

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT			1. CONTRACT ID CODE	PAGE OF PAGES 1 OF 2
2. AMENDMENT/MODIFICATION NO. AM-0005	3. EFFECTIVE DATE 02/07/02	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO. (If applicable)	
6. ISSUED BY US ARMY ENGINEER DISTRICT, HONOLULU CORPS OF ENGINEERS, BUILDING S-200 FORT SHAFTER, HAWAII 96858-5440 CONTRACT SPECIALIST: RENEE M. HICKS	CODE	7. ADMINISTERED BY (If other than Item 6) CODE		

8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code)	<input checked="" type="checkbox"/> 9A. AMENDMENT OF SOLICITATION NO. DACA83-02-R-0003
	9B. DATED (SEE ITEM 11) 12/07/01
	10A. MODIFICATION OF CONTRACT/ORDER NO.
CODE	FACILITY CODE
10B. DATED (SEE ITEM 13)	

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers  is extended,  is not extended.

Offer must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods:

(a) By completing Items 8 and 15, and returning \_\_\_\_\_ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGEMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. Accounting and Appropriation Data (If required)

13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS, IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.

B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc). SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).

C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:

D. OTHER (Specify type of modification and authority)

E. IMPORTANT: Contractor  is not,  is required to sign this document and return \_\_\_\_\_ copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)  
FY02 MCA PN 50846 COLD STORAGE FACILITY, AND FY01 RDT&E REPAIR WATER TANKS, U.S. ARMY KWAJALEIN ATOLL

(See Page 2 of 2 Pages)

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNER (Type or print)	16A. NAME AND TITLE OF SIGNER (Type or print)
15B. CONTRACTOR/OFFEROR  (Signature of person authorized to sign)	16B. UNITED STATES OF AMERICA BY _____ (Signature of Contracting Officer)
15C. DATE SIGNED	16C. DATE SIGNED

1. CHANGES TO SPECIFICATIONS. Attached hereto are new and revised pages and sections to the specifications. The revision mark "(AM-0005)" is shown on each page.

A. REVISIONS. The following information has been revised in the solicitation:

Section 00700 - 52.236-4 "Physical Data"

**COLD STORAGE SPECS**

Section 03200 - paragraphs: 2.1 and 3.1

Section 13038 - paragraphs: 2.1

Section 16375 - paragraphs: 3.7

Section 16415 - paragraphs: 1.1, 1.2.5.1, 1.3.1, 2.22, 2.23 and 3.2.1.9.

Section 16710 - paragraphs: 2.3.2.1.

B. ADDITIONS. The following information has been added to the solicitation:

Section 00700 - 252.225-7005 "Identification of Expenditures in the United States"

252.225-7042 "Authorization to Perform"

252.225-7043 "Antiterrorism/Force Protection Policy for Defense Contractors  
Outside the United States"

252.233-7001 "Choice of Law"

52.236-1 "Performance of Work by the Contractor"

Section 00900 - Questions and Answers

Section 00950 - Preproposal Conference Information

Section 03314 - Attachments - ACI 350 IR TESTING WATERTIGHTNESS - AWAA C 651  
DISENFECTION

C. DELETIONS. The following information has been deleted from the solicitation:

Section 00700 - 52.211-12 "Liquidated Damages--Alternate I

52.236-13 "Accident Prevention"

D. REVISED DRAWINGS (ISSUED). The following revised drawings replace like-numbered drawings and are issued herewith:

<u>REV</u>	<u>RING NO.</u>	<u>DRAWING NO.</u>	<u>SHEET NO.</u>	<u>LTR</u>	<u>REVISION DATE</u>	
1		841-21-01		T-1	b	1/18/02
2		841-21-01		S-1	b	1/18/02
5		841-21-01		S-4	b	1/18/02
11		841-21-01		M-1	b	1/18/02

2. The proposal due date of March 1, 2002, 2:00 P.M. Hawaiian Standard Time (HST) remains unchanged.

APPENDIX B  
 PRICE BREAKDOWN - PART 1

REQUEST FOR PROPOSALS NO: DCA83-02-R-0003

ITEM NO.	DESCRIPTION (Brief)	TOTAL DIRECT LABOR MANHOURS	TOTAL DIRECT LABOR COST	TOTAL EQUIPMENT COST	TOTAL MATERIAL (INCL SHIP) COST	SUBCONTRACTOR COST	TOTAL DIRECT COST
1. Cold Storage Facility							
	Direct Cost Subtotals		\$ _____	\$ _____	\$ _____	\$ _____	\$ _____
	Distributed Mobilization and Demobilization		\$ _____				\$ _____
	Distributed Camp Facilities						\$ _____
	Distributed Site Indirect Costs						\$ _____
	Distributed Home Office Overhead						\$ _____
	Profit						\$ _____
	<b>TOTAL</b>		\$ _____				\$ _____

(AM-0005)

PRICE BREAKDOWN - PART 2

SUMMARY BY CSI DIVISION

Item No. 1. Cold Storage Facility

CSI DIV	DESCRIPTION	TOTAL LABOR MANHOUR	COST	TOTAL EQUIPMENT	TOTAL MATERIAL	SHIP TONS	SHIP COST	SUBCONTRACTOR COST	TOTAL CSI DIVISION COST
02	SITE WORK								
03	CONCRETE								
04	MASONRY								
05	METALS								
06	WOOD & PLASTIC								
07	THERMAL & MOISTURE PROTECTION								
08	DOORS & WINDOWS								
09	FINISHES								
10	SPECIALTIES								
11	EQUIPMENT								
12	FURNISHINGS								
13	SPECIAL CONSTRUCTION								
14	CONVEYING SYSTEMS								
15	MECHANICAL								
16	ELECTRICAL								

TOTAL DIRECT

(AM-0005)

PRICE BREAKDOWN PART 3

SUBCONTRACTED WORK ONLY

SUMMARY BY CSI DIVISION

Item No. 1 Cold Storage Facility

CSI DIV	DESCRIPTION	TOTAL LABOR MANHOUR	COST	TOTAL EQUIPMENT	TOTAL MATERIAL	SHIP TONS	SHIP COST	SUBCONTRACTOR MARK-UP	TOTAL CSI DIVISION COST
02	SITE WORK								
03	CONCRETE								
04	MASONRY								
05	METALS								
06	WOOD & PLASTIC								
07	THERMAL & MOISTURE PROTECTION								
08	DOORS & WINDOWS								
09	FINISHES								
10	SPECIALTIES								
11	EQUIPMENT								
12	FURNISHINGS								
13	SPECIAL CONSTRUCTION								
14	CONVEYING SYSTEMS								
15	MECHANICAL								
16	ELECTRICAL								

TOTAL

(AM-0005)

PRICE BREAKDOWN - PART 4

ITEM NO.	DESCRIPTION (Brief)	TOTAL DIRECT LABOR MANHOURS	TOTAL DIRECT LABOR COST	TOTAL EQUIPMENT COST	TOTAL MATERIAL (INCL SHIP) COST	SUBCONTRACTOR COST	TOTAL DIRECT COST
2. REPAIR WATER TANKS							

Direct Cost Subtotals	_____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____
Distributed Mobilization and Demobilization							\$ _____
Distributed Camp Facilities							\$ _____
Distributed Site Indirect Costs							\$ _____
Distributed Home Office Overhead							\$ _____
Profit							\$ _____
TOTAL							\$ _____

(AM-0005)

PRICE BREAKDOWN - PART 5

SUMMARY BY CSI DIVISION

Item No. 2 REPAIR WATER TANKS

CSI DIV	DESCRIPTION	TOTAL LABOR MANHOUR	COST	TOTAL EQUIPMENT	TOTAL MATERIAL	SHIP TONS	SHIP COST	SUBCONTRACTOR COST	TOTAL CSI DIVISION COST
02	SITE WORK								
03	CONCRETE								
04	MASONRY								
05	METALS								
06	WOOD & PLASTIC								
07	THERMAL & MOISTURE PROTECTION								
08	DOORS & WINDOWS								
09	FINISHES								
10	SPECIALTIES								
11	EQUIPMENT								
12	FURNISHINGS								
13	SPECIAL CONSTRUCTION								
14	CONVEYING SYSTEMS								
15	MECHANICAL								
16	ELECTRICAL								

TOTAL DIRECT

(AM-0005)

PRICE BREAKDOWN PART 6

SUBCONTRACTED WORK ONLY

SUMMARY BY CSI DIVISION

Item No. 2 REPAIR WATER TANKS

CSI DIV	DESCRIPTION	TOTAL LABOR MANHOUR	COST	TOTAL EQUIPMENT	TOTAL MATERIAL	SHIP TONS	SHIP COST	SUBCONTRACTOR MARK-UP	TOTAL CSI DIVISION COST
02	SITE WORK								
03	CONCRETE								
04	MASONRY								
05	METALS								
06	WOOD & PLASTIC								
07	THERMAL & MOISTURE PROTECTION								
08	DOORS & WINDOWS								
09	FINISHES								
10	SPECIALTIES								
11	EQUIPMENT								
12	FURNISHINGS								
13	SPECIAL CONSTRUCTION								
14	CONVEYING SYSTEMS								
15	MECHANICAL								
16	ELECTRICAL								

TOTAL

(AM-0005)

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## SECTION 00700 Contract Clauses

### CLAUSES INCORPORATED BY FULL TEXT

#### 252.201-7000 CONTRACTING OFFICER'S REPRESENTATIVE (DEC 1991)

(a) "Definition. Contracting officer's representative" means an individual designated in accordance with subsection 201.602-2 of the Defense Federal Acquisition Regulation Supplement and authorized in writing by the contracting officer to perform specific technical or administrative functions.

(b) If the Contracting Officer designates a contracting officer's representative (COR), the Contractor will receive a copy of the written designation. It will specify the extent of the COR's authority to act on behalf of the contracting officer. The COR is not authorized to make any commitments or changes that will affect price, quality, quantity, delivery, or any other term or condition of the contract.

(End of clause)

#### 52.202-1 DEFINITIONS (MAY 2001) --ALTERNATE I (MAY 2001)

(a) Agency head or head of the agency means the Secretary (Attorney General, Administrator, Governor, Chairperson, or other chief official, as appropriate) of the agency, unless otherwise indicated, including any deputy or assistant chief official of the executive agency.

(b) "Commercial component" means any component that is a commercial item.

(c) Except as otherwise provided in this contract, the term "subcontracts" includes, but is not limited to, purchase orders and changes and modifications to purchase orders under this contract.

(d) Component means any item supplied to the Government as part of an end item or of another component, except that for use in 52.225-9, and 52.225-11 see the definitions in 52.225-9(a) and 52.225-11(a).

(e) Contracting Officer means a person with the authority to enter into, administer, and/or terminate contracts and make related determinations and findings. The term includes certain authorized representatives of the Contracting Officer acting within the limits of their authority as delegated by the Contracting Officer.

(f) Nondevelopmental item means--

(1) Any previously developed item of supply used exclusively for governmental purposes by a Federal agency, a State or local government, or a foreign government with which the United States has a mutual defense cooperation agreement;

(2) Any item described in paragraph (f)(1) of this definition that requires only minor modification or modifications of a type customarily available in the commercial marketplace in order to meet the requirements of the procuring department or agency; or

(3) Any item of supply being produced that does not meet the requirements of paragraph (f)(1) or (f)(2) solely because the item is not yet in use.

(End of clause)

#### 52.203-3 GRATUITIES (APR 1984)

(a) The right of the Contractor to proceed may be terminated by written notice if, after notice and hearing, the agency head or a designee determines that the Contractor, its agent, or another representative--

(1) Offered or gave a gratuity (e.g., an entertainment or gift) to an officer, official, or employee of the Government; and

(2) Intended, by the gratuity, to obtain a contract or favorable treatment under a contract.

(b) The facts supporting this determination may be reviewed by any court having lawful jurisdiction.

(c) If this contract is terminated under paragraph (a) of this clause, the Government is entitled--

(1) To pursue the same remedies as in a breach of the contract; and

(2) In addition to any other damages provided by law, to exemplary damages of not less than 3 nor more than 10 times the cost incurred by the Contractor in giving gratuities to the person concerned, as determined by the agency head or a designee. (This subparagraph (c)(2) is applicable only if this contract uses money appropriated to the Department of Defense.)

(d) The rights and remedies of the Government provided in this clause shall not be exclusive and are in addition to any other rights and remedies provided by law or under this contract.

(End of clause)

#### 52.203-5 COVENANT AGAINST CONTINGENT FEES (APR 1984)

(a) The Contractor warrants that no person or agency has been employed or retained to solicit or obtain this contract upon an agreement or understanding for a contingent fee, except a bona fide employee or agency. For breach or violation of this warranty, the Government shall have the right to annul this contract without liability or, in its discretion, to deduct from the contract price or consideration, or otherwise recover, the full amount of the contingent fee.

(b) "Bona fide agency," as used in this clause, means an established commercial or selling agency, maintained by a contractor for the purpose of securing business, that neither exerts nor proposes to exert improper influence to solicit or obtain Government contracts nor holds itself out as being able to obtain any Government contract or contracts through improper influence.

"Bona fide employee," as used in this clause, means a person, employed by a contractor and subject to the contractor's supervision and control as to time, place, and manner of performance, who neither exerts nor proposes to exert improper influence to solicit or obtain Government contracts nor holds out as being able to obtain any Government contract or contracts through improper influence.

"Contingent fee," as used in this clause, means any commission, percentage, brokerage, or other fee that is contingent upon the success that a person or concern has in securing a Government contract.

"Improper influence," as used in this clause, means any influence that induces or tends to induce a Government employee or officer to give consideration or to act regarding a Government contract on any basis other than the merits of the matter.

(End of clause)

#### 52.203-7 ANTI-KICKBACK PROCEDURES. (JUL 1995)

(a) Definitions.

"Kickback," as used in this clause, means any money, fee, commission, credit, gift, gratuity, thing of value, or compensation of any kind which is provided, directly or indirectly, to any prime Contractor, prime Contractor employee, subcontractor, or subcontractor employee for the purpose of improperly obtaining or rewarding favorable treatment in connection with a prime contract or in connection with a subcontract relating to a prime contract.

"Person," as used in this clause, means a corporation, partnership, business association of any kind, trust, joint-stock company, or individual.

"Prime contract," as used in this clause, means a contract or contractual action entered into by the United States for the purpose of obtaining supplies, materials, equipment, or services of any kind.

"Prime Contractor," as used in this clause, means a person who has entered into a prime contract with the United States.

"Prime Contractor employee," as used in this clause, means any officer, partner, employee, or agent of a prime Contractor.

"Subcontract," as used in this clause, means a contract or contractual action entered into by a prime Contractor or subcontractor for the purpose of obtaining supplies, materials, equipment, or services of any kind under a prime contract.

"Subcontractor," as used in this clause, (1) means any person, other than the prime Contractor, who offers to furnish or furnishes any supplies, materials, equipment, or services of any kind under a prime contract or a subcontract entered into in connection with such prime contract, and (2) includes any person who offers to furnish or furnishes general supplies to the prime Contractor or a higher tier subcontractor.

"Subcontractor employee," as used in this clause, means any officer, partner, employee, or agent of a subcontractor.

(b) The Anti-Kickback Act of 1986 (41 U.S.C. 51-58) (the Act), prohibits any person from -

(1) Providing or attempting to provide or offering to provide any kickback;

(2) Soliciting, accepting, or attempting to accept any kickback; or

(3) Including, directly or indirectly, the amount of any kickback in the contract price charged by a prime Contractor to the United States or in the contract price charged by a subcontractor to a prime Contractor or higher tier subcontractor.

(c)(1) The Contractor shall have in place and follow reasonable procedures designed to prevent and detect possible violations described in paragraph (b) of this clause in its own operations and direct business relationships.

(2) When the Contractor has reasonable grounds to believe that a violation described in paragraph (b) of this clause may have occurred, the Contractor shall promptly report in writing the possible violation. Such reports shall be made to the inspector general of the contracting agency, the head of the contracting agency if the agency does not have an inspector general, or the Department of Justice.

(3) The Contractor shall cooperate fully with any Federal agency investigating a possible violation described in paragraph (b) of this clause.

(4) The Contracting Officer may (i) offset the amount of the kickback against any monies owed by the United States under the prime contract and/or (ii) direct that the Prime Contractor withhold, from sums

owed a subcontractor under the prime contract, the amount of any kickback. The Contracting Officer may order the monies withheld under subdivision (c)(4)(ii) of this clause be paid over to the Government unless the Government has already offset those monies under subdivision (c)(4)(i) of this clause. In either case, the Prime Contractor shall notify the Contracting Officer when the monies are withheld.

(5) The Contractor agrees to incorporate the substance of this clause, including this subparagraph (c)(5) but excepting subparagraph (c)(1), in all subcontracts under this contract which exceed \$100,000.

#### 52.203-8 CANCELLATION, RESCISSION, AND RECOVERY OF FUNDS FOR ILLEGAL OR IMPROPER ACTIVITY (JAN 1997)

(a) If the Government receives information that a contractor or a person has engaged in conduct constituting a violation of subsection (a), (b), (c), or (d) of Section 27 of the Office of Federal Procurement Policy Act (41 U.S.C. 423) (the Act), as amended by section 4304 of the 1996 National Defense Authorization Act for Fiscal Year 1996 (Pub. L. 104-106), the Government may--

(1) Cancel the solicitation, if the contract has not yet been awarded or issued; or

(2) Rescind the contract with respect to which--

(i) The Contractor or someone acting for the Contractor has been convicted for an offense where the conduct constitutes a violation of subsection 27 (a) or (b) of the Act for the purpose of either--

(A) Exchanging the information covered by such subsections for anything of value; or

(B) Obtaining or giving anyone a competitive advantage in the award of a Federal agency procurement contract; or

(ii) The head of the contracting activity has determined, based upon a preponderance of the evidence, that the Contractor or someone acting for the Contractor has engaged in conduct constituting an offense punishable under subsections 27(e)(1) of the Act.

(b) If the Government rescinds the contract under paragraph (a) of this clause, the Government is entitled to recover, in addition to any penalty prescribed by law, the amount expended under the contract.

(c) The rights and remedies of the Government specified herein are not exclusive, and are in addition to any other rights and remedies provided by law, regulation, or under this contract.

#### 52.203-10 PRICE OR FEE ADJUSTMENT FOR ILLEGAL OR IMPROPER ACTIVITY (JAN 1997)

(a) The Government, at its election, may reduce the price of a fixed-price type contract and the total cost and fee under a cost-type contract by the amount of profit or fee determined as set forth in paragraph (b) of this clause if the head of the contracting activity or designee determines that there was a violation of subsection 27 (a), (b), or (c) of the Office of Federal Procurement Policy Act, as amended (41 U.S.C. 423), as implemented in section 3.104 of the Federal Acquisition Regulation.

(b) The price or fee reduction referred to in paragraph (a) of this clause shall be--

(1) For cost-plus-fixed-fee contracts, the amount of the fee specified in the contract at the time of award;

(2) For cost-plus-incentive-fee contracts, the target fee specified in the contract at the time of award, notwithstanding any minimum fee or "fee floor" specified in the contract;

(3) For cost-plus-award-fee contracts--

- (i) The base fee established in the contract at the time of contract award;
  - (ii) If no base fee is specified in the contract, 30 percent of the amount of each award fee otherwise payable to the Contractor for each award fee evaluation period or at each award fee determination point.
- (4) For fixed-price-incentive contracts, the Government may--
- (i) Reduce the contract target price and contract target profit both by an amount equal to the initial target profit specified in the contract at the time of contract award; or
  - (ii) If an immediate adjustment to the contract target price and contract target profit would have a significant adverse impact on the incentive price revision relationship under the contract, or adversely affect the contract financing provisions, the Contracting Officer may defer such adjustment until establishment of the total final price of the contract. The total final price established in accordance with the incentive price revision provisions of the contract shall be reduced by an amount equal to the initial target profit specified in the contract at the time of contract award and such reduced price shall be the total final contract price.
- (5) For firm-fixed-price contracts, by 10 percent of the initial contract price or a profit amount determined by the Contracting Officer from records or documents in existence prior to the date of the contract award.
- (c) The Government may, at its election, reduce a prime contractor's price or fee in accordance with the procedures of paragraph (b) of this clause for violations of the Act by its subcontractors by an amount not to exceed the amount of profit or fee reflected in the subcontract at the time the subcontract was first definitively priced.
  - (d) In addition to the remedies in paragraphs (a) and (c) of this clause, the Government may terminate this contract for default. The rights and remedies of the Government specified herein are not exclusive, and are in addition to any other rights and remedies provided by law or under this contract.

(End of clause)

52.203-12      LIMITATION ON PAYMENTS TO INFLUENCE CERTAIN FEDERAL TRANSACTIONS  
(JUN 1997)

(a) Definitions.

"Agency," as used in this clause, means executive agency as defined in 2.101.

"Covered Federal action," as used in this clause, means any of the following Federal actions:

- (1) The awarding of any Federal contract.
- (2) The making of any Federal grant.
- (3) The making of any Federal loan.
- (4) The entering into of any cooperative agreement.
- (5) The extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

"Indian tribe" and "tribal organization," as used in this clause, have the meaning provided in section 4 of the Indian Self-Determination and Education Assistance Act (25 U.S.C. 450B) and include Alaskan Natives.

"Influencing or attempting to influence," as used in this clause, means making, with the intent to influence, any communication to or appearance before an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with any covered Federal action.

"Local government," as used in this clause, means a unit of government in a State and, if chartered, established, or otherwise recognized by a State for the performance of a governmental duty, including a local public authority, a special district, an intrastate district, a council of governments, a sponsor group representative organization, and any other instrumentality of a local government.

