DE-AC05-94 DE-AC05-94

U.S. WEST COMMUNICATIONS, INC.
DE-AC05-94OR21965
AWARD DOCUMENT A000

OR21965B.1

OR-OR

2 2
1 1
9 9
6 6
5 5

B.1 B.1
#001 #001

AWARD/CONTRACT

1. THIS CONTRACT IS A RATED ORDER UNDER DPAS (15 CFR 350) — RATING

2. CONTRACT (Proc. Inst. Ident.) NO.: DE-AC05-940R21965

3. EFFECTIVE DATE: MAY 02 1994

4. REQUISITION/PURCHASE REQUEST/PROJECT NO.: 05-920R21965.000

5. ISSUED BY — CODE

U. S. Department of Energy
Oak Ridge Operations Office
Procurement and Contracts Division
P. O. Box 2001
Oak Ridge, TN 37831-8757

6. ADMINISTERED BY (If other than Item 5) — CODE

7. NAME AND ADDRESS OF CONTRACTOR (No., street, city, county, State and ZIP Code)

US West Communications Federal Services, Inc.
188 Inverness Drive West
Suite 600
Englewood, CO 80112

CODE — FACILITY CODE

8. DELIVERY: ☐ FOB ORIGIN ☐ OTHER (See below)

9. DISCOUNT FOR PROMPT PAYMENT: N/A

10. SUBMIT INVOICES (4 copies unless otherwise specified) TO THE ADDRESS SHOWN IN: ITEM See Clause G.5

11. SHIP TO/MARK FOR — CODE

12. PAYMENT WILL BE MADE BY — CODE

Martin Marietta Energy Systems
Telecommunications Finance Officer

13. AUTHORITY FOR USING OTHER THAN FULL AND OPEN COMPETITION:

☐ 10 U.S.C. 2304(c)( ) ☐ 41 U.S.C. 253(c)( )

14. ACCOUNTING AND APPROPRIATION DATA

39AE99
PRN94E201000900 $3,875,763

15A. ITEM NO.	15B. SUPPLIES/SERVICES	15C. QUANTITY	15D. UNIT	15E. UNIT PRICE	15F. AMOUNT
	Letter Contract for only the work authorized in Clause H.41 Sections K, L and M have been removed for award purposes				

15G. TOTAL AMOUNT OF CONTRACT ▶ $

16. TABLE OF CONTENTS

(X)	SEC.	DESCRIPTION	PAGE(S)	(X)	SEC	DESCRIPTION	PAGE(S)
		PART I — THE SCHEDULE				PART II — CONTRACT CLAUSES	
X	A	SOLICITATION/CONTRACT FORM	1	X	I	CONTRACT CLAUSES	96
X	B	SUPPLIES OR SERVICES AND PRICES/COSTS	2			PART III — LIST OF DOCUMENTS, EXHIBITS AND OTHER ATTACH.	
X	C	DESCRIPTION/SPECS./WORK STATEMENT	39	X	J	LIST OF ATTACHMENTS	126
X	D	PACKAGING AND MARKING	41			PART IV — REPRESENTATIONS AND INSTRUCTIONS	
X	E	INSPECTION AND ACCEPTANCE	43		K	REPRESENTATIONS, CERTIFICATIONS AND OTHER STATEMENTS OF OFFERORS	
X	F	DELIVERIES OR PERFORMANCE	47				
X	G	CONTRACT ADMINISTRATION DATA	57		L	INSTRS., CONDS., AND NOTICES TO OFFERORS	
X	H	SPECIAL CONTRACT REQUIREMENTS	64		M	EVALUATION FACTORS FOR AWARD	

CONTRACTING OFFICER WILL COMPLETE ITEM 17 OR 18 AS APPLICABLE

17. [X] CONTRACTOR'S NEGOTIATED AGREEMENT (Contractor is required to sign this document and return 2 copies to issuing office.) Contractor agrees to furnish and deliver all items or perform all the services set forth or otherwise identified above and on any continuation sheets for the consideration stated herein. The rights and obligations of the parties to this contract shall be subject to and governed by the following documents: (a) this award/contract, (b) the solicitation, if any, and (c) such provisions, representations, certifications, and specifications, as are attached or incorporated by reference herein. (Attachments are listed herein.)

18. ☐ AWARD (Contractor is not required to sign this document.) Your offer on Solicitation Number _____, including the additions or changes made by you which additions or changes are set forth in full above, is hereby accepted as to the items listed above and on any continuation sheets. This award consummates the contract which consists of the following documents: (a) the Government's solicitation and your offer, and (b) this award/contract. No further contractual document is necessary.

19A. NAME AND TITLE OF SIGNER (Type or print)

William R. Cobb, President
US West Communications Federal Services, Inc.

20A. NAME OF CONTRACTING OFFICER

Jeffrey R. Burgan

19B. NAME OF CONTRACTOR — BY William R. Cobb (Signature of person authorized to sign)

19C. DATE SIGNED: APR 28 1994

20B. UNITED STATES OF AMERICA — BY Jeffrey R. Burgan (Signature of Contracting Officer)

20C. DATE SIGNED: MAY 02 1994

ENTIRE TABLE OF CONTENTS

Section Page

SECTION B - SUPPLIES OR SERVICES AND PRICES/COSTS

B.1 LOCAL 999.B01 ITEMS BEING ACQUIRED (JULY 1991) (DEVIATION) 3

B.2 FAR 52.232-18 AVAILABILITY OF FUNDS (APRIL 1984) 3

B.3 PRICING OF EQUIPMENT/SERVICE ORDERS (MARCH 1991) 4

B.4 PRICE SCHEDULES (MARCH 1991) 4

B.5 MINIMUM PURCHASE 5

SECTION C - DESCRIPTION/SPECIFICATIONS/WORK STATEMENT

C.1 LOCAL 999.C06 SPECIFICATION (APR 1984) 40

C.2 LOCAL 999.C04 REPORTS (APRIL 1986) 40

SECTION D - PACKAGING AND MARKING

D.1 LOCAL 999.D01 PACKAGING (ALTERNATE 1) (APR 1984) 42

SECTION E - INSPECTION AND ACCEPTANCE

E.1 LOCAL 999.E01 INSPECTION (MAR 1989) 44

E.2 LOCAL 999.E02 ACCEPTANCE (APR 1984) 44

E.3 RESPONSIBILITY FOR SUPPLIES (JULY 1991) 44

E.4 TESTING AND INSPECTION (JULY 1991) 44

E.5 STANDARDS AND GUIDELINES (JULY 1991) 45

E.6 ACCEPTANCE OF EQUIPMENT PERFORMANCE (JULY 1991) 45

E.7 PAYMENT (JULY 1991) 46

SECTION F - DELIVERIES OR PERFORMANCE

F.1 TERM OF CONTRACT 48

F.2 LOCAL 999.F04 PRINCIPAL PLACE OF PERFORMANCE (APR 1984) . 48

F.3 LOCAL 999.F05 DELIVERY POINT (APR 1984) 48

F.4 FAR 52.247-34 F.O.B. DESTINATION (NOV 1991) 48

F.5 TIME OF DELIVERY 50

SECTION G - CONTRACT ADMINISTRATION DATA

G.1 LOCAL 999.G01 CORRESPONDENCE PROCEDURES (MAR 1989) 58

G.2 LOCAL 999.G02 DESIGNATION of PATENT ADVISOR (JAN 1994) 59

G.3 LOCAL 999.G06 CONTRACTING OFFICER'S REPRESENTATIVE (COR) (MAR 1989) 59

G.4 CONTRACT ADMINISTRATION (MAR 1989) 59

G.5 INVOICE/PAYMENT REQUIREMENTS (JULY 1991) 59

G.6 LOCAL 999.G09 TECHNICAL MONITOR (MAY 1992) (DEVIATION) . . 61

SECTION H - SPECIAL CONTRACT CLAUSES

H.1 LOCAL 999.H01 TECHNICAL DIRECTION (MAR 1989) 65

H.2 DEFINITIONS AND ACRONYMS (JULY 1991) 66

H.3 LOCAL 999.H02 MODIFICATION AUTHORITY (APR 1984) 67

H.4 LOCAL 999.H07 KEY PERSONNEL (ALTERNATE 1) (APR 1984) 67

H.5 LOCAL 999.H08 CONFIDENTIALITY OF INFORMATION (AUG 1992) 68

H.6 LOCAL 999.H04 - GOVERNMENT FURNISHED PROPERTY AND DATA (ALTERNATE I) (JULY 1990) 69

H.7 TITLE TO EQUIPMENT (JULY 1991) 69

H.8 FAR 52.219-16 LIQUIDATED DAMAGES-SMALL BUSINESS SUBCONTRACTING PLAN (AUGUST 1989) 69

H.9 UTILITY CHARGES 70

H.10 TECHNOLOGICAL SUBSTITUTIONS (JULY 1991) 71

H.11 RESERVED 71

H.12 SCHEDULING OF WORK (JULY 1991) 72

H.13 SPECIAL CLAUSE - TMS APPLICATION SOURCE CODE ESCROW ACCOUNT (JULY 1991) 72

H.14 LOCATION CHANGES AND ADDITIONS (JULY 1991) 72

H.15 INSTALLATION, MAINTENANCE, AND SERVICE OF GOVERNMENT-FURNISHED EQUIPMENT AFTER ACCEPTANCE OF THE VDTS (JULY 1991) 72

H.16 AUTHORIZATION FOR RELOCATION, INSTALLATION, MODIFICATION AND DISCONNECTION (RIMD) SERVICES AND MAINTENANCE AND REPAIR (M/R) (MAR 1991) 73

H.17 LOCAL 999.H43 ENVIRONMENTAL LAWS (JUL 1991) 73

H.18 SPECIAL REQUIREMENTS FOR WORK IN AREAS CONTAINING ASBESTOS (JULY 1991) 73

H.19 LOCAL 999.H13 EQUIVALENT FEDERAL WAGE RATES (APR 1984) (DEVIATION) 74

H.20 ECONOMIC PRICE ADJUSTMENT ARTICLE (JULY 1991) 74

H.21 ADDITIONAL TERMS AND CONDITIONS APPLICABLE TO LEASE (JULY 1991) 77

H.22 BID GUARANTEE, PERFORMANCE AND PAYMENT BONDS (MAR 1991) 78

H.23 ADDITIONAL PROVISIONS REGARDING CONSTRUCTION (JULY 1991) 79

H.24 SECURITY CLEARANCE FOR ON-SITE WORK (JULY 1991) 79

H.25 REPRESENTATION AS TO CONDITION OF WORK AND SITE EXAMINATION (JULY 1991) 80

H.26 SMALL BUSINESS AND SMALL DISADVANTAGED BUSINESS SUBCONTRACTING PLAN (JULY 1991) 80

H.27 LOCAL 999.H24 PROPERTY and SUBCONTRACTING REPORT REQUIREMENTS (NOV 1987) 80

H.28 LOCAL 999.H29 REPRESENTATIONS, CERTIFICATIONS and OTHER STATEMENTS of the OFFEROR (FEB 1990) 81

H.29 LOCAL 999.H36 SAFETY and HEALTH (FEB 1993) 81

H.30 PERMITS (JULY 1991) 81

H.31 DRUG ABUSE PROGRAM (JULY 1991) 81

H.32 GOVERNMENT BUY OUT UNDER LEASE OR LWOP (JULY 1991) . . 82

H.33 EQUIPMENT REMOVAL (JULY 1991) 82

H.34 RESERVED 82

H.35 PROCUREMENT AUTHORITY (JULY 1991) 83

H.36 REQUIRED INSURANCE (JUL 1991) 83

H.37 LOCAL 999.H23 RIGHTS TO PROPOSAL DATA (TECHNICAL) (AUG 1991) 84

H.38 APPLICABLE FEDERAL INFORMATION PROCESSING STANDARD (FIPS) 84

H.39 LOCAL 999.H03 OVERSIGHT OF CONTRACTOR (MAR 1994) 85

H.40 PRIVACY OR SECURITY SAFEGUARDS (OCT. 90 FIRMR) 86

H.41 LOCAL 999.H32 LETTER CONTRACT (AUG 1992) 86

H.42 FAR 52.216-23 EXECUTION AND COMMENCEMENT OF WORK (APR 1984) 87

H.43 FAR 52.216-24 LIMITATION OF GOVERNMENT LIABILITY (APR 1984) 87

H.44 FAR 52.216-25 CONTRACT DEFINITIZATION (APR 1984) 87

H.45 FOCI DETERMINATIONS 89

H.46 DEAR 952.250-70 NUCLEAR HAZARDS INDEMNITY AGREEMENT (JAN 1992) 89

H.47 RCRA AND CERCLA RESPONSIBILITY (APR 1994) 94

H.48 GENERAL INDEMNIFICATION (APR 1994) 94

SECTION I - CONTRACT CLAUSES

I. 1 PREPRINTED CONTRACT CLAUSES FOR FIXED PRICE SUPPLY CONTRACTS (DOE SET 301 - SEPTEMBER 1993) AND FIXED PRICE SERVICE CONTRACTS (DOE SET 301S-FEBRUARY 1992) ... 97

I. 2 DEAR 952.212-72 UNIFORM REPORTING SYSTEM (OCT 1991) 97

I. 3 DEAR 952.204-2 SECURITY REQUIREMENTS (OCT 1987) 98

I. 4 DEAR 952.204-74 FOREIGN OWNERSHIP, CONTROL, OR INFLUENCE OVER CONTRACTOR APR 1984) 99

I. 5 FAR 52.210-7 USED OR RECONDITIONED MATERIAL, RESIDUAL INVENTORY, AND FORMER GOVERNMENT SURPLUS PROPERTY (APR 1984) 101

I. 6 FAR 52.220-1 PREFERENCE FOR LABOR SURPLUS AREA CONCERNS (APR 1984) 101

I. 7 FAR 52.220-4 LABOR SURPLUS AREA SUBCONTRACTING PROGRAM (APR 1984) 102

I. 8 FAR 52.222-43 FAIR LABOR STANDARDS ACT AND SERVICE CONTRACT ACT-PRICE ADJUSTMENT (MULTIPLE YEAR AND OPTION CONTRACTS) (MAY 1989) 103

I. 9 FAR 52.223-3 HAZARDOUS MATERIAL IDENTIFICATION AND MATERIAL SAFETY DATA (NOV 1991) 104

I.10 DEAR 952.223-71 SAFETY AND HEALTH (GOVERNMENT-OWNED OR LEASED) (APR 1984) 106

I.11 DEAR 952.223-75 PRESERVATION OF INDIVIDUAL OCCUPATIONAL RADIATION EXPOSURE RECORDS (APR 1984) . . . 107

I.12 FAR 52.224-1 PRIVACY ACT NOTIFICATION (APR 1984) 107

I.13 FAR 52.224-2 PRIVACY ACT (APR 1984) 107

I.14 FAR 52.227-19 COMMERCIAL COMPUTER SOFTWARE--RESTRICTED RIGHTS (JUN 1987) 108

I.15 FAR 52.228-5 INSURANCE -- WORK ON A GOVERNMENT INSTALLATION (SEP 1989) 110

I.16 FAR 52.232-9 LIMITATION ON WITHHOLDING OF PAYMENTS (APR 1984) 111

I.17 FAR 52.237-2 PROTECTION OF GOVERNMENT BUILDINGS, EQUIPMENT, AND VEGETATION (APR 1984) 111

I.18 FAR 52.237-3 CONTINUITY OF SERVICES (JAN 1991) 111

I.19 FAR 52.248-1 VALUE ENGINEERING (MAR 1989) 112

I.20 PREPRINTED CONTRACT CLAUSES FOR FIXED PRICE CONSTRUCTION CONTRACTS (DOE SET 307- SEPTEMBER 1993) . . . 121

I.21 RESERVED 121

I.22 FAR 52.228-1 BID GUARANTEE (APR 1984) 121

I.23 FAR 52.228-11 PLEDGES OF ASSETS (FEB 1990) 122

I.24 FAR 52.236-14 AVAILABILITY AND USE OF UTILITY SERVICES (APR 1984) 123

I.25 FAR 52.232-18 AVAILABILITY OF FUNDS (APR 1984) 123

I.26 FAR 52.216-18 ORDERING (APR 1984) 123

I.27 RESERVED 124

I.28 FAR 52.216-22 INDEFINITE QUANTITY (APR 1984) 124

I.29 DEAR 970.5204-58 WORKPLACE SUBSTANCE ABUSE PROGRAMS AT DOE SITES (AUG 1992) 124

SECTION J - LIST OF ATTACHMENTS

J. 1 LOCAL 999.J01 LIST of DOCUMENTS, EXHIBITS, and OTHER ATTACHMENTS (APR 1984) 127

SECTION B

SUPPLIES OR SERVICES AND PRICES/COSTS

B.1 LOCAL 999.B01 Items Being Acquired (Jul 1991) (Deviation)

B.2 FAR 52.232-18 Availability of Funds (Apr 1984)

B.3 Pricing of Equipment/Service Orders (Mar 1991)

B.4 Price Schedules (Mar 1991)
- Schedule A
- Schedule B
- Schedule C
- Schedule D
- Schedule E
- Schedule F
- Schedule G

B.5 Minimum Purchase

SECTION B

SUPPLIES OR SERVICES AND PRICES/COSTS

B.1 LOCAL 999.B01 ITEMS BEING ACQUIRED (JULY 1991) (DEVIATION)

The Contractor shall furnish all personnel, equipment, materials, supplies, services, and facilities (except as may be expressly set forth in this contract as furnished by the Government) and otherwise do all things necessary for, or incident to, the performance and providing the following items of work to perform the requirements set forth in the Work Statement (Section C):

- Plan, manage, execute the work described in the Technical Specification and Statement of Work, Y/EN-2351, and Specification and Statement of Work K/CSD-INF-8822, contained in Part III, Section J, Attachments A and B.

- Beginning at the award of the contract; relocation, installation, modification, disconnection, maintenance, and repair service shall be provided for existing facilities and equipment per the Statement of Work (SW-TNS-001) which is contained in Part III, Section J, Attachment C. The acronym RIMD/M-R shall refer to this service, including maintenance and repair. The existing facilities are identified in Appendix 8 of Technical Specifications and Statement of Work, Y/EN-2351.

B.2 FAR 52.232-18 AVAILABILITY OF FUNDS (APRIL 1984)

Funds are not presently available for this contract. The Government's obligation under this contract is contingent upon the availability of appropriated funds from which payment for contract purposes can be made. No legal liability on the part of the Government for any payment may arise until funds are made available to the Contracting Officer for this contract and until the Contractor receives notice of such availability, to be confirmed in writing by the Contracting Officer.

B.3 PRICING OF EQUIPMENT/SERVICE ORDERS (MARCH 1991)

All service and equipment orders provided under this contract shall be priced in accordance with the prices contained in Price Schedules A through G and Clause B.3 of this section. **Prices contained herein are subject to change only in accordance with the Economic Price Adjustment Clause H.20 of this contract, unless otherwise indicated.**

B.4 PRICE SCHEDULES (MARCH 1991)

Schedule A -- RIMD/M-R Services for Existing System:

Item 001 is for Relocation, Installation, Modification and Disconnection, Maintenance and Repair (RIMD/M-R) service only for the existing system from contract award until cutover. Pricing shall be offered on a fixed price basis for a dedicated work force. Lease, and lease with option to purchase do not apply for Item 001.

Schedule B -- Lease with Option to Purchase (LWOP)

This schedule provides the monthly Lease with Option to Purchase (LWOP) prices applicable to line items 002, 003, and 005, the appropriate monthly charge for items 004 and 006, and the purchase price of item 007 on Schedule B and additional options that can be exercised at the Government's discretion.

Schedule C

This schedule shall be used to determine the purchase price of line items 002 through 006 shown on Schedule B.

Schedule D - Lease Rate Factor

This schedule shall be used to determine the monthly lease amounts for added equipment under Item 005, Schedule B.

Schedule E - Early Purchase Schedule

This schedule shall be used to determine the early purchase price of item 002, Telecommunications Management System or the equipment under item 003, Integrated Communications Network during any month of the contract.

Schedule F - RESERVED

Schedule G - Amounts Subject to Economic Price Adjustment

This schedule shall be used to determine the portion of the proposal subject to escalation.

B.5 MINIMUM PURCHASE

At a minimum, the Government will require the purchase of item 007, the lease with option to purchase of item 002, and one year of RIMD M/R on the existing system under item 001.

SCHEDULE A - RIMD/M-R Services for Existing System

		ESTIMATED QUANTITY	UNIT PRICE PER MONTH	TOTAL PRICE
001	Provide dedicated work force to perform RIMD/MR service for the existing telecommunications system (the OORTS) prior to cutover of the ORF-ICN Private Branch Exchange (PBX) system during the hours 6 am to 10 pm seven days a week. Dedicated work force shall be based on performing and average 2000 TWRs per month including cable pulls and refurbishing of used equipment. 15 Number of technicians.		*$197,715	
			$TBD	$TBD
			$TBD	$TBD
			$TBD	$TBD

SCHEDULE A - RIMD/M-R Services for Existing System

		ESTIMATED QUANTITY	UNIT PRICE PER MONTH	TOTAL PRICE
001A	Console operator services for the OORTS. (See Section 3.9 of the Supplemental Statement of Work for detailed description of the service required.)		*$19,422	
	5 Number of operators.		$TBD	$TBD
			$TBD	$TBD
			$TBD	$TBD

SCHEDULE A - RIMD/M-R Services for Existing System

		ESTIMATED QUANTITY	UNIT PRICE PER HOUR	TOTAL PRICE
001B	Rate per hour for overtime (estimated to be 100 hours per month). Overtime hours are defined as:		*$52.22	
	a) 10 pm - 6 am seven days a week.		$TBD	$TBD
	b) Swing shift w/o notification by previous Thursday.			
	c) Saturday and Sundays when work is not scheduled the prior week.		$TBD	$TBD
	d) MR during the off shift.		$TBD	$TBD
	No overtime shall be incurred without prior DOE approval.			
001C	Hourly rate for temporary additional technicians. (500 Hours per 12 month period.)		*$54.05	*$27,025
			$TBD	$TBD
			$TBD	$TBD
			$TBD	$TBD

SCHEDULE A - RIMD/M-R Services for Existing System

		ESTIMATED QUANTITY	UNIT PRICE PER HOUR	TOTAL PRICE
001D	Hourly rate for Fiber Optic Cable installation in existing ductway or on existing poles. (6000 Hours per 12 month period.)		*$338.21	
			$TBD	$TBD
			$TBD	$TBD
			$TBD	$TBD
001E	Hourly rate for terminating single-mode optical fiber. (100 Hours per 12 month period.)		*$185.32	
			$TBD	$TBD
			$TBD	$TBD
			$TBD	$TBD

SCHEDULE A - RIMD/M-R Services for Existing System

		ESTIMATED QUANTITY	UNIT PRICE PER HOUR	TOTAL PRICE
001F	Hourly rate for terminating multi-mode optical fiber. (100 Hours per 12 month period.)		*$185.32	
			$TBD	$TBD
			$TBD	$TBD
			$TBD	$TBD
001G	Hourly rate for testing single-mode optical fiber. (100 Hours per 12 month period.)		*$185.32	
			$TBD	$TBD
			$TBD	$TBD
			$TBD	$TBD

SCHEDULE A - RIMD/M-R Services for Existing System

		ESTIMATED QUANTITY	UNIT PRICE PER HOUR	TOTAL PRICE
001H	Hourly rate for testing multi-mode optical fiber.(100 Hours per 12 month period.)		*$185.32	
			$TBD	$TBD
			$TBD	$TBD
			$TBD	$TBD
001I	Hourly rate for splicing single-mode optical fiber. (100 Hours per 12 month period.)		*$185.32	
			$TBD	$TBD
			$TBD	$TBD
			$TBD	$TBD

SCHEDULE A - RIMD/M-R Services for Existing System

		ESTIMATED QUANTITY	UNIT PRICE PER HOUR	TOTAL PRICE
001J	Hourly rate for splicing multi-mode optical fiber. (100 Hours per 12 month period.)		*$185.32	
			$TBD	$TBD
			$TBD	$TBD
			$TBD	$TBD

* For Billing and Liability purposes only. Actual price To-Be-Determined (TBD).

Quantities of items 001 through 001J are estimates for evaluation purposes only and do not reflect either maximum or minimum requirements. Quantities are estimated based on a 30-month performance period. Estimated monthly usages are provided for the Offeror's information only and do not commit the Government to purchase any minimum quantity. All TWR's must be scheduled as directed by the DOE.

SCHEDULE B - Lease with Option to Purchase (LWOP)
BASE AWARD

To enable the Government to complete required analyses of various methods of acquisition, the following shall be provided by the Contractor. All prices in Section B will be effective for the life of the contract subject to annual adjustments for escalation as described in Section H-20.

ITEM NO	QTY		UNIT PRICE	TOTAL PRICE
002	120 MO	Lease and maintenance of Telecommunications Management System per Specification K/CSD/INF-8822.	$TBD	$TBD
003	120 MO	Lease, operation, and maintenance of the Oak Ridge Federal Integrated Communications Network per Specification Y/EN-2351, excluding the quantities of RIMD/M-R per section 3.8.3 of Specification Y/EN-2351.	$TBD	$TBD
004	120 MO	Services, as required, to provide RIMD/M-R and other special services per Section 3.8.3 of Specification Y/EN-2351. (Unit and total prices of item 004 are estimated based on the estimated quantities to be used in the evaluation of item 004, see Section B, Schedule C itemized pricing of item 004. Actual monthly and total price of item 004 will depend on the services required).	N/A	$TBD
005	1 LOT	Lease of additional equipment following acceptance of item 003 during the term of the contract. Contractor shall insert the evaluation amount stated in Section B, Schedule C.	N/A	$TBD

SCHEDULE B - Lease with Option to Purchase (LWOP)
BASE AWARD

006	1 LOT	Additional Work (reference Section 5 of Specification Y/EN-2351, see Section B, Schedule C Itemized Pricing of Item 006).	N/A	$TBD
007	1 JOB	Purchase of Y-12 Site structure, other structures, and building improvements.	N/A	$TBD

OPTIONS

The Government shall have the unilateral right to exercise the following options:

	QTY		TOTAL PRICE
I.	1 JOB	Upgrade FOTS transmission rate from OC-12(622.08 Mbps) to OC-48 (2488.21 Mbps). Include price for all nodes (K-25, X-10, Y-12, and FOB). See Specification Y/EN-2351 Sections 3.3.1.10 and 3.3.11)	$TBD
II.	1 LOT	Purchase of item 002 following lease expiration. (Amount shall not exceed one month's original payment amount for item 002.)	$TBD
III.	1 LOT	Purchase of item 003 including all software. (Amount shall not exceed one-month's original payment amount for item 003.)	$TBD
IV.	1 LOT	Purchase of all equipment provided under item 005 at the end of term.	$1.00
V.	1 JOB	Price for removal of any new cable plant provided under item 003.	$TBD
VI.	1 SET	Additional System Telephone Features (See Section 3.3.1.14 of Specification Y/EN-2351)	$TBD

SCHEDULE B - Lease with Option to Purchase (LWOP)
BASE AWARD

	QTY		TOTAL PRICE
VII.	18 MO	Lease and maintenance for early delivery of the Company-use fiber triangle between Y-12, X-10, and K-25 per drawing D2E-145866 of Specification Y/EN-2351 for 18 months prior to the acceptance of the ORF-ICN. These costs shall be included as part of Item 003 for the remaining 120 months of the contract.	

In the event the foregoing options are exercised by the Government, they shall be exercised by written notice to the Contractor and modification to the original contract in accordance with the following schedule:

Option I - Anytime during the term of the contract.

Option II - 30 days prior to payment of the 120th lease payment.

Option III - 30 days prior to payment of the 120th lease payment of item 003.

Option IV - 30 days prior to payment of the 120th lease payment of item 003.

Option V - 30 days prior to payment of the 120th lease payment of item 003.

Option VI - Anytime during the term of the contract.

Option VII - 30 days after award with acceptance of the fiber 12 months after award.

SCHEDULE C

ITEM 002 TELECOMMUNICATIONS MANAGEMENT SYSTEM, COMPONENTS AND PRICING

The Contractor shall list quantities, manufacturer, model number, unit and total purchase prices for all hardware and software offered to meet item 002 requirements. (Reference Specification K/CSD/INF-8822). Additional pages, if required, shall be inserted by the Contractor.

Quantity	Part Description/ Manufacturer	Model Number	Price	Unit Total Price

See Proposal Detail

TOTAL PURCHASE PRICE FOR ITEM 002 $TBD

SCHEDULE C (CONT.)

ITEM 002 TELECOMMUNICATIONS MANAGEMENT SYSTEM, OPERATION AND MAINTENANCE

In the space provided below, the Contractor shall identify the monthly dollar amount associated with the maintenance and operation of the Telecommunications Management System. (Reference Specification K/CSD/INF-8822). Additional page(s), if required, shall be inserted by the Contractor.

Monthly Rate for Maintenance and Operation $TBD

SCHEDULE C (CONT.)

ITEM 003 INTEGRATED COMMUNICATIONS NETWORK, HARDWARE AND SOFTWARE COMPONENTS AND PRICING

In the space provided below, the Contractor shall list quantities, manufacturer, model numbers, unit and total purchase prices for all hardware and software offered to meet item 003, Integrated Communications Network, requirements. Additional pages, if required, shall be inserted by the Contractor.

Quantity	Part Description/ Manufacturer	Model Number	Price	Unit Total Price

See Proposal Detail

Total Purchase Price of Item 003 Hardware/Software $TBD

SCHEDULE C (CONT.)

ITEM 003 INTEGRATED COMMUNICATIONS NETWORK CABLE INSTALLATION/CONSTRUCTION

In the space provided below, the Contractor shall identify the dollar amounts associated with installation of equipment and cabling, including burial of cable. The listing shall be made by site for the following: Plant Y-12, Plant X-10, Plant K-25, the Federal Office Building, and Other Areas. (Reference Specification Y/EN-2351).

The dollar amounts listed below, excluding the cost of the installation of equipment, shall be the basis for establishing bid, performance, and payment bond amounts as specified in Section H.22.

The Contractor should note that for this portion of item 003, Integrated Communications Network, the following applies:

(1) Terms and Conditions contained in Part II, Section I, Contract Clauses Fixed Price Construction Contracts and;

(2) Davis-Bacon Wage Determinations #TN930001.

Additional pages, if required, shall be inserted by the Contractor.

See Proposal Detail

Total Purchase Price of all Cable Installation/Construction $TBD

SCHEDULE C (CONT.)

ITEM 003 INTEGRATED COMMUNICATIONS NETWORK MAINTENANCE AND OPERATION

In the space provided below, the Contractor shall identify the monthly dollar amount associated with the maintenance and operation of the Integrated Communications Network (exclude costs associated with RIMD M/R activities, Console Operators, and TMS data entry operators). Additional page(s), if required, shall be inserted by the Contractor.

Monthly Rate for Maintenance and Operation $TBD

ITEMIZED PRICING FOR ITEM 004 - RELOCATION, INSTALLATION, MODIFICATION AND DISCONNECTION AND OTHER SPECIAL SERVICES.

Prices will be effective for the life of the contract subject to annual adjustments for escalation as described in Section H-20. For purposes of evaluation, it shall be assumed that all quantities are evenly distributed throughout the 10-year period.

Except for Items 004, 004A, and 004B, the Contractor shall be informed formally by the Government to perform the work listed (under 004C through 004L). This is not meant to limit the scope of other work that may be specified or called for throughout the term of the contract but rather to indicate some of the most frequent types of services. The quantity of items for 004, 004A, and 004B and the estimated quantities shown below for items 004C through 004L will be used for the evaluation of item 004. Estimated quantities do not represent either minimum or maximum requirements. All quantities are in addition to those required under item 003.

		ESTIMATED QUANTITY	UNIT PRICE	TOTAL PRICE
004	Provide dedicated work force to perform RIMD/MR service for the ORF-ICN Private Branch Exchange (PBX) system. Dedicated work force shall be based on performing an average 2000 TWRs per month. 13 Number of technicians.		$TBD	$TBD
004A	Console operator services for the ORF-ICN. (See Appendix 10 of Y/EN-2351 for detailed description of the service required.) 5 Number of operators.		$TBD	$TBD
004B	TMS Data Entry Operators. N/A Number of operators.		$N/A	$N/A

		ESTIMATED QUANTITY	UNIT PRICE	TOTAL PRICE
004C	Rate per hour for overtime. Overtime hours are defined as: a) 10 pm - 6 am seven days a week. b) Swing shift w/o notification by previous Thursday. c) Saturday and Sundays when work is not scheduled the prior week. d) MR during the off shift. No overtime shall be incurred without prior DOE approval.	10,000 hrs	$TBD	$TBD
004D	Hourly rate for temporary additional technicians.		$TBD	$TBD
004E	Hourly rate for Fiber Optic Cable installation in existing ductway or on existing poles.		$TBD	$TBD
004F	Hourly rate for terminating single-mode optical fiber.		$TBD	$TBD
004G	Hourly rate for terminating multi-mode optical fiber.		$TBD	$TBD
004H	Hourly rate for testing single-mode optical fiber.		$TBD	$TBD
004I	Hourly rate for testing multi-mode optical fiber.		$TBD	$TBD
004J	Hourly rate for splicing single-mode optical fiber.		$TBD	$TBD
004K	Hourly rate for splicing multi-mode optical fiber.		$TBD	$TBD
004L	Hourly rate for copper trunk cable installation in existing ductway or on existing poles.		$TBD	$TBD

ITEMIZED PRICING OF ITEM 005, ADDITIONAL EQUIPMENT

The Contractor shall provide the Manufacturer's Published Price (MPP) Lists containing equipment necessary to support the entire ORF-ICN system (VDTS, Voice Mail, FOTS, TMS, etc.) in the following areas:

- Switch and Associated Central Office Equipment and Material
- Transmission Equipment and Material
- Premise Equipment and Material
- Outside Plant Material
- Inside Plant Material
- TMS Equipment and Material
- Special Services Equipment and Material
- Fiber Optic Transmission Equipment and Material

The Government shall have the right to purchase or lease with option to purchase (LWOP) any items from the MPP List's anytime during the contract. The Contractor shall state a single discount rate for each MPP List. The discount rate shall be applied to the MPP to determine the Government's purchase price. Additionally, the Contractor shall state the applicable material handling charge to be added to the purchase price.

For leased equipment, the above purchase price will be multiplied by the lease rate factor on Schedule D, and then added at the lease rate under Item 005 for the balance of the 10-year lease period. Lease payments for added leased equipment shall begin in the month the equipment is installed. All leased equipment added shall become an integral part of Item 003, Integrated Communications Network for maintenance and operations. Title shall pass to the Government upon the exercise of Option IV, Schedule B.

The proposed discount rate for each MPP List will be the minimum allowable discount rate throughout the first five years of the contract. The five year period commences at the expiration of the warranty period. Revised discount rates for each MPP List will be negotiated after the first five years of the contract. The MPP Lists used to calculate the purchase or lease prices shall remain in effect until such time as the Manufacturer revises or issues a new MPP List. The Contractor shall provide revised or new MPP Lists to the Contracting Officer or designee as they are available.

The Government assumes no obligation to purchase any or all of these items. Requests for any additional equipment shall be made to the Contractor via a "Material Request" generated by the Government's authorized telecommunications personnel. The Contractor shall not supply additional equipment until such time as the Contractor has received a "Material Request".

ITEMIZED PRICING OF ITEM 005, ADDITIONAL EQUIPMENT

	GENERAL EQUIPMENT TYPES	DISCOUNT RATE	MATERIAL HANDLING RATE
A.	Switch and Associated Central Office Equipment and Material:	TBD	TBD
B.	Transmission Equipment and Material:	TBD	TBD
C.	Premise Equipment and Material:	TBD	TBD

ITEMIZED PRICING OF ITEM 005, ADDITIONAL EQUIPMENT

	GENERAL EQUIPMENT TYPES	DISCOUNT RATE	MATERIAL HANDLING RATE
D.	Outside Plant Material:	TBD	TBD
E.	Inside Plant Material:	TBD	TBD
F.	TMS Equipment and Material:	TBD	TBD

ITEMIZED PRICING OF ITEM 005, ADDITIONAL EQUIPMENT

	GENERAL EQUIPMENT TYPES	DISCOUNT RATE	MATERIAL HANDLING RATE
G.	Special Services Equipment and Material:		
		TBD	TBD
H.	Fiber Optic Transmission Equipment and Material:		
		TBD	TBD

ITEMIZED PRICING FOR ITEM 006, ADDITIONAL WORK
(Reference Section 5.1 of Specification Y/EN-2351)

The quantities provided are estimates and are for evaluation purposes only. They do not represent either minimum or maximum quantities which the Government may require. The Government assumes no obligation to purchase any or all of these items. Items A through E could apply to Item 003 installation and/or Item 007 construction and facility renovations. This additional work could be required either pre-cutover or post-cutover. All pre-cutover work involving items A through E will be at the discretion of the Contractor. Items F through M will be strictly post-cutover for new and special construction as requested and are in addition to any equipment usage necessary to provide operation and maintenance of Item 003. Post-cutover request for any additional work (items A through M) shall be made to the Contractor via a "work request" generated by the Government's authorized telecommunications personnel. The Contractor shall not perform additional work until such time as the Contractor has received a "work request."

	DESCRIPTION	ESTIMATED QUANTITY	UNIT PRICE	TOTAL PRICE
A.	Standby and Training Time		$TBD	$TBD
B.	Dress-out, Type 2		$TBD	$TBD
C.	Handling and Storage of Contaminated Soils		$TBD	$TBD
D.	Asbestos Penetrations through Walls, Floors, and Ceiling			
	1" or less		$TBD	$TBD
	1" to 6"		$TBD	$TBD
	Asbestos Abatement			
	Piping		$TBD	$TBD
	Ceiling Tile		$TBD	$TBD
	Floor Tile		$TBD	$TBD
E.	Rock Excavation		$TBD	$TBD
F.	Hourly Rate for Line Truck use and operator		$TBD	$TBD
G.	Hourly Rate for Bucket Truck use and operator		$TBD	$TBD
H.	Hourly Rate for Back Hoe Use and operator		$TBD	$TBD
I.	Hourly Rate for Dump Truck use and operator		$TBD	$TBD

ITEMIZED PRICING FOR ITEM 006, ADDITIONAL WORK
(Reference Section 5.1 of Specification Y/EN-2351)

	DESCRIPTION	ESTIMATED QUANTITY	UNIT PRICE	TOTAL PRICE
J.	Price of Installing New Poles		$TBD	$TBD
K.	Price of Installing New Under Ground Duct Way		$TBD	$TBD
L.	Price of Installing Entrance Cable or Feeder Cable to New Structure		$TBD	$TBD
M.	Price of Reworking or Rearrangement of Existing Feeder Cable or Entrance Cable		$TBD	$TBD
N.	Overtime premium above the normal hourly rate to perform construction work outside the normal business hours when directed by the DOE/Company (Y/EN-2351 section 5.1.2.2).		$TBD	$TBD
O.	Price for performing additional MCRS		$TBD	$TBD
			Total Price (Contractor shall insert as Item 006 in Schedule B.)	$TBD

SCHEDULE C (CONT.)

ITEM 007 Y-12 STRUCTURE DESCRIPTION

In the space provided below, the Contractor shall provide a summary description of the Y-12 structure proposed for Item 007, Integrated Communications Network, including, as a minimum, the square footage allocation proposed for the hardware and personnel.

The dollar amounts listed below shall be the basis for establishing bid, performance, and payment bond amounts as specified in Section H.22.

The Contractor should note that for this portion of item 007, the following applies:

(1) Terms and Conditions contained in Part II, Section I. Contract Clauses Fixed Price Construction Contracts and;

(2) Davis-Bacon Wage Determinations #TN930001.

Additional pages, if required, shall be inserted by the Contractor.

Total Purchase Price of the Y-12 Structure $TBD

SCHEDULE C (CONT.)

ITEM 007 - OTHER NEW STRUCTURES

In the space provided below the Contractor shall provide a summary description of all other new structures proposed for Item 007, including, as a minimum, the square footage allocation of each proposed structure for the hardware and personnel.

The dollar amounts listed below shall be the basis for establishing bid, performance, and payment bond amounts as specified in Section H.22.

The Contractor should note that for this portion of item 007, the following applies:

(1) Terms and Conditions contained in Part II, Section I, Contract Clauses Fixed Price Construction Contracts and;

(2) Davis-Bacon Wage Determinations #TN930001.

Additional pages, if required, shall be inserted by the Contractor.

Total Purchase Price of Other Structures $TBD

SCHEDULE C (CONT.)

ITEM 007 - FACILITY RENOVATIONS

In the space provided below, the Contractor shall provide a summary description of all facility renovations proposed for item 007, including, as a minimum, the square footage allocation of each proposed renovation.

The dollar amounts listed below shall be the basis for establishing bid, performance, and payment bond amounts as specified in Section H.22.

The Contractor should note that for this portion of item 007, the following applies:

(1) Terms and Conditions contained in Part II, Section I, Contract Clauses Fixed Price Construction Contracts and;

(2) Davis-Bacon Wage Determinations #TN930001.

Additional pages, if required, shall be inserted by the Contractor.

Total Purchase Price of Renovations $TBD

SCHEDULE D - LEASE RATE FACTOR

LEASE RATE FACTOR TO DETERMINE MONTHLY LEASE AMOUNTS FOR ADDITIONAL EQUIPMENT UNDER ITEM 005

The Contractor shall complete the table below to provide a lease rate factor for each month of the ten-year period. The unit prices from Schedule C, Item 005 will be multiplied by the appropriate month's factor when installation of the additional equipment is completed. Contractor should note in completing the factors below that the Contractor will be required to provide maintenance of such equipment for the balance of the lease at no additional charge.

As an example: In month 26, the Government requests installation of 4 ISDN digital line cards. Price is as follows:

Line Cards <u>$1700 Each</u>

$6800 Total

If the factor for a 95-month lease period (months of lease remaining) is 0.017, the monthly payment will be $115.60/mo beginning with month 26. In this example, the Government will pay 95 monthly lease payments of $115.60 or a total of $10,982. If the same installation were made in month 108 and Contractor's factor for a 13 month lease period was 0.082, the monthly lease payment would be $557.60 or a total of $7,248.80.

Contractor shall compute evaluation factor for item 005 by adding the products of the lease rate factors and number of months. The sum of the products is divided by 120 to determine the average evaluation factor. (Multiply each factor below by the number of the corresponding blank, (i.e., the number of lease payments) add the products and divide by 120.)

The proposal evaluation amount for item 005 is the total estimated amount of item 005 multiplied by the evaluation factor. Contractor shall complete the section entitled "Evaluated Price for Item 005." on Schedule C.

MONTHS OF LEASE REMAINING

1.	TBD	15.	TBD	29.	TBD	43.	TBD	57.	TBD
2.	TBD	16.	TBD	30.	TBD	44.	TBD	58.	TBD
3.	TBD	17.	TBD	31.	TBD	45.	TBD	59.	TBD
4.	TBD	18.	TBD	32.	TBD	46.	TBD	60.	TBD
5.	TBD	19.	TBD	33.	TBD	47.	TBD	61.	TBD
6.	TBD	20.	TBD	34.	TBD	48.	TBD	62.	TBD
7.	TBD	21.	TBD	35.	TBD	49.	TBD	63.	TBD
8.	TBD	22.	TBD	36.	TBD	50.	TBD	64.	TBD
9.	TBD	23.	TBD	37.	TBD	51.	TBD	65.	TBD
10.	TBD	24.	TBD	38.	TBD	52.	TBD	66.	TBD
11.	TBD	25.	TBD	39.	TBD	53.	TBD	67.	TBD
12.	TBD	26.	TBD	40.	TBD	54.	TBD	68.	TBD
13.	TBD	27.	TBD	41.	TBD	55.	TBD	69.	TBD
14.	TBD	28.	TBD	42.	TBD	56.	TBD	70.	TBD
71.	TBD	81.	TBD	91.	TBD	101.	TBD	111.	TBD
72.	TBD	82.	TBD	92.	TBD	102.	TBD	112.	TBD
73.	TBD	83.	TBD	93.	TBD	103.	TBD	113.	TBD
74.	TBD	84.	TBD	94.	TBD	104.	TBD	114.	TBD
75.	TBD	85.	TBD	95.	TBD	105.	TBD	115.	TBD
76.	TBD	86.	TBD	96.	TBD	106.	TBD	116.	TBD
77.	TBD	87.	TBD	97.	TBD	107.	TBD	117.	TBD
78.	TBD	88.	TBD	98.	TBD	108.	TBD	118.	TBD
79.	TBD	89.	TBD	99.	TBD	109.	TBD	119.	TBD
80.	TBD	90.	TBD	100.	TBD	110.	TBD	120.	TBD

SCHEDULE E - EARLY PURCHASE SCHEDULE

At any time during the term of lease the Government, with 30 days prior written notice may perform an early purchase of Item 002, Telecommunications Management System (TMS) or the equipment under items 003, Integrated Communications Network. In the event of early purchase the Contractor shall continue to perform operation and maintenance in accordance with items 002 and 003 rates reduced by the amount attributable to lease and purchase price as stated in this Schedule. The Contractor shall list below factors which may be multiplied by the purchase price to determine the early buyout amount.

In the event of early purchase, the Government will negotiate with the Contractor to establish an equitable purchase amount for added equipment (item 005) in accordance with the unit pricing on Schedule C. The following early purchase schedule shall begin upon the successful completion of the required acceptance tests for each item.

EARLY PURCHASE SCHEDULE FOR ALL EQUIPMENT EXCEPT ITEM 005

	AFTER PAYMENT		AFTER PAYMENT
1	TBD	26	TBD
2	TBD	27	TBD
3	TBD	28	TBD
4	TBD	29	TBD
5	TBD	30	TBD
6	TBD	31	TBD
7	TBD	32	TBD
8	TBD	33	TBD
9	TBD	34	TBD
10	TBD	35	TBD
11	TBD	36	TBD
12	TBD	37	TBD
13	TBD	38	TBD
14	TBD	39	TBD
15	TBD	40	TBD
16	TBD	41	TBD
17	TBD	42	TBD
18	TBD	43	TBD
19	TBD	44	TBD
20	TBD	45	TBD
21	TBD	46	TBD
22	TBD	47	TBD
23	TBD	48	TBD
24	TBD	49	TBD
25	TBD	50	TBD

SCHEDULE E (CONT.) - EARLY PURCHASE SCHEDULE FOR ALL EQUIPMENT EXCEPT ITEM 005

	AFTER PAYMENT		AFTER PAYMENT
51	TBD	90	TBD
52	TBD	91	TBD
53	TBD	92	TBD
54	TBD	93	TBD
55	TBD	94	TBD
56	TBD	95	TBD
57	TBD	96	TBD
58	TBD	97	TBD
59	TBD	98	TBD
60	TBD	99	TBD
61	TBD	100	TBD
62	TBD	101	TBD
63	TBD	102	TBD
64	TBD	103	TBD
65	TBD	104	TBD
66	TBD	105	TBD
67	TBD	106	TBD
68	TBD	107	TBD
69	TBD	108	TBD
70	TBD	109	TBD
71	TBD	110	TBD
72	TBD	111	TBD
73	TBD	112	TBD
74	TBD	113	TBD
75	TBD	114	TBD
76	TBD	115	TBD
77	TBD	116	TBD
78	TBD	117	TBD
79	TBD	118	TBD
80	TBD	119	TBD
81	TBD	120	TBD
82	TBD		
83	TBD		
84	TBD		
85	TBD		
86	TBD		
87	TBD		
88	TBD		
89	TBD		

SCHEDULE E (CONT.) - EARLY PURCHASE SCHEDULE

To enable the Government to complete required analysis of various methods of acquisition the following information shall be provided by the Contractor.

The Contractor shall state below the percentages of the unit prices shown in Schedule B for items 002, Telecommunications Management System and item 003, Integrated Communications Network, which are attributable to the lease of equipment.

	ITEM 002	ITEM 003
Portion of rate for lease		

The totals on this table shall not exceed the portion not subject to escalation in Schedule G.

SCHEDULE F

RESERVED

SCHEDULE G

AMOUNTS SUBJECT TO ECONOMIC PRICE ADJUSTMENT (REFERENCE PARAGRAPH H.20)

	ITEM 002	ITEM 003	ITEM 004	ITEM 006
Escalation Index, SIC 4813				
Not Subject to Escalation				
Total	100%	100%	100%	100%

Contractors shall include the worksheets used to establish the above percentages.

SECTION C

DESCRIPTION/SPECIFICATIONS/WORK STATEMENT

C.1 LOCAL 999.C06 Specification (April 1984)

C.2 LOCAL 999.C04 Reports (April 1986

C.1 LOCAL 999.C06 SPECIFICATION (APR 1984)

The Specifications and Statement of Work for the Oak Ridge Federal-Integrated Communications Network (ORF-ICN), the Telecommunications Management System (TMS), and the services to be performed on the existing telephone system are located in Part III, Section J, as Attachments A, B, and C respectively. A description of these documents follows:

1. **Specification and Statement of Work Y/EN-2351** - This Technical Specification and Statement of Work covers the requirements for the new Oak Ridge Federal-Integrated Communications Network (ORF-ICN) including Relocation, Installation, Modification, and Disconnection/Maintenance and Repair (RIMD/MR) of the new telephone system.

2. **Drawings** - The following system diagrams are provided in Appendix 1 of the Technical Specifications and Statement of Work, Y/EN-2351.

   Drawing D2E-145866 - ORF-ICN Network System Diagram

   Drawing D2E-145865 - ORF-ICN Connectivity/Operations Requirements

   Drawing D2E-145907 - ORF-ICN Cable Connection System Diagram

   Drawing D2E-146787 - ORF-ICN Service Building Wiring Requirements

3. **Specification K/CSD/INF-8822** - This specification covers the requirements of the Telecommunications Management System.

4. **Statement of Work (Supplement) SW-TNS-001** - This specification provides the requirements for relocation, modification, disconnection, maintenance and repair (RIMD/M-R) activities on the existing telephone system for the interim period between contract award and acceptance of the ORF-ICN.

C.2 LOCAL 999.C04 REPORTS (APRIL 1986)

Reports shall be prepared and submitted in accordance with the reporting requirements in contained in Part I -- Section F, clause F.5, and the clause entitled "Uniform Reporting System."

SECTION D

PACKAGING AND MARKING

D.1 LOCAL 999.D01 Packaging (Alternate 1) (APR 1984)

SECTION D

PACKAGING AND MARKING

D.1 LOCAL 999.D01 PACKAGING (ALTERNATE 1) (APR 1984)

Preservation, packaging, and packing for shipment or mailing of all work deliverable hereunder shall be in accordance with good commercial practice and adequate to insure acceptance by common carrier and safe transportation at the most economical rates.

SECTION E
INSPECTION AND ACCEPTANCE

E.1 LOCAL 999.E01 INSPECTION (MAR 1989)

E.2 LOCAL 999.E02 Acceptance (Apr 1984)

E.3 Responsibility for Supplies (July 1991)

E.4 Testing and Inspection (July 1991)

E.5 Standards and Guidelines (July 1991)

E.6 Acceptance of Equipment Performance (July 1991)

E.7 Payment (July 1991)

SECTION E

INSPECTION AND ACCEPTANCE

E.1 LOCAL 999.E01 INSPECTION (MAR 1989)

Inspection of all items under this contract shall be accomplished by the DOE Contracting Officer's Representative (COR), or any other duly authorized representative as designated in writing by the Contracting Officer.

E.2 LOCAL 999.E02 ACCEPTANCE (APR 1984)

Acceptance of all work and effort under this contract (including "Reporting Requirements," if any) shall be accomplished by the DOE Contracting Officer, or any duly designated representative as designated in writing by the Contracting Officer.

E.3 RESPONSIBILITY FOR SUPPLIES (JULY 1991)

(a) Title to supplies and equipment furnished under this contract shall remain with the Contractor until such time as the Government may exercise its purchase option(s) or the Contractor abandons the supplies in place. At this time title shall pass to the Government.

(b) The Contractor shall not be liable for loss of or damage to supplies and equipment caused by the negligence of officers, agents, or employees of the Government acting within the scope of their employment.

E.4 TESTING AND INSPECTION (JULY 1991)

Testing and inspection requirements for the VDTS and FOTS System are described in Section 4.5 of Specification Y/EN-2351. Additional testing and inspection requirements are included in Section 5 of this same specification. Testing and inspection requirements for the Telecommunications Management System are described in Section 4.3 of Specification K/CSD/INF-8822. Testing and inspection of the RIMD/M-R services of the existing telephone system are described in Sections 3.4 and 3.5 of Statement of Work SW-TNS-001.

E.5 STANDARDS AND GUIDELINES (JULY 1991)

The Contractor shall inspect all services, supplies, and equipment, as well as test all equipment to assure that all the requirements, standards, and regulations addressed in Specifications Y/EN-2351, K/CSD/INF-8822, and SW-TNS-001 are met.

E.6 ACCEPTANCE OF EQUIPMENT PERFORMANCE (JULY 1991)

(a) General: All items of equipment provided shall be subject to acceptance in conformity with the standards of performance contained in the Contractor's performance and functional test plans, as approved by the Government and in conformity with the requirements of Specifications Y/EN-2351, K/CSD/INF-8822, and SW-TNS-001. The provisions of this clause apply also to all replacement, substitute equipment, and equipment added and/or modified during the contract period.

(b) Acceptance Testing: Acceptance shall be deemed to have occurred only after an item of equipment and/or system(s) has fully met the Government approved standards of operational performance (see paragraph (a) above) for a period of thirty (30) consecutive calendar days beginning the day after cutover, with the exception of the TMS which shall be sixty (60) calendar days after completion of the TMS installation test. If the equipment and/or system(s) does not meet the standard of performance during the initial 30 consecutive day period, the acceptance testing period shall continue on a day-by-day basis until the standard of performance is met for a total of (thirty) 30 consecutive days. If the equipment and/or system(s) fails to meet the standards of performance after (ninety) 90 calendar days have elapsed from cutover, the Government may, at its option, request a replacement or terminate the contract and request the immediate removal of the equipment and/or system(s) from Government-owned or leased premises.

(c) Date of Acceptance: Lease and LWOP charges shall apply beginning on the first day of the successful performance period.

(d) Delay of 30-Day Performance Test Period: The Government may delay the start of the performance period for a maximum period of (thirty) 30 consecutive days at no additional cost to the Government.

(e) Definition of Acceptance: The term "acceptance" in the "Responsibility for Supplies" clause of Section I and the term "accepted" in the Section I "Payments" clause are deemed to mean the same as the term "acceptance" as used in the preceding paragraph (b).

E.7 PAYMENT (JULY 1991)

No payments will be made by the Government to the Contractor for any supplies and equipment provided and/or any services performed by the Contractor in support of this contract, until the equipment's performance has been accepted, irrespective of the Government's beneficial use of partially complete or partially operational equipment, irrespective of the length of time of said beneficial use pending acceptance, and irrespective of the substantiality of the Contractor's performance. The parties hereby agree that the date of the Government's acceptance is purely incidental to such testing and that no additional sums are due to the Contractor. Further, payment for the acceptance testing period will be due only for the successful consecutive thirty (30) day period.

The Government will not pay for inventory held by the Contractor. Payments will be made only for supplies, equipment, and services actually placed in service or otherwise utilized.

SECTION F

DELIVERIES OR PERFORMANCE

F.1 Term of Contract

F.2 LOCAL 999.F04 Principal Place of Performance (APR 1984)

F.3 LOCAL 999.F05 Delivery Point (APR 1984)

F.4 FAR 52.247.34 F.O.B. Destination (NOV 1991)

F.5 Time of Delivery

SECTION F

DELIVERIES OR PERFORMANCE

F.1 TERM OF CONTRACT

This contract shall be for 120 months from cutover of the Oak Ridge Federal-Integrated Communications Network (ORF-ICN) with an estimated 30 months of Relocation, Installation, Modification, and Disconnection, Maintenance and Repair (RIMD/M-R) service for the existing system prior to cutover.

F.2 LOCAL 999.F04 PRINCIPAL PLACE OF PERFORMANCE (APR 1984)

The principal place of performance under this contract will be in Oak Ridge, Tennessee. The ORF-ICN will be an Integrated Services Digital Network (ISDN) integrated voice and data network distribution among three main communication nodes at plant locations, Y-12, X-10, and K-25 with a major tributary to the townsite locations.

F.3 LOCAL 999.F05 DELIVERY POINT (APR 1984)

Delivery of all items deliverable under this contract shall be made F.O.B. Destination.

F.4 FAR 52.247-34 F.O.B. DESTINATION (NOV 1991)

(a) The term "f.o.b. destination," as used in this clause, means -

(1) Free of expense to the Government, on board the carrier's conveyance, at a specified delivery point where the consignee's facility (plant, warehouse, store, lot, or other location to which shipment can be made) is located; and

(2) Supplies shall be delivered to the destination consignee's wharf (if destination is a port city and supplies are for export), warehouse unloading platform, or receiving dock, at the expense of the Contractor. The Government shall not be liable for any delivery, storage, demurrage, accessorial, or other charges involved before the actual delivery (or "constructive placement" as defined in carrier tariffs) of the supplies to the destination, unless such charges are caused by an act or order of the Government acting in its contractual capacity. If rail carrier is used, supplies shall be delivered to the specified

unloading platform of the consignee. If motor carrier (including "piggyback") is used, supplies shall be delivered to truck tailgate at the unloading platform of the consignee, except when the supplies delivered meet the requirements of Item 568 of the National Motor Freight Classification for "heavy or bulky freight." When supplies meeting the requirements of the referenced Item 568 are delivered, unloading (including movement to the tailgate) shall be performed by the consignee, with assistance from the truck driver, if requested. If the contractor uses rail carrier or freight forwarder for less than carload shipments, the contractor shall ensure that the carrier will furnish tailgate delivery, when required, if transfer to truck is required to complete delivery to consignee.

(b) The Contractor shall -

(1) (i) Pack and mark the shipment to comply with contract specifications; or

(ii) In the absence of specifications, prepare the shipment in conformance with carrier requirements;

(2) Prepare and distribute commercial bills of lading;

(3) Deliver the shipment in good order and condition to the point of delivery specified in the contract;

(4) Be responsible for any loss of and/or damage to the goods occurring before receipt of the shipment by the consignee at the delivery point specified in the contract;

(5) Furnish a delivery schedule and designate the mode of delivering carrier; and

(6) Pay and bear all charges to the specified point of delivery.

F.5 TIME OF DELIVERY

The Government requires delivery to be made or service to begin according to the following schedule:

REQUIRED DELIVERY SCHEDULE

ITEM	ACTION	PERIOD
001	RIMD M/R Service of Existing System.	Beginning from contract award until cutover of the ORF-ICN.
002	TMS Acceptance Test Passed.	Beginning January 1997 and continuing for 120 months.
003	ORF-ICN Acceptance Test passed. (Reference Section 4.5.5 of Specification Y/EN-2351). NOTE: Contractor is responsible to complete construction in sufficient time to install all equipment and pass final acceptance January 1997. Operation and Maintenance shall begin at cutover of the system.	Beginning January 1997 and continuing for 120 months.
004	Beginning at cutover of system and continuing, as required, through the term of the contract. (Reference Section 3.8 of Specification Y/EN-2351).	Beginning at ORF-ICN cutover and continuing for 120 months.
005	Beginning at cutover of system and continuing, as required, through the term of the contract.	As required as various conditions are encountered.
006	Additional Work (Reference Section 5, Specification Y/EN-2351)	As required as various conditions are encountered.
007	Acceptance of the Y-12 Site Structure, other structures and building improvements	18 months after contract award.
Option I	Upgrade FOTS Transmission rate from OC-12 (622.08 mbps) to OC-48 (2488.21 mbps)	120 days after exercise of the option or with item 003 if option is exercised at least 4 months before acceptance.

REQUIRED DELIVERY SCHEDULE

ITEM	ACTION	PERIOD
Option VI	Additional Telephone Features	90 days after exercise of the option.
Option VII	Early Delivery of Inter-Site Fiber Triangle	12 months after contract award.

ACTION	REFERENCE	PERIOD
Specification Y/EN-2351		
System Design Report	4.4.1	120 days after contract award
Overall Project Plan and Schedule	4.4.2	120 days after contract award
Installation Plans and Installation Schedule	4.4.3.1 4.4.4.1	6 months after contract award
Test Plans and Test Schedules	4.4.3.2 4.4.4.2	6 months after contract award
Training Plans and Training Schedule	4.4.3.3 4.4.4.3	8 months after contract award
System Cutover Plan and System Cutover Schedule	4.4.3.4 4.4.4.4	8 months after contract award
Operations and Maintenance Plan	4.4.3.5	6 months after contract award
Monthly Operations Report	3.8.8	Monthly after cutover
Performance Review Report	3.8.9	Quarterly after cutover
Logistics Support Plan	4.4.3.6	8 months after contract award
Monthly Project Management Reports	4.2	2 weeks prior to monthly meeting
EMI/RFI Test Procedures and Reports	3.3.6	4 weeks prior to installation checkout testing
Test Reports	4.4.5	Within 30 days of test completion

REPORTS REQUIRED - DELIVERY SCHEDULE

ACTION	REFERENCE	PERIOD
Installed Drawings	4.4.7	2 weeks prior to system acceptance test
System Records	4.4.8	2 weeks prior to system acceptance test
Computer Hardware and Software Documentation	4.4.9	2 weeks prior to installation checkout testing
Disaster Recovery Plan	4.4.3.7	6 months after contract award
Weekly Report	5.1.2.4	Weekly
List of Activities Requiring Contractor's Other than those Designated with "Q" clearances	5.1.1.3	90 days after contract award
Design Document List	5.2.1.4.2	60% Design Review
Design Documents	5.2.1.4.2	30%, 60%, 90% of design completion and CFC
Material & Equipment List	5.2.1.4.2	60% design review
Manufacturer & Vendor Data	5.2.1.4.2	Prior to or with shipment of equipment
Shop Drawings	5.2.1.4.2	4 weeks prior to shipment of equipment
Samples	5.2.1.4.2	4 weeks before installation
Design Calculations	5.2.1.4.2	30% of design completion
Daily Report	5.1.2.4.1	Daily
Construction Project Requirements Summary	5.2.1.4.2	90% design review
Test and Inspection Reports	5.2.1.4.2	30 days after completion of testing
Field Change Requests	5.2.1.4.2	Upon occurrence
Welding Procedures and Qualification of Welders and Welding Inspectors	5.2.1.4.2 5.2.2.2.6	4 weeks prior to building erection
Safety Program	5.1.3.9	120 days after contract award

REPORTS REQUIRED - DELIVERY SCHEDULE

ACTION	REFERENCE	PERIOD
Field Change Requests	5.2.1.4.2	Upon occurrence
Welding Procedures and Qualification of Welders and Welding Inspectors	5.2.1.4.2 5.2.2.2.6	4 weeks prior to building erection
Safety Program	5.1.3.9	120 days after contract award
Hazard Communication Policy	5.1.3.8.3	120 days after contract award
Crane Inspection Certificates	5.1.3.16.1	2 weeks prior to use of cranes
Construction Schedule	5.2.1.6	120 days after contract award
Procurement Status Report	5.2.1.7	30 days after design CFC
List of Vehicles Requiring Access	5.3.13	1 week prior to need
Inspection Plan for Building High Strength Bolts	5.2.2.2.6	2 weeks prior to building erection
HVAC Systems Test Report	5.2.3.2.3	30 days after testing complete
Piping Welding Procedures and Welder Qualifications	5.2.5.1	4 weeks prior to starting work
Evidence of Sprinkler System Experience	5.2.5.3.7	2 weeks prior to installation
Sprinkler System Certificate of Inspection	5.2.5.3.7	30 days after test and inspection
Slump Test Reports	5.2.2.2.6	Within 24 hours of test
Compaction Test Reports	5.2.2.1.11	Within 24 hours of test
Facilities Equipment and Materials Data Submittals	5.2.2.3.15	2 weeks prior to construction
Noise Level Calculations	5.2.3.1.1	30% design review
Energy Conservation LCC Report	5.2.3.1.3	30% design review
HVAC System Test Plan and Equipment Calibration Certificates	5.2.3.1.7/ 5.2.3.2.3	30 days prior to test
Respiratory Protection	5.1.9.4	2 weeks prior to construction
As Built Drawings	5.2.1.3	2 weeks prior to cutover

REPORTS REQUIRED - DELIVERY SCHEDULE

ACTION	REFERENCE	PERIOD
Contaminated Work	5.1.5.3.5	2 weeks prior to construction
Hazard Communications Policy	5.1.3.8.3	60 days after award
Asbestos Pre-construction Submittals License	5.1.4.3.1	4 weeks prior to construction
Asbestos Pre-Job Submittals		
Work Plan	5.1.4.3.2.1 5.1.4.11	30 days prior to construction
Rental Equipment Agreement	5.1.4.3.2.2	4 weeks prior to construction
Competent Person	5.1.4.3.2.3	2 weeks prior to construction
Emergency Personnel	5.1.4.3.2.4	2 weeks prior to construction
Trained Personnel	5.1.4.3.2.5	2 weeks prior to construction
Testing Laboratory	5.1.4.3.2.6	4 weeks prior to testing
Medical Examinations	5.1.4.3.2.7	2 weeks prior to construction
Asbestos Construction Submittals		
Deactivate Utilities	5.1.4.3.3.1	2 weeks prior to construction
Waste Disposal Request	5.1.4.3.3.2	48 hours in advance
Sampling Results	5.1.4.3.3.3	48 hours after taken
Chemical Exposure Monitoring	5.1.4.3.3.4	End of job
Checklists	5.1.4.3.3.5	Following work day
Air Monitoring Test Results	5.1.4.3.3.6	48 hours posting; 72 hours delivery
Entry/Exit Log	5.1.4.3.3.7	Upon final acceptance

REPORTS REQUIRED - DELIVERY SCHEDULE

ACTION	REFERENCE	PERIOD
List of Fields and Validation Approach	5.1.3	30 days prior to Software Development
Terminating Call Location Table	2.7.4	At installation test and thereafter
Documented Releases to TMS Software	3.5	As released
Software Change Control Procedure	3.5	30 days prior to VDTS System Acceptance Test
Final Project Management Plan	4.1.2	30 days prior to Software Development or 90 days prior to VDTS System Acceptance Test, whichever comes first
Escalation Procedure	4.1.4	60 days after contract award
Project Review Meeting Agenda	4.1.5	1 week before meeting
Project Review Meeting Minutes	4.1.5	1 week after meeting
Initial Project Review Meeting	4.1.6	45 days after contract award
Software Review Meeting Agenda	4.2.3	1 week before meeting
Software Review Meeting Minutes	4.2.3	1 week after meeting
Final Software Development Plan	4.2.4	30 days prior to Software Development
Test Agendas (installation and acceptance)	4.3.1	1 week before test
Test Results (installation and acceptance)	4.3.1	2 weeks after test
Test Plan for VDTS Impact	4.3.4	45 days prior to VDTS System Acceptance Test
Final Training Plan	4.4.5	30 days prior to test
Data Consistency Plan	4.5.1	Before site survey begins
Documentation (Hardware and Software)	4.6	Prior to installation

REPORTS REQUIRED - DELIVERY SCHEDULE

ACTION	REFERENCE	PERIOD
Documentation Updates (Hardware and Software)	4.6	As available after installation test

NOTE: The completion times indicated shall apply from the effective date of contract award. Completion time is in CALENDAR DAYS.

The Government will evaluate equally, as regards time of delivery, offers that propose delivery of each item within the applicable delivery period specified above. Offers that propose delivery that will not clearly fall within the applicable required delivery period specified above, will be considered non-responsive and rejected. The Government reserves the right to award under either the required delivery schedule or the proposed delivery schedule, when a Contractor offers an earlier delivery schedule than required above. If the Contractor proposes no other delivery schedule, the required delivery schedule above will apply.

PART I - SECTION G

CONTRACT ADMINISTRATION DATA

G.1 LOCAL 999.G01 Correspondence Procedures (MAR 1989)

G.2 LOCAL 999.G02 Designation of Patent Advisor (JAN 1994)

G.3 LOCAL 999.G06 Contracting Officer's Representative (COR) (JULY 1991)

G.4 Contract Administration (MARCH 1989)

G.5 Invoice/Payment Requirements (JULY 1991)

G.6 LOCAL 999.G09 Technical Monitor (MAY 1992) (Deviation)

PART I - SECTION G

CONTRACT ADMINISTRATION DATA

G.1 LOCAL 999.G01 CORRESPONDENCE PROCEDURES (MAR 1989)

All correspondence submitted by the Contractor (except for invoices and reports) shall be subject to the following procedures:

a. Technical Correspondence. Technical correspondence concerning performance of this contract shall be addressed to the DOE Contracting Officer's Representative (COR) with an information copy of the correspondence to the DOE Contract Specialist.

b. Patents/Technical Data Correspondence. Correspondence concerning patent and technical data issues shall be addressed to the Patent Counsel, Office of Patent Counsel as designated in 999.G02, with an information copy to the Contracting Officer and the COR.

c. Non-technical Administrative Correspondence.

   1. If a Government Contract Administration Office is designated in Block 6 on the face page of this contract, all non-technical correspondence, shall be addressed to the Contracting Officer at the Government Contract Administration Office so designated, with information copies of the correspondence to the Contracting Officer and the COR.

   2. If no Government Contract Administration Office is designated in Block 6 on the face page of this contract, all correspondence, other than technical correspondence shall be addressed to the DOE Contracting Officer, with information copies of the correspondence to the DOE COR, and to the DOE Patent Counsel (where patent or technical data issues are involved).

d. Subject Line(s). All correspondence shall contain a subject line commencing with the contract number, as illustrated below:

"SUBJECT: Contract No. (Insert the contract number) (Insert subject topic after contract number, e.g., "Request for subcontract placement consent")".

G.2 LOCAL 999.G02 DESIGNATION of PATENT ADVISOR (JAN 1994)

The Patent Counsel, Office of Patent Counsel, DOE, Post Office Box 2001, Oak Ridge, TN 37831, is hereby designated to represent the Contracting Officer in administrating the Patents Clause in this contract.

Correspondence with respect to this clause shall be directed to the Patent Counsel, with a copy to the Contracting Officer.

G.3 LOCAL 999.G06 CONTRACTING OFFICER'S REPRESENTATIVE (COR) (MAR 1989)

The Contracting Officer's Representative (COR) will be designated by separate letter and will represent the Contracting Officer in the technical phases of the work. The COR is not authorized to change any of the terms and conditions of this contract. Changes in the Scope of Work will be made only by the Contracting Officer by properly written modification(s) to the contract. Additional Contracting Officer's Representative(s) for other purposes as required may be designated in writing by the Contracting Officer.

G.4 CONTRACT ADMINISTRATION (MAR 1989)

The contract will be administered by:

U. S. Department of Energy
Oak Ridge Operations
Procurement and Contracts Division
ATTN: Jeffery R. Burgan, Contract Specialist
P. O. Box 2001
Oak Ridge, Tennessee 37831-8757

Written communication shall make reference to the contract number and shall be mailed to the Contract Specialist designated via separate correspondence to the above address.

G.5 INVOICE/PAYMENT REQUIREMENTS (JULY 1991)

All billing periods shall be from the first day of the month through the last day of the month.

The Contractor shall invoice monthly for the prior month's services. Each month's invoice shall be itemized to reflect the charges for items 002, 003, 004, 005, and 006.

From contract award for item 001, the Contractor shall invoice monthly for the prior month's service. Invoices shall be itemized to reflect the fixed monthly charge plus any additional charges for work in excess of the allotted amount.

For item 002, the Contractor's first monthly invoice shall not be submitted for payment until the TMS, including all required data is supplied and the continuous 60 day acceptance period has been successfully completed. Successful completion of the continuous 60 day acceptance period shall constitute the first two month's service for which the Contractor may invoice; thereafter the Contractor shall invoice monthly for item 002 for the prior months lease. The computation of the lease amount should be based on the period from the acceptance of the TMS to the end of the contract.

For item 003, the Contractor's first monthly invoice shall not be submitted for payment until the ORF-ICN System, including all required data is supplied and the continuous 30 day acceptance period has been successfully completed. Successful completion of the continuous 30 day acceptance period shall constitute the first month's service for which the Contractor may invoice. Thereafter, the Contractor shall invoice monthly for item 003 for the prior month's lease.

For item 004, the Contractor shall invoice monthly for the prior month's services provided under item 004. Such billing invoice shall itemize the quantities and types of all services performed. The local supervisor shall provide to the Government's Contracting Officer's Representative, a monthly itemization of technician's hours worked with a breakdown for RIMD/M-R worked at straight time rates and RIMD/M-R worked at overtime rates. In addition, a daily work force report shall be provided.

For items purchased under Item 005, the Contractor shall invoice monthly and itemize all equipment for the prior month. For leased items under 005, the Contractor shall invoice monthly and itemize all equipment added to the system during the prior month. For leased items only, the Government will issue a modification at the end of each month adjusting the lease payment of Item 005 to include the additional leased equipment added during the month. This payment will then become the monthly lease payment until additional leased equipment is added.

For item 006, the Contractor shall accumulate all invoices for work related to Item 003 until cutover at which time the total amount against shall be divided by 120 months and added to the monthly lease payment invoiced as item 003. For item 006 work applicable to item 007, the contractor shall accumulate all invoices until acceptance of item 007, at which time

the total amount shall be added to the price of item 007. After cutover, the Contractor shall submit monthly invoices for any work performed under item 006.

For item 007, the Contractor shall not submit an invoice until the Government notifies the Contractor that all building and renovations have been accepted.

For items 002 and 003, the Government shall notify the Contractor, in writing, immediately upon acceptance, at which time the Contractor shall invoice the Government. No invoices for item 004 shall be submitted until after the Government has notified the Contractor of acceptance of items 002 and 003.

For Options I, II, III, IV, and VI, the Contractor shall submit an invoice at the time the Government exercises the option, except that Option I will be invoiced as a part of item 003 if Option I is exercised at least 4 months before acceptance of item 003.

For Option V, the Government shall notify the Contractor, in writing, immediately upon acceptance, at which time the Contractor shall invoice the Government.

For Option VII, the Government shall notify the Contractor, in writing, immediately upon acceptance and after 30 days, the Contractor shall begin the invoicing monthly for Option VII for the prior month's lease.

The office designated to receive the invoices will be designated by separate letter.

G.6 LOCAL 999.G09 TECHNICAL MONITOR (MAY 1992) (DEVIATION)

Work under this contract will be in support of Martin Marietta Energy Systems, Inc. (MMES), and will be performed pursuant to the Specifications and the Statement of Work. The performance of all work will be monitored by MMES employees throughout the term of the contract.

The Technical Monitor(s) will be designated by separate letter by the COR, with notification to the Contractor, and will represent MMES and the COR as the work progresses. The Technical Monitor(s) are not authorized to change any of the terms and conditions of the contract. Changes in the Scope of Work will be made only by the Contracting Officer by properly written modification(s) to the contract.

SECTION H

SPECIAL CONTRACT REQUIREMENTS

H.1 LOCAL 999.H01 Technical Direction (MAR 1989)

H.2 Definitions and Acronyms (JULY 1991)

H.3 LOCAL 999.H02 Modification Authority (APR 1984)

H.4 LOCAL 999.H07 Key Personnel (Alternate 1) (APR 1984)

H.5 LOCAL 999.H08 Confidentiality of Information (AUG 1992)

H.6 LOCAL 999.H04 Government Furnished Property and Data (Alternative I) (JULY 1990)

H.7 Title to Equipment (JULY 1991)

H.8 FAR 52.219-16 Liquidated Damages-Small Business Subcontracting Plan (AUG 1989)

H.9 RESERVED

H.10 Technological Substitutions (July 1991)

H.11 RESERVED

H.12 Scheduling of Work (JULY 1991)

H.13 Special Clause - TMS Application Source Code Escrow Account (July 1991)

H.14 Location Changes and Additions (JULY 1991)

H.15 Installation, Maintenance, and Service of Government-Furnished Equipment After Acceptance of the VDTS (JULY 1991)

H.16 Authorization for Relocation, Installation, Modification and Disconnection (RIMD) Services and Maintenance and Repair (M/R) (MARCH 1991)

H.17 LOCAL 999.H43 Environmental Laws (JUL 1991)

H.18 Special Requirements for Work in Areas Containing Asbestos (JULY 1991)

H.19 LOCAL 999.H13 Equivalent Federal Wage Rate (APR 1984) (Deviation)

H.20 Economic Price Adjustment Article (JULY 1991)

H.21 Additional Terms and Conditions Applicable to Lease (JULY 1991)

H.22 Bid Guarantee, Performance and Payment Bonds (MARCH 1991)

H.23 Additional Provisions Regarding Construction (JULY 1991)

H.24 Security Clearance for On-Site Work (JULY 1991)

H.25 Representation as to Condition of Work and Site Examination (JULY 1991)

H.26 Small Business and Small Disadvantaged Business Subcontracting Plan (JULY 1991)

H.27 LOCAL 999.H24 Property and Subcontracting Report Requirements (NOV 1987)

H.28 LOCAL 999.H29 Representation, Certifications and Other Statements of the Offeror (FEB 1990)

H.29 LOCAL 999.H36 Safety and Health (FEB 1993)

H.30 Permits (JULY 1991)

H.31 Drug Abuse Program (JULY 1991)

H.32 Government Buy Out Under Lease or LWOP (JULY 1991)

H.33 Equipment Removal (JULY 1991)

H.34 RESERVED

H.35 Procurement Authority (JULY 1991)

H.36 Required Insurance (JULY 1991)

H.37 LOCAL 999.H23 Rights to Proposal Data (Technical) (AUG 1991)

H.38 Applicable Federal Information Processing Standards (FIPS)

H.39 LOCAL 999.H03 Oversight of Contractor

H.40 Privacy or Security Safeguards (OCT. 90 FIRMR)

H.41 LOCAL 999.H32 LETTER CONTRACT (AUG 1992)

H.42 FAR 52.216-23 EXECUTION AND COMMENCEMENT OF WORK (APR 1984)

H.43 FAR 52.216-24 LIMITATION OF GOVERNMENT LIABILITY (APR 1984)

H.44 FAR 52.216-25 CONTRACT DEFINITIZATION (APR 1984)

H.45 FOCI DETERMINATIONS

H.46 DEAR 952.250-70 NUCLEAR HAZARDS INDEMNITY AGREEMENT (JAN 1992)

H.47 RCRA AND CERCLA RESPONSIBILITY (APR 1994)

H.48 GENERAL INDEMNIFICATION (APR 1994)

PART 1 - SECTION H
SPECIAL CONTRACT REQUIREMENTS

H.1 LOCAL 999.H01 TECHNICAL DIRECTION (MAR 1989)

a. Performance of the work under this contract shall be subject to the technical direction of DOE Contracting Officer's Representative (COR). The term "technical direction" is defined to include, without limitation:

   1. Directions to the Contractor which redirect the contract effort, shift work emphasis between work areas or tasks, require pursuit of certain lines of inquiry, fill in details, or otherwise serve to accomplish the contractual Statement of Work.

   2. Provisions of written information to the Contractor which assists in the interpretation of drawings, specifications, or technical portions of the work description.

   3. Review and, where required by the contract, approval of technical reports, drawings, specifications, and technical information to be delivered by the Contractor to the Government under the contract.

b. Technical direction must be within the scope of work stated in the contract. The COR does not have the authority to, and may not, issue any technical direction which:

   1. Constitutes an assignment of additional work outside the Statement of Work;

   2. Constitutes a change as defined in the contract clause entitled "Changes";

   3. In any manner causes an increase or decrease in the total price or the time required for contract performance.

   4. Changes any of the expressed terms, conditions or specifications of the contract; or

   5. Interferes with the Contractor's right to perform the terms and conditions of the contract.

c. All technical directions shall be issued in writing by the COR.

d. The Contractor shall proceed promptly with the performance of technical directions duly issued by the COR in the manner prescribed by this clause and within his authority under the provisions of this clause. If, in the opinion of the Contractor, any instruction or direction by the COR falls within one of the categories defined in b.1. through 5. above, the Contractor shall not proceed but shall notify the Contracting Officer in writing within five (5) working days after receipt of any such instruction or direction and shall request the Contracting Officer to modify the contract accordingly. Upon receiving the notification from the Contractor, the Contracting Officer shall:

1. Advise the Contractor in writing within thirty (30) days after receipt of the Contractor's letter that the technical direction is within the scope of the contract effort and does not constitute a change under the "Changes" clause of the contract;

2. Advise the Contractor in writing within a reasonable time that the Government will issue a written change order.

e. A failure of the Contractor and Contracting Officer to agree that the technical direction is within the scope of the contract, or a failure to agree upon the contract action to be taken with respect thereto shall be subject to the provisions of the clause entitled "Disputes--Alternate I."

H.2 DEFINITIONS AND ACRONYMS (JULY 1991)

The following definitions and acronyms are applicable to and used throughout this contract.

"Company" Martin Marietta Energy Systems, Inc., Oak Ridge, Tennessee

ORF-ICN Oak Ridge Federal-Integrated Communication Network has formerly been known as the Oak Ridge Operations-Integrated Communications Network (ORO-ICN) or the Oak Ridge Official-Integrated Communications Network.

"Seller" is the same as Contractor.
"A-E" Architectural-engineering firm under contract to the Seller

H.3 LOCAL 999.H02 MODIFICATION AUTHORITY (APR 1984)

Notwithstanding any of the other clauses of this contract, the Contracting Officer shall be the only individual authorized to:

a. Accept nonconforming work,

b. Waive any requirement of this contract, or

c. Modify any term or condition of this contract.

H.4 LOCAL 999.H07 KEY PERSONNEL (ALTERNATE 1) (APR 1984)

The personnel specified below are considered to be essential to the work being performed hereunder. Prior to diverting any of the specified individuals to other programs, the Contractor shall notify the Contracting Officer reasonably in advance and shall submit justification (including proposed substitutions) in sufficient detail to permit evaluation of the impact on the program.* No diversion shall be made by the Contractor without the written consent of the Contracting Officer. Provided that the Contracting Officer may ratify in writing such diversion and such ratification shall constitute the consent of the Contracting Officer required by this clause.

This clause may be amended from time to time during the course of the contract to either add or delete personnel, as appropriate.

NAME	TITLE

*The Contracting Officer is to be notified reasonably in advance of diverting of, or substitution for, any of these individuals. That period of time shall not be less than thirty (30) days.

H.5 LOCAL 999.H08 CONFIDENTIALITY OF INFORMATION (AUG 1992)

a. To the extent that the work under this contract requires that the Contractor be given access to confidential or proprietary business, technical, or financial information belonging to the Government or other companies, the Contractor shall after receipt thereof, treat such information as confidential and agrees not to appropriate such information to its own use or to disclose such information to third parties unless specifically authorized by the Contracting Officer in writing. The foregoing obligations, however, shall not apply to:

1. Information which, at the time of receipt by the Contractor, is in public domain;

2. Information which is published after receipt thereof by the Contractor or otherwise becomes part of the public domain through no fault of the Contractor;

3. Information which the Contractor can demonstrate was in its possession at the time of receipt thereof and was not acquired directly or indirectly from the Government or other companies;

4. Information which the Contractor can demonstrate was received by it from a third party who did not require the Contractor to hold it in confidence.

b. The Contractor shall obtain the written agreement, in a form satisfactory to the Contracting Officer, of each employee permitted access, whereby the employee agrees that he will not discuss, divulge or disclose any such information or data to any person or entity except those persons within the Contractor's organization directly concerned with the performance of the contract.

c. The Contractor agrees, if requested by the Government, to sign an agreement identical, in all material respects, to the provisions of this clause, with each company supplying information to the Contractor under this contract, and to supply a copy of such agreement to the Contracting Officer.

d. The Contractor agrees that upon request by DOE it will execute a DOE-approved agreement with any party whose facilities or proprietary data it is given access to or is furnished, restricting use and disclosure of the data or the information obtained from the facilities. Upon request by DOE, such an agreement shall also be signed by Contractor personnel.

e. This clause shall flow down to all appropriate subcontracts.

H.6 LOCAL 999.H04 - GOVERNMENT FURNISHED PROPERTY AND DATA (ALTERNATE I) (JULY 1990)

Only that property and data specifically included in the LIST OF GOVERNMENT PROPERTY--FURNISHED, PART III--SECTION J--ATTACHMENT D to the contract, shall be furnished.

H.7 TITLE TO EQUIPMENT (JULY 1991)

Title to all supplies and equipment furnished under this contract, except the Y-12 site structure, other structures, and building renovations, shall remain with the Contractor until such time as the Government may exercise its purchase option(s) or the Contractor abandons the supplies in place (Reference H.33). Title to the Y-12 site structure, other structures, and building renovations shall pass to the Government upon payment of item 007. Title to all other items shall pass to the Government upon exercise of the purchase options.

H.8 FAR 52.219-16 LIQUIDATED DAMAGES-SMALL BUSINESS SUBCONTRACTING PLAN (AUGUST 1989)

(a) "Failure to make a good faith effort to comply with the subcontracting plan," as used in this clause, means a willful or intentional failure to perform in accordance with the requirements of the subcontracting plan approved under the clause in this contract entitled "Small Business and Small Disadvantaged Business Subcontracting Plan," or willful or intentional action to frustrate the plan.

(b) If, at contract completion, or in the case of a commercial products plan, at the close of the fiscal year for which the plan is applicable, the Contractor has failed to meet its subcontracting goals and the Contracting Officer decides in accordance with paragraph (c) of this clause that the Contractor failed to make a good faith effort to comply with its subcontracting plan, established in accordance with the clause in this contract entitled Small and Small Disadvantaged Business Subcontracting Plans, the Contractor shall pay the Government liquidated damages in an amount stated. The amount of damages attributable to the Contractor's failure to comply shall be an amount equal to the actual dollar amount by which the Contractor failed to achieve each subcontract goal, or in the case of a commercial products plan, that portion of the dollar amount

allocable to Government contracts by which the Contractor failed to achieve each subcontract goal.

(c) Before the Contracting Officer makes a final decision that the Contractor has failed to make such good faith effort, the Contracting Officer shall give the Contractor written notice specifying the failure and permitting the Contractor to demonstrate what good faith efforts have been made. Failure to respond to the notice may be taken as an admission that no valid explanation exists. If, after consideration of all the pertinent data, the Contracting Officer finds that the Contractor failed to make a good faith effort to comply with the subcontracting plan, the Contracting Officer shall issue a final decision to that effect and require that the Contractor pay the Government liquidated damages as provided in paragraph (b) of this clause.

(d) With respect to commercial products plans, i.e., company-wide or division-wide subcontracting plans approved under paragraph (g) of the clause in this contract entitled, Small Business and Small Disadvantaged Business Subcontracting Plan, the Contracting Officer of the agency that originally approved the plan will exercise the functions of the Contracting Officer under this clause on behalf of all agencies that awarded products plan.

(e) The Contractor shall have the right of appeal, under the clause in this contract entitled Disputes, from any final decision of the Contracting Officer.

(f) Liquidated damages shall be in addition to any other remedies that the Government may leave.

H.9 UTILITY CHARGES

The U. S. Department of Energy will make available to the Contractor all reasonably required amounts of utilities from existing outlets and supplies in Government-owned facilities for the term of the contract.

H.10 TECHNOLOGICAL SUBSTITUTIONS (JULY 1991)

During the course of this contract, the Contractor shall propose for the Government's consideration Technological Replacement Substitutions for any provided product(s) that may become available as a result of technological improvements. The Government may, at any time during the term of this contract or any extension thereof, modify the contract to acquire products which are similar to those under the basic contract and that the Contractor has formally announced for marketing purposes. This action is considered to be within the scope of the contract. At the option of the Government, a Live Test Demonstration of the substitute product may be required. The Government is under no obligation to modify the contract in response to the proposed substitution. Such substitutions may include any part of, or all of, a given system provided that the following conditions are met and substantiated by documentation in the Technological Replacement Substitution proposal:

a. The proposed product(s) shall meet all of the technical specifications of this document, including having been formally announced and field proven.

b. The proposed product(s) shall have capacity, performance, or functional characteristics equal to or greater than the then currently installed product(s) to be replaced.

c. The proposal shall discuss the impact on training, maintenance. documentation, other software, other hardware, existing data files and data bases, and delivery schedules. The cost of changes to hardware. software, and/or existing data files and data bases not specifically addressed in the substitution proposal shall be borne entirely by the Contractor.

d. The substitution(s) shall be at least as (or more) cost effective than the product to be replaced.

Contractor agrees to offer and negotiate any additional or new features available due to technological changes made in the hardware or software during the term of the contract. Furthermore, if equipping the entire capacity required by Section 3.3.1.10 of Specification Y/EN-2351 requires the replacement of previously supplied equipment, the cost associated with such replacement shall be at the Contractor's expense.

H.11 RESERVED

H.12 SCHEDULING OF WORK (JULY 1991)

The Contractor shall arrange with the Contracting Officer's Representative (COR), at least 15 calendar days prior to each system installation, procedures for interruptions of services, means of access to premises, delivery and storage of materials and equipment, use of approaches, use of corridors, stairways, elevators and similar matters. Any requests received by the Contractor, from any individual other than the Contracting Officer, to change the sequence or scope of work shall be referred to the Contracting Officer. The above applies to all work performed prior to cutover and only to those system installations designated by the COR after cutover.

H.13 SPECIAL CLAUSE - TMS APPLICATION SOURCE CODE ESCROW ACCOUNT (JULY 1991)

All source code for the TMS Application Software will be kept in escrow and provided to DOE in the event the Contractor is unable to fulfill the terms of the contract for software support.

H.14 LOCATION CHANGES AND ADDITIONS (JULY 1991)

The Government may change, delete, and/or add locations to be served under this contract, subject to the terms and conditions set forth herein. Pricing of additional locations shall be subject to the pricing provisions contained in Section B.

H.15 INSTALLATION, MAINTENANCE, AND SERVICE OF GOVERNMENT-FURNISHED EQUIPMENT AFTER ACCEPTANCE OF THE VDTS (JULY 1991)

The Contractor shall install, maintain, and service Government-Furnished Equipment (GFE) in the same manner as it installs, maintains, and services the supplies and equipment provided by the Contractor. Installation, maintenance, and services shall be provided at the prices contained in the Section B price schedules of this contract.

The Government shall tender for installation, maintenance, and service only that GFE which is in good operating condition, subject to the Contractor's inspection and acceptance. Equipment is considered to be in good operating condition if it is performing all intended functions and there are no missing or broken parts. Equipment shall not be rejected for maintenance on the basis that it needs cleaning, minor repairs, or minor adjustments.

The Contractor shall examine and inspect the equipment within seven (7) calendar days of the Government's request for installation, maintenance, or other services; and shall provide written notification to the Government of acceptance or non-acceptance. Any notification of non-acceptance under this clause shall be accompanied by detailed justification of the reason for unacceptability of the equipment.

H.16 AUTHORIZATION FOR RELOCATION, INSTALLATION, MODIFICATION AND DISCONNECTION (RIMD) SERVICES AND MAINTENANCE AND REPAIR (M/R) (MAR 1991)

All RIMD/M-R activities will be performed based on service orders or trouble tickets received from the Government during the term of the contract. The Contractor shall perform only RIMD/M-R work directed by the Government service orders unless changes are coordinated and agreed to by the COR. Changes in the field, other than required by ORF-ICN maintenance, without approval of the COR shall not be permitted.

H.17 LOCAL 999.H43 ENVIRONMENTAL LAWS (JUL 1991)

The Contractor shall comply with all applicable Federal, State, and local environmental laws and regulations.

H.18 SPECIAL REQUIREMENTS FOR WORK IN AREAS CONTAINING ASBESTOS (JULY 1991)

(a) This contract incorporates those requirements of the OSHA asbestos regulations contained in Title 29, Parts 1910 and 1926.58 of the Code of Federal Regulations. All installation and/or site preparation work undertaken in areas containing asbestos shall be completed in accordance with these requirements and the requirements stated in Section 5.1.4 of Specification Y/EN-2351.

(b) The Contractor's work plan as required by Section 5.1.4.11 of Specification Y/EN-2351 is made a part of this contract.

(c) The Contractor maintains full responsibility and liability for compliance with all applicable regulations pertaining to the protection of workers, visitors to the site and persons occupying adjacent areas. The Contractor holds the Government harmless against injury resulting from the failure on the Contractor's part, or on the part of the Contractor's employees or subContractors to comply with any applicable safety or health regulation.

H.19 LOCAL 999.H13 EQUIVALENT FEDERAL WAGE RATES (APR 1984) (DEVIATION)

In the performance of construction, installation of equipment and cable, and facility renovations under this contract, the Contractor shall comply with the requirements of U. S. Department of Labor Wage Determination Number 93TN0001, dated December 3, 1993. A copy of this Wage Determination is attached to this contract (see Part III--Section J Attachment E). Furthermore, the clause entitled "Service Contract Act (SCA)" is applicable in Part II - Section I of this contract. The SCA wage determination is located in Part III - -Section J, Attachment "F".

H.20 ECONOMIC PRICE ADJUSTMENT ARTICLE (JULY 1991)

1. Index Escalation Methodology

(a) The maintenance portion of the price of item 002 (Reference Schedule C of Section B); the operation, maintenance and service portions of item 003, and the unit prices of items 004 and 006 shall be subject to adjustment upward or downward pursuant to the provisions of this article. No other prices are subject to adjustment under this article.

(b) The Contractor represents and warrants that the portions of the prices of items 002, 003, 004, and 006 set forth in Schedule G as subject to escalation do not include any contingency allowance to cover the possibility of increased costs of performance resulting from increases in (1) the Contractor's rates of pay for direct labor, (2) the prices that the Contractor is required to pay for direct material, or (3) the Contractor's indirect expenses.

(c) For the purpose of this clause, the following definitions shall apply:

The "Escalation Index" shall be the average hourly earnings for Telephone Communications, SIC Code 4813, as determined and reported monthly by the Bureau of Labor Statistics, U.S. Department of Labor in its publication entitled "Employment and Earnings". The "Base Escalation Index" shall be the Escalation Index for February 1994.

(d) Before the first annual service period the prices of items which are subject to economic price adjustment (EPA), shall be provisionally adjusted for billing purposes. The adjustment for the portion of the price subject to EPA shall be the percent by which the latest published September index is greater or less than the corresponding base

index. At the request of the Contractor, these provisional billing prices may be further revised during the scheduled annual service period by adjusting components by amounts which, in the Government's opinion, fairly reflect changes in the applicable index to the time of the requested adjustment.

(e) Upon completion of each annual service period, final prices for that period shall be calculated by adjusting the portion of the original contract price (i.e., the price before provisional adjustment) that is subject to EPA. The adjustment for that portion shall be the percent by which the average escalation index for the "Escalation Period" is greater or less than the corresponding Base Escalation index. (The Escalation Period shall correspond to the preceding annual service period for each of the ten (10) annual periods. The first annual service period shall commence upon the successful completion of the system acceptance testing).

-EXAMPLE-

The following example is provided to illustrate the manner in which the Government will apply the Economic Price Adjustment Article. Figures used are for illustration purposes only. Actual Economic Price Adjustments will depend on the actual reported indexes.

Assume the monthly lease rate for the ORF-ICN system, item 003, is $100,000/month with 60 percent or $60,000 being subject to escalation provisions and 40 percent or $40,000 not subject to escalation. Also assume that the Base Escalation Index (September 1992) is $12.00/hour. Also assume the following monthly indexes are published by the Bureau of Labor Statistics:

Average Hourly Earnings

Lease Period	SIC 4813
October 92	$12.00
November 92	12.00
December 92	12.00
January 93	15.00
April 93	15.00
May 93	15.00
June 93	18.00
July 93	18.00
August 93	18.00
September 93	18.00
	$180.00 Total

The average hourly index for the period 10/1/92 - 9/30/93 would be $15.00.

$180.00 / 12 months = $15/hour or a 25 percent increase over the base rate.

Thus the final monthly rate for the period 10/1/92 - 9/30/93 is:

[$60,000 + .25($60,000) + $40,000] = $115,000/month.

The adjustment due the Contractor for the stated period is the difference between 12 months x $115,000 (final monthly adjusted rate) and 12 months x $100,000 (monthly amount previously billed).

i.e.,
$1,380,000.00
- 1,200,000.00
$180,000.00 Amount due Contractor

Now for the period 10/1/93 - 9/30-94, the Contractor may provisionally bill at the adjusted $115,000/mo. rate.

To establish the final monthly rate for the period 10/1/93 - 9/30/94 assuming the average index is $18.00, the calculation is as follows:

[$60,000 + .50($60,000) + $40,000] = $130,000

Again the final adjustment due the Contractor is the difference:

between	12 x $130,000 (final adjusted rate) =		$1,560,000.00
and	12 x $115,000 (provisional rate billed) =	1,380,000.00	
	Amount Due Contractor for 12-Month Service Period	$180,000.00	

(f) A sum equal to the amount by which the Government's total expenditures would have been increased or decreased had the prices calculated in accordance with paragraph (e) above been in effect shall be paid to or by the Contractor within sixty (60) days after indexes necessary for the calculation of final price are published by the Bureau of Labor Statistics.

(g) Economic price adjustment shall be executed by the Contracting Officer's unilateral modification of the contract. Should the index used in this contract for escalation purposes, be discontinued, or should the basis of its calculation be significantly modified; a suitable index shall be substituted by agreement of the parties.

(h) After the final monthly rate for a 12-month service period is established, the Contractor may use that rate to provisionally bill for the services in the following 12-month service period until the final monthly rate is established for that service period.

2. **Relationship of the Service Contract Act Labor Rate and Economic Price Adjustment**

Service Contract Act wage determinations apply to the maintenance portion of item 002; the operation, maintenance, and service portions of item 003; and the unit prices of items 004 and 006. The Government does not intend to make any price adjustment as a result of changes to the Service Contract Act Labor Rate Determinations unless the Contractor provides evidence that the revised wage determination causes cost increases that exceed increases resulting from the above economic price adjustment article provisions.

H.21 ADDITIONAL TERMS AND CONDITIONS APPLICABLE TO LEASE (JULY 1991)

1. The total monthly lease and maintenance charges set forth in Section B, Schedule B of this contract shall entitle the Government to unlimited use 24 hours per day, 7 days per week of the ORF-ICN System for the term of the contract.

2. Title to and risk of loss to equipment, accessories, and devices leased under this

contract remains with the Contractor.

3. All leased equipment, accessories, and devices located on Government property shall be dismantled and removed from Government premises by the Contractor at the Contractor's expense, within 90 calendar days from the expiration of this contract except as otherwise stated in the contract.

H.22 BID GUARANTEE, PERFORMANCE AND PAYMENT BONDS (MAR 1991)

The following applies to construction, installation of cable, and facility renovations required by Item 003 and Item 007 of Schedule B, Section B.

1. **Bid Guarantee (Bid Bond Form SF 24)**

(a) Bid guarantee shall be in amount of 20% of the amount for construction, installation of cable, and facility renovations or $3,000,000, whichever is less.

2. **Performance and Payment Bonds (Forms SF-25 and SF-25A)**

(a) Performance Bond. If the contract price exceeds $25,000, the Contractor shall furnish a performance bond with good and sufficient surety or sureties acceptable to the Government, in connection with the performance of the work under this agreement, on Standard Form 25. The penal sum of the performance bond shall be 100 percent of the contract price.

(b) Payment Bond. If the contract price exceeds $25,000, the Contractor shall furnish a payment bond with good and sufficient surety or sureties acceptable to the Government, for the protection of persons furnishing material or labor in connection with the performance of the work under this agreement, on Standard Form 25-A. The penal sum of the payment bond shall be as follows:

(1) When the contract price is $1,000,000 or less, 50 percent of the contract price;

(2) When the contract price is in excess of $1,000,000, and $5,000,000 or less, 40 percent of the contract price;

(3) When the contract price is more than $5,000,000 the bond amount shall be $2,500,000.

(c) *Deadline* for Submission. Bonds required under this contract shall be provided to the

Contracting Office within ten (10) calendar days after receipt of notice of acceptance of the offer. Bonds shall be dated the same or later than the date of the contract.

(d) The requirement to provide a performance bond is intended solely to guarantee the Contractor's performance of the work required by this contract.

(e) The requirement to provide a payment bond is intended solely to provide a remedy, pursuant to the Miller Act (40 USC 270a-270f), to unpaid persons or firms who furnish labor or materials to the prime Contractor on this contract.

(f) This clause shall flow down to all subcontracts.

H.23 ADDITIONAL PROVISIONS REGARDING CONSTRUCTION (JULY 1991)

1. Conditions Affecting the Work

Contractors should attend the preproposal conference, site visit, and take such other steps as may be reasonably necessary to ascertain the nature and location of the work, and the general and local conditions which can affect the work or the cost thereof. Failure to do so will not relieve Contractors from responsibility for estimating properly the difficulty or cost of successfully performing the work. The Government will assume no responsibility for any understanding or representations concerning conditions made by any of their officers or agents prior to the execution of the contract, unless included in the contract documents.

2. Taxes

Contractor is required to pay all applicable taxes for construction, installation of equipment and cable, and facility renovations. Monthly rates shall not include any additional state or local sales or use tax, however, Contractor may be required to pay personal property taxes.

H.24 SECURITY CLEARANCE FOR ON-SITE WORK (JULY 1991)

Security clearances will be required for work under this contract. However, there is no requirement that a firm submitting a proposal have security cleared personnel at the time of submission of a proposal.

Contractor's attention is directed to section 5.3 of the Specification Y/EN-2351. Part III,

Section J, Attachment A identifies possible sources of Q-Cleared subContractors or escorts, however, it is the Contractor's responsibility to provide sufficient L- and Q-Cleared personnel and/or escorts to meet the Government's schedule requirements.

Within 10 days after notification of award, the Contractor shall provide a complete list of all personnel requiring clearances.

H.25 REPRESENTATION AS TO CONDITION OF WORK AND SITE EXAMINATION (JULY 1991)

The Contractor represents that it has had an opportunity to examine and has examined all of the contract documents, specifications and supporting data and that it has, from the information contained in such documents, specifications and data, fully acquainted itself with all conditions relevant to the work, to the extent permitted by DOE.

The Contractor represents that it has fully acquainted himself with the conditions, nature and location of the work and has examined the general conditions of site work which can affect the work or cost thereof. Any failure by the Contractor to do so will not relieve it from the responsibility for successfully performing the work without additional expense to the Government. The Government makes no representations concerning such conditions not expressly stated in the contract and specification Y/EN-2351.

H.26 SMALL BUSINESS AND SMALL DISADVANTAGED BUSINESS SUBCONTRACTING PLAN (JULY 1991)

The Small Business and Small Disadvantaged Business Subcontracting Plan submitted by Contractor for this contract, and approved by the Contracting Officer on (To Be Determined) will be included in Part III, Section J, as Attachment I. Any required revisions to the Plan shall be accomplished by contract modification. A Master Subcontracting Plan or a Corporate Commercial Subcontracting Plan as prescribed in FAR 52.219-9 (f) and (g) may be used in lieu of the individual subcontracting plan.

H.27 LOCAL 999.H24 PROPERTY and SUBCONTRACTING REPORT REQUIREMENTS (NOV 1987)

Government property reports, if applicable, shall be prepared and submitted in accordance with the "Government Property" clause of this contract. If this contract contains a Small/Disadvantaged Business Subcontracting Plan, subcontracting reports shall be

prepared and submitted in accordance with the Plan and the contract clause entitled "Small Business and Small Disadvantaged Business Subcontracting Plan."

H.28 LOCAL 999.H29 REPRESENTATIONS, CERTIFICATIONS and OTHER STATEMENTS of the OFFEROR (FEB 1990)

The Representations, Certifications, and Other Statements of the Contractor, dated February 1, 1993, for this contract are, by reference, hereby incorporated in and made a part of this contract.

H.29 LOCAL 999.H36 SAFETY and HEALTH (FEB 1993)

The Contractor shall take all reasonable precautions in the performance of the work under this contact to protect the safety and health of employees and of members of the public and shall comply with all applicable safety and health regulations and requirements set forth in 29 CFR Part 1910, Occupational Safety and Health Standards for General Industry, and 29 CFR Part 1926, Occupational Safety and Health Standards for Construction Industry. In addition, all workers shall wear eye and head protection that complies with American National Standards Institute (ANSI) Z87.1, Z89.1 and Z89.2 at all times while in designated construction or operational areas.

H.30 PERMITS (JULY 1991)

The Contractor shall, without additional expense to the Government, be responsible for obtaining any necessary licenses and permits, and for complying with any applicable federal, state, and municipal laws, codes, and regulations, in connection with the performance of the contract.

H.31 DRUG ABUSE PROGRAM (JULY 1991)

1. The Department of Energy is committed to a safe and healthy work environment and quality performance on construction contracts. Included within this goal is a commitment to provide a work environment free of illegal drugs and the abuse of prescription drugs.

2. A drug abuse program is being implemented for construction contracts being performed for the U.S. Department of Energy, Oak Ridge Operations. Martin

Marietta Energy Systems and MK-Ferguson of Oak Ridge Company are cooperating in the administration of a program to help improve the safety of all construction workers.

3. MK-Ferguson of Oak Ridge Company (MK-F) currently under prime contract to the Department of Energy, has implemented a drug abuse program (copy will be furnished upon request) in cooperation with Martin Marietta Energy Systems. In order to provide a uniform, consistent approach to dealing with drug abuse in the construction environment at Oak Ridge, MK-F is administering the program for all construction workers on DOE projects. The Contractor is required to abide by this drug abuse program and it will be provided at no charge to the participants.

4. The Contractor shall assure that each of its subContractors performing work on the site adopt and abide by the policy and procedures and all provisions of this clause. All communications will be between the Contractor and MK-F.

H.32 GOVERNMENT BUY OUT UNDER LEASE OR LWOP (JULY 1991)

The Government shall have the right to purchase any items acquired under the lease or LWOP plan anytime during the contract life by paying only the unamortized principal balance of the principal amount using the interest method of amortization. No interest charges, prepayment penalties or other costs, other than the unamortized balance of the principal amount, shall be considered in computation of the buy out price.

H.33 EQUIPMENT REMOVAL (JULY 1991)

All leased equipment, accessories, and devices located on Government property shall be dismantled and removed from Government premises by the Contractor at the Contractor's expense, within 90 calendar days from the expiration of this contract. Exceptions to this requirement shall be mutually agreed upon and written notice issued by the Contracting Officer.

H.34 RESERVED

H.35 PROCUREMENT AUTHORITY (JULY 1991)

This acquisition is being conducted under a specific acquisition delegation from GSA for procurement of Federal Information Processing (FIP) resources. The specific GSA Delegation of Procurement Authority (DPA) case number is KMA-91-0430.

H.36 REQUIRED INSURANCE (JULY 1991)

(a) The Contractor shall procure and maintain the following minimum insurance during the period of performance of this contract:

(1) Workmen's Compensation and Employer's Liability Insurance

(i) Compliance with applicable workmen's compensation and occupational disease statutes is required under this contract.

(ii) Employer's liability coverage in the minimum amount of $1 million.

(2) General Liability Insurance in the minimum amount of $500,000 per occurrence.

(3) Automobile Liability Insurance in the minimum amount of $200,000 per person and $500,000 per occurrence for bodily injury and $20,000 per occurrence for property damage.

(i) Prior to the commencement of work hereunder, the Contractor shall furnish to the Contracting Officer a certificate or written statement of the above required insurance. The policies evidencing required insurance shall contain an endorsement to the effect that cancellation or any material change in the policies adversely affecting the interests of the Government in such insurance shall not be effective for such periods as may be prescribed by the laws of the state in which this contract is to be performed and in no event less than thirty (30) days after written notice thereof to the Contracting Officer.

(b) The Contractor agrees to insert the substance of this clause including this paragraph (b), in subcontracts under this contract that require work on a Government installation. The subContractor(s), will be obligated by the prime Contractor, to provide and maintain the insurance required by virtue of this contract. At least five (5) days before entry of each such subContractor's personnel on Government installation, the Contractor shall furnish (or ensure that there has been furnished)

to the Contracting Officer a current certificate of insurance, meeting the requirements of paragraphs (a) and (b) under this Clause.

H.37 LOCAL 999.H23 RIGHTS TO PROPOSAL DATA (TECHNICAL) (AUG 1991)

Pursuant to the clause entitled "Rights to Proposal Data (Technical)" the following is inserted therein:

".....VOL I pages I.57 - I.101"
".....proposal dated April 8, 1994"

H.38 APPLICABLE FEDERAL INFORMATION PROCESSING STANDARD (FIPS)

FIPS #	TITLE
22-1	Synchronous Signaling Rates Between Data Terminal and Data Communication Equipment
107	Local Area Networks: Baseboard Carrier Sense Multiple Access with Collision Detection Access Method and Physical Layer Specifications and Link Layer Protocol
112	Password Usage
113	Computer Data Authentication
127-1	Database Language (SQL)
140	General Security Requirements for Equipment using the Data Encryption Standard
160	C
(NEW)	Integrated Services Digital Network

H.39 LOCAL 999.H03 OVERSIGHT OF CONTRACTOR (MAR 1994)

1. The parties recognize that DOE has entered into Contract No. DE-AC05-84OR21400 (hereinafter referred to as Contract 21400) with Martin Marietta Energy Systems, Inc. (hereinafter Energy Systems), for the management and operation of Government-owned facilities located in Oak Ridge, Tennessee, and for environmental restoration and waste management at the Paducah Gaseous Diffusion Plant located in Paducah, Kentucky, and the Portsmouth Gaseous Diffusion Plant located in Piketon, Ohio, at which sites (as identified elsewhere in the contract) the Contractor will be performing under this contract. The Contractor hereby agrees that while it is performing work at such sites it shall comply with applicable Federal, state and local laws, regulations, DOE orders and directions, and with the standards and procedures of Energy Systems with respect to health, safety, environmental, quality assurance, and safeguard and security matters. The Contractor agrees that its responsibility to comply with the foregoing is not reduced by the oversight provided by Energy Systems under Clause H.17 of Contract 21400 nor are any the Contractor's responsibilities assumed by Energy Systems by such clause. The Contractor acknowledges that the performance by Energy Systems under Contract 21400 is not intended to and does not reduce the Contractor's obligations, responsibilities, and/or accountability to DOE or any regulatory agency, including judicial body, responsible for audit, licensing, permitting, or other administrative review or adjudication capacity.

2. The Contractor agrees to cooperate fully and in good faith with DOE and Energy Systems so as to enable Energy Systems to perform its obligations under Clause H.17 of Contract 21400, including evaluation of the Contractor's programs, procedures, systems, processes, and policies regarding health and safety, housekeeping, environmental requirements, radiation protection, security, quality assurance, industrial hygiene, criticality safety, and related operations. In performing such evaluations, the Contractor agrees to allow Energy Systems access to documents relating to the foregoing, including but not limited to policies; procedures; operating instructions; manuals; training programs; qualification of employees consistent with the Privacy Act; quality assurance program; accident reports; insurance reports and claim files; requests for proposals, bids, and other necessary procurement related documents from or to any Governmental agency relating to such matters; and reports whether generated by the Contractor, subcontractor, prospective subcontractors, or a third party relating to such matters.

3. The Contractor acknowledges that Clause H.17 of Contract 21400 authorizes Energy Systems, under specified circumstances, to suspend work of the Contractor or deny the Contractor access to the Government's facilities. The Contractor agrees to comply with any such Energy Systems direction.

4. The Contractor agrees to include in all subcontracts, that may include on-site work under this contract, a clause which will obligate such subcontractors to comply with the provisions of this clause and to impose these obligations on all their subcontractors or suppliers, at any tier, which involve performance of work on-site. As used in this clause, subcontractor(s) and subcontract(s) include such at any tier.

H.40 PRIVACY OR SECURITY SAFEGUARDS (OCT. 90 FIRMR)

(a) The details of any safeguards the Contractor may design or develop under this contract are the property of the Government and shall not be published or disclosed in any manner without the Contracting Officer's express written consent.

(b) The details of any safeguards that may be revealed to the Contractor by the Government in the course of performance under this contract shall not be published or disclosed in any manner without the Contracting Officer's express written consent.

(c) The Government shall be afforded full, free, and uninhibited access to all facilities, installations, technical capabilities, operations, documentation, records, and data bases for the purpose of carrying out a program of inspection to ensure continued efficacy and efficiency of safeguards against threats and hazards to data security, integrity, and confidentiality.

(d) If new or unanticipated threats or hazards are discovered by either the Government or the Contractor, or if existing safeguards have ceased to function, the discoverer shall immediately bring the situation to the attention of the other party. Mutual agreement shall then be reached on changes or corrections to existing safeguards or institution of new safeguards, with final determination of appropriateness being made by the Government. The Government's liability is limited to an equitable adjustment of cost for such changes or corrections, and the Government shall not be liable for claims of loss of business, damage to reputation, or damages of any other kind arising from discovery of new or unanticipated threats or hazards, or any public or private disclosure thereof.

H.41 LOCAL 999.H32 LETTER CONTRACT (AUG 1992)

a. Purpose of Letter Contract. The purpose of this Letter Contract is to permit the immediate commencement of the work necessary to maintain the required schedule for Construction, RIMD M/R and Installation of the Fiber Triangle in accordance with the terms and conditions contained herein.

b. This Letter Contract authorizes the Contractor to work only on the following as defined in the statement of work:

Item 001, Item 007, Option VII and limited work in Item 002 and Item 003.

H.42 FAR 52.216-23 EXECUTION AND COMMENCEMENT OF WORK (APR 1984)

The Contractor shall indicate acceptance of this letter contract by signing two copies of the contract and returning them to the Contracting Officer not later than May 2, 1994. Upon acceptance by both parties, the Contractor shall proceed with performance of the work, including purchase of necessary materials.

H.43 FAR 52.216-24 LIMITATION OF GOVERNMENT LIABILITY (APR 1984)

(a) In performing this contract, the Contractor is not authorized to make expenditures or incur obligations exceeding $15,000,000 dollars.

(b) The maximum amount for which the Government shall be liable if this contract is terminated is as follows.

Item 001	$2,372,580	Item 001G	$ 18,532
Item 001A	$ 233,059	Item 001H	$ 18,532
Item 001B	$ 62,658	Item 001I	$ 18,532
Item 001C	$ 27,025	Item 002	$ 148,114
Item 001D	$2,029,260	Item 003	$22,277,493
Item 001E	$ 18,532	Item 007	$ 3,875,763
Item 001F	$ 18,532	Option VII	$ 208,440
Total			$31,327,052

The amounts shown above are based on the proposal submitted March 25, 1994.

H.44 FAR 52.216-25 CONTRACT DEFINITIZATION (APR 1984)

(a) A Firm-Fixed-Price definitive contract is contemplated. The Contractor agrees to begin promptly negotiating with the Contracting Officer the terms of a definitive contract that will include (1) all clauses required by the Federal Acquisition Regulation (FAR) on the date of execution of the letter contract, (2) all clauses required by law on the date of execution

of the definitive contract, and (3) any other mutually agreeable clauses, terms, and conditions. The Contractor agrees to submit a Firm-Fixed-Price proposal and cost or pricing data supporting its proposal.

(b) The schedule for definitizing this contract is:

July 18, 1994	Begin Negotiations
July 29, 1994	Complete Negotiations
August 31, 1994	Subcontracting Plan Submitted
August 31, 1994	Execute Definitizing Modification
September, 15, 1994	Final Cost Proposal Submitted

(c) If agreement on a definitive contract to supersede this letter contract is not reached by the target date in paragraph (b) above, or within any extension of it granted by the Contracting Officer, the Contracting Officer may, with the approval of the head of the contracting activity, determine a reasonable price or fee in accordance with Subpart 15.8 and Part 31 of the FAR, subject to Contractor appeal as provided in the Disputes clause. In any event, the Contractor shall proceed with completion of the contract, subject only to the Limitation of Government Liability clause.

(1) After the Contracting Officer's determination of price or fee, the contract shall be governed by--

(i) All clauses required by the FAR on the date of execution of this letter contract for either fixed-price or cost-reimbursement contracts, as determined by the Contracting Officer under this paragraph (c);

(ii) All clauses required by law as of the date of the Contracting Officer's determination; and

(iii) Any other clauses, terms, and conditions mutually agreed upon.

(2) To the extent consistent with subparagraph (c)(1) above, all clauses, terms, and conditions included in this letter contract shall continue in effect, except those that by their nature apply only to a letter contract.

H.45 FOCI DETERMINATIONS

Performance under this contract requires security clearances for purposes of site access. As a result, the contractor, as well as certain subcontractors, are subject to DEAR 904.7001. Accordingly, a FOCI determination must be issued on the contractor, as well as certain subcontractors, prior to their beginning performance with personnel having security clearances. Since the schedule necessitated portions of the work being awarded as a letter contract, FOCI determinations have not been made.

While this letter contract will allow for design work and transition related activities to begin, no on-site work with personnel having security clearances may commence until favorable FOCI determinations have been issued by the Contracting Officer.

H. 46 952.250-70 NUCLEAR HAZARDS INDEMNITY AGREEMENT (JAN 1992)

(a) Authority. This clause is incorporated into this contract pursuant to the authority contained in subsection 170d. of the Atomic Energy Act of 1954, as amended (hereinafter called the Act.)

(b) Definitions. The definitions set out in the Act shall apply to this clause.

(c) Financial protection. Except as hereafter permitted or required in writing by DOE, the contractor will not be required to provide or maintain, and will not provide or maintain at Government expense, any form of financial protection to cover public liability, as described in paragraph (d)(2) below. DOE may, however, at any time require in writing that the contractor provide and maintain financial protection of such a type and in such amount as DOE shall determine to be appropriate to cover such public liability, provided that the costs of such financial protection are reimbursed to the contractor by DOE.

(d) Indemnification. (1) To the extent that the contractor and other persons indemnified are not compensated by any financial protection permitted or required by DOE, DOE will indemnify the contractor and other persons indemnified against (i) claims for public liability as described in subparagraph (d)(2) of this clause; and (ii) such legal costs of the

contractor and other persons indemnified as are approved by DOE, provided that DOE's liability, including such legal costs, shall not exceed the amount set forth in section 170e.(1)(B) of the Act in the aggregate for each nuclear incident or precautionary evacuation occurring within the United States or $100 million in the aggregate for each nuclear incident occurring outside the United States, irrespective of the number of persons indemnified in connection with this contract.

(2) The public liability referred to in subparagraph (d)(1) of this clause is public liability as defined in the Act which (i) arises out of or in connection with the activities under this contract, including transportation; and (ii) arises out of or results from a nuclear incident or precautionary evacuation, as those terms are defined in the Act.

(e) Waiver of Defenses. (1) In the event of a nuclear incident, as defined in the Act, arising out of nuclear waste activities, as defined in the Act, the contractor, on behalf of itself and other persons indemnified, agrees to waive any issue or defense as to charitable or governmental immunity.

(2) In the event of an extraordinary nuclear occurrence which: (i) Arises out of, results from, or occurs in the course of the construction, possession, or operation of a production or utilization facility; or

(ii) Arises out of, results from, or occurs in the course of transportation of source material, by-product material, or special nuclear material to or from a production or utilization facility; or

(iii) Arises out of or results from the possession, operation, or use by the contractor or a subcontractor of a device utilizing special nuclear material or by-product material, during the course of the contract activity; or

(iv) Arises out of, results from, or occurs in the course of nuclear waste activities, the contractor, on behalf of itself and other persons indemnified, agrees to waive:

(A) Any issue or defense as to the conduct of the claimant (including the conduct of persons through whom the claimant derives its cause of action) or fault or persons indemnified, including, but not limited to:

1. Negligence;

2. Contributory negligence;

3. Assumption of risk; or

4. Unforeseeable intervening causes, whether involving the conduct of a third person or an act of God;

(B) Any issue or defense as to charitable or governmental immunity; and

(C) Any issue or defense based on any statute of limitations, if suit is instituted within 3 years from the date on which the claimant first knew, or reasonably could have known, of his injury or damage and the cause thereof. The waiver of any such issue or defense shall be effective regardless of whether such issue or defense may otherwise be deemed jurisdictional or relating to an element in the cause of action. The waiver shall be judicially enforceable in accordance with its terms by the claimant against the person indemnified.

(v) The term extraordinary nuclear occurrence means an event which DOE has determined to be an extraordinary nuclear occurrence as defined in the Act. A determination of whether or not there has been an extraordinary nuclear occurrence will be made in accordance with the procedures in 10 CFR part 840.

(vi) For the purposes of that determination, "offsite" as that term is used in 10 CFR part 840 means away from "the contract location" which phrase means any DOE facility, installation, or site at which contractual activity under this contract is being carried on, and any contractor-owned or controlled facility, installation, or site at which the

contractor is engaged in the performance of contractual activity under this contract.

(3) The waivers set forth above:

(i) Shall be effective regardless of whether such issue or defense may otherwise be deemed jurisdictional or relating to an element in the cause of action;

(ii) Shall be judicially enforceable in accordance with its terms by the claimant against the person indemnified;

(iii) Shall not preclude a defense based upon a failure to take reasonable steps to mitigate damages;

(iv) Shall not apply injury or damage to a claimant or to a claimant's property which is intentionally sustained by the claimant or which results from a nuclear incident intentionally and wrongfully caused by the claimant;

(v) Shall not apply to injury to a claimant who is employed at the site of and in connection with the activity where the extraordinary nuclear occurrence takes place, if benefits therefor are either payable or required to be provided under any workmen's compensation or occupational disease law;

(vi) Shall not apply to any claim resulting from a nuclear incident occurring outside the United States;

(vii) Shall be effective only with respect to those obligations set forth in this clause and in insurance policies, contracts or other proof of financial protection; and

(viii) Shall not apply to, or prejudice the prosecution or defense of, any claim or portion of claim which is not within the protection afforded under (A) the limit of liability provisions under subsection 170e. of the Act, and (B) the terms of this agreement and the terms of insurance policies, contracts, or other proof of financial protection.

(f) *Notification* and litigation of claims. The contractor

shall give immediate written notice to DOE of any known action or claim filed or made against the contractor or other person indemnified for public liability as defined in paragraph (d)(2). Except as otherwise directed by DOE, the contractor shall furnish promptly to DOE, copies of all pertinent papers received by the contractor or filed with respect to such actions of claims. DOE shall have the right to, and may collaborate with, the contractor and any other person indemnified in the settlement or defense of any action or claim and shall have the right to (1) require the prior approval of DOE for the payment of any claim that DOE may be required to indemnify hereunder; and (2) appear through the Attorney General on behalf of the contractor or other person indemnified in any action brought upon any claim that DOE may be required to indemnify hereunder, take charge of such action, and settle or defend any such action. If the settlement of defense of any such action or claim is undertaken by DOE, the contractor or other person indemnified shall furnish all reasonable assistance in effecting a settlement or asserting a defense.

(g) Continuity of DOE obligations. The obligations of DOE under this clause shall not be affected by any failure on the part of the contractor to fulfill its obligation under this contract and shall be unaffected by the death, disability, or termination of existence of the contractor, or by the completion, termination or expiration of this contract.

(h) Effect of other clauses. The provisions of this clause shall not be limited in any way by, and shall be interpreted without reference to, any other clause of this contract, including the clause entitled Contract Disputes, provided, however, that this clause shall be subject to the clauses entitled Covenant Against Contingent Fees, Officials Not to Benefit, and Examination of Records by the Comptroller General, and any provisions that are later added to this contract as required by applicable Federal law, including statutes, executive orders and regulations, to be included in Nuclear Hazards Indemnity Agreements.

(i) Civil penalties. The contractor and its subcontractors and suppliers who are indemnified under the provisions of this clause are subject to civil penalties, pursuant to 234A of the

Act, for violations of applicable DOE nuclear-safety related rules, regulations, or orders.

(j) Criminal penalties. Any individual director, officer, or employee of the contractor or of its subcontractors and suppliers who are indemnified under the provisions of this clause are subject to criminal penalties, pursuant to 223c. of the Act, for knowing and willful violation of the Atomic Energy Act of 1954, as amended, and applicable DOE nuclear safety-related rules, regulations or orders which violation results in, or, if undetected, would have resulted in a nuclear incident.

(k) Inclusion in subcontracts. The contractor shall insert this clause in any subcontract which may involve the risk of public liability, as that term is defined in the Act and further described in paragraph (d)(2) above. However, this clause shall not be included in subcontracts in which the subcontractor is subject to Nuclear Regulatory Commission (NRC) financial protection requirements under section 170b. of the Act or NRC agreements of indemnification under section 170c. or k. of the Act for the activities under the subcontract.

