000	3,845,000
	(ADJUSTED TO MEET DOE 5100.4)				
	PROJECT TOTAL	3,076,000	25	769,000	3,845,000

B-2

TOTAL OF ALL ALTERNATIVES, SEE PAGE B-1 FOR BREAKDOWN OF EACH ALTERNATIVE.

R. ACKERMAN
9/20/96

WHC-SD-TWR-ES-004, REV. 0

TYPE OF ESTIMATE: STUDY ESTIMATE	SEPTEMBER 6, 1996
ARCHITECT ENGINEER: Kadlewick	
OPERATING CONTRACTOR:	

REMARKS: ESTIMATE IS CONSTRUCTION ONLY

THIS ESTIMATE DOES NOT INCLUDE ANY: ENGINEERING, PROJECT MANAGEMENT, ESCALATION

SEE PAGE B-1 FOR ESTIMATE

(ROUNDED/ADJUSTED TO THE NEAREST " 1,000 / 10,000 " - PERCENTAGES NOT RECALCULATED TO REFLECT ROUNDING)

WBS	DESCRIPTION	ESTIMATE SUBTOTAL	ONSITE INDIRECTS	SUB TOTAL	ESCALATION %	ESCALATION TOTAL	SUB TOTAL	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
20001	CANTON TO 4S & E/W CONNECTOR	281365	61900	343265	0.00	0	343265	25	85816	429082
20002	4S TO E/W CONNECTOR	291547	64140	355687	0.00	0	355687	25	88922	444609
20003	N/S CONNECTOR	97190	21382	118572	0.00	0	118572	25	29643	148215
20004	ALTERNATE 1 NORTH	271700	59774	331474	0.00	0	331474	25	82869	414343
20005	ALTERNATE 2A NORTH	195595	43031	238626	0.00	0	238626	25	59656	298282
20006	ALTERNATE 2 NORTH	252930	55645	308575	0.00	0	308575	25	77144	385718
20007	INTERNAL GRAVEL ROAD	39650	8723	48373	0.00	0	48373	25	12093	60466
20008	RAILROAD	1091100	240042	1331142	0.00	0	1331142	25	332786	1663928
SUBTOTAL 32	CONSTRUCTION-FIXED PRICE	2521077	554637	3075714	0.00	0	3075714	25	768929	3844643
SUBTOTAL 3	CONSTRUCTION	2521077	554637	3075714	0.00	0	3075714	25	768929	3844643
ROJECT TOTAL		2,521,077	554,637	3,075,714	0.00	0	3,075,714	25	768,929	3,844,643

ITEM 3200007 GRAVEL ROAD TOTAL COST — TOTAL

= 39,650 x .30 x 1.25 = 14,869 + 60,466 = 75,335

ERROR.

ITEM 3200& RAIL ROAD

= 1,091,100 x .30 x 1.25 = 409,163 + 1,663,928 = 2,073,091

COST CODE/WBS	DESCRIPTION	ESTIMATE SUBTOTAL	ONSITE INDIRECTS	SUB TOTAL	ESCALATION %	ESCALATION TOTAL	SUB TOTAL	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
460	IMPROVEMENTS TO LAND									
320001	CANTON TO 4S & E/W CONNECTOR	281365	61900	343265	0.00	0	343265	25	85816	429082
320002	4S TO E/W CONNECTOR	291547	64140	355687	0.00	0	355687	25	88922	444609
320003	N/S CONNECTOR	97190	21382	118572	0.00	0	118572	25	29643	148215
320004	ALTERNATE 1 NORTH	271700	59774	331474	0.00	0	331474	25	82869	414343
320005	ALTERNATE 2A NORTH	195595	43031	238626	0.00	0	238626	25	59656	298282
320006	ALTERNATE 2 NORTH	252930	55645	308575	0.00	0	308575	25	77144	385718
320007	INTERNAL GRAVEL ROAD	39650	8723	48373	0.00	0	48373	25	12093	60466
320008	RAILROAD	1091100	240042	1331142	0.00	0	1331142	25	332786	1663928
TOTAL 460	IMPROVEMENTS TO LAND	2521077	554637	3075714	0.00	0	3075714	25	768929	3844643
PROJECT TOTAL		2,521,077	554,637	3,075,714	0.00	0	3,075,714	25	768,929	3,844,643

ICF KAISER HANFORD
WESTINGHOUSE HANFORD COMPANY
JOB NO. Z421SAA1/P6P400
FILE NO. Z421SAA1

** TEST - INTERACTIVE ESTIMATING **
PRIVITIZATION, ROAD & RAIL SYSTEM
STUDY ESTIMATE
DOE_R05 - ESTIMATE SUMMARY BY CSI DIVISION

PAGE OF
DATE 09/06/96 13:27:39
BY KLR

CSI	DESCRIPTION	ESTIMATE SUBTOTAL	ONSITE INDIRECTS	SUB TOTAL	ESCALATION %	ESCALATION TOTAL	SUB TOTAL	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
CONSTRUCTION										
02	SITEWORK	2521077	554637	3075714	0.00	0	3075714	25	768929	3844643
TOTAL CONSTRUCTION		2,521,077	554,637	3,075,714	0.00	0	3,075,714	25	768,929	3,844,643
PROJECT TOTAL		2,521,077	554,637	3,075,714	0.00	0	3,075,714	25	768,929	3,844,643

ICF KAISER HANFORD
WESTINGHOUSE HANFORD COMPANY
JOB NO. Z421SAA1/P6P400
FILE NO. Z421SAA1

** TEST - INTERACTIVE ESTIMATING **
PRIVITIZATION, ROAD & RAIL SYSTEM
STUDY ESTIMATE
DOE_R07 - ONSITE INDIRECT COSTS BY WBS

DATE 09/06/96 13:27:58
BY KLR

WBS	DESCRIPTION	ESTIMATE SUBTOTAL	CONTRACT ADMINISTRATION %	CONTRACT ADMINISTRATION TOTAL	BID PACK PREP.	OTHER INDIRECTS	TOTAL INDIRECTS
320001	CANTON TO 4S & E/W CONNECTOR	281365	22.00	61900	0	0	61900
320002	4S TO E/W CONNECTOR	291547	22.00	64140	0	0	64140
320003	N/S CONNECTOR	97190	22.00	21382	0	0	21382
320004	ALTERNATE 1 NORTH	271700	22.00	59774	0	0	59774
320005	ALTERNATE 2A NORTH	195595	22.00	43031	0	0	43031
320006	ALTERNATE 2 NORTH	252930	22.00	55645	0	0	55645
320007	INTERNAL GRAVEL ROAD	39650	22.00	8723	0	0	8723
320008	RAILROAD	1091100	22.00	240042	0	0	240042
PROJECT TOTAL		2,521,077		554,637	0	0	554,637

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320001	CANTON TO 4S & E/W CONNECTOR										
320001.02	SITEWORK										
320001.0200002	**********	460	1 LS	0	0	0	0	0	0	0	0
	ACCEL/DECEL LANES										
	**********										
320001.0200004	ASPHALT CUTTING	460	1 LS	0	0	0	0	750	0	0	750
320001.0200006	ASPHALT REMOVAL	460	1 LS	0	0	0	0	1500	0	0	1500
320001.0200008	EXCAVATION	460	1900 CY	0	0	0	0	5700	0	0	5700
320001.0200010	FINE GRADING	460	7700 SY	0	0	0	0	5775	0	0	5775
320001.0200012	6" 1-1/4"-0 BASE COURSE	460	2330 TON	0	0	0	0	34950	0	0	34950
320001.0200014	3" 5/8"-0 BASE COURSE	460	1175 TON	0	0	0	0	18800	0	0	18800
320001.0200016	4" CL-B ASPHALT	460	1100 TON	0	0	0	0	44000	0	0	44000
320001.0200018	WATER FOR CONSTRUCTION	460	400 MG	0	0	0	0	2800	0	0	2800
320001.0200020	SURVEY	460	1 LS	0	0	0	0	5000	0	0	5000
320001.0200022	MOBE/DEMOBE	460	1 LS	0	0	0	0	2000	0	0	2000
320001.0200024	MISC. STRIPING/SIGNS	460	1 LS	0	0	0	0	5000	0	0	5000
320001.0200026	TRAFFIC CONTROL	460	1 LS	0	0	0	0	3500	0	0	3500
320001.0200028	MISC. STABILIZATION	460	1 LS	0	0	0	0	7500	0	0	7500
320001.0200040	**********	460	1 LS	0	0	0	0	0	0	0	0
	OVERLAY										
	**********										
320001.0200042	BROOMING & CLEAN UP	460	1 LS	0	0	0	0	8000	0	0	8000
320001.0200044	TACK COAT	460	2000 GAL	0	0	0	0	4000	0	0	4000
320001.0200046	2" CL-B ASPHALT	460	1500 TON	0	0	0	0	63000	0	0	63000
320001.0200050	**********	460	1 LS	0	0	0	0	0	0	0	0
	WIDEN EXISTING ROADWAY										
	**********										
320001.0200052	EXCAVATION	460	1200 CY	0	0	0	0	6000	0	0	6000
320001.0200054	FINE GRADING	460	5600 SY	0	0	0	0	4200	0	0	4200
320001.0200056	6" CRUSHED ROCK	460	1500 TON	0	0	0	0	22500	0	0	22500
320001.0200058	3" CLASS B ASPHALT	460	400 TON	0	0	0	0	20000	0	0	20000
320001.0200060	WATER FOR CONSTRUCTION	460	270 MG	0	0	0	0	1890	0	0	1890
320001.0200062	SURVEY	460	1 LS	0	0	0	0	5000	0	0	5000
320001.0200064	MOB/DEMOB	460	1 LS	0	0	0	0	1000	0	0	1000
320001.0200066	MISC STRIPING/SIGNS	460	1 LS	0	0	0	0	2000	0	0	2000
320001.0200068	TRAFFIC CONTROL	460	1 LS	0	0	0	0	1500	0	0	1500
320001.0200070	MISC. STABILIZATION	460	1 LS	0	0	0	0	5000	0	0	5000
SUBTOTAL	SITEWORK			0	0	0	0	281,365	0	0	281,365
TOTAL	COST CODE 46002 WBS 320001			0	0	0	0	281,365	0	0	281,365

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
	(ESCALATION 0.00% - CONTINGENCY 25.00 %)										
TOTAL WBS 32000	CANTON TO 4S & E/W CONNECTOR		0	0	0	0	0	281,365	0	0	281,365

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CCOUNT UMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320002	4S TO E/W CONNECTOR										
320002.02	SITEWORK			0	0	0	0	4500	0	0	4500
320002.0200002	CLEAR & GRUB	460	1500 CY	0	0	0	0	36000	0	0	36000
320002.0200004	EXCAVATION	460	12000 CY	0	0	0	0	6400	0	0	6400
320002.0200006	FINE GRADING	460	12800 SY	0	0	0	0	44250	0	0	44250
320002.0200008	6" CRUSHED ROCK	460	2950 TON	0	0	0	0	44160	0	0	44160
320002.0200010	3" CL-B ASPHALT	460	1104 TON	0	0	0	0	4480	0	0	4480
320002.0200012	WATER FOR CONSTRUCTION	460	640 MG	0	0	0	0	5000	0	0	5000
320002.0200014	SURVEY	460	1 LS	0	0	0	0	2000	0	0	2000
320002.0200016	MOBE/DEMOBE	460	1 LS	0	0	0	0	1500	0	0	1500
320002.0200018	MISC. STRIPING/SIGNS	460	1 LS	0	0	0	0	1000	0	0	1000
320002.0200020	TRAFFIC CONTROL	460	1 LS	0	0	0	0	5000	0	0	5000
320002.0200022	MISC. STABILIZATION	460	1 LS	0	0	0	0	137257	0	0	137257
320002.0200024	********** ACCEL/DECEL LANES **********	460	1 LS	0	0	0	0				
SUBTOTAL	SITEWORK			0	0	0	0	291,547	0	0	291,547
TOTAL	COST CODE 46002 WBS 320002 (ESCALATION 0.00% - CONTINGENCY 25.00 %)			0	0	0	0	291,547	0	0	291,547
TOTAL WBS 320002 4S TO E/W CONNECTOR				0	0	0	0	291,547	0	0	291,547

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320003	N/S CONNECTOR										
320003.02	SITEWORK										
320003.0200002	**********	460	0	0	0	0	0	0	0	0	0
	OVERLAY										
	**********										
320003.0200004	BROOMING & CLEAN UP	460	1 LS	0	0	0	0	500	0	0	500
320003.0200006	TACK COAT	460	150 GAL	0	0	0	0	300	0	0	300
320003.0200008	2" CL-B ASPHALT	460	75 TON	0	0	0	0	3750	0	0	3750
320003.0200010	WIDEN ROAD	460	250 LF	0	0	0	0	3750	0	0	3750
320003.0200020	**********	460	0	0	0	0	0	0	0	0	0
	NEW ROADWAY										
	**********										
320003.0200022	CLEAR & GRUB	460	1075 CY	0	0	0	0	3225	0	0	3225
320003.0200024	EXCAVATION	460	3065 CY	0	0	0	0	9195	0	0	9195
320003.0200026	FINE GRADING	460	10000 SY	0	0	0	0	5000	0	0	5000
320003.0200028	6" CRUSHED ROCK	460	2110 TON	0	0	0	0	31650	0	0	31650
320003.0200030	3" CL-B ASPHALT	460	800 TON	0	0	0	0	32000	0	0	32000
320003.0200032	WATER FOR CONSTRUCTION	460	460 MG	0	0	0	0	3220	0	0	3220
320003.0200034	SURVEY	460	1 LS	0	0	0	0	400	0	0	400
320003.0200036	MOBE/DEMOBE	460	1 LS	0	0	0	0	2000	0	0	2000
320003.0200038	MISC. STRIPING/SIGNS	460	1 LS	0	0	0	0	1200	0	0	1200
320003.0200040	MISC. STABILIZATION	460	1 LS	0	0	0	0	1000	0	0	1000
SUBTOTAL	SITEWORK			0	0	0	0	97,190	0	0	97,190
TOTAL	COST CODE 46002			0	0	0	0	97,190	0	0	97,190
	WBS 320003										
	(ESCALATION 0.00% - CONTINGENCY 25.00 %)										
TOTAL WBS 320003 N/S CONNECTOR				0	0	0	0	97,190	0	0	97,190

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320004	ALTERNATE 1 NORTH										
320004.02	SITEWORK										
320004.0200002	CLEAR & GRUB	460	2900 CY	0	0	0	0	7250	0	0	7250
320004.0200004	EXCAVATION	460	8300 CY	0	0	0	0	20750	0	0	20750
320004.0200006	FINE GRADING	460	25000 SY	0	0	0	0	10000	0	0	10000
320004.0200008	6" CRUSHED ROCK	460	5720 TON	0	0	0	0	85800	0	0	85800
320004.0200010	3" CL-B ASPHALT	460	2150 TON	0	0	0	0	86000	0	0	86000
320004.0200012	WATER FOR CONST.	460	1200 MG	0	0	0	0	8400	0	0	8400
320004.0200014	SURVEY	460	1 LS	0	0	0	0	7500	0	0	7500
320004.0200016	MOBE/DEMOBE	460	1 LS	0	0	0	0	3000	0	0	3000
320004.0200018	MISC. STRIPING/SIGNS	460	1 LS	0	0	0	0	1000	0	0	1000
320004.0200020	MISC. STABILIZATION	460	1 LS	0	0	0	0	2000	0	0	2000
320004.0200022	CROSSING FILL	460	10000 CY	0	0	0	0	40000	0	0	40000
SUBTOTAL	SITEWORK			0	0	0	0	271,700	0	0	271,700
TOTAL	COST CODE 46002			0	0	0	0	271,700	0	0	271,700
	WBS 320004										
	(ESCALATION 0.00% - CONTINGENCY 25.00 %)										
TOTAL WBS 320004 ALTERNATE 1 NORTH				0	0	0	0	271,700	0	0	271,700

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320005	ALTERNATE 2A NORTH										
320005.02	SITEWORK										
320005.0200002	CLEAR & GRUB	460	2500 CY	0	0	0	0	5000	0	0	5000
320005.0200004	EXCAVATION	460	7160 CY	0	0	0	0	14320	0	0	14320
320005.0200006	FINE GRADING	460	21500 SY	0	0	0	0	8600	0	0	8600
320005.0200008	6" CRUSHED ROCK	460	4930 TON	0	0	0	0	73950	0	0	73950
320005.0200010	3" CL-B ASPHALT	460	1855 TON	0	0	0	0	74200	0	0	74200
320005.0200012	WATER FOR CONST.	460	1075 MG	0	0	0	0	7525	0	0	7525
320005.0200014	SURVEY	460	1 LS	0	0	0	0	6500	0	0	6500
320005.0200016	MOBE/DEMOBE	460	1 LS	0	0	0	0	2500	0	0	2500
320005.0200018	MISC. STRIPING/SIGNING	460	1 LS	0	0	0	0	1000	0	0	1000
320005.0200020	MISC. STABILIZATION	460	1 LS	0	0	0	0	2000	0	0	2000
SUBTOTAL	SITEWORK			0	0	0	0	195,595	0	0	195,595
TOTAL	COST CODE 46002			0	0	0	0	195,595	0	0	195,595
	WBS 320005										
	(ESCALATION 0.00% - CONTINGENCY 25.00 %)										
TOTAL WBS 320005 ALTERNATE 2A NORTH				0	0	0	0	195,595	0	0	195,595

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320006	ALTERNATE 2 NORTH										
320006.02	SITEWORK										
320006.0200002	CLEAR & GRUB	460	3220 CY	0	0	0	0	6440	0	0	6440
320006.0200004	EXCAVATION	460	9200 CY	0	0	0	0	18400	0	0	18400
320006.0200006	FINE GRADING	460	27600 SY	0	0	0	0	11040	0	0	11040
320006.0200008	6" CRUSHED ROCK	460	6350 TON	0	0	0	0	95250	0	0	95250
320006.0200010	3" CL-B ASPHALT	460	2400 TON	0	0	0	0	96000	0	0	96000
320006.0200012	WATER FOR CONST.	460	1400 MG	0	0	0	0	9800	0	0	9800
320006.0200014	SURVEY	460	1 LS	0	0	0	0	8500	0	0	8500
320006.0200016	MOBE/DEMOBE	460	1 LS	0	0	0	0	3500	0	0	3500
320006.0200018	MISC. STRIPING/SIGNS	460	1 LS	0	0	0	0	1500	0	0	1500
320006.0200020	MISC. STABILIZATION	460	1 LS	0	0	0	0	2500	0	0	2500
SUBTOTAL	SITEWORK			0	0	0	0	252,930	0	0	252,930
TOTAL	COST CODE 46002			0	0	0	0	252,930	0	0	252,930
	WBS 320006										
	(ESCALATION 0.00% - CONTINGENCY 25.00 %)										
TOTAL WBS 320006 ALTERNATE 2 NORTH				0	0	0	0	252,930	0	0	252,930

ICF KAISER HANFORD
WESTINGHOUSE HANFORD COMPANY
JOB NO. Z421SAA1/96P400
FILE NO. Z421SAA1

** TEST - INTERACTIVE ESTIMATING **
PRIVITIZATION, ROAD & RAIL SYSTEM
STUDY ESTIMATE
DOE_R08 - ESTIMATE DETAIL BY WBS / COST CODE

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320007	INTERNAL GRAVEL ROAD										
320007.02	SITEWORK										
320007.0200002	CLEAR & GRUB	460	950 CY	0	0	0	0	1900	0	0	1900
320007.0200004	EXCAVATION	460	1400 CY	0	0	0	0	2800	0	0	2800
320007.0200006	FINE GRADING	460	8100 SY	0	0	0	0	3240	0	0	3240
320007.0200008	4" CRUSHED ROCK	460	1825 TON	0	0	0	0	27375	0	0	27375
320007.0200010	WATER FOR CONSTRUCTION	460	405 MG	0	0	0	0	2835	0	0	2835
320007.0200012	MOBE/DEMOBE	460	1 LS	0	0	0	0	1500	0	0	1500
SUBTOTAL	SITEWORK			0	0	0	0	39,650	0	0	39,650
TOTAL	COST CODE 46002			0	0	0	0	39,650	0	0	39,650
	WBS 320007										
	(ESCALATION 0.00% - CONTINGENCY 25.00 %)										
TOTAL WBS 320007 INTERNAL GRAVEL ROAD				0	0	0	0	39,650	0	0	39,650

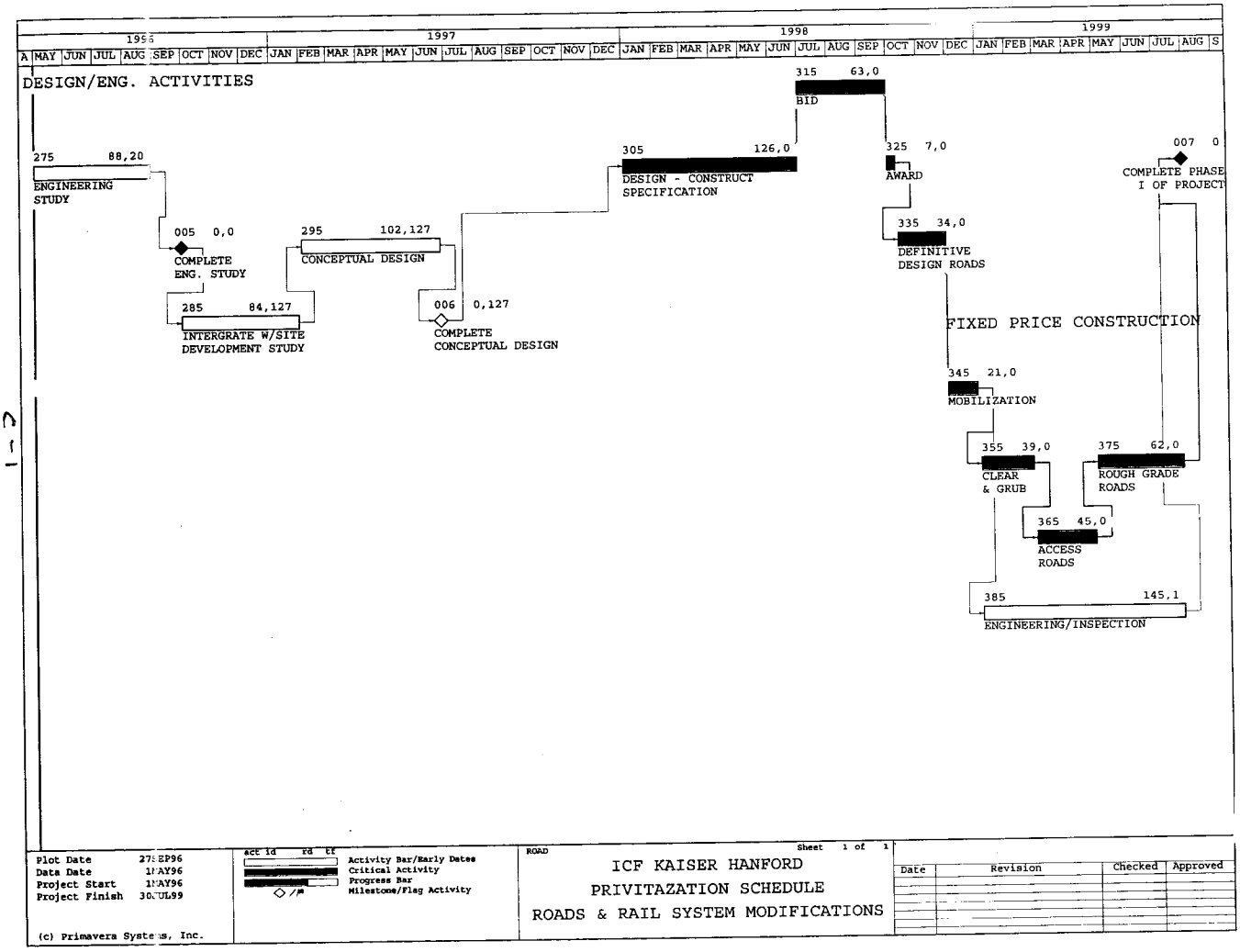
ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
320008	RAILROAD										
320008.02	SITEWORK										
320008.0200002	CLEAR & GRUB	460	2800 CY	0	0	0	0	11200	0	0	11200
320008.0200004	HAUL OFF WASTE	460	1200 CY	0	0	0	0	6000	0	0	6000
320008.0200006	BALANCE CUT & FILL	460	12100 CY	0	0	0	0	36300	0	0	36300
320008.0200008	RAIL INSTALL	460	10880 LF	0	0	0	0	979200	0	0	979200
320008.0200010	MISC. STABILIZATION	460	1 LS	0	0	0	0	35000	0	0	35000
320008.0200012	WATER FOR CONSTRUCTION	460	1200 MG	0	0	0	0	8400	0	0	8400
320008.0200014	MOBE/DEMOBE	460	1 LS	0	0	0	0	15000	0	0	15000
SUBTOTAL	SITEWORK			0	0	0	0	1,091,100	0	0	1,091,100
TOTAL	COST CODE 46002 WBS 320008 (ESCALATION 0.00% - CONTINGENCY 25.00 %)			0	0	0	0	1,091,100	0	0	1,091,100
TOTAL WBS 320008 RAILROAD				0	0	0	0	1,091,100	0	0	1,091,100

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
REPORT TOTAL				0	0	0	0	2,521,077	0	0	2,521,077

B-16
B-17

APPENDIX C

SCHEDULE



C-1

Plot Date 27SEP96
Data Date 1MAY96
Project Start 1MAY96
Project Finish 30JUL99

(c) Primavera Systems, Inc.

act id rd tf
Activity Bar/Early Dates
Critical Activity
Progress Bar
◇/# Milestone/Flag Activity

ROAD

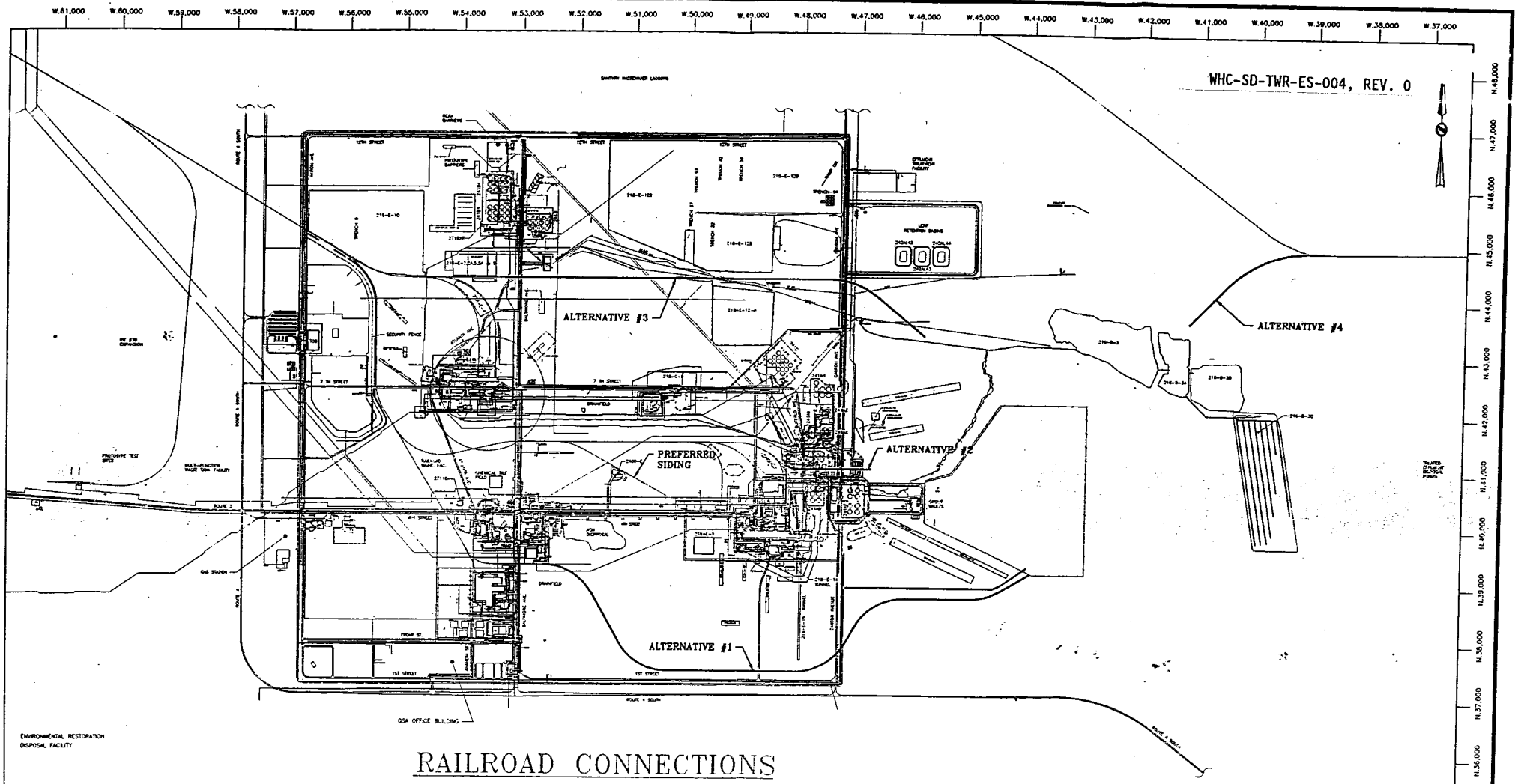
Sheet 1 of 1

ICF KAISER HANFORD
PRIVITAZATION SCHEDULE
ROADS & RAIL SYSTEM MODIFICATIONS

Date	Revision	Checked	Approved

APPENDIX D

SKETCHES



RAILROAD CONNECTIONS
200 EAST AREA

SITE PLAN

SCALE: 1:19000

0 190 380 760 1140 1520

1 cm = 190 meters

NOTE: THIS MAP IS FOR REFERENCE ONLY. DO NOT USE FOR CONSTRUCTION OR ENGINEERING PURPOSES.

ICF KAISER HANFORD COMPANY
MAPPING SERVICES

CADFILE: E23378C4	CUSTOMER:
DATE: 8-1-96	DRAWN BY: TA DAVIN

TITLE: 200 EAST AREA

ES-23378-C-004

SITE PLAN

SCALE: 1:4500

1 cm = 45 meters

0 45 90 180 270 360

Cad File E23378C8 Drawn by TA DAVIN

LEGEND

W.46,000 N.40,000	HANFORD PLANT COORDINATES (FEET)
E.576,000 N.135,750	WASHINGTON STATE COORDINATES (METERS)

N.39,000 N.40,000 N.41,000 N.42,000

N.135500 N.135750 N.136000 N.136250

W.43,000 W.44,000 W.45,000 W.46,000 W.47,000 W.48,000

E.576750 E.576500 E.576250 E.576000 E.575750 E.575500

PARCEL "A" 6.1 HECTARES (15.1 ACRES)

ALTERNATIVE LOCATION FOR PARCEL "A" 6.1 HECTARES (15.1 ACRES)

FUTURE ACP ROAD (TYP)

30M UTILITY CORRIDOR (TYP)

PROPOSED INTERNAL ROAD

POSSIBLE NEW GROUT VAULT

EXIST ACP ROAD

SNOWS CANYON (216-A-29 DITCH)

ALT #2 – NORTH

EXIST GROUT VAULTS

TILE FIELD

DRAIN FIELD

GROUT DR

CANYON AVENUE

TO ROUTE 4 SOUTH

4TH ST. LOOP

216-A-2

216-A-19 (ABANDONED)

216-A-20 (ABANDONED)

216-A-18 (ABANDONED)

216-A-8

216-A-37-1

216-A-37-2

216-A-30

216-A-42

216-A-6

241-A-201

241-AP-271

241-AP-272

241-SY-101

241-SY-102

241-SY-103

241AN

241AW

241AX

241AY

241AZ

241AP

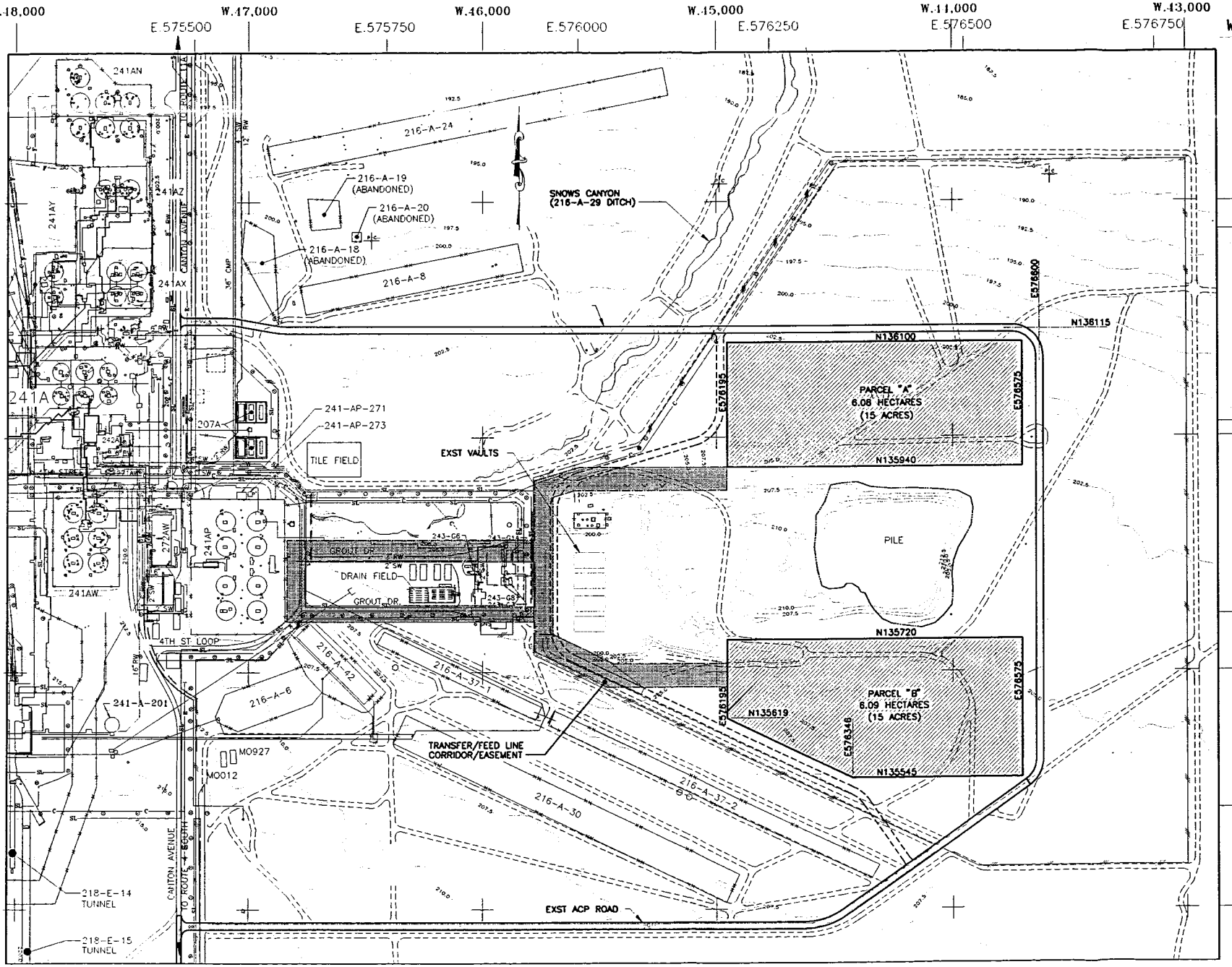
207A

M0927

M0012

218-E-14 TUNNEL

218-E-15 TUNNEL



LEGEND

	HANFORD PLANT COORDINATES (FEET)	WASHINGTON STATE COORDINATES (METERS)
	W.46,000 N.40,000	E.576,000 N.135,750

SITE PLAN

SCALE: 1:4500

0 45 90 180 270 360

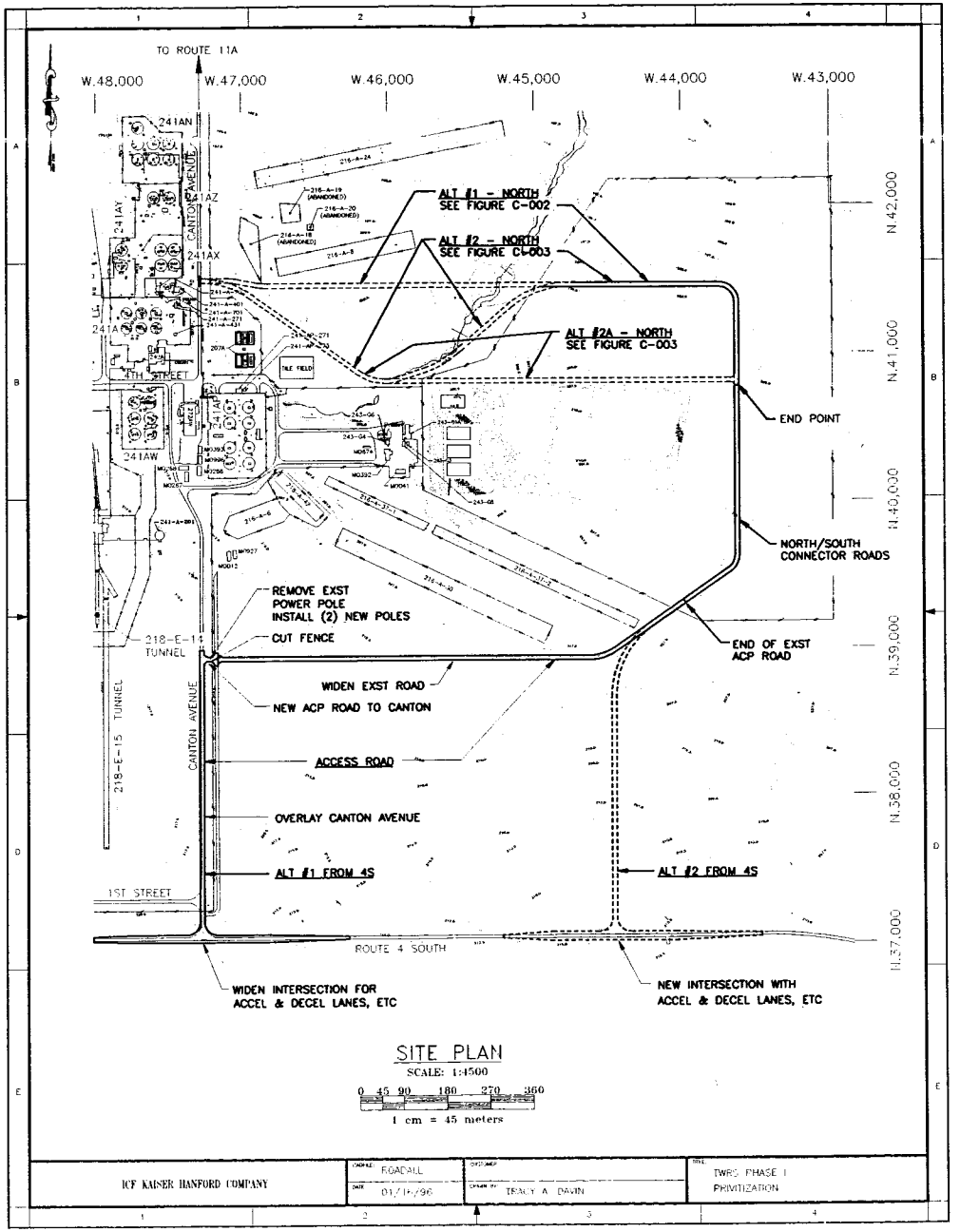
1 cm = 45 meters

Drawn by TA DAVIN

Cad File E2337701

ES-E23378-C-002

D-2



ES-23378-C-001. ACCESS ROADS

DISTRIBUTION SHEET

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Project Title/Work Order		EDT No. 618848
TWRS Privatization Phase I Roads and Rail System Engineering Study		ECN No. N/A

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