"Officer or employee of an agency," as used in this clause, includes the following individuals who are employed by an agency:

- (1) An individual who is appointed to a position in the Government under title 5, United States Code, including a position under a temporary appointment.
- (2) A member of the uniformed services, as defined in subsection 101(3), title 37, United States Code.
- (3) A special Government employee, as defined in section 202, title 18, United States Code.
- (4) An individual who is a member of a Federal advisory committee, as defined by the Federal Advisory Committee Act, title 5, United States Code, appendix 2.

"Person," as used in this clause, means an individual, corporation, company, association, authority, firm, partnership, society, State, and local government, regardless of whether such entity is operated for profit, or not for profit. This term excludes an Indian tribe, tribal organization, or any other Indian organization with respect to expenditures specifically permitted by other Federal law.

"Reasonable compensation," as used in this clause, means, with respect to a regularly employed officer or employee of any person, compensation that is consistent with the normal compensation for such officer or employee for work that is not furnished to, not funded by, or not furnished in cooperation with the Federal Government.

"Reasonable payment," as used in this clause, means, with respect to professional and other technical services, a payment in an amount that is consistent with the amount normally paid for such services in the private sector.

"Recipient," as used in this clause, includes the Contractor and all subcontractors. This term excludes an Indian tribe, tribal organization, or any other Indian organization with respect to expenditures specifically permitted by other Federal law.

"Regularly employed," as used in this clause, means, with respect to an officer or employee of a person requesting or receiving a Federal contract, an officer or employee who is employed by such person for at least 130 working days within 1 year immediately preceding the date of the submission that initiates agency consideration of such person for receipt of such contract. An officer or employee who is employed by such person for less than 130 working days within 1 year immediately preceding the date of the submission that initiates agency consideration of such person shall be considered to be regularly employed as soon as he or she is employed by such person for 130 working days.

"State," as used in this clause, means a State of the United States, the District of Columbia, the Commonwealth of Puerto Rico, a territory or possession of the United States, an agency or

instrumentality of a State, and multi-State, regional, or interstate entity having governmental duties and powers.

(b) Prohibitions.

(1) Section 1352 of title 31, United States Code, among other things, prohibits a recipient of a Federal contract, grant, loan, or cooperative agreement from using appropriated funds to pay any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with any of the following covered Federal actions: the awarding of any Federal contract; the making of any Federal grant; the making of any Federal loan; the entering into of any cooperative agreement; or the modification of any Federal contract, grant, loan, or cooperative agreement.

(2) The Act also requires Contractors to furnish a disclosure if any funds other than Federal appropriated funds (including profit or fee received under a covered Federal transaction) have been paid, or will be paid, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with a Federal contract, grant, loan, or cooperative agreement.

(3) The prohibitions of the Act do not apply under the following conditions:

(i) Agency and legislative liaison by own employees.

(A) The prohibition on the use of appropriated funds, in subparagraph (b)(1) of this clause, does not apply in the case of a payment of reasonable compensation made to an officer or employee of a person requesting or receiving a covered Federal action if the payment is for agency and legislative liaison activities not directly related to a covered Federal action.

(B) For purposes of subdivision (b)(3)(i)(A) of this clause, providing any information specifically requested by an agency or Congress is permitted at any time.

(C) The following agency and legislative liaison activities are permitted at any time where they are not related to a specific solicitation for any covered Federal action:

(1) Discussing with an agency the qualities and characteristics (including individual demonstrations) of the person's products or services, conditions or terms of sale, and service capabilities.

(2) Technical discussions and other activities regarding the application or adaptation of the person's products or services for an agency's use.

(D) The following agency and legislative liaison activities are permitted where they are prior to formal solicitation of any covered Federal action--

(1) Providing any information not specifically requested but necessary for an agency to make an informed decision about initiation of a covered Federal action;

(2) Technical discussions regarding the preparation of an unsolicited proposal prior to its official submission; and

(3) Capability presentations by persons seeking awards from an agency pursuant to the provisions of the Small Business Act, as amended by Pub. L. 95-507, and subsequent amendments.

(E) Only those services expressly authorized by subdivision (b)(3)(i)(A) of this clause are permitted under this clause.

(ii) Professional and technical services.

(A) The prohibition on the use of appropriated funds, in subparagraph (b)(1) of this clause, does not apply in the case of--

(1) A payment of reasonable compensation made to an officer or employee of a person requesting or receiving a covered Federal action or an extension, continuation, renewal, amendment, or modification of a covered Federal action, if payment is for professional or technical services rendered directly in the preparation, submission, or negotiation of any bid, proposal, or application for that Federal action or for meeting requirements imposed by or pursuant to law as a condition for receiving that Federal action.

(2) Any reasonable payment to a person, other than an officer or employee of a person requesting or receiving a covered Federal action or an extension, continuation, renewal, amendment, or modification of a covered Federal action if the payment is for professional or technical services rendered directly in the preparation, submission, or negotiation of any bid, proposal, or application for that Federal action or for meeting requirements imposed by or pursuant to law as a condition for receiving that Federal action. Persons other than officers or employees of a person requesting or receiving a covered Federal action include consultants and trade associations.

(B) For purposes of subdivision (b)(3)(ii)(A) of this clause, "professional and technical services" shall be limited to advice and analysis directly applying any professional or technical discipline. For example, drafting of a legal document accompanying a bid or proposal by a lawyer is allowable. Similarly, technical advice provided by an engineer on the performance or operational capability of a piece of equipment rendered directly in the negotiation of a contract is allowable. However, communications with the intent to influence made by a professional (such as a licensed lawyer) or a technical person (such as a licensed accountant) are not allowable under this section unless they provide advice and analysis directly applying their professional or technical expertise and unless the advice or analysis is rendered directly and solely in the preparation, submission or negotiation of a covered Federal action. Thus, for example, communications with the intent to influence made by a lawyer that do not provide legal advice or analysis directly and solely related to the legal aspects of his or her client's proposal, but generally advocate one proposal over another are not allowable under this section because the lawyer is not providing professional legal services. Similarly, communications with the intent to influence made by an engineer providing an engineering analysis prior to the preparation or submission of a bid or proposal are not allowable under this section since the engineer is providing technical services but not directly in the preparation, submission or negotiation of a covered Federal action.

(C) Requirements imposed by or pursuant to law as a condition for receiving a covered Federal award include those required by law or regulation and any other requirements in the actual award documents.

(D) Only those services expressly authorized by subdivisions (b)(3)(ii)(A)(1) and (2) of this clause are permitted under this clause.

(E) The reporting requirements of FAR 3.803(a) shall not apply with respect to payments of reasonable compensation made to regularly employed officers or employees of a person.

(c) Disclosure.

(1) The Contractor who requests or receives from an agency a Federal contract shall file with that agency a disclosure form, OMB standard form LLL, Disclosure of Lobbying Activities, if such person has made or has agreed to make any payment using nonappropriated funds (to include profits from any covered Federal action), which would be prohibited under subparagraph (b)(1) of this clause, if paid for with appropriated funds.

(2) The Contractor shall file a disclosure form at the end of each calendar quarter in which there occurs any event that materially affects the accuracy of the information contained in any disclosure form previously filed by such person under subparagraph (c)(1) of this clause. An event that materially affects the accuracy of the information reported includes--

(i) A cumulative increase of \$25,000 or more in the amount paid or expected to be paid for influencing or attempting to influence a covered Federal action; or

(ii) A change in the person(s) or individual(s) influencing or attempting to influence a covered Federal action; or

(iii) A change in the officer(s), employee(s), or Member(s) contacted to influence or attempt to influence a covered Federal action.

(3) The Contractor shall require the submittal of a certification, and if required, a disclosure form by any person who requests or receives any subcontract exceeding \$100,000 under the Federal contract.

(4) All subcontractor disclosure forms (but not certifications) shall be forwarded from tier to tier until received by the prime Contractor. The prime Contractor shall submit all disclosures to the Contracting Officer at the end of the calendar quarter in which the disclosure form is submitted by the subcontractor. Each subcontractor certification shall be retained in the subcontract file of the awarding Contractor.

(d) Agreement. The Contractor agrees not to make any payment prohibited by this clause.

(e) Penalties.

(1) Any person who makes an expenditure prohibited under paragraph (a) of this clause or who fails to file or amend the disclosure form to be filed or amended by paragraph (b) of this clause shall be subject to civil penalties as provided for by 31 U.S.C. 1352. An imposition of a civil penalty does not prevent the Government from seeking any other remedy that may be applicable.

(2) Contractors may rely without liability on the representation made by their subcontractors in the certification and disclosure form.

(f) Cost allowability. Nothing in this clause makes allowable or reasonable any costs which would otherwise be unallowable or unreasonable. Conversely, costs made specifically unallowable by the requirements in this clause will not be made allowable under any other provision.

(End of clause)

#### 252.203-7001 PROHIBITION ON PERSONS CONVICTED OF FRAUD OR OTHER DEFENSE- CONTRACT-RELATED FELONIES (MAR 1999)

(a) Definitions. As used in this clause—

(1) “Arising out of a contract with the DoD” means any act in connection with—

(i) Attempting to obtain;

(ii) Obtaining, or

(iii) Performing a contract or first-tier subcontract of any agency, department, or component of the Department of Defense (DoD).

(2) “Conviction of fraud or any other felony” means any conviction for fraud or a felony in violation of state or Federal criminal statutes, whether entered on a verdict or plea, including a plea of *nolo contendere*, for which sentence has been imposed.

- (3) "Date of conviction" means the date judgment was entered against the individual.
- (b) Any individual who is convicted after September 29, 1988, of fraud or any other felony arising out of a contract with the DoD is prohibited from serving--
- (1) In a management or supervisory capacity on any DoD contract or first-tier subcontract;
  - (2) On the board of directors of any DoD contractor or first-tier subcontractor;
  - (3) As a consultant, agent, or representative for any DoD contractor or first-tier subcontractor; or
  - (4) In any other capacity with the authority to influence, advise, or control the decisions of any DoD contractor or subcontractor with regard to any DoD contract or first-tier subcontract.
- (c) Unless waived, the prohibition in paragraph (b) of this clause applies for not less than 5 years from the date of conviction.
- (d) 10 U.S.C. 2408 provides that a defense contractor or first-tier subcontractor shall be subject to a criminal penalty of not more than \$500,000 if convicted of knowingly—
- (1) Employing a person under a prohibition specified in paragraph (b) of this clause; or
  - (2) Allowing such a person to serve on the board of directors of the contractor or first-tier subcontractor.
- (e) In addition to the criminal penalties contained in 10 U.S.C. 2408, the Government may consider other available remedies, such as—
- (1) Suspension or debarment;
  - (2) Cancellation of the contract at no cost to the Government; or
  - (3) Termination of the contract for default.
- (f) The Contractor may submit written requests for waiver of the prohibition in paragraph (b) of this clause to the Contracting Officer. Requests shall clearly identify—
- (1) The person involved;
  - (2) The nature of the conviction and resultant sentence or punishment imposed;
  - (3) The reasons for the requested waiver; and
  - (4) An explanation of why a waiver is in the interest of national security.
- (g) The Contractor agrees to include the substance of this clause, appropriately modified to reflect the identity and relationship of the parties, in all first-tier subcontracts exceeding the simplified acquisition threshold in Part 2 of the Federal Acquisition Regulation, except those for commercial items or components.
- (h) Pursuant to 10 U.S.C. 2408(c), defense contractors and subcontractors may obtain information as to whether a particular person has been convicted of fraud or any other felony arising out of a contract with the DoD by contacting The Office of Justice Programs, The Denial of Federal Benefits Office, U.S. Department of Justice, telephone (202) 616-3507.

(End of clause)

52.204-4 PRINTING/COPYING DOUBLE-SIDED ON RECYCLED PAPER (AUG 2000)

(a) Definitions. As used in this clause--

Postconsumer material means a material or finished product that has served its intended use and has been discarded for disposal or recovery, having completed its life as a consumer item. Postconsumer material is a part of the broader category of "recovered material." For paper and paper products, postconsumer material means "postconsumer fiber" defined by the U.S. Environmental Protection Agency (EPA) as--

(1) Paper, paperboard, and fibrous materials from retail stores, office buildings, homes, and so forth, after they have passed through their end-usage as a consumer item, including: used corrugated boxes; old newspapers; old magazines; mixed waste paper; tabulating cards; and used cordage; or

(2) All paper, paperboard, and fibrous materials that enter and are collected from municipal solid waste; but not

(3) Fiber derived from printers' over-runs, converters' scrap, and over-issue publications.

Printed or copied double-sided means printing or reproducing a document so that information is on both sides of a sheet of paper.

Recovered material, for paper and paper products, is defined by EPA in its Comprehensive Procurement Guideline as "recovered fiber" and means the following materials:

(1) Postconsumer fiber; and

(2) Manufacturing wastes such as--

(i) Dry paper and paperboard waste generated after completion of the papermaking process (that is, those manufacturing operations up to and including the cutting and trimming of the paper machine reel into smaller rolls or rough sheets) including: envelope cuttings, bindery trimmings, and other paper and paperboard waste resulting from printing, cutting, forming, and other converting operations; bag, box, and carton manufacturing wastes; and butt rolls, mill wrappers, and rejected unused stock; and

(ii) Repulped finished paper and paperboard from obsolete inventories of paper and paperboard manufacturers, merchants, wholesalers, dealers, printers, converters, or others.

(b) In accordance with Section 101 of Executive Order 13101 of September 14, 1998, Greening the Government through Waste Prevention, Recycling, and Federal Acquisition, the Contractor is encouraged to submit paper documents, such as offers, letters, or reports, that are printed or copied double-sided on recycled paper that meet minimum content standards specified in Section 505 of Executive Order 13101, when not using electronic commerce methods to submit information or data to the Government.

(c) If the Contractor cannot purchase high-speed copier paper, offset paper, forms bond, computer printout paper, carbonless paper, file folders, white wove envelopes, writing and office paper, book paper, cotton fiber paper, and cover stock meeting the 30 percent postconsumer material standard for use in submitting paper documents to the Government, it should use paper containing no less than 20 percent postconsumer material. This lesser standard should be used only when paper meeting the 30 percent postconsumer material standard is not obtainable at a reasonable price or does not meet reasonable performance standards.

(End of clause)

252.204-7000 DISCLOSURE OF INFORMATION (DEC 1991)

(a) The Contractor shall not release to anyone outside the Contractor's organization any unclassified information, regardless of medium (e.g., film, tape, document), pertaining to any part of this contract or any program related to this contract, unless--

(1) The Contracting Officer has given prior written approval; or

(2) The information is otherwise in the public domain before the date of release.

(b) Requests for approval shall identify the specific information to be released, the medium to be used, and the purpose for the release. The Contractor shall submit its request to the Contracting Officer at least 45 days before the proposed date for release.

(c) The Contractor agrees to include a similar requirement in each subcontract under this contract. Subcontractors shall submit requests for authorization to release through the prime contractor to the Contracting Officer.

(End of clause)

252.204-7003 CONTROL OF GOVERNMENT PERSONNEL WORK PRODUCT (APR 1992)

The Contractor's procedures for protecting against unauthorized disclosure of information shall not require Department of Defense employees or members of the Armed Forces to relinquish control of their work products, whether classified or not, to the contractor.

(End of clause)

252.204-7004 REQUIRED CENTRAL CONTRACTOR REGISTRATION.(NOV 2001)

(a) Definitions.

As used in this clause--

(1) Central Contractor Registration (CCR) database means the primary DoD repository for contractor information required for the conduct of business with DoD.

(2) Data Universal Numbering System (DUNS) number means the 9-digit number assigned by Dun and Bradstreet Information Services to identify unique business entities.

(3) Data Universal Numbering System +4 (DUNS+4) number means the DUNS number assigned by Dun and Bradstreet plus a 4-digit suffix that may be assigned by a parent (controlling) business concern. This 4-digit suffix may be assigned at the discretion of the parent business concern for such purposes as identifying subunits or affiliates of the parent business concern.

(4) Registered in the CCR database means that all mandatory information, including the DUNS number or the DUNS+4 number, if applicable, and the corresponding Commercial and Government Entity (CAGE) code, is in the CCR database; the DUNS number and the CAGE code have been validated; and all edits have been successfully completed.

(b)(1) By submission of an offer, the offeror acknowledges the requirement that a prospective awardee must be registered in the CCR database prior to award, during performance, and through final payment of

any contract resulting from this solicitation, except for awards to foreign vendors for work to be performed outside the United States.

(2) The offeror shall provide its DUNS or, if applicable, its DUNS+4 number with its offer, which will be used by the Contracting Officer to verify that the offeror is registered in the CCR database.

(3) Lack of registration in the CCR database will make an offeror ineligible for award.

(4) DoD has established a goal of registering an applicant in the CCR database within 48 hours after receipt of a complete and accurate application via the Internet. However, registration of an applicant submitting an application through a method other than the Internet may take up to 30 days. Therefore, offerors that are not registered should consider applying for registration immediately upon receipt of this solicitation.

(c) The Contractor is responsible for the accuracy and completeness of the data within the CCR, and for any liability resulting from the Government's reliance on inaccurate or incomplete data. To remain registered in the CCR database after the initial registration, the Contractor is required to confirm on an annual basis that its information in the CCR database is accurate and complete.

(d) Offerors and contractors may obtain information on registration and annual confirmation requirements by calling 1-888-227-2423, or via the Internet at <http://www.ccr.com>.

(End of clause)

#### 252.205-7000 PROVISION OF INFORMATION TO COOPERATIVE AGREEMENT HOLDERS (DEC 1991)

(a) Definition.

"Cooperative agreement holder" means a State or local government; a private, nonprofit organization; a tribal organization (as defined in section 4(c) of the Indian Self-Determination and Education Assistance Act (Pub. L. 93-268; 25 U.S.C. 450 (c))); or an economic enterprise (as defined in section 3(e) of the Indian Financing Act of 1974 (Pub. L. 93-362; 25 U.S.C. 1452(e))) whether such economic enterprise is organized for profit or nonprofit purposes; which has an agreement with the Defense Logistics Agency to furnish procurement technical assistance to business entities.

(b) The Contractor shall provide cooperative agreement holders, upon their request, with a list of those appropriate employees or offices responsible for entering into subcontracts under defense contracts. The list shall include the business address, telephone number, and area of responsibility of each employee or office.

(c) The Contractor need not provide the listing to a particular cooperative agreement holder more frequently than once a year.

(End of clause)

#### 52.209-6 PROTECTING THE GOVERNMENT'S INTEREST WHEN SUBCONTRACTING WITH CONTRACTORS DEBARRED, SUSPENDED, OR PROPOSED FOR DEBARMENT (JUL 1995)

(a) The Government suspends or debar Contractors to protect the Government's interests. The Contractor shall not enter into any subcontract in excess of the \$25,000 with a Contractor that is debarred, suspended, or proposed for debarment unless there is a compelling reason to do so.

(b) The Contractor shall require each proposed first-tier subcontractor, whose subcontract will exceed \$25,000, to disclose to the Contractor, in writing, whether as of the time of award of the subcontract, the subcontractor, or its principles, is or is not debarred, suspended, or proposed for debarment by the Federal Government.

(c) A corporate officer or a designee of the Contractor shall notify the Contracting Officer, in writing, before entering into a subcontract with a party that is debarred, suspended, or proposed for debarment (see FAR 9.404 for information on the List of Parties Excluded from Federal Procurement and Nonprocurement Programs). The notice must include the following:

(1) The name of the subcontractor.

(2) The Contractor's knowledge of the reasons for the subcontractor being on the List of Parties Excluded from Federal Procurement and Nonprocurement Programs.

(3) The compelling reason(s) for doing business with the subcontractor notwithstanding its inclusion on the List of Parties Excluded from Federal Procurement and Nonprocurement Programs.

(4) The systems and procedures the Contractor has established to ensure that it is fully protecting the Government's interests when dealing with such subcontractor in view of the specific basis for the party's debarment, suspension, or proposed debarment.

(End of clause)

#### 252.209-7000 ACQUISITION FROM SUBCONTRACTORS SUBJECT TO ONSITE INSPECTION UNDER THE INTERMEDIATE-RANGE NUCLEAR FORCES (INF) TREATY (NOV 1995)

(a) The Contractor shall not deny consideration for a subcontract award under this contract to a potential subcontractor subject to on-site inspection under the INF Treaty, or a similar treaty, solely or in part because of the actual or potential presence of Soviet inspectors at the subcontractor's facility, unless the decision is approved by the Contracting Officer.

(b) The Contractor shall incorporate this clause, including this paragraph (b), in all solicitations and contracts exceeding the simplified acquisition threshold in part 13 of the Federal Acquisition Regulation, except those for commercial items.

#### 252.209-7004 SUBCONTRACTING WITH FIRMS THAT ARE OWNED OR CONTROLLED BY THE GOVERNMENT OF A TERRORIST COUNTRY (MAR 1998)

(a) Unless the Government determines that there is a compelling reason to do so, the Contractor shall not enter into any subcontract in excess of \$25,000 with a firm, or subsidiary of a firm, that is identified, on the List of Parties Excluded from Federal Procurement and Nonprocurement Programs, as being ineligible for the award of Defense contracts or subcontracts because it is owned or controlled by the government of a terrorist country.

(b) A corporate officer or a designee of the Contractor shall notify the Contracting Officer, in writing, before entering into a subcontract with a party that is identified, on the List of Parties Excluded from Federal Procurement and Nonprocurement Programs, as being ineligible for the award of Defense contracts or subcontracts because it is owned or controlled by the government of a terrorist country. The notice must include the name of the proposed subcontractor notwithstanding its inclusion on the List of Parties Excluded From Federal Procurement and Nonprocurement Programs.

#### 52.211-10 COMMENCEMENT, PROSECUTION, AND COMPLETION OF WORK (APR 1984)

The Contractor shall be required to (a) commence work under this contract within seven (7) (Contracting Officer insert number) calendar days after the date the Contractor receives the notice to proceed, (b) prosecute the work diligently, and (c) complete the entire work ready for use not later than five hundred seventy (570) calendar days. The time stated for completion shall include final cleanup of the premises.

(End of clause)

#### 52.211-12 LIQUIDATED DAMAGES--CONSTRUCTION (SEP 2000)

(a) If the Contractor fails to complete the work within the time specified in the contract, the Contractor shall pay liquidated damages to the Government in the amount of \$405.00 for each calendar day of delay until the work is completed or accepted.

(b) If the Government terminates the Contractor's right to proceed, liquidated damages will continue to accrue until the work is completed. These liquidated damages are in addition to excess costs of repurchase under the Termination clause.

(End of clause)

#### ~~\*52.211-12 LIQUIDATED DAMAGES--CONSTRUCTION (APR 1984)--ALTERNATE I (APR 1984)(DELETED)~~

~~(a) If the Contractor fails to complete the work within the time specified in the contract, or any extension, the Contractor shall pay to the Government as liquidated damages, the sum of \$405.00 for delay of each separate part or stage of the work.~~

~~(b) If the Government terminates the Contractor's right to proceed, the resulting damage will consist of liquidated damages until such reasonable time as may be required for final completion of the work together with any increased costs occasioned the Government in completing the work.~~

~~(c) If the Government does not terminate the Contractor's right to proceed, the resulting damage will consist of liquidated damages until the work is completed or accepted.~~

(End of clause)

\*

#### 52.211-13 TIME EXTENSIONS (SEP 2000)

Time extensions for contract changes will depend upon the extent, if any, by which the changes cause delay in the completion of the various elements of construction. The change order granting the time extension may provide that the contract completion date will be extended only for those specific elements related to the changed work and that the remaining contract completion dates for all other portions of the work will not be altered. The change order also may provide an equitable readjustment of liquidated damages under the new completion schedule.

(End of clause)

#### 52.211-15 DEFENSE PRIORITY AND ALLOCATION REQUIREMENTS (SEP 1990)

This is a rated order certified for national defense use, and the Contractor shall follow all the requirements of the Defense Priorities and Allocations System regulation (15 CFR 700).

(End of clause)

52.215-2 AUDIT AND RECORDS--NEGOTIATION (JUN 1999)

(a) As used in this clause, "records" includes books, documents, accounting procedures and practices, and other data, regardless of type and regardless of whether such items are in written form, in the form of computer data, or in any other form.

(b) Examination of costs. If this is a cost-reimbursement, incentive, time-and-materials, labor-hour, or price redeterminable contract, or any combination of these, the Contractor shall maintain and the Contracting Officer, or an authorized representative of the Contracting Officer, shall have the right to examine and audit all records and other evidence sufficient to reflect properly all costs claimed to have been incurred or anticipated to be incurred directly or indirectly in performance of this contract. This right of examination shall include inspection at all reasonable times of the Contractor's plants, or parts of them, engaged in performing the contract.

(c) Cost or pricing data. If the Contractor has been required to submit cost or pricing data in connection with any pricing action relating to this contract, the Contracting Officer, or an authorized representative of the Contracting Officer, in order to evaluate the accuracy, completeness, and currency of the cost or pricing data, shall have the right to examine and audit all of the Contractor's records, including computations and projections, related to--

(1) The proposal for the contract, subcontract, or modification;

(2) The discussions conducted on the proposal(s), including those related to negotiating;

(3) Pricing of the contract, subcontract, or modification; or

(4) Performance of the contract, subcontract or modification.

(d) Comptroller General--(1) The Comptroller General of the United States, or an authorized representative, shall have access to and the right to examine any of the Contractor's directly pertinent records involving transactions related to this contract or a subcontract hereunder.

(2) This paragraph may not be construed to require the Contractor or subcontractor to create or maintain any record that the Contractor or subcontractor does not maintain in the ordinary course of business or pursuant to a provision of law.

(e) Reports. If the Contractor is required to furnish cost, funding, or performance reports, the Contracting Officer or an authorized representative of the Contracting Officer shall have the right to examine and audit the supporting records and materials, for the purpose of evaluating (1) the effectiveness of the Contractor's policies and procedures to produce data compatible with the objectives of these reports and (2) the data reported.

(f) Availability. The Contractor shall make available at its office at all reasonable times the records, materials, and other evidence described in paragraphs (a), (b), (c), (d), and (e) of this clause, for examination, audit, or reproduction, until 3 years after final payment under this contract or for any shorter period specified in Subpart 4.7, Contractor Records Retention, of the Federal Acquisition Regulation (FAR), or for any longer period required by statute or by other clauses of this contract. In addition--

(1) If this contract is completely or partially terminated, the Contractor shall make available the records relating to the work terminated until 3 years after any resulting final termination settlement; and

(2) The Contractor shall make available records relating to appeals under the Disputes clause or to litigation or the settlement of claims arising under or relating to this contract until such appeals, litigation, or claims are finally resolved.

(g) The Contractor shall insert a clause containing all the terms of this clause, including this paragraph

(g), in all subcontracts under this contract that exceed the simplified acquisition threshold, and--

(1) That are cost-reimbursement, incentive, time-and-materials, labor-hour, or price-redeterminable type or any combination of these;

(2) For which cost or pricing data are required; or

(3) That require the subcontractor to furnish reports as discussed in paragraph (e) of this clause.

The clause may be altered only as necessary to identify properly the contracting parties and the Contracting Officer under the Government prime contract.

(End of clause)

52.215-11 PRICE REDUCTION FOR DEFECTIVE COST OR PRICING DATA--MODIFICATIONS  
(OCT 1997)

(a) This clause shall become operative only for any modification to this contract involving a pricing adjustment expected to exceed the threshold for submission of cost or pricing data at FAR 15.403-4, except that this clause does not apply to any modification if an exception under FAR 15.403-1 applies.

(b) If any price, including profit or fee, negotiated in connection with any modification under this clause, or any cost reimbursable under this contract, was increased by any significant amount because (1) the Contractor or a subcontractor furnished cost or pricing data that were not complete, accurate, and current as certified in its Certificate of Current Cost or Pricing Data, (2) a subcontractor or prospective subcontractor furnished the Contractor cost or pricing data that were not complete, accurate, and current as certified in the Contractor's Certificate of Current Cost or Pricing Data, or (3) any of these parties furnished data of any description that were not accurate, the price or cost shall be reduced accordingly and the contract shall be modified to reflect the reduction. This right to a price reduction is limited to that resulting from defects in data relating to modifications for which this clause becomes operative under paragraph (a) of this clause.

(c) Any reduction in the contract price under paragraph (b) of this clause due to defective data from a prospective subcontractor that was not subsequently awarded the subcontract shall be limited to the amount, plus applicable overhead and profit markup, by which--

(1) The actual subcontract; or

(2) The actual cost to the Contractor, if there was no subcontract, was less than the prospective subcontract cost estimate submitted by the Contractor; provided, that the actual subcontract price was not itself affected by defective cost or pricing data.

(d)(1) If the Contracting Officer determines under paragraph (b) of this clause that a price or cost reduction should be made, the Contractor agrees not to raise the following matters as a defense:

(i) The Contractor or subcontractor was a sole source supplier or otherwise was in a superior bargaining position and thus the price of the contract would not have been modified even if accurate, complete, and current cost or pricing data had been submitted.

(ii) The Contracting Officer should have known that the cost or pricing data in issue were defective even though the Contractor or subcontractor took no affirmative action to bring the character of the data to the attention of the Contracting Officer.

(iii) The contract was based on an agreement about the total cost of the contract and there was no agreement about the cost of each item procured under the contract.

(iv) The Contractor or subcontractor did not submit a Certificate of Current Cost or Pricing Data.

(2)(i) Except as prohibited by subdivision (d)(2)(ii) of this clause, an offset in an amount determined appropriate by the Contracting Officer based upon the facts shall be allowed against the amount of a contract price reduction if--

(A) The Contractor certifies to the Contracting Officer that, to the best of the Contractor's knowledge and belief, the Contractor is entitled to the offset in the amount requested; and

(B) The Contractor proves that the cost or pricing data were available before the "as of" date specified on its Certificate of Current Cost or Pricing Data, and that the data were not submitted before such date.

(ii) An offset shall not be allowed if--

(A) The understated data were known by the Contractor to be understated before the "as of" date specified on its Certificate of Current Cost or Pricing Data; or

(B) The Government proves that the facts demonstrate that the contract price would not have increased in the amount to be offset even if the available data had been submitted before the "as of" date specified on its Certificate of Current Cost or Pricing Data.

(e) If any reduction in the contract price under this clause reduces the price of items for which payment was made prior to the date of the modification reflecting the price reduction, the Contractor shall be liable to and shall pay the United States at the time such overpayment is repaid--

(1) Simple interest on the amount of such overpayment to be computed from the date(s) of overpayment to the Contractor to the date the Government is repaid by the Contractor at the applicable underpayment rate effective for each quarter prescribed by the Secretary of the Treasury under 26 U.S.C. 6621(a)(2); and

A penalty equal to the amount of the overpayment, if the Contractor or subcontractor knowingly submitted cost or pricing data that were incomplete, inaccurate, or noncurrent.

#### 52.215-13 SUBCONTRACTOR COST OR PRICING DATA--MODIFICATIONS (OCT 1997)

(a) The requirements of paragraphs (b) and (c) of this clause shall--

(1) Become operative only for any modification to this contract involving a pricing adjustment expected to exceed the threshold for submission of cost or pricing data at FAR 15.403-4; and

(2) Be limited to such modifications.

(b) Before awarding any subcontract expected to exceed the threshold for submission of cost or pricing data at FAR 15.403-4, on the date of agreement on price or the date of award, whichever is later; or before pricing any subcontract modification involving a pricing adjustment expected to exceed the threshold for submission of cost or pricing data at FAR 15.403-4, the Contractor shall require the subcontractor to submit cost or pricing data (actually or by specific identification in writing), unless an exception under FAR 15.403-1 applies.

(c) The Contractor shall require the subcontractor to certify in substantially the form prescribed in FAR 15.406-2 that, to the best of its knowledge and belief, the data submitted under paragraph (b) of this clause were accurate, complete, and current as of the date of agreement on the negotiated price of the subcontract or subcontract modification.

The Contractor shall insert the substance of this clause, including this paragraph (d), in each subcontract that exceeds the threshold for submission of cost or pricing data at FAR 15.403-4 on the date of agreement on price or the date of award, whichever is later.

52.215-21 REQUIREMENTS FOR COST OR PRICING DATA OR INFORMATION OTHER THAN COST OR PRICING DATA--MODIFICATIONS (OCT 1997)

(a) Exceptions from cost or pricing data. (1) In lieu of submitting cost or pricing data for modifications under this contract, for price adjustments expected to exceed the threshold set forth at FAR 15.403-4 on the date of the agreement on price or the date of the award, whichever is later, the Contractor may submit a written request for exception by submitting the information described in the following subparagraphs. The Contracting Officer may require additional supporting information, but only to the extent necessary to determine whether an exception should be granted, and whether the price is fair and reasonable--

(i) Identification of the law or regulation establishing the price offered. If the price is controlled under law by periodic rulings, reviews, or similar actions of a governmental body, attach a copy of the controlling document, unless it was previously submitted to the contracting office.

(ii) Information on modifications of contracts or subcontracts for commercial items. (A) If--

(1) The original contract or subcontract was granted an exception from cost or pricing data requirements because the price agreed upon was based on adequate price competition or prices set by law or regulation, or was a contract or subcontract for the acquisition of a commercial item; and

(2) The modification (to the contract or subcontract) is not exempted based on one of these exceptions, then the Contractor may provide information to establish that the modification would not change the contract or subcontract from a contract or subcontract for the acquisition of a commercial item to a contract or subcontract for the acquisition of an item other than a commercial item.

(B) For a commercial item exception, the Contractor shall provide, at a minimum, information on prices at which the same item or similar items have previously been sold that is adequate for evaluating the reasonableness of the price of the modification. Such information may include--

(1) For catalog items, a copy of or identification of the catalog and its date, or the appropriate pages for the offered items, or a statement that the catalog is on file in the buying office to which the proposal is being submitted. Provide a copy or describe current discount policies and price lists (published or unpublished), e.g., wholesale, original equipment manufacturer, or reseller. Also explain the basis of each offered price and its relationship to the established catalog price, including how the proposed price relates to the price of recent sales in quantities similar to the proposed quantities.

(2) For market-priced items, the source and date or period of the market quotation or other basis for market price, the base amount, and applicable discounts. In addition, describe the nature of the market.

(3) For items included on an active Federal Supply Service Multiple Award Schedule contract, proof that an exception has been granted for the schedule item.

(2) The Contractor grants the Contracting Officer or an authorized representative the right to examine, at any time before award, books, records, documents, or other directly pertinent records to verify any request for an exception under this clause, and the reasonableness of price. For items priced using catalog or market prices, or law or regulation, access does not extend to cost or profit information or other data relevant solely to the Contractor's determination of the prices to be offered in the catalog or marketplace.

(b) Requirements for cost or pricing data. If the Contractor is not granted an exception from the requirement to submit cost or pricing data, the following applies:

(1) The Contractor shall submit cost or pricing data and supporting attachments in accordance with Table 15-2 of FAR 15.408.

As soon as practicable after agreement on price, but before award (except for unpriced actions), the Contractor shall submit a Certificate of Current Cost or Pricing Data, as prescribed by FAR 15.406-2.

#### 252.215-7000 PRICING ADJUSTMENTS (DEC 1991)

The term "pricing adjustment," as used in paragraph (a) of the clauses entitled "Price Reduction for Defective Cost or Pricing Data - Modifications," "Subcontractor Cost or Pricing Data," and "Subcontractor Cost or Pricing Data - Modifications," means the aggregate increases and/or decreases in cost plus applicable profits.

#### 52.222-3 CONVICT LABOR (AUG 1996)

The Contractor agrees not to employ in the performance of this contract any person undergoing a sentence of imprisonment which has been imposed by any court of a State, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, American Samoa, the Commonwealth of the Northern Mariana Islands, or the Trust Territory of the Pacific Islands. This limitation, however, shall not prohibit the employment by the Contractor in the performance of this contract of persons on parole or probation to work at paid employment during the term of their sentence or persons who have been pardoned or who have served their terms. Nor shall it prohibit the employment by the Contractor in the performance of this contract of persons confined for violation of the laws of any of the States, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, American Samoa, the Commonwealth of the Northern Mariana Islands, or the Trust Territory of the Pacific Islands who are authorized to work at paid employment in the community under the laws of such jurisdiction, if--

- (a)(1) The worker is paid or is in an approved work training program on a voluntary basis;
  - (2) Representatives of local union central bodies or similar labor union organizations have been consulted;
  - (3) Such paid employment will not result in the displacement of employed workers, or be applied in skills, crafts, or trades in which there is a surplus of available gainful labor in the locality, or impair existing contracts for services; and
  - (4) The rates of pay and other conditions of employment will not be less than those paid or provided for work of a similar nature in the locality in which the work is being performed; and
- (b) The Attorney General of the United States has certified that the work-release laws or regulations of the jurisdiction involved are in conformity with the requirements of Executive Order 11755, as amended by Executive Orders 12608 and 12943.

(End of clause)

#### 52.222-10 COMPLIANCE WITH COPELAND ACT REQUIREMENTS (FEB 1988)

The Contractor shall comply with the requirements of 29 CFR Part 3, which are hereby incorporated by reference in this contract.

#### 52.222-21 PROHIBITION OF SEGREGATED FACILITIES (FEB 1999)

(a) Segregated facilities, as used in this clause, means any waiting rooms, work areas, rest rooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees, that are segregated by explicit directive or are in fact segregated on the basis of race, color, religion, sex, or national origin because of written or oral policies or employee custom. The term does not include separate or single-user rest rooms or necessary dressing or sleeping areas provided to assure privacy between the sexes.

(b) The Contractor agrees that it does not and will not maintain or provide for its employees any segregated facilities at any of its establishments, and that it does not and will not permit its employees to perform their services at any location under its control where segregated facilities are maintained. The Contractor agrees that a breach of this clause is a violation of the Equal Opportunity clause in this contract.

(c) The Contractor shall include this clause in every subcontract and purchase order that is subject to the Equal Opportunity clause of this contract.

(End of clause)

#### 52.222-26 EQUAL OPPORTUNITY (FEB 1999)

(a) If, during any 12-month period (including the 12 months preceding the award of this contract), the Contractor has been or is awarded nonexempt Federal contracts and/or subcontracts that have an aggregate value in excess of \$10,000, the Contractor shall comply with subparagraphs (b)(1) through (11) of this clause. Upon request, the Contractor shall provide information necessary to determine the applicability of this clause.

(b) During performing this contract, the Contractor agrees as follows:

(1) The Contractor shall not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. However, it shall not be a violation of this clause for the Contractor to extend a publicly announced preference in employment to Indians living on or near an Indian reservation, in connection with employment opportunities on or near an Indian reservation, as permitted by 41 CFR 60-1.5.

(2) The Contractor shall take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, religion, sex, or national origin. This shall include, but not be limited to, (i) employment, (ii) upgrading, (iii) demotion, (iv) transfer, (v) recruitment or recruitment advertising, (vi) layoff or termination, (vii) rates of pay or other forms of compensation, and (viii) selection for training, including apprenticeship.

(3) The Contractor shall post in conspicuous places available to employees and applicants for employment the notices to be provided by the Contracting Officer that explain this clause.

(4) The Contractor shall, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, or national origin.

(5) The Contractor shall send, to each labor union or representative of workers with which it has a collective bargaining agreement or other contract or understanding, the notice to be provided by the Contracting Officer advising the labor union or workers' representative of the Contractor's commitments under this clause, and post copies of the notice in conspicuous places available to employees and applicants for employment.

(6) The Contractor shall comply with Executive Order 11246, as amended, and the rules, regulations, and orders of the Secretary of Labor.

(7) The Contractor shall furnish to the contracting agency all information required by Executive Order 11246, as amended, and by the rules, regulations, and orders of the Secretary of Labor. The Contractor shall also file Standard Form 100 (EEO-1), or any successor form, as prescribed in 41 CFR part 60-1. Unless the Contractor has filed within the 12 months preceding the date of contract award, the Contractor shall, within 30 days after contract award, apply to either the regional Office of Federal Contract Compliance Programs (OFCCP) or the local office of the Equal Employment Opportunity Commission for the necessary forms.

(8) The Contractor shall permit access to its premises, during normal business hours, by the contracting agency or the OFCCP for the purpose of conducting on-site compliance evaluations and complaint investigations. The Contractor shall permit the Government to inspect and copy any books, accounts, records (including computerized records), and other material that may be relevant to the matter under investigation and pertinent to compliance with Executive Order 11246, as amended, and rules and regulations that implement the Executive Order.

(9) If the OFCCP determines that the Contractor is not in compliance with this clause or any rule, regulation, or order of the Secretary of Labor, this contract may be canceled, terminated, or suspended in whole or in part and the Contractor may be declared ineligible for further Government contracts, under the procedures authorized in Executive Order 11246, as amended. In addition, sanctions may be imposed and remedies invoked against the Contractor as provided in Executive Order 11246, as amended; in the rules, regulations, and orders of the Secretary of Labor; or as otherwise provided by law.

(10) The Contractor shall include the terms and conditions of subparagraphs (b)(1) through (11) of this clause in every subcontract or purchase order that is not exempted by the rules, regulations, or orders of the Secretary of Labor issued under Executive Order 11246, as amended, so that these terms and conditions will be binding upon each subcontractor or vendor.

(11) The Contractor shall take such action with respect to any subcontract or purchase order as the contracting officer may direct as a means of enforcing these terms and conditions, including sanctions for noncompliance; provided, that if the Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of any direction, the Contractor may request the United States to enter into the litigation to protect the interests of the United States.

(c) Notwithstanding any other clause in this contract, disputes relative to this clause will be governed by the procedures in 41 CFR 60-1.1.

#### 52.222-27 AFFIRMATIVE ACTION COMPLIANCE REQUIREMENTS FOR CONSTRUCTION (FEB 1999)

(a) Definitions. "Covered area," as used in this clause, means the geographical area described in the solicitation for this contract.

"Deputy Assistant Secretary," as used in this clause, means Deputy Assistant Secretary for Federal Contract Compliance, U.S. Department of Labor, or a designee.

"Employer's identification number," as used in this clause, means the Federal Social Security number used on the employer's quarterly federal tax return, U.S. Treasury Department Form 941.

"Minority," as used in this clause, means--

(1) American Indian or Alaskan Native (all persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community

identification).

(2) Asian and Pacific Islander (all persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands);

(3) Black (all persons having origins in any of the black African racial groups not of Hispanic origin); and

(4) Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race).

(b) If the Contractor, or a subcontractor at any tier, subcontracts a portion of the work involving any construction trade, each such subcontract in excess of \$10,000 shall include this clause and the Notice containing the goals for minority and female participation stated in the solicitation for this contract.

(c) If the Contractor is participating in a Hometown Plan (41 CFR 60-4) approved by the U.S. Department of Labor in a covered area, either individually or through an association, its affirmative action obligations on all work in the plan area (including goals) shall comply with the plan for those trades that have unions participating in the plan. Contractors must be able to demonstrate participation in, and compliance with, the provisions of the plan. Each Contractor or subcontractor participating in an approved plan is also required to comply with its obligations under the Equal Opportunity clause, and to make a good faith effort to achieve each goal under the plan in each trade in which it has employees. The overall good-faith performance by other Contractors or subcontractors toward a goal in an approved plan does not excuse any Contractor's or subcontractor's failure to make good-faith efforts to achieve the plan's goals.

(d) The Contractor shall implement the affirmative action procedures in subparagraphs (g)(1) through (16) of this clause. The goals stated in the solicitation for this contract are expressed as percentages of the total hours of employment and training of minority and female utilization that the Contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. If the Contractor performs construction work in a geographical area located outside of the covered area, it shall apply the goals established for the geographical area where that work is actually performed. The Contractor is expected to make substantially uniform progress toward its goals in each craft.

(e) Neither the terms and conditions of any collective bargaining agreement, nor the failure by a union with which the Contractor has a collective bargaining agreement, to refer minorities or women shall excuse the Contractor's obligations under this clause, Executive Order 11246, as amended, or the regulations thereunder.

(f) In order for the nonworking training hours of apprentices and trainees to be counted in meeting the goals, apprentices and trainees must be employed by the Contractor during the training period, and the Contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees must be trained pursuant to training programs approved by the U.S. Department of Labor.

(g) The Contractor shall take affirmative action to ensure equal employment opportunity. The evaluation of the Contractor's compliance with this clause shall be based upon its effort to achieve maximum results from its actions. The Contractor shall document these efforts fully and implement affirmative action steps at least as extensive as the following:

(1) Ensure a working environment free of harassment, intimidation, and coercion at all sites and in all facilities where the Contractor's employees are assigned to work. The Contractor, if possible, will assign two or more women to each construction project. The Contractor shall ensure that foremen, superintendents, and other onsite supervisory personnel are aware of and carry out the Contractor's obligation to maintain such a working environment, with specific attention to minority or female individuals working at these sites or facilities.

(2) Establish and maintain a current list of sources for minority and female recruitment. Provide written

notification to minority and female recruitment sources and community organizations when the Contractor or its unions have employment opportunities available, and maintain a record of the organizations' responses.

(3) Establish and maintain a current file of the names, addresses, and telephone numbers of each minority and female off-the-street applicant, referrals of minorities or females from unions, recruitment sources, or community organizations, and the action taken with respect to each individual. If an individual was sent to the union hiring hall for referral and not referred back to the Contractor by the union or, if referred back, not employed by the Contractor, this shall be documented in the file, along with whatever additional actions the Contractor may have taken.

(4) Immediately notify the Deputy Assistant Secretary when the union or unions with which the Contractor has a collective bargaining agreement has not referred back to the Contractor a minority or woman sent by the Contractor, or when the Contractor has other information that the union referral process has impeded the Contractor's efforts to meet its obligations.

(5) Develop on-the-job training opportunities and/or participate in training programs for the area that expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the Contractor's employment needs, especially those programs funded or approved by the Department of Labor. The Contractor shall provide notice of these programs to the sources compiled under subparagraph (g)(2) of this clause.

(6) Disseminate the Contractor's equal employment policy by--

(i) Providing notice of the policy to unions and to training, recruitment, and outreach programs, and requesting their cooperation in assisting the Contractor in meeting its contract obligations;

(ii) Including the policy in any policy manual and in collective bargaining agreements;

(iii) Publicizing the policy in the company newspaper, annual report, etc.;

(iv) Reviewing the policy with all management personnel and with all minority and female employees at least once a year; and

(v) Posting the policy on bulletin boards accessible to employees at each location where construction work is performed.

(7) Review, at least annually, the Contractor's equal employment policy and affirmative action obligations with all employees having responsibility for hiring, assignment, layoff, termination, or other employment decisions. Conduct review of this policy with all on-site supervisory personnel before initiating construction work at a job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and disposition of the subject matter.

(8) Disseminate the Contractor's equal employment policy externally by including it in any advertising in the news media, specifically including minority and female news media. Provide written notification to, and discuss this policy with, other Contractors and subcontractors with which the Contractor does or anticipates doing business.

(9) Direct recruitment efforts, both oral and written, to minority, female, and community organizations, to schools with minority and female students, and to minority and female recruitment and training organizations serving the Contractor's recruitment area and employment needs. Not later than 1 month before the date for acceptance of applications for apprenticeship or training by any recruitment source, send written notification to organizations such as the above, describing the openings, screening procedures, and tests to be used in the selection process.

(10) Encourage present minority and female employees to recruit minority persons and women. Where reasonable, provide after-school, summer, and vacation employment to minority and female youth both on the site and in other areas of the Contractor's workforce.

(11) Validate all tests and other selection requirements where required under 41 CFR 60-3.

(12) Conduct, at least annually, an inventory and evaluation at least of all minority and female personnel for promotional opportunities. Encourage these employees to seek or to prepare for, through appropriate training, etc., opportunities for promotion.

(13) Ensure that seniority practices, job classifications, work assignments, and other personnel practices do not have a discriminatory effect by continually monitoring all personnel and employment-related activities to ensure that the Contractor's obligations under this contract are being carried out.

(14) Ensure that all facilities and company activities are nonsegregated except that separate or single-user rest rooms and necessary dressing or sleeping areas shall be provided to assure privacy between the sexes.

(15) Maintain a record of solicitations for subcontracts for minority and female construction contractors and suppliers, including circulation of solicitations to minority and female contractor associations and other business associations.

(16) Conduct a review, at least annually, of all supervisors' adherence to and performance under the Contractor's equal employment policy and affirmative action obligations.

(h) The Contractor is encouraged to participate in voluntary associations that may assist in fulfilling one or more of the affirmative action obligations contained in subparagraphs (g)(1) through (16) of this clause. The efforts of a contractor association, joint contractor-union, contractor-community, or similar group of which the contractor is a member and participant may be asserted as fulfilling one or more of its obligations under subparagraphs (g)(1) through (16) of this clause, provided the Contractor--

(1) Actively participates in the group;

(2) Makes every effort to ensure that the group has a positive impact on the employment of minorities and women in the industry;

(3) Ensures that concrete benefits of the program are reflected in the Contractor's minority and female workforce participation;

(4) Makes a good-faith effort to meet its individual goals and timetables; and

(5) Can provide access to documentation that demonstrates the effectiveness of actions taken on behalf of the Contractor. The obligation to comply is the Contractor's, and failure of such a group to fulfill an obligation shall not be a defense for the Contractor's noncompliance.

(i) A single goal for minorities and a separate single goal for women shall be established. The Contractor is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female, and all women, both minority and nonminority. Consequently, the Contractor may be in violation of Executive Order 11246, as amended, if a particular group is employed in a substantially disparate manner.

(j) The Contractor shall not use goals or affirmative action standards to discriminate against any person because of race, color, religion, sex, or national origin.

(k) The Contractor shall not enter into any subcontract with any person or firm debarred from Government

contracts under Executive Order 11246, as amended.

(l) The Contractor shall carry out such sanctions and penalties for violation of this clause and of the Equal Opportunity clause, including suspension, termination, and cancellation of existing subcontracts, as may be imposed or ordered under Executive Order 11246, as amended, and its implementing regulations, by the OFCCP. Any failure to carry out these sanctions and penalties as ordered shall be a violation of this clause and Executive Order 11246, as amended.

(m) The Contractor in fulfilling its obligations under this clause shall implement affirmative action procedures at least as extensive as those prescribed in paragraph (g) of this clause, so as to achieve maximum results from its efforts to ensure equal employment opportunity. If the Contractor fails to comply with the requirements of Executive Order 11246, as amended, the implementing regulations, or this clause, the Deputy Assistant Secretary shall take action as prescribed in 41 CFR 60-4.8.

(n) The Contractor shall designate a responsible official to--

(1) Monitor all employment-related activity to ensure that the Contractor's equal employment policy is being carried out;

(2) Submit reports as may be required by the Government; and

(3) Keep records that shall at least include for each employee the name, address, telephone number, construction trade, union affiliation (if any), employee identification number, social security number, race, sex, status (e.g., mechanic, apprentice, trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, separate records are not required to be maintained.

Nothing contained herein shall be construed as a limitation upon the application of other laws that establish different standards of compliance or upon the requirements for the hiring of local or other area residents (e.g., those under the Public Works Employment Act of 1977 and the Community Development Block Grant Program).

#### 52.222-29 NOTIFICATION OF VISA DENIAL (FEB 1999)

It is a violation of Executive Order 11246, as amended, for a Contractor to refuse to employ any applicant or not to assign any person hired in the United States, on the basis that the individual's race, color, religion, sex, or national origin is not compatible with the policies of the country where the work is to be performed or for whom the work will be performed (41 CFR 60-1.10). The Contractor agrees to notify the U.S. Department of State, Assistant Secretary, Bureau of Political-Military Affairs (PM), 2201 C Street NW, Room 7325, Washington, DC 20520, and the U.S. Department of Labor, Deputy Assistant Secretary for Federal Contract Compliance, when it has knowledge of any employee or potential employee being denied an entry visa to a country in which the Contractor is required to perform this contract, and it believes the denial is attributable to the race, color, religion, sex, or national origin of the employee or potential employee.

(End of clause)

#### 52.222-35 AFFIRMATIVE ACTION FOR DISABLED VETERANS AND VETERANS OF THE VIETNAM ERA (APR 1998)

(a ) Definitions. As used in this clause--

All employment openings includes all positions except executive and top management, those positions that will be filled from within the contractor's organization, and positions lasting 3 days or less. This term includes full-time employment, temporary employment of more than 3 days' duration, and part-time employment.

Appropriate office of the State employment service system means the local office of the Federal-State national system of public employment offices with assigned responsibility to serve the area where the employment opening is to be filled, including the District of Columbia, Guam, the Commonwealth of Puerto Rico, and the Virgin Islands.

Positions that will be filled from within the Contractor's organization means employment openings for which no consideration will be given to persons outside the Contractor's organization (including any affiliates, subsidiaries, and parent companies) and includes any openings that the Contractor proposes to fill from regularly established "recall" lists. The exception does not apply to a particular opening once an employer decides to consider applicants outside of its organization.

Veteran of the Vietnam era means a person who--

(1) Served on active duty for a period of more than 180 days, any part of which occurred between August 5, 1964, and May 7, 1975, and was discharged or released therefrom with other than a dishonorable discharge; or

(2) Was discharged or released from active duty for a service-connected disability if any part of such active duty was performed between August 5, 1964, and May 7, 1975.

(b) General. (1) Regarding any position for which the employee or applicant for employment is qualified, the Contractor shall not discriminate against the individual because the individual is a disabled veteran or a veteran of the Vietnam era. The Contractor agrees to take affirmative action to employ, advance in employment, and otherwise treat qualified disabled veterans and veterans of the Vietnam era without discrimination based upon their disability or veterans' status in all employment practices such as--

(i) Employment;

(ii) Upgrading;

(iii) Demotion or transfer;

(iv) Recruitment;

(v) Advertising;

(vi) Layoff or termination;

(vii) Rates of pay or other forms of compensation; and

(viii) Selection for training, including apprenticeship.

(2) The Contractor agrees to comply with the rules, regulations, and relevant orders of the Secretary of Labor (Secretary) issued under the Vietnam Era Veterans' Readjustment Assistance Act of 1972 (the Act), as amended.

(c) Listing openings. (1) The Contractor agrees to list all employment openings existing at contract award or occurring during contract performance, at an appropriate office of the State employment service system in the locality where the opening occurs. These openings include those occurring at any Contractor facility, including one not connected with performing this contract. An independent corporate affiliate is exempt from this requirement.

(2) State and local government agencies holding Federal contracts of \$10,000 or more shall also list all their employment openings with the appropriate office of the State employment service.

(3) The listing of employment openings with the State employment service system is required at least concurrently with using any other recruitment source or effort and involves the obligations of placing a bona fide job order, including accepting referrals of veterans and nonveterans. This listing does not require hiring any particular job applicant or hiring from any particular group of job applicants and is not intended to relieve the Contractor from any requirements of Executive orders or regulations concerning nondiscrimination in employment.

(4) Whenever the Contractor becomes contractually bound to the listing terms of this clause, it shall advise the State employment service system, in each State where it has establishments, of the name and location of each hiring location in the State. As long as the Contractor is contractually bound to these terms and has so advised the State system, it need not advise the State system of subsequent contracts. The Contractor may advise the State system when it is no longer bound by this contract clause.

(d) Applicability. This clause does not apply to the listing of employment openings that occur and are filled outside the 50 States, the District of Columbia, the Commonwealth of Puerto Rico, Guam, and the Virgin Islands.

(e) Postings. (1) The Contractor agrees to post employment notices stating (i) the Contractor's obligation under the law to take affirmative action to employ and advance in employment qualified disabled veterans and veterans of the Vietnam era, and (ii) the rights of applicants and employees.

(2) These notices shall be posted in conspicuous places that are available to employees and applicants for employment. They shall be in a form prescribed by the Deputy Assistant Secretary for Federal Contract Compliance Programs, Department of Labor (Deputy Assistant Secretary), and provided by or through the Contracting Officer.

(3) The Contractor shall notify each labor union or representative of workers with which it has a collective bargaining agreement or other contract understanding, that the Contractor is bound by the terms of the Act, and is committed to take affirmative action to employ, and advance in employment, qualified disabled veterans and veterans of the Vietnam Era.

(f) Noncompliance. If the Contractor does not comply with the requirements of this clause, appropriate actions may be taken under the rules, regulations, and relevant orders of the Secretary issued pursuant to the Act.

(g) Subcontracts. The Contractor shall include the terms of this clause in every subcontract or purchase order of \$10,000 or more unless exempted by rules, regulations, or orders of the Secretary. The Contractor shall act as specified by the Deputy Assistant Secretary to enforce the terms, including action for noncompliance.

(End of clause)

#### 52.222-36 AFFIRMATIVE ACTION FOR WORKERS WITH DISABILITIES (JUN 1998)

(a) General. (1) Regarding any position for which the employee or applicant for employment is qualified, the Contractor shall not discriminate against any employee or applicant because of physical or mental disability. The Contractor agrees to take affirmative action to employ, advance in employment, and otherwise treat qualified individuals with disabilities without discrimination based upon their physical or mental disability in all employment practices such as--

(i) Recruitment, advertising, and job application procedures;

(ii) Hiring, upgrading, promotion, award of tenure, demotion, transfer, layoff, termination, right of return from layoff, and rehiring;

(iii) Rates of pay or any other form of compensation and changes in compensation;

(iv) Job assignments, job classifications, organizational structures, position descriptions, lines of progression, and seniority lists;

(v) Leaves of absence, sick leave, or any other leave;

(vi) Fringe benefits available by virtue of employment, whether or not administered by the Contractor;

(vii) Selection and financial support for training, including apprenticeships, professional meetings, conferences, and other related activities, and selection for leaves of absence to pursue training;

(viii) Activities sponsored by the Contractor, including social or recreational programs; and

(ix) Any other term, condition, or privilege of employment.

(2) The Contractor agrees to comply with the rules, regulations, and relevant orders of the Secretary of Labor (Secretary) issued under the Rehabilitation Act of 1973 (29 U.S.C. 793) (the Act), as amended.

(b) Postings. (1) The Contractor agrees to post employment notices stating--

(i) The Contractor's obligation under the law to take affirmative action to employ and advance in employment qualified individuals with disabilities; and

(ii) The rights of applicants and employees.

(2) These notices shall be posted in conspicuous places that are available to employees and applicants for employment. The Contractor shall ensure that applicants and employees with disabilities are informed of the contents of the notice (e.g., the Contractor may have the notice read to a visually disabled individual, or may lower the posted notice so that it might be read by a person in a wheelchair). The notices shall be in a form prescribed by the Deputy Assistant Secretary for Federal Contract Compliance of the U.S. Department of Labor (Deputy Assistant Secretary) and shall be provided by or through the Contracting Officer.

(3) The Contractor shall notify each labor union or representative of workers with which it has a collective bargaining agreement or other contract understanding, that the Contractor is bound by the terms of Section 503 of the Act and is committed to take affirmative action to employ, and advance in employment, qualified individuals with physical or mental disabilities.

(c) Noncompliance. If the Contractor does not comply with the requirements of this clause, appropriate actions may be taken under the rules, regulations, and relevant orders of the Secretary issued pursuant to the Act.

(d) Subcontracts. The Contractor shall include the terms of this clause in every subcontract or purchase order in excess of \$10,000 unless exempted by rules, regulations, or orders of the Secretary. The Contractor shall act as specified by the Deputy Assistant Secretary to enforce the terms, including action for noncompliance.

(End of clause)

52.222-37 EMPLOYMENT REPORTS ON DISABLED VETERANS AND VETERANS OF THE VIETNAM ERA (JAN 1999)

(a) Unless the Contractor is a State or local government agency, the Contractor shall report at least annually, as required by the Secretary of Labor, on--

(1) The number of disabled veterans and the number of veterans of the Vietnam era in the workforce of the contractor by job category and hiring location; and

(2) The total number of new employees hired during the period covered by the report, and of that total, the number of disabled veterans, and the number of veterans of the Vietnam era.

(b) The above items shall be reported by completing the form entitled "Federal Contractor Veterans' Employment Report VETS-100."

(c) Reports shall be submitted no later than September 30 of each year beginning September 30, 1988.

(d) The employment activity report required by paragraph (a)(2) of this clause shall reflect total hires during the most recent 12-month period as of the ending date selected for the employment profile report required by paragraph (a)(1) of this clause. Contractors may select an ending date: (1) As of the end of any pay period during the period January through March 1st of the year the report is due, or (2) as of December 31, if the contractor has previous written approval from the Equal Employment Opportunity Commission to do so for purposes of submitting the Employer Information Report EEO-1 (Standard Form 100).

(e) The count of veterans reported according to paragraph (a) of this clause shall be based on voluntary disclosure. Each Contractor subject to the reporting requirements at 38 U.S.C. 4212 shall invite all disabled veterans and veterans of the Vietnam era who wish to benefit under the affirmative action program at 38 U.S.C. 4212 to identify themselves to the Contractor. The invitation shall state that the information is voluntarily provided; that the information will be kept confidential; that disclosure or refusal to provide the information will not subject the applicant or employee to any adverse treatment; and that the information will be used only in accordance with the regulations promulgated under 38 U.S.C. 4212.

(f) Subcontracts. The Contractor shall include the terms of this clause in every subcontract or purchase order of \$10,000 or more unless exempted by rules, regulations, or orders of the Secretary.

(End of clause)

52.223-3 HAZARDOUS MATERIAL IDENTIFICATION AND MATERIAL SAFETY DATA (JAN 1997)

(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 (If none, insert "None")	Identification No.
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_____	_____
_____	_____

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(c) 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, 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.

(End of clause)

#### 52.223-5 POLLUTION PREVENTION AND RIGHT-TO-KNOW INFORMATION (APR 1998)

(a) Executive Order 12856 of August 3, 1993, requires Federal facilities to comply with the provisions of the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA)(42 U.S.C. 11001-11050) and the Pollution Prevention Act of 1990 (PPA)(42 U.S.C. 13101-13109).

(b) The Contractor shall provide all information needed by the Federal facility to comply with the emergency planning reporting requirements of Section 302 of EPCRA; the emergency notice requirements of Section 304 of EPCRA; the list of Material Safety Data Sheets required by Section 311 of

EPCRA; the emergency and hazardous chemical inventory forms of Section 312 of EPCRA; the toxic chemical release inventory of Section 313 of EPCRA, which includes the reduction and recycling information required by Section 6607 of PPA; and the toxic chemical reduction goals requirements of Section 3-302 of Executive Order 12856.

252.223-7001 HAZARD WARNING LABELS (DEC 1991)

(a) "Hazardous material," as used in this clause, is defined in the Hazardous Material Identification and Material Safety Data clause of this contract.

(b) The Contractor shall label the item package (unit container) of any hazardous material to be delivered under this contract in accordance with the Hazard Communication Standard (29 CFR 1910.1200 et seq). The Standard requires that the hazard warning label conform to the requirements of the standard unless the material is otherwise subject to the labeling requirements of one of the following statutes:

- (1) Federal Insecticide, Fungicide and Rodenticide Act;
- (2) Federal Food, Drug and Cosmetics Act;
- (3) Consumer Product Safety Act;
- (4) Federal Hazardous Substances Act; or
- (5) Federal Alcohol Administration Act.

(c) The Offeror shall list which hazardous material listed in the Hazardous Material Identification and Material Safety Data clause of this contract will be labeled in accordance with one of the Acts in paragraphs (b)(1) through (5) of this clause instead of the Hazard Communication Standard. Any hazardous material not listed will be interpreted to mean that a label is required in accordance with the Hazard Communication Standard.

MATERIAL (If None, Insert "None.")

ACT

\_\_\_\_\_

\_\_\_\_\_

(d) The apparently successful Offeror agrees to submit, before award, a copy of the hazard warning label for all hazardous materials not listed in paragraph (c) of this clause. The Offeror shall submit the label with the Material Safety Data Sheet being furnished under the Hazardous Material Identification and Material Safety Data clause of this contract.

(e) The Contractor shall also comply with MIL-STD-129, Marking for Shipment and Storage (including revisions adopted during the term of this contract).

(End of clause)

252.223-7006 PROHIBITION ON STORAGE AND DISPOSAL OF TOXIC AND HAZARDOUS MATERIALS (APR 1993)

(a) "Definitions".

As used in this clause --

(1) "Storage" means a non-transitory, semi-permanent or permanent holding, placement, or leaving of material. It does not include a temporary accumulation of a limited quantity of a material used in or a

waste generated or resulting from authorized activities, such as servicing, maintenance, or repair of Department of Defense (DoD) items, equipment, or facilities.

(2) "Toxic or hazardous materials" means:

(i) Materials referred to in section 101(14) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 (42 U.S.C. 9601(14)) and materials designated under section 102 of CERCLA (42 U.S.C. 9602) (40 CFR part 302);

(ii) Materials that are of an explosive, flammable, or pyrotechnic nature; or

(iii) Materials otherwise identified by the Secretary of Defense as specified in DoD regulations.

(b) In accordance with 10 U.S.C. 2692, the Contractor is prohibited from storing or disposing of non-DoD-owned toxic or hazardous materials on a DoD installation, except to the extent authorized by a statutory exception to 10 U.S.C. 2692 or as authorized by the Secretary of Defense or his designee.

(End of clause)

#### 52.225-11 BUY AMERICAN ACT--BALANCE OF PAYMENTS PROGRAM--CONSTRUCTION MATERIALS UNDER TRADE AGREEMENTS (FEB 2000)

(a) Definitions. As used in this clause--

Component means any article, material, or supply incorporated directly into construction materials.

Construction material means an article, material, or supply brought to the construction site by the Contractor or subcontractor for incorporation into the building or work. The term also includes an item brought to the site preassembled from articles, materials, or supplies. However, emergency life safety systems, such as emergency lighting, fire alarm, and audio evacuation systems, that are discrete systems incorporated into a public building or work and that are produced as complete systems, are evaluated as a single and distinct construction material regardless of when or how the individual parts or components of those systems are delivered to the construction site. Materials purchased directly by the Government are supplies, not construction material.

Cost of components means--

(1) For components purchased by the Contractor, the acquisition cost, including transportation costs to the place of incorporation into the end product (whether or not such costs are paid to a domestic firm), and any applicable duty (whether or not a duty-free entry certificate is issued); or

(2) For components manufactured by the Contractor, all costs associated with the manufacture of the component, including transportation costs as described in paragraph (1) of this definition, plus allocable overhead costs, but excluding profit. Cost of components does not include any costs associated with the manufacture of the end product.

Designated country means any of the following countries: Aruba, Austria, Bangladesh, Belgium, Benin, Bhutan, Botswana, Burkina Faso, Burundi, Canada, Cape Verde, Central African Republic, Chad, Comoros, Denmark.

Djibouti, Equatorial Guinea, Finland, France, Gambia, Germany, Greece, Guinea, Guinea-Bissau, Haiti, Hong Kong, Ireland, Israel, Italy, Japan.

Kiribati, Korea, Republic of, Lesotho, Liechtenstein, Luxembourg, Malawi, Maldives, Mali, Mozambique, Nepal, Netherlands, Niger, Norway, Portugal, Rwanda.

Sao Tome and Principe, Sierra Leone, Singapore, Somalia, Spain, Sweden, Switzerland, Tanzania U.R., Togo, Tuvalu, Uganda, United Kingdom, Vanuatu, Western Samoa, Yemen.

Designated country construction material means a construction material that--

- (1) Is wholly the growth, product, or manufacture of a designated country; or
- (2) In the case of a construction material that consists in whole or in part of materials from another country, has been substantially transformed in a designated country into a new and different construction material distinct from the materials from which it was transformed.

Domestic construction material means--

- (1) An unmanufactured construction material mined or produced in the United States; or
- (2) A construction material manufactured in the United States, if the cost of its components mined, produced, or manufactured in the United States exceeds 50 percent of the cost of all its components. Components of foreign origin of the same class or kind for which nonavailability determinations have been made are treated as domestic.

Foreign construction material means a construction material other than a domestic construction material.

North American Free Trade Agreement country means Canada or Mexico.

North American Free Trade Agreement country construction material means a construction material that--

- (1) Is wholly the growth, product, or manufacture of a North American Free Trade Agreement (NAFTA) country; or
- (2) In the case of a construction material that consists in whole or in part of materials from another country, has been substantially transformed in a NAFTA country into a new and different construction material distinct from the materials from which it was transformed.

United States means the 50 States and the District of Columbia, U.S. territories and possessions, Puerto Rico, the Northern Mariana Islands, and any other place subject to U.S. jurisdiction, but does not include leased bases.

(b) Construction materials. (1) This clause implements the Buy American Act (41 U.S.C. 10a-10d) and the Balance of Payments Program by providing a preference for domestic construction material. In addition, the Contracting Officer has determined that the Trade Agreements Act and the North American Free Trade Agreement (NAFTA) apply to this acquisition. Therefore, the Buy American Act and Balance of Payments Program restrictions are waived for designated country and NAFTA country construction materials.

(2) The Contractor shall use only domestic, designated country, or NAFTA country construction material in performing this contract, except as provided in paragraphs (b)(3) and (b)(4) of this clause.

(3) The requirement in paragraph (b)(2) of this clause does not apply to the construction materials or components listed by the Government as follows: (i) Articles determined to be nonavailable listed at FAR 25.104 or DFARS 225.104. (ii) Construction Materials listed in Clause K-24, Section 00800 of this solicitation.

(4) The Contracting Officer may add other foreign construction material to the list in paragraph (b)(3) of this clause if the Government determines that--

(i) The cost of domestic construction material would be unreasonable. The cost of a particular domestic construction material subject to the restrictions of the Buy American Act is unreasonable when the cost of such material exceeds the cost of foreign material by more than 6 percent. For determination of unreasonable cost under the Balance of Payments Program, the Contracting Officer will use a factor of 50 percent;

(ii) The application of the restriction of the Buy American Act or Balance of Payments Program to a particular construction material would be impracticable or inconsistent with the public interest; or

(iii) The construction material is not mined, produced, or manufactured in the United States in sufficient and reasonably available commercial quantities of a satisfactory quality.

(c) Request for determination of inapplicability of the Buy American Act or Balance of Payments Program.

(1)(i) Any Contractor request to use foreign construction material in accordance with paragraph (b)(4) of this clause shall include adequate information for Government evaluation of the request, including--

(A) A description of the foreign and domestic construction materials;

(B) Unit of measure;

(C) Quantity;

(D) Price;

(E) Time of delivery or availability;

(F) Location of the construction project;

(G) Name and address of the proposed supplier; and

(H) A detailed justification of the reason for use of foreign construction materials cited in accordance with paragraph (b)(3) of this clause.

(ii) A request based on unreasonable cost shall include a reasonable survey of the market and a completed price comparison table in the format in paragraph (d) of this clause.

(iii) The price of construction material shall include all delivery costs to the construction site and any applicable duty (whether or not a duty-free certificate may be issued).

(iv) Any Contractor request for a determination submitted after contract award shall explain why the Contractor could not reasonably foresee the need for such determination and could not have requested the determination before contract award. If the Contractor does not submit a satisfactory explanation, the Contracting Officer need not make a determination.

(2) If the Government determines after contract award that an exception to the Buy American Act or Balance of Payments Program applies and the Contracting Officer and the Contractor negotiate adequate consideration, the Contracting Officer will modify the contract to allow use of the foreign construction material. However, when the basis for the exception is the unreasonable price of a domestic construction material, adequate consideration is not less than the differential established in paragraph (b)(4)(i) of this clause.

(3) Unless the Government determines that an exception to the Buy American Act or Balance of Payments Program applies, use of foreign construction material is noncompliant with the Buy American Act or Balance of Payments Program.

(d) Data. To permit evaluation of requests under paragraph (c) of this clause based on unreasonable cost, the Contractor shall include the following information and any applicable supporting data based on the survey of suppliers:

Foreign and Domestic Construction Materials Price Comparison

Construction material description	Unit of measure	Quantity	Price (dollars) \1\
Item 1:			
Foreign construction material....			
Domestic construction material...			
Item 2:			
Foreign construction material....			
Domestic construction material...			

\1\ Include all delivery costs to the construction site and any applicable duty (whether or not a duty-free entry certificate is issued).

List name, address, telephone number, and contact for suppliers surveyed. Attach copy of response; if oral, attach summary.

Include other applicable supporting information.

(End of clause)

52.225-13 RESTRICTIONS ON CERTAIN FOREIGN PURCHASES (JUL 2000)

(a) The Contractor shall not acquire, for use in the performance of this contract, any supplies or services originating from sources within, or that were located in or transported from or through, countries whose products are banned from importation into the United States under regulations of the Office of Foreign Assets Control, Department of the Treasury. Those countries are Cuba, Iran, Iraq, Libya, North Korea, Sudan, the territory of Afghanistan controlled by the Taliban, and Serbia (excluding the territory of Kosovo).

(b) The Contractor shall not acquire for use in the performance of this contract any supplies or services from entities controlled by the government of Iraq.

(c) The Contractor shall insert this clause, including this paragraph (c), in all subcontracts.

(End of clause)

\*252.225-7005 IDENTIFICATION OF EXPENDITURES IN THE UNITED STATES (DEC 1991)

(a) On each invoice, voucher, or other request for payment under this contract, the Contractor shall identify that part of the requested payment which represents estimated expenditures in the United States. The identification—

(1) May be expressed either as dollar amounts or as percentages of the total amount of the request for payment.

(2) Should be based on reasonable estimates.

(3) Shall consist of stating the full amount of the payment requested, subdivided into the following categories:

(i) U.S. products--expenditures for material and equipment manufactured or produced in the United States, excluding transportation;

(ii) U.S. services--expenditures for services performed in the United States, including charges for overhead, other indirect costs, and profit;

(iii) Transportation on U.S. carriers--expenditures for transportation furnished by U.S. flag, ocean, surface, and air carriers; and

(iv) Expenditures not identified under paragraphs (a)(1), (2), and (3).

(b) If this contract is principally for supplies or if the Contractor is not an incorporated concern incorporated in the United States, or an unincorporated concern having its principal place of business in the United States, the amounts identified under paragraphs (a)(3)(i), (ii), and (iii) will be limited to payments made pursuant to the requirements either of the United States Products and Services clause, if any, or of any other specific provision of this contract that obligates the Contractor to acquire certain materials, equipment, transportation, or services from U.S. sources.

(c) Nothing in this clause requires the establishment or maintenance of detailed accounting records or gives the U.S. Government any right to audit the Contractor's books or records.

(End of clause) \*

252.225-7031 SECONDARY ARAB BOYCOTT OF ISRAEL (JUN 1992)

(a) Definitions. As used in this clause--

(1) "Foreign person" means any person other than a United States person as defined in Section 16(2) of the Export Administration Act of 1979 (50 U.S.C. App. Sec 2415).

(2) "United States person" is defined in Section 16(2) of the Export Administration Act of 1979 and means any United States resident or national (other than an individual resident outside the United States and employed by other than a United States person), any domestic concern (including any permanent domestic establishment of any foreign concern), and any foreign subsidiary or affiliate (including any permanent foreign establishment) of any domestic concern which is controlled in fact by such domestic concerns, as determined under regulations of the President.

(b) Certification. By submitting this offer, the Offeror, if a foreign person, company or entity, certifies that it--

(1) Does not comply with the Secondary Arab Boycott of Israel; and

(2) Is not taking or knowingly agreeing to take any action, with respect to the Secondary Boycott of Israel by Arab countries, which 50 U.S.C. App. Sec 2407(a) prohibits a United States person from taking.

(End of clause)

\*252.225-7042 AUTHORIZATION TO PERFORM (JUN 1997)

The Contractor represents that it has been duly authorized to operate and to do business in the country or countries in which this contract is to be performed. The Contractor also represents that it will fully comply with all laws, decrees, labor standards, and regulations of such country or countries, during the performance of this contract.

(End of clause) \*

\*252.225-7043 ANTITERRORISM/FORCE PROTECTION POLICY FOR DEFENSE CONTRACTORS OUTSIDE THE UNITED STATES (JUN 1998)

(a) Except as provided in paragraph (b) of this clause, the Contractor and its subcontractors, if performing or traveling outside the United States under this contract, shall<sup>3/4</sup>

(1) Affiliate with the Overseas Security Advisory Council, if the Contractor or subcontractor is a U.S. entity;

(2) Ensure that Contractor and subcontractor personnel who are U.S. nationals and are in-country on a non-transitory basis, register with the U.S. Embassy, and that Contractor and subcontractor personnel who are third country nationals comply with any security related requirements of the Embassy of their nationality;

(3) Provide, to Contractor and subcontractor personnel, antiterrorism/force protection awareness information commensurate with that which the Department of Defense (DoD) provides to its military and

civilian personnel and their families, to the extent such information can be made available prior to travel outside the United States; and

(4) Obtain and comply with the most current antiterrorism/force protection guidance for Contractor and subcontractor personnel.

(b) The requirements of this clause do not apply to any subcontractor that is

(1) A foreign government;

(2) A representative of a foreign government; or

(3) A foreign corporation wholly owned by a foreign government.

(c) Information and guidance pertaining to DoD antiterrorism/force protection can be obtained from (Contracting Officer to insert applicable information cited in 225.7401).

(End of clause) \*

#### 252.227-7033 RIGHTS IN SHOP DRAWINGS (APR 1966)

(a) Shop drawings for construction means drawings, submitted to the Government by the Construction Contractor, subcontractor or any lower-tier subcontractor pursuant to a construction contract, showing in detail (i) the proposed fabrication and assembly of structural elements and (ii) the installation (i.e., form, fit, and attachment details) of materials or equipment. The Government may duplicate, use, and disclose in any manner and for any purpose shop drawings delivered under this contract.

(b) This clause, including this paragraph (b), shall be included in all subcontracts hereunder at any tier.

#### 52.228-2 ADDITIONAL BOND SECURITY (OCT 1997)

The Contractor shall promptly furnish additional security required to protect the Government and persons supplying labor or materials under this contract if--

(a) Any surety upon any bond, or issuing financial institution for other security, furnished with this contract becomes unacceptable to the Government.

(b) Any surety fails to furnish reports on its financial condition as required by the Government;

(c) The contract price is increased so that the penal sum of any bond becomes inadequate in the opinion of the Contracting Officer; or

(d) An irrevocable letter of credit (ILC) used as security will expire before the end of the period of required security. If the Contractor does not furnish an acceptable extension or replacement ILC, or other acceptable substitute, at least 30 days before an ILC's scheduled expiration, the Contracting officer has the right to immediately draw on the ILC.

#### 52.228-5 INSURANCE--WORK ON A GOVERNMENT INSTALLATION (JAN 1997)

(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 notify 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.

(End of clause)

#### 52.228-11 PLEDGES OF ASSETS (FEB 1992)

(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 securities 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 owners; 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.

(End of clause)

#### 52.228-14 IRREVOCABLE LETTER OF CREDIT (DEC 1999)

(a) "Irrevocable letter of credit" (ILC), as used in this clause, means a written commitment by a federally insured financial institution to pay all or part of a stated amount of money, until the expiration date of the letter, upon presentation by the Government (the beneficiary) of a written demand therefor. Neither the financial institution nor the offeror/Contractor can revoke or condition the letter of credit.

(b) If the offeror intends to use an ILC in lieu of a bid bond, or to secure other types of bonds such as performance and payment bonds, the letter of credit and letter of confirmation formats in paragraphs (e) and (f) of this clause shall be used.

(c) The letter of credit shall be irrevocable, shall require presentation of no document other than a written demand and the ILC (including confirming letter, if any), shall be issued/confirmed by an acceptable federally insured financial institution as provided in paragraph (d) of this clause, and--

(1) If used as a bid guarantee, the ILC shall expire no earlier than 60 days after the close of the bid acceptance period;

(2) If used as an alternative to corporate or individual sureties as security for a performance or payment bond, the offeror/Contractor may submit an ILC with an initial expiration date estimated to cover the entire period for which financial security is required or may submit an ILC with an initial expiration date that is a minimum period of one year from the date of issuance. The ILC shall provide that, unless the issuer provides the beneficiary written notice of non-renewal at least 60 days in advance of the current expiration date, the ILC is automatically extended without amendment for one year from the expiration date, or any future expiration date, until the period of required coverage is completed and the Contracting Officer provides the financial institution with a written statement waiving the right to payment. The period of required coverage shall be:

(i) For contracts subject to the Miller Act, the later of--

(A) One year following the expected date of final payment;

(B) For performance bonds only, until completion of any warranty period; or

(C) For payment bonds only, until resolution of all claims filed against the payment bond during the one-year period following final payment.

(ii) For contracts not subject to the Miller Act, the later of--

(A) 90 days following final payment; or

(B) For performance bonds only, until completion of any warranty period.

(d) Only federally insured financial institutions rated investment grade or higher shall issue or confirm the ILC. The offeror/Contractor shall provide the Contracting Officer a credit rating that indicates the financial institution has the required rating(s) as of the date of issuance of the ILC. Unless the financial institution issuing the ILC had letter of credit business of less than \$25 million in the past year, ILCs over \$5 million must be confirmed by another acceptable financial institution that had letter of credit business of less than \$25 million in the past year.

(e) The following format shall be used by the issuing financial institution to create an ILC:

\_\_\_\_\_

[Issuing Financial Institution's Letterhead or Name and Address]

Issue Date \_\_\_\_\_

IRREVOCABLE LETTER OF CREDIT NO. \_\_\_\_\_

Account party's name \_\_\_\_\_

Account party's address \_\_\_\_\_

For Solicitation No. \_\_\_\_\_(for reference only)

TO: [U.S. Government agency]

[U.S. Government agency's address]

1. We hereby establish this irrevocable and transferable Letter of Credit in your favor for one or more

drawings up to United States \$\_\_\_\_\_. This Letter of Credit is payable at [issuing financial institution's and, if any, confirming financial institution's] office at [issuing financial institution's address and, if any, confirming financial institution's address] and expires with our close of business on \_\_\_\_\_, or any automatically extended expiration date.

2. We hereby undertake to honor your or the transferee's sight draft(s) drawn on the issuing or, if any, the confirming financial institution, for all or any part of this credit if presented with this Letter of Credit and confirmation, if any, at the office specified in paragraph 1 of this Letter of Credit on or before the expiration date or any automatically extended expiration date.

3. [This paragraph is omitted if used as a bid guarantee, and subsequent paragraphs are renumbered.] It is a condition of this Letter of Credit that it is deemed to be automatically extended without amendment for one year from the expiration date hereof, or any future expiration date, unless at least 60 days prior to any expiration date, we notify you or the transferee by registered mail, or other receipted means of delivery, that we elect not to consider this Letter of Credit renewed for any such additional period. At the time we notify you, we also agree to notify the account party (and confirming financial institution, if any) by the same means of delivery.

4. This Letter of Credit is transferable. Transfers and assignments of proceeds are to be effected without charge to either the beneficiary or the transferee/assignee of proceeds. Such transfer or assignment shall be only at the written direction of the Government (the beneficiary) in a form satisfactory to the issuing financial institution and the confirming financial institution, if any.

5. This Letter of Credit is subject to the Uniform Customs and Practice (UCP) for Documentary Credits, 1993 Revision, International Chamber of Commerce Publication No. 500, and to the extent not inconsistent therewith, to the laws of \_\_\_\_\_ [state of confirming financial institution, if any, otherwise state of issuing financial institution].

6. If this credit expires during an interruption of business of this financial institution as described in Article 17 of the UCP, the financial institution specifically agrees to effect payment if this credit is drawn against within 30 days after the resumption of our business.

Sincerely,

\_\_\_\_\_

[Issuing financial institution]

(f) The following format shall be used by the financial institution to confirm an ILC:

\_\_\_\_\_  
[Confirming Financial Institution's Letterhead or Name and Address]

(Date) \_\_\_\_\_

Our Letter of Credit Advice Number \_\_\_\_\_

Beneficiary: \_\_\_\_\_ [U.S. Government agency]

Issuing Financial Institution: \_\_\_\_\_

Issuing Financial Institution's LC No.: \_\_\_\_\_

Gentlemen:

1. We hereby confirm the above indicated Letter of Credit, the original of which is attached, issued by

\_\_\_\_\_ [name of issuing financial institution] for drawings of up to United States dollars  
\_\_\_\_\_/U.S. \$\_\_\_\_\_ and expiring with our close of business on \_\_\_\_\_ [the expiration  
date], or any automatically extended expiration date.

2. Draft(s) drawn under the Letter of Credit and this Confirmation are payable at our office located at  
\_\_\_\_\_.

3. We hereby undertake to honor sight draft(s) drawn under and presented with the Letter of Credit and  
this Confirmation at our offices as specified herein.

4. [This paragraph is omitted if used as a bid guarantee, and subsequent paragraphs are renumbered.] It  
is a condition of this confirmation that it be deemed automatically extended without amendment for one  
year from the expiration date hereof, or any automatically extended expiration date, unless:

(a) At least 60 days prior to any such expiration date, we shall notify the Contracting Officer, or the  
transferee and the issuing financial institution, by registered mail or other receipted means of delivery,  
that we elect not to consider this confirmation extended for any such additional period; or

(b) The issuing financial institution shall have exercised its right to notify you or the transferee, the  
account party, and ourselves, of its election not to extend the expiration date of the Letter of Credit.

5. This confirmation is subject to the Uniform Customs and Practice (UCP) for Documentary Credits, 1993  
Revision, International Chamber of Commerce Publication No. 500, and to the extent not inconsistent  
therewith, to the laws of \_\_\_\_\_ [state of confirming financial institution].

6. If this confirmation expires during an interruption of business of this financial institution as described in  
Article 17 of the UCP, we specifically agree to effect payment if this credit is drawn against within 30 days  
after the resumption of our business.

Sincerely,

\_\_\_\_\_

[Confirming financial institution]

(g) The following format shall be used by the Contracting Officer for a sight draft to draw on the Letter of  
Credit:

SIGHT DRAFT

\_\_\_\_\_

[City, State]

(Date) \_\_\_\_\_

[Name and address of financial institution]

Pay to the order of \_\_\_\_\_ [Beneficiary Agency] \_\_\_\_\_ the sum of United States  
\$\_\_\_\_\_. This draft is drawn under Irrevocable Letter of Credit No.

\_\_\_\_\_.

\_\_\_\_\_

[Beneficiary Agency]

By: \_\_\_\_\_

(End of clause)

52.228-15 PERFORMANCE AND PAYMENT BONDS--CONSTRUCTION (JULY 2000)

(a) *Definitions.* As used in this clause--

"Original contract price" means the award price of the contract; or, for requirements contracts, the price payable for the estimated total quantity; or, for indefinite-quantity contracts, the price payable for the specified minimum quantity. Original contract price does not include the price of any options, except those options exercised at the time of contract award.

(b) *Amount of required bonds.* Unless the resulting contract price is \$100,000 or less, the successful offeror shall furnish performance and payment bonds to the Contracting Officer as follows:

(1) *Performance bonds (Standard Form 25).* The penal amount of performance bonds at the time of contract award shall be 100 percent of the original contract price.

(2) *Payment Bonds (Standard Form 25-A).* The penal amount of payment bonds at the time of contract award shall be 100 percent of the original contract price.

(3) *Additional bond protection.* (i) The Government may require additional performance and payment bond protection if the contract price is increased. The increase in protection generally will equal 100 percent of the increase in contract price.

(ii) The Government may secure the additional protection by directing the Contractor to increase the penal amount of the existing bond or to obtain an additional bond.

(c) *Furnishing executed bonds.* The Contractor shall furnish all executed bonds, including any necessary reinsurance agreements, to the Contracting Officer, within the time period specified in the Bid Guarantee provision of the solicitation, or otherwise specified by the Contracting Officer, but in any event, before starting work.

(d) *Surety or other security for bonds.* The bonds shall be in the form of firm commitment, supported by corporate sureties whose names appear on the list contained in Treasury Department Circular 570, individual sureties, or by other acceptable security such as postal money order, certified check, cashier's check, irrevocable letter of credit, or, in accordance with Treasury Department regulations, certain bonds or notes of the United States. Treasury Circular 570 is published in the *Federal Register* or may be obtained from the:

U.S. Department of Treasury  
Financial Management Service  
Surety Bond Branch  
401 14th Street, NW, 2nd Floor, West Wing  
Washington, DC 20227.

(e) *Notice of subcontractor waiver of protection (40 U.S.C. 270b(c)).* Any waiver of the right to sue on the payment bond is void unless it is in writing, signed by the person whose right is waived, and executed after such person has first furnished labor or material for use in the performance of the contract.

(End of clause)

52.229-6 TAXES--FOREIGN FIXED-PRICE CONTRACTS.

As prescribed in 29.402-1(a), insert the following clause:

Taxes--Foreign Fixed-Price Contracts (Jan 1991)

(a) To the extent that this contract provides for furnishing supplies or performing services outside the United States, its possessions, and Puerto Rico, this clause applies in lieu of any Federal, State, and local taxes clause of the contract.

(b) "Contract date," as used in this clause, means the date set for bid opening or, if this is a negotiated contract or a modification, the effective date of this contract or modification.

"Country concerned," as used in this clause, means any country, other than the United States, its possessions, and Puerto Rico, in which expenditures under this contract are made.

"Tax" and "taxes," as used in this clause, include fees and charges for doing business that are levied by the government of the country concerned or by its political subdivisions.

"All applicable taxes and duties," as used in this clause, means all taxes and duties, in effect on the contract date, that the taxing authority is imposing and collecting on the transactions or property covered by this contract, pursuant to written ruling or regulation in effect on the contract date.

"After-imposed tax," as used in this clause, means any new or increased tax or duty, or tax that was exempted or excluded on the contract date but whose exemption was later revoked or reduced during the contract period, other than excepted tax, on the transactions or property covered by this contract that the Contractor is required to pay or bear as the result of legislative, judicial, or administrative action taking effect after the contract date.

"After-relieved tax," as used in this clause, means any amount of tax or duty, other than an excepted tax, that would otherwise have been payable on the transactions or property covered by this contract, but which the Contractor is not required to pay or bear, or for which the Contractor obtains a refund, as the result of legislative, judicial, or administrative action taking effect after the contract date.

"Excepted tax," as used in this clause, means social security or other employment taxes, net income and franchise taxes, excess profits taxes, capital stock taxes, transportation taxes, unemployment compensation taxes, and property taxes. "Excepted tax" does not include gross income taxes levied on or measured by sales or receipts from sales, property taxes assessed on completed supplies covered by this contract, or any tax assessed on the Contractor's possession of, interest in, or use of property, title to which is in the U.S. Government.

(c) Unless otherwise provided in this contract, the contract price includes all applicable taxes and duties, except taxes and duties that the Government of the United States and the government of the country concerned have agreed shall not be applicable to expenditures in such country by or on behalf of the United States.

(d) The contract price shall be increased by the amount of any after-imposed tax or of any tax or duty specifically excluded from the contract price by a provision of this contract that the Contractor is required to pay or bear, including any interest or penalty, if the Contractor states in writing that the contract price does not include any contingency for such tax and if liability for such tax, interest, or penalty was not incurred through the Contractor's fault, negligence, or failure to follow instructions of the Contracting Officer or to comply with the provisions of paragraph (i) below.

(e) The contract price shall be decreased by the amount of any after-relieved tax, including any interest or penalty. The Government of the United States shall be entitled to interest received by the Contractor incident to a refund of taxes to the extent that such interest was earned after the Contractor was paid by the Government of the United States for such taxes. The Government of the United States shall be entitled to repayment of any penalty refunded to the Contractor to the extent that the penalty was paid by the Government.

(f) The contract price shall be decreased by the amount of any tax or duty, other than an excepted tax, that was included in the contract and that the Contractor is required to pay or bear, or does not obtain a refund of, through the Contractor's fault, negligence, or failure to follow instructions of the Contracting Officer or to comply with the provisions of paragraph (i) below.

(g) No adjustment shall be made in the contract price under this clause unless the amount of the adjustment exceeds \$250.

(h) If the Contractor obtains a reduction in tax liability under the United States Internal Revenue Code (Title 26, U.S. Code) because of the payment of any tax or duty that either was included in the contract

price or was the basis of an increase in the contract price, the amount of the reduction shall be paid or credited to the Government of the United States as the Contracting Officer directs.

(i) The Contractor shall take all reasonable action to obtain exemption from or refund of any taxes or duties, including interest or penalty, from which the United States Government, the Contractor, any subcontractor, or the transactions or property covered by this contract are exempt under the laws of the country concerned or its political subdivisions or which the governments of the United States and of the country concerned have agreed shall not be applicable to expenditures in such country by or on behalf of the United States.

(j) The Contractor shall promptly notify the Contracting Officer of all matters relating to taxes or duties that reasonably may be expected to result in either an increase or decrease in the contract price and shall take appropriate action as the Contracting Officer directs. The contract price shall be equitably adjusted to cover the costs of action taken by the Contractor at the direction of the Contracting Officer, including any interest, penalty, and reasonable attorneys' fees.

(End of clause)

#### 252.231-7000 SUPPLEMENTAL COST PRINCIPLES (DEC 1991)

When the allowability of costs under this contract is determined in accordance with part 31 of the Federal Acquisition Regulation (FAR), allowability shall also be determined in accordance with part 231 of the Defense FAR Supplement, in effect on the date of this contract.

#### 52.232-5 PAYMENTS UNDER FIXED-PRICE CONSTRUCTION CONTRACTS (MAY 1997)

(a) Payment of price. The Government shall pay the Contractor the contract price as provided in this contract.

(b) Progress payments. The Government shall make progress payments monthly as the work proceeds, or at more frequent intervals as determined by the Contracting Officer, on estimates of work accomplished which meets the standards of quality established under the contract, as approved by the Contracting Officer.

(1) The Contractor's request for progress payments shall include the following substantiation:

(i) An itemization of the amounts requested, related to the various elements of work required by the contract covered by the payment requested.

(ii) A listing of the amount included for work performed by each subcontractor under the contract.

(iii) A listing of the total amount of each subcontract under the contract.

(iv) A listing of the amounts previously paid to each such subcontractor under the contract.

(v) Additional supporting data in a form and detail required by the Contracting Officer.

(2) In the preparation of estimates, the Contracting Officer may authorize material delivered on the site and preparatory work done to be taken into consideration. Material delivered to the Contractor at locations other than the site also may be taken into consideration if--

(i) Consideration is specifically authorized by this contract; and

(ii) The Contractor furnishes satisfactory evidence that it has acquired title to such material and that the material will be used to perform this contract.

(c) Contractor certification. Along with each request for progress payments, the Contractor shall furnish the following certification, or payment shall not be made: (However, if the Contractor elects to delete paragraph (c)(4) from the certification, the certification is still acceptable.)

I hereby certify, to the best of my knowledge and belief, that--

(1) The amounts requested are only for performance in accordance with the specifications, terms, and conditions of the contract;

(2) Payments to subcontractors and suppliers have been made from previous payments received under the contract, and timely payments will be made from the proceeds of the payment covered by this certification, in accordance with subcontract agreements and the requirements of chapter 39 of Title 31, United States Code;

(3) This request for progress payments does not include any amounts which the prime contractor intends to withhold or retain from a subcontractor or supplier in accordance with the terms and conditions of the subcontract; and

(4) This certification is not to be construed as final acceptance of a subcontractor's performance.

\_\_\_\_\_

(Name)

\_\_\_\_\_

(Title)

\_\_\_\_\_

(Date)

(d) Refund of unearned amounts. If the Contractor, after making a certified request for progress payments, discovers that a portion or all of such request constitutes a payment for performance by the Contractor that fails to conform to the specifications, terms, and conditions of this contract (hereinafter referred to as the "unearned amount"), the Contractor shall--

(1) Notify the Contracting Officer of such performance deficiency; and

(2) Be obligated to pay the Government an amount (computed by the Contracting Officer in the manner provided in paragraph (j) of this clause) equal to interest on the unearned amount from the 8th day after the date of receipt of the unearned amount until--

(i) The date the Contractor notifies the Contracting Officer that the performance deficiency has been corrected; or

(ii) The date the Contractor reduces the amount of any subsequent certified request for progress payments by an amount equal to the unearned amount.

(e) Retainage. If the Contracting Officer finds that satisfactory progress was achieved during any period for which a progress payment is to be made, the Contracting Officer shall authorize payment to be made in full. However, if satisfactory progress has not been made, the Contracting Officer may retain a maximum of 10 percent of the amount of the payment until satisfactory progress is achieved. When the work is substantially complete, the Contracting Officer may retain from previously withheld funds and future progress payments that amount the Contracting Officer considers adequate for protection of the Government and shall release to the Contractor all the remaining withheld funds. Also, on completion and

acceptance of each separate building, public work, or other division of the contract, for which the price is stated separately in the contract, payment shall be made for the completed work without retention of a percentage.

(f) Title, liability, and reservation of rights. All material and work covered by progress payments made shall, at the time of payment, become the sole property of the Government, but this shall not be construed as--

(1) Relieving the Contractor from the sole responsibility for all material and work upon which payments have been made or the restoration of any damaged work; or

(2) Waiving the right of the Government to require the fulfillment of all of the terms of the contract.

(g) Reimbursement for bond premiums. In making these progress payments, the Government shall, upon request, reimburse the Contractor for the amount of premiums paid for performance and payment bonds (including coinsurance and reinsurance agreements, when applicable) after the Contractor has furnished evidence of full payment to the surety. The retainage provisions in paragraph (e) of this clause shall not apply to that portion of progress payments attributable to bond premiums.

(h) Final payment. The Government shall pay the amount due the Contractor under this contract after--

(1) Completion and acceptance of all work;

(2) Presentation of a properly executed voucher; and

(3) Presentation of release of all claims against the Government arising by virtue of this contract, other than claims, in stated amounts, that the Contractor has specifically excepted from the operation of the release. A release may also be required of the assignee if the Contractor's claim to amounts payable under this contract has been assigned under the Assignment of Claims Act of 1940 (31 U.S.C. 3727 and 41 U.S.C. 15).

(i) Limitation because of undefinitized work. Notwithstanding any provision of this contract, progress payments shall not exceed 80 percent on work accomplished on undefinitized contract actions. A "contract action" is any action resulting in a contract, as defined in FAR Subpart 2.1, including contract modifications for additional supplies or services, but not including contract modifications that are within the scope and under the terms of the contract, such as contract modifications issued pursuant to the Changes clause, or funding and other administrative changes.

(j) Interest computation on unearned amounts. In accordance with 31 U.S.C. 3903(c)(1), the amount payable under subparagraph (d)(2) of this clause shall be--

(1) Computed at the rate of average bond equivalent rates of 91-day Treasury bills auctioned at the most recent auction of such bills prior to the date the Contractor receives the unearned amount; and

(2) Deducted from the next available payment to the Contractor.

#### 52.232-17 INTEREST (JUNE 1996)

(a) Except as otherwise provided in this contract under a Price Reduction for Defective Cost or Pricing Data clause or a Cost Accounting Standards clause, all amounts that become payable by the Contractor to the Government under this contract (net of any applicable tax credit under the Internal Revenue Code (26 U.S.C. 1481)) shall bear simple interest from the date due until paid unless paid within 30 days of becoming due. The interest rate shall be the interest rate established by the Secretary of the Treasury as provided in Section 12 of the Contract Disputes Act of 1978 (Public Law 95-563), which is applicable to the period in which the amount becomes due, as provided in paragraph (b) of this clause, and then at the

rate applicable for each six-month period as fixed by the Secretary until the amount is paid. reproduce, prepare derivative works, distribute copies to the public, and (b) Amounts shall be due at the earliest of the following dates:

- (1) The date fixed under this contract.
  - (2) The date of the first written demand for payment consistent with this contract, including any demand resulting from a default termination.
  - (3) The date the Government transmits to the Contractor a proposed supplemental agreement to confirm completed negotiations establishing the amount of debt.
  - (4) If this contract provides for revision of prices, the date of written notice to the Contractor stating the amount of refund payable in connection with a pricing proposal or a negotiated pricing agreement not confirmed by contract modification.
- (c) The interest charge made under this clause may be reduced under the procedures prescribed in 32.614-2 of the Federal Acquisition Regulation in effect on the date of this contract.

#### 52.232-23 ASSIGNMENT OF CLAIMS (JAN 1986) - ALTERNATE I (APR 1984)

(a) The Contractor, under the Assignment of Claims Act, as amended, 31 U.S.C. 3727, 41 U.S.C. 15 (hereafter referred to as "the Act"), may assign its rights to be paid amounts due or to become due as a result of the performance of this contract to a bank, trust company, or other financing institution, including any Federal lending agency. The assignee under such an assignment may thereafter further assign or reassign its right under the original assignment to any type of financing institution described in the preceding sentence. Unless otherwise stated in this contract, payments to an assignee of any amounts due or to become due under this contract shall not, to the extent specified in the Act, be subject to reduction or setoff.

(b) Any assignment or reassignment authorized under the Act and this clause shall cover all unpaid amounts payable under this contract, and shall not be made to more than one party, except that an assignment or reassignment may be made to one party as agent or trustee for two or more parties participating in the financing of this contract.

(c) The Contractor shall not furnish or disclose to any assignee under this contract any classified document (including this contract) or information related to work under this contract until the Contracting Officer authorizes such action in writing.

#### 52.232-27 PROMPT PAYMENT FOR CONSTRUCTION CONTRACTS (MAY 2001)

Notwithstanding any other payment terms in this contract, the Government will make invoice payments and contract financing payments under the terms and conditions specified in this clause. Payment shall be considered as being made on the day a check is dated or the date of an electronic funds transfer. Definitions of pertinent terms are set forth in sections 2.101 and 32.902 of the Federal Acquisition Regulation. All days referred to in this clause are calendar days, unless otherwise specified. (However, see subparagraph (a)(3) concerning payments due on Saturdays, Sundays, and legal holidays.)

(a) Invoice payments. (1) Types of invoice payments. For purposes of this clause, there are several types of invoice payments that may occur under this contract, as follows:

(i) Progress payments, if provided for elsewhere in this contract, based on Contracting Officer approval of the estimated amount and value of work or services performed, including payments for reaching milestones in any project:

(A) The due date for making such payments shall be 14 days after receipt of the payment request by the designated billing office. If the designated billing office fails to annotate the payment request with the actual date of receipt at the time of receipt, the payment due date shall be the 14th day after the date of the Contractor's payment request, provided a proper payment request is received and there is no disagreement over quantity, quality, or Contractor compliance with contract requirements.

(B) The due date for payment of any amounts retained by the Contracting Officer in accordance with the clause at 52.232-5, Payments Under Fixed-Price Construction Contracts, shall be as specified in the contract or, if not specified, 30 days after approval for release to the Contractor by the Contracting Officer.

(ii) Final payments based on completion and acceptance of all work and presentation of release of all claims against the Government arising by virtue of the contract, and payments for partial deliveries that have been accepted by the Government (e.g., each separate building, public work, or other division of the contract for which the price is stated separately in the contract):

(A) The due date for making such payments shall be either the 30th day after receipt by the designated billing office of a proper invoice from the Contractor, or the 30th day after Government acceptance of the work or services completed by the Contractor, whichever is later. If the designated billing office fails to annotate the invoice with the date of actual receipt at the time of receipt, the invoice payment due date shall be the 30th day after the date of the Contractor's invoice, provided a proper invoice is received and there is no disagreement over quantity, quality, or Contractor compliance with contract requirements.

(B) On a final invoice where the payment amount is subject to contract settlement actions (e.g., release of claims), acceptance shall be deemed to have occurred on the effective date of the contract settlement.

(2) Contractor's invoice. The Contractor shall prepare and submit invoices to the designated billing office specified in the contract. A proper invoice must include the items listed in subdivisions (a)(2)(i) through (a)(2)(ix) of this clause. If the invoice does not comply with these requirements, it shall be returned within 7 days after the date the designated billing office received the invoice, with a statement of the reasons why it is not a proper invoice. Untimely notification will be taken into account in computing any interest penalty owed the Contractor in the manner described in subparagraph (a)(4) of this clause.

(i) Name and address of the Contractor.

(ii) Invoice date. (The Contractor is encouraged to date invoices as close as possible to the date of mailing or transmission.)

(iii) Contract number or other authorization for work or services performed (including order number and contract line item number).

(iv) Description of work or services performed.

(v) Delivery and payment terms (e.g., prompt payment discount terms).

(vi) Name and address of Contractor official to whom payment is to be sent (must be the same as that in the contract or in a proper notice of assignment).

(vii) Name (where practicable), title, phone number, and mailing address of person to be notified in the event of a defective invoice.

(viii) For payments described in subdivision (a)(1)(i) of this clause, substantiation of the amounts requested and certification in accordance with the requirements of the clause at 52.232-5, Payments Under Fixed-Price Construction Contracts.

(ix) Any other information or documentation required by the contract.

(x) While not required, the Contractor is strongly encouraged to assign an identification number to each invoice.

(3) Interest penalty. An interest penalty shall be paid automatically by the designated payment office, without request from the Contractor, if payment is not made by the due date and the conditions listed in subdivisions (a)(3)(i) through (a)(3)(iii) of this clause are met, if applicable. However, when the due date falls on a Saturday, Sunday, or legal holiday when Federal Government offices are closed and Government business is not expected to be conducted, payment may be made on the following business day without incurring a late payment interest penalty.

(i) A proper invoice was received by the designated billing office.

(ii) A receiving report or other Government documentation authorizing payment was processed and there was no disagreement over quantity, quality, Contractor compliance with any contract term or condition, or requested progress payment amount.

(iii) In the case of a final invoice for any balance of funds due the Contractor for work or services performed, the amount was not subject to further contract settlement actions between the Government and the Contractor.

(4) Computing penalty amount. The interest penalty shall be at the rate established by the Secretary of the Treasury under section 12 of the Contract Disputes Act of 1978 (41 U.S.C. 611) that is in effect on the day after the due date, except where the interest penalty is prescribed by other governmental authority (e.g., tariffs). This rate is referred to as the "Renegotiation Board Interest Rate," and it is published in the Federal Register semiannually on or about January 1 and July 1. The interest penalty shall accrue daily on the invoice principal payment amount approved by the Government until the payment date of such approved principal amount; and will be compounded in 30-day increments inclusive from the first day after the due date through the payment date. That is, interest accrued at the end of any 30-day period will be added to the approved invoice principal payment amount and will be subject to interest penalties if not paid in the succeeding 30-day period. If the designated billing office failed to notify the Contractor of a defective invoice within the periods prescribed in subparagraph (a)(2) of this clause, the due date on the corrected invoice will be adjusted by subtracting from such date the number of days taken beyond the prescribed notification of defects period. Any interest penalty owed the Contractor will be based on this adjusted due date. Adjustments will be made by the designated payment office for errors in calculating interest penalties.

(i) For the sole purpose of computing an interest penalty that might be due the Contractor for payments described in subdivision (a)(1)(ii) of this clause, Government acceptance or approval shall be deemed to have occurred constructively on the 7th day after the Contractor has completed the work or services in accordance with the terms and conditions of the contract. In the event that actual acceptance or approval occurs within the constructive acceptance or approval period, the determination of an interest penalty shall be based on the actual date of acceptance or approval. Constructive acceptance or constructive approval requirements do not apply if there is a disagreement over quantity, quality, or Contractor compliance with a contract provision. These requirements also do not compel Government officials to accept work or services, approve Contractor estimates, perform contract administration functions, or make payment prior to fulfilling their responsibilities.

(ii) The following periods of time will not be included in the determination of an interest penalty:

(A) The period taken to notify the Contractor of defects in invoices submitted to the Government, but this may not exceed 7 days.

(B) The period between the defects notice and resubmission of the corrected invoice by the Contractor.

(C) For incorrect electronic funds transfer (EFT) information, in accordance with the EFT clause of this

contract.

(iii) Interest penalties will not continue to accrue after the filing of a claim for such penalties under the clause at 52.233-1, Disputes, or for more than 1 year. Interest penalties of less than \$1 need not be paid.

(iv) Interest penalties are not required on payment delays due to disagreement between the Government and the Contractor over the payment amount or other issues involving contract compliance, or on amounts temporarily withheld or retained in accordance with the terms of the contract. Claims involving disputes, and any interest that may be payable, will be resolved in accordance with the clause at 52.233-1, Disputes.

(5) Prompt payment discounts. An interest penalty also shall be paid automatically by the designated payment office, without request from the Contractor, if a discount for prompt payment is taken improperly. The interest penalty will be calculated on the amount of discount taken for the period beginning with the first day after the end of the discount period through the date when the Contractor is paid.

(6) Additional interest penalty. (i) If this contract was awarded on or after October 1, 1989, a penalty amount, calculated in accordance with subdivision (a)(6)(iii) of this clause, shall be paid in addition to the interest penalty amount if the Contractor--

(A) Is owed an interest penalty of \$1 or more;

(B) Is not paid the interest penalty within 10 days after the date the invoice amount is paid; and

(C) Makes a written demand to the designated payment office for additional penalty payment, in accordance with subdivision (a)(6)(ii) of this clause, postmarked not later than 40 days after the date the invoice amount is paid.

(ii)(A) Contractors shall support written demands for additional penalty payments with the following data. No additional data shall be required. Contractors shall--

(1) Specifically assert that late payment interest is due under a specific invoice, and request payment of all overdue late payment interest penalty and such additional penalty as may be required;

(2) Attach a copy of the invoice on which the unpaid late payment interest was due; and

(3) State that payment of the principal has been received, including the date of receipt.

(B) Demands must be postmarked on or before the 40th day after payment was made, except that--

(1) If the postmark is illegible or nonexistent, the demand must have been received and annotated with the date of receipt by the designated payment office on or before the 40th day after payment was made; or

(2) If the postmark is illegible or nonexistent and the designated payment office fails to make the required annotation, the demand's validity will be determined by the date the Contractor has placed on the demand; provided such date is no later than the 40th day after payment was made.

(iii)(A) The additional penalty shall be equal to 100 percent of any original late payment interest penalty, except--

(1) The additional penalty shall not exceed \$5,000;

(2) The additional penalty shall never be less than \$25; and

(3) No additional penalty is owed if the amount of the underlying interest penalty is less than \$1.

(B) If the interest penalty ceases to accrue in accordance with the limits stated in subdivision (a)(4)(iii) of this clause, the amount of the additional penalty shall be calculated on the amount of interest penalty that would have accrued in the absence of these limits, subject to the overall limits on the additional penalty specified in subdivision (a)(6)(iii)(A) of this clause.

(C) For determining the maximum and minimum additional penalties, the test shall be the interest penalty due on each separate payment made for each separate contract. The maximum and minimum additional penalty shall not be based upon individual invoices unless the invoices are paid separately. Where payments are consolidated for disbursing purposes, the maximum and minimum additional penalty determination shall be made separately for each contract therein.

(D) The additional penalty does not apply to payments regulated by other Government regulations (e.g., payments under utility contracts subject to tariffs and regulation).

(b) Contract financing payments. (1) Due dates for recurring financing payments. If this contract provides for contract financing, requests for payment shall be submitted to the designated billing office as specified in this contract or as directed by the Contracting Officer. Contract financing payments shall be made on the [insert day as prescribed by Agency head; if not prescribed, insert 30th day] day after receipt of a proper contract financing request by the designated billing office. In the event that an audit or other review of a specific financing request is required to ensure compliance with the terms and conditions of the contract, the designated payment office is not compelled to make payment by the due date specified.

(2) Due dates for other contract financing. For advance payments, loans, or other arrangements that do not involve recurring submissions of contract financing requests, payment shall be made in accordance with the corresponding contract terms or as directed by the Contracting Officer.

(3) Interest penalty not applicable. Contract financing payments shall not be assessed an interest penalty for payment delays.

(c) Subcontract clause requirements. The Contractor shall include in each subcontract for property or services (including a material supplier) for the purpose of performing this contract the following:

(1) Prompt payment for subcontractors. A payment clause that obligates the Contractor to pay the subcontractor for satisfactory performance under its subcontract not later than 7 days from receipt of payment out of such amounts as are paid to the Contractor under this contract.

(2) Interest for subcontractors. An interest penalty clause that obligates the Contractor to pay to the subcontractor an interest penalty for each payment not made in accordance with the payment clause--

(i) For the period beginning on the day after the required payment date and ending on the date on which payment of the amount due is made; and

(ii) Computed at the rate of interest established by the Secretary of the Treasury, and published in the Federal Register, for interest payments under section 12 of the Contract Disputes Act of 1978 (41 U.S.C. 611) in effect at the time the Contractor accrues the obligation to pay an interest penalty.

(3) Subcontractor clause flowdown. A clause requiring each subcontractor to include a payment clause and an interest penalty clause conforming to the standards set forth in subparagraphs (c)(1) and (c)(2) of this clause in each of its subcontracts, and to require each of its subcontractors to include such clauses in their subcontracts with each lower-tier subcontractor or supplier.

(d) Subcontract clause interpretation. The clauses required by paragraph (c) of this clause shall not be construed to impair the right of the Contractor or a subcontractor at any tier to negotiate, and to include in their subcontract, provisions that--

(1) Retainage permitted. Permit the Contractor or a subcontractor to retain (without cause) a specified percentage of each progress payment otherwise due to a subcontractor for satisfactory performance under the subcontract without incurring any obligation to pay a late payment interest penalty, in accordance with terms and conditions agreed to by the parties to the subcontract, giving such recognition as the parties deem appropriate to the ability of a subcontractor to furnish a performance bond and a payment bond;

(2) Withholding permitted. Permit the Contractor or subcontractor to make a determination that part or all of the subcontractor's request for payment may be withheld in accordance with the subcontract agreement; and

(3) Withholding requirements. Permit such withholding without incurring any obligation to pay a late payment penalty if--

(i) A notice conforming to the standards of paragraph (g) of this clause previously has been furnished to the subcontractor; and

(ii) A copy of any notice issued by a Contractor pursuant to subdivision (d)(3)(i) of this clause has been furnished to the Contracting Officer.

(e) Subcontractor withholding procedures. If a Contractor, after making a request for payment to the Government but before making a payment to a subcontractor for the subcontractor's performance covered by the payment request, discovers that all or a portion of the payment otherwise due such subcontractor is subject to withholding from the subcontractor in accordance with the subcontract agreement, then the Contractor shall--

(1) Subcontractor notice. Furnish to the subcontractor a notice conforming to the standards of paragraph (g) of this clause as soon as practicable upon ascertaining the cause giving rise to a withholding, but prior to the due date for subcontractor payment;

(2) Contracting Officer notice. Furnish to the Contracting Officer, as soon as practicable, a copy of the notice furnished to the subcontractor pursuant to subparagraph (e)(1) of this clause;

(3) Subcontractor progress payment reduction. Reduce the subcontractor's progress payment by an amount not to exceed the amount specified in the notice of withholding furnished under subparagraph (e)(1) of this clause;

(4) Subsequent subcontractor payment. Pay the subcontractor as soon as practicable after the correction of the identified subcontract performance deficiency, and--

(i) Make such payment within--

(A) Seven days after correction of the identified subcontract performance deficiency (unless the funds therefor must be recovered from the Government because of a reduction under subdivision (e)(5)(i)) of this clause; or

(B) Seven days after the Contractor recovers such funds from the Government; or

(ii) Incur an obligation to pay a late payment interest penalty computed at the rate of interest established by the Secretary of the Treasury, and published in the Federal Register, for interest payments under section 12 of the Contracts Disputes Act of 1978 (41 U.S.C. 611) in effect at the time the Contractor accrues the obligation to pay an interest penalty;

(5) Notice to Contracting Officer. Notify the Contracting Officer upon--

(i) Reduction of the amount of any subsequent certified application for payment; or

(ii) Payment to the subcontractor of any withheld amounts of a progress payment, specifying--

(A) The amounts withheld under subparagraph (e)(1) of this clause; and

(B) The dates that such withholding began and ended; and

(6) Interest to Government. Be obligated to pay to the Government an amount equal to interest on the withheld payments (computed in the manner provided in 31 U.S.C. 3903(c)(1)), from the 8th day after receipt of the withheld amounts from the Government until--

(i) The day the identified subcontractor performance deficiency is corrected; or

(ii) The date that any subsequent payment is reduced under subdivision (e)(5)(i) of this clause.

(f) Third-party deficiency reports. (1) Withholding from subcontractor. If a Contractor, after making payment to a first-tier subcontractor, receives from a supplier or subcontractor of the first-tier subcontractor (hereafter referred to as a "second-tier subcontractor") a written notice in accordance with section 2 of the Act of August 24, 1935 (40 U.S.C. 270b, Miller Act), asserting a deficiency in such first-tier subcontractor's performance under the contract for which the Contractor may be ultimately liable, and the Contractor determines that all or a portion of future payments otherwise due such first-tier subcontractor is subject to withholding in accordance with the subcontract agreement, the Contractor may, without incurring an obligation to pay an interest penalty under subparagraph (e)(6) of this clause--

(i) Furnish to the first-tier subcontractor a notice conforming to the standards of paragraph (g) of this clause as soon as practicable upon making such determination; and

(ii) Withhold from the first-tier subcontractor's next available progress payment or payments an amount not to exceed the amount specified in the notice of withholding furnished under subdivision (f)(1)(i) of this clause.

(2) Subsequent payment or interest charge. As soon as practicable, but not later than 7 days after receipt of satisfactory written notification that the identified subcontract performance deficiency has been corrected, the Contractor shall--

(i) Pay the amount withheld under subdivision (f)(1)(ii) of this clause to such first-tier subcontractor; or

(ii) Incur an obligation to pay a late payment interest penalty to such first-tier subcontractor computed at the rate of interest established by the Secretary of the Treasury, and published in the Federal Register, for interest payments under section 12 of the Contracts Disputes Act of 1978 (41 U.S.C. 611) in effect at the time the Contractor accrues the obligation to pay an interest penalty.

(g) Written notice of subcontractor withholding. A written notice of any withholding shall be issued to a subcontractor (with a copy to the Contracting Officer of any such notice issued by the Contractor), specifying--

(1) The amount to be withheld;

(2) The specific causes for the withholding under the terms of the subcontract; and

(3) The remedial actions to be taken by the subcontractor in order to receive payment of the amounts withheld.

(h) Subcontractor payment entitlement. The Contractor may not request payment from the Government of any amount withheld or retained in accordance with paragraph (d) of this clause until such time as the Contractor has determined and certified to the Contracting Officer that the subcontractor is entitled to the

payment of such amount.

(i) Prime-subcontractor disputes. A dispute between the Contractor and subcontractor relating to the amount or entitlement of a subcontractor to a payment or a late payment interest penalty under a clause included in the subcontract pursuant to paragraph (c) of this clause does not constitute a dispute to which the United States is a party. The United States may not be interpleaded in any judicial or administrative proceeding involving such a dispute.

(j) Preservation of prime-subcontractor rights. Except as provided in paragraph (i) of this clause, this clause shall not limit or impair any contractual, administrative, or judicial remedies otherwise available to the Contractor or a subcontractor in the event of a dispute involving late payment or nonpayment by the Contractor or deficient subcontract performance or nonperformance by a subcontractor.

(k) Non-recourse for prime contractor interest penalty. The Contractor's obligation to pay an interest penalty to a subcontractor pursuant to the clauses included in a subcontract under paragraph (c) of this clause shall not be construed to be an obligation of the United States for such interest penalty. A cost-reimbursement claim may not include any amount for reimbursement of such interest penalty.

#### 52.232-33 PAYMENT BY ELECTRONIC FUNDS TRANSFER—CENTRAL CONTRACTOR REGISTRATION (MAY 1999)

(a) Method of payment. (1) All payments by the Government under this contract shall be made by electronic funds transfer (EFT), except as provided in paragraph (a)(2) of this clause. As used in this clause, the term "EFT" refers to the funds transfer and may also include the payment information transfer.

(2) In the event the Government is unable to release one or more payments by EFT, the Contractor agrees to either--

(i) Accept payment by check or some other mutually agreeable method of payment; or

(ii) Request the Government to extend the payment due date until such time as the Government can make payment by EFT (but see paragraph (d) of this clause).

(b) Contractor's EFT information. The Government shall make payment to the Contractor using the EFT information contained in the Central Contractor Registration (CCR) database. In the event that the EFT information changes, the Contractor shall be responsible for providing the updated information to the CCR database.

(c) Mechanisms for EFT payment. The Government may make payment by EFT through either the Automated Clearing House (ACH) network, subject to the rules of the National Automated Clearing House Association, or the Fedwire Transfer System. The rules governing Federal payments through the ACH are contained in 31 CFR part 210.

(d) Suspension of payment. If the Contractor's EFT information in the CCR database is incorrect, then the Government need not make payment to the Contractor under this contract until correct EFT information is entered into the CCR database; and any invoice or contract financing request shall be deemed not to be a proper invoice for the purpose of prompt payment under this contract. The prompt payment terms of the contract regarding notice of an improper invoice and delays in accrual of interest penalties apply.

(e) Contractor EFT arrangements. If the Contractor has identified multiple payment receiving points (i.e., more than one remittance address and/or EFT information set) in the CCR database, and the Contractor has not notified the Government of the payment receiving point applicable to this contract, the Government shall make payment to the first payment receiving point (EFT information set or remittance address as applicable) listed in the CCR database.

(f) Liability for uncompleted or erroneous transfers. (1) If an uncompleted or erroneous transfer occurs because the Government used the Contractor's EFT information incorrectly, the Government remains responsible for--

(i) Making a correct payment;

(ii) Paying any prompt payment penalty due; and

(iii) Recovering any erroneously directed funds.

(2) If an uncompleted or erroneous transfer occurs because the Contractor's EFT information was incorrect, or was revised within 30 days of Government release of the EFT payment transaction instruction to the Federal Reserve System, and--

(i) If the funds are no longer under the control of the payment office, the Government is deemed to have made payment and the Contractor is responsible for recovery of any erroneously directed funds; or

(ii) If the funds remain under the control of the payment office, the Government shall not make payment, and the provisions of paragraph (d) of this clause shall apply.

(g) EFT and prompt payment. A payment shall be deemed to have been made in a timely manner in accordance with the prompt payment terms of this contract if, in the EFT payment transaction instruction released to the Federal Reserve System, the date specified for settlement of the payment is on or before the prompt payment due date, provided the specified payment date is a valid date under the rules of the Federal Reserve System.

(h) EFT and assignment of claims. If the Contractor assigns the proceeds of this contract as provided for in the assignment of claims terms of this contract, the Contractor shall require as a condition of any such assignment, that the assignee shall register in the CCR database and shall be paid by EFT in accordance with the terms of this clause. In all respects, the requirements of this clause shall apply to the assignee as if it were the Contractor. EFT information that shows the ultimate recipient of the transfer to be other than the Contractor, in the absence of a proper assignment of claims acceptable to the Government, is incorrect EFT information within the meaning of paragraph (d) of this clause.

(i) Liability for change of EFT information by financial agent. The Government is not liable for errors resulting from changes to EFT information made by the Contractor's financial agent.

(j) Payment information. The payment or disbursing office shall forward to the Contractor available payment information that is suitable for transmission as of the date of release of the EFT instruction to the Federal Reserve System. The Government may request the Contractor to designate a desired format and method(s) for delivery of payment information from a list of formats and methods the payment office is capable of executing. However, the Government does not guarantee that any particular format or method of delivery is available at any particular payment office and retains the latitude to use the format and delivery method most convenient to the Government. If the Government makes payment by check in accordance with paragraph (a) of this clause, the Government shall mail the payment information to the remittance address contained in the CCR database.

(End of Clause)

#### 52.233-1 DISPUTES. (DEC 1998)

(a) This contract is subject to the Contract Disputes Act of 1978, as amended (41 U.S.C. 601-613).

(b) Except as provided in the Act, all disputes arising under or relating to this contract shall be resolved under this clause.

(c) "Claim," as used in this clause, means a written demand or written assertion by one of the contracting parties seeking, as a matter of right, the payment of money in a sum certain, the adjustment or interpretation of contract terms, or other relief arising under or relating to this contract. A claim arising under a contract, unlike a claim relating to that contract, is a claim that can be resolved under a contract clause that provides for the relief sought by the claimant. However, a written demand or written assertion by the Contractor seeking the payment of money exceeding \$100,000 is not a claim under the Act until certified as required by subparagraph (d)(2) of this clause. A voucher, invoice, or other routine request for payment that is not in dispute when submitted is not a claim under the Act. The submission may be converted to a claim under the Act, by complying with the submission and certification requirements of this clause, if it is disputed either as to liability or amount or is not acted upon in a reasonable time.

(d)(1) A claim by the Contractor shall be made in writing and, unless otherwise stated in this contract, submitted within 6 years after accrual of the claim to the Contracting Officer for a written decision. A claim by the Government against the Contractor shall be subject to a written decision by the Contracting Officer.

(2)(i) The contractors shall provide the certification specified in subparagraph (d)(2)(iii) of this clause when submitting any claim -

(A) Exceeding \$100,000; or

(B) Regardless of the amount claimed, when using -

(1) Arbitration conducted pursuant to 5 U.S.C. 575-580; or

(2) Any other alternative means of dispute resolution (ADR) technique that the agency elects to handle in accordance with the Administrative Dispute Resolution Act (ADRA).

(ii) The certification requirement does not apply to issues in controversy that have not been submitted as all or part of a claim.

(iii) The certification shall state as follows: "I certify that the claim is made in good faith; that the supporting data are accurate and complete to the best of my knowledge and belief; that the amount requested accurately reflects the contract adjustment for which the Contractor believes the Government is liable; and that I am duly authorized to certify the claim on behalf of the Contractor.

(3) The certification may be executed by any person duly authorized to bind the Contractor with respect to the claim.

(e) For Contractor claims of \$100,000 or less, the Contracting Officer must, if requested in writing by the Contractor, render a decision within 60 days of the request. For Contractor-certified claims over \$100,000, the Contracting Officer must, within 60 days, decide the claim or notify the Contractor of the date by which the decision will be made.

(f) The Contracting Officer's decision shall be final unless the Contractor appeals or files a suit as provided in the Act.

(g) If the claim by the Contractor is submitted to the Contracting Officer or a claim by the Government is presented to the Contractor, the parties, by mutual consent, may agree to use alternative dispute resolution (ADR). If the Contractor refuses an offer for ADR, the Contractor shall inform the Contracting Officer, in writing, of the Contractor's specific reasons for rejecting the request.

(h) The Government shall pay interest on the amount found due and unpaid from (1) the date the Contracting Officer receives the claim (certified, if required); or (2) the date that payment otherwise would be due, if that date is later, until the date of payment. With regard to claims having defective

certifications, as defined in (FAR) 48 CFR 33.201, interest shall be paid from the date that the Contracting Officer initially receives the claim. Simple interest on claims shall be paid at the rate, fixed by the Secretary of the Treasury as provided in the Act, which is applicable to the period during which the Contracting Officer receives the claim and then at the rate applicable for each 6-month period as fixed by the Treasury Secretary during the pendency of the claim.

(i) The Contractor shall proceed diligently with performance of this contract, pending final resolution of any request for relief, claim, appeal, or action arising under the contract, and comply with any decision of the Contracting Officer.

(End of clause)

#### 52.233-3 PROTEST AFTER AWARD (AUG. 1996)

(a) Upon receipt of a notice of protest (as defined in FAR 33.101) or a determination that a protest is likely (see FAR 33.102(d)), the Contracting Officer may, by written order to the Contractor, direct the Contractor to stop performance of the work called for by this contract. The order shall be specifically identified as a stop-work order issued under this clause. Upon receipt of the order, the Contractor shall immediately comply with its terms and take all reasonable steps to minimize the incurrence of costs allocable to the work covered by the order during the period of work stoppage. Upon receipt of the final decision in the protest, the Contracting Officer shall either--

(1) Cancel the stop-work order; or

(2) Terminate the work covered by the order as provided in the Default, or the Termination for Convenience of the Government, clause of this contract.

(b) If a stop-work order issued under this clause is canceled either before or after a final decision in the protest, the Contractor shall resume work. The Contracting Officer shall make an equitable adjustment in the delivery schedule or contract price, or both, and the contract shall be modified, in writing, accordingly, if--

(1) The stop-work order results in an increase in the time required for, or in the Contractor's cost properly allocable to, the performance of any part of this contract; and

(2) The Contractor asserts its right to an adjustment within 30 days after the end of the period of work stoppage; provided, that if the Contracting Officer decides the facts justify the action, the Contracting Officer may receive and act upon a proposal at any time before final payment under this contract.

(c) If a stop-work order is not canceled and the work covered by the order is terminated for the convenience of the Government, the Contracting Officer shall allow reasonable costs resulting from the stop-work order in arriving at the termination settlement.

(d) If a stop-work order is not canceled and the work covered by the order is terminated for default, the Contracting Officer shall allow, by equitable adjustment or otherwise, reasonable costs resulting from the stop-work order.

(e) The Government's rights to terminate this contract at any time are not affected by action taken under this clause.

(f) If, as the result of the Contractor's intentional or negligent misstatement, misrepresentation, or miscertification, a protest related to this contract is sustained, and the Government pays costs, as provided in FAR 33.102(b)(2) or 33.104(h)(1), the Government may require the Contractor to reimburse the Government the amount of such costs. In addition to any other remedy available, and pursuant to the requirements of Subpart 32.6, the Government may collect this debt by offsetting the amount against any

payment due the Contractor under any contract between the Contractor and the Government.

252.233-7001 CHOICE OF LAW (OVERSEAS) (JUN 1997)

This contract shall be construed and interpreted in accordance with the substantive laws of the United States of America. By the execution of this contract, the Contractor expressly agrees to waive any rights to invoke the jurisdiction of local national courts where this contract is performed and agrees to accept the exclusive jurisdiction of the United States Armed Services Board of Contract Appeals and the United States Court of Federal Claims for the hearing and determination of any and all disputes that may arise under the Disputes clause of this contract.

(End of clause)

\*52.236-1 PERFORMANCE OF WORK BY THE CONTRACTOR.

As prescribed in 36.501(b), insert the following clause in solicitations and contracts when a fixed-price construction contract is contemplated and the contract amount is expected to exceed \$1,000,000. The Contracting Officer may insert the clause in solicitations and contracts when a fixed-price construction contract is contemplated and the contract amount is expected to be \$1,000,000 or less. Complete the clause by inserting the appropriate percentage consistent with the complexity and magnitude of the work and customary or necessary specialty subcontracting (see 36.501(a)).

Performance of Work by the Contractor (Apr 1984)

The Contractor shall perform on the site, and with its own organization, work equivalent to at least twenty (20%) percent of the total amount of work to be performed under the contract. This percentage may be reduced by a supplemental agreement to this contract if, during performing the work, the Contractor requests a reduction and the Contracting Officer determines that the reduction would be to the advantage of the Government.

(End of clause) \*

52.236-2 DIFFERING SITE CONDITIONS (APR 1984)

As prescribed in 36.502, insert the following clause in solicitations and contracts when a fixed-price construction contract or a fixed-price dismantling, demolition, or removal of improvements contract is contemplated and the contract amount is expected to exceed the small purchase limitation. The Contracting Officer may insert the clause in solicitations and contracts when a fixed-price construction or a fixed-price contract for dismantling, demolition, or removal of improvements is contemplated and the contract amount is expected to be within the small purchase limitation.

(a) The Contractor shall promptly, and before the conditions are disturbed, give a written notice to the Contracting Officer of

(1) subsurface or latent physical conditions at the site which differ materially from those indicated in this contract, or

(2) unknown physical conditions at the site, of an unusual nature, which differ materially from those ordinarily encountered and generally recognized as inhering in work of the character provided for in the contract.

(b) The Contracting Officer shall investigate the site conditions promptly after receiving the notice. If the conditions do materially so differ and cause an increase or decrease in the Contractor's cost of, or the time required for, performing any part of the work under this contract, whether or not changed as a result of the conditions, an equitable adjustment shall be made under this clause and the contract modified in writing accordingly.

(c) No request by the Contractor for an equitable adjustment to the contract under this clause shall be allowed, unless the Contractor has given the written notice required; provided, that the time prescribed in (a) above for giving written notice may be extended by the Contracting Officer.

(d) No request by the Contractor for an equitable adjustment to the contract for differing site conditions shall be allowed if made after final payment under this contract.

#### 52.236-3 SITE INVESTIGATION AND CONDITIONS AFFECTING THE WORK (APR 1984)

(a) The Contractor acknowledges that it has taken steps reasonably necessary to ascertain the nature and location of the work, and that it has investigated and satisfied itself as to the general and local conditions which can affect the work or its cost, including but not limited to

(1) conditions bearing upon transportation, disposal, handling, and storage of materials;

(2) the availability of labor, water, electric power, and roads;

(3) uncertainties of weather, river stages, tides, or similar physical conditions at the site;

(4) the conformation and conditions of the ground; and (5) the character of equipment and facilities needed preliminary to and during work performance. The Contractor also acknowledges that it has satisfied itself as to the character, quality, and quantity of surface and subsurface materials or obstacles to be encountered insofar as this information is reasonably ascertainable from an inspection of the site, including all exploratory work done by the Government, as well as from the drawings and specifications made a part of this contract. Any failure of the Contractor to take the actions described and acknowledged in this paragraph will not relieve the Contractor from responsibility for estimating properly the difficulty and cost of successfully performing the work, or for proceeding to successfully perform the work without additional expense to the Government.

(b) The Government assumes no responsibility for any conclusions or interpretations made by the Contractor based on the information made available by the Government. Nor does the Government assume responsibility for any understanding reached or representation made concerning conditions which can affect the work by any of its officers or agents before the execution of this contract, unless that understanding or representation is expressly stated in this contract.

#### 52.236-4 PHYSICAL DATA (APR 1984)

Data and information furnished or referred to below is for the Contractor's information. The Government shall not be responsible for any interpretation of or conclusion drawn from the data or information by the Contractor.

\*(a) The indications of physical conditions on the drawings and in the specifications are the result of site investigations by surveys, test pits, and as-built drawings. \*

(b) Weather conditions: Tropical. Data on temperature and rainfall may be obtained from the National Weather Service in Honolulu.

(c) Transportation facilities: The Contractor shall make his own investigation of the condition and availability of public and private roads as well as clearances, restrictions, and load limits of bridges.

(d) Security Requirements. The Contractor shall comply with the industrial security requirements of the Army. Contractor personnel requiring access to the military installation in connection with the contract may be subject to security investigation and shall be admitted to only those parts of the installation or building(s) where their presence is required. While on the job, Contractor employees shall display

identification as may be required under the Special Contract Requirements paragraph 'Identification of Employees.' Vehicles operating on the military installation are subject to search by security personnel at any time. Immediately upon receipt of notice to proceed, the Contractor shall furnish to the Contracting Officer the following:

(i) A roster of all employees who will need access to the military installation in connection with the contract. The roster shall be submitted in three copies. If requested in writing by the Contracting Officer, additional personnel data shall also be furnished.

(ii) A list of automotive vehicles which will be used on the military installation in connection with the contract. The list shall include make, year, license number, details of insurance coverage required by the Special Contract Requirements paragraph "Required Insurance", and expiration date of safety inspection decal. The list of automotive vehicles shall be submitted in four copies. The Contractor shall be responsible for vehicle permits issued to him and its subcontractors. When so authorized by the Contracting Officer, the Contractor may coordinate directly with the military police concerning permits for contractor-owned vehicles. Privately-owned vehicles used by Contractor personnel must be registered with the military police by the individual owners.

(End of Clause)  
(R 7-603.25 1965 JAN)

#### 52.236-5 MATERIAL AND WORKMANSHIP (APR 1984)

(a) All equipment, material, and articles incorporated into the work covered by this contract shall be new and of the most suitable grade for the purpose intended, unless otherwise specifically provided in this contract. References in the specifications to equipment, material, articles, or patented processes by trade name, make, or catalog number, shall be regarded as establishing a standard of quality and shall not be construed as limiting competition. The Contractor may, at its option, use any equipment, material, article, or process that, in the judgment of the Contracting Officer, is equal to that named in the specifications, unless otherwise specifically provided in this contract.

(b) The Contractor shall obtain the Contracting Officer's approval of the machinery and mechanical and other equipment to be incorporated into the work. When requesting approval, the Contractor shall furnish to the Contracting Officer the name of the manufacturer, the model number, and other information concerning the performance, capacity, nature, and rating of the machinery and mechanical and other equipment. When required by this contract or by the Contracting Officer, the Contractor shall also obtain the Contracting Officer's approval of the material or articles which the Contractor contemplates incorporating into the work. When requesting approval, the Contractor shall provide full information concerning the material or articles. When directed to do so, the Contractor shall submit samples for approval at the Contractor's expense, with all shipping charges prepaid. Machinery, equipment, material, and articles that do not have the required approval shall be installed or used at the risk of subsequent rejection.

(c) All work under this contract shall be performed in a skillful and workmanlike manner. The Contracting Officer may require, in writing, that the Contractor remove from the work any employee the Contracting Officer deems incompetent, careless, or otherwise objectionable.

#### 52.236-6 SUPERINTENDENCE BY THE CONTRACTOR (APR 1984)

At all times during performance of this contract and until the work is completed and accepted, the Contractor shall directly superintend the work or assign and have on the worksite a competent superintendent who is satisfactory to the Contracting Officer and has authority to act for the Contractor.

#### 52.236-7 PERMITS AND RESPONSIBILITIES (NOV 1991)

The Contractor shall, without additional expense to the Government, be responsible for obtaining any necessary licenses and permits, and for complying with any Federal, State, and municipal laws, codes, and regulations applicable to the performance of the work. The Contractor shall also be responsible for all damages to persons or property that occur as a result of the Contractor's fault or negligence. The Contractor shall also be responsible for all materials delivered and work performed until completion and acceptance of the entire work, except for any completed unit of work which may have been accepted under the contract.

#### 52.236-8 OTHER CONTRACTS (APR 1984)

The Government may undertake or award other contracts for additional work at or near the site of the work under this contract. The Contractor shall fully cooperate with the other contractors and with Government employees and shall carefully adapt scheduling and performing the work under this contract to accommodate the additional work, heeding any direction that may be provided by the Contracting Officer. The Contractor shall not commit or permit any act that will interfere with the performance of work by any other contractor or by Government employees.

#### 52.236-9 PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS (APR 1984)

(a) The Contractor shall preserve and protect all structures, equipment, and vegetation (such as trees, shrubs, and grass) on or adjacent to the work site, which are not to be removed and which do not unreasonably interfere with the work required under this contract. The Contractor shall only remove trees when specifically authorized to do so, and shall avoid damaging vegetation that will remain in place. If any limbs or branches of trees are broken during contract performance, or by the careless operation of equipment, or by workmen, the Contractor shall trim those limbs or branches with a clean cut and paint the cut with a tree-pruning compound as directed by the Contracting Officer.

(b) The Contractor shall protect from damage all existing improvements and utilities

(1) at or near the work site, and

(2) on adjacent property of a third party, the locations of which are made known to or should be known by the Contractor. The Contractor shall repair any damage to those facilities, including those that are the property of a third party, resulting from failure to comply with the requirements of this contract or failure to exercise reasonable care in performing the work. If the Contractor fails or refuses to repair the damage promptly, the Contracting Officer may have the necessary work performed and charge the cost to the Contractor.

#### 52.236-10 OPERATIONS AND STORAGE AREAS (APR 1984)

(a) The Contractor shall confine all operations (including storage of materials) on Government premises to areas authorized or approved by the Contracting Officer. The Contractor shall hold and save the Government, its officers and agents, free and harmless from liability of any nature occasioned by the Contractor's performance.

(b) Temporary buildings (e.g., storage sheds, shops, offices) and utilities may be erected by the Contractor only with the approval of the Contracting Officer and shall be built with labor and materials furnished by the Contractor without expense to the Government. The temporary buildings and utilities shall remain the property of the Contractor and shall be removed by the Contractor at its expense upon completion of the work. With the written consent of the Contracting Officer, the buildings and utilities may be abandoned and need not be removed.

(c) The Contractor shall, under regulations prescribed by the Contracting Officer, use only established roadways, or use temporary roadways constructed by the Contractor when and as authorized by the Contracting Officer. When materials are transported in prosecuting the work, vehicles shall not be loaded beyond the loading capacity recommended by the manufacturer of the vehicle or prescribed by any Federal, State, or local law or regulation. When it is necessary to cross curbs or sidewalks, the Contractor shall protect them from damage. The Contractor shall repair or pay for the repair of any damaged curbs, sidewalks, or roads.

52.236-11 USE AND POSSESSION PRIOR TO COMPLETION (APR 1984)

(a) The Government shall have the right to take possession of or use any completed or partially completed part of the work. Before taking possession of or using any work, the Contracting Officer shall furnish the Contractor a list of items of work remaining to be performed or corrected on those portions of the work that the Government intends to take possession of or use. However, failure of the Contracting Officer to list any item of work shall not relieve the Contractor of responsibility for complying with the terms of the contract. The Government's possession or use shall not be deemed an acceptance of any work under the contract.

(b) While the Government has such possession or use, the Contractor shall be relieved of the responsibility for the loss of or damage to the work resulting from the Government's possession or use, notwithstanding the terms of the clause in this contract entitled "Permits and Responsibilities." If prior possession or use by the Government delays the progress of the work or causes additional expense to the Contractor, an equitable adjustment shall be made in the contract price or the time of completion, and the contract shall be modified in writing accordingly.

52.236-12 CLEANING UP (APR 1984)

The Contractor shall at all times keep the work area, including storage areas, free from accumulations of waste materials. Before completing the work, the Contractor shall remove from the work and premises any rubbish, tools, scaffolding, equipment, and materials that are not the property of the Government. Upon completing the work, the Contractor shall leave the work area in a clean, neat, and orderly condition satisfactory to the Contracting Officer.

~~\* 52.236-13 ACCIDENT PREVENTION (NOV 1991) (DELETED)~~

~~(a) The Contractor shall provide and maintain work environments and procedures which will~~

~~(1) safeguard the public and Government personnel, property, materials, supplies, and equipment exposed to Contractor operations and activities;~~

~~(2) avoid interruptions of Government operations and delays in project completion dates; and~~

~~(3) control costs in the performance of this contract.~~

~~(b) For these purposes on contracts for construction or dismantling, demolition, or removal of improvements, the Contractor shall-~~

~~(1) Provide appropriate safety barricades, signs, and signal lights;~~

~~(2) Comply with the standards issued by the Secretary of Labor at 29 CFR Part 1926 and 29 CFR Part 1910; and~~

~~(3) Ensure that any additional measures the Contracting Officer determines to be reasonably necessary~~

~~for the purposes are taken.~~

~~(c) If this contract is for construction or dismantling, demolition or removal of improvements with any Department of Defense agency or component, the Contractor shall comply with all pertinent provisions of the latest version of U.S. Army Corps of Engineers Safety and Health Requirements Manual, EM 385-1-1, in effect on the date of the solicitation.~~

~~(d) Whenever the Contracting Officer becomes aware of any noncompliance with these requirements or any condition which poses a serious or imminent danger to the health or safety of the public or Government personnel, the Contracting Officer shall notify the Contractor orally, with written confirmation, and request immediate initiation of corrective action. This notice, when delivered to the Contractor or the Contractor's representative at the work site, shall be deemed sufficient notice of the noncompliance and that corrective action is required. After receiving the notice, the Contractor shall immediately take corrective action. If the Contractor fails or refuses to promptly take corrective action, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. The Contractor shall not be entitled to any equitable adjustment of the contract price or extension of the performance schedule on any stop work order issued under this clause.~~

~~(e) The Contractor shall insert this clause, including this paragraph (e), with appropriate changes in the designation of the parties, in subcontracts.~~ \*

#### 52.236-13 ACCIDENT PREVENTION (NOV 1991) – ALTERNATE I (NOV 1991)

(a) The Contractor shall provide and maintain work environments and procedures which will

(1) safeguard the public and Government personnel, property, materials, supplies, and equipment exposed to Contractor operations and activities;

(2) avoid interruptions of Government operations and delays in project completion dates; and

(3) control costs in the performance of this contract.

(b) For these purposes on contracts for construction or dismantling, demolition, or removal of improvements, the Contractor shall-

(1) Provide appropriate safety barricades, signs, and signal lights;

(2) Comply with the standards issued by the Secretary of Labor at 29 CFR Part 1926 and 29 CFR Part 1910; and

(3) Ensure that any additional measures the Contracting Officer determines to be reasonably necessary for the purposes are taken.

(c) If this contract is for construction or dismantling, demolition or removal of improvements with any Department of Defense agency or component, the Contractor shall comply with all pertinent provisions of the latest version of U.S. Army Corps of Engineers Safety and Health Requirements Manual, EM 385-1-1, in effect on the date of the solicitation.

(d) Whenever the Contracting Officer becomes aware of any noncompliance with these requirements or any condition which poses a serious or imminent danger to the health or safety of the public or Government personnel, the Contracting Officer shall notify the Contractor orally, with written confirmation, and request immediate initiation of corrective action. This notice, when delivered to the Contractor or the Contractor's representative at the work site, shall be deemed sufficient notice of the noncompliance and that corrective action is required. After receiving the notice, the Contractor shall immediately take corrective action. If the Contractor fails or refuses to promptly take corrective action, the Contracting

Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. The Contractor shall not be entitled to any equitable adjustment of the contract price or extension of the performance schedule on any stop work order issued under this clause.

(e) The Contractor shall insert this clause, including this paragraph (e), with appropriate changes in the designation of the parties, in subcontracts.

(f) Before commencing the work, the Contractor shall-

(1) Submit a written proposed plan for implementing this clause. The plan shall include an analysis of the significant hazards to life, limb, and property inherent in contract work performance and a plan for controlling these hazards; and

(2) Meet with representatives of the Contracting Officer to discuss and develop a mutual understanding relative to administration of the overall safety program.

#### 52.236-15 SCHEDULES FOR CONSTRUCTION CONTRACTS (APR 1984)

(a) The Contractor shall, within five days after the work commences on the contract or another period of time determined by the Contracting Officer, prepare and submit to the Contracting Officer for approval three copies of a practicable schedule showing the order in which the Contractor proposes to perform the work, and the dates on which the Contractor contemplates starting and completing the several salient features of the work (including acquiring materials, plant, and equipment). The schedule shall be in the form of a progress chart of suitable scale to indicate appropriately the percentage of work scheduled for completion by any given date during the period. If the Contractor fails to submit a schedule within the time prescribed, the Contracting Officer may withhold approval of progress payments until the Contractor submits the required schedule.

(b) The Contractor shall enter the actual progress on the chart as directed by the Contracting Officer, and upon doing so shall immediately deliver three copies of the annotated schedule to the Contracting Officer. If, in the opinion of the Contracting Officer, the Contractor falls behind the approved schedule, the Contractor shall take steps necessary to improve its progress, including those that may be required by the Contracting Officer, without additional cost to the Government. In this circumstance, the Contracting Officer may require the Contractor to increase the number of shifts, overtime operations, days of work, and/or the amount of construction plant, and to submit for approval any supplementary schedule or schedules in chart form as the Contracting Officer deems necessary to demonstrate how the approved rate of progress will be regained.

(c) Failure of the Contractor to comply with the requirements of the Contracting Officer under this clause shall be grounds for a determination by the Contracting Officer that the Contractor is not prosecuting the work with sufficient diligence to ensure completion within the time specified in the contract. Upon making this determination, the Contracting Officer may terminate the Contractor's right to proceed with the work, or any separable part of it, in accordance with the default terms of this contract.

#### 52.236-17 LAYOUT OF WORK (APR 1984)

The Contractor shall lay out its work from Government established base lines and bench marks indicated on the drawings, and shall be responsible for all measurements in connection with the layout. The Contractor shall furnish, at its own expense, all stakes, templates, platforms, equipment, tools, materials, and labor required to lay out any part of the work. The Contractor shall be responsible for executing the work to the lines and grades that may be established or indicated by the Contracting Officer. The Contractor shall also be responsible for maintaining and preserving all stakes and other marks established by the Contracting Officer until authorized to remove them. If such marks are destroyed by the Contractor or through its negligence before their removal is authorized, the Contracting Officer may

replace them and deduct the expense of the replacement from any amounts due or to become due to the Contractor.

#### 52.236-21 SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION (FEB 1997)

(a) The Contractor shall keep on the work site a copy of the drawings and specifications and shall at all times give the Contracting Officer access thereto. Anything mentioned in the specifications and not shown on the drawings, or shown on the drawings and not mentioned in the specifications, shall be of like effect as if shown or mentioned in both. In case of difference between drawings and specifications, the specifications shall govern. In case of discrepancy in the figures, in the drawings, or in the specifications, the matter shall be promptly submitted to the Contracting Officer, who shall promptly make a determination in writing. Any adjustment by the Contractor without such a determination shall be at its own risk and expense. The Contracting Officer shall furnish from time to time such detailed drawings and other information as considered necessary, unless otherwise provided.

(b) Wherever in the specifications or upon the drawings the words "directed", "required", "ordered", "designated", "prescribed", or words of like import are used, it shall be understood that the "direction", "requirement", "order", "designation", or "prescription", of the Contracting Officer is intended and similarly the words "approved", "acceptable", "satisfactory", or words of like import shall mean "approved by," or "acceptable to", or "satisfactory to" the Contracting Officer, unless otherwise expressly stated.

(c) Where "as shown," as indicated", "as detailed", or words of similar import are used, it shall be understood that the reference is made to the drawings accompanying this contract unless stated otherwise. The word "provided" as used herein shall be understood to mean "provide complete in place," that is "furnished and installed".

(d) Shop drawings means drawings, submitted to the Government by the Contractor, subcontractor, or any lower tier subcontractor pursuant to a construction contract, showing in detail (1) the proposed fabrication and assembly of structural elements, and (2) the installation (i.e., fit, and attachment details) of materials or equipment. It includes drawings, diagrams, layouts, schematics, descriptive literature, illustrations, schedules, performance and test data, and similar materials furnished by the contractor to explain in detail specific portions of the work required by the contract. The Government may duplicate, use, and disclose in any manner and for any purpose shop drawings delivered under this contract.

(e) If this contract requires shop drawings, the Contractor shall coordinate all such drawings, and review them for accuracy, completeness, and compliance with contract requirements and shall indicate its approval thereon as evidence of such coordination and review. Shop drawings submitted to the Contracting Officer without evidence of the Contractor's approval may be returned for resubmission. The Contracting Officer will indicate an approval or disapproval of the shop drawings and if not approved as submitted shall indicate the Government's reasons therefor. Any work done before such approval shall be at the Contractor's risk. Approval by the Contracting Officer shall not relieve the Contractor from responsibility for any errors or omissions in such drawings, nor from responsibility for complying with the requirements of this contract, except with respect to variations described and approved in accordance with (f) below.

(f) If shop drawings show variations from the contract requirements, the Contractor shall describe such variations in writing, separate from the drawings, at the time of submission. If the Contracting Officer approves any such variation, the Contracting Officer shall issue an appropriate contract modification, except that, if the variation is minor or does not involve a change in price or in time of performance, a modification need not be issued.

(g) The Contractor shall submit to the Contracting Officer for approval four copies (unless otherwise indicated) of all shop drawings as called for under the various headings of these specifications. Three sets (unless otherwise indicated) of all shop drawings, will be retained by the Contracting Officer and one set will be returned to the Contractor.

52.236-26 PRECONSTRUCTION CONFERENCE (FEB 1995)

If the Contracting Officer decides to conduct a preconstruction conference, the successful offeror will be notified and will be required to attend. The Contracting Officer's notification will include specific details regarding the date, time, and location of the conference, any need for attendance by subcontractors, and information regarding the items to be discussed.

252.236-7000 MODIFICATION PROPOSALS - PRICE BREAKDOWN. (DEC 1991)

(a) The Contractor shall furnish a price breakdown, itemized as required and within the time specified by the Contracting Officer, with any proposal for a contract modification.

(b) The price breakdown --

(1) Must include sufficient detail to permit an analysis of profit, and of all costs for --

(i) Material;

(ii) Labor;

(iii) Equipment;

(iv) Subcontracts; and

(v) Overhead; and

(2) Must cover all work involved in the modification, whether the work was deleted, added, or changed.

(c) The Contractor shall provide similar price breakdowns to support any amounts claimed for subcontracts.

(d) The Contractor's proposal shall include a justification for any time extension proposed.

252.236-7001 CONTRACT DRAWINGS AND SPECIFICATIONