

JUL 31 1998

## ENGINEERING DATA TRANSMITTAL

Page 1 of 1

1. EDT

625258

|                                                                                                                                                                                                        |                          |                                                                                                                              |                         |                                                                                                                                  |                                                                    |                                                                                                                      |                                            |                                                                            |                         |          |          |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|------------------------------------------------------------------------------------------------------------------------------|-------------------------|----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|--------------------------------------------|----------------------------------------------------------------------------|-------------------------|----------|----------|
| 2. To: (Receiving Organization)<br>Distribution                                                                                                                                                        |                          | 3. From: (Originating Organization)<br>R. J. Parazin / NHC                                                                   |                         | 4. Related EDT No.:<br>N/A                                                                                                       |                                                                    |                                                                                                                      |                                            |                                                                            |                         |          |          |
| 5. Proj./Prog./Dept./Div.:<br>W-519/TWRS Priv. Phase I<br>Infrastructure Support                                                                                                                       |                          | 6. Design Authority/ Design Agent/Cog.<br>Engr.:<br>J.M. Hache & G.D. Roosendaal (DynCorp)/<br>P.Thakkar(FDNW)/ D.Fort(FDNW) |                         | 7. Purchase Order No.:<br>N/A                                                                                                    |                                                                    |                                                                                                                      |                                            |                                                                            |                         |          |          |
| 8. Originator Remarks:<br>Issued for Approval. Document is a supplement<br>to Summary Conceptual Design Report for TWRS<br>Privatization Phase I Infrastructure Support,<br>Project W-519, (HNF-1938). |                          |                                                                                                                              |                         | 9. Equip./Component No.:<br>N/A                                                                                                  |                                                                    |                                                                                                                      |                                            |                                                                            |                         |          |          |
|                                                                                                                                                                                                        |                          |                                                                                                                              |                         | 10. System/Bldg./Facility:<br>200-E                                                                                              |                                                                    |                                                                                                                      |                                            |                                                                            |                         |          |          |
| 11. Receiver Remarks: 11A. Design Baseline Document? [ ] Yes [X] No                                                                                                                                    |                          |                                                                                                                              |                         | 12. Major Assm. Dwg. No.:<br>N/A                                                                                                 |                                                                    |                                                                                                                      |                                            |                                                                            |                         |          |          |
|                                                                                                                                                                                                        |                          |                                                                                                                              |                         | 13. Permit/Permit Application No.:<br>N/A                                                                                        |                                                                    |                                                                                                                      |                                            |                                                                            |                         |          |          |
|                                                                                                                                                                                                        |                          |                                                                                                                              |                         | 14. Required Response Date:<br>N/A                                                                                               |                                                                    |                                                                                                                      |                                            |                                                                            |                         |          |          |
| 15. DATA TRANSMITTED                                                                                                                                                                                   |                          |                                                                                                                              |                         |                                                                                                                                  |                                                                    |                                                                                                                      |                                            |                                                                            |                         |          |          |
| (A)<br>Item<br>No.                                                                                                                                                                                     | (B) Document/Drawing No. | (C)<br>Sheet<br>No.                                                                                                          | (D)<br>Rev.<br>No.      | (E) Title or Description of Data<br>Transmitted                                                                                  | (F)<br>Approval<br>Design-<br>nator                                | (G)<br>Reason<br>for<br>Trans-<br>mittal                                                                             | (H)<br>Orig-<br>inator<br>Dispo-<br>sition | (I)<br>Receiv-<br>er<br>Dispo-<br>sition                                   |                         |          |          |
| 1                                                                                                                                                                                                      | HNF-2703                 | N/A                                                                                                                          | Rev.0                   | Project W-519 CDR Supplement,<br>Raw Water and Electrical<br>Services for Privatization<br>Contractor AP Tank Farm<br>Operations | N/A                                                                | 1,2                                                                                                                  | 1                                          |                                                                            |                         |          |          |
| 16. KEY                                                                                                                                                                                                |                          |                                                                                                                              |                         |                                                                                                                                  |                                                                    |                                                                                                                      |                                            |                                                                            |                         |          |          |
| Approval Designator (F)                                                                                                                                                                                |                          | Reason for Transmittal (G)                                                                                                   |                         |                                                                                                                                  | Disposition (H) & (I)                                              |                                                                                                                      |                                            |                                                                            |                         |          |          |
| E, S, O, D or N/A<br>(see WHC-CM-3-5,<br>Sec.12.7)                                                                                                                                                     |                          | 1. Approval<br>2. Release<br>3. Information                                                                                  |                         |                                                                                                                                  | 4. Review<br>5. Post-Review<br>6. Dist. (Receipt Acknow. Required) |                                                                                                                      |                                            | 1. Approved<br>2. Approved w/comment<br>3. Disapproved w/comment           |                         |          |          |
|                                                                                                                                                                                                        |                          |                                                                                                                              |                         |                                                                                                                                  |                                                                    |                                                                                                                      |                                            | 4. Reviewed no/comment<br>5. Reviewed w/comment<br>6. Receipt acknowledged |                         |          |          |
| 17. SIGNATURE/DISTRIBUTION<br>(See Approval Designator for required signatures)                                                                                                                        |                          |                                                                                                                              |                         |                                                                                                                                  |                                                                    |                                                                                                                      |                                            |                                                                            |                         |          |          |
| (G)<br>Reason                                                                                                                                                                                          | (H)<br>Disp.             | (J) Name                                                                                                                     | (K) Signature           | (L) Date                                                                                                                         | (M) MSIN                                                           | (G)<br>Reason                                                                                                        | (H)<br>Disp.                               | (J) Name                                                                   | (K) Signature           | (L) Date | (M) MSIN |
| 1                                                                                                                                                                                                      | /                        | Design Auth.                                                                                                                 | J.M. Hache (Elect)      | S2-12                                                                                                                            |                                                                    | 1                                                                                                                    | /                                          | Design Auth.                                                               | G.D. Roosendaal (Water) | 16-07    |          |
| 1                                                                                                                                                                                                      | /                        | Design Auth.                                                                                                                 | G.D. Roosendaal (Water) | 16-07                                                                                                                            |                                                                    | 3                                                                                                                    | /                                          | Design Agent                                                               | P. Thakkar (FDNW)       | G3-08    |          |
| 3                                                                                                                                                                                                      | /                        | Design Agent                                                                                                                 | P. Thakkar (FDNW)       | G3-08                                                                                                                            |                                                                    | 3                                                                                                                    | /                                          | Cog.Eng.                                                                   | D.L. Fort               | H5-49    |          |
| 3                                                                                                                                                                                                      | /                        | Cog.Eng.                                                                                                                     | D.L. Fort               | H5-49                                                                                                                            |                                                                    | 3                                                                                                                    | /                                          | Cog. Mgr.                                                                  | R.J. Parazin            | H5-49    |          |
| 1                                                                                                                                                                                                      | /                        | Cog. Mgr.                                                                                                                    | R.J. Parazin            | H5-49                                                                                                                            |                                                                    | 3                                                                                                                    | /                                          | QA                                                                         | J.F. Bores              | G3-21    |          |
| 3                                                                                                                                                                                                      | /                        | QA                                                                                                                           | J.F. Bores              | G3-21                                                                                                                            |                                                                    | 3                                                                                                                    | /                                          | Safety                                                                     | O.M. Jaka               | S5-12    |          |
| 3                                                                                                                                                                                                      | /                        | Safety                                                                                                                       | O.M. Jaka               | S5-12                                                                                                                            |                                                                    | 3                                                                                                                    | /                                          | Env.                                                                       | P.C. Miller             | R1-51    |          |
| 3                                                                                                                                                                                                      | /                        | Env.                                                                                                                         | P.C. Miller             | R1-51                                                                                                                            |                                                                    | 3                                                                                                                    | /                                          |                                                                            |                         |          |          |
| 18. (R.J. Parazin)<br>Signature of EDT<br>Originator                                                                                                                                                   |                          | 19. _____<br>Authorized Representative Date<br>for Receiving Organization                                                    |                         | 20. (R.J. Parazin)<br>Signature of EDT<br>Originator                                                                             |                                                                    | 21. DOE APPROVAL (if required)<br>Ctrl. No.<br>[ ] Approved<br>[ ] Approved w/comments<br>[ ] Disapproved w/comments |                                            |                                                                            |                         |          |          |

# **Project W-519 CDR Supplement Raw Water and Electrical Services for Privatization Contractor AP Tank Farm Operations**

**R.J. Parazin**

Numatec Hanford Company, Richland, WA 99352

U.S. Department of Energy Contract DE-AC06-96RL13200

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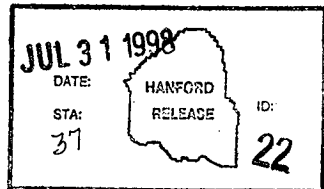
**Key Words:** TWRS Privatization; Infrastructure, AP Tank Farm

**Abstract:** The purpose of this CDR supplement is to identify Raw Water (RW) and Electrical service line routes to the TWRS Privatization Contractor (PC) feed delivery tanks, AP-106 and/or AP-108, and establish associated cost impacts to the Project W-519 baseline.

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*V. L. Berkland* 7/31/98  
Release Approval Date



Release Stamp

**Approved for Public Release**

HNF-2703  
Revision 0

**PROJECT W-519 CDR SUPPLEMENT**

**RAW WATER & ELECTRICAL SERVICES**

**for**

**PRIVATIZATION CONTRACTOR**

**AP TANK FARM OPERATIONS**

July 1998

Prepared for  
U.S. Department of Energy  
Richland Operations Office  
Richland, Washington

Project Hanford Management Contractor for the  
U.S. Department of Energy under Contract DE-AC06-96RL13200

**PROJECT W-519 CDR SUPPLEMENT  
RAW WATER & ELECTRICAL SERVICES  
for  
PRIVATIZATION CONTRACTOR  
AP TANK FARM OPERATIONS**

Prepared by  
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7/22/98  
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APPROVED

Robert J. Parazin  
Robert J. Parazin  
Project Manager  
Numatec Hanford Company

7/22/98  
Date

## ABBREVIATIONS

|        |                                 |
|--------|---------------------------------|
| CSL    | Chemical Sewer Line             |
| DOE-RL | Department of Energy - Richland |
| FDAS   | Field Data Acquisition System   |
| FDNW   | Fluor Daniel Northwest          |
| GPR    | Ground Penetrating Radar        |
| HPT    | Health Physics Technician       |
| ILAW   | Immobilized Low Activity Waste  |
| NOC    | Notice of Construction          |
| PC     | Privatization Contractor        |
| PIV    | Post Indicator Valve            |
| PVC    | Polyvinyl Chloride              |
| PW     | Process Water                   |
| RW     | Raw Water                       |
| TWRS   | Tank Waste Remediation System   |

**PROJECT W-519 CDR SUPPLEMENT**  
**RAW WATER & ELECTRICAL SERVICES**  
**for**  
**PRIVATIZATION CONTRACTOR AP TANK FARM OPERATIONS**

**1.0 INTRODUCTION**

This supplement to the Project W-519 Conceptual Design will identify a means to provide RW and Electrical services to serve the needs of the TWRS Privatization Contractor (PC) at AP Tank Farm as directed by DOE-RL [ref 1]. The RW will serve the fire suppression and untreated process water requirements for the PC.

For background information, see Project W-519 Summary Conceptual Design Report (CDR) [ref 2].

This CDR Supplement documents the RW and Electrical line preferred routing and tie-in points.

The cost estimate summary for this supplement is in Appendix A. Design and construction activities will be performed within the project schedule defined in Appendix D of the Project W-519 Summary Conceptual Design Report [ref 2].

**II. SUMMARY**

The purpose of this CDR supplement is to identify Raw Water (RW) and Electrical service line routes to the TWRS Privatization Contractor (PC) feed delivery tanks, AP-106 and/or AP-108, and establish associated cost impacts to the Project W-519 baseline.

The work will include the installation of approximately 15 to 20 m (50 to 65 ft) of additional DN300 (12-in.), DN150 (6-in.), and DN75 (3-in.) Pipe. The tie-in to the 200 East Area RW distribution system, as previously planned for Project W-519, will be relocated to provide

service to the east side of the AP Tank Farm. Sectional valves and a fire hydrant will be installed accordingly in support of PC activities.

Electrical work will consist of tapping an adjacent 13.8 kV overhead power line that will be installed by the Site/Utilities portion of Project W-519, and installing disconnect switches and a 1000 kVA, 13.8 kV-480 V transformer to support the PC operations at the feed delivery tanks, AP-106 and/or AP-108.

Project W-519 is a FY-99 Line Item Project. Total estimated construction costs of the supplement are \$166K; other project costs are \$42K. The total project cost is for Project W-519 will increase by \$208K to \$39,208,000.

### **III. JUSTIFICATION**

The upgrades provided by Project W-519 are required to support the TWRS privatization mission as well as the Tri-Party Agreement. The Additional upgrades recommended by this report are required in order to implement DOE-RL direction to accommodate Privatization Strategic Planning Team decisions [ref 1].

### **IV. DESCRIPTION OF PROJECT SCOPE**

This document supplements the TWRS Privatization Phase I Infrastructure Support Project W-519 documentation, which identifies how the privatization site will be developed and how essential utilities will be provided to the PC. The purpose of this supplement is specific to providing the essential water and electrical power demands to the PC operations at the AP Tank Farm.

Two types of water are required: raw (or untreated process) water and fire suppression water. This supplement identifies the preferred method to provide RW service from the 200E Area infrastructure to the Privatization operations at the east side of the AP Tank Farm. Installation of a RW line under Project W-519 will satisfy DOE Order 6430.1A, "General Design Criteria", requirements to provide a reliable water source for fire protection demands.

Electrical power will be provided at 480 volts (three phase-four wire). The work scope of this supplement includes connection to the 200 East Area 13.8 kV distribution system, extending a 13.8 kV service line to near the PC operations at the AP Tank Farm, and transformation from 13.8 kV to 480 volts.

## A. Utilities (600)

### Raw Water:

Raw water for fire suppression and untreated process water demands will be provided to the PC for operations at the 241-AP Tank Farm through an extension of the 200 East Area raw water distribution system. To meet the requirements of DOE Order RLID 5480.7, *Fire Protection*, alternate flow paths to the source of water will be provided by extending a DN300 (12 inch) main around the eastern and southern sides of the AP Tank Farm, eventually connecting to the existing distribution system at a second location.

In early fiscal year 2000, Project W-211, Tank Farm Upgrades, is to extend a DN300 (12 inch) RW main from an existing pipeline west of the 207-A Basins, along the northern side of the AP Tank Farm, to adjacent the northeast corner of the of the tank farm fence (reference drawing H-14-102276). From this point, Project W-519 will extend the DN300 RW main along the eastern and southern sides of the AP Tank Farm to continue the distribution loop to a point south of 274 AW and west of the 216-A-6 Crib where it will meet the distribution loop described in the W-519 Summary CDR. (See sketch ES-W519S-C01. All sketches are in appendix C unless noted otherwise). A total of 415 meters (1,350 feet) of DN300 pipe will be employed in constructing this run.

This new routing provides service to the eastern side of AP Tank Farm while functionally providing the second tie-in point to the existing 200 East Area RW distribution system for the extension into the Privatization Phase I site (former Grout Disposal compound). As such, the routing previously planned by Project W-519 that runs west of the 272 AW facility becomes redundant. By removing this redundant 400 meter (1,300 feet) pipeline run from Project W-519 scope, the cost impact of the additional scope to provide raw water services to the PC operations at the AP Tank Farm is largely offset.

The raw water line extending along the east side of AP Tank Farm will cross through the corridor established for construction of the transfer/feed lines serving the Privatization facilities. To lessen the potential for impact to the transfer/feed line route design, within the transfer/feed corridor the water line will be placed within the horizontal shadow of the existing 12 inch CSL that runs parallel to the proposed water line route. Any transfer/feed line design that avoids the CSL will therefore avoid the new water line.

The PC will be provided with 190 lpm (50 gpm) of untreated process water through a metered DN75 (3 inch) service connection placed adjacent the PC's AP tank Farm operations area (see sketch ES-W519S-C02). The water meter will be turbine type and compatible with Field Data Acquisition System (FDAS) electronic monitoring hardware. (FDAS hardware to be installed by others.) Fire suppression water will be provided by a fire hydrant located in the southeast corner of the intersection of 4th Street Loop and South Grout Drive.

The RW distribution system extension will have sectional valves placed at specific locations, such as major services and junctions, to provide adequate isolation and shutoff capability for maintenance functions. Gate valves serving as sectional valves will be equipped with a non-supervised Post Indicator Valve (PIV) extension and guarded by post barricades.

In the vicinity of the North Grout Drive and 4th Street Loop intersection, a DN300 tee and a set of PIV section valves will be installed for future expansion of the RW distribution system into the 218-E-16 Vault complex. Project W-465, Immobilized Low Activity Waste (ILAW) Interim Storage Facility, will convert the former Grout Vaults for storage of ILAW. As part of the Vault improvements, Project W-465 will extend the RW distribution system through the Vault complex (see sketch ES-W465-C2 in ref. 3).

Additionally, south of the 274-AW building the new water line will cross an existing raw water line. This existing 8 inch pipeline is part of, and near the end of, a dead-end leg that provides fire suppression water service to the 272-AW, 274-AW, and other nearby and related buildings and office trailers. Inter-tying the two lines at this location would enhance the distribution system serving these facilities. During definitive design, the feasibility of providing a tie-in at the crossing will be investigated and implemented if practical.

Scanning for underground utilities will be performed during the initial stages of definitive design. Unknown items detected may require additional exploratory excavations, or potholing, to determine their origin.

#### **Electrical:**

Three alternatives were considered for providing electrical power to the PC's AP-106 and/or 108 tank operations:

- (1) Supply power from the existing AP Tank Farm service transformer;
- (2) Supply power from line C8-L5;
- (3) Supply power from line C8-L8.

Alternative (1) was rejected because the existing transformer is only rated for 1000 kVA and already has a historical demand load of approximately 160 kW. The existing transformer is incapable of supplying an additional 1000 kVA.

Either line C8-L5 or line C8-L8 would be capable of supplying the additional load from extensions that are planned to be constructed by the Site/Utilities portion of Project W-519 to provide temporary power for PC construction (ref. 4). A portion of the extensions would be constructed as a permanent part of the 200 East Area distribution system. Line C8-L5 has existing loads serving different customers while line C8-L8 is projected to have no other loads

and is 70 meters (230 feet) closer to the point at which the electrical power will be required. However, line C8-L8 has less capacity due to the conductor size and with the change to a single PC there may be no need to construct the C8-L8 extension in order to provide construction power. There is a possibility that the C8-L8 extension may be removed from the project scope. Either alternative would work, and are very similar in approach with only a small variance in cost. For reasons of simplicity, alternative (3), supplying power from line C8-L8, was selected for this supplement. Should the extension of C8-L8 be removed from project scope a portion of the resultant savings would be applied towards the additional 70 meters of duct bank and cable needed to connect to C8-L5.

The concept illustrated (sketch ES-W519S-C02) consists of tapping line C8-L8 where it will pass the southeast corner of AP Tank Farm and installing an underground feeder to a 1000 kVA transformer located adjacent the PC's AP Tank Farm operations. Distribution of power beyond the secondary bushings of the transformer will be the PC's responsibility. Electrical metering will be provided by the PC as specified by DynCorp Electrical Utilities group.

#### **B. Other Project Costs (900)**

Radiation surveys will be required for the areas being excavated. An allowance for HPT coverage will be needed to cover the cost of these radiation surveys.

#### **C. Design Compliance**

The design and construction of the supplement to Project W-519 will comply with the codes and regulations listed in the Project W-519 Design Requirements Documents [see ref 2 for listing].

### **V. METHODS OF PERFORMANCE**

See Methods of Performance Section of Project W-519 CDR [ref 2].

### **VI. REQUIREMENTS AND ASSESSMENTS**

See Requirements and Assessments Section of Project W-519 CDR [ref 2].

## VII. IDENTIFICATION AND ANALYSIS OF UNCERTAINTIES

### Raw Water

The proposed location of the RW line has not been scanned for existing underground interferences. Undetermined utility lines may alter the anticipated location and depth of bury.

The extension of the RW distribution system along the north side of AP Tank Farm will be constructed by Project W-211 as planned.

### Electrical

This study assumes that existing line C8-L8 will have been extended to the PC parcel prior to the time the proposed service is constructed, and it will pass near by the southeast corner of the AP Tank Farm.

It is assumed that PC construction power and tanks AP-106 and/or AP-108 operations power will not be required simultaneously.

The interface location between the PC and the electrical utility will be at the transformers' secondary bushings.

During excavations for underground electrical feeders radioactive contaminated soils may be encountered, which would increase the project cost.

The spare capacity projected to be available from the existing 200 East Area 13.8 kV electrical system at the time pumping operations begin will be realized.

## VIII. REFERENCES

1. DOE-RL Letter, "Contract Number DE-AC06-96RL13200 Decisions Affecting Tank Waste Remediation System (TWRS) Baseline and Planning Bases," Document No. 98-WSD007, January 1998.
2. Summary Conceptual Design Report, "TWRS Privatization Phase I Infrastructure Support," Project W-519, Document No. HNF-1938, Rev. 0, December 1997, prepared by Fluor Daniel Northwest, Richland, WA.
3. "Conceptual Design Report for Immobilized Low-Activity Waste Interim Storage Facility (Phase I) Project W-465," Document No. HNF-1975, Rev. 1, 1998, prepared by Fluor Daniel Northwest, Richland, WA.

4. "Conceptual Design Report, TWRS Privatization Phase I Site Development and Roads, Subproject W-505," Document No. HNF-SD-W505-CDR-001, Rev. 0, 1997, prepared by Fluor Daniel Northwest, Richland, WA.

## **APPENDICES**

Appendix A: Cost Estimate Summary

Appendix B: Outline Specification

Appendix C: Figures

## APPENDIX A

### Cost Estimate Summary

FLUOR DANIEL NORTHWEST, INC.  
NUMATEC HANFORD CORP  
JOB NO. W519  
FILE NO. W519BAB1

\*\* TEST - INTERACTIVE ESTIMATING \*\*  
THRS PRIVATIZATION PHASE I INFRASTRUCTURE SUPPORT  
STUDY ESTIMATE  
PHMCR01 - PROJECT COST SUMMARY

PAGE 1 OF 11  
DATE 07/08/98 11:03:11  
BY DKH/JPM

| SORT               | DESCRIPTION                        | ESCALATED  |    | CONTINGENCY |  | TOTAL<br>DOLLARS |
|--------------------|------------------------------------|------------|----|-------------|--|------------------|
|                    |                                    | TOTAL COST | %  | TOTAL       |  |                  |
| DYN                | DYN CORP TRI-CITIES SERVICES, INC. | 5,000      | 0  | 0           |  | 5,000            |
| FDH                | FLUOR DANIEL HANFORD, INC.         | 3,000      | 0  | 0           |  | 3,000            |
| FDNW               | FLUOR DANIEL NORTHWEST             | 128,000    | 20 | 26,000      |  | 154,000          |
| NHC                | NUMATEC HANFORD CORPORATION        | 4,000      | 0  | 0           |  | 4,000            |
| SUBTOTAL           |                                    | 140,000    | 18 | 26,000      |  | 166,000          |
| SITE               |                                    | 35,000     | 20 | 7,000       |  | 42,000           |
| (ADJUSTED/ROUNDED) |                                    | 0          |    | 0           |  | 0                |
| PROJECT TOTAL      |                                    | 175,000    | 19 | 33,000      |  | 208,000          |

REMARKS:

TYPE OF ESTIMATE STUDY ESTIMATE 7/08/1998  
FDNW LEAD ESTIMATOR *James P. Beggs*  
PROJECT MANAGER *DR. Thelma* 7/9/98  
CLIENT

(( ESTIMATE IN 1997 DOLLARS ))

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

FLUOR DANIEL NORTHWEST, INC.  
 HUMATEC HANFORD CORP  
 JOB NO. W519  
 FILE NO. W519BAB1

\*\* TEST - INTERACTIVE ESTIMATING \*\*  
 TURS PRIVATIZATION PHASE I INFRASTRUCTURE SUPPORT  
 PHMCR02 - WORK BREAKDOWN STRUCTURE (WBS) SUMMARY

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 DATE 07/08/98 11:03:25  
 BY DKH/JPH

| WBS DESCRIPTION                            | ESTIMATE<br>SUBTOTAL | ESCALATION<br>% TOTAL | SUB<br>TOTAL | CONTINGENCY<br>% TOTAL | SUB<br>TOTAL | SITE<br>ALLOCAT'N | TOTAL<br>DOLLARS |
|--------------------------------------------|----------------------|-----------------------|--------------|------------------------|--------------|-------------------|------------------|
| 210400 WATER CAT 1                         | 19048                | 4.06                  | 773          | 20                     | 3964         | 23785             | 7810             |
| 211400 WATER CAT 2                         | 12028                | 4.07                  | 483          | 20                     | 2504         | 15021             | 4929             |
| 212400 ENG/INSPECTION DURING CONSTRUCTION  | 3885                 | 7.03                  | 273          | 20                     | 832          | 4990              | 1639             |
| SUBTOTAL 21 WATER/SITE/LIQ EFFLUENT ENG    | 34961                | 4.39                  | 1535         | 20                     | 7300         | 43796             | 14378            |
| 232403 HDPE PIPE IN EXISTING LINER C0#3/#4 | -52121               | 6.17                  | -3216        | 20                     | -11067       | -66404            | -82771           |
| 232405 12" RAW WATER LOOP                  | 72351                | 6.17                  | 4464         | 20                     | 15363        | 92178             | 114898           |
| SUBTOTAL 2324 WATER FP CONSTRUCTION        | 20230                | 6.17                  | 1248         | 20                     | 4296         | 25774             | 32127            |
| 232513 NEW 1000KVA XMFR FEED FROM C8-L8    | 73589                | 5.54                  | 4078         | 18                     | 14033        | 91700             | 112453           |
| SUBTOTAL 23 WTER/SITE/LIQ EFFLUENT CONS    | 93819                | 5.68                  | 5326         | 18                     | 18329        | 117474            | 27106            |
| 253002 PROJECT TECHNICAL SUPPORT           | 4249                 | 0.00                  | 0            | 0                      | 4249         | 0                 | 4249             |
| SUBTOTAL 2 WTR/SITE/LIQ EFFLUENT COST      | 133029               | 5.16                  | 6861         | 18                     | 25629        | 165519            | 41484            |
| PROJECT TOTAL                              | 133,029              | 5.16                  | 6,861        | 18                     | 25,629       | 165,519           | 207,003          |
|                                            |                      |                       |              |                        |              | 41,484            |                  |

FLUOR DANIEL NORTHWEST, INC.

NUMATEC HANFORD CORP.

JOB NO. W519

FILE NO. W519B881

\*\* TEST - INTERACTIVE ESTIMATING \*\*

THRS PRIVATIZATION PHASE I INFRASTRUCTURE SUPPORT

STUDY ESTIMATE

PHMCR03 - ESTIMATE BASIS SHEET

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DATE 07/08/98 11:04:46  
BY DKH/JPM

# 1. ESTIMATE PURPOSE

STUDY COST ESTIMATE: THIS ESTIMATE WILL BE USED TO SUPPLEMENT THE ESTABLISH PROJECT BUDGET(BASELINE).

# 2. ESTIMATE TECHNICAL BASIS

- A. THIS ESTIMATE HAS BEEN PREPARED FOR THE W-519 PROJECT AS REQUESTED BY FDNW AND MRC PROJECT MANAGEMENT.
- B. A DESCRIPTION OF THE TECHNICAL SCOPE OF WORK MAY BE FOUND IN THE FOLLOWING REFERENCE DOCUMENTS:  
LOI DATED AUGUST 4, 1997 FOR W519 PRIVATIZATION PHASE I INFRASTRUCTURE SUPPORT  
THRS PRIVATIZATION CDR'S FOR WATER, SITE, LIQUID EFFLUENTS AND ELECTRICAL SYSTEM.
- C. STUDY DESCRIPTION OF THE TECHNICAL SCOPE OF WORK MAY BE FOUND IN THE FOLLOWING REFERENCE DOCUMENT:  
PROJECT W-519 CDR SUPPLEMENT RAW WATER & ELECTRICAL SERVICES.

# 3. ESTIMATE METHODOLOGY

A BOTTOMS-UP TECHNIQUE WAS BEEN UTILIZED IN THE PREPARATION OF THIS ESTIMATE.

- (1) CONSTRUCTION LABOR MATERIALS AND EQUIPMENT COSTS HAVE BEEN ESTIMATED BASED UPON ONE OR MORE OF THE FOLLOWING STANDARD COMMERCIAL ESTIMATING RESOURCES: PUBLISHED ESTIMATING STANDARDS/DATABASES: VIN HOUSE DATABASES-VR.S. MEANS  
Y RICHARDSON'S PROCESS PLANT CONSTRUCTION ESTIMATING STANDARDS/DATABASES: ELECTRICAL CONTRACTORS ASSOCIATION, INC.  
(NECA) MANUAL OF LABOR UNITS Y ELECTRICAL RESOURCES INC. ELECTRICAL ESTIMATING LABOR MANUAL.  
THE UNITS MAY HAVE BEEN FACTORED/ADJUSTED BY THE ESTIMATOR AS APPROPRIATE TO REFLECT INFLUENCES BY CONTRACT, WORK SITE, OR OTHER IDENTIFIED PROJECT OR SPECIAL CONDITIONS.
  - (2) FLUOR DANIEL HANFORD & PROJECT HANFORD MANAGEMENT CONTRACT (PHMC) SUBCONTRACTOR DIRECT COSTS FOR RUSTY FEDERAL MANAGEMENT HANFORD, INC., LOCKHEED MARTIN HANFORD CORP., DYNACORP, NUMATEC HANFORD CORP. HAVE BEEN PROVIDED BY FDNW PROJECT MANAGEMENT FOR INCLUSION INTO THIS ESTIMATE.
  - (3) ENTERPRISE CONTRACTORS (ENCO) DIRECT COSTS FOR LOCKHEED MARTIN SERVICES, INC. CORP. HAVE BEEN PROVIDED BY FDNW PROJECT MANAGEMENT FOR INCLUSION INTO THIS ESTIMATE.
- B. DIRECT COST FACTORS
- (1) SALES TAX HAS BEEN APPLIED TO ALL MATERIALS AND EQUIPMENT PURCHASES AT 8%.
  - (2) AN ESTIMATING FACTOR OF 15% HAS BEEN APPLIED TO TOTAL FDNWS CONSTRUCTION CRAFT LABOR COST FOR GENERAL CONDITIONS
  - (3) CONSUMABLES OF 23-35% HAS BEEN APPLIED TO TOTAL FDNW CONSTRUCTION COST FOR TECHNICAL SERVICES.
  - (4) GENERAL FOREMAN FACTOR OF 7% OF DIRECT CRAFT LABOR COSTS.
  - (5) CONTRACT ADMINISTRATION FOR FIXED PRICE FACTOR OF 10% OF DIRECT CRAFT LABOR CREWS.
  - (6) COSTS FOR BID PACKAGE PREPARATION, CONTRACT MANAGEMENT, INFORMATION AND PROJECT MANAGEMENT & PLANNING SUPPORT 10% HAS BEEN APPLIED TO DIRECT CRAFT LABOR AND 0-25% FOR HOME OFFICE ENGINEERING TO ALLOW FOR USAGE OF GOVERNMENT OWNED EQUIPMENT CONTROLLED BY DYNACORP.

- C. INDIRECT COSTS  
FIXED PERCENT CONTRACTOR OVERHEAD, PROFIT, BOND AND INSURANCE COSTS AND ARE REFLECTED IN THE "OR&P/8&I" COLUMN OF THE ESTIMATE DETAIL REPORT.

FLUOR DANIEL NORTHWEST, INC.

MUNATEC HANFORD CORP

JOB NO. W519

FILE NO. W519B81

\*\* TEST - INTERACTIVE ESTIMATING \*\*  
TURS PRIVATIZATION PHASE I INFRASTRUCTURE SUPPORT  
STUDY ESTIMATE  
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### 3. ESTIMATE METHODOLOGY (CONT)

#### D. RATES

- (1) FLUOR DANIEL NORTHWEST LABOR RATES ARE BASED UPON THE FLUOR DANIEL FEDERAL OPERATIONS (FEDFO) DISCLOSURE STATEMENT AND APPROVED PROVISIONAL BILLING RATES. FOR ESTIMATING PURPOSES, AVERAGE RATES BY OPERATIONS CODE HAVE BEEN DEVELOPED BASED UPON RECENT COST HISTORY.
- (2) FLUOR DANIEL NORTHWEST SERVICES (CONSTRUCTION CRAFT LABOR) RATES ARE THOSE LISTED IN APPENDIX A TO THE HANFORD SITE STABILIZATION AGREEMENT.
- (3) FDN & PHMC SUBCONTRACTOR STANDARD LABOR RATES ARE THOSE LISTED IN THE FINANCIAL DATA SYSTEM (FDS) POST 321R REPORT ORGANIZATION RATES PLUS ADJUSTERS.

#### E. SITE ALLOCATIONS FACTORS

- (1) SITE ALLOCATION FACTORS ARE DEVELOPED AND PROVIDED BY FLUOR DANIEL HANFORD (FDH) FOR ESTIMATING USE.
- (2) GOVERNMENT FURNISHED SERVICES RATE IS APPLIED TO ALL COSTS TO LIQUIDATE GOVERNMENT FURNISHED SERVICES PROVIDED TO THE ENTERPRISE COMPANIES: 14% FOR FDNW, 10% FOR FDNWS (CONSTRUCTION).
- (3) HANFORD SITE G&A RATE OF 15.1% IS APPLIED TO ALL COSTS TO LIQUIDATE THE HANFORD GENERAL & ADMINISTRATIVE COSTS. THE WEIGHTED AVERAGE RATE OF 15.1% IS BASED ON THE TOTAL SCOPE TO BE PERFORMED IN FY99 (16.3% G&A) AND FY00 (13.9% G&A).
- (4) HANFORD SITE MPR RATE OF 7.0% IS APPLIED TO ALL PURCHASED MATERIAL AND ALL PURCHASED SERVICES TO LIQUIDATE THE COST OF PROCUREMENT (INCLUDING RECEIVING).

FDNW APPLIES THE ABOVE FACTORS TO ESTIMATED COSTS AS FOLLOWS:

- (1) FDNW GFS/G&A CM FACTOR: A COMPOSITE FACTOR HAS BEEN APPLIED TO TOTAL FDNW FIXED PRICE CONSTRUCTION MANAGEMENT WHICH INCLUDES GOVERNMENT FURNISHED SERVICES. THE WEIGHTED AVERAGE RATE OF 24.44% HAS BEEN APPLIED TO THE FDNW FIXED PRICE CONSTRUCTION CONTRACT VALUE.
- (2) FDNW CM RATE FP CONST FACTOR: A MATERIAL PROCUREMENT RATE FACTOR OF 24.44% HAS BEEN APPLIED TO THE FDNW FIXED PRICE CONSTRUCTION CONTRACT VALUE.
- (3) FDNW GFS/G&A LABOR FACTOR: A COMPOSITE FACTOR HAS BEEN APPLIED TO TOTAL FDNW LABOR COSTS AS FOLLOWS:  
AS/CM COSTS = 32.58%, FDNWS CONSTRUCTION LABOR = 27.93%, FDNWS CONSTRUCTION MANAGEMENT LABOR = 32.58%, FDNW CONTRACT MANAGEMENT AND ADMINISTRATION = 32.58%
- (4) FDNW G&A MATERIAL FACTOR: A COMPOSITE FACTOR OF 24.87% HAS BEEN APPLIED TO TOTAL FDNW MATERIAL COST WHICH INCLUDES GOVERNMENT FURNISHED MATERIAL. THE WEIGHTED AVERAGE OF 23.16% ON FIXED PRICE WORK WAS APPLIED BECAUSE CONSTRUCTION OCCURS DURING FY99 AND FY00. THIS BASED ON EXECUTION RATES PERFORMANCE AGREEMENT DATED JUNE 11, 1997.

#### 4. ESCALATION

ESCALATION PERCENTAGES WERE CALCULATED FROM THE JANUARY 1997 UPDATE OF THE ECONOMIC ESCALATION PRICE CHANGE INDICES FOR DOE CONSTRUCTION PROJECTS AS PUBLISHED BY THE "OFFICE OF INFRASTRUCTURE ACQUISITION" PM-50.

#### 5. CONTINGENCY

##### A. DEFINITION OF CONTINGENCY AS PROVIDED BY DOE

"CONTINGENCY COVERS COSTS THAT MAY RESULT FROM INCOMPLETE DESIGN, UNFORESEEN AND UNPREDICTABLE CONDITIONS, OR UNCERTAINTIES WITHIN THE DEFINED PROJECT SCOPE. THE AMOUNT OF CONTINGENCY SHALL BE BASED ON THE STATUS OF DESIGN, PROCUREMENT, AND CONSTRUCTION; AND THE COMPLEXITY AND UNCERTAINTIES OF THE COMPONENTS OF THE PROJECT. CONTINGENCY IS NOT TO BE USED TO AVOID MAKING AN ACCURATE ASSESSMENT OF EXPECTED COST" (OFFICE OF WASTE MANAGEMENT (EN-50) COST AND SCHEDULE GUIDE.

FLUOR DANIEL NORTHWEST, INC.  
NUMATEC HANFORD CORP  
JOB NO. W519  
FILE NO. W519B81

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## 5. CONTINGENCY (CONT)

### B. CONTINGENCY ALLOWANCE GUIDELINES

THE DOE GUIDELINE CONTINGENCY ALLOWANCE FOR A BUDGET ESTIMATE - STANDARD = 15% - 25%

### C. METHODOLOGY

CONTINGENCY IS EVALUATED AT THE LOWEST WORK BREAKDOWN STRUCTURE (WBS) LEVEL WITHIN THE COST ESTIMATE DETAILS. IT IS SUMMARIZED AT UPPER WBS LEVELS AND REPORTED ON THE SUMMARY REPORTS.

### D. ANALYSIS

AN ASSESSMENT OF DESIGN MATURITY, WORK COMPLEXITY AND PROJECT UNCERTAINTIES HAS BEEN PERFORMED. AN EXPLANATION OF THIS ASSESSMENT AND CONTINGENCY RATES WHICH HAVE BEEN ADDED TO THE COST OF WORK ARE AS FOLLOWS:

#### WATER/SITE/LIQUID EFFLUENTS:

=====

WBS 2.1.0. TITLE 11 CAT 1 DD A CONTINGENCY OF 20% HAS BEEN APPLIED DUE TO THE PRELIMINARY STAGE OF DESIGN, AND INCOMING DATA FROM SUBCONTRACTORS FOR THE FACILITIES THAT ARE BEING DESIGNED TO SUPPORT THE PRIVATIZATION PHASE. MINOR DESIGN ALTERATIONS MAY BE REQUIRED TO FACILITATE THE PRIVATIZATION PHASE.

WBS 2.1.1. TITLE 11 CAT 2 DD A CONTINGENCY OF 20% HAS BEEN APPLIED DUE TO THE PRELIMINARY STAGE OF DESIGN, AND INCOMING DATA FROM SUBCONTRACTORS FOR THE FACILITIES THAT ARE BEING DESIGNED TO SUPPORT THE PRIVATIZATION PHASE. MINOR DESIGN ALTERATIONS MAY BE REQUIRED TO FACILITATE THE PRIVATIZATION PHASE.

WBS 2.1.2. E/I DURING CONSTRUCTION A CONTINGENCY OF 20% HAS BEEN APPLIED BECAUSE THE PERCENTAGE USED WAS TAKEN BASED OFF CONSTRUCTION DIRECT DOLLARS. SEE COMMENTS ON W.B.S. 2.3.2.

WBS 2.3.2.4. A CONTINGENCY OF 20% HAS BEEN APPLIED DUE TO THE PRELIMINARY STAGE OF DESIGN AND UNCERTAINTY CONCERNING UNDERGROUND OBSTRUCTIONS WITHIN THE UTILITY CORRIDOR.

WBS 2.3.2.5. A CONTINGENCY OF 35% WAS USED ON GROUT TRAILER DUE TO UNKNOWN EXISTING SUBSURFACE CONDITIONS WITH A HIGH POSSIBILITY OF ENCOUNTERING CONTAMINATED SOIL. A 20% CONTINGENCY WAS APPLIED TO THE REMAINDER OF CONSTRUCTION TO FACILITATE THE PRIVATIZATION PHASE. GIVE CONSTRUCTION AN OVERALL CONTINGENCY OF 24%. ALTERATIONS MAY BE REQUIRED TO FACILITATE THE PRIVATIZATION PHASE.

WBS 2.5.3. A CONTINGENCY OF 0% HAS BEEN APPLIED. NUMBERS INCLUDE ESCALATION AND CONTINGENCY.

## 6. ROUNDING

THE PROJECT COST SUMMARY REPORT IS SUMMARIZED AND ADJUSTED/ROUNDED AS FOLLOWS:  
THE ESCALATED TOTAL COST COLUMN AND THE TOTAL DOLLARS COLUMN SUB-TOTALS ARE SUMMARIZED BY CONTRACTOR.  
THE COLUMN SUB-TOTALS ARE ADJUSTED/ROUNDED TO THE NEAREST \$1,000/\$10,000. THE PROJECT TOTAL SUMMARY LINE TOTALS ARE ADJUSTED/ROUNDED TO THE NEAREST \$10,000/\$100,000.

## 7. REMARKS

MAJOR ASSUMPTIONS WHICH HAVE BEEN MADE IN THE PREPARATION OF THIS ESTIMATE ARE AS FOLLOWS:

FLUOR DANIEL NORTHWEST, INC.  
NUMATEC HANFORD CORP  
JOB NO. W519  
FILE NO. W519B4B1

\*\* TEST - INTERACTIVE ESTIMATING \*\*  
THURS PRIVATIZATION STUDY ESTIMATE

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PHMCR03 - ESTIMATE BASIS SHEET

# WATER/SITE/LIQUID EFFLUENTS:

=====

- A.) E & I WERE ESTIMATED AS A DIRECT PERCENTAGE OF CONSTRUCTION.
- B.) FUND PROJECT MANAGEMENT AND DEFINITIVE DESIGN WERE MANLOADED BY FDMW PROJECT MANAGEMENT.
- C.) FUND PROJECT MANAGEMENT AND DEFINITIVE DESIGN WERE MANLOADED BY NUMATEC HANFORD INC.
- D.) OTHER PROJECT COSTS FOR PRIOR YEARS FY90 - FY98 WERE USED TO DETERMINE ON BALANCE EXPENDITURES, FISCAL YEAR 97 BUDGETS AND ESTIMATES TO COMPLETE FISCAL YEARS 98, 99, 00 AND 01. PROJECT COST PROVIDED BY NUMATEC HANFORD INC.
- E.) DESIGN REQUIREMENTS, DOCUMENTS, STUDIES, AND PLANS COMPLETED TO DATE. COST PROVIDED BY NUMATEC HANFORD INC.
- F.) 4.0, 5.1, 5.2, AND 5.3 ARE INCLUSIVE OF ESCALATION AND APPLICABLE TAXES PER NMC PROJECT MANAGEMENT.
- G.) THE NUMATEC PROJECT MANAGERS EXPERTISE AND EXPERIENCE WITH PREVIOUS PROJECTS, THE PREVIOUSLY COMPLETED LIFE CYCLE COST ESTIMATE, AND HISTORICAL DATA FROM PREVIOUSLY COMPLETED PROJECTS HAVE BEEN USED TO DERIVE THE ESTIMATED COSTS. DETAILED PLANNING FOR THESE ACTIVITIES WILL BE REFLECTED IN THE PHMC FY98 MULTI YEAR WORK PLAN.
- H.) ASSUME ONSITE CONSTRUCTION FORCES WILL PERFORM THE FINAL TIE-INS OF THE RADIOACTIVE EFFLUENT LINE AND LIFE CYCLE COST ESTIMATE, AND HISTORICAL DATA FROM PREVIOUSLY COMPLETED PROJECTS HAVE BEEN USED TO DERIVE THE ESTIMATED COSTS. DETAILED PLANNING FOR THESE ACTIVITIES WILL BE REFLECTED IN THE PHMC FY98 MULTI YEAR WORK PLAN.
- I.) ASSUME ONSITE CONSTRUCTION FORCES WILL PERFORM THE FINAL TIE-INS OF THE RADIOACTIVE EFFLUENT LINE AND LIFE CYCLE COST ESTIMATE, AND HISTORICAL DATA FROM PREVIOUSLY COMPLETED PROJECTS HAVE BEEN USED TO DERIVE THE ESTIMATED COSTS. DETAILED PLANNING FOR THESE ACTIVITIES WILL BE REFLECTED IN THE PHMC FY98 MULTI YEAR WORK PLAN.
- J.) ASSUME ONSITE CONSTRUCTION FORCES WILL PERFORM ALL REMAINING CONSTRUCTION WORK.
- K.) ASSUME ONSITE CONSTRUCTION FORCES WILL PERFORM ALL REMAINING CONSTRUCTION WORK.
- L.) ASSUME ONSITE CONSTRUCTION FORCES WILL PERFORM ALL REMAINING CONSTRUCTION WORK.
- M.) ASSUME ONSITE CONSTRUCTION FORCES WILL PERFORM ALL REMAINING CONSTRUCTION WORK.
- N.) ASSUME ONSITE CONSTRUCTION FORCES WILL PERFORM ALL REMAINING CONSTRUCTION WORK.
- O.) ASSUME ONSITE CONSTRUCTION FORCES WILL PERFORM ALL REMAINING CONSTRUCTION WORK.
- P.) ASSUME ONSITE CONSTRUCTION FORCES WILL PERFORM ALL REMAINING CONSTRUCTION WORK.
- Q.) ASSUME ONSITE CONSTRUCTION FORCES WILL PERFORM ALL REMAINING CONSTRUCTION WORK.
- R.) ASSUME ONSITE CONSTRUCTION FORCES WILL PERFORM ALL REMAINING CONSTRUCTION WORK.
- S.) ASSUME ONSITE CONSTRUCTION FORCES WILL PERFORM ALL REMAINING CONSTRUCTION WORK.
- T.) ASSUME ONSITE CONSTRUCTION FORCES WILL PERFORM ALL REMAINING CONSTRUCTION WORK.
- U.) ASSUME ONSITE CONSTRUCTION FORCES WILL PERFORM ALL REMAINING CONSTRUCTION WORK.
- V.) ASSUME ONSITE CONSTRUCTION FORCES WILL PERFORM ALL REMAINING CONSTRUCTION WORK.
- W.) ASSUME ONSITE CONSTRUCTION FORCES WILL PERFORM ALL REMAINING CONSTRUCTION WORK.
- X.) ASSUME ONSITE CONSTRUCTION FORCES WILL PERFORM ALL REMAINING CONSTRUCTION WORK.
- Y.) ASSUME ONSITE CONSTRUCTION FORCES WILL PERFORM ALL REMAINING CONSTRUCTION WORK.
- Z.) ASSUME ONSITE CONSTRUCTION FORCES WILL PERFORM ALL REMAINING CONSTRUCTION WORK.

FLUOR DANIEL NORTHWEST, INC.

MUNATEC HANFORD CORP  
 400 N.W. 10TH AVE  
 FILE NO. 45198A81

\*\* TEST - INTERACTIVE ESTIMATING \*\*  
 THRS PRIVATIZATION PHASE I INFRASTRUCTURE SUPPORT  
 STUDY ESTIMATE  
 PHMCR04 - COMPANY/WBS SUMMARY

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| SORT<br>CODE/WBS | DESCRIPTION                              | ESTIMATE |      | ESCALATION |        | SUB   |        | CONTINGENCY |        | SUB    |        | SITE    |   | TOTAL   |   |
|------------------|------------------------------------------|----------|------|------------|--------|-------|--------|-------------|--------|--------|--------|---------|---|---------|---|
|                  |                                          | SUBTOTAL | %    | %          | TOTAL  | TOTAL | %      | %           | TOTAL  | TOTAL  | %      | ALLOCAT | % | DOLLARS | % |
| DYN              | DYN CORP TRI-CITIES SERVICES, INC.       |          |      |            |        |       |        |             |        |        |        |         |   |         |   |
|                  | 232513 NEW 1000KVA XMR FEED FROM C8-L8   | 5000     | 0.00 | 0          | 5000   | 0     | 0      | 0           | 0      | 5000   | 0      | 5000    | 0 | 5000    | 0 |
|                  | TOTAL DYN DYN CORP TRI-CITIES SERVICES,  | 5000     | 0.00 | 0          | 5000   | 0     | 0      | 0           | 0      | 5000   | 0      | 5000    | 0 | 5000    | 0 |
| FDH              | FLUOR DANIEL HANFORD, INC.               |          |      |            |        |       |        |             |        |        |        |         |   |         |   |
|                  | 232513 NEW 1000KVA XMR FEED FROM C8-L8   | 2500     | 0.00 | 0          | 2500   | 0     | 0      | 0           | 0      | 2500   | 0      | 2500    | 0 | 2500    | 0 |
|                  | SUBTOTAL 23 WTER/SITE/LIQ EFFLUENT       | 7500     | 0.00 | 0          | 7500   | 0     | 0      | 0           | 0      | 7500   | 0      | 7500    | 0 | 7500    | 0 |
|                  | TOTAL FDH FLUOR DANIEL HANFORD, INC.     | 2500     | 0.00 | 0          | 2500   | 0     | 0      | 0           | 0      | 2500   | 0      | 2500    | 0 | 2500    | 0 |
| FDNW             | FLUOR DANIEL NORTHWEST                   |          |      |            |        |       |        |             |        |        |        |         |   |         |   |
|                  | 210400 WATER CAT 1                       | 19048    | 4.06 | 773        | 19821  | 20    | 3964   | 20          | 3964   | 23785  | 7810   | 31595   |   | 31595   |   |
|                  | 211400 WATER CAT 2                       | 12028    | 4.07 | 489        | 12517  | 20    | 2504   | 20          | 2504   | 15021  | 4929   | 19950   |   | 19950   |   |
|                  | 212400 ENG/INSPECTION DURING CONSTRUCTI  | 3885     | 7.03 | 273        | 4158   | 20    | 832    | 20          | 832    | 4990   | 1639   | 6629    |   | 6629    |   |
|                  | SUBTOTAL 21 WATER/SITE/LIQ EFFLUENT      | 34961    | 4.39 | 1535       | 36496  | 20    | 7300   | 20          | 7300   | 43796  | 14378  | 58174   |   | 58174   |   |
|                  | 232403 HDPE PIPE IN EXISTING LINER COW#3 | -52121   | 6.17 | -3216      | -55337 | 20    | -11067 | 20          | -11067 | -66404 | -16367 | -82771  |   | -82771  |   |
|                  | 232405 12" RAW WATER LOOP                | 72351    | 6.17 | 4664       | 76815  | 20    | 15363  | 20          | 15363  | 92178  | 22720  | 114898  |   | 114898  |   |
|                  | SUBTOTAL 2324 WATER EP CONSTRUCTION      | 20230    | 6.17 | 1248       | 21478  | 20    | 4296   | 20          | 4296   | 25774  | 6353   | 32127   |   | 32127   |   |
|                  | 232513 NEW 1000KVA XMR FEED FROM C8-L8   | 60089    | 6.17 | 4078       | 70167  | 20    | 14033  | 20          | 14033  | 84200  | 20753  | 104953  |   | 104953  |   |
|                  | SUBTOTAL 23 WTER/SITE/LIQ EFFLUENT       | 86319    | 6.17 | 5326       | 91645  | 20    | 18329  | 20          | 18329  | 109974 | 27106  | 137080  |   | 137080  |   |
|                  | TOTAL FDNW FLUOR DANIEL NORTHWEST        | 121280   | 5.66 | 6861       | 128141 | 20    | 25629  | 20          | 25629  | 153770 | 41484  | 195255  |   | 195255  |   |
| NHC              | MUNATEC HANFORD CORPORATION              |          |      |            |        |       |        |             |        |        |        |         |   |         |   |
|                  | 253002 PROJECT TECHNICAL SUPPORT         | 4249     | 0.00 | 0          | 4249   | 0     | 0      | 0           | 0      | 4249   | 0      | 4249    | 0 | 4249    | 0 |

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ELIOR DANIEL NORTHWEST, INC.  
 NUMATEC HANFORD CORP  
 JOB NO. W519  
 FILE NO. W519B481

\*\* TEST - INTERACTIVE ESTIMATING \*\*  
 THRS PRIVATIZATION PHASE II  
 STUDY ESTIMATE  
 PHMCR04 - COMPANY/WBS SUMMARY

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| SORT<br>CODE/WBS | DESCRIPTION                           | ESTIMATE |      | ESCALATION |   | SUB<br>TOTAL |   | CONTINGENCY<br>% | TOTAL    |   | SUB<br>TOTAL | SITE<br>ALLOCAT'N |   | TOTAL<br>DOLLARS |
|------------------|---------------------------------------|----------|------|------------|---|--------------|---|------------------|----------|---|--------------|-------------------|---|------------------|
|                  |                                       | SUBTOTAL | %    | SUBTOTAL   | % | SUBTOTAL     | % |                  | SUBTOTAL | % |              | SUBTOTAL          | % |                  |
|                  | SUBTOTAL 2 WTR/SITE/LIQ EFFLUENT C    | 133029   | 5.16 | 6861       |   | 139890       |   | 18               | 25629    |   | 165519       | 41484             |   | 207003           |
|                  | TOTAL WRC NUMATEC HANFORD CORPORATION | 4249     | 0.00 | 0          |   | 4249         |   | 0                | 0        |   | 4249         | 0                 |   | 4249             |
|                  | PROJECT TOTAL                         | 133,029  | 5.16 | 6,861      |   | 139,890      |   | 18               | 25,629   |   | 165,519      | 41,484            |   | 207,003          |

FLUOR DANIEL NORTHWEST, INC.  
 HUMATIC HANFORD CORP.  
 JOB NO. W519  
 FILE NO. U519EAB1

\*\* TEST - INTERACTIVE ESTIMATING \*\*  
 THRS PRIVATIZATION PROJECT INFRASTRUCTURE SUPPORT  
 STUDY ESTIMATE

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PHNCR05 - CONSTRUCTION MANAGEMENT/OTHER COST SUMMARY

| WBS           | DESCRIPTION                         | ESTIMATE<br>SUBTOTAL | CONSTRUCTION<br>% | MANAGEMENT<br>TOTAL | OTHER<br>COSTS | SUB<br>TOTAL | TOTAL   |
|---------------|-------------------------------------|----------------------|-------------------|---------------------|----------------|--------------|---------|
| 210400        | WATER CAT 1                         | 10018                | 0.00              | 0                   | 0              | 0            | 19048   |
| 211400        | WATER CAT 2                         | 12038                | 0.00              | 0                   | 0              | 0            | 12038   |
| 212400        | ENG/INSPECTION DURING CONSTRUCTION  | 3885                 | 0.00              | 0                   | 0              | 0            | 3885    |
| SUBTOTAL 21   | WATER/SITE/LIQ EFFLUENT ENG         | 34961                |                   | 0                   | 0              | 0            | 34961   |
| 232403        | HDPE PIPE IN EXISTING LINER COMB/#4 | -43891               | 18.75             | -8230               | 0              | -8230        | -52121  |
| 232405        | 12" RAW WATER LOOP                  | 60927                | 18.75             | 11424               | -0             | 11424        | 72351   |
| SUBTOTAL 2324 | WATER FP CONSTRUCTION               | 51997                |                   | 3194                | 0              | 3194         | 55191   |
| 232513        | NEW 1000KVA XMFR FEED FROM C8-L8    | 63154                | 16.52             | 10435               | 0              | 10435        | 73589   |
| SUBTOTAL 23   | WATER/SITE/LIQ EFFLUENT CONS        | 115151               |                   | 13629               | 0              | 13629        | 128780  |
| 253002        | PROJECT TECHNICAL SUPPORT           | 4249                 | 0.00              | 0                   | 0              | 0            | 4249    |
| SUBTOTAL 2    | WTR/SITE/LIQ EFFLUENT COST          | 119400               |                   | 13629               | 0              | 13629        | 133029  |
| PROJECT TOTAL |                                     | 119,400              |                   | 13,629              | 0              | 13,629       | 133,029 |

FLUOR DANIEL NORTHWEST, INC.  
 HUMATEC HANFORD CORP  
 JOB NO. W519  
 FILE NO. W519B481

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 THRS PRIVATIZATION PHASE I INFRASTRUCTURE SUPPORT  
 PHNCR06 - SITE ALLOCATIONS BY WBS

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| WBS           | DESCRIPTION                         | ESTIMATE | DYN      | FDH GFS/G&A | FDH MPR   | FDH GFS/G&A | FDH MPR/G&A | SITE ALLOC |
|---------------|-------------------------------------|----------|----------|-------------|-----------|-------------|-------------|------------|
|               |                                     | SUBTOTAL | EQ.USAGE | CONST.MGMT  | F.P./S.C. | LABOR       | MATERIAL    | SUBTOTAL   |
| 210400        | WATER CAT 1                         | 19048    | 48       | 0           | 0         | 6206        | 0           | 6254       |
| 211400        | WATER CAT 2                         | 13228    | 30       | 0           | 0         | 3918        | 0           | 3948       |
| 212400        | ENG/INSPECTION DURING CONSTRUCTION  | 3889     | 10       | 0           | 0         | 1266        | 0           | 1276       |
| SUBTOTAL 21   | WATER/SITE/LIQ EFFLUENT ENG         | 34961    | 88       | 0           | 0         | 11390       | 0           | 11478      |
| 232403        | HDPE PIPE IN EXISTING LINER COW3/#4 | -43891   | 0        | -2681       | -10165    | 0           | 0           | -12846     |
| 232405        | 12" RAW WATER LOOP                  | 60927    | 0        | 3722        | 14111     | 0           | 0           | 17833      |
| SUBTOTAL 2324 | WATER FP CONSTRUCTION               | 17036    | 0        | 1041        | 3946      | 0           | 0           | 4987       |
| 232513        | NEW 1000KVA XMFR FEED FROM C8-L8    | 63154    | 0        | 3400        | 12889     | 0           | 0           | 16289      |
| SUBTOTAL 23   | WATER/SITE/LIQ EFFLUENT CONS        | 80190    | 0        | 4441        | 16835     | 0           | 0           | 21276      |
| 253002        | PROJECT TECHNICAL SUPPORT           | 4249     | 0        | 0           | 0         | 0           | 0           | 0          |
| SUBTOTAL 2    | WTR/SITE/LIQ EFFLUENT COST          | 119400   | 88       | 4441        | 16835     | 11390       | 0           | 32754      |
| PROJECT TOTAL |                                     | 119,400  | 88       | 4,441       | 16,835    | 11,390      | 0           | 32,754     |

FLUOR DANIEL NORTHWEST, INC.  
 HUMATEC HANFORD CORP  
 JOB NO. W519  
 FILE NO. W519B41

\*\* TEST - INTERACTIVE ESTIMATING \*\*  
 THRS PRIVATIZATION PHASE I INFRASTRUCTURE SUPPORT  
 PHNCR07 - SITE ALLOCATION ESCALATION/CONTINGENCY REPORT

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 DATE 07/08/98 11:04:14  
 BY DKH/JPM

| WBS DESCRIPTION                            | SITE ALLOC<br>SUBTOTAL | ESCALATION<br>% TOTAL | SUB<br>TOTAL | CONTINGENCY<br>% TOTAL | TOTAL<br>DOLLARS |
|--------------------------------------------|------------------------|-----------------------|--------------|------------------------|------------------|
| 210400 WATER CAT 1                         | 6254                   | 0.00                  | 6508         | 20                     | 1302             |
| 211400 WATER CAT 2                         | 5254                   | 0.00                  | 4108         | 20                     | 821              |
| 212400 ENG/INSPECTION DURING CONSTRUCTION  | 1276                   | 0.00                  | 1366         | 20                     | 273              |
| SUBTOTAL 21 WATER/SITE/LIQ EFFLUENT ENG    | 11478                  | 4.39                  | 11982        | 20                     | 2396             |
| 232403 HDPE PIPE IN EXISTING LINER COM5/#4 | -12846                 | 0.00                  | -13639       | 20                     | -2728            |
| 232405 12" RAW WATER LOOP                  | 17833                  | 0.00                  | 18933        | 20                     | 3787             |
| SUBTOTAL 2324 WATER FP CONSTRUCTION        | 4987                   | 6.16                  | 5294         | 20                     | 1059             |
| 232513 NEW 1000KVA XMR FEED FROM C8-L8     | 16289                  | 0.00                  | 17294        | 20                     | 3459             |
| SUBTOTAL 23 WATER/SITE/LIQ EFFLUENT CONS   | 21276                  | 6.17                  | 22588        | 20                     | 4518             |
| 253002 PROJECT TECHNICAL SUPPORT           | 0                      | 0.00                  | 0            | 0                      | 0                |
| SUBTOTAL 2 WTR/SITE/LIQ EFFLUENT COST      | 32754                  | 5.54                  | 34570        | 20                     | 6914             |
| PROJECT TOTAL                              | 32,754                 | 5.54                  | 34,570       | 20                     | 6,914            |
|                                            |                        |                       |              |                        | 41,484           |

## APPENDIX B

### Outline Specification

## OUTLINE SPECIFICATION

### DIVISION 2 - SITEWORK

#### Section 02200 Earthwork

1. Load-bearing backfill, compacted
2. Bedding: Sand cushion for pipe, compacted
3. Plastic sheet marker for buried piping
4. Soil compaction testing

#### Section 02237 Controlled Density Fill

1. Flowable concrete piping backfill, design strength 345 to 690 kpa (50 to 100 psi).

#### Section 02650 Piped Utilities

1. Process water piping: DN75 (3-in.), PVC meeting ASTM D 2241 Rev B, SDR 13.5.
2. Fittings: PVC meeting ASTM D 2241 Rev B, SDR 13.5.
3. Valves: Cast Iron body, lined, gate, AWWA C500 and C509, flanged, non-rising stem, with indicator post flange.
4. Water meters: Turbine, AWWA C701, compatible with remote signal.
5. Indicator Post: Adjustable, telescoping barrel type with locking handle.
6. Flushed and hydrostatic tested
7. Disinfected
8. Thrust restrained, NFPA 24

Section 02668 Fire Water Systems

1. Raw/Fire water piping: DN300 (12-in.) and DN150 (6-in.), PVC meeting AWWA C900, Class 150 or Ductile Iron, AWWA C151 with C111 joints.
2. Fittings: Ductile Iron, AWWA C110/C111, lined
3. Valves: Cast Iron body, lined, gate, AWWA C500 and C509, flanged, non-rising stem, with indicator post flange.
4. Indicator Post: Adjustable, telescoping barrel type with locking handle.
5. Fire Hydrants: DN150 (6-in.), AWWA C502, Dry Barrel.
6. Flushed and hydrostatic tested
7. Disinfected
8. Thrust restrained, NFPA 24

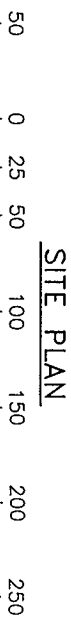
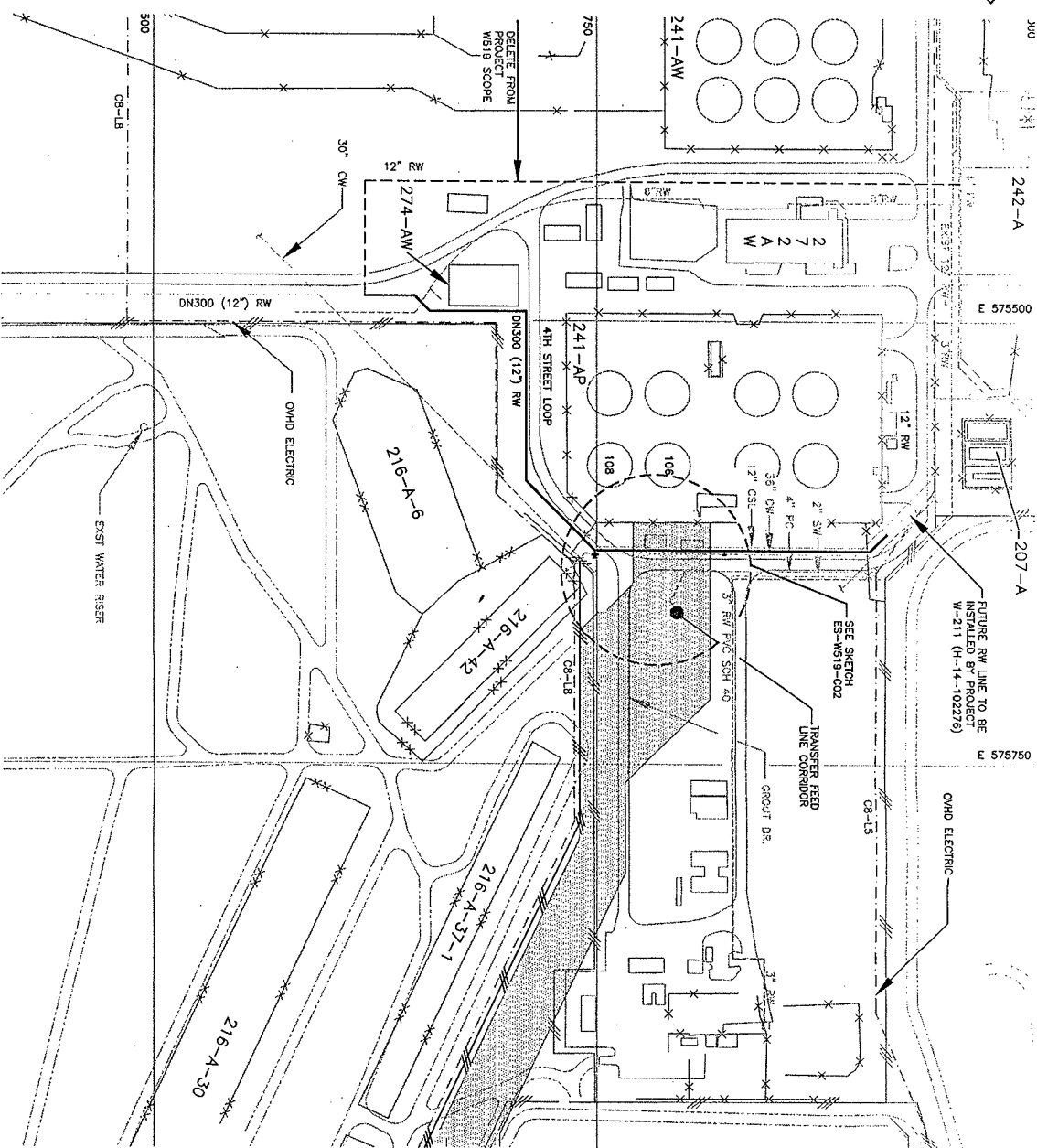
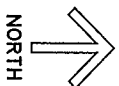
DIVISION 16 - ELECTRICAL

Section 16300 Medium Voltage Distribution

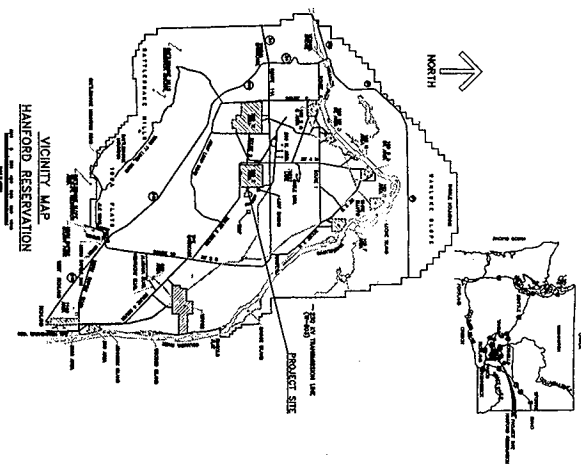
1. Transformer: 1000 kVA, 13.8 kV - 480 V, 3 phase, 4 wire, delta primary, grounded wye secondary, 60 Hz, oil-filled, pad-mounted.
2. Disconnect Switch: Fused cutout type, cross-mounted, 15 kV, 95 kV BIL.
3. Lightning Arrester: Heavy duty distribution class surge arrester, metal oxide, silicone rubber housing, 15.3 kV.
4. Cable: 15 kV, copper conductor, shielded, EPR insulation, PVC jacket.
5. Underground concrete ductbank for primary feeder.
6. Concrete pad with ground ring connected to high voltage grounding system.
7. Concrete barrier posts.

## APPENDIX C

### Sketches



SITE PLAN

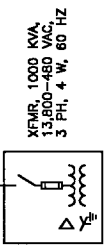
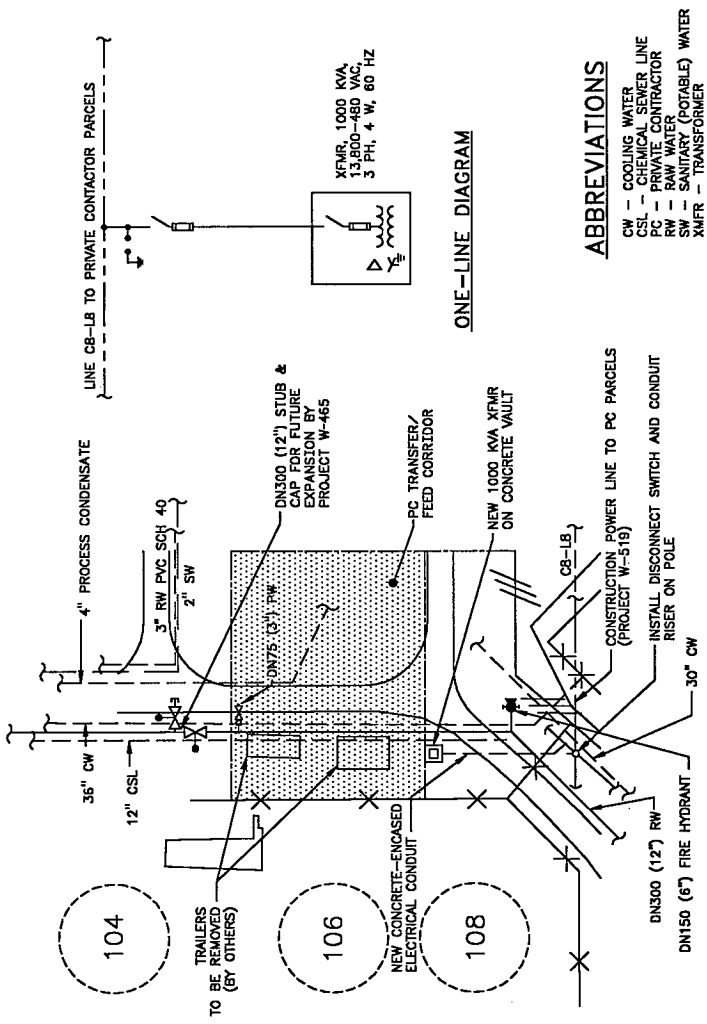


LEGEND:

- TRANSFER FEED LINE CORRIDOR
- EXIST UOHD UTILITY
- EXIST OHD ELECTRIC
- RAW WATER
- WASHINGTON STATE GRID SYSTEM COORDINATE IN METERS

ABBREVIATIONS

- OW - OOHND WATER
- PC - PRIVATE CONDUIT
- SW - SWANLEY (PONDERS) WATER



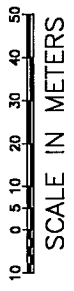
ONE-LINE DIAGRAM

ABBREVIATIONS

- CW - COOLING WATER
- CSL - CHEMICAL SEWER LINE
- PC - PRIVATE CONTRACTOR
- RW - RIGHT-OF-WAY
- SW - SATURABLE WATER
- XFMR - TRANSFORMER

DETAIL EXPANDED SITE PLAN

SCALE: SHOWN



|                                                                                     |              |                      |
|-------------------------------------------------------------------------------------|--------------|----------------------|
|  |              |                      |
| FLUOR DANIEL NORTHWEST                                                              |              |                      |
| Prepared By/Date<br>KR AXT/07-07-98                                                 | ES-W519S-C02 | CAD FILE<br>IW519C2B |