H.47 RCRA AND CERCLA RESPONSIBILITY (APR 1994)

RCRA - The contractor will not be responsible for DOE generated RCRA materials. The contractor will be responsible for RCRA materials it brings onto the Oak Ridge site.

CERCLA - The contractor is not held responsible for releases of hazardous substances under CERCLA which have occurred prior to its commencement of work on the Oak Ridge site. CERCLA liability could be imposed if the contractor causes a release during the performance of the contract.

H.48 GENERAL INDEMNIFICATION (APR 1994)

The contractor will not be required to indemnify and hold harmless the Government from claims, demands, causes of actions, or suits of any nature arising out of acts or conduct of the Government, unrelated third parties, or anyone or anything, other than to the extent they are caused by the gross negligence or intentional misconduct of the contractor or its' subcontractors.

SECTION I

CONTRACT CLAUSES

I.1 Preprinted Contract Clauses for Fixed Price Supply Contracts (DOE Set 301-September 1993) and Fixed Price Service Contracts (DOE Set 301s-February 1992)

I.2 DEAR 952.212-72 Uniform Reporting System (October 1991)

I.3 DEAR 952.204-2 Security Requirements (October 1987)

I.4 DEAR 952.204-74 Foreign Ownership, Control or Influence Over Contractor (April 1984)

I.5 FAR 52.210-7 Used or Reconditioned Material, Residual Inventory, and Former Government Surplus Property (April 1984)

I.6 FAR 52.220-1 Preference for Labor Surplus Area Concerns (April 1984)

I.7 FAR 52.220-4 Labor Surplus Area Subcontracting Program (April 1984)

I.8 FAR 52.222-43 Fair Labor Standards Act and Service Contract Act - Price Adjustment (multiple year and option contracts) (May 1989)

I.9 FAR 52.223-3 Hazardous Material Identification and Material Safety Data (November 1991)

I.10 DEAR 952.223-71 Safety and Health (Government-Owned or Leased) (April 1984)

I.11 DEAR 952.223.75 Preservation of Individual Occupational Radiation Exposure Records (April 1984)

I.12 FAR 52.224-1 Privacy Act Notification (April 1984)

I.13 FAR 52.224-2 Privacy Act (April 1984)

I.14 FAR 52.227-19 Commercial Computer Software - Restricted Rights (June 1987)

I.15 FAR 52.228-5 Insurance - Work on a Government Installation (September 1989)

SECTION I
CONTRACT CLAUSES
Additional Contract Clauses Applicable to Other Than Construction Work

I.16 FAR 52.232-9 Limitation on Withholding of Payments (April 1984)

I.17 FAR 52.237-2 Protection of Government Buildings, Equipment, and Vegetation (April 1984)

I.18 FAR 52.237-3 Continuity of Services (January 1991)

I.19 FAR 52.248-1 Value Engineering (March 1989)

Additional Contract Clauses Applicable to Construction Work, Installation of Equipment and Cable, and Facility Renovations

I.20 Preprinted Contract Clauses for Fixed Price Construction Contracts (DOE Set 307 - September 1993)

I.21 RESERVED

I.22 FAR 52.228-1 Bid Guarantee (April 1984)

I.23 FAR 52.228-11 Pledges of Assets (February 1990)

I.24 FAR 52.236-14 Availability and Use of Utility Services (April 1984)

I.25 FAR 52.232-18 Availability of Funds (April 1984)

I.26 FAR 52.216-18 Ordering (April 1984)

I.27 RESERVED

I.28 FAR 52.216-22 Indefinite Quantity (April 1984)

I.29 DEAR 970.5204-58 Workplace Substance Abuse Programs at DOE Sites (AUG 1992)

Part II

Section I

Additional Contract Clauses Applicable to Other Than Construction Work

I.1 PREPRINTED CONTRACT CLAUSES FOR FIXED PRICE SUPPLY CONTRACTS (DOE SET 301 - SEPTEMBER 1993) AND FIXED PRICE SERVICE CONTRACTS (DOE SET 301S-FEBRUARY 1992)

The contract clauses contained in DOE Set 301, Fixed Price Supply Contracts and on DOE Set 301s Fixed Price Service Contracts--Changes to Set 301 are included in Part III, Section J, Attachment G and are applicable to work on this contract that is not related to construction, installation of equipment and cable, and facility renovations.

I.2 DEAR 952.212-72 UNIFORM REPORTING SYSTEM(OCTOBER 1991)

Reporting on cost, schedule, and technical performance related to DOE contracts (excluding special research contracts and management and operating contracts) is controlled by DOE Order 1332.1A, Uniform Reporting System, of October 15, 1985, or any later version of the Order in effect on the effective date of contract, and by 5 CFR 1320.6. As discussed in DEAR 904.601-71, the following clause is to be included in a contract when plans and reports are required under the Uniform Reporting System:

Uniform Reporting System (May 1987)

Contractor shall prepare and submit (postage prepaid) the plans and reports indicated on the DOE Form 1332.1, Reporting Requirements Checklist or amendments to this checklist included in this contract, to the addressees and in the specified number of copies as designated in the attachment to the checklist. The Contractor shall prepare the specified plans and reports in accordance with the formats and structure set forth in DOE Order 1332.1A, or any later version in effect on the effective date of the contract. The Contractor shall be responsible for levying appropriate reporting requirements on any subContractors in such a manner to ensure that data submitted by the subContractor to the Contractor is timely and compatible with the data elements that the Contractor is responsible for submitting to DOE. Plans and reports submitted in compliance with this clause are in addition to any other reporting requirements of this contract.

I. 3 DEAR 952.204-2 SECURITY REQUIREMENTS (OCT 1987)

(a) Responsibility. It is the Contractor's duty to safeguard all classified information, special nuclear material, and other DOE property. The Contractor shall, in accordance with DOE security regulations and requirements, be responsible for safeguarding all classified information, and protecting against sabotage, espionage, loss and theft, the classified documents and material in the Contractor's possession in connection with the performance of work under this contract. Except as otherwise expressly provided in this contract, the Contractor shall, upon completion or termination of this contract, transmit to DOE any classified matter in the possession of the Contractor or any person under the Contractor's control in connection with performance of this contract. If retention by the Contractor of any classified matter is required after the completion or termination of the contract and such retention is approved by the Contracting Officer, the Contractor will complete a certificate of possession to be furnished to DOE specifying the classified matter to be retained. The certification shall identify the items and types or categories retained, the conditions governing the retention of the matter, and the period of retention, if known. If the retention is approved by the Contracting Officer, the security provisions of the contract will continue to be applicable to the matter retained. Special nuclear material will not be retained after the completion or termination of the contract.

(b) Regulations. The Contractor agrees to conform to all security regulations and requirements of DOE.

(c) Definition of Classified Information. The term "Classified Information" means Restricted Data, Formerly Restricted Data, or National Security Information.

(d) Definition of Restricted Data. The term "Restricted Data" means all data concerning (1) design, manufacture, or utilization of atomic weapons; (2) the production of special nuclear material; or (3) the use of special nuclear material in the production of energy, but shall not include data declassified or removed from the Restricted Data category pursuant to Section 142 of the Atomic Energy Act of 1954, as amended.

(e) Definition of Formerly Restricted Data. The term "Formerly Restricted Data" means all data removed from the Restricted Data category under section 142 d. of the Atomic Energy Act of 1954, as amended.

(f) Definition of National Security Information. The term "National Security Information" means any information or material, regardless of its physical form or

characteristics, that is owned by, produced for or by, or is under the control of the United States Government, that has been determined pursuant to Executive Order 12356 or prior Orders to require protection against unauthorized disclosure, and which is so designated.

(g) Definition of Special Nuclear Material (SNM). SNM means (1) plutonium, uranium enriched in the isotope 233 or in the isotope 235, and any other material which pursuant to the provisions of Section 51 of the Atomic Energy Act of 1954, as amended, has been determined to be special nuclear material, but does not include source material; or (2) any material artificially enriched by any of the foregoing, but does not include source material.

(h) Security clearance of personnel. The Contractor shall not permit any individual to have access to any classified information, except in accordance with the Atomic Energy Act of 1954, as amended, Executive Order 12356, and the DOE's regulations or requirements applicable to the particular level and category of classified information to which access is required.

(i) Criminal liability. It is understood that disclosure of any classified information relating to the work or services ordered hereunder to any person not entitled to receive it, or failure to safeguard any classified information that may come to the Contractor or any person under the Contractor's control in connection with work under this contract, may subject the Contractor, its agents, employees, or subcontractors to criminal liability under the laws of the United States. (See the Atomic Energy Act of 1954, as amended, 42 U.S.C. 2011 et seq.; 18 U.S.C. 793 and 794; and Executive Order 12356).

(j) Subcontracts and purchase orders. Except as otherwise authorized in writing by the Contracting Officer, the Contractor shall insert provisions similar to the foregoing in all subcontracts and purchase orders under this contract.

I. 4 DEAR 952.204-74 FOREIGN OWNERSHIP, CONTROL, OR INFLUENCE OVER CONTRACTOR APR 1984)

(a) For purposes of this clause, a foreign interest is defined as any of the following:

(1) A foreign government or foreign government agency;

(2) Any form of business enterprise organized under the laws of any country other than the United States or its possessions;

(3) Any form of business enterprise organized or incorporated under the laws of the U.S., or a State or other jurisdiction within the U.S., which is owned, controlled, or influenced by a foreign government, agency, firm, corporation or person; or

(4) Any person who is not a U.S. citizen.

(b) Foreign ownership, control, or influence (FOCI) means the situation where the degree of ownership, control, or influence over a Contractor by a foreign interest is such that a reasonable basis exists for concluding that compromise of classified information, special nuclear material as defined in 10 CFR Part 710, may result.

(c) For purposes of this clause, subcontractor means any subcontractor at any tier and the term "Contracting Officer" shall mean DOE Contracting Officer. When this clause is included in a subcontract, the term "Contractor" shall mean subcontractor and the term "contract" shall mean subcontract.

(d) The Contractor shall immediately provide the Contracting Officer written notice of any changes in the extent and nature of FOCI over the Contractor which would affect the answers to the questions presented in DEAR 952.204-73. Further, notice of changes in ownership or control which are required to be reported to the Securities and Exchange Commission, the Federal Trade Commission, or the Department of Justice shall also be furnished concurrently to the Contracting Officer.

(e) In those cases where a Contractor has changes involving FOCI, the DOE must determine whether the changes will pose an undue risk to the common defense and security. In making this determination, the Contracting Officer shall consider proposals made by the Contractor to avoid or mitigate foreign influences.

(f) If the Contracting Officer at any time determines that the Contractor is, or is potentially, subject to FOCI, the Contractor shall comply with such instructions as the Contracting Officer shall provide in writing to safeguard any classified information or significant quantity of special nuclear material.

(g) The Contractor agrees to insert terms that conform substantially to the language of this clause including this paragraph (g) in all subcontracts under this contract that will require access to classified information or a significant quantity of special nuclear material. Additionally, the Contractor shall require such subContractors to submit a completed certification required in DEAR 952.204-73 prior to award of a

subcontract. Information to be provided by a subcontractor pursuant to this clause may be submitted directly to the Contracting Officer.

(h) Information submitted by the Contractor or any affected subcontractor as required pursuant to this clause shall be treated by DOE to the extent permitted by law, as business or financial information submitted in confidence to be used solely for purposes of evaluating FOCI.

(i) The requirements of this clause are in addition to the requirement that a Contractor obtain and retain the security clearances required by the contract. This clause shall not operate as a limitation on DOE's rights, including its rights to terminate this contract.

(j) The Contracting Officer may terminate this contract for default either if the Contractor fails to meet obligations imposed by this clause, e.g., provide the information required by this clause, comply with the Contracting Officer's instructions about safeguarding classified information, or make this clause applicable to subContractors, or if, in the Contracting Officer's judgment, the Contractor creates an FOCI situation in order to avoid performance or a termination for default. The Contracting Officer may terminate this contract for convenience if the Contractor becomes subject to FOCI and for reasons other than avoidance of performance of the contract, cannot, or chooses not to, avoid or mitigate the FOCI problem.

I. 5 FAR 52.210-7 USED OR RECONDITIONED MATERIAL, RESIDUAL INVENTORY, AND FORMER GOVERNMENT SURPLUS PROPERTY (APR 1984)

(a) The Contractor shall not furnish any item or component which is used or reconditioned material, residual inventory resulting from terminated Government contracts, or former Government surplus property, unless such item or component was listed in the applicable attachment to the offer and approved by the Contracting Officer or unless otherwise authorized in writing by the Contracting Officer.

(b) All items or components furnished under this contract shall comply with the terms and specifications contained in the contract.

I. 6 FAR 52.220-1 PREFERENCE FOR LABOR SURPLUS AREA CONCERNS (APR 1984)

(a) This acquisition is not a set aside for labor surplus area (LSA) concerns. However, the offeror's status as such a concern may affect (1) entitlement to award in case of tie offers or (2) offer evaluation in accordance with the Buy American Act clause of this solicitation. In order to determine whether the offeror is entitled to a preference under (1) or (2) above, the offeror must identify, below, the LSA in which the costs to be incurred on account of manufacturing or production (by the offeror or the first-tier subContractors) amount to more than 50 percent of the contract price.

(b) Failure to identify the locations as specified above will preclude consideration of the offeror as an LSA concern. If the offeror is awarded a contract as an LSA concern and would not have otherwise qualified for award, the offeror shall perform the contract or cause the contract to be performed in accordance with the obligations of an LSA concern.

I. 7 FAR 52.220-4 LABOR SURPLUS AREA SUBCONTRACTING PROGRAM (APR 1984)

(a) See the Utilization of Labor Surplus Area Concerns clause of this contract for applicable definitions.

(b) The Contractor agrees to establish and conduct a program to encourage labor surplus area (LSA) concerns to compete for subcontracts within their capabilities when the subcontracts are consistent with the efficient performance of the contract at prices no higher than obtainable elsewhere. The Contractor shall-

(1) Designate a liaison officer who will (i) maintain liaison with authorized representatives of the Government on LSA matters, (ii) supervise compliance with the Utilization of Labor Surplus Area Concerns clause, and (iii) administer the Contractor's labor surplus area subcontracting program;

(2) Provide adequate and timely consideration of the potentialities of LSA concerns in all make-or-buy decisions;

(3) Ensure that LSA concerns have an equitable opportunity to compete for subcontracts, particularly by arranging solicitations, time for the preparation of offers, quantities, specifications, and delivery schedules so as to facilitate the participation of LSA concerns;

(4) Include the Utilization of Labor Surplus Area Concerns clause in subcontracts that offer substantial LSA subcontracting opportunities; and

(5) Maintain records showing (i) the procedures adopted and (ii) the Contractor's performance, to comply with this clause. The records will be kept available for review by the Government until the expiration of 1 year after the award of this contract, or for such longer period as may be required by any other clause of this contract or by applicable law or regulations.

(c) The Contractor further agrees to insert in any related subcontract that may exceed $500,000 and that contains the Utilization of Labor Surplus Area Concerns clause, terms that conform substantially to the language of this clause, including this paragraph (c), and to notify the Contracting Officer of the names of subcontractors.

I.8 FAR 52.222-43 FAIR LABOR STANDARDS ACT AND SERVICE CONTRACT ACT-PRICE ADJUSTMENT (MULTIPLE YEAR AND OPTION CONTRACTS) (MAY 1989)

(a) This clause applies to both contracts subject to area prevailing wage determinations and contracts subject to collective bargaining agreements.

(b) The Contractor warrants that the prices in this contract do not include any allowance for any contingency to cover increased costs for which adjustment is provided under this clause.

(c) The wage determination, issued under the Service Contract Act of 1965, as amended, (41 U.S.C. 351, et seq.), by the Administrator, Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, current on the anniversary date of a multiple year contract or the beginning of each renewal option period, shall apply to this contract. If no such determination has been made applicable to this contract, then the Federal minimum wage as established by section 6(a)(1) of the Fair Labor Standards Act of 1938, as amended, (29 U.S.C. 206) current on the anniversary date of a multiple year contract or the beginning of each renewal option period shall apply to this contract.

(d) The contract price or contract unit price labor rates will be adjusted to reflect the Contractor's actual increase or decrease in applicable wages and fringe benefits to the extent that the increase is made to comply with or the decrease is voluntarily made by the Contractor as a result of:

(1) The Department of Labor wage determination applicable on the anniversary date of the multiple year contract, or at the beginning of the renewal *option* period. For example, the prior year wage determination required a minimum wage rate of $4.00 per hour. The Contractor chose to pay $4.10. The new wage

determination increases the minimum rate to $4.50 per hour. Even if the Contractor voluntarily increases the rate to $4.75 per hour, the allowable price adjustment is $.40 per hour.

(2) An increased or decreased wage determination otherwise applied to the contract by operation of law; or

(3) An amendment to the Fair Labor Standards Act of 1938 that is enacted after award of this contract, affects the minimum wage, and becomes applicable to this contract under law.

(e) Any adjustment will be limited to increases or decreases in wages and fringe benefits as described in paragraph (c) of this clause, and the accompanying increases or decreases in social security and unemployment taxes and workers' compensation insurance, but shall not otherwise include any amount for general and administrative costs, overhead, or profit.

(f) The Contractor shall notify the Contracting Officer of any increase claimed under this clause within 30 days after receiving a new wage determination unless this notification period is extended in writing by the Contracting Officer. The Contractor shall promptly notify the Contracting Officer of any decrease under this clause, but nothing in the clause shall preclude the Government from asserting a claim within the period permitted by law. The notice shall contain a statement of the amount claimed and any relevant supporting data, including payroll records, that the Contracting Officer may reasonably require. Upon agreement of the parties, the contract price or contract unit price labor rates shall be modified in writing. The Contractor shall continue performance pending agreement on or determination of any such adjustment and its effective date.

(g) The Contracting Officer or an authorized representative shall have access to and the right to examine any directly pertinent books, documents, papers and records of the Contractor until the expiration of 3 years after final payment under the contract.

I.9 FAR 52.223-3 HAZARDOUS MATERIAL IDENTIFICATION AND MATERIAL SAFETY DATA (NOV 1991)

(a) Hazardous material, as used in this clause, includes any material defined as hazardous under the latest version of Federal Standard No. 313 (including revisions adopted during the term of the contract).

(b) The offeror must list any hazardous material, as defined in paragraph (a) of this clause, to be delivered under this contract. The hazardous material shall be properly identified and include any applicable identification number, such as National Stock Number or Special Item Number. This information shall also be included on the Material Safety Data Sheet submitted under this contract.

Material Identification No.
(If none, insert None)

_____

_____

_____

(c) The apparently successful offeror, by acceptance of the contract, certifies that the list in paragraph (b) of this clause is complete. This list must be updated during performance of the contract whenever the Contractor determines that any other material to be delivered under this contract is hazardous.

(d) The apparently successful offeror agrees to submit, for each item as required prior to award, a Material Safety Data Sheet, meeting the requirements of 29 CFR 1910.1200(g) and the latest version of Federal Standard No. 313, for all hazardous material identified in paragraph (b) of this clause. Data shall be submitted in accordance with Federal Standard No. 313, whether or not the apparently successful offeror is the actual manufacturer of these items. Failure to submit the Material Safety Data Sheet prior to award may result in the apparently successful offeror being considered nonresponsible and ineligible for award.

(e) If, after award, there is a change in the composition of the item(s) or a revision to Federal Standard No. 313, which renders incomplete or inaccurate the data submitted under paragraph (d) of this clause or the certification submitted under paragraph (c) of this clause, the Contractor shall promptly notify the Contracting Officer and resubmit the data.

(f) Neither the requirements of this clause nor any act or failure to act by the Government shall relieve the Contractor of any responsibility or liability for the safety of Government, Contractor, or subContractor personnel or property.

(g) Nothing contained in this clause shall relieve the Contractor from complying with applicable Federal, State, and local laws, codes, ordinances, and regulations

(including the obtaining of licenses and permits) in connection with hazardous material.

(h) The Government's rights in data furnished under this contract with respect to hazardous material are as follows:

(1) To use, duplicate and disclose any data to which this clause is applicable. The purposes of this right are to

(i) Apprise personnel of the hazards to which they may be exposed in using, handling, packaging, transporting, or disposing of hazardous materials;

(ii) Obtain medical treatment for those affected by the material; and

(iii) Have others use, duplicate, and disclose the data for the Government for these purposes.

(2) To use, duplicate, and disclose data furnished under this clause, in accordance with subparagraph (h)(1) of this clause, in precedence over any other clause of this contract providing for rights in data.

(3) The Government is not precluded from using similar or identical data acquired from other sources.

I.10 DEAR 952.223-71 SAFETY AND HEALTH (GOVERNMENT-OWNED OR LEASED) (APR 1984)

The Contractor shall take all reasonable precautions in the performance of the work under this contract to protect the safety and health of employees and of members of the public and shall comply with all applicable safety and health regulations and requirements (including reporting requirements) of DOE. The Contracting Officer shall notify the Contractor, in writing, of any noncompliance with the provisions of the clause and the corrective action to be taken. After receipt of such notice, the Contractor shall immediately take corrective action. The Contractor shall submit a management program and implementation plan to the Contracting Officer for review and approval within 30 days after the date of award of this contract. In the event that the Contractor fails to comply with said regulations or requirements of DOE, the Contracting Officer may, without prejudice to any other legal or contractual rights of DOE, issue an order stopping all or any part of the work; thereafter, a start order for resumption of the work may be issued at the discretion of the Contracting Officer. The Contractor shall make no claim for an extension

of time or for compensation or damages by reason of, or in connection with, such work stoppage.

I.11 DEAR 952.223-75 PRESERVATION OF INDIVIDUAL OCCUPATIONAL RADIATION EXPOSURE RECORDS (APR 1984)

Individual occupational radiation exposure records generated in the performance of work under this contract shall be subject to inspection by DOE and shall be preserved by the Contractor until disposal is authorized by DOE or at the option of the Contractor delivered to DOE upon completion or termination of the contract. If the Contractor exercises the foregoing option, title to such records shall vest in DOE upon delivery.

I.12 FAR 52.224-1 PRIVACY ACT NOTIFICATION (APR 1984)

The Contractor will be required to design, develop, or operate a system of records on individuals, to accomplish an agency function subject to the Privacy Act of 1974, Public Law 93-579, December 31, 1974 (5 U.S.C. 552a) and applicable agency regulations. Violation of the Act may involve the imposition of criminal penalties.

I.13 FAR 52.224-2 PRIVACY ACT (APR 1984)

(a) The Contractor agrees to-

(1) Comply with the Privacy Act of 1974 (the Act) and the agency rules and regulations issued under the Act in the design, development, or operation of any system of records on individuals to accomplish an agency function when the contract specifically identifies-

(i) The systems of records; and

(ii) The design, development, or operation work that the Contractor is to perform;

(2) Include the Privacy Act notification contained in this contract in every solicitation and resulting subcontract and in every subcontract awarded without a solicitation, when the work statement in the proposed subcontract requires the design, development, or operation of a system of records on individuals that is subject to the Act; and

(3) Include this clause, including this subparagraph (3), in all subcontracts awarded under this contract which requires the design, development, or operation of such a system of records.

(b) In the event of violations of the Act, a civil action may be brought against the agency involved when the violation concerns the design, development, or operation of a system of records on individuals to accomplish an agency function, and criminal penalties may be imposed upon the officers or employees of the agency when the violation concerns the operation of a system of records on individuals to accomplish an agency function. For purposes of the Act, when the contract is for the operation of a system of records on individuals to accomplish an agency function, the Contractor and any employee of the Contractor is considered to be an employee of the agency.

(c) (1) "Operation of a system of records," as used in this clause, means performance of any of the activities associated with maintaining the system of records, including the collection, use, and dissemination of records.

(2) "Record," as used in this clause, means any item, collection, or grouping of information about an individual that is maintained by an agency, including, but not limited to, education, financial transactions, medical history, and criminal or employment history and that contains the person's name, or the identifying number, symbol, or other identifying particular assigned to the individual, such as a fingerprint or voiceprint or a photograph.

(3) "System of records on individuals," as used in this clause means a group of any records under the control of any agency from which information is retrieved by the name of the individual or by some identifying number, symbol, or other identifying particular assigned to the individual.

I.14 FAR 52.227-19 COMMERCIAL COMPUTER SOFTWARE--RESTRICTED RIGHTS (JUN 1987)

(a) As used in this clause, "restricted computer software" means any computer program, computer data base, or documentation thereof, that has been developed at private expense and either is a trade secret, is commercial or financial and confidential or privileged, or is published and copyrighted.

(b) Notwithstanding any provisions to the contrary contained in any Contractor's standard commercial license or lease agreement pertaining to any restricted

computer software delivered under this purchase order/contract, and irrespective of whether any such agreement has been proposed prior to or after issuance of this purchase order/contract or of the fact that such agreement may be affixed to or accompany the restricted computer software upon delivery, vendor agrees that the Government shall have the rights that are set forth in paragraph (c) of this clause to use, duplicate or disclose any restricted computer software delivered under this purchase order/contract. The terms and provisions of this contract, including any commercial lease or license agreement, shall be subject to paragraph (c) of this clause and shall comply with Federal laws and the Federal Acquisition Regulation.

(c) (1) The restricted computer software delivered under this contract may not be used, reproduced or disclosed by the Government except as provided in subparagraph (c)(2) of this clause or as expressly stated otherwise in this contract.

(2) The restricted computer software may be--

(i) Used or copied for use in or with the computer or computers for which it was acquired, including use at any Government installation to which such computer or computers may be transferred;

(ii) Used or copied for use in or with backup computer if any computer for which it was acquired is inoperative;

(iii) Reproduced for safekeeping (archives) or backup purposes;

(iv) Modified, adapted, or combined with other computer software, provided that the modified, combined, or adapted portions of the derivative software incorporating any of the delivered, restricted computer software shall be subject to same restrictions set forth in this purchase order/contract;

(v) Disclosed to and reproduced for use by support service Contractors or their subContractors, subject to the same restrictions set forth in this purchase order/contract; and

(vi) Used or copied for use in or transferred to a replacement computer.

(3) If the restricted computer software delivered under this purchase order/contract is published and copyrighted, it is licensed to the Government, without disclosure prohibitions, with the rights set forth in subparagraph (c)(2) of this clause unless expressly stated otherwise in this purchase order/contract.

(4) To the extent feasible the Contractor shall affix a Notice substantially as follows to any restricted computer software delivered under this purchase order/contract; or, if the vendor does not, the Government has the right to do so: "Notice-Notwithstanding any other lease or license agreement that may pertain to, or accompany the delivery of, this computer software, the rights of the Government regarding its use, reproduction and disclosure are as set forth in Government Contract (or Purchase Order) No. DE-AC05-94OR21965.

(d) If any restricted computer software is delivered under this contract with the copyright notice of 17 U.S.C. 401, it will be presumed to be published and copyrighted and licensed to the Government in accordance with subparagraph (c)(3) of this clause, unless a statement substantially as follows accompanies such copyright notice: "Unpublished - rights reserved under the copyright laws of the United States."

I.15 FAR 52.228-5 INSURANCE -- WORK ON A GOVERNMENT INSTALLATION (SEP 1989)

(a) The Contractor shall, at its own expense, provide and maintain during the entire performance of this contract, at least the kinds and minimum amounts of insurance required in the schedule or elsewhere in the contract.

(b) Before commencing work under this contract, the Contractor shall certify to the Contracting Officer in writing that the required insurance has been obtained. The policies evidencing required insurance shall contain an endorsement to the effect that any cancellation or any material change adversely affecting the Government's interest shall not be effective (1) for such period as the laws of the State in which this contract is to be performed prescribe or (2) until 30 days after the insurer or the Contractor gives written notice to the Contracting Officer, whichever period is longer.

(c) The Contractor shall insert the substance of this clause, including this paragraph (c), in subcontracts under this contract that require work on a Government installation and shall require subContractors to provide and maintain the insurance required in the Schedule or elsewhere in the contract. The Contractor shall maintain a copy of all subcontractors' proofs of required insurance, and shall make copies available to the Contracting Officer upon request.

I.16 FAR 52.232-9 LIMITATION ON WITHHOLDING OF PAYMENTS (APR 1984)

If more than one clause or Schedule term of this contract authorizes the temporary withholding of amounts otherwise payable to the Contractor for supplies delivered or services performed, the total of the amounts withheld at any one time shall not exceed the greatest amount that may be withheld under any one clause or Schedule term at that time; provided that this limitation shall not apply to-

(a) Withholdings pursuant to any clause relating to wages or hours of employees;

(b) Withholdings not specifically provided for by this contract;

(c) The recovery of overpayments; and

(d) Any other withholding for which the Contracting Officer determines that this limitation is inappropriate.

I.17 FAR 52.237-2 PROTECTION OF GOVERNMENT BUILDINGS, EQUIPMENT, AND VEGETATION (APR 1984)

The Contractor shall use reasonable care to avoid damaging existing buildings, equipment, and vegetation on the Government installation. If the Contractor's failure to use reasonable care causes damage to any of this property, the Contractor shall replace or repair the damage at no expense to the Government as the Contracting Officer directs. If the Contractor fails or refuses to make such repair or replacement, the Contractor shall be liable for the cost, which may be deducted from the contract price.

I.18 FAR 52.237-3 CONTINUITY OF SERVICES (JAN 1991)

(a) The Contractor recognizes that the services under this contract are vital to the Government and must be continued without interruption and that, upon contract expiration, a successor, either the Government or another Contractor, may continue them. The Contractor agrees to (1) furnish phase-in training and (2) exercise its best efforts and cooperation to effect an orderly and efficient transition to a successor.

b) The Contractor shall, upon the Contracting Officer's written notice, (1) furnish phase-in, phase-out services for up to 90 days after this contract expires and (2) negotiate in good faith a plan with a successor to determine the nature and extent

of phase-in, phase-out services required. The plan shall specify a training program and a date for transferring responsibilities for each division of work described in the plan, and shall be subject to the Contracting Officer's approval. The Contractor shall provide sufficient experienced personnel during the phase-in, phase-out period to ensure that the services called for by this contract are maintained at the required level of proficiency.

(c) The Contractor shall allow as many personnel as practicable to remain on the job to help the successor maintain the continuity and consistency of the services required by this contract. The Contractor also shall disclose necessary personnel records and allow the successor to conduct onsite interviews with these employees. If selected employees are agreeable to the change, the Contractor shall release them at a mutually agreeable date and negotiate transfer of their earned fringe benefits to the successor.

(d) The Contractor shall be reimbursed for all reasonable phase-in, phase-out costs (i.e., costs incurred within the agreed period after contract expiration that result from phase-in, phase-out operations) and a fee (profit) not to exceed a pro rata portion of the fee (profit) under this contract.

I.19 FAR 52.248-1 VALUE ENGINEERING (MAR 1989)

(a) General. The Contractor is encouraged to develop, prepare, and submit value engineering change proposals (VECP's) voluntarily. The Contractor shall share in any net acquisition savings realized from accepted VECP's, in accordance with the incentive sharing rates in paragraph (f) below.

(b) Definitions. "Acquisition savings," as used in this clause, means savings resulting from the application of a VECP to contracts awarded by the same contracting office or its successor for essentially the same unit. Acquisition savings include--

(1) Instant contract savings, which are the net cost reductions on this, the instant contract, and which are equal to the instant unit cost reduction multiplied by the number of instant contract units affected by the VECP, less the Contractor's allowable development and implementation costs;

(2) Concurrent contract savings, which are net reductions in the prices of other contracts that are definitized and ongoing at the time the VECP is accepted; and

(3) Future contract savings, which are the product of the future unit cost reduction multiplied by the number of future contract units scheduled for delivery during the sharing period. If this contract is a multiyear contract, future contract savings include savings on all quantities funded after VECP acceptance.

"Collateral costs," as used in this clause, means agency cost of operation, maintenance, logistic support, or Government-furnished property.

"Collateral savings," as used in this clause, means those measurable net reductions resulting from a VECP in the agency's overall projected collateral costs, exclusive of acquisition saving, whether or not the acquisition cost changes.

"Contracting office" includes any contracting office that the acquisition is transferred to, such as another branch of the agency or another agency's office that is performing a joint acquisition action.

"Contractor's development and implementation costs," as used in this clause, means those costs the Contractor incurs on a VECP specifically in developing, testing, preparing, and submitting the VECP, as well as those costs the Contractor incurs to make the contractual changes required by Government acceptance of a VECP.

"Future unit cost reduction," as used in this clause, means the instant unit cost reduction adjusted as the Contracting Officer considers necessary for projected learning or changes in quantity during the sharing period. It is calculated at the time the VECP is accepted and applies either (1) throughout the sharing period, unless the Contracting Officer decides that recalculation is necessary because conditions are significantly different from those previously anticipated or (2) to the calculation of a lump-sum payment, which cannot later be revised.

"Government costs," as used in this clause, means those agency costs that result directly from developing and implementing the VECP, such as any net increases in the cost of testing, operations, maintenance, and logistics support. The term does not include the normal administrative costs of processing the VECP or any increase in this contract's cost or price resulting from negative instant contract savings.

"Instant contract," as used in this clause, means this contract, under which the VECP is submitted. It does not include increases in quantities after acceptance of the VECP that are due to contract modifications, exercise of options, or additional orders. If this is a multiyear contract, the term does not include quantities funded after VECP acceptance. If this contract is a fixed-price contract with prospective price redetermination, the term refers to the period for which firm prices have been established.

"Instant unit cost reduction" means the amount of the decrease in unit cost of performance (without deducting any Contractor's development of implementation costs) resulting from using the VECP on this, the instant contract. If this is a service contract, the instant unit cost reduction is normally equal to the number of hours per line-item task saved by using the VECP on this contract, multiplied by the appropriate contract labor rate.

"Negative instant contract savings" means the increase in the cost or price of this contract when the acceptance of a VECP results in an excess of the Contractor's allowable development and implementation costs over the product of the instant unit cost reduction multiplied by the number of instant contract units affected.

"Net acquisition saving" means total acquisition savings, including instant, concurrent, and future contract savings, less Government costs.

"Sharing base," as used in this clause, means the number of affected end items on contracts of the contracting office accepting the VECP.

"Sharing period," as used in this clause, means the period beginning with acceptance of the first unit incorporating the VECP and ending at the later of (1) 3 years after the first unit affected by the VECP is accepted or (2) the last scheduled delivery date of an item affected by the VECP under this contract's delivery schedule in effect at the time the VECP is accepted.

"Unit," as used in this clause, means the item or task to which the Contracting Officer and the Contractor agree the VECP applies.

"Value engineering change proposal (VECP)" means a proposal that--

(1) Requires a change to this, the instant contract, to implement; and

(2) Results in reducing the overall projected cost to the agency without impairing essential functions or characteristics; provided, that it does not involve a change--

(i) In deliverable end item quantities only;

(ii) In research and development (R&D) end items or R&D test quantities that is due solely to results of previous testing under this contract; or

(iii) To the contract type only.

(c) VECP preparation. As a minimum, the Contractor shall include in each VECP the information described in subparagraphs (1) through (8) below. If the proposed change is affected by contractually required configuration management or similar procedures, the instructions in those procedures relating to format, identification, and priority assignment shall govern VECP preparation. The VECP shall include the following:

(1) A description of the difference between the existing contract requirement and the proposed requirement, the comparative advantages and disadvantages of each, a justification when an item's function or characteristics are being altered, the effect of the change on the end item's performance, and any pertinent objective test data.

(2) A list and analysis of the contract requirements what must be changed if the VECP is accepted, including any suggested specification revisions.

(3) Identification of the unit to which the VECP applies.

(4) A separate, detailed cost estimate for (i) the affected portions of the existing contract requirement and (ii) the VECP. The cost reduction associated with the VECP shall take into account the Contractor's allowable development and implementation costs, including any amount attributable to subcontracts under the Subcontracts paragraph of this clause, below.

(5) A description and estimate of costs the Government may incur in implementing the VECP, such as test and evaluation and operating and support costs.

(6) A prediction of any effects the proposed change would have on collateral costs to the agency.

(7) A statement of the time by which a contract modification accepting the VECP must be issued in order to achieve the maximum cost reduction, noting any effect on the contract completion time or delivery schedule.

(8) Identification of any previous submission of the VECP, including the dates submitted, the agencies and contract numbers involved, and previous Government actions, if known.

(d) Submission. The Contractor shall submit VECP's to the Contracting Officer, unless this contract states otherwise. If this contract is administered by other than the

contracting office, the Contractor shall submit a copy of the VECP simultaneously to the Contracting Officer and to the Administrative Contracting Officer.

(e) Government action. (1) The Contracting Officer shall notify the Contractor of the status of the VECP within 45 calendar days after the contracting office receives it. If additional time is required, the Contracting Officer shall notify the Contractor within the 45 day period and provide the reason for the delay and the expected date of the decision. The Government will process VECP's expeditiously; however, it shall not be liable for any delay in acting upon a VECP.

(2) If the VECP is not accepted, the Contracting Officer shall notify the Contractor in writing, explaining the reasons for rejection. The Contractor may withdraw any VECP, in whole or in part, at any time before it is accepted by the Government. The Contracting Officer may require that the Contractor provide written notification before undertaking significant expenditures for VECP effort.

(3) Any VECP may be accepted, in whole or in part, by the Contracting Officer's award of a modification to this contract citing this clause and made either before or within a reasonable time after contract performance is completed. Until such a contract modification applies a VECP to this contract, the Contractor shall perform in accordance with the existing contract. The Contracting Officer's decision to accept or reject all or part of any VECP and the decision as to which of the sharing rates applies shall be final and not subject to the Disputes clause or otherwise subject to litigation under the Contract Disputes Act of 1978 (41 U.S.C. 601-613).

(f) Sharing rates. If a VECP is accepted, the Contractor shall share in net acquisition savings according to the percentages shown in the table below. The percentage paid the Contractor depends upon (1) this contract's type (fixed-price, incentive, or cost-reimbursement), (2) the sharing arrangement specified in paragraph (a) above (incentive, program requirement, or a combination as delineated in the Schedule), and (3) the source of the savings (the instant contract, or concurrent and future contracts), as follows:

CONTRACTOR'S SHARE OF NET ACQUISITION SAVINGS

	Sharing Arrangement			
	Incentive (voluntary)		Program Requirement (mandatory)	
Contract Type	Instant contract rate	Con-current and future contract rate	Instant contract rate	Con-current and future contract rate
Fixed-price (other than incentive)	50%	50%	25%	25%
Incentive (fixed-price or cost)	*	50%	*	25%
Cost-reimbursement (other than incentive)	25%	25%	15%	15%

*Same sharing arrangement as the contract's profit or fee adjustment formula.

**Includes cost-plus-award-fee contracts.

(g) Calculating net acquisition savings. (1) Acquisition savings are realized when (i) the cost or price is reduced on the instant contract, (ii) reductions are negotiated in concurrent contracts, (iii) future contracts are awarded, or (iv) agreement is reached on a lump-sum payment for future contract savings (see subparagraph (i)(4) below). Net acquisition savings are first realized, and the Contractor shall be paid a share, when Government costs and any negative instant contract savings have been fully offset against acquisition savings.

(2) Except in incentive contracts, Government cost and any price or cost increases resulting from negative instant contract savings shall be offset against acquisition savings each time such savings are realized until they are fully offset. Then, the Contractor's share is calculated by multiplying net acquisition saving by the appropriate Contractor's percentage sharing rate (see paragraph (f) above). Additional Contractor shares of net acquisition savings shall be paid to the Contractor at the time realized.

(3) If this is an incentive contract, recovery of Government costs on the instant contract

shall be deferred and offset against concurrent and future contract savings. The Contractor shall share through the contract incentive structure in savings on the instant contract items affected. Any negative instant contract savings shall be added to the target cost or to the target price and ceiling price, and the amount shall be offset against concurrent and future contract savings.

(4) If the Government does not receive and accept all items on which it paid the Contractor's share, the Contractor shall reimburse the Government for the proportionate share of these payments.

(h) Contract adjustment. The modification accepting the VECP (or a subsequent modification issued as soon as possible after any negotiations are completed) shall--

(1) Reduce the contract price or estimate cost by the amount of instant contract savings, unless this is an incentive contract;

(2) When the amount of instant contract savings is negative, increase the contract price, target price and ceiling price, target cost, or estimated cost by that amount;

(3) Specify the Contractor's dollar share per unit on future contracts, or provide the lump-sum payment;

(4) Specify the amount of any Government costs or negative instant contract savings to be offset in determining net acquisition savings realized from concurrent or future contract savings; and

(5) Provide the Contractor's share of any net acquisition savings under the instant contract in accordance with the following:

(i) Fixed-price contracts--add to contract price.

(ii) Cost-reimbursement contracts--add to contract fee.

(i) Concurrent and future contract savings. (1) Payments of the Contractor's share of concurrent and future contract savings shall be made by a modification to the instant contract in accordance with subparagraph (h)(5) above. For incentive contracts, shares shall be added as a separate firm-fixed-price line item on the instant contract. The Contractor shall maintain records adequate to identify the first delivered unit for 3 years after final payment under this contract.

(2) The Contracting Officer shall calculate the Contractor's share of concurrent contract

savings by (i) subtracting from the reduction in price negotiated on the concurrent contract any Government costs or negative instant contract savings not yet offset and (ii) multiplying the result by the Contractor's sharing rate.

(3) The Contracting Officer shall calculate the Contractor's share of future contract savings by (i) multiplying the future unit cost reduction by the number of future contract units scheduled for delivery during the sharing period, (ii) subtracting any Government costs or negative instant contract savings not yet offset, and (iii) multiplying the result by the Contractor's sharing rate.

(4) When the Government wishes and the Contractor agrees, the Contractor's share of future contract savings may be paid in a single lump sum rather than in a series of payments over time as future contracts are awarded. Under this alternate procedure, the future contract savings may be calculated when the VECP is accepted, on the basis of the Contracting Officer's forecast of the number if units that will be delivered during the sharing period. The Contractor's share shall be included in a modification to this contract (see subparagraph (h)(3) above) and shall not be subject to subsequent adjustment.

(5) Alternate no-cost settlement method. When, in accordance with subsection 48.104-3 of the Federal Acquisition Regulation, the Government and the Contractor mutually agree to use the no-cost settlement method, the following applies:

(i) The Contractor will keep all the savings on the instant contract and on its concurrent contracts only.

(ii) The Government will keep all the savings resulting from concurrent contracts placed on other sources, savings from all future contracts, and all collateral savings.

(j) Collateral savings. If a VECP is accepted, the instant contract amount shall be increased, as specified in subparagraph (h)(5) above, by 20 percent of any projected collateral savings determined to be realized in a typical year of use after subtracting any Government costs not previously offset. However, the Contractor's share of collateral savings shall not exceed (1) the contract's firm-fixed-price, target price, target cost, or estimated cost, at the time the VECP is accepted, or (2) $100,000, whichever is greater. The Contracting Officer shall be the sole determiner of the amount of collateral savings, and that amount shall not be subject to the Disputes clause or otherwise subject to litigation under 41 U.S.C. 601-613.

(k) Relationship to other incentives. Only those benefits of an accepted VECP not rewardable under performance, design-to-cost (production unit cost, operating and

support costs, reliability and maintainability), or similar incentives shall be rewarded under this clause. However, the targets of such incentives affected by the VECP shall not be adjusted because of VECP acceptance. If this contract specifies targets but provides no incentive to surpass them, the value engineering sharing shall apply only to the amount of achievement better than target.

(l) Subcontracts. The Contractor shall include an appropriate value engineering clause in any subcontract of $100,000 or more and may include one in subcontracts of lesser value. In calculating any adjustment in this contract's price for instant contract savings (or negative instant contract savings), the Contractor's allowable development and implementation costs shall include any subContractor's allowable development and implementation costs, and any value engineering incentive payments to a subContractor, clearly resulting from a VECP accepted by the Government under this contract. The Contractor may choose any arrangement for subContractor value engineering incentive payments; provided, that the payments shall not reduce the Government's share of concurrent or future contract savings or collateral savings.

(m) Data. The Contractor may restrict the Government's right to use any part of a VECP or the supporting data by marking the following legend on the affected parts:

"These data, furnished under the Value Engineering clause of contract....., shall not be disclosed outside the Government or duplicated, used, or disclosed, in whole or in part, for any purpose other than to evaluate a value engineering change proposal submitted under the clause. This restriction does not limit the Government's right to use information contained in these data if it has been obtained or is otherwise available from the Contractor or from another source without limitations."

If a VECP is accepted, the Contractor hereby grants the Government unlimited rights in the VECP and supporting data, except that, with respect to data qualifying and submitted as limited rights technical data, the Government shall have the rights specified in the contract modification implementing the VECP and shall appropriately mark the data. (The terms "unlimited rights" and "limited rights" are defined in Part 27 of the Federal Acquisition Regulation.)

Additional Contract Clauses Applicable to Construction Work, Installation of Equipment and Cable, and Facility Renovations

I.20 PREPRINTED CONTRACT CLAUSES FOR FIXED PRICE CONSTRUCTION CONTRACTS (DOE SET 307- SEPTEMBER 1993)

The contract clauses contained in DOE Set 307, Fixed Price Construction Contracts dated September 1993, are included in Part III, Section J, Attachment H, and are applicable to work on this contract that is related to construction, installation of equipment and cable, and facility renovations. These clauses are applicable to subcontracts issued to perform this work.

I.21 RESERVED

I.22 FAR 52.228-1 BID GUARANTEE (APR 1984)

(a) Failure to furnish a bid guarantee in the proper form and amount, by the time set for opening of bids, may be cause for rejection of the bid.

(b) The offeror (bidder) shall furnish a bid guarantee in the form of a firm commitment, such as a bid bond, postal money order, certified check, cashier's check, irrevocable letter of credit, or, under Treasury Department regulations, certain bonds or notes of the United States. The Contracting Officer will return bid guarantees, other than bid bonds, (1) to unsuccessful bidders as soon as practicable after the opening of bids, and (2) to the successful bidder upon execution of contractual documents and bonds (including any necessary coinsurance or reinsurance agreements), as required by the bid as accepted.

(c) If the successful bidder, upon acceptance of its bid by the Government within the period specified for acceptance, fails to execute all contractual documents or give a bond(s) as required by the solicitation within the time specified, the Contracting Officer may terminate the contract for default.

(d) Unless otherwise specified in the bid, the bidder will (1) allow 60 days for acceptance of its bid and (2) give bond within 10 days after receipt of the forms by the bidder.

(e) In the event the contract is terminated for default, the bidder is liable for any cost of

acquiring the work that exceeds the amount of its bid, and the bid guarantee is available to offset the difference.

I.23 FAR 52.228-11 PLEDGES OF ASSETS (FEB 1990)

(a) Offerors shall obtain from each person acting as an individual surety on a bid guarantee, a performance bond, or a payment bond --

(1) Pledge of assets; and

(2) Standard Form 28, Affidavit of Individual Surety.

(b) Pledges of assets from each person acting as an individual surety shall be in the form of --

(1) Evidence of an escrow account containing cash, certificates of deposit, commercial or Government securities, or other assets described in FAR 28.203-2 (except see 28.203-2(b)(2) with respect to Government sureties held in book entry form) and/or;

(2) A recorded lien on real estate. The offeror will be required to provide --

(i) Evidence of title in the form of a certificate of title prepared by a title insurance company approved by the United States Department of Justice. This title evidence must show fee simple title vested in the surety along with any concurrent owner: whether any real estate taxes are due and payable; and any recorded encumbrances against the property, including the lien filed in favor of the Government as required by FAR 28.203-3(d);

(ii) Evidence of the amount due under any encumbrance shown in the evidence of title;

(iii) A copy of the current real estate tax assessment of the property or a current appraisal dated no earlier than 6 months prior to the date of the bond, prepared by a professional appraiser who certifies that the appraisal has been conducted in accordance with the generally accepted appraisal standards as reflected in the Uniform Standards of Professional Appraisal Practice, as promulgated by the Appraisal Foundation.

I.24 FAR 52.236-14 AVAILABILITY AND USE OF UTILITY SERVICES (APR 1984)

(a) The Government shall make all reasonably required amounts of utilities available to the Contractor from existing outlets and supplies, as specified in the contract. Unless otherwise provided in the contract, the amount of each utility service consumed shall be charged to or paid for by the Contractor at prevailing rates charged to the Government or, where the utility is produced by the Government or, at reasonable rates determined by the Contracting Officer. The Contractor shall carefully conserve any utilities furnished without charge.

(b) The Contractor, at its expense and in a workmanlike manner satisfactory to the Contracting Officer, shall install and maintain all necessary temporary connections and distribution lines, and all meters required to measure the amount of each utility used for the purpose of determining charges. Before final acceptance of the work by the Government, the Contractor shall remove all the temporary connections, distribution lines, meters, and associated paraphernalia.

I.25 FAR 52.232-18 AVAILABILITY OF FUNDS (APR 1984)

Funds are not presently available for this contract. The Government's obligation under this contract is contingent upon the availability of appropriated funds from which payment for contract purposes can be made. No legal liability on the part of the Government for any payment may arise until funds are made available to the Contracting Officer for this contract and until the Contractor receives notice of such availability, to be confirmed in writing by the Contracting Officer.

I.26 FAR 52.216-18 ORDERING (APR 1984)

(a) Any supplies and services to be furnished under this contract shall be ordered by issuance of delivery orders by the individuals or activities designated in the Schedule. Such orders may be issued from contract award through contract completion.

(b) All delivery orders are subject to the terms and conditions of this contract. In the event of conflict between a delivery order and this contract, the contract shall control.

(c) If mailed, a delivery order is considered "issued" when the Government deposits the order in the mail. Orders may be issued orally or by written telecommunications only if authorized in the Schedule.

I.27 RESERVED

I.28 FAR 52.216-22 INDEFINITE QUANTITY (APR 1984)

(a) This is an indefinite-quantity contract for the supplies or services specified, and effective for the period stated, in the Schedule. The quantities of supplies and services specified in the Schedule are estimates only and are not purchased by this contract.

(b) Delivery or performance shall be made only as authorized by orders issued in accordance with the Ordering clause. The Contractor shall furnish to the Government, when and if ordered, the supplies or services specified in the Schedule up to and including the quantity designated in the Schedule as the "maximum." The Government shall order at least the quantity of supplies or services designated in the Schedule as the "minimum."

(c) Except for any limitations on quantities in the Delivery- Order Limitations clause or in the Schedule, there is no limit on the number of orders that may be issued. The Government may issue orders requiring delivery to multiple destinations or performance at multiple locations.

(d) Any order issued during the effective period of this contract and not completed within that period shall be completed by the Contractor within the time specified in the order. The contract shall govern the Contractor's and Government's rights and obligations with respect to that order to the same extent as if the order were completed during the contract's effective period; provided, that the Contractor shall not be required to make any deliveries under this contract after ten (10) years from date of successful cutover.

I.29 DEAR 970.5204-58 WORKPLACE SUBSTANCE ABUSE PROGRAMS AT DOE SITES (AUG 1992)

(a) Program Implementation. The contractor shall, consistent with 10 CFR part 707, Workplace Substance Abuse Programs at DOE Sites, incorporated herein by reference with full force and effect, develop, implement, and maintain a workplace substance abuse program.

(b) Remedies. In addition to any other remedies available to the Government, the contractor's failure to comply with the requirements of 10 CFR part 707 or to perform in a manner consistent with its approved program may render the contractor subject

to: the suspension of contract payments, or, where applicable, a reduction in award fee; termination for default; and suspension or debarment.

(c) Subcontracts.

(1) The contractor agrees to notify the contracting officer reasonably in advance of, but not later than 30 days prior to, the award of any subcontract the contractor believes may be subject to the requirements of 10 CFR part 707.

(2) The DOE prime contractor shall require all subcontracts subject to the provisions of 10 CFR part 707 to agree to develop and implement a workplace substance abuse program that complies with the requirements of 10 CFR Part 707, Workplace Substance Abuse Programs at DOE Sites, as a condition for award of the subcontract. The DOE prime contractor shall review and approve each subcontractor's program, and shall periodically monitor each subcontractor's program, and shall periodically monitor each subcontractor's implementation of the program for effectiveness and compliance with 10 CFR part 707.

(3) The contractor agrees to include, and require the inclusion of, the requirements of this clause in all subcontracts, at any tier, that are subject to the provisions of 10 CFR part 707.

SECTION J

LIST OF ATTACHMENTS

J. 1 LOCAL 999.J01 LIST OF DOCUMENTS, EXHIBITS, AND OTHER ATTACHMENT (APR 1984)

A. APPLICABLE DOCUMENTS

J. 1 LOCAL 999J01 LIST of DOCUMENTS, EXHIBITS, and OTHER ATTACHMENTS (APR 1984)

ATTACHMENT	DESCRIPTION
A	Technical Specification and Statement of Work for the Oak Ridge Federal Integrated Communications Network, Y/EN-2351
B	Technical Specification and Statement of Work for the Telecommunications Management of System - K/CSD/INF-8822
C	Statement of Work (Supplement) SW-TNS-001
D	List of Government Furnished Property
E	Davis Bacon Wage Determination
F	Service Contract Act Wage Determination
G	DOE Set 301 Fixed Price Supply Contracts and DOE Set 301S Fixed Price Service Contracts
H	DOE Set 307 Fixed Price Construction Contracts

DE-AC05-94OR21965

ATTACHMENT A

Y/EN-2351 (Rev. E)

TECHNICAL SPECIFICATION

AND

STATEMENT OF WORK

FOR THE

OAK RIDGE FEDERAL

INTEGRATED COMMUNICATIONS NETWORK

MARCH 10, 1994

TABLE OF CONTENTS

TECHNICAL SPECIFICATION AND STATEMENT OF WORK FOR THE OAK RIDGE FEDERAL INTEGRATED COMMUNICATIONS NETWORK

1.0 SCOPE 1

2.0 REFERENCES 1

3.0 REQUIREMENTS 1

3.1 GENERAL SYSTEM REQUIREMENTS 1

3.1.1 Voice and Data Telecommunications System (VDTS) Requirements 2
3.1.1.1 Expected Moves, Adds, and Changes 2
3.1.1.2 VDTS Ports 2
3.1.1.3 Telephones 2
3.1.1.4 Data Ports 3
3.1.1.5 ISDN Capability 3
3.1.2 Special Circuits 4
3.1.3 Cable Plant 5
3.1.4 Operation and Maintenance 5

3.2 SYSTEM INTERFACES 6

3.2.1 Outside Connections and Demarcation Requirements 6
3.2.2 Internal Interfaces 7
3.2.3 Telecommunications Management System (TMS) 8
3.2.3.1 Hardware/Software Interface 8
3.2.3.2 Call Detail Record (CDR) Storage 8
3.2.3.3 Service Order Interface 8
3.2.3.4 Data Base Installation/Synchronization 8

3.3 SYSTEM PERFORMANCE REQUIREMENTS 9

3.3.1 System Features 9
3.3.1.1 Equipment and Configuration Requirements 9
3.3.1.2 911 Service 9
3.3.1.3 Grade of Service (GOS) 10
3.3.1.3.1 Traffic Handling Requirements 10
3.3.1.3.2 Call Processing 11
3.3.1.3.2.1 Performance Criteria 11
3.3.1.3.2.2 Call Processing Capacity 11
3.3.1.3.3 Trunking 11
3.3.1.4 Data Switching and Packet Switching 12
3.3.1.5 ISDN/Non-ISDN Digital Telephones 12
3.3.1.6 Speaker Phones and Amplifiers 13
3.3.1.7 Single System Image 13
3.3.1.8 Key Systems and Merlins 13
3.3.1.9 Numbering Plan 13
3.3.1.9.1 Numbering Plan Capacity 13

3.3.1.9.2 Numbering Plan Digit Requirements 13
3.3.1.9.3 Numbering Plan Flexibility 14
3.3.1.9.4 Numbering Plan Compatibility 15
3.3.1.10 System Expandability and Flexibility 15
3.3.1.11 Trunking 15
3.3.1.12 Call Processing 16
3.3.1.12.1 Standard/Nonstandard Tones 16
3.3.1.12.2 Recorded Announcements 16
3.3.1.12.3 Line Lockout 16
3.3.1.12.4 Post Dialing Delay 16
3.3.1.12.5 Dial Tone Delay 16
3.3.1.12.6 Call Setup Delay (Requirement Deleted) 16
3.3.1.12.7 Immediate Ring 16
3.3.1.12.8 Immediate Ring Trip 17
3.3.1.12.9 Answer Supervision Delay 17
3.3.1.12.10 Line Release 17
3.3.1.12.11 Trunk Release 17
3.3.1.13 Dialing 17
3.3.1.14 System Telephone Features 17
3.3.1.15 Routing 19
3.3.1.15.1 Automatic Routing Selection (ARS) 19
3.3.1.15.2 Class of Station Priority 19
3.3.1.15.3 Trunk Queuing 19
3.3.1.15.4 Distributed Communication System Architecture 20
3.3.1.15.4.1 Distributed Switching 20
3.3.1.15.4.2 Inter-site Transmission 20
3.3.1.15.5 Multiple Phone Connection Feature 20
3.3.1.16 Station Features 20
3.3.1.17 Network Synchronization 21
3.3.2 Voice Messaging 21
3.3.3 Data Handling Requirements 22
3.3.3.1 Reserved 22
3.3.3.2 Modem Pool Service 22
3.3.4 System Operation and Control 22
3.3.4.1 Operation and Control Features 23
3.3.4.2 Network Management 23
3.3.4.2.1 Monitoring and Alarm 23
3.3.4.2.1.1 Measurements 24
3.3.4.2.1.2 Measurement Reports 24
3.3.4.2.2 Network Control 25
3.3.4.3 Testing and Diagnostics 25
3.3.4.4 Data Base Maintenance 25
3.3.4.5 Control Consoles 26
3.3.4.5.1 Attendant Consoles 26
3.3.4.5.2 Administrative Consoles 27
3.3.4.5.3 Monitoring Console 27
3.3.4.5.4 Test Facility 27
3.3.5 System Security Requirements 28
3.3.5.1 Physical Security 28
3.3.5.2 Cabling 28
3.3.5.3 Signal Protection 28
3.3.5.4 Software Protection 29
3.3.5.5 Remote Diagnostic Stations 29
3.3.5.6 VDTS Features 30

3.3.5.7 Station Features 30
3.3.5.8 Configuration Control 30
3.3.5.9 Documentation 31
3.3.5.10 Technical Security Areas 31
3.3.6 Electromagnetic Interference/Radio Frequency Interference (EMI/RFI) Requirements 31
3.3.7 Computer Hardware 32
3.3.7.1 Processor Capacity 32
3.3.7.2 Memory Capacity 32
3.3.8 System Software 32
3.3.9 Reliability, Availability, and Maintainability Requirements 32
3.3.9.1 System Availability 32
3.3.9.2 Response Times 33
3.3.9.3 Redundancy 33
3.3.9.4 Alternate Routes: X-10, Y-12, K-25 33
3.3.9.5 Alternate Routes: Townsite 34
3.3.9.6 Central Processor Requirements 34
3.3.9.7 Backup Power Systems 34
3.3.9.8 Bypass System for Critical Telephones 34
3.3.9.9 Backup Control Center 35
3.3.10 Communications Equipment Connections 35
3.3.10.1 Existing Analog Telephones 35
3.3.10.2 Host Processors 35
3.3.10.3 Data Terminals and Work Stations (Reserved) 35
3.3.10.4 Special Circuits 35
3.3.10.5 Unclassified System Select Network (Requirement Deleted) 36
3.3.10.6 Townsite Buildings 36
3.3.10.7 Reserved 36
3.3.10.8 Modem Pool 36
3.3.10.9 Outside Connections and Demarcation Requirements 36
3.3.11 Inter-plant Fiber Optics Transmission System (FOTS) 36
3.3.12 Cable Plant Requirements 37
3.3.12.1 Current Transmission Facility Systems 37
3.3.12.2 Cable Plant Certification 37
3.3.12.2.1 Sampling for Cable Testing 38
3.3.12.2.2 Copper Cable Continuity and Resistance to Shield Testing 39
3.3.12.2.3 Copper Cable Signal Testing 39
3.3.12.2.4 Fiber Cable Testing 39
3.3.12.2.5 Trunk Cabling Certification 40
3.3.12.3 Inter-site Transmission Facilities 40
3.3.12.4 Intra-site Cabling for VDTS 40
3.3.12.5 Space and Power for Fiber Networks 40
3.3.12.6 Service Building Cabling 41
3.3.12.7 Special Circuit Cabling 41
3.3.12.8 Separation from Classified Networks 41
3.3.12.9 Cable Records 41
3.3.12.10 Cabling Equipment 42
3.3.13 Environmental Requirements 43

3.4 SITE PREPARATION AND FIELD CONSTRUCTION 43

3.5 INSTALLATION....44

3.5.1 Pre-Installation Activities....44
3.5.1.1 Coordination with Commercial Carriers....44
3.5.1.2 Installation of New Facilities and Services....44
3.5.1.3 Removal of Old Facilities....44
3.5.1.4 Unknown Special Circuits....45
3.5.1.5 Equipment Shipping and Handling....45
3.5.2 Installation Activities....45
3.5.2.1 Equipment Installation....45
3.5.2.2 Transmission Facilities Installation....45
3.5.3 Post-Installation Activities....45
3.5.4 EMI/RFI Grounding....46

3.6 CUTOVER....46

3.7 TRAINING....47

3.7.1 System Orientation and General User Training....47
3.7.2 Specialized Training....47
3.7.3 Ongoing Training....47
3.7.4 Software Training....47

3.8 OPERATION AND MAINTENANCE....47

3.8.1 Equipment and Services....47
3.8.2 General Requirements....48
3.8.2.1 General Staffing Requirements....48
3.8.2.2 Design Assistance....48
3.8.2.3 VDTS Staffing....49
3.8.3 Relocation, Installation, Modification, Disconnection, Maintenance and Repair (RIMD M/R)....49
3.8.3.1 General....49
3.8.3.2 Equipment Installation....50
3.8.3.3 Wiring/Cabling and Assignment Requirements....51
3.8.3.4 Removal Requirements....51
3.8.4 Maintenance....51
3.8.4.1 Preventative Maintenance (PM)....52
3.8.4.2 Routine Corrective Maintenance (RCM)....52
3.8.4.3 Urgent Corrective Maintenance (UCM)....53
3.8.4.4 Emergency Corrective Maintenance (ECM)....53
3.8.4.5 Software Maintenance....53
3.8.5 Diagnostics....54
3.8.6 Logistics Support....54
3.8.6.1 Supply Times....54
3.8.6.2 Transportation....55
3.8.6.3 Equipment Handling....55
3.8.6.4 Parts Storage....55
3.8.6.5 Protection of DOE Property....55
3.8.7 Billing....55
3.8.8 Reports....55
3.8.9 Performance Reviews....56

4.0 QUALITY ASSURANCE 56

4.1 QUALITY ASSURANCE PROGRAM PLAN 56

4.2 PROJECT MANAGEMENT 57

4.3 DESIGN REVIEW 57

4.4 DOCUMENTATION 57

4.4.1 System Design Report 58
4.4.2 Overall Project Plan and Schedule 60
4.4.3 Task Plans 60
4.4.3.1 Installation Plan 60
4.4.3.2 Test Plans 60
4.4.3.3 Training Plan 61
4.4.3.4 System Cutover Plan 61
4.4.3.5 Operations and Maintenance Plan 61
4.4.3.6 Logistics Support Plan 62
4.4.3.7 Disaster Recovery Plan 62
4.4.4 Task Schedules 62
4.4.4.1 Installation Schedule 62
4.4.4.2 Testing Schedule 62
4.4.4.3 Training Schedule 62
4.4.4.4 System Cutover Schedule 63
4.4.5 Inspection and Testing Reports 63
4.4.6 Manuals 63
4.4.7 Installed Drawings 63
4.4.8 Records 63
4.4.8.1 Station Records 63
4.4.8.2 Trunks and Special Circuits 63
4.4.8.3 Equipment Inventory 63
4.4.8.4 Records of Facilities/Services 64
4.4.8.5 Technical Cable Records 64
4.4.9 Computer Hardware and Software Documentation 64
4.4.10 ISDN Implementation Plan 65
4.4.11 Local Area Network Services Description (Requirement Deleted) 65
4.4.12 Documentation Summary 65
4.4.13 Site Preparation and Field Construction Documentation Summary 67

4.5 SYSTEM INSPECTION AND TESTING 70

4.5.1 Factory Test and Burn-In (Requirement Deleted) 70
4.5.2 Installation Checkout Testing 70
4.5.3 Integrated System Test Program 70
4.5.4 Pre-Cutover Test 71
4.5.5. System Acceptance Test 71

4.6 VDTS CERTIFICATION 72

4.7 OPERATIONAL READINESS REVIEW 72

5.0 FACILITIES DESIGN AND CONSTRUCTION REQUIREMENTS....74

5.1 CONSTRUCTION SPECIAL CONDITIONS....74

5.1.1 General....74
5.1.1.1 Location....74
5.1.1.2 Construction Work....74
5.1.1.2.1 Labor and Materials....74
5.1.1.2.2 Requirements....74
5.1.1.2.3 Unit Price Construction Work Items....74
5.1.1.2.3.1 Standby and Training Time....74
5.1.1.2.3.2 Dress-Out - Type 2....74
5.1.1.2.3.3 Handling and Storage of Contaminated Soils....75
5.1.1.2.3.4 Asbestos Penetrations Through Walls, Floor, and Ceilings....75
5.1.1.2.3.5 Rock Excavation....75
5.1.1.3 Construction Contractor Q-Clearances....75
5.1.1.4 Construction Engineer....75
5.1.1.5 Specifications and Drawings....75
5.1.1.6 Working and Storage Areas....75
5.1.1.7 Underground Utilities Within Y-12, X-10, and K-25....76
5.1.1.8 Special Work Requirements....76
5.1.1.8.1 Underground Utility Damage Prevention Act....76
5.1.1.8.2 Work in the City of Oak Ridge....76
5.1.1.8.3 Work in the Biology Area....76
5.1.1.8.4 Earth, Concrete Floor, and Wall Penetrations....77
5.1.1.9 Work to be Performed or Services to be Furnished by the Company....77
5.1.1.10 Project Meetings....77
5.1.1.10.1 Preconstruction Conference....77
5.1.1.10.2 Job Site Meetings....77
5.1.1.11 Construction Sign....78
5.1.1.12 Testing....78
5.1.1.13 Suspension of Work....78
5.1.1.14 Review of Shop Drawings, Product Data, and Samples....78
5.1.2 Coordination....79
5.1.2.1 Project Coordination....79
5.1.2.2 Normal Working Hours....79
5.1.2.3 Supervision of Work....80
5.1.2.4 Activities and Manpower Report....80
5.1.3 Safety and Health (Requirement Deleted)....80
5.1.3.1 General....80
5.1.3.2 General Employee Training....81
5.1.3.3 Hard Hats and Safety Glasses....81
5.1.3.4 Temporary Facilities....81
5.1.3.5 Evacuation of the Work Area....81
5.1.3.6 Medical and Fire Fighting Services....81
5.1.3.7 Construction Safety Work Permit....82
5.1.3.8 Occupational Safety and Health Acts Hazard Communication Standard....82
5.1.3.9 Safety Program....82
5.1.3.10 Blasting....84
5.1.3.11 Temporary Heating Devices....84
5.1.3.12 Tool Grounding for Concrete Floor and Wall Penetrations....84
5.1.3.13 Protection of the Work Area....84
5.1.3.14 Smoking....84
5.1.3.15 Hazardous and Flammable Liquids and Gases....84

5.1.3.16 Crane and High Profile Equipment Safety Requirements....85
5.1.3.17 Equipment and Tools....87
5.1.3.18 Traffic and Safety Signs....87
5.1.3.19 On-Site Safety Inspection....87
5.1.3.20 Confined Space Entry....88
5.1.3.21 Laser-Driven Device Safety Precautions....88
5.1.3.22 Carcinogen Control....88
5.1.3.23 Hoisting and Rigging....88
5.1.3.24 Elevated Work....89
5.1.3.25 Telecommunication Training....89
5.1.4 Asbestos....89
5.1.4.1 Description....89
5.1.4.1.2 Definitions....90
5.1.4.2 References....91
5.1.4.3 Submittals....92
5.1.4.3.1 Pre-Construction Submittals....92
5.1.4.3.2 Pre-Job Submittals....92
5.1.4.3.2.1 Work Plan....92
5.1.4.3.2.2 Rental Equipment Agreement....92
5.1.4.3.2.3 Competent Person(s)....93
5.1.4.3.2.4 Emergency Personnel....93
5.1.4.3.2.5 Trained Personnel....93
5.1.4.3.2.6 Testing Laboratory....93
5.1.4.3.2.7 Medical Examinations....93
5.1.4.3.3 Construction Submittals....93
5.1.4.3.3.1 Deactivate Utilities....93
5.1.4.3.3.2 Waste Disposal Requests....93
5.1.4.3.3.3 Sampling Results....93
5.1.4.3.3.4 Chemical Exposure Monitoring....94
5.1.4.3.3.5 Checklists....94
5.1.4.3.3.6 Air Monitoring Test Results....94
5.1.4.3.3.7 Entry/Exit Log....94
5.1.4.3.4 Submittal Updates....94
5.1.4.4 Delivery, Storage, and Handling....94
5.1.4.4.1 Asbestos Waste Transportation....94
5.1.4.4.2 Temporary Storage....95
5.1.4.5 Material....95
5.1.4.6 Equipment....95
5.1.4.7 Preparation....95
5.1.4.7.1 Medical Surveillance....95
5.1.4.7.2 Training....96
5.1.4.7.3 Entrance Posting....97
5.1.4.8 Installation/Application/Erection....97
5.1.4.8.1 Control Zone....97
5.1.4.8.2 Regulated Area....97
5.1.4.8.3 Danger Signs and Labels....97
5.1.4.8.4 Work Requirements for Asbestos-Containing Materials (ACM)....98
5.1.4.8.4.1 General Work Requirements....98
5.1.4.8.4.2 Negative Pressure Enclosure....100
5.1.4.8.4.3 Negative Pressure Glove Bags....101
5.1.4.8.4.4 Negative Pressure Mini-Enclosure....103
5.1.4.8.4.5 Decontamination Facility for Negative Pressure Glove Bags or Negative Pressure Mini-Enclosures....103
5.1.4.8.5 Area Decontamination and Clearance....103

5.1.4.8.5.1 Negative Pressure Enclosure....103
5.1.4.8.5.2 Negative Pressure Glove Bag and Negative Pressure Mini-Enclosure Operations....104
5.1.4.8.5.3 Regulated Area (Excluding Negative Pressure Glove Bag and Mini-Enclosures....104
5.1.4.9 Field Quality Control....104
5.1.4.9.1 Checklists....104
5.1.4.9.2 Testing Laboratory....104
5.1.4.9.3 Air Sampling and Analysis....104
5.1.4.9.4 Prevalent Level Monitoring....105
5.1.4.9.5 Personnel Monitoring....105
5.1.4.9.5.1 Permissible Exposure Limit/Action Level....105
5.1.4.9.5.2 Excursion Limit....105
5.1.4.9.6 Area Monitoring....106
5.1.4.9.6.1 Negative Pressure Enclosures....106
5.1.4.9.6.2 Negative Pressure Glove Bag and Negative Pressure Mini-Enclosure Operations....106
5.1.4.9.7 Clearance Sampling....106
5.1.4.10 Protection....106
5.1.4.10.1 Respiratory Protection....106
5.1.4.10.2 Protective Clothing....107
5.1.4.11 Work Plan....108
5.1.5 Work in Radioactive Contaminated Areas....109
5.1.5.1 Identification of Contamination and Establishing Work Criteria....109
5.1.5.1.1 Contaminated and Regulated Buildings....109
5.1.5.1.2 Burial Grounds....111
5.1.5.1.3 Other Locations....111
5.1.5.1.4 Requirements....111
5.1.5.2 Codes, Standards, and References....111
5.1.5.3 Training Requirements....112
5.1.5.3.1 Training Programs for Work in Radioactive Contaminated Areas....112
5.1.5.3.2 Training Programs for Hazardous Waste Areas....112
5.1.5.3.3 Other Training....112
5.1.5.3.4 Company-Furnished Training Materials....112
5.1.5.3.5 Certification....113
5.1.5.4 Protective Clothing....113
5.1.5.4.1 Contractor-Furnished Clothing....113
5.1.5.4.2 Contractor-Furnished Shoes....113
5.1.5.5 Change Facilities....113
5.1.5.6 Respiratory Protection....113
5.1.5.7 Tools and Equipment....113
5.1.5.7.1 Tool Storage....113
5.1.5.7.2 Contamination Survey....113
5.1.5.8 Monitoring....114
5.1.5.8.1 Company Monitoring....114
5.1.5.8.2 Personnel Exposure Records....114
5.1.5.9 Clean Up and Personal Hygiene....114
5.1.5.9.1 Waste Disposal....114
5.1.5.9.2 Personal Hygiene....114
5.1.6 Construction Facilities and Temporary Controls....114
5.1.6.1 Cleaning Up....114
5.1.6.2 Temporary Fencing....115
5.1.6.3 Temporary Utilities....115
5.1.6.3.1 Electric Power and Water....115

5.1.6.3.2 Sanitation Facilities 115
5.1.6.3.3 Telephone Service 116
5.1.6.3.4 Eating Facilities 116
5.1.6.4 Parking Area 116
5.1.6.5 Alterations to Existing Facilities and Utilities 116
5.1.6.6 Deactivation of Existing Utilities 116
5.1.6.7 Protection of Existing Vegetation, Structures, Equipment, Utilities, Survey Reference Points, and Improvements 117
5.1.6.7.1 Utilities and Structures 117
5.1.6.7.2 Vegetation 117
5.1.6.7.3 Paint Overspray and Drift 117
5.1.6.8 Protection of Traffic 117
5.1.6.9 Identification of Contractor's Facilities 118
5.1.6.9.1 Identification 118
5.1.6.9.2 Emergency Notification Signs 118
5.1.6.10 Liquid Waste 118
5.1.6.11 Erosion and Environmental Protection 119
5.1.6.12 Disposal Area 119
5.1.6.12.1 Spoil 119
5.1.6.12.2 Concrete 119
5.1.6.12.3 Non-contaminated Waste 119
5.1.6.12.4 Spoil and Waste from Non-DOE Job Sites in the City of Oak Ridge 120
5.1.6.13 Salvageable Materials 120
5.1.6.14 Borrow 120
5.1.7 Non-Asbestos Fibrous Insulation 120
5.1.7.1 Description 120
5.1.7.2 Submittals 121
5.1.7.2.1 Records 121
5.1.7.2.2 Respiratory Fit Test 121
5.1.7.2.3 Training 121
5.1.7.3 Delivery, Storage, and Handling 121
5.1.7.4 Material 121
5.1.7.5 Equipment 121
5.1.7.6 Preparation 122
5.1.7.6.1 Fibrous Material Determination--New Installations 122
5.1.7.6.2 Fibrous Material Determination--Existing Facilities 122
5.1.7.6.3 Training 122
5.1.7.7 Installation/Application/Erection 122
5.1.7.7.1 Established Work Area 122
5.1.7.7.2 General Requirements 122
5.1.7.7.3 Clean-Up Requirements 123
5.1.8 Welding Procedures, Qualifications, Inspection, and Testing 123
5.1.8.1 Welders Stamp 123
5.1.8.2 Inspection and Testing 124
5.1.8.3 Incidental Welding 124
5.1.8.4 Cutting, Welding, Burning, and Hot Work Operations 124
5.1.8.4.1 Permit 124
5.1.8.4.2 Fire Watch 124
5.1.9 Respiratory Protection 124
5.1.9.1 Description 124
5.1.9.2 Definitions 125
5.1.9.3 References 125
5.1.9.4 Submittals 125

5.1.9.5 Delivery, Storage, and Handling (Requirement Deleted) 125
5.1.9.6 Inspection (Requirement Deleted) 125
5.1.9.7 Preparation 125
5.1.9.7.1 Medical Evaluation 125
5.1.9.7.2 Training (Requirement Deleted) 125
5.1.9.7.3 Fit Test 125
5.1.9.8 Installation, Application, Erection 126
5.1.9.8.1 Respirator Information 126
5.1.9.8.2 Face Piece Seal 126
5.1.9.8.3 General Requirements (Requirement Deleted) 126
5.1.9.8.4 Field Quality Control 126
5.1.9.8.5 Protection 126

5.2 CONSTRUCTION AND DESIGN REQUIREMENTS 127

5.2.1 Engineering Information 127
5.2.1.1 General 127
5.2.1.2 Design Requirements 127
5.2.1.2.1 Computer-Aided Design Equipment 128
5.2.1.2.2 Computer-Aided Design Deliverables 128
5.2.1.2.3 Computer-Aided Design Drawing Structure 128
5.2.1.2.4 Validation of Computer-Aided Design Translation 128
5.2.1.3 Field Requirements 128
5.2.1.4 Submittals 129
5.2.1.4.1 Cover Letter 129
5.2.1.4.2 Design Documents 129
5.2.1.5 Design Kickoff 132
5.2.1.6 Schedule 132
5.2.1.7 Procurement of Materials and Equipment 132
5.2.2 Civil, Structural, and Architectural 132
5.2.2.1 Civil, Site, and Waste Management 132
5.2.2.1.1 General 132
5.2.2.1.2 Site Work 133
5.2.2.1.3 Earthwork 133
5.2.2.1.4 Asphaltic Pavement 136
5.2.2.1.5 Curbs and Gutters 136
5.2.2.1.6 Sidewalks 136
5.2.2.1.7 Storm Sewers 136
5.2.2.1.8 Open Channels 137
5.2.2.1.9 Street Drainage 137
5.2.2.1.10 Security Fence 137
5.2.2.1.11 Testing 139
5.2.2.2 Structural and Architectural 140
5.2.2.2.1 General 140
5.2.2.2.2 Loads 140
5.2.2.2.3 Structural Systems for Buildings and Other Structures 144
5.2.2.2.4 Concrete 145
5.2.2.2.5 Steel 146
5.2.2.2.6 Submittals and Testing 146
5.2.2.2.7 Y-12 Central Office Building 147
5.2.2.2.8 Modifications to Existing Rooms/Asbestos Control 147
5.2.2.2.9 Welding 148
5.2.2.2.10 Inspection 148
5.2.2.2.11 Identification 148

5.2.2.3 Architectural 149
5.2.2.3.1 General 149
5.2.2.3.2 Masonry 149
5.2.2.3.3 Thermal and Moisture Protection 150
5.2.2.3.3.1 Waterproofing 150
5.2.2.3.3.2 Sheet Membrane Waterproofing 152
5.2.2.3.3.3 Cementitous Waterproofing 152
5.2.2.3.3.4 Dampproofing 152
5.2.2.3.3.5 Vapor and Air Retarders 154
5.2.2.3.3.6 Insulation 154
5.2.2.3.3.7 Roof and Deck Insulation 155
5.2.2.3.3.8 Exterior Insulation and Finish Systems 156
5.2.2.3.3.9 Membrane Roofing 156
5.2.2.3.3.10 Roof-Mounted Equipment 156
5.2.2.3.3.11 Walkways 157
5.2.2.3.3.12 Built-Up Bituminous Roofing 157
5.2.2.3.3.13 Sheet Metal Flashing and Trim 157
5.2.2.3.3.14 Sealants and Joints 158
5.2.2.3.4 Doors and Windows 159
5.2.2.3.5 Finishes 162
5.2.2.3.6 Service Areas 163
5.2.2.3.7 Exterior Walls 164
5.2.2.3.8 Interior Walls 165
5.2.2.3.9 Ceilings 165
5.2.2.3.10 Floors 166
5.2.2.3.11 Painting 168
5.2.2.3.11.1 General 168
5.2.2.3.11.2 References 168
5.2.2.3.11.3 Submittals 168
5.2.2.3.11.4 Materials 168
5.2.2.3.12 Roof System 170
5.2.2.3.13 Fire Rated Construction 171
5.2.2.3.14 Battery Rooms 174
5.2.2.3.15 Submittals 174
5.2.2.3.16 Lightning Protection 174
5.2.2.3.17 Stairs 175
5.2.2.3.18 Miscellaneous 175
5.2.3 Environmental Control 176
5.2.3.1 Y-12 Site Central Office 176
5.2.3.1.1 Design Parameters 176
5.2.3.1.2 HVAC Drawings/Calculations 179
5.2.3.1.3 Energy Conservation 180
5.2.3.1.4 Equipment Requirements 182
5.2.3.1.5 Alarms 184
5.2.3.1.6 Ductwork 184
5.2.3.1.7 Start-Up Testing and Balancing 184
5.2.3.2 Facilities Other Than the Y-12 Site Central Office 184
5.2.3.2.1 General Requirements 185
5.2.3.2.2 Design Requirements and Conditions 185
5.2.3.2.3 Start-Up, Testing, and Balancing 188
5.2.4 Electrical 190
5.2.4.1 Facilities General Design Requirements 190
5.2.4.1.1 Engineering Drawings 190
5.2.4.1.2 Equipment and Construction Specifications 190

5.2.4.1.3 Engineering Standards....191
5.2.4.1.4 Calculations....191
5.2.4.1.5 Quality Assurance Checklist....191
5.2.4.1.6 Field Surveys and Measurements....191
5.2.4.1.7 Electrical Testing....191
5.2.4.1.8 Seismic Requirements....191
5.2.4.2 Telecommunications Cabling....191
5.2.4.2.1 General....191
5.2.4.2.2 Underground Cable Marking....193
5.2.4.2.3 Intra-Site Fiber Optic Cabling....193
5.2.4.2.4 Classified Fiber Optic Cabling....194
5.2.4.2.5 Inter-Site Fiber Optic Cabling....194
5.2.4.2.6 Perimeter Intrusion Detection Alarm System (PIDAS) Detection Zone Crossing....195
5.2.4.3 Lightning and Surge Protection....195
5.2.4.4 Grounding Requirements....195
5.2.4.5 Plant Alarms and Public Address....196
5.2.4.6 Power Systems Alarms and Controls....196
5.2.4.7 Administrative Voice and Data Intra Building Wiring Systems for the Y-12 OICC....197
5.2.4.7.1 General....197
5.2.4.7.2 Communications Room Alternating Current Power System....197
5.2.4.7.3 Telephone Service....197
5.2.4.7.4 Cabling to Voice and Data Outlets....197
5.2.4.7.5 Drawings....198
5.2.5 Piping....198
5.2.5.1 General....198
5.2.5.1.1 Design Documents....199
5.2.5.1.2 Drawings....199
5.2.5.1.3 Piping Design....200
5.2.5.1.4 Construction Specifications....201
5.2.5.1.5 Equipment Specifications....201
5.2.5.1.6 Equipment Data Sheets....201
5.2.5.1.7 Test and Inspection Summary Sheet....201
5.2.5.1.8 Excavation-Penetration Permits....202
5.2.5.1.9 Additional Documentation....202
5.2.5.1.10 Vendor Data Submittals....202
5.2.5.1.11 Valving Design....203
5.2.5.1.12 Valving Specifications....204
5.2.5.2 Utilities-Exterior....204
5.2.5.2.1 Potable Water (designated SW on drawings)....204
5.2.5.2.2 Fire Protection Water (designated FWD on drawings)....205
5.2.5.2.3 Instrument Air (designated YA [90 psig] on drawings)....205
5.2.5.2.4 Sanitary Sewers (designated SS on drawings)....206
5.2.5.2.5 Storm Sewers (designated SD on drawings)....207
5.2.5.2.6 Steam (designated S on drawings)....207
5.2.5.2.7 Chilled Water (designated CWS and CNR on drawings)....208
5.2.5.3 Utilities--Interior....209
5.2.5.3.1 Potable Water (designated SW or for hot potable water SWH on drawings)....209
5.2.5.3.2 Sanitary Drainage (designated SS on drawings)....211
5.2.5.3.3 Steam (designated S on drawings)....211
5.2.5.3.4 Condensate (designated C on drawings)....213
5.2.5.3.5 Chilled Water (designated CWS and CWR on drawings)....214

5.2.5.3.6 Water Heating System (designated PWH on drawings) 215
5.2.5.3.7 Sprinkler Systems 216
5.2.5.3.8 Eye Wash and Safety Shower Equipment 219
5.2.5.4 Cleaning and Sterilization 219
5.2.5.5 Testing and Inspection 220
5.2.5.6 Identification of Piping and Color Code 220
5.2.6 Fire Protection Systems 221

5.3 SECURITY 222

5.3.1 Definitions 222
5.3.2 Security Areas and Access Requirements 222
5.3.3 Requirements to Obtain Badges/Passes 224
5.3.4 Escort Requirements 225
5.3.5 Drug/Abuse Program 226
5.3.6 Requirements to Obtain Clearance for Employees 226
5.3.7 Requirements When Security Clearance is Granted 227
5.3.8 Other Requirements 228
5.3.9 Communications 229
5.3.10 Subcontract Requirements 229
5.3.11 Security Fencing for Construction 229
5.3.12 Security Access Planning 229
5.3.13 Vehicular Requirements 230
5.3.14 Business Radios and Mobile Telephones 230

APPENDIX 231

Appendix 1 List of Company References and South Central Bell Drawings for the ORF-ICN Technical Specification
Appendix 2A Intra-site Telecommunications Service Report (includes existing analog telephones, existing key systems, and other circuits)
Appendix 2B Merlin Systems Database
Appendix 2C Buildings Owned/Leased
Appendix 2D Buildings Not Requiring ISDN
Appendix 3 Acceptable Site Locations for Equipment
Appendix 3A FB Space Layout
Appendix 4 Busy Hour Call Requirements
Appendix 5A Inter-site Circuits
Appendix 5B National and International Circuits
Appendix 5C Special Circuits Listing
Appendix 6 Fiber Optic Cabling Requirements
Appendix 7 Company Office Requirements
Appendix 8 Special USOC Summary Listing
Appendix 9 Calendar Year 1993 RIMD Job Information
Appendix 10 Operator Duties and Responsibilities
Appendix 11 Valve Specifications
Appendix 12 Guidelines for Temporary Structures
Appendix 13 Buildings Wired to the DOE Wiring Standard

ACRONYMS AND ABBREVIATIONS

AABC	-	Associated Air Balance Council
AAMA	-	American Architectural Manufacturers Association
AASHTO	-	American Association of State Highways and Transportation Officials
ACI	-	American Concrete Institute
ACM	-	Asbestos-Containing Material
A-E	-	Architect-Engineer
AISC	-	American Institute of Steel Construction
AIHA	-	American Industrial Hygiene Association
ALARA	-	As Low As Reasonably Achievable
AMCA	-	Air Moving and Control Association
ANSI	-	American National Standards Institute
APF	-	Assigned Protection Factors
AQL	-	Acceptable Quality Levels
ARI	-	American Refrigeration Institute
ARMA	-	Asphalt Roofing Manufacturers Association
ARS	-	Automatic Routing Selection
ASCE	-	American Society of Civil Engineers
ASHRAE	-	American Society of Heating, Refrigeration, and Air Conditioning Engineers
ASME	-	American Society of Mechanical Engineers
ASTM	-	(formerly American Society for Testing and Materials, now ASTM)
ATM	-	Asynchronous Transfer Mode
AT&T	-	American Telephone and Telegraph
AWI	-	American Woodwork Institute
AWS	-	American Welding Society
AWWA	-	American Water Works Association
BER	-	Bit Error Rate
BIA	-	Brick Institute of America
BOC	-	Bell Operating Companies
BRI	-	Basic Rate Interface
CCITT	-	Consultative Committee International Telegraph and Telephone
CCS	-	Centum Call Seconds
CDR	-	Call Detail Record
CE	-	Construction Engineer
CERCLA	-	Comprehensive Environmental Response, Compensation, and Liability Act
CFC	-	Certified for Construction
CFM	-	Cubic Feet per Minute
CFR	-	Code of Federal Regulations
CI	-	Cast Iron
CISCA	-	Ceiling and Interior Systems Contractors Association
CPRS	-	Construction Project Requirements Summaries
CPU	-	Central Processing Unit
CRI	-	Carpet and Rug Institute
CRT	-	Cathode Ray Tube
DCA	-	Digital Communications Associates
DCE	-	Data Communications Equipment
DOE	-	Department of Energy
DOENTS	-	Department of Energy Nationwide Telecommunications Service
DOT	-	Department of Transportation
DP	-	Dial Pulse
DTE	-	Data Terminal Equipment
DTMF	-	Dual Tone Multifrequency
DTR	-	Data Terminal Ready
DX	-	Duplex Signaling

ACRONYMS AND ABBREVIATIONS (continued)

DXF	-	Data Exchange Format
E&M	-	E-lead (receives) and M-lead (transmits)
ECES	-	External Communications Ethernet Segment
ECM	-	Emergency Corrective Maintenance
ECN	-	Engineering Change Notice
EEO	-	Equal Employment Opportunity
EFS	-	Error Free Seconds
EIA	-	Electronic Industries Association
EIMA	-	Exterior Insulation Manufacturers Association
EMI/RFI	-	Electromagnetic Interference/Radio Frequency Interference
EOC	-	Emergency Operation Center
EPA	-	Environmental Protection Agency
ES&H	-	Environmental, Safety, and Health
ESSX	-	Electronic Switching System Exchange
FB	-	Federal Building
FBI	-	Federal Bureau of Investigation
FBLCC	-	Federal Building Life Cycle Cost
FCC	-	Federal Communications Commission
FDDI	-	Fiber Disbributed Data Interface
FGMA	-	Flat Glass Marketing Association
FM	-	Factory Mutual
FOTS	-	Fiber Optic Transmission System
FS	-	Federal Specifications
FTS	-	Federal Telecommunications System
FX	-	Foreign Exchange
GDDM	-	Graphical Data Display Manager
GOS	-	Grade of Service
HDBK	-	Handbook
HEPA	-	High Efficiency Particulate Air
HVAC	-	Heating, Ventilation, and Air Conditioning
ICBO	-	International Conference of Building Officials
IEEE	-	Institute of Electrical and Electronic Engineers
IGES	-	Initial Graphics Exchange Specification
I/O	-	Input or Output
IPBBN	-	Inter-plant Broadband Network
ISDN	-	Integrated Services Digital Network
ISDSI	-	Insulated Steel Door Systems Institute
LAN	-	Local Area Network
LATA	-	Local Access and Transport Area
LCC	-	Life Cycle Cost
LEC	-	Local Exchange Company
LEL	-	Lower Explosive Limit
LRU	-	Line Replaceable Unit
MDF	-	Main Distribution Frame
MF	-	Multifrequency
MI	-	Malleable Iron
MIL	-	Military Standard or Military
MLSFA	-	Metal Lath/Steel Framing Association
MSA	-	Mine Safety Appliance
MSDS	-	Material Safety Data Sheets
MTBF	-	Mean Time Between Failure
MTTR	-	Maximum Mean Time to Repair
NC	-	Noise Criterion

ACRONYMS AND ABBREVIATIONS (continued)

SMDF	-	Site Main Distribution Frame
SNA	-	Systems Network Archictecture
SONET	-	Synchronous Optical Network
SPDT	-	Single Pole Double Throw
SSN	-	System Select Network
SSPC	-	Steel Structures Painting Council
STU	-	Secure Telephone Unit
SV	-	Service Weight
SWP	-	Standard Wiring Plan
TCA	-	Tile Council of America, Inc.
TDR	-	Time Domain Reflectometer
TLD	-	Thermoluminescent Dosimetries
TMS	-	Telecommunications Management System
TNSD	-	Telephone Network Services Department
TSCA	-	Toxic Substance Control Act
TWA	-	Time Weighted Average
UBC	-	Uniform Building Code
UCM	-	Urgent Corrective Maintenance
UCRL	-	University of California Research Laboratory
UENET	-	Uranium Enrichment Network
UFAS	-	Uniform Federal Accessibility Standards
UL	-	Underwriters Laboratory
UMS	-	Utilities Management System
UPS	-	Uninterruptable Power Supply
USOC	-	Uniform Service Order Code
VDTS	-	Voice and Data Telecommunications System
WATS	-	Wide Area Telephone System

NCMA	-	National Concrete Masonry Association
NEBB	-	National Environmental Balancing Bureau
NEC	-	National Electrical Code
NEMA	-	National Electrical Manufacturers Association
NEPA	-	National Environmental Policy Act
NESC	-	National Electrical Safety Code
NFPA	-	National Fire Protection Association
NIOSH	-	National Institute of Occupational Safety and Health
NRCA	-	National Roofing Contractors Association
NWWDA	-	National Wood Window and Door Association
OA	-	Office Automation
OAM&P	-	Operations, Accounting, Maintenance, and Provisioning
OAS	-	Office Automation System
OFNP	-	Optical Fiber Network Plan
OICC	-	Operations Integrated Control Center
OORTS	-	Official Oak Ridge Telephone System
OPM	-	Office of Personnel Management
ORF-ICN	-	Oak Ridge Federal Integrated Communications Network
ORNL	-	Oak Ridge National Laboratory
ORR	-	Operational Readiness Review
OSHA	-	Occupational Safety and Health Administration
OSTI	-	Office of Scientific and Technical Information
OTDR	-	Optical Time Domain Reflectometer
PAT	-	Proficiency Analytical Testing
PEL	-	Permissible Exposure Limits
PBX	-	Private Branch Exchange
PC	-	Personal Computer
PCI	-	Prestressed Concrete Institute
PIDAS	-	Perimeter Intrusion Detection Alarm System
PIV	-	Post Indicator Valve
PM	-	Preventive Maintenance
PPE	-	Personnel Protective Equipment
PPS	-	Physically Protected Space
PRI	-	Primary Rate Interface
PSN	-	Public Switched Network
PSS	-	Plant Shift Superintendent
QA	-	Quality Assurance
RAM	-	Reliability, Availability, and Maintainability
RCM	-	Routine Corrective Maintenance
RCRA	-	Resource Conservation and Recovery Act
RDS	-	Remote Diagnostic Station
REA	-	Rural Electrification Administration
RFCI	-	Resilient Floor Covering Institute
RIMD	-	Relocation, Installation, Modification, and Disconnection
SBC	-	Standard Building Code
SCB	-	South Central Bell
SDI	-	Steel Door Institute
SDIS	-	Switched Digital Integrated Services
SDR	-	System Design Report
SEER	-	Seasonal Energy Efficiency Rating
SF	-	Single Frequency
SIB	-	Security Isolation Blocks
SMACNA	-	Sheet Metal and Air Conditioning Contractors National Association

TECHNICAL SPECIFICATION AND STATEMENT OF WORK FOR THE OAK RIDGE FEDERAL INTEGRATED COMMUNICATIONS NETWORK

1.0 SCOPE

This specification provides requirements for the Oak Ridge Federal Integrated Communications Network (ORF-ICN). The scope of work requested is complete--design, engineer, furnish, install, test, cutover, operate, maintain, repair, and service hardware and software necessary to provide the communications systems and transmission facilities specified in this document. Also, prepare sites for equipment installation and provide documentation, engineering and operational services, and training on the use and operation of all installed systems. The ORF-ICN is planned as a replacement for the Official Oak Ridge Telephone System (OORTS), which provides telephone service to the Department of Energy (DOE) and its contractors and other government agencies in Oak Ridge. The OORTS is an Electronic Switching System Exchange (ESSX) system leased from and managed by South Central Bell (SCB). The ORF-ICN includes a voice and data telecommunications system (VDTS), cable plant, inter-site fiber optics transmission system (FOTS), telecommunications management system (TMS), and special circuits, excluding intra-building special circuits.

All main ORF-ICN switching equipment must be located on DOE property. Remote modules may be located on leased DOE property for Townsite services.

Within this specification, the term Company refers to Martin Marietta Energy Systems, Inc., DOE's management and operating contractor for the Oak Ridge sites.

2.0 REFERENCES

Applicable DOE drawings, specifications, general design criteria, standards, and SCB drawings showing existing trunk cabling are listed in Appendix 1. These documents, national consensus standards, building codes, federal and state government regulations and standards, and other documents form a part of this specification to the extent they are referenced in the specification. Unless otherwise specified, the latest revision shall be used.

3.0 REQUIREMENTS

3.1 GENERAL SYSTEM REQUIREMENTS

The ORF-ICN shall function in accordance with the system diagrams shown in Drawings D2E-145866, D2E-145865, D2E-145907, and D2E-146787.

Provide voice, data, and special circuit services up to the MCR demarcation point for the Y-12 Plant, also known as Y-12; the Oak Ridge National Laboratory (ORNL), also known as X-10; the Oak Ridge K-25 Site, also known as K-25; the Office of Scientific and Technical Information (OSTI), 175 Oak Ridge Turnpike; the Federal Building (FB); and selected buildings in Oak Ridge, also known as Townsite.

The ORF-ICN shall be an Integrated Services Digital Network (ISDN) integrated voice and data network distributed among three main communication nodes at plant locations Y-12, X-10, and

K-25 with a major tributary to FB and OSTI. The Townsite locations can be served off of one of the major nodes as best meets the vendors design. Y-12 shall be the central control node with the X-10, K-25, FB, and OSTI nodes acting as major remote nodes. The Y-12, X-10, and K-25 communication nodes shall be interconnected with multiple single-mode fiber cables in a triangular configuration which affords both point-to-point circuit multiplicity and inter-site path redundancy. A system operation and control center shall be provided to manage the system. Transmission system routing control functions shall be coordinated with switch routing functions to provide integrated route selection and backup capability to achieve the required system network availability.

The switching system and new cable plant shall accommodate digital terminals, hosts, and other digital users, and shall provide digital network interfaces, interconnectivity and a media for network transport.

The ORF-ICN shall provide the interfaces required to the Public Switched Network, FTS 2000, DOECN, and other long-haul private networks.

3.1.1 Voice and Data Telecommunications System (VDTS) Requirements

3.1.1.1 Expected Moves, Adds, and Changes

The VDTS system design shall accommodate the moves, adds, and changes listed in Section 3.8.3.

3.1.1.2 VDTS Ports

Provide ports in accordance with Table 1. The present distribution of telephone equipment is shown in Appendix 2. The Preliminary System Design Report of Section 4.4 shall be based on Table 1 data. The Final System Design Report shall be based on the telephone equipment distribution existing at the time of design report issue. This distribution information shall be obtained by the Contractor by obtaining data from SCB, surveys, or other means.

3.1.1.3 Telephones

Connect existing Government-owned analog telephones to all analog voice ports supplied with this system.

Connect Government-owned ISDN voice telephones to ISDN voice/data ports supplied with this system.

Table 1 - VDTS Line Card Ports

Switched Service	Equipped (1)	Wired (2) (7)	Capacity (3) (7)
Analog Voice	1,000 (4)	0	0
ISDN Voice/Data	3,500 (5)	25,000	29,000

Analog, and/or non-ISDN digital, and/or ISDN Voice	18,500 (6)	0	0
TOTAL	23,000	25,000	29,000

NOTES:

1. Equipped ports shall have all necessary equipment including cabinets, cables, card cages, line cards, and telephones or data connections ready for service.

2. Wired ports that are not equipped shall have all necessary equipment including cabinets, cables, and card cages but no line card installed.

3. Capacity ports that are not wired shall have floor space for equipment cabinets but no cabinets, card cages, or line cards.

4. At cutover 1,000 analog ports shall be equipped for use with facsimiles, 300 existing DOE analog Secure Telephone Unit (STU) III telephones, and other miscellaneous analog hardware.

5. At cutover 50 ISDN voice/data ports shall be connected to 50 ISDN voice telephones including NT1s supplied by the Government.

6. These ports shall be equipped in any combination of ISDN voice, non-ISDN digital voice, and analog such that the total cost of the equipment and services required by this specification plus the cost for ten years of operation and maintenance (including the moves, adds, and changes of Section 3.8.3) is minimized. Upgrading analog and non-ISDN digital ports to ISDN capability shall require only the installation of ISDN line cards in accordance with Section 4.4.10.
7. Wired and capacity ports shall be provided at site central offices and remote modules in a distribution similar to that provided for the equipped ports.

3.1.1.4 Data Ports

The VDTS shall be equipped with ports for trunk service to the host processors and modem pools specified in 3.2.2, 3.3.10.2, and 3.3.10.8 respectively. The Contractor shall provide the necessary hardware interfaces for all data port trunks. All data ports trunks shall be in sufficient quantities to maintain the grade of service specified in 3.3.1.3.

3.1.1.5 ISDN Capability

When ISDN compatibility is specifically required, the VDTS shall be compatible with ISDN in accordance with approved standards from the Consultative Committee International Telegraph and Telephone (CCITT) and American National Standards Institute (ANSI) standards bodies. Specifically, the VDTS shall comply with approved recommendations of the Series I and Q of the CCITT, i.e.,

I.100 Series, General;
I.200 Series, Service Aspects;
I.300 Series, Network Aspects;
I.400 Series, User Network Interfaces;

I.500 Series, Internetwork Interfaces;
I.600 Series, Maintenance Principles;
Q.921/922, Layer 2 Protocols;
Q.940 Series, Maintenance and Management; and
Q.931/932, Signaling, D Channel Protocols,

except where equivalent standards have been adopted by the ANSI, then, ANSI standards shall supersede CCITT recommendations. Specific applicable ANSI standards are:

ANS T1.113-1988, Signaling System No. 7 ISDN User Part,

ANS T1.408-1990, Telecommunications - ISDN - Primary Rate - Customer Installation Metallic Interfaces - Layer 1 Specification,

ANS T1.601-1988, Telecommunications - ISDN - Basic Access Interface for Use on Metallic Loops for Application of the Network Side of NT - Layer 1 Specification,

ANS T1.602-1989, Telecommunications - ISDN - Data Link Layer Signaling Specification for Application at the User Network Interface,

ANS T1.603-1990, Telecommunications - ISDN - Minimal Set of Bearer Services for the Primary Rate Interface,

ANS T1.604-1990, Telecommunications - ISDN - Minimal Set of Bearer Services for the Basic Rate Interface,

ANS T1.605-1991, Telecommunications - ISDN - Basic Access Interface at S and T Reference Points - Layer 1 Specification,

ANS T1.607-1990, Telecommunications - ISDN - Digital Subscriber Signaling System Number 1 (DSS1) - Layer 3 Signaling Specification for Circuit Switched Bearer Service,

ANS T1.608-1990, Telecommunications - ISDN - Digital Subscriber Signaling System Number 1 (DSS1) - Signaling Specification for X.25 Packet Switched Bearer Service, and

ANS T1.612-1990, Telecommunications - ISDN - Terminal Adaption Using Statistical Multiplexing.

Compliance with Federal Information Processing Standard for Integrated Services Digital Network (ISDN) is required.

Availability of two "B" channels shall be provided to each ISDN user. Multi-point configurations shall not be used unless approved by DOE.

3.1.2 Special Circuits

Provide service which maintains the current operational capabilities of the existing special circuits listed in Appendix 5C and any additional special circuits found during cutover (See Section 3.5.1.4).

Circuits carrying digital signals shall have a Bit Error Rate (BER) for new wiring of no greater than 1 in 10E06 when operating at the speed of the existing circuit. BER shall be determined as stated in Section 3.3.3.

Circuits carrying analog or dry contact signals shall use new cable between the site's central office and the buildings' wiring closets which will pass the voice cable testing of Section 3.3.12.2.3 and have a line length no greater than that of the existing cable. Retermination of existing cable on new terminal block equipment shall increase the existing line length by no more than 50 feet.

3.1.3 Cable Plant

All inter-building cabling shall be new at the X-10, K-25, and Y-12 sites.

At the X-10, K-25, and Y-12 plant sites, there are existing underground duct systems. These duct systems have open ducts in most areas which are available for use in the Contractor's design. See telephone manhole photo drawings listed in Appendix 1, pages 1-12 & 1-13.

Provide a cable plant consisting of the following:

(a) Inter-building cabling certified to handle digital data, digital voice, and analog voice service.

(b) Inter-site single-mode fiber optic cabling needed for Fiber Optic Transmission System (FOTS) operation plus spare fiber pairs for future DOE use. (See drawing D2E-145866.)

(c) Cabling needed to support special circuits, excluding intra-building special circuits.

(d) Cable ducts, poles, conduit, or other equipment used for routing cable as needed (see Section 5.2.4).

(e) Other transmission facilities as required to serve remote locations and Townsite buildings.

The cable plant installed by the Contractor shall be certified as required by Section 3.3.12.2. All modifications to the Contractor installed cable plant necessary to make the cable plant compliant with the specification will be made at no additional cost to the Government.

A few buildings within X-10, Y-12, and K-25 will not require ISDN services. Digital services is preferred in these buildings when it is cost-effective. A listing of these buildings is provided in Appendix 2D.

A few buildings are scheduled for demolition. A listing of these buildings is provided in Appendix 2D.

3.1.4 Operation and Maintenance

Beginning at the award of the contract, relocation, installation, modification, disconnection, maintenance, and repair service shall be provided for currently DOE-owned facilities per the Statement of Work (SW-TNS-001). The acronym RIMD shall refer to this service including maintenance and repair. The DOE-owned facilities are identified in Appendix 8.

At acceptance, operations and maintenance will encompass the new DOE-owned facilities as specified in this document and will last 10 years. The vendor shall propose a new operations and maintenance plan to begin at cutover which must be DOE approved. Major facilities to be operated and maintained after cutover include:

(a) Unless otherwise specified, all equipment required by this specification.

(b) The entire ORF-ICN cable plant.

(c) The following equipment retained from the existing OORTS. Reference Statement of Work (SW-TNS-001).

Equipment	Quantity	
System 75 PBX	2	
Merlin Systems	64	See Section 3.3.1.8

3.2 SYSTEM INTERFACES

The present system interfaces are described in the following sections. The Preliminary System Design Report of Section 4.4 shall be based on this data. The Final System Design Report shall be based on the system interfaces at the time of design issue. These interfaces definitions shall be obtained by the Contractor.

3.2.1 Outside Connections and Demarcation Requirements

The Contractor shall design and build facilities housing all demarcation points that interface with the system interfaces identified below. The facilities shall be located on DOE property, and the location shall be approved by DOE. The Contractor shall work with SCB and other communications companies responsible for outside connections to meet connection requirements. These outside connections shall be as shown on drawing D2E-145866. Outside connections include:

TRUNKS

The ORF-ICN shall provide trunks to the outside connections identified below:

External Trunks	Quantity
SCB Oak Ridge Central Office Switch	As Design Req. **
Knoxville Foreign Exchange (FX)	37
FTS 2000	160
DOE Communications Network (DOECN)	4 T1's
External Communications Ethernet Segment (ECES)	8 T1's
Switched Digital Integrated Services (SDIS)	1 T1
Uranium Enrichment Network (UENET)	2 T1's

** Quantities shall be in accordance with the blocking requirements of Section 3.3.1.3 and 3.3.9.4 and data in Appendices 2, 4, and 5.

A trunk shall have the capacity for one telephone channel, i.e., a DSO circuit. Connection lines supplying these trunks shall be configured such that the total cost of the ORF-ICN plus ORF-ICN operation for 10 years plus SCB charges for 10 years is minimized.

Upon trunk failure, traffic shall be automatically routed to the remaining operational trunks.

The DOECN DS1 trunk interface shall handle up to 24 DSO voice circuits each. One DS1 interface shall provide stratum 2 reference clocking for synchronization according to ANSI T1.101-1987. The DS1 services shall be provided to Building 9117 and terminated on standard 66 blocks in Room 132. This service shall be extended into Room 133D and terminated with RJ45 8-pin connectors.

In the event of DOECN failure the VDTS shall recognize the "yellow" or "ALS" alarm on any T-1 span from DOECN, shall busy out trunks associated with the span, and take appropriate routing action. The busy out condition shall be maintained until the alarm is removed. Following removal of the alarm the VDTS shall return the trunks to service.

OTHER CIRCUITS

In addition to the connections noted above, numerous other outside connections are currently in place. Comparable connections will be in place at cutover and shall be provided. Coordinate with SCB and other communications companies to ensure that comparable service is provided after cutover, and operate and maintain the resultant connections for the life of the contract. A summary list of current connections is included below:

Other Circuits	Quantity*
Pay Stations - Semi/Public	16
Pay Stations - Full/Public	4
Miscellaneous WATS Connections	1
National and International Circuits	47 (See Appendix 5B for details.)

All hardware and software necessary to interface these outside connections shall be provided. This includes any hardware and software necessary for translation between the VDTS and external analog systems and Primary Rate Interface (PRI) requirements (see Section 3.3.1.11).

3.2.2 Internal Interfaces

The ORF-ICN shall provide connections and required interface hardware to the communications equipment within the Oak Ridge facility listed here and shown on drawing D2E-145866. These interfaces shall be served from the data ports referenced in 3.1.1.4.

Equipment	Quantity	Reference
Host Processors	As Required	3.3.10.2
Modem Pool	79	3.3.10.8
TMS Computer	1	3.2.3

3.2.3 Telecommunications Management System (TMS)

Requirements for the TMS are included in the TMS Technical Specification (K/CSD/INF 8822). Interface requirements for this system are listed in this section.

3.2.3.1 Hardware/Software Interface

Provide an electronic communications link between the VDTS and the TMS computer which will support the communications requirements listed in this section. All hardware and software required for this interface shall be provided. This interface activity shall not degrade any response time requirements specified in the TMS Specification.

3.2.3.2 Call Detail Record (CDR) Storage

For Call Accounting Purposes--Provide all hardware and software for the collection (per TMS, Appendix TMS-5) and storage of all calls that incur charges on a monthly basis. This information shall be transferred via the interface described in 3.2.3.1 at the request of the TMS.

3.2.3.3 Service Order Interface

The interface described in 3.2.3.1 shall be used to provide the VDTS with information from the TMS for activating, deactivating, and modifying customer service (for telephone, data, and voice mail). The TMS shall assign station identities and features maintained by the TMS and shall provide that data to the VDTS for use. Manual entry capability from the VDTS console shall be used for back-up to this interface. The VDTS will assign all station numbers that are VDTS related station numbers at the request of the TMS (per TMS section 2.2.5 and 2.3.1.3). This interface shall be limited to the functionality defined in the TMS Specification (K/CSD/INF-8822).

3.2.3.4 Data Base Installation/Synchronization

The Contractor shall be responsible for initial loading of all the necessary data into the VDTS and TMS data bases. When the same information resides in the TMS and VDTS for operational purposes, the information shall be identical and kept identical by the hardware and software interface as changes are made on either system. This includes, but is not limited to, telephone (data, voice mail) number and feature details, cable records, port number, and all installation requirements as specified in the TMS Specification. This data shall be maintained during any pre-cutover period and through the acceptance test of the VDTS (per TMS section 4.5).

At periodic intervals (once a week minimum), database synchronization between the TMS and VDTS shall be verified. Any discrepancies shall be reported. Provide a procedure for resolving the reported discrepancies for approval by DOE.

3.3 SYSTEM PERFORMANCE REQUIREMENTS

3.3.1 System Features

3.3.1.1 Equipment and Configuration Requirements

Provide a fully digital system including digital common control and digital transmission matrices. The switches shall be of a solid state, stored program, processor controlled design that can provide for both voice and data exchange services.

All hardware and software provided shall be new and a current standard production model of the manufacturer.

Modifications to existing, standard, off-the-shelf software are acceptable provided that they meet all of the following:

(a) Voice services in accordance with Sections 3.3.1 through 3.3.3 can be provided with existing software until the modifications are complete and verified.

(b) Modified software can be loaded into the VDTS with less than one hour of control system downtime and no loss of communications service.

(c) Modified software represents no more than 20% of the total number of software modules or lines of code.

(d) Software modifications are supported as an original equipment manufacturer product such that VDTS software operates in accordance with this specification when new software versions, releases, or updates are installed on the VDTS.

(e) Software modifications are approved in writing by DOE.

One main Private Branch Exchange (PBX) unit shall be used for each site. All other VDTS switch equipment shall be remote modules which are connected to an appropriate main PBX unit located at site central office. (See Appendix 3.)

The VDTS, FOTS, and cable plant shall function as a totally integrated network and shall switch and transmit analog and data communications at specified rates and quantities.

The VDTS shall interconnect any ISDN port to any other ISDN port for both voice and data communication service (Ref. 3.3.3.1).

The VDTS shall be certified by the original equipment manufacturer to be in accordance with Federal Communications Commission (FCC) Rule 68.

3.3.1.2 911 Service

Provide a 911 emergency service which provides equivalent features/services to the SCB product ENHANCED 911 (registered).

The 911 service shall be designed in accordance with National Fire Protection Association (NFPA) 1221, Section 2-1.13.2 and Appendix A-2-1.13.2.

Call routing at cutover shall be as follows:

Call Origin	Emergency Office Termination
Townsite (as designated by DOE)	Oak Ridge Police Department
K-25	K-25 Fire Department
ORNL	ORNL Fire Department
Y-12 (inside of the plant perimeter fence)	Y-12 Fire Department
Y-12 (outside of the plant perimeter fence)	Oak Ridge Police Department

Flexibility shall exist in the VDTS to allow call origin areas and/or emergency offices to be moved, added, or deleted as specified by DOE.

3.3.1.3 Grade of Service (GOS)

The VDTS shall provide the grades of service specified herein while handling the service connections and traffic loads in Table 2 at the call rates, and to the destinations specified in the traffic tables in Appendix 4.

3.3.1.3.1 Traffic Handling Requirements

Voice--The traffic loads specified in Appendix 4 originating from the maximum capacity voice service connections specified in Table 1 (Section 3.1.1.3).

Data--The busy hour throughput originating from the following ISDN voice/data service connections specified in Table 1, Section 3.1.1.3. The VDTS shall have the capability to handle the data loads specified in Table 2 at cutover. The load is shown for year 1, and increased in the out years, as required, to accommodate up to 8,000 SSN users by equipping these data users with ISDN interfaces.

Table 2 Data Traffic Handling Requirements

Busy Hour Throughput Gbits	Year	Total Data Users by Location: FB, OSTI and Townsite	X-10	K-25	Y-12	Total
1.5	1	500	750	750	1,500	3,500
4.0	*	2,000	2,750	2,750	5,500	13,000

* Phased-in to accommodate SSN data users migrating to the VDTS.

The stated throughput is assumed to be the mean value of random input traffic which is Poisson distributed and can be related to GOS by Erlang or Neal-Wilkerson traffic tables. Poisson is defined as a process that results in a distribution of events such that the intervals between events are independent random variables with an exponential distribution. This distribution is used to approximate the binomial distribution (the normal curve) in certain traffic applications.

3.3.1.3.2 Call Processing

3.3.1.3.2.1 Performance Criteria--The VDTS call processing function shall adhere to the following performance criteria while subjected to peak busy hour traffic loading. Peak busy hour loading, for this purpose, is a value of 1.75 times the means of the Poisson-distributed offered loads specified in Tables 1 and 2 of Appendix 4.

(a) Blocking--The grade of service for setting up a connection after sufficient address information has been received by the call processor, shall be:

(1) P.02 for internal calls,
(2) P.02 for incoming calls, and
(3) P.01 for outgoing calls.

(b) Cutoff Calls--No more than one call in 8,000 shall be cut off by any switching system.

(c) Incorrect Treatment--No more than one call in 10,000 shall be incorrectly treated.

3.3.1.3.2.2 Call Processing Capacity

(a) Rated Call Capacity--The load which the call processor can sustain indefinitely, based on the real-time processing speed per call, while still allowing all performance criteria to be met, shall be sufficient to simultaneously process calls from 50% of all line connections.

(b) Switching Matrix Call Capacity--The real time capacity of the switching matrix shall be sufficient to carry calls simultaneously from 25 percent of all line connections.

3.3.1.3.3 Trunking

The VDTS shall provide sufficient internal and external trunk capacity to maintain the specified GOS while serving the traffic loads and traffic distributions required by Appendix 4.

(a) Internal Trunks. Internal trunks are those required for service internal to the ORF-ICN, e.g., trunks between distributed PBX functions, or between PBX functions and communications equipment within the ORF-ICN such as the SSN Network, modem pools, voice mail box equipment, and ISDN/LAN gateways.

(b) External Trunks. External trunks are those required for service between the VDTS and networks outside the ORF-ICN, e.g., SCB Centrex, FTS 2000, DOECN. Refer to Section 3.2.

Trunk Type	Grade of Service
Internal	P.001
External	P.01

3.3.1.4 Data Switching and Packet Switching

The VDTS shall provide performance in accordance with this specification while supporting simultaneous data and voice traffic loads.

The VDTS shall provide for data transmission from user input terminals to the switch at ISDN rates up to 64 Kbps, and for trunk connectivity from the switch to ORF-ICN destination devices. The rates of the trunks and the quantities required shall be determined from the traffic handling and GOS requirements of 3.3.1.3.

Data Packet Switching. The packet section of the ISDN Basic Rate D signaling channel shall be used for ORF-ICN data at rates up to 9600 bps. An ISDN Basic Rate B channel shall be used for ORF-ICN data at rates up to 64 Kbps.

Any combination of B and D channels may be used to carry the ORF-ICN data, but at no time shall the data packet load occupy more than 10% of the physical circuit handling capability of the circuit switch. It shall be possible for the network manager to impose a restriction level on data traffic to limit the level of data traffic through the circuit switch at 10%, or, other selected levels.

Data traffic which is not carried through the circuit switching matrix as physical connections shall be handled by a packet switching function. The packet switch function shall provide virtual connections through the switch, and shall not cause an increase in the traffic load on the conventional voice and data circuit switching matrix.

3.3.1.5 ISDN/Non-ISDN Digital Telephones

A minimum of three types of telephone sets shall be available under Item 005 of the RFP. All sets shall provide a message indicating lamp, fixed features buttons (for Conference, Transfer, Drop, and Hold). All ISDN digital sets shall be programmable from the switch on initialization, feature changes, or power outages..

In addition, the new digital telephone sets shall have the following attributes as a minimum:

(a) Digital Set I:

This voice set shall provide multiple call appearance feature buttons with status lamps. A minimum of four call appearance buttons, a minimum of 4 programmable feature buttons, and an alphanumeric character display of at least 24 characters. This set shall be available in both desk and wall mount models.

(b) Digital Set II:

This voice set shall provide multiple call appearance feature buttons with status lamps. A minimum of ten call appearance buttons, a minimum of 12 programmable feature buttons, and an alphanumeric character display of at least 40 characters.

(c) Digital Set III:

This set shall be the same as set II plus a built-in speaker phone with mute button.

3.3.1.6 Speaker Phones and Amplifiers

Where existing Western Electric or Precision Components Type 4A speaker phones are being used, the VDTS shall provide equal service. Speakers in the VDTS phones offered under Item 005 of the RFP shall provide hands-free operation except answering. The VDTS phones can have hands-free answering capability provided there is a way to manually (local hardware switching) disable this feature and a visual indicator of which state the feature is in is provided. All incoming calls shall be answered manually. The loudspeaker and amplifier shall control ringing, tone buzzing, voice messaging signals both on- and off-hook, and off-hook voice and dial tone. The volume of these signals shall be adjustable at each set.

3.3.1.7 Single System Image

All features shall be accessible from all sets in the system. The composition of the VDTS shall be transparent to all users, providing uniform access to all system features and capabilities throughout the network. All users shall have access to the same capabilities regardless of the node to which they are connected, and the VDTS shall provide the same features between nodes and sites as within them. System configuration shall not affect the ability to provide the features of Section 3.3.2 and 3.3.1.14.

3.3.1.8 Key Systems and Merlins

Provide service to existing key systems and Merlins which maintain equivalent operational functionalities. Reference Appendices 2 and 2B for further information on these systems.

3.3.1.9 Numbering Plan

The VDTS shall have a numbering plan which is uniform to all locations. System dialing patterns and dialing capabilities for internal and external calls shall be uniform throughout the system.

3.3.1.9.1 Numbering Plan Capacity

The VDTS shall have the capacity to assign directory numbers as required to accommodate the system at maximum capacity as defined in Table 1 Section 3.1.1.3 in an all ISDN voice/data configuration.

3.3.1.9.2 Numbering Plan Digit Requirements

Dialing patterns shall be as follows:

Destination	Dialing Pattern
VDTS Attendant	dial 0
VDTS Attendant for Directory Assistance	dial 6-5454, 6-5455, 6-5456, 6-5457, 6-5458, 6-5459 (The VDTS shall provide rotary operation to the next number when number(s) are busy.)

VDTS Attendant for Directory Assistance	dial 574-1000 (This number is for users accessing the VDTS via outside exchanges.)
VDTS Internal Extensions	dial 1-XXXX, 4-XXXX, 6-XXXX (Note that feature access codes cannot begin with 1, 4, or 6.)
VDTS per Section 3.3.1.2	dial 911 (access to the emergency service shall require that the user only dial 911. Dialing 8-911 shall route to the same location as dialing 911 for a particular station.)
Local Calls	dial 8 + 7 digits
On-Net FTS	dial 8 + 10 digits
DOECN Calls	dial 8 + 10 digits (The VDTS shall have a pattern set up that routes these calls based on nnx dialed to DOECN facilities.)
Off-Net FTS 615 Long Distance	dial 8 + 615 + 7 digits (Dialing "615" avoids conflict between duplicated on-net nnx codes and 615 nnx codes.)
Off-Net FTS 10 Digit	dial 8 + 10 digits
International Number	dial 8 + 01 or 011 + international
Operator Assisted Calls (collect, 3rd Number, etc.)	dial 8 + 0 + 7 or 10 digits
Free Calls (800, 950, 555, 1-411, etc.)	dial 8 + appropriate number (The VDTS shall route based on digit screening pattern set up in software.)
Primary Inter-Exchange Carrier, By-pass Alternate by Routing Selection (ARS)	dial 5 + 10 digits (The VDTS shall provide an alternate outside access bypass ARS.)

All stations shall be capable of utilizing the above dialing plan, but some stations may be restricted to a subset of this plan as determined by DOE.

3.3.1.9.3 Numbering Plan Flexibility

The VDTS shall use digit insertion, deletion, and translation to assign:

- A line number for internal calls
- Line telephone number(s) to any line
- A line telephone number(s) for calls to the attendant
- A line number or access code for internal calls to the attendant
- A line number for outward calls to any trunk group
- A line number to any interconnected system
- Any line number or access code to an intercept tone or announcement

3.3.1.9.4 Numbering Plan Compatibility

Line/station telephone numbers shall be the same as those listed in the OORTS at cutover. Stations shall retain their existing extension numbers.

3.3.1.10 System Expandability and Flexibility

Equipment shall consist of modular assemblies and subassemblies that can be replaced, updated, or enlarged by replacing or adding equipment modules.

Acceptable modularity for peripheral equipment such as consoles, stations, or special circuit drivers shall be to the equipment item. For switching equipment, modularity shall be to the printed circuit board.

It shall be possible to equip wired ports for any of the services listed in Table 1 (see Section 3.1.1.3) by adding only line cards and to equip capacity ports by adding equipment cabinets and line cards. Equipping of digital ports shall provide digital functionality up to the MCR demarcation. It shall be possible to use the full capacity provided at any site central office or remote module location for any combination of the Section 3.3.1.3.1 services and their corresponding Centum Call Seconds (CCS) requirements at any time without changing the services being provided to existing users (i.e., depopulating switches to change and/or add services shall not be required).

Increasing the number of trunks required in Section 3.2 by 50% shall require no more than adding equipment cabinets, line cards, and making software translations.

The FOTS design shall provide floor space in each site's central office, power, and cabinet space for upgrading to OC-48 (2488.21 Mbps).

Increasing the data packet handling capacity of the switch shall require no more than the addition of modular assemblies and/or software modules.

3.3.1.11 Trunking

The system shall access Local Exchange Company (LEC) trunks via two-wire, four-wire, T1, and ISDN Primary Rate Interfaces. Trunks shall operate as either incoming, outgoing, or two-way.

The VDTS shall provide the following signaling as specified in Section 6 of Notes on the Bell Operating Companies (BOC) Intra-LATA Networks, Issue 1, April 1986:

- Loop Start Signaling
- Ground Start Signaling
- E&M Signaling for E&M Types I, II, III, and IV
- DX Signaling
- SF Signaling
- MF Signaling
- ISDN "D" Channel Signaling

T1 interfaces must implement all of the above signaling types.

Primary Rate Interfaces shall comply with ANSI T1.408-1990.

3.3.1.12 Call Processing

3.3.1.12.1 Standard/Nonstandard Tones

The VDTS shall provide tones (dial, recall, ringing, reorder, busy, ring back) to inform users about the condition and progress of their calls. All signals shall be provided in accordance with the guidelines and specifications stated in Section 6, Paragraphs 16.01 through 16.34 and 17.01 through 17.36 of the Notes on the BOC Intra-LATA Network, Issue 1, April 1986.

3.3.1.12.2 Recorded Announcements

The VDTS shall provide recorded announcements. The VDTS shall support at least 6 customized announcements. Provide support for announcements up to 40 seconds in length. Provide for simultaneous access of 50 users to each announcements.

3.3.1.12.3 Line Lockout

If the VDTS does not receive the first dialed digit within 25 seconds after sending dial tone to a station, or if it does not receive each of the remaining digits within 10 seconds each, the VDTS shall lock out the line and return a tone or intercept announcement to the calling party until the user disconnects.

The VDTS shall lock out the line if the number of digits required to successfully complete a call are not received within 60 seconds of the initial transmission of the intercept tone.

3.3.1.12.4 Post Dialing Delay

The average delay between the end of dialing and the occurrence of an audible network response shall not exceed 0.4 second.

3.3.1.12.5 Dial Tone Delay

The system shall be provisioned such that no more than 1.5 percent of attempts shall wait over 3 seconds for dial tone. The dial tone delay shall not exceed 0.6 seconds on the average.

3.3.1.12.6 Call Setup Delay (Requirement Deleted)

3.3.1.12.7 Immediate Ring

The VDTS shall return a ringing tone to the calling party and send a ring signal on the called line within 4 seconds after a connection has been established. The first, as well as subsequent, ring signals shall be regular cycles of ringing and not an immediate burst of ringing applied prior to picking up regular ringing cycles.

3.3.1.12.8 Immediate Ring Trip

The VDTS shall detect an answer signal on a line and trip the ring signal within 100 milliseconds during either the silent or the ringing interval of the ringing cycle.

3.3.1.12.9 Answer Supervision Delay

The average overall system answer supervision delay shall not exceed 0.5 second.

3.3.1.12.10 Line Release

When the VDTS receives a disconnect signal on a internal line, the line shall then be freed within 500 milliseconds to make or receive another call.

In a two-party intra-system call, if one of the parties does not disconnect within three seconds after the other party has disconnected, the VDTS shall activate the switch system time-out procedure for handling inadvertent off-hook conditions.

3.3.1.12.11 Trunk Release

When the VDTS receives a disconnect signal on a trunk, it shall release the trunk from a call, return a disconnect signal, and free the trunk.

If the VDTS does not receive a disconnect signal on a trunk that has been otherwise released from a call it shall send a disconnect signal on the trunk. When a disconnect signal is returned on the trunk, the VDTS shall free the trunk.

3.3.1.13 Dialing

Activation of a system feature shall require the user to dial no more than 3 digits or use a feature button. Three digit feature access codes shall conform to present codes (Reference 3.3.1.16).

The VDTS shall send or receive dial pulse (DP), or dual-tone multi-frequency (DTMF) signals in the following manner:

- Trunks shall pass DP or DTMF signals as described in Sections 4.6.1.1 and 4.6.1.2 ("Dial Pulse Signaling") and Sections 4.6.2.1 through 4.6.2.6 ("Dual Tone Multi-frequency Signaling") of the RS-464 EIA Standard for PBX, published in December 1979.

- The VDTS shall accept and process call originations from a variety of work stations, including terminal keyboards, rotary dial stations, and electronic keypads.

The VDTS shall accept and process both DP and DTMF signals for incoming and outgoing calls.

3.3.1.14 System Telephone Features

System telephone features to be provided shall include the following, as defined in the Glossary of Terminology, PBX Systems, The Marketing Programs and Services Group, Gaithersburg,

Maryland. (To order this glossary: The ARIES Group, 1350 Piccard Drive, Suite 300, Rockville, Maryland 20850, Phone 301-840-0800.) There shall be no limit on the number of stations which can be assigned these features.

Required System Telephone Features:

Area/Office Code Restriction
Add-on Conference, 3 Party Minimum
Auto Recall for Attendant
Authorization Code
Account Code Capability
Automatic Number Identification, Automatic Identification of Outward Dialing, or Equivalent Capability Compatible with Both FTS-2000 Networks A and B
Automatic Station Release
Call Hold Reminder
Centralized Attendant Service
Classes of Service
- Direct Inward Dialing
- Direct Outward Dialing

Dedicated Ringdown (Hotline)
Emergency Dialing (911)
Executive Busy Override
Executive Camp-on
Fixed or Preset Conference
Hunting
- Circular Hunting
- Terminal Hunting

Industry Standard Off Premise Stations
Intercept Treatment
- Recorded Announcement
- Tone
- Vacant Code Intercept

Inter PBX Call Transfer
Inter PBX Call Coordinated Station Numbering
Least Cost Routing
Line Load Control
Lockout
Malicious Call Trace
Meet-Me Conference, 2 Groups of 12 Each, Toll Quality Transmission
Multiple Trunk Groups
Off Premise Proprietary Station Instruments
Recorded Announcement Intercept (See Intercept)
Station Restrictions Including:
- Fully Restricted
- Inward Restriction
- Manual Originating Line Service
- Origination Restriction
- Outward Restriction
- Toll Restriction 0 & 1 PBX
- Toll Diversion

Station Message Detail Recording
DTMF System Outpulsing
Timing and Synchronization

Trunk Camp-on (See Outgoing Trunk Camp-on)
Vacant Code Intercept

Additional System Telephone Feature Requirements:

The system software and hardware shall be expandable to include the following features:

Call Park
Direct Inward Dial Signal
Discriminating Ringing
Executive Intercom
Fixed Night Service
Flexible Night Service
Lockout with Secrecy
Manual Intercept
Multiple Discriminating Ringing
Outgoing Trunk Camp-on Priority
Office Code Restriction
Paging
Tone Intercept
DTMF Tone to Dial Pulse Conversion
Trunk to Trunk Connections--Stations
Uniform Call Distribution

3.3.1.15 Routing

3.3.1.15.1 Automatic Routing Selection (ARS)

The system shall have Automatic Routing Selection (ARS) with 6 digit screening for routing and alternate routing over the trunks to the outside exchanges of Section 3.2 based on least cost, trunks busy, or other bases.

3.3.1.15.2 Class of Station Priority

It shall be possible to assign priority levels to stations such that when trunks to outside exchanges (see Section 3.2) become overloaded (blocking begins to occur) stations with higher priority will receive the outside exchange dial tone before stations with lower priority. At least 3 levels of priority shall be provided.

3.3.1.15.3 Trunk Queuing

The VDTS shall incorporate queuing into its ARS algorithms. A caller's maximum waiting time in queue and connection method shall be based on class of station priority and type of queuing used. Two types of queuing shall be available: on-line and call back. With on-line queuing, the VDTS shall automatically queue an off-hook caller when primary outgoing trunks are busy, in accordance with the class of station priority. The VDTS shall route queued calls over the first appropriate available trunk. With call-back queuing, the caller shall enter an access code or depress a function button when trunk facilities are busy and then hang up. When an appropriate trunk is free, depending on class of station priority, the VDTS shall call the user and automatically establish the outgoing call when the user goes off-hook.

3.3.1.15.4 Distributed Communication System Architecture

3.3.1.15.4.1 Distributed Switching. The VDTS shall be configured as a distributed communication network with the main communication node located at the Y-12 site and subordinate nodes, as required, at X-10, K-25, FB, OSTI, or other Townsite locations. The main node shall provide the interconnection points to the Public Switched Network (PSN) and other external networks. If necessary, remote switching units may be located off nodes at each site to extend facilities to other on-site locations.

The switching nodes shall have tandem switching capability to through-route calls which are addressed to other switching nodes and processor to processor communication channels which provide full feature transparency among nodes and switching units connected to the nodes. Tandem switching algorithms shall perform any needed code conversions or number translations and shall verify the availability of trunks before establishing a connection. It shall be possible to operate and use the distributed switching network as if it were a single switch. All users, regardless of network location, shall have equal access to all switch features as if they were connected to a single switch.

3.3.1.15.4.2 Inter-site Transmission. Inter-site transmission between switching nodes at X-10, K-25, and Y-12 shall use the fiber optic transmission system. The inter-site transmission system provides a primary route between any two sites over the directly connected leg of the fiber optic triangle, and an alternate route to each site through the other two legs. The tandem switching function of the distributed switching node at each site shall interact with the control of the inter-site transmission system to interconnect over the alternate route in the event of total failure to the primary route, and to provide load balancing within both primary and alternate pathways to alleviate trunk congestion between sites.

3.3.1.15.5 Multiple Phone Connection Feature

Provide capability to configure groups of telephones such that many telephones can be called simultaneously from one telephone using a single phone number. Capability shall be provided for one group of 100 at Y-12 and nine groups of 25 distributed as defined by DOE with any four of the groups active at any one time. This is called Fixed or Preset Conference.

3.3.1.16 Station Features

Include the following as defined in the Glossary of Terminology, PBX Systems, The Marketing Programs and Services Group, Gaithersburg, Maryland. (To order this glossary: The ARIES Group, 1350 Piccard Drive, Suite 300, Rockville, Maryland 20850, Phone 301-840-0800.) There shall be no limit to the number of stations which can be assigned these features.

- Add-on Conference, 3-Party Minimum
- Automatic Redial
- Automatic Callback Calling
- Call Forwarding
  - Don't Answer
  - Busy Line
  - All Calls/Call Forwarding (Feature Access Codes 102 and 103)
  - Group

Call Hold (Feature Access Code 104)
Call Transfer
Call Pickup/Dial Call Pickup (Feature Access Code 107)
Call Waiting Services
Call Waiting Terminating (Feature Access Code 106)
Directed Call Pickup (Feature Access Code 105)
Inter Group Call Pickup
Last Number Redial
Speed Calling (Feature Access Code 100)
Station Forced Busy (Do Not Disturb)
Three-Way Conference Transfer

3.3.1.17 Network Synchronization

Provide network synchronization in accordance with ANSI Standard T1.101-1987.

3.3.2 Voice Messaging

A new voice messaging system shall be provided with the VDTS at cutover for 5,000 users and shall be expandable to 10,000 users. Input trunks shall have sufficient capacity to meet the grade of service requirements in Section 3.3.1.3.3. A message in the system shall activate a message waiting indicator lamp on any user station. The voice messaging system shall have the following features:

Voice Mailbox

This feature will allow voice messaging subscribers to access storage where they can create, receive, store, and delete messages. All voice messages shall be time stamped, this time stamp shall be user retrievable. The system shall allow users to create personalized greetings or use a standard system generated greeting. Length of the greeting message shall be configurable to a maximum of 60 seconds. Incoming message length shall be configurable for a maximum of 90 seconds. The system shall retain messages for a configurable amount of time of at least 72 hours before the message is deleted. The voice mailboxes shall be password protected.

Call Answer

This feature will allow the voice messaging system to answer calls for subscribers who do not pick up an incoming call. This feature must allow all forwarded calls to a station connected to the voice messaging to be passed through to the voice messaging system. The subscribers shall be able to redirect their calls to the voice messaging system as needed. A configurable escape to operator feature shall be provided. Both callers from inside and outside the VDTS shall be able to leave messages.

Information Service

The information service (bulletin board) feature shall allow callers to dial a special extension to hear a pre-recorded message.

Automated Attendant

The automated attendant (caller routing) feature shall be capable of answering incoming calls and routing them to various departments, extensions, information services, or voice mailboxes. A menu of choices shall be presented to the caller, who can then make a selection by pressing a touchtone key from the VDTS user station.

Call Placement

The call placement (outcalling) feature shall allow the system to make outgoing calls. This shall allow the system to call to any station or multiple stations inside or outside the VDTS and announce new messages. This feature shall also have the option to allow message notification to be sent to a pager station.

Management

Management of the voice messaging system shall be provided and consists of managing the subscriber data base, maintaining the file system, monitoring the trunk lines, performance monitoring, accumulation of traffic statistics, and performing tape backups. Setup of multiple management stations (minimum of three) shall be provided for and shall be located anywhere within the VDTS system.

3.3.3 Data Handling Requirements

All digital line data service shall have a maximum bit error rate (BER) of 1 in 10E06.

All Contractor provided analog lines shall have a BER of no greater than 1 in 10E05 for 4800 bps and below 1 in 10E04 for 4800 to 9600 bps. BER shall be determined by a measurement of the equivalent error free seconds (EFS) over a 24-hour period. Equivalent EFS is defined by: EFS = EXP(-BR x BER).

After connections are established, VDTS action shall be transparent to the connected devices.

3.3.3.1 Reserved.

3.3.3.2 Modem Pool Service

The VDTS shall support modem pooling. Any user on the VDTS shall have access to a modem pool. Access to any particular pool shall be controllable through class of service restrictions.

Data terminals accessing the VDTS via trunks from outside exchanges (see Section 3.2) shall have access to hosts only through the DOE's existing modem pool.

3.3.4 System Operation and Control

The ORF-ICN shall be provided with an Operations Integrated Control Center (OICC) at the Y-12 site Central Office to manage, monitor, and control ongoing operations of the VDTS, inter-site special circuits, FOTS hardware, the inter-site fiber trunk, cable plant, and all other aspects of the ORF-ICN. This center is hereinafter referred to as the OICC.

Unless otherwise specified, all equipment and controls specified in this section shall be located at the OICC.

3.3.4.1 Operation and Control Features

The VDTS (including FOTS hardware) shall perform operations, maintenance, network management, and analysis activities. Operations and maintenance activities shall include real-time detection of failures, recovery from outages, equipment monitoring, fault isolation, and problem diagnosis. Management and analysis activities shall include data monitoring on inter-site special circuits, reporting, and data base management.

The control system shall be user-friendly. Menus, prompts, and commands shall be in English or acronyms. In no instance shall it be necessary for operators to interpret or utilize information in machine language form (e.g. binary, hexadecimal, etc.). In order to perform any type of add, move, or change in the data base it shall only be necessary to perform the data base change one time, after which all other modules shall be automatically updated. The control system shall be "self-protecting" in that it shall not allow non-logical input. If an operator erroneously attempts to execute a non-logical data base change, the control system shall inform the operator of the reason for not performing the change, via a textual explanation or acronym. For instance, if an operator attempts to assign a feature to a non-existing station, the system shall inform the operator of the non-logical attempt.

Graphic displays of system configuration shall be provided.

The VDTS shall downline load all operational software and control commands to VDTS switching components and integral card shelves from the OICC. Software loading or booting components in the field shall not be required.

3.3.4.2 Network Management

3.3.4.2.1 Monitoring and Alarm

System on-line status monitoring shall include automatic fault detection, isolation, and recovery checks on the central processing units (CPU), VDTS components, trunk and line modules, other system components, inter-site special circuits (excluding intra-site special circuits), and FOTS hardware. The operation of on-line status monitoring shall not interfere with normal call processing functions of the VDTS.

The VDTS shall screen and classify the alarms generated through on-line status monitoring according to their effect on the system. A minimum of two alarm classifications shall be provided:

(a) Major--The condition is causing a loss of service.

(b) Minor--The condition is not causing a loss of service but requires attention.

The VDTS shall maintain records of alarm conditions from the switching system and FOTS. All alarms shall be stored for at least 2 days for retrieval and reporting. The stored log shall include the alarm, date, time it occurred, reason for alarm, and date and time the alarm cleared. Alarms shall be displayed visually via a descriptive plain English message (or acronym) presented on a cathode ray tube (CRT) display and a printer, and annunciated. Textual descriptions of alarm conditions shall also be provided automatically at the monitoring

terminal and printer. The system shall provide on-demand reports of all alarms stored by type, date, and time. The reports shall be presented on a CRT display and/or a printer at the option of the operator.

It shall be possible to disable alarms so that tests and diagnostics can be performed without causing alarms. A list of disabled alarms shall be available for display on operator demand.

Power and environmental control system alarms required in Sections 5.2.4.5 and 5.2.3.2.2 shall be displayed and annunciated on equipment which is accessible from the administrative console.

Provide one Single Pole Double Throw (SPDT), 120 VAC, 3 amp, contact closure which the Company will connect to the Y-12 Plant Shift Superintendent (PSS) office alarm system. Also, provide a visual and annunciated abnormal system alarm at the monitoring console. This contact and alarm should be activated whenever a VDTS major alarm condition or an ORF-ICN power or environmental control system alarm condition occurs.

3.3.4.2.1.1 Measurements

Traffic, plant, and service measurements shall be made to view operation of the ORF-ICN over selected periods of time. Switched traffic measurements shall include, as a minimum:

- Peak Hour Traffic
- Total Usage, CCS
- Total Seizures
- Trunk Group Overflow
- Trunk Queue Size
- Trunks Out of Service
- Percent All Trunk Busy
- Percent Outgoing Blocking
- Calls Carried
- Call Processing Dial Tone Delay
- DS1 Errored Seconds
- DS1 BER
- Switching Matrix Usage

3.3.4.2.1.2 Measurement Reports

Measurement reports shall provide a summary of events that have taken place over 15 minute, 30 minute, 1 hour, and 24 hour periods, selectable by the operator. Switching center reports shall include, as a minimum:

Traffic Measurement Reports
- Trunk Groups and Trunk Usage
- Hunt Groups
- Modem Pool Groups
- Automatic Route Selection
- Call-By-Call Trunk Groups
- Call Rates
- DS1 Link Performance
- TDM Usage

Tone Receivers
Security Violations

Performance Measurement Reports
Trunk Group Performance
Hunt Group Performance

System Status Reports
Traffic Status
Maintenance Status

3.3.4.2.2 Network Control

The network control function shall provide real time surveillance and control to minimize the effects of degradation to network performance from traffic overloads or failure conditions. The following switched traffic controls shall be provided, as a minimum:

Line Load Control
Trunk Group Prehunt/Posthunt Control
Cancel Traffic to/from Trunk Group
Trunk Group Skip
Reroute Modification
Destination Code Cancellation
Trunk Directionalization
Dynamic Overload Control

3.3.4.3 Testing and Diagnostics

The OICC shall contain management systems to perform testing and diagnostic routines (as specified in Section 3.8.5) for both VDTS and FOTS hardware (excluding intra-site special circuits). These routines shall assist technical personnel in troubleshooting once a problem has been identified. The testing and diagnostic routines of Section 3.8.5 shall be initiated on demand.

Diagnostics critical to switching functions shall run continuously in background mode. Abnormal conditions found by testing and diagnostic functions shall be displayed and stored as alarms.

3.3.4.4 Data Base Maintenance

The VDTS shall maintain the system configuration data required to support switching operations and maintenance. Include information on system configuration, line and trunk group sizes and configurations, and a list of station characteristics and feature assignments by station number. This list shall specify the switching features (e.g., call forward capability) that have been assigned to a specific station.

The VDTS shall maintain the routing tables used by the automatic routing selection system.

The VDTS shall provide the capability to manage physical and logical moves and feature changes for all end instruments. The moves and changes management function shall allow an operator to create, edit, update, delete, and purge moves and changes records.

See section 3.2.3.4 for database installation and 3.2.3.3 for change notices.

3.3.4.5 Control Consoles

Provide the consoles described in this section and any other monitoring and control equipment needed to provide operational control of the ORF-ICN.

3.3.4.5.1 Attendant Consoles

Provide and maintain 3 attendant consoles located at the Y-12 Plant site Central Office area for operation by Contractor's supplied operators (reference 3.8.2.3 and Appendix 10). Provide connection ports, floor space, and power equipment for 3 additional consoles. The operators are required to have input access to the TMS per Appendix 10. The Contractor shall recommend and provide the necessary hardware to provide this access for each console operator.

Attendant consoles shall have no system alarm, monitoring, or control functions.

Attendant consoles shall be equipped for push button dialing and include all necessary attendant and supervisor headsets, handsets, and accessories. An incoming call display shall identify the type of service, trunk group, or circuit associated with the call. Call waiting lamps shall light when a call is waiting on the attendant's line. Busy indicator lamps or an equivalent indicator shall be provided to identify an all-trunks-busy condition for each class of station priority group. The number of the calling station and the class of station priority of an internal station placing a call through the attendant shall be displayed on the console.

The attendant consoles shall place calls to and receive calls from any station and shall place outward calls to and receive inward calls from the outside exchanges of Section 3.2. The attendants shall provide directory assistance and other operator functions. The capability shall be provided for the attendant to override restriction on a station line to terminate internal or external calls. Automatic and unrestricted access to all facilities shall be available to all console positions.

The VDTS shall route direct inward dialed calls addressed to a listed directory attendant number to the attendant consoles.

Assume the consoles receive 3,500 calls per week at an average of 30 seconds holding time per call.

These consoles shall include the following features as defined in the Glossary of Terminology, PBX Systems, The Marketing Programs and Services Group, Gaithersburg, Maryland:

Alphanumeric Display
Attendant Console
Attendant Camp-on
Attendant Conference, 6 party minimum
Attendant Control of Trunk Group Access
Attendant Numerical Call Waiting Display
Attendant Transfer All Calls
Attendant Trunk Group Busy Lamps
Attendant Incoming Call Control
Attendant Loop Transfer

Attendant Emergency Access
Attendant Station Number Display
Automatic Hold
Automatic Loop Release
Automatic Recall
Automatic Redial
Busy Override
Busy Verification of Stations
Called Number Display
Class of Service Display to Attendant
Night Transfer Fixed and Flexible
Straight Forward Outward Completion
Through Dialing
Trunk-to-Trunk Connections - Attendant
Trunk Verification by Customer (Attendant)
Trunk Switch Loop Operation
Two-Way Splitting

3.3.4.5.2 Administrative Consoles

Provide a minimum of two administrative consoles at the Y-12 Plant Site Central Office for VDTS operation. These consoles provide the capability to make on-line changes and corrections to the VDTS data bases, provide alarm and status displays, and issue control commands.

3.3.4.5.3 Monitoring Console

In addition to the administrative consoles, provide a console for Company monitoring of system operation in the Company office area at the Y-12 Site Central Office. This console shall be solely for Company use.

The console shall provide displays and alarms from the switching system and FOTS.

3.3.4.5.4 Test Facility

Provide and equip a test facility for Company use at the central office at Y-12 to interconnect ORF-ICN voice, data terminal, and computer equipment through the switch for on-line testing. The test facility shall be equipped with the following hardware and interconnections to the switching system at Y-12:

Quantity	Hardware/Interface Type
5	ISDN Basic Rate Interface
2	ISDN Primary Rate Interface
2	1.544 Mbps DS1 Interface
1 ea.	Analog Interface
1 ea.	TMS Development Computer System (See TMS Specifications, K/CSD/INF-8822)

By this facility it shall be possible to dial up interconnections between telephones or data terminals under test and compatible equipment under test through the interfaces provided.

3.3.5 System Security Requirements

3.3.5.1 Physical Security

The main VDTS switches and remote modules serving the Y-12, K-25, and X-10 sites shall be located on DOE property and within the fenced perimeter of each site. (The Federal Building [FB] is considered to be within the fenced perimeter.)

The buildings which house the main and remote switches shall have controlled access in the form of automatic key locks. Key storage locations shall be coordinated with DOE.

Door locks shall be installed on all doors to equipment rooms, facility termination points, storage rooms, and records rooms. Control the keys for these rooms and provide for rekeying if keys cannot be accounted for. All windows providing access to existing areas shall have 1/2 inch rebar welded on 6-inch centers or steel wire mesh securely affixed to the window frames. Except for offices, new facilities shall have no windows.

3.3.5.2 Cabling

Where signals to individual trunks, or special circuits are carried on individual cables (not multiplexed), these cables shall be terminated on pairs of Security Isolation Blocks (SIB) as shown on drawing D2E-145907.

The purpose of this isolation is to allow easy inspection, to prevent cross-talk between cabling carrying signals within plant fenced areas, referred to hereinafter as physically protected space (PPS), and those carrying signals exiting these areas, and to insure that cables not being used are not connected to the switch equipment. Include any recommended alternative designs meeting the intent of these features for approval as part of the Final System Design Report.

Cabling exiting the plant PPS area shall be terminated on blocks, card racks, or equipment separate from those used for cabling remaining within PPS areas. Cross connect cabling between the SIB pairs shall consist of separate single pair cables. Only those needed to provide the required service shall be installed.

VDTS and special circuit signals shall exit the plant sites only when necessary to reach a destination not on the site where it originated.

3.3.5.3 Signal Protection

Signal isolation between noncommunicating VDTS ports and cabling circuits shall be at least 70 db.

Electrical coupling between port circuits or between a port circuit and a distribution or multiplex bus shall be provided only when the associated stations are off-hook.

Stations inside PPS areas shall share neither port circuits nor assigned directory numbers with stations outside PPS areas.

3.3.5.4 Software Protection

All software media (tapes, disks, etc.) shall be provided physical protection against unauthorized alterations.

To ensure no unauthorized changes have been made, the operating program shall be reloaded from a protected master copy no less frequently than once each quarter and after each Remote Diagnostic Station service or upon specific request from DOE in the event unauthorized changes are suspected. Scheduled reloads shall be performed at night on weekends and only after notification to the Y-12 PSS office of the time period the VDTS will be out of service. If the program media are nonremovable, the complete memory shall be dumped and compared with the master copy. Any discrepancies shall be reported immediately to DOE.

Changes to VDTS assigned features, data base entries, or any other control software from locations other than the OICC shall be made only when specifically authorized by DOE in writing. Use of user ID, passwords, or any other access control mechanism to deny access from locations other than the OICC are not acceptable. Changes to control software parameters from the OICC shall be controlled by user identification and password codes.

3.3.5.5 Remote Diagnostic Stations

Maintenance and diagnostics shall be conducted from Remote Diagnostic Station (RDS) facilities only under the following conditions:

(a) The RDS facility shall not be able to access the VDTS except through a dedicated port.

(b) Unless in use, the RDS port shall remain disconnected from all trunks and lines leaving PPS areas.

(c) If ancillary equipment such as modems or telephones is necessary for connection, it shall be totally disconnected when not in use.

(d) Connection between the RDS port and the RDS facility shall be established only by a call to the RDS facility that is initiated from a designated station inside the PPS.

(e) DOE approved personnel shall be provided to ensure the security of the RDS services. They shall be responsible for the following actions:

(1) Verify the immediate need for RDS.

(2) Telephone the RDS facility and verify that the support activity can begin and that the facility is ready to transmit.

(3) Make the necessary connections between the RDS port, ancillary equipment, and outgoing trunks or line.

(4) Dial the RDS facility to establish the RDS port connection and verify with the facility that the connection was established.

(5) Monitor in real time (with hard copy printout) all communications between the RDS facility and the VDTS. Terminate the session should any improper activity be noted.

(6) When RDS service is terminated, disconnect all connections required for this service.

(7) If the VDTS has removable program media, reload the protected master copy. If the program media are nonremovable, dump the complete memory and compare with the master copy. Any discrepancies shall be reported immediately to DOE. If multiple RDS connections are needed to troubleshoot one problem, this action need only be performed once.

3.3.5.6 VDTS Features

When a station is on-hook, the VDTS shall not be able to place or hold the station in the off-hook condition, or activate any function which should be turned off, unless directed to do so by some manual action performed at the station itself.

VDTS features allowing monitoring of station off-hook audio by stations other than those called shall not be permitted.

Any features allowing activation of station and/or system features from locations other than the OICC shall be disabled.

3.3.5.7 Station Features

Voice terminals provided under Item 005 of the RFP shall have the following attributes:

- The on-hook condition of stations shall be controlled by the user and shall not involve or require any activity by any other part of the system except the station set itself.
- The on-hook condition of stations shall not be dependent on VDTS programming.
- The on-hook condition of stations shall not be canceled by the VDTS, by someone with access to the VDTS software, or by someone with access to the station set mounting cord wiring.
- The transition from off-hook to on-hook may be directed either by the user or by the VDTS; however, if directed by the user, it shall not be inhibited by the VDTS.
- If voice-activated call answering, automatic call answering, hands-free answering, or response to incoming calls other than annunciation is provided with user station equipment, these features shall be physically disabled and require the user to manually operate hardware switches to enable these functions. If these types of answering features are provided, a visual indicator shall also be provided to indicate the state of these features.
- Telephone instruments installed shall not allow any audio to be transmitted from any component within the telephone over any wire leaving the instrument while in the on-hook condition.

3.3.5.8 Configuration Control

After initial DOE approval, system software and hardware shall be changed only after such changes have been reviewed and approved by DOE in writing.

Changes to software shall be documented and verifiable.

3.3.5.9 Documentation

Complete copies of all Contractor provided documentation shall be maintained in the control center. This documentation shall include instructions, manuals, service practices, system configuration methods, maintenance records of hardware and software, etc.

3.3.5.10 Technical Security Areas

Type-accepted analog telephones are used in Technical Security Areas. Almost all Technical Security Areas are located at the Y-12 Plant. Physical barriers exist which prevent access to building distribution panels. Access is controlled by locks and keys supplied by the DOE.

There are approximately 20 to 30 stations (telephones) located in these secure areas. At cutover, provide equivalent service/functionality at the MCR for these telephones.

Type-accepted digital telephones offered under Item 005 in the RFP shall meet the requirements of the latest version of the Telephone Security Group Standard 2 (TSG-2).

3.3.6 Electromagnetic Interference/Radio Frequency Interference (EMI/RFI) Requirements

All remote module, central office, and FOTS equipment as installed shall meet the operating requirements of this specification when subjected to EMI/RFI conditions created by the tests defined below.

(1) Radiated susceptibility tests performed in accordance with Military Standard (MIL-STD)-462, Method RS03 using test limits of 10 volts/meter from 14 KHz to 1 GHz.

(2) Conducted susceptibility tests (power line transients) performed in accordance with MIL-STD-462, Method CS01 using test limits shown in Figure 1 of the Company Engineering Standard ES-2.9-1.

(3) Conducted susceptibility tests (power line transients) performed in accordance with MIL-STD-462, Method CS06 using a 400-volt spike.

(4) Electrostatic Discharge tests performed in accordance with the Company Engineering Standard ES-2.9-1, Electromagnetic Interference/Compatibility Definition, for 15 kV.

Verification that equipment meets the above requirements can be demonstrated through performance of the listed tests on equipment that is identical to that delivered. Verification may also be accomplished by analysis of the equipment under consideration, or by comparing test results on similar equipment. Verification through analysis or comparison test will be accepted by DOE only after satisfactory review of analysis or comparison. Verification through test will be accepted by DOE only after satisfactory review of test plans, procedures, and test reports, that document test conditions and results.

The VDTS shall be certified to be in accordance with Federal Communications Commission (FCC) Rules, Part 15, Subpart J, Class A.

3.3.7 Computer Hardware

3.3.7.1 Processor Capacity

The VDTS shall be designed so that all processors supporting the system have a utilization which is at least 10% below the maximum level recommended by the processor's manufacturer while providing system performance in accorcance with this specification.

3.3.7.2 Memory Capacity

The system shall be configured so that the memory can be expanded via installable plug-in units to at least 125% of that supplied at cutover.

3.3.8 System Software

System software shall support operation in accordance with this specification for the Section 3.3.7.1 specified capacity. Software supporting the VDTS shall allow changes and/or upgrades to be implemented in a manner which does not disrupt VDTS operation. Disruptions such as the need to cold restart (de-energize and reboot) major system components shall not be required.

All software furnished shall be operational on the hardware delivered and documented at the time of delivery.

3.3.9 Reliability, Availability, and Maintainability Requirements

3.3.9.1 System Availability

The major components of the ORF-ICN shall meet the minimum availability requirements specified in Table 3, where, availability, A, is defined as the ratio of time the component is functioning in an undegraded mode to the total time it is required to be operational, or;

$$A = \frac{\text{Undegraded Operating Time}}{\text{Undegraded + Degraded Operating Time}}$$

or, equivalent;

$$A = \frac{\text{MTBF}}{\text{MTBF + MTTR}}$$

Where, MTBF: Mean Time Between Failure
MTTR: Mean Time to Repair

Any Contractor provided equipment not being available when needed for service due to failure shall be considered in the availability calculation (including downtime due to preventive maintenance if the downtime occurs when the equipment is needed for service). Downtime caused by loss of DOE supplied power, water or other utilities, DOE-operated and maintained equipment, inaccessibility to equipment caused by DOE operations, or system software reloads required by Section 3.3.5.4 shall not be considered.

Table 3 ORF-ICN Availability Requirements

Failure Effect:	A
(a) Station terminals, or, devices affecting one station, circuit, data port, or DSO:	.99950
(b) Channel banks, multiplexors, circuits, or, devices affecting up to 700 multiple users, stations, or data ports, e.g., DS1s or DS3s:	.99995
(c) Switches, FOTS, cabling, or other major transmission equipment affecting more than 700 stations, or data ports, i.e., catastrophic failures:	.99999

Changing plug-in circuit boards or any other routine and preventive maintenance shall not require shutdown of any part of the system nor interfere with call processing.

3.3.9.2 Response Times

Response times for repair shall be in accordance with Section 3.8.4

3.3.9.3 Redundancy

Sufficient redundancy of system components shall be provided so that no single component failure of Contractor provided equipment shall affect more than 48 users or 48 trunks.
Provide at least one air conditioning unit in addition to those needed to properly maintain equipment environment. This unit shall be activated automatically upon high ambient temperature.

Replacement of redundant components shall not require interruption of operation. Failure of primary and backup units shall be alarmed at the OICC.

The OICC control system shall be designed and implemented so that any single component failure shall not affect the ORF-ICN communications capabilities or functionality (reference 3.3.4).

3.3.9.4 Alternate Routes: X-10, Y-12, and K-25

Service shall not be degraded and dialing patterns shall not change if any one inter-site trunk link is inoperable.

If two Inter-site trunk links are inoperable, dialing patterns shall not change and service for internal connections within the isolated site shall not be degraded. Service connections for calls within or between the sites connected by the remaining link shall not be degraded, and dialing patterns shall not change.

Provide automatic trunk connections from K-25, Y-12 and X-10 switch nodes when the Y-12 Site Central Office is incapable of providing access to the SCB Oak Ridge Central Office. These backup trunk connections shall provide access to at least 96 phones selected by DOE at each site.

3.3.9.5 Alternate Routes: Townsite

Provide backup trunk connections from the FB and OSTI to the SCB Oak Ridge Central Office such that if the Inter-site trunk link from the FB or OSTI to the Y-12 Site Central Office is inoperable, dialing patterns shall not change and service for buildings served by the Townsite Site Central Office shall not be degraded. Ninety-six (96) backup trunk connections shall be provided at the OSTI and at the FB locations. Phone locations shall be selectable by DOE.

3.3.9.6 Central Processor Requirements

Redundant central processors shall be provided and operate such that immediate transfer of system control between processors without loss, reduction, or disruption of user services is assured.

The processors shall have automatic reload/restoral capability that can reinitialize the entire control system within 15 minutes of system failure.

3.3.9.7 Backup Power Systems

Provide backup power systems to maintain continuity of service to Central Offices at K-25, X-10, and Y-12 sites, OSTI, and the FB. The backup power system shall maintain service until normal power is restored. There shall be no interruption of service upon automatic transfer to backup power or transfer back to normal power.

Permanent emergency generators shall be provided for the Central Offices at Y-12, K-25, X-10, FB, and OSTI. Space will be provided at the FB adjacent to the switch location. The generator for X-10 shall be located in the basement of 4500-N adjacent to the existing building generator. The generator for OSTI shall be located outside the south wall of the T1 building near the OSTI Central Office location. Generators for Y-12 and K-25 may be located inside or outside the new buildings at the discretion of the Contractor.

If the Contractor's design incorporates the use of a remote hub(s) off the site's CO at X-10, Y-12, or K-25, provide backup power systems to maintain continuity of service for a minimum of four hours to Remote Hub locations. Provide a manual transfer switch and interface equipment for connection of a portable generator if power loss exceeds 4 hours. The Contractor shall provide at least one portable generator at each of the K-25, Y-12, and X-10 sites for use at the Remote Hub locations, if Hubs are utilized.

3.3.9.8 Bypass System for Critical Telephones

Design and install a bypass system to connect critical telephones at each site to the public switched network when the primary route to the Oak Ridge SCB switch is blocked by failure of either the Oak Ridge SCB switch, an ORF-ICN site switch, or, both. Whether activation of the bypass is manual or automatic, it shall be made with the cognizance of the operator at the attendant console in the OICC.

Bypass service shall be provided for the following quantities of critical telephones:

K-25	24
Y-12	24

X-10	24
Townsite	24

The capability shall be provided to test this feature without interrupting normal operations.

3.3.9.9 Backup Control Center

Provide one administrative console and one attendant console in the Oak Ridge National Laboratory (ORNL) Site Central Office for use when the OICC cannot be used. The capability to manually transfer control from Y-12 to ORNL and vice versa from either the OICC or the ORNL consoles shall be provided (see section 3.3.4.5.1).

3.3.10 Communications Equipment Connections

3.3.10.1 Existing Analog Telephones

Where existing cable is used, telephone connections shall be changed as little as possible. Where new cabling is installed, connection shall be in accordance with Detail 1 of drawing D2E-146787.

3.3.10.2 Host Processors

There is one main central computing facility at each site. These facilities are located in Buildings K-1007, 4500-N, and 9103 at the K-25, X-10, and Y-12 sites respectively.

The VDTS shall provide one primary rate interface for connection to an existing Company-owned ISDN/Ethernet gateway at these sites.

3.3.10.3 Data Terminals and Work Stations

Reserved.

3.3.10.4 Special Circuits

There are approximately 400 inter-site special circuits on the Oak Ridge reservation. Half of these special circuits carry signals between the plant sites and half carry signals between a plant site and a Townsite location, or between two Townsite locations. A listing of the inter-site special circuits is included in Appendix 5. Special circuits carrying digital signals between plant sites shall use the Inter-site Trunk fiber lines. Circuits carrying analog, contact closure, or other signals shall use either the Inter-site Trunk fiber lines or other cabling as appropriate.

Connections for special circuits shall be made at a clearly identified demarcation point which designates the interface to Government Furnished Equipment (GFE).

All special circuits passing through the SCB Central Office in Oak Ridge, to connect to a Townsite location, must be approved by DOE.

3.3.10.5 Unclassified System Select Network (Requirement Deleted)

3.3.10.6 Townsite Buildings

The Townsite buildings to be connected are listed in Appendix 2.

3.3.10.7 Reserved

3.3.10.8 Modem Pool

Provide analog dial tone connections to the existing modem pools located at OSTI (quantity 15), in Building 4500-N at X-10 (quantity 40), and in Building K-1007 at K-25 (quantity 24).

3.3.10.9 Outside Connections and Demarcation Requirements

See Section 3.2.

3.3.11 Inter-plant Fiber Optics Transmission System (FOTS)

An Inter-site FOTS shall be provided to interconnect ORF-ICN telecommunications facilities at the three main plant sites and the Federal Office Building. In addition to carrying ORF-ICN traffic, the fiber optics transmission system shall have the capability to add future inter-site Local Area Network (LAN) and data traffic.

A control and monitoring subsystem shall be provided. It shall interact with the VDTS control system to provide dynamic load control and when alternate routing between sites is required.

The plant sites, X-10, K-25, and Y-12 shall be interconnected by the FOTS in a triangle such that each site is directly interconnected to the others in a primary route, and indirectly connected by alternate routes which serve as backup in the event of total failure of the primary transmission path, such as by cutting of the cable bundle.

The FOTS shall be modular to allow the system to be initialized with only the equipment components necessary to meet the transmission requirements at cutover, but can be expanded by the addition of equipment such as line cards or subchassis to the full capability.

The FOTS shall be compatible with Synchronous Optical Network (SONET) standards in accordance with ANSI 204/205-1988, ANSI T1.106-1988, and ANSI T1.105-1991. The FOTS shall be capable of all rates in the SONET hierarchy when the full capability is implemented. At cutover the FOTS shall accommodate:

(a) All ORF-ICN inter-site voice and data traffic, specifically that required by Sections 3.3.1.3 and 3.3.1.4,

(b) SONET transmission rates up to OC-12 (622.08 Mbps), as a minimum,

(c) SONET shall have Operations, Accounting, Maintenance, and Provisioning (OAM&P) functions which support requirements for system operation and control.

The FOTS shall be capable of migration to full SONET functionality by integration and consolidation of equipment and functions with that initially deployed, as future SONET phases build upon phase 1 in the standards bodies. Particularly, the FOTS shall be able to incorporate the user dynamic allocation of switched bandwidth-on-demand functions afforded by the Asynchronous Transfer Mode (ATM) and the consolidation of cross-connect, circuit switching, packet switching, drop-insert, multiplexing functions into SONET-compatible implementation. The capability shall include migration of the deployed equipment with future SONET operation, OAM&P functions as they mature. The Contractor shall show how its FOTS design will migrate to these future SONET functions.

In addition to VDTS inter-site transmissions, the FOTS shall provide an FDDI interface at cutover for trunking of FDDI traffic between sites at X-10, K-25, and Y-12. Interface options at FB will be selected prior to acceptance.

At cutover, the FOTS hardware at each site (K-25, X-10, Y-12, and FB) shall be designed and sized to accommodate the following quantities of data interfaces for DOE use. Activation of these LAN and digital interfaces shall only require the addition of their modular interface.

Type	Quantity
FDDI	2 (100 Mbps)
DS0	24
DS1	10
DS3	1

The FOTS shall interface with the data networks at both their full and subrate speeds of the data network to enable the interface of subrate speeds in the initial phases of system implementation and full rate speeds when the full capability of FOTS is implemented.

The Contractor shall furnish all hardware and software required to implement the FOTS.

3.3.12 Cable Plant Requirements

The cable plant configuration is shown on drawings D2E-145907 and D2E-145866.

3.3.12.1 Current Transmission Facility Systems

DOE currently has a variety of transmission facility systems installed and operating. Intra-building communications needs are primarily served by telephone grade copper pairs owned by DOE, whereas inter-building and inter-site communications are primarily served using SCB leased services.

3.3.12.2 Cable Plant Certification

The cable plant shall be certified to meet the following requirements:

(a) New cabling which connects any new ISDN telephone station to its respective line card shall carry the ISDN Basic Rate Interface (BRI) signals as specified in Section 3, Recommendation I.430 of the CCITT ISDN Recommendation of the Series I, VIIIth

Plenary Assembly, Geneva, with a maximum bit error rate (BER) of 1 in 10E09. This requirement shall apply for new cabling at X-10, Y-12, K-25, FB, OSTI, and other buildings in Townsite as indicated in Appendix 2.

(b) For new copper trunks to service buildings at X-10, Y-12, K-25, FB, OSTI, and Townsite locations, 10% of every intra-site copper trunk shall carry the North American Standard 1.544 Mbps, 24 channel, T1-DS-1 framing format with a maximum BER of 1 in 10E09.

(c) Cabling which provides DOE's "special circuits" shall maintain the current operational capabilities.

(d) All other cabling shall be certified for its intended use.

(e) All new cabling used by the system shall be installed such that plant environmental conditions existing at all points along the cable runs shall cause no cable to be used under any conditions in which the specifications of the cable manufacturer are exceeded. Plant environmental conditions which could cause violation of manufacturer specifications and methods to be used to protect the cabling shall be listed in the Preliminary System Design Report of Section 4.4.1. Considerations shall include:

1. The proximity to steam lines in the vicinity and to the susceptibility of the cable to internal condensation which may result when subjected to temperature differentials along its length. An example is, specification ISS 4, American Telephone and Telegraph (AT&T) 626-020-020 paragraph 6.06 Environmental Considerations for Heat and Steam, when using Western Electric bonded stalpeth pulp insulated cabling, and,

2. The maintenance of pressure and air drying mechanism to manufacturers specification when pressurized cables are used.

Testing will not be required on existing cabling which will not be used.

New cable certification shall include performing any testing recommended by the VDTS original equipment manufacturer and the testing required in accordance with this section and drawing D2E-145865.

3.3.12.2.1 Sampling for Cable Testing

Sampling shall be in accordance with MIL-STD-105 using a General Inspection Level II, double sampling plan.

Lot definition and acceptance quality levels (AQL) shall be as follows:

Item	Lot Definition	AQL
Spare pairs in new trunk cable (test per Section 3.3.12.2.5)	Pairs in a single cable	2.5
New voice cabling (test per Section 3.3.12.2.3)	Pairs serving a single building	2.5

New copper cable on reel (test per Section 3.3.12.2.2)	Pairs in a single cable	1
New fiber cable on reel (test per Section 5.2.4)	Fibers in a single cable	1

Upon rejection of a lot of cabling on the reel, obtain new cable and retest.

Upon rejection of a lot of installed cabling, perform whatever action is necessary to achieve the specified AQL.

3.3.12.2.2 Copper Cable Continuity and Resistance to Shield Testing

Prior to installation and while cable is on the reel and as indicated by Note 1 on drawing D2E-145865, test the continuity of each conductor and the resistance of each conductor to the overall shield. Acceptable results shall be measurements showing both conductors are continuous and that the resistance of each conductor to the overall shield is greater than 100K ohms.

3.3.12.2.3 Copper Cable Signal Testing

After installation of new copper cabling, perform certification testing which shall consist of measuring responses while transmitting test signals over the entire length of the cable.

For new voice cabling (shown as note 2 on drawing D2E-145865), the test signal data rate shall be 192 Kbps. The test signal electrical characteristics shall be in accordance with the CCITT ISDN Recommendations of the Series I, VIIIth Plenary Assembly, Geneva. Acceptance shall be based on a measured bit error rate (BER) of no greater than 1 in 10E09.

Test new voice cabling by transmitting the test signal from the existing phone connector or new communication outlet through all cabling, blocks, patch cords, and other connections to the remote module or main switch line card port.

For new cable carrying digital signals with data rates greater than the ISDN BRI (192 Kbps), the test signal shall be the North American Standard 1.544 Mbps, 24 channel, T1-DS-1 framing format. Acceptance shall be based on a measured bit error rate (BER) of no greater than 1 in 10E09. For new cables which are too long to use a T-1 test signal, an appropriate test signal shall be submitted for DOE approval.

For new cable carrying all other signals, the test signal shall be the same as that for which the cable will be used. Acceptance shall be based on achieving a measured response which is the same as the response needed for proper operation.

3.3.12.2.4 Fiber Cable Testing

All new fiber shall be tested in accordance with the requirements listed in Section 5.2.4.

3.3.12.2.5 Trunk Cabling Certification

Perform the certification test of Section 3.3.12.2.3 for data rates greater than 192 Kbps on all conductor pairs to be certified to the North American Standard 1.544 Mbps data rate. Maintain records of which pairs have passed this test.

Perform the 192 Kbps certification test of Section 3.3.12.2.3 on the spare conductor pairs to be certified to the ISDN BRI using the sampling requirements of Section 3.3.12.2.1.

3.3.12.3 Inter-site Transmission Facilities

Except where otherwise needed for special circuits, all inter-site communications between K-25, Y-12, X-10, and FB shall be provided via new single-mode fiber optic links as shown on drawing D2E-145866 and described in Appendix 6. See Section 5.2.4.2.5 for routing.

The Y-12 to FB fiber optic link shall be a new optical cable along a Contractor-supplied right-of-way. At least 6 pair of fibers shall be provided for DOE use.

Trunk cabling from the selected major node to Townsite buildings (see Appendix 2) may consist of SCB facilities and/or new transmission facilities. Obtain any necessary right-of-ways.

When installing additional inter-site trunk cable to meet Townsite requirements, install at least 30% spares on all new copper cables and sufficient spare optical fibers to meet Contractor's design requirements and reliability requirements of Y/EN-2351 Section 3.3.9. All new cable shall be certified according to Y/EN-2351 Section 3.3.12.2.

3.3.12.4 Intra-site Cabling for VDTS

Wherever it is necessary to add new cable to intra-site trunks (i.e., cabling between the site main distribution frame [MDF] and the service buildings, cabling between the site MDF and remote switching hubs, or cabling between remote switching hubs and the service buildings), install at least 30% spares on all new copper cables and sufficient spare optical fibers to meet Contractor's design requirements and reliability requirements of Y/EN-2351 Section 3.3.9. All new copper cable shall be certified according to Y/EN-2351 Section 3.3.12.2.

3.3.12.5 Space and Power for Fiber Networks

At K-25, Y-12, and X-10, provide additional floor space for 5 standard 24" rack panel cabinets 36" deep by 84" high at site central offices. This floor space shall be reserved for DOE unclassified fiber optic network equipment. The Contractor shall notify DOE in the Preliminary Systems Design Report if designated areas listed in Appendix 3 are insufficient for these space requirements.

Cabinet space shall include 3 feet minimum of maintenance access space at the front and rear of each cabinet. Cabinets shall be placed to allow easy access to FOTS.

At K-25, Y-12, and X-10, provide three 30 amp, 120 VAC breakers for DOE use at the site central offices.

Additional details about intra-site fiber cabling requirements are included in Appendix 6 and Section 5.2.4.

3.3.12.6 Service Building Cabling

For each building, provide for DOE approval what actions need to be performed on the building's MCR and inter-building special circuits end-to-end. Document these in the final System Design Report.

Service building cabling and equipment shall be in accordance with drawing D2E-146787 unless approved otherwise by DOE.

Buildings containing complete and partial DOE Standard Wiring Plan (SWP) are listed in Appendix 13.

3.3.12.7 Special Circuit Cabling

Cabling for special circuits (excluding intra-building special circuits) shall be designed and installed to meet the requirements for special circuits stated in Section 3.3.10.4.

3.3.12.8 Separation from Classified Networks

DOE has clearly marked communication networks that carry classified data (classified networks).

New copper cabling inside buildings shall be separated from these networks by at least 2 inches.

New copper cabling outside buildings shall be separated from these networks by at least 12 inches.

New fiber cabling shall be separated from these networks by at least 2 inches.

ORF-ICN electronic equipment must be separated from equipment cabinets housing classified network equipment and devices connected to classified networks by at least 3 feet.

3.3.12.9 Cable Records

All cable records shall be maintained by the Contractor. Access to the information in these records necessary to meet the requirements of the TMS specification (K/CSD/INF-8822) shall be provided.

Cable records for new installation shall consist of information detailing all trunk and riser cables, fiber optic cables, station and data drop cables, splices, cross-connects, patch cords, terminal blocks, remote modules, main switches, special circuit modems, communications outlets, and other cable components by cable number and pair number. (Engineering drawings describing the new cable plant up to the MCR demarcation blocks shall be provided in accordance with Section 5.2.4.1.1.)

Existing intra-building cabling records are presently maintained in log books located in Standard Wiring Plan (SWP) wiring closets. In non-SWP wiring closets, voice circuits are identified on the covers of the RJ blocks and data circuits are identified either by hanging yellow tags or a log book. The Contractor shall continue to maintain the SWP information in the log books, and

provide a new log book in the non-SWP wiring closets. This information shall be verified for accuracy and completeness during site survey and transferred to the Contractor's cable management system. Procedures shall be put in place by the Contractor to ensure that these records are kept up-to-date following the site survey.

A cable numbering system shall be recommended by the Contractor and approved by DOE following award and prior to commencement of the site survey. If the existing cabling records cannot be incorporated into the proposed numbering system, alternative methods for maintaining this data until the buildings are rewired and/or re-labeled shall be proposed to DOE for approval as part of the numbering plan.

3.3.12.10 Cabling Equipment

All cable, wire, and associated hardware installed shall be in accordance with equipment manufacturer's recommendations and accepted industry standards, unless otherwise specified. Establish a standard manufacturer and part number for any particular type of hardware that will be used in more than a single instance.

The distribution frames that terminate the copper cable shall be on an open metal frame, high density termination design, such as that found in a local telephone company central office. These frames shall be equipped with test jack assemblies and test shoes. Supply all patch and test cords necessary for complete and fully-equipped operation of the distribution frames.

Minimum requirements for cabling are as follows:

Drop Cable

Voice drop cable shall be in accordance with Company specification DS-EE-6359-1.

Data drop cable shall be in accordance with Company specification DS-EE-6359-2.

Inter-building Copper Cable

All cable shall meet Rural Electrification Administration (REA) specifications PE-39 or PE-89. The cable stub shall be in compliance with REA PE-87. It shall be flame resistant and shall not be gel-filled. Stub cable shall be used to terminate a gel-filled cable into a terminal block or distribution frame.

Fiber Optic Cable

Intra-site and inter-site fiber optic cabling specifications are included in Appendix 6.

3.3.13 Environmental Requirements

The ORF-ICN shall meet the requirements of this specification when operating in an environment of:

Temperature	40° F to 120° F
Humidity	95% Noncondensing

3.4 SITE PREPARATION AND FIELD CONSTRUCTION

All construction activities shall be performed in accordance with Section 5.

Construction shall be provided for the following:

(a) Site central office facilities at K-25, X-10, Y-12, OSTI, and FB

(b) A control center (OICC) at the Y-12 Site Central Office

(c) A Company office area at the Y-12 Site Central Office

(d) An inter-plant trunk connecting the site central offices

(e) Remote module hub facilities where needed to support the system design

(f) Facilities to house demarcation equipment up to the MCR where needed

(g) MCR renovations in service buildings as needed

(h) Outside cable plant up to the MCR demarcation point, the inter-building special circuits end-to-end, and their associated facilities as needed.

(i) Facilities to house backup power equipment

(j) Shops, maintenance, storage, or other facilities needed to provide system operation in accordance with this specification.

(k) Construction as needed to support the outside cable plant for Townsite service buildings as listed in Appendix 2.

Acceptable locations and appropriate engineering data for these facilities are listed in Appendix 3. Unless otherwise approved by DOE, only these sites shall be used. Site central office locations are adjacent to the existing central office cable equipment at K-25, X-10, and Y-12. Requirements for DOE space at the Y-12 Site Central Office are listed in Appendix 7.

Site central offices shall be provided at K-25, X-10, Y-12, OSTI, and the FB in Oak Ridge. Remote module hubs shall be provided as necessary to support the system design.

The Contractor shall construct these facilities and provide all needed service extensions from existing DOE power, steam, chilled water, potable water, fire water, sewer, and other systems. The Company will make final tie-ins to existing systems. Drawings showing existing utility systems are listed in Appendix 1, Section 4. Connection to DOE fire alarm, public

address, and other alarm and control systems shall be as stated in Sections 3.3.4.2 and 5.2.4.5.

3.5 INSTALLATION

Plan for and provide all office space requirements for all phases of installation. Land for temporary offices for managers, engineers, and clerical people is available at the Y-12 site. Arrangements to use this land will have to be approved by and coordinated with DOE.

3.5.1 Pre-Installation Activities

Identify all key individuals associated with installation and indicate their responsibilities These individuals shall be responsible for the coordination and timing of the shipment and delivery of equipment to be installed. Pre-installation activities include ensuring that all buildings and existing equipment are ready for installation, all external circuits necessary to implement the ORF-ICN have been reserved from commercial carriers, and all equipment to be installed has been delivered and is accounted for. The following subsections explain these activities in greater detail.

3.5.1.1 Coordination With Commercial Carriers

Following approval by DOE, coordinate with commercial carriers to provide external circuits required to implement the ORF-ICN. If any existing circuits are made unnecessary by the ORF-ICN, coordinate their removal from service.

3.5.1.2 Installation of New Facilities and Services

Install new and reterminate all existing commercial facilities and services. This responsibility includes placing of the order, negotiating for service, verifying, testing and accepting of facilities, and connection of facilities to ORF-ICN components.

3.5.1.3 Removal of Old Facilities

Provide a listing of all cabling and equipment no longer to be used after cutover. DOE will determine what action shall be taken with respect to removal, abandon in place, or reuse by DOE of this equipment. All disconnected cable and equipment shall be left in place for at least 24 hours in order to enable prompt restoration of any lost services including those covered in section 3.5.1.4. Dispose of equipment which must be removed in order to install VDTS equipment as specified in Section 5.1.6.12. DOE will take any needed action on equipment abandoned in place.

Cabling abandoned in place shall be marked as such at both ends.

3.5.1.4 Unknown Special Circuits

There are existing Inter-building special circuits for which the end points are known and routing is unknown.

Cutover of known voice and special circuits may also affect these unknown special circuits. Each increment of work shall be coordinated with DOE and SCB in order to provide time to allow loss of services provided by the circuits to become known. The work shall be performed in a structured manner so that any disconnected special circuits can be reconnected in one hour. The reason for loss of service shall be determined and corrected prior to another cutover attempt.

3.5.1.5 Equipment Shipping and Handling

Provide off-site warehouse space to ensure proper storage of equipment. Provide all equipment handling activities on site, to include loading, unloading, packing, unpacking, inventory control, inspection, and security.

All components shall be packaged such that they are not damaged prior to installation. All off-the-shelf components shall be delivered in original manufacturers' containers.

3.5.2 Installation Activities

3.5.2.1 Equipment Installation

The installation of all equipment shall be completed without interruption of existing services.

Installation activities shall include the arrangement of voice switching components and termination blocks, the local storage of phone sets for distribution at cutover, coordination with the installation of and interface to transmission facilities, and the organization and labeling of cabling.

3.5.2.2 Transmission Facilities Installation

The installation of all transmission facilities required to support the ORF-ICN shall be provided. This effort shall be completed without interruption of service provided by existing transmission facilities during normal working hours, 7 a.m. to 5 p.m. weekdays. The Contractor shall submit to DOE for approval a schedule of affected areas at least 48 hours prior to the interruption of services.

3.5.3 Post-Installation Activities

Compile all "as-installed" drawings and cable plans, facilities records and equipment inventories, engineering documentation, and records of all installation activities.

Perform any necessary phone set surveys, etc. to provide users equivalent phone features at cutover as they have before cutover. The ESSX database is available to assist in this effort.

As installation is completed at each site, restore the original appearance to all premises disturbed during installation.

3.5.4 EMI/RFI Grounding

Ground equipment in a manner consistent with the ground used for the testing or verification of Section 3.3.6 and in accordance with Section 5.2.4.

3.6 CUTOVER

Cutover shall not begin until the training of Sections 3.7.1 and 3.7.2 has been completed, all documentation is complete, and all VDTS data base(s) are complete and accurate. Provide complete cutover of the ORF-ICN from existing systems.

Cutover shall occur such that no weekday 7 a.m. to 5 p.m. service is interrupted.

Cutover activities shall be performed at a time mutually agreed upon between DOE and the Contractor.

Any needed temporary tie lines shall be installed between the current systems and the ORF-ICN to maintain effective connectivity between all users. Also coordinate all installation of Common Carrier-provided trunks.

Ensure that all transmission facilities are cutover in time to support the communications requirements of the ORF-ICN. Install and test needed new inter-site, intra-site/inter-building, and intra-building facilities while existing facilities are still in use. Where existing facilities are to be used, cutover shall be coordinated with DOE and SCB to ensure minimum disruption of service.

There are some telephones that provide critical communications. Cutover of these telephones shall be coordinated with DOE representatives and be performed such that service is lost for less than 5 minutes per phone.

Do not deactivate existing cable until installation and testing of replacement cable is complete.

When transferring users from the existing system to the VDTS, provide each user with equivalent service at the time of cutover.

VDTS data bases shall be made available for DOE review prior to the pre-cutover test of Section 4.5.4.

Throughout pre-cutover testing and cutover, provide on-site personnel who have received sufficient training from the VDTS and FOTS original equipment manufacturer to operate, maintain, and troubleshoot the VDTS and FOTS.

After cutover, verify dial tone at each station. Place a call on phones randomly selected per MIL-STD-105 using General Inspection Level II, double sampling plan.

3.7 TRAINING

3.7.1 System Orientation and General User Training

Provide on-site training for up to 10 DOE/Company personnel on system orientation and features six months prior to cutover. The training provided shall be sufficiently detailed to provide necessary skills for these employees to be used as instructors for providing General User Training to the user community at the sites. The class shall provide training material and documentation. If the installation of the switch schedule permits, hands-on training should be incorporated into the class.

Provide a General User handbook for the DOE/Company use in training the user community. Provide a Right-to-Copy license to the DOE/Company to reproduce this manual for information and training purposes. The handbook shall be provided in electronic format. Provide handbook in both IBM WordPerfect for Windows (latest version) and Word for Macintosh (latest version) formats. Distribution shall be on CD ROM or 3.5 inch disk media.

Three months prior to cutover, 8 analog lines and 2 ISDN BRI lines shall be installed at a Company designated training location. This location will be used by DOE/Company personnel for end-user training. The Company will provide required station terminals.

3.7.2 Specialized Training

Provide description of available specialized training for Company's staff. The training shall consist of the manufacturer's approved training and shall cover administration, engineering, software, installation, and maintenance of all components of the ORF-ICN. The description shall include the course schedule, duration, and per-student cost.

3.7.3 Ongoing Training

Provide training and documentation updates as needed throughout the term of the contract to keep the Company personnel trained on System Orientation and General User Training up to date on new features, functions, maintenance, and other system changes.

3.7.4 Software Training

Provide a description of software training courses available for attendance by Company personnel. The description shall include the course schedule, duration, and per-student cost.

3.8 OPERATION AND MAINTENANCE

Unless otherwise specified, all requirements in this section apply to activities occurring after cutover.

3.8.1 Equipment and Services

All equipment, cabling, installation, construction, and other materials and services provided shall be in accordance with the requirements of this specification.

Refurbished equipment, such as telephones previously in use at other OORTS locations, shall be used in lieu of newly purchased equipment as long as the equipment meets the requirements of this specification.

Operation shall include provision for continued service in case of either Contractor or Company labor problems.

Monitor blocking and traffic load patterns, monitor changes in system and station feature assignments and usage, provide switch engineering services to determine what hardware and/or software changes should be made to provide service in accordance with this specification, or to minimize cost to DOE, and recommend to DOE what hardware, administrative, trunk line, and other changes should be made.

Provide operation and maintenance of equipment as shown on drawing D2E-145865.

3.8.2 General Requirements

Provide all maintenance and repair of all supplied materials, equipment, and software for the duration of the contract. This responsibility shall apply to any maintenance or repair required due to whatever reason. Supply all coordination, labor, hardware, equipment, and tools necessary to properly repair and maintain the ORF-ICN equipment.

Cost of building maintenance and utilities at K-25, X-10, and Y-12 shall be provided by DOE.

All construction activities required for operation, maintenance, or RIMD activities shall be performed in accordance with Section 5.

3.8.2.1 General Staffing Requirements

Assign a full-time Program Manager who has the complete authority to act in all related matters. This manager shall act as the primary point of contact between the Contractor and DOE and shall be located on-site.

Provide a dedicated on-site work force to perform all operating and maintenance services. This dedicated work force shall work exclusively on the ORF-ICN. Provice backup support and technical assistance for the proposed on-site work force on a priority basis, in the event that the on-site staff is unable to meet the current demands.

Any proposed changes to the on-site staff shall be subject to DOE review and approval.

If the Contractor experiences temporary shortages of manpower, DOE shall be provided straight time hours equivalent to a full workforce complement. DOE shall not be required to request overtime rate service to maintain schedules that a full complement of manpower would otherwise be able to maintain.

3.8.2.2 Design Assistance

Provide design assistance capability via access to technical resources and personnel on a priority basis whenever conditions or projects arise that are beyond the capability of on-site personnel.

The design assistance staff may be required to make site or field visits to plan and implement assigned projects.

Technical resource personnel shall have completed certified training by the VDTS original equipment manufacturer and shall have access to VDTS original equipment manufacturer technical personnel.

3.8.2.3 VDTS Staffing

Provide personnel experienced in the various equipment composing the ORF-ICN. Provide all personnel required to operate and maintain the ORF-ICN 24 hours a day, year round.

Personnel shall be trained by the original equipment manufacturer as a minimum.

Attendant console operators shall be provided by the Contractor. Duties and responsibilities are specified in Appendix 10.

3.8.3 Relocation, Installation, Modification, Disconnection, Maintenance and Repair (RIMD M/R)

At the award of the contract, provide services per the Statement of Work (Supplement) (SW-TNS-001). After cutover of the ORF-ICN, provide equivalent RIMD M/R service for all existing equipment, all miscellaneous equipment described in Appendix 8 of this specification, and the equipment shown as the Contractor's responsibility on drawing D2E-145865.

See Appendix 9 for historical information concerning RIMD activities.

In addition to RIMD services described, provide cable additions, cable rerouting, and cable rearrangements, and/or replacement as needed.

Provide a lead role in planning and coordinating RIMD M/R services during cutover and describe how RIMD M/R services will be coordinated with DOE and Company personnel and SCB in the Cutover Plan of Section 4.4.3.4. Identify responsibilities and actions to be taken for all organizations and personnel.

Describe how RIMD M/R services after cutover will be coordinated between the Contractor and DOE in the Operations and Maintenance Plan of Section 4.4.3.5. This plan shall provide for equivalent service as defined in the Statement of Work #SW-TNS-001. Identify responsibilities and actions for all organizations and personnel. After DOE approval, the Operations and Maintenance Plan shall serve as the day-to-day working agreement between the Contractor and the Company.

3.8.3.1 General

Perform all RIMD M/R activities as required by service orders or trouble tickets received throughout the term of the contract. Details of service orders which are non-routine, high-cost, and/or require special equipment and greater manpower will be documented and provided to the Contractor outside the normal service order or trouble ticket channels. Jobs of this nature include cable additions, cable rerouting, cable rearrangements, and/or replacement as needed to meet changing service requirements.

The Company's normal business hours are 8:00 a.m. to 5:00 p.m. Monday through Friday excluding holidays observed by the DOE/Company. It is expected that the Contractor will perform RIMD activities during normal work hours. The Contractor shall also provide RIMD coverage from 6:00 a.m. to 10:00 p.m. Sunday through Saturday, without incurring overtime, provided DOE notifies the Contractor by Thursday of the preceding week.

RIMD service may be performed outside the Company's normal business hours for the Contractor's convenience without additional charge. However, all work outside the Company's normal business hours shall be approved by DOE/Company in advance.

Perform only RIMD M/R work directed by service orders unless changes are coordinated and agreed to by DOE. Changes in the field, other than required for ORF-ICN maintenance, without concurrence from DOE shall not be permitted.

The Contractor shall perform RIMD in a manner to minimize completion time of each TWR. Due dates will be assigned at the time the Contractor receives the TWR. Generally, TWRs shall be completed within three days based on the monthly average of TWRs performed that month. No TWR shall require more than five days to complete without prior DOE/Company approval. Expedited TWRs may be requested and shall be completed within the due date requested.

DOE has the right to inspect and test all equipment and services provided or performed as part of RIMD M/R activity. DOE will perform inspections and tests in a manner that will not unduly delay the work.

Provide all necessary equipment and tools such as trucks and ladders to satisfy RIMD M/R services.

Each telephone instrument shall be provided with a minimum ten-foot mounting cord equipped with connectors.

3.8.3.2 Equipment Installation

Provide material items such as straps, staples, screws, and other incidental hardware.

Inspect all equipment before installation and test prior to placing into service to ensure physical and functional conformance to the manufacturer's specifications and after placing into service to ensure proper performance.

Inform DOE in writing of any special site preparation activities that must be accomplished before an installation activity can be initiated. Any site preparation required for proper equipment operation such as commercial power, grounding, conduits, or environmental requirements will be coordinated through DOE. DOE will provide tie-in to existing systems at the K-25, X-10, and Y-12 Sites.

Inform DOE whenever installation activities will result in degradation of service.

Use of DOE owned and/or controlled excess distribution facilities upon verification of the usable condition of the facilities is acceptable. This includes reuse of DOE owned/controlled duct, cable trays, and building and station cabling. Use of any DOE-proviced facilities or reuse of

cable shall not relieve the Contractor of responsibility for the performance requirements of this specification.

3.8.3.3 Wiring/Cabling and Assignment Requirements

Responsibility for wiring and cabling begins at the demarcation point as designated by DOE and other common carriers. In those instances where a demarcation point has not been established or is questioned, work with the appropriate organizations to establish the demarcation point.

All wiring or cable work shall include materials and the necessary supporting electrical protection, grounding and terminating hardware, equipment, backboards and tools, necessary to provide full operational service.

3.8.3.4 Removal Requirements

Except as needed for maintenance, equipment shall not be removed unless authorized by a Company service order or trouble ticket. Removal shall include all labor, tools, and incidental parts or materials necessary to remove equipment, cabling, or other items from a location specified by the Service Order or to correct problems reported on a trouble ticket.

Equipment removals shall not adversely affect other equipment and services.

A tag shall be applied to removed equipment that identifies its physical and operational condition.

Removed items which are reusable shall be fully inventoried and stored by the Contractor at a location provided by the Contractor. DOE will provide on-site space at each site as a staging area to temporarily store equipment in transit between the field and the permanent storage location(s). These staging areas will also be used to collect equipment for bulk contamination checks before removal from a particular site.

Any equipment removed from use is subject to the Company's special health physics inspection procedures prior to removal and reuse. These inspections will be performed by Company personnel. Provide coordination with Company personnel such that these procedures are properly executed.

Prior to performing work, notify the Company of any work required to surrounding facilities or equipment as a result of equipment removal. Take sufficient precautionary measures to ensure that no disturbance is made to the surrounding facilities. If restoration work results from the negligence or improper job performance, as judged by DOE, the DOE may require rework outside the Company's normal business hours at no additional cost to the DOE.

3.8.4 Maintenance

Provide all required labor and materials and arrangements with original equipment manufacturer to supply preventive and corrective maintenance services (including software) specified in this section and to maintain operation in accordance with this specification.

All system upgraces and system maintenance must be performed in a manner that shall not interfere with system operation during the standard work period or during other work periods

specified by DOE under special circumstances. DOE shall be notified prior to performing any maintenance activity which will cause degradation of service at any time. Describe the work to be performed, the degradation to be caused, and the expected time duration.

Maintain all hardware and software at the most current revision level. All Engineering Change Notices (ECNs) and other revision information shall be provided to DOE for review.

Maintenance shall be divided into four categories: Preventive, Routine Corrective, Urgent Corrective, and Emergency Corrective. Response time for each maintenance category are listed below. Completion of each repair shall be reported by telephone call to the appropriate Company trouble desk within 1 hour of repair completion. All completed trouble tickets and any Contractor generated records of maintenance activities shall be returned to the Company's TNSD organization within 24 hours of repair completion.

3.8.4.1 Preventive Maintenance (PM)

Preventive maintenance is that which is performed to prevent a failure from occurring or to reduce the impact of a failure. As a minimum, preventive maintenance shall address all items recommended by the original equipment manufacturer. Examples of preventive maintenance are:

- Checking battery cables for corrosion
- Checking level and condition of wet cell batteries
- Cleaning and adjustment of contacts on relays
- Checking trunks
- Checking critical components (on-line maintenance tests)
- Checking and cycling of backup systems (Central Processing Unit [CPU], power)

For each item, maintain records of the maintenance frequency, the date the maintenance was last performed, and any performance comments. Review preventive maintenance actions and modify them as necessary to provide operation in accordance with this specification.

3.8.4.2 Routine Corrective Maintenance (RCM)

RCM is defined as maintenance required to restore any failure that affects 24 or fewer lines or stations.

The response time shall be no more that 1 hour during any regular work day between the hours of 7:30 a.m. and 4 p.m. After these hours and on weekends and holidays, the response time shall be no later than 9 a.m. on the next regular work day.

When an RCM repair activity cannot be completed within the specified response time with the availability specified in Section 3.3.9.1, it shall be automatically upgraded to the Urgent Corrective Maintenance (UCM) category unless otherwise authorized by DOE.

Review routine corrective maintenance actions for trends and take actions necessary to prevent recccurring failures from causing operation not in accordance with this specification.

3.8.4.3 Urgent Corrective Maintenance (UCM)

UCM is defined as maintenance required to restore any failure affecting 25 to 100 lines or stations or complete loss of service to any Townsite building. All UCM activities shall continue until the malfunction is cleared unless otherwise directed by DOE.

Response time shall be no more than 1 hour.

When a UCM activity cannot be completed within the specified response time with the availability specified in Section 3.3.9.1, it shall be automatically upgraded to the ECM category unless otherwise authorized by DOE.

Review urgent corrective maintenance actions for trends and take actions necessary to prevent recurring failures from causing operation not in accordance with this specification.

3.8.4.4 Emergency Corrective Maintenance (ECM)

ECM is defined as maintenance required to restore any failure affecting 101 or more lines, recover from a catastrophic failure as defined in Section 3.3.9.1, or to restore any line or service as follows:

(a) Equipment serving any site or DOE Emergency Operations Center or Guard Headquarters operations.

(b) Attendant positions and circuits serving radio paging systems or other public address or paging systems.

(c) 911 service.

(e) Seventy-five lines and systems serving key management personnel. These lines and systems will be identified after award of contract by DOE.

(f) Service outages designated on an ad hoc basis. Presently, approximately 10 calls for ECM are made each month.

All maintenance resources shall be focused on ECM activities, and restoration efforts shall be around the clock until the malfunction is corrected unless otherwise directed by DOE.

Response time shall be no more than 1 hour.

3.8.4.5 Software Maintenance

Provide maintenance service for all software products required by this specification. The software maintenance service shall provide software updates and software documentation updates, patches to resolve known problems, and telephone support as a minimum. If more than one copy of any software product is needed, the additional copies shall be provided with right-to-copy licenses and corresponding maintenance service.

Provide maintenance within the principal time period of 7:30 a.m. to 4 p.m. Monday through Friday with a maximum response time of 45 minutes.

Provide on call off-shift software maintenance support with maximum response time of four hours.

Any subcontract for maintenance of the system software shall require prior approval by DOE.

3.8.5 Diagnostics

Provide diagnostic programs to check the operation of both hardware and software. System exercisers shall be provided to test general purpose software and compare results with known answers and shall log all discrepancies. These exercisers shall run while normal operations proceed. Hardware diagnostic programs shall be provided to perform stand-alone checks of peripheral functions and to isolate faults to the malfunctioning component.

Provide a full set of off-line diagnostics and trained technicians to use it. These diagnostics shall fully exercise hardware and software functions and isolate faults down to the board, software module, peripherals (terminals and printers), or the lowest line replacement unit (LRU).

3.8.6 Logistics Support

Provide a materials management function to include ordering, shipping, receiving, and inventory management of the equipment and spare parts required to operate and maintain ORF-ICN on a daily basis.

Replacement parts shall be new, original manufacturer's parts.

Stock sufficient equipment and materials to maintain operation and performance in accordance with this specification.

Except for where the Contractor is the original manufacturer, minimize the use of equipment for which there is less than two suppliers.

Develop and maintain throughout the term of the contract a list of all sole-source material and equipment items, their source of supply, and their delivery times after receipt of an order.

Obtain written sourcing agreements from all sole source contractors or suppliers who provide hardware or software.

3.8.6.1 Supply Times

Provide spare parts for the ORF-ICN which will support the response times specified herein. During normal conditions, provide spare parts on-site within 14 days of their requisition. Under priority conditions, the spare parts shall be provided on-site within 72 hours of their requisition. A priority condition is defined as a situation where the number of on-site spares of a given part has dropped below its recommended spare level. Under emergency conditions, ship the spare part(s) to DOE site(s) within 24 hours of their requisition. An emergency condition is defined as a situation where a failure has occurred, and the spare parts required to correct the failure are not available on-site.

3.8.6.2 Transportation

Provide shipment of spares to the site and defective parts from the site. Exact intra-site locations of shipments shall be agreed upon with DOE. In addition, provide for the shipment of necessary equipment both to and from the site. This transportation responsibility shall include provisions for overnight delivery. Pre-addressed shipping containers shall be provided to the site and shall be constructed in such a way as to minimize any possible damage to equipment.

3.8.6.3 Equipment Handling

Provide for handling of all ORF-ICN equipment including loading, unloading, packing, unpacking, inventory, inspection, and security.

3.8.6.4 Parts Storage

Provide storage of all equipment and spare parts. Provide a list of spare parts with recommendations as to which parts will be stored off-site and which parts should be stored on-site. Once it has been determined which parts shall be stored on-site, provide and replenish the quantity of spare parts required to maintain the appropriate stock level.

3.8.6.5 Protection of DOE Property

Provide appropriate protection and care of DOE property to prevent damage, loss, or theft. Report in writing to DOE all pertinent information relating to each instance of damage to DOE property. If DOE elects to conduct an investigation of the accident, cooperate fully and assist DOE until the investigation is complete.

3.8.7 Billing

See Request for Proposal for details.

3.8.8 Reports

Monthly reports shall be provided and shall include:

(a) Status of open TWRs and summary of service orders completed during the month. Summary shall include at a minimum the number of RIMD jobs, M/R jobs, pulls, and refurbishments along with any overtime associated with each category.

(b) Corrective maintenance statistics report containing type of trouble, repair time, and the average time from initial indication of a problem to the delivery of a completed trouble ticket to the Company's TNSD organization for RCM, UCM, and ECM maintenance activities.

(c) Network loading and traffic data.

(d) System availability as defined in Section 3.3.9.1.

(e) Preventive maintenance actions.

(f) Itemized list of refurbished and new equipment in stock.

3.8.9 Performance Reviews

DOE shall evaluate the Contractor's performance on a quarterly basis. Formal performance reviews shall be conducted between DOE and the Contractor's on-site program manager and staff.

Track and report on all DOE-identified performance deficiencies until they are corrected. All action items shall be recorded and addressed at subsequent meetings until the action item is closed.

Propose performance review procedures such that DOE can track actual performance versus planned performance for all aspects of operation. In so doing, include sample reports that will be used to record performance data. Performance evaluation shall include the following major areas:

(a) The average time from initial indication of a problem to the delivery of a completed trouble ticket to the Company's TNSD organization, system availability, and outstanding service orders.

(b) Switch engineering services provided to maintain acceptable service as traffic load patterns change.

(c) Switch engineering services provided to resolve problems with bandwidth utilization and capacity.

4.0 QUALITY ASSURANCE

4.1 QUALITY ASSURANCE PROGRAM PLAN

This plan shall describe the program to be used for ensuring quality of performance on activities required by this specification including design, manufacture, acceptance, shipping, project management, construction, installation, cutover, operation, maintenance, repair, and service.

The plan shall describe the Quality organization which is responsible for all quality activities and show how it will execute responsibilities for ensuring inspections and tests are performed and that documentation is performed in accordance with this specification.

The quality program used shall include the following features:

(a) The Contractor's Quality Assurance (QA) organization which is independent of the design and manufacturing organizations.

(b) All inspection and test reports certified by the QA organization.

4.2 PROJECT MANAGEMENT

Upon award of the contract, DOE will designate the interfaces with the Contractor's project management for total administration of the project.

Unless otherwise specified, the requirements of this section apply only to activities up to and including cutover.

For activities through acceptance, designate an overall project manager; an Environmental Officer (per Section 5.1.3.9.1 (b)); and a separate site supervisor for each of the sites--K-25, X-10, Y-12, and Townsite as a minimum. These personnel shall be located on-site and shall be dedicated full-time to this project.

Following acceptance, RIMD and construction activities requiring Health Physics and/or Industrial Hygiene support will be provided by the DOE/Company.

Provide resumes for the designated personnel. Changing the overall project manager or the site managers shall require DOE approval.

All personnel performing project management, design, installation, construction, or other activities needing access to DOE facilities shall be subject to the administrative security requirements in Section 5.3.

The project management team shall meet with DOE's team at least monthly to coordinate task efforts and ensure the successful completion of all tasks. The purpose of these meetings is to provide continuing confidence that project activities are proceeding according to plan or deviations from plans are being identified, discussed, and resolved.

Provide monthly reports to be used in preparation for the monthly review meetings. Describe all activities scheduled for the following month. Indicate progress with respect to the overall project schedule. Identify problem areas encountered and action items needed.

4.3 DESIGN REVIEW

System approval shall consist of written DOE approval of the Final System Design Report described in Section 4.4.1.

Facilities construction design approval shall be in accordance with Section 5.2.1.4.2.

4.4 DOCUMENTATION

Provide documentation for DOE information, review, approval, or certification as prescribed by Section 4.4.12 and 4.4.13 of this specification. Once the documentation is accepted by DOE, it shall be used unless revisions are submitted and approved by DOE via formal revision, resubmittal, and reacceptance by DOE.

The Preliminary System Design Report shall nclude descriptions addressing Section 4.4.1 Items 1 through 7, 9 through 14, 16, 20, 21, 22, 25, 26, 27, 31, and 32. All other preliminary documents required by Section 4.4.12 shall address each item discussed in the referenced section of the specification to the extent possible without detail site inspections.

These preliminary documents are expected to be the basis for final documents submitted for DOE approval after contract award.

4.4.1 System Design Report

The System Design Report (SDR) shall consist of text and system diagram drawings similar to drawings D2E-145866, D2E-145865, and D2E-145907.

All assumptions used in designing and sizing the facilities supporting the VDTS (including FOTS) shall be explicitly stated.

The document shall identify and describe the following:

(1) The interconnection and operation of all VDTS (including FOTS) equipment.

(2) All cabling needed for interconnection of VDTS (including FOTS) equipment.

(3) Cabling, equipment, and connection methods to be used for special circuits.

(4) Cabling and equipment needed for connection to the Company's Modem pool.

(5) Cabling and equipment needed for connection to the outside exchanges of Section 3.2.1, the TMS, and the monitoring console.

(6) Location, manufacturer, and model number of all VDTS equipment (including cable connection and input/output boards).

(7) Equipment room, storage area, shops office areas, and other needed space locations and requirements for floor space; power; grounding; and heating, ventilating, and air conditioning for each.

(8) Location, manufacturer, and model number of all cable plant equipment such as amplifiers, repeaters, power supplies, lightning arrestors, patch panels, termination blocks, etc.

(9) Processors and peripheral equipment needed for the VDTS control system including model number and manufacturer.

(10) Any redundant processors, backup cabling systems, battery backup power supplies, Uninterruptable Power Supplies (UPS), or other provisions necessary to meet the specified requirements. Specify size, type, hour rating, location, and other pertinent parameters.

(11) Connection method of all control consoles, attendant consoles, and any other system control equipment.

(12) Cabling and connection design (including power) for digital telephones.

(13) VDTS management and control features such as equipment failure alarms, system usage statistics, remote reset capabilities, status monitoring, graphic displays provided, and method for making moves and changes.

(14) Identification of any existing software documentation and what, if any, structured design system was used for development. Identification of any custom software or modifications to off-the-shelf software which must be developed for the VDTS.

(15) Grounding methods to be used for cable, chassis, shield, enclosures, and other equipment grounds. Specify where single copper conductor, braid straps, or other grounding methods will be used.

(16) Identification of all existing and/or planned hardware, software, maintenance, user, and operation manuals and indicate the status of each. Identification of any manuals which must be generated for the VDTS.

(17) Distribution and routing of all cabling external to buildings.

(18) Reconnection, tie in, or other methods for using the intra-building telephone cabling and how this cabling will be documented.

(19) Connection and/or termination methods to be used for all fiber, twisted pair, or other cabling.

(20) The configuration, termination methods, equipment used, and signaling speeds used on inter-site trunk fiber optic cabling. Describe data and voice interface, available expansion capabilities, data interfaces available, protocol used at each layer, and redundancy features.

(21) The number of additional telephone and/or data connections which can be added to each central office switch and/or remote modules without upgrading equipment beyond adding equipment cabinets, card cages, and line cards.

(22) Analyses which state the technical basis for the following:

Grade of service provided for all functions,
Processor capacity and utilization, and
System memory capacity and expansion capacity.

(23) Any alternative designs meeting security cabling requirements listed in Section 3.3.5.

(24) Itemized list of any test fixtures, tools, and test equipment required for system maintenance.

(25) List of any proprietary software and required licensing agreements.

(26) Diagnostic programs to be provided.

(27) A listing of alarms that will be displayed and/or printed out at the OICC and any operator messages provided.

(28) The configuration control methods for VDTS software. Methods used to verify, deliver, and install software changes and methods used to update structured documentation.

(29) Cabling design to be used for service buildings including communication outlets, termination blocks, wiring closet layout, cable and termination block labeling,

method of grounding spare conductors and shields, and other pertinent details. (See Section 3.3.12.6.)

(30) The Contractor's plan for providing CDR data and for assuring CDR data are not lost. (See Section 3.2.3.2.)

(31) Trunk configuration meeting Section 3.2.

(32) A synchronization plan which details network synchronization methods used.

(33) Applicable design procedures, practices, and standards to be used for design of manholes and confined working spaces.

4.4.2 Overall Project Plan and Schedule

Develop an overall project plan that identifies appropriate design, installation, construction, testing, cutover, and other tasks. The overall plan shall include an overall project schedule to be used to coordinate the individual task schedules. Describe the level of effort in man-months and the structure of task teams required to adhere to the proposed schedule. The planning software shall export OPEN PLAN file formats. Provide an organization chart showing the relationship of all task teams and the project management team. The overall schedule shall also note dates of the monthly project reviews. Include a list of any subcontractors (other than construction subcontractors) that will be used.

4.4.3 Task Plans

For each task identify all of the requirements of that task and formulate a task plan outlining the intended methodology for meeting those requirements. Each task plan shall identify the sequence of milestones which must be achieved to sustain task progress.

Task plans shall include the following:

4.4.3.1 Installation Plan

The Installation Plan shall describe the three phases of installation required in Section 3.5. In addition, this plan shall include a detailed site-specific listing down to the lowest replaceable unit of all hardware items and software packages/modules to be delivered and installed, as well as any special equipment and tools that will be needed. These listings shall identify manufacturer's and vendor's part nomenclatures, part numbers, and associated quantities of each item. Specific equipment cabinet, frame, shelf, and slot locations for all hardware items shall be indicated.

4.4.3.2 Test Plans

Provide test plans describing the activities to be performed to meet the requirements of Sections 4.5.1, 4.5.2, 4.5.3, 4.5.4, and 4.5.5. Include acceptance and rejection criteria for all test plans.

4.4.3.3 Training Plan

The Training Plan shall outline the plans for accomplishing the training required in Section 3.7. Include all corresponding syllabi and other materials.

4.4.3.4 System Cutover Plan

This plan shall describe how the requirements of Section 3.6 will be accomplished. In addition, it shall include:

(a) contingency plans for the preservation of services in the event of an unsuccessful cutover of a particular floor, building, or site;

(b) descriptions of testing which will be performed in preparation for cutover;

(c) identification of specific procedures that will be generated and followed during cutover to include detailed explanation of procedures to ensure data bases are appropriately populated;

(d) identification of the segments of the system which will be cutover at the same time and the sequence of their cutover;

(e) description of any special cabling arrangements that will be used to aid in cutover; and

(f) identification of the number and qualifications of personnel who will be involved in cutover and an explanation of how they will be organized to ensure cutover activities are controlled and coordinated.

4.4.3.5 Operations and Maintenance Plan

Provide a plan which describes the approach for meeting each of the requirements of Section 3.8. This plan shall also provide a narrative description of the relationship the dedicated work force has with the Contractor's corporation explaining the reporting relationships, lines of authority, and means for providing technical and design assistance when needed. The plan shall include a clear definition of the role of subcontractors (if any), an organization chart detailing each staff position and the function(s) it serves, and copies of resumes for each manager/supervisor proposed (see Section 3.8.2.1). The plan shall also describe the process by which updated information on system operations and/or maintenance is provided to the dedicated staff. List all training on VDTS (including FOTS) equipment that staff personnel have received.

Provide a smooth transition with continued high quality service between the pre-cutover working relationship as described in the Statement of Work (SW-TNS-001) and the post-cutover working relationship.

Provide a plan subject to the Government's approval for assuming responsibility for the Attendant Console Function including staffing, personnel administration, and operation at cutover of the ORF-ICN. Reference Appendix 10.

4.4.3.6 Logistics Support Plan

Provide the following information:

A description of the suggested approach for performing repair and/or replacement of failed hardware assemblies, circuit cards, etc.

Recommended on-site spares and quantities needed to meet the mean time between failure (MTBF), maximum mean time to repair (MTTR), and availability requirements of this specification.

Procedures for testing and storing on-site spares.

Procedures for tagging, packing, and shipping spares.

Procedures for identifying the need for replenishment of on-site spares.

Procedures for ordering and tracking the shipment of spares and replacement parts.

Procedures for ordering spares which are not, cannot, or will not be located on site.

4.4.3.7 Disaster Recovery Plan

Describe specific actions that will be taken to recover from failures that render the VDTS equipment serving 2,000 or more lines completely inoperative. Identify sources of technical support, hardware, and software which will be made available to enhance recovery operations.

4.4.4 Task Schedules

Corresponding to each task plan, develop a Task Schedule to include all events and reviews critical to the success of that task.

4.4.4.1 Installation Schedule

The Installation Schedule shall show all major events which occur during each of the three phases of installation.

4.4.4.2 Testing Schedule

The Testing Schedule shall identify when the tests required by Section 4.5 are expected to be performed.

4.4.4.3 Training Schedule

The Training Schedule shall define the proposed schedule for training required by Section 3.7.

4.4.4.4 System Cutover Schedule

This schedule shall be developed in cooperation with DOE and SCB and shall indicate all dates critical to cutover.

4.4.5 Inspection and Testing Reports

Submit test reports as required by Sections 4.5 and 5.2.

4.4.6 Manuals

Provide, maintain, and keep current in the OICC a complete set of technical documentation on the components of the ORF-ICN for the duration of the operational period. This documentation shall be sufficient to operate and maintain the ORF-ICN and shall include, as a minimum, manuals providing General Overviews, Technical Descriptions, and Procedures for Installation, Service, Maintenance, and Operations of all hardware and software components of the ORF-ICN. Existing manufacturer's manuals are sufficient if they include the above information.

4.4.7 Installed Drawings

Provide the drawings required in Sections 4.4.1 and 5. Accurately maintain reproducible copies of all drawings for the duration of the contract.

4.4.8 Records

Submit the following records and keep them current for the term of the contract. Records kept by the Contractor shall always be the property of DOE and shall be provided to DOE at DOE's request. These records include records specified in this document as well as any other records required for effective operation of the VDTS. Records stored on computer should be made available to the Company by a remote ASCII terminal and printer supplied by DOE.

4.4.8.1 Station Records

The TMS shall supply (via the interface described in 3.2.3) all station (voice and data) identities and those related features maintained by the TMS. The Contractor shall maintain and assign port identities to these stations as well as any other details pertinent to the operation of the VDTS.

4.4.8.2 Trunks and Special Circuits

See Section 4.4.8.5.

4.4.8.3 Equipment Inventory

Maintain an inventory of any equipment which the Contractor supplies. This includes stocked, new, and reusable equipment which is specified in this document as well as any other item required for effective operation of the VDTS.

4.4.8.4 Records of Facilities/Services

Furnish records of all commercial carrier facilities and services to be utilized by the ORF-ICN on a per-location basis. These records shall include circuit numbers, type of facility, application of facility, trunk/equipment number, and group number.

4.4.8.5 Technical Cable Records

Technical cable details shall be recorded and maintained separately from the TMS cable information for all cables and special circuits. These technical cable details typically are not needed nor accommodated in the TMS cable records and include such items as physical cable routing details, splice locations, cable electrical and physical characteristics, manhole I.D., cable numbers, signal type, circuit, application, and grouped by location. The details to be maintained shall be approved by DOE in writing and the data made available to DOE on request.

4.4.9 Computer Hardware and Software Documentation

Provide user manuals for modules of the supplied software that perform data input or output (I/O) to or from representatives of DOE or other systems operated by DOE such as the TMS, be it in the form of hard copy or other means of data transfer. This documentation should provide for each module a detailed description of data being transferred and data format, required hardware configuration to accomplish the data I/O, and details of how the I/O is accomplished including user interaction. The CDR module would be an example of a module requiring this type of documentation.

If and when DOE takes over ownership of the system, the following computer hardware and software documentation is required.

Provide object files and operating instructions for all software. All software shall also be furnished on magnetic media compatible with the storage system provided with the system.

All software provided shall be documented with data flow diagrams, data dictionary, and software structure charts. All data structures, both memory and disk resident, shall be documented as to purpose and contents. Programming and operating manuals shall be provided for control and monitoring support software and for the operating system supplied on the host processor.

Supply "certified correct" data and drawings which show the following:

(a) Computer operation and maintenance documentation including technical manuals, schematics, and a preventative maintenance schedule

(b) Peripheral operation and maintenance documentation including technical manuals, schematics, and a preventive maintenance schedule

(c) Recommended spare parts lists

(d) Programming and operating manuals for the control and monitoring software and the operating system software

(e) Control and monitoring software listings

(f) Module headers, data flow diagrams, data dictionary and software structure charts

(g) Diagnostic program listings

(h) Diagnostic User Manuals

4.4.10 ISDN Implementation Plan

Describe the planned ISDN system. Describe any ISDN non-compliances, and any proprietary software or hardware implemented. List all ISDN standards that the system is designed to meet.

Describe all known interoperability (or feature transparencies) problems that exist between the proposed VDTS and other ISDN switch implementations in the public switched network.

Describe ISDN set features, models, and colors.

Describe requirements for upgrading an ISDN phone with data capability. Describe interfaces available and functionality provided.

Describe data capability provided for both circuit switching and packet switching on the D or B channels. Describe assumptions made to size switching gear for data use.

Provide a description of the hardware designed to meet the requirements of Sections 3.3.10.2, 3.3.10.3, 3.3.10.5, and 3.3.10.8. Provide a description of other ISDN products available for interfacing data equipment.

Describe planned method of meeting phone set power requirements described in Section 3.3.9.7.

4.4.11 Local Area Network Services Description (Requirement Deleted)

4.4.12 Documentation Summary

Provide 1 copy of the preliminary plans and 5 copies of the other documents listed below:

Document	Submitted For*	Described in Spec. Section	Due Date
Preliminary System Design Report	I	4.4.1	With bid
System Design Report	A	4.4.1	120 days after contract award
Preliminary Project Plan & Schedule	I	4.4.2	With bid
Overall Project Plan & Schedule	A	4.4.2	120 days after contract award
Installation Plan	A	4.4.3.1	6 months after contract award
Installation Schedule	A	4.4.4.1	

Test Plans Testing Schedule	A A	4.4.3.2 4.4.4.2	6 months after contract award
Training Plan	R	4.4.3.3	With bid
Training Schedule	A	4.4.4.3	8 months after contract award
Preliminary System Cutover Plan	I	4.4.3.4	With bid
System Cutover Plan System Cutover Schedule	A A	4.4.3.4 4.4.4.4	8 months after contract award
Preliminary Operations and Maintenance Plan	I	4.4.3.5	With bid
Operations and Maintenance Plan	A	4.4.3.5	6 months after contract award
Monthly Operations Report	R	3.8.8	Monthly after cutover
Performance Review Report	R	3.8.9	Quarterly after cutover
Preliminary Logistics Support Plan	I	4.4.3.6	With bid
Logistics Support Plan	A	4.4.3.6	8 months after contract award
Monthly Project Management Reports	I	4.2	2 weeks prior to monthly meeting
EMI/RFI Test Procedures and Reports	A	3.3.6	4 weeks prior to installation checkout testing
Test Reports	C	4.4.5	Within 30 days of test completion
Preliminary QA Program Plan	I	4.1	With bid
Final QA Program Plan	A	4.1	120 days after contract award
Technical Manuals	I	4.4.6 & 4.4.9	2 weeks prior to system acceptance test
Installed Drawings	C	4.4.7	2 weeks prior to system acceptance test
System Records	C	4.4.8	2 weeks prior to system acceptance test

ISDN Implementation Plan	I	4.4.10	With bid
Computer Hardware and Software Documentation	C	4.4.9	2 weeks prior to installation checkout testing
Preliminary Disaster Recovery Plan	I	4.4.3.7	With bid
Disaster Recovery Plan	A	4.4.3.7	6 months after contract award
Attendant Console Plan	A	Appendix 10	With bid

* I--Information, R--Review, A--Approval, and C--Certification

4.4.13 Site Preparation and Field Construction Documentation Summary

DOCUMENT	SUBMITTED FOR*	DESCRIBED IN SPEC. SECT.	DUE DATE	NUMBER OF COPIES
Weekly Progress Report	I	5.2.1.3	Each week	4
List of A-E Firms	I	5.2.1.4	With bid	4
List of Activities Requiring Contractors Other than those Designated with Q Clearances	R	5.1.1.3	90 days after contract award	4
Preliminary Design Document List	I	5.2.1.4.2	With bid	1
Design Document List	I	5.2.1.4.2	60% design review	4
Design Documents	A	5.2.1.4.2	30%, 60%, 90% of design completion and CFC	4
Material and Equipment List	I	5.2.1.4.2	60% design review	4
Manufacturer and Vendor Data	R	5.2.1.4.2	Prior to or with shipment of equipment	4
Shop Drawings	A	5.2.1.4.2	4 weeks prior to shipment of equipment	4
Samples	R	5.2.1.4.2	4 weeks before installation	4
Design Calculations	A	5.2.1.4.2	30% of design completion	4
Weekly Report	I	5.1.2.4.1	Weekly	4

Construction Project Requirements Summaries (CPRS)	A	5.2.1.4.2	90% design review	4
Test and Inspection Reports	C	5.2.1.4.2	30 days after completion of testing	4
Field Change Requests	A	5.2.1.4.2	Upon occurrence	4
Welding Procedures and Qualifications of Welders and Welding Inspectors	A	5.2.1.4.2/ 5.2.2.2.6	4 weeks prior to building erection	4
Safety Program	A	5.1.3.9	120 days after contract award	4
Crane Inspection Certificates	I	5.1.3.16.1	2 weeks prior to use of cranes	4
Construction Schedule	A	5.2.1.6	120 days after contract award	4
Procurement Status Report	R	5.2.1.7	30 days after design CFC	4
List of Vehicles Requiring Access	I	5.3.13	5 days prior to need	4
Inspection Plan for Building High Strength Bolts	C	5.2.2.2.6	2 weeks prior to building erection	4
HVAC Systems Test Report	C	5.2.3.2.3	30 days after testing complete	4
Piping Welding Procedures and Welder Qualifications	A	5.2.5.1	4 weeks prior to starting work	4
Evidence of Sprinkler System Experience	I	5.2.5.3.7	2 weeks prior to installation	4
Sprinkler System Certificate of Inspection	C	5.2.5.3.7	30 days after test and inspection	4
Slump Test Reports	R	5.2.2.2.6	Within 24 hours of test	4
Compaction Test Reports	R	5.2.2.1.11	Within 24 hours of test	4
Facilities Equipment and Materials Data Submittals	R	5.2.2.3.15	2 weeks prior to construction	4
Noise Level Calculations	R	5.2.3.1.1	30% design review	4
Energy Conservation LCC Report	R	5.2.3.1.3	30% design review	4

HVAC System Test Plan and Equipment Calibration Certificates	R	5.2.3.1.7/ 5.2.3.2.3	30 days prior to test	4
Respiratory Protection	R	5.1.9.4	2 weeks prior to construction	4
As Built Drawings	C	5.2.1.3	2 weeks prior to cutover	4
Contaminated Work	R	5.1.5.3.5	2 weeks prior to construction	4
Hazard Communications Policy	R	5.1.3.8.3	60 days after award	4

Asbestos Pre-Construction Submittal

License	I	5.1.4.3.1	4 weeks prior to construction	4

Asbestos Pre-Job Submittals

Work Plan	A	5.1.4.3.2.1/ 5.1.4.11	30 days prior to construction	4
Rental Equipment Agreement	A	5.1.4.3.2.2	4 weeks prior to construction	4
Competent Person	I	5.1.4.3.2.3	2 weeks prior to construction	4
Emergency Personnel	I	5.1.4.3.2.4	2 weeks prior to construction	4
Trained Personnel	I	5.1.4.3.2.5	2 weeks prior to construction	4
Testing Laboratory	A	5.1.4.3.2.6	4 weeks prior to testing	4
Medical Examinations	I	5.1.4.3.2.7	2 weeks prior to construction	4

Asbestos Construction Submittals

Deactivate Utilities	I	5.1.4.3.3.1	2 weeks prior to construction	4

Waste Disposal Request	I	5.1.4.3.3.2	48 hours in advance	4
Sampling Results	I	5.1.4.3.3.3	48 hours after taken	4
Chemical Exposure Monitoring	I	5.1.4.3.3.4	End of job	4
Checklists	I	5.1.4.3.3.5	Following work day	4
Air Monitoring Test Results	I	5.1.4.3.3.6	48 hours posting; 72 hours delivery	4
Entry/Exit Log	I	5.1.4.3.3.7	Upon final acceptance	4

* I--Information, R--Review, A--Approval, and C--Certification

4.5 SYSTEM INSPECTION AND TESTING

This section includes inspection and testing requirements for the VDTS and FOTS system. Testing requirements for construction work are included in Section 5.

Notify DOE within 10 days prior to start of any testing. DOE may elect to witness some or all of the proposed testing.

4.5.1 Factory Test and Burn-In (Requirement Deleted)

4.5.2 Installation Checkout Testing

Installation checkout testing shall be conducted on all installed equipment prior to beginning integrated systems testing. This testing shall verify that each component of the ORF-ICN is compliant with the technical specification. To achieve this end, manufacturer-recommended functional tests for all equipment and subcomponents of the ORF-ICN shall be conducted. Any additional testing required to verify technical specification compliance shall also be conducted.

When any subsystem or component tested fails to meet the applicable requirements, corrective actions shall be taken, and all tests failed shall be repeated until successfully completed.

4.5.3 Integrated System Test Program

An Integrated System Test program shall be conducted after completion of all installation checkout tests and before the Pre-cutover Test. This test program shall consist of a logical progression of tests which operates each VDTS and utilities subsystem independently, then in appropriate groups of systems, and finally with all systems functioning simultaneously. Tests of each system shall demonstrate all of its functions, capabilities, instrumentation, controls and alarms. All redundant, back-up, and automatic transfer features shall be demonstrated during these tests. The final test in this program shall consist of all systems operating simultaneously in the same manner that they will operate for the Pre-cutover Test except that telephone lines or external systems shall not be connected.

The program shall be conducted in accordance with a Construction Project Requirements Summaries prepared in accordance with Company Engineering Procedure EP-E-12.

4.5.4 Pre-cutover Test

After completion of installation checkout tests and the Integrated System Test Program and prior to performing cutover and operation activities, a pre-cutover test shall be conducted to ensure proper system operation. Evidence of proper operation shall be presented to and accepted by DOE before proceeding with cutover.

The system configuration for this test shall be as follows:

(a) All ORF-ICN equipment, utilities equipment, controls and alarms operational.

(b) Connection to the Host processor networks, modem pool, outside exchanges, and test facility complete and operational.

(c) Inter-site trunks, intra-site cabling, all FOTS hardware (including FDDI interface) installed and operational.

(d) 15 Company-selected stations at each site cutover and operating on the new system. One ISDN voice/data phone working from each main switch and remote switching modules at each site.

(e) Requirement Deleted.

(f) Requirement Deleted.

(g) All equipment and cable labeling complete and data entered into the cable plant management system required by Section 3.3.12.9.

(h) All documentation complete and delivered to its appropriate on-site storage location.

4.5.5 System Acceptance Test

The system acceptance test shall be performed immediately following cutover and shall consist of operating the entire system continuously for 30 days. Record all failures, corrective action taken, time to restore operation, and calculate system availability as specified in Section 3.3.9.1. The system will be accepted if the system availability meets the requirements of Section 3.3.9.1 and if no major failure occurs. If a major failure occurs, the test shall be restarted after reporting the failure cause and corrective action taken and correction of the failure.

Should failure occur three times, conduct inspections and testing as needed to correct the problem, and present to DOE actions to be taken for preventing these failures before testing is restarted.

A "major system failure" includes any of the following:

- Total VDTS failure
- Failure of greater than 25% of the trunks within any one site
- Failure of greater than 25% of the consoles

- Failure of more than 10% of the stations over the testing period
- Simultaneous failure of more than 5% of the stations
- Failure of a VDTS main processor
- Failure of the VDTS main power supply
- Failure of FOTS hardware

The maintenance requirements of Section 3.8.4 shall be in effect during this test.

4.6 VDTS CERTIFICATION

Obtain a certificate of compliance from the VDTS original equipment manufacturer that the equipment supplied will provide operation in accordance with this specification when used as shown in the Preliminary and Final System Design Reports. Include documentation of this certification in the Preliminary and Final System Design Report.

4.7 OPERATIONAL READINESS REVIEW

An Operational Readiness Review (ORR) analysis and presentation shall be provided in accordance with Company Policy GP-24, Operational Readiness Process. Analysis results shall be presented to the Y-12 Plant Operational Readiness Review Board for approval prior to cutover. The Operational Readiness Review Team shall consist of the following:

(a) Contractor's Program Manager (3.8.2.1) and Overall Site Project Manager (4.2)
(b) Telephone Network Services Department (TNSD) Manager
(c) Telecommunications ORF-ICN Program Manager
(d) Engineering Project Manager
(e) Engineering Principal Engineer
(f) Environmental, Safety, and Health (ES&H) Representative

The readiness review analysis shall include an examination of the completeness of all elements required to ensure continued safe and reliable operation. The following general topic areas should be addressed, and the analysis should ensure that they are complete, qualified, functional, and ready for operation.

(a) Equipment, hardware, software

1. Integrated system test planning and test results

   - construction test results
   - cable and equipment test results

2. Operation status of all facilities and equipment (including the TMS communication link, backup power, environmental control systems and human factors evaluation)

3. Spare parts available during cutover and operation

4. Identification of critical and special circuits

5. Status of ORF-ICN and TMS data bases

(b) Procedures and management controls

1. Documented and approved training program

   - Operation and maintenance training
     Attendant operator training
     User training
     Support organization training
       - Maintenance
       - Construction groups as far as location of underground cables, etc.

2. Roles, responsibilities, and authority clearly defined and documented

3. Environmental protection, safety, and health documents

   - OSHA compliance documented
   - Safety analysis and National Environmental Policy Act (NEPA) documentation have been provided by DOE and shall be included in ORR activities and documentation.

4. Program management plans

   - Overall project plan and schedule
   - System cutover plan
   - Operations and maintenance plan
   - Logistics support plan
   - Disaster recovery plan
   - QA program plan

5. Safeguards and security documents

   - Documentation of how security requirements of Section 3.3.5 were met.

(c) Personnel

1. Staffing (recruitment and selection) adequate (operators, users, maintainers)

2. Training adequate (operators, users, maintainers)

5.0 FACILITIES DESIGN AND CONSTRUCTION REQUIREMENTS

5.1 CONSTRUCTION SPECIAL CONDITIONS

5.1.1 General

5.1.1.1 The work is located in the DOE Reservation and the City of Oak Ridge, Anderson, and Roane Counties, Tennessee.

5.1.1.2 Construction Work

5.1.1.2.1 Furnish all labor, materials, tools, equipment and services (except that specified to be performed by others) required to construct the ORF-ICN complete and in accordance with this specification, drawings, and all other provisions of the contract.

5.1.1.2.2 Section 3.0, Requirements, provides a detailed work description and Section 5.2 further defines construction requirements.

5.1.1.2.3 Unit Price Construction Work Items

Certain work activities will require special training, protective clothing, and handling of materials; and the quantities of work cannot be estimated prior to the start of construction. Unit price payment will be made for the following items in accordance with the Request for Proposal.

5.1.1.2.3.1 Standby and Training Time

(a) Time spent waiting for Company security delays beyond the normal 5 minute delay at each portal, and the Company stopping work for unknown contamination. This is actual time lost from work and applies only until workers can be assigned other work.

(b) Training: time for training required to perform hazardous work. This includes training for lockout/tagout; hazard communications for lithium, beryllium, PCBs, and mercury; confined-space entry; carcinogen control; hazardous waste sites (per 29 CFR 1910.120); radiation; fall protection; fire watch; and other training using Company furnished materials (see 5.1.5.3.4). Specifically excluded from the training requirements that the Company will pay for are the following: General Employee Training (4 hours), security orientation and drug testing (2-4 hours); asbestos; hazardous communications training for hazardous materials other than lithium, beryllium, PCBs and mercury; and Contractor weekly safety meetings.

5.1.1.2.3.2 Dress-Out - Type 2

Work that requires protective clothing, respirators, and showers.

Payment will be made when protective clothing and respirators are used to perform construction. Provide showers when work requirements include showering. Company showers are not available to the Contractor.

5.1.1.2.3.3 Handling and Storage of Contaminated Soils

Dirt containing contamination that restricts its use for backfill shall be placed in Company furnished B-25 boxes (see Section 5.1.1.9).

5.1.1.2.3.4 Asbestos Penetrations through Walls, Floor, and Ceilings

Penetrations through transite siding, floor tile, ceilings, and other asbestos containing materials, shall be handled in accordance with Section 5.1.4. Dress out payment will not be made for asbestos penetrations.

5.1.1.2.3.5 Rock Excavation

Excavation for direct burial of cable, duct banks, telephone poles, and foundations may encounter rock. See Section 5.2.2.1.3 for definition and methods allowed for excavation.

5.1.1.3 Construction Contractor Q-Clearances

Maximize the use of subcontractors located within the Oak Ridge area that have personnel already Q-cleared. Upon request, DOE will provide a list of contractors in the Oak Ridge area who can provide construction personnel having Q-clearances. Submit a list of construction activities that require clearances and cannot be accomplished with contractors having Q-cleared personnel. See Section 5.3 for security and access requirements.

5.1.1.4 Construction Engineer

The Company Construction Engineer (CE) will be the designated representative of DOE with full authority to accept or reject all construction work. In addition, the CE will be responsible for auditing security, health, safety, fire, and environmental protection practices to ensure adherence to the regulations of the Company and DOE.

5.1.1.5 Specifications and Drawings

Construction shall not start without signed-off Certified for Construction (CFC) drawings.

5.1.1.6 Working and Storage Areas

5.1.1.6.1 Limit construction activities and storage to the immediate construction site and designated storage areas. Personnel shall enter and exit the plant through designated portal(s). Limit travel to the main roads designated on the drawings. The Contractor shall be responsible for providing detailed instructions outlining the work area restrictions to its personnel and keeping its personnel within authorized limits. The Company's Plant Protection Department will remove personnel from the plant when found outside the designated areas.

5.1.1.6.2 Store only work-related material and equipment in stockpile areas, storage trailers, and designated storage areas located on Government-controlled land. Although the work may be within a restricted or secured area; the Contractor shall be responsible for all

loss, destruction, or damage to property on the site (including the subcontract work in progress). The Contractor may, subject to other provisions of this contract, employ personnel sufficient to protect its property.

5.1.1.6.3 Company Provided Storage Areas - The Company will provide a 200 feet by 200 feet storage area at each of the three plant sites. The Contractor shall be required to fence and gravel these storage areas. Restore the site to the original condition upon completion of work.

5.1.1.7 Underground Utilities Within Y-12, X-10, and K-25

Before performing any excavations the Contractor shall locate all underground utilities. As-built drawings of existing utilities are provided by the Company, but they may not be complete or accurate. It shall be the Contractor's responsibility to field locate all utilities before excavating.

Field location (scanning) is required within the plants, road crossings, and road right-of-ways containing utilities outside of the plants. Scanning is required along the inter-site cable routes only where existing utilities intersect the proposed route.

5.1.1.8 Special Work Requirements

5.1.1.8.1 Underground Utility Damage Prevention Act

The Contractor shall be responsible for complying with any federal, state, and municipal codes, laws, and regulations, including the responsibility to notify the appropriate utility companies in accordance with the State of Tennessee Underground Utility Damage Prevention Act for all excavations outside the Plant perimeter fences. No permits issued by the Company shall abrogate these responsibilities.

5.1.1.8.2 Work in the City of Oak Ridge

The Contractor shall not commence work in the city of Oak Ridge property until permission and/or permits are obtained through the Department of Community Development. The Contractor shall post city permits at the job site.

5.1.1.8.3 Work in the Biology Area

Buildings 9207, 9210, 9211, and 9220 in the Y-12 Plant contain active animal laboratories. First and third floors of Building 9211 are barrier areas. Personnel entering are required to shower and change clothes. Work in and around Building 9207 shall be considered as similar to work in an operating hospital. Where work is required in the space below floors and above the ceilings, the planned work is to be coordinated with the Company. The intent is to provide protection to the existing area from construction activity, water, dust, debris, and insofar as possible, excessive sustained noise levels.

5.1.1.8.4 Earth, Concrete Floor, and Wall Penetrations

The Contractor shall identify all excavations and penetrations as defined in Engineering Procedure EP-D-06 during design. Submit a Construction Excavation/Penetration Permit with the 90% design review for approval by the Company. The permit shall identify the location of work and existing utilities shown on as-built drawings and located during the design process. See Engineering Procedure EP-D-06 for detailed requirements. Drilling and cutting equipment shall be grounded in accordance with Engineering Standard ES-1.2-6, "Special Grounding of Drilling and Cutting Equipment."

5.1.1.9 Work to be Performed or Services to be Furnished by the Company

The following services will be provided by the Company upon receipt of 48 hour advance notice:

(a) De-energize systems and provide "Lockout/Tagout" tags in accordance with Section 5.1.6.6.

(b) Conduct final tie-ins to existing service facilities and process systems which cannot be removed from service.

(c) Initiate final air balancing of heating, ventilating, and air-conditioning systems that cannot be isolated. This work will be performed after receiving the system's certified prints, as-built drawings, operation and maintenance manuals, and completion of the Contractor's testing and startup.

(d) Provide B-25 boxes for disposal of contaminated waste. (Boxes are 96 cubic feet.) The Company will deliver the boxes to the Contractor and remove them from the site.

(e) Provide storage tanks for contaminated water. When contaminated water is removed from existing manholes the Company will provide a storage tank at the job site and will dispose of the waste upon completion of the work.

5.1.1.10 Project Meetings

5.1.1.10.1 Preconstruction Conference

A preconstruction conference between the Contractor and DOE will be held before the start of field work. All Contractor's supervisory personnel and the major subcontractors shall be required to attend. The date, time, and location will be mutually agreed upon by the Company and the Contractor.

5.1.1.10.2 Job Site Meetings

DOE will hold weekly project meetings to ensure orderly and expeditious completion of the work. Meetings will include a Company representative, Contractor's superintendent, and necessary subcontractors and suppliers.

These meetings shall include the following:

(a) Progress of work and schedules
(b) Problems and corrective actions

(c) Administration and coordination requirements
(d) Outstanding issues from previous meetings
(e) Safety activities
(f) Required permits

Minutes of each meeting will be promptly issued by the Contractor to all attendees.

5.1.1.11 Construction Sign

Provide and install at each plant where construction work is being performed an all-weather sign (minimum dimensions 4 ft x 4 ft), which will include the job title, Contractor's company name, and telephone number. The exact location will be determined by the Company.

Post on or near the construction sign the following:

(a) Safety Work Permit
(b) Occupation Safety and Health Protection Form DOE F-5480.2
(c) Occupation Safety and Health Complaint Form DOE F-5480.4
(d) Safety Information
(e) Highlights on Employee Rights to Know
(f) Equal Employment Opportunity (EEO) Poster OFCCP-1420
(g) Davis-Bacon Poster WH1321 and Wage Rates.

5.1.1.12 Testing

Perform and document all the tests outlined in this specification. Notify the Company, not less than 24 hours prior to starting, the exact time and date of all tests. The Company may witness and approve or reject test results.

The Company may choose to make its own tests as supplements to and checks on the Contractor's tests. The Contractor will be notified 24 hours in advance and shall witness these tests.

5.1.1.13 Suspension of Work

When construction has been suspended by the Contractor for any reason other than a suspension by DOE or the Company, the Contractor shall give the Company 24 hours advance notice of its intention to resume work. Should the Contractor resume work without such notification, the Company reserves the right to use the work areas for a period of 24 hours after the Contractor returns to work. Delays caused by the Company due to the Contractor's failure to comply with this requirement will not constitute a basis for any adjustment in the contract price or time.

5.1.1.14 Review of Shop Drawings, Product Data, and Samples

5.1.1.14.1 Construction submittals include all shop drawings and any other information called for under the various headings of these specifications that are required to be transmitted to the Company. Catalogs for submittal shall have unrelated pages removed and shall have capacities and specified parameters relating to the item or items clearly marked. The adequacy and accuracy of submittals and their compliance with the contract documents are the

responsibility of the Contractor. Except in cases where approval by the Company is required, certification by the Contractor that a submittal complies with the contract requirements shall signify completion of the review process. However, the Company reserves the right to review and require correction of any submittal, but failure to do so shall not constitute a waiver of any requirement of the contract drawings or specifications. If the Contractor proposes to deviate in any respect from the contract requirements for any item submitted, the Contractor shall so indicate on the face of the transmittal on which the item is submitted, referencing any supplemental information required. Partial submittals will not be accepted.

5.1.1.14.2 The Contractor shall be responsible for the scheduling and control of submittals and shall submit to the Company for approval three copies of a schedule listing all items requiring submission. The schedule shall indicate the type of item, the contract requirement reference, and the Contractor's scheduled dates. The schedule shall include a notation as to whether Company approval is required or if the submittal is for information only. Scheduling of submittals on the control document shall be coordinated with the approved program schedule.

Information submitted for approval in accordance with the contract conditions will be returned to the Contractor within 14 calendar days of receipt of submittals by the Company.

5.1.2 Coordination

5.1.2.1 Project Coordination

5.1.2.1.1 The Contractor shall coordinate its work with other contractors performing work at the site. All contractors have equal rights to roads, grounds, parking areas, and facilities that are available for the joint use of the contractors. In case of disagreements regarding such use, the decision of the Company will be final. Work in the city of Oak Ridge will be coordinated by the city's Public Works Department.

5.1.2.1.2 Plan and schedule work with the Company to maximize use of existing facilities, and minimize interruptions with the Company's and other contractors' activities.

5.1.2.1.3 The construction work area will be occupied during construction. Protect equipment, furniture, and existing facilities from damage and personnel from injury during construction.

5.1.2.1.4 Portions of work may require interruptions to utility services. Outages shall be approved in advance by the Company and held to a minimum in number and duration. Specific requirements are set forth in the various technical provisions of the contract.

5.1.2.2 Normal Working Hours

5.1.2.2.1 Normal working hours at the site are 7:30 a.m. to 4 p.m., Monday through Friday, excluding holidays. This does not imply the contract can be completed on time using normal working hours. The Contractor shall furnish sufficient manpower, material, equipment and work sufficient hours (including overtime and extra shifts) necessary to complete the work in accordance with the approved progress schedule and specified time. Work other than normal working hours requires four hours advance notice.

5.1.2.2.2 The Company may require connection to existing utilities (electricity, water, sewer, communication, etc.) and work in some office and operational areas outside normal working hours. The Contractor shall perform this work from 4:00 p.m. to 10:00 p.m. Sunday through Saturday, without incurring overtime, provided DOE notifies the Contractor by Thursday of the preceding week. If this advance notice cannot be provided, then work directed by DOE to be performed outside normal working hours will be billed in accordance with provisions stated in line item 006 of the RFP.

The Contractor may choose for his convenience to work outside normal working hours to expedite construction in offices and operating areas. Such work shall not result in overtime charges to DOE.

5.1.2.3 Supervision of Work

The Contractor's superintendent shall be at the site of the work at all times when work is being performed and shall devote 100% of his/her time to this project. The Contractor's superintendent shall have the authority to accept all changes and modifications made to the contract. Identify the superintendent at the preconstruction conference and submit subsequent changes in writing. At the preconstruction conference, furnish a power of attorney identifying the limits for the superintendent.

5.1.2.4 Activities and Manpower Report

Provide a weekly written report to the Company showing the following:

(a) Contract number
(b) Contract name
(c) Work order number
(d) Temperature range
(e) Weather conditions
(f) Number of employees; list by Contractor and subcontractors
(g) Names of supervisors
(h) Names of visitors
(i) Description of work performed (including unit price, construction activities), completed, activities, and progress related to the progress schedule
(j) Identify potential problems that critically impact the schedule
(k) Quality assurance test/inspection results
(l) Safety problems identified
(m) General comments
(n) Contractor superintendent's signature

5.1.3 Safety and Health

5.1.3.1 General

All work shall be performed in accordance with 29 CFR 1926 and 29 CFR 1910.

The Contractor shall provide an independent testing laboratory to perform all required monitoring and testing. The testing laboratory shall comply with OSHA requirements regarding National Institute of Occupational Safety and Health (NIOSH) training and testing methods.

5.1.3.2 General Employee Training

The Company will provide a four hour General Employee Training (GET) program for Contractor personnel. This training is mandatory for all personnel and requires passing a written examination before working at any DOE Oak Ridge site. Submit a written request for GET training 21 days in advance. Training is required every 2 years.

5.1.3.3 Hard Hats and Safety Glasses

5.1.3.3.1 The Contractor shall provide its employees with hard hats and safety glasses or goggles in accordance with 29 CFR 1926.100 and 29 CFR 1926.102. Safety glasses shall have side shields. The Contractor is also responsible for ensuring employees wear hard hats and eye protection devices while working in designated construction area or operating area where hard hats or eye protection is required.

5.1.3.3.2 Variable shade glasses shall not be worn on the job site.

5.1.3.4 Temporary Facilities

Temporary facilities including trailers shall conform to the Guidelines for Temporary Structures (see Appendix 12).

5.1.3.5 Evacuation of the Work Area

5.1.3.5.1 The Contractor shall observe and participate in notices to evacuate the work area. The evacuation notices may be a drill or an actual event.

5.1.3.5.2 Before evacuating the work area, shut down or make safe equipment or processes which could become a safety or fire hazard if left unattended.

5.1.3.5.3 If the performance of work is, for an unreasonable period of time, suspended, delayed, or interrupted by participation in an evacuation, an equitable adjustment will be made in accordance with the contract documents.

5.1.3.6 Medical and Fire Fighting Services

5.1.3.6.1 The Company will provide emergency ambulance service to Oak Ridge Hospital at no expense to the Contractor.

5.1.3.6.2 The Contractor shall determine, prior to start of work, the location of the nearest fire alarm box to be used in case of emergency. In case of emergency, the Company will provide fire fighting equipment.

5.1.3.6.3 Adequate first aid and medical service facilities shall be provided by the Contractor at the Contractor's own expense.

5.1.3.6.4 The Contractor shall provide fire extinguishing for each welding and cutting operation and other areas designated by the Company.

5.1.3.7 Construction Safety Work Permit

The Contractor shall request a Construction Safety Work Permit ten days prior to start of work, and start work upon receipt of the permit. Post the permit at the job site. The term "work," as used herein, includes any activity (including pre-construction) that requires the removal of electrical panel covers, opening electrical panel doors, or access to similar electrical devices or systems.

A permit will be issued for segments of construction work performed as a continuous task such as cable installation between two plants, rewiring a large building or group of smaller buildings, or construction of a new building. The permit will not be issued until after the design review is completed and comments resolved.

Lifting ceiling panels during design will require a permit. The Company will issue a permit for this specific operation in lieu of a complete Construction Safety Work Permit. Request permit five days in advance.

5.1.3.8 Occupational Safety and Health Acts Hazard Communication Standard

5.1.3.8.1 Pursuant to the OSHA Hazard Communication Standard for construction, the Company has material safety data sheets available to the Contractor for all work sites. Since hazards vary throughout Y-12, K-25, and X-10, specific information will be provided for each work site. This activity will be covered in the weekly construction meeting.

5.1.3.8.2 The requirements of OSHA's Hazard Communication Standard, 29 CFR 1926.59, is applicable to the Company, Contractor, its subcontractors, and other subcontractors performing work for DOE on the Oak Ridge Reservation.

5.1.3.8.3 The Contractor shall submit its hazard communication policy, procedures, and written program which address all the requirements of 29 CFR 1926.59. In addition, the Contractor shall submit hazardous material information as identified in 40 CFR Sections 350, 355, 370, 372.

5.1.3.8.4 The Company will provide training videotapes for lithium, beryllium, PCB, and mercury.

5.1.3.9 Safety Program

Prior to commencing work at the site, and after receipt of notice of contract award, the Contractor shall submit to the DOE for approval, its safety program (including the operations of its subcontractors) encompassing aspects of industrial safety, health protection, hazardous communications, and fire prevention/protection. The safety program shall contain a safety plan and first aid plan.

5.1.3.9.1 The Health Safety Plan shall include:

(a) A statement of the Contractor's safety policy.

(b) The name of a qualified, full-time Health, Safety, and Environmental Officer, capable of interfacing with the Contractor's personnel and Company representatives. This officer shall be a certified industrial hygienist and shall have sufficient experience, education, and training to be proficient in areas of confined space, safety, asbestos exposure safety, radiation contamination safety, and be familiar with compliance related activities of OSHA, Toxic Substance Control Act (TSCA), RCRA, and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The official shall not be the superintendent and shall report directly to the Contractor's Project Manager.

(c) Weekly safety inspections of the construction site to be conducted by the designated Contractor official. Copies of the results of these inspections, the corrective actions taken, and the names of all personnel participating in the safety inspections shall be maintained by the Contractor at the work site.

(d) Weekly safety meetings to be held with Contractor employees and subcontractor employees to emphasize project safety, fire prevention, and hazardous substances. Copies of the agenda of these meetings and the names of all personnel participating in these meetings shall be maintained by the Contractor at the work site.

(e) The locations at which the "Notice to Employees" (Form DOE-F-5480.2) will be posted and at which the "Occupational Safety and Health Complaint" forms will be available to employees.

(f) An analysis of the personnel safety, health, and fire hazards expected on the project, and the types of safety equipment and/or procedures to be used in facing those hazards. Asbestos hazards are present in some of the buildings and the Contractor's personnel must meet the requirements set forth in Occupational Safety and Health Administration (OSHA) 29 CFR 1926.58 (OSHA Standard for Construction Industry) and OSHA 29 CFR 1910.1001 (Standard for General Industry) to work in areas containing asbestos hazards.

(g) A description of the Contractor's program for certifying safe operating conditions and for assuring proper maintenance of vehicles and protective devices for portable electrical tools and other portable equipment.

(h) The Contractor's program for ensuring adequate housekeeping in work areas.

(i) The mechanism by which the Contractor will have available at all times information concerning the names and characteristics of all toxic materials, gases, or liquids that may be introduced to the site or that may be produced in the course of the job.

(j) A plan to identify these materials and their effect on employees and a program to protect employees from these potential hazards.

(k) The mechanism for ensuring that all personnel have eye protection at all times while at the job site.

(l) A plan to ensure reporting to the Company Service Contract Coordinator information regarding unsafe conditions, accidents, or injuries which the Contractor's personnel may observe or incur while performing their work on the various installations.

5.1.3.9.2 The First Aid Plan shall include:

(a) A list of employees available at the site who are trained in administering first aid.

(b) The method for prompt investigation and reporting of injuries.

(c) Provisions for adequate first aid supplies.

5.1.3.10 Blasting

Explosives are not permitted.

5.1.3.11 Temporary Heating Devices

Approval is required for the use of all temporary heating devices before delivery of the units to the work area. The request for approval shall include type, number, use, location, operating instructions and restrictions, methods of fueling, and fuel storage provisions.

5.1.3.12 Tool Grounding for Concrete Floor and Wall Penetrations

All drilling and cutting equipment used to make penetrations into existing floors, walls, and ceiling shall be grounded.

5.1.3.13 Protection of the Work Area

5.1.3.13.1 Furnish, post, erect, and install safety devices, equipment, signs, barricades, flagging, and any other item necessary to protect personnel having access to the area.

5.1.3.13.2 Storage and work areas shall be conspicuously flagged or barricaded.

5.1.3.14 Smoking

Smoking will be permitted in designated smoking areas only.

5.1.3.15 Hazardous and Flammable Liquids and Gases

5.1.3.15.1 Drums shall meet the requirements of Interstate Commerce Commission Specification 5 for shipping containers. Safety cans for flammable liquids shall be of a type approved and listed in the Underwriters' Laboratories, Inc., "List of Inspected Fire Protection Equipment and Materials" or "Equipment for Industrial Fire Protection," as published by the Factory Mutual System.

5.1.3.15.2 Drums and containers brought to the construction site shall be labeled with the drum's contents in a conspicuous location. Fasten drum lids securely at all times except during use.

5.1.3.15.3 Remove cleaning fluids such as turpentine, kerosene, or other organic solvents from the site upon completion of activities requiring their use.

5.1.3.15.4 Dispensing from drums shall be by means of approved mechanical pump. During transfer of flammable or hazardous liquids, place a catch pan or impermeable membrane under the transfer equipment to contain spills and protect the environment.

5.1.3.15.5 Provide secondary containment for petroleum products (gasoline, kerosene, etc.) stored in quantities greater than 50 gallons.

5.1.3.15.6 All drums and containers that have been emptied shall be labeled EMPTY. Remove original labels from empty drums or containers that have been emptied and cleaned and label EMPTY - FOR REUSE.

5.1.3.15.7 Hazardous liquids (including, but not limited to, gasoline, diesel fuel, lubricating oil, antifreeze, chlorine, and cleaning chemicals) shall not be allowed to enter the sanitary or storm sewer systems, waterways, drainage ditches, or the ground. In the event of an accidental spill, notify the Company immediately. All efforts shall be made by the Contractor to contain the spill.

5.1.3.15.8 Compressed gas cylinders and liquid petroleum cylinders shall comply with all requirements of the Department of Transportation regulations regarding cylinder condition and retest date.

5.1.3.15.9 Compressed gas cylinders shall be transported and used in portable welding carts with the cylinders securely chained to the cart. Valve protector caps shall be in place except when the cylinders are in use. Chain or secure stored compressed gas cylinders in an upright position to a firm base and protected from direct light or other source of heat. Hoses used for acetylene, helium, argon, and oxygen shall be positively identified.

5.1.3.15.10 Store compressed fuel cylinders at least 20 feet from oxygen cylinders unless separated by a noncombustible wall at least 5 feet high.

5.1.3.15.11 Identify compressed gas cylinders and liquid petroleum cylinders and have a valid hydrostatic test date noted on or attached to the cylinder.

5.1.3.16 Crane and High Profile Equipment Safety Requirements

5.1.3.16.1 The requirement in this section supplements the requirements of OSHA Safety and Health Regulations for Construction, 29 CFR 1926.550, for crane and high profile

equipment. Prior to using cranes, the Contractor shall submit a copy of the current annual inspection certificate, as stipulated in OSHA 29 CFR 1926.550. The inspection certificate shall be signed by the inspecting person or agency and by the owner of the equipment. If the inspection certificate expires while the equipment is on-site, an inspection is required, and an updated inspection certificate shall be issued prior to continuing with the work using the equipment.

5.1.3.16.2 Provide an experienced, qualified operator at the controls of the equipment. When the equipment is moved, the boom or mast shall be in a retracted traveling position.

5.1.3.16.3 If the equipment is a mobile crane, a licensed and qualified driver shall be required at the controls of the carrier unit.

5.1.3.16.4 Mobile cranes in transit shall comply with the following.

5.1.3.16.4.1 Remove loads, lower boom, and secure for transportation.

5.1.3.16.4.2 Maintain a minimum clearance of 4 feet for voltages less than 50 kV, 10 feet voltages over 50 kV and less than 345 kV, and 16 feet for voltages in excess of 345 kV.

5.1.3.16.4.3 Designate a person to observe equipment clearance and signal the operator.

5.1.3.16.5 Conspicuously post special hazard warnings or instructions on all equipment. Instructions or warnings shall be visible to the operator while at the control stations.

5.1.3.16.6 Assign a flagman to the equipment. The flagman shall be in plain view of the operator and driver at all times during operations. The flagman shall signal starts, stops, and boom movement to prevent contact of the unit with other objects. At no time shall anyone on the ground be in bodily contact with the equipment without the specific knowledge and consent of the flagman.

5.1.3.16.7 When it is necessary to operate equipment which could come into contact with energized lines, the equipment shall be properly grounded using insulated 4/0 cable up to 400 feet long. If no suitable ground is available, a ground rod (8 feet minimum) shall be driven for the ground connection. Attach the ground conductor to the ground rod by an approved ground lug. The connection at the equipment shall be by a ground lug attached with a bolt to a clean brightened surface.

5.1.3.16.8 Contractor supervision shall be present when equipment is operated in an area with overhead wires.

5.1.3.16.9 Contractor supervision shall survey the job area and note any safety obstacles before commencing work. Contractor supervision shall be present when the equipment is

moved from one work location to another. Notify the Company before the equipment is moved from one construction site to another.

5.1.3.16.10 All hoisting and lifting equipment shall have load rating plates attached in a prominent location. When modifications or changes are made to lifting or hoisting equipment or when equipment is modified to permit lifting or hoisting, attach a new manufacturer's load rating plate. In lieu of a manufacturer's load rating plate, the Contractor may furnish the Company a certification that the equipment has safely undergone a performance test of at least 125% of the maximum anticipated load. This load rating shall then be affixed to the equipment.

5.1.3.17 Equipment and Tools

5.1.3.17.1 Inspect, maintain, and ensure that all equipment and tools used for this contract are safe, environmentally acceptable, and adequate for the purposes intended. Remove defective or otherwise unsafe equipment from the work site.

5.1.3.17.2 Identify all equipment and tools with the Contractor's or subcontractor's name.

5.1.3.17.3 Inspect equipment containing liquid systems (including, but not limited to, bulldozers, backhoes, bobcats, drill rigs, trucks, hoists, and cranes) daily to ensure the liquid containing systems are leak free; hoses, tubing, and hydraulic lines are in good operating condition; and plugs, stoppers, valves, etc., are properly sealed for leak free operation. Systems that cannot be maintained completely leak free shall have leakage rates maintained as low as reasonably achievable and have all leakage contained. Clean up spillage immediately to prevent release to the environment.

5.1.3.17.4 Washing of tools and equipment (including concrete trucks) while on the DOE property is prohibited unless authorized by the Company.

5.1.3.17.5 Use equipment only for the purpose it was designed. Modifications, extensions, replacement parts, or repairs of equipment shall maintain at least the same factor of safety as the original equipment.

5.1.3.18 Traffic and Safety Signs

Violations of the posted traffic and safety signs and regulations may result in the denial of access to the Government reservation or work site.

5.1.3.19 On-Site Safety Inspection

The safety, health, fire, and environmental protection personnel of the Company and DOE will inspect the Contractor's facilities and operations at the job site to ensure compliance with the hazardous communications, safety, health, fire prevention, and environmental protection requirements of the contract. All communication, except in cases of imminent danger, will be through the Company Construction Engineer to the Contractor.

5.1.3.20 Confined Space Entry

5.1.3.20.1 Confined Space is defined as enclosed space which:

(a) is large enough and so configured that an employee can bodily enter and perform work; and

(b) has limited or restricted means of entry or exit usually requiring stooping or other body contortions and use of the hands while getting in or out (examples: tanks, process vessels, boilers, ventilation or exhaust ducts, sewers, tunnels, pit, diked areas, underground utility vaults; and

(c) its primary function is something other than human occupancy; and

(d) may contain potential or known hazards.

5.1.3.20.2 All work shall be in accordance with OSHA, ANSI Z117.1, and Engineering Technical Specification 01160 titled Confined Space Entry and Work. The Contractor shall submit a permit prior to access to a confined space. The space will be evaluated by the Company and classified as either High or Low risk.

5.1.3.21 Laser-Driven Device Safety Precautions

The following recommendations shall be followed during testing, installation and operation of devices which utilize lasers to interface with fiber optic transmission systems:

(a) Avoid prolonged viewing of the laser beam.

(b) Never view the beam with optical instruments.

(c) Refer to the users manual for the laser-driven devices and follow all instructions.

(d) Post a sign near the equipment as specified by ANSI Standard Z136.2-1988.

(e) Comply with the requirements of ANSI Standard Z136.2-1988.

5.1.3.22 Carcinogen Control

Use chemical carcinogens only in situations where no practical substitutes are available. Use of carcinogens requires a Company approved permit. Use of carcinogenic material shall be in accordance with 29 CFR 1910 Subpart Z and Engineering Technical Specification 01170 titled Carcinogen Control.

5.1.3.23 Hoisting and Rigging

Hoisting and rigging shall be in accordance with DOE/ID-10500 DOE Hoisting and Rigging Manual. Identify "critical lifts" during design and specify method of accomplishment for these lifts.

5.1.3.24 Elevated Work

All work above six feet requires an Elevated Work Permit. Submit requests for permit 48 hours in advance.

5.1.3.25 Telecommunication Training

Provide proof of training required by OSHA 1910.268 for workers performing telecommunications work.

5.1.4 Asbestos

5.1.4.1 Description

5.1.4.1.1 This section provides the requirements for removal and demolition of asbestos and working in asbestos contaminated areas. Asbestos databases for each site (X-10, Y-12, and K-25) are available for viewing upon request.

Exterior siding, pipe insulation, gaskets, duct insulation, fireproofing insulation, floor tile, ceiling tile, and wall panels may contain asbestos. Asbestos also may be present in other materials throughout the sites. The Contractor is responsible for identifying all asbestos containing materials and performing work in accordance with this specification.

In addition, work will have to be performed in areas where friable asbestos levels are above acceptable limits. These areas are labeled with appropriate warning signs. All personnel entering these areas shall meet the training, medical, protective clothing, and respirator requirements of this specification.

Work shall be performed in accordance with 29 CFR 1926.58, 40 CFR 61, State of Tennessee Contractors License Law and additional specific requirements of this specification. The non-mandatory Appendixes B, F, and G in 29 CFR 1926.58 are mandatory for this work. The Contractor is responsible for determining the most recent asbestos removal and disposal requirements established by applicable federal, state, and local government regulations. If conflicts exist between applicable requirements and this section, the most stringent provisions apply. The current procedure is Energy Systems Y-12 Procedure 70-211, "Procedure for Authorizing Asbestos Removal Activities," dated 9-14-90.

Work activities where asbestos will be encountered:

(a) Lifting ceiling tiles to investigate wire and cable routing during design.

(b) Penetrations through walls, floors, ceilings, and roofs.

(c) Installing wire and cable above suspended ceilings, crawl spaces, in attics, pipe chases, and utility rooms.

(d) Modifications to existing buildings and utility tie-ins for new buildings.

This project does not require asbestos abatement whenever asbestos is encountered. Requirements are included to protect Contractor employees and prevent exposure to Company personnel. Asbestos removal is required for penetration through asbestos containing material, and for tie-ins to existing structures and utilities. If loose friable asbestos is encountered

reroute cable and wires. When work is required in areas where airborne asbestos is present protect workers and prevent exposure to operating personnel in adjacent areas.

Access to areas above ceiling tiles and the lifting of ceiling tiles requires full-face respiratory protection and tyvek suits unless historical data or sampling assures that ceiling tiles are asbestos free, and the area above the ceiling does not contain asbestos. Room occupants and bystanders must be removed from the immediate vicinity of the work.

Penetration through walls, floors, and ceilings 1" diameter or less may be made with a HEPA vacuum equipped drill. Larger penetrations require mini-enclosures or glove bags. Structural or utility tie-ins to asbestos insulated material requires removal of asbestos beyond the tie-in locations by using mini-enclosures, glove bags, or negative pressure enclosures.

Personnel monitoring is required whenever workers encounter asbestos. Area monitoring is required where work activities disturb asbestos and create a potential exposure to Company personnel.

5.1.4.1.2 Definitions

The following definitions are in addition to those provided in 29 CFR 1926.58, 40 CFR 61.

5.1.4.1.2.1 Abatement: Asbestos work directed by procedures to control fiber release. Includes, but is not limited to, preparation, removal, encapsulation, enclosure, and cleanup activities.

5.1.4.1.2.2 Aggressive Sampling (Requirement Deleted)

5.1.4.1.2.3 Amended Water: Water treated with a surfactant to increase its wetting ability.

5.1.4.1.2.4 Asbestos-Containing Material (ACM): A material or product which contains more than one percent asbestos.

5.1.4.1.2.5 Asbestos Worker: An employee meeting the following criteria: (1) informed of mandatory requirements and trained in accordance to the OSHA Standard 29 CFR 1926.58, and 40 CFR 763, (2) participant in a special respiratory protection program, (3) participant in a special medical surveillance program, and (4) assigned to work involving potential exposures to airborne asbestos fibers.

5.1.4.1.2.6 Bulk Sample: A sample of a building material or other material taken for asbestos content analysis.

5.1.4.1.2.7 Encapsulant: A material that surrounds or embeds asbestos fibers in an adhesive matrix to prevent the release of fibers. The encapsulant creates a membrane over the surface (bridging encapsulant) or penetrates the material and binds its components together (penetrating encapsulant).

5.1.4.1.2.8 Engineering Control: A mechanism for controlling the dispersal of airborne asbestos at the point of origin, including, but not limited to, source enclosure, exhaust ventilation, and mechanical collection.

5.1.4.1.2.9 Negative-Pressure Enclosure: A temporary structure built to provide a barrier, maintained under negative pressure, to completely envelope an asbestos abatement area and protect personnel outside the enclosure from exposure to asbestos during abatement. The enclosure is large enough to allow entry by asbestos workers and to perform the abatement activities. High Efficiency Particulate Air (HEPA)-filtered exhaust systems and contiguous three-stage decontamination facilities complete with equipment room, shower room, and clean change room are included to minimize exposure of workers.

5.1.4.1.2.10 Negative-Pressure Glove Bag: A small containment around an asbestos removal area, using HEPA-filtered vacuum systems and filtered or valved (not simple flaps) inlet ports, to allow for maintenance of negative pressure during abatement activities. The negative pressure glove bag is constructed with arms through which work can be performed. It allows for complete isolation of the worker from the asbestos material.

5.1.4.1.2.11 Negative-Pressure Mini-Enclosure: A small portable enclosure designed, using HEPA-filtered vacuum systems and filtered or valved (not simple flaps) inlet ports, to be maintained under negative pressure during asbestos abatement activities. The mini-enclosure normally does not contain a contiguous decontamination facility. Decontamination is attained by HEPA vacuuming and disposal of contaminated clothing before exiting the mini-enclosure.

5.1.4.1.2.12 Personnel Protective Equipment (PPE): Any device designed to be worn by an individual to provide protection from inhalation or contact with airborne asbestos fibers.

5.1.4.1.2.13 Control Zone: An area exterior to the regulated area demarcated by zoning tape or rope with OSHA warning signs. The control zone is located outside the regulated area and the boundary is a minimum of 10 feet from the regulated area inside buildings and 30 feet outside, unless conditions do not permit. Company approval is required to reduce these minimum distances. The purpose of this zone is to prevent unprotected personnel from being exposed to airborne asbestos and unauthorized persons from entering the regulated area. No personnel protective equipment is required for trained workers, competent persons, or authorized visitors crossing the control zone in route to a clean room facility.

5.1.4.2 References

5.1.4.2.1 OSHA Regulations for Construction, 29 CFR 1926.58 (Asbestos Standard).

5.1.4.2.2 OSHA Regulations for General Industry, 1910.1200 (Hazard Communication), 1910.134 (Respiratory Protection), 1910.141 (Sanitation), 1910.145 (Specifications for Accident Prevention Signs and Tags).

5.1.4.2.3 Transportation of Hazardous Materials, 49 CFR 171 and 172.

5.1.4.2.4 40 CFR 61, Subparts A and M (EPA Regulation for Removal and Disposal of Hazardous Materials), National Emission Standards for Hazardous Air Pollutants: Asbestos

5.1.4.2.5 40 CFR 302 (EPA) Designation, Reportable Quantities, and Notification Requirements under the Comprehensive Environmental Response, Compensation, and Liability Act).

5.1.4.2.6 40 CFR 763 (Asbestos Hazard Emergency Response Act).

5.1.4.2.7 Rules and Regulations, State of Tennessee Contractors License Law.

5.1.4.2.8 National Institute of Occupational Safety and Health (NIOSH) Method 7400 from the NIOSH Manual of Analytical Methods.

5.1.4.2.9 National Institute of Building Science Asbestos Abatement Guidelines Specification.

5.1.4.2.10 Y-12 Procedure 70-211. Procedure for Authorizing Asbestos Removal Activities, 9-14-90.

5.1.4.3 Submittals

5.1.4.3.1 Pre-Construction Submittals

License. Submit a copy of the General Tennessee Contractor License for Asbestos Abatement.

5.1.4.3.2 Pre-Job Submittals

5.1.4.3.2.1 Work Plan

Before the start of work, provide a work plan for written approval. See 5.1.4.11 for Work Plan Requirements.

5.1.4.3.2.2 Rental Equipment Agreement

Before rental equipment is used for asbestos handling and disposal, the rental agency is to provide written approval acknowledging the intended use. Submit this approval.

5.1.4.3.2.3 Competent Person(s)

Provide a list of the designated competent person(s) and qualification certificates for each individual. The list is to be updated as individuals change.

5.1.4.3.2.4 Emergency Personnel

Provide qualifications of the person in charge of the emergency program.

5.1.4.3.2.5 Trained Personnel

Provide a list of training received by all personnel. State the employee's full name, job title, title of course(s), training date, training organization, and certification number.

5.1.4.3.2.6 Testing Laboratory

The independent testing laboratory shall provide proof of compliance with OSHA requirements regarding NIOSH training and testing methods before submitting the first test results.

The Contractor may perform tests if the technical requirements are met. Personnel performing the tests can not perform construction work or be designated as the competent person.

5.1.4.3.2.7 Medical Examinations

Submit a list of employees receiving the required medical examinations. Include the employee's full name, social security number, and date of most recent examination.

5.1.4.3.3 Construction Submittals

5.1.4.3.3.1 Deactivate Utilities

Provide a listing of utilities and systems, including ventilation systems to be shut down to perform the work.

5.1.4.3.3.2 Waste Disposal Requests

Submit requests for waste disposal permits at least 48 hours in advance of the day needed.

5.1.4.3.3.3 Sampling Results

Submit copies of sampling results within 48 hours after samples are taken.

5.1.4.3.3.4 Chemical Exposure Monitoring

Submit exposure monitoring results necessitated by the use of chemicals related to abatement activities at the end of the job or upon request.

5.1.4.3.3.5 Checklists

Submit Asbestos Removal Checklist(s) and a Clearance Checklist for each work area no later than the work day following the day the inspection is made.

5.1.4.3.3.6 Air Monitoring Test Results

Submit copies of the air sample documentation and analyses made by the testing laboratory. Post test results at the work site no later than 48 hours after the samples are taken. Deliver test results, including the results of the quality control blank recounts, as required by 29 CFR 1926.58, Appendix A, within 72 hours after the samples are taken. As a minimum, these submittals are to include information required by 29 CFR 1926.58(n)(2)(ii).

5.1.4.3.3.7 Entry/Exit Log

An entry/exit log shall be provided for every regulated area. Submit a copy of the log upon acceptance of final clearance.

5.1.4.3.4 Submittal Updates

Update submittals to indicate current status. Employees shall not be permitted to work if submittals do not demonstrate all requirements are met.

5.1.4.4 Delivery, Storage, and Handling

5.1.4.4.1 Asbestos Waste Transportation

5.1.4.4.1.1 Remove asbestos from the job site and dispose of it at the Y-12 Centralized sanitary landfill II or in Company furnished B-25 boxes if the asbestos waste is radiation contaminated. The landfill is open on Tuesdays from 9 a.m. to 11 a.m. and 1 p.m. to 2 p.m.

The following are requirements for the transportation of asbestos waste:

(a) Provide temporary on-site storage until the material can be transported to the disposal site. See 5.1.4.4.2.

(b) Vehicles are Department of Transportation (DOT) approved.

c) Provide complete containment during transport. Asbestos waste material transported in an open bed truck shall be covered with 6-mil polyethylene and a secured tarpaulin. Line the truck cargo bed with 6-mil polyethylene.

(d) Truck drivers are Department of Transportation (DOT) certified.

(e) Asbestos waste cannot be removed from the job site or the temporary on-site storage area until a waste disposal permit is received from the Company. The loaded vehicle will be inspected by the Company at its receiving department before issuance of the permit.

5.1.4.4.1.2 Manually handle and unload wrapped or bagged waste to prevent rupturing. If necessary, unload heavy plastic wrapped waste with fork lifts, cranes, or other suitable equipment. Place waste in the waste cell area designated by the Company.

5.1.4.4.2 Temporary Storage

Temporary on-site storage areas shall be flagged with "Asbestos Danger" labeled barrier tape and posted with danger signs. Store double-bagged, wrapped, or drummed waste on 6-mil polyethylene sheets.

5.1.4.5 Material

5.1.4.5.1 Use only surfactant, or wetting agents, sold for the purpose of asbestos wetting. Materials intended for other uses, such as household detergents, are not permitted.

5.1.4.5.2 Plastic used for enclosures shall be fire retardant.

5.1.4.5.3 Wood shall be treated fire-retardant lumber or painted with fire-retardant paint.

5.1.4.5.4 Disposal bags shall be 6-mil polyethylene and pre-printed with labels in accordance with 29 CFR 1926.58(k)(2)(iii) and 49 CFR 172.

5.1.4.5.5 Disposal drums shall be metal or fiberboard with a locking ring top.

5.1.4.5.6 HEPA filters shall provide an efficiency of not less than 99.97% when challenged with 0.3 micrometer particle-size aerosol.

5.1.4.6 Equipment

All vacuum cleaners shall be equipped with a HEPA filter.

5.1.4.7 Preparation

5.1.4.7.1 Medical Surveillance

Before the start of work, all personnel shall receive a physical examination in accordance with 29 CFR 1926.58(m). In addition to 29 CFR 1926.58(m), the following shall be provided:

5.1.4.7.1.1 The medical examination is to be conducted regardless of the number of days of anticipated or actual airborne exposure levels, or the type of respiratory protection.

5.1.4.7.1.2 The medical examination is mandatory before allowing access to the regulated area.

5.1.4.7.1.3 If a worker's medical examination anniversary date lapses, the worker shall not be allowed to continue work until after the required examination has been performed and the appropriate documentation submitted.

5.1.4.7.1.4 Examining physician(s) acknowledgment that information stated in 29 CFR 1926.58(m)(3) was received.

5.1.4.7.1.5 Each employee is provided a copy of the physician's written opinion within 30 days from its receipt.

5.1.4.7.2 Training

In addition to the training requirements of 29 CFR 1926.58(k)(3)(ii & iii) the following shall be provided:

5.1.4.7.2.1 All personnel, except the competent person, entering the regulated area shall be trained in accordance with 40 CFR 763 (3-day training and annual update). Access will not be permitted until training is completed.

5.1.4.7.2.2 The competent person shall have received the EPA-approved asbestos supervision certification (4-day training course) or the annual asbestos supervision recertification (1-day training course) within the past year.

5.1.4.7.2.3 If a worker's anniversary data for training lapses, the worker is not allowed to continue with work until after the required training has been performed and documentation submitted.

5.1.4.7.2.4 Copies of certification cards/papers (including dates) of the personnel taking and conducting the training are to be available upon request.

5.1.4.7.2.5 Persons performing air monitoring shall have attended and passed the NIOSH course, Sampling and Evaluating Airborne Asbestos Dust (NIOSH 582), or shall be a certified Health and Safety Technologist, Industrial Hygienist-in-Training, or Certified Industrial Hygienist.

5.1.4.7.2.6 Personnel performing analysis of airborne asbestos samples shall be included in the American Industrial Hygiene Association Analyst Registry or the NIOSH/American Industrial Hygiene Association (AIHA) Proficiency Analytical Testing (PAT) Program.

5.1.4.7.3 Entrance Posting

5.1.4.7.3.1 Post, accumulate, and maintain the checklists, air monitoring test results, and entry/exit log at a location easily reviewed before entering the regulated area.

5.1.4.7.3.2 Post "no smoking" signs at all entrances. In addition, all rooms and areas contiguous to the regulated area shall have "no smoking" signs posted at points of entry.

5.1.4.8 Installation/Application/Erection

Abatement areas shall be controlled by both a control zone and a regulated area regardless of the anticipated or actual airborne exposure levels.

5.1.4.8.1 Control Zone

Establish the control zone immediately upon the start of on-site work. The control zone shall remain in place until the negative pressure enclosure is disassembled and the regulated area is cleared by the Company. A log is not required for entering this area.

5.1.4.8.2 Regulated Area

Abatement areas are to be regulated as required by 29 CFR 1926.58(e) and (k)(1), and in addition the following requirements apply:

5.1.4.8.2.1 Inside the control zone, the regulated area shall be established prior to precleaning activities, constructing enclosures, or any activity that could disturb asbestos fibers.

5.1.4.8.2.2 Flag off entrances and approaches to the work areas with "Asbestos-Danger" labeled barrier tape and post danger signs. Danger signs are required regardless of the anticipated or actual airborne exposure levels (even at or below the Permissible Exposure Limit).

5.1.4.8.2.3 The work shall remain regulated, requiring flagging and proper danger signs, until final clearance is approved by the Company.

5.1.4.8.3 Danger Signs and Labels

5.1.4.8.3.1 Signs shall be in accordance with 29 CFR 1926.58(k)(1)(ii). Signs shall be legible at least 20 feet away and meet requirements of 29 CFR 1910.145 (red, black, and white).

5.1.4.8.3.2 Wrapped or drummed asbestos waste material shall have a danger label in accordance with 29 CFR 1926.58(k)(2) and in addition shall be red, black, and white.

5.1.4.8.3.3 Label waste containers prepared for transportation to the disposal facility in accordance with 49 CFR 172.

5.1.4.8.3.4 Provide labels on vacuum cleaners and negative air pressure machines. Labels shall be in accordance with 29 CFR 1926.58(k)(2)(iii).

5.1.4.8.4 Work Requirements for Asbestos-Containing Materials (ACM)

Conduct abatement work using state-of-the-art work practices and engineering controls as required in 29 CFR 1926.58, 40 CFR 61, Subparts A and M and additional requirements stated in this specification.

All abatement activities shall use negative pressure enclosures, negative pressure glove bags, or negative pressure mini-enclosures. It is possible to use two different systems at the same time.

5.1.4.8.4.1 General Work Requirements

(a) Ensure workers comply with training, respiratory fit testing, or medical surveillance requirements.

(b) Preclean work areas prior to set up of the containment system. Precleaning is only required for penetrations and asbestos removal when modifying existing structures and piping. The area is controlled as a regulated area and the workers are to be provided with appropriate protective equipment.

(c) The competent person shall be at the work site continuously during asbestos site preparation and removal.

(d) Ensure the building ventilation has been turned off and/or segregated from the regulated area. Seal all supply air diffusers, return air grills, or other openings in the ventilation system within the regulated area with 6-mil polyethylene. This seal is in addition to the two layers of polyethylene required on walls and floors.

(e) Portable hand tools used to drill, cut, or otherwise disturb ACMs are to be equipped with an HEPA-filtered exhaust ventilation. An HEPA-filtered vacuum cleaner, designated for asbestos, can also be used. Position the hose attachment in such a manner to ensure dust will be captured by the vacuum.

(f) Sweeping, using compressed air for cleaning, or other fiber disturbing activities is prohibited.

(g) Adequately wet ACMs with amended water before disturbing or removing. Friable materials shall feel spongy to be considered adequately wetted.

(h) Wet methods are mandatory regardless of other methods used in conjunction with wetting. When a situation restricts or prohibits the use of water such as electrical hazards, criticality concerns, etc., the Company's written approval shall be required.

(i) Vacuuming of potential asbestos-contaminated objects is done with HEPA-filtered vacuum cleaner(s) designated for asbestos cleanups.

(j) Bag ACMs at the immediate removal area, move to a designated cleaning area within the regulated area, and bag again (double bagged).

(k) Large pieces of waste materials or building/equipment components containing asbestos shall be wrapped with two layers of 6-mil polyethylene sheeting, labeled, and sealed.

(l) Double bag asbestos waste material containing sharp-edged components (e.g., nails, screws, tin sheeting, chicken wire, etc.) and place in labeled disposal drums.

(m) Items in (i), (j), and (k) above are to be vacuumed, wet-wiped, or washed before being removed from the regulated area.

(n) Do not drop or throw to the ground asbestos material or disposal bags.

(o) Loose asbestos-containing material (ACM) shall be contained as it is removed. Assure all loose ACM is contained at the end of each work shift.

(p) After completion of stripping/removal work, wet brush or sponge surface from which ACMs have been removed. Remove visible residue.

(q) Encapsulate exposed surfaces which may contain friable asbestos (including all cleaned surfaces). After cleaning, apply a thin coat of encapsulation agent (lock-down material). NOTE: (1) High temperature components, such as boilers and steam pipes, may not permit the application of some types of encapsulation; (2) If insulation or acoustical materials free of asbestos are to be reapplied, the encapsulant selected shall permit good adhesion to the substrate.

(r) Use only low-pressure sprayers to apply encapsulant or amended water.

(s) Smoking, chewing tobacco, chewing gum, eating, drinking, or use of cosmetics are not permitted in the regulated area.

(t) Immediately mend rips or tears in the protective clothing with duct tape or replace.

(u) Vacuum and remove disposable clothing before leaving the regulated area. Disposable protective clothing is considered asbestos waste.

(v) Provide a vacuum cleaner in the decontamination area within the regulated area. This designated vacuum cleaner is in addition to other vacuum cleaners used for asbestos removal (a minimum of two vacuum cleaners are required at each regulated area).

(w) Decontaminate tools and equipment by vacuuming and wet wiping before removing from the regulated area. Cleaning materials, including water (unless filtered) are considered as asbestos-containing waste materials. The Company will inspect all rental equipment in the regulated area and will not allow removal until decontamination of equipment is complete.

(x) Personnel shall shower before leaving the regulated area. Use the following procedure for negative pressure enclosures, negative pressure glove bag, negative pressure mini-enclosures where the shower facility is not contiguous to the regulated area. At the conclusion of the ACM abatement activity (end of shift or any other activity which requires leaving the regulated area) the worker will thoroughly vacuum the outer surface of the protective clothing/equipment. The outer garment(s) will immediately be removed and disposed as contaminated material. The person will then proceed directly to the decontamination facility, shower, and dress. In all shower/decontamination procedure the respirator shall not be removed until the person has thoroughly wetted his/her head and respirator.

(y) All personnel entering the regulated area shall sign the entry/exit log recording their names, social security number, date, and time of entry and exit. Maintain a log upon establishing the regulated area until the area has passed final clearance. Locate the log at the entrance(s) to the regulated area. Access to the regulated area is limited to authorized personnel meeting the requirements for protective equipment and clothing, medical surveillance, training, and respirator fitting. The Company personnel will enter the regulated area to perform inspections and testing.

(z) Filter water that contains asbestos through a 5-micrometer filter system before discharging into the sanitary sewer system. Documentation describing the type of filter system used shall be submitted to the Company upon request. Used filters are considered asbestos-contaminated waste.

5.1.4.8.4.2 Negative Pressure Enclosure

(a) Provide an adequate hot water heater for the showers in accordance with 29 CFR 1910.141(d)(3).

(b) Decontamination facilities are required regardless of the anticipated or actual airborne exposure levels.

(c) If the Company determines it is not feasible for the Contractor to locate the shower between the equipment room and clean change room, a remote shower shall be constructed in accordance with 29 CFR 1926.58(j)(2)(iii)(A and B). In such cases, personnel leaving the regulated area shall clean protective clothing with an HEPA vacuum, remove the protective clothing, don clean disposable clothing, and proceed directly to the nearby shower facility.

(d) Every work area enclosure shall have a two foot square clear Plexiglass window, approximately five feet above the floor.

(e) The negative pressure air filter system shall provide a minimum of one air change every 10 minutes (6 air changes per hour) as required in the National Institute of Building Science Asbestos Abatement Guideline Specification. Also, maintain a minimum pressure differential of minus 0.02 inches of water column relative to outside the enclosure. If air-supplied respirators are used, provide additional needed negative pressure to compensate for the added volume of supplied air. The negative pressure filtration system shall operate continuously until final clearance has been approved.

(f) Vent the air leaving the HEPA-filtered negative pressure machine to the *outside of the building*. Written approval is required to vent inside a building.

(g) Check the enclosure for leaks from the inside using visualizing techniques, such as smoke from smoke generating tubes (with filtration machines turned off). Correct leaks and recheck. Perform tests at the entrance and egress points, near the negative pressure air filtration unit, and other places inside the enclosure where a seal malfunction is likely. With filtration machines on, make additional smoke tests to indicate if void areas ("dead spots") exist. Smoke tube checks are to be documented on the initial Asbestos Removal Checklist.

(h) Construct the negative pressure enclosure in accordance with Appendix F of 29 CFR 1926.58. In addition, install a second layer of plastic over the walls, stationary objects, and ceiling. Spray-on polyethylene may be used with the sheeting to meet this requirement with written approval from the Company.

(i) Damage to the integrity of the containment shall be mended immediately upon discovery and noted on the current Removal Checklist.

5.1.4.8.4.3 Negative Pressure Glove Bags

Negative pressure glove bags are permitted only for removal of pipe insulation and lagging.

Each glove bag is to be used only one time. Glove bags cannot be reused or slipped down to an adjacent location. This section provides a step-by-step work procedure to the Contractor when using Glove Bags. Perform abatement activities with procedures at least as stringent as those provided in this specification.

(a) Wet-clean the area adjacent to the removal location. Do not blow compressed air or dry sweep or use any other technique that may create unnecessary dust. Remove dust or debris from the pipes, ducts, walls, etc., to start with a "clean" work location to reduce the potential for airborne fibers.

(b) Prepare the glove bag. Lay the glove bag flat. Cut the seams on the sides of the glove bag from the top so it will fit around the pipe or duct, etc. Fold the flap at the top over and out of the way. If not pre-existing, cut a small hole and install filter or valve for the makeup air. If necessary, place a rigid plastic collar inside or a support frame outside the bag to prevent collapse when negative pressure is created. Place necessary tools, lock-down paint, jacket material, etc., in the glove bag.

(c) Pick up the glove bag and place the glove bag (and, if used, position the external frame) around the pipe, covering the desired removal location. Pull it up snugly to the side seams, seal it around the pipe, and seal the flaps to themselves, using duct tape or the pre-applied adhesive. Securely seal all edges.

(d) Seal all exterior edges with duct tape, folding the tape over the edges. Inspect all seals to ensure that no openings exist. Reseal as required.

(e) Cut small holes in the bag (some may come with ports) slightly above and adjacent to the removal location for insertion of the water sprayer nozzle and vacuum wand. Place the end of the wand of the vacuum through one opening and seal the opening around the wand with duct tape.

(f) Inspect all seals and ensure that all are completely closed by inserting a smoke tube through the water sprayer port and creating a visible cloud inside the bag. Observe for visible leaks. Seal any leaks found.

(g) Remove the smoke tube and insert the water sprayer nozzle, taping around it to seal the opening.

(h) Turn on the vacuum to create negative pressure in the glove bag and proceed with the removal.

(i) Wet the material thoroughly with amended water.

(j) Place hands and arms in the arm holes, take tools from pouch, and cut ACM to remove it. Continue wetting at all times.

(k) After ACM is loose, remove it and place it in bottom of bag.

(l) After all material is removed, wash and wipe off all debris from the removal location. Use scrapping tools or the pan scrubber, etc., to remove all visible evidence of the ACM. After visible ACM is removed, repeat this step to ensure that all material has been removed.

(m) Inspect the removal location. Repeat cleaning if necessary.

(n) Spray lock-down on the ends of the remaining ACM (where the ACM had been cut). Spray the location from which the ACM had been removed (bare pipe, valve, etc.).

(o) Encapsulate the ends of the remaining ACM.

(p) Spray lock-down on the interior of the glove bag and over the entire removal location to minimize fiber release.

(q) Tie off the portion of the glove bag (lower) containing ACM debris and tools and materials with duct tape to seal the debris into the lower area.

(r) If tools are to be saved and cleaned, pull the armholes inside out. Use one hand to place the tools in an inverted armhole. After the desired tools are collected, tie off one of the inverted armholes with twisting and duct tape at two locations, leaving a small area between the tied-off area. Cut the armhole between the tied-off locations. Place the end of the armhole containing the tools into a new glove bag (if the tools are to be reused immediately) or into a bucket of amended water and cut the armhole open, allowing the tools to become free in the amended water.

(s) With the vacuum on, seal the makeup air inlet with tape to collapse the bag. If plastic reinforcing collars or external frames were used, these will have to be positioned and/or cut to allow the bag to collapse. Make sure that the ends do not puncture the bag.

(t) Turn off the vacuum system and remove it and the garden sprayer, sealing the holes with tape.

(u) Remove the glove bag very carefully by cutting the seals at the top and sides of the upper part of the bag. Do not drop the glove bag. Lower the glove bag to the floor. Spray the cut seams with adhesive and reseal tightly.

(v) Place the entire glove bag in an asbestos disposal bag for disposal.

(w) HEPA vacuum outer clothing. Remove outer layer, bagging appropriately for disposal or decontamination. Vacuum inner clothing layer. Wipe any dust or debris from respirator. Proceed to shower and remove respirator after wetting head.

5.1.4.8.4.4 Negative Pressure Mini-Enclosure

Negative pressure mini-enclosures may be used in lieu of a full scale negative pressure enclosure for removal of small areas of transite siding, floor tile, and roofing material; and for making penetrations greater than 1-inch diameter through asbestos containing material.

The Company's written approval is required before the start of mini-enclosure activities. Perform abatement activities with procedures at least as stringent as those provided in OSHA 1926.58, Appendix G, Mini-Enclosures.

An enclosure is not required when HEPA vacuum-equipped drill motors are used for holes drilled 1-inch in diameter or less. Establish a regulated area. A control zone is not required.

5.1.4.8.4.5 Decontamination Facility for Negative Pressure Glove Bags or Negative Pressure Mini-Enclosures

In situations requiring negative pressure glove bags or negative pressure mini-enclosures, provide a portable or temporary decontamination facility with direct access from the work area. Due to the small scale nature of many jobs for which either of these removal techniques might be acceptable, a contiguous shower may not be feasible. In such cases, a remote shower shall be provided in accordance with 29 CFR 1926.58(j)(2)(iii)(A and B). Personnel leaving the regulated area shall clean protective clothing with a vacuum, remove the protective clothing (disposing as asbestos-contaminated waste), don clean clothing and proceed directly to the nearby shower facility. Respirators shall not be removed until in the shower.

5.1.4.8.5 Area Decontamination and Clearance

5.1.4.8.5.1 Negative Pressure Enclosure

(a) After all asbestos has been removed/encapsulated, lock-down material applied, and contamination cleaned up, the area shall pass a thorough initial visual inspection conducted by the competent person(s) and documented on the clearance checklist. Then the Company will inspect the area and authorize the Contractor to remove the first layer of polyethylene (adjacent to removal area). If necessary, lightly mist the sheeting to mitigate the release of airborne fibers.

(b) After removing the layer of polyethylene sheeting adjacent to the work area, the Contractor is to ensure the area is free of accumulations of asbestos fibers by vacuuming and wet wiping. The area shall pass another thorough visual inspection conducted by the competent person(s) and documented on the clearance checklist. Then, the Company will inspect the area and authorize the Contractor to proceed with aggressive monitoring.

(c) Conduct aggressive area monitoring. Continuously disturb the air throughout the clearance sampling period. The clearance level is not more than 0.01 f/cc. Final clearance of any removal area will not be given until the area is inspected and accepted, in writing, by the Company. The request for final inspection shall be made after obtaining successful clearance air monitoring results and submitting the completed Clearance Checklist. The Company's final inspection will be made within 72 hours of the request. Removal areas shall remain a regulated area until accepted.

5.1.4.8.5.2 Negative Pressure Glove Bag and Negative Pressure Mini-Enclosure Operations

(a) After all asbestos has been removed/encapsulated, lock-down material has been applied and the area has been thoroughly cleaned, the regulated area shall be inspected by the competent person(s) and documented on the Clearance Checklist. When the work was performed inside a building, clearance monitoring shall be conducted after visual inspection.

(b) If a negative pressure glove bag or a negative pressure mini-enclosure is used in conjunction with a negative pressure enclosure, aggressive sampling shall be performed. The clearance level is not more than 0.01 f/cc. Final clearance of any removal area will not be given until the area is inspected and accepted, in writing, by the Company. The request for final inspection shall be made after obtaining successful clearance air monitoring results and submitting the completed Clearance Checklist. Final inspection will be made by the Company within 72 hours of the request. Removal areas shall remain a regulated area until accepted.

5.1.4.8.5.3 Regulated Area (Excluding Negative Pressure Glove Bag and Mini-Enclosures)

Clean the regulated area, excluding the negative pressure glove bag and mini-enclosure to 0.01 f/cc or levels established in 3.03 D (Prevalent Level Monitoring).

5.1.4.9 Field Quality Control

5.1.4.9.1 Checklists

The Asbestos Removal Checklist and Clearance Checklist forms are to be equivalent to Figs. F-6 and F-7 in 29 CFR 1926.58, Appendix F. The asbestos removal checklists shall be completed and posted at the work site at the beginning of each shift (not to exceed a 12 hour time period). Use the clearance checklist for the final inspection phase of asbestos removal.

5.1.4.9.2 Testing Laboratory

The Contractor shall provide an independent testing laboratory per Section 5.1.3.1.

5.1.4.9.3 Air Sampling and Analysis

5.1.4.9.3.1 In accordance with 29 CFR 1926.58(f)(6), the Contractor shall notify his or her affected employees, in writing, of all monitoring results.

5.1.4.9.3.2 Sampling quality assurance/quality control procedures shall be as stringent as 29 CFR 1926.58, Appendixes A and B, and in addition the precision shall be within that specified by NIOSH Method 7400.

5.1.4.9.3.3 Post sampling results at the work site immediately after obtaining the results, but not later than 48 hours after the samples were taken.

5.1.4.9.3.4 The competent person(s) is to evaluate air sampling results immediately upon receipt and initiate all corrective actions.

5.1.4.9.3.5 Results of area sampling taken outside the regulated area during abatement activities shall be compared to the prevalent background level. If any results exceed the prevalent background level (which cannot exceed the action level of 0.1 f/cc), the Contractor shall immediately stop work, extend the boundaries of the regulated area and notify the Company. Work shall not continue until the problem is identified and corrected. Within 8 hours of receiving the monitoring results exceeding the background level, provide the Company with a written report describing the problem and corrective actions taken.

5.1.4.9.4 Prevalent Level Monitoring

If work is required in an area identified by signs as containing unsafe levels of airborne asbestos take background measurements before beginning work. Take a minimum of two ambient air samples inside the proposed regulated area. If the average background measurements exceeds .01 f/cc then the accepted clearance level shall be established by the Company and the Contractor, in writing, before the start of work. At no time will the background level be allowed to exceed 0.1 f/cc.

5.1.4.9.5 Personnel Monitoring

Daily monitoring is to be conducted where there is a potential exposure regardless of the anticipated or actual exposure levels. At a minimum, 25% of each group of representative employees in the regulated areas are to be monitored daily for excursion limits and permissible exposure limits.

5.1.4.9.5.1 Permissible Exposure Limit/Action Level

Conduct employee exposure monitoring in accordance with 29 CFR 1926.58(f). Daily monitoring is required that is representative of the 8-hour time weighted average (TWA) exposure of each employee assigned to work within a regulated area. Representative monitoring shall be collected from employees performing the same tasks under the same work place conditions, type of material, control methods, work practices, and environmental conditions. Employee exposures shall be determined from breathing zone samples.

5.1.4.9.5.2 Excursion Limit

Conduct daily monitoring to ensure compliance with the excursion limit of short-term exposure of personnel to no more than 1.0 f/cc as averaged over a sampling period of 30 minutes.

Excursion limit sampling shall be conducted throughout the project at locations of highest concentrations.

5.1.4.9.6 Area Monitoring

5.1.4.9.6.1 Negative Pressure Enclosures

Conduct daily area monitoring for the full work shift inside the enclosure. At least four samples for each 5,000 feet of enclosure area shall be taken. Additionally, at least three samples shall be collected outside the work area as follows: two full shift measurements (calculated as 8 hour TWAs for comparison to the Permissible Exposure Limits [PEL]) at the entrance to the change room or regulated area and one full shift measurement (also calculated as an 8 hour TWA for comparison to the PEL) at the exhaust of the portable ventilation system. For each separate waste load-out exit, an additional area sample shall be taken at that location outside the enclosure.

5.1.4.9.6.2 Negative Pressure Glove Bag and Negative Pressure Mini-Enclosure Operations

Conduct daily full shift area monitoring. At least three samples shall be collected inside the regulated area. Also, at least three samples shall be collected outside the regulated area but inside the control zone. If located outside a building, one sample is located upwind and two located downwind. All shall be full shift measurements (calculated as 8 hour TWAs for comparison to the PEL).

5.1.4.9.7 Clearance Sampling

5.1.4.9.7.1 Conduct clearance monitoring in accordance with the NIOSH 7400 PCM Method. The transmission electron microscopy method (TEM), in accordance with 40 CFR 763, may be performed in lieu of the NIOSH 7400 method.

5.1.4.9.7.2 Negative pressure filtration systems for negative pressure enclosures shall continue in operation during all clearance sampling until the final clearance results are accepted by the Company.

Negative Pressure Glove Bag and Negative Pressure Mini-Enclosure Operations. Conduct clearance monitoring for all negative pressure glove bags and negative pressure mini-enclosures except those performed completely outdoors. Sampling pumps shall be calibrated to draw an average air flow rate of 16 lpm. Volumes of air sampled shall be approximately 3,600 liters.

5.1.4.10 Protection

5.1.4.10.1 Respiratory Protection

5.1.4.10.1.1 Respiratory protection shall be in accordance with 5.1.9.7.

5.1.4.10.1.2 Respiratory protection is to be used by everyone entering the regulated area regardless of anticipated or actual airborne exposure levels until the final clearance results are accepted by the Company.

5.1.4.10.1.3 The type of respirator chosen shall meet the specifications of 29 CFR 1926.58(h)(2), except the following additional requirements apply:

(a) As a minimum, a half-face air-purifying respirator equipped with HEPA cartridges shall be used when using the negative pressure glove bag or negative pressure mini-enclosure techniques of removal.

(b) As a minimum, a full-face air-purifying respirator equipped with HEPA cartridges shall be used for all removals using negative pressure enclosures.

(c) As a minimum, a half-face air purifying respirator equipped with HEPA cartridges shall be used when drilling holes 1-inch or less in size.

5.1.4.10.1.4 The Contractor may consider historical monitoring data, taking into account the characteristics of the job, engineering controls, and work practice in determining the appropriate level of respiratory protection. Historical monitoring data used for this purpose shall be summarized in the Safety Work Plan. If historical monitoring data are not available, respiratory protection used shall be of sufficient protection factors to provide protection for unknown concentrations.

5.1.4.10.1.5 The Contractor shall provide adequate respiratory protection for other air contaminants from other sources (e.g., spray poly, encapsulant).

5.1.4.10.2 Protective Clothing

5.1.4.10.2.1 Provide personnel with disposable coveralls, head and foot coverings, gloves, and eye protection. Protective clothing and equipment shall be worn by anyone who enters the regulated area regardless of the anticipated or actual airborne exposure levels until final clearance results are accepted by the Company.

5.1.4.10.2.2 Street clothes shall not be worn under the disposable clothing. All nondisposible clothing that is worn during asbestos removal work shall be placed in labeled impermeable containers and laundered in accordance with 29 CFR 1926.58(i). The nondisposible clothing shall be considered asbestos contaminated regardless of actual or anticipated exposure levels.

NOTE: Respirators shall be worn such that when doffing protective clothing, respirators can be removed last.

5.1.4.10.2.3 At a minimum, a half-face air-purifying respirator equipped with HEPA cartridges and disposable coveralls shall be worn by personnel loading and off-loading waste.

5.1.4.11 Work Plan

The work plan shall include a complete narrative description of the proposed work methods and procedures used. The plan is to be signed by the designated competent person. The plan shall be updated and resubmitted for approval if any changes are made in work procedures, personnel, or materials. As a minimum, the plan shall include:

(a) Project title, work order number, and brief summary of the work.

(b) Name the competent person(s) in charge of abatement activities.

(c) Provide a schedule listing areas in the order work is to be performed, required utility shutdowns (including ventilation systems) for each area, and anticipated completion dates.

(d) Details of the enclosure erection, methods used to provide negative pressure exhausting, including calculations. Also, provide the proposed job layout (e.g., negative pressure machine placement).

(e) Describe work methods used to remove the ACMs. The wetting agent and other chemicals (e.g., lock-down encapsulant) used are to be identified and supported with safety data sheets.

(f) A detailed description of the air monitoring program. State the firm performing the air monitoring, the name and qualifications of the person supervising monitoring, and the name and qualifications of the person performing the monitoring.

(g) Administrative procedures used to enforce the regulated area. This includes descriptions of the following: personnel hygiene procedures, personnel protective device and clothing requirements, entry and exit procedures (including decontamination), prohibited activities, work practices to be observed in the regulated area, and other pertinent information.

(h) Details of the emergency program. The program shall designate medical personnel needed in the regulated area to assist or rescue injured personnel. Emergency planning shall include considerations of fire, explosion, toxic atmospheres, electrical hazards, slips and falls, confined spaces, and heat-related injuries.

(i) Details of the medical examination program.

(j) Details of the respiratory protection program. Include information explaining the respirator selection logic, including personal monitoring data summaries if other than supplied-air respiratory protection is used.

(k) Details of the training program.

(l) Details of a written Hazard Communication Program in accordance with 29 CFR 1926.59(e).

(m) Describe the method for labeling waste and posting signs. Include the proposed locations of all signs and how/where waste containers are labeled and located prior to transportation to the appropriate disposal site.

(n) Provide methods for transporting asbestos-containing waste to the landfill.

5.1.5 Work in Radioactive Contaminated Areas

5.1.5.1 Identification of Contamination and Establishing Working Criteria

The Contractor, under the direction of it's full time Health, Safety, and Environmental Officer (referred to in Section 5.1.3.9.1) shall provide health physics and industrial hygiene monitoring for all work. Not all contamination is presently identified, and it is the Contractor's responsibility to protect their workers at all times.

Contaminated work sites exist within each of the plants and burial grounds outside of the plant boundaries. Not all contaminated areas are identified, and it is the Contractor's responsibility to monitor all sites for contamination.

The Contractor shall determine the type of hazards present and provide protection measures necessary to protect personnel assigned to the work. Protective measures and training shall meet the requirements of DOE orders listed in Section 5.1.5.2 and DOE Radiological Control Manual dated June 1992.

The Company's Health Physics and Industrial Hygiene Department will provide assistance and will review the Contractor's monitoring and approve protective measures.

5.1.5.1.1 Contaminated and Regulated Buildings

Contractor personnel entering the buildings listed in this section shall take the contamination control protective measures listed below:

Notify the Construction Engineer of the purpose and nature of the visit before entering any process area. The Construction Engineer will then notify the process area supervisor to obtain permission for entering the area.

Follow the contamination control requirements posted at the building entrance.

Type 1 dressout is required as a minimum for work involving direct contact with the surfaces identified as being contaminated. Goggles are required inside chemical areas.

If higher levels of contamination are found, Type 2 dressout may be required.

Follow any special precautions as prescribed by the process area supervisor.

Y-12 Buildings:

81-22	9204-2E*	9616-6	9720-24
9201-1	9204-3	9616-7	9720-28
9201-2	9204-4*	9623	9720-29
9201-3	9205	9720-3	9720-32
9201-4	9206*	9720-5*	9720-33
9201-5	9212*	9720-13	9720-44
9201-5E	9213	9720-14	9721
9201-5W	9215	9720-16	9723-25
9201-5N	9401-2	9720-17	9728
9202	9401-4	9720-18	9731
9203	9401-5	9720-20	9737

9204-1	9423	9720-22	9744
9204-2*	9103	9786	9812
9815	9818	9980	9981
9995	9996	9998	9720-12
9767-2	9828-1	9828-2	9828-3

* Only Energy Systems Maintenance and M. K. Ferguson personnel can perform construction work in certain areas of these buildings.

K-25 Buildings:

K-25 (K-303-1 thru K-312-3)	K-1025-A thru E	K-1301
K-27 (K-402)	K-1031	K-1302
K-29 (K-502)	K-1037 (AVLIS)	K-1303
K-31 (K-602)	K-1040	K-1401
K-33 (K-902)	K-1059	K-1405
K-101	K-1064	K-1407-B
K-131	K-1066-B, -E, J, -K	K-1407-C
K-413	K-1070-A, and -B	K-1410
K-601 (Third Floor)	K-1071	K-1413
K-631	K-1098-E	K-1417 (Staging Area Only)
K-633	K-1131	K-1419
K-711	K-1200 (South Bay)	K-1420
K-725	K-1210	K-1421
K-726	K-1210-A	K-1422
K-1004-A thru -D	K-1211	K-1423
K-1004-L	K-1220	K-1425
K-1006	K-1231	K-1435 (TSCA Incinerator)
K-1008-C	K-1232	K-1600
K-1015	K-1300	K-770 (Contam. Scrap Metal Yard)

X-10 (ORNL) Buildings:

1504	3020 Stack	3523	7503
1505	3025	3525	7601
1506	3026	3541	7602
2011	3027	3544	7654
2024	3042	3550	7811
2026	3044	3592	7819
2528	3074	4500-N	7823
2531	3080	4500-S	7824
2537	3100	4501	7830
3001	3127	4505	7831
3002	3502	4507	7842
3003	3503	4508	7860
3005	3505	5500	7863
3009	3506	6000	7877
3010	3508	6010	7900
3012	3517	7025	7920
3019	3518	7500	7930
7876			
White Oak Creek Stations		White Oak Dam Stations	

(8)

Contamination exists in all the listed buildings, but only in limited locations. Some areas are identified as "Regulated Areas" and require health physics surveys and monitoring to verify the absence of contamination before entering the work site, and upon leaving the site. These regulated areas require Type 1 dress out even if contamination is not present. Nonworking personnel may wear shoe covers and lab coats in lieu of coveralls and designated "dirty" shoes.

5.1.5.1.2 Burial Grounds

Training shall be per Section 5.1.5.3.2. All work in burial grounds shall be considered contaminated work.

5.1.5.1.3 Other Locations

Contamination may be encountered in addition to work in the listed buildings and burial grounds. It is estimated that the additional contaminated areas will involve approximately 1-2% of the work.

5.1.5.1.4 Requirements

Work in contaminated areas shall be in accordance with the Contractor's industrial hygiene and health physics recommendations and the requirements of this specification for training, protective clothing, change facilities, respiratory protection, tools and equipment storage, monitoring, and cleanup. The Contractor's recommendations shall be reviewed and approved by the Company prior to beginning.

Worker protection can be divided into two categories: Type 1 and 2. If worker protection requirements exceed Type 2 requirements, the work will be performed by others. Respirator cartridge type is to be determined by the Contractor and approved by the Company.

Type 1 dressout will require coveralls and two pairs of shoes (one clean pair and one dirty pair). After completion of work, dirty shoes will be cleaned by the Company and returned to the Contractor.

Type 2 dressout will require protective clothing, and two pairs of shoes (one clean pair and one dirty pair), respirators, and change facilities. After completion of work, dirty shoes will be turned over to the Company for disposal.

5.1.5.2 Codes, Standards, and References

Code of Federal Regulations 49 Code of Federal Regulation (CFR) Resource Conservation Recovery Act (RCRA)

DOE Order 5480.11, Radiation Protection for Occupational Workers*

DOE Order 5480.10, Contractor Industrial Hygiene Program*

DOE Order 5400.5, Radiation Protection of the Public and Environment*

DOE Order 5480.18, Accreditation of Performance Based Training for Category of Reactors and Nuclear Facilities*

* DOE Orders will be provided upon request.

American National Standards Institute, ANSI Z88.2, 1980

5.1.5.3 Training Requirements

5.1.5.3.1 Training Programs for Work In Radioactive Contaminated Areas

Before working in radioactively contaminated areas, the Contractor's personnel shall be trained regarding OSHA safety requirements, including the Hazard Communication Standard. In addition, radiation worker training and site specific training is required. The Company will provide general radiation training that conforms to the requirements of the DOE Orders listed in Section 5.1.5.2. Training time is 24 hours. Construction workers shall be trained prior to the commencement of on-site work.

5.1.5.3.2 Training Programs for Hazardous Waste Areas

Before working in non-radioactive contaminated areas, the Contractor's personnel shall be trained regarding OSHA safety requirements, including the Hazard Communication Standard. In addition, training is required for the hazardous waste sites non-radioactive contaminants. Construction workers shall be trained prior to the commencement of on-site work.

Establish worker training programs to familiarize the worker with the fundamentals of industrial hygiene and the proper procedures for maintaining exposures ALARA. Training programs are on a continuing basis to enable personnel to remain proficient. Training shall include a means to determine if the trainees have attained necessary qualification status.

The training program shall conform to 29 CFR 1910.120 paragraph (e).

5.1.5.3.3 Other Training

For anything not considered radiological or hazardous waste site training the Contractor shall provide standard industrial training meeting the requirements of the contract, and the Company will furnish site specific training requirements.

5.1.5.3.4 Company-Furnished Training Materials

In addition to training listed above, the Company will provide literature and video tapes to the Contractor as a method to assist the Contractor in training his or her employees for Company work requirements. The tapes include minimum protective requirements required by the Company; procedures for using Company-furnished materials, equipment, and safety instructions typically provided at the preconstruction meeting. Training time for Company-furnished tapes and literature is approximately 2 hours.

5.1.5.3.5 Certification

A copy of the certificate of completed training for each employee assigned to work shall be submitted to the Company prior to any of the Contractor's employees being allowed access to the work area.

5.1.5.4 Protective Clothing

5.1.5.4.1 Contractor-Furnished Clothing

The Contractor shall provide clothing items such as coveralls, underwear, socks, gloves, and shoes. Contaminated (only) clothing will be laundered by the Company at the Company's expense.

5.1.5.4.2 Contractor-Furnished Shoes

The Contractor shall furnish safety shoes for all personnel. Store shoes used in contaminated areas in designated change facility at the completion of each workday.

5.1.5.5 Change Facilities

5.1.5.5.1 Change facilities for use by the Contractor will not be provided by the Company.

5.1.5.5.2 The Contractor shall provide change facilities that include clean/dirty change areas, shower facilities, lockers, and storage for clean/dirty protective clothing.

5.1.5.6 Respiratory Protection

Provide respiratory protection in accordance with Section 5.1.9.

5.1.5.7 Tools and Equipment

5.1.5.7.1 Tool Storage

Tools used by the Contractor in contaminated areas are kept within the contaminated area until removal is approved by the Company. Minimize the quantity of tools and equipment brought into contaminated areas.

5.1.5.7.2 Contamination Survey

Tools and equipment, including power equipment and temporary scaffolding, to be removed from a contaminated area will be checked for contamination and if contamination is present will be decontaminated by the Company.

Schedule Company contamination surveys seven days in advance for vehicles and equipment, and three days for tools. Provide a list and description of items to be surveyed.

5.1.5.8 Monitoring

5.1.5.8.1 Company Monitoring

The Contractor shall comply with the following contamination control and personnel monitoring procedures routinely used by the Company:

(a) Radiation dosimeters and identification badges for each Contractor's employees are required and furnished by M. K. Ferguson.

(b) Bioassay (urine and blood analysis) and in vivo (body) monitoring may be required and, if required, will be performed by the Company.

(c) In order to protect the Contractor's personnel from exposure to contaminants, the Company may take samples in the work area and/or monitor the employees.

5.1.5.8.2 Personnel Exposure Records

The personnel exposure records of the radiation dosimeters and bioassay monitoring will be supplied to the Contractor by the Company, and it is the responsibility of the Contractor to provide the information to its employees, and keep permanent exposure records for all employees.

5.1.5.9 Clean Up and Personal Hygiene

5.1.5.9.1 Waste Disposal

Remove all non-contaminated trash and debris from the work area daily and dispose of it at locations designated by the Company. Contaminated material is not permitted in the sanitary landfill.

Handle material in DOT-approved vehicles. Drivers shall be DOT certified. Line truck beds with plastic and cover tops with plastic to provide complete containment.

Place contaminated materials in Company provided containers for disposal by the Company.

5.1.5.9.2 Personal Hygiene

No eating, drinking, or use of tobacco products is permitted in the work area.

Wash hands upon leaving the work area and prior to eating or smoking.

Follow all posted requirements in each work area.

5.1.6 Construction Facilities and Temporary Controls

5.1.6.1 Cleaning Up

Cleanup, disposal of trash, and orderly arrangement of equipment, material, and supplies shall be done daily by the Contractor. Delivered and surplus materials shall be neatly stacked and

maintained. Dispose of waste and debris, including such items as cigarette butts, food wrappers, drink containers, and construction litter, in Contractor-provided trash receptacles. The Contractor shall request and receive the Company's approval before removing empty trash receptacles from the Plant.

If the Contractor fails to maintain the cleanliness and orderly arrangement requirements, the Company may, after 48 hours written notice, correct the deficiencies and charge the cost to the Contractor.

5.1.6.2 Temporary Fencing

Provide the following security fencing prior to starting construction.

Y-12 perimeter fencing shall be relocated such that Y-12 site Central Office construction area is out of the Limited Security Area. After installation and checkout, but prior to cutover, the fencing shall be moved such that this facility is inside the perimeter fence.

K-25 fencing shall be relocated such that the K-25 site Central Office construction area is outside the K-25 protected area. After installation and checkout, but prior to cutover, the fencing shall be moved to the original location.

If used, the Y-12 remote module hub site at Building 9201-5 shall be surrounded by a security fence to create a Property Protection Area island. Any classified wirelines transversing the newly created island must be secured by installing razor ribbon on the carrier poles. Until cutover, personnel must be escorted to and from this area by Contractor provided Q-cleared escorts. The Company will provide a security guard at the entrance to this area to prevent unauthorized access or exit while work is being performed. After cutover, this fence shall be removed.

5.1.6.3 Temporary Utilities

5.1.6.3.1 Electric Power and Water

5.1.6.3.1.1 Electric power, 120 V and water in reasonable quantities, sufficient for the Contractor's requirements to perform the work of this contract, will be furnished from existing outlets and supplies by the Government without charge. The Contractor shall carefully conserve utilities furnished.

5.1.6.3.1.2 Submit a written request for approval four working days in advance of the need, for temporary connections to existing utility systems. The Contractor shall furnish, install and maintain lines and connections and provide acceptable protective devices necessary to prevent damage to Government property. Backflow preventers for temporary water lines and ground fault interrupters for temporary electrical lines are mandatory. Upon completion of the work, restore utility services to their original condition.

5.1.6.3.2 Sanitation Facilities

When toilet facilities are not available provide chemical toilet facilities at locations approved by the Company. Maintain the toilets in a clean, safe, and sanitary condition for the duration of the project.

5.1.6.3.3 Telephone Service

Telephone services are available through the telephone company at the Contractor's expense.

5.1.6.3.4 Eating Facilities

Existing eating facilities are not available for use by the Contractor's personnel.

5.1.6.4 Parking Area

Parking facilities for the Contractor's employees are limited to the areas designated for construction personnel. Parking along roads is prohibited.

5.1.6.5 Alterations to Existing Facilities and Utilities

5.1.6.5.1 Submit a written request for approval, four working days in advance of the desired start, of an alteration that will affect the structural integrity, weather protection, or moisture resistance of a facility or utility; disrupt an existing utility or process system; or require work above offices or other areas occupied by the Company's personnel. The request shall include the work location, method of accomplishment, and date and time(s) work will be performed.

5.1.6.5.2 When making penetrations of floors, walls, or ceilings into adjacent operating areas, including the plenum over ceilings, provide a means of containing all debris and dust in the construction area. While making such penetrations, tools and equipment shall be grounded.

5.1.6.5.3 Phase demolition and new work to ensure dust and debris do not impede activity in adjacent operating areas.

5.1.6.5.4 Maintain the integrity of the existing roof and exterior walls. Provide absolute protection from moisture and adverse weather conditions for the existing operating facility at all times during the construction period.

5.1.6.6 Deactivation of Existing Utilities

The Company will remove and restore service to all active utilities including valving off water lines and deenergizing and grounding power lines. Submit a written request to the Company 4 working days in advance of the desired shutdown of service facilities. When the system is deenergized, lockout the system in accordance with 29 CFR 1910.147 and the Company's Technical Specification Section 01190, Lockout/Tagout.

5.1.6.7 Protection of Existing Vegetation, Structures, Equipment, Utilities, Survey Reference Points, and Improvements

5.1.6.7.1 Utilities and Structures

When utilities or structures not shown or not correctly located on the drawings are encountered, the Contractor shall immediately stop work and notify the Company. The Company will issue detailed instructions indicating the method used to proceed. If the Contractor damages utilities or structures, whether or not shown on the drawings, the Company shall be immediately notified. The Company will issue instructions indicating the method of repair or replacement.

5.1.6.7.2 Vegetation

Vegetation not identified to be removed on the drawings shall be protected and preserved. Damaged vegetation shall be replaced.

5.1.6.7.3 Paint Overspray and Drift

Submit a written request for approval four days in advance of the need to start spray painting operations. Spray painting is not permittec unless the area is sufficiently roped off and shielded to prevent overspray and paint drift damage to adjacent property, equipment, personnel, or vehicles. If a spray paint application is used, the Contractor shall be prepared to work weekends, holidays, or evening hours to accommodate operations and prevent potential overspray damage. Damage due to overspray or drift is to be replaced or restored at the Contractor's expense.

5.1.6.8 Protection of Traffic

5.1.6.8.1 Minimize interferences with the use of existing roads. If work will obstruct traffic, submit a written traffic plan for approval four days in advance of the need to perform work which could impede or obstruct traffic. The Contractor shall make temporary arrangements required to maintain at least one lane of traffic. Acceptable methods of performance include, but are not limited to, bridging an excavation, providing ramps over surface obstructions, or providing a suitable temporary bypass around the construction. This does not include rerouting of traffic to a different road or street unless written permission is given.

5.1.6.8.2 The Contractor shall provide, erect, and maintain all temporary bypasses, barricades, bridging, ramps, sidewalks, guardrails, and warning signs; furnish, place, and maintain adequate lights and warning signals; and provide flagmen and watchmen. These safeguards shall protect pedestrian and vehicular traffic. Remove barricades, bridging, or other temporary construction upon completion of the work.

5.1.6.8.3 Traffic control shall conform to the current Manual on Uniform Traffic Control Devices for Street and Highways, Bureau of Public Roads (DOT).

5.1.6.9 Identification of Contractor's Facilities

All permanent and temporary buildings, structures, and enclosures (e.g., storage sheds, shops, offices, trailers, fenced areas, rooms, etc.) capable of being secured by the Contractor, its subcontractors, or suppliers shall be posted with identification and emergency notification signs.

5.1.6.9.1 Identification

Signs shall be weatherproof and include:

(a) Name of the Contractor
(b) Contractor's contract number
(c) Company's work order number
(d) Name of the contractor, or supplier, responsible for the contents of the area (if applicable)
(e) Address of the firm identified in Items (a) and (d)

5.1.6.9.1.1 Lettering shall be at least 3 inches high and colored to contrast well with the background.

5.1.6.9.1.2 The identification sign shall be placed in a conspicuous location adjacent to the Contractor's secured entrance to the building, structure, or enclosure.

5.1.6.9.2 Emergency Notification Signs

(a) Emergency notification signs shall be weatherproof and include the phone number of the person, and at least one alternate, to be notified in the event of an emergency. The phone number(s) furnished shall ensure that notification can be given at all times; nights, weekends, and holidays included.

(b) The lettering shall be legible (minimum 1 inch high if handwritten) and colored to contrast well with the background.

(c) Place emergency notification sign adjacent to the identification sign described above.

5.1.6.10 Liquid Waste

Dumping of liquid waste into sanitary sewers, storm sewers, waterways or drainage ditches without the written permission of the Company is prohibited. Immediately report all spills of liquid material to the Company. The Contractor shall make every effort to contain the spill.

Any liquid waste removed from manholes shall be sampled by the Contractor and if contamination exists shall be pumped into Company furnished storage tanks.

5.1.6.11 Erosion and Environmental Protection

5.1.6.11.1 Erosion and sediment control measures shall be detailed on construction drawings, approved by the Company, and in place prior to excavation and grading operations. These measures shall be in accordance with the U.S. Department of Transportation Best Management Practices Plan for Erosion and Sediment Control, dated December 1978; and Y/EN-4167, Best Management Practices Plan for the ORF-ICN, or other guidelines as approved by the Company.

5.1.6.11.2 Grade the work area ground surface to prevent water from running into excavated areas.

5.1.6.11.3 All operations shall be conducted in a manner that:

(a) Minimizes the potential for erosion of soils and silt.

(b) Prevents the entry of construction debris, soils, silt, or other deleterious materials into surface streams or the storm sewer system.

(c) Minimizes the transfer of surface water including, but not limited to, precipitation, storm runoff water, and potable water into the subsurface environment.

(d) Ensures erosion and sediment control measures taken are maintained throughout the contract and removed at the end of the contract.

5.1.6.12 Disposal Area

5.1.6.12.1 Spoil

Dispose of excavated earth stumps and wood only at designated disposal sites. Various sites are available throughout the reservation, but are not located within the plant sites. Locations are within 2 miles of X-10, Y-12, and K-25.

5.1.6.12.2 Concrete

5.1.6.12.2.1 The flushing of empty concrete trucks or the dumping of excess concrete is allowed only in the area designated for that purpose by the Construction Engineer.

5.1.6.12.2.2 If full strength concrete is to be wasted, it shall be diluted with water to the point it will not consolidate in large unbreakable masses.

5.1.6.12.3 Non-contaminated Waste

All waste removed from the job site shall be accompanied by a Company-furnished permit. Request for these permits shall be made 24 hours in advance by the Contractor. Deliver materials to the sanitary landfill between the hours of 9 a.m. and 3 p.m. daily. Sort the material into the following categories:

- combustible waste,
- noncombustible debris (including concrete, asphalt, etc.),
- insulation (package before deliver),
- glass and glass containers (broken and crushed before delivery), and
- asbestos (Tuesdays from 9 to 11 a.m. and 12 to 1 p.m. only).

The Contractor shall provide satellite on-site storage for RCRA and hazardous wastes (excluding asbestos). The Company will transfer the waste to permanent storage facilities. All temporary storage areas shall comply with Federal regulations.

Provide dumpsters and containers for storage of waste. Assign an individual responsible for waste disposal activities, and perform a daily inspection at waste storage areas.

A Waste Transfer Storage and Disposal Request and a Health Physic's green tag is required before transporting waste to the landfill. The landfill will not accept waste without the proper disposal forms.

Transport recyclable waste (wood, aluminum, and cardboard) to Company on-site storage areas.

5.1.6.12.4 Spoil and Waste from Non-DOE Job Sites in the City of Oak Ridge

Waste removal from non-DOE job sites shall be disposed of in accordance with codes and ordinances of the city of Oak Ridge.

5.1.6.13 Salvageable Materials

5.1.6.13.1 Deliver scrap metal, metal duct after the insulation is removed, etc. (excluding equipment), to a salvage yard at Y-12, X-10, or K-25 where the Company will direct the Contractor where to unload the materials.

5.1.6.13.2 Installation shown on the drawings to be removed by the Contractor shall be removed with reasonable care. Deliver salvageable portions to the salvage yard.

5.1.6.13.3 Provide for complete containment of any spoil, waste, and salvageable materials during transport.

5.1.6.14 Borrow

Borrow is available from the Government site upon request. Exact locations will be designated for each work area requiring borrow.

5.1.7 Non-Asbestos Fibrous Insulation

5.1.7.1 Description

5.1.7.1.1 This section provides the general work requirements for installation and removal of fibrous insulation, excluding asbestos, to ensure adequate worker protection.

5.1.7.1.2 Definitions

Established Work Area-Boundaries, established by the Contractor, where airborne concentrations of fibrous insulation may be expected because of the work activity.

5.1.7.2 Submittals

5.1.7.2.1 Records

After completing the work activity, submit records providing the name, badge number, date, and the amount of time spent installing or removing fibrous material for all personnel involved in the insulation work.

5.1.7.2.2 Respiratory Fit Test

5.1.7.2.2.1 Provide a list of employees who received the respirator fit test. Include the employee's full name, social security number, and test date.

5.1.7.2.2.2 Submit copies of certification cards/papers (including dates) for personnel conducting the respiratory fit tests.

5.1.7.2.3 Training

Submit a list of personnel trained in the requirements of this section. State the employee's full name, job title, title of course, training date, training organization, and training instructor.

5.1.7.3 Delivery, Storage, and Handling

Do not rupture bags or wrapped waste during loading and unloading operations. If necessary, unload heavy plastic wrapped waste with fork lifts, cranes, or other suitable equipment.

5.1.7.4 Material

Disposal bags shall be 6-mil polyethylene. Do not use bags pre-printed with asbestos labels.

5.1.7.5 Equipment

5.1.7.5.1 All vacuum cleaners shall be equipped with an HEPA filter.

5.1.7.5.2 Portable electric hand tools shall be used with a means of dust control.

5.1.7.6 Preparation

5.1.7.6.1 Fibrous Material Determination--New Installations

The Contractor is to determine if new insulation is fibrous material.

5.1.7.6.2 Fibrous Material Determination--Existing Facilities

If existing insulation is encountered during the work activities, the Contractor shall determine if the insulation contains fibrous materials before proceeding with construction activities.

5.1.7.6.3 Training

All personnel working with fibrous material shall be trained to this section.

5.1.7.7 Installation/Application/Erection

5.1.7.7.1 Established Work Area

5.1.7.7.1.1 Establish a work area by using barrier tape of flagging before the start of on-site work. Do not use asbestos tape.

5.1.7.7.1.2 Post signs warning personnel not to enter the work area and identify the type of insulation material being handled.

5.1.7.7.1.3 The barrier tape or flagging is to remain in place until work and final clean up is complete.

5.1.7.7.1.4 Access to the area is limited to personnel equipped with protective clothing, respirator, and properly trained.

5.1.7.7.2 General Requirements

5.1.7.7.2.1 Ensure workers comply with training and respiratory fit testing requirements.

5.1.7.7.2.2 Eating, chewing tobacco, chewing gum, drinking, or smoking is prohibited in the established work area.

5.1.7.7.2.3 Workers shall shower at the end of the work activity or the workday, whichever comes first.

5.1.7.7.2.4 Implement dust suppression techniques whenever feasible. Sweeping, using compressed air for cleaning, or other fiber disturbing activities are prohibited in the established work area.

5.1.7.7.2.5 As a minimum, half-face respirators equipped with HEPA filters are required. For insulation containing refractory ceramic fibers, a full-face respirator equipped with either a Type H HEPA filter or a GMC-H combination filter is required.

5.1.7.7.2.6 Portable hand tools used to drill, cut, or otherwise disturb fibrous insulation are to be equipped with a HEPA-filtered exhaust ventilation system. As an alternate, a vacuum cleaner can be used by positioning the hose attachment in such a manner to ensure dust will be captured.

5.1.7.7.2.7 Workers inside the work area are to wear disposable impervious Tyvek coveralls equipped with a hood and shoe covers. Immediately repair rips or tears in the protective clothing with duct tape or replace.

5.1.7.7.2.8 Workers are to wear eye protection while in the established work area.

5.1.7.7.2.9 Workers are to wear the respirator and vacuum the disposable suits and external clothing underneath the suits before leaving the established work area. After leaving the established work area, workers shall vacuum the respirator while it is being worn and then remove it.

5.1.7.7.3 Clean-Up Requirements

5.1.7.7.3.1 Debris created during the installation of fibrous insulation is to be bagged or contained at the end of each shift. Double bagging is not required.

5.1.7.7.3.2 Loose fibrous material shall be bagged or contained as it is removed. Assure all other debris created during the activity is bagged or contained at the end of each work shift. Double bagging is not required.

5.1.8 Welding Procedures, Qualifications, Inspection, and Testing

Submit 6 copies of the proposed welding procedures and welder qualifications for approval to the Company prior to the start of either shop or field fabrication. Additional welding code requirements are identified in the applicable sections of this specification.

5.1.8.1 Welders Stamp

The Company will provide each welder a unique identification number, letter, symbol, and stamp to identify the welder's work when weld identification is specified in the applicable sections of the specification.

5.1.8.2 Inspection and Testing

5.1.8.2.1 Perform testing and inspection required by the applicable section of the specification and submit 6 copies of the inspection and test reports to the Company. Repair all nonconforming welds in accordance with applicable sections of this specification.

5.1.8.2.2 The Company may perform or request the Contractor to perform additional nondestructive tests identified in the specified codes. Nonconformances disclosed by such tests shall be repaired and retested to specification requirements by the Contractor at its expense.

5.1.8.3 Incidental Welding

Incidental welding required by the work but not specifically identified in the specification shall be performed in accordance with the requirements of American Welding Society Standard D-1.1 and quality shall be assured by visual inspection.

5.1.8.4 Cutting, Welding, Burning, and Hot Work Operations

5.1.8.4.1 Permit

A daily permit is required for cutting, welding, burning, or hot work operation. After checking the work location, the Company will complete one side of the permit and issue the permit to the Contractor. The Contractor shall inspect and prepare the work area and complete the Contractor's side of the permit. The names of the designated fire watch personnel shall be printed in the space provided on the permit.

5.1.8.4.2 Fire Watch

5.1.8.4.2.1 Provide a continuous fire-watch during all cutting, welding, burning, and hot work operations. The fire-watch shall be maintained through all work breaks, lunch breaks and for a period of 30 minutes after the completion of such work operations or after quitting time. The fire-watch personnel shall not perform any other tasks during the fire-watch period.

5.1.8.4.2.2 The Contractor shall instruct fire-watch personnel in the fire prevention practices of National Fire Protection Association Standard 51B. Verification of this instruction shall be provided to the Company upon request.

5.1.9 Respiratory Protection

5.1.9.1 Description. This section provides the respiratory protection requirements for all personnel working with asbestos, non-asbestos fibrous insulation, carcinogenic substances, radioactive contamination, welding, confined space, painting or other processes where a respirator is the required personnel protective clothing. Work shall be performed in accordance with Standard 29 CFR 1910.134, ANSI Z88.2, ANSI Z88.6 and requirements stated herein.

5.1.9.2 Definitions. Single-use of respirator: The time period starting at entry into the contaminated zone until the respirator face-to-face piece seal is broken. Essentially one donning and doffing cycle.

5.1.9.3 References

ANSI Z88.2, 1992, "Practices for Respiratory Protection"

ANSI Z88.6, 1984, "For Respiratory Protection - Respirator Use - Physical Qualifications for Personnel"

OSHA Regulations for General Industry, Standard 29 CFR 1910.134, Respiratory Protection

5.1.9.4 Submittals

(a) Respiratory Protection Program Operating Procedures.

(b) Respiratory Program Administrator name and qualifications.

(c) Copy of Physician's medical evaluations.

(d) List of trained personnel, and dates when training occurred.

(e) List of personnel receiving fit test, and date of most recent fit test.

5.1.9.5 Delivery, Storage, and Handling. (Requirement Deleted)

5.1.9.6 Inspection. (Requirement Deleted)

5.1.9.7 Preparation

5.1.9.7.1 Medical Evaluation. Before an employee is issued a respirator, a physician's written approval shall be submitted stating the employee is suitable to wear a respirator in accordance with the requirements of ANSI Z88.2 and ANSI Z88.6.

5.1.9.7.2 Training. (Requirement Deleted)

5.1.9.7.3 Fit Test. Before an employee is issued a respirator, the employee shall receive a quantitative (not qualitative) fit test in accordance with ANSI Z88.2. Submit records of all personnel receiving a fit test.

5.1.9.8 Installation, Application, Erection

5.1.9.8.1 Respirator Information

(a) Respirators shall not be re-used in areas where single-use is identified. Single-use is required where radioactive contamination is present.

(b) When re-use of respirators is approved the following shall be performed:

(1) Respirators placed in a clean plastic bag and stored in a secure location accessible only to the wearer.

(2) Respirator cleaning material provided to the wearer when the respirator is initially issued.

(c) When respirators are re-used, reuse is limited to thirty (30) calendar days.

(d) Contact lenses may be worn under full face respirators instead of glasses. Personnel wearing contact lenses shall also have respirator corrective lens inserts available.

(e) Quarter-mask respirators, half face respirators, and disposable dust masks that cannot have a positive and negative pressure test performed are not permitted.

(f) Use of disposable respirators that meet the fit test requirements is encouraged.

(g) Respirators used in radiation areas will be monitored by the Company, and if radioactive contamination is present will be cleaned by the Company at a cost to the Contractor of $34 each. (Disposable respirators will be disposed of by the Company.)

(h) The Contractor shall provide all respiratory protection.

5.1.9.8.2 Face Piece Seal

(a) All personnel wearing a respirator shall check the respirator seal with a positive or negative pressure check in accordance with Annex A of ANSI Z88.2 before entering a harmful or potentially harmful atmosphere.

(b) Requirement Deleted.

5.1.9.8.3 General Requirements. (Requirement Deleted)

5.1.9.8.4 Field Quality Control. The Facilities Manager may perform periodic surveillance of the Contractor's respirator program to ensure compliance with this section.

5.1.9.8.5 Protection. Whenever possible, controls shall be used to prevent atmospheric contamination of harmful elements such as dust, fumes, sprays, mists, fogs, smoke, vapor, or gases. A respirator is a secondary method of worker protection and used in conjunction with engineering controls such as ventilation, enclosures, and vacuums.

5.2 CONSTRUCTION AND DESIGN REQUIREMENTS

5.2.1 Engineering Information

5.2.1.1 General

Provide complete architectural-engineering (A-E) services by utilizing a licensed A-E firm that normally engages in facility engineering and design work. The A-E firm shall provide the complete facility design for the project. The quality and completeness of the engineering shall be equal to that produced by such firms awarded subcontracts for the design and construction of commercial and/or industrial work.

The Contractor shall provide A-E services to follow the construction phase of the project, to provide field surveys, to supervise and document tests, and to review and approve construction documents. All submittals shall have been reviewed and approved by the A-E before the Contractor submits the items to the Company.

The drawings furnished by the Company are, in general, to scale. Scales shown on a microfilmed reproduced drawing change in proportion to the reduction of the drawing from the original size. Figured dimensions shall always be followed, and the drawings shall not be scaled. The Contractor shall verify "as-built" conditions appearing on all drawings furnished by the Company.

It is the Contractor's responsibility to define his or her subcontractor's work and to provide the job complete in accordance with the drawings and specifications.

5.2.1.2 Design Requirements

Design shall be in accordance with the Project Design Criteria Y/EN-4451 and the references listed in Appendix 1. If any conflict exists between Y/EN-4451 and this specification, this specification shall govern. The design shall include the structural and architectural components; associated site work; piping; electrical; sprinkler; and heating, ventilating, and air conditioning systems.

Design drawings shall show dimensional plans, elevations, sections, details of construction/installation, notes, and specific identification of all materials and equipment.

"Certified for Construction" (CFC) design documents approved by the Company shall be generated prior to the start of any construction or procurement of material.

Note: Issuance of design documents may be segmented to facilitate the construction schedule. The Company will work with the Contractor by making early reviews of architectural floor plans, site work, foundations, utilities, long-lead procurement items, etc. Advanced drawings shall be accompanied with applicable design calculations.

CFC documents and final design calculations shall bear the seal of a licensed architect or engineer registered in the State of Tennessee and employed with the A-E.

All design documents shall be submitted in the form of hard copy reproducible transparencies.

5.2.1.2.1 Computer-Aided Design Equipment

All new drawings, and revisions to electronic drawings supplied by the Company, shall be prepared or revised using a computer-aided design (CAD) system. The CAD system in use by the Company for facility design is the Intergraph. Therefore, Intergraph is a preferred CAD system for facility design. However, other CAD systems may be used if they provide complete bi-directional translation capability to and from Intergraph via the Initial Graphics Exchange Specification (IGES) or the Autodesk Data Exchange Format (DXF).

5.2.1.2.2 Computer-Aided Design Deliverables

All new design drawings, and revised electronic drawings supplied by the Company, shall be provided in a computer sensible format as well as in hard copy (reproducibles). At project completion, these deliverables shall be submitted in the A-E firm's CAD system format and in either a neutral file format (IGES Version 3.0 or later or DXF as specified by Energy Systems) or in CADAM NURESTOR format. The medium for the data transfer is specified in Y/EN-4612, "Martin Marietta Energy Systems, Inc., CAD Data Exchange."

5.2.1.2.3 Computer-Aided Design Drawing Structure

The CAD drafting standards and drawing structure as outlined in the latest revision of Y/EN-4612, "Martin Marietta Energy Systems, Inc., CAD Data Exchange," shall be followed.

5.2.1.2.4 Validation of Computer-Aided Design Translation

See Y/EN-4612, paragraph 2.1.

5.2.1.3 Field Requirements

The A-E shall follow the course of the work in the field to assure compliance with the prepared CFC documents.

Maintain field records and provide the Company with final A-E stamped "As-Built" drawings.

All construction documents such as vendor/manufacturer data, concrete design mixes, shop drawings, etc., shall have been reviewed and approved by the A-E before submittal to the Company.

The A-E shall certify results of all required tests.

A weekly progress report and surveillance report shall be submitted to the Company through the duration of construction and testing activities. Reports shall briefly summarize activities occurring through the reporting interval including material deliveries, work progress, tests, etc.

Provide an on-site A-E representative for as much time as is necessary to accomplish the intent of these field requirements. A full-time A-E representative is not required.

5.2.1.4 Submittals

Submit the name of probable A-E firms with the bid.

5.2.1.4.1 Cover Letter

All submittals of drawings, data, and warranties shall be attached to a cover letter which explains the contents as follows:

(a) The job name, which shall be the title of specification.

(b) The contract number.

(c) The specification number.

(d) The name of the Contractor and Contractor's subcontractor.

(e) The name of the item, material, or equipment.

(f) The data of the original submission and the date of all changes or revisions.

(g) The Company equipment identification number where applicable.

(h) The CFC drawing number to which the shop drawings, manufacturers' data, and/or warranty apply.

5.2.1.4.2 Design Documents

The following offers a brief description of each type of submittal:

(a) Preliminary Design Document List

Submit with the bid a preliminary list of estimated design drawings, including identification of drawing types, which will be used to document the facility and cable plant design.

(b) Design Document List

Submit a complete list of all design documents that will be prepared by the A-E. The list shall be submitted as early as possible after award of bid and no later than the 60% design completion.

The Company will return the list complete with drawing number assignments.

(c) Design Documents

Unless specified otherwise, drawings, specifications, bills of material, checkout procedures and other design documents for site preparation and construction shall be submitted for approval at points where design activities are 30%, 60%, and 90% complete as defined by Company Procedure EP-C-27. Separate design packages shall be submitted for K-25, Y-12, X-10, Townsite, and the Inter-plant Fiber Optic Trunk.

Design packages shall include the information listed in Figure 3 of Company Procedure EP-C-27.

Company comments on the 30%, 60%, and 90% submittal will be documented on the form shown in Figure 4 of EP-C-27. Action on the comments on the 30%, 60%, and 90% design packages shall be documented via written responses on the same form prior to issuing the 60%, 90%, and CFC packages respectively. Design packages submitted for the 90% design review shall be complete such that this review need only address minor errors in documentation.

(d) Design Calculations

Provide design analyses and calculations per the Company's Engineering Standards ES-0.7.

The design calculations shall be submitted at 30% completion of drawings or sketches in sufficient detail to establish intent of design.

All calculations shall be prepared, dated, and signed by a registered professional engineer(s) or an architect, as appropriate. The package shall include the following calculations as a minimum:

1. Structural

Building foundation and floor designs
Steel framing and connections
Reinforced concrete items
Building resistance to seismic loadings
Masonry wall reinforcement designs

2. Electrical

Lighting design
Short circuit
Voltage drop
Load and demand
Bending radius for conductors/cables
Power factor
Grounding design
Protective device coordination
Signal strength and loss (telecommunications)

3. Piping

Sizing of systems

4. Heating, Ventilating, and Air Conditioning

Calculations related to loads, sizing, selection, and layout of all heating, ventilating, and air conditioning (HVAC) equipment and duct work and Life Cycle Cost Analysis as specified in Section 5.2.3.

5. Civil

Storm sewer and sanitary sewer sizes

(e) Material and Equipment List

Prepare a complete list of all items of material and equipment proposed for use in the construction of the work. The list shall be submitted at 60% design completion.

(f) Vendor and Manufacturer Data

Submit vendor and manufacturer data to the Company for review. The data shall include as a minimum the catalog or model number, size, weight, performance data, etc.

Four copies of all certified data, installation and operating instructions, spare parts lists, etc., that are received either before or with the shipment shall be transmitted to the Company as record copies.

(g) Shop Drawings

Shop drawings shall be defined as those drawings which show details required for fabrication or installation of items where such detail is not part of the design drawings; for example, structural steel fabrication and erection drawings, prefabricated building drawings, reinforcing steel detail drawings, sprinkler drawings, equipment internal wiring and control diagrams, and manufacturer's instructions and/or drawings used for field installation.

(h) Samples

Material or item samples shall be submitted to the Company for review and comment to assure suitability for intended use.

(i) Test and Inspection Reports

Submit test reports for all tests and inspections. These reports shall be certified.

(j) Field Change Requests

Requests for changes to the CFC design documents shall be in written form and shall be approved by the A-E before being submitted to the Company. Company approval shall be required for all field changes.

(k) Welding Procedures and Operator Qualifications

Submit proposed welding procedures and operator qualifications for approval.

(l) Welding Inspector Qualifications

Submit welding inspector qualifications for approval.

(m) Construction Project Requirements Summaries

Submit a Construction Project Requirements Summaries (CPRS) in accordance with Company Engineering Procedure EP-E-12 describing how all testing specified in Section 5 will be performed. Include a testing requirements summary similar to Company Engineering Standard ES-0.4-1.

5.2.1.5 Design Kickoff

Prior to starting design, a kickoff meeting shall be held between the Contractor, the A-E performing this design work, and the Company design team. This kickoff meeting shall cover the information listed in Figure 2 of Company Engineering Procedure EP-C-27.

5.2.1.6 Schedule

Prepare a construction schedule for the work and submit it for approval to the Company 120 days after contract award.

5.2.1.7 Procurement of Materials and Equipment

After design CFC issue, promptly place orders for all equipment, materials, and services required to complete the project.

Submit to the Company, within 30 calendar days after design CFC issue, a Procurement Status Report listing critical material and equipment, vendor, and promised delivery of items which may affect timely completion of the project.

Immediately notify the Company in writing of any changes in deliveries or circumstances that would affect timely delivery of any equipment, material, or services that have potential for delaying completion of construction work.

Any request for an extension of time for completion because of late delivery of equipment, material, and services shall be accompanied by documentation showing that reasonable effort to accomplish procurement has been expended.

5.2.2 Civil, Structural, and Architectural

5.2.2.1 Civil, Site, and Waste Management

5.2.2.1.1 General

Existing utility lines, structures, roadway surfaces, sidewalks, grassed areas, and other features adjacent to the work area shall be protected. Damages to such items shall be repaired.

Provide erosion and sediment control to minimize erosion and the transport of sediment into storm sewers or beyond the limits of the work area. Methods of control may include geotextile filter fabric silt fences, straw bale barriers, sediment traps, check dams, or other approved control structures. The erosion control plan shall be detailed on construction drawings and the material and requirements included in the construction specifications. Design of erosion control methods shall be in accordance with the U.S. Department of Transportation Best Management Practices for Erosion and Sediment Control, dated December 1978, or other guidelines as approved by the Company, and Y/EN-4167, Best Management Practices Plan for the ORF-ICN.

Maintain excavations free from water and protected from traffic. Should water enter the completed excavation, dispose of the water in a Company approved manner and allow for soil to adequately dry before proceeding with work.

A subsurface soil investigation report is provided in Appendix 7A to supplement the information included in this specification.

Consult with the Company regarding the acceptability of soil conditions at the bottom of excavated areas for foundations before proceeding with work.

Notify the Company when unusual or unexpected circumstances are encountered. Such things as soft or yielding soil in cut areas, spring or seepage water, buried objects of significant mass or size, and underground utility lines not shown on the reference drawings would fall in this category.

5.2.2.1.2 Site Work

All surface features within the work area shall be cleared. Demolition will involve the removal of existing sidewalks at the sites, rerouting portions of sidewalks, and rerouting some storm drains. Provision shall be made for temporary all-weather walks for pedestrian traffic while the rerouting of a walk is taking place. As a minimum, surface shall be asphalt.

Areas to be graded shall be stripped of topsoil or sod. Topsoil suitable for reuse shall be stored at nearby locations designated by the Company.

Grading around buildings shall be provided to give positive drainage for storm water runoff. Maximum slope of finished grading shall be 1.0 vertical on 3.0 horizontal for grassed areas so mowing equipment can be used safely. Where it is not practical to maintain the 1.0 on 3.0 slope, reinforced concrete retaining walls shall be provided to resist the lateral force of earth pressures.

Newly graded areas not specified for other surface treatment shall be finished with a minimum 4 inch layer of topsoil. Areas shall be fertilized and seeded with Kentucky 31 Fescue at a rate of 5 lb/1,000 sq feet. Seeded areas shall be covered with straw, watered, and maintained to achieve an acceptable stand of grass. Seeding with Kentucky 31 fescue shall be done during the periods of February 15 through April 14 or August 15 through October 14. Other types of ground cover shall be used to stabilize the soil when required during periods other than those for Kentucky 31 fescue as approved by the Company.

5.2.2.1.3 Earthwork

Fill and backfill material shall be as follows:

Earth shall be free of organic matter and solid fragments exceeding 3 inches in size.

Sand shall be natural or crushed stone passing No. 10 sieve.

Crushed stone shall be aggregate mixture conforming to American Association of State Highways and Transportation Officials (AASHTO) Standard Specification M-147, Gradation C.

<u>Stabilized Aggregate Base</u> course shall consist of a premixed base material of crushed stone mixed with binder material and water.

The materials, methods of construction and workmanship shall be in accordance with the Tennessee Department of Transportation, Bureau of Highways "Standard Specifications for

Road and Bridge Construction," latest editior, Section 303, unless otherwise specified in this specification, or on the drawings. Mineral aggregate base shall be type A, class A aggregate, grading D.

When additional base material is to be added to existing stabilized aggregate base, the existing base shall be scarified to a depth of 2 to 3 incnes. New stabilized base material shall be added, thoroughly mixed with the old material by blending, and compaction continued as for new aggregate base.

The surface of the top layer shall not show any deviation in excess of 3/8 inches when tested with a 10-foot straight edge applied parallel to and at right angles to the center line of the paved area.

Compaction of each layer shall continue until a density of not less than 83% of the solid volume has been achieved. The density determination will be based on the bulk specific gravity, "Methods of Testing," AASHTO Designations T-84, and T-85, and the dry weight of the aggregate. The required compaction shall be verified by in-place density tests using any one of the following provisions for "Methods of Testing," AASHTO T-191, T-205, or T-238.

The finished base course shall be maintained in a condition satisfactory to the Company until installation of asphaltic concrete surfacing or final acceptance by the Company. Areas showing washes or looseness shall be repaired or restored to the specified condition at no expense to the Company.

Unless otherwise specified, earth fill for structures shall be compacted to a minimum of 95% of maximum density at optimum moisture content which shall be determined in the provisions of AASHTO T-180. Earth fill shall be spread in layers that will not exceed 6 inches in thickness after compaction. Sand and crushed stone shall be spread in 3 inches layers. Frozen material shall not be used for fill and fill materials shall not be placed on or against frozen surfaces.

Earth fill for yards and grounds shall be compacted to a minimum of 90% of maximum density at optimum moisture content which shall be determined in accordance with the provisions of "Methods of Testing, AASHTO T-99," unless otherwise noted on the drawings. The required compaction shall be verified by in-place density tests using any one of the following provisions for "Methods of Testing, AASHTO T-191, T-204, T-205, T-214, T-233, or T-238." Maximum density determinations and in-place density tests will be performed by the Company.

The bottom of trenches shall be accurately cut to provide uniform bearing and support for the utility lines either on undisturbed soil or compacted backfill throughout its entire length, except where it is necessary to excavate deeper for bell or coupling holes and for proper sealing of pipe joints. Remove all rocks and other foreign material prior to backfilling.

Backfill of trenches shall be done promptly after all required tests of the utility have been approved by the Company. Backfill material shall be earth or sand deposited in layers and carefully rammed or tamped until the pipe has a minimum 12-inch cover. The remainder of backfill to grade shall be compacted to a density equal to the surrounding earth (use stabilized aggregate when trenches are under structures and paved areas).

The top of the subgrades shall be a uniformly smooth grade surface, without high or low points, and be no more than 0.10 feet above or below specified grades. Thin layers of added material shall be bound tight to the material in place by scarifying and recompacting.

Cut and fill slopes shall be no steeper than 1.0 vertical on 3.0 horizontal unless otherwise specified and shall be finished to a smooth compacted surface, or scarified if topsoil is to be added.

Excavation shall consist of satisfactory removal of materials to the lines, elevations, and dimensions specified and disposition of any or all material encountered as specified.

Rock excavation consists of the removal of material classified as rock and disposal of the excavated material as specified herein and in conformity with the lines, grades, and dimensions to be shown on the drawings. To be classified as rock the material must be boulders of 9 cubic feet or more, solid or ledge rock or other hard material in place that cannot be excavated by power shovels or bulldozers equipped with ripping points. Material classified as rock shall be removed by drilling and feathering, bull point wedging, or other suitable means. Use of explosives will require special written authorization by the Company.

The limits of excavation shall be that required to provide a minimum of a 2-foot working space around the structure, except where authorized by the Company to deposit concrete directly against excavated surfaces. In areas where the excavated walls are unstable or where necessary to prevent slides or cave-ins, walls shall be shored or sloped.

Excavation in the vicinity of existing buildings and structures shall not be carried below the existing foundations until underpinning and shoring have been installed. Existing structures, piping or foundations which are to be incorporated into the final work shall be protected by the Contractor.

Excavation for foundations shall be carried to elevations specified. If satisfactory load-bearing soil is not reached at depth specified, excavation shall be carried deeper as directed in writing by the Company. When freezing temperatures are expected, no excavation shall be made to the full depth specified unless either the foundation can be poured immediately after excavation has been completed or bottom of the excavation is adequately protected from frost.

Excavation below elevations or beyond other required limits as specified or as approved in writing by the Company shall be restored at the Contractor's expense as follows: if under slabs, the excavation shall be restored in accordance with the procedure specified for backfill; if under footings, the footing shall be increased in depth. Backfill under concrete footings shall not be permitted, unless otherwise specified.

Rock under footings shall be removed to a point 8 inches below the bottom of the footings and backfilled to the bottom of footings with well compacted sand or crushed stone.

Rock removal shall be limited to that required to provide reasonably level planes for foundation walls and pier footings, adequate clearance for the removal of wall forms, a clear area within the building limits and adequate clearance for the installation of piping systems specified, both interior and exterior.

Control grading in the vicinity of excavations to prevent water from running into excavated areas.

All existing and new underground and overhead utility lines shall be shown on the design drawings. Prior to construction, note these locations, and protect the lines from damage. Hand excavation shall be used in the immediate vicinity of existing underground lines.

Blasting will not be permitted.

All excavations shall be in accordance with the OSHA safety regulations (29 CFR 1926, Subpart P) where necessary to prevent slides or cave-ins.

5.2.2.1.4 Asphaltic Pavement

Parking areas shall be provided as needed for ORF-ICN operations plus additional spaces for Company personnel using the Company offices at the Y-12 Site Central Office as stated in Appendix 7.

Parking areas shall be paved in accordance with the Tennessee DOT, Bureau of Highways "Standard Specifications for Road and Bridge Construction."

The subgrade shall be compacted to 95% maximum density.

The base course shall be stabilized aggregate consisting of a premix base material of crushed stone mixed with binder material and water.

Mineral aggregate base shall be Type A, Class A aggregate, Grading D. The base course shall be deposited in two 3 inch layers. Each layer shall be compacted until a density of not less than 83% of the solid volume has been achieved.

Surface material shall be hot asphaltic concrete pavement, 2 inches thick, aggregate Grading E.

Parking areas shall be striped for 9 feet-wide, perpendicular parking stalls. Lines shall be 4 inches wide. Paint shall be white reflectorized stripe paint. Handicapped parking spaces are not required.

5.2.2.1.5 Curbs and Gutters

As a minimum, extruded concrete curbing shall be installed around the perimeter of parking areas. New curbing or curbing and guttering shall match any existing in the area.

Curb shall be a minimum 6 inches high.

Gutter inlet boxes or separate catch basins shall be provided for surface drainage of the paved area to the storm sewer system.

5.2.2.1.6 Sidewalks

Concrete sidewalks, 48 inches wide with a 4 inches minimum thickness, shall be provided for access into new building additions and around the Y-12 Site Central Office building. Sidewalks and exterior slab shall receive a light broom finish. Sidewalks shall be installed with control joints at a maximum of 48 inches and expansion joints at a maximum of 20 feet. Provide handicapped ramps at elevation changes in accordance with the "Uniform Federal Accessibility Standards" (FED-STD-795, dated April, 1988).

5.2.2.1.7 Storm Sewers

Subsurface drainage systems shall be sized to accommodate runoff from the 25-year, 24-hour storm. Sediment transport requirements shall be incorporated within subsurface drainage

system designs. Storm sewers shall be designed to maintain adequate scour velocities. New storm sewers shall be sized for open channel flow. The minimum storm sewer size shall be 12 inches. The minimum culvert size shall be 15 inches. For roof drain systems, the minimum pipe size for laterals and collectors shall be 4 inches.

5.2.2.1.8 Open Channels

Open-channel storm water conveyance systems shall be sized to accommodate the 25-year, 24-hour design flow with a minimum freeboard. Open-channel stormwater conveyance systems shall be designed for minimal maintenance. Inlets to open-channel stormwater conveyance systems shall be placed at locations where erosion potential is minimal.

5.2.2.1.9 Street Drainage

Street drainage in developed areas shall be conveyed within the roadway cross section. Curb inlets shall be used to divert stormflows to surface and subsurface stormwater conveyance systems. Curb inlets shall not be located within curb returns or in areas of heavy pedestrian traffic. Pedestrian and cyclist safety shall not be adversely impacted by storm inlet grates. Curb gaps shall be used where roadside drainage swales exist.

5.2.2.1.10 Security Fence

Materials

Chain Link Fabric: Chain-link fabric shall be constructed of steel wire. Fabric shall be 7-foot wide with top and bottom selvages barbed, with 2-inch diamond-shaped mesh from No. 9 gage wire. Tensile strength of wire shall not be less than 80,000 psi.

Zinc-coated fabric shall be galvanized after weaving in accordance with ASTM A-392, Class II, to give a minimum of 2.0 oz. of zinc per square foot of wire surface evenly distributed over the entire fabric.

Barbed Wire: Barbed wire shall be two strands of 12 1/2-gage, coated steel with 14-gage, 4-point round barbs at 5-inch maximum centers. The coating shall be zinc, ASTM A-121, Class III, or aluminum, ASTM A-585, Class II.

Tension Wire: Tension wire shall be aluminum-coated or zinc-coated, 7-gage, spring-coil steel wire. Tensile strength of coated wire shall not be less than 80,000 psi. Minimum weight of aluminum coating shall be 0.40 oz/square feet of wire surface. Zinc coating shall have a minimum of 0.80 oz of zinc per square foot of surface area.

Galvanized Materials: All galvanizing shall be by the hot dip process. All parts which are galvanized shall have a zinc coating of not less than 2.0 oz/square feet of surface unless otherwise noted above.

Line Posts: Posts shall be 2 1/4-inch, galvanized steel, H-column, weight 4.0 lb/feet or 2 3/8-inch OD, galvanized steel pipe, weight 3.65 lb/feet or other steel pipe with outside dimensions and minimum wall thickness to meet Federal Specification RR-F-191/3C and with a minimum yield strength of 50,000 psi.

End, Corner, and Pull Posts shall be 2 7/8-inch OD, galvanized steel pipe, weight 5.79 lb/feet or other steel pipe with outside dimensions and minimum wall thickness to meet Federal Specification RR-F-191/3C and with a minimum yield strength of 50,000 psi.

Gate Posts shall be galvanized steel pipe of the following sizes and weights for single gate or one leaf of double gate:

Gate Opening	Outside Diameter	Weight*
6 feet wide or less	2 7/8 inch	5.79 lb/ft
Over 6 feet to 13 feet	4 inch	9.11 lb/ft
Over 13 feet to 18 feet	6 5/8 inch	18.97 lb/ft

* or other steel pipe with outside dimensions and minimum wall thickness to meet Federal Specification RR-F-191/3C and with a minimum yield strength of 50,000 psi.

Bracing at End, Corner and Pull Posts shall be 1 5/8 inch OD, galvanized steel pipe, weight 2.27 lb/ft or other steel pipe with outside dimensions and minimum wall thickness to meet Federal Specification RR-F-191/3C and with a minimum yield strength of 50,000 psi.

Truss Rods shall be 3/8-inch diameter galvanized steel rod.

Tension Bars shall be 3/16-inch x 3/4-inch, galvanized steel bar.

Extension Arms shall be galvanized after assembly and designed to carry three strands of barbed wire at 45 degree angle with the topmost with approximately 12 inches above the fabric and approximately 12 inches out from the fence line.

Extension arms for line posts may be made entirely of pressed steel or with a malleable-iron (MI) base and pressed steel arm. Minimum weight of pressed steel shall be 12 gage.

Corner and end post arms are to be of similar construction with provisions for riveting or fastening to posts. Arms shall be made of 12-gage minimum pressed steel or entirely of heavy MI.

Fabric Ties: Ties used to secure fabric to line posts shall be 6-gage, zinc-coated steel wire, preformed to a "C" shape. Ties for securing fabric to tension wire shall be 9-gage, galvanized hog rings.

Miscellaneous Fittings: All miscellaneous fittings shall be galvanized steel or galvanized MI.

Gates: Gate frames shall be made of 1 7/8-inch OD, galvanized steel pipe, weight 2.72 lb/ft, internally braced to prevent sag. Fabric shall be the same as specified for fence and secure to frame with tension bars and hook bolts. The top of gates shall have three strands of barbed wire of the same material and height as used on the fence. Hinges shall be galvanized MI, bottom hinge being of ball-and-socket type designed to carry the weight of the gate. Each gate shall be equipped with a positive-type latching device with provisions for padlocking. Double gates shall have center-plunger rod catches. Semi-automatic outer catches shall be provided to secure gates in open position.

Demolition

The new security perimeter fencing must be installed prior to the removal of any existing security perimeter fencing. New fencing, gates, and grounding must be approved and accepted by the Company before existing fence is demolished. No breach in the perimeter security fence will be permitted.

Erection

Where the terrain along the fence is uneven, the ground shall be graded to provide a uniform slope before erecting the fence.

The fence shall be 8'-0" overall height consisting of 7'-0" wide fabric with top and bottom tension wires and three strands of barbed wire supported on 45 ^{o} extension arms projecting away fro the secured area. The fence shall be erected on the lines and to the grades shown on the drawings. Space posts on 10'-0" maximum centers and imbed 3'-0" in concrete footings. Concrete shall be a mixture of portland cement, sand and course aggregate and shall have a minimum 28 day compressive strength of 2,000 psi. The maximum aggregate size shall be 1-1/2". The top surface of concrete footings shall be sloped down from post to edge and troweled smooth. Posts are to be set plumb and to a uniform grade.

All corner, end, pull, gate, and end panels of sloping runs posts are to be braced. Space tension wires approximately 3" above bottom and below top of fabric. Space tension bands and fabric bands on 14" maximum centers and fabric ties on 24" maximum centers. When completed, fabric and barbed wire shall be free from sags, posts straight and plumb and gates shall swing and latch freely. Galvanized steel pipe brace rails shall be installed at the bottom of fence and fabric fastened securely to the rails to resist a 250-pound force from lifting the fabric more than 12 inches above grade.

Posts, bracing, and other structural members shall be located on the inside of secured perimeters. Once in place, all fence hardware shall be peened or spot welded to prevent easy removal.

All exposed surfaces resulting from field cuts, welding and other erection activities shall receive one (1) coat of "Zinkote" paint or other zinc-enriched paint.

Existing fencing adjacent to the work areas shall be protected. Damages shall be repaired by the Contractor.

All fencing and gates shall be grounded in accordance with the Company's Engineering Standard ES-1.2-2..

5.2.2.1.11 Testing

Perform compaction test and submit a written report to the Company for the following work:

(a) Fill and/or backfill under and for a distance of 2 feet beyond all aggregate, asphalt, and concrete surfaces.

(b) Stabilized aggregate base course.

5.2.2.2 Structural and Architectural

5.2.2.2.1 General

A structural engineer licensed in the state of Tennessee shall prepare the necessary calculations for the design of the structural systems including foundations. Calculations shall be stamped and sent to the Company for the 60% design review.

Design shall be in accordance with requirements of these specifications, the Uniform Building Code (UBC), and the Project Design Criteria, Y/EN-4451, except minimum uniform floor live load shall be 100 psf.

This section applies to the structural elements of buildings and facilities. The structural elements include, but are not limited to, the following:

- All floor, roof, and wall framing members and slabs
- All piers, walls, columns, footings, piles, and similar elements of the substructure
- All other substructure and superstructure elements that are proportioned on the basis of stress, strength, and deflection requirements.

Materials, framing systems, and details shall be compatible with the following:

- Clear space and span requirements
- Serviceability requirements
- Applicable fire protection classification
- Security requirements
- Foundation conditions
- Future expansion requirements
- Architectural treatment
- Climatic conditions
- Structural design loads for the specific facility and location

Use locally available structural system construction materials and labor force except where needed to meet the requirements of this specification or to reduce cost.

The structural design drawings shall indicate the design criteria, the structural materials and their strengths with applicable materials standards, the design loads including loads that can occur during construction, and the allowable foundation loads that were used in the design.

Drawings showing topographic details of sites for new buildings and others showing building locations and access plans for the plant areas are listed in Appendix 1.

5.2.2.2.2 Loads

General Requirements

Structures and their elements shall be designed for the loads prescribed in this specification.

Dead Loads

General

Dead loads are loads that remain permanently in place. They shall include the weights of all permanent materials and equipment, including the structure's own weight, supported in, or on, a structure. Load calculations shall include an allowance for any loadings anticipated to be added at a later date. Initially assumed loads shall be revised so that the final design reflects the configuration shown on the drawings.

Unit Weights

The unit weights of materials and construction assemblies for buildings and other structures shall be those given in ASCE-7. Where unit weights are neither established in that standard nor determined by test or analysis, the weights shall be determined from data in manufacturers' drawings or catalogs.

Service Equipment

Design dead loads shall include the weight of all permanent service equipment. Service equipment shall include plumbing stacks, piping, heating and air conditioning equipment, electrical equipment, flues, fire sprinkler piping and valves, and similar fixed furnishings. The weight of service equipment that may be removed with change of occupancy of a given area shall be considered as live load.

Allowance for Partition Loads

The minimum allowance for the weights of partitions, where partitions are likely to be rearranged or relocated, shall be as follows:

- For partition weights of 150 plf or less, an equivalent uniform dead load of 20 psf shall be used.
- For partition weights above 150 plf, the actual linear loads shall be used.

Live Loads

General

Live loads shall include all loads resulting from the occupancy and use of the structure, whether acting vertically down, vertically up, or laterally. Operating, moving, stopping, and impact forces shall be considered part of the live loads. Live loads shall include neither dead loads nor loads from the environment, such as wind, tornado, earthquake, thermal forces, earth pressure, and fluid pressure.

Buildings and Other Structures

Live loads for buildings and other structures shall be those produced by the intended use or occupancy. In no case shall they be less than minimum uniform load or concentrated load stipulated in ANSI A58.1.

Live loads on roofs shall be as stipulated in ANSI A58.1. They shall include the minimum roof live loads or the snow loads and snow drifts or possible rain loads stipulated therein, whichever produces the more severe effect.

In continuous framing and cantilever construction, the design shall consider live load on all spans and arrangements of partial live load that will produce maximum stresses in the supporting members.

Wind Loads

General

The structural frame and exterior components of all buildings and other exposed structures shall be designed to resist pressures due to wind assumed to act from any direction. Partial wind loading shall be considered if it produces a more severe effect.

Buildings and Other Structures

Wind loads for buildings and other structures shall be determined in accordance with procedures in ANSI A58.1 and University of California Research Laboratory (UCRL) 15910.

The basic wind speed shall be derived from DOE site-specific hazard model studies summarized in UCRL 53526, Rev. 1 (available at DOE Field Offices or from the Office of Nuclear Safety, DOE Headquarters). If site-specific hazard model studies are not available, a hazard model shall be developed consistent with the approach used in UCRL 53526, Rev. 1.

The basic wind speeds for any specific site shall be determined following the procedures in UCRL 15910, except that Exposure "C" should be used for all construction unless it can be shown that the necessary permanent shielding will be provided by natural terrain (not including shielding from trees or adjacent buildings).

To determine the design wind loads, all factors and coefficients stipulated in ASCE-7 shall be applied to the site-specific basic wind speeds. Use Exposure Type C, Importance Factor of 1.0.

Building additions shall be designed as parts of a totally new building without regard to shielding from the original building and without regard to lesser wind resistance for which the original building may have been designed. The possibility that the original portion of the building may require strengthening due to an increase in the wind loads acting on it shall be addressed.

Earthquake Loads

Earthquake loads for buildings and other structures shall be determined in accordance with the procedures contained in the UBC and UCRL 15910. Use Seismic Zone 2A and I value of 1.0.

The provisions and design procedures of TM 5-809-10 for the applications of seismic loadings to buildings shall also apply.

Other Loads for Buildings and Other Structures

Vibratory Loadings

Structures shall be designed to avoid resonance resulting from the harmony between the natural frequency of the structure and the operating frequency of reciprocating or rotating equipment supported on the structure. The operating frequency of supported equipment shall be determined from manufacturer's data prior to completion of structural design. Resonance shall be prevented by designing the structural framing and other elements so that their natural frequency and the frequency of the applied load are sufficiently far apart to reduce the dynamic transmission of the applied load to a level which will allow equipment to function in accordance with this specification.

Equipment-induced dynamic loads and amplitudes of vibration shall be determined by dynamic analysis. If the amplitudes of vibration will cause physical discomfort, interfere with sensitive equipment, or damage the structure, either the vibrating equipment shall be isolated from the structure, the structural support system shall be separated from the vibratory equipment, or the support system shall be modified.

Earth and Groundwater Pressures

Every foundation wall or other wall serving as a retaining structure shall be designed to resist, in addition to the vertical loads acting on it, the incident lateral earth pressures and surcharges, plus hydrostatic pressures corresponding to the maximum probably ground-water level.

Retaining walls shall be designed for earth pressures and potential groundwater levels producing the highest stresses and overturning moments. When a water-pressure-relief system is incorporated into the design, only earth pressures need be considered. In cohesive soils, the long-term consolidation effects on the stability of the walls shall be addressed. Lateral earth pressures shall be determined in accordance with accepted structural and geotechnical engineering practice.

Fluid and Gas Pressures

The design of components of buildings and other structures shall include the effects of fluid and gas pressures, both internal and external.

Thermal Forces

The design of structures shall include the effects of stresses and movements resulting from variation in temperature. The rise and fall in the temperature shall be determined for the localities in which the structures are to be built. Structures shall be designed for movements resulting from the maximum seasonal temperature change. The design shall provide for the lags between air temperature and the interior temperature of massive concrete members or structures. In cable-supported structures, changes in cable sag and tension shall be considered.

Creep and Shrinkage Forces

Concrete and masonry structures shall be investigated for stresses and deformations induced by creep and shrinkage.

For concrete and masonry structures, the minimum linear coefficient of shrinkage shall be assumed to be 0.0002 inch/inch, unless a detailed analysis is undertaken. The theoretical shrinkage displacement shall be computed as the product of the linear coefficient and the length of the member.

Combination of Loads and Design Requirements for Buildings and Other Structures

Combination of loads, allowable stresses, and strength requirements for buildings and other structures shall be as stipulated in the UBC.

5.2.2.2.3 Structural Systems for Buildings and Other Structures

General

Determine the type of structural systems used for new buildings except as noted below; however, they shall meet the architectural requirements and other criteria set forth in this specification.

Masonry structures shall be provided for new buildings/additions except as specified otherwise. Face brick shall be provided for the site central offices at Y-12 and K-25 and prefabricated modular units shall not be used for these. Other masonry materials, erection requirements and workmanship shall be as specified in Company Technical Specifications Sections 04000, 04100, 04150, 04210, and 04220.

A reinforced concrete foundation wall shall be provided as part of the building wall to resist lateral earth pressures at buildings where it is not practical to maintain a 1.0 vertical to 3.0 horizontal finished grade. The walls shall receive waterproof protection, and a subgrade drainage system tied into the storm drain system shall be provided to reduce hydrostatic pressure.

Buildings shall be framed to allow for simple formwork, fabrication, and construction procedures.

Structural systems shall be designed for ductile modes of failure to the extent feasible.

In the selection of a particular framing system, address the structure's functional requirements, including:

- Column-free areas
- Floor-to-ceiling heights
- Number of stories
- Heavy loads
- Other particular requirements pertaining to the specific facility

Floors

Where the first floor uses concrete-slab-on-grade construction, the slab shall be placed on a free-draining aggregate base overlying a compacted subgrade. A plastic vapor barrier shall be used under the slab. Excessive loads or equipment subject to vibration shall be supported by separate pads isolated from the rest of the floor slab with flexible joints.

For framed floors, use prefabricated systems that simplify the installation of mechanical, electrical, and communications services unless economically justified to do otherwise. Where concrete floors are used, the economy of flat plate slabs shall be considered, with the objective of using their undersurface for ceilings.

Control Joints

Control joints shall be designed and placed in such a manner as to avoid structural distress and uncontrolled cracking from thermal expansion and contraction, concrete shrinkage, and movements due to wind and earthquake forces.

Foundations

The provisions of the UBC shall be the minimum requirements for foundations design. The potential adverse effects of frost heave and movements due to expansive soils shall also be addressed in the design.

A geotechnical report for this project will be furnished by the Company for the engineer's use in the design of the foundations.

Minimum depth of building foundations shall be 2'-0" below finished grade to prevent frost damage.

5.2.2.2.4 Concrete

Concrete design and construction shall be in accordance with the UBC and American Concrete Institute 318. Transit mix concrete shall be in accordance with ASTM C-94 and ACI 304. The minimum concrete strength used for any structural component shall be 3,000 psi. Selection of proportions for concrete mixes shall comply with ACI 211.1. Hot weather concreting shall comply with ACI 305R. Cold weather concreting shall comply with ACI 306R.

Slumps for various phases of concrete work shall conform to the following:

Types of Construction	Slump in Inches Max.	Min.
Reinforced foundation walls, footings and drainage structures	3	1
Plain footings, substructure walls, curbs, and gutters	3	1
Beams and reinforced walls	4	1
Building columns	4	1
Slabs and walks	3	1

Concrete which fails to meet consistency requirements will be rejected.

Air entrainment admixtures shall comply with ATM C260.

Precast concrete shall comply with Prestressed Concrete Institute (PCI) MNL-116.

Welded-wire fabric shall conform to ASTM A-185. Reinforcing bars shall be ASTM A-615, Grade 60.

5.2.2.2.5 Steel

The American Institute of Steel Construction (AISC) "Specification for Structural Steel Buildings--Allowable Stress Design and Plastic Design" and the "Code of Standard Practice for Steel Buildings and Bridges" shall govern this work.

Light steel framing systems shall conform with specifications for the Design of Cold-Formed Steel Structural Members, American Iron and Steel Institute; and ASTM A-446.

Structural steel shall conform to ASTM A-36; sheet or strip steel shall be ASTM A-36 or A-570 Grade 36. Structural tubing shall be A-500 Grade B or A-501. High strength steel bolts, nuts, and washers shall be A-325.

Steel joists shall comply with the Steel Joist Institute "Standard Specification, Load Tables and Weight Tables for Joists and Joist Girders." Joist end-bearing plates on concrete or masonry and column base plates shall be grouted using a shrink-resistant metallic grout equal to Master Builders' Embeco 153.

All steel shall be prime painted in accordance with section 5.2.2.3.11. All metal decks shall comply with the Steel Deck Institute "Design Manual for Composite Decks, Form Decks, and Roof Decks" and/or "Diaphragm Design Manual" as applicable.

5.2.2.2.6 Submittals and Testing

Provide the following (also see Section 5.2.1.4.2):

(a) Building erection drawings which clearly show sizes, arrangement, anchorage details, and connection details of all shop-fabricated items and the relation of all components and accessories necessary for the on-site assembly of the complete building system.

(b) Design calculations showing all assumptions, loads, and pressures, load combinations and applications, stress analysis and values, identification of allowable stresses and basis of determination, frame and component deflections, and column base reactions.

(c) Shop drawings for the reinforcing steel and anchor bolts and anchor bolt layout.

(d) Concrete mix designs.

(e) Reinforcing bar fabrication drawings.

(f) Welder, welding inspector, and welding procedure qualifications/certifications. In the Engineering Technical Specification, Section 1120 "Welding", the statement specifying weld qualification and inspection by the Company is not applicable. This statement requiring Company participation is deleted for this project.

(g) Weld inspection reports.

(h) Structural inspection reports.

(i) An inspection plan for checking the installation of the high-strength bolts used in the field assembly of the building.

(j) As built drawings of building structures and structural components (e.g., precast concrete units).

(k) Vendor data and installation/operating/maintenance instructions for entrance door assemblies, special doors, locks, door closers, panic hardware, and any fixed lifting or handling equipment.

Perform the following field tests:

(a) Take field samples (three test cylinders) from each 50 $yd.^3$ of concrete poured during progress or from each day's pour if less than 50 $yd.^3$ Samples shall be secured in accordance with ASTM C-192. Furnish molds for testing to be performed by the Company.

(b) Make slump tests in accordance with ASTM C-143 from the same field samples taken for the compression cylinders. The Company's Construction Engineer shall be notified 2 hours before and be present to observe test.

5.2.2.2.7 Y-12 Central Office Building

This building shall be designed as a two-story structure to provide: (1) an area for the Contractor's ORF-ICN operating personnel and ORF-ICN equipment and (2) office areas and associated services for Company personnel. The ORF-ICN area will take up part of the first floor and the Company office area will use the remainder of the first floor and all of the second floor. Separate entrances shall be provided at ground level on each floor (south side on first floor and north side on second floor) for the Company's office. A description of the offices/facilities to be provided is defined in Appendix 7.

Access from Company office areas to ORF-ICN equipment or Contractor office areas shall be controlled with automatic key locks in accordance with Section 3.3.5.1.

5.2.2.2.8 Modifications to Existing Rooms/Asbestos Control

Structural modifications to existing buildings should not be required. However, drilling holes for conduit or for electrical modifications may be needed. Some of the floors have vinyl floor tile covering which is suspect of having some asbestos content. These tiles must be checked before performing any drilling or breaking of the tiles. The Company's Industrial Hygiene Department will, when requested, check the tiles and advise of asbestos content. If asbestos is found, handle, contain, and dispose of it in accordance with the requirements of Section 5.1.4.

5.2.2.2.9 Welding

Welding shall be in accordance with the section of the AISC Specifications and the ANSI/AWS (American Welding Society) "Structural Welding Code" (AWS D1.1).

All welding shall be done in accordance with approved welding procedures in compliance with AWS D1.1. Welders shall be currently qualified for the approved welding procedure in accordance with AWS D1.1. Welding inspectors shall be AWS certified welding inspectors qualified and certified in accordance with AWS QC1, Standard for Qualification and Certification of Welding Inspectors.

Documentation shall be furnished to the Company for review and approval concerning welding procedure specifications and qualification records, welder performance qualification records for each welder, and welding inspector qualification records. Do not perform any welding until written approval of this documentation is received from the Company.

5.2.2.2.10 Inspection

Inspection shall ascertain and certify: (1) by a qualified weld inspector that all welds are of acceptable quality per AWS D-1.1, Sect. 6.5, and (2) by a registered professional engineer that all structural members are the proper size and weight and are properly erected, and that bolted connections are assembled in compliance with the drawings and specifications using the proper bolts.

All welds are subject to inspection by the Company per AWS D-1.1, Sect. 6.5, or other methods listed in Section 6 when judged necessary by the Company. The Company reserves the right to accept, reject, or demand removal of welds which are in violation or judged to be in violation of these specifications. All welds requiring repair or replacement shall be reinspected after the repair or replacement, using the inspection techniques chosen by the Company. The Contractor shall bear the cost of all weld repair and replacement. Welders performing welds found to be unsound shall be subject to appropriate retest provisions of AWS D-1.1 or other applicable standards.

Structural members, bolts and connections shall be randomly sampled and inspected by the Company for proper type, assembly, and material. The Contractor shall bear the cost of correcting any deficiencies.

5.2.2.2.11 Identification

All steel materials shall be marked at the source in compliance with ASTM A6 or other applicable ASTM specifications.

Material identification shall be maintained from raw material through as-built structure in accordance with applicable drawings and specifications.

Welds inspected by the Company shall be serially marked, and the method of marking shall not be destructive to the weld.

5.2.2.3 Architectural

5.2.2.3.1 General

Design shall be in accordance with the UBC and the Project Design Criteria Y/EN-4451.

Establish exact site location and all elevations during design. Sides of the new buildings shall be parallel to adjacent buildings, except where specified otherwise.

Prepare floor plans showing offices, room layout and sizes, entrances, corridor widths, door locations, door swings, and service locations. Prepare detailed layouts for restrooms, janitor closets, kitchen, lunchroom, all equipment and equipment rooms.

Prepare a room finish schedule listing interior finishes for walls, floors, ceilings, stairs, and doors for the offices, corridors, stairways, and other rooms in new buildings or for modified rooms in existing buildings.

During the design phase, notify the Company for resolution of any problems which may arise with the layout.

Design for the ratio of men and women of the staff to be supplied for ORF-ICN operation and for 15% men and 85% women for the Company office area.

The buildings including rest rooms, entries, doorways, sidewalks, etc., shall be designed for access and use by the physically handicapped in compliance with ANSI A117.1 and the Uniform Federal Accessibility Standards in 41 CFR 101-19.6.

Prior to purchase of material, provide the Company with color chips for the interior decor of the building, including ceiling system, wall coverings, floor coverings, window blinds, rest room partitions, door hardware, etc. Colors shall be selected from manufacturer's standard color charts.

The building shall be UBC Type II, noncombustible construction.

Office space for the Contractor's operations personnel shall be designed in accordance with 41 CFR 101 Federal Property Management Regulations Subchapter D Part 101-17.

5.2.2.3.2 Masonry

Materials, design, construction, and workmanship of masonry structures shall comply with Company Technical Specification Sections 04000, 04100, 04150, 04210, and 04220 and UBC Chapter 24.

The following sources shall also be used as guides for the design of masonry structures:

- ACI 531
- ACI 531.1
- National Concrete Masonry Association (NCMA) TR 75B
- Brick Institute of America (BIA) Building Code Requirements for Engineered Brick Masonry

Mortar shall be designed to perform the following functions:

- Join masonry units into an integral structure
- Create tight seals between masonry units to prevent the entry of air and moisture.
- Bond with steel joint reinforcement, metal ties and anchor bolts, where used, so that they act integrally with the masonry
- Provide a desired architectural quality to exposed masonry structures through color contrasts or shadow lines from various joint-tooling procedures
- Compensate for size variations in the units by providing a bed to accommodate the tolerances of unit sizes

Grout shall be used in reinforced load-bearing masonry construction to bond the masonry units and the reinforcing steel so that they act together to resist the imposed loads. It may also be used in unreinforced load-bearing masonry wall construction to give it added strength.

Requirements for materials, mixing, strength, and specifications for mortar and grout for masonry structures shall comply with the UBC.

5.2.2.3.3 Thermal and Moisture Protection

5.2.2.3.3.1 Waterproofing

General

Waterproofing shall be used at walls, floors, or other building elements that at any time are subject to hydrostatic pressure, are below the water table, or are liable to be immersed in water.

Waterproofing shall also be used at walls, floors, and other building elements to prevent water leakage from showers, built-in refrigerators and freezers, areas using water wash-down, containment areas, and other types of water basins.

Where water is to be contained, waterproofing shall extend to fully cover the expected wall areas to be washed.

Wall, floor, slab-at-grade, and other building element waterproofing shall meet base course and through-the-wall flashings, and shall make a bond with these flashings.

Materials and Construction

Concrete waterproofing shall comply with ACI Guide to the Use of Waterproofing, Dampproofing, Protective and Decorative Barrier Systems for Concrete.

Concrete masonry waterproofing shall comply with NCMA Waterproof Coatings for Concrete Masonry and NCMA Waterproofing Concrete Masonry Basements and Earth-Sheltered Structures.

Brick masonry waterproofing shall comply with BIA Dampproofing and Waterproofing Masonry Walls.

All other waterproofing shall comply with the manufacturer's recommendations.

A single-ply elastomeric, liquid-applied elastomeric, cementitious, bentonite clay, or fiber-reinforced fabric bituminous waterproofing shall be continuously applied to those surfaces of building elements to be protected from water.

Building elements at and below grade that receive waterproofing shall be constructed of concrete with:

- A water-reducing agent
- Non-porous aggregates
- Reinforcement to control differential movement
- Reinforcement to control cracking from temperature, live loads, dead loads, and drying shrinkage
- Expansive cement or a dampproofing admixture

Building elements above grade that receive waterproofing shall be constructed of concrete as described above or masonry as follows:

- Type M mortar in accordance with ASTM C270
- Grade SW brick in accordance with ASTM C62
- Type I, Grade N concrete brick in accordance with ASTM C90 for hollow load bearing
- Type I, Grade N concrete block in accordance with ASTM C145 for solid load bearing

Construction joints and expansion joints shall be bridged by waterstops that shall be embedded in the materials on each side of joints.

Waterproofing at or below grade shall be chemically compatible with ground water and soils.

Protective Cover

Waterproofing on walls, except cementitious and bentonite clay panel waterproofing, shall have a protective cover that shall be readily removable to repair damaged waterproofing and readily replaceable.

Waterproofing on horizontal building elements to be covered with earth, except bentonite clay panel waterproofing, shall have a protective cover.

Each slab-at-grade to be waterproofed, except those waterproofed with bentonite clay panels, shall have a concrete subslab beneath it upon which waterproofing shall be placed.

Capillary Water Barriers

Capillary water barriers such as sand, gravel, or crushed stone courses shall be provided beneath subslabs at slabs-at-grade and over waterproofed horizontal building elements to be covered with earth except where bentonite clay panels are used.

Drainage matting or capillary water barriers such as sand, gravel, or crushed stone courses shall be provided on the exterior side of all waterproofed vertical building elements except where bentonite clay panels are used.

Penetrations

Penetrations below grade through slabs-at-grade and other horizontal building elements shall be limited to drains and structural elements.

Penetrations through waterproofing shall be sealed to waterproofing. Penetrations by building elements other than structural elements shall be within sleeves. Sleeves shall be sealed to waterproofing, and joints between sleeves and penetrating elements shall be waterstopped.

Drainage and Drainage Piping

Positive drainage away from the facility shall be provided.

Drainage piping shall be provided at the bottom of exterior walls where the amount and intensity of rain is significant. Drainage piping shall be provided at the bottom of exterior walls and under the waterproofing of slabs-at-grade where the water table at any time is at or near the level of the waterproofing.

Drainage piping shall also be provided where any one or combination of the following occur:

- Walls extend above grade in a plane more than 30 feet
- Roof drains discharge directly at grade
- Water runs directly off the roof
- The unpaved grade does not slope sharply away from exterior walls
- Lawn sprinklers are used.

5.2.2.3.3.2 Sheet Membrane Waterproofing

Bituminous membrane waterproofing shall comply with National Roofing Contractors Association (NCRA) Roofing and Waterproofing Manual.

Fiber reinforced fabric bituminous waterproofing shall not be used where the water head is greater than 3 feet.

5.2.2.3.3.3 Cementitious Waterproofing

Cementitious waterproofing shall not be used on horizontal building elements at or above grade.

5.2.2.3.3.4 Dampproofing

General

Dampproofing shall be used at walls, floors, and other building elements that at any time are subject to high humidity, dampness, or frequent direct water contact, but are not subject to hydrostatic pressure, are not below the water table, or are not immersed in water.

Dampproofing shall begin on walls, ceilings, and other building elements where membrane waterproofing ends.

Dampproofing shall be applied to the interior face of all exterior walls with a furred interior finish, except cavity walls.

Dampproofing at slabs-at-grade shall meet base course and through-the-wall flashings and shall make a bond with these flashings.

Where exterior wall, ceiling, and other building element dampproofing meets base course, spandrel, and through-the-wall flashings there shall be a bond between the dampproofing and the flashings.

Materials and Construction

Concrete dampproofing shall comply with ACI Guide to the Use of Waterproofing, Dampproofing, Protective and Decorative Barrier Systems for Concrete.

Concrete masonry dampproofing shall comply with NCMA Waterproofing Coatings for Concrete Masonry and NCMA Waterproofing Concrete Masonry Basements and Earth-Sheltered Structures.

Brick masonry dampproofing shall comply with BIA Dampproofing and Waterproofing Masonry Walls.

All other dampproofing shall comply with manufacturer's recommendations.

A single-ply elastomeric, liquid applied elestomeric, bituminous, or cementitious membrane or coating shall be continuously applied to the exterior surfaces of walls, floors, and other building elements to be dampproofed. The material shall have low permeability and a bond strength to the substrate at least equal to the tensile strength of the substrate at the surface where the material is applied.

Continuous dampproofing of water-impermeable plastic shall be placed beneath concrete slabs-at-grade. A bed of fine sand not less than 1-1/2 inches thick shall be placed between the membrane and the concrete slab to improve concrete curing conditions and reduce shrinkage cracking.

Building elements below grade that are to be dampproofed shall be constructed of concrete or masonry. They shall have reinforcement to control differential movement and cracking from room temperature, live loads, dead loads, and drying shrinkage.

Construction joints and expansion joints shall be bridged by waterstops that shall be embedded in the materials on each side of the joints.

Dampproofing at and below grade shall be chemically compatible with ground water and soils.

Capillary Water Barriers

Capillary water barriers such as sand, gravel, or crushed stone courses shall be provided beneath membranes at slabs-at-grade and on the exterior side of all walls below grade with dampproofing. At walls, drainage matting can be used instead.

Drainage and Drainage Piping

Drainage and drainage piping shall comply with previous section titled Waterproofing.

Base Course, Spandrel, and Through-the-Wall Flashings

Base course flashings shall be installed to provide a water-impermeable membrane between the exterior at grade and the interior.

Water-impermeable spandrel and through-the-wall flashings shall be installed to prevent water leakage or driving rain from entering a facility at the following joints:

- Around openings
- Between walls and floors
- Between walls and roofs
- Between walls, floors, roofs and structural members

5.2.2.3.3.5 Vapor and Air Retarders

Building element assemblies shall be analyzed for potential condensation problems and the need for vapor retarders as a part of the energy conservation analysis required in Section 5.2.3.1.3 and the design of mechanical systems.

Vapor retarders shall be used to resist the diffusion of water vapor through building elements and to prevent water vapor migration and condensation in exterior walls and roofs. Vapor retarders shall be installed where needed between the exterior and interior at walls, roofs, and other building elements at or below grade. Vapor retarders shall also be installed between interior spaces with different controlled temperatures and humidities.

Vapor retarders shall be located as close as practical to the warm side of an assembly of building elements. Under the most severe estimated in-use conditions, the temperature at the vapor retarder shall always be above the dew point of the actual air-vapor mixture at the vapor retarder to prevent condensation from forming on the vapor retarder itself.

The vapor retarder shall be installed to make a continuous interior envelope. Vapor retarder joints and terminations shall be sealed with material of the same or better vapor permeance as the vapor retarder.

Vapor retarders shall be installed in facilities housing electronic equipment.

Vapor retarders at roofs shall comply with ARMA Guide to Preparing Built-Up Roofing Specifications, the NRCA Roofing and Waterproofing Manual, and NRCA Handbook of Accepted Roofing Knowledge.

5.2.2.3.3.6 Insulation

Insulation shall comply with UBC Chapter 17. No type of foam insulation shall be used except below grade on a building exterior surface throughout the structure. The overall heat transfer coefficient (u-factor) shall be determined by the requirements of Section 5.2.3.1.3.

Thermal insulation shall be installed above and below grade between the exterior and interior of a facility where the exterior temperature differs significantly from the required interior temperature, e.g., such as where heated spaces are adjacent to exterior walls at slab-at-grade construction and at floors above grade, and where heated spaces are adjacent to roofs.

Thermal insulation shall be installed between interior spaces where significantly different temperatures are required.

Thermal insulation used between the exterior and interior shall be moisture resistant.

A clear air space of not less than 1 inch exclusive of any cavity insulation shall be provided in all masonry cavity walls above grade, except in masonry cavity walls with loose-fill insulation in the cavity.

Where loose-fill insulation is used, it shall completely fill the cavity of exterior masonry or concrete cavity walls. If the required thermal resistance is not met, loose-fill insulation shall be used to completely fill the cores of such interior with materials as hollow masonry, provided the required thermal resistance can be achieved. If the required thermal resistance cannot be met by insulating the cavity and the cores of the interior wythe, additional insulation shall be added on the interior face of the wythe only when analysis shows that the dew point does not occur in the interior wythe. Loose-fill thermal insulation shall be the water-repellent type. Loose-fill insulation shall not be used where future remodeling, renovation, or expansion can reasonably be expected to occur and to require removal of portions of insulated walls.

Rigid-board insulation shall be placed on the exterior surface of the interior wythe of cavity walls. If the required thermal resistance is not met, additional insulation shall be added to the cores of such interior wythe materials as hollow masonry or to be the interior surface of the interior wythe only when analysis shows that the dew point does not occur in the interior wythe.

Insulation in cavity walls shall be adhered to the exterior surface of the interior wythe. Corrosion-resistant cavity wall anchors, joint reinforcement, or metal ties shall be used to hold the insulation at its top and bottom firmly against the exterior surface of the interior wythe.

Batt insulation, blanket insulation, and fiberboard insulation exposed to view 8 or more feet above a finished floor, platform, mezzanine, walkway, stair, or landing shall be covered to prevent the shedding of fibers.

All insulation that is within 8 feet of a finished floor, platform, mezzanine, walkway, stair, or landing shall have its exposed surface covered from view and protected from physical damage.

The space between outside window frames and adjoining walls, and between exterior door frames and adjoining walls, shall be insulated.

5.2.2.3.3.7 Roof and Deck Insulation

Only insulation approved for Underwriters Laboratory (UL) Class A and Factory Mutual (FM) Class I roof construction shall be used on roofs.

All roof insulation shall comply with NRCA Roofing and Waterproofing Manual and NRCA Handbook of Accepted Roofing Knowledge.

5.2.2.3.3.8 Exterior Insulation and Finish Systems

Rigid expanded polystyrene insulation, external fabric or lath reinforcement, and base and finish coats shall comply with Exterior Insulation Manufacturers Association (EIMA) Guideline Specification for Exterior Insulation and Finish Systems Class PB Type A.

The following shall comply with EIMA Guideline Specifications for Exterior Insulation and Finish Systems Class PM Types A and B:

- Rigid extruded insulation
- External fabric or lath reinforcement
- Base and finish coats
- Rigid extruded insulation
- Internal reinforcement tape
- Base and finish coats

Exterior insulation and finish systems shall comply with UBC Standard No. 17-6.

5.2.2.3.3.9 Membrane Roofing

Membrane roofing shall comply with UBC Chapter 32 for roof construction and covering and UBC Chapter 23 for roof design and wind design.

Where a roof deck's slope, after considering deflection and construction tolerances, is less than the slope required for the roofing, the slope shall be increased the required amount by the addition of fill, or tapered insulation in accordance with NRCA Roofing and Waterproofing Manual, NRCA Handbook of Accepted Roofing Knowledge, and manufacturers' recommendations.

5.2.2.3.3.10 Roof-Mounted Equipment

Supports for equipment shall be by the use of curbs or structural frames in compliance with NRCA Construction Details.

Clearances for roofing maintenance and repair under structural frames shall comply with "Width of Equipment/Height of Legs" chart of NRCA Construction Details.

The weight of roof-top piping and equipment shall not be carried on any part of the roof assembly except the structural system.

The weight of equipment on roofs, the weight of equipment used during the life of the building to remove, re-install, maintain, and repair roof-mounted equipment, and the path across the roof used by that equipment to transport roof-mounted equipment shall be taken into account when establishing roof loads.

Penetrations of roofs by pipes and equipment of all types, and by curbs and legs for structural frames to support equipment, shall be minimized. Penetrations shall comply with NRCA Construction Details. Where possible, equipment shall be contained in equipment rooms and penthouses.

5.2.2.3.3.11 Walkways

Roof walkways shall be provided from points of roof access to penthouse entrances and to roof-mounted and roof-accessible equipment and devices. Walkways that are more than 30 inches above a roof or within 10 feet of a roof edge shall have guardrails that comply with UBC Chapter 17 and UBC Chapter 23.

5.2.2.3.3.12 Built-Up Bituminous Roofing

Built-up bituminous membrane roofing shall comply with the NRCA Roofing and Waterproofing Manual, NRCA Handbook of Accepted Roofing Knowledge, FM Class I, and UL Class A. Coal tar roofs are not allowed.

5.2.2.3.3.13 Sheet Metal Flashing and Trim

Expansion Joints

Roof and exterior wall expansion joints shall be coordinated with structural system expansion joints. All roof expansion joints shall be elevated not less than 8 inches above the roof plane and shall not obstruct the flow of water off a roof.

Flashing, Trim, and Accessories

Flashing, trim, and accessories, including exterior drains and gutters, and interior drains shall have a service life at least equal to that of the roofing and shall be compatible with the roofing and exterior wall materials.

Drains, Gutters, and Accessories

Roof drains and gutters shall comply as a minimum with Sheet Metal and Air Conditioning Contractors National Association (SMACNA) Architectural Sheet Metal Manual for a storm of 5 minutes' duration that is exceeded only once in 10 years. Roof drainage details shall comply with NRCA Construction Details and NRCA Steep Roofing Manual.

Overflow outlets shall be provided on all roofs with parapets or curbs. The weight of retained water below the bottom level of the overflow outlets shall be included as a load in structural calculations.

Drains shall comply with UBC Chapter 32.

Interior roof drains shall be used on buildings with over 500 square feet in area except that exterior overflow outlets are permitted.

Exterior gutters and downspouts shall be used on buildings with less than 500 square feet in area.

Interior built-in gutters shall not be used.

No building roof with interior drains shall have fewer than two independent drains. Each such independent drain shall be independently connected to the storm drain.

Roof drain spacing shall not exceed 75 feet in any direction.

No roof drain shall serve a roof area greater than 10,000 square feet.

Interior roof drains shall be located only at roof low points.

Drain inlets shall be recessed below the adjacent roof level.

Drains shall have strainers.

No drain shall be less than 4 inches in diameter.

On exterior roof drains 30 feet or longer, leader heads shall be used at the junction of drains and gutters.

Exterior roof drains that discharge onto roofs shall have splash pans secured to the bottom of the drains.

Drains, gutters, and accessories shall have a service life at least equal to that of the roofing, and shall be compatible with the roofing.

Exterior roof drains shall be protected from yard maintenance and building maintenance equipment, and from vehicles at roads, parking areas, and loading areas.

Where soil erosion can occur from the discharge of exterior roof drains at grade, roof drains shall be connected to storm sewers or shall discharge into stabilized drainage ditches, splash blocks, or paving.

5.2.2.3.3.14 Sealants and Joints

Sealant selection and installation for architectural aluminum shall comply with American Architectural Manufacturers Association (AAMA) 800.

Only non-staining sealants shall be used.

Sealants shall prevent weather damage to building elements at joints.

Joints shall be detailed to minimize the reliance on sealants for weather protection.

Joints shall be designed to prevent any local overstressing of the sealant.

Joints shall be designed to allow for the depth of sealant contact as required for the specific sealant system being used.

Joints to be sealed shall be sized in proportion to the amount of movement that will occur.

Sealant material shall be physically and chemically compatible with adjacent materials.

5.2.2.3.4 Doors and Windows

General

See Environmental Control, Section 5.2.3, for thermal envelope criteria.

When located in designated fire walls or where required by code, fire doors, fire windows, frames, and hardware shall be either tested and listed by UL or similar nationally accredited testing laboratories or approved by FM or similar national insurance organizations. Such fire doors, fire windows, frames, and hardware shall be installed with label attached in accordance with National Fire Protection Association (NFPA) 80.

Windows

Where used, windows shall be operable for ventilation.

Operable windows used for ventilation shall have insect screens.

Where double or triple glazing is required, insulating glass units shall be used, not multiple glazing.

Windows and curtain walls shall be designed for wind loads in accordance with UBC.

Windows shall offer substantial resistance to unauthorized entry but need not be more resistant to penetration than adjoining walls, ceilings, and floors.

Window cleaning provisions shall comply with ANSI A39.1.

Operating mechanisms, parts, and equipment in operable windows shall have a history of reliability and readily available replacement parts, and shall not be made of zinc.

Where insect screens are used, they shall not require seasonal removal and storage, and they shall not interfere with normal window operations.

Screen frames of aluminum may be used with wood, aluminum, or steel windows. Screen frames of wood shall be used only with wood windows. Screen frames of steel shall be used only with wood or steel windows. Screen frames of bronze shall be used only with bronze windows.

Aluminum and plastic coated or impregnated fibrous glass insect screen shall be used with wood, aluminum, bronze, or steel screen frames. Aluminum insect screens shall not be used where it is exposed to a saltwater atmosphere. Bronze insect screen shall be used only with wood, bronze, or steel screen frames. Glass fabric insect screening shall comply with ASTM D3656.

Windows--Y-12 Site Central Office--Office Areas--First and Second Floors

Exterior windows shall be aluminum framed, medium bronze finish, fixed sash with locations to be shown on the floor plan drawing. Glass shall be bronze, double insulated, 5/8 inch face-to-face unless dictated by the energy conservation analysis of Section 5.2.3.1.3.

Window size shall be approximately 30 inches by 60 inches. Provide 1-inch minislat venetian blind similar to "Levilor" at each window.

Hardware

Door and window hardware shall comply with the ANSI A156 series.

The preparation of doors and frames for the installation of bolts, closers, latches, locks, pivots, and strikes shall comply with the ANSI A115 series.

Keying systems for new and renovated facilities and new additions shall be coordinated with existing facilities on a site.

Exterior swinging doors that open out shall have door closers.

Zinc hardware shall not be used.

Operable windows located more than 6 feet above the finished floor shall be provided with extension operators or poles.

The locks on at least one door of any room shall be equipped to prevent personnel from being locked inside, except as otherwise specified.

Door silencers shall be used on all metal door frames except those for double-acting doors and those for doors in rooms with acoustical security.

Where primary reliance is placed on doors or windows as physical security barriers, heavy-duty builders' hardware shall be used, and all screws, nuts, bolts, hasps, clamps, bars, wire mesh, hinges, and hinge pins shall be fastened securely to preclude surreptitious removal and assure visual evidence of tampering. Hardware accessible from outside the area shall be peened, brazed, or spot welded to preclude removal or be otherwise secured by hardware that is inaccessible to unauthorized tampering (e.g., nonrenewable hinge pins).

Where primary reliance is placed on doors as physical security barriers, locks shall meet the following requirements:

- A combination lock shall meet UL 768, Group I-R.
- A combination padlock shall meet Federal Specifications (FS) FF-P-110 and 41 CFR 101.
- A key padlock shall meet MIL-P-43951 or FS FF-P-001480.
- A key lockset shall meet the ANSI A156 series.
- Panic locks used on emergency exit doors in security area perimeters shall be operable only from the inside and shall be equipped with at least a loud local alarm. Door locks and latches shall comply with NFPA 101.
- Magnetic-type locks shall have at least 1200-pound holding force.

Glazing

Glazing material with reflective coatings or films shall not be used where they cause disorientation and unsafe conditions.

Glazing materials adjacent to unattended entrances and exits shall be protected from damage.

Glazing methods and materials shall comply with Flat Glass Marketing Association (FGMA) Glazing Manual and FGMA Sealant Manual.

Flat glass shall comply with ASTM C1036.

Doors

All doors shall have "Life of Installation" warranty. Minimum size shall be 3 feet 0 inches by 6 feet 8 inches. All hardware shall be ANSI A156 series, Grade 1, heavy duty commercial, and preparation shall conform to the ANSI A115 series.

Frequently used doors shall have a vision panel except where privacy, security, or fire safety requirements preclude installation.

Doors shall offer substantial resistance to unauthorized entry but need not be more resistant to penetration than adjoining walls, ceilings, and floors. If visual access is permissible, doors with glass panels may be used; however, they shall comply with the foregoing section on windows, or shall be equipped with wire mesh fastened securely to the door, preferably on the inside. When visual access is not permissible, a sight baffle shall be used when a door is open. When doors are used in pairs, an overlap molding is required where the doors meet. Door jambs shall be reinforced when necessary to make it more difficult to open by use of a wedge, jimmy, or similar tool.

Exterior Doors

All exterior doors for the Y-12 Site Central Office ORF-ICN equipment areas and for all other new buildings shall be insulated hollow metal (no glazing) with pressed steel frames. Standard hardware shall include pull handle, closer, weatherstripping, and threshold. Provide locks with Best Universal Lock Company seven-pin core. Provide 1-1/2 pair ball bearing butts per door.

A manufacturer's standard aluminum entrance door and frame shall be used at the building entries, including airlock doors, for the Y-12 Site Central Office Company office areas. The doors shall be narrow style with 1/4-inch-thick bronze safety glass. Aluminum finish shall be medium bronze. Standard hardware shall include paddle-type panic device, pull handle, surface closer, weatherstripping, and threshold. Locks shall have Best Universal Lock Company seven-pin core. Provide 1-1/2 pair ball bearing butts per door.

Interior Doors

Except doors in fire rated walls, all interior doors for offices, rest rooms, and storage rooms shall be 1 3/4 inch, hollow-core wood doors. Doors shall have two-ply face panels, flush, with birch veneers suitable for transparent finish. Transfer grilles shall be provided as required for ventilation.

Locksets shall be Best Universal Lock Company, 1 5/32 inch bore with seven-pin removable core. Kickplates shall be furnished on rest room and janitor closet doors; closers on rest room doors. Door stops shall be installed on all doors; provide locksets on all doors except rest rooms. Provide 1 1/2 pair heavy-duty butts per door, ball bearing at closers.

Door frames shall be pressed steel suitable for the type of interior wall construction used. Frames shall be prime painted, adequately-reinforced for hardware, complete with anchors.

Metal Doors and Frames

Hollow steel doors and frames shall comply with Steel Door Institute (SDI) 100 and SDI 108.

Insulated steel door systems shall comply with Insulated Steel Door Systems Institute (ISDSI) 102.

Wood Doors and Frames

Exterior door and interior doors where significant moisture is normally present shall not be faced with hardboard or have unimpregnated paper honeycomb door cores or paper honeycomb door cores with foam plastic fill or vermiculite fill.

Wood doors shall comply either with National Wood Window and Door Association (NWWDA) IS-1 and NWWDA IS-3, and NWWDA IS-6.

Wood frame or combination steel buck and frame shall be used with wood flush doors.

5.2.2.3.5 Finishes

General

The underside of floor and roof construction shall be exposed to view except where acoustical treatment, heating, ventilating, air conditioning, cleanliness, or the containment or dispersion of contaminants requires the installation of a ceiling.

Finish material and its support, backup, and substrate shall be selected, designed, fabricated, assembled, and installed to exclude or prevent the escape of fibers, such as asbestos, and the escape of emissions from volatile organic compounds, such as formaldehyde, and combinations of volatile organic compounds that have been determined to be a health hazard.

Walls

Stairways and corridors may be protected with hardboard wainscot. The use of plaster shall be avoided. Painted finishes shall be used throughout the remainder of the facility, such as on masonry walls, dry wall, and factory finished panels.

Where tile is to used, structural facing units shall be used where needed.

Finishes for walls, ceilings, and floor shall conform to Sections 5.2.2.3.7, 5.2.2.3.8, 5.2.2.3.9, and 5.2.2.3.10.

Gypsum Board

The application and finishing of gypsum shall comply with ASTM C840.

Ceramic Tile

Ceramic tile shall comply with Tile Council of America (TCA) Handbook for Ceramic Tile Installation.

Acoustical Treatment

General

Acoustical analyses shall be made for areas with high sound levels, areas where speech intelligibility is important to occupant performance, and for areas where speech privacy is important to occupant performance or required for security. These areas include, but are not limited to, industrial facilities, data processing centers, word processing centers, large conference rooms, auditoriums, audiovideo studios, program control centers, open offices, and secure rooms.

Acoustical treatments in industrial facilities and other high noise occupancies shall comply with 29 CFR 1926 and 29 CFR 1910.

Facilities with low sound levels shall be provided with acoustical treatments that produce balanced acoustical environments and promote occupant productivity.

No acoustical treatment shall be provided to control the acoustical environment within normally unoccupied storage areas, service areas, or support areas that have lower sound levels.

Acoustical treatment and administrative control in areas that require periodic occupancy by operations or maintenance personnel (for example, utility rooms, equipment rooms, storage areas, service areas, support areas, and industrial process areas) and have such high sound levels that personnel would be injured by periodic short-duration exposure shall comply with 29 CFR 1926 and 29 CFR 1910.

Acoustical material shall not be in contact with the underside of roof decks where moisture can collect, or where the deck is exposed to extreme heat.

Acoustical ceilings shall comply with Ceiling and Interior Systems Contractors Association (CISCA) Acoustical Ceilings--Use and Practice.

Acoustic plaster ceilings shall not be used.

In areas subject to moisture or high humidity, such as shower rooms, kitchens, and spaces with industrial processes using water, any metal suspension system shall be corrosion resistant, and ceiling materials shall be protected from moisture or be moisture resistant.

5.2.2.3.6 Service Areas

Where required, service areas shall provide the facilities listed below.

Mechanical Equipment Rooms--all pumps, motors, valves, etc., associated with the HVAC system.

Janitors Closets--service sink with some storage space.

5.2.3.2.1 General Requirements

Revisions of existing drawings shall be to same scale as exists on those drawings. Ductwork shall be shown as one-line drawings.

Drawings shall include air flow rates at all supply air outlets, return air inlets, air handling unit discharge, hood inlets, exhaust fan discharge, supply fan discharge, and outside air inlets.

The air handlers shall be provided with automatic reset freeze protection controls.

Dampers shall be provided with blade and shaft seals.

New HVAC systems shall be provided for each facility to totally accommodate the temperature and humidity requirements resulting from the loads of the equipment and ambient surroundings. Existing HVAC systems shall be modified when required by installation of ORF-ICN equipment such that the existing system is not adversely impacted. (For example blanking off diffusers or re-routing return air ductwork.)

The HVAC units in all facilities shall be from one manufacturer and be of reliable computer room design such as Leibert or Hiross. The units shall have built-in electronic controls, be models for standard or raised floors, be capable of cooling, heating, humidifying and dehumidifying and operating with only electrical power, drains, and unheated water.

The HVAC equipment shall be of the direct expansion type with glycol dry coolers capable of year-round operation. Dry coolers shall be capable of roof or pad mounting as required according to location and type of facility or restrictions.

Determine the required capacity of the HVAC units, loads of the ORF-ICN equipment, and facility heat/humidity transmission.

Load calculations shall be submitted to the Company in ASHRAE format at the 30% design review for approval. Manufacturer's data for HVAC equipment to be used shall be submitted for approval.

Design drawings and specifications shall define the equipment and details of construction to be used.

5.2.3.2.2 Design Requirements and Conditions

Temperature and humidity design conditions shall be as follows:

	Dry Bulb Temperature	Wet Bulb Temperature
Outside Design Conditions:		
Summer	93°F	79°
Winter	13°F	
Inside Design Conditions:		
Summer	76 ± 2°F	55% ± 5%
Winter	72 ± 2°F	45% ± 5%

The design conditions for the ORF-ICN equipment shall take precedent over these if a conflict exists.

Ventilation and Exhaust Requirements

Minimum outside air requirements for air conditioned and ventilated spaces shall be as recommended by the current edition of ASHRAE Standard 62, Ventilation for Acceptable Indoor Air Quality. The building shall be supplied with excess outside make-up air to maintain a slight positive building pressure (0.05 inch water static pressure) to minimize building air infiltration.

Internal Loads

The heat loads are as follows:

People: Determine personnel load in each area and document these quantities in design calculations.

Design for:

Sensible heat: 255 BTUH/Person

Latent heat: 255 BTUH/Person

Equipment: The ORF-ICN equipment heat load

Lighting Loads - Determine from electrical engineering lighting plans and include in above loads.

Sound Level

Noise produced by the air conditioning systems serving each area shall be sufficiently attenuated to obtain a noise criteria (NC) curve as measured in the space of NC-45 maximum.

The air shall be returned from all offices and staff rooms through louvers in doors to the equipment area.

Energy Conservation

The following energy conservation requirements apply:

(a) Use energy efficient equipment
(b) Use energy efficient motors
(c) Insulation shall be installed per the minimum and prescriptive requirements of 10 CFR 435.

Provide system design with equipment operating characteristics and efficiencies which will achieve the lowest total life cycle cost over 25 years. Data for calculating costs is listed in Section 5.2.3.1. Submittal of analysis reports for these buildings is not required.

Ductwork

Ductwork shall be sized in accordance with ASHRAE and SMACNA Guidelines and Recommendations.

Ductwork materials and sealing requirements shall be in accordance with SMACNA HVAC Duct Construction Standards--Metal and Flexible, 1985. Any duct systems constructed to 4 inch WG pressure class and higher shall be tested for leakage in accordance with the SMACNA Air Duct Leakage Test Manual, 1985. Ductwork shall be externally insulated when located outside the conditioned space. Insulation coverings shall meet the requirements of NFPA 90A, "Air Conditioning and Ventilation Systems."

Turning vanes shall be used at square duct elbows. Access doors shall be installed at (1) both sides of fire dampers for servicing spring latches and fusible links; (2) both air entering and leaving sides of all heating coils; (3) air entering side of all multi-blade balancing dampers; and (4) all locations requiring periodic inspection, adjustment, and/or maintenance. Balancing dampers shall be provided as required to balance the air distribution.

For the purpose of testing and balancing the supply systems, instrument test openings shall be provided for pitot tube traverses in accordance with Company Engineering Standards ES-5.11-1 and ES-5.11-5 and placed such that the duct air turbulence due to upstream disturbances is minimized.

Battery Room/Rack Ventilation

The battery installation areas shall be exhausted/ventilated in accordance with Industrial Ventilation Manual current edition for the LEL values as applicable.

Alarms

The HVAC equipment shall generate alarms when deviating from design conditions.

Provide the following alarms to the OICC:

(a) High or low indoor temperature (VDTS equipment power not shutdown)
(b) High indoor temperature causing VDTS equipment power shutdown
(c) Primary HVAC unit(s) abnormal
(d) Backup HVAC unit(s) abnormal
(e) Transfer from primary to backup HVAC unit(s)

Item (c) is not required where environmental control is provided by existing service building equipment.

Provide a local alarm which provides a visual indication of high indoor temperature. This alarm shall be independent of alarms provided with HVAC units.

Water

Water for the HVAC humidifiers will be provided by the Company at ambient pipe temperature. If hot water is required for the humidifiers, provide the necessary water heater.

Filtration

The HVAC units shall be equipped with disposable air filters meeting 30% eificiency requirements of ASHRAE Standard 52-76.

Duct Insulation

Ductwork shall be externally insulated with the fiberglass insulation in accordance with the Company Technical Specification as follows:

Inside Building -	15293
Outside Building -	15294

Controls

Provide the following HVAC unit controls:

(a) Electronic controls, built-in to the AC unit if possible, to maintain design indoor conditions.
(b) Digital display of temperature and humidity of room condition and setpoint.
(c) Visual and annunciated alarms of equipment malfunction.
(d) Transfer to and/or activation of backup units upon failure of primary units.
(e) Activation of backup units upon high indoor temperature alarm.

Prepare control system drawing showing the sequence of operation.

Equipment Identification

The following note shall be placed on the construction drawing: Equipment shall be identified with stainless steel tags embossed or engraved with equipment number in 1/4" (min) characters attached with stainless steel pop rivets, plated screws, or stainless steel wire. Tags for panel mounted instruments, switches, etc., shall be standard engraved laminated plastic with 1/4" (min) high characters attached by screws or epoxy adhesive.

5.2.3.2.3 Start-Up, Testing, and Balancing

Furnish all labor, materials, tools, and equipment for the start-up, testing, and balancing of the environmental control systems.

Testing procedures for any air and water-side systems shall be in accordance with the guidelines contained in the ASHRAE Systems Handbook, Associate Air Balance Council Manual, and the SMACNA Manual. Tests shall verify that the system has the capacity to handle the maximum design loads and operate at the design parameters specified for the system.

Submit a test plan and certificates of equipment calibration to the Company 30 days prior to the scheduled test date. The testing firm shall perform the testing and balancing activities, and each system test shall be documented, with the og sheets bearing the initials of the Company's designated observer. Provide a completed performance test report to the Company prior to acceptance of the building and instruct Company personnel in the operation and maintenance of all equipment.

Notify the Company three days prior to each system start-up, testing, and balancing.

Coordinate and schedule the start-up test and ensure that all required test personnel will be present and the required test equipment and instruments will be available and calibrated.

Obtain the services of an independent agency such as Associated Air Balancing Council (AABC) or National Environmental Balancing Bureau (NEBB) to conduct the start-up, testing, and balancing of the system and to generate the certified report.

The testing and balancing firm shall have been performing work of this nature for a minimum of 3 years, shall have certified personnel to supervise all field work, and shall submit a resume of their qualifications for review by the Company.

Obtain the services of manufacturer's representatives as required by the equipment specification and/or start-up specification.

The ductwork shall be completely inspected for conformance to the specifications and drawings.

Dampers for all diffusers shall be initially set in the wide open position prior to any attempts at air flow balancing.

All equipment shall conform to the specifications and be completely installed, lubricated, and in proper working order. Drives on equipment shall be checked for proper rotation and alignment; v-belts shall be checked and adjusted for proper tension.

The controls shall be inspected for conformance to the specifications and for verification that installed components are appropriate for the intended application. The controls shall be calibrated to the set points and ranges as incicated on the drawings, and shall be operated through the sequence-of-operation to verify proper response of controlled devices. Each controlled device shall be operated through its full range (including all valves, dampers, etc.).

The voltage, amperage, and rpm of all motors shall be checked and recorded at the start of the test for agreement with the motor nameplate ratings. If the check indicates an overload condition. equipment shall be shut down and the overload alleviated; and the condition shall be reported to the Company's representative.

Balance the air flow to the values shown on the drawings. Should design values not be achievable, the airflow shall be appropriately ratioed to attain a balanced condition.

After testing and balancing has been completed, the system shall be given a run-in operational test of not less than 24 hours over a three-day (regular work shift) period. During this period, the equipment shall be closely observed so that any anomalies such as motor overloads, overheating of bearings, vibration, misalignment, or any other malfunctioning of the equipment or controls can be detected early and corrected. Equipment and air distribution systems shall be checked to assure no undue noise or vibration persists. The controls shall be monitored during this period and recalibrated as necessary to verify proper function of controlled devices and response that is consistent with the sequence-of-operation.

All test data shall be recorded in a report containing all the control drawings, equipment specifications, check lists, test data sheets, final component settings, and manufacturer's certified data of installed equipment. All check lists, test data sheets, etc., required for recording purposes shall be provided.

In the event there is a failure of the system to meet the requirements of the specification, repair any deficient items and repeat the tests (including the 24 hour run-in). The Company shall reserve the right to operate the system or equipment where there is a failure to operate and perform as specified, or if the equipment fails to meet the performance guarantees provided for in this specification, until such defects have been remedied and the guarantees complied with. In the event that defects necessitate the rejection of the system or equipment, the Company shall have the right to operate the equipment without additional cost until such time as new equipment is provided to replace the rejected equipment. Replacement of the equipment shall be coordinated and scheduled with the Company.

5.2.4 Electrical

5.2.4.1 Facilities General Design Requirements

The electrical facilities design, which includes new buildings, building modifications, and cable plant, shall be in accordance with the Project Design Criteria, Y/EN-4451 and applicable Engineering Standards and Engineering Technical Specifications listed in Appendix 1.

All work shall conform to recommendations contained in the most recent issue of the NEC and the National Electrical Safety Code (NESC). In the event of conflict between these code requirements and this specification, the more stringent requirements shall govern. Contrary to the scope restrictions listed in Article 90-2 of the NEC, the NEC requirements for circuits operating at 120 VAC or higher shall also be applicable to installations used exclusively for signaling and communication purposes.

5.2.4.1.1 Engineering Drawings

As a minimum, the type of electrical drawings to be provided shall be as listed in Y/EN-4451, Division 11. Drawings shall include distribution cabling and duct systems and shall provide complete sets of cable and duct location records. Drawings shall include the routing of the outside cable plant, including ducts and direct buried cable, depth of burial, and coordinates locating duct and cable. The drawings shall provide cable pair count, wire gauge, and cable lengths of each section of cable included in the system for both new and reused cable.

The drawings shall provide for each site and building location the equipment layout and designations of all equipment, frames, powerboards, test facilities, and any other installed electrical features.

The electrical drawing format shall be in accordance with Y/EN-4451, Division 11. Power, control schematics, and conduit and wiring for HVAC systems shall be shown on the electrical drawings. Design discipline drawings shall be cross referenced.

5.2.4.1.2 Equipment and Construction Specifications

The electrical equipment specifications shall conform to the format and requirements of the Company's Technical Specifications listed in Appendix 1. The electrical construction specifications shall incorporate all applicable requirements of the Company's Technical Specifications listed in Appendix 1.

5.2.4.1.3 Engineering Standards

The Company's Electrical Engineering Standards shall be incorporated into the design. Applicable standards shall be referenced on the drawings and included in the construction specifications.

5.2.4.1.4 Calculations

Provide electrical design analyses and calculations per the Company's Engineering Standard ES-0.7-7. See Sections 5.2.1.4.2 for a list of calculations to be included as a minimum.

5.2.4.1.5 Quality Assurance Checklist

The electrical design quality assurance checklist furnished by the Company to the Contractor shall include applicable entries by the Contractor and submitted at each design review. The checklist shall be completed by the 90% review.

5.2.4.1.6 Field Surveys and Measurements

The Contractor shall be responsible for making any electrical field surveys or measurements necessary to perform the design. All field visits shall be coordinated with the Company. Cabling within plants may be routed overhead on existing poles, or on new poles, or may be installed underground in existing telephone duct banks or in new duct banks. The priority to be used in selecting the routing of intra-site cabling is as follows: (1) existing spare underground conduits, (2) aerial on poles, and (3) new underground conduits. The Contractor shall survey all overhead pole lines to determine availability of space and clearances on poles prior to completion of design. Spare ducts are available for use in the existing telephone duct banks. The Company has completed a recent survey of the existing telephone duct banks to determine where spare conduits are available. Results of this survey are documented on drawings listed in Appendix 1. In no case can it be assumed that the reference drawings are accurate and in as-built condition. Facilities shall be inspected to determine the actual existing conditions.

5.2.4.1.7 Electrical Testing

Prepare electrical testing requirements summaries and test procedures in accordance with Y/EN-4451, Division 11.

5.2.4.1.8 Seismic Requirements

Electrical equipment supports shall be designed to comply with earthquake loads in accordance with Section 5.2.2.2.2.

5.2.4.2 Telecommunications Cabling

5.2.4.2.1 General

For additional cable plant requirements, see Section 3.3.12 and Appendix 6. Drawings showing existing cabling facilities and the SCB cable plant are listed in Appendix 1.

All cable and associated hardware installed shall be in accordance with equipment manufacturer's recommendations and accepted industry standards unless otherwise specified. Establish a standard manufacturer and part number for any particular type of hardware that will be used in more than a single instance.

All fiber cabling shall be tested prior to installation by connecting an optical time domain reflectometer (OTDR) to the cable and measuring attenuation, cable length, and number of anomalies. Perform this test on both ends of each fiber to be tested. Install the cable only if the cable has adequate length for the run being installed and measured attenuation meets this specification with no cable anomalies. Repeat this test after installation of the cable.

For unused fibers installed for future use, record the output of the OTDR and deliver this output to DOE. Provide these recordings for all fibers.

All aerial cable shall be spiral wrapped on a 3/8" stranded steel messenger. "Boxing" of the utility poles shall not be permitted. The messenger shall be bonded to the pole grounding conductor at intervals not to exceed three pole spans and at each cable splice. If a pole grounding conductor is not available on existing poles, it shall be added to those poles where bonding of the messenger cable is required.

The physical location and protection of all below-ground fiber optic cable plant shall meet the applicable requirements of ANSI/EIA/TIA-590-1991. Where conflicts exist between the ANSI standard and this specification; the requirements of this specification shall govern.

All direct buried cable shall be installed at a depth of not less than 30 inches. All splices as they are made shall be checked prior to being buried.

The cable pulling stress shall be continuously monitored to preclude exceeding the rated maximum pulling stress, minimum bending radii and maximum side-wall pressure of the cable during installation.

All conduit openings at building entrances and pole stub ups shall be sealed to prevent air flow and rodent and insect access. Additional requirements regarding sealing compounds to be used and the sealing of penetrations in fire zone floors, walls or partitions are contained in Company Technical Specifications listed in Appendix 1. Plugs shall be installed in all spare conduit openings in manholes.

Within buildings cabling to voice and data outlets shall be installed in an organized bundled routing scheme. In office areas and other similar areas, the cables shall be concealed as much as practical above suspended ceilings and in walls. When installation of cabling above ceilings or inside walls is impractical because of environmental issues, cabling can be routed exposed in a surface raceway painted to match the adjacent walls. This installation must be approved by the Company CE. Conduits shall be required for the cables where they pass through fire zone walls and floors or where there is the possibility of physical or chemical damage to the cables. All outlets shall be flush mounted where practical. Appendix 2D contains a listing of buildings where wire mold is required when cables can not otherwise be concealed.

All conduit installed exposed, external to buildings shall be rigid galvanized steel or IMC.

When installing copper and fiber cable in the same manhole, the copper cable shall be installed first to prevent damage to the fiber cable.

5.2.4.2.2 Underground Cable Marking

All underground conduit not encased in concrete and all direct burial cable shall be installed with an underground warning tape. The tape shall be installed above the cable or conduit system at a depth between 6 to 12 inches below grade for the full length of the run. Trenches 18 inches wide or less shall have a single tape located in the center of the trench. Trenches wider than 18 inches shall have 2 tapes laid parallel to each other as close to the sides of the trench as possible. In cases where it becomes necessary to install the cables or conduits less than 18 inches below grade, the tape elevation shall be one-half the distance between the cable or conduit and grade.

The tape shall serve as an early warning for inadvertent excavation into areas where circuits exist. The tape shall be 6 inches wide, red polyethylene with a minimum thickness of 3.5 mils. A continuous warning message in black letters shall be imprinted on the tape. The tape shall be as listed below or an approved equal:

Manufacturer	Message
Thomas & Betts Corp. #NA-0600	"Caution-Electric Line"
Panduit #HTU6R-E	"Caution-Caution-Caution Electric Line Buried Below"
W. H. Brady Co. #91296	"Caution-Caution-Caution Buried Electric Line"

In addition to the tape markers, a 2 feet by 2 feet by 4 inch thick concrete marker shall be installed flush with the ground above each splice, on each side of a roadway crossing, and every 500 feet along the buried cable run for the inter-site cabling. The intra-site cabling, in addition to the tape markers, shall be marked with a 4 inch diameter by 4 feet long concrete marker post installed (2 feet above ground, 2 feet below) on each side of a roadway crossing, and every 500 feet along the buried cable run.

5.2.4.2.3 Intra-site Fiber Optic Cabling

See Appendix 6 for additional cable specifications.

All fibers shall be terminated on patch panels suitable for reconfiguring and patching and which use industry standard low loss ST type connectors. At least 10 feet of slack shall be supplied for future maintenance (for example in event of broken connector requiring replacement). Each end of every cable shall be labeled with the location of the other end. Patch panels shall be sized for 30% growth. Electronic devices will be connected via pigtails with ST type connectors.

Patch panels for all fibers shall be mounted on the site main, building main, or service building distribution frames. See drawing D2E-145907. The patch panels shall be housed in National Electrical Manufacturers Association (NEMA) 1 enclosures with hinged, key-lockable covers.

Inside buildings, all fiber shall be installed in conduit.

In-line cable splices are not allowed in any intra-site fiber link. When routing the fiber cables in underground conduits, install one or more 1 inch diameter inner non-metallic conduits (similar to Carlon "Innerduct") with the fiber cables to the capacity of the conduit. Each inner duct shall contain a nylon pull rope for future cable installations.

5.2.4.2.4 Classified Fiber Optic Cabling

At Y-12, fiber links for classified network services shall include an additional 12 pairs of multi-mode and 4 pairs of single-mode fibers. These links shall meet the same specifications as the Intra-site fiber specified in Section 5.2.4.2.3. In addition, the installation of these fibers shall meet the following requirements:

Classified network services fibers shall be terminated on separate patch panels which are installed in steel, NEMA 1, padlockable equipment cabinets marked with a one-inch red band around the perimeter of the front cover.

All junction boxes containing classified network services cabling shall be steel, NEMA 1, with screw cover marked with a one-inch red band around the perimeter of the front cover.

Classified network services fibers shall be installed in conduit separate from other conduit housing copper lines. Classified network services fibers may be installed on the same messenger or in the same underground duct as the non-classified network services intra-site fiber links provided separate cables are used. Mixing of classified network services and non-classified network services fibers in the same cable is not allowed. Except when installing fiber in underground ducts, classified network services fiber lines shall be separated from copper lines and separated from all non-ORF-ICN lines by at least two inches.

All above ground conduits containing classified network services fiber lines shall be marked with a one-inch wide red band every five feet.

Aerial runs of classified network services fiber shall be labeled at each pole with the following tag:

CAUTION
This aerial cable is for a special communications system installed in compliance with YEL-STD-85-1. It is mandatory that a minimum clearance of 12 inches be maintained between this cable and all other runs and cables. Questions concerning the installation or modification of cables or wirelines on this pole in the vicinity of this cable should be directed to the Electrical Engineering Department.

The tags will be furnished by the Company.

5.2.4.2.5 Inter-site Fiber Optic Cabling

See Appendix 6 for additional cable specifications.

Except where otherwise needed for special circuits, all inter-site communications between K-25, Y-12, and Townsite shall be provided via new single-mode fiber optic links as shown on Drawing D2E-145866.

Cabling between K-25, X-10, and Y-12 and cabling from Y-12 to the FB shall be routed and installed as shown on drawing C6F-400003A002 and E6E-400003A001. Except where specified otherwise, cabling shall be direct buried. Cabling may be run aerially over roads unless otherwise specified. New poles shall not be wooden. Cabling within Oak Ridge shall be installed in accordance with the City of Oak Ridge regulations. The design and installation shall

be in accordance with standard construction practices. All required manholes/handholes and physical security features to lock the covers shall be provided.

Splicing of the fiber is allowed due to the distance between the facilities. The integrity of the copper shield (lightning protection) shall be maintained through the splice. Minimize cable splices. Include the cable installation design showing splice locations and calculated end-to-end loss in the Final System Design Report.

5.2.4.2.6 Perimeter Intrusion Detection Alarm System (PIDAS) Detection Zone Crossing

No cables shall be run overhead crossing the PIDAS detection zone at Y-12. This zone is shown on the following reference drawings:

C2E135702 through C2E135719, C2E135722 through C2E135725, and C2E135728

All cabling crossing the zone shall be run underground in existing telephone duct banks. If any new underground ducts are required, they shall be installed at least 5.5 feet below the ground and shall not disturb the PIDAS bed.

5.2.4.3 Lightning and Surge Protection

The lightning protection design shall be in accordance with Y/EN-4451 and MIL Handbook 419. Electrical surge protection shall be provided on all distribution frames that terminate interbuilding cables. Provide gas-tube type protection in accordance with UL 497.

A power surge shall not cause any components to shatter and expel solid matter outside equipment housings. A power surge shall not cause equipment to become a fire hazard.

Provide sneak current protection for terminal equipment that operates with a low resistance path to ground.

Install any additional electrical protection devices recommended by equipment manufacturers.

The design for the OICC shall include a lightning protection system meeting the requirements of the Lightning Protection Code, NFPA 78.

5.2.4.4 Grounding Requirements

Grounding design and construction requirements shall be in accordance with Y/EN-4451, Engineering Technical Specifications, and Engineering Standards referenced in Appendix 1. The grounding systems shall also meet the requirements of MIL Handbook 419.

Provide equipotential planes in all new computer rooms in accordance with acceptable design practices as specified in MIL Handbook 419. If any existing computer rooms are expanded, the equipotential plane shall be expanded to cover the entire room.

The size of grounding conductors shall be in accordance with the National Electrical Code, the National Fire Code, General Services Administration regulations, and MIL Handbook 419.

All new poles shall be equipped with a pole grounding conductor, minimum #6 AWG copper, extending a minimum of one foot above the top of the pole and connected to a grounding electrode at the base of the pole. The grounding electrode shall be a driven ground rod meeting the requirements of Engineering Technical Specifications listed in Appendix 1.

5.2.4.5 Plant Alarms and Public Address

Alarms and controls shall be in accordance with Drawings E1E-70003A001, E2E-900003A001, E3E-020003A001, and E6E-400003A002.

Expand the existing fire alarm systems to cover building modifications or additions to existing buildings in accordance with Y/EN-4451. New buildings shall have new fire alarm systems in accordance with Y/EN-4451.

At X-10, smoke and heat detectors shall be provided in equipment rooms and below raised floors. At all other sites, smoke detectors shall be provided in equipment rooms and below raised floors. At all sites, one smoke detector shall be provided in any room supply and return HVAC ducts used.

Provide all required fire alarm devices, i.e., Gamewell manual pull boxes, McCulloh transmitters, annunciator panels, post indicator valve switches, smoke detectors, heat detectors, horns, water flow supervisory alarm switches, etc., and all wiring and conduit.

Provide public address system equipment for site central offices, (including the OICC, Company office areas, and maintenance and storage areas), remote module hub facilities, and facilities housing demarcation and backup power equipment. The design shall be in accordance with Y/EN-4451 and drawing E6E-400003A002. A sufficient number of speakers shall be installed to provide adequate coverage for emergency instructions. If the PA coverage is changed in remodeled facilities, additional speakers shall be added to provide acceptable coverage.

All speaker lines shall be connected for balanced line 70-volt distribution. Each speaker shall be provided with an individual multi-tap line matching transformer. Speakers for office areas shall be cone and baffle type. Speakers for high noise level areas shall be horn type.

5.2.4.6 Power Systems Alarms and Controls

The requirements for backup power systems are described in Section 3.3.9.7. Provide the following automatic power controls:

(a) Transfer to backup power upon loss of Company supplied power.

(b) Except for X-10, shutdown of HVAC equipment power upon activation of any smoke detector.

(c) Except for X-10, shutdown of HVAC equipment power and power to VDTS equipment upon detection of sprinkler system water flow.

(d) At X-10, shutdown of HVAC equipment and VDTS power upon activation of heat detectors.

(e) At all locations, shutdown of power to VDTS equipment upon high ambient temperature.

For items (b) and (c), see Drawings E1E-700003A001, E2E-900003A001, and E3E-020003A001.

Provide the following power system alarms at the OICC:

(a) Loss of Company supplied power
(b) Failure of backup power to pickup load
(c) Backup power equipment abnormal (not able to provide service)

5.2.4.7 Administrative Voice and Data Intrabuilding Wiring Systems for the Y-12 OICC

5.2.4.7.1 General

Building wiring design for telephone and data systems shall be in accordance with Engineering Standard ES-1.13-1, Unclassified Communications Building Wiring Plan.

5.2.4.7.2 Communications Room Alternating Current Power System

As described in Engineering Standard ES-1.13-1, each communication room has an isolated ac power system. This system is an integral part of the room and serves not only the room lighting, but also provides ac power for communication equipment located within the room. The electrical feeder (50 A at 208 V ac, single phase) for the ac power system of the room shall originate from the normal ac power system of the building. Back-up power shall be provided by an alternate standby power source.

5.2.4.7.3 Telephone Service

Design shall include the installation of a conduit for the telephone service cable entrance to the building, as described in Engineering Standard ES-1.13-1. Conduit installed inside buildings shall be EMT unless the strength and rigidity of rigid conduit is essential or is required by NFPA 70. Conduit exiting the building underground shall conform to the following: (a) the conduit may be either rigid galvanized steel, IMC, or polyvinyl chloride (PVC); (b) the conduit shall be installed in accordance with Engineering Standard ES-1.1-20, "Duct Bank Details," unless otherwise noted; and (c) the conduit may be installed in the same concrete envelope with power conduits if a minimum spacing of 3 inch is maintained between it and the power conduits.

5.2.4.7.4 Cabling to Voice and Data Outlets

The cable to the voice and data outlets shall be as specified in Engineering Standard ES-1.13-1. All cables shall be installed in an organized bundled routing scheme. In office areas and other similar areas, the cables shall be concealed above suspended ceilings as much as practical. Conduits shall be required for the cables where they pass through fire zone walls and floors or where there is the possibility of physical or chemical damage to the cables. Conduits used to

penetrate fire zone walls and floors shall be IMC or rigid galvanized steel and shall be installed in accordance with Engineering Standard ES-4.11-6. All outlets shall be flush mounted where feasible.

5.2.4.7.5 Drawings

Communication plan drawing(s) shall be prepared per Engineering Standard ES-1.13-1. These drawing(s) shall contain the following as a minimum: (a) the location of all communication outlets; (b) the routing of cables to these outlets; (c) the routing of riser cables, if required; (d) the location of all communication rooms; and (e) the size, number, and routing of the telephone service conduit(s). The construction package for the installation shall also include the revised master drawings as specified in Engineering Standard ES-1.13-1, Subsection 1.0, Part 2.B.5, and cable data sheets as specified in Engineering Standard ES-1.13-1, Subsection 1.0, Part 2.B.6.

5.2.5 Piping

5.2.5.1 General

Where details of design or fabrication are not shown on the drawings of Appendix 1 or specified in this specification, design and fabrication shall be in accordance with the applicable requirements of the American Society for Testing Materials, American Water Works Association, Standard Plumbing Code of the Southern Building Code Congress, American Society of Mechanical Engineers (ASME), Construction Specification Institute, and the American National Standards Institute. No plastic piping materials shall be used.

As-built drawings and vendor data with spare parts lists and operating instructions for all equipment (such as, collection tank, condensate receiver, pumps, safety valves, and reducing valves) shall be supplied.

Welding: All welding, qualification procedures, and qualification of welders shall be in compliance with ASME Boiler and Pressure Vessel Code, Section IX, and ANSI B31.1. All welding procedures and operators shall be qualified by an independent testing laboratory in accordance with the applicable provisions of the referenced codes. All procedures and operator qualifications and results from the independent test laboratories shall be subject to acceptance by the Company. Accurate records of operator and procedure qualifications shall be maintained and shall be made available to the Company on request. All welding procedures and welder's qualifications shall be approved by the Company before work is started. Each welder shall be assigned an identification number, letter, or symbol which shall be used to identify his or her work when specified in applicable codes, standards, or specifications.

All welds are subject to inspection by the Company. The Company reserves the right to accept, reject, or demand removal of welds which are in violation of these specifications. Welders performing welds found to be unsound shall be subject to appropriate retest provisions of the ASME Boiler Code or other applicable standards.

Soldering: All soldered joints shall be made using a solid wire solder and a noncorrosive flux. The solder mixture shall contain no lead. Valves to be soldered shall be disassembled prior to soldering and all packing removed. After soldering, the valves shall be allowed to cool before reassembling. Remove all excess flux and solder from the exterior surface of the joint.

Hangers: Location and design of anchors and hangers shall be shown on drawings. The location and spacing of hangers shall be such that the piping or tubing is held in position without swaying, vibrating, or sagging.

5.2.5.1.1 Design Documents

Prepare design documents in sufficient detail and quantity to provide complete construction information needed by the construction forces for construction of the facility.

Prepare design documents to reflect appropriate elements required to support the method of construction specified herein.

Prepare design documents in accordance with the following criteria.

5.2.5.1.2 Drawings

Prepare all new construction drawings in accordance with Div. 1, Sect. 1.4, Engineering Drawings, of the Project Design Criteria, Y/EN-4451.

Verify dimensions shown on existing drawings since piping drawings may not be truly "as-built."

Prepare engineering flow diagrams for all piping systems and submit for approval with first scheduled drawing review submittal. Show line sizes, line numbers, piping system designations, and V-numbers of line valves. Identify control valves by control valve number (instrument number).

Prepare drawings in sufficient detail so that no design or installation details are to be performed by the construction contractor unless specifically stated herein.

Prepare piping drawings to show all piping systems required for the facility (both inside and outside of buildings). Show all piping construction details on piping drawings except for the following:

Storm Drains
Gravity Sanitary Sewers (outside)

Indicate that any piping shown on other discipline drawings (except as indicated above) is for reference only.

Prepare separate drawings for the following systems: outside utility piping, drain systems, fire protection sprinkler systems.

Prepare plan and profile drawings for all underground piping.

Reference all Energy Systems' Standards to be used in construction by the Standard number. Do not redraw or duplicate the Standard on the drawings except as necessary for clarity.

Identify utility tie-in point location on the piping plan drawings. See Div. 1 of the Master Design Criteria for tie-in tabulation requirements. Design of tie-in connections to utility piping must be approved by the Company.

Locate, detail, and number hangers and supports for banks of pipes and for individual pipes 3 inch and larger on the piping drawings. Use Energy Systems Standard ES-4.5.3 for spacing of hangers and ES-4.5.2 for hanger details where applicable.

Locate, detail, and number all pipe anchors on the piping drawings.

Prepare a table identifying special equipment which is not explicitly defined by the piping construction specifications. The table shall include specification numbers and data sheet numbers for all special equipment.

All piping construction drawing sets shall have a drawing which contains the following:

General piping notes.

A table listing each service, its designation, and its applicable construction specification subsection.

A table listing each service design pressure, test pressure, test type, and test media.

A table listing relief valves and their pressure settings.

A table listing insulation thickness and type.

Notes referencing the applicable construction specification subsection for cleaning, inspection, and labeling.

5.2.5.1.3 Piping Design

Use Energy Systems' Engineering Standards to the maximum extent possible.

Design piping for areas designed to accommodate the physically handicapped in accordance with 41 CFR 101-19.6.

Design all fluid systems to accommodate future expansion without extensive modification.

Use only standard pipe sizes. Avoid use of 1 1/4-inch, 2 1/2-inch, 3 1/2-inch, or 5-inch NPS piping sizes except for fire protection.

Provide access panels where maintenance or replacement of equipment, valves, or other devices may be necessary.

Provide escutcheons at wall, ceiling, and floor penetrations in occupied areas. Provide sleeves in accordance with Engineering Standards.

Install insulating couplings between ferrous and other metal pipes.

Show size and V-numbers for all valves on piping drawings. Show valve identification number if appropriate.

Protect undergroup piping from corrosion by use of resistant materials or other protective measures. Design cathodic protection system, if required, to be installed at the same time as piping system. Design piping system to reflect the special requirements of cathodically protected systems.

Coordinate with the electrical designer the need for or type of cathodic protection required.

Note on drawings that tie-in to existing cast iron (CI) pipe will require a field examination to determine type, size, and wall thickness of existing CI pipe.

5.2.5.1.4 Construction Specifications

Prepare construction specifications in accordance with Div. 1, Sect. 1.6 of the Project Design Criteria, Y/EN-4451.

Prepare specifications to reflect the requirements of Technical Specifications, Engineering Standards, and these criteria.

Prepare complete construction specifications so that no materials are to be selected by the construction contractor unless specifically required herein.

Include only those materials, sizes, and construction practices required for a specific project.

5.2.5.1.5 Equipment Specifications

Prepare equipment specifications for fluid system equipment not otherwise described in the construction specification.

Prepare equipment specification in accordance with Energy Systems' Engineering Procedure EP-C-22.

5.2.5.1.6 Equipment Data Sheets

Prepare Equipment Data Sheets for fluid system equipment not otherwise covered by the construction specifications.

Prepare data sheets in accordance with Energy Systems' Engineering Procedure EP-C-23.

Use existing Energy System data sheets listed in the Appendix whenever practical.

5.2.5.1.7 Test and Inspection Summary Sheet

Prepare a Testing and Inspection Summary Sheet as part of the construction package in accordance with Energy Systems' Engineering Procedure EP-E-12.

Include all tests and inspections required for the piping systems as part of the construction activities. Include as a minimum the following:

- pressure test (type, pressure, media)
- leak tests (type, media)
- weld examination (visual, X-ray, dye penetrant)
- sterilization test

Include other pipe system test and inspection requirements for the specific project.

5.2.5.1.8 Excavation-Penetration Permits

Identify all piping related excavations and penetrations and prepare Excavation-Penetration Permit forms in accordance with Energy Systems' Engineering Procedure EP-D-06 as part of the design package. As a minimum, the location and size of all excavations/penetrations shall be shown on the forms.

Show location and extent of all excavation and penetrations (wall, floor, or ceiling) required for the installation of the piping systems for the project.

5.2.5.1.9 Additional Documentation

Provide the following documentation in addition to that required by other sections of these criteria.

- Design calculations (line sizing, flow quantities, design pressure, pressure drop (loss) and valve sizing). Design calculations shall be of sufficient detail to clearly support design decisions. Design analysis and calculations shall be in accordance with the Company's Engineering Standard ES-0.7.

- Estimating Billing of Material by system in accordance with Company standards.

- Advance Bill of Material for Energy Systems' Specification 15050, Subsection 128, Materials.

5.2.5.1.10 Vendor Data Submittals

See 5.2.1.4.2 for basic vendor data submittal requirements. Piping system additional requirements are listed in the following sections.

Specify that approval of vendors' data does not relieve the construction contractor of the contractual duty to comply with the specifications nor does it constitute an authorized change to the specifications.

Since the purpose of vendor data submittal for review is to verify compliance with the specifications, specify that vendor certify that item submitted meets each and every requirement of the specifications or list areas of noncompliance. A compliance checklist is one way to check specification requirements.

If alternate items are submitted, it is the vendors responsibility to prove that item submitted meets specifications.

Specify that vendor submit data in sufficient detail to adequately describe item. Model number without additional information is not adequate.

Specify that failure to comply fully with these criteria may result in rejection of the item with or without a request for further data submittals.

5.2.5.1.11 Valving Design

Design fluid systems piping to use valves selected from those listed in the Technical Specifications and Engineering Standards except as otherwise required to meet design parameters.

Provide block valves on all service branch lines (except as prohibited herein) to maintain service during maintenance.

Locate block valves for all branch headers as close as practical to the main headers.

Provide block (shut off) valves at all plumbing fixtures and in all looped heaters. Block valves are prohibited on relief valve lines.

Provide check valves on all pump discharge piping.

Show size and V-numbers for all valves on piping drawings. Show valve identification number if appropriate.

Show type, size, pressure setting, and capacity of all pressure reducing and relieving devices on the drawings. Design pressure relieving devices in accordance with ASME Code, Sect. VIII. Note on the drawing that all safety valves, relief valves, safety relief valves, pressure control valves, pressure reducing valves, and backflow prevention devices are to be turned over to the Company for testing and/or pressure setting prior to installation.

Pressure relieving devices for use on piping systems are defined as follows:

- Pressure Relieving Device: Any of several types of self-actuating devices, as defined below, which are used to prevent over-pressure of boilers, pressure vessels, and piping systems under static and/or dynamic loading conditions.

- Safety Valve: An automatic pressure relieving device, intended for gas or vapor service, actuated by the inlet pressure and characterized by full-opening, pop action.

- Relief Valve: An automatic pressure relieving device, intended for liquid service, actuated by the inlet pressure and characterized by an increase in pressure resulting in a proportional increase in valve opening.

- Safety Relief Valve: An automatic, pressure-actuated, relieving device suitable for use either as a safety valve or relief valve, depending on its application.

- Temperature-Pressure Relief Valve: A relief valve used primarily on hot water tanks and water heating boilers for relieving water at a predetermined temperature and/or at a predetermined pressure.

- Rupture Disc: A nonclosing pressure relief device, usually a metal disc actuated by inlet pressure, designed to burst at a predetermined pressure and temperature rating.

- Fuse Plug: A plug or disc, usually metal, that will melt and relieve the pressure at a predetermined temperature. Such pressure relieving devices are commonly used on refrigerant vessels.

5.2.5.1.12 Valving Specifications

Obtain approval of Energy Systems prior to specifying valves not listed in Appendix 11.

Specify that valves will be tagged with respective V-numbers as shown on the drawings.

Specify pressure reducing valves for dead-end services.

Specify that safety valves shall be National Board stamped and have lever operators (packed for indoor service).

5.2.5.2 Utilities--Exterior

5.2.5.2.1 Potable Water (designated SW on drawings)

The potable water supply shall be routed from the existing potable water main. Connection of 3" and larger to the potable water main shall be made by using a mechanical joint ductile iron reducing tee and a mechanical joint cutting-in sleeve and underground mechanical joint butterfly valve (V-6403) with a slip type valve box. Connection to the potable water main smaller than 3" shall be made using a corporation stop and a curb stop with seamless copper water tube, Type K, soft drawn per ASTM B-88. The valved connection to the main shall be furnished and installed by the Contractor. Minimum cover over line shall be three feet.

Pipe shall be ductile iron class 52, ASTM A-377 with mechanical joint ends. Ductile iron pipe and fittings shall be cement lined and bituminous seal coated inside and outside per American Water Works Association (AWWA) C-104.

Valves: For valve specifications see Appendix 11.

Service	Size	Valve No.
Butterfly, Shutoff	3" to 12"	V-6403
Corporation Stop	to 2"	V-415
Curb Stop	to 2"	V-6151

Testing: New lines shall be hydrostatically tested at 200 psig. Leakage rate shall not exceed 0.12 quarts per joint for test period of two hours on lines 3" and larger. Lines shall be sterilized in accordance with Section 5.2.5.4.3.

Size water lines using a "C" factor of 100 in the Williams and Hazen formula for friction losses in water pipe.

Design water systems to meet all requirements of Standard Plumbing Code of the Southern Building Code Congress International, Inc.

Locate potable water lines in separate trench from sewer lines. Avoid routing lines under pavement (except at road crossing) or other inaccessible locations.

Locate water mains to minimize effort and cost when excavation for maintenance and repairs are necessary.

Design distribution system to deliver peak potable flow of 2 1/2 times the average daily demand plus any special demands, at a minimum residual pressure of 30 psig at ground elevation.

Design potable water headers that also serve fire protection requirements to satisfy fire protection requirements plus 50% of the average potable water requirements plus any process demands that cannot be reduced during a fire.

Design water mains to maintain a normal operating pressure range of 40 to 100 psi in distribution mains and building service lines. Design mains for a minimum pressure rating of 150 psi.

Where service lines enter the building, provide suitable flexibility to protect against differential settlement or seismic activity in accordance with Standard Plumbing Code of the Southern Building Code Congress International, Inc., or NFPA 13.

5.2.5.2.2 Fire Protection Water (designated FWD on drawings)

The fire protection water supply shall be from a new valved connection to the existing fire water system. A new post indicator type valve shall be installed near the connection to the main. Valve stems shall be taped for a valve supervisory switch. Indicator posts shall carry a UL-approved tag and shall have a target to show whether the valve is opened or closed. The target is to be set so that the words "open" or "shut" appear, in full view when the valve is fully opened or fully closed. The post shall fit valves V-1103. Indicator shall be adjustable. Direction of turn to open shall be counter clockwise with wrench nut size 1 1/4 inch square. The pipe, pipe fittings, testing and sterilization shall be the same as required for underground potable water and in accordance with NFPA-24.

5.2.5.2.3 Instrument Air (designated YA (90 psig) on drawings)

Provide a new underground instrument air (90 psig) line from the existing main located south of Building 9704-1, to the Y-12 Site Central Office. The connection to the instrument air main shall be made by installing a butt-weld reducing tee and a gate valve. The valved connection to the existing main shall be provided by the Contractor.

Pipe: To 1 1/2" shall be Steel, welded Schedule 40, ASTM A-53.

Pipe: 2" and over shall be Steel, seamless or ERW, standard weight, ASTM A-53 Grade B.

Fittings: To 1 1/2" shall be MI, 150 lb., ASTM A-197, with screwed ends, ANSI B16.3.

Fittings: 2" and over shall be Steel, standard weight, ASTM A-234 Grade WPA or WPB, butt weld ends, ANSI B16.9.

Unions: To 2" shall be MI, 150 lb., ASTM A-197, with brass-to-iron seats, screwed ends.

Unions: 2 1/2" and over use flanges.

Flanges: All shall be Steel, 150 lb, slip-on or welding neck, ASTM A-105 or A-181, Grade 1, per ANSI B16.5.

Plugs: All shall be Steel, square head, solid type, screwed, per ANSI B16.14

Gaskets: All shall be spiral wound with carbon steel ring material and non-asbestos chlorite/graphite paper filler, 1/16 inch thick, ring type. ASTM F-104, Grade P1161A.

Tubing: To 3/4" nominal shall be Copper seamless water tube, ASTM B-88, Type L, soft temper. Copper tubing and copper fittings shall be used only where specified on the drawings.

Tube fittings: All shall be Wrought copper, solder joint for silver brazing per ANSI B16.22.

Pipe and fitting installed underground shall be coated in accordance with AWWA 207-73, including Appendix A, Section A1.5.

Valves: For valve specifications, see Appendix 11.

Service	Size	Valve No.
Shutoff Gate	1/4" to 2"	V-1
Globe Control	1/4" to 2"	V-6036
Swing Check	1/4" to 2"	V-202

All valves shall be identified by valve number on all drawings.

Pressure Relief and Reducing Valves: All safety relief valves shall have lever operators, and be packed for indoor service. The capacity of the safety relief valve shall be based on 1.1 times the manufacturers maximum rated flow of pressure reducing valve (full open position), when this valve is subjected to the pressure of the upstream main line and is discharging at the specified relief valve set pressure. Set pressures shall be 10 psig above operating line pressure unless the allowable working pressure of downstream equipment is less than indicated set pressures. Where such equipment is used, special set pressures are required. Drawings shall show capacity of pressure reducing and pressure safety and set pressures. Safety relief valves shall be National Board stamped and shall be turned over to the Company for set pressure testing.

Cleaning: Cleaning shall be as specified in Section 5.2.5.4.

Testing and Inspection: Testing and inspection shall be as specified in Section 5.2.5.5.

Maximum pressure at air hose outlets is 15 psig.

Design steel piping systems to meet the requirements of ANSI B13.3, Code for Pressure Piping Chemical Plant, and Petroleum Refinery Piping.

Avoid use of lubricators in oil free systems.

Provide shut-off valves for connections to instrumentation systems.

5.2.5.2.4 Sanitary Sewers (designated SS on drawings)

The new sanitary sewer lines shall tie into the existing plant sanitary sewer system. Plan and profile design of all new sanitary sewers shall be provided in the design package. Nearby existing sanitary sewers are shown on the topographic drawings or drawing ECV-26147.

Material shall conform to the Standard Plumbing Code. Piping and fittings can be extra-strength bell and spigot clay per ASTM C-700; concrete per ASTM C-14; PVC per ASTM D-3034; or ABS per ASTM D-2680.

Pipe and fittings shall be installed in compliance with manufacturer's instruction. Lines shall be sloped to provide flow velocity between 2-10 feet per second. Provide three feet minimum cover over pipe. Perform lamping test as defined in storm sewer section below.

Testing and Inspection: Testing and inspection shall be as specified in Section 5.2.5.5.

5.2.5.2.5 Storm Sewers (designated SD on drawings)

All new storm sewer systems shall tie into the existing plant system and shall collect drainage from the new parking areas, the basement wall subsurface drain pipes, the roof drain systems, condensate drainage, and any new catch basins required for surface drainage around the new buildings.

Materials shall conform to the standard plumbing code. Pipe and fittings can be either extra-strength bell and spigot clay per ASTM C-700 or concrete per ASTM C-14.

The minimum cover over pipe shall be three feet. Minimum pipe slope shall be 1/8 inch per foot.

Tests of sanitary and storm sewers shall be made by lamping from one manhole to another. Each run of sewer piping between manholes shall show a full circle of light upon visual inspection.

5.2.5.2.6 Steam (designated S on drawings)

Provide a new underground steam supply line from an existing 12-inch 150 psig line, running North/South on the west side of Building 9210, to the new OICC.

The new system shall include an underground trapping station for steam condensate and a drain for the conduit casing. Connections shall be provided to permit future pressure testing of the outside casing by Company maintenance personnel.

A new valved connection to the main shall be furnished and installed by the Contractor. The new underground steam line shall be installed in factory prefabricated, preinsulated pipe. The carrier pipe shall be seamless Schedule 40 steel pipe in accordance with ASTM A-53, Grade B, with 2-inch thick calcium-silicate insulation inside a steel conduit casing. Welding shall be in accordance with ANSI B31.1. The steel casing shall be epoxy coated inside to 6 mils thickness and epoxy coated outside with layers of glass cloth to 20 mils thickness. A cathodic protection system shall be provided for the outside steel conduit casing.

Flanges: All shall be steel, 150 lb. slip-on or welding neck, ASTM A-105 or A-181, Grade 1, per ANSI B16.5.

Gaskets: All shall be spiral wound with carbon steel ring material and non-asbestos chlorite/graphite paper filler, 1/10" thick, ring type, ASTM F-104.

Valves: For valve specifications, see Appendix 11.

Service	Size	Valve Number
Shut off Gate	1 1/2" to 4"	V-59

All valves shall be identified by valve number on all drawings.

Cleaning: Cleaning shall be as specified in Section 5.2.5.4.

Testing and Inspection: Testing and inspection shall be as specified in Section 5.2.5.5.

Check

Swing	1/4" to 2"	V-210

All valves shall be identified by valve number on all drawings.

Design steam piping systems to meet the requirements of ANSI B31.1, Code for Pressure Piping, Power Piping.

Provide gages having a diaphragm attachment (liquid silicone filled) for outside locations or in other areas subject to freezing.

Install direct buried pipe in accordance with manufacture's instructions.

Provide expansion loops to compensate for expansion of steam lines. Do not use expansion joints. Use only welded fittings on expansion loops. Show any required cold springing on the drawings.

Provide permanent metering in accordance with 10 CFR 435 for new buildings unless total energy consumption is not expected to exceed 500 M Btu/year. Provide valved bypass around meter and shutoff valves on meter inlet and outlet.

Install condensate trapping station on steam distribution headers in accordance with Engineering Standards at all low points and on straight runs as recommended by the trap manufacturer.

5.2.5.2.7 Chilled Water (designated CWS and CWR on drawings)

Provide new underground chilled water supply and return lines from the existing 16-inch CWS and CWR lines running south out of Building 9767-11 to the new OICC. The new lines shall have a minimum of 3 feet cover.

New valved connections to the mains shall be furnished and installed by the Contractor. The new underground chilled water lines shall be installed in factory preinsulated pipe with the carrier pipe being seamless steel, Schedule 40, in accordance with ASTM A-53, Grade B, with 3/4-inch thick, 90% closed-cell polyurethane with a K Factor of up to ASTM D-1784. The PVC jacket shall be sealed to provide a moisture-resistant vapor barrier. All welded branch lines shall be made with tees.

Flanges: All shall be steel, 150 lb. slip-on or welding neck, ASTM A-105 or A-181 Grade 1, per ANSI B16.5.

Gaskets: All shall be red rubber sheet, 1/10" thick ring type or full face, ASTM D-2000.

Valve: For valve specifications, see Appendix 11.

Service	Size	Valve Number
Shut Off Butterfly	3" to 4"	V6431

Underground valves shall be provided with cast iron valve boxes. All valves shall be identified by valve number on all drawings.

Cleaning: Cleaning shall be as specified in Section 5.2.5.4.

Testing and Inspection: Testing and inspection shall be as specified in Section 5.2.5.5.

Design to meet requirements of ANSI B31.3, Code for Pressure Piping, Chemical Plant, and Petroleum Refinery Piping.

Pipe hangers and supports shall not penetrate the insulation on chilled water lines.

5.2.5.3 Utilities--Interior

5.2.5.3.1 Potable Water (designated SW or for hot potable water SWH on drawings)

Provide a piping system to distribute hot and cold potable water to the restrooms, service sinks, and electric water coolers. Include an electric water heater and a potable hot water system of sufficient holdup and recovery rate to serve building population. Potable water shall be supplied to humidifying equipment as required. The potable water system shall be installed in accordance with the Standard Plumbing Code.

Tubing: To 2" nominal shall be Copper, seamless water tube, hard drawn, ASTM B-88, type L.

Pipe: 3" and 4" shall be Steel, butt welded, Schedule 40, ASTM A-53, galvanized.

Fittings: To 2" nominal shall be Copper, wrought type, solder joint, per ANSI B16.22.

Fittings: 3" to 12" shall be CI, 125 lb., flanged ends, ASTM A-126, ASNI B16.1, galvanized.

Flanges: 3" to 12" shall be CI, 125 lb., screwed companion, ASTM A-126, ASNI B16.1, galvanized, with smooth or serrated faces conforming to MSS SP-6.

Valves: For valve specifications, see Appendix 11.

Service	Size	Valve Number
Gate, Shut Off	1/2" to 2"	V-6134
Gate, Shut Off	3" to 12"	V-5
Globe, Control	3/8" to 2"	V-6135
Globe, Control	3" to 12"	V-102

Swing, Check	1/4" to 2"	V-1163
Swing, Check	3" to 12"	V-204

All valves shall be identified by valve number on all drawings.

Gaskets: All shall be red rubber sheet, 1/16-inch thick, full face, ASTM D-2000.

Piping Fabrication and Installation: Provisions shall be made to prevent water hammer, rattling of the pipe, chattering valve and faucets, and other objectional noises in the system. Full size air chambers, two to three feet vertical length, shall be provided at the top of all risers, at the end of all branches, and at individual fixtures where necessary. Whenever it is necessary to have a submerged potable water supply to a fixture, tank or other equipment, a vacuum breaker shall be installed in the supply line at an elevation above the overflow line of the fixture. Valves shall be installed in all branches at the takeoff from the main, at all risers, before all connections to equipment, and as shown on the drawings.

Cleaning and Sterilization: Cleaning and sterilization shall be as specified in Section 5.2.5.4.

Testing and Inspection: Testing and inspection shall be as specified in Section 5.2.5.5.

Insulation: All hot and cold potable water lines shall be insulated for energy conservation and anti-sweat protection. Insulation shall be composed of 1" thick fibrous glass wool with a rosin binder, formed into semi-cylindrical sections for pipe insulation and 24" by 48" semigrid boards for equipment insulation. Pipe insulation shall have a flame-retardant self-sealing lap jacket of a laminate of aluminum foil and a special embossed white draft paper with a ilame-retardant snuffer-type adhesive and shall be reinforced with glass fibers. Insulation shall have the following properties:

Density	6 lb. per cu ft for pipe insulation. 4.2 lb. per cu ft for equipment insulation.
Thermal Conductivity	Shall not exceec the following values per ASTM C-177 or C-355:

Mean Temperature (Deg F)	Conductivity (btu/hr/sq ft/deg F/in thk)
50	0.24
100	0.27
200	0.38

Provide stop valves at each plumbing fixture.

Provide accessible shut-off valves at branches serving floors or fixture batteries, at risers serving multiple floors, and at equipment or appurtenances.

Provide drain valves to drain the plumbing system. Provide manual air vents at high points in the system. Provide for expansion compensation by using the inherent flexibility of the piping system or by expansion loops. Do not use expansion joints.

Provide vacuum breaker at all hose connections on potable water system.

Design potable water system to comply with 40 CFR 141 and 40 CFR 142. Supply potable water by a separate line and not a combined fire protection and potable water or a combined process water and potable water system within the building.

Design combined fire water and potable water supplied to each building with valving that permits potable water system shutdown without affecting fire water system.

5.2.5.3.2 Sanitary Drainage (designated SS on drawings)

Provide a complete sanitary drainage system to serve the restrooms, service sink, and electric water coolers. The sanitary drainage system shall be collected into a single header exiting the new facility. The sanitary drainage system shall be designed, installed, and tested in accordance with the Standard Plumbing Code. No plastic pipe shall be used.

Pipe and Fittings: (buried, exposed and main stacks) 2" to 15" shall be cast iron, service weight (SV), hub and plain end pattern, coated inside and out, conforming to ANSI ASTM A-74, or WW-P-401, Class A, with Neoprene gaskets conforming to ASTM C-564.

Pipe: (exposed) 1" to 2" shall be galvanized steel, Schedule 40, ASTM A-120, butt welded.

Fittings: (exposed) 1" to 2" shall be CI, galvanized, recessed threaded drainage fittings ANSI B16.12.

Piping Fabrication and Installation: All lines shall have a minimum pitch of 1/4-inch per foot for sizes 3-inches and less and 1/8-inch per foot for sizes larger than 3 inches. All exposed horizontal runs of piping shall be securely supported at each hub or at maximum intervals of 5 feet for cast iron soil pipe.

Cleaning: Prior to erection the inside of all pipe and fittings shall be cleaned of all dirt and foreign materials. After installation, all drain lines shall be cleaned free of foreign deposits and inspected for broken or cracked pipe or fittings. Defective pipe or fittings shall be replaced.

Testing and Inspection: Testing and inspection shall be as specified in Section 5.2.5.5.

Design sanitary drain lines to meet the requirements of Standard Plumbing Code, Southern Building Code Congress International, Inc.

5.2.5.3.3 Steam (designated S on drawings)

Provide a steam system to supply building steam heat coils and steam heated water heaters, where used. Provide air operated pressure reducing valves, inside the building, reducing pressure from 100 psig to required working pressure. All reducing stations shall have pressure gages showing upstream and downstream pressures from reducing valves. All reducing stations shall have valved by-pass lines. Condensate trapping stations and dirt legs minimum of 6" long shall be at all low points in the system. At the bottom of all dirt legs (regardless of pressure) use a 3/4" minimum gate valve.

For steam pressures 150 psig or less use:

Pipe to 1 1/2" shall be steel, seamless, Schedule 40, ASTM A-106, Grade B or C.

Pipe 2" to 8" shall be steel, ERW or seamless, standard weight per ANSI B36.10, ASTM A-53, Grade B, type E or S. Type F shall not be used.

Fittings to 1 1/2" shall be steel, 2000 lb., ASTM A-105 or A-181 class 70, screwed ends, ANSI B16.11, EXCEPT use 3000 lb. rating on couplings, half couplings, reducers, and caps.

Fittings 2" to 8" shall be steel, seamless, ASTM A-234, Grade WPB or WPC, butt-weld ends, ANSI 16.9 to match pipe.

Flanges 1/2" to 3/4" shall be steel, ASTM A-105 or A-181 class 60, 150 lb., socket weld type, ANSI B16.5.

Flanges 1" to 24" shall be steel, ASTM A-105 or A-181, class 60, 150 lb.

Unions to 2" shall be steel, 3000 lb., ASTM A-105 or A-181 class 70, with integral steel seats and screwed ends, dimensions per manufacturer's standard.

Plugs: all shall be steel, solid type, square-head screwed, ANSI B16.14.

Gaskets: all shall be spiral wound with carbon steel ring material and non-asbestos chlorite/graphite paper filler, 1/16-inch thick, ring type, ASTM F-104.

Studs and Nuts shall be steel studs, ASTM A-193, Grade B-7 and heavy hex nuts, ASTM A-194, Grade 2 or 2H.

Strainers to 2" shall be cast steel, ASTM A-216, Grade WCB, screwed ends, Y-pattern, Monel screen with 1/64-inch perforations.

Strainers 3" to 8" shall be cast steel, ASTM A-216, Grade WCB, flanged ends, Y-pattern, Monel screen with 1/64-inch perforations.

Valves: For valve specifications see Appendix 11.

Service

Shutoff	Size	Valve Number
Gate	1/2" to 2"	V-1133
Gate	2" to 30"	V-59
Gate	1/2" to 3"	V-6114 (use on condensate lines downstream of steam traps)
Control		
Globe	1/4" to 2"	V-1132
Globe	2" to 14"	V-143
Check		
Swing	1/4" to 2"	V-210

All valves shall be identified by valve number on all drawings.

Safety Relief Valves

All safety valves shall have lever operators, and be packed for indoor service. The capacity of the safety relief valve shall be based on 1.1 times the manufacturers maximum rated flow of the pressure reducing valve (full open position), when this valve is subjected to the pressure of the upstream main line and is discharging at the specified relief valve set pressure. Set pressures shall be 10 psig above operating line pressure unless the allowable working pressure of downstream equipment is less than indicated set pressures. Where such equipment is used special set pressures are required. All safety valves shall be National Board stamped. Safety valves shall be turned over to the Company for set pressure testing prior to installation.

Pressure Reducing Valves

Valves shall be air operated for dead end service.

Piping and Installation

All steam piping shall be pitched down 1/4-inch per 10 feet in the direction of flow unless otherwise shown on drawings. Only weld fittings shall be used on expansion loops. Apply graphite and oil to both sides of gaskets before use in flanged joints.

Cleaning

Cleaning shall be as specified in Section 5.2.5.4.

Testing and Inspection

Testing and inspection shall be as specified in Section 5.2.5.5.

Insulation

All steam piping shall be insulated with 1 1/2" thick calcium siliate insulation per ASTM C-533 (asbestos free).

5.2.5.3.4 Condensate (designated C on drawings)

All steam condensate shall be gravity drained to the storm sewer system. If gravity drainage is not possible, steam condensate shall be collected in an alternating duplex condensate receiver and pumped to the storm sewer system.

All condensate piping shall be insulated for personnel protection as needed.

Pipe and fittings for up to 150 psig steam shall be as specified in Section 5.2.5.3.3.

Traps

Use float type steam traps after heating coils. All other traps shall be inverted bucket type. Traps with recessed plugs are not acceptable.

Piping and Installation

All condensate piping shall be pitched down 1/4-inch per 10 feet in the direction of flow unless shown otherwise on the drawings.

Insulation

All exposed condensate piping in service areas between floor levels and seven feet above shall be insulated with 1" thick fibrous glass insulation.

5.2.5.3.5 Chilled Water (designated CWS and CWR on drawings)

Chilled water supply and return line shall be provided to HVAC equipment as required.

Pipe to 1 1/2" shall be steel, welded Schedule 40, ASTM A-53.

Pipe 2" and over shall be steel, seamless or ERW, standard weight, ASTM A-53 Grade B.

Fittings to 1 1/2" shall be MI, 150 lb., ASTM A-197, with screwed ends, ANSI B16.3.

Fittings 2" and over shall be steel, standard weight, ASTM A-234, Grade WPA or WPB, butt weld ends, ANSI B16.9.

Unions to 2" shall be MI, 150 lb., ASTM A-197, with brass-to-iron seats, screwed ends, dimensions per manufacturer's standard.

Flanges shall be steel, 150 lb., slip-on or welding neck, ASTM A-105 or A-181 Grade 1, per ANSI B16.5.

Plugs shall be steel, square head, solid type, screwed, per ANSI B16.14.

Gaskets shall be red rubber sheet, 1/16 inch thick, ring type.

Valves: For valve specifications see Appendix 11.

Service	Size	Valve Number
Shutoff		
Gate	1/4" to 2"	V-1
Gate	2" to 6"	V-5
Control		
Globe	1/4" to 2"	V-6036
Globe	3" to 6"	V-102

Check Swing	1/4" to 2"	V-201

All valves shall be identified by valve number on all drawings.

Cleaning: Cleaning shall be as specified in Section 5.2.5.4.

Testing and Inspection: Testing and inspection shall be as specified in Section 5.2.5.5.

Design to meet requirements of ANSI B31.3, Code for Pressure Piping, Chemical Plant, and Petroleum Refinery Piping.

Pipe hangers and supports shall not penetrate the insulation on chilled water lines.

5.2.5.3.6 Water Heating System (designated PWH on drawing)

If a process water heating system is selected, the following requirements shall apply:

The process water heating system shall be a reverse return system constructed of hard drawn, seamless copper tube. The system shall be designed and constructed for a service rating of 150 psig and 220 degrees F. The system shall be insulated with minimum 1-inch thick fibrous glass insulation.

A heat transfer package shall be used to convert steam to hot water. One pump at a time will be used to circulate the hot water and shall be selected manually. The hot water temperature shall be reset in an inverse ratio to outside temperature. The operating pump shall be started and stopped by an outdoor temperature control.

The heat transfer package shall be a complete and tested assembly of components supported on a structural steel, skid-mounted frame. The assembly shall consist of the following principal items:

(a) Two identical horizontal, centrifugal pumps with motors, starters, controls, and wiring;
(b) A steam-to-hot-water exchanger with copper coils;
(c) An expansion tank;
(d) A complete air-elimination system;
(e) Interconnecting pipe, valves, and fittings;
(f) Ancillary equipment; and
(g) Insulation.

Each unfired pressure vessel in the package shall be fabricated in strict compliance with Section 8 in the 1983 ASME Boiler and Pressure Vessel Code for Unfired Pressure Vessels operating at 125 psig or as indicated. The manufacturer shall provide a properly authenticated Form U-1 for each vessel, and each shall bear the compliance symbol.

A water treatment system shall be provided for the water heating system. The water treatment system hardware shall consist of a pressure tank with a funnel attached for placing treatment chemicals in the tank. The Contractor shall mount the tank and perform piping required to connect the tank to the common pump discharge and suction lines with 1/2-inch pipe including a valve in each line near the tank. The system shall be rated for 125 psig. The make up water supply shall be from the potable water system through a reduced pressure type backflow preventer.

The system shall also include the services of a company specialized in water treatment that has been in business not less than 10 years. This service shall include, but not be limited to, initial water analysis and recommendations, system start-up assistance, training of operating personnel, periodic field service and consultation; all performed by a qualified full-time local representative for a period of 1 year from start-up. Report and log sheets as well as all required chemicals for the 1-year period shall be included.

Cleaning: Cleaning shall be as specified in Section 5.2.5.4.

Testing and Inspection: Testing and inspection shall be as specified in Section 5.2.5.5.

Design the process water heating system to provide flow such that within 10 seconds a supply of 110°F process water at the most remote outlet is provided, except where it is deemed unnecessary by the Company. Provide booster heaters where higher temperature water is required.

5.2.5.3.7 Sprinkler Systems

Sprinkler systems shall be operational when 75% of building construction is complete.

Sprinkler heads shall be located below raised floors and both above and below suspended ceilings where the area above the ceiling is used as a plenum or cableway. Heads shall be 165 degree with a maximum spacing of 130 square feet per head. Additional heads shall be provided below all raised floors with a maximum spacing of 8 feet between sprinklers and a maximum of 8 feet between branch lines. The system shall be supplied by a new underground line. Alarms shall include an alarm check valve with a water motor alarm and an alarm pressure switch and controls in accordance with Section 5.2.4.5.

The system riser shall be located in a separate utility room with dimensions of at least 8 feet by 8 feet and an exterior door. This room shall have lighting, heat, and a ground fault 120 VAC receptacle. Isolation valves shall be provided for piping to the OICC and other Y-12 Site Central Office rooms housing VDTS equipment. These valves shall be located in the riser utility room.

Sprinkler systems shall be in accordance with NFPA 13, Ordinary Hazard Pipe Schedule.

The work required shall be performed by a recognized sprinkler Contractor licensed under the State of Tennessee by the Department of Commerce and Insurance, Division of Fire Protection for the design and installation of automatic sprinkler systems. Before installation, submit to the Company in writing, evidence of experience comparable to that required for the installation.

Where details of design, fabrication, and erection are not specified in this or other specifications, the omitted details shall be in accordance with the requirements of NFPA Standards 13, 14, and 15 (latest revision) and their appendices. Approval of materials will be based on the manufacturer's published ratings. All materials shall be listed in the UL "Fire Protection Equipment Directory" or in FM "Approval Guide." Any materials, fixtures, and equipment which are not in accordance with the specification requirements may be rejected. For inside wet pipe sprinkler systems, these components shall be non-galvanized. All materials shall be new. All drains shall be used in non-pressurized drain lines and trim lines only. Bushings shall not be used.

Pipe and Fittings for Screwed Piping

Pipe: To size 8 inch shall be steel, Schedule 40, ASTM A-53, butt weld.

Fittings: To size 6" shall be MI, 150 pound, ASTM A-197, screwed ends, ANSI B16.3 or CI, 125 pound, ASTM A-126, flanged or screwed ends, ANSI B16.3.

Flanges: To 10" shall be MI, 125 pound, ASTM A-47, Group B-1 or ASTM A-126, screwed, ANSI B16.1.

Pipe and Fittings for Shop Welded Mains

Pipe: To 4 inch shall be steel, Schedule 40, ASTM A-53 and 5 inches to 12 inches shall be steel, seamless, ASTM A-234, WPA or WPB, butt-weld ends, ANSI B16.9, schedule to match pipe.

Flanges: To 12 inches shall be 150 pounds, F.S., ASTM A-105 or A-181, Class 60, slip-on welding or welding neck, ANSI B16.5.

Threadolets: To 3 1/2 inches shall be steel, 2000 pounds, ASTM A-105.

Weldolets: 4 inch to 10 inch shall be MI, 150 pounds, ASTM A-197, screwed ends, brass-to-iron seats. Dimensions per manufacturer's standard. (For valve trim and drains only).

Plugs: All sizes shall be CI, square head.

Gaskets: All sizes shall be red rubber sheet, 1/16-inch thick, full face, ASTM D-2000, No. 2AA705A13L14, Sepco Corp. No. 20.

Dope: Shall be Rectroseal No. 5, Rectroseal Corp.; TFE Tape, Sepco Corp.; Key Title, W.K.M. Valve Div., ACF Industries; Tyte Unyte, J. C. Whitlam Mfg. Company.

Bolts and Nuts: Shall be ANSI, heavy-hex or regular square-head steel machine bolts with semifinished heavy-hex steel nuts, ASTM A-307 Grade B.

Sprinkler Head: Shall be UL-listed standard-type heads shall be used unless otherwise specified or required by the Government. Automatic on-off sprinkler heads shall be used over electronic equipment.

Hangers: Shall be installed in accordance with NFPA Standard 13.

Alarm Check Valves: Shall be UL-listed,alarm check valves shall be installed complete with trim including retard chambers and external by-pass. An alarm check valve is required on all wet-pipe sprinkler systems.

Alarm Pressure Switch: Shall have an adjustable range 2-20 psi with differential 3 $\pm$ 2 psi. Proof pressure shall be 300 psi. It shall have two single-pole, double-throw, snap-acting switches. The switch shall be United Electric Control Company, Type J33AX, Model 5355, or approved equal.

Pumper Connection: Shall be 2 1/2-inch by 2 1/2-inch by 4-inch, Siamese standard sprinkler connection (Elkhart Brass Plate 12) complete with plugs and 12-inch diameter metal escutcheon plate with raised or depressed letters indicating this as the point of connection for the sprinkler system from an outside source. Connection will have an automatic ball drip and National Standard fire hose threads.

Water Motor Mechanical Alarms: Shall be UL-listed water motor mechanical alarms.

Valves: For valve specifications, see Appendix 11.

Wafer valves shall not be used.

Service	Size	Valve Number
Gate, Shutoff	1/2" to 2"	V-32 (OS&V)
Gate, Shutoff	2 1/2" to 12"	V-6206 (OS&V)
Globe	1/4" to 2"	V-6036
Swing Check	1/4" to 2"	V-202
Swing Check	2 1/2" to 10"	V-6432

Shop Drawings

Shop drawings shall be to a convenient scale, clearly indicating the essential details including all specialties, concealed spaces and ventilators. In general, the shop drawings shall include a layout of the sprinkler or hose systems, or a combination of both systems, in the designated areas. The fabrication number of all pipelines, locations, test pipe, drain connections, valves, hangers, and other pertinent features shall be shown on the layout. The size, number, type, and temperature ratings of the sprinkler heads shall be shown on each layout.

Automatic sprinkler system and fire protection extinguishing system designs shall be produced on separate drawings and shall never be incorporated in drawings showing other piping systems. The minimum scale shall be 1/4 inch equals 1 feet 0 inch.

Drawings shall be submitted for approval prior to performing any work.

Piping Fabrication and Installation

Shop welded piping may be used for sprinkler piping 4 inches and larger when approved by the Company. Shop welded sections shall be joined by screwed fittings or flanges.

Torch cutting and welding shall not be used as a means of installing, modifying, or repairing sprinkler systems inside buildings.

Sprinkler piping shall be arranged to drain through the main drain valve as much as practical. All trapped sections of pipe, except that supplying a single sprinkler, shall be provided with an auxiliary drain valve complete with nipple and cap or brass plug. Drains shall be piped to the building extension if the trapped capacity is greater than 5 gallons.

Sprinkler protection shall be provided at the top of the stairways and under each stairway.

A gate valve, outside screw-and-yoke type, shall be provided on the supply side of the main sprinkler valve inside the facility. The gate valve shall be provided in addition to the post indicator valve (PIV) located in the feed main outside the building. At X-10 this valve shall have a tamper switch and be located approximately 5 feet above the floor.

Cleaning: Cleaning shall be as specified in Section 5.2.5.4.

Testing and Inspection

Testing of the sprinkler system shall be as prescribed by NFPA Standards 13 and 14. Each test shall be performed in the presence of an authorized representative of the Company. This representative shall sign the certificate of inspection as a witness of a successful test. Deliver these certificates of inspection in duplicate to the Company. The Company shall be notified at least 24 hours in advance of all testing.

All welds are subject to visual inspection. At least 5% of the welds shall be inspected in accordance with ASME B31.3, paragraph 341.4.1(a). Welds made by each welder or welder operator shall be included in those examined. If the examination reveals an unacceptable defect, the requirements of ASME B31.3, paragraph 341.3.4, Progressive Examination, shall apply.

Painting

Paint all fire protection carbon steel, galvanized carbon steel, and black iron pipe, fittings, valves and hangers, indoors and outdoors, and above and below suspended ceiling red.

5.2.5.3.8 Eye Wash and Safety Shower Equipment

Eye wash and safety shower equipment shall be installed in accordance with Company Standards ES-4.11-1, ES-4.11-11, and ES-4.14-6.

5.2.5.4 Cleaning and Sterilization

5.2.5.4.1 For instrument air, provide chemical cleaning of pipes, valves, and fittings prior to erection.

5.2.5.4.2 After installation, piping for Fire Protection Water, Chilled Water, Steam, Condensate, Heating Hot Water, and Sanitary Sewer shall be cleaned and tested by flushing with potable water for five minutes.

5.2.5.4.3 The Potable Water and Fire Protection Water system shall be sterilized by filling the system with a disinfecting solution which contains a minimum of 50 ppm of chlorine by weight of water. The system shall stand for 24 hours. At the end of this time the chlorine content of the water shall not be less than 10 ppm. The system shall then be flushed until the chlorine content is less than 1 ppm. The sterilization shall be performed in the presence of an authorized representative of the Company. The Company will check chlorine content of the water after completion of the sterilization process.

5.2.5.5 Testing and Inspection

Prepare a Testing and Inspection Summary Sheet as a part of the construction package in accordance with Energy Systems' Engineering Procedure EP-E-12.

Include all tests and inspections required for the piping systems as part of the construction activities. Include as a minimum the following:

- pressure test (type, pressure, media)
- leak test (type, media)
- weld examination (visual, x-ray, dye penetrant)
- sterilization test

5.2.5.5.1 Instrument Air system shall be pneumatically tested at 1.5 times the maximum working pressure. All welds are subject to visual inspection.

5.2.5.5.2 Potable Water, Chilled Water Systems, Steam Systems, Condensate Systems, and Heating Water Systems above ground shall be hydrostatically tested at 1.5 times the maximum working pressure. All welds shall be visually inspected and 5% of the welds shall be examined by random radiography by the Company.

5.2.5.5.3 Water test of sanitary sewers shall be made by plugging the line at the downstream manhole and filling to provide a 10-foot head of water on the invert of the pipes at the lower end. Allowable leakage rate shall be as follows:

$$\text{Allowable Leakage (gallons/hr)} = 0.003 \frac{\text{Gal}}{\text{hr-ft-in}} \text{ (pipe length in feet) (pipe diameter in inches)}$$

5.2.5.5.4 Sprinkler piping shall be hydrostatically tested at 200 psi for a minimum of 2 hours.

5.2.5.6 Identification of Piping and Color Code

All piping which is visible or may be exposed by the removal of covers or panels shall be labeled and color coded as follows:

The labels shall be of specified background color upon which shall be printed the name of the flowing medium with specified letter color. The direction of flow in each pipe shall be identified by arrows on a banding tape adjacent to the identification label of the same color as the identification label.

Services listed below require addition of line operating pressure information which will consist of individual numeral labels indicating normal line operating pressure plus a label containing the letters PSIG.

Labels shall conform to ANSI A13.1, Schemes for the Identification of Piping Systems.

Label colors shall be as follows:

Flowing Medium	Background Color	Color of Letters
Potable Water	Green	White
Sanitary Sewer	Green	White
Instrument Air	Blue	White
Fire Protection Water	Red	White

All valves shall be permanently identified with stainless steel tags embossed with the applicable V-numbers. Tags shall not be attached to handwheels or levers or other parts of valves which would interfere with operation.

5.2.6 Fire Protection Systems

The facilities listed below shall have wet pipe sprinkler systems, smoke detection systems, automatic HVAC and VDTS equipment shutdown systems, and fire extinguishers.

(a) K-25, Y-12, X-10, OSTI, and FB Site Central Office areas housing ORF-ICN switch, special circuit, OICC, or other electronic equipment.

(b) Remote module hubs having active electronic equipment.

(c) Facilities housing demarcation equipment which include active electronic equipment.

The following facilities shall have wet pipe sprinkler systems and fire extinguishers:

(a) Office areas

(b) Remote module hubs having no electronic equipment

(c) Facilities housing demarcation equipment including no electronic equipment

(d) Maintenance, shop, storage, and other areas having no active electronic equipment which is a functioning part of the system

(e) Facilities housing backup power generators (generators not installed in buildings or enclosures need only have an adjacent fire extinguisher--no sprinkler protection)

Wiring closets or communication rooms in service buildings at K-25, X-10, Y-12, or in the city of Oak Ridge will require no additional fire protection equipment.

Battery rooms shall have wet pipe sprinkler system protection, one smoke detector connected to the most convenient smoke detector panel, a BC rated fire extinguisher, and construction in accordance with Section 5.2.2.3.14.

Wet pipe sprinkler systems shall be in accordance with Sections 5.2.5.3.7 and 5.2.4.6.

Smoke and heat detection systems shall be in accordance with Sections 5.2.4.5, 5.2.4.6, and NFPA 72-E.

Automatic HVAC and VDTS shutdown systems shall be in accordance with Section 5.2.4.6.

Except for battery rooms, fire extinguishers shall be installed in accordance with Section 5.2.2.3.13.

Fire protection structure and construction for all facilities shall be in accordance with Section 5.2.2.3.13.

HVAC systems shall have duct-type smoke detectors installed in the supply and return HVAC system ducts if the capacity of the system exceeds 2,000 CFM. Installation shall be in accordance with NFPA 90-A.

5.3 Security

5.3.1 Definitions

5.3.1.1 The term "employee," as used in this document, includes any employee of the Contractor and any employee of any subcontractor who will perform any work under this contract on the site. Unless otherwise specified, the term includes all employees, regardless of the position held, including partners and individuals doing business as a firm.

5.3.1.2 The terms "work areas and site" used in this document, means the area(s) in which the work is located. The entire facility (excluding work in the city of Oak Ridge), is managed, operated, and maintained by the Company under its contract with DOE.

5.3.1.3 The term "vehicle," as used in this document, includes any vehicle of the Contractor and any vehicle of any subcontractor which will come on the site under this contract.

5.3.1.4 The term "Construction Manager," refers to the M. K. Ferguson Company, which will provide security access for all construction work on the Oak Ridge site.

5.3.2 Security Areas and Access Requirements

5.3.2.1 All personnel shall be U.S. citizens and shall meet the security access requirements. The DOE facilities have been divided into different security area types. Security clearances and escort requirements for access to each type are shown in Table 2. Security area types with additional requirements are identified below:

5.3.2.1.1 Property Protection Area--Access is administratively controlled and uncleared personnel are permitted unescorted access provided prior arrangements are made.

The entire X-10 area is a Property Protection Area except the following areas which must be treated as Exclusion Security Areas: (1) Building 4500-N, Rooms H-204 and 205, (2) Building 3508, Room 7A and Lab 4, (3) Building 3037, Room 203, and (4) the Communications room in Building 2500.

The fenced area at the eastern end of the Y-12 plant is a Property Protection Area.

5.3.2.1.2 Limited Security Area--L-cleared personnel may or may not be permitted unescorted building access depending on the specific building and/or site.

The FB is a Limited Security Area except for three rooms which shall be treated as Exclusion Security Areas. All other buildings in the city of Oak Ridge are Property Protection Areas.

5.3.2.1.3 Material Access Area--Additional Company authorizations are required for unescorted access into these area. Area specific criticality safety related training will also be required in some areas. Q-cleared personnel must have a photo badge ID.

5.3.2.1.4 Exclusion Security Area and Protected Security Area--Q-cleared personnel must have a photo badge ID. Escorted, uncleared, or L-cleared personnel will only be granted access after the Company's Security Department issues a job-specific security plan.

5.3.2.1.5 Operational Impact Areas--Q-cleared personnel must have a photo badge ID and authorization from the Company's Security Department. Operational Impact Areas are as follows:

K-25 Plant:

K-1007, K-25 Building, K-1420, K-1037, K-1401, K-1004L, K-1200 complex, K-1030, K-1652 Alarm Room, K-1650 EOC, K-1600, and K-1039.

Y-12 Plant:

9212, 9215, 9995, 9996, 9998, 9201-1, 9201-5, 9201-5N, 9202, 9203, 9206, 9204-2, 9204-2E, 9204-4, 9404-10, 9731, 9720-5, 9723-10

X-10 Plant:

HFIR-Building 7900, Guard Headquarters--Building 2500, and Building 3037, Room 203.

5.3.2.1.6 Security areas at Y-12 and K-25 are shown on Plant Area Security maps listed in Appendix 1.

5.3.2.1.7 A summary of clearance and escort requirements follows:

Table 2--Personnel Clearance and Escort Requirements

	Acceptable Clearance and Escort Arrangements					
Security Area Type	1	2	3	4	5	6
Property Protection Area	X	X	X	X	X	X
Limited Security Area	X	X	X	X	X	
Exclusion Security Area	X	X		X		
Protected Security Area	X	X		X		
Material Access Area	X	X				
Operational Impact Area	X	X				

1 - Q-cleared personnel with no escort

2 * - L-cleared personnel with a Q-cleared escort

3 - L-cleared personnel with no escort

4 * - Uncleared personnel with a Q-cleared escort

5 * - Uncleared personnel with an L-cleared escort

6 * - Uncleared personnel with no escort

* Requires prior coordination and approval.

5.3.3 Requirements to Obtain Badges/Passes

In order to have access to the work area, all employees must be badged or otherwise authorized to enter the site in accordance with the requirements of this section.

5.3.3.1 The Contractor shall submit a written request to the Security Office of M. K. Ferguson, Building 9626, Y-12 Plant, for issuances of badges. Badges shall be requested for only those employees actually assigned to the contract work and then only as those employees are scheduled to report to work. Badge requests must be submitted at least 10 working days (Monday through Friday) but not more than 14 working days in advance of necessary entrance. The badge requests shall be submitted on forms provided by M. K. Ferguson. Badge requests shall include the employee's full name, social security number, employer, citizenship status, contract number, project title, access duration requirements by date, and date submitted (no middle name [NMN] in an employee's name on the badging form is acceptable where applicable). When a pass is requested for Q-cleared individuals whose clearance in not currently held by M. K. Ferguson, a written request for extension of clearance, including contract number, is required.

5.3.3.2 During the employee's first day on the job, he or she shall report to M. K. Ferguson's Security Office, between 7:30 and 11:30 a.m. or 1 and 3 p.m., Monday through Friday, holidays excepted, for processing, including pictures for badges.

5.3.3.3 A photo badge will be issued by the Security Office of M. K. Ferguson for those employees authorized to have access to the site. This badge will be coded to reflect the type of DOE security clearance, if any, then held by the employee.

5.3.3.4 If access for an appropriately cleared employee for a short duration (less than 30 calendar days) is required, entry may be afforded by the use of a temporary nonphoto badge. This type of access shall be requested in writing (on forms provided by M. K. Ferguson) 5 working days in advance of desired entrance. Upon arrival at the portal of entrance, the employee must present acceptable identification to the guard who will issue the temporary nonphoto badge to the employee. Upon departing from the site, the nonphoto badge will be returned to the guard at the portal of entrance.

5.3.3.5 If access for a noncleared employee for a one-time visit is required (e.g., material and equipment delivery personnel, consultants, specialty Contractor personnel, testing personnel, etc.), the Contractor shall submit a pass request to M. K. Ferguson (on forms provided by M. K. Ferguson) at least 5 working days in advance of the visit and shall await notification of approval before proceeding with the arrangements for the visit. The employee shall confine the visit to the conditions stipulated.

5.3.3.6 Requirement Deleted.

5.3.3.7 Incorrect or incomplete paperwork will be returned to the Contractor by M. K. Ferguson without being processed.

5.3.3.8 M. K. Ferguson will not set up visits to the site by telephone requests.

5.3.3.9 Requirement Deleted.

5.3.3.10 Badges and passes for advance design personnel will be authorized by the Company. Requests for access should contain the same information as required by M. K. Ferguson. Specific instruction for requesting access will be given after contract award.

5.3.4 Escort Requirements

5.3.4.1 Escorts shall have an active DOE Q-clearance and a site-specific security orientation.

5.3.4.2 Escorts shall be non-working personnel and can not perform any other construction activities.

5.3.4.3 An escort can not escort more than five (5) uncleared personnel within the Y-12, K-25, and X-10 sites and three (3) at the Federal Building. Additional escorts may be required depending on the work location, method of accomplishment, and access to the job site. Uncleared personnel shall remain within sight of an escort when in secured areas.

5.3.4.4 Escorts shall not be used for maintenance and operation activities after cutover.

5.3.4.5 Upon request, the Company will provide a listing of potential sources for escorts. The cost for escorts ($10 - $13 per hour) will be at the expense of the contractor.

5.3.5 Drug/Abuse Program

The Contractor shall abide by the Morrison Knudson Corporation Substance Abuse Prevention Program (furnished upon request).

The Contractor shall adopt this policy and procedure for all on site work under this contract and take actions as necessary to implement the policy and procedure while performing on site work under this contract. Such actions include without limitation, the Contractor ensuring that its employees submit to any testing and searches required by the policy and procedure and notifying M. K. Ferguson in writing of the name of the person in its organization who will perform the functions of the drug coordinator as contemplated by the procedure.

All testing required by the Contractor's implementation of the policy and procedure will be performed by M. K. Ferguson at the facilities of M. K. Ferguson. The Contractor will notify M. K. Ferguson 24 hours in advance of its need for pre-employment testing.

The selection of employees for initial and subsequent periodic testing required by the Contractor's implementation of the policy and procedure will be performed by M. K Ferguson.

The Contractor shall assure that each of its subcontractors performing work on the site adopt and abide by the policy and procedure and all provisions of this clause. All communications by M. K. Ferguson with the Contractor for compliance with the policy and procedure shall be given to the Contractor rather than to any subcontractor.

5.3.6 Requirements to Obtain Clearance for Employees

5.3.6.1 The Contractor shall request in writing the necessary security clearance for each employee. Request on behalf of the following employees will not be deemed appropriate: (1) employees who have a pending request for clearance; (2) employees who have been denied clearance within the last 5 years; (3) employees whose clearance has been revoked within the last 5 years; and (4) employees of the Contractor and all subcontractor employees whose scheduled work inside the Plants is less than 365 calendar days and who are not locally hired or do not maintain a permanent residence in the area of Oak Ridge. The list in the preceding sentence is not all inclusive, and M. K. Ferguson may deem any request on behalf of an employee inappropriate for other reasons not stated herein.

5.3.6.2 DOE will be responsible for the cost and expense of processing completed applications for security clearances.

5.3.6.3 The Contractor shall be required to prepare and submit requests for clearance on the forms provided by M. K. Ferguson. The forms include: one signed original and two signed copies of Office of Personnel Management (OPM) Standard Form 86 (SF-86); two completed Federal Bureau of Investigation (FBI) Fingerprint Cards, Form FD-258; and two signed Security Acknowledgements, Form DOE-15. (The original and all copies must have original signatures.) All forms are to be typewritten. Every applicant for clearance shall, prior to executing any of the above forms, be provided with a copy of the Privacy Act Notice which is furnished with the SF-86.

5.3.6.4 Under normal circumstances, request for Q clearances (Top Secret access) will require 6 to 12 months for processing. However, areas of security concern that exist in the background of an applicant for clearance may result in a longer than normal processing time. Concern is raised where there is information that indicates the applicant has: committed any act of sabotage or treason; established an association with saboteurs, spies, traitors, revolutionists, or agents of foreign nations; advocated or has membership in an organization which, by force of violence, seeks the overflow of the Government of the United States by unconstitutional means or prevents others from exercising their constitutional rights; relatives in communist-controlled countries and is susceptible to pressure as a result; deliberately omitted or falsified significant information; willfully violated security regulations; refused to testify regarding charges relevant to authorization for access to restricted data, national security information, or special nuclear materials; suffered from a mental illness which may cause a significant defect in judgement or reliability; been a user of alcohol habitually to excess without adequate evidence of rehabilitation or reformation; used, trafficked in, sold, transferred, or possessed an illegal drug without adequate evidence of rehabilitation or reformation; and/or engaged in an unusual conduct which tends to show that the individual is not reliable or trustworthy or is subject to any other circumstances which may cause the individual to act contrary to national security.

5.3.6.5 The Contractor shall furnish, with the request for clearance, written documentation showing that the employer of the applicant for clearance has conducted a preliminary background check. Request for clearance that does not include this information will be returned without action. The preliminary background check shall include: the applicant's credit status; verification of high school degree/diploma or degree/diploma granted by an institution of higher learning within the last five (5) years; contacts with listed personal references (listed on the applicant's SF-86); contacts with listed employers for the past three (3) years (excluding employment of less than 60 days duration, part-time employments, and craft/union employments) (listed on the applicant's SF-86); and local law enforcement checks when such checks are not prohibited by state or local law, statute, or regulation and when the applicant had resided in the jurisdiction where the Contractor is located.

5.3.7 Requirements When Security Clearance is Granted

5.3.7.1 The Security Office of M. K. Ferguson will notify the Contractor when an appropriate clearance is granted by DOE to an employee pursuant to a previous request for clearance.

5.3.7.2 The Contractor shall submit a badge request (Form RS101).

5.3.7.3 The Contractor shall schedule an appointment by the employee with the Security Office of M. K. Ferguson so as to permit:

(a) photographing the employee for the issuance of a photo badge appropriately coded to reflect the clearance granted;

(b) completion of an SF-312 (Non-disclosure Agreement);

(c) employee's receipt of a security indoctrination lecture; and

(d) return by the employee of any previously issued badge, including thermoluminescent dosimetries (TLD), and the issuance to the employee of the appropriate photo badge;

(e) This processing should take approximately 2 hours.

5.3.7.4 The Contractor shall immediately notify M. K. Ferguson in writing of any of the following items that may come to its attention regarding a cleared employee: convictions, arrests, charges (including charges that are cismissed), or detentions by Federal, State, or other law enforcement authorities for any violation of any Federal law, State law, county or municipal law, regulation, or ordinance other than traffic violations for which a fine of $100 or less was imposed; hospitalization or treatment for alcoholism, drug abuse, and emotional or mental illness; marriage or remarriage; proposed travel to Soviet bloc countries; or any other situation deemed by the Contractor to have a bearing on the continued clearance status of the employee.

5.3.8 Other Requirements

5.3.8.1 When entrance is required to any areas protected by security fences, the employees shall approach the security inspector/guard at the designated portal/gate and present their badge or appropriate identification to secure a pass to the security inspector/guard for inspection for entry.

5.3.8.2 All badges (photo or nonphoto) shall be worn prominently displayed above the waist on outer clothing at all times while on the site.

5.3.8.3 Photo badges, once delivered to the employee, may be retained by the employee while off the site. The Contractor will return the thermal luminescent dosimeter (TLD) badges of his or her employees at the end of each calendar quarter at which time new TLD badges will be issued.

5.3.8.4 All containers carried by employees will be subject to search prior to gaining access to or departing from the site.

5.3.8.5 Cameras, recording devices, firearms, alcohol or drugs, and all communication devices of any kind will not be allowed on the site unless authorized by the Security Office of M. K. Ferguson and the specific Company site security office.

5.3.8.6 The Contractor shall immediately notify the Security Office of M. K. Ferguson in writing whenever any employee authorized to enter the site either terminates employment or no longer needs access to the site. The Contractor shall also be responsible for obtaining Security Termination Statements (Form DOE-136) and badges from all cleared employees separated from employment. Termination statements and badges, including TLDs, shall be transmitted to the Security Office of M. K. Ferguson.

5.3.8.7 Employees approved for access will have their access authorization automatically terminated when it has been demonstrated there is no longer a need to enter the site. Generally, automatic termination of the access authorization occurs whenever access has not been sought within any 90 day period.

5.3.9 Communications

5.3.9.1 All communications in the administration of these security provisions of the contract will be between the Security Office of M. K. Ferguson and the Contractor. Communications by subcontractors or by those other than the Contractor will not be honored by the Security Office.

5.3.9.2 Requirement Deleted.

5.3.10 Subcontract Requirements

The Contractor shall insert the provisions of this document and the related provisions contained in this contract in all subcontracts under this contract which require work on the site.

5.3.11 Security Fencing for Construction

See Section 5.16, Construction Facilities and Temporary Facilities.

5.3.12 Security Access Planning

5.3.12.1 Include the security access planning information described in this section in the Preliminary and Final Project Plans required by Section 4.4.12.

- the number of L-cleared and Q-cleared personnel needed for activities through cutover and the number needed for operation and maintenance activity after cutover.
- The number of Q-cleared escorts that will be needed for activities through cutover.

5.3.12.2 Final Plan

- A list of names requiring L- and Q-security clearances.
- A list of Contractors and names of their personnel with existing L- and Q-clearances which will be used for this project.

- A list of people who will be used for Q-cleared. Identify their employer and which people have existing clearances.

- A description of how activities through cutover will be performed such that sufficient Q-cleared and L-cleared design, construction, installation, testing, and escort personnel are available.

5.3.13 Vehicular Requirements

5.3.13.1 Access of vehicles to the site shall be limited to vehicles on official Contractor business. The Contractor shall submit to M. K. Ferguson's Security Office a list of the make, model, insurance carrier, and license number/state of each vehicle to be admitted to the site on forms provided by M. K. Ferguson. Each vehicle must prominently display two identification signs (one on each front door). The signs must be weatherproof and may be permanently or magnetically mounted. The lettering shall be at least 2 inches in height and colored to contrast well with the background. The signs must be displayed on the vehicle at all times while on the site. All vehicles entering the site will be subject to search prior to gaining access to or departing from the site. Vehicle passes must be submitted to the Security Office by 12 noon the day prior to required access.

5.3.13.2 A vehicle authorization is required for all vehicles that travel inside the site. This authorization must be renewed on a 90-calendar day basis at least 2 weeks prior to expiration.

5.3.14 Business Radios and Mobile Telephones

5.3.14.1 The Company will allow the Contractor to use business and mobile telephones in the plant areas with the following limitations and restrictions.

(a) Use of Contractor's equipment shall not interfere with existing frequencies in use at the site.

(b) The use of two-way mobile (and portable) radios and mobile telephone equipment is restricted to official business related to the Contractor's work.

(c) No classified information shall be transmitted.

(d) No amateur radio equipment will be used.

(e) Use of any radio and mobile telephone equipment requires advance written approval from the Company. At the preconstruction meeting, the Contractor should submit the request to the Company for the use of radios and mobile telephones. The request should include the following:

- the number of units to be used and their serial numbers,
- the operating frequencies of the units,
- the designated operators, and
- Government installation(s) at which the units will be used.

LIST OF APPENDICES

TECHNICAL SPECIFICATION AND STATEMENT OF WORK FOR THE OAK RIDGE FEDERAL INTEGRATED COMMUNICATIONS NETWORK

Appendix 1 - List of Company References and South Central Bell Drawings for the ORF-ICN Technical Specification

Appendix 2A - Intra-site Telecommunications Service Report (includes existing analog telephones and other circuits)

Appendix 2B - Merlin Systems Database

Appendix 2C - Buildings Owned/Leased

Appendix 2D - Buildings Not Requiring ISDN

Appendix 3 - Acceptable Site Locations for Equipment

Appendix 3A - FB Space Layout

Appendix 4 - Busy Hour Call Requirements

Appendix 5A - Inter-site Circuits

Appendix 5B - National and International Circuits

Appendix 5C - Special Circuits Listing

Appendix 6 - Fiber Optic Cabling Requirements

Appendix 7 - Company Office Requirements

Appendix 8 - Special USOC Summary Listing

Appendix 9 - RIMD Activity for 1993

Appendix 10 - Operator Duties and Responsibilities

Appendix 11 - Valve Specifications

Appendix 12 - Guidelines for Temporary Structures

Appendix 13 - Buildings Wired to the DOE Wiring Standard

APPENDIX 1

LIST OF COMPANY REFERENCES AND SOUTH CENTRAL BELL DRAWINGS FOR THE ORF-ICN TECHNICAL SPECIFICATION

1. SYSTEM DIAGRAMS

Drawing D2E-145866, Rev. D, ORF-ICN Network System Diagram
Drawing D2E-145865, Rev. A, ORF-ICN Connectivity Requirements Diagram
Drawing D2E-145907, Rev. A, ORF-ICN Cable Connection System Diagram
Drawing D2E-146787, Rev. A, ORF-ICN Service Building Wiring Diagram

2. TMS SPECIFICATION

Telecommunications Management System Technical Specification, K/CSD/INF-8822, Martin Marietta Energy Systems, Inc., Oak Ridge K-25 Plant

3. PROCEDURES, STANDARDS, SPECIFICATIONS, AND OTHER DOCUMENTATION

3.1 PROJECT DESIGN CRITERIA, Y/EN-4451

3.2 ENGINEERING STANDARDS

ES-0.1-1	Equipment Identification
ES-0.3-1	Safety Requirements for Movement and Operation of Cranes and High-Profile Mechanical Equipment
ES-0.4-1	Testing Requirements Summary
ES-0.7	Design Analysis and Calculations
ES-1.1-4	Brace and Guy Assemblies
ES-1.1-5	Guy Wire Anchors
ES-1.1-6	Overhead Distribution Conductor Clearances
ES-1.1-7	Conductor Crossing Clearances Separate Structures
ES-1.1-20	Duct Bank Details
ES-1.2-1	Typical Grounding Details
ES-1.2-2	Grounding of Metal Fences and Gates
ES-1.2-6	Special Grounding of Drilling and Cutting Equipment
ES-1.2-10	Grounding and Bonding--Cable Tray System

3.2 ENGINEERING STANDARDS (continued)

ES-1.3-1	Illumination Intensities
ES-1.3-2	Lighting Fixture Support Details
ES-1.6-1	Through-Penetration Firestop Systems - Electrical
ES-1.6-2	Electrical Receptacles
ES-1.6-3	125 Volt Receptacle-Neutral and Ground Wiring
ES-1.7-2	Electrical System Identification Scheme
ES-1.8-1	Auxiliary Fire Loop Diagram (Y-12 Only)
ES-1.8-19	Building Evacuation and Alarm Circuit (Applies to K-25 Only)
ES-1.8-20	Typical Automatic Fire Alarm Circuit (Applies to K-25 Only)
ES-1.11-1	Electrical Test Report
ES-2.9-1	Electromagnetic Interference/Compatibility Definition
ES-4.5-2	Pipe Hangers--General Notes
ES-4.5-3	Pipe Support Spacing
ES-4.5-6	Thrust Block For C.I. Water Pipe
ES-4.11-1	Safety Shower
ES-4.11-6	Pipe and Electrical Conduit Penetrations of Fire Zone Floors and Partitions
ES-4.11-11	Eye Wash Fountain
ES-4.11-14	Combination Emergency Shower/Eye Face Wash
ES-4.14-6	Potable Water Service Connection
ES-4.14-11	Typical Water Line Branch Connection
ES-4.17-3	Water Closet Installation (Floor Mounted)
ES-4.17-5	Service Sink Installation
ES-4.17-7	Lavatory Installation
ES-4.17-8	Urinal Installation
ES-4.17-9	Water Cooler Installation

3.2 ENGINEERING STANDARDS (continued)

ES-4.17-14	Water Closet Installation (Wall Hung)
ES-4.18-1	Gauge Connection
ES-4.18-2	Backflow Preventer Installation
ES-5.11-1	Instrument Test Ports--Rectangular Duct
ES-5.11-5	Instrument Test Ports--Round Duct--With or Without External Insulation
ES-6.6-13	CADAM Drawing Structure

3.3 ENGINEERING TECHNICAL SPECIFICATIONS

01160	Confined Space Entry and Work
01170	Carcinogen Control
01190	Lockout/Tagout
04000	Masonry-General
04100	Mortar
04150	Masonry Accessories
04210	Brick Unit Masonry
04220	Concrete Block Unit Masonry
15050	Pipe Systems
15051	Pipe Welding
15052	Pipe Brazing
15060	Basic Pipe and Tube Materials
15061	Basic Pipe and Tube Fittings
15063	Basic Gaskets, Lubricant, Packing, and Dope
15064	Basic Fasteners
15065	Unions, Plugs, and Caps
15066	Miscellaneous Pipe Accessories
15071	Underground Protective Coating For Steel Pipe

3.3 ENGINEERING TECHNICAL SPECIFICATIONS (continued)

15072	Cleaning and Sterilization
15073	Pressure/Leak Testing
15074	Identification and Color Codes
15101	Steam and Condensate
15103	Above Ground Potable Water
15104A	Fire Protection (Wet and Dry Sprinkler Systems)
15105	Underground Potable Water
15106	Cooling Water
15109	Sanitary and Storm Drains Within Buildings
15136	Dry, Oil Free, Compressed Air
15145	Degreasing Fluids
15260	Piping Insulation
15261	Calcium Silicate Insulation
15262	Fibrous Glass Insulation
15263	Cellular Glass Insulation
15270	Aluminum Jacketing
15293	Thermal Insulation for Ductwork--Fibrous Glass Blanket with Aluminum Facing
15294	Thermal Insulation for Ductwork--Fibrous Glass Panels with Applied Surface Finish
15501	Environmental Control System Installation and Equipment
15891	Ductwork--Galvanized Steel--Low Velocity and Low Pressure
15951	Controls--Control System
16050	Basic Materials and Methods
16111	Conduit
16117	Manholes

3.3 ENGINEERING TECHNICAL SPECIFICATIONS (continued)

16118	Underground Conduit Duct Bank
16120	Building Wire and Cable - 600 V and Below
16121	Medium-Voltage Cable - 5-kV Insulated
16122	Medium-Voltage Cable - 15-kV Insulated
16123	Splices and Terminations - 600 V and Below
16124	Splices and Terminations - Medium-Voltage Cables
16130	Boxes, Conduit Fittings, and Covers
16141	Wiring Devices
16180	Electrical Construction - Miscellaneous Equipment
16190	Supporting Devices
16195	Electrical Identification
16352	Medium-Voltage Switchgear
16370	Overhead Power Distribution
16426	Low-Voltage Metal-Clad Switchgear
16440	Disconnect Switches
16450	Secondary Grounding
16461	Dry Type Transformers (75 kVA to 500 kVA)
16462	Dry Type Transformers (600 kVA to 5000 kVA)
16465	Electrical Busway System
16470	Panelboards
16476	Enclosed Circuit Breakers
16480	Motor Control
16481	Motor Control Centers
16482	Motor-Operated Equipment
16485	Contactors

3.3 ENGINEERING TECHNICAL SPECIFICATIONS (continued)

16495	Transfer Switch
16511	Commercial Fluorescent Luminaires
16512	Troffer-Type Fluorescent Luminaires
16513	Industrial Open-Type Fluorescent Luminaires
16518	Exit Lighting Equipment with Emergency Supply
16519	Exit Lighting Equipment
16530	Site Lighting
16535	Emergency Lighting Equipment
16611	Static Uninterruptible Power Supply
16622	Packaged Engine Generator Systems
16950	Electrical Testing
DS-EE-6359-1	Voice Drop Cable
DS-EE-6359-2	Data Drop Cable

3.4 ENGINEERING PROCEDURES

EP-C-22	Equipment Specifications
EP-C-23	Equipment Data Sheets
EP-C-27	Architect-Engineer Design Services
EP-D-06	Excavation/Penetration Permits
EP-D-21	Waste Handling for Construction Projects
EP-E-12	Construction Project Requirements Summaries

3.5 OTHER DOCUMENTS

Company Policy for Drug Testing of Construction Workers at the Oak Ridge Sites

Y-12 Plant Area Security Map

K-25 Plant Area Security Map

DOE/EH-0256T Radiological Control Manual

4. COMPANY DRAWINGS

PIDAS Fence Drawings

C2E135702 through C2E135719, C2E135722 through C2E135725, and C2E135728

Inter-site Fiber Optic Cable Routing Plan

E6E-400003A001

Civil and Architectural Drawings

Plant	Site No.	Building Number	Drawing Number	Rev.	Drawing Title*
Y-12			C2E900003A001	0	Building Location & Access Plan
Y-12	Y-1	9702-1	C2E970201A001	0	Site Y-1, Central Office, Site Plan
Y-12	Y-1	9702-1	C2E970201A002	0	Site Y-1, Central Office, Site Topography Sht. 1 of 2
Y-12	Y-1	9702-1	C2E970201A003	0	Site Y-1, Central Office, Site Topography Sht. 2 of 2
Y-12	Y-2	9702-2	C2E970202A001	0	Site Y-2, Remote Equipment Building, Site Plan
Y-12	Y-2	9702-2	C2E970202A002	0	Site Y-2, Remote Equipment Building, Site Topography
Y-12	Y-3	9702-3	C2E970203A001	0	Site Y-3, Remote Equipment Building, Site Plan
Y-12	Y-3	9702-3	C2E970203A002	0	Site Y-3, Remote Equipment Building, Site Topography
Y-12	Y-4	9702-4	C2E970204A001	0	Site Y-4, Remote Equipment Building, Site Plan
Y-12	Y-4	9702-4	C2E970204A002	0	Site Y-4, Remote Equipment Building, Site Topography
K-25			C1E700003A001	0	Bldg. Location & Access Plan
K-25	K-1	K-1039-1	C1E710391A001	0	Site K-1, Central Office, Site Plan
K-25	K-1	K-1039-1	C1E710391A002	0	Site K-1, Central Office, Site Topography
K-25	K-2	K-1039-2	C1E710392A001	0	Site K-2, Remote Equipment Building, Site Plan
K-25	K-2	K-1039-2	C1E710392A002	0	Site K-2, Remote Equipment Building, Site Topography
K-25	K-3	K-1007	A1E710070A001	0	Site K-3, Remote Equip. Room Plan-Room, at Column J2
K-25	K-4	K-1401	A1E714010A001	0	Site K-4, Remote Equipment Room, Plan-Room, at Column F/17
X-10			C3E020003A001	0	Bldg. Location & Access Plan
X-10	X-1	4500N	A3E020629B181	0	Site X-1, Central Office, Plan--Basement, Rooms 13, 13a, & 14

Plant	Site No.	Building Number	Drawing Number	Rev.	Drawing Title*
X-10	X-2	1505	A3E021249B003	0	Site X-2, Remote Equipment Room, Plan--Room 117
X-10	X-3	6000	A3E020683B172	0	Site X-3, Remote Equipment Room, Plan--Room at Column H/10
X-10	X-4	7603	A3E021169B028	0	Site X-4, Remote Equipment Room, Plan--Room 255
X-10	X-5	7917	A3E021304B006	0	Site X-5, Remote Equipment Room, Plan--Tel. Comm. Room
TWN			C6E400003A001	0	Bldg. Location & Access Plan
TWN	T-1	FB	A6E400100A001	0	Site T-1, Central Office, Plan--Basement, Room B-109
TWN	T-20		C6F400003A002	0	Site T-20, Interplant Cable Routes--Plan

* First line--all drawings: ORF INTEGRATED COMMUNICATIONS NETWORK

Underground Sanitary Sewer Block Plan Drawing

Y-12 Plant: E-CV-26147

HVAC Master Plans

EEC-1007 A through C
EEC-1401 A through H, J, and K
H3D20629 G094
H3E20629 G095 through G103
H3E21249 G006 through G009
H3E20683 G044 through G053
H3E21163 G005 through G014

H1E1007D
H1E1007E
H1C1007F
H1C1007G
H1C1007H

Piping Drawings

Y-12 Central Office Building

ECV25858 Potable Water and Fire Protection Water-Block Plan

Remote 9723-27

ECV-25850 Potable Water and Fire Protection Water-Block Plan
ECV-25851 Potable Water and Fire Protection Water-Block Plan

Remote 9731

ECV-25858 Potable Water and Fire Protection Water-Block Plan

Remote 9201-5

ECV-25866 Potable Water and Fire Protection Water-Block Plan

Y-12 Central Office Building

P2E112207		Instrument Air
P2E114211	P1	Steam
P2E114213	P3	Steam
P2E114214	P4	Steam
P2E114215	P5	Steam
P2E110778		Chilled Water
P2E110779		Chilled Water
P2E110780		Chilled Water

K25

Central Office K-1039-1

C1E18123 Fire Protection Water
C1E18124 Fire Protection Water

K-1039-2

C1E18123 Fire Protection Water

K-1007

C1E18123 Fire Protection Water

K-1401

C1E18103 Fire Protection Water
C1E18113 Fire Protection Water

K-1039-1

S-AWT-18719 Steam and Condensate
S-AWT-18718 Steam and Condensate

X-10/ORNL

1505

P3E21249-C901 Fire Protection
P3E21249-C902 Fire Protection

4500N

P20629YC905 Fire Protection

7603

P3D13403C910 Fire Protection

6000

P20683YC902 Fire Protection
P20683YC900 Fire Protection

Plant Alarm and Public Address System Drawings

E1E-700003A001
E2E-900003A001
E3E-020003A001
E6E-400003A002

Underground Telephone Conduit Drawings (Crouch & Adams)

Y-12 Plant:	K-25:	ORNL:
E2E105770	E1E45750CA	E3D-20003-D063
E2E105771	E1E45750CB	E3D-20003-D064
E2E105772	E1E45750CC	E3D-20003-D065
E2E105773	E1E45750CD	E3D-20003-D066
E2E105774	E1E45750CE	E3D-20003-D067
E2E105775	E1E45750CF	E3D-20003-D068
E2E105776	E1E45750CG	E3D-20003-D069
E2E105777	E1E45750CH	E3D-20003-D070
E2E105778	E1E45750CJ	E3D-20003-D071
E2E105779	E1E45750CK	E3D-20003-D072
E2E105780	E1E45750CL	E3D-20003-D073
E2E105781	E1E45750CM	E3D-20003-D074
E2E105782	E1E45750CN	E3D-20003-D075
E2E105783	E1E45750CP	E3D-20003-D076
E2E105784	E1E45750CQ	E3D-20003-D077
E2E105785	E1E45750CR	E3D-20003-D078

E2E105786
E2E105787
E2E105788

E1E45750CS
S-AWT-1900CS
S-AWT-19002
S-AWT-19003
S-AWT-19004
S-AWT-19005
S-AWT-19006
S-AWT-19007
S-AWT-19008
S-AWT-19009
S-AWT-19010
S-AWT-19011
S-AWT-19012
S-AWT-19013
S-AWT-19014
S-AWT-19016
S-AWT-19017
S-AWT-19018
S-AWT-19019
S-AWT-19021
S-AWT-19022
S-AWT-19023
S-AWT-19024
S-AWT-19025

E3D-20003-D079
E3D-20003-D080
E3D-20003-D081
E3D-20003-D082
E3D-20003-D083
E3D-20003-D084
E3D-20003-D085
E3D-20003-D086
E3D-20003-D087
E3D-20003-D088
E3D-20003-D089
E3D-20003-D090
E3D-20003-D091
E3D-20003-D092
E3D-20003-D093
E3D-20003-D094
E3D-20003-D095
E3D-20003-D096
E3D-20003-D097
E3D-20003-D098

K-25 Electrical Underground Block Plans

C1E-18800
C1E-18800S1
C1E-18800S2
C1E-18801
C1E-18801-1
C1E-18801A
C1E-18801B
C1E-18802
C1E-18803
C1E-18806
C1E-18806-1
C1E-18806A
C1E-18807
C1E-18807-1
C1E-18808
C1E-18809

C1E-18811A
C1E-18811
C1E-18812
C1E-18812-1
C1E-18813
C1E-18814
C1E-18816
C1E-18817
C1E-18818
C1E-18819
C1E-18821
C1E-18822
C1E-18823
C1E-18824
C1E-18828

ORNL SSB Distribution Cable Drawings

E3D-20003-D020
E3D-20003-D021
E3D-20003-D022
E3D-20003-D023

E3D-20003-D043
E3D-20003-D044
E3D-20003-D045
E3D-20003-D046

E3D-20003-D024
E3D-20003-D025
E3D-20003-D026
E3D-20003-D027
E3D-20003-D028
E3D-20003-D029
E3D-20003-D030
E3D-20003-D031
E3D-20003-D032
E3D-20003-D033
E3D-20003-D034
E3D-20003-D035
E3D-20003-D036
E3D-20003-D037
E3D-20003-D038
E3D-20003-D039
E3D-20003-D040
E3D-20003-D041
E3D-20003-D042
E3D-20003-D047
E3D-20003-D048
E3D-20003-D049
E3D-20003-D050
E3D-20003-D051
E3D-20003-D052
E3D-20003-D053
E3D-20003-D054
E3D-20003-D055
E3D-20003-D056
E3D-20003-D057
E3D-20003-D058
E3D-20003-D059
E3D-20003-D060
E3D-20003-D061
E3D-20003-D062

ORNL 13.8 & 2.4KV Pole Plans

E3E-20002-D400
E3D-20002-D401
E3D-20002-D402
E3D-20002-D403
E3D-20002-D404
E3D-20002-D405
E3D-20002-D406
E3D-20002-D407
E3D-20002-D408
E3D-20002-D409
E3D-20002-D410
E3D-20002-D411
E3D-20002-D412
E3D-20002-D413
E3E-20002-D414
E3E-20002-D415
E3E-20002-D416
E3E-20002-D417
E3D-20002-D418
E3D-20002-D419

Telephone Manhole Photo Drawings

X-10:

E3E020003D160
E3E020003D161
E3E020003D162
E3E020003D163
E3E020003D164
E3E020003D165
E3E020003D166
E3E020003D167
E3E020003D168
E3E020003D169
E3E020003D170
E3E020003D171
E3E020003D172

Y-12:

E2E900003A002
E2E900003A003
E2E900003A004
E2E900003A005
E2E900003A006
E2E900003A007
E2E900003A008
E2E900003A009
E2E900003A010
E2E900003A011
E2E900003A012
E2E900003A013
E2E900003A014

K-25:

E1E700003A002
E1E700003A003
E1E700003A004
E1E700003A005
E1E700003A006
E1E700003A007
E1E700003A008
E1E700003A009
E1E700003A010
E1E700003A011
E1E700003A012
E1E700003A013
E1E700003A014

E3E020003D173
E3E020003D174
E3E020003D175
E3E020003D176
E3E020003D178
E3E020003D179
E3E020003D180
E3E020003D181
E3E020003D182
E3E020003D183
E3E020003D184
E3E020003D185
E3E020003D186
E3E020003D187
E3E020003D188
E3E020003D189
E3E020003D190
E3E020003D191

E2E900003A015
E2E900003A016
E2E900003A017
E2E900003A018
E2E900003A019
E2E900003A020
E2E900003A021
E2E900003A022
E2E90C003A023
E2E900003A024
E2E900003A025
E2E900003A026
E2E900003A027
E2E900003A028
E2E900003A029
E2E900003A030
E2E900003A031
E2E900003A032
E2E900003A033
E2E900003A034
E2E900003A035
E2E900003A036
E2E900003A037

E1E700003A015
E1E700003A016
E1E700003A017
E1E700003A018
E1E700003A019
E1E700003A020
E1E700003A021
E1E700003A023
E1E700003A024
E1E700003A025
E1E700003A026
E1E700003A027
E1E700003A028
E1E700003A029
E1E700003A030
E1E700003A031
E1E700003A032
E1E700003A033
E1E700003A034
E1E700003A035
E1E700003A036
E1E700003A037
E1E700003A038

5. SOUTH CENTRAL BELL PLAT DRAWINGS

Blk. or Building Plat No.

2
4
5
7 through 13
13A
14 through 17
19 through 25
33 through 65
71

UG Plat No.

16
49 through 53
53A
54 through 69
69A
70 through 98
106 through 107

Area Plat No.

105
107SE
107SW
107NE
107NW
113
115
117
117/0423
125/0431
201
211
213
215
315
317
401
411
413
417
517
517/1123
525/1131
533
541/1147
613
615
735
813
815
933
935
1133
1135
1137
1139
1325/1931
1333/1939
1335
1337
1339
1341/1947
2125/2731
2135
2137
2139
2141/2747
2149/2755
2333
2337

Area Plat No. (continued)

2339
2531
2533
2535
2537
2539
2729
2731
2733
2735
2737
2739
2741
2929
2931
2933
2935
2939
2941
3131
3133
3139
3141

South Central Bell Conduit/Manhole Drawings

Sheet No.

21
31 through 46

APPENDIX 2A

INTRODUCTION
EXPLANATION OF COLUMN HEADINGS AND OTHER INFORMATION ON INTRA-SITE TELECOMMUNICATIONS SERVICE REPORT

Total Stations - Identifies the total of 1) quantities of ESSX main telephone stations by building (a main station is defined as an ESSX station which has a unique telephone number); and 2) quantities of ESSX extension telephone stations by building (an extension telephone is defined as an ESSX telephone station connected to the same telephone line and having the same telephone number as an asscciated main station).

Intra Building Circuits - a 2 pair circuit in which both ends of the circuit terminate within the same building. Circuits are used for analog, digital, or audio transmission.

Intra-site Analog Circuits - Identifies the quantity of 2 pair analog circuits that originate from the building. The second point of termination is located within the same plant, different building.

Intra-site Digital Circuits - Identifies the quantity of 2 pair digital circuits that originate from the building. The second point of termination is located within the same plant, different building. These circuits are contact closure type operations.

Intra-site Audio Circuits - Identifies the quantity of 1 pair audio circuits that originate from the building. The second point of termination is located within the same plant, different building.

NOTE 1: The Codes K, X, Y, and T refer to the following:

- K - Buildings located at K-25
- X - Buildings located at X-10
- Y - Buildings located at Y-12
- T - Townsite buildings in Oak Ridge

After cutover, demarcation with South Central Bell will be within the building on all Townsite buildings.

NOTE 2: The special circuits listed in Appendix 5C are included in the totals of the appropriate columns (Analog Circuits, Digital Circuits, and Audio Circuits). Appendix 5C is a listing of South Central Bell installed circuits. Appendix 2A includes some other similar circuits which are MMES installed. This Appendix does not include Standard Wiring Plan circuits or stand alone local area network MMES installed private wiring.

NOTE 3: The total number of data circuits out of the building can be determined by adding: 1) the analog circuits, 2) digital circuits, 3) audio circuits, 4) adding the intersite and townsite to townsite circuits listed for the building in Appendix 5A, Parts I and II, and 5) the National and International circuits listed in Appendix 5B.

NOTE 4: The number of telephone sets in a building can be determined by subtracting the "Merlin Sets" column from the "Total Stations" column in Appendix 2A. An example is shown below:

Building K-1001	Main Stations plus Extensions (total telephone sets)	416
	Merlin Sets	-140
		276

NOTE 5: Standard Wiring Plan Circuits have been eliminated from this report.

K-25 INTRA-SITE TELECOMMUNICATIONS SERVICE REPORT

NOTE: On the K-25 Site Building Directory Map, the "K" prefix is not used on the following process buildings: K-25U, K-27, K-29, K-31, and K-33.

BUILDING	Total Stations	Intra Bldg Circuits	Analog Circuits	Digital Circuits	Audio Circuits	Merlin Sets
K-1000	9	5	3	0	0	0
K-1001*	416	363	6	0	0	140
*K-1001A,B,C,D						
K-1002	39	4	16	0	0	0
K-1003	39	1	7	0	0	0
K-1004A	31	0	3	0	0	0
K-1004B	38	0	0	0	0	0
K-1004C	40	0	1	0	0	0
K-1004D	78	0	10	0	0	0
K-1004E	1	0	0	0	0	0
K-1004J	26	0	13	0	0	0
K-1004L	58	0	30	0	0	0
K-1004R	3	0	2	0	0	0
K-1004T	6	0	0	0	0	0
K-1005	21	0	0	0	0	0
K-1006	70	0	1	0	0	0
K-1007	382	431	36	2	0	58
K-1008E/F	4	0	0	0	0	0
K-1008C	13	0	1	0	0	0
K-1008D	8	0	3	0	0	0
K-1008E/F	20	0	3	0	0	0
K-101	2	0	0	0	0	0
K-1010	2	0	0	0	0	0
K-1015	3	0	2	0	0	0
K-1020	58	11	0	0	0	0
K-1021	2	0	2	0	0	0
K-1023	17	0	5	0	0	0
K-1024	86	1	1	0	0	55
K-1024	2	0	1	0	0	0
K-1025A/E	3	0	0	0	0	0
K-1028-45 (PORTAL 4)	4	0	1	0	0	0
K-1028-47 (PORTAL 5)	3	0	0	0	0	0
K-1028-49 (PORTAL 10)	2	0	0	0	0	0
K-1028-50 (PORTAL 6)	1	0	0	0	0	0
K-1028-56 (PORTAL 8)	2	0	0	0	0	0

K-25 INTRA-SITE TELECOMMUNICATIONS SERVICE REPORT

BUILDING	Total Stations	Intra Bldg Circuits	Analog Circuits	Digital Circuits	Audio Circuits	Merlin Sets
K-1028-57 (PORTAL 2)	2	0	0	0	0	0
K-1028-65 (PORTAL 3)	3	0	0	0	0	0
K-1030	54	0	2	0	0	0
K-1034A	7	0	2	0	0	0
K-1035	94	0	45	0	0	0
K-1036	49	25	11	1	0	0
K-1037	200	107	12	0	1	0
K-1039	40	5	45	0	1	0
K-1045	2	0	1	0	0	0
K-1052	12	1	1	0	0	0
K-1059	1	0	0	0	0	0
K-1065C*	5	0	0	0	0	0
*K-1065-C is not listed on site map. Building is near Portal 8, west of K-33						
K-1095	5	0	1	0	0	0
K-1098D	10	0	0	0	0	0
K-1098E	1	0	0	0	0	0
K-1098F	1	0	0	0	0	0
K-1101	23	0	0	0	0	6
K-1131	1	0	0	0	0	0
K-1200	157	27	19	0	2	23
K-1203	1	0	0	0	0	0
K-1208	0	0	1	0	0	0
K-1209	0	0	2	0	0	0
K-1210	28	2	1	0	0	0
K-1210A	2	0	0	0	0	0
K-1216	1	0	0	0	0	0
K-1220	40	0	10	0	0	0
K-1225	93	37	1	0	0	0
K-1232	1	0	0	0	0	0
K-1301	2	0	0	0	0	0
K-1303	1	0	0	0	0	0
K-1310A	13	0	0	0	0	0
K-1310B	14	0	0	0	0	0
K-1310C	7	0	0	0	0	0
K-1310D	10	0	4	0	0	0
K-1310E	8	0	0	0	0	0
K-1310F	9	0	0	0	0	0
K-1310G	1	0	0	0	0	0
K-1310H	9	0	0	0	0	0
K-1310J	15	0	1	0	0	0

K-25 INTRA-SITE TELECOMMUNICATIONS SERVICE REPORT

BUILDING	Total Stations	Intra Bldg Circuits	Analog Circuits	Digital Circuits	Audio Circuits	Merlin Sets
K-1310K	12	0	0	0	0	0
K-1310L	9	0	0	0	0	0
K-1310M	9	0	0	0	0	0
K-1310N	5	0	0	0	0	0
K-1310P	9	0	0	0	0	0
K-1310Q	12	0	0	0	0	6
K-1310R	10	0	1	0	0	0
K-1310AA	5	0	3	0	0	0
K-1310AB	4	0	2	0	0	0
K-1310AC	6	0	3	0	0	0
K-1310AD	4	0	0	0	0	0
K-1310AE	2	0	0	0	0	0
K-1310AF	4	0	0	0	0	0
K-1310AG	1	0	0	0	0	0
K-1310AH	2	0	0	0	0	0
K-1310AI	4	0	0	0	0	0
K-1310AJ	3	0	0	0	0	0
K-1310AK	3	0	0	0	0	0
K-1310AL	2	0	0	0	0	0
K-1310AM	3	0	2	0	0	0
K-1310AN	1	0	3	0	0	0
K-1310AQ	2	0	2	0	0	0
K-1310AR	4	0	0	0	0	0
K-1320	90	37	4	0	0	37
K-1330	72	0	1	1	0	55
K-1400	48	0	2	0	0	16
K-1401	193	29	63	0	0	16
K-1407	0	0	2	0	0	0
K-1407K	1	0	0	0	0	0
K-1413	4	0	0	0	0	0
K-1414	9	0	3	0	0	0
K-1417	5	0	0	0	0	0
K-1419	6	0	0	0	0	0
K-1420	17	0	4	0	0	1
K-1423A,B,C	24	14	2	0	0	0
K-1425	3	0	0	0	0	0
K-1430	5	0	3	0	0	0
K-1435*	85	25	24			
*Eight Buildings in K-1435 area						
K-1501	3	0	2	0	0	0
K-1501H	3	0	0	0	0	0
K-1501Q	1	0	0	0	0	0

K-25 INTRA-SITE TELECOMMUNICATIONS SERVICE REPORT

BUILDING	Total Stations	Intra Bldg Circuits	Analog Circuits	Digital Circuits	Audio Circuits	Merlin Sets
K-1515	2	0	4	0	0	0
K-1546C*	7	0	6	0	0	5
*Trailer behind K-1001 (D Wing)						
K-1550A	4	0	0	0	0	0
K-1550B	6	0	4	0	0	0
K-1550C	7	0	3	0	0	0
K-1550D	0	0	7	0	0	0
K-1550E	7	0	2	0	0	0
K-1550F	10	0	8	0	0	0
K-1550G	3	0	3	0	0	0
K-1550H	5	0	2	0	0	0
K-1550I	8	0	2	0	0	0
K-1550J	9	0	1	0	0	0
K-1550K	10	0	0	0	0	0
K-1550L	13	0	0	0	0	0
K-1550T	12	0	7	0	0	0
K-1550U	13	0	4	0	0	0
K-1550V	8	0	0	0	0	0
K-1550W	10	0	8	0	0	0
K-1580	135	105	0	0	0	9
K-1600	33	0	19	0	0	0
K-1650	108	2	4	0	4	1
K-1652	72	2	17	0	10	0
K-1654B	11	0	0	0	0	4
K-1654D	14	0	0	0	0	8
K-1654-H	1	0	0	0	0	1
K-1654K	7	0	0	0	0	7
K-1654L	10	0	0	0	0	9
K-1654M	3	0	0	0	0	2
K-25	80	1	4	0	0	0
K-25 CU**	9	0	0	0	0	0
**Townsite map under T-Raleigh - B14						
K-303-1	1	0	0	0	0	0
K-303-4	2	0	0	0	0	0
K-303-5	1	0	0	0	0	0
K-303-6	17	0	0	0	0	0
K-303-7	65	0	1	0	0	0
K-303-8	78	0	1	0	0	0
K-304-1	5	0	6	0	0	0
K-304-2	5	0	2	0	0	0
K-304-4	0	0	1	0	0	0

K-25 INTRA-SITE TELECOMMUNICATIONS SERVICE REPORT

BUILDING	Total Stations	Intra Bldg Circuits	Analog Circuits	Digital Circuits	Audio Circuits	Merlin Sets
K-304-5	5	0	0	0	0	0
K-305-4	1	0	0	0	0	0
K-310-2	1	0	0	0	0	0
K-312-1	2	0	1	0	0	0
K-502-1	2	0	0	0	0	0
K-601	46	2	2	0	0	18
K-602-1	4	0	0	0	0	0
K-631	4	0	0	0	0	0
K-702	2	0	0	0	0	0
K-704	1	0	0	0	0	0
K-708-E	1	0	0	0	0	0
K-711	1	0	0	0	0	0
K-722	5	0	3	0	0	0
K-731	8	0	3	0	0	0
K-761	9	6	4	0	0	0
K-791	1	0	0	0	0	0
K-791-S	2	0	0	0	0	0
K-814	0	0	0	0	3	0
K-892	2	0	3	0	0	0
K-892-Y	1	0	0	0	0	0
K-901	1	0	0	0	0	0
K-902-1	39	0	6	0	0	0
K-902-8	2	0	0	0	0	0
K-25 TOTALS	4,027	1,243	570	4	21	477

TOWNSITE INTRA-SITE TELECOMMUNICATIONS SERVICE REPORT

NOTE: Townsite Analog, Digital, and Audio Intra-Site Circuits have been listed separately in Appendix 5A, Part II.

BUILDING	Total Stations	Intra Bldg Circuits	Analog Circuits	Digital Circuits	Audio Circuits	Merlin Sets
907	15	0	0	0	0	14
1009COM*	118	0	0	0	0	37
*Map Location E15 119						
100 O.R.TURNPK	2	0	0	0	0	0
1201 O.R.TURNPK	141	0	0	0	0	8
475 O.R.TURNPK	3	0	0	0	0	0
800 O.R.TURNPK*	274	24	0	0	0	22
*Jackson Plaza, Map location 31, D-16						
983 O.R.TURNPK	4	0	0	0	0	0
1946 O.R.TURNPK	1	0	0	0	0	0
1956 O.R.TURNPK	4	0	0	0	0	0
1978 O.R.TURNPK	1	0	0	0	0	0
101MIDWAY#	21	0	0	0	0	0
#Map Location D-15						
105BROADWAY	70	0	0	0	0	0
62MITCHELL	17	0	0	0	0	0
105MITCHELL	303	1	0	0	0	39
118MITCHELL	15	0	0	0	0	0
130MITCHELL	24	0	0	0	0	0
161MITCHELL	27	0	0	0	0	8
173MITCHELL	1	0	0	0	0	1
1093CommercePk**	1	0	0	0	0	0
1099CommercePk**	370	0	0	0	0	13
**Map Location E-15						
116 E DIVISION***	2	0	0	0	0	0
***Map Location C-15						
185 LAFAYETTE Ave	19	0	0	0	0	18
1916-T1	458	3	0	0	0	0
1916-TC	186	0	0	0	0	8
2714-01	9	0	0	0	0	0
2714-02	9	0	0	0	0	0
2714-03****	3	0	0	0	0	0
****Map Location 28, C-16						
2714-F	112	0	0	0	0	0
2714-G	43	0	0	0	0	0
2714-H	37	0	0	0	0	0
2714-J	50	0	0	0	0	0
2715	16	0	0	0	0	0
2715-T	16	0	0	0	0	0
393WARE	10	0	0	0	0	0
3 MAIN ST##	2	0	0	0	0	0
##Map Location C-14						

TOWNSITE INTRA-SITE TELECOMMUNICATIONS SERVICE REPORT

BUILDING	Total Stations	Intra Bldg Circuits	Analog Circuits	Digital Circuits	Audio Circuits	Merlin Sets
55JEFFERSON***	356	0	0	0	0	44
***Map Location 3, B-13						
601SCAR	112	0	0	0	0	0
677 EMORY VALLEY	2	0	0	0	0	0
701SCAR	330	0	0	0	0	210
702SIA*	40	0	0	0	0	32
*Map Location 39, D-14						
78MITCH	58	0	0	0	0	34
TRI-CO	246	1	0	0	0	40
900 TriCountyBlvd	195	0	0	0	0	118
97BMID**	6	0	0	0	0	0
**Map Location D-15						
ADMIN	57	0	0	0	0	10
ATDL	76	0	0	0	0	0
AVISCO###	4	0	0	0	0	0
###OLD BETHEL VALLEY ROAD						
BADGER	0	40	0	0	0	0
CHARLOT	135	1	0	0	0	33
CHEYENN	118	0	0	0	0	0
CIV-SER	44	0	0	0	0	0
CLARK4	1	0	0	0	0	0
COMERCE	34	0	0	0	0	0
DNTNCON	68	31	0	0	0	8
***Map Location C14 #15						
E-DIVSV	1	0	0	0	0	0
E-VANCE	20	1	0	0	0	0
ENERGY	176	0	0	0	0	15
FEDC	123	0	0	0	0	0
FEDERAL	988	58	0	0	0	120
FOUROAK	2	0	0	0	0	0
GARDEN	2	0	0	0	0	0
HOLIDAY	3	0	0	0	0	0
MARMSET	1	2	0	0	0	0
MAXIMA	36	1	0	0	0	1
MEDICAL	144	0	0	0	0	0
MILAN	4	0	0	0	0	0
MITCHEL	38	1	0	0	0	0
MUSEUM	83	1	0	0	0	0
ORCORP	471	0	0	0	0	29
ORFECU	1	0	0	0	0	0
PELLISI	1	0	0	0	0	0

TOWNSITE INTRA-SITE TELECOMMUNICATIONS SERVICE REPORT

BUILDING	Total Stations	Intra Bldg Circuits	Analog Circuits	Digital Circuits	Audio Circuits	Merlin Sets
POLLARD	69	0	0	0	0	0
RALEIGH	7	0	0	0	0	0
SCB/BO	2	0	0	0	0	0
SWEETWT****	1	0	0	0	0	0
****This is the town of Sweetwater, TN						
TRI-CO*****	4	0	0	0	0	1
*****821 Tri-Co. Blvd., Oliver Springs, TN						
UT	2	0	0	0	0	0
Y12 /cy	2	2				
TOWNSITE TOTALS	**6,447**	**167**	**0**	**0**	**0**	**863**

X-10 INTRA-SITE TELECOMMUNICATIONS SERVICE REPORT

BUILDING	Total Stations	Intra Bldg Circuits	Analog Circuits	Digital Circuits	Audio Circuits	Merlin Sets
800*	3	0	0	0	0	0
*Remote location from site, off highway 95, close to Clinch River						
901	0	0	2	0	0	0
961	0	0	1	0	0	0
964	1	0	1	0	0	0
1000	255	182	14	0	0	0
1053A,B	6	0	2	0	0	0
1054	6	0	2	0	0	0
1054	17	0	2	0	0	0
1503	36	32	3	0	0	0
1504	32	0	25	0	0	0
1505	289	282	18	0	0	7
1506	33	0	20	0	0	0
1563	2	0	0	0	0	0
1564	6	0	1	0	0	0
1565	1	0	0	0	0	0
2000	47	0	13	0	0	12
2001	149	8	8	0	4	29
2007	17	0	4	0	0	0
2008	18	0	5	0	0	0
2009	0	0	1	0	0	0
2010	25	0	1	0	4	0
2011	4	0	2	0	0	0
2013	14	0	8	0	0	20
2016	8	0	4	0	0	0
2018	9	0	7	0	0	0
2019	2	0	0	0	0	0
2024	49	0	31	0	0	33
2026	11	0	14	0	0	0
2029	9	0	5	0	0	0
2500	31	11	158	0	12	0
2506	55	0	29	0	2	0
2517	12	1	7	0	0	13
2518	60	43	7	0	1	0
2519	6	2	14	0	0	0
2521	0	0	2	0	0	0
2523	4	0	2	0	0	0
2525	22	0	5	0	0	0
2528	9	0	10	0	0	0
2531	2	0	5	0	0	0
2540	0	0	3	0	0	0
2547	3	0	6	0	0	0

X-10 INTRA-SITE TELECOMMUNICATIONS SERVICE REPORT

BUILDING	Total Stations	Intra Bldg Circuits	Analog Circuits	Digital Circuits	Audio Circuits	Merlin Sets
2609	2	0	0	0	0	0
2621	28	0	10	0	1	58
2632	0	0	3	0	0	0
2640	0	0	1	0	0	0
2644	9	0	1	0	1	0
2647	10	0	6	0	0	0
2652-A	10	0	0	0	0	10
2652-B	8	0	0	0	0	9
2652-C	9	0	0	0	0	9
3000	1	0	2	0	0	0
3001	90	69	14	0	2	0
3002	0	0	1	0	0	0
3003	17	0	4	0	0	0
3004	2	0	0	0	0	0
3005	4	0	4	0	0	0
3008	1	0	1	0	0	0
3010	8	0	10	0	0	0
3012	3	0	1	0	0	0
3017	71	41	4	0	10	0
3019A,B	23	0	26	0	0	71
3025-E	2	0	0	0	0	0
3025-M	114	0	12	0	0	9
3026	4	0	1	0	0	0
3026-C	19	0	7	0	0	0
3026-D	5	0	3	0	0	0
3027	1	0	2	0	0	0
3028	1	0	1	0	0	0
3029	3	0	0	0	0	0
3030	2	0	0	0	0	0
3031	2	0	0	0	0	0
3032	2	0	1	0	0	0
3033	2	0	1	0	0	0
3033-A	0	0	1	0	0	0
3034	0	0	1	0	0	0
3036	3	0	0	0	0	0
3037	40	1	16	0	0	0
3038	10	0	4	0	0	0
3042	52	38	10	0	0	0
3044	2	0	1	0	0	0
3047	59	32	12	0	0	0
3074	5	0	0	0	0	0
3080	2	0	1	0	0	0

X-10 INTRA-SITE TELECOMMUNICATIONS SERVICE REPORT

BUILDING	Total Stations	Intra Bldg Circuits	Analog Circuits	Digital Circuits	Audio Circuits	Merlin Sets
3082	0	0	11	0	0	0
3085	0	0	1	0	0	0
3087	1	0	0	0	0	0
3104	11	1	5	0	0	0
3105	3	3	108	0	0	0
3111	0	0	1	0	0	0
3114	5	0	1	0	0	0
3115	11	0	2	0	0	0
3125	0	0	1	0	0	0
3127	1	0	0	0	0	0
3129	0	0	3	0	0	0
3130	14	0	34	0	0	0
3131	0	0	1	0	0	0
3132	0	0	1	0	0	0
3137	23	11	1	0	0	0
3144	10	0	1	0	0	0
3146	0	0	1	0	0	0
3147	87	0	4	0	1	0
3500	272	1	15	0	2	0
3501	0	0	1	0	0	0
3502	8	0	8	0	0	0
3503	14	0	9	0	0	0
3504	24	3	9	0	1	0
3505	3	0	3	0	0	0
3508	29	0	6	0	3	0
3517	8	1	3	0	0	0
3525	11	0	15	0	0	0
3541	1	0	0	0	0	0
3543	1	0	0	0	0	0
3544	3	0	1	0	0	0
3546	42	0	6	0	1	0
3550	36	0	23	0	1	50
3587	8	0	2	0	1	0
3598	0	0	1	0	0	0
3606	35	0	1	0	1	0
3608	4	0	2	0	1	0
4500-N	1,213	384	331	1	18	161
4500-S	866	326	322	0	21	116
4501	110	0	25	0	1	4
4505	49	1	17	0	0	0
4507	1	0	1	0	0	0
4508	193	78	20	0	2	2

X-10 INTRA-SITE TELECOMMUNICATIONS SERVICE REPORT

BUILDING	Total Stations	Intra Bldg Circuits	Analog Circuits	Digital Circuits	Audio Circuits	Merlin Sets
4509	2	0	4	0	1	0
4512	16	0	67	0	3	18
4515	112	0	3	0	2	103
4557	3	0	0	0	0	0
5000	25	0	24	0	0	0
5500	152	1	19	0	0	0
5505	60	0	15	0	0	16
5507	6	0	3	0	0	0
5510-P	15	0	3	0	0	29
5553	1	0	0	0	1	0
6000	122	4	12	0	4	0
6003	33	0	1	0	0	0
6005	2	0	0	0	0	0
6007	7	0	1	0	0	0
6008-P	17	0	2	0	1	0
6010	88	2	10	0	1	0
6011	60	0	4	0	2	0
6012-P	59	0	2	0	1	0
6025	85	0	12	0	1	26
6026	0	0	2	0	0	0
6026-A	20	0	1	0	1	17
6026-B	10	0	1	0	0	1
6026-C	23	0	0	0	0	25
6026-D	10	0	0	0	0	7
6026-E	14	0	0	0	0	11
6026-F	2	0	0	0	0	0
6556-A	8	0	1	0	1	0
6556-C	2	0	4	0	0	0
7001	59	0	26	1	0	14
7002	18	0	2	0	0	0
7003	3	0	5	0	0	0
7005	4	0	0	0	0	0
7007	2	0	0	0	0	0
7009	1	0	0	0	0	0
7012	21	0	14	0	2	0
7015	1	0	0	0	0	0
7018	5	0	3	0	0	0
7025	1	0	1	0	0	0
7033	1	0	0	0	0	0
7035	1	0	1	0	0	0
7038	1	0	0	0	0	0
7039	0	0	1	0	0	0

X-10 INTRA-SITE TELECOMMUNICATIONS SERVICE REPORT

BUILDING	Total Stations	Intra Bldg Circuits	Analog Circuits	Digital Circuits	Audio Circuits	Merlin Sets
7040	0	0	1	0	0	0
7058	1	0	0	0	0	0
7060	1	0	0	0	0	0
7069	4	0	0	0	0	0
7072	5	0	0	0	0	0
7077	4	1	2	0	0	0
7078-A	11	0	3	1	1	0
7078-B	12	0	0	0	0	0
7078-C	14	0	1	0	0	0
7500	4	0	1	0	0	0
7503	34	9	13	0	0	0
7505	31	0	4	0	1	0
7506	5	0	1	0	0	0
7507	1	0	0	0	0	0
7509	23	2	8	0	0	0
7516	2	0	0	0	0	0
7568	1	0	0	0	1	0
7601	133	18	9	0	0	0
7602	9	0	6	0	0	0
7603	28	7	3	0	0	0
7606	8	1	2	0	0	0
7611	2	0	1	0	0	0
7652	0	0	1	0	0	0
7653	5	0	1	0	0	0
7661	0	0	1	0	1	0
7666	7	0	1	0	0	0
7702	8	0	8	0	0	0
7709	0	0	4	0	0	0
7710	24	12	17	0	2	0
7735	3	0	1	0	1	0
7740	1	0	2	0	7	0
7751	0	0	1	0	0	0
7752	1	0	1	0	0	0
7802#	1	0	0	0	0	0
7811#	1	0	0	0	0	0
7824#	11	0	6	0	1	0
7831#	2	0	3	0	1	0
7842#	1	0	1	0	1	0
7860#	3	1	1	0	0	0
7872#	0	0	8	0	0	0
7874#	1	0	0	0	0	0
7875#	0	0	5	0	0	0

X-10 INTRA-SITE TELECOMMUNICATIONS SERVICE REPORT

BUILDING	Total Stations	Intra Bldg Circuits	Analog Circuits	Digital Circuits	Audio Circuits	Merlin Sets
7879#	2	0	2	0	0	0
# THE ABOVE 7800 BUILDINGS COMPRISE A COMPLEX IN AN AREA PROXIMINATE TO GRID G8 ON THE X-10 SITE MAP NEXT TO THE 7900 AREA						
7900	68	0	24	0	1	0
7901	0	0	1	0	0	0
7910	49	1	6	0	1	0
7915	2	0	0	0	0	0
7917	66	0	2	0	0	0
7920	41	3	12	0	0	0
7921	0	0	1	0	0	0
7922	0	0	15	0	0	0
7930	10	0	9	0	0	0
7931	0	0	1	0	0	0
7933##	1	0	4	0	0	0
## THE ABOVE 7900 BUILDINGS COMPRISE A COMPLEX IN AN AREA PROXIMINATE TO GRID G8 ON THE X-10 SITE MAP NEXT TO THE 7900 AREA:						
7934	1	0	1	0	0	0
7962	26	0	7	0	1	0
7964-A###	10	11	15	0	0	0
7964-B###	16	0	6	0	1	14
7964-C###	13	0	1	0	1	0
###X-10 HFIR Area across from 7920						
7964-D####	4	0	4	0	0	4
7964-E####	10	0	1	0	0	0
7964-F####	10	0	0	0	0	0
####X-10 HFIR Area across from 7900						
7965-A	6	0	1	0	0	0
SCAR FAC *	112		1	1	1	
* SEE DESCRIPTION NOTE, GRID F-15, TOWNSITE MAP (SCARBOROUGH FACILITY is the Old Scarborough School on Bethel Valley Road)						
X-10**	60	2	9	0	0	3
**Guard Portals on the Site Security Map, circled 1,2,3, etc.						
X-10 TOTALS	**6,957**	**1,626**	**2,085**	**4**	**135**	**901**

Y-12 INTRA-SITE TELECOMMUNICATIONS SERVICE REPORT

BUILDING	Total Stations	Intra Bldg Circuits	Analog Circuits	Digital Circuits	Audio Circuits	Merlin Sets
1501-2	1	0	1	0	0	0
2002*	2	0	0	0	0	0
2005*	6	0	0	0	0	0
*Located on Y-12 Plant Security Map (G-4) (on map, omitted from legend)						
9102-1	30	0	0	0	0	7
9102-2	24	0	8	0	0	0
9103	254	193	25	1	1	0
9104-1	22	0	0	0	0	0
9104-2	23	11	21	0	9	0
9104-3	28	0	1	0	0	0
9105	34	1	14	0	0	0
9106	79	60	42	0	0	0
9107	23	1	1	0	0	18
9108	38	0	1	0	0	0
9109	34	3	19	0	0	18
9110	43	31	11	1	0	0
9111	96	2	7	0	0	0
9112	32	59	53	0	0	0
9113	210	206	5	0	1	0
9114	207	26	8	0	0	0
9115	73	0	3	0	0	0
9116	89	0	2	0	0	7
9117	46	4	49	5	1	0
9119	276	0	6	2	3	0
**New Building adjacent to 9106						
9201-1	152	4	43	0	2	0
9201-2	314	0	26	0	1	0
9201-3	211	39	43	0	0	11
9201-4	12	0	7	0	0	0
9201-5	236	190	36	1	3	0
9201-5N	46	1	21	0	0	0
9201-5W	39	0	12	0	0	0
9202	214	2	3	0	0	0
9203	99	0	3	0	0	0
9203-A#	14	0	0	0	0	0
#Reference Y-12 Plant Area Security Map						
9204-1	230	107	13	1	1	0
9204-2	83	63	28	0	2	0
9204-2E	92	13	82	5	0	0
9204-3	35	1	8	1	1	0
9204-4	108	36	36	0	1	0
9205	1	0	0	0	0	0

Y-12 INTRA-SITE TELECOMMUNICATIONS SERVICE REPORT

BUILDING	Total Stations	Intra Bldg Circuits	Analog Circuits	Digital Circuits	Audio Circuits	Merlin Sets
9206	25	1	12	0	1	0
9207	242	132	29	0	2	0
9208	34	4	27	1	12	0
9210	36	1	0	0	0	0
9211	108	0	8	0	0	0
9212	222	11	83	0	2	0
9212-A*	26	27	0	0	0	0
*Map Location D2						
9213	7	0	4	0	0	0
9215	123	1	45	0	2	0
9219	4	0	4	0	0	0
9220	23	0	0	0	0	0
9224	15	0	1	0	0	0
9401-1	4	0	0	0	0	0
9401-3	10	1	10	0	0	0
9401-5	4	0	0	0	0	0
9401-8**	8	0	0	0	0	0
**Y-12 Map Location D3 (Replaces 9401-2)						
9404-10	3	0	0	0	0	0
9404-11	1	0	0	0	0	0
9404-18	3	0	1	0	0	0
9404-2	2	0	0	0	0	0
9404-20	3	0	2	0	1	0
9404-5	3	0	3	0	0	0
9404-8	1	0	1	0	0	0
9404-9	4	0	0	0	0	0
9409-21	1	0	0	0	0	0
9417-6/7	0	0	1	0	0	0
9420	21	0	1	0	0	0
9422-10	0	0	1	0	0	0
9422-11	0	0	1	0	0	0
9422-12	0	0	1	0	0	0
9423	2	0	4	0	0	0
9610	1	0	1	0	0	0
9616-7	12	6	6	0	1	0
9616-9	2	1	2	0	1	0
9623	7	1	2	0	1	0
9624***	75	0	0	0	0	0
***Y-12 Map Location G-3 (75 stations)						
9626	31	0	6	0	0	0
9701-5	5	0	0	0	0	0
9701-6	1	0	0	0	0	0

Y-12 INTRA-SITE TELECOMMUNICATIONS SERVICE REPORT

BUILDING	Total Stations	Intra Bldg Circuits	Analog Circuits	Digital Circuits	Audio Circuits	Merlin Sets
9702	35	5	290	1	94	0
9703-11	0	0	1	0	0	0
9703-15	27	0	3	0	0	0
9704-1	67	36	24	0	0	0
9704-2	187	104	31	1	0	35
9706-1	39	27	21	0	2	0
9706-1A	30	0	10	0	0	0
9706-2	169	11	102	0	123	0
9709	97	37	35	0	2	0
9710-2	56	10	45	0	4	0
9710-3	97	2	20	0	5	0
9711-1	77	25	17	0	0	0
9711-5	83	37	12	0	1	0
9712	12	0	2	0	1	0
9714	13	0	0	0	0	0
9720-1	4	0	0	0	0	0
9720-12	2	0	1	0	0	0
9720-13	3	0	1	0	0	0
9720-15	3	0	0	0	0	0
9720-16	3	0	3	0	2	0
9720-2	7	0	4	0	1	0
9720-20	6	0	5	0	0	0
9720-25	3	0	1	0	0	0
9720-28	1	0	1	0	0	0
9720-3	11	0	47	0	0	0
9720-31	1	0	0	0	0	0
9720-33	6	0	1	0	0	0
9720-38	0	0	1	0	0	0
9720-39	1	0	0	0	0	0
9720-4	8	0	6	0	0	0
9720-41	0	0	1	0	0	0
9720-5	31	0	1	0	0	0
9720-6	87	60	15	1	4	0
9720-7	2	0	2	0	0	0
9720-8	97	0	10	0	0	0
9720-9	1	0	0	0	0	0
9722	1	0	3	0	0	0
9723-1	2	0	0	0	0	0
9723-11A	0	2	1	0	0	0
9723-14	53	57	2	0	0	0
9723-16	82	65	14	0	0	0
9723-18	8	0	1	0	0	0

Y-12 INTRA-SITE TELECOMMUNICATIONS SERVICE REPORT

BUILDING	Total Stations	Intra Bldg Circuits	Analog Circuits	Digital Circuits	Audio Circuits	Merlin Sets
9723-21	3	0	2	0	1	0
9723-24	3	0	0	0	0	0
9723-25	16	0	12	0	0	0
9723-27	1	0	0	0	0	0
9723-28	3	0	0	0	5	0
9723-4	2	0	1	0	0	0
972311A	0	3	0	0	0	0
9724-1	1	0	0	0	0	0
9724-3	1	0	7	0	0	0
9725	1	0	0	0	0	0
9727-3	1	0	0	0	0	0
9728	1	1	4	0	1	0
9731	47	16	11	0	1	0
9732-2	2	0	0	0	0	0
9733-1	69	0	22	0	0	0
9733-2	73	0	9	0	0	0
9733-3	68	0	34	0	0	0
9733-4	39	1	16	0	0	0
9734	19	0	10	0	0	0
9735	14	0	4	0	0	0
9736	26	0	12	0	0	0
9737	104	0	3	2	1	0
9738	1	0	0	0	0	0
9739	90	18	60	0	0	8
9744	3	0	1	0	0	0
9752	1	0	0	0	0	0
9754-2	3	0	0	0	0	0
9764	22	0	14	0	1	0
9766	135	100	21	0	1	0
9767-12	1	0	1	0	0	0
9767-13	1	0	3	0	0	0
9767-2	3	0	0	0	0	0
9767-4	0	0	1	0	0	0
9767-6	5	0	4	0	0	0
9767-8	1	0	1	0	0	0
9769	35	0	10	1	2	0
9769-E	32	0	0	0	0	0
9770-1	1	0	0	0	0	0
9770-2	1	0	0	0	0	0
9770-6	0	0	1	0	0	0
9770-7	0	0	1	0	0	0
9771	5	0	4	0	0	0

Y-12 INTRA-SITE TELECOMMUNICATIONS SERVICE REPORT

BUILDING	Total Stations	Intra Bldg Circuits	Analog Circuits	Digital Circuits	Audio Circuits	Merlin Sets
9805	0	1	0	0	0	0
9805-1	1	0	0	0	0	0
9808	4	0	2	0	0	0
9811	2	0	1	0	0	0
9811-1	2	0	0	0	0	0
9811-6	1	0	0	0	0	0
9811-8	0	0	1	0	1	0
9814	1	0	0	0	0	0
9815	3	0	0	0	0	0
9816	1	0	0	0	0	0
9818	5	0	2	0	0	0
9821-1	1	0	0	0	0	0
9824-4	2	0	0	0	0	0
9824-5	1	0	0	0	0	0
9826-1	2	0	0	0	0	0
9828-6	1	0	0	0	0	0
9831	15	0	2	0	0	0
9949-4	0	0	1	0	0	0
9949-51	0	0	1	0	0	0
9949-52	1	0	0	0	1	0
9959-1	0	0	1	0	0	0
9977	1	0	0	0	0	0
9977-1	0	0	1	0	0	0
9980	2	0	1	0	0	0
9981	4	0	1	0	0	0
9983	6	0	6	0	0	0
9983-09	1	0	2	0	0	0
9983-1	4	0	0	0	0	0
9983-10	1	0	1	0	0	0
9983-13	3	0	3	0	0	0
9983-18	6	0	0	0	0	0
9983-20	0	0	1	0	0	0
9983-24	3	0	0	0	0	0
9983-26	2	0	0	0	0	0
9983-28	2	0	0	0	0	0
9983-29	2	0	2	0	0	0
9983-30	7	1	2	0	0	0
9983-31	1	0	0	0	0	0
9983-32	22	0	3	0	0	0
9983-35	2	0	2	0	0	1
9983-39	6	0	5	0	0	0
9983-47	3	0	0	0	0	0

Y-12 INTRA-SITE TELECOMMUNICATIONS SERVICE REPORT

BUILDING	Total Stations	Intra Bldg Circuits	Analog Circuits	Digital Circuits	Audio Circuits	Merlin Sets
9983-48	0	0	1	0	0	0
9983-49	3	0	1	0	0	0
9983-53	1	0	0	0	0	0
9983-55	15	0	12	0	0	0
9983-58	18	0	2	0	0	0
9983-62	23	29	4	1	0	0
9983-63	25	3	22	0	0	0
9983-64	33	1	25	0	0	0
9983-65	18	0	25	0	0	0
9983-66	11	0	0	0	0	0
9983-67	13	0	0	0	0	0
9983-71	21	0	22	0	0	0
9983-72	23	21	6	0	0	0
9983-73	10	0	7	0	0	0
9983-74	3	1	1	0	0	0
9983-78	2	0	0	0	0	0
9983-79	1	0	0	0	0	0
9983-81	9	0	2	0	0	0
9983-82	9	0	1	0	0	0
9983-83	24	0	1	0	0	0
9983-85	4	0	5	0	0	0
9983-86	28	0	3	0	0	0
9983-88	1	0	0	0	0	0
9983-94	6	0	4	0	0	0
9983-AD	7	0	0	0	0	0
9983-AF	7	0	0	0	0	0
9983-AG	9	0	0	0	0	0
9983-AH	11	0	0	1	0	0
9983-AL**	6	0	1	0	0	0
**New trailer on east side of 9206						
9987	2	0	0	0	0	0
9990-3	1	0	0	0	0	0
9995	150	44	42	0	0	0
9996	4	4	23	0	0	0
9998	84	54	6	3	6	0
9999-3	1	0	0	0	0	0
Y-12*	148	1	69	0	8	0
*Guard Portals on Site Map circled 1,2.3. etc.						
Y-12 TOTALS	7,723	2,016	2,223	29	317	105
GRAND TOTALS	25,154	5,052	4,878	37	473	2,346

APPENDIX 2B

MARTIN MARIETTA ENERGY SYSTEMS, INC.
OAK RIDGE COMPLEX
MERLIN SYSTEMS DATABASE

LOCATION	TYPE_SYS	PLANT	DEPARTMENT	EQPT LINES	EQPT STAS
K-25:					
K33	MER LEGEND	K	SFO	16	16
K303-8	MER LEGEND	K	ENGINEERING	10	10
K-601	MER II,FM2	K	POWER UTILITIES	20	24
K1001	MER PLUS	K	BENEFIT PLANS	5	5
K1001	MER LEGEND	K	DOE	30	30
K1001	MER PLUS	K	ENV TECH DEV	5	5
K1001	MER II,FM3	K	ENVIRON COMP	32	32
K1001	MER II,FM3	K	ENVIRON RESTORATION	16	16
K1001	MER PLUS	K	ETO	4	4
K1001	MER II	K	HEALTH & SAFETY	12	12
K1001	MER II,FM3	K	HLTH SFTY ENV MGMT	12	8
K1001	MER PLUS	K	PERSONNEL	4	10
K1001	MER II,FM3	K	PLANT MGR	20	24
K1007	MER II,FM3	K	COMP USER SUPPORT	8	16
K1007	MER LEGEND	K	FINANCE	30	30
K1007	MER II,FM2	K	MGMT INFO SYSTEMS	32	32
K1007	MER PLUS	K	OFF AUTOMATION SUPPORT	6	5
K1007	MER PLUS	K	PROG ASSIST	4	4
K1024	MER LEGEND	K	ENRICH REV TEAM	48	48
K1037	MER LEGEND	K	ERWM	35	35
K1037	MER LEGEND	K	ENVIRON RESTORATION	2	2
K1101	MER PLUS	K	OPNS, UTILITIES	8	10
K1200	MER 11,FM3	K	C&TS TNSD	36	40
K1200	MER LEGEND	K	QUALITY	5	5
K1320	MER LEGEND	K	ENGINEERING	17	18
K1320	MER 11,FM3	K	TELECOMMUNICATIONS	48	48
K1330	MER 11,FM3	K	ENVIRON REST	56	56
K1400	MER LEGEND	K	WASTE MGT DIV	18	18
K1401	MER II	K	MAINTENANCE DIVISION	20	20
K1420	MER LEGEND	K	FACILITY OPERATIONS	11	11
K1546*	MER PLUS	K	TIGER TEAM &AUDIT	8	10
*Trailer behind K-1001 (D Wing)					
K1580	MER II,FM2	K	C&TS	16	16
K1654	MER II,FM2	K	CTF	24	24
X-10:					
1505	MER PLUS	X	ENVIRON SCIENCES	5	10
1505	MER PLUS	X	ANALYTICAL CHEM	4	10
2001	MER LEGEND	X	OPERATIONAL SAFETY	7	10
2013	MER PLUS	X	PLANT & EQUIPMENT	8	20
2024	MER II,FM3	X	OPERATIONAL SAFETY	20	24
2024/2001	MER LEGEND	X	QA & INSPECTION	8	40
2506	MER II,FM3	X	OFC COMP SUPP	16	16
2517	MER II,FM2	X	HUMAN RESOURCES	16	16
2621	MER II,FM3	X	E&SH	28	48
2621	MER 11,FM2	X	S&H PROTECTION	22	22
2652C	MER 11,FM2	X	OPERATIONAL SAFETY	22	22
3019A,B	30/70	X	CHEM TECH	30	70
3025M	MER PLUS	X	SOLID STATE	7	8
3550	MER II,FM2	X	S&H PROTECTION	20	32
4500N	MER PLUS	X	BENEFIT PLANS	4	10
4500N	MER PLUS	X	CENT MGMT OFFICE	4	4
4500N	MER PLUS	X	CMO (GUEST SERVICES)	8	10

APPENDIX 2B

MARTIN MARIETTA ENERGY SYSTEMS, INC.
OAK RIDGE COMPLEX
MERLIN SYSTEMS DATABASE

LOCATION	TYPE_SYS	PLANT	DEPARTMENT	EQPT LINES	EQPT STAS
4500N	MER PLUS	X	CMO	4	4
4500N	MER II,FM2	X	CMO	16	16
4500N	MER PLUS	X	CMO	6	6
4500N	MER II,FM2	X	CMO (PLANNING & MGMT)	20	24
4500N	MER II,FM3	X	DOE FIELD OFFICE	48	48
4500N	MER II,FM2	X	DOE FIELD OFFICE (TRESP)	12	15
4500N	MER PLUS	X	ENVIRONMENTAL COMPLIANCE	6	5
4500N	MER PLUS	X	GRAPHICS (JOY NIX)	5	15
4500N	MER II,FM2	X	HUMAN RESOURCES	32	32
4500N	MER PLUS	X	PROG ASSISTANCE	8	10
4500N	MER PLUS	X	SPACE & DEFENSE TECH	3	3
4500S	MER PLUS	X	ANALYTICAL CHEMISTRY	6	6
4500S	MER LEGEND	X	ANALYTICAL CHEMISTRY	8	19
4500S	MER LEGEND	X	CMO - EOC	20	14
4500S	MER PLUS	X	ENVIRONMENTAL COMPLIANCE	5	5
4500S	MER II,FM2	X	ENVIRONMENTAL H&S	20	24
4500S	MER LEGEND	X	OSHP (EDDIE FORD)	10	10
4500S	MER LEGEND	X	OSHP - DIVISION OFFICE	7	7
4500S	MER PLUS	X	RAD PROTECTION	4	4
4500S	MER PLUS	X	RADIATION PROTECTION	7	7
4500S	MER II,FM3	X	TECH PHOTOGRAPHY	8	21
4501	MER PLUS	X	ENVIRONMENTAL COMPLIANCE	6	6
4508	MER PLUS	X	S&H PROTECTION (OSHA)	8	8
4512	MER LEGEND	X	CMO-LSS	10	19
4515	MER II,FM3	X	METALS & CERAMICS	16	16
4515	MER II,FM3	X	METALS AND CERAMICS	50	80
5505	MER PLUS	X	ANALYTICAL CHEMISTRY	1	12
5510P	MER PLUS	X	ANALYTICAL CHEMISTRY	4	20
5510P	MER PLUS	X	ANALYTICAL CHEMISTRY	12	8
5510P	MER PLUS	X	ANALYTICAL CHEMISTRY	8	16
6025	MER II,FM3	X	ENG PHYSICS & MATH	7	6
6026A&D	MER II,FM3	X	C&TS	28	28
6026C	MER LEGEND	X	ENVIRONMENTAL COMPLIANCE	15	19
6026E	MER PLUS	X	CMO - OGUI	6	10
7001	MER LEGEND	X	FINANCE & BUSINESS MGMT	12	14
7964A & D#	MER II,FM3	X	HRR	24	24

#X-10 HFIR Area across from 7920

Y-12:

9102-1	MER PLUS	Y	ET ENGR TECH ADMIN	8	10
9107	MER PLUS	X	ENVIRONMENTAL SCIENCES	10	8
9107	MER LEGEND	Y	SOUTHEAST COURIER	14	19
9109	MER LEGEND	Y	STAFFING/BADGE AND PASS	18	19
9116	MER PLUS	Y	QUALITY	7	10
9203-3	MER PLUS	Y	ENGINEERING TECHNOLOGY	6	11
9704-2	MER PLUS	Y	ENERGY SYS COMPENSATION	5	5
9704-2	MER 11,FM2	Y	EXECUTIVE SUITE	12	16
9704-2	30/70	Y	LEGAL DEPARTMENT	20	24
9704-2	MER PLUS	Y	PERSONNEL	8	10
9711-1	MER PLUS	Y	TECH LIBRARY	8	10
9739	MER PLUS	Y	GRAPHICS	6	8

APPENDIX 2B

MARTIN MARIETTA ENERGY SYSTEMS, INC.
OAK RIDGE COMPLEX
MERLIN SYSTEMS DATABASE

LOCATION	TYPE_SYS	PLANT	DEPARTMENT	EQPT LINES	EQPT STAS
TOWNSITE:					
1916-TC	MER LEGEND	T	SECURITY	8	16
130 BADGER	MER LEGEND	T	ORAU	16	16
CHAR HALL	MER II,RM3	T	CENTRAL STAFFING	36	36
1099 COMMERCE	MER LEGEND	T	BENEFITS ADMIN	16	16
COMMERCE	MER LEGEND	T	TAX ADMINISTRATION	8	8
COMMERCE	MER PLUS	T	OFC OF TREAS	4	8
CONCRSE	MER PLUS	T	UE ENRICHMENT	8	10
ENERGY	MER LEGEND	T	ORAU	16	16
FEDERAL	MER LEGEND	T	DOE	54	54
FEDERAL		T	DOE	26	26
FEDERAL	MER LEGEND	T	DOE	73	73
JACKSON	MER PLUS	T	C&TS - APM	8	10
JACKSON	MER II	T	CONFIG MGMT	16	11
JACKSON	MER PLUS	T	ENVR HEALTH & PROT	8	10
JACKSON	MER LEGEND	T	INFO SERVICES	16	16
JACKSON	MER PLUS	T	OFFICE OF CONTROLLER	8	8
JACKSON	MER PLUS	T	TASK TEAM	8	20
55 JEFFERSON	30/70	T	DOE	32	32
55 JEFFERSON		T	DOE (ENRICHMENT FACILITIES)	20	24
55 JEFFERSON	MER LEGEND	T	MARKETING SUPPORT	44	48
151 LAFAYETTE	MER II	T	BECHTEL	16	16
185 LAF	MER II	T	CONTRACTS DIV	24	24
702 ILLINOIS AV	MER LEGEND	T	ORAU	20	24
78 MITCH	MER II,RM3	T	USER SERVICE OFC	20	24
78 MITCH	MER PLUS	T	INFO SVCS	8	10
78A MITCHELL	MER PLUS	T	OFC OF TREASURY	8	10
105 MITCH	MER LEGEND	T	CHEM TECH	16	16
105 MITCH	MER LEGEND	T	ORISE	16	16
105 MITCH	MER II,RM2	T	SAFETY &HLTH	24	24
173 MITCHELL	MER PLUS	T	AVLIS	8	10
173 MITCHELL	MER II,RM3	T	RECONFIG GROUP	30	30
PINERDG	MER PLUS	T	URANIUM ENRICHMENT	8	10
701 SCAR	MER II,RM2	T	C&TS	20	24
701 SCAR	MER II,RM2	T	TECH TRANSFER	40	40
701 SCAR	MER PLUS	T	HUMAN RESOURCES	8	10
701 SCAR	MER LEGEND	T	SAFETY & HEALTH	12	24
701 SCAR	MER LEGEND	T	TRAINING	64	64
TRI-CO	MER LEGEND	T	HAZWRAP	64	64
TRI-CO	MER LEGEND	T	HAZWRAP	64	64
TRI-CO	MER II,RM3	T	HAZWRAP	48	48
1201 TRPK	MER LEGEND	T	LOCKWOOD GREENE	16	8
TECH-3	MER PLUS	T	INFO SERVICES	8	10
TECH-3	MER PLUS	T	CONTROLLER	4	8
			TOTALS:	2402	2783

APPENDIX 2C

The requirement is to have a cost effective solution for providing access to the ORF-ICN for all townsite locations. The townsite locations listed in Table 2C below are owned by DOE or have long-term leases; all other townsite property is leased short-term. The Offeror's design should allow for flexible, cost-effective movement of services between short-term lease locations. The 30% growth requirement for cable sizing is not applicable if leased utilities are used to provide these connections.

TABLE 2C

TOWNSITE LOCATIONS OWNED OR LONG-TERM LEASED BY DOE			
OWNED BY DOE	MAP #	LONG-TERM LEASE	MAP #
Federal Building	29	FEDC	48
ATDD/ATDL/NOAA	41	Mitchell Road Facilities	43, 44, 45
Charlotte Hall	22	Commerce Park Center III	50
Cheyenne Hall	23	Tech. Center IV	50
Clark Center	*	831 TCB	*
1916-T1	28		
1916-T2	36		
2714F	28		
2714J	28		
2714G	28		
2714H	28		
ORAU - Medical Research	26		
2715	27		
Museum of Science and Energy	14		

* Not shown on the townsite map.

APPENDIX 2D

Notes for listings contained in Appendix 2D.

Buildings Not Requiring ISDN Service listing.

These buildings will not require ISDN service. Therefore, the cable plant certification requirements in 3.3.12.2 (a) shall not apply to this list of buildings. The offeror shall test and certify the cables in these buildings for their intended telephone use whether it be analog or digital. Digital service is preferred where is it cost-effective however it is not mandatory.

The comment field for some buildings states "do not rewire." These buildings are slated for closing in the next few years and the least cost method for providing telephone service in these buildings is acceptable and preferred including the re-utilization of existing wire facilities and telephones.

Buildings Being Demolished

This listing is all know buildings planned for demolition. Equivalent service shall be provided to these buildings at least cost to DOE at acceptance until service is removed. ISDN services and ISDN cable certification for these buildings are not required.

Buildings That Require Wiremold For Exposed Cables

This listing is where wiremold will be mandatory when cables cannot be concealed by other methods. This listing is not all inclusive. The offeror shall estimate the requirement for wiremold in the remaining buildings based on the site survey. In general, new buildings and office areas will require wiremold when cables cannot be routed above ceilings and beneath floors. The comment field on this listing indicates where wiremold will not be required throughout the entire building.

Buildings Not Requiring ISDN Service					
Site	Building	Description	Location	# Ckts	Comments
Townsite	391Ware			1	
Townsite	393Ware			4	
Townsite	475ORTP			3	
Townsite	601Scar			1	
Townsite	9983-4			1	
Townsite	Badger			1	
Townsite	Clark4			2	
Townsite	E-Divsv			1	
Townsite	Holiday			1	
Townsite	ORFECU			1	
Townsite	SCB/BO			2	
Townsite	Sweetwt			1	
K-25	K-1015	Laundry		4	Possibly Vacant
K-25	K-1021	Old Firehall		1	
K-25	K-1045	Valve Shop	F-7	2	Do Not Rewire
K-25	K-1059	Mat. Warehouse		1	
K-25	K-1131	Feed & Tails Bldg.	D-6	1	Do Not Rewire
K-25	K-1208	Metor. Tower		1	
K-25	K-1209	Metor. Tower		2	
K-25	K-1216	Scale House	On Blair Road	1	
K-25	K-1232	Chem Recovery Pit	N. of K-27	1	
K-25	K-1301	Utilities Office	N. of K-1401	1	
K-25	K-1303	Model Test Fac.	N. of K-1401	1	
K-25	K-1413	Lab/Engr.	Corner of Ave J &16	2	
K-25	K-1425	Waste Oil Storage	E. of K-1037	2	
K-25	K-1515	Water Fil. Plant	Bear Creek Road	5	
K-25	K-1654	Rifle Range	Bear Creek Road	2	
K-25	K-25W	W. side of "U"		1	
K-25	K-27	Process bldg		4	
K-25	K-29	Process bldg		2	
K-25	K-303-1	Process bldg	E. side of "U"	1	
K-25	K-303-4	Process bldg	E. side of "U"	1	
K-25	K-303-5	Process bldg	E. side of "U"	1	
K-25	K-305-4	Process bldg	W. side of "U"	1	
K-25	K-31	Process bldg		2	
K-25	K-310-2	Process bldg	E. side of "U"	1	
K-25	K-631	Process Tails		1	
K-25	K-633	Test Loop		1	
K-25	K-702	Turbine Room	Power House Area	1	
K-25	K-704	Main Switch House	Power House Area	1	
K-25	K-708-E	Scale House	Power House Area	1	
K-25	K-711	Warehouse	Power House Area	1	
K-25	K-722	Warehouse	Power House Area	6	

Buildings Not Requiring ISDN Service					
Site	Building	Description	Location	# Ckts	Comments
K-25	K-751	X-10 Switch House	At X-10	1	
K-25	K-791	K-33 Switch house		1	
K-25	K-791-S	K-33 Switch House		2	
K-25	K-892	Fire Water Pump		6	
K-25	K-892-Y	RCW Softener Fac.	E. of K-33	1	
K-25	K-901	Clinch River Pump		1	
K-25	K-902-8	Process Bldg.		1	
K-25	K1025-C	Warehouse	N. of "U"	1	
K-25	K1065-C	Warehouse	W. of K-33	1	
K-25	K1098-E	Heat Treat Fac.	E. of k-1401	1	
K-25	K1098-F	Sand Blast Fac.	W. of K-1035	1	
K-25	K1131-C	Sprinkler House	N. of K-1131	1	
K-25	K1203-4	Chlor. Control	SW of K-27	1	
K-25	K1405	Air & Stack Monitor	N. of K-1401	1	
K-25	K1501-Q	Storage		1	
K-25	K1654-H	Training Course	Bear Creek Road	2	
K-25	K1654-M	Parking Lot	Bear Creek Road	1	
K-25	K312-1	Process Bldg	E. side of "U"	2	
X-10	800	Air Pollution Site		1	
X-10	961	Visitor Overlook	C2 - N. of Bethel Valley	1	
X-10	964			2	
X-10	1001	Solid Waste Storage #3		3	
X-10	1563	Sub Station #234-4	W. of First Street	2	
X-10	2009	Storage	E. of 2010	1	
X-10	2521	Sewage Treatment	S. of Aeriation Ponds	3	
X-10	2523	Decontaminate Laundry	on White Oak Ave.	6	
X-10	2531	Rad. Waste Bldg.	S. of 2506	6	
X-10	2632	5000 KVA Substation	On Third Street	3	
X-10	2644	Coal Yard Run-Off	S. of 2521	4	
X-10	2648	Fire Training Tower	S. of 2644	1	
X-10	3000	13.8KV Substation	On Northside Drive	4	
X-10	3002	Filter House	On Reactor Drive	1	
X-10	3004	Water Demineral	On Reactor Drive	2	
X-10	3008	Material Vault	NE of 3001	2	
X-10	3012	Rolling Mill	On Hillside Ave	2	
X-10	3027	SNM Vault	On Hillside Ave	3	
X-10	3034	Rad. Area Services	On Isotope Circle	1	
X-10	3036	Storage	On Isotope Circle	4	
X-10	3044	Machine Shop	N. of 3027	3	
X-10	3074	Manipulator Repair	On Third Street	1	
X-10	3085	Pump House	N. of 3012	1	
X-10	3087	Heat Exchanger	N. of 3085	1	
X-10	3101	Storage Shed	On Reactor Drive	1	

Buildings Not Requiring ISDN Service					
Site	Building	Description	Location	# Ckts	Comments
X-10	3109	Off-Gas Filters	N. of 3028	1	
X-10	3123	Diesel Generator	SE of 3017	1	
X-10	3125	Emerg. Generator	NW of 3028	1	
X-10	3127	Vault	N. of 3047	1	
X-10	3131	Diesel Generator	Off Third Street	1	
X-10	3132	Emerg. Generator	E. of 3012	1	
X-10	3136	Test Building	Next to 3074	1	
X-10	3146	Emerg. Generator		2	
X-10	3153	Envelope Systems	E. of 3144	1	
X-10	3501	Sewage Pumping Sta.	On Fifth Street	1	
X-10	3518	Water Treatment	Off Third Street	1	
X-10	3524	Equalization Basin	S. of White Oak Ave	1	
X-10	3543	Storage Building	E. of 3508	1	
X-10	3544	Water Treatment	On Third Street	2	
X-10	3544-A			2	
X-10	3598	Emerg. Gen. Building	Off White Oak Ave.	1	
X-10	3608	Waste Water Plant	S. of Incinerator Drive	5	
X-10	4000	Substation	N. of Central Ave.	2	
X-10	4509	Compressor House	E. of 4515	8	
X-10	5507	Elect. Spec. Facility	S. of 5505	1	
X-10	6005	Gas Compressor House	On Eighth Street	1	
X-10	7003	Welding Shop	On White Oak Ave.	9	
X-10	7005	Lead Shop	S. of White Oak Ave.	1	
X-10	7007	Paint Shop	S. of 7012	1	
X-10	7009	Carpenter Shop	On White Oak Ave	1	
X-10	7015	Metal Storage	E. of 7001	1	
X-10	7018	Bulk Warehouse Fac.	S. of 7005	7	
X-10	7025	Target Facility	E. of 7000 Area	2	
X-10	7033	Line Crew Facility	On white Oak Ave.	1	
X-10	7035	Storage	Next to E. Perim. Fence	2	
X-10	7038	Storage		1	
X-10	7039	Storage	S. of 7018	1	
X-10	7040	Storage	E. of 7001	1	
X-10	7058	Repair Facility	S. of 7012	1	
X-10	7060	Steel Yard	S. of 7015	1	
X-10	7062	Storage	E. of 7009	1	
X-10	7069	Gas Service Facility	On White Oak Ave.	2	
X-10	7077	Laborer Bldg.	On White Oak Ave.	7	
X-10	7506	CPAF Trailer	Reactor Valley Area	6	
X-10	7507	Sub Stores	Reactor Valley Area	1	
X-10	7516	Field Service Shop	Reactor Valley Area	2	
X-10	7605	Warehouse	Reactor Valley Area	1	
X-10	7606	Maint. Bldg.	Reactor Valley Area	9	

Buildings Not Requiring ISDN Service					
Site	Building	Description	Location	# Ckts	Comments
X-10	7652	Storage	Reactor Valley Area	1	
X-10	7653	Storage	Reactor Valley Area	2	
X-10	7661	Elect. Utility Bldg.	Reactor Valley Area	2	
X-10	7666	Storage	Reactor Valley Area	4	
X-10	7802	Storage	Reactor Valley Area	1	
X-10	7811	Pilot Pits	Reactor Valley Area	1	
X-10	7822	Solid Waste Storage	Reactor Valley Area	1	
X-10	7830	Melton Valley Storage	Reactor Valley Area	1	
X-10	7842	Temp Lo lev. Waste	Reactor Valley Area	3	
X-10	7860	Hydro Frac. Facility	Reactor Valley Area	3	
X-10	7874	Storage	Reactor Valley Area	1	
X-10	7875	Storage	Reactor Valley Area	5	Locked
X-10	7876	HP Office Trailer	Reactor Valley Area	1	RAD Area
X-10	7879	Storage	Reactor Valley Area	3	
X-10	7901	Electrical Bldg.	Reactor Valley Area	1	
X-10	7915	Storage	Reactor Valley Area	1	No Phone
X-10	7921	Generator	Reactor Valley Area	2	No Phone
X-10	7931	Generator	Reactor Valley Area	1	
X-10	7934	Storage	Reactor Valley Area	1	
X-10	7935	Equip. Clean. Facility	Reactor Valley Area	1	
Y-12	9201-4	Production	D-3	5	Do Not Rewire
Y-12	9201-5	Production	E-3	187	Do Not Rewire
Y-12	9201-5A	Production		10	Do Not rewire
Y-12	9201-5W	Production	E-3	31	Do Not Rewire
Y-12	9204-4	Production	E-3	91	Do Not Rewire
Y-12	9206	Maintenance/DCON	D-3	19	Do Not Rewire
Y-12	9213	Training/HFIR	F-5	2	Do Not Rewire
Y-12	9401-1	Engine Test Cells	C-4 Behind 9201-1	2	
Y-12	9401-5	Uranium Chip Oxidation	F-3	1	
Y-12	9404-10	Pumphouse	D-3	1	
Y-12	9404-11	Pumphouse	D-3	1	
Y-12	9404-2	Plant & Industrial Air	C-4	1	
Y-12	9404-8	Carpenter Shop	C-4 Behind 9201-1	2	
Y-12	9420-1	Fab Shop MKF	F-2 North of 9420, South	1	
Y-12	9422-10	Storm Drain Monitor	D-3	1	
Y-12	9422-11	Storm Drain Monitor	D-3	1	Locked Up
Y-12	9422-12	Storm Drain Monitor	D-3	1	
Y-12	9616-6	Liquid Waste Facility	F-2	1	RAD Area
Y-12	9703-11	Post 16 West Portal	D-2	1	Do Not Rewire
Y-12	9703-16	Storage & Millwrights	F-3	8	
Y-12	9714-1	Range Tower (9714)	9 mi West of Y-12	1	
Y-12	9720-1	Stores	C-4	1	
Y-12	9720-25	Trash Facility	F-3	1	

Buildings Not Requiring ISDN Service					
Site	Building	Description	Location	# Ckts	Comments
Y-12	9720-28	Low Waste Disposal Bldg.	F-3	1	Vacant
Y-12	9720-31	RCRA Mixed Storage	F-3	1	
Y-12	9720-34	Storage & Shop	B-3	1	
Y-12	9720-41	Process Storage Bldg.	H-3	2	
Y-12	9720-9	RCRA	D-4	1	
Y-12	9723-1	Maintenance Changehouse	C-3 Across from 9201-1	3	No Phone
Y-12	9723-4	Elec. Maint. Storage	B-3	3	Do Not Rewire
Y-12	9723-11A	Utilities	D-3	3	Do Not Rewire
Y-12	9723-18	Utilities Changehouse	D-3	6	Fenced Off
Y-12	9723-27	Changehouse	A-3 Next to East Portal	1	
Y-12	9723-28	Changehouse	B-3 East of 9203	9	
Y-12	9723-4	Changehouse	B-3	3	
Y-12	9724-1	ISD Parking Facility	F-3	1	
Y-12	9728	Laundry Utilities	B-3	5	Do Not Rewire
Y-12	9767-2	Utilities	D-3	1	
Y-12	9767-4	Compressor Building	D-3	1	
Y-12	9767-5	Compressor Building	B-3	1	
Y-12	9770-1	Emergency Generator	B-3	1	
Y-12	9770-2	Radiation Source	B-3	1	
Y-12	9770-6	Sampling Station	C-3	1	
Y-12	9770-7	Sampling Station	C-3	1	
Y-12	9805	Uranium Chemistry	D-3	1	
Y-12	9805-1	Uranium Chemistry	D-3	1	
Y-12	9811	Classified Waste Disposal	D-3	3	

Buildings Being Demolished				
Site	Building	Location	# Circuits	Comments
Y-12	9401-2	D-3	5	
Y-12	9723-1	C-3	2	
Y-12	9723-11A	D-3	2	
Y-12	9811	D-3	2	
K-25	K-631	D-6	1	
K-25	K-633	D-6	1	
K-25	K-702	B-11	1	
K-25	K-1045	F-7	2	
K-25	K-1131	D-6	1	
K-25	K-1303	F-4	1	
K-25	K-1413	E-4	2	

Buildings That Require Wiremold For Exposed Cables				
Site	Building	Decscription	# Ckts	Comments
Townsite	907	Office Area	8	
Townsite	105Bway	Office Area	44	
Townsite	105Mitch	Office Area	176	
Townsite	185Laf	Office Area	17	
Townsite	1916-T1	Office Area	394	
Townsite	1916-T2	Office Area	170	
Townsite	1940Oak	Office Area	8	
Townsite	1942Oak	Office Area	10	
Townsite	1946Oak	Office Area	11	
Townsite	1956Atp	Office Area	22	
Townsite	1978Oak	Office Area	14	
Townsite	2714-01	Office Area	14	
Townsite	2714-02	Office Area	3	
Townsite	2714-F	Office Area	119	
Townsite	2714-G	Office Area	41	
Townsite	2714-H	Office Area	25	
Townsite	2714-J	Office Area	50	
Townsite	2715	Office Area	18	
Townsite	2715-T	Office Area	19	
Townsite	701Sca	Office Area	214	
Townsite	78AMitch	Office Area	9	
Townsite	78Mitch	Office Area	38	
Townsite	Admin	Office Area	51	
Townsite	ATDL	Office Area	71	
Townsite	Charlott	Office Area	135	
Townsite	Cheyenne	Office Area	112	
Townsite	Civ-Ser	Office Area	34	
Townsite	Concourse	Office Area	78	
Townsite	E-Vance	Office Area	17	
Townsite	Energy	Office Area	155	
Townsite	FEDC	Office Area	107	
Townsite	Federal	Office Area	928	
Townsite	FourOak	Office Area	7	
Townsite	Jackson Plaza	Office Area	206	800 Tpk
Townsite	Jefferson	Office Area	362	55 Jefferson
Townsite	Jeffct	Office Area	15	
Townsite	Marmset	Office Area	9	
Townsite	Maxima	Office Area	39	
Townsite	Medical	Office Area	109	
Townsite	Mitchel	Office Area	139	
Townsite	Museum	Office Area	71	
Townsite	ORCorp	Office Area	446	
Townsite	Pollard	Office Area	54	
Townsite	Raleigh	Office Area	7	K-25 CU
Townsite	601 Scarbor	Office Area	98	1009Com
Townsite	Tech-3	Office Area	304	1099Com

Buildings That Require Wiremold For Exposed Cables				
Site	Building	Decscription	# Ckts	Comments
Townsite	Tri-Co	Office Area	325	
Townsite	X-10 CU	Office Area	5	
Townsite	Y-12 CU	Office Area	2	
K-25	K-1001	Administration	367	
K-25	K-1002	Library/Cafeteria	37	
K-25	K-1003	Dispensary	34	
K-25	K-1004A	Chemistry Offices	18	
K-25	K-1004B	Chemistry Lab	18	
K-25	K-1004C	Chemistry Lab	23	
K-25	K-1004D	Chemistry Lab	53	
K-25	K-1004J	Development Lab	24	
K-25	K-1004L	Lab Pilot Plant	42	
K-25	K-1005	Lab	23	
K-25	K-1006	Development Lab	46	
K-25	K-1007	Computer Facility	139	
K-25	K-1008C	Respiratory Clinic	9	
K-25	K-1008D	Medical Therapy Bldg.	5	
K-25	K-1008F	Lab	10	
K-25	K-1020	Environmental Division	51	
K-25	K-1023	Lab	22	
K-25	K-1024	Lab	72	
K-25	K-1030	Office Building	60	
K-25	K-1035	Maint. Office Bldg	86	
K-25	K-1036	Materials Mgt.	45	
K-25	K-1037	Industrial Research	158	
K-25	K-1052	Machine Dev. Lab.	6	
K-25	K-1101	Nitrogen Bldg.	19	
K-25	K-1200	Centrifuge Lab/TNS	139	
K-25	K-1210	Centrifuge Test	25	
K-25	K-1220	Centrifuge Demo	35	
K-25	K-1225	ETEA Office Bldg.	87	
K-25	K-1320	Engineering Bldg.	84	
K-25	K-1330	ER Office Bldg.	66	
K-25	K-1400	Accounting Bldg.	34	
K-25	K-1401	Maintenance Bldg.	151	Office Areas Only
K-25	K-1420	Decon Facility	19	
K-25	K-1423	Toll Enrichment Facility	21	
K-25	K-1580	Engineering Offices	121	
K-25	K-1600	Technology Test Facility	22	
K-25	K-1650	Central Control Facility	83	
K-25	K-1652	Plant Protection Hdq.	62	
K-25	K-303-6	Process Bldg.	10	Office Areas Only
K-25	K-303-7	Process Bldg.	37	Office Areas Only
K-25	K-303-8	Process Bldg.	61	Office Areas Only
K-25	K-601	Maint. Training Facility	38	
K-25	K-902-1	Process Building	31	Office Areas Only

Buildings That Require Wiremold For Exposed Cables				
Site	Building	Decscription	# Ckts	Comments
X-10	1000	Engineering	211	
X-10	1503	Plant Sciences Lab	26	
X-10	1504	Aquatic Sciences Lab	16	
X-10	1505	Envir. Sciences Lab	233	
X-10	1506	Controlled Envir.	22	
X-10	2000	Solid State Lab Annex	28	
X-10	2001	Information Center	96	
X-10	2007	Calibration Lab	8	
X-10	2008	Internal Dosimetry Lab	9	
X-10	2010	Cafeteria	20	
X-10	2013	West Maint. Center	14	
X-10	2018	Elec. & AC Center	8	
X-10	2024	QA & Inspection	34	
X-10	2026	RAD Analytical Lab	10	
X-10	2029	Info. Center Annex	7	
X-10	2500	Guard & Firehouse	16	
X-10	2506	Fab. Shop / Timekeeping	45	
X-10	2517	Personnel Dev. Offices	12	
X-10	2518	Plant & Equip. Offices	55	
X-10	2525	Fabrication Dept.	16	
X-10	2528	Coal Research Lab	9	
X-10	2621	Tool Stores	27	
X-10	2647	Rust Engineering Office	10	
X-10	3001	Graphite Reactor	60	
X-10	3003	Solid State Facility	14	
X-10	3010	Bulk Shielding Facility	7	
X-10	3017	Chem. Tech. Div. Annex	37	
X-10	3019A & B	Pilot Plant & Lab	16	
X-10	3025M	Soild State Div. Labs	79	
X-10	3026C	Radioisotope Lab	12	
X-10	3037	Operations Div. Offices	40	
X-10	3038	Radioisotope Lab	5	
X-10	3042	OR Research Reactor	40	
X-10	3047	Isotope Technology Bldg.	59	
X-10	3104	West Research Center	9	
X-10	3115	Solid State Office	8	
X-10	3130	West Oper. Control	11	
X-10	3137	Surface Science Lab	18	
X-10	3147	Eff. Renewable Office	87	
X-10	3500	Inst. & Controls	217	
X-10	3502	East Research Center	6	
X-10	3503	High RAD Lab	6	
X-10	3504	Geosciences Lab	19	
X-10	3508	Chem. Tech. Alpha Lab	19	
X-10	3517	Fission Product Lab	5	
X-10	3525	High RAD Exam Lab	12	

Buildings That Require Wiremold For Exposed Cables				
Site	Building	Decscription	# Ckts	Comments
X-10	3546	I & C Office Annex	38	
X-10	3550	Research Lab Annex	37	
X-10	3606	Office	32	
X-10	4500N	Central Res. & Admin.	992	
X-10	4500S	Central Res. & Admin.	642	
X-10	4501	High RAD Lab	68	
X-10	4505	Experimental Eng.	34	
X-10	4508	Metals & Ceramics Lab	160	
X-10	4512	Emerg. Response Center	10	
X-10	4515	HTML	96	
X-10	5000	Main Portal	18	
X-10	5505	Transuranium Lab	37	
X-10	5510P	Mass Spec. Lab	13	
X-10	6000	Heavy Ion Res. Facility	96	
X-10	6003	Modular Offices	32	
X-10	6007	Heavy Ion Research	6	
X-10	6008P	Office/Lab Facility	11	
X-10	6010	Electron Linear Accel.	71	
X-10	6011	C & T Building	57	
X-10	6012P	Comp. Science Facility	50	
X-10	6025	Eng. Phy. Office/Lab	81	
X-10	7001	General Stores	45	
X-10	7002	Garage	14	Office Areas Only
X-10	7012	Central Mechanical Shop	14	
X-10	7503	Molton Salt Exp. Bldg.	29	
X-10	7505	CPAF Contractor Hdq.	13	
X-10	7509	Molton Salt Office Bldg.	23	
X-10	7601	Office Bldg.	113	
X-10	7603	Exp. Engineering	19	
X-10	7702	Shielding Facility	8	
X-10	7710	Dosar Facility	10	
X-10	7900	High Flux Isotope React.	44	
X-10	7910	Office Bldg.	40	
X-10	7917	Research Reactors Office	66	
X-10	7920	Radio Chem. Center	13	
X-10	7930	Radio Chem. Center	9	
X-10	7962	Neutron Office/Lab	26	
Y-12	9103	Info. Center Offices	240	
Y-12	9104-1	Offices	20	
Y-12	9104-2	Offices	25	
Y-12	9104-3	Offices	28	
Y-12	9105	Offices	31	
Y-12	9106	Offices	79	
Y-12	9107	Trans. Safeguard Fac.	15	
Y-12	9108	Tech. Staff Offices	36	
Y-12	9109	Offices	34	

Buildings That Require Wiremold For Exposed Cables				
Site	Building	Decscription	# Ckts	Comments
Y-12	9110	Offices	44	
Y-12	9111	Num. Tool Design	91	
Y-12	9112	Mechanical Design	26	
Y-12	9113	Trident II Offices	200	
Y-12	9114	MKF Offices	164	
Y-12	9115	HS Offices	75	
Y-12	9116	HS Offices	79	
Y-12	9117	Computer Center	41	
Y-12	9119	FCAP Offices	280	
Y-12	9201-1	Production	98	Office Areas Only
Y-12	9201-2	Production	271	Office Areas Only
Y-12	9201-3	Production	156	Office Areas Only
Y-12	9201-5N	Production	40	Office Areas Only
Y-12	9202	Development	172	
Y-12	9203	Development	65	
Y-12	9203A	Development	6	
Y-12	9204-1	Production	141	Office Areas Only
Y-12	9204-2	Assmebly Operations	71	Office Areas Only
Y-12	9204-2E	Assembly Operations	76	Office Areas Only
Y-12	9204-3	Production	22	Office Areas Only
Y-12	9207	Shops/Lab/Production	195	Office Areas Only
Y-12	9208	Engineering	36	
Y-12	9210	Utilities	21	
Y-12	9211	Utilities	58	
Y-12	9212	Production	154	Office Areas Only
Y-12	9215	Production	82	Office Areas Only
Y-12	9220	Utilities	12	
Y-12	9224	Cell Systems	10	
Y-12	9401-3	Process Maintenance	9	
Y-12	9626	MKF Offices	24	
Y-12	9703-15	Fab Offices & Storage	16	Office Areas Only
Y-12	9704-1	Offices	45	
Y-12	9704-2	Administration Offices	171	
Y-12	9706-1	Prod. Cert.	42	
Y-12	9706-1A	Prod. Cert.	23	
Y-12	9706-2	Medical/PSS	112	
Y-12	9709	Shops/Training	58	
Y-12	9710-2	Guard Hdg.	42	
Y-12	9710-3	Guard Hdq.	78	
Y-12	9711-1	Tech. Library	60	
Y-12	9711-5	Cafeteria/Training	69	
Y-12	9712	Garage	12	Office Areas Only
Y-12	9720-3	Maintenance	10	
Y-12	9720-5	SS Warehouse	24	
Y-12	9720-6	Plant Maintenance	72	
Y-12	9720-8	Stores Offices	84	Office Areas Only

Buildings That Require Wiremold For Exposed Cables				
Site	Building	Deescription	# Ckts	Comments
Y-12	9723-14	Offices/Testing	51	
Y-12	9723-16	Construction Eng.	81	
Y-12	9723-25	Fab. Systems	18	
Y-12	9731	Research Services	35	
Y-12	9733-1	Engineering	58	
Y-12	9733-2	Engineering	65	
Y-12	9733-3	Engineering	58	
Y-12	9733-4	Engineering	38	
Y-12	9734	Engineering	18	
Y-12	9735	Mass Spectr. Lab	11	
Y-12	9736	Engineering	29	
Y-12	9737	Maintenance	84	
Y-12	9739	Engineering	69	
Y-12	9764	Offices	22	
Y-12	9766	Tech. Info. Offices	115	
Y-12	9769	Plant Labs	27	
Y-12	9831	Elec. Rev. & Warehouse	11	Office Areas Only
Y-12	9983-62	Mod West Offices	21	
Y-12	9983-63	Mod West Offices	19	
Y-12	9983-64	Mod West Offices	25	
Y-12	9983-65	Mod West Offices	14	
Y-12	9983-71	Mod West Offices	23	
Y-12	9983-72	Mod West Offices	25	
Y-12	9995	Plant Lab	104	Office Areas Only
Y-12	9998	Production	68	Office Areas Only

APPENDIX 3

ACCEPTABLE SITE LOCATIONS FOR EQUIPMENT

SITE NO.	FACILITY NAME /FUNCTION	FACILITY LOCATION	NEW BLDG	EXIST BLDG	DRAWINGS/REPORTS					
					SITE	ACCESS	TOPO	BLDG	KEY	SOILS REPORTS
Y-1	CENTRAL OFFICE 9702-1 (& OFFICES FOR COMPANY EMPLOYEES)	9702 (AREA WEST OF)	X		X	X	X			*
	CONTROL CENTER (OICC)									
	PERSONNEL OFFICES									
	MAINTENANCE SHOPS	SITE CENTRAL OFFICE								
	PARTS/EQUIPMENT STORAGE									
Y-2	REMOTE EQUIPMENT (HUB) 9702-2	9723-27 (AT S W CORNER)	X		X	X	X			
Y-3	REMOTE EQUIPMENT (HUB) 9702-3	9731 (AREA SOUTH OF)	X		X	X	X			
Y-4	REMOTE EQUIPMENT (HUB) 9702-4	9201-5 (AT S E CORNER)	X		X	X	X			
K-1	CENTRAL OFFICE K-1039-1	K-1039 (AREA SOUTH OF)	X		X	X	X		X	*
K-2	REMOTE EQUIPMENT (HUB) K-1039-2	K-1001 (N W OF "C" WING)	X		X	X	X		X	
K-3	REMOTE EQUIPMENT RM (HUB)	K-1007 (ROOM AT COL J/2)		X		X		X	X	
K-4	REMOTE EQUIPMENT RM (HUB)	K-1401 (ROOM AT COL F/17)		X		X		X	X	
X-1	CENTRAL OFFICE ROOM	4500N (RMS 13, 13A & 14 BASEMENT)		X		X		X	X	
X-2	REMOTE EQUIPMENT RM (HUB)	1505, ROOM #117		X		X		X	X	
X-3	REMOTE EQUIPMENT RM (HUB)	6000 (ROOM AT COL H/10)		X		X		X	X	
X-4	REMOTE EQUIPMENT RM (HUB)	7603 (ROOM 255)		X		X		X	X	
X-5	REMOTE EQUIPMENT RM (HUB)	7917 (TEL COMM RM)		X		X		X	X	
T-1	CENTRAL OFFICE ROOM	FEDERAL BUILDING RM B109 AND ADDITIONAL SPACE AS SHOWN IN APPENDIX 3A		X		X		X	X	
T-2	CENTRAL OFFICE ROOM	1916-T1 (OSTI BLDG ROOM 201)		X				X		

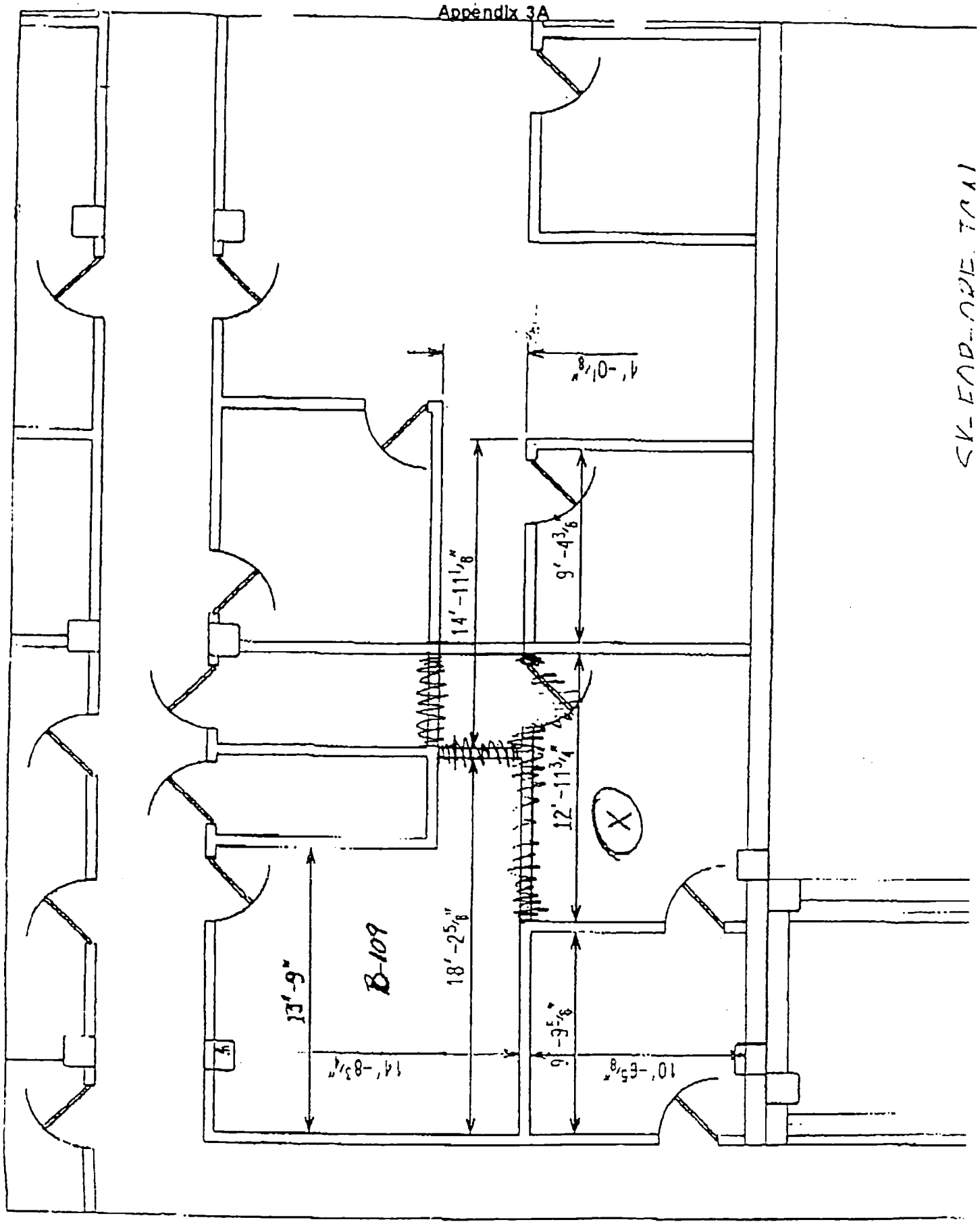
REMARKS: * SOILS REPORT TO BE FURNISHED LATER
Y is Y-12; K is K-25; X is X-10; T is Townsite

APPENDIX 3

ACCEPTABLE EQUIPMENT ROOMS IN EXISTING BUILDINGS

SITE NO.	BLDG NO.	ROOM NO. OR COLUMN LINES	EXISTING ROOM CONDITIONS					
			CLG.	FLOOR	NORTH WALL	EAST WALL	SOUTH WALL	WEST WALL
X-1	4500-N	13	12"X12" ACOUST TILE 9'-10" HIGH	VINYL TILE ON CONC	GYP BD ON 4" STUDS	GYP BD ON 4" STUDS	CONC BLOCK	GYP BD ON 4" STUDS
X-1	4500-N	13A	SUSP EGG CRATE W/ FLUSH LGTS 7'-8" HIGH	VINYL TILE ON CONC	PRE-FINISHED MASONIT E PANELS	GYP BD ON 4" STUDS	GYP BD ON 4" STUDS	CONC BLOCK
X-1	4500-N	14	12"X12" ACOUST TILE 3 LEVEL CLG	VINYL TILE ON CONC	GYP BD ON REINF CONC	GYP BD ON CONC BLOCK	CONC BLOCK	GYP BD ON 4" STUDS
X-2	1505	117	SUSP ACOUST FLUSH LGTS 9'-6" HGT	CONC		CONC BLOCK	CONC BLOCK	CONC BLOCK
X-3	6000	AT COL. H/10	CONC PLANK 16"W HGT 13'-0"	CONC	CONC BLOCK	GYP BD ON 4" STUDS	ROLL FORMED METAL SIDING	CONC BLOCK
X-4	7603	255	EXPOSED INSUL ROOF DECK-HGT 14'-6"	VINYL TILE ON CONC	CONC BLOCK	GYP BD ON 4" STUDS 8'-0" HGT	CONC BLOCK	MTL INSUL SAND PNL & EXPOSED INSUL ABV
-	7603	256 FOR INFO ONLY	EXPOSED INSUL ROOF DECK-HGT 14'-6"	VINYL TILE ON CONC	CONC BLOCK	CONC BLOCK	CONC BLOCK	GYP BD ON 4" STUDS 8'-0" HGT
X-5	7917	TEL COMM ROOM	EXPOSED MTL FLR DECK 11'-10" HGT	VINYL TILE ON CONC	GYP BD ON 4" MTL STUDS	GYP BD ON 4" MTL STUDS	GYP BD ON 4" MTL STUDS	GYP BD ON 4" MTL STUDS
K-3	K-1007	AT COL. LINE J/2	24"X48" SUSP ACOUST 9'-0" HGT	VINYL TILE ON CONC	CONC BLOCK & BRICK VENEER	CONC BLOCK	CONC BLOCK	CONC BLOCK
K-4	K-1401	AT COL. LINE F/17	12"X12" ACOUST TILE ON 2X6 WD JST 8'-0" HGT	CONC PAINTED	CONC BLOCK	CONC BLOCK	CONC BLOCK	1/4" PLY WD SOUTH END - CONC BLOCK NRTH END
T-1	FEDERAL BLDG	B109 STORAGE ROOM	EXPOSED REINF CONC FLR HGT 13'-2"	CONC PAINTED	CONC BLOCK (E&W ENDS)	CONC BLOCK	CONC BLOCK	CONC BLOCK
-	FEDERAL BLDG	ELECT EQP. RM ADJ. TO B109 FOR INFO ONLY	EXPOSED REINF CONC FLR HGT 13'-2"	CONC	CONC BLOCK	CONC BLOCK	CONC BLOCK	CONC BLOCK
-	FEDERAL BLDG	TELECOMM. RM ADJ. TO B109 FOR INFO ONLY	EXPOSED REINF CONC FLR HGT 13'-2"	CONC	CONC BLOCK	CONC BLOCK	CONC BLOCK	CONC BLOCK

REMARKS: Y is Y-12; K is K-25; X is X-10; T is Townsite


B-109
13'-9"
14'-8 3/4"
18'-2 5/8"
14'-11 1/8"
12'-11 3/4"
9'-4 3/8"
9'-3 5/8"
10'-6 5/8"
4'-0 1/8"
X

APPENDIX 4

AVERAGE BUSY HOUR TRAFFIC REQUIREMENTS

TABLE 1: VOICE TRAFFIC - OFFERED LOAD

		Y-12	X-10	K-25	TOWNSITE
INTRA-SITE	Calls	16,170	10,212	2,553	7,830
	CCS	16,281	10,283	2,571	4,971
Y-12	Calls		5,106	2,043	8,170
	CCS		5,141	2,057	8,227
X-10	Calls			2,043	5,787
	CCS			2,057	5,827
K-25	Calls				3,064
	CCS				3,086
SCB	Calls	6,344	4,178	1,084	3,858
	CCS	6,388	4,207	1,090	3,896
FTS2000	Calls*	1,786	1,191	298	1,190
	CCS*	1,800	1,200	300	1,200

NOTES:

*FTS2000 calls shall be processed by the switch. FTS2000 trunks will be provided by AT&T.

The busy hour offered traffic load in hundred call-seconds, CCS, as stated in this appendix, is the mean traffic intensity for Poisson-distributed calling, and is the mean number of simultaneous calls offered during busy hour.

Average Busy Hour: As defined for this requirement, average busy hour is the average of the busiest hours in each of the five busiest days during twenty business days of the busiest season. In this context, average busy hour is equivalent to the Average Bouncing Busy Hour, ABBH, of the busy season.

These loads include a 10% margin to handle an optional data load, in accordance with Section 3.3.1.4, Data Packet Switching.

APPENDIX 4

AVERAGE BUSY HOUR TRAFFIC REQUIREMENTS (CONTINUED)

TABLE 2: DATA TRAFFIC - 1.5 GIGABIT THRUPUT

BUSY HOUR THRUPUT- Megabits

		Y-12	X-10	K-25	TOWNSITE
INTRA-SITE	Packet Sw	263.4	213.4	214.6	63.3
	CS Option	2.6	1.6	0.4	1.2
	Total	266.9	215.0	215.0	64.5
Y-12	Packet Sw		150.0	158.7	73.7
	CS Option		1.0	0.3	1.3
	Total		159.0	159.0	75.0
X-10	Packet Sw			111.6	112.5
	CS Option			0.4	1.0
	Total			112.0	113.5
K-25	Packet Sw				93.6
	CS Option				.4
	Total				94.0

NOTES:

CS Option: Data traffic which can utilize the circuit switch in accordance with Section 3.3.1.4, Data Packet Switching. With this option exercised the data traffic carried by the circuit switch will be 10% of the capacity traffic specified in Table 1, and is included in offered load.

The total load specified in this table defines a busy hour thruput of 1.5 Gigabits for the VDTS, as specified in Section 3.3.1.3.1.

APPENDIX 5A, Parts I and II

INTER-SITE and TOWNSITE TO TOWNSITE CIRCUITS

The following circuit designations and descriptions explain the types of circuits listed on the inter-site circuit list. For those designations in () that begin with the letter A, A is simply a filler the Company sometimes inserts to establish a 7 digit circuit identification number. The A has no relevance to the SCB designation for circuit type.

Circuit Designator	Description
DH, D	1.544 megabit channel; two point; intra- or inter-office channel; for the transmission of simultaneous two-way digital signals; SCB Private Line Tariff, Section B7.1, Page 1.
HWD, HW, H	Synchronet digital service used to transmit intra-lata digital service in speeds of 2.4, 4.8, 9.6 or 56 kbps; all OORTS service is two point; SCB Private Line Tariff, Section B7.1, Page 6.
GD/FD/GH (OR AGD/AFD/AGH)	Type 2150 4 wire, intra exchange circuit or Type 2152 2 wire, intra exchange circuit; used for analog data service between two points at the OORTS; full duplex available on Type 2150 and half duplex available on 2152; SCB Private Line Tariff, Section B3.2, Page 10.
GL/GT (OR AGL/AGT)	Type 2053 2 wire, voice grade circuit; bridging and signaling available; engineered for 1004Hz net loss of up to 10db; used as two point ringdown circuits at the OORTS. SCB Private Line Tariff, Section B3.3.2, Page 28.
GS/GC (or AGS/AGC)	Type 1101 2 wire, intra-exchange, sub voice grade circuit used for DC transmission (Metallic Continuity); Alarm, remote metering, and supervisory control type circuits; SCB Private Line Tariff, Section B3.2, Page 7.
GM/GR (or AGM/AGR)	Type 2153 2 wire, intra-exchange, voice grade circuit used for radio circuits, ringdown circuits and metering circuits; used in two point installations at the OORTS. SCB Private Line Tariff, Section B3.2.2, Page 11.
LA	A short run (i.e., less than 1/2 mile) intra-site 4 wire circuit similar to a "GD" circuit but without a load coil to extend the distance.

Appendix 5A, Part I

INTER-SITE CIRCUITS

(On Y-12-X-10-K-25-Federal-1916-T1 Fiber Loop)

MACCT	CIRCUIT	BNO1	BNO2
M746500	GR10038	962*	9706-2
M746500	GR10029	962*	K-1650
M746500	GR10033	962*	K-1650
M746500	GR10034	962*	K-1650
M746500	GR10028	962*	FEDERAL
M746500	GR10030	962*	FEDERAL
M746500	GR10031	962*	FEDERAL
M746500	GR10032	962*	FEDERAL
*X-10 Site - Radio Transmitter Facility at Chestnut Ridge			
M745000	AGM5166	1916-T1	9706-2
M745000	GC10139	1916-T1	FEDERAL
M745000	AGM5165	1916-T2	9706-2
M748000	GL10194	1916-T2	FEDERAL
M748000	GL10199	1916-T2	FEDERAL
M748000	GL10961	1916-T2	FEDERAL
M748000	GL14935	1916-T2	FEDERAL
M748000	GL16417	1916-T2	FEDERAL
M748000	GL18382	1916-T2	FEDERAL
M745000	GS83198	1916-T2	FEDERAL
M745000	GS84859	1916-T2	FEDERAL
M745000	GS85145	1916-T2	FEDERAL
M745000	GS88135	1916-T2	FEDERAL
M745000	GS88484	1916-T2	FEDERAL
M745000	GS84186	1916-TC	2714-H
M745000	GS84859	1916-TC	FEDERAL
M745000	GS85145	1916-TC	FEDERAL
M745000	GS88135	1916-TC	FEDERAL
M745000	GS88484	1916-TC	FEDERAL
M748000	GL10194	1916-TC	FEDERAL
M748000	GL10199	1916-TC	FEDERAL
M748000	GL10483	1916-TC	1916-T1
M748000	GL10961	1916-TC	FEDERAL
M748000	GL14935	1916-TC	FEDERAL
M748000	GL16417	1916-TC	FEDERAL
M748000	GL18382	1916-TC	FEDERAL
M740002	*D500400*	*2500*	*9103*
M745000	GD05261	2500	9117
M745000	GC10105	2500	7930
M740002	*D500401*	*2500*	*K-1652*
M745000	GC13595	2500	K-303-7

Appendix 5A, Part I

INTER-SITE CIRCUITS

(On Y-12-X-10-K-25-Federal-1916-T1 Fiber Loop)

MACCT	CIRCUIT	BNO1	BNO2
M746500	GR10038	962*	9706-2
M746500	GR10029	962*	K-1650
M746500	GR10033	962*	K-1650
M746500	GR10034	962*	K-1650
M746500	GR10028	962*	FEDERAL
M746500	GR10030	962*	FEDERAL
M746500	GR10031	962*	FEDERAL
M746500	GR10032	962*	FEDERAL
*X-10 Site - Radio Transmitter Facility at Chestnut Ridge			
M745000	AGM5166	1916-T1	9706-2
M745000	GC10139	1916-T1	FEDERAL
M745000	AGM5165	1916-T2	9706-2
M748000	GL10194	1916-T2	FEDERAL
M748000	GL10199	1916-T2	FEDERAL
M748000	GL10961	1916-T2	FEDERAL
M748000	GL14935	1916-T2	FEDERAL
M748000	GL16417	1916-T2	FEDERAL
M748000	GL18382	1916-T2	FEDERAL
M745000	GS83198	1916-T2	FEDERAL
M745000	GS84859	1916-T2	FEDERAL
M745000	GS85145	1916-T2	FEDERAL
M745000	GS88135	1916-T2	FEDERAL
M745000	GS88484	1916-T2	FEDERAL
M745000	GS84186	1916-TC	2714-H
M745000	GS84859	1916-TC	FEDERAL
M745000	GS85145	1916-TC	FEDERAL
M745000	GS88135	1916-TC	FEDERAL
M745000	GS88484	1916-TC	FEDERAL
M748000	GL10194	1916-TC	FEDERAL
M748000	GL10199	1916-TC	FEDERAL
M748000	GL10483	1916-TC	1916-T1
M748000	GL10961	1916-TC	FEDERAL
M748000	GL14935	1916-TC	FEDERAL
M748000	GL16417	1916-TC	FEDERAL
M748000	GL18382	1916-TC	FEDERAL
M740002	*D500400*	*2500*	*9103*
M745000	GD05261	2500	9117
M745000	GC10105	2500	7930
M740002	*D500401*	*2500*	*K-1652*
M745000	GC13595	2500	K-303-7
M745000	GS95964	2714-G/J*	FEDERAL

*Breezeway between 2714-G & 2714-J

Appendix 5A, Part I

INTER-SITE CIRCUITS
(On Y-12-X-10-K-25-Federal-1916-T1 Fiber Loop)

MACCT	CIRCUIT	BNO1	BNO2
M740002	*DHD3285*	*2714-G*	*4500-N*
M745000	GC13544	2714-H	FEDERAL
M740001	GD33457	2714-H	FEDERAL
M745000	GS80587	2714-H	FEDERAL
M745000	AGM5164	2714-J	9706-2
M740002	*DH72254*	*4500-N*	*9103*
DOENETS	GD93696	4500-N	9117
M740002	GD06613	4500-N	9709
M740002	GD88830	4500-N	9709
M740001	AGD2435	4500-N	9201-2
M740001	AGD4653	4500-N	9201-2
M740001	GDP2934	4500-N	9201-2
M748000	GL10217	4500-N	9201-2
M740002	AGD2431	4500-N	9711-1
M740001	AGD4654	4500-N	9711-1
M740001	GD11782	4500-N	K-1002
M740002	GD83936	4500-N	K-1002
M740002	AGD1487	4500-S	9112
M740002	GD10560	4500-S	9117
M740002	GD67920	4500-S	9769
M740002	AGD1026	4500-S	9201-2
M740002	AGD3769	4500-S	9201-2
M740001	GD10227	4500-S	K-1007
M740002	GD12883	4500-S	K-1007
M740002	*HWD0037*	*4500-S*	*K-1007*
M740002	AGD4302	4500-S	BADGER
M748000	GLP0005	4512	FEDERAL
M740002	*D500868*	*7001*	*9720-8*
M746500	GL97635	7505	W.Radio *
*Y-12 W Radio at Pineridge			
M740001	GD92805	9103	2500
M740002	GD67779	9103	4500-N
M740002	*HWD0019*	*9103*	*4500-S*
M740002	*D500548*	*9103*	*K-1007*
M740002	*DH80458*	*9103*	*K-1007*
M740001	*DHD3089*	*9103*	*K-1007*
M740002	GD31784	9103	K-1007
IBMU003	AGD1061	9104-2	4500-N
M740002	AGD3601	9104-2	4500-N
M740002	AGD3602	9104-2	4500-N
M740002	*HWD1089*	*9117*	*1916-T1*
M740002	*DHD3247*	*9117*	*FEDERAL*

Appendix 5A, Part I

INTER-SITE CIRCUITS

(On Y-12-X-10-K-25-Federal-1916-T1 Fiber Loop)

MACCT	CIRCUIT	BNO1	BNO2
M740002	D500801	9117	4500-N
M740002	DHD3141	9117	4500-N
M740002	HWD0046	9117	4500-N
M740002	HWD0047	9117	4500-N
M740002	HWD1510	9117	4500-N
M740002	HWD1837	9117	4500-N
M740002	D500306	9117	FEDERAL
M740001	DHD0079	911.7	K-1007
M740002	DHD3606	9117	K-1007
M740002	H500404	9117	K-1007
M740002	HWD0039	9117	K-1007
M740002	HWD0055	9117	K-1023
M740002	GD10700	9117	K-1030
M740002	DHD3433	9117	K-1320
M740002	GD94025	9117	K-1580
M740002	DHD3442	9117	K-1650
M740002	GD39417	9117	K-303-8
M740002	DHD0073	9201-2	4500-N
IBMU003	AGD1165	9204-1	4500-N
M740002	GD17359	9211	4500-S
M740001	AGD2432	9224	4500
M740001	AGD2433	9224	4500
M740001	AGD2434	9224	4500
M740001	AGD4655	9224	4500-N
M740002	AGD0170	9706-2	3500
M740002	AGD0171	9706-2	3500
M740002	AGD0937	9706-2	3500
M740002	GD19791	9706-2	3500
M746500	GD93388	9706-2	7740
M746500	GR10067	9706-2	FEDERAL
M746500	GT11352	9710-2	FEDERAL
M746500	GT15012	9710-2	FEDERAL
M746500	GT72003	9710-2	FEDERAL
M740001	AGD2421	9711-1	4500-N
M740001	AGD2422	9711-1	4500-N
M748000	GL73495	9714	1916-T2#
#SAME AS 1916-TC			
M740001	GD07229	9714	K-1039
M740001	GD10623	9714	K-1039
M740001	GD16469	9714	K-1039
M740001	GD17863	9714	K-1039
M740001	GD85390	9714	K-1039

Appendix 5A, Part I

INTER-SITE CIRCUITS

(On Y-12-X-10-K-25-Federal-1916-T1 Fiber Loop)

MACCT	CIRCUIT	BNO1	BNO2
M740001	GD93925	9714	K-1039
M740001	LA28039	9714	K-1039
M740002	AGD1020	9720-8	K-1007
M740002	*D500833*	*9720-8*	*K-1007*
M740002	GD74835	9720-8	K-1007
M740002	GD76209	9720-8	K-1007
M740002	GD73810	9733-1	4500-N
M740001	AGD3780	9736	K-1007
M740001	LA75056	BADGER	FEDERAL
M740002	GD16370	FEDERAL	9117
DOENETS	GD93450	FEDERAL	9117
DOENETS	GD97227	FEDERAL	9117
M745000	GC11888	FEDERAL	1916-T1
M745000	GC13381	FEDERAL	1916-T1
M740002	GD67743	FEDERAL	1916-T1
M740002	GD69996	FEDERAL	1916-T1
M740001	GL19723	FEDERAL	1916-T2
M745000	GL29469	FEDERAL	1916-T2
M748000	GL28762	FEDERAL	2714-H
M740002	*D500537*	*FEDERAL*	*2714-J*
M745000	AGM5169	FEDERAL	9706-2
M740002	*DHD3180*	*FEDERAL*	*9706-2*
M740002	GD18231	FEDERAL	9706-2
M748000	GLP0004	FEDERAL	9706-2
M748000	GLP0002	FEDERAL	9710-3
M748000	GL15369	FEDERAL	K-1650
M746500	GT70018	FEDERAL	RADIO*
*Radio Repeater Guardshack Y-12			
M746500	GR10040	FEDERAL	TOWER*
*Y-12 Radio Tower near Water Plant East Corner			
M748000	GD13765	K-814	962*
*X-10 Site - Radio Transmitter Facility at Chestnut Ridge			
M746500	GR10039	K-814	FEDERAL
M740002	GD65655	K-1002	4500-N
M740001	AGD1055	K-1007	7001
M740002	*HWD0012*	*K-1007*	*7001*
M740002	*HWD0040*	*K-1007*	*9103*
M740002	*DHD3400*	*K-1007*	*9117*
M740002	GD13692	K-1007	9117
IBMU003	AGD4110	K-1007	4500-N
M740002	*DHD3154*	*K-1007*	*4500-N*
M740002	*DHD3507*	*K-1007*	*4500-N*

Appendix 5A, Part I

INTER-SITE CIRCUITS
(On Y-12-X-10-K-25-Federal-1916-T1 Fiber Loop)

MACCT	CIRCUIT	BNO1	BNO2
M740002	*HWD0004*	*K-1007*	*4500-N*
M740002	*HWD0005*	*K-1007*	*4500-N*
M740002	*HWD0041*	*K-1007*	*4500-N*
M740001	*DHD3092*	*K-1007*	*4500-S*
M740002	*HWD0017*	*K-1007*	*4500-S*
M740002	*HWD0063*	*K-1007*	*4500-S*
M740002	GDP1022	K-1007	9711-5
M740002	AGD2031	K-1007	9720-8
M740002	*HWD0014*	*K-1007*	*9720-8*
M740001	GD01478	K-1039	1916-T2#
M740001	GD02199	K-1039	1916-T2#
M740001	GD05628	K-1039	1916-T2#
M740001	GD06580	K-1039	1916-T2#
M740001	GD06640	K-1039	1916-T2#
#SAME AS 1916-TC			
M746500	GL98259	K-1039	3017
M746500	GL90050	K-1039	9706-2
M746500	RT06658	K-1200	7740
M740002	GD00852	K-1200	9706-2
M740002	GD33690	K1310AR	9114
M740002	*DHD0069*	*K-1580*	*9117*
M740002	*DHD0070*	*K-1580*	*9117*
IBMU001	*HWD0050*	*K-1580*	*9736*
M740002	GD17585	K-1650	2016
M740002	GD27546	K-1650	1501-1
M740001	GD72349	K-1650	9706-2
M740002	*D500294*	*K-1650*	*FEDERAL*
M746500	GR10053	K-1650	FEDERAL
M746500	GR10054	K-1650	FEDERAL
M746500	GR10064	K-1652	FEDERAL
M740002	GD94179	Y-12*	X-10*

*Y-12 SUBSTATION K751 TO X10 SUBSTATION K741

Appendix 5A, Part II

TOWNSITE CIRCUITS
(NOT On Inter-Site Fiber Loop)

MACCT	CIRCUIT	BNO1	BNO2
M740001	GD76308	1916-T1	POLLARD
M740002	*DHD3149*	*2714-G*	*1404-5**
**See Description Note, Grid F-15, Townsite Map (Scarborough Facility)*			
M740002	*D500991*	*2714-G*	*MEDICAL°°°*
°°°140 E Vance			
M740002	*DHD3715*	*4500-N*	*701SCAR*
M740002	*DHD0080*	*4500-N*	*78MITCH*
M740001	*DHD3432*	*4500-N*	*78MITCH*
M740002	*D500397*	*4500-N*	*97BMID#*
#Map Location D15			
M740002	*D500850*	*4500-N*	*CLINTON HS*
M745000	GC10076	4500-N	CHEYENN
M745000	GC10015	4500-N	MIDWAY
M740002	*D500986*	*4500-N*	*MUSEUM*
M740001	*DHD3132*	*4500-S*	*9204-2E*
M740002	*D500114*	*9114*	*55JEFF*
M740002	*H500009*	*9117*	*COMM PK*
M740001	*DHD3359*	*9117*	*EBASCO**
*111 Union Valley Rd.			
M740002	*DHD3607*	*9117*	*FEDC*
M740002	AGD4752	9201-2	MAXIMA
M740001	GD23401	9702	1009COM
M740002	GD12561	9702	185LAFAYETTE
M748000	GL85533	9706-2	100TPK
M748000	GL86862	9706-2	100TPK
M748000	GL86883	9706-2	100TPK
M745000	GC10128	9706-2	CHEYENN
M745000	GC10130	9706-2	CHEYENN
M745000	GC10131	9706-2	CHEYENN
M745000	GC10132	9706-2	CHEYENN
M745000	GC10135	9706-2	CHEYENN
M745000	GC10136	9706-2	CHEYENN
M748000	GL10038	9710-2	119 Midway
M745000	GT74409	9983-49	PINERDG
M740002	*D500180*	*105 BROADWAY*	*K-1007*
M740001	GD33958	1009COM	9702
M740002	*D500993*	*1009COM*	*MEDICAL°°°*
°°°140 E Vance			
M740001	*D500186*	*200FAIR**	*4500-N*
**200 Fairbanks Road (Jefferson Jr. High School)*			
M740002	*DHD0067*	*55JEFF*	*2714*

Appendix 5A, Part II

TOWNSITE CIRCUITS
(NOT On Inter-Site Fiber Loop)

MACCT	CIRCUIT	BNO1	BNO2
M740002	GD16282	55JEFF	9114
M740002	*D500334*	*55JEFF*	*9117*
M740001	*H500334*	*55JEFF*	*9117*
M745000	GC10192	55JEFF	9706-2
M745000	GS11534	55JEFF	FEDERAL
M745000	GS13151	55JEFF	FEDERAL
M745000	LA72671	55JEFF	FEDERAL
M745000	LA74262	55JEFF	FEDERAL
M745000	LA78499	55JEFF	FEDERAL
M740002	*DH83663*	*55JEFF*	FEDERAL
M740002	*DH87837*	*55JEFF*	FEDERAL
M740002	*DH83663*	*55JEFF*	*JEFERSN*
M740002	*DH87837*	*55JEFF*	*JEFERSN*
M740001	GD94421	55JEFF	K-1007
M740001	*HWD0800*	*55JEFF*	*K-1007*
M740002	GD12700	55JEFF	K-1023
M740001	GD72544	55JEFF	K-1023
M740002	GD76762	55JEFF	K-1023
M740002	GD25828	55JEFF	LAB**
**301 Laboratory Road			
M740001	GD33176	101MIDWAY	9702
M740001	GD31248	78MITCHEL	9702
M740001	GD37467	78MITCHEL	9702
M740002	*DHD3441*	*105MITCHEL*	*2714-G*
M740002	*D500884*	*105MITCHEL*	*4500-S*
M740001	GD30467	105MITCHEL	9702
M740002	*D500200*	*105MITCHEL*	*COMERCE*
M740002	*D500990*	*105MITCHEL*	*MEDICAL°°°*
°°°140 E Vance			
M740001	LA16492	105MITCHEL	MITCHEL
M740001	LA20636	105MITCHEL	62MITCHEL
M740001	LA22689	105MITCHEL	62MITCHEL
M740001	LA24537	105MITCHEL	62MITCHEL
M740001	LA24663	105MITCHEL	62MITCHEL
M740001	LA24685	105MITCHEL	62MITCHEL
M740001	LA18019	105MITCHEL	78MITCHEL
M740002	GD39668	118MITCHEL	9702
M740001	LA24793	118MITCHEL	105MITCHEL
M740001	LA27134	118MITCHEL	105MITCHEL
M740001	LA29885	118MITCHEL	105MITCHEL
M740001	LA31042	118MITCHEL	105MITCHEL

Appendix 5A, Part II

TOWNSITE CIRCUITS
(NOT On Inter-Site Fiber Loop)

MACCT	CIRCUIT	BNO1	BNO2
M740001	LA32495	118MITCHEL	105MITCHEL
M740001	LA33967	118MITCHEL	105MITCHEL
M740001	LA35138	118MITCHEL	105MITCHEL
M740001	LA35981	118MITCHEL	105MITCHEL
M740001	LA36774	118MITCHEL	105MITCHEL
M740001	LA37235	118MITCHEL	105MITCHEL
M740001	LA39746	118MITCHEL	105MITCHEL
M740001	GD36599	130MITCHEL	9702
M740001	LA28179	130MITCHEL	MITCHEL
M740002	*D501057*	*173MITCHEL*	*9117*
M740001	GD33730	173MITCHEL	9702
M740001	*D500183*	*304NYAV**	*4500-N*
*304 New York Avenue			
M740001	*D500184*	*127PROV**	*4500-N*
*127 Providence Road (Oak Ridge High School)			
M740001	GD18083	331-ROB*	K-1007
M740002	GD23211	331-ROB*	K-1007
*331 Robertsville Rd (AT&T Office)			
M740001	*D500185*	*245ROBV*	*4500-N*
*245 Robertsville Rd - Robertsville Jr. High School			
M740001	LA73609	601 SCAR	2714-G
M740002	*HWD0064*	*701SCAR*	*1000*
M740002	*H500420*	*701SCAR*	*9117*
M740001	*H500196*	*701SCAR*	*9702*
M740002	GD13288	701SCAR	9737
M740002	GD19945	701SCAR	9737
M740002	*DH50065*	*701SCAR*	*4500-N*
M740002	*D500242*	*701SCAR*	*COMERCE*
M740002	GD04275	1956TPK	K-1035
M740002	*DHD0076*	*1201TPK*	*9117*
M740002	*HWD0981*	*831TriCountyBlvd*	*JEFERSN*
M740002	*D500538*	*831TriCountyBlvd*	*K-1007*
M740002	*DHD3816*	ADMIN*	*1916-T2#*
#SAME AS 1916-TC			
M740002	*DHD3103*	ADMIN*	*MITCHEL*
**120 BADGER*			
M745000	GS18737	ADMIN*	200 S.TULANE
**130 BADGER*			
M745000	GS27734	ADMIN*	200 S.TULANE
*120 Badger			
M740002	*HWD0053*	*ATDL*	*FEDERAL*

Appendix 5A, Part II

TOWNSITE CIRCUITS
(NOT On Inter-Site Fiber Loop)

MACCT	CIRCUIT	BNO1	BNO2
M740002	*HWD0054*	*ATDL*	*FEDERAL*
M740001	LA75056	BADGER	FEDERAL
M740002	AGD1848	BADGER	CRAU
M740001	GD29538	CHARLOT	9702
M745000	AGM5168	CHARLOT	9706-2
M740002	LA77660	CHARLOT	CHEYENN
M740001	GD14737	CHEYENN	4500-N
M745000	AGM5167	CHEYENN	9706-2
M745000	GS12598	CHEYENN	9706-2
M745000	GS13764	CHEYENN	9706-2
M740002	AGD3334	CHEYENN	CHARLOT
M740002	GD11577	CHEYENN	CHARLOT
M740002	GD12834	CHEYENN	CHARLOT
M740002	GD13848	CHEYENN	CHARLOT
M740002	GD13900	CHEYENN	CHARLOT
M740002	GD15358	CHEYENN	CHARLOT
M740002	GD17203	CHEYENN	CHARLOT
M740001	GD17380	CHEYENN	CHARLOT
M740001	LA71049	CHEYENN	CHARLOT
M740002	LA88683	CHEYENN	CHARLOT
M740002	*HWD0035*	*CHEYENN*	*K-1036*
M740002	*DHD3818*	*COMM PK*	*K-1007*
M740002	*DHD3819*	*COMM PK*	*K-1007*
M748000	GL10196	DNTNCON	1916-T2#
#SAME AS 1916-TC			
M745000	AGM5163	E-VANCE	9706-2
M740002	AGD2966	E-VANCE	BADGER
M748000	GL31160	FEDERAL	55JEFF
M740002	LA18857	FEDERAL	JEFERSN
M748000	GLP0003	FEDERAL	MUSEUM
M745000	GC13210	FEDERAL	WIL AVE*
*149 Wilson Ave.			
M740001	GD14264	FOUROAK	K-1007
M745000	GS76449	HWY-58**	FEDERAL
**OR Turnpk @ Flannagan Loop Road			
M740001	*DHD3516*	*JACKSON*	*K-1007*
M740002	*DHD3566*	*JACKSON*	*K-1007*
M740002	GD32408	JACKSON	K-1007
M740002	*HWD2024*	*JACKSON*	*K-1330*
M740002	*D500217*	*K-1007*	*800TPK*
M740001	GD96359	K-1007	CHARLOT

Appendix 5A, Part II

TOWNSITE CIRCUITS
(NOT On Inter-Site Fiber Loop)

MACCT	CIRCUIT	BNO1	BNO2
M740001	*D500338*	*K-1007*	*CHEYENE*
M740001	*DHD3360*	*K-1007*	*CHEYENN*
IBMU003	AGD1740	K-1007	JEFERSN
IBMU003	GD18749	K-1007	JEFERSN
M740001	*HWD0801*	*K-1007*	*JEFERSN*
M740002	*DHD0071*	*K-1023*	*DNTNCON*
M740002	*DHD3632*	*K-1023*	*JEFERSN*
M745000	GC13101	K-25 CU	POLICE*
*K-25 Credit Union to 205 S. Tulane Police Dept			
M740002	AGD4793	MARMSET	EVANCE
M740002	*DHD3376*	*MEDICAL°°°*	*1916-T2*
#SAME AS 1916-TC			
M745000	LA74071	MEDICAL°°°	FEDERAL
°°°140 E Vance			
M740001	LA24793	MITCHEL	105MITCHELL
M740001	LA27134	MITCHEL	105MITCHELL
M740001	LA29885	MITCHEL	105MITCHELL
M740001	LA31042	MITCHEL	105MITCHELL
M740001	LA32495	MITCHEL	105MITCHELL
M740001	LA33967	MITCHEL	105MITCHELL
M740001	LA35138	MITCHEL	105MITCHELL
M740001	LA35981	MITCHEL	105MITCHELL
M740001	LA36774	MITCHEL	105MITCHELL
M740001	LA37235	MITCHEL	105MITCHELL
M740001	LA39746	MITCHEL	105MITCHELL
M740002	AGD1802	MUSEUM	SCITECH*
*300 S. Tulane			
M740002	*HWD0051*	*ORCORP*	*2714-J*
M740002	GD82248	OS3*	9720-8
M740001	GD89454	OS3*	K-1039
*Off-Site Breeder, 18 Flannagan Loop Rd.			
M740001	GL25171	POLLARD	FEDERAL
M745000	GS97170	PINERDG	9706-2
M740001	GD22035	PINERDG	9702
M740001	GD22035	PINERDG	9702
M740002	GD04340	PINERDG	K-1039
M740002	*DHD3724*	*TENNINN*	*9998*

APPENDIX 5B
ORO NATIONAL AND INTERNATIONAL CIRCUIT DIRECTORY

	A	B	C	D	E	F	G	H	I	J	K	L	M
4	CIR. NUM.		VENDOR	SPEED	LOC SITE	LOC BLDG	REM SITE	APPL	TSP	ENC	FUNDING	$/MON.	COMMENTS
5	80HBDC500314		SCB	19.2 KBPS	97BMIT		Athens, TN	OREN			TVA		Ingleside School, OHEN
6	DQEC871233.293		ATT	9.6 KBPS	Comm. Park	ORTC3	Denver	Covia Travel			Covia		For travel reservations
7	AQEM978771		FTS2000	9.6 KBPS	K-25	K1007	NRC/Rockville, Md	NRC			NRC		
8	DHEM956291		FTS2000	1.544 M	K-25	K-1007	PORTSMOUTH	T1 TRIANGLE		DES	UE	$3,909	T1 TRIANGLE, OR-PAD-PORTS
9	DHEM956293		FTS2000	1.544 M	K-25	K-1007	PGDP	T1 TRIANGLE		DES	UE	$3,705	T1 TRIANGLE, OR-PAD-PORTS
10	DQEC871233.292		ATT	9.6 KBPS	K 25	K-1002	Denver	Covia Travel			Covia		For travel reservations
11	12LNGC216551		SCB	9.6 KBPS	K-25	K1007	IBM, KNOXVILLE	MAINT.			IBM		maintenance of IBM equip.
12	80HRDC259		SCB	9.6 KBPS	ORAU	2714G	UT/KNOX	BITNET			ORAU		MACH RM M3
13	AREM954606		FTS2000	56 KBPS	ORAU	ORAU	WASH. D.C.	LAN BRIDGE			ORAU	$946	SDIS CHANNEL 5 (virtual circuit bundled into DHEM986290)
14	FDEJ103325		FTS2000	9.6 KBPS	ORCC	55 Jefferson	Strat. Petro Res. Ofc.	SPRO			DOE		
15	FDEJ978390		FTS2000	9.6 KBPS	ORCC	55 Jefferson	METC	DATA			DOE		METC, Morgantown, WV
16	PLLJ953603		FTS2000	4.8 KBPS	ORO	FOB	PIKETON	RINGDOWN	X		DOE	$624	EOC Ringdown
17	DHEM906249		FTS2000	1.544 M	PAD		PORTS	U E T1 Net		DES	MMES	$4,122	UE T1 Net
18	DHLP981791-001		FTS2000	1.544 M	SCB CO	CO	Birmingham, ALA	Voice					T1 trunk for FTS2000 SVS
19	DHLP981791-002		FTS2000	1.544 M	SCB CO	CO	Birmingham, ALA	Voice					T1 trunk for FTS2000 SVS
20	DHLP981791-003		FTS2000	1.544 M	SCB CO	CO	Birmingham, ALA	Voice					T1 trunk for FTS2000 SVS
21	DHLP981791-004		FTS2000	1.544 M	SCB CO	CO	Birmingham, ALA	Voice					T1 trunk for FTS2000 SVS
22	DHLP981791-005		FTS2000	1.544 M	SCB CO	CO	Birmingham, ALA	Voice					T1 trunk for FTS2000 SVS
23	DHLP981791-006		FTS2000	1.544 M	SCB CO	CO	Birmingham, ALA	Voice					T1 trunk for FTS2000 SVS
24	DQEC871233.292		ATT	9.6 KBPS	Tri City	Tri City Plaza	Denver	Covia Travel			Covia		For travel reservations
25	80DHDC3394		SCB	1.544 M	X-10	4500N	OSTI	ECES			OSTI		T1 link for OSTI access to ECES
26	80DSDC131		SCB	9.6 KBPS	X-10	4500S	UT/KNXVL	DATA			UTK	$337	SSN link to UTK
27	80FDPC5530		SCB	19.2 KBPS	X-10	4500S	Knoxville	RECON			C&TS	$1,200	ACCESS TO TYMNET
28	80HRDC53		SCB	9.6 KBPS	X-10	4500S	UTK	BITNET			C&TS		STC10 BITNET
29	80HRDC5		SCB	9.6 KBPS	X-10	6010	UT/KNXVL	BITNET			C&TS	$130	BITNET, CESAR Lab
30	AQEM978772		FTS2000	9.6 KBPS	X-10	4500N	NRC/Rockville, Md	NRC			NRC		
31	DHEM953872		FTS2000	1.544 M	X-10	4500N	Waksahatchie, Tx	ESNET			DOE-SF		ESNET SSC T1 LINK
32	DHEM954320		FTS2000	1.544 M	X-10	4500N	LeMont, OK	ARM			PNL		ESnet T1 to ARM site
33	DHEM978335		FTS2000	1.544 M	X-10	4500N	ARGONNE	ESNET			DOE-SF		ESNET ANL T1 LINK
34	DHEM978336		FTS2000	1.544 M	X-10	4500N	TALLAHASSEE, FL	ESNET			DOE-SF		ESNET FL T1 LINK
35	DHEP978095		FTS2000	1.544 M	X-10	4500N	NEWPORT NEWS	ESNET			DOE-SF		ESNET CEBAF T1 LINK
36	DQEC871233.292		ATT	9.6 KBPS	X-10	4500N	Denver	Covia Travel			Covia		For travel reservations
37	GTS9100522		SPRINT	9.6 KBPS	X-10	4500N	OCLC	Library			MMES		Library, OCLC

	A	B	C	D	E	F	G	H	I	J	K	L	M
2	APPENDIX 5B												
3	ORO NATIONAL AND INTERNATIONAL CIRCUIT DIRECTORY												
4	CIR. NUM.		VENDOR	SPEED	LOC SITE	LOC BLDG	REM SITE	APPL	TSP	ENC	FUNDING	$/MON.	COMMENTS
38	4065500010001		MCI	1.544 M	X-10	4500N	Knoxville MCI POP	SURAnet					T1 to MCI POP for SURAnet
39	80FDPC4400		FTS2000	4.8 KBPS	Y-12	9201-2	Knoxville	MFE/ Europe			MFE		Tymnet -England and Germany
40	DHD0076		SCB	1.544 M	Y-12	9117	LCKWD GREENE	CADAM			MMES		T1 CADAM TO LG
41	AREM956292		FTS2000	56 KBPS	Y-12	9117	SCOTT/AFB	TRANS/RES			ORNL	$851	ADANS, SDIS CH.2 (virtual circuit bundled into DHEM986290)
42	DHEM955972		FTS2000	1.544 M	Y-12	9117	ALBUQUERQUE	DOECN	X		ALO	$12,100	DOECN T1 TO SA NODE 66
43	DHEM956224		FTS2000	1.544 M	Y-12	9117	GERMANTOWN	DOECN	X		DOE		DOECN T1
44	DHEM978808		FTS2000	1.544 M	Y-12	9117	KANSAS CITY	DOECN	X		ALO		DOECN T1 LINK
45	DHEM979311		FTS2000	1.544 M	Y-12	9117	GERMANTOWN	DOECN	X		DOE		DOECN T1
46	DHEM986290		FTS2000	1.544 M	Y-12	9117	Birmingham	SDIS			MMES		FTS2000 SDIS T1 CIRCUIT
47	DQEC871232 292		ATT	9.6 KBPS	Y-12	9711-5	Denver	Covia Travel			Covia		For travel reservations
48	QSEM953398		FTS2000	56 KBPS	Y-12	9117	Atlanta	PSS			MMES	$0	SDIS ch. 1 (virtual circuit bundled into DHEM986290)
49	DHEM743693		FTS2000	1.544 M	701SCA	701SCA	Vienna, VA	CVTS			MMES		Tech Trans. CVTS
50			This circuit is also listed in Appendix 5A ("Inter-site Circuits) and Appendix 5C ("Special Circuits")										
51	Note:		Two additional FTS 2000 T1s for video conference centers will be installed in 1994, one into the FB, and another one into OSTI.										

APPENDIX 5C - SPECIAL CIRCUITS LISTING

(This appendix is provided under separate cover)

APPENDIX 6

FIBER OPTIC CABLING REQUIREMENTS

INTRA-SITE FIBER OPTIC CABLING

Intra-site fiber links shall consist of 24 fibers of multi-mode fiber and 12 fibers of single-mode fiber.

Multi-mode fiber cable shall comply with the following optical specifications:

Fiber Type:	Graded Index multi-mode fiber
Core Diameter (microns):	62.5
Cladding Diameter (microns):	125 ± 3.0 microns
Numerical Aperture:	0.275
Maximum Attenuation:	3.75 dB/km at 850 nm
	1.5 dB/km at 1300 nm
Minimum Bandwidth:	160 MHz-km at 850 nm
	500 MHz-km at 1300 nm

Single-mode fiber cable shall comply with the following optical specifications:

Fiber Type:	Step index single-mode fiber
Mode Field Diameter (microns):	8.7 - 10 microns ± 0.5 microns
Cladding Diameter (microns):	125 ± 2.0 microns
Cladding Non-circularity:	± 2%
Core to Clad Concentricity Error	≤ 1.0 micron
Cable Cut-off Wavelength	≤ 1270 nm
Maximum Attenuation:	0.4 dB/km at 1310 nm
	0.3 dB/km at 1550 nm
Zero Dispersion Wavelength:	1300 - 1322 nm
Zero Dispersion Slope	< 0.095 ps/(nm^2 - km)
Maximum Dispersion:	3.5 ps/nm - km at 1310 nm
	19 ps/nm - km at 1550 nm

All fiber cabling shall meet the following construction specifications:

Rated for an installation load of 500 lbs. or greater.
Minimum bending radius of 15 times the outside cable diameter.

Aerial installation - loose tube buffer construction, all dielectric, outer UV resistant polyethylene jacket.

Duct installation - loose tube buffer construction, gel-filled, all dielectric construction, outer PVC jacket, meets VF-1 Vertical Flame Test.

Direct Burial - loose tube buffer, gel filled, steel over copper rodent and lightning protective sheath, outer High Density Polyethylene Jacket.

Plenum rated cable (for installation in a building duct, plenum or other environmental air handling spaces) - loose tube buffer construction, all dielectric construction, meets NEC 770-6 (c) and VF-1 Vertical Flame Test.

All cable shall be marked at no more than 2 foot intervals as to the type, number, and gauge of conductors or fiber, and the manufacturer's name. Cable fibers or conductors shall be color coded or numbered to facilitate ease of identification and hookup.

OUTDOOR CABLE JACKET

Outdoor cable shall have a UV resistant, black polyethylene outer jacket. The polyethylene shall conform to one of the following:

Medium density polyethylene - ASTM D1248, Type II, Class C, Category 3, 4, or 5, Grade J4.

High density polyethylene - ASTM D1248, Type III, Class C, Category 5.

The jacket thickness shall conform to the following tolerances:

The minimum nominal outer jacket thickness be 1.4 mm (0.055 inch).

The average thickness of the outer jacket, at any cross section, shall not be less than 85 percent nor greater than 115 percent of the nominal thickness.

The minimal thickness of the outer jacket, at any cross section, shall not be less than 70 percent of the nominal thickness.

OUTDOOR CABLE MECHANICAL REQUIREMENTS

Outdoor cable shall comply with the following mechanical specifications:

Installation Load Rating:	≥ 2700 N (600 lbs.)
Operating Load Rating:	≥ 440 N (100 lbs.)
Installation Bending Radius:	≤ twenty (20) x Cable OD
Operating Bending Radius:	≤ ten (10) x Cable OD

ENVIRONMENTAL PERFORMANCE REQUIREMENTS

The attenuation of the multimode fibers shall not vary more than 0.50 dB/km at 1300 nm and the attenuation of the single-mode fibers shall not vary more than 0.20 dB/km at 1550 nm for the following environmental conditions:

Operation:	-40 degrees C to +65 degrees C
Installation:	-30 degrees C to +60 degrees C
Storage:	-50 degrees C to +70 degrees C

INTER-SITE FIBER OPTIC CABLING

The fiber shall meet the design specifications of the intra-site single-mode fiber optic cabling. See Drawing D2E-145866 for the number of fibers.

APPENDIX 7

COMPANY OFFICE REQUIREMENTS

The Operations Section of the Telephone Network Services Department (TNSD) is a service organization within the Computing and Telecommunications Division. TNSD's primary duties are to provide communications services including operations, maintenance, and administrative functions for all companies/organizations using the official Oak Ridge Telephone System.

Since available space at K-25 is decreasing and the Oak Ridge Federal Integrated Communications Network main switching facility will be located at the Y-12 Plant Site, the TNSD Operations Section (38 employees) will relocate to Y-12.

Minimum space requirements for the Operations Section are listed below:

Functional Requirements for Upper Level:

	Size, Sq. Ft.	No. of Voice/Data Communications Outlets
Secretary Office	120	2
2 - Operations Manager Office	450	2 ea. (4)
Contractor Interface Office	120	2
3 - Group Leader's Office (120 sq. ft. ea.)	360	2 ea. (6)
12 - General Offices (120 sq. ft. ea.)	1,440	2 ea. (24)
Accounting, Cost & Data Base Section	625	15
Service Order Center Section	500	10
Attendant Console Center Section	500	10
Copy, Facsimile, Computer Prt. Ofc.	120	2
Kitchen and Lunch Room	400	2
Directory Publication Office	120	2
Women's Restroom	200	
Men's Restroom	200	
Janitors Closet	48	
Total	5,203	

Functional Requirements for Lower Level:

	Size, Sq. Ft.	No. of Voice/Data Communications Outlets
Conference Room	440	2
Directory Storage & Distribution Ofc.	225	2
Cost Distribution Office	120	2
3 - Communications Specialists Offices	432	2 ea. (6)
Main Communications Room	120	1
Electrical Room	120	
Women's Restroom	130	
Men's Restroom	130	
Janitors Closet	48	
Total	1,765	

Additional Requirements

Provide a Test and Evaluation Room (size--600 sq. ft.) in the telephone equipment area adjacent to the first floor office area with connecting doors to both areas.

Provide desired room dimensions to the greatest extent possible.

Secretary Office - Desirable dimensions 12' x 10'.

Operations Manager Office - Desirable dimensions 15' x 15'.

Contractor Interface Office - Desirable dimensions 12' x 10'.

Group Leader Office - Desirable dimensions 12' x 10'. Office to be adjacent to the Accounting, Cost and Data Base Section.

Group Leader Office - Desirable dimensions 12' x 10'. Office to be adjacent to the Service Order Center Section.

Group Leader Office - Desirable dimensions 12' x 10'. Office to be adjacent to the Console Attendant Section.

Accounting, Cost and Data Base Section - Desirable dimensions 25' x 25'.

Service Order Center Section - Desirable dimensions 25' x 20'.

Console Attendant Section - Desirable dimensions 25' x 20'.

Copy, Facsimile & Computer Printer Office - Desirable dimensions 12' x 10'.

Kitchen & Lunch Room Area - Desirable dimensions 20' x 20'. Equipped with stove, 2 refrigerators, microwave and sink with 8 linear feet of base cabinets.

Directory Publications Office - Desirable dimensions 12' x 10'.

Women's Restroom - Desirable dimensions 20' x 10' to 14' x 14'. Facilities to accommodate an average of 24 to 27 employees.

Men's Restroom - Desirable dimensions 20' x 10' to 14' x 14'. Facilities to accommodate an average of 10 to 15 employees.

Janitors Closet - Desirable dimensions 8' x 6' with a utility sink.

Conference Room - Desirable dimensions 22' x 20' with 40 sq. ft. of closet space in one corner (bi-fold doors on closet; 4 shelves)

Directory Storage & Distribution Office - Desirable dimensions 15' x 15'.

Cost Distribution Office - Desirable dimensions 12' x 10'.

Communications Specialists Offices - Desirable dimensions 12' x 12' each.

Main Communications Room - Dimensions requirement 12' x 10'. A dedicated room for communications equipment.

Electrical Room - Desirable dimensions 12' x 10'.

Women's Restroom - Desirable dimensions 18' x 7' to 12' x 11'. Facilities to accommodate an average of 10 to 15 employees.

Men's Restroom - Desirable dimensions 18' x 7' to 12' x 11'. Facilities to accommodate an average of 8 to 12 employees.

Janitors Closet - Desirable dimensions 8' x 6' with a utility sink.

Test and Evaluation Room - Desirable dimensions 20' x 30'.

Each office shall have a lockable door with a partial glass panel and a window.

Provide 10 paved parking spaces for Company vehicles.

Space adjustment: Some shuffling of office space may be necessary to balance the office space and the ORF-ICN space requirements. Therefore, if offices need to be moved to the second floor, move 1, 2, or 3 of the Communications Specialists offices; or if offices need to be moved to the first floor, move the Directory Publications office first and move the copy, facsimile, and computer printer office next.

APPENDIX 8

DESCRIPTION OF THE SPECIAL USOC SUMMARY LISTING

INTRODUCTION

This Appendix is a report titled "Special USOC Summary Listing." It is multi-purpose data base file depicting both standard Uniform Service Order Codes (USOCs) used throughout the Bell System and modified codes established by the Company.

A description for each code is given, and the quantity that makes up the embedded base and terminal equipment for the existing Official Oak Ridge Telephone System (OORTS) is provided. This is the equipment that is government owned and maintained. The file also contains codes for leased facilities or services from various vendors and cabling configurations for buildings where the DOE Standard Wiring Plan has been installed.

DATE: 10/01/1990 SPECIAL USOC SUMMARY LISTING PAGE: 1

USOC	DESCRIPTION	TOTAL
00100	WIRE LABOR	1
1-3 MIN	OPER SP 1-3-6 MIN	4
1-3-6	OPER SP 1-3-6 MIN	6
1-3MIN	OPER SP 1-3 MIN	1
1-MIN	OPER SP 1 MIN	2
105C	APPARATUS BOX	38
12346	OPER SP 12346 MIN	9
12SCA	12' SPRINGCORD ASH	6
13B	DATA SET	1
13TSX	13' KEYSET CORD	1
153BM3	FML 50P CON RJ11	3
15SCS	OPER SP 15SCS	2
17B	17B RELAY FOR PA	11
17BREL	17B RELY FOR OVRRIDE	17
18K	DATA SET	10
18L	MODEM 202T	98
1DZ	DATA LOCAL CHANNEL	1
1DZNR	DATA CHNL 4 WIRE	68
1L1OG	MOBILE PHONE CHAN	4
1L1OR	MOBILE PHONE CHAN	23
1L3AANR	ADD TERM-SAME BLDG	6
1L3ABNR	SAME BLDG	12
1L3AQNR	SAME PREM,DIFF BLDG	1764
1L3CYNR	DATA MILEAGE	1
1L6BYNR	DATA MILEAGE	77
1L6DANR	ADD TERM-SAME BLDG	20
1L6DBNR	SAME BLDG	216
1L6DGNR	SAME PREM,DIFF BLDG	84
1L6DYNR	SAME PREM,DIFF BLDG	879
1L6GBNR	SAME BLDG	1350
1L6GJ	LOCAL CHANNEL LDCDL	1
1L6GJNR	LOCAL CHANNEL NR	45
1L6GQNR	SAME PREM,DIFF BLDG	3719
1L7KNXX	MILEAGE PVT LI DIGIT	20
1L7KZXX	MILEAGE PVT LI DIGIT	8
1LDPA	LOCAL CHAN 1/2 MILE	226
1LDPZRT	DATA MILEAGE RATED	54
1LHA4	DATA MILEAGE	4
1LHA6	DATA MILEAGE	64
1LHAR	DATA MILEAGE	3
1LHAX	DATA MILEAGE	84
1LHBR	DATA MILEAGE	1
1LHBX	DATA MILEAGE	28
1LMEANR	ADD TERM-SAME BLDG	153
1LMEB	DATA MILE SAME BLDG	2
1LMEBNR	SAME BLDG	1743
1LMEGNR	SAME PREM,DIFF BLDG	63
1LMEXNR	DATA MILEAGE	26
1LMEYNR	SAME PREM,DIFF BLDG	4224
1LMFANR	ADD TERM,SAME BLDG	11
1LMFBNR	SAME PREM,DIFF BLDG	34
1LMFENR	DATA MILEAGE	126

USOC	DESCRIPTION	TOTAL
1LMFGNR	DATA MILEAGE	29
1LMFMNR	DATA MILEAGE	12
1LMFQNR	DATA MILEAGE	3373
1LMFYNR	DATA MILEAGE	745
1LMJBNR	DATA MILEAGE	124
1LPJANR	ADD TERM-SAME BLDG	19
1LPJBNR	SAME BLDG	20
1LPJGNR	SAME PREM,DIFF BLDG	9
1LPJYNR	SAME PREM,DIFF BLDG	522
1LTBY	DATA MILEAGE	4
1LVBENR	PBX STA LNS AND CEN	13
1M820	202 T DATA SET	5
1RSD5NR	DIGITAL LOCAL CHAN	94
1SE12	DATA LOCAL CHANNEL	3
1SENR	DATA LOCAL CHANNEL	2
1SESX	DATA LOCAL CHANNEL	12
2012	2012 TRNSFRM FOR LSI	210
202T	0/1800 202T MODEM	3
2100ANS	ANSWERING MACH ATT	1
217048E	DL BKUP ATND/UNAT	1
2190072	DATA CABINET 72 IN	4
21903	CABINET SHELF GRILL	4
21904	SIDE PANELS	8
21907	DP2 ADDL POWER	2
21D	DIAGNOSTIC CONSOLE	2
2200DC2	DP2 DIAG CONSOLE	1
220148C	MODEM 2048C	2
220196	MODEM 2096A LEASED	1
22631	DP2 S/A MTG 63A2	17
22631A	DP2 S/A MTG LEASED	1
22642	DPII MULTI MTG 64A2	10
2301GPA	MERL GEN PURP ADAPT	9
238	PAGING EQ LOW PWR AM	2
239	PAGING EQ HI PWR AMP	42
23F	PBX LOUDSPEAKER STA	18
24A	ADDTNL TERMINATION	2
24M	MODEM 201C PL	2
24N	PVT LN TTY CHAN TERM	4
24V	MODEM 201C DDD	2
258A	25 PR TO 6 8-PIN JCK	18
259A	25 PR TO 1 8-PIN JCK	36
25P100N	NON-SHIELD 100' 25PR	248
25P100S	SHIELDED 100' 25 PR	523
25P200N	NON-SHIELD 200'25 PR	14
25P200S	SHIELDED 200' 25 PR	29
25P50N	NON-SHIELD 50' 25 PR	4
25SCA	25' SPRINGCORD ASH	36
25SCB	25' SPRING CRD BLACK	21
25SCE	25' SPRING CRD BEIGE	59
25SCEA	25-FT SPRINGCORD	3
25SCV	25' SPRING CRD IVORY	39
25SCVA	25-ST SPRINGCORD	1

USOC	DESCRIPTION	TOTAL
25SCW	25' SPRING CRD WHITE	13
2671XNR	PVT LINE TELE SVC	3
2700ANS	ANSWERING MAC ATT	2
270BDS	DISC SWITCH-SECURE	12
272104G	M4AU CRD-7 FEET	1
272207C	M9G CORD 3-FEET	4
272207T	M9G CORD 30-FEET	1
272501L	4CND-HNDST CRD-12'	2
2750A02	ADAPTER	24
2772BA1	WRG/CK-KEY	2
2772ZA1	WIRING	95
29Q	PVT LINE SWITCH KEY	1
2EG	MODEM DP II 2024	4
2EH	MODEM DP I 2024	2
2EJ	MULTI MOUNT	4
2LNESEL	2 LINE SELECTOR	18
2SE	PVT LINE 2000 SERIES	92
2UN56	DATA NODE TERM	93
3-MIN	OPER SP 3 MIN	4
30032	LINE STATUS IND 16	1
30900	ANSWERBACK	1
30SCS	OPER SP 30 SECONDS	4
31000	TELEPHONE ROTARY ND	2
31001TD	TT SET DESK	1
3100TWR	TEL WALL SET	2
3121040	CODE-A-PHONE PURCH	1
3124180	SIDESADDLE HEDSET JK	1
3160111	MERLIN 5-BTN SET	29
3161172	MERLIN 10 BTN VOICE	53
3162417	MERLIN 34 BTN DLX	7
3162ATD	CONSOLES DELUXE	3
3162BIS	MERLIN 34BTN STA SET	28
3163HFU	MERLIN HANDS FREE	16
3164HFA	MERL HSET ADAPT 2PRG	17
316510B	MERLIN 10B BIS	129
316622B	MERLIN 22B BIS	61
316734B	MERLIN 34B BIS	7
3167DBS	34BTN DLX DISP STA	8
3167DSB	MERLIN 34B DISP	291
31753A	MERL VOL CTRL HNDST	4
31754	NSY LOCATION HANDSET	13
32000	WALL MOUNT 5-BTN SET	26
32001	WALL MOUNT 10BTN SET	29
36A	PLATRONIC HEADSET	3
36ABI	PLATRONIC BI-NAURAL	14
36AE	HEADSET BEIGE	39
36N	NEW OPER HEADSET	12
36S	HEADSET	38
36SU2	PUSH TLK HDSET 2PRNG	3
36VS1	VENTED SER 1 HEADSET	2
36VS2	VENTED SER 2 HEADSET	1
3FU	AUTO ANS & RECORD	1

USOC	DESCRIPTION	TOTAL
3LBNANR	DIGITAL CHANNEL	6
3M-1000	FAX 3M EMT 1000	1
3M-2110	FAX HARRIS 3M-2110	29
3M-2123	FAX HARRIS 3M-2123	1
3M-2127	FAX HARRIS 3M-2127	1
3M-9165	FAX 3M-9165	1
415A	INTRA BLDG R/D CARD	5
418	KS RINGDOWN CARD/642	1
43AXS	TELETYPEWRITER M-43	4
43B	MESSAGE REGISTER EQP	1
43LXS	TELEPRINTER KEYBOARD	2
43LYS	TELEPRINTER RECEIVE	5
475117	NORTHCOM 16-LINE SET	1
475119	NORTHCOM BUSY LAMPFD	1
48J	MODEM DP II 2048A	13
48N	DATAPHONE MULTI MNT	1
49A1	PUSHBTN PAD 1	506
49A2	PUSHBTN PAD 2	58
49B	PUSHBTN PAD 3 OR 4	52
49B4	PUSHBTN PAD 4	31
49C	PUSHBTN PAD 6 OR 8	7
4LA	LAMP INDIC ALL CLRS	7
4LA3	3 LMP INDICATOR LITE	1
4LAA	AMBER LAMP	19
4LAG	GREEN LAMP	15
4LAR	RED LAMP	37
4LAW	WHITE LAMP	200
4LB	LAMP IND 2 OR MORE	14
4LC	VISUAL RING INDICATO	94
4MCPV14	2PR14'MRCD,RJ11/RJ45	12
4MCPV25	2PR25'MRCD,RJ11/RJ45	45
4MCPV7	2PR,7'MCRD,RJ11/RJ45	8
4MCRD14	14 FT,4 COND CORD	1391
4MCRD25	25 FT,4 COND CORD	706
4MCRD7	7 FT, 4 COND CORD	7701
4QF	MODEM DP II	2
4SC	DATA CALLING UNIT	2
51001	15 WATT HORN UNI-DIR	49
51002	4 WATT HORN UNI-DIR	8
5150	WALL MOUNT SPEAKER	63
51AP4	MODULAR LAMP	1
51AP4LA	SINGLE MODULAR LAMP	4
51J	AUTO CARD DIALER	1
52335	MOD TALK-BACK INHIB	3
53010	35 WATT V-P ATTENUAT	8
5322101	VOICE PAGE 100	1
5322A	35 WATT AMPLICENTER	4
5322B	100 WATT AMPLICENTER	1
53GFBYC	BUSY SIGNAL CONTROL	3
53GPEXG	GONG EXT/STA	1
55Y	PAGING EXP ATMOS SET	3
56001	5 WATT CONE SPK SUSP	4

USOC	DESCRIPTION	TOTAL
56130	SPKR KIT RECESSED	109
56150A	5 WATT CONE SPK WALL	1
56150B	5 WATT CONE SPK WALL	6
58000	V/P TALK-BACK CRD	1
58101	V/P AUX ZONE CD T-1	2
59X	PAGING EQ HORN SPK	168
59Z	PAGING EQ SPK HORN	289
5C2	50 A CONFERENCE SET	9
5C2-1	PORT CONF PHONE-NEW	2
5P7	LONG MOUNTING CORD	3
6-MIN	OPER SP 6 MIN	7
6104FC2	MERLIN FEAT CART 2	1
6120CU1	MERLIN 820 COM EQP	1
61212	EXTERNAL BELL	4
61215	EERN ALERT SWITCHES	4
61216	MER2-AUX POWER MOD	1
61224	MERLIN 2 LINE MODULE	2
61225	MER+ 4-LINE MODULE	8
61226	MER+ 10 STA MODULE	2
6122CU2	MER PLUS CTRL UNIT	12
61301	MERLIN 3070 EXPAN	1
61305	FIVE LINE MODULE	7
6130CU	1030/1520 EQP MERLIN	1
6130CU2	CONTROL UNIT 30/70	1
6130F5N	FEATURE MOD#5 MERLIN	1
6130FM4	FTR MODULE 4	1
61310	10 STA MERLIN MODULE	8
6131CU1	MER 2 COM EQPT	14
6131CU2	MER2-COM EQPT REL3	8
61320	PAGING INTERFACE	1
61350	SUP PWR MODUL MERLIN	3
61378	MER2-FEATURE MOD 3	8
61379	MER2-4 LINE MOD	1
61380	MER 2 FTR MODULE 1	1
61381	MER2-FEATURE MOD 2	12
61382	MER 2 4LN/8STA CORD	51
61383	MER 2 4LN CORD	1
61384	MER 2 8LN CORD	28
61385	MER 2 8 STA CORD	10
61390	MER 2 EXPANSION UNIT	5
61392	MER 2 ATTEND CONSOLE	20
641A	PANEL FOR IC	1
642	KS RINGDOWN PANEL	1
66G	PAGING EQ SPK HORN	381
66GAB	PAGING EQPT	510
66GAC	PAGING EQ CONE SPKR	266
66M	66M150 CONNECT BLOCK	161
66MJACK	CINCH CONECT/ADAPTER	118
69F	SIGNALING APPARATUS	2
6BU	PUSHBTN PAD 5	3
6KAEA	PRIVATE LINE MUSIC	1
6SCBA	6FT SPRGCORD BLACK	844

USOC	DESCRIPTION	TOTAL
6SCDA	6FT SPRGCORD GRAY	2
6SCEA	6FT SPRGCORD BEIGE	4043
6SCGA	6FT SPRGCORD GREEN	285
6SCLA	6FT SPRGCORD BLUE	197
6SCRA	6FT SPRGCORD RED	258
6SCVA	6FT SPRGCORD IVORY	1763
6SCWA	6FT SPRGCORD WHITE	96
6SCYA	6FT SPRGCORD YELLOW	124
75P200S	75 PR,200 FT CABLE	2
82B49	82B CONNECT LOCK	10
8310001	428 SURGE PROTECTOR	4
8310002	145A SURGE PROTECTOR	2
8402010	CABLE 10 FT	4
85B1	TRNSFRM FOR WE SPKPH	1
888	RECDS ONLY SEE 9145	85
888-1	SEE GL75694	1
888-10	K25 MNT PD23 PWRSTA	1
888-101	SEE TN 4-6725	1
888-102	CUTOFF CKT CTRL 1650	3
888-103	SHARE IC W/KS 359	1
888-104	SHARE IC W/KS 363	1
888-11	SEE 6-0154	2
888-14	X10 LSS PA CONTROL	15
888-16	Y12 PA CONTROL OR	1
888-19	EXT IN KS204 9117	3
888-2	GS84582 TNS BOMB CTL	3
888-20	SEE 4-3840 EXT 9117	3
888-21	SEE 4-3841 EXT 9117	3
888-22	SEE 4-3842 EXT 9117	3
888-23	SEE 88GSPC88583	1
888-24	SEE 88GSPC86898	1
888-25	SEE 88GSPC87392	1
888-26	SEE 88GSPC84202	1
888-27	SEE 88GSPC86419	1
888-28	SEE 88GSPC84123	1
888-29	SEE 88GSPC86822	1
888-3	GL88613 TNS BOMB VC	3
888-30	SEE 88GSPC87362	1
888-31	SEE 88GSPC89658	2
888-33	RINGER CUTOFF 4-3841	1
888-34	RINGER CUTOFF 4-3842	1
888-35	SEE GLPC89050	1
888-36	SEE GSPC88021	1
888-37	SEE 88GSPC87086	1
888-38	SEE 88GSPC80979	1
888-39	SEE 88GSPC89940	1
888-4	GL82946 TNS RCZ LINE	2
888-40	SEE 88GSPC81337	1
888-41	SEE 88GSPC89497	1
888-42	SEE 88GSPC803070	1
888-43	SEE 88GSPC82766	1
888-44	SEE 88GSPC82089	1

USOC	DESCRIPTION	TOTAL
888-45	SEE 88GSPC82190	1
888-46	SEE 88GSPC86395	1
888-47	SEE 88GSPC88633	1
888-48	SEE 88GSPC80950	1
888-49	SEE 4-5851 KS EXT	2
888-5	SEE 4-7103 ON KS 347	2
888-50	SEE 4-5852 KS EXT	3
888-51	SEE 4-5853 KS EXT	3
888-52	IC F/7710 T/7735	3
888-53	PA CTRL F/7710T/7735	3
888-54	COMRING CKT F/KS 321	1
888-55	SEE 88GSPC88098	1
888-56	SEE 88GSPC83681	1
888-57	SEE 88GSPC83681	1
888-58	PA CNTRL 3525/30260	2
888-59	SEE 800-541-1089 B5	1
888-6	GL72668 RINGDOWN DOE	1
888-60	SEE KS 541 6-0144	1
888-61	SEE 800-541-1531	1
888-62	DIAL BKUP @ KNOX BR	1
888-63	CPE MERLIN II FM II	1
888-64	LSI CKT GS82547	1
888-65	LSI CKT GS84089	1
888-66	LSI CKT GS85555	1
888-67	LSI CKT GS86517	1
888-68	LSI CKT FOR 4-3800	1
888-69	LSI CKT FOR 4-8013	1
888-7	GL84660 K25 MNT DP8	1
888-70	LSI CKT FOR 4-3574	1
888-71	LSI CKT FOR 4-9589	1
888-75	800-243-3724 TL1	1
888-8	SEE K25 K1650 PAX#10	1
888-82	SEE TSV-0014	3
888-83	SEE RECORDS 888-82	1
888-84	SEE TSV-0015	1
888-85	SEE KS ON 6-1890	1
888-9	SEE LS4@X10 911 4512	1
888-93	SEE 88GSPC92870	1
888-94	SEE TN 4-8919	1
8BU	PUSH BTN PADS-10/12B	1
8MCRD14	14 FT,8 COND CORD	7
8MCRD25	25 FT,8 COND CORD	3
8MCRD7	7 FT,8 COND CORD	4
912A2	TELPAX CHNL-PVT LNS	6
9191A	TELABS 911 CRT PCK	6
95B1	TRANSFORM WE FOR TAJ	5
96V	MODEM DP II 2096	32
96Y	MODEM DP II 2096	17
99Q	PAGING EQ SPK HORN	540
99R	PAGING EQ HORN SPKR	282
99S	PAGING EQ SPK WTRPF	2
99W	PAGING EQ SIG GEN	1

USOC	DESCRIPTION	TOTAL
9CY	LINE TERMINATION	1
9FV	PAGING OVERRIDE	81
9SRA	12 FT SPRGCORD ASH	12
9SRAI	12FT SPRGCORD ALMOND	7
9SRB	12FT SPRGCORD BLACK	475
9SRBI	12FT SPRGCORD BLACK	21
9SRE	12FT SPRGCORD BEIGE	2711
9SREI	12FT SPRGCORD BEIGE	453
9SRG	12FT SPRGCORD GREEN	204
9SRGI	12FT SPRGCORD GREEN	34
9SRITT	ITT SPRING CORD	4
9SRL	12FT SPRGCORD BLUE	129
9SRLI	12FT SPRGCORD BLUE	16
9SRNI	SPRING CORD BROWN	1
9SRR	12FT SPRGCORD RED	109
9SRRI	12FT SPRGCORD RED	17
9SRV	12FT SPRGCORD IVORY	575
9SRVI	12FT SPRGCORD IVORY	75
9SRW	12FT SPRGCORD WHITE	63
9SRWI	12FT SPRGCORD WHITE	7
9SRY	12FT SPRGCORD YELLOW	114
A2ZNR	DATA CHNL-PVT LINE	18
A6H	HEAD SET	8
ADDL	ADDL PAGER NUMBER	31
AGD3308	SCB TO BROADBAND	1
AGD3964	SCB CIR TO BB CIR	1
AGD4237	SCB CIR TO BB CIR	1
AGD4238	SCB CIR TO BB CIR	1
AGT0118	SCB CKT	1
AGT0215	SCB CIR TO BB CIR	1
ALD0001	D CIR SAV RIV WBCN	1
ALERT	MEDIC ALERT DIALER	2
ALPHA	ALPHA-NUMERIC PAGER	25
ALPMATE	ALPHAMATE KEYBOARD	2
ALT/ACS	ALTERNATE ACCESS CST	1507
ALWRNTY	WARRANTY YRLY CHRG	10
AM2	AMPLIFIER MED POWER	5
ANSNORC	PANASONIC ANS DEVICE	32
ANSTC	ANS MACH REMOTE CTRL	9
AP2002	DAK 2LN FEATURE TEL	1
AP362TD	6 BTN DESK SET	8
AR5XX	ARS PER TRUNK	39
ARKXX	ARS FACILITY	1
AS34X	PVT LINE 4 WIRE CKT	8
ASU	INTERCOM SYSTEM	1
ATH	OPERATOR SETS-HEAD	8
ATT2000	2 LN EXTENSION STA	7
ATT2052	2 LN MASTER STATION	6
AUTOFAX	OPER SP AUTOMATIC	12
AVHDSET	ASTCM AVIATOR HDSET	2
B1T	BUS INTERPH SPK STAT	1
BB183A	183A BACKBOARD	1

USOC	DESCRIPTION	TOTAL
BBAAL	PVT LINE WIDE BAND	3
BBU	SIG APP OUTDOOR HORN	3
BCB	SIGNAL CONTRL INDOOR	1
BCD	SIGNALING APPAR BELL	2
BFFLRND	8 INCH ROUND BAFFLE	181
BFFLSOR	8 IN. SQUARE SPEAKER	1
BFFLSQR	SQUARE BAFFLE	59
BJZ	SIGNALING APPARATUS	4
BKF	MOD RINGER CUT-OFF	203
BL4	VIBRATING BELL	12
BL5	SINGLE STROKE BELL	6
BLG	SIGNAL APPARATUS BEL	1
BP312TD	10-BUT DESK TTN	10
BP312TW	10-BUT WALL SET KS	1
BQ9	VOICE GRADE BRIDGING	4
BRKT1	1-BTN PAD BRACKET	20
BRKT2	2-BTN PAD BRACKET	1
BRKT4	4-BTN PAD BRACKET	3
BUT	SIGNAL BTN GVT-OWN	4
BUZ	BUZZER	565
BYC	BUSY LAMP CNTRL UNIT	203
BYU	SIG APP INDOOR HORN	44
C3W	CANCEL CALL WAITING	2
C86KZ	SINGLE SYSTEM SHELF	1
CABLE	CLASSIFIED DCA/LAN	3
CALLID1	TC10312 99# CALL ID	8
CAN-120	FAX CANON 120	2
CAN-350	FAX CANON 350	2
CAN-520	FAX CANON 520	1
CAN-610	FAX CANON 610	1
CAN-705	FAX CANON 705	1
CB7	BUS INTERPHONE TH-TO	1
CBJ	BUSINESS INTERPHONE	1
CBS04	DATA ACCESS UNATTEND	1
CBS05	DATA ACCESS UNATTEND	1
CBS18	DATA ACCESS UNATTEND	4
CBT02	DATA ARGT S & R	3
CBT05	DATA ARGT S & R	3
CDT	DATA ACCESS CPE	3
CFF2	2 POSITION SWITCH	236
CFF2E1	CFF @ EXT IN BLDG 1	1
CFF3	3 POSITION SWITCH	4
CFT	AUTOMATIC ANSWERING	5
CHEAT10	10-FT CHEATER CABLE	25
CHEAT15	15-FT CHEATER CABLE	16
CHEAT30	30-FT CHEATER CABLE	15
CHEAT5	5-FT CHEATER CABLE	305
CHEAT60	60-FT CHEATER CABLE	2
CHH	CHIME XYLOPHONE	6
CIRCUIT	INSTALLED CIRCUIT	2841
CJJ	JACK IN TEL BASE	19
CKY25	COMM KEY STA WIRING	2

USOC	DESCRIPTION	TOTAL
CLASS	CLASSIFIED DCA/LAN	2409
CM7	WALL CHIME BELL	1
CMTXX	SMD LINE EQPT	39
CMWXX	SMD COM EQPT	3
CNO	EXTENTION STATION	12
COEHZ	COE-HAZWRAP	1
CORDLSS	CRDLESS PORTABLE TEL	1
COST	CIRCUIT NRC	3
CP322TD	20-BUT SET	1
CPEPANL	MONITOR STA PANELS	3
CPERN	CUST PROVIDED EQUIP	770
CPERN3	CUSTOMER PROVIDED EQ	123
CR-CD	TEL CREDIT CARD	1110
CTD10	PDP 10	1
CTDVX1	VAX 11/785	1
CTDVX2	VAX 11/785	1
CTDVX3	VAX 11/785	1
CTDVX5	VAX 8600	1
CXP	A/R 2-HR FEATURE	1
D1L	MODEM 113D	2
D1P	MODEM 113A	7
D2A	MODEM 212A	132
D2C	MODEM 212A	83
D2E03	SWITCH TERMINAL	2
DA001-M	PARIS 1&2	1
DA002-M	PAIRS 1&2	1
DA003-M	PAIRS 1&2	1
DA004-M	PAIRS 1&2	1
DA005-M	PAIRS 1 & 2	1
DA006-M	PAIRS 1 & 2	2
DA007-M	PAIRS 1 & 2	1
DA009-M	PAIRS 1 & 2	1
DA010-M	PAIRS 1 & 2	1
DA011-M	PAIRS 1&2	2
DA013-M	PAIRS 1 & 2	2
DA014-M	PAIRS 1 & 2	1
DA016-M	PAIRS 1 & 2	2
DA017-M	PAIRS 1 & 2	1
DA018-M	PAIRS 1&2	2
DA019-M	PAIRS 1 & 2	1
DA020-M	PAIRS 1 & 2	1
DA021-M	PAIRS 1&2	2
DA023-M	PAIRS 1&2	2
DA024-M	PAIRS 1 & 2	1
DA025-M	PAIRS 1 & 2	1
DA027-M	PAIRS 1&2	1
DA030-M	PAIRS 1 & 2	1
DA033-M	PAIRS 1&2	1
DA035-M	PAIRS 1&2	1
DA039-M	PAIRS 1&2	1
DA040-M	PAIRS 1 & 2	1
DA041-M	PAIRS 1 & 2	1

USOC	DESCRIPTION	TOTAL
DA042-M	PAIRS 1&2	1
DA043-M	PAIRS 1&2	1
DA044-M	PAIRS 1&2	1
DA045-M	PAIRS 1&2	1
DA046-M	PAIRS 1&2	1
DA051-M	PAIRS 1 & 2	1
DA076-M	PAIRS 1 & 2	2
DA078-M	PAIRS 1 & 2	1
DA079-M	PAIRS 1&2	1
DA083-M	PAIRS 1&2	1
DA084-M	PAIRS 1 & 2	1
DA087-M	PAIRS 1&2	1
DA088-M	PAIRS 1&2	1
DA089-M	PAIRS 1 & 2	1
DA090-M	PAIRS 1&2	1
DA091-M	PAIRS 1 & 2	1
DA093-M	PAIRS 1 & 2	1
DA096-M	PAIRS 1&2	1
DA102-M	PAIRS 1 & 2	1
DA107-M	PAIRS 1&2	1
DA110-M	PAIRS 1 & 2	1
DA112-M	PAIRS 1&2	1
DA116-M	PAIRS 1&2	1
DA117-M	PAIRS 1&2	1
DA119-M	PAIRS 1&2	1
DA122-M	PAIRS 1 & 2	1
DA133-M	PAIRS 1 & 2	1
DA134-M	PAIRS 1 & 2	1
DA149-M	PAIRS 1 & 2	1
DA150-M	PAIRS 1 & 2	1
DA6	INTERCOMMUN TO 36	18
DA8	INTERCOM TO 19	44
DACOM	FAX DACOM 412F	1
DATDL	DATA CLASS OF SERV	48
DB001-M	PAIRS 3	1
DB018-M	PAIRS 3 & 4	1
DB051-M	PAIRS 3	1
DB059-M	PAIRS 3 & 4	1
DB060-M	PAIRS 3 & 4	1
DB068-M	PAIRS 3	1
DB076-M	PAIRS 1 & 2	1
DB089-M	PAIRS 1 & 2	1
DB102-M	PAIRS 1 & 2	1
DB122-M	PAIRS 1 & 2	1
DB133-M	PAIRS 1 & 2	1
DB134-M	PAIRS 1 & 2	1
DB143-M	PAIRS 3 & 4	1
DB149-M	PAIRS 1 & 2	1
DB150-M	PAIRS 1 & 2	1
DC00002	GERM-ORO SACNET	2
DC001-M	PAIR NUMBER 3	2
DC002-M	PAIR NUMBER 3	2

USOC	DESCRIPTION	TOTAL
DC003-M	PAIR NUMBER 3	2
DC004-M	PAIR NUMBER 3	1
DC005-M	PAIR NUMBER 3	3
DC006-M	PAIR NUMBER 3	2
DC007-M	PAIR NUMBER 3	2
DC008-M	PAIR NUMBER 3	2
DC009-M	PAIR NUMBER 3	3
DC010-M	PAIR NUMBER 3	1
DC011-M	PAIR NUMBER 3	1
DC012-M	PAIR NUMBER 3	4
DC013-M	PAIR NUMBER 3	3
DC014-M	PAIR NUMBER 3	2
DC015-M	PAIR NUMBER 3	2
DC016-M	PAIRS NUMBER 3	3
DC017-M	PAIRS NUMBER 3	2
DC021-M	PAIR NUMBER 3	2
DC022-M	PAIRS NUMBER 3	1
DC024-M	PAIR NUMBER 3	1
DC025-M	PAIR NUMBER 3	1
DC029-M	PAIRS NUMBER 3	3
DC030-M	PAIRS NUMBER 3	2
DC033-M	PAIR NUMBER 3	1
DC035-M	PAIR NUMBER 3	1
DC036-M	PAIR NUMBER 3	1
DC037-M	PAIR NUMBER 3	1
DC038-M	PAIRS NUMBER THREE	1
DC039-M	PAIRS NUMBER 3	1
DC040-M	PAIRS NUMBER 3	2
DC041-M	PAIRS NUMBER 3	1
DC042-M	PAIRS NUMBER 3	1
DC044-M	PAIRS NUMBER 3	1
DC045-M	PAIRS NUMBER 3	1
DC046-M	PAIRS NUMBER 3	1
DC057-M	PAIRS NUMBER 3	1
DC059-M	PAIRS NUMBER 3	1
DC060-M	PAIRS NUMBER 3	1
DC061-M	PAIRS NUMBER 3	2
DC062-M	PAIRS NUMBER 3	1
DC063-M	PAIRS NUMBER 3	1
DC065-M	PAIRS NUMBER 3	1
DC066-M	PAIRS NUMBER 3	1
DC067-M	PAIRS NUMBER 3	1
DC069-M	PAIRS NUMBER 3	1
DC070-M	PAIR NUMBER 3	1
DC078-M	PAIRS NUMBER 3	2
DC079-M	PAIRS NUMBER 3	1
DC080-M	PAIRS NUMBER 3	1
DC082-M	PAIRS NUMBER 3	1
DC084-M	PAIRS NUMBER 3	2
DC089-M	PAIRS NUMBER 3	1
DC091-M	PAIRS NUMBER 3	1
DC093-M	PAIRS NUMBER 3	1

USOC	DESCRIPTION	TOTAL
DC105-M	PAIRS NUMBER 3	1
DC110-M	PAIRS NUMBER 3	1
DC6	INTERCOM SYS 2-LNK-L	6
DD001-M	PAIR NUMBER 4	2
DD002-M	PAIR NUMBER 4	2
DD003-M	PAIR NUMBER 4	2
DD004-M	PAIR NUMBER 4	1
DD005-M	PAIR NUMBER 4	3
DD006-M	PAIR NUMBER 4	2
DD007-M	PAIR NUMBER 4	1
DD008-M	PAIR NUMBER 4	2
DD009-M	PAIR NUMBER 4	3
DD010-M	PAIR NUMBER 4	1
DD011-M	PAIR NUMBER 4	1
DD012-M	PAIR NUMBER 4	4
DD013-M	PAIR NUMBER 4	2
DD014-M	PAIR NUMBER 4	2
DD015-M	PAIR NUMBER 4	2
DD016-M	PAIR NUMBER 4	2
DD021-M	PAIR NUMBER 4	2
DD022-M	PAIRS NUMBER 4	1
DD024-M	PAIR NUMBER 4	1
DD025-M	PAIR NUMBER 4	1
DD029-M	PAIR NUMBER 4	2
DD030-M	PAIR NUMBER 4	1
DD033-M	PAIR NUMBER 4	1
DD035-M	PAIR NUMBER 4	1
DD036-M	PAIR NUMBER 4	1
DD037-M	PAIR NUMBER 4	1
DD038-M	PAIRS NUMBER FOUR	1
DD039-M	PAIRS NUMBER 4	1
DD040-M	PAIRS NUMBER 4	1
DD042-M	PAIRS NUMBER 4	1
DD044-M	PAIRS NUMBER 4	1
DD045-M	PAIRS NUMBER 4	1
DD046-M	PAIRS NUMBER 4	1
DD057-M	PAIRS NUMBER 4	1
DD059-M	PAIRS NUMBER 4	1
DD060-M	PAIRS NUMBER 4	1
DD061-M	PAIRS NUMBER 4	2
DD062-M	PAIRS NUMBER 4	1
DD063-M	PAIRS NUMBER 4	1
DD065-M	PAIRS NUMBER 4	1
DD066-M	PAIRS NUMBER 4	1
DD067-M	PAIRS NUMBER 4	1
DD069-M	PAIRS NUMBER 4	1
DD078-M	PAIRS NUMBER 4	1
DD079-M	PAIRS NUMBER 4	1
DD080-M	PAIRS NUMBER 4	1
DD084-M	PAIRS NUMBER 4	1
DD089-M	PAIRS NUMBER 4	1
DETANGL	DETANGLER	42

USOC	DESCRIPTION	TOTAL
DGG	DATA VOICE USE	1
DGH	DATA 800 SERIES	1
DIR	DIRECTORY LISTING	110
DIRAD01	DIRECT AD ANDERSON	1
DIRAD02	DIRECT AD ANDERSON	1
DIRAD03	DIRECTORY AD KNOX	1
DIRAD04	DIRECT AD ANDERSON	1
DIRAD06	DIRECT AD ANDERSON	1
DL551V	T1 DSU/CSU	2
DLJ	MODEM LADS SINGLE	78
DLJ05	DATA SET	1
DLJXX	TWO TIER	21
DLQ	2 LINK INTERCOM EXP	2
DLX	MODEM LADS MULTI	18
DLY	INTERCOM 2-LINK STAT	11
DMA	BARGE IN	82
DMF	MULTI MOUNT EQPT	1
DNO	MODEM 103J	9
DOK	AUTO DIRECT CONN-911	3
DPN38	DATAPHONE DIGITAL	1
DPN3L	DATA CLASS OF SERV	23
DPNLL	DATA CLASS OF SERV	1
DRD	INTERCOMMUNICAT TO 9	76
DRVER30	SPEAKER DRIVER	68
DSU56	DATA SERV UNIT 5600	40
DSU96	DATA SERV UNIT 9600	3
DTM	DIAL TONE DETECTION	45
DUMMYB	BLACK DUMMY PLUG	8
DUMMYV	IVORY DUMMY PLUG	1
DVS	MODEM 100 SERIES	6
DYL	INTECOM 2-LINK STAT	27
E3DPG	SPEED CALL-30 #'S	35
E3N	CALL PICK-UP GROUP	1279
E3PNRHZ	CALL PICKUP	146
E3PPG	CALL PICKUP LINE	8881
E4DPG	CALL FORWARD VARI	7230
E5B	KEY SYSTEM EXTENSION	613
E6APG	SPEED CALL-6 #'S	134
E6GNRHZ	CALL FRWD BSY	132
E6GPG	CALL FORWARD BUSY	5232
E9AHZ	CALL TRANSFER-HZWRAP	149
E9GNRHZ	CALL FRWD DA	123
E9GPG	CALL FRWRD DONT ANS	8791
EABNRHZ	CALL HOLD - HAZWRAP	4
EABPG	CALL HOLD	1953
EASY2	2LINE NORTHWESTERN	11
EATNRHZ	CALL FRWD VAR	160
EC8	EXT DIFF PLANT	11
ELX03HZ	5 FEATURE PKG-HAZWRP	1
EOC	EOC MAIN NUMBER	1
EQA	NETWORK ACCESS	16102
EQAADJ	EQA HAZWRAP ADJUST	1

USOC	DESCRIPTION	TOTAL
EQAHZ	NETWRK ACC-HAZWRAP	189
ESJXX	TIE LINE TERM	39
ESL	ESSENTIAL SERV LINE	193
ESXPG	CALL WAIT TERM	835
ETB	TOLL DIVERSION MN ST	291
ETBNR	TOLL DIVERT NO RATE	8
ETH0002	ETHER DATABK PR-3&4	13
ETH0004	ETHER DATABK PR-3&4	17
ETH0005	ETHER DATABK PR-3&4	1
ETH0006	ETHER DATABK PR-3&4	1
ETH0008	ETHER DATABK PR-3&4	1
ETH0012	ETHER DATABK PR-3&4	1
ETH0015	ETHER DATABK PR-3&4	1
ETH0016	ETHER DATABK PR-3&4	1
ETH0057	ETHER DATABK PR-3&4	1
ETH0059	ETHER DATABK PR-3&4	1
ETH0060	ETHERDATABK PR-3&4	1
ETH0061	ETHER DATABK PR-3&4	1
ETH0062	ETHER DATABK PR-3&4	1
ETH0063	ETHER DATABK PR-3&4	1
ETH0065	ETHER DATABK PR-3&4	1
ETH0066	ETHER DATABK PR-3&4	1
ETH0067	ETHER DATABK PR-3&4	1
ETH0069	ETHER DATABK PR-3&4	1
ETH0079	ETHERDATABK PR-3&4	1
ETH0089	ETHERDATABK PR-3&4	1
EX-2310	FAX EXXON QWIP 2310	1
EX2	SIG APP OUTDOOR BELL	3
EX3	SCB EXTEN SAME BLDG	1505
EX5	EXT DIF BLDG,SAME PL	387
EXB	SIGN APP INDOOR BELL	137
EXF	EXTENSION DIF BLDG	2
EXG	EXTENSION GONG	351
EXM	STATION	16103
EXMBX	MILEAGE 1/2	251
EXMEX	MILEAGE 1 1/2	201
EXMFX	MILEAGE 2	185
EXMGX	MILEAGE 2 1/2	2
EXMGXHZ	STATION	189
EXMHX	MILEAGE 3	23
EXMJX	MILEAGE 3 1/2	23
EXMNR	STATION NO RATE	18
EXN	CABLE EXTENSION	9
EXT	ATT EXTENSION LINE	831
EXTOP	EXTENSION	1
EYJXX	TIE LINE COM GROUP	3
FAL	DIRECTORY LISTING KN	58
FAS	12 FT SPRING CORD	6
FAX-BRD	BOARD TO PC FOR FAX	1
FAXROT2	FAX SWITCH FACJ300	2
FAXROUT	FAX PHONE SWITCH	3
FAXTCR	FACSIMILE LINE	227

USOC	DESCRIPTION	TOTAL
FDX	MODEM AUTOCALL PURCH	2
FILTR2F	TWO CIRCUIT FILTER	4
FLT	ADD'L LISTNG-NO RATE	69
FLTRCSF	FILTER CASE	4
FMINTCM	STAND ALONE IC	2
FONE1PC	ONE PIECE TELEPHONE	1
FPSVL	DATA CLASS OF SERV	1
FTS2000	FTS2000 MONTHLY COST	182
FTSADJ	FTS2000 ADJUSTMENT	1
FTSTEST	FTS 2000 TEST STA	7
FXBCKUP	FX BACK-UP LINE	56
FXSTS	FOREIGN EXCHG SERV	8
GA1000	SCB GRP ALERT KS1000	25
GA2000	SCB GRP ALERT KS2000	13
GA3000	SCB GRP ALERT KS3000	13
GAA	QUORUM CONF TEL	1
GAC	QUORUM CONF TEL	1
GAE	QUORUM CONF TEL	1
GAF	QUORUM CONF TEL	1
GC/NUMB	GROUP CALL NUMBER	23
GD08971	SCB CKT TO MUX	19
GD81596	SCB CKT TO X-10	21
GD81969	SCB CKT TO MUX	3
GD86333	SCB CKT TO X-10	21
GD87450	SCB CIRCUIT TO MUX	16
GD87832	SCB CKT TO 4500-N	14
GD88268	DEMARCATION BLOCK	22
GD89523	SCB CKT TO 4500-S	21
GD96359	SCB CKT TO MUX	26
GE1CO	GRP ALERT COM EQPT	3
GE2CO	GRP ALERT MOUNT SHLF	7
GE3CO	GRP ALERT RPT APPLI	4
GE4CO	GRP ALERT ALERTING	48
GHB	MODEM 202R	1
GL83118	SCB CKT TO 4500-N	11
GL89050	SCB CKT TO BLDG 9702	1
GOVT	GOVT OWNED PAGER	533
GP-123	OPER SP GRP 123 MIN	15
GROUP	GROUP CALL PAGER NO	474
GRP/PGR	NO INDIV #/GRP ONLY	94
GS83590	CKT TO 4500-N BSMNT	15
GS89256	SCB CKT TO 4500-N	11
GTD0003	GERM-OR SNAINN	1
GTD0004	GERM-SR SNAINN	1
HAY12	HAYES MODEM 1200	229
HAY24	HAYES MODEM 2400	258
HCF	CONFIDENCER	71
HCFBX	CONFIDENCER BLACK	13
HCFEX	CONFIDENCER BEIGE	37
HCFVX	CONFIDENCER IVORY	2
HCFWX	CONFIDENCER WHITE	4
HCFYX	CONFIDENCER YELLOW	3

USOC	DESCRIPTION	TOTAL
HCG	EXPLOSIVE ATMOS TEL	6
HCJ	OUTDOOR TEL SET	162
HCR	ELEVATOR TEL SET	4
HCU	HANDSET PUSH TO TALK	6
HDSTLW	LIGHT WEIGHT HEADSET	6
HEADST1	LIGHTWEIGHT HEADSET	6
HEWPAK	HEWLETT PACKARD COMP	17
HHH	PAGING EQ ANNOUN PT	1
HHS	CONFIDENCER	8
HNB	OUTDOOR HORN	1
HNDSTAI	HANDSET ALMOND ITT	8
HNDSTBA	HANDSET BLACK	1087
HNDSTBI	HANDSET BLACK ITT	21
HNDSTDA	HANDSET GRAY	1
HNDSTEA	HANDSET BEIGE	5097
HNDSTEI	HANDSET BEIGE ITT	91
HNDSTGA	HANDSET GREEN	490
HNDSTGI	HANDSET GREEN ITT	32
HNDSTLA	HANDSET BLUE	328
HNDSTLI	HANDSET BLUE ITT	17
HNDSTNI	HANDSET BROWN ITT	3
HNDSTRA	HANDSET RED	293
HNDSTRI	HANDSET RED ITT	16
HNDSTRT	HANDSET TRIMLINE RED	66
HNDSTVA	HANDSET IVORY	2271
HNDSTVI	HANDSET IVORY ITT	76
HNDSTVT	HANDSET IVORY TRML	2
HNDSTWA	HANDSET WHITE	152
HNDSTWI	HANDSET WHITE ITT	3
HNDSTYA	HANDSET YELLOW	235
HNN	SIGNAL APPARATUS HN	9
HOST	HOST PORT CONNECTION	2
HP00005	HP BLOCK	1
HP00006	HP BLOCK	1
HP00007	HP BLOCK	1
HP00008	HP BLOCK	1
HP00010	HP BLOCK	1
HP00011	HP BLOCK	1
HP00015	HP BLOCK	1
HP00016	HP BLOCK	1
HP00017	HP BLOCK	1
HP00018	HP BLOCK	1
HP00019	HP BLOCK	1
HP00020	HP BLOCK	1
HP00021	HP BLOCK	1
HP00022	HP BLOCK	1
HP00023	HP BLOCK	1
HP00030	HP BLOCK	1
HP00031	HP BLOCK	1
HP3000A	HP3000A	1
HP3000B	HP3000B	1
HTG	HUNTING	1385

USOC	DESCRIPTION	TOTAL
HVS	AMP VOI CONTROL EQPT	1
HWD0056	SCB CKT TO MUX	19
HWD0296	SCK CKT TO MUX	135
HWD0297	SCB CKT TO MUX	2
IBM0001	IBM-3270 DATABK PR-3	1
IBM0003	IBM-3270 DATABK PR-3	1
IBM0004	IBM-3270 DATABK PR-3	1
IBM0005	IBM-3270 DATABK PR-3	1
IBM0009	IBM-3270 DATABK PR-3	1
IBM0011	IBM-3270 DATABK PR-3	1
IBM0013	IBM-3270 DATABK PR-3	1
IBM0014	IBM-3270 DATABK PR-3	1
IBM0015	IBM-3270 DATABK PR-3	2
IBM0017	IBM-3270 DATABK PR-3	1
IBM0019	IBM-3270 DATABK PR-3	1
IBM0021	IBM-3270 DATABK PR-3	1
IBM0025	IBM-3270 DATABK PR-3	1
IBM0027	IBM-3270 DATABK PR-3	1
IBM0029	IBM-3270 DATABK PR-3	1
IBM0031	IBM-3270 DATABK PR-3	1
INFVX1	VAX 11/785	1
INFVX3	VAX 11/785	1
ITTAT	ASH ALMOND DESK TT	16
ITTBT	BLACK DESK TT	35
ITTDT	GOLD DESK TT	16
ITTET	BEIGE DESK TT	157
ITTGT	GREEN DESK TT	78
ITTLT	BLUE DESK TT	56
ITTNT	BROWN DESK TT	15
ITTRT	RED DESK TT	58
ITTVT	IVORY DESK TT	180
ITTWT	WHITE DESK TT	22
J5YNS	DATA LOCAL CHANNEL	6
J9A	FTURE CON EQ OUT SVC	4
JA1X1	JACK SET TYPE 1	29
JA1X2	JACK SET TYPE 2	3
JACK6M	JACK 6W MTG CORD	7
JK9	4 PRONG COND JCK	8852
JKS	3 OR 4 PRG COND JCK	844
JPLATE	DUPLEX ELEC JCK PLT	1051
K81	TEL SET W CARD DIALE	4
K8M	MULTI-LINE CONF 8 LN	1
KA00350	BB CIR TO SCB CIR	1
KA00351	BB CIR TO SCB CIR	1
KA00354	BB CIR TO SCB CIR	1
KA00356	BB CIR TO SCB CIR	1
KAL	CARD DIALER CARDS	62
KBC	BSY CONS MESSAGE WTG	1
KD2ET	CALL DIRECTOR BEIGE	22
KD9	RINGER TRANSFER	5
KDL	CALL DIRECTOR	2
KDS	CALL DIR THREE MOD	4

USOC	DESCRIPTION	TOTAL
KDSNK	CALL DIRECTOR NONKEY	1
KDU	CALL DIRECTOR 18 BTN	3
KEJ	EXTERNAL 6040 KEY	4
KEL02	2_PR_KEY_STA_WIRE	206
KEL04	DIALOG COML	4
KEL25	KEY STA WIRE	1013
KEL50	50 PR CABLE	21
KEL5A	50 PR MODIF CABLE	2
KEL75	75 PR CABLE	45
KELAX	100 PR CABLE	2
KER	12 BUT SET W/ JCK	4
KEX	INTERCOMMUN LINE ONL	33
KEY0205	K EQ CA 205 TO MS BL	1
KH7SX	COMKEY 718 CON MESS	2
KHH	K S TERMINATION	52
KJX	6_BUT_W/LIGHTS&JACK	2
KJXV6	6-BUT IVORY W/LTS	2
KKM	ONE BUTTON SET	3
KLD	LINE EQPT PER LINE	1624
KLDE1	LINE CARD BLDG 1	3
KLDSC	SANBAR SEC LINE CARD	95
KRU	BELL LOW VOLTAGE	14
KRV	418 RINGDOWN CARD	4
KSE	620A PANEL	234
KSEE1	620 PANEL BLDG 1	1
KSK	MULTI-LINE CONF 20 B	2
KSN	1A2 KS PWRUNIT 79B2	386
KSNE1	POWER UNIT BLDG 1	1
KSV800	VAX 8700	1
KSV801	COMPUTER HOST NAME	1
KT2	TURN BTN DESK SET	43
KT2B1	1 BTN TEL SET BLACK	3
KT2G1	1 BTN TEL SET GREEN	1
KT2V1	1 BTN TEL SET IVORY	4
KT63	MELCO LAMP EXTENDOR	4
KTB	6 BUT SET W/O LIGHTS	1
KTR	6 BTN SET W/LIGHTS	1
KTRB4	6BTN WALL SET BLACK	9
KTRB6	6 BTN DESK SET BLACK	57
KTRB8	6BTN NON DIAL	7
KTRBA	6 BUTTON	7
KTRE4	6BTN WALL SET BEIGE	42
KTRE6	6 BTN DESK SET BEIGE	990
KTRE6E1	KEYSET EXT. BLDG 1	1
KTRG4	6BTN WALL SET GREEN	4
KTRG6	6 BTN DESK SET GREEN	36
KTRL6	6 BTN DESK SET BLUE	5
KTRNK	6 BUT SET W/LIGHTS	1
KTRR4	6 BTN WALL SET RED	3
KTRR6	6 BTN DESK SET RED	10
KTRV4	6 BTN WALL SET IVORY	50
KTRV6	6 BTN DESK SET IVORY	82

USOC	DESCRIPTION	TOTAL
KTRV8	6 BTN NON-DIAL	1
KTRW4	6BTN WALL SET WHITE	59
KTRW6	6 BTN DESK SET WHITE	2
KTRY4	6BTN WALL SET YELLOW	8
KTRY6	6BTN DESK SET YELLOW	1
KU2	TWO WIRE EXTERNAL KY	3
KU3	POWER FAILURE ARRANG	3
KV1	10 BUTTON TEL SET	169
KV1B4	10 BTN BLACK WALL	18
KV1B6	10 BTN DESK BLACK	6
KV1E4	10-BTN BEIGE WALL	9
KV1E6	10 BTN DESK BEIGE	228
KV1G6	10 BTN DESK GREEN	2
KV1L6	10 BUTTON SET BLUE	4
KV1R6	10 BTN DESK RED	4
KV1V4	10 BTN IVORY WALL	10
KV1V6	10 BTN DESK IVORY	30
KV1W6	10 BUTTON SET WHITE	1
KV1Y4	10-BTN YELLOW WALL	1
KV1Y6	10 BTN DESK YELLOW	2
KV2	20 BUTTON TEL SET	19
KV2E6	20 BTN DESK BEIGE	5
KV2G6	20 BTN DESK GREEN	1
KV2V6	20 BTN DESK IVORY	3
KV2VT	20 BUTTON KEY SET	1
KV3A6	ITT 30 BTN ASH SET	1
KV3E6	ITT 30 BTN BEIGE SET	12
KXA09	PANASONIC TRANSFORM	6
KXZ	WIRING PLAN 203 TYPE	42
LA00611	SCB CKT TO MUX	28
LA00654	SCB CKT TO USER	1
LA04796	SCB CKT TO USER	1
LA06465	SCB CKT TO MUX	17
LA07153	SCB CKT TO USER	1
LA08698	SCB CKT TO USER	1
LA08843	SCB CKT TO MUX	75
LA08971	SCB CKT TO MUX	11
LA09241	SCB CKT TO MUX	16
LA10389	SCB CKT TO MUX	34
LA6	PAGING EQ LIM AMP	20
LA7	PAGING EQ AMPLIFIER	1
LA70240	SCB CKT TO MUX	25
LA72367	SCB CKT TO MUX	3
LA72952	SCB CKT TO MUX	4
LA72962	SCB CKT TO LAN BLOCK	57
LA75836	SCB CKT TP 4500-S	1
LA76229	SCB CIR TO BB CIR	1
LA77516	SCB CKT TO LAN BLOCK	73
LA80193	SCB TO BROADBAND	49
LA80411	SCT CKT TO BLD K1030	18
LA80498	SCB CKT TO MUX	41
LA80644	SCB CKT TP 7964-A	1

USOC	DESCRIPTION	TOTAL
LA81617	SCB CKT TO BLD K1007	2
LA81969	SCB CKT TO MUX	20
LA82127	SCB CKT TO MUX	25
LA82517	SCB CKT	171
LA82871	SCB CKT TO MODEM	15
LA83228	SCB CIRCUIT	1
LA83568	SCB CKT	171
LA83925	SCB CKT TO 7964-A	1
LA84190	SCB CKT TO DATA BL	1
LA84204	SCB CKT TO BLD K1007	2
LA84334	SCB CKT TO 7964-A	1
LA84594	SCB CKT TO LAN BLOCK	25
LA85758	SCB CKT TO 7964-A	1
LA87315	SCB CKT TO BLD K1030	24
LA88851	SCB CKT TO 7964-A	1
LA89944	SCB CKT TO MUX	6
LA89986	SCB CKT	1
LA90332	SCT CKT TO MUX	10
LA90374	SCAB CKT TO MUX	18
LA91111	SCB CKT TO USER	1
LA91234	SCB CKT TO MUX	1
LA92499	SCB CKT TO MUX	1
LA92918	SCB CKT TO MUX	60
LA92928	SCB CKT TO MUX	60
LA93895	SCB CKT TO MUX	12
LA94774	SCB CKT TO MUX	25
LA95956	SCB CKT TO MUX	13
LA95988	SCB CKT TO MUX	1
LA96700	SCB CKT TO MUX	1
LA96956	SCB CKT TO MUX	17
LA97038	SCB CKT TO MUX	5
LA98085	SCB CKT TO MUX	30
LA98288	SCB CKT TO MUX	1
LA98815	SCB CKT TO MUX	6
LAA	DATA SET TO 2	2
LAB	ANS ONLY MODEM 100 S	14
LAD	DATA ARRANGE CONSOLE	2
LADSC	MODEM CARD	8
LAL	DATA CABINETS TO 20	2
LAN0001	LAN BLOCK	33
LAN0002	LAN BLOCK	31
LAN0003	LAN BLOCK	28
LAN0004	LAN BLOCK	31
LAN0005	LAN BLOCK	33
LAN0006	LAN BLOCK	33
LAN0007	LAN BLOCK	31
LAN0008	LAN BLOCK	31
LAN0009	LAN BLOCK	35
LAN0010	LAN BLOCK	27
LAN0011	LAN BLOCK	31
LAN0012	LAN BLOCK	26
LAN0013	LAN BLOCK	33

USOC	DESCRIPTION	TOTAL
LAN0014	LAN BLOCK	27
LAN0015	LAN BLOCK	25
LAN0016	LAN BLOCK	26
LAN0017	LAN BLOCK	21
LAN0018	LAN BLOCK	26
LAN0019	LAN BLOCK	26
LAN0020	LAN BLOCK	21
LAN0021	LAN BLOCK	20
LAN0022	LAN BLOCK	20
LAN0023	LAN BLOCK	21
LAN0024	LAN BLOCK	21
LAN0025	LAN BLOCK	20
LAN0026	LAN BLOCK	19
LAN0027	LAN BLOCK	17
LAN0028	LAN BLOCK	16
LAN0029	LAN BLOCK	18
LAN0030	LAN BLOCK	19
LAN0031	LAN BLOCK	14
LAN0032	LAN BLOCK	12
LAN0033	LAN BLOCK	13
LAN0034	LAN BLOCK	9
LAN0035	LAN BLOCK	12
LAN0036	LAN BLOCK	10
LAN0037	LAN BLOCK	10
LAN0038	LAN BLOCK	9
LAN0039	LAN BLOCK	10
LAN0040	LAN BLOCK	11
LAN0041	LAN BLOCK	9
LAN0042	LAN BLOCK	9
LAN0043	LAN BLOCK	8
LAN0044	LAN BLOCK	8
LAN0045	LAN BLOCK	8
LAN0046	LAN BLOCK	8
LAN0047	LAN BLOCK	10
LAN0048	LAN BLOCK	7
LAN0049	LAN BLOCK	7
LAN0050	LAN BLOCK	7
LAN0051	LAN BLOCK	6
LAN0052	LAN BLOCK	8
LAN0053	LAN BLOCK	8
LAN0054	LAN BLOCK	7
LAN0055	LAN BLOCK	8
LAN0056	LAN BLOCK	8
LAN0057	LAN BLOCK	7
LAN0058	LAN BLOCK	8
LAN0059	LAN BLOCK	6
LAN0060	LAN BLOCK	6
LAN0061	LAN BLOCK	6
LAN0062	LAN BLOCK	6
LAN0063	LAN BLOCK	6
LAN0064	LAN BLOCK	5
LAN0065	LAN BLOCK	5

USOC	DESCRIPTION	TOTAL
LAN0066	LAN BLOCK	5
LAN0067	LAN BLOCK	5
LAN0068	LAN BLOCK	5
LAN0069	LAN BLOCK	3
LAN0070	LAN BLOCK	4
LAN0071	LAN BLOCK	4
LAN0072	LAN BLOCK	4
LAN0073	LAN BLOCK	2
LAN0074	LAN BLOCK	3
LAN0075	LAN BLOCK	3
LAN0076	LAN BLOCK	2
LAN0077	LAN BLOCK	3
LAN0078	LAN BLOCK	4
LAN0079	LAN BLOCK	4
LAN0080	LAN BLOCK	3
LAN0081	LAN BLOCK	3
LAN0082	LAN BLOCK	2
LAN0083	LAN BLOCK	3
LAN0084	LAN BLOCK	3
LAN0085	LAN BLOCK	2
LAN0086	LAN BLOCK	2
LAN0087	LAN BLOCK	2
LAN0088	LAN BLOCK	2
LAN0089	LAN BLOCK	3
LAN0090	LAN BLOCK	3
LAN0091	LAN BLOCK	1
LAN0092	LAN BLOCK	2
LAN0093	LAN BLOCK	3
LAN0094	LAN BLOCK	3
LAN0095	LAN BLOCK	4
LAN0096	LAN BLOCK	1
LAN0097	LAN BLOCK	1
LAN00M2	LAN BLOCK	2
LAN0101	LAN BLOCK	1
LAN0102	LAN BLOCK	1
LAN0103	LAN BLOCK	1
LAN0105	LAN BLOCK	2
LAN0106	LAN BLOCK	2
LAN0107	LAN BLOCK	1
LAN0108	LAN BLOCK	1
LAN0109	LAN BLOCK	2
LAN0110	LAN BLOCK	1
LAN0111	LAN BLOCK	1
LAN0112	LAN BLOCK	1
LAN0113	LAN BLOCK	1
LAN0114	LAN BLOCK	1
LAN0115	LAN BLOCK	1
LAN0116	LAN BLOCK	2
LAN0117	LAN BLOCK	2
LAN0118	LAN BLOCK	2
LAN0119	LAN BLOCK	1
LAN0120	LAN BLOCK	1

USOC	DESCRIPTION	TOTAL
LAN0121	LAN BLOCK	1
LAN0122	LAN BLOCK	2
LAN0123	LAN BLOCK	2
LAN0124	LAN BLOCK	1
LAN0125	LAN BLOCK	2
LAN0126	LAN BLOCK	1
LAN0127	LAN BLOCK	1
LAN0128	LAN BLOCK	1
LAN0129	LAN BLOCK	1
LAN0130	LAN BLOCK	1
LAN0131	LAN BLOCK	1
LAN0132	LAN BLOCK	1
LAN0133	LAN BLOCK	1
LAN0135	LAN BLOCK	1
LAN0136	LAN BLOCK	1
LAN0137	LAN BLOCK	1
LAN0138	LAN BLOCK	1
LAN0139	LAN BLOCK	1
LAN0140	LAN BLOCK	1
LAN0141	LAN BLOCK	1
LAN0142	LAN BLOCK	1
LAN0143	LAN BLOCK	1
LAN0144	LAN BLOCK	1
LAN0145	LAN BLOCK	1
LAN0146	LAN BLOCK	1
LAN0147	LAN BLOCK	1
LAN0148	LAN BLOCK	1
LAN0149	LAN BLOCK	1
LAN0151	LAN BLOCK	1
LAN0161	LAN BLOCK	1
LAN0169	LAN BLOCK	1
LAN0170	LAN BLOCK	1
LAN0173	LAN BLOCK	1
LAN0174	LAN BLOCK	1
LAN0175	LAN BLOCK	1
LAN0177	LAN BLOCK	1
LAN0178	LAN BLOCK	1
LAN0180	LAN BLOCK	1
LAP0043	SCB CKT	1
LC3	LINE LAMP CON EQPT	19
LDCBL	DATA CLASS OF SERV	38
LDCCL	DATA CLASS OF SERV	2
LDCDL	DATA CLASS OF SERV	3928
LDM	NEW UDS LADS MODEMS	278
LEV	LOUDSPEAKER	71
LFAD	LANIER FAX	1
LH96	LONG HAUL 9600	60
LLT	CROSS REFERENCE LIST	3
LNRSMT	LANIER SMART PHONE	3
LOCK	DTMF KEYPAD LOCK	1
LOCKB	DTMF LOCK BLACK	18
LOCKE	DTMF LOCK BEIGE	30

USOC	DESCRIPTION	TOTAL
LP7	SIG LAMP 15 TYPE	45
LS4	106E SPEAKERS	16
LSI0001	LSI CABLE ONE	4
LSI0002	LSI CABLE TWO	6
LSI0003	LSI CABLE THREE	3
LSI0005	LSI CABLE FIVE	8
LSI0105	LSI CA 105 TO MS BL	1
LSI0110	LSI CA 110 TO MS BL	6
LSI0117	LSI CA 117 TO MS BL	3
LSI0123	LSI CA 123 TO MS BL	3
LSI0216	LSI CA 216 TO MS BL	1
LSI0227	LSI CA 227 TO MS BL	10
LSIBX10	LSI 0-10 LINES BLACK	25
LSIBX20	LSI 0-20 LINES BLACK	6
LSIBX50	LSI 0-50 LINES BLACK	1
LSIME30	MELCO 30 LINE INDIC	22
LSM0001	LINE STATUS MONITOR	1
LSM30A	MICO 30 LSI AUDIBLE	162
LSOBX	STATUS IND 8 BLACK	45
LSOVX	STATUS IND 8 IVORY	478
LSSBX	STATUS IND 16 BLACK	18
LSSVX	STATUS IND 16 IVORY	186
LSTBX	STATUS IND 32 BLACK	3
LSTVX	STATUS IND 32 IVORY	38
MC6	PAGING EQPT CUTOFF	4
MD5	DATA SET CABINET	8
MDD	DATA T&R EQUIP MOUNT	2
MDE	DATA SET	8
MDG	DATA T&R EQUIP	3
MER3122	MERLIN HEADSET-NO AD	2
MFH2LN	2 LINE TEL ATT	6
MFONEA1	MULT-FUNC W/ A1 LEAD	5
MUX2S	DATA CHNL ADDL PLNT	3
MUXNR	DATA CHNL-PVT LINE	12
MWXB4	MSG WAIT BOX 24-SLOT	1
MWY	MESSAGE WAITING LAMP	5
NCC	VAX 11/780	1
NCM	INTERCOMMUNICATING	16
NEC AM	FAX NEC AMERICA	2
NEXFAX	FAX NEFAX-BIT III	1
NK25B	INTERLINK	1
NNQ	PANEL TELEPHONE	4
NNQH2	PANEL TELEPHONE	2
NNQK2	PANEL TELEPHONE	1
NNX	6 BUTN PANEL PHONE	1
NO DIR	NO DIRECTORY LISTING	48
NP3	DIR LIST PRIVATE	1
NRC	NON-RECURRING	32
NRX	INTERCOMMUNICATING	16781
NRXHZ	INTERCOM	189
NRXNR	INTERCOMMUM NO RATE	2
NTZ	INTERCOM SET	9

USOC	DESCRIPTION	TOTAL
NUMBER	TMP NUMBER CHG ONLY	431
NX10B	INTERLINK-	1
OBD	BUS INTERPHNE LOUDSP	1
OBP	BUS INTERPHNE ADD SP	6
OCU1	VAX 8600	1
OCU2	VAX 8600	1
OCU3	VAX 8700	1
OCU4	OCU4	1
OP60122	19 CODE DL ICOM TTN	1
ORD0001	D CIR MMES E-MAIL	1
ORD0002	D CIR MMES E-MAIL	1
ORD0003	D CIR MMES E-MAIL	1
ORD0006	CIR USDA CRAY	1
ORD0007	GERM Y-12 SACNET	1
ORD0008	GERM Y-12 SACNET	1
P1JAX	LOCAL CHANNEL PYKA	6
P1JAXNR	LOCAL CHANNEL PYKA	137
P2JGX	SAME PREM,DIFF BLDG	6
P2JMX	LOCAL CHANNEL PYCM	11
P2JMXNR	LOCAL CHANNEL PYCM	381
P2JUX	LOCAL CHANNEL PYCU	1
P2JUXNR	LOCAL CHANNEL PYCU	132
PA-AMP	AMP TIE-IN NON DISC	3
PA00000	PAGING CONTROL CKT	2
PAGEPK1	PAGEPAK 100W AMP	1
PAGEPKA	PAGEPK APPLIQUE CARD	1
PAGEPKM	PGEPK MSTR ZONE CARD	1
PAGEPKZ	PAGEPK ZONE CARD T1	1
PAN250U	FAX PANAFAX UF-250	5
PAN400U	FAX PANAFAX UF-400	1
PAN600U	FAX PANAFAX UF-600	10
PAN600V	FAX PANFAX VF-600	1
PANATEL	PANASONIC EASA-PHONE	297
PATCH2P	4 FT, 110 PATCH CORD	86
PC223B	SPKRPHONE CONNECTOR	103
PC82C	SPKRPHONE CONNECTOR	51
PF8	AMPLIFIER MUSIC CON	7
PKT	SCB CO STA TEST	12
PLUGB	DUMMY PLUG BLACK	10
PLUGV	DUMMY PLUG IVORY	2
PORTBLE	PORTABLE FAX	1
PROC20	DEC 2060	1
PT2	DATA PVT-2000 SER	164
PT2E5	DATA PVT LINE	5
PT7EX	HANDSET PUSH BEIGE	3
PV4	TELABS 6003 RD PACK	10
PYCGL	CLASS OF SERVICE	12
PYCML	CLASS OF SERVICE	3770
PYCMS	CLASS OF SERVICE	1
PYCNL	CLASS OF SERVICE	85
PYCUL	CLASS OF SERVICE	446
PYKAL	CLASS OF SERVICE	978

USOC	DESCRIPTION	TOTAL
PYKHL	CLASS OF SERVICE	83
PYMAL	CLASS OF SERVICE	1
Q1C	PAGING EQPT	107
Q1D	PAGING EQPT	8
QHA	D1 LINE CONDITION	45
QKT	CONNECTING ARRANGEMT	3
R1ARI	RING ISOLATOR-SECURE	13
R2RI	R2 RINGER ISOLATE	14
RCZ	RECD EQPT PERMANENT	6
RCZNR	RECD EQPT COUPLER	37
RDL	RECORDER COUPLER	3
RDMZR	CONNT AGRT TO CPE	5
RDY	CONNECT ARRANGEMENT	1
RIC020E	FAX RICOH 20E	1
RIC1000	RICOH FAX 1000L	2
RIC0100	FAX RICOH F/000L	3
RIC0120	FAX RICOH 120	2
RIC0205	FAX RICOH 205	3
RIC0210	FAX RICOH 2100	2
RIC0230	FAX RICOH 230	2
RICOH10	FAX RICOH 10	2
RICOH20	FAX RICOH 20	1
RICOH60	FAX RICOH 60	8
RICOH65	FAX RICOH 65	7
RICOH70	FAX RICOH 70-E	2
RJ11C	MINI-MOD JACK BASEBD	15792
RJ11C2	DUPLEX JACK	35
RJ11W	MINI-MOD JACK WALL	1941
RJ12C	A-LEAD CTRL JACK	1
RJ13C	A-LEAD CRTL JCK BSBD	45
RJ13W	A-LEAD CRTL JCK WALL	6
RJ14C	BSBD JCK FOR 2 LINES	67
RJ14W	WALL JCK FOR 2 LINES	2
RJ15C	WEATHER PROOF JACK	5
RJ16X	JACK	4
RJ1DC	JACK	2772
RJ21X	25 PR CONN JCK	2531
RJ31X	AHEAD OF EQPT JCK	8
RJ32X	MOD JCK AT STA	3
RJ36X	JCK W/ MOD IND DATA	13
RJ41S	MINI-MOD JCK DATA	285
RJ45DK	8 COND KEY DATA JACK	1016
RJ45DKS	DUPLEX SURF JACK	174
RJ45S	MINI MOD JACK DATA	75
RJ45SKS	8C,SINGLE,KEY,SURFAC	120
RJ45SNF	8C,SINGLE,NON-KEY FL	4
RJ45SNS	8C,SINGLE,NON-KEY SU	156
RJ48M	4 WIRE JACK-DIGITAL	11
RJ48S	8 PIN,KEYED,SINGL JK	3785
RJA1X	SAME LINE T-ADAPT	59
RJA2X	2 LINE T-ADAPT	153
RMCAL	DATA CLASS OF SERV	122

USOC	DESCRIPTION	TOTAL
RMTAL	DATA CLASS OF SERV	1
RS00000	RS-232 DATA BK PR1&2	1
RS00001	RS-232 DATA BK PR1&2	2
RS00002	RS-232 DATA BK PR1&2	2
RS00003	RS-232 DATA BK PR1&2	2
RS00004	RS-232 DATA BK PR1&2	2
RS00005	RS-232 DATA BK PR1&2	2
RS00006	RS-232 DATA BK PR1&2	1
RS00007	RS-232 DATA BK PR1&2	2
RS00008	RS-232 DATA BK PR1&2	1
RS00009	RS-232 DATA BK PR1&2	2
RS00010	RS-232 DATA BK PR1&2	1
RS00011	RS-232 DATA BK PR1&2	1
RS00012	RS-232 DATA BK PR1&2	1
RS00013	RS-232 DATA BK PR1&2	2
RS00015	RS-232 DATA BK PR1&2	1
RS00016	RS-232 DATA BK PR1&2	2
RS00017	RS-232 DATA BK PR1&2	1
RS00018	RS-232 DATA BK PR1&2	1
RS00019	RS-232 DATA BK PR1&2	1
RS00021	RS-232 DATA BK PR1&2	1
RS00022	RS-232 DATA BK PR1&2	1
RS00023	RS-232 DATA BK PR1&2	2
RS00024	RS-232 DATA BK PR1&2	2
RS00025	RS-232 DATA BK PR1&2	2
RS00026	RS-232 DATA BK PR1&2	2
RS00027	RS-232 DATA BK PR1&2	1
RS00028	RS-232 DATA BK PR1&2	1
RS00029	RS-232 DATA BK PR1&2	1
RS00030	RS-232 DATA BK PR1&2	1
RS00031	RS-232 DATA BK PR1&2	1
RS00032	RS-232 DATA BK PR1&2	1
RS00034	RS-232 DATA BK PR1&2	1
RS00036	RS-232 DATA BK PR1&2	1
RS00049	RS-232 DATA BK PR1&2	1
RS00050	RS-232 DATA BK PR1&2	1
RS00051	RS-232 DATA BK PR1&2	2
RS00052	RS-232 DATA BK PR1&2	1
RS00053	RS-232 DATA BK PR1&2	1
RS00054	RS-232 DATA BK PR1&2	2
RS00055	RS-232 DATA BK PR1&2	1
RS00056	RS-232 DATA BK PR1&2	1
RS00057	RS-232 DATA BK PR1&2	1
RS00058	RS-232 DATA BK PR1&2	2
RS00059	RS-232 DATA BK PR1&2	1
RS00060	RS-232 DATA BK PR1&2	2
RS00061	RS-232 DATA BK PR1&2	1
RS00062	RS-232 DATA BK PR1&2	1
RS00063	RS-232 DATA BK PR1&2	1
RS00064	RS-232 DATA BK PR1&2	2
RS00065	RS-232 DATA BK PR1&2	1
RS00066	RS-232 DATA BK PR1&2	2

USOC	DESCRIPTION	TOTAL
RS00067	RS-232 DATA BK PR1&2	2
RS00068	RS-232 DATA BK PR1&2	1
RS00069	RS-232 DATA BK PR1&2	1
RS00070	RS-232 DATA BK PR1&2	1
RS00071	RS-232 DATA BK PR1&2	2
RS00072	RS-232 DATA BK PR1&2	1
RS00073	RS-232 DATA BK PR1&2	2
RS00075	RS-232 DATA BK PR1&2	1
RS00076	RS-232 DATA BK PR1&2	2
RS00077	RS-232 DATA BK PR1&2	2
RS00078	RS-232 DATA BK PR1&2	1
RS00079	RS-232 DATA BK PR1&2	1
RS00080	RS-232 DATA BK PR1&2	1
RS00081	RS-232 DATA BK PR1&2	1
RS00082	RS-232 DATA BK PR1&2	1
RS00083	RS-232 DATA BK PR1&2	1
RS00084	RS-232 DATA BK PR1&2	1
RS00085	RS-232 DATA BK PR1&2	1
RS00097	RS-232 DATA BK PR1&2	1
RS00098	RS-232 DATA BK PR1&2	1
RS000M1	RS-232 DATA BK PR1&2	1
RS000M2	RS-232 DATA BK PR1&2	1
RS00100	RS-232 DATA BK PR1&2	1
RS00101	RS-232 DATA BK PR1&2	1
RS00102	RS-232 DATA BK PR1&2	1
RTC	DATA AUX 6 BTN SET	13
RTCC5	502B TEL SET	1
RTCCRD	15 FT MTG CORD	2
RX5	INTERIOR STATION	2
RXRTX	TERM AS TRUNK	17
S48	MODEM 208B	17
S4PBX	SPEAKERPHONE BLACK	29
S4PEX	SPEAKERPHONE BEIGE	261
S4PGX	SPEAKERPHONE GREEN	20
S4PLX	SPEAKERPHONE BLUE	2
S4PRX	SPEAKERPHONE RED	5
S4PVX	SPEAKERPHONE IVORY	92
S4PWX	SPEAKERPHONE WHITE	6
S4PYX	SPEAKERPHONE YELLOW	5
S75LINE	SYS 75 STA TERM @FOB	66
S75POOL	SYS 75 MODEM POOL	16
S75TOLL	SYS 75 TOLL BILLING#	1
SAM	SPKR ADAPTR TCHMATIC	23
SBV	RELAY LMP & 105C BOX	31
SC14	14' SILENCER CORD	7
SC25	25' SILENCER CORD	3
SC7	7' MOD RNGER CUT OFF	8
SD001-M	DATA BLOCK	27
SD002-M	DATA BLOCK	24
SD003-M	DATA BLOCK	27
SD004-M	DATA BLOCK	22
SD005-M	DATA BLOCK	28

USOC	DESCRIPTION	TOTAL
SD006-M	DATA BLOCK	24
SD007-M	DATA BLOCK	28
SD008-M	DATA BLOCK	21
SD009-M	DATA BLOCK	27
SD010-M	DATA BLOCK	24
SD011-M	DATA BLOCK	21
SD012-M	DATA BLOCK	26
SD013-M	DATA BLOCK	24
SD014-M	DATA BLOCK	19
SD015-M	DATA BLOCK	20
SD016-M	DATA BLOCK	24
SD017-M	DATA BLOCK	18
SD018-M	DATA BLOCK	19
SD019-M	DATA BLOCK	22
SD020-M	DATA BLOCK	21
SD021-M	DATA BLOCK	26
SD022-M	DATA BLOCK	24
SD023-M	DATA BLOCK	29
SD024-M	DATA BLOCK	19
SD025-M	DATA BLOCK	20
SD026-M	DATA BLOCK	22
SD027-M	DATA BLOCK	17
SD028-M	DATA BLOCK	15
SD029-M	DATA BLOCK	21
SD030-M	DATA BLOCK	22
SD031-M	DATA BLOCK	14
SD032-M	DATA BLOCK	13
SD033-M	DATA BLOCK	15
SD034-M	DATA BLOCK	15
SD035-M	DATA BLOCK	15
SD036-M	DATA BLOCK	15
SD037-M	DATA BLOCK	13
SD038-M	DATA BLOCK	14
SD039-M	DATA BLOCK	12
SD040-M	DATA BLOCK	15
SD041-M	DATA BLOCK	10
SD042-M	DATA BLOCK	12
SD043-M	DATA BLOCK	13
SD044-M	DATA BLOCK	14
SD045-M	DATA BLOCK	15
SD046-M	DATA BLOCK	13
SD047-M	DATA BLOCK	8
SD048-M	DATA BLOCK	8
SD049-M	DATA BLOCK	13
SD050-M	DATA BLOCK	15
SD051-M	DATA BLOCK	13
SD052-M	DATA BLOCK	11
SD053-M	DATA BLOCK	13
SD054-M	DATA BLOCK	13
SD055-M	DATA BLOCK	13
SD056-M	DATA BLOCK	11
SD057-M	DATA BLOCK	9

USOC	DESCRIPTION	TOTAL
SD058-M	DATA BLOCK	8
SD059-M	DATA BLOCK	11
SD060-M	DATA BLOCK	11
SD061-M	DATA BLOCK	9
SD062-M	DATA BLOCK	8
SD063-M	DATA BLOCK	10
SD064-M	DATA BLOCK	10
SD065-M	DATA BLOCK	8
SD066-M	DATA BLOCK	8
SD067-M	DATA BLOCK	9
SD068-M	DATA BLOCK	8
SD069-M	DATA BLOCK	12
SD070-M	DATA BLOCK	9
SD071-M	DATA BLOCK	8
SD072-M	DATA BLOCK	5
SD073-M	DATA BLOCK	6
SD074-M	DATA BLOCK	5
SD075-M	DATA BLOCK	7
SD076-M	DATA BLOCK	9
SD077-M	DATA BLOCK	9
SD078-M	DATA BLOCK	7
SD079-M	DATA BLOCK	9
SD080-M	DATA BLOCK	7
SD081-M	DATA BLOCK	6
SD082-M	DATA BLOCK	10
SD083-M	DATA BLOCK	6
SD084-M	DATA BLOCK	9
SD085-M	DATA BLOCK	5
SD086-M	DATA BLOCK	4
SD087-M	DATA BLOCK	4
SD088-M	DATA BLOCK	4
SD089-M	DATA BLOCK	5
SD090-M	DATA BLOCK	5
SD091-M	DATA BLOCK	6
SD092-M	DATA BLOCK	3
SD093-M	DATA BLOCK	5
SD094-M	DATA BLOCK	4
SD095-M	DATA BLOCK	4
SD096-M	DATA BLOCK	4
SD097-M	DATA BLOCK	4
SD098-M	DATA BLOCK	3
SD099-M	DATA BLOCK	2
SD100-M	DATA BLOCK	4
SD101-M	DATA BLOCK	2
SD102-M	DATA BLOCK	2
SD103-M	STATION DATA BLOCK	2
SD104-M	DATA BLOCK	2
SD105-M	DATA BLOCK	3
SD106-M	STATION DATA BLOCK	1
SD107-M	DATA BLOCK	2
SD108-M	STATION DATA BLOCK	1
SD109-M	STATION DATA BLOCK	1

USOC	DESCRIPTION	TOTAL
SD110-M	DATA BLOCK	2
SD111-M	STATION DATA BLOCK	1
SD112-M	DATA BLOCK	2
SD113-M	STATION DATA BLOCK	1
SD114-M	STATION DATA BLOCK	1
SD115-M	STATION DATA BLOCK	1
SD116-M	DATA BLOCK	2
SD117-M	DATA BLOCK	2
SD118-M	STATION DATA BLOCK	1
SD119-M	DATA BLOCK	2
SD120-M	STATION DATA BLOCK	1
SD121-M	STATION DATA BLOCK	1
SD122-M	STATION DATA BLOCK	1
SD123-M	STATION DATA BLOCK	1
SD124-M	STATIN DATA BLOCK	1
SD125-M	STATION DATA BLOCK	2
SD126-M	STATION DATA BLOCK	1
SD127-M	STATION DATA BLOCK	1
SD128-M	STATION DATA BLOCK	1
SD129-M	STATION DATA BLOCK	1
SD130-M	STATION DATA BLOCK	1
SD131-M	STATION DATA BLOCK	1
SD132-M	STATION DATA BLOCK	1
SD133-M	STATION DATA BLOCK	1
SD134-M	STATION DATA BLOCK	1
SD135-M	STATION DATA BLOCK	1
SD136-M	STATION DATA BLOCK	1
SD137-M	STATION DATA BLOCK	1
SD138-M	STATION DATA BLOCK	1
SD139-M	STATION DATA BLOCK	1
SD140-M	STATION DATA BLOCK	1
SD141-M	STATION DATA BLOCK	1
SD142-M	STATION DATA BLOCK	1
SD143-M	STATION DATA BLOCK	2
SD144-M	STATION DATA BLOCK	1
SD145-M	STATION DATA BLOCK	1
SD146-M	STATION DATA BLOCK	1
SD147-M	STATION DATA BLOCK	1
SD148-M	STATION DATA BLOCK	1
SD149-M	STATION DATA BLOCK	1
SD150-M	STATION DATA BLOCK	1
SD152-M	DATA BLOCK	1
SDD2XNR	LOCAL CHANNEL PYC__	5
SE700AA	ASH 700 BLOCK	1
SFONEFM	FULL MODULAR SPKR	16
SKYTALK	SKYTEL VMB	1
SKYTEL	SKYTEL NATIONWIDE	2
SL3	MANUAL RGNDWN SIGNAL	2
SL5	AUTOMATIC RINGDOWN	62
SL5NR	PVT LINE-NO RATE	2
SLC96	SUBSCRIBER LINE CARR	226
SLM	SIGNAL ARRG W/CPE	6

USOC	DESCRIPTION	TOTAL
SPDL909	SPEED DIAL 632-5525	4
SPDL919	SPEED DIAL 544-9111	4
SPJ	TELEHELPER SPEAKER	6
SPJVX	TELEHELPER SPEAKER	1
SPKRWL1	WOODGRAIN WALL SPKR	1
SPLIT	COST CENTER SPLIT	2
SPLTOTH	RJ45 DATA SPLITTER	114
SPLTRS2	RJ45 DATA SPLITTER	31
SQY	STA IN CPE WITH 482	1
SRD0001	DATA GER-SAV SACNET	1
SRD0002	DATA GER-SAV SACNET	1
SRT	SHOULDER REST	27
SRTBR	SOFT BLACK SHLDR RST	41
SRTBX	SHOULDER REST BLACK	1
SRTER	SOFT BEIGE SHLDR RST	50
SRTEX	SHOULDER REST BEIGE	3
SRTVR	SOFT IVORY SHLDR RST	32
SRTVX	SHOULDER REST IVORY	8
SS7403D	SYS 75 7403D SET	4
SS7406A	16 BTN DISP,ADJNT,T2	7
SS7406D	16 BTN DISPLAYSET,T1	18
SS7434D	S75 34 BTN TEL	1
SSATNC	S75 ATTND CONSOLE,T4	2
SSC401B	S75 CVG MODULE	1
SSTEL	2500 W/ADJNT,T3	1
SSV0001	SSV BL FR EQ	16
SSV0002	SSV BL FR EQ	12
SSV0003	SSV BL FR EQ	14
SSV0004	SSV BL FR EQ	17
SSV0005	SSV BL FR EQ	16
SSV0006	SSV BL FR EQ	15
SSV0007	SSV BL FR EQ	16
SSV0008	SSV BL FR EQ	9
SSV0009	SSV BL FR EQ	8
SSV0010	SSV BL FR EQ	8
SSV0011	SSV BL FR EQ	10
SSV0012	SSV BL FR EQ	8
SSV0013	SSV BL FR EQ	9
SSV0014	SSV BL FR EQ	10
SSV0015	SSV BLOCK TO KEY EQ	7
SSV0016	SSV BLOCK TO KEY EQ	8
SSV0017	SSV BL FR EQ	8
SSV0018	SSV BL FR EQ	10
SSV0019	SSV BL FR EQ	8
SSV0020	SSV BL FR EQ	9
SSV0021	SSV BL FR EQ	8
SSV0022	SSV BL FR EQ	5
SSV0023	SSV BL FR EQ	8
SSV0024	SSV BL FR EQ	7
SSV0025	SSV BLOCK TO KEY EQ	7
SSV0026	SSV BL FR EQ	2
SSV0027	SSV BL FR EQ	3

USOC	DESCRIPTION	TOTAL
SSV0028	SSV BL FR EQ	3
SSV0029	SSV BL FR EQ	3
SSV0030	SSV BL FR EQ	2
SSV0031	SSV BL FR EQ	2
SSV0032	SSV BL FR EQ	2
SSV0033	SSV BL FR EQ	2
SSV0034	SSV BL FR EQ	3
SSV0035	SSV BL FR EQ	2
SSV0036	SSV BL FR EQ	3
SSV0037	SSV BL FR EQ	2
SSV0038	SSV BL FR EQ	2
SSV0039	SSV BL FR EQ	2
SSV0040	SSV BL FR EQ	1
SSV0041	SSV BL FR EQ	2
SSV0042	SSV BL FR EQ	3
SSV0043	SSV BL FR EQ	2
SSV0044	SSV BL FR EQ	3
SSV0046	SSV BL FR EQ	2
SSV0047	SSV BL FR EQ	1
SSV0048	SSV BL FR EQ	1
SSV0050	SSV BL FR EQ	1
SSV0051	SSV BL FR EQ	1
SSV0052	SSV BL FR EQ	1
SSV0055	SSV BL FR EQ	1
SSV0056	SSV BL FR EQ	1
SSV0057	SSV BL FR EQ	1
SSV0058	SSV BL FR EQ	1
SSV0060	SSV BL FR EQ	1
SSV0061	SSV BL FR EQ	1
SSV0063	SSV BL TO KEY EQ	1
SSV0077	SSV BL TO KEY EQ	1
SSV0078	SSV BL TO KEY EQ	1
SSV0079	SSV BL TO KEY EQ	1
SSV0080	SSV BL TO KEY EQ	1
SSV0081	SSV BL TO KEY EQ	1
SSV0082	SSV BL TO KEY EQ	1
SSV0083	SSV BL TO KEY EQ	1
SSV0084	SSV BL TO KEY EQ	1
SSV0085	SSV BL TO KEY EQ	1
SSV0087	SSV BL TO KEY EQ	1
SSV0088	SSV BL TO KEY EQ	1
SSV0089	SSV BL FR EQ	1
SSV0090	SSV BL TO KEY EQ	1
SSV0091	SSV BL TO KEY EQ	2
SSV0092	SSV BL TO KEY EQ	1
SSV0093	SSV BL TO KEY EQP	2
SSV0095	SSV BL TO KEY EP	1
SSV0096	SSV BL TO KEY EQP	1
SSV0097	SSV BL TO KEY EQP	1
SSV0098	SSV BL TO KEY EQP	1
SSV0205	SSV BLOCK FR EQ	1
STC	DATA COUPLER	1

USOC	DESCRIPTION	TOTAL
STC00	VAX8200	1
STC10	VAX 8600	1
STC11	VAX 8600	1
STROBE	STOBE LIGHT LAMP	1
SUB-MIN	OPER SP SUB MIN	1
SUPRA	MOD SUPRA HEADSET	44
SUPRAPT	HEADSET/PUSH TO TALK	4
SV001-M	VOICE BLOCK	23
SV002-M	VOICE BLOCK	14
SV003-M	VOICE BLOCK	23
SV004-M	VOICE BLOCK	17
SV005-M	VOICE BLOCK	18
SV006-M	VOICE BLOCK	16
SV007-M	VOICE BLOCK	16
SV008-M	VOICE BLOCK	16
SV009-M	VOICE BLOCK	14
SV010-M	VOICE BLOCK	15
SV011-M	VOICE BLOCK	19
SV012-M	VOICE BLOCK	19
SV013-M	VOICE BLOCK	15
SV014-M	VOICE BLOCK	20
SV015-M	VOICE BLOCK	16
SV016-M	VOICE BLOCK	17
SV017-M	VOICE BLOCK	17
SV018-M	VOICE BLOCK	12
SV019-M	VOICE BLOCK	14
SV020-M	VOICE BLOCK	12
SV021-M	VOICE BLOCK	12
SV022-M	VOICE BLOCK	15
SV023-M	VOICE BLOCK	16
SV024-M	VOICE BLOCK	13
SV025-M	VOICE BLOCK	15
SV026-M	VOICE BLOCK	15
SV027-M	VOICE BLOCK	11
SV028-M	VOICE BLOCK	12
SV029-M	VOICE BLOCK	14
SV030-M	VOICE BLOCK	20
SV031-M	VOICE BLOCK	14
SV032-M	VOICE BLOCK	15
SV033-M	VOICE BLOCK	12
SV034-M	VOICE BLOCK	12
SV035-M	VOICE BLOCK	15
SV036-M	VOICE BLOCK	13
SV037-M	VOICE BLOCK	9
SV038-M	VOICE BLOCK	14
SV039-M	VOICE BLOCK	13
SV040-M	VOICE BLOCK	10
SV041-M	VOICE BLOCK	9
SV042-M	VOICE BLOCK	5
SV043-M	VOICE BLOCK	9
SV044-M	VOICE BLOCK	12
SV045-M	VOICE BLOCK	7

USOC	DESCRIPTION	TOTAL
SV046-M	VOICE BLOCK	9
SV047-M	VOICE BLOCK	6
SV048-M	VOICE BLOCK	6
SV049-M	VOICE BLOCK	10
SV050-M	VOICE BLOCK	12
SV051-M	VOICE BLOCK	10
SV052-M	VOICE BLOCK	9
SV053-M	VOICE BLOCK	10
SV054-M	VOICE BLOCK	11
SV055-M	VOICE BLOCK	9
SV056-M	VOICE BLOCK	9
SV057-M	VOICE BLOCK	7
SV058-M	VOICE BLOCK	12
SV059-M	VOICE BLOCK	8
SV060-M	VOICE BLOCK	9
SV061-M	VOICE BLOCK	6
SV062-M	VOICE BLOCK	9
SV063-M	VOICE BLOCK	8
SV064-M	VOICE BLOCK	11
SV065-M	VOICE BLOCK	9
SV066-M	VOICE BLOCK	8
SV067-M	VOICE BLOCK	11
SV068-M	VOICE BLOCK	10
SV069-M	VOICE BLOCK	11
SV070-M	VOICE BLOCK	8
SV071-M	VOICE BLOCK	10
SV072-M	VOICE BLOCK	8
SV073-M	VOICE BLOCK	8
SV074-M	VOICE BLOCK	6
SV075-M	VOICE BLOCK	6
SV076-M	VOICE BLOCK	7
SV077-M	VOICE BLOCK	9
SV078-M	VOICE BLOCK	7
SV079-M	VOICE BLOCK	7
SV080-M	VOICE BLOCK	6
SV081-M	VOICE BLOCK	7
SV082-M	VOICE BLOCK	5
SV083-M	VOICE BLOCK	7
SV084-M	VOICE BLOCK	9
SV085-M	VOICE BLOCK	3
SV086-M	VOICE BLOCK	5
SV087-M	VOICE BLOCK	8
SV088-M	VOICE BLOCK	6
SV089-M	VOICE BLOCK	5
SV090-M	VOICE BLOCK	6
SV091-M	VOICE BLOCK	4
SV092-M	VOICE BLOCK	3
SV093-M	VOICE BLOCK	3
SV094-M	VOICE BLOCK	3
SV095-M	VOICE BLOCK	3
SV096-M	VOICE BLOCK	3
SV097-M	VOICE BLOCK	2

USOC	DESCRIPTION	TOTAL
SV098-M	VOICE BLOCK	3
SV099-M	VOICE BLOCK	2
SV100-M	VOICE BLOCK	1
SV101-M	VOICE BLOCK	3
SV102-M	STATION VOICE BLOCK	2
SV103-M	STATION VOICE BLOCK	2
SV104-M	STATION VOICE BLOCK	3
SV105-M	STATION VOICE BLOCK	2
SV107-M	STATION VOICE BLOCK	2
SV108-M	STATION BLOCK	2
SV109-M	STATION VOICE BLOCK	1
SV110-M	STA. VOICE BLOCK	2
SV111-M	STATION VOICE BLOCK	1
SV112-M	STATION VOICE BLOCK	2
SV113-M	STATION VOICE BLOCK	1
SV114-M	STATION VOICE BLOCK	1
SV115-M	STA. VOICE BLOCK	2
SV116-M	STATION VOICE BLOCK	1
SV117-M	STATION VOICE BLOCK	2
SV118-M	STATION VOICE BLOCK	2
SV119-M	STATION VOICE BLOCK	1
SV120-M	STATION VOICE BLOCK	1
SV121-M	STATION VOICE BLOCK	3
SV122-M	STATION VOICE BLOCK	1
SV123-M	STATION VOICE BLOCK	1
SV124-M	STATION VOICE BLOCK	1
SV125-M	STATION VOICE BLOCK	1
SV126-M	STATION VOICE BLOCK	1
SV127-M	STATION VOICE BLOCK	1
SV128-M	STATION VOICE BLOCK	1
SV129-M	STATION VOICE BLOCK	1
SV130-M	STATION VOICE BLOCK	1
SV131-M	STATION VOICE BLOCK	1
SV132-M	STATION VOICE BLOCK	2
SV133-M	STATION VOICE BLOCK	1
SV134-M	STATION VOICE BLOCK	2
SV135-M	STATION VOICE BLOCK	1
SV136-M	STATION VOICE BLOCK	1
SV137-M	STATION VOICE BLOCK	1
SV138-M	STATION VOICE BLOCK	1
SV139-M	STATION VOICE BLOCK	1
SV140-M	STATION VOICE BLOCK	1
SV141-M	STATION VOICE BLOCK	1
SV142-M	STATION VOICE BLOCK	1
SV143-M	STATION VOICE BLOCK	3
SV144-M	STATION VOICE BLOCK	1
SV145-M	STATION VOICE BLOCK	1
SV146-M	STATION VOICE BLOCK	1
SV147-M	STATION VOICE BLOCK	1
SV148-M	STATION VOICE BLOCK	1
SV150-M	STATION VOICE BLOCK	2
SV151-M	STATION VOICE BLOCK	1

USOC	DESCRIPTION	TOTAL
SV152-M	VOICE BLOCK	1
SV167-M	STATION VOICE BLOCK	1
SV168-M	STATION VOICE BLOCK	1
SV201-M	STATION VOICE BLOCK	1
SV205-M	STATION VOICE BLOCK	1
SV207-M	STATION VOICE BLOCK	1
SV214-M	STATION VOICE BLOCK	1
SV220-M	STATION VOICE BLOCK	1
SV223-M	STATION VOICE BLOCK	1
SYZRL	CLASS OF SERVICE	47
T&V	TONE & VOICE PAGER	1
T&VNUMB	T&V GOVT OWNED	8
TAJ	TOUCHAMATIC	10
TAJB6	BLACK TOUCHMATIC	48
TAJE6	BEIGE TOUCHMATIC	72
TAJET	TOUCHAMATIC BEIGE	3
TAJV2	TOUCHMATIC	2
TAJV6	IVORY TOUCHAMATIC	48
TAJWT	WHITE TOUCHMATIC	1
TAX	ADJUNCT DIALER TCMAT	3
TAXVT	ADJUNCT DIALER IVORY	1
TDD200	TELECOM DEAF DEVICE	20
TDD400	DEAF DEVICE SUPERPRT	5
TDLAMP	DEAF DEVICE LAMP	7
TDP	STATION SELECTOR	76
TE2LSCB	TLN SCB 480 TEL	2
TELAN	BUSCOM NON-DIAL	12
TELAT3L	3 LINE TELEPHONE ASH	21
TELATAD	SLS W/28# AUTO-DIAL	82
TELATDX	STARPLUS DELUXE SET	36
TELATRD	2365AUTO-REDIALW/SPK	5
TELB2	BLACK WALL TT	463
TELB2KS	BLACK WALL KEYSET	2
TELB5	PORTBL DESK TT BLACK	2
TELBC	BLACK DESK ROTARY	1
TELBN	BLACK DESK N-DIAL	7
TELBS	BLACK WALL N-DIAL	37
TELBT	BLACK DESK TT	1455
TELBTAS	COMB ANSWER-SPEAKER	38
TELBTKS	BLACK TT KEYSET	4
TELBTSP	TEL MODIFIED SPKRPHN	18
TELBW	WALL ROTARY BLACK	11
TELE2	BEIGE WALL TT	634
TELEC	BEIGE DESK ROTARY	1
TELEN	TEL SET ROTARY BEIGE	2
TELES	TEL SET ROTARY	3
TELET	BEIGE DESK TT	5230
TELET1	STARPLUS 2500 SET	40
TELETE1	TEL IN EXT. BLDG 1	3
TELETKS	BEIGE TT KEYSET	55
TELETMW	MESSAGE WAIT BEIGE	7
TELETSP	TEL MODIFIED SPKRPHN	147

USOC	DESCRIPTION	TOTAL
TELG2	GREEN WALL TT	94
TELGN	TEL SET ROTARY	1
TELGR	GREEN NON-DIAL	1
TELGS	GREEN WALL N-DIAL	3
TELGT	GREEN DESK TT	1077
TELGTKS	TELE KEY SET GREEN	6
TELGTSP	TEL MODIFIED SPKRPHN	5
TELL2	BLUE WALL TT	92
TELLN	BLUE DESK NONDIAL	1
TELLS	TEL BLUE N-DIAL	1
TELLT	BLUE DESK TT	774
TELLTKS	TEL SET BLUE KS	3
TELNR	TT SET ON TEST STA	1
TELR2	RED WALL TT	93
TELR5	DESK PORTABLE TT RED	1
TELRC	RED ROTARY COMBINED	1
TELRN	TEL SET RED NON-DIAL	6
TELRS	TEL SET ROTARY DIAL	7
TELRT	RED DESK TT	652
TELRTKS	TEL MODIFIED KS	4
TELRTSP	TEL MODIFIED SPKRPHN	3
TELV2	IVORY WALL TT	259
TELV5	PORTABLE DESK TT	1
TELVN	IVORY DESK NONDIAL	1
TELVS	WALL NON-DIAL IVORY	1
TELVSEC	SEC 2500 IVORY DESK	15
TELVT	IVORY DESK TT	2837
TELVT2L	2 LINE PHONE-IVORY	62
TELVTKS	TEL SET IVORY KS	18
TELVTSP	TEL MODIFIED SPKRPHN	49
TELVW	WALL ROTARY IVORY	2
TELW2	WHITE WALL TT	50
TELW5	PORTABLE DESK TT	3
TELWS	WHITE WALL NON-DIAL	1
TELWT	WHITE DESK TT	249
TELWTSP	TEL MODIFIED SPKRPHN	2
TELY2	YELLOW WALL TT	80
TELYC	YELLOW DESK ROTARY	2
TELYT	YELLOW DESK TT	575
TELYTKS	YELLOW SET KS	3
TELYTSP	TEL MODIFIED SPKRPHN	3
TF00008	DEMARCATION BLOCK	1
TF00906	DEMARCATION BLOCK	1
TF00907	DEMARCATION BLOCK	1
TF00909	DEMARCATION BLOCK	1
TF00913	DEMARCATION BLOCK	1
TF00915	DEMARCATION BLOCK	1
TF00916	DEMARCATION BLOCK	1
TF00917	DEMARCATION BLOCK	1
TF00918	DEMARCATION BLOCK	1
TF00920	DEMARCATION BLOCK	1
TF00921	DEMARCATION BLOCK	1

USOC	DESCRIPTION	TOTAL
TF00922	DEMARCATION BLOCK	1
TF10000	DEMARCATION BLOCK	20
TF10001	DEMARCATION BLOCK	60
TF10002	DEMARCATION BLOCK	7
TF10003	DEMARCATION BLOCK	6
TF10004	DEMARCATION BLOCK	8
TF10005	DEMARCATION BLOCK	8
TF10006	DEMARCATION BLOCK	6
TF10007	DEMARCATION BLOCK	8
TF10008	DEMARCATION BLOCK	5
TF10009	DEMARCATION BLOCK	7
TF10010	DEMARCATION BLOCK	10
TF10011	DEMARCATION BLOCK	8
TF10012	DEMARCATION BLOCK	6
TF10013	DEMARCATION BLOCK	6
TF10014	DEMARCATION BLOCK	7
TF10015	DEMARCATION BLOCK	8
TF10016	DEMARCATION BLOCK	9
TF10017	DEMARCATION BLOCK	9
TF10018	DEMARCATION BLOCK	7
TF10019	DEMARCATION BLOCK	5
TF10020	DEMARCATION BLOCK	5
TF10021	DEMARCATION BLOCK	8
TF10022	DEMARCATION BLOCK	8
TF10023	DEMARCATION BLOCK	8
TF10024	DEMARCATION BLOCK	6
TF10025	DEMARCATION BLOCK	7
TF10026	DEMARCATION BLOCK	4
TF10027	DEMARCATION BLOCK	5
TF10028	DEMARCATION BLOCK	7
TF10029	DEMARCATION BLOCK	6
TF10030	DEMARCATION BLOCK	5
TF10031	DEMARCATION BLOCK	5
TF10032	DEMARCATION BLOCK	3
TF10033	DEMARCATION BLOCK	4
TF10034	DEMARCATION BLOCK	4
TF10035	DEMARCATION BLOCK	3
TF10036	DEMARCATION BLOCK	3
TF10037	DEMARCATION BLOCK	3
TF10038	DEMARCATION BLOCK	3
TF10039	DEMARCATION BLOCK	3
TF10040	DEMARCATION BLOCK	2
TF10041	DEMARCATION BLOCK	1
TF10042	DEMARCATION BLOCK	4
TF10043	DEMARCATION BLOCK	3
TF10044	DEMARCATION BLOCK	2
TF10045	DEMARCATION BLOCK	1
TF10046	DEMARCATION BLOCK	1
TF10047	DEMARCATION BLOCK	1
TF10049	DEMARCATION BLOCK	1
TF10050	DEMARCATION BLOCK	5
TF10051	DEMARCATION BLOCK	1

USOC	DESCRIPTION	TOTAL
TF10052	DEMARCATION BLOCK	1
TF10053	DEMARCATION BLOCK	1
TF10054	DEMARCATION BLOCK	1
TF10055	DEMARCATION BLOCK	1
TF10056	DEMARCATION BLOCK	1
TF10058	DEMARCATION BLOCK	1
TF10059	DEMARCATION BLOCK	1
TF10060	DEMARCATION BLOCK	1
TF10061	DEMARCATION BLOCK	2
TF10062	DEMARCATION BLOCK	3
TF10063	DEMARCATION BLOCK	2
TF10064	DEMARCATION BLOCK	1
TF10065	DEMARCATION BLOCK	1
TF10066	DEMARCATION BLOCK	1
TF10067	DEMARCATION BLOCK	1
TF10068	DEMARCATION BLOCK	2
TF10069	DEMARCATION BLOCK	2
TF10070	DEMARCATION BLOCK	3
TF10071	DEMARCATION BLOCK	2
TF10072	DEMARCATION BLOCK	1
TF10073	DEMARCATION BLOCK	2
TF10074	DEMARCATION BLOCK	2
TF10075	DEMARCATION BLOCK	1
TF10076	DEMARCATION BLOCK	1
TF10077	DEMARCATION BLOCK	1
TF10078	DEMARCATION BLOCK	1
TF10079	DEMARCATION BLOCK	1
TF10082	DEMARCATION BLOCK	1
TF10083	DEMARCATION BLOCK	1
TF10084	DEMARCATION BLOCK	1
TF10091	DEMARCATION BLOCK	1
TF10094	DEMARCATION BLOCK	1
TF10095	DEMARCATION BLOCK	1
TF10096	DEMARCATION BLOCK	1
TF10100	DEMARCATION BLOCK	2
TF10104	DEMARCATION BLOCK	1
TF10106	DEMARCATION BLOCK	1
TF10108	DEMARCATION BLOCK	1
TF10140	DEMARCATION BLOCK	1
TF10141	DEMARCATION BLOCK	1
TF10142	DEMARCATION BLOCK	1
TF10143	DEMARCATION BLOCK	1
TF10144	DEMARCATION BLOCK	1
TF10145	DEMARCATION BLOCK	1
TF10146	DEMARCATION BLOCK	1
TF10147	DEMARCATION BLOCK	1
TF10148	DEMARCATION BLOCK	1
TF10149	DEMARCATION BLOCK	2
TF10150	DEMARCATION BLOCK	1
TF10201	DEMARCATION BLOCK	1
TF10202	DEMARCATION BLOCK	2
TF10203	DEMARCATION BLOCK	2

USOC	DESCRIPTION	TOTAL
TF10204	DEMARCATION BLOCK	2
TF10212	DEMARCATION BLOCK	1
TF10213	DEMARCATION BLOCK	1
TF10216	DEMARCATION BLOCK	1
TF10217	DEMARCATION BLOCK	1
TF10219	DEMARCATION BLOCK	1
TF10221	DEMARCATION BLOCK	1
TF10224	DEMARCATION BLOCK	1
TF10225	DEMARCATION BLOCK	1
TF10227	DEMARCATION BLOCK	1
TF10228	DEMARCATION BLOCK	1
TF10230	DEMARCATION BLOCK	1
TF10234	DEMARCATION BLOCK	1
TF10242	DEMARCATION BLOCK	1
TF10246	DEMARCATION BLOCK	1
TF10248	DEMARCATION BLOCK	1
TF10249	DEMARCATION BLOCK	1
TF10250	DEMARCATION BLOCK	1
TF10253	DEMARCATION BLOCK	1
TF10258	DEMARCATION BLOCK	1
TF10261	DEMARCATION BLOCK	1
TF10265	DEMARCATION BLOCK	1
TF10266	DEMARCATION BLOCK	1
TF10267	DEMARCATION BLOCK	1
TF10269	DEMARCATION BLOCK	1
TF10270	DEMARCATION BLOCK	1
TF10272	DEMARCATION BLOCK	1
TF10274	DEMARCATION BLOCK	1
TF10293	DEMARCATION BLOCK	1
TF10386	DEMARCATION BLOCK	1
TF10387	DEMARCATION BLOCK	1
TF10388	DEMARCATION BLOCK	1
TF10389	DEMARCATION BLOCK	1
TF10391	DEMARCATION BLOCK	1
TF10392	DEMARCATION BLOCK	1
TF10393	DEMARCATION BLOCK	3
TF10394	DEMARCATION BLOCK	1
TF10395	DEMARCATION BLOCK	1
TF10396	DEMARCATION BLOCK	1
TF10397	DEMARCATION BLOCK	1
TF10401	DEMARCATION BLOCK	1
TF10402	DEMARCATION BLOCK	1
TF10404	DEMARCATION BLOCK	1
TF10405	DEMARCATION BLOCK	1
TF10409	DEMARCATION BLOCK	1
TF10411	DEMARCATION BLOCK	1
TF10412	DEMARCATION BLOCK	1
TF10420	DEMARCATION BLOCK	1
TF10421	DEMARCATION BLOCK	1
TF10425	DEMARCATION BLOCK	1
TF10426	DEMARCATION BLOCK	1
TF10428	DEMARCATION BLOCK	1

USOC	DESCRIPTION	TOTAL
TF10429	DEMARCATION BLOCK	1
TF10430	DEMARCATION BLOCK	4
TF10432	DEMARCATION BLOCK	1
TF10433	DEMARCATION BLOCK	1
TF10434	DEMARCATION BLOCK	1
TF10441	DEMARCATION BLOCK	1
TF10442	DEMARCATION BLOCK	1
TF10445	DEMARCATION BLOCK	1
TF10446	DEMARCATION BLOCK	1
TF10447	DEMARCATION BLOCK	1
TF10461	DEMARCATION BLOCK	1
TF10466	DEMARCATION BLOCK	2
TF10475	DEMARCATION BLOCK	1
TF10484	DEMARCATION BLOCK	1
TF10487	DEMARCATION BLOCK	1
TF10601	DEMARCATION BLOCK	2
TF10602	DEMARCATION BLOCK	1
TF10603	DEMARCATION BLOCK	1
TF10605	DEMARCATION BLOCK	1
TF10606	DEMARCATION BLOCK	1
TF10607	DEMARCATION BLOCK	1
TF10608	DEMARCATION BLOCK	2
TF10609	DEMARCATION BLOCK	2
TF10612	DEMARCATION BLOCK	1
TF10613	DEMARCATION BLOCK	1
TF10614	DEMARCATION BLOCK	1
TF10615	DEMARCATION BLOCK	16
TF10617	DEMARCATION BLOCK	1
TF10618	DEMARCATION BLOCK	1
TF10619	DEMARCATION BLOCK	1
TF10620	DEMARCATION BLOCK	1
TF10621	DEMARCATION BLOCK	1
TF10622	DEMARCATION BLOCK	1
TF10623	DEMARCATION BLOCK	1
TF10624	DEMARCATION BLOCK	1
TF10625	DEMARCATION BLOCK	1
TF10626	DEMARCATION BLOCK	1
TF10628	DEMARCATION BLOCK	1
TF10629	DEMARCATION BLOCK	1
TF10630	DEMARCATION BLOCK	1
TF10631	DEMARCATION BLOCK	1
TF10633	DEMARCATION BLOCK	1
TF10636	DEMARCATION BLOCK	2
TF10638	DEMARCATION BLOCK	1
TF10639	DEMARCATION BLOCK	1
TF10640	DEMARCATION BLOCK	1
TF10641	DEMARCATION BLOCK	1
TF10644	DEMARCATION BLOCK	1
TF10645	DEMARCATION BLOCK	1
TF10646	DEMARCATION BLOCK	1
TF10647	DEMARCATION BLOCK	1
TF10648	DEMARCATION BLOCK	1

USOC	DESCRIPTION	TOTAL
TF10649	DEMARCATION BLOCK	1
TF10650	DEMARCATION BLOCK	1
TF10651	DEMARCATION BLOCK	1
TF10652	DEMARCATION BLOCK	1
TF10653	DEMARCATION BLOCK	1
TF10654	DEMARCATION BLOCK	1
TF10656	DEMARCATION BLOCK	3
TF10657	DEMARCATION BLOCK	1
TF10658	DEMARCATION BLOCK	1
TF10659	DEMARCATION BLOCK	1
TF10661	DEMARCATION BLOCK	1
TF10662	DEMARCATION BLOCK	1
TF10675	DEMARCATION BLOCK	1
TF10683	DEMARCATION BLOCK	1
TF10684	DEMARCATION BLOCK	1
TF10685	DEMARCATION BLOCK	1
TF10686	DEMARCATION BLOCK	1
TF10687	DEMARCATION BLOCK	1
TF10690	DEMARCATION BLOCK	1
TF10698	DEMARCATION BLOCK	1
TF10699	DEMARCATION BLOCK	1
TF10700	DEMARCATION BLOCK	1
TF10763	DEMARCATION BLOCK	2
TF10765	DEMARCATION BLOCK	1
TF10767	DEMARCATION BLOCK	1
TF10768	DEMARCATION BLOCK	1
TF10769	DEMARCATION BLOCK	1
TF10770	DEMARCATION BLOCK	1
TF10855	DEMARCATION BLOCK	1
TF10856	DEMARCATION BLOCK	1
TF10857	DEMARCATION BLOCK	1
TF10858	DEMARCATION BLOCK	1
TF10859	DEMARCATION BLOCK	1
TF10860	DEMARCATION BLOCK	1
TF10864	DEMARCATION BLOCK	1
TF10865	DEMARCATION BLOCK	1
TF10866	DEMARCATION BLOCK	2
TF10869	DEMARCATION BLOCK	1
TF10870	DEMARCATION BLOCK	1
TF10871	DEMARCATION BLOCK	1
TF10872	DEMARCATION BLOCK	1
TF10873	DEMARCATION BLOCK	1
TF10874	DEMARCATION BLOCK	1
TF10876	DEMARCATION BLOCK	1
TF10877	DEMARCATION BLOCK	1
TF10901	DEMARCATION BLOCK	3
TF10902	DEMARCATION BLOCK	3
TF10903	DEMARCATION BLOCK	3
TF10904	DEMARCATION BLOCK	4
TF10905	DEMARCATION BLOCK	4
TF10906	DEMARCATION BLOCK	3
TF10907	DEMARCATION BLOCK	3

USOC	DESCRIPTION	TOTAL
TF10908	DEMARCATION BLOCK	2
TF10909	DEMARCATION BLOCK	3
TF10910	DEMARCATION BLOCK	3
TF10911	DEMARCATION BLOCK	1
TF10912	DEMARCATION BLOCK	3
TF10913	DEMARCATION BLOCK	2
TF10914	DEMARCATION BLOCK	2
TF10915	DEMARCATION BLOCK	2
TF10916	DEMARCATION BLOCK	2
TF10917	DEMARCATION BLOCK	3
TF10918	DEMARCATION BLOCK	2
TF10919	DEMARCATION BLOCK	2
TF10920	DEMARCATION BLOCK	2
TF10921	DEMARCATION BLOCK	2
TF10922	DEMARCATION BLOCK	5
TF10923	DEMARCATION BLOCK	2
TF10924	DEMARCATION BLOCK	3
TF10925	DEMARCATION BLOCK	3
TF10926	DEMARCATION BLOCK	3
TF10927	DEMARCATION BLOCK	1
TF10928	DEMARCATION BLOCK	1
TF10929	DEMARCATION BLOCK	2
TF10930	DEMARCATION BLOCK	2
TF10931	DEMARCATION BLOCK	2
TF10932	DEMARCATION BLOCK	3
TF10933	DEMARCATION BLOCK	3
TF10934	DEMARCATION BLOCK	2
TF10935	DEMARCATION BLOCK	3
TF10936	DEMARCATION BLOCK	2
TF10937	DEMARCATION BLOCK	3
TF10938	DEMARCATION BLOCK	4
TF10939	DEMARCATION BLOCK	3
TF10940	DEMARCATION BLOCK	2
TF10941	DEMARCATION BLOCK	2
TF10942	DEMARCATION BLOCK	1
TF10943	DEMARCATION BLOCK	2
TF10944	DEMARCATION BLOCK	2
TF10945	DEMARCATION BLOCK	1
TF10946	DEMARCATION BLOCK	2
TF10947	DEMARCATION BLOCK	3
TF10948	DEMARCATION BLOCK	1
TF10949	DEMARCATION BLOCK	2
TF10950	DEMARCATION BLOCK	1
TF10951	DEMARCATION BLOCK	1
TF10952	DEMARCATION BLOCK	2
TF10953	DEMARCATION BLOCK	2
TF10954	DEMARCATION BLOCK	3
TF10955	DEMARCATION BLOCK	2
TF10956	DEMARCATION BLOCK	2
TF10957	DEMARCATION BLOCK	2
TF10958	DEMARCATION BLOCK	2
TF10959	DEMARCATION BLOCK	2

USOC	DESCRIPTION	TOTAL
TF10960	DEMARCATION BLOCK	2
TF10961	DEMARCATION BLOCK	2
TF10962	DEMARCATION BLOCK	1
TF10963	DEMARCATION BLOCK	1
TF10964	DEMARCATION BLOCK	1
TF10965	DEMARCATION BLOCK	1
TF10966	DEMARCATION BLOCK	1
TF10967	DEMARCATION BLOCK	1
TF10968	DEMARCATION BLOCK	1
TF10969	DEMARCATION BLOCK	1
TF10970	DEMARCATION BLOCK	1
TF10971	DEMARCATION BLOCK	2
TF10972	DEMARCATION BLOCK	1
TF10973	DEMARCATION BLOCK	2
TF10974	DEMARCATION BLOCK	1
TF10975	DEMARCATION BLOCK	1
TF10976	DEMARCATION BLOCK	1
TF10977	DEMARCATION BLOCK	1
TF10978	DEMARCATION BLOCK	1
TF10979	DEMARCATION BLOCK	1
TF10980	DEMARCATION BLOCK	1
TF10981	DEMARCATION BLOCK	1
TF10982	DEMARCATION BLOCK	2
TF10983	DEMARCATION BLOCK	1
TF10984	DEMARCATION BLOCK	1
TF10985	DEMARCATION BLOCK	1
TF10986	DEMARCATION BLOCK	1
TF10987	DEMARCATION BLOCK	2
TF10989	DEMARCATION BLOCK	1
TF10990	DEMARCATION BLOCK	1
TF10991	DEMARCATION BLOCK	1
TF10992	DEMARCATION BLOCK	1
TF10993	DEMARCATION BLOCK	1
TF10994	DEMARCATION BLOCK	1
TF10998	DEMARCATION BLOCK	1
TF11007	DEMARCATION BLOCK	1
TF11303	DEMARCATION BLOCK	1
TF11304	DEMARCATION BLOCK	1
TF11306	DEMARCATION BLOCK	1
TF11307	DEMARCATION BLOCK	1
TF11308	DEMARCATION BLOCK	1
TF11314	DEMARCATION BLOCK	1
TF11315	DEMARCATION BLOCK	1
TF11316	DEMARCATION BLOCK	1
TF11318	DEMARCATION BLOCK	1
TF11322	DEMARCATION BLOCK	1
TF11324	DEMARCATION BLOCK	1
TF11326	DEMARCATION BLOCK	1
TF11327	DEMARCATION BLOCK	1
TF11328	DEMARCATION BLOCK	1
TF11329	DEMARCATION BLOCK	1
TF11330	DEMARCATION BLOCK	1

USOC	DESCRIPTION	TOTAL
TF12207	DEMARCATION BLOCK	2
TF12208	DEMARCATION BLOCK	1
TF12209	DEMARCATION BLOCK	1
TF12212	DEMARCATION BLOCK	1
TF12213	DEMARCATION BLOCK	1
TF12214	DEMARCATION BLOCK	1
TF12215	DEMARCATION BLOCK	1
TF12216	DEMARCATION BLOCK	1
TF12217	DEMARCATION BLOCK	1
TF12218	DEMARCATION BLOCK	1
TF12219	DEMARCATION BLOCK	1
TF12220	DEMARCATION BLOCK	1
TF12221	DEMARCATION BLOCK	1
TF12222	DEMARCATION BLOCK	1
TF12223	DEMARCATION BLOCK	1
TF12224	DEMARCATION BLOCK	1
TF12225	DEMARCATION BLOCK	1
TF12226	DEMARCATION BLOCK	1
TF12227	DEMARCATION BLOCK	1
TF12228	DEMARCATION BLOCK	2
TF12229	DEMARCATION BLOCK	1
TF12230	DEMARCATION BLOCK	1
TF12231	DEMARCATION BLOCK	2
TF12232	DEMARCATION BLOCK	1
TF12233	DEMARCATION BLOCK	2
TF12234	DEMARCATION BLOCK	2
TF12235	DEMARCATION BLOCK	1
TF12237	DEMARCATION BLOCK	1
TF12238	DEMARCATION BLOCK	2
TF12239	DEMARCATION BLOCK	2
TF12240	DEMARCATION BLOCK	1
TF12244	DEMARCATION BLOCK	1
TF12245	DEMARCATION BLOCK	2
TF12246	DEMARCATION BLOCK	1
TF12248	DEMARCATION BLOCK	1
TF12253	DEMARCATION BLOCK	1
TF12254	DEMARCATION BLOCK	1
TF12257	DEMARCATION BLOCK	1
TF12259	DEMARCATION BLOCK	1
TF12261	DEMARCATION BLOCK	1
TF12263	DEMARCATION BLOCK	1
TF12264	DEMARCATION BLOCK	1
TF12266	DEMARCATION BLOCK	1
TF12268	DEMARCATION BLOCK	1
TF12271	DEMARCATION BLOCK	1
TF12274	DEMARCATION BLOCK	1
TF12330	DEMARCATION BLOCK	1
TF12333	DEMARCATION BLOCK	1
TF12344	DEMARCATION BLOCK	1
TF12351	DEMARCATION BLOCK	1
TF12352	DEMARCATION BLOCK	2
TF12353	DEMARCATION BLOCK	2

USOC	DESCRIPTION	TOTAL
TF12354	DEMARCATION BLOCK	1
TF12355	DEMARCATION BLOCK	1
TF12356	DEMARCATION BLOCK	1
TF12357	DEMARCATION BLOCK	1
TF12358	DEMARCATION BLOCK	1
TF12359	DEMARCATION BLOCK	1
TF12361	DEMARCATION BLOCK	1
TF12394	DEMARCATION BLOCK	1
TF12395	DEMARCATION BLOCK	1
TF12396	DEMARCATION BLOCK	1
TF12397	DEMARCATION BLOCK	1
TF12398	DEMARCATION BLOCK	1
TF12399	DEMARCATION BLOCK	1
TF12400	DEMARCATION BLOCK	1
TF12419	DEMARCATION BLOCK	1
TF12476	DEMARCATION BLOCK	1
TF12477	DEMARCATION BLOCK	1
TF12478	DEMARCATION BLOCK	1
TF12480	DEMARCATION BLOCK	1
TF12482	DEMARCATION BLOCK	1
TF12483	DEMARCATION BLOCK	1
TF12495	DEMARCATION BLOCK	1
TF12497	DEMARCATION BLOCK	1
TF12498	DEMARCATION BLOCK	1
TF20000	DEMARCATION BLOCK	1
TF20017	DEMARCATION BLOCK	2
TF20018	DEMARCATION BLOCK	1
TF20023	DEMARCATION BLOCK	1
TF20061	DEMARCATION BLOCK	1
TF20076	DEMARCATION BLOCK	1
TF20078	DEMARCATION BLOCK	1
TF20119	DEMARCATION BLOCK	1
TF20120	DEMARCATION BLOCK	1
TF20121	DEMARCATION BLOCK	1
TF20122	DEMARCATION BLOCK	1
TF20123	DEMARCATION BLOCK	1
TF20124	DEMARCATION BLOCK	1
TF20125	DEMARCATION BLOCK	2
TF20126	DEMARCATION BLOCK	1
TF20132	DEMARCATION BLOCK	1
TF20133	DEMARCATION BLOCK	1
TF20149	DEMARCATION BLOCK	1
TF20150	DEMARCATION BLOCK	1
TF20155	DEMARCATION BLOCK	1
TF20190	DEMARCATION BLOCK	1
TF20191	DEMARCATION BLOCK	1
TF20201	DEMARCATION BLOCK	1
TF20301	DEMARCATION BLOCK	1
TF20302	DEMARCATION BLOCK	1
TF20303	DEMARCATION BLOCK	1
TF20306	DEMARCATION BLOCK	1
TF20309	DEMARCATION BLOCK	1

USOC	DESCRIPTION	TOTAL
TF20311	DEMARCATION BLOCK	1
TF20321	DEMARCATION BLOCK	1
TF20322	DEMARCATION BLOCK	1
TF20323	DEMARCATION BLOCK	1
TF20324	DEMARCATION BLOCK	1
TF20325	DEMARCATION BLOCK	1
TF20352	DEMARCATION BLOCK	1
TF20366	DEMARCATION BLOCK	1
TF20367	DEMARCATION BLOCK	2
TF20398	DEMARCATION BLOCK	1
TF20399	DEMARCATION BLOCK	1
TF20400	DEMARCATION BLOCK	1
TF20537	DEMARCATION BLOCK	2
TF20539	DEMARCATION BLOCK	2
TF20541	DEMARCATION BLOCK	1
TF20542	DEMARCATION BLOCK	1
TF20544	DEMARCATION BLOCK	1
TF20547	DEMARCATION BLOCK	4
TF20548	DEMARCATION BLOCK	1
TF20568	DEMARCATION BLOCK	2
TF20951	DEMARCATION BLOCK	1
TF20952	DEMARCATION BLOCK	1
TF20974	DEMARCATION BLOCK	1
TF20975	DEMARCATION BLOCK	1
TF20976	DEMARCATION BLOCK	1
TF20977	DEMARCATION BLOCK	1
TF20978	DEMARCATION BLOCK	1
TF20995	DEMARCATION BLOCK	1
TF20999	DEMARCATION BLOCK	1
TF21000	DEMARCATION BLOCK	1
TF21001	911 TK NO 1	2
TF21002	911 TK NO 2	3
TF21003	911 TK NO 3	2
TF21004	DEMARCATION BLOCK	1
TF21005	DEMARCATION BLOCK	2
TF21006	DEMARCATION BLOCK	2
TF21007	DEMARCATION BLOCK	2
TF21008	DEMARCATION BLOCK	2
TF21009	DEMARCATION BLOCK	1
TF21010	DEMARCATION BLOCK	1
TF21011	DEMARCATION BLOCK	1
TF21012	DEMARCATION BLOCK	2
TF21013	DEMARCATION BLOCK	2
TF21014	DEMARCATION BLOCK	2
TF21015	DEMARCATION BLOCK	2
TF21016	DEMARCATION BLOCK	1
TF21018	DEMARCATION BLOCK	1
TF21019	DEMARCATION BLOCK	2
TF21020	DEMARCATION BLOCK	1
TF21021	DEMARCATION BLOCK	2
TF21022	DEMARCATION BLOCK	2
TF21024	DEMARCATION BLOCK	2

USOC	DESCRIPTION	TOTAL
TF21025	DEMARCATION BLOCK	1
TF21026	DEMARCATION BLOCK	2
TF21027	DEMARCATION BLOCK	1
TF21028	DEMARCATION BLOCK	2
TF21029	DEMARCATION BLOCK	2
TF21030	DEMARCATION BLOCK	1
TF21031	DEMARCATION BLOCK	1
TF21032	DEMARCATION BLOCK	2
TF21033	DEMARCATION BLOCK	1
TF21034	DEMARCATION BLOCK	2
TF21035	DEMARCATION BLOCK	2
TF21036	DEMARCATION BLOCK	1
TF21037	DEMARCATION BLOCK	3
TF21038	DEMARCATION BLOCK	2
TF21039	DEMARCATION BLOCK	1
TF21040	DEMARCATION BLOCK	2
TF21041	DEMARCATION BLOCK	2
TF21042	DEMARCATION BLOCK	2
TF21043	DEMARCATION BLOCK	3
TF21044	DEMARCATION BLOCK	2
TF21045	DEMARCATION BLOCK	2
TF21046	DEMARCATION BLOCK	2
TF21047	DEMARCATION BLOCK	2
TF21048	DEMARCATION BLOCK	1
TF21050	DEMARCATION BLOCK	2
TF21051	DEMARCATION BLOCK	1
TF21052	DEMARCATION BLOCK	1
TF21053	DEMARCATION BLOCK	1
TF21054	DEMARCATION BLOCK	1
TF21055	DEMARCATION BLOCK	1
TF21056	DEMARCATION BLOCK	1
TF21057	DEMARCATION BLOCK	1
TF21058	DEMARCATION BLOCK	1
TF21059	DEMARCATION BLOCK	1
TF21061	DEMARCATION BLOCK	1
TF21062	DEMARCATION BLOCK	1
TF21063	DEMARCATION BLOCK	1
TF21064	DEMARCATION BLOCK	1
TF21067	DEMARCATION BLOCK	1
TF21068	DEMARCATION BLOCK	1
TF21069	DEMARCATION BLOCK	1
TF21070	DEMARCATION BLOCK	1
TF21071	DEMARCATION BLOCK	1
TF21072	DEMARCATION BLOCK	1
TF21073	DEMARCATION BLOCK	1
TF21074	DEMARCATION BLOCK	1
TF21075	DEMARCATION BLOCK	1
TF21077	DEMARCATION BLOCK	1
TF21079	DEMARCATION BLOCK	2
TF21080	DEMARCATION BLOCK	1
TF21081	DEMARCATION BLOCK	1
TF21082	DEMARCATION BLOCK	2

USOC	DESCRIPTION	TOTAL
TF21083	DEMARCATION BLOCK	1
TF21084	DEMARCATION BLOCK	1
TF21085	DEMARCATION BLOCK	1
TF21086	DEMARCATION BLOCK	2
TF21087	DEMARCATION BLOCK	1
TF21088	DEMARCATION BLOCK	1
TF21095	DEMARCATION BLOCK	1
TF21096	DEMARCATION BLOCK	1
TF21100	DEMARCATION BLOCK	1
TF21437	DEMARCATION BLOCK	1
TF21454	DEMARCATION BLOCK	1
TF21456	DEMARCATION BLOCK	1
TF21459	DEMARCATION BLOCK	1
TF21460	DEMARCATION BLOCK	1
TF21461	DEMARCATION BLOCK	2
TF21463	DEMARCATION BLOCK	1
TF21464	DEMARCATION BLOCK	1
TF21465	DEMARCATION BLOCK	1
TF21468	DEMARCATION BLOCK	1
TF21469	DEMARCATION BLOCK	1
TF21470	DEMARCATION BLOCK	2
TF21471	DEMARCATION BLOCK	1
TF21472	DEMARCATION BLOCK	2
TF21473	DEMARCATION BLOCK	1
TF21474	DEMARCATION BLOCK	1
TF21476	DEMARCATION BLOCK	1
TF21477	DEMARCATION BLOCK	1
TF21478	DEMARCATION BLOCK	1
TF21479	DEMARCATION BLOCK	1
TF21480	DEMARCATION BLOCK	1
TF21481	DEMARCATION BLOCK	1
TF21484	DEMARCATION BLOCK	1
TF21485	DEMARCATION BLOCK	1
TF21486	DEMARCATION BLOCK	1
TF21488	DEMARCATION BLOCK	1
TF21490	DEMARCATION BLOCK	1
TF21491	DEMARCATION BLOCK	1
TF21493	DEMARCATION BLOCK	1
TF21494	DEMARCATION BLOCK	1
TF21495	DEMARCATION BLOCK	1
TF21496	DEMARCATION BLOCK	1
TF21497	DEMARCATION BLOCK	1
TF21498	DEMARCATION BLOCK	1
TF21500	DEMARCATION BLOCK	1
TF22331	DEMARCATION BLOCK	1
TF22334	DEMARCATION BLOCK	1
TF22336	DEMARCATION BLOCK	1
TF22337	DEMARCATION BLOCK	1
TF22339	DEMARCATION BLOCK	1
TF22341	DEMARCATION BLOCK	1
TF22342	DEMARCATION BLOCK	1
TF22345	DEMARCATION BLOCK	1

USOC	DESCRIPTION	TOTAL
TF22346	DEMARCATION BLOCK	1
TF22348	DEMARCATION BLOCK	1
TF22350	DEMARCATION BLOCK	1
TF22642	DEMARCATION BLOCK	1
TF30003	DEMARCATION BLOCK	1
TF30004	DEMARCATION BLOCK	1
TF30005	DEMARCATION BLOCK	1
TF30007	DEMARCATION BLOCK	1
TF30252	DEMARCATION BLOCK	1
TF30405	DEMARCATION BLOCK	1
TF30406	DEMARCATION BLOCK	1
TF30407	DEMARCATION BLOCK	1
TF30408	DEMARCATION BLOCK	1
TF30436	DEMARCATION BLOCK	1
TF30437	DEMARCATION BLOCK	1
TF30450	DEMARCATION BLOCK	1
TF30478	DEMARCATION BLOCK	1
TF30479	DEMARCATION BLOCK	1
TF30482	DEMARCATION BLOCK	1
TF30484	DEMARCATION BLOCK	1
TF30485	DEMARCATION BLOCK	1
TF30487	DEMARCATION BLOCK	1
TF30879	DEMARCATION BLOCK	1
TF30880	DEMARCATION BLOCK	1
TF30882	DEMARCATION BLOCK	1
TF30883	DEMARCATION BLOCK	1
TF30884	DEMARCATION BLOCK	1
TF30886	DEMARCATION BLOCK	1
TF30887	DEMARCATION BLOCK	1
TF30888	DEMARCATION BLOCK	1
TF30889	DEMARCATION BLOCK	1
TF30890	DEMARCATION BLOCK	1
TF30891	DEMARCATION BLOCK	1
TF30893	DEMARCATION BLOCK	1
TF30895	DEMARCATION BLOCK	1
TF30897	DEMARCATION BLOCK	1
TF30899	DEMARCATION BLOCK	1
TF30900	DEMARCATION BLOCK	1
TF31194	DEMARCATION BLOCK	1
TF31195	DEMARCATION BLOCK	1
TF31196	DEMARCATION BLOCK	1
TF31197	DEMARCATION BLOCK	1
TF31198	DEMARCATION BLOCK	1
TF31199	DEMARCATION BLOCK	1
TF40477	DEMARCATION BLOCK	1
TF41261	DEMARCATION BLOCK	1
TF41262	DEMARCATION BLOCK	1
TF41265	DEMARCATION BLOCK	1
TF41267	DEMARCATION BLOCK	1
TF41268	DEMARCATION BLOCK	1
TF41270	DEMARCATION BLOCK	1
TF41271	DEMARCATION BLOCK	1

USOC	DESCRIPTION	TOTAL
TF41272	DEMARCATION BLOCK	1
TF41273	DEMARCATION BLOCK	1
TF41275	DEMARCATION BLOCK	1
TF41278	DEMARCATION BLOCK	1
TF41279	DEMARCATION BLOCK	1
TF41280	DEMARCATION BLOCK	1
TF41281	DEMARCATION BLOCK	1
TF41282	DEMARCATION BLOCK	1
TF41284	DEMARCATION BLOCK	1
TF41285	DEMARCATION BLOCK	1
TF41286	DEMARCATION BLOCK	1
TF41287	DEMARCATION BLOCK	1
TF41288	DEMARCATION BLOCK	1
TF41289	DEMARCATION BLOCK	1
TF41290	DEMARCATION BLOCK	1
TF41291	DEMARCATION BLOCK	1
TF41292	DEMARCATION BLOCK	1
TF41294	DEMARCATION BLOCK	1
TF41295	DEMARCATION BLOCK	1
TF41297	DEMARCATION BLOCK	1
TF41298	DEMARCATION BLOCK	1
TF41299	DEMARCATION BLOCK	1
TF41300	DEMARCATION BLOCK	1
TF50406	DEMARCATION BLOCK	1
TF50407	DEMARCATION BLOCK	1
TF60501	DEMARCATION BLOCK	1
TF60502	DEMARCATION BLOCK	1
TF60504	DEMARCATION BLOCK	1
TF60533	DEMARCATION BLOCK	1
TF60542	DEMARCATION BLOCK	1
TF60550	DEMARCATION BLOCK	1
TF60554	DEMARCATION BLOCK	1
TF60555	DEMARCATION BLOCK	1
TF60556	DEMARCATION BLOCK	1
TF60557	DEMARCATION BLOCK	1
TF60558	DEMARCATION BLOCK	1
TF60564	DEMARCATION BLOCK	1
TF60565	DEMARCATION BLOCK	1
TF60569	DEMARCATION BLOCK	1
TF60575	DEMARCATION BLOCK	1
TF60581	DEMARCATION BLOCK	1
TF60582	DEMARCATION BLOCK	2
TF60583	DEMARCATION BLOCK	1
TF60584	DEMARCATION BLOCK	1
TF60585	DEMARCATION BLOCK	1
TF60586	DEMARCATION BLOCK	2
TF60587	DEMARCATION BLOCK	1
TF60588	DEMARCATION BLOCK	1
TF60589	DEMARCATION BLOCK	1
TF60590	DEMARCATION BLOCK	1
TF60592	DEMARCATION BLOCK	1
TF60593	DEMARCATION BLOCK	2

USOC	DESCRIPTION	TOTAL
TF60594	DEMARCATION BLOCK	1
TF60595	DEMARCATION BLOCK	1
TF60597	DEMARCATION BLOCK	1
TF60598	DEMARCATION BLOCK	2
TF60599	DEMARCATION BLOCK	2
TF60600	DEMARCATION BLOCK	1
THE	TELEHELPER	9
TKN0008	TOKEN RING SERVICE	1
TKN0009	TOKEN RING SERVICE	1
TKN0014	TOKEN RING SERVICE	1
TKN0078	TOKEN RING SERVICE	1
TKN0080	TOKEN RING SERVICE	1
TL9	DATA PVT-2000 SER	1
TMLB2	BLACK WALL TRIM LINE	2
TMLR2	RED WALL TRIM LINE	66
TMLRT	RED DESK TRIM LINE	1
TMLV2	IVORY WALL TRIM LINE	22
TOKEN	IBM TOKEN RING CKT	7
TONE	SINGLE ADDRESS	2
TPU35	35 WATT AMPLIFIER	4
TQJ	FOREIGN SVC	8
TRIUMPH	TRIUMPH MULTI-LINE	5
TRMTRNR	TRANSMIT NOISE REDUC	19
TRS0001	TOKENR DATA BK PR3&4	1
TRS0002	TOKENR DATA BK PR3&4	1
TRS0003	TOKENR DATA BK PR3&4	1
TRS0004	TOKENR DATA BK PR3&4	1
TRS0005	TOKENR DATA BK PR3&4	1
TRS0006	TOKENR DATA BK PR3&4	1
UG1T1	DATA HI PWR EQT	2
UNCLASS	UNCLASS DCA/LAN	8156
VA003-M	PAIR ONE	1
VA010-M	VOICE PAIR ONE	1
VA058-M	PAIRS 1	1
VB010-M	VOICE PAIR THREE	1
VB022-M	PAIRS NUMBER 2	1
VBOX	VOICE MAIL BOX	1593
VC001-M	PAIRS THREE	1
VC003-M	PAIR THREE	1
VC005-M	PAIR NUMBER 3	2
VC017-M	PAIRS NUMBER 3	1
VC021-M	PAIR NUMBER 3	1
VC027-M	PAIRS THREE	1
VC032-M	PAIRS NUMBER 3	1
VC044-M	PAIRS 3	1
VC045-M	PAIRS NUMBER 3	1
VC051-M	PAIRS THREE	1
VC058-M	PAIRS 3	2
VC061-M	PAIR NUMBER 3	1
VC064-M	PAIR NUMBER 3	1
VC065-M	PAIR NUMBER 3	1
VC084-M	PAIRS 3	1

USOC	DESCRIPTION	TOTAL
VC143-M	PAIRS NUMBER 3	1
VC150-M	PAIRS NUMBER 3	1
VD020-M	PAIRS NUMBER 4	1
VD022-M	PAIRS NUMBER 4	1
VD030-M	PAIRS NUMBER 4	1
VD050-M	PAIRS NUMBER 4	1
VD064-M	PAIRS NUMBER 4	1
VIB/DSP	VIBRATR DISPLY PAGR	964
VIDEO	VIDEO TWO-WAY (BB)	1
VLNBX	VOLUME CONTROL BLACK	33
VLNEX	VOLUME CONTROL BEIGE	82
VLNGX	VOLUME CONTROL GREEN	13
VLNLX	VOLUME CONTROL BLUE	4
VLNRX	VOLUME CONTROL RED	9
VLNVX	VOLUME CONTROL IVORY	51
VLNWX	VOLUME CONTROL WHITE	4
VLNYX	VOLUME CONTRL YELLOW	4
VT00001	V TK SAV RIV-ORO	5
VT00002	V TK SAV RIV-GERM	5
VT00003	V TK SAV RIV-SAT	12
VT00004	V TK GERM-ORO	5
VT00005	V TK GERM-SAV RIV	5
VT00006	V TK ORO-SAV RIV	5
VT00007	VOICE TK ORO-GERM	5
VUXYX	NOISE REDUCE HANDSET	1
W2W5J	LOCAL CHNL ADD TERM	2
WIRE	WIRE	2
WJJAG	SPECIAL ASSEMBLY ARG	1
WJJAGNR	SPECIAL ASSEMBLY ARG	1
WRROE	SPECIAL ASSEMBLY	3
WW6	EXT BELL	1
WYY34	SPECIAL ASSEMBLY ARG	1
WZZ	TERM COILS	22
XCL	MAN EXCLUSION KEY	7
XCN	MANUAL EXCLUSION KEY	1
XER-710	FAX XEROX 710	1
YZZD4	911 SVC	24
YZZD5	911 SVC	9
ZZ199	PAGING SPEC SHLD CAB	23
ZZ1AG	SPECIAL TELE INSTR	1
ZZ1AH	SPECIAL TELE SWITCH	1
ZZ1AJ	SPECIAL TELE RINGER	1
ZZ1SY	STA SECURITY EQPT	6
ZZ1UG	SPECIAL TELE INSTR	2
ZZ1UH	SPECIAL TELE SWITCH	2
ZZ1UJ	SPECIAL TELE RINGER	2
ZZ200	PAGING EQ SPEC SHL C	36
ZZ201	PAGING SPEC SHLD CAB	27
ZZ208	PAGING 30C CYCLE OS	1
ZZ2E7	SPEAKER LARGE TRUMP	40
ZZ2E0	AMPLIFIER HI PWR 100	101
ZZ2EP	SPK TYPE 4 LARGE HRN	6

USOC	D E S C R I P T I O N	TOTAL
ZZ2EQ	SPK TP8 FLUSH-CEIL M	383
ZZ2ER	SPK TYPE 13 WALL MT	577
ZZ2QH	DATA CLASS OF SERV	44
ZZ2QY	DATA CLASS OF SERV	4
ZZ3EW	SPEAKER	3
ZZ3EY	PAGING EQ AMPLIFIER	2
ZZ4E1	SMALL HORN SPEAKER	164
ZZ4E2	100 WATT AMPLIFIER	1
ZZ4E3	AUX PRE-AMPLIFIER	1
ZZ4E4	SPK TYPE 2 SMALL HRN	17
ZZ4E5	SPK TYPE 3 LARGE HRN	20
ZZ4E6	PAGING EQ HI LEV HRN	9
ZZ4E7	PAGING EQ WP HORN	50
ZZ4E9	SPK TP9 DECOR CEIL	264
ZZ4EA	PAGING EQ SPEAKER	41
ZZ4EB	PAGING EQ BI DI SPKR	31
ZZ4EC	PAGING	2
ZZ5PN	911 SVC	2
ZZ6RC	COMN CONTROL BRIDG	1
ZZ6RD	PAGING ACCESS	17
ZZ8L3	HEAD SET AMPLIFIER	1
ZZ9N5	SPECIAL PANEL	1
ZZE33	PAGING SPL TONE GEN	3
ZZH68	SPEC HAN SET	11
ZZM94	PAGING VOL CONTROL	28
ZZM95	PAGING EQ LDSPK TYCR	6
ZZM96	PAGING EQ LDSPK TYML	8
ZZM97	PAGING EQ LDSPK TIB8	9
ZZN23	PAGING COM EQPT	2
ZZN24	PAGING POW SUPPLY	4
ZZN25	PAGING AMPLIFIER	4
ZZN27	PAGING TEL LN INPUT	22
ZZN28	PAGING EQ PROG AMP	4
ZZN29	PAGING AMPLIFIER	11
ZZN31	PAGING TRANS JACK	19
ZZN32	PAGING SPKR UNIV MOD	34
ZZN33	PAGING SPKR JENSON	6
ZZN34	PAGING TRANSFORMER	6
ZZN35	PAGING SPKR DUKANE	14
ZZN36	PAGING TRANSFORMER	14
ZZN37	PAGING SPKR UNIV	6
ZZN38	PAGING DRIVER UNIT	40
ZZV66	SPECIAL SEC TEL SET	6
ZZV67	SEE 270BDS/066656440	1
ZZX13	SEE R1ARI/066655900	1

FINAL TOTAL - 263950

APPENDIX 9

CALENDAR YEAR 1993 RIMD JOB INFORMATION

MONTH	Feature Programming	M/R Jobs[1]	RIMD Jobs[2]	Wiring Jobs[3]	Refurbished Sets	SCB Jobs[4]
January	541	644	1,419	81	44	1,063
February	883	633	1,634	125	108	1,087
March	611	807	1,470	435	183	749
April	806	546	1,031	255	74	912
May	598	693	1,390	271	80	938
June	800	773	1,393	174	141	727
July	648	664	918	293	113	729
August	824	812	1,281	261	116	737
September	624	785	1,093	427	104	584
October	838	647	1,659	653	153	1,279
November	620	900	1,430	945	80	991
December	853	731	1,325	641	11	833
TOTAL	8646	8,635	16,043	4,561	1,207	10,629

NOTE 1: Approximately 12% of the Maintenance/Repair Jobs did not require a site visit.

NOTE 2: Relocation jobs to a new building were counted twice here - approximately 12% represented the job at the old location, and another 12% represented the job at the new location. Changes within the same building were counted as one job. The programming of Merlins was not counted as a job here. 9.3% of OORTS phone sets were Merlins.

NOTE 3: Number of Wiring Jobs - a separate wire pull job and a separate jack termination job were included for each drop (special Y-12 large facility job in October - December).

NOTE 4: 30% of SCB jobs were intra-building changes to different wiring closets in non-Standard Wiring Plan Buildings. 40% of SCB jobs were relocations (20% at the old location, 20% at the new one). Approximately 19% of the SCB jobs were independent of an RIMD job (involving changes to SCB data lines or to Oliver Springs features).

RIMD JOB TYPE BREAKDOWN BY PERCENTAGE

MONTH	Intra-Bldg. New Rm.	Changes Same Rm	Inter-Bldg Old	Relocates New	Adds (New # or Line)	Discon-nects
1/2 Sept.	25.5%	44.4%	4.0%	4.2%	13.0%	8.9%
October	24.3%	23.2%	10.8%	10.6%	24.3%	7.0%
November	20.6%	27.9%	15.0%	14.6%	20.2%	1.7%
December	21.0%	24.8%	13.3%	13.5%	22.2%	5.1%
January '94	20.5%	26.6%	14.4%	14.6%	21.0%	3.0%

APPENDIX 10

OPERATOR DUTIES AND RESPONSIBILITIES

Consoles shall be staffed Monday through Friday between the hours of 7 a.m. and 7 p.m. Staffing levels for normal duty hours should be sufficient to handle approximately 28,000 calls per month. Consoles shall also be staffed on the weekends from 8 a.m. to 4 p.m. Staffing levels for normal weekend service shall be sufficient to handle a maximum of 100 calls per day. Holiday staffing hours should be from 8 a.m. to 4 p.m. Holidays mutually observed by both the Company and DOE will require staffing levels sufficient to handle a maximum of 100 calls per day. However, on holidays not mutually observed, staffing should be sufficient to handle a maximum of 300 calls per day.

Below is the current breakdown structure of Operator Service:

7:00 a.m. to 3:00 p.m.	Console Attendant
7:30 a.m. to 3:30 p.m.	Chief Console Attendant
8:00 a.m. to 4:00 p.m.	Console Attendant (Serves as relief)
8:30 a.m. to 4:30 p.m.	Console Attendant
11:00 a.m. to 7:00 p.m.	Console Attendant

Weekend assignments are rotated among the Console Attendants with the Chief Console Attendant providing backup coverage.

Console Attendant's duties include, but are not limited to, the following:

(a) Coordination with the Contractor's supervisors and technicians concerning services, maintenance, and repairs.

(b) Informs the DOE/Company of events or situations that may require further management notification to alleviate potential problems and effectively manage events.

(c) Provides timely and efficient service in processing information or assistance calls.

(d) Prepares call telephone account cards for all calls that go beyond the local calling rate area that are completed through the consoles by the Attendants on behalf of the users for certification, verification, and accountability of charges against the government account.

(e) Assists telephone users in placing person-to-person, collect, and credit card calls. Arranges special assistance and conference calling requirements. Furnishes organizational, functional, and individuals telephone numbers.

(f) Handles intercept calls which are customer calls to disconnected or changed numbers. Refers callers to the various sites and agencies in an attempt to satisfy an information inquiry.

(g) Maintains the alphabetical telephone directory database. Incorrect listing information is corrected.

(h) Posts changes to the organizational, functional, and emergency directories and forwards to the Company for formal master directory formatting.

(i) Responds to emergency situations or conditions that arise by following prescribed procedural guidelines as well as independent judgment.

(j) Performs call trace procedures. Emergency Call Trace is used to identify the origination source of a call placed over the public switched telephone network.

(k) Executes actions as directed by DOE/Company security to render certain telephone lines, circuits, etc., inoperative under an Emergency Crisis Management Situation (CMS).

(l) Maintains listings of special telephone numbers, circuits, etc., that are designated as requiring emergency status treatment.

(m) Initiates emergency operations including activation of the Foreign Exchange Emergency Backup System.

(n) Notifies and keeps informed DOE/Company Security Organizations during emergency situations or conditions.

(o) Receives trouble calls from users concerning equipment and/or services, records the information, and directs repair personnel to restore service.

APPENDIX 11 - VALVE SPECIFICATIONS

VALVE, GATE, V-1

Description:

Valve, gate, bronze body, 125 psi at 353° F. minimum, non-shock 200 psi at 100° F. minimum, screwed ends, bronze trim, taper integral seat, split wedge disc, rising stem, inside screw, rising wheel, T-head slot stem to disc connection, and screwed or union bonnet. Valves shall be marked in accordance with MSS SP-25 latest edition.

Material:

Body:	Bronze, ASTM B62 or B61
Seat:	Bronze, ASTM B62 or B61
Disc:	Bronze, ASTM B62 or B61
Stem:	Manufacturer's Standard Bronze
Bonnet Gasket:	Manufacturer's Standard
Stem Packing:	Manufacturer's Standard

Rating:

Primary, 125 psi at 353°F., minimum

Non-Shock, 200 psi at 100°F., minimum

Characteristics:

Type:	Gate
Ends:	Screwed
Seat:	Taper-Integral
Disc:	Split Wedge
Stem:	Rising
Screw:	Inside
Wheel:	Rising
Stem to Disc:	T-Head, Slot
Bonnet Type:	Screwed or Union

VALVE, GATE, V-5

Description:

Valve, gate, cast iron body, minimum acceptable primary rating: 125 psi at 353°F., minimum acceptable non-shock rating: 175 psi at 100°F., flanged plain face ends, brass or bronze trim, taper or parallel inserted seat, solid or double wedge disc, rising stem, outside screw, non-rising wheel, stem to disc connection: T-head slot or thread and pin, flanged bonnet. Valves shall be marked in accordance with MSS SP-25, latest edition.

Material:

Body:	Cast Iron, ASTM A 126, Grade B
Seat:	Brass, ASTM B 62 or Bronze, ASTM B 61
Disc:	Brass, Bronze, or Cast Iron with Brass Rings, ASTM B 62 or B 61
Stem:	Brass or Bronze, Manufacturer's Standard
Bonnet Gasket:	Manufacturer's Standard
Stem Packing:	Manufacturer's Standard

Minimum Acceptable Rating:

Primary: 125 psi at 353° F.
Non-shock: 175 psi at 100 °F.

Characteristics:

Type:	Gate
Ends:	Flanged, Plain Face
Seat:	Taper or Parallel Inserted
Disc:	Solid or Double
Stem:	Rising
Screw:	Outside
Wheel:	Non-rising
Stem to Disc:	T-Head Slot or Thread and Pin
Bonnet Type:	Flanged, Plain Face and Yoke

VALVE, GATE, V-32

Description:

Valve, gate, bronze body, Underwriters' and Factory Mutual approved, minimum acceptable non-shock rating: 175 psi at 100°F., outside screw, rising stem, bronze trim, non-rising wheel, tapered integral seat, solid wedge disc, stem to disc, stem to disc connection: T-head slot, screwed bonnet. Valves shall be marked in accordance with MSS-SP25, latest edition. Valve stems shall be grooved for acceptance of a supervisory switch.

Material:

Body:	Bronze, ASTM B 61 or B 62
Seat:	Bronze ASTM B 61 or B 62
Disc:	Bronze ASTM B61 or B 62
Stem:	Bronze Manufacturer's Standard
Bonnet Gasket:	Manufacturer's Standard
Stem Packing:	Manufacturer's Standard

Minimum Acceptable Rating:

Non-Shock: 175 psi at 100°F.

Characteristics:

Type:	Gate
Ends:	Screwed
Seat:	Tapered, Integral
Disc:	Solid Wedge
Stem:	Rising
Screw:	Outside
Wheel:	Non-rising
Stem to Disc:	T-head Slot
Bonnet:	Screwed

VALVE, GLOBE, V-102

Description:

Valve, globe, cast iron body, minimum acceptable primary rating: 125 psi at 353°F., minimum acceptable non-shock rating: 200 psi at 100°F., flanged plain face ends, brass or bronze trim, plug inserted seat, plug type disc, rising stem, outside screw, rising wheel, stem to disc connection-upset stem, flanged bonnet. Valves shall be marked in accordance with MSS-SP25 Latest Edition.

Material:

Body:	Cast Iron, ASTM A126 Class B
Seat:	Brass ASTM B62 or Bronze ASTM B61
Disc:	Brass, Bronze, or Cast Iron with Brass or Bronze Rings, ASTM B62 or B61
Stem:	Brass or Bronze Manufacturer's Standard
Bonnet Gasket:	Manufacturer's Standard
Stem Packing:	Manufacturer's Standard

Minimum Acceptable Rating:

Primary:	125 psi at 353°F.
Non-shock:	200 psi at 100°F.

Characteristics:

Type:	Globe
Ends:	Flanged plain face
Seat:	Plug, inserted
Disc:	Plug type
Stem:	Rising
Screw:	Outside
Wheel:	Rising
Stem to Disc:	Upset stem
Bonnet:	Flanged, plain face, yoke

VALVE, CHECK, V-202
(Soft-seat)

Description:

Valve, check, horizontal swing, brass or bronze body, 125 psi at 353°F., minimum, non-shock 200 psi at 100°F. minimum, screwed ends, brass or bronze trim, flat integral seat, resilient faced renewable disc with separable hinge, horizontal and vertical upward position, and screwed cap bonnet. Valves shall be marked in accordance with MSS-SP25-78. Valves shall pass shell and seat leakage tests in accordance with MSS-SP80-79.

Material:

Body:	Brass, ASTM B 62 or Bronze, ASTM B 61
Seat:	Brass ASTM B62 or Bronze ASTM B61
Disc:	Buna-N or Composition
Disc Holder:	Brass, ASTM B 62 or Bronze, ASTM B 61
Bonnet Gasket:	Manufacturer's Standard

Rating:

Primary: 125 psi at 353°F.
Non-shock: 200 psi at 100°F.

Characteristics:

Type:	Swing Check
Ends:	Screwed
Seat:	Flat Integral
Disc:	Resilient faced renewable with separable hinge
Position:	Horizontal and Vertical Upward
Bonnet Type:	Screwed cap

VALVE, CHECK, V-204

Description:

Valve, check, swing, cast iron body, 125 psi at 353°F., minimum, non-shock 150 psi at 100°F. minimum, brass or bronze trim, flanged ends, flat inserted seat, flat faced separable hinge disc, horizontal and vertical upward position, and flanged plain face bonnet, Marked per MSS SP-25, latest revision.

Material:

Body:	Cast Iron ASTM A126 Class B
Seat:	Brass or Bronze ASTM B 61 or B 62
Disc:	Brass or Bronze, ASTM B 61, B 62 or Cast Iron with Brass Rings
Bonnet Gasket:	Manufacturer's Standard

Rating:

Primary:	125 psi at 353°F., Min.
Non-shock:	150 psi at 100°F., Min.

Characteristics:

Type:	Swing Check
Ends:	Flanged, F & D 125 lb.
Seat:	Flat, solid, or inserted rings
Disc:	Flat face, separable hinge
Position:	Horizontal and Vertical Upward
Bonnet Type:	Flanged, plain face

VALVE, GATE, V-1103

Description:

Valve, gate, cast iron body, minimum acceptable non-shock rating: 2 through 12 inches 175 psi, 14-inch 150 psi at 100°F., mechanical joint ends, bronze trim, inside screw, nonrising stem, stem to disc connection - screwed, counter clockwise opening, bolted bonnet, 2-inch square operating nut with indicator post flange. In full compliance with UL and FM latest specifications and listings. Each piece shall be marked with current UL and FM designation and in accordance with MSS-SP25.

Material:		Minimum Acceptable Rating (Non-shock):	
Body:	Cast Iron, AWWA Standard	2-inch through 12-inch	- 175 psi
		14-inch	- 150 psi at 100°F.
Seat:	Bronze, AWWA Standard	Characteristics:	
		Type:	Gate, with indicator post flange
Disc:	Bronze, AWWA Standard or Cast Iron with Bronze ass Rings	Ends:	Mechanical Joint*
		Seat:	Parallel Inserted Ring
		Disc:	Double Disc with Inserted Rings
		Stem:	Nonrising
Bonnet		Screw:	Inside
Gasket:	Manufacturer's Standard	Operator:	2-inch square nut
		Stem to	
Stem		Stem Nut:	Threaded
Packing:	O-Rings, AWWA Standard	Bonnet Type:	Bolted

*ANSI A21.11 with glands, bolts, and oil and weather resistant rubber gaskets.

VALVE, CHECK, V-1163

Description:

Valve, check, horizontal swing, bronze body, minimum acceptable primary rating: 125 psi at 500°F., minimum acceptable non-shock rating: 200 psi at 100°F., solder ends, bronze trim, integral seat, swivel disc, horizontal and vertical upward position, screwed cap. Valves shall be marked in accordance with MSS-SP25.

Material:

Body:	Bronze, ASTM B62
Seat:	Bronze Manufacturer's Standard
Disc:	Bronze Manufacturer's Standard

Minimum Acceptable Rating:

Primary: 125 psi at 500°F.
Non-shock: 200 psi at 100°F.

Characteristics:

Type:	Swing Check
Ends:	Solder
Seat:	Integral
Disc:	Swivel
Position:	Horizontal and Vertical Upward
Bonnet	
Type:	Screwed Cap

VALVE, GLOBE, V-6036

Description:

Valve, globe, bronze or brass body, minimum acceptable primary rating: 150 psi at 366°F, minimum acceptable non-shock rating: 300 psi at 100°F, screwed ends, integral seat, renewable composition disc, rising stem and wheel, inside screw, stem to disc connection: upset stem, union type bonnet. Valves shall be marked in accordance with MSS-SP25.

Material:

Body:	Bronze or Brass, ASTM B 61 or B 62
Seat:	Bronze or Brass ASTM B 61 or B 62
Disc:	Manufacturer's Standard
Stem:	Bronze or Brass Manufacturer's Standard
Bonnet Gasket:	Ground Joint
Stem Packing:	Manufacturer's Standard

Minimum Acceptable Rating:

Primary:	150 psi at 366°F
Non-shock:	300 psi at 100°F

Characteristics:

Type:	Globe
Ends:	Screwed*
Seat:	Integral
Disc:	Renewable Composition
Stem:	Rising
Screw:	Inside
Wheel:	Rising
Stem to Disc:	Upset Stem
Bonnet Type:	Union

*Threads shall conform to ANSI B2.1.

VALVE, GATE, V-6134

Description:

Valve, gate, bronze body, minimum acceptable rating: 125 psi at 353°F., minimum non-shock rating: 200 psi at 100°F., soldered ends, bronze trim, tapered integral seat, solid wedge disc, rising stem, inside screw, rising wheel, T-head slot stem to disc connection, screwed bonnet. Valves shall be marked in accordance with MSS-SP25.

Material:

Body:	Bronze, ASTM B 61 or ASTM B 62
Seat:	Bronze, ASTM B 61 or ASTM B 62
Disc:	Bronze, ASTM B 61 or ASTM B 62
Stem:	Manufacturer's Standard Bronze
Bonnet Gasket:	Manufacturer's Standard
Stem Packing:	Manufacturer's Standard

Minimum Acceptable Rating:

Primary:	125 psi at 353°F
Non-shock:	200 psi at 100°F

Characteristics:

Type:	Gate
Ends:	Solder
Seat:	Integral
Disc:	Solid Wedge
Stem:	Rising
Screw:	Inside
Wheel:	Rising
Stem to Disc:	T-Head Slot
Bonnet Type:	Screwed

VALVE, GLOBE, V-6135

Description:

Valve, Globe, bronze body, minimum acceptable primary rating: 125 psi at 353°F., minimum acceptable non-shock rating: 200 psi at 100°F., soldered ends, bronze trim, integral seat, composition disc, rising stem, inside screw, rising wheel, T-head slot stem to disc connection, screwed or union bonnet, valves shall be marked in accordance with MSS-SP25.

Material:

Body:	Bronze, ASTM B 61 or ASTM B 62
Seat:	Bronze, ASTM B 61 or ASTM B 62
Disc:	Non-Metallic
Stem:	Bronze, ASTM B 61 or B 62
Bonnet Gasket:	Manufacturer's Standard
Stem Packing:	Manufacturer's Standard

Minimum Acceptable Rating:

Primary:	125 psi at 353°F
Non-shock:	200 psi at 100°F

Characteristics:

Type:	Globe
Ends:	Solder
Seat:	Integral
Disc:	Composition
Stem:	Rising
Screw:	Inside
Wheel:	Rising
Stem to Disc:	Swivel
Bonnet Type:	Screwed or Union

VALVE, GATE, V-6206

Description:

Valve, gate, cast iron body, minimum acceptable non-shock rating: 2 through 12 inches 175 psi, 14 through 24 inches 150 psi at 100°F, flanged ends, bronze trim, outside screw, rising stem, nonrising wheel, stem to disc connection - screwed, counterclockwise opening, bolted bonnet, in full compliance with UL and FM specifications and listings. Each piece shall be marked with current UL designation and in accordance with MSS-SP25. Valve stems shall be grooved to accept a supervisory switch.

Material:	
Body:	Cast Iron, Mfr. UL Std.
Seat:	Bronze, Mfr. UL Std.
Disc:	Bronze, Mfr. UL Std. or Cast Iron with Bronze Rings
Stem:	Bronze, Mfr. UL Std.
Bonnet Gasket:	UL Standard
Stem Packing:	O-Rings, UL Standard

Minimum Acceptable Rating (Non-shock):
2-inch through 12-inch: 175 psi
14-inch through 24-inch: 150 psi
at 100°F

Characteristics:	
Type:	Gate****
Ends:	Flanged, Plain Face
Seat:	Parallel Inserted Ring
Disc:	Double Disc with Inserted Rings***
Stem:	Rising
Screw:	Outside
Wheel:	Nonrising**
Stem to Stem Nut:	Threaded
Bonnet Type:	Bolted

Seller shall furnish an affidavit of compliance as shown in UL HMRZ.

Testing: Valves shall be tested in accordance with MSS-SP-70.

*Dimensions and drilling of end flanges shall conform to ANSI B16.1 and B16.10.

**Extended gear case and bypass are required for 16 inches and larger valves and shall conform to AWWA.

***Solid wedge disc is acceptable.

****Face to face dimensions shall conform to ANSI B16.10.

VALVE, BUTTERFLY, V-6403

Description:

Valve, butterfly, cast iron body, for underground water servie, of 150 deg.F., mechanical joint ends, Ductile or Cast Iron disc, Type 300 series Stainless Steel stem, Buna N seat material bonded or vulcanized to valve body or disc. Valve shall meet all requirements of AWWA Standard C-504-80, Class 150B and be marked in accordance with MSS-SP25.

Material:

Body:	Cast Iron, ASTM A-126, Class B or ASTM A-48, Class 40
Seat:	Buna N
Disc:	Ductile or Cast Iron, ASTM A-536, Gl.64-45-12 or ASTM A-48, Class 40
Stem:	Stainless Steel, AISI Type 300 Series
Stem Seal:	O-Ring, Buna N

Minimum Acceptable Rating (Non-shock):

3-inch through 12-inch:	200 psi
14-inch through 48-inch:	150 psi

Characteristics:

Type:	Butterfly
Ends:	Mechanical Joint*
Seat:	Bonded, Vulcanized, or Mechanically Held with Screws
Operator:	AWWA Standard Gear Type with 2-in. Square Drive Nut

Testing: Valves shall be turned over to the Company for testing.

*ANSI A21.11 with glands, bolts, and oil resistant gaskets.

VALVE, GATE, V-6407

Description:

Valve, gate, cast iron body, minimum acceptable non-shock rating: 4 through 12 inches 175 psi at 100 deg F., flanged ends, bronze trim, inside screw, nonrising stem, stem to disc connection - screwed, counter clockwise opening, bolted bonnet, 2-inch square operating nut, for use with wall type indicator post. In full compliance with AWWA C-500, UL designation and in accordance with MSS-SP25.

Material:

Body:	Cast Iron, AWWA Standard
Seat:	Bronze, AWWA Standard
Disc:	Bronze, AWWA Standard or Cast Iron with Bronze Rings
Stem:	Bronze, AWWA Standard
Bonnet Gasket:	AWWA Standard
Stem Packing:	O-Rings, AWWA Standard

Minimum Acceptable Rating (Non-shock):
4-inch through 12-inch: 175 psi at 100 deg F.

Characteristics: ***

Type:	Gate*
Ends:	Flanged**
Seat:	Parallel Inserted Rings
Disc:	Double Disc with Inserted Rings
Stem:	Nonrising
Screw:	Inside
Operator:	2-inch Square Nut
Stem to Stem Nut:	Threaded
Bonnet Type:	Bolted

Seller shall furnish an affidavit of compliance as shown in AWWA C-500.

*For use with wall type indicator post.

**Dimensions and drilling of end flanges shall conform to ANSI B 16.1 and B16.10.

***Face to face dimensions shall conform to ANSI B16.10.

VALVE, CHECK, V-6432

Description:

Valve, check, horizontal swing, cast iron body, Underwriters' and Factory Mutual approved, minimum acceptable non-shock rating: 175 psi at 100°F, bronze trim, flanged ends, plain face, flat inserted seat, flat faced separable hinge disc having Buna-N face, horizontal and vertical upward position, bolted bonnet. Valves shall be marked in accordance with MSS-SP25, UL, and FM.

Material:		Minimum Acceptable Rating:	
Body:	Cast Iron, ASTM A 126, Class B	Non-shock:	175 psi at 100°F
Seat:	Bronze ASTM B 61 or B 62	Characteristics:	
		Type:	Swing Check**
		Ends:	Flanged, Plain Face*
Disc:	Bronze, Buna-N Faced, ASTM B 61, B 62, or Cast Iron Buna-N Faced with Bronze Rings	Seat:	Flat, Solid, or Inserted Rings
		Disc:	Buna-N Faced
		Position:	Horizontal and Vertical Upward
Bonnet		Bonnet Type:	Bolted
Gasket:	Manufacturer's Standard		

Seller shall furnish manufacturer's certified flow data, preferably C_v coefficients or L/D equivalents.

Testing: Valves shall be tested in accordance wit MSS-SP-71.

*Dimensions and drilling of end flanges shall conform to ANSI B16.1.

**Face to face dimensions shall conform to ANSI B16.10.

VALVE, BUTTERFLY, V-6431

Description:

Valve, butterfly, cast iron body, for underground water service, of 150 psi at 180 deg. F., flanged ends, Ni-resist cast iron disc, Type 300 series stainless steel stem, Buna N seat material (rated for 0 deg. F. to 180 deg. F. continuous service) bonded or vulcanized to valve body or disc. Valve shall meet all requirements of the latest edition of AWWA Standard C-504, Class 150B and be marked in accordance with MSS-SP25.

Material:

Body:	Cast Iron, ASTM A 126, Class B or ASTM A 48, Class 40
Seat:	Buna N, Rated for 0 deg. F. to 180 deg. F.
Disc:	Ni-resist Cast Iron, ASTM A 436, Type I or II
Stem:	Stainless Steel, AISI Type 300 Series
Stem Seal:	O-Ring, Buna N

Minimum Acceptable Rating (Non-shock):
3 through 12 inches - 200 psi
14 through 72 inches, 150 psi at 180 deg. F.

Characteristics:

Type:	Butterfly
Ends:	Flanged*
Seat:	Bonded, Vulcanized, or mechanically held with screws
Operator:	AWWA Standard Gear type with 2-inch square drive nut

VALVE, GATE, V-6114

Description:

Valve, gate, bronze body, minimum acceptable rating: 150 psi at 358 deg. F., minimum acceptable nonshock rating: 300 psi at 100 deg. F., screwed ends, bronze trim, tapered integral seat, solid wedge type disc, inside screw, rising stem and wheel, stem to disc connection: T-head slot, union bonnet. Valves shall be marked in accordance with MSS-SP25.

Material:

Body:	Bronze ASTM B 62
Seat:	Bronze ASTM B 62
Disc:	Bronze ASTM B 62
Stem:	Bronze, Manufacturer's Standard
Bonnet Gasket:	Manufacturer's Standard
Stem Packing:	Manufacturer's Standard

Minimum Acceptable Rating:

Primary:	150 psi at 358 deg. F.
Nonshock:	300 psi at 100 deg. F.

Characteristics:

Type:	Gate
Ends:	Screwed*
Seat:	Tapered, Integral
Disc:	Solid
Stem:	Rising
Screw:	Inside
Wheel:	Rising
Stem to Disc:	T-Head Slot
Bonnet Type:	Union

Testing: Valves shall be tested in accordance with MSS-SP-80.

*Threads shall conform to ANSI B2.1.

VALVE, GLOBE, V-6036

Description:

Valve, globe, bronze or brass body, minimum acceptable primary rating: 150 psi at 366 deg. F., minimum acceptable nonshock rating: 300 psi at 100 deg. F., screwed ends, integral seta, renewable composition disc, rising stem and wheel, inside screw, stem to disc connection: upset stem, union type bonnet. Valves shall be marked in accordance with MSS-SP25.

Material:

Body:	Bronze or Brass, ASTM B 61 or B 62
Seat:	Bronze or Brass ASTM B 61 or B 62
Disc:	Manufacturer's Standard
Stem:	Bronze or Brass Manufacturer's Standard
Bonnet Gasket:	Ground Joint
Stem Packing:	Manufacturer's Standard

Minimum Acceptable Rating:

Primary:	150 psi at 366 deg. F.
Nonshock:	300 psi at 100 deg. F.

Characteristics:

Type:	Globe
Ends:	Screwed*
Seat:	Integral
Disc:	Renewable Composition
Stem:	Rising
Screw:	Inside
Wheel:	Rising
Stem to Disc:	Upset Stem
Bonnet Type:	Union

Testing: Valves shall be tested in accordance with MSS-SP-80.

*Threads shall conform to ANSI B2.1.

VALVE, GATE, V-1163

Description:

Valve, check, horizontal swing, bronze body, minimum acceptable primary rating: 125 psi at 500 deg. F., minimum acceptable nonshock rating: 200 psi at 100 deg. F., solder ends, bronze trim, integral seat, swivel disc, horizontal and vertical upward position, screwed cap. Valves shall be marked in accordance with MSS-SP25.

Material:

Body:	Bronze, ASTM B 62
Seat:	Bronze Manufacturer's Standard
Disc:	Bronze Manufacturer's Standard

Minimum Acceptable Rating:

Primary:	125 psi at 500 deg. F.
Nonshock:	200 psi at 100 deg. F.

Characteristics:

Type:	Swing Check
Ends:	Solder
Seat:	Integral
Disc:	Swivel
Position:	Horizontal and Vertical Upward
Bonnet Type:	Screwed Cap

Testing: Valves shall be tested in accordance with MSS-SP-80.

VALVE, GATE, V-1133

Description:

Valve, gate, forged steel body, minimum acceptable primary rating: 600 psi at 850 deg. F.: minimum acceptable nonshock rating: 2,000 psi at 100 deg. F., screwed ends, chrome steel trim, tapered inserted ring seats, tapered solid wedge disc, rising stem, nonrising wheel, outside screw, stem to disc connection: T-head slot and flange bonnet. Valves shall be marked in accordance with MSS-SP25.

Material:

Body:	Forged Steel, ASTM A 105, Grade 2
Seat:	11-1/2 to 14% Chrome Steel or 11-1/2 to 14% Chrome Steel Stellite Faced
Disc:	11-1/2 to 14% Chrome Steel
Bonnet Gasket:	Spiral Wound - 304 - Asbestos
Stem Packing:	Manufacturer's Standard

Minimum Acceptable Rating:

Primary:	600 psi at 850 deg. F.
Nonshock:	2,000 psi at 100 deg. F.

Characteristics:

Type:	Gate
Ends:	Screwed*
Seat:	Tapered, Inserted Rings
Disc:	Tapered, Solid Wedge
Stem:	Rising
Screw:	Outside
Wheel:	Nonrising
Stem to Disc:	T-Head Slot
Bonnet Type:	Flanged, Male and Female

*Threads shall conform to ANSI B2.1.

Port size shall meet the minimum requirements listed below.

Valve Size	Port Size Min
1/4	0.28
3/8	0.31
1/2	0.38
3/4	0.50
1	0.75
1-1/4	0.94
1-1/2	1.06
2	1.44

Testing: Valves shall be tested in accordance with MSS-SP-61.

VALVE, GLOBE, V-1132

Description:

Valve, globe, forged carbon steel body and bonnet, minimum acceptable rating: 600 psi at 850 deg. F., minimum acceptable nonshock rating: 2,000 psi at 100 deg. F., OS and Y, screwed ends, plug integral seat, plug type disc, rising stem, rising wheel, bolted bonnet. Valves shall be marked in accordance with MSS-SP25.

Material:

Body:	Forged Carbon Steel ASTM A 105, Grade 2
Seat:	Stellite
Disc:	11-1/2 to 14% Chrome Steel or Stellite
Stem:	11-1/2 to 14% Chrome Steel
Bonnet Gasket:	"Flexitallic" Style "R"
Stem Packing:	Manufacturer's Standard

Minimum Acceptable Rating:

Primary: 600 psi at 850 deg. F.
Nonshock: 2,000 psi at 100 deg. F.

Characteristics:

Type:	Globe
Ends:	Screwed*
Seat:	Plug, Integral
Disc:	Plug Type
Stem:	Rising
Screw:	Outside
Wheel:	Rising
Stem to Disc:	Upset Stem
Bonnet Type:	Flanged, M & F, Yoke

Testing: Valves shall be tested in accordance with MSS-SP-61.

*Threads shall conform to ANSI B2.1.

VALVE, CHECK, V-210

Description:

Valve, check, swing, bronze body, minimum acceptable primary rating: 200 psi at 550 deg. F., minimum acceptable nonshock rating: 400 psi at 100 deg. F., screwed ends, bronze trim, flat integral seat, flat face separable hinge disc, horizontal or vertical upward position, and screw cap. Valves shall be marked in accordance with MSS-SP25.

Material:

Body:	Bronze, ASTM B 61
Seat:	Bronze, ASTM B 61
Disc:	Bronze, ASTM B 61, B 16, B 21 Alloy A, B 62
Bonnet Gasket:	Manufacurer's Standard

Minimum Acceptable Rating:

Primary: 200 psi at 550 deg. F.
Nonshock: 400 psi at 100 deg. F.

Characteristics:

Type:	Swing Check
Ends:	Screwed*
Seat:	Flat, Integral
Disc:	Flat Face, Separable Hinge
Position:	Horizontal or Vertical Up
Bonnet Type:	Screwed Cap

Cv of valve shall meet the minimum requirements listed below.

Valve Size	Cv (GPM per psi Pressure Drop) Min.
1/8"	0.9
1/4"	1.8
3/8"	3.5
1/2"	6.0
3/4"	10.7
1"	17.7
1-1/4"	31.5
1-1/2"	44
2"	75
2-1/2"	111
3"	178

Testing: Valves shall be tested in accordance with MSS-SP-80.

*Threads shall conform to ANSI B2.1.

VALVE, CHECK, V-201

Description:

Valve, check, horizontal swing, brass or bronze body, 125 psi at 353 deg. F., minimum nonshock 200 psi at 100 deg. F. minimum, screwed ends, brass or bronze trim, flat integral seat, flat face integral or separable hinge disc, horizontal and vertical upward position, and screwed cap bonnet. Valves shall be marked in accordance with MSS-SP25, UL and FM.

Material:

Body:	Brass, ASTM B 62 or Bronze, ASTM B 61
Seat:	Brass, ASTM B 62 or Bronze, ASTM B 61
Disc:	Brass, ASTM B 62 or Bronze, ASTM B 61
Bonnet Gasket:	Manufacturer's Standard

Rating:

Primary:	125 psi at 353 deg. F., min.
Nonshock:	200 psi at 100 deg. F., min.

Characteristics:

Type:	Swing Check
Ends:	Screwed
Seat:	Flat Integral
Disc:	Flat Face Integral or Separable Hinge
Position:	Horizontal and Vertical Upward
Bonnet Type:	Screwed Cap

Cv of valve shal meet the minimum requirements listed below:

Size	cv (GPM per psi Pressure Drop) Min.
1/4"	1.8
3/8"	3.5
1/2"	6.0
3/4"	10.0
1"	18
1-1/4"	32
1-1/2"	43
2"	72
2-1/2"	106
3"	176

Testing: Valves shall be tested in accordance with MSS-SP-80.

VALVE, GLOBE, V-143

Description:

Valve, globe, cast steel body, minimum acceptable primary rating: 150 psi at 500 deg. F., minimum acceptable nonshock rating: 230 psi at 100 deg. F., flanged end, raised face, chrome steel trim, plug type inserted seat, plug type disc, outside screw, rising stem and wheel, stem to disc connection: upset stem, bonnet type: flanged, male and female. Valves shall be marked in accordance with MSS-SP25.

Material:

Body:	Cast Carbon Steel, ASTM A 216 WCB
Seat:	11-1/2 to 14% Chrome Stainless Steel
Disc:	11-1/2 to 14% Chrome Stainless Steel or Steel 11-1/2 to 14% Chrome Steel Faced
Stem:	11-1/2 to 14% Chrome Steel
Bonnet Gasket:	Manufacturer's Standard
Stem Packing:	Manufacturer's Standard

Minimum Acceptable Rating:

Primary:	150 psi at 500 deg. F.
Nonshock:	230 psi at 100 deg. F.

Characteristics:

Type:	Globe*
Ends:	Flanged, 1/16 inch Raised Face
Seat:	Plug, Inserted
Disc:	Plug Type
Stem:	Rising
Screw:	Outside
Wheel:	Rising
Stem to Disc:	Upset Stem
Bonnet Type:	Flanged, Male and Female, Yoke

Testing: Valves shall be tested in accordance with MSS-SP-61.

*Face to face dimensions shall conform to B16.10.

VALVE, GATE, V-59

Description:

Valve, gate, cast or forged steel body, minimum acceptable primary rating: 150 psi at 500 deg. F., minimum acceptable nonshock rating: 230 psi at 100 deg. F., flanged raised face ends, chrome steel trim, taper inserted seat, solid wedge disc, outside screw, rising stem, nonrising wheel, stem to disc connection: T-head slot, bonnet type: flanged plain face, split or solid yoke. Vales shall be marked in accordance with MSS-SP25.

Material:

Body:	Forged Steel, ASTM A 105, Grade 2 or Cast Steel, ASTM A 216, Grade WCB
Seat:	11-1/2 to 14% Chrome Steel
Disc:	11-1/2 to 14% Chrome Steel
Stem:	11-1/2 to 14% Chrome Steel
Bonnet Gasket:	Manufacturer's Standard
Stem Packing:	Manufacturer's Standard

Minimum Acceptable Rating:

Primary:	150 psi at 500 deg. F.
Nonshock:	230 psi at 100 deg. F.

Characteristics:

Type:	Gate**
Ends:	Flanged, 1/16 inch Raised Face*
Seat:	Taper, Inserted Rings
Disc:	Solid Wedge, Tapered
Stem:	Rising
Screw:	Outside
Wheel:	Nonrising
Stem to Disc:	T-Head Slot
Bonnet Type:	Flanged, Plain Face or M&F, Split or Solid Yoke

Testing: Valves shall be tested in accordance with MSS-SP-61.

*Facing and drilling of flanges shall conform to ANSI B16.5 for 150 pound steel flange specifications.

**Face to face dimensions shall conform to ANSI B16.10.

VALVE, CURB STOP WITH DRAIN, V-6151

Description:

Valve, Curb Stop with Drain, Minneapolis pattern, brass body, minimum acceptable primary rating: 175 psi at 180 deg. F, minimum acceptable nonshock rating: 200 psi at 100 deg. F, screwed ends, bronze trim, taper integral seat. Valves shall be market in accordance with MSS-SP25.

Material:

Body:	Brass, ASTM B 62
Seat:	Bronze, Manufacturer's Standard
Plug:	Bronze, Manufacturer's Standard

Minimum Acceptable Rating:

Primary 175 psi at 180 deg. F
Nonshock: 200 psi at 100 deg. F

Characteristics:

Type:	Curb Stop
Ends:	Screwed*
Seat:	Taper, Integral
Plug:	Tee Head

The tee head shall open by turning to the left (counter-clockwise).

Valves shall comply with all applicable parts of the following specifications:

AWWA C800-66
ASTM B 62.63 (85.5.5.5)
ANSI B2.1-60

VALVE, CORPORATION STOP, V-415

Description:

Valve, Corporation Stop, brass body, minimum acceptable primary rating: 150 psi at 140 deg F., minimum acceptable nonshock rating: 200 psi at 100 deg. F., screwed ends, bronze trim, taper integral seat. Valves shall be marked in accordance with MSS-SP25.

Material:		Minimum Acceptable Rating:
Body:	Brass, or Bronze with 10% Zn	Primary 150 psi at 100 deg. F Nonshock: 200 psi at 100 deg. F
Seat:	Bronze, Manufacturer's Standard	Characteristics:
Plug:	Bronze, Manufacturer's Standard	Type: Corporation Stop Ends: Screwed* Seat: Taper, Integral Disc: Tapered Plug

*Thread Ends

Inlet: Mueller thread

Outlet: Increasing I.P., the 5/8" Stop has 3/4" I.P. Thread

VALVE, CORPORATION STOP, V-415

Description:

Valve, Corporation Stop, brass body, minimum acceptable primary rating: 150 psi at 140 deg. F., minimum acceptable nonshock rating: 200 psi at 100 deg. F., screwed ends, bronze trim, taper integral seat. Valves shall be marked in accordance with MSS-SP25.

Material:

Body:	Brass, or Bronze with 10% Zn
Seat:	Bronze, Manufacturer's Standard
Plug:	Bronze, Manufacturer's Standard

Minimum Acceptable Rating:
Primary 150 psi at 100 deg. F.
Nonshock: 200 psi at 100 deg. F.

Characteristics:

Type:	Corporation Stop
Ends:	Screwed*
Seat:	Taper, Integral
Disc:	Tapered Plug

*Thread Ends

Inlet: Mueller thread

Outlet: Increasing I.P., the 5/8" Stop has 3/4" I.P. Thread.

APPENDIX 12

GUIDELINES FOR TEMPORARY STRUCTURES

These are minimum requirements relative to portable structures. Deviations from these guidelines must be coordinated through Environment, Safety, and Health (ES&H). Deviations from location requirements require approval by the Energy Systems site selection organization. Notification to the local Fire Protection Group must also be required for all deviations.

PORTABLE STRUCTURE LOCATION

1. Each temporary, portable structure location must be approved by the MMES Construction Engineer. This process needs to be initiated at the earliest opportunity.

2. Portable structures separation distances are dependent on local Fire Protection Group requirements. In general, portable structures must be separated by a distance of 35 feet. This distance may be reduced to 10 feet for portable structures having an automatic sprinkler system.

   Additional Separation Requirements

   (a) 10 feet from a fire hydrant, fire department connection and other fire fighting equipment.

   (b) 25 feet from overhead natural gas lines or other fuel lines.

   (c) 25 feet from electrical power and alarm lines unless approval is given by the Energy Systems site selection organization.

3. Locations must permit emergency vehicles to operate within 100 feet of the portable structure.

4. Subject structures shall not be located over control valves, manholes, storm drains, and other utility equipment requiring access.

5. Subject structures shall not interfere with any exit necessary for life safety or any fire lane.

6. Subject structures shall not be located beneath non-sprinkled overhangs of existing buildings unless approved by the local Fire Protection Group.

7. Welding and flame cutting operations within subject structures require a standard welding, burning/hotwork permit.

8. Temporary, portable structures shall be removed upon request by Energy Systems and when the structure is not servicing construction activities.

APPENDIX 12

GUIDELINES FOR TEMPORARY STRUCTURES

These are minimum requirements relative to portable structures. Deviations from these guidelines must be coordinated through Environment, Safety, and Health (ES&H). Deviations from location requirements require approval by the Energy Systems site selection organization. Notification to the local Fire Protection Group must also be required for all deviations.

CONSTRUCTION AND SET-UP

1. Combustible materials of wood products may be used for structures located with required distances provided:

   (a) Operations within the structure do not involve hot work activities, and

   (b) smoking is not allowed inside the structures, and

   (c) temporary heating is not allowed, and

   (d) the value of the structure does not exceed $250,000.

2. Polyethylene plastic shall be of the fire-retardant type. Tarps used shall be listed as non-combustible.

3. Applicable platforms, stairs, and handrails must be provided at each exterior door. Platforms shall be level with the floor of the structure. A non-skid surface shall be applied to steps and the platform floor.

4. Storage of materials beneath portable structures is prohibited.

5. All wheeled (previously mobile) portable structures with the exception of semi-truck trailers that are elevated above grade must be anchored and supported to prevent sliding and overturning according to ANSI A225.1 and NFPA 501A.

6. Each portable structure must be identified by a readily visible sign containing the name of the company/occupant and telephone number of responsible individual who can be reached at one of the listed numbers at all times including off-shifts and weekends.

7. Plant utility connections shall be approved by appropriate plant, Energy Systems utility department.

8. Wood floors of structures where metal cutting, welding, or other hot work is to be performed shall be sheathed with a metal cover.

APPENDIX 12

GUIDELINES FOR TEMPORARY STRUCTURES

These are minimum requirements relative to portable structures. Deviations from these guidelines must be coordinated through Environment, Safety, and Health (ES&H). Deviations from location requirements require approval by the Energy Systems site selection organization. Notification to the local Fire Protection Group must also be required for all deviations.

LIFE SAFETY AND FIRE PROTECTION

1. All exit doors shall be maintained in a workmanship manner. Broken glass must be replaced. All exits shall have a clear width of 32 inches.

2. The location of fire alarms and emergency notification equipment must be identified for those who use and/or occupy the structures.

3. Portable heat devices such as coffee pots, hot plates, ovens, and similar devices shall be UL labeled and shall be shut-off or disconnected during non-working hours, except where timers are utilized. All nonessential electrical circuits shall be deenergized during non-working hours by a breaker or switch conveniently located at the primary exit of the structure.

4. Electric heating shall be utilized only when necessary. Use of kerosene or oil heating is not permitted.

5. Heating and cooling equipment is to be listed and installed in accordance with the manufacturer's recommendations. Air duct and plenum materials are to be UL listed as Class 1 or better. Portable heaters are not to be used as the primary source of heat within the structure.

6. Propane heaters may be used subject to approval from Energy Systems' Plant Fire Protection Group and the following restrictions:

   (a) Propane supply shall be limited to one bottle having capacity of a maximum of 100 lbs. No reserve supply is to be stored in the structure.

   (b) Heaters shall not be left on and unattended for extended periods of time during the workday and never left on nights, weekends, or holidays.

   (c) Propane cylinder shall be secured to prevent falling over and shall be located exterior to the structure.

   (d) New heaters purchased for use in the plant shall be UL listed. Existing units should use UL listed components where possible.

   (e) Propane tank shall be valved off when not in use. Cylinders designed to accommodate a protective cap shall have the protective cap in place when the cylinder is not in service.

APPENDIX 12

GUIDELINES FOR TEMPORARY STRUCTURES

LIFE SAFETY AND FIRE PROTECTION
(continued)

(f) Heater shall be provided with a 36-inch clear space from walls or other combustibles.

(g) Heater shall be located a minimum of six feet from the propane cylinder.

(h) Adequate ventilation shall be provided.

(i) If oil or fuel is supplied to the structure, readily accessible manual shutoff valves are to be installed external to the structure.

7. Portable fire extinguishers shall be provided. Fire extinguishers shall be properly mounted, if applicable, and locations clearly marked/identified.

8. Flammable and combustible liquids shall be stored in an approved flammable storage cabinet.

9. Lighting shall be properly guarded.

10. Metal trash cans with lids shall be provided. Fiber drums and plastic bags shall not be used to store trash.

11. Keys shall be provided to the PSS/LSS to allow access in the case of an emergency.

12. Automatic sprinkler systems may be required in portable structures located in high hazard areas if directed by the local Fire Protection Group.

13. Portable structure exteriors shall be properly labeled to identify hazardous materials stored in the structure.

APPENDIX 13

BUILDINGS CONTAINING DOE STANDARD WIRING

The list below contains the buildings on the Oak Ridge reservation that have been completely wired to the DOE Standard Wiring Plan (SWP). Future major renovations to existing buildings and any new buildings will include the SWP. Clarifications in building IDs between this listing and the list found in Amendment No. 002 Attachment E are shown on the following page.

Building	Building	Building	Building
1000	702SIA	9739	K1310-B
1009COM	7078-A	9766	K1310-C
105MIT	7078-B	9769	K1310-D
1099COM	78AMIT	9769-A	K1310-E
118MIT	78MIT	9769-E	K1310-F
130MIT	7917	97BMID	K1310-G
161MIT	7962	9983-58	K1310-H
173MIT	7964-C	9983-62	K1310-J
185LAF	7964-E	9983-63	K1310-K
1944TPK	7964-F	9983-64	K1310-L
1946TPK	831TCB	9983-65	K1310-M
1956TPK	900TCB	9983-66	K1310-N
1978TPK	9102	9983-67	K1310-P
2013	9102-1	9983-71	K1310-Q
2621	9110	9983-72	K1310-R
2652-A	9111	9983-AD	K1310AD
2652-B	9112	9983-AF	K1310AE
2652-C	9115	9983-AG	K1310AF
3147	9116	9983-AH	K1310AG
5500	9117	DNTNCCN	K1310AH
5500-A	9119	FOUROAK	K1310AI
5510	9201-5	K-1024	K1310AJ
5510-A	9203	K-1030	K1310AK
6011	9204-1	K-1200	K1310AL
6012	9212-A	K-1210	K1423-D
6026-A	9706-2	K-1320	K1423-E
6026-B	9710-3	K-1330	K1435-R
6026-C	9720-5	K-1650	K1435-S
6026-D	9720-8	K-303-6	K1654-K
6026-E	9733-1	K-303-7	K1654-L
6026-F	9733-2	K-303-8	MITCHEL
7001	9733-3	K-601	ORCORP
701SCA	9733-4	K1310-A	

APPENDIX 13

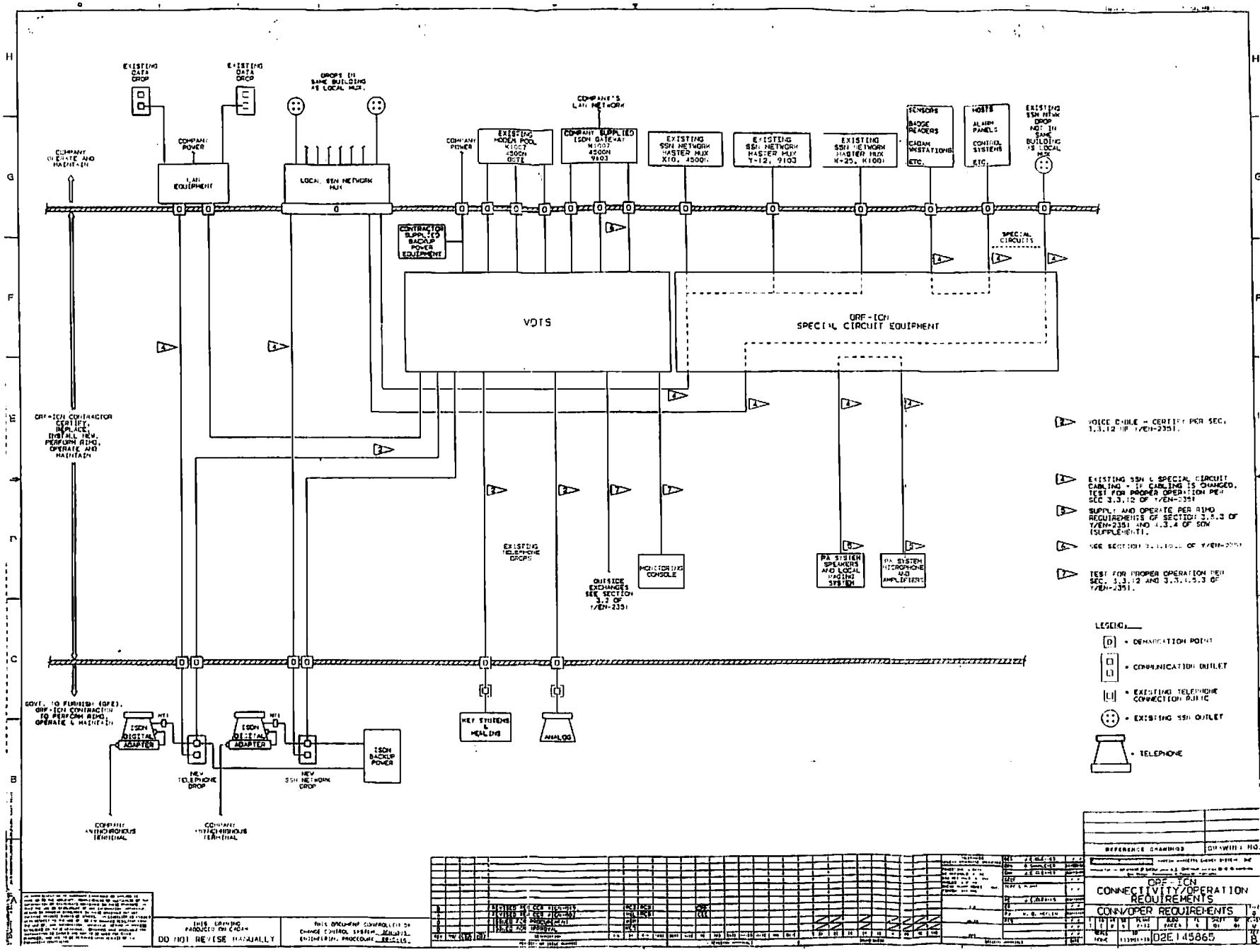
BUILDINGS WIRED TO THE DOE WIRING STANDARD - continued

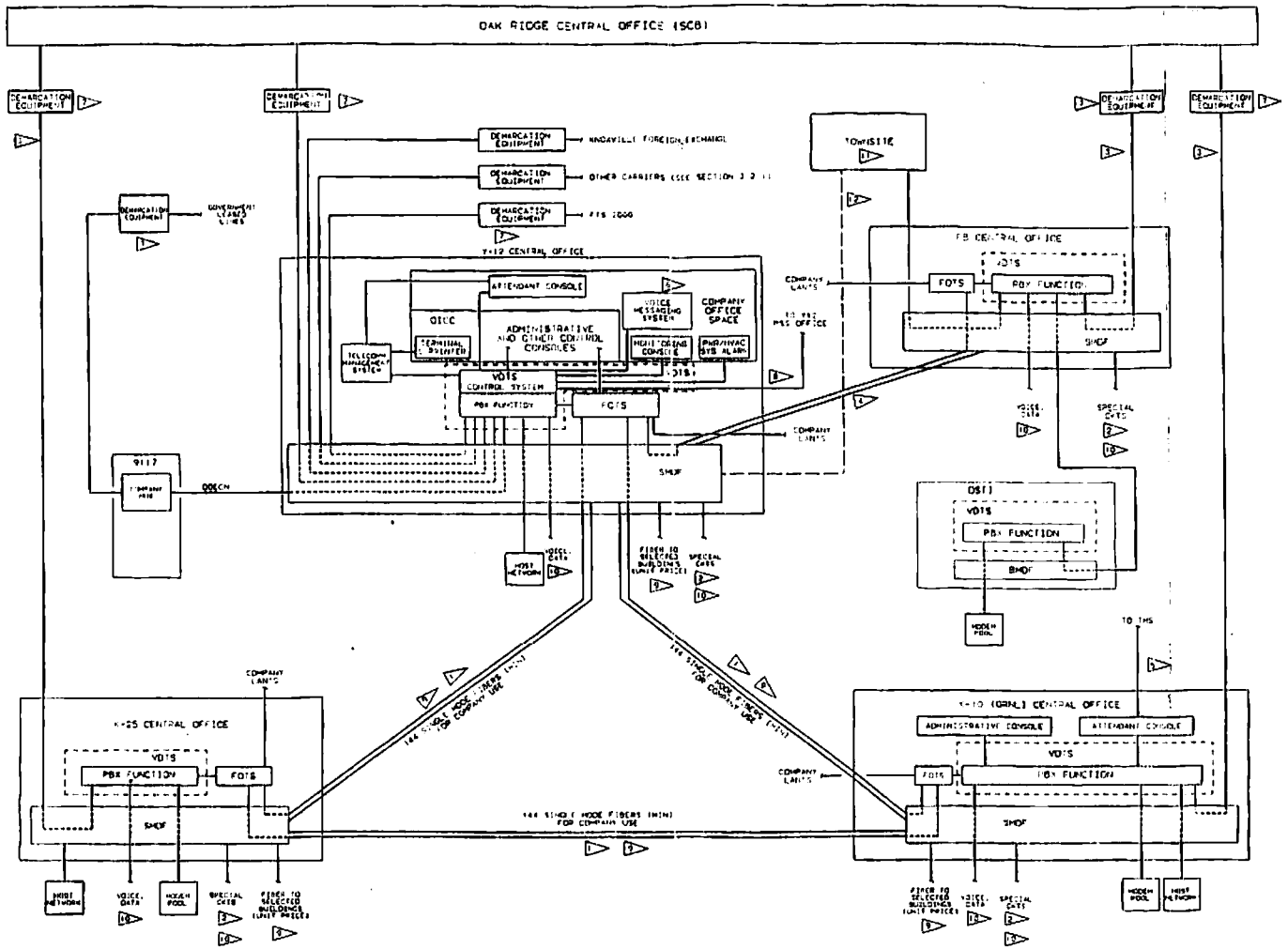
Original Bldg. ID	New Bldg. ID
105MTCH	105MIT
118MTCH	118MIT
130MTCH	130MIT
1944OAK	1944TPK
1946OAK	1946TPK
1956ATP	1956TPK
1978OAK	1978TPK
701SCAR	701SCA
78MITCH	78MIT
TRI-CO	831TCB

BUILDINGS PARTIALLY WIRED TO THE DOE WIRING STANDARD

The list below includes those buildings on the Oak Ridge reservation that have been partially wired to the DOE Standard Wiring Plan (SWP). The number of active circuits for each building is shown in the parenthesis.

Building	Active Circuits	Building	Active Circuits
1054-B	(15)	K-1001	(11)
3550	(48)	K-1002	(8)
4500-N	(51)	K-1007	(26)
62MIT	(1)	K-1020	(69)
7002	(15)	K-1101	(8)
7078-C	(1)	K-1400	(26)
7666A	(4)	K-1420	(10)
800TPK	(170)	K-1423	(6)
9103	(196)	K-1580	(81)
9215	(56)	K-1654	(2)
9711-1	(26)	K-33	(17)
9711-5	(23)	K-731	(3)
9734	(3)	K1654-H	(1)
9736	(27)	MAXIMA	(27)
CHARLOT	(32)		


EXISTING DATA DROP
EXISTING DATA DROP
DROPS IN SAME BUILDING AS LOCAL MUX.
COMPANY'S LAN NETWORK
COMPANY OPERATE AND MAINTAIN
COMPANY POWER
LAN EQUIPMENT
LOCAL SSN NETWORK MUX
COMPANY POWER
EXISTING MODEM POOL K1007 4500N OGTE
COMPANY SUPPLIED ISDN GATEWAY K1007 4500N 9103
EXISTING SSN NETWORK MASTER MUX X10, 4500N
EXISTING SSN NETWORK MASTER MUX Y-12, 9103
EXISTING SSN NETWORK MASTER MUX K-25, K1001
SENSORS
BADGE READERS
CADAM WKSTATIONS
ETC.
HOSTS
ALARM PANELS
CONTROL SYSTEMS
ETC.
EXISTING SSN NTWK DROP NOT IN SAME BUILDING AS LOCAL MUX
CONTRACTOR SUPPLIED BACKUP POWER EQUIPMENT
SPECIAL CIRCUITS
VOTS
ORF-ICN SPECIAL CIRCUIT EQUIPMENT
ORF-ICN CONTRACTOR CERTIFY, REPLACE, INSTALL NEW, PERFORM RIMO, OPERATE AND MAINTAIN
EXISTING TELEPHONE DROPS
OUTSIDE EXCHANGES SEE SECTION 3.2 OF Y/EN-2351
MONITORING CONSOLE
PA SYSTEM SPEAKERS AND LOCAL PAGING SYSTEM
PA SYSTEM MICROPHONE AND AMPLIFIERS
VOICE CABLE - CERTIFY PER SEC. 3.3.12 OF Y/EN-2351.
EXISTING SSN & SPECIAL CIRCUIT CABLING - IF CABLING IS CHANGED, TEST FOR PROPER OPERATION PER SEC 3.3.12 OF Y/EN-2351
SUPPLY AND OPERATE PER RIMO REQUIREMENTS OF SECTION 3.5.3 OF Y/EN-2351 AND 4.3.4 OF SOW (SUPPLEMENT).
TEST FOR PROPER OPERATION PER SEC. 3.3.12 AND 3.3.4.5.3 OF Y/EN-2351.
LEGEND:
DEMARCATION POINT
COMMUNICATION OUTLET
EXISTING TELEPHONE CONNECTION PJ11C
EXISTING SSN OUTLET
TELEPHONE
GOVT. TO FURNISH (GFE), ORF-ICN CONTRACTOR TO PERFORM RIMO, OPERATE & MAINTAIN
ISDN DIGITAL ADAPTER
ISDN DIGITAL ADAPTER
NEW TELEPHONE DROP
NEW SSN NETWORK DROP
ISDN BACKUP POWER
KEY SYSTEMS & HEALING
ANALOG
COMPANY ANTINCHRONOUS TERMINAL
COMPANY ANTINCHRONOUS TERMINAL
REFERENCE DRAWINGS
DRAWING NO.
ORF-ICN CONNECTIVITY/OPERATION REQUIREMENTS
CONN/OPER REQUIREMENTS
D2E145865
THIS DRAWING PRODUCED ON CADAM
DO NOT REVISE MANUALLY
THIS DOCUMENT CONTROLLED BY CHANGE CONTROL SYSTEM
ENGINEERING PROCEDURE



1. SINGLE MODE FIBER AS NEEDED OF VOTS
2. NOT ALL SPECIAL CIRCUIT CABLING MUST BE CONNECTED TO SMDF'S
3. INSTALL AS NEEDED TO MEET OWN REQUIREMENTS OF TECHNICAL SPECIFICATION Y/X-[illegible], SEC 3.3.9
4. SEE Y/X-[illegible], SECTION 3.1.12.3.
5. COMMUNICATION LINK TO BE DETERMINED BY SELLER.
6. LOCATION TO BE DETERMINED BY SELLER & DISTRIBUTED SYSTEM IS ACCEPTABLE.
7. DEMARCATION EQUIPMENT SHALL BE LOCATED ON GOVERNMENT PROPERTY.
8. CABLE TO BE PROVIDED BY COMPANY (SEE SECTION 3.3.8.2 OF Y/X-[illegible])
9. FIBER REQUIREMENTS ARE ON Y/X-[illegible] APPENDIX [illegible] AND SECTION [illegible]
10. FOR DETAIL WIRING SEE DRAWING [illegible]
11. TOWNSITE LOCATIONS TO BE SERVICED ARE LISTED IN APPENDIX [illegible]
12. TOWNSITE LOCATIONS MAY BE SERVICED FROM FOB OR Y-12

THIS DRAWING PRODUCED ON CADAM
DO NOT REVISE MANUALLY

THIS DOCUMENT CONTROLLED BY CHANGE CONTROL SYSTEM
ENGINEERING PROCEDURE EP-C-[illegible]

REV	DATE	DESCRIPTION	DRN	CHK	APP
D		REVISED PER F/R [illegible]	[illegible]	[illegible]	[illegible]
C		REVISED PER CCR [illegible]	[illegible]	[illegible]	[illegible]
B		REVISED PER CCR [illegible]	[illegible]	[illegible]	[illegible]
A		REVISED PER CCR [illegible]	[illegible]	[illegible]	[illegible]
1		ISSUED FOR PROGRESS	[illegible]	[illegible]	[illegible]
0		ISSUED FOR REVIEW	[illegible]	[illegible]	[illegible]
		ISSUED FOR CONSTRUCTION	[illegible]	[illegible]	[illegible]

REVISION OF THIS SHEET

DRAWN	J.E. [illegible]	8-[illegible]-[illegible]
CHK	P.R. JONES	8-[illegible]-[illegible]
APP	J.E. [illegible]	8-[illegible]-[illegible]
DESIGN		
CHK	J.E. [illegible]	8-[illegible]-[illegible]
APP		
CHK		
APP		
CHK		
APP		

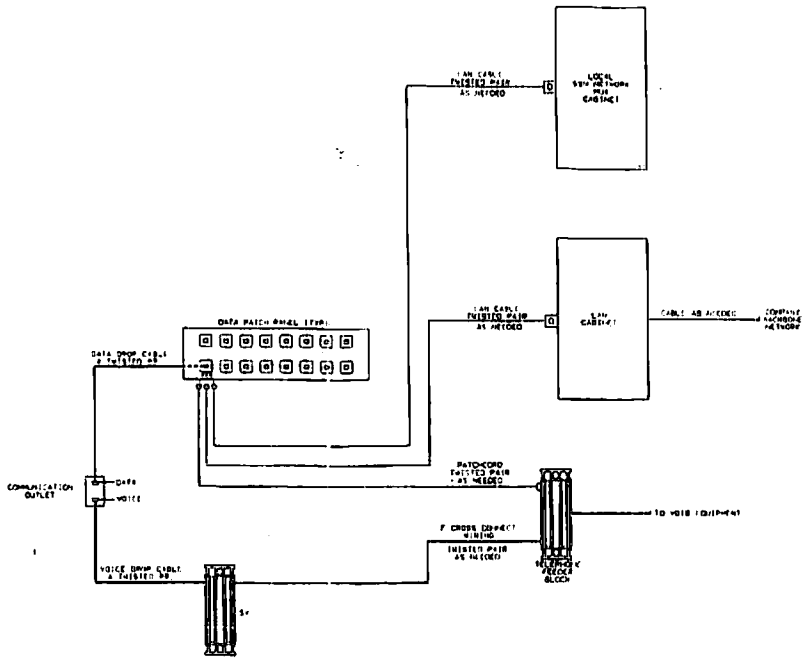
MARTIN MARIETTA ENERGY SYSTEMS, INC.
OAK RIDGE, TENNESSEE

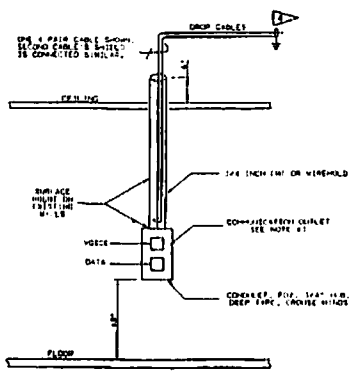
ORF-ICN NETWORK SYSTEM DIAGRAM

ORF-ICN NETWORK SYS DIAG

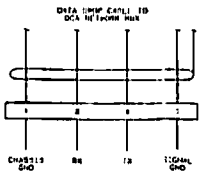
SYSTEM	SUBSYSTEM	DISCIPLINE	SEQUENCE	SHEET	REV
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

ORF-[illegible]





DETAIL 1
NEW DROP INSTALLATION



DETAIL 2
COMMUNICATIONS OUTLET PIN WIRING FOR DCA NETWORK CONNECTION

NOTES:

1. FOR CABLE REQUIREMENTS, SEE SECTION 5.2.1 OF Y/EH-0351
2. ALL TERMINAL BLOCKS ARE AMP 110 TYPE.
3. COMMUNICATION OUTLET IS AMP 557600-1.

LEGEND:

SD = STATION DATA BLOCKS
SV = STATION VOICE BLOCKS
LAN = LAN BLOCKS
[D] = DEMARCATION POINT

THIS DRAWING DEPICTS REQUIREMENTS FOR NEW CABLE INSTALLATIONS

THIS DRAWING PRODUCED ON CADAM

DO NOT REVISE MANUALLY

THIS DOCUMENT CONTROLLED BY CHANGE CONTROL SYSTEM, ICN-002 ENGINEERING PROCEDURE ER-E-03

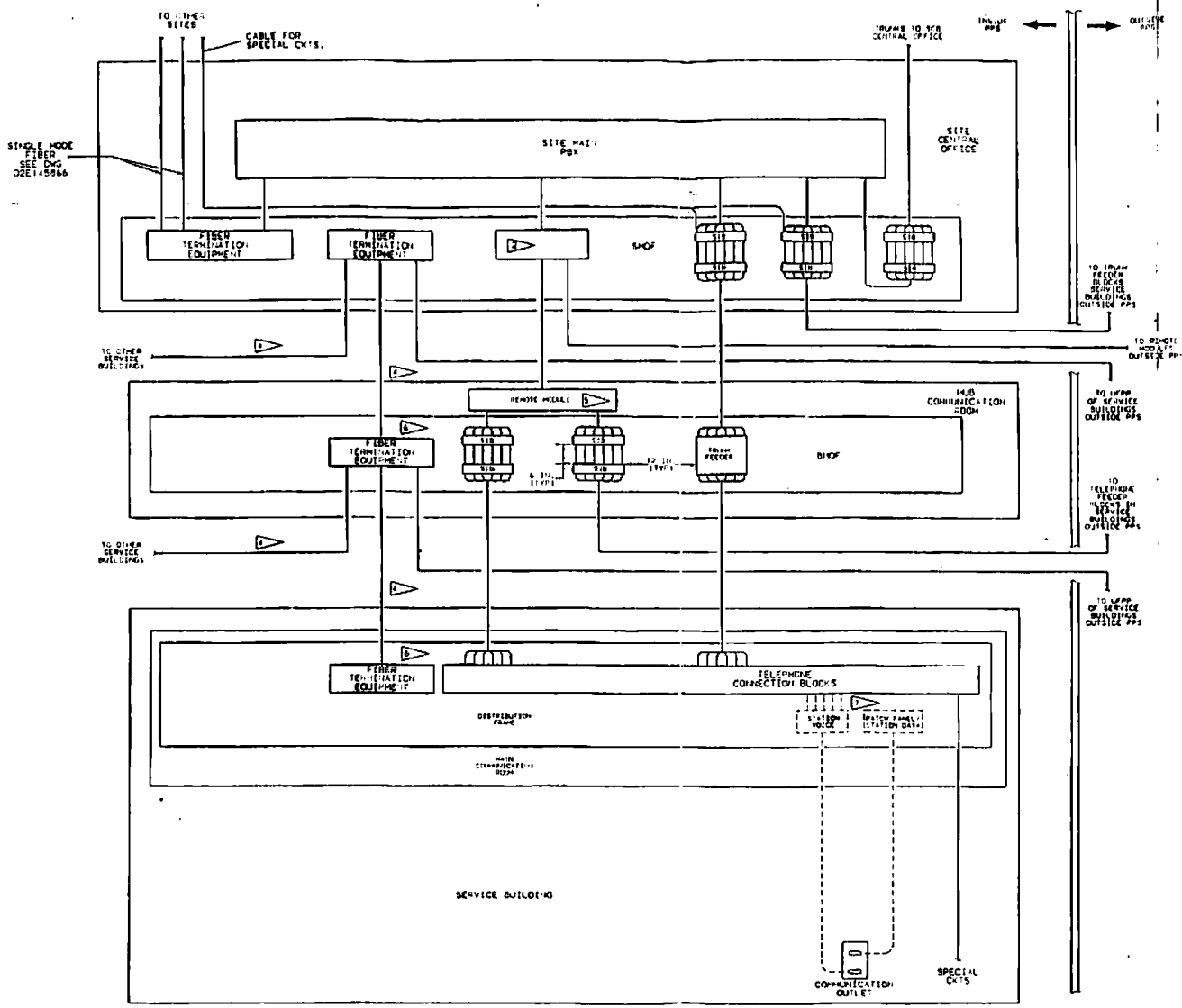
REV	DATE	DESCRIPTION
A	12/1/93	REVISED TO NEW FORMAT
B	12/1/93	REVISED PER ECN 93-0191
C	12/1/93	ISSUED FOR REVIEW/COMMENT
D	12/1/93	ISSUED FOR APPROVAL

DATE: JAN 06 1993
DRN: J. E. CLEAVER
CHK: J. E. CLEAVER
APP'D BY: N/A
DATE: 12/1/93
DRN: J. E. CLEAVER
CHK: J. E. CLEAVER
APP: V. D. TAYLOR
DATE: 12/1/93

ORF-ICN
SERVICE BUILDING
WIRING REQUIREMENTS

ORF-ICN SER BLDG WIRING REQ

D2E1467870000 A



NOTES

1. CONNECTIONS SHOWN FOR ONE SITE. ALL SITES ARE TYPICAL.
2. TERMINAL BLOCK OR FIBER PATCH PANEL TO BE DETERMINED BY CONTRACTOR.
3. UNLESS OTHERWISE SPECIFIED, CABLING TO BE DETERMINED BY CONTRACTOR.
4. FIBER CABLING IS DEFINED IN APPENDIX A OF Y/EN-235X AND SECTION B 2.4.
5. NEED DETERMINED BY CONTRACTOR. INSTALL ONLY AT DESIGNATED POSSIBLE LOCATIONS. (SEE SPECIFICATION Y/EN-235X)
6. INSTALL PER UNIT PRICE AGREEMENT.
7. FOR DETAILED CABLING REQUIREMENTS SEE DRAWING NUMBER D2E146397

LEGEND

SMDF	SITE MAIN DISTRIBUTION FRAME
SIB	SECURITY ISOLATION BLOCK
BMDF	BUILDING MAIN DISTRIBUTION FRAME
PPS	PHYSICALLY PROTECTED SPACE
UFPP	UNCLASSIFIED FIBEROPTIC PATCH PANEL
----	INDICATES EXISTING CIRCUITS & EQUIPMENT

DO NOT REVISE MANUALLY

B		REVISED PER ECN Y/CN-019	
A		REVISED PER ECN Y/CN-003	
0		ISSUED FOR REQUIREMENT	
0		ISSUED FOR APPROVAL	
0		ISSUED FOR COMMENT	

DESCRIPTION

DES J.E. GLEASER
DR J.F. JONES
CHK J.E. GLEASER
SECT
SUPV E. J. GLEASER
PM
PE V. A. HOLLIN
CM

ORF-ICN
CABLE CONNECTION SYSTEM DIAGRAM

ORF-ICN CABLE CONN SYS DIAG

D2E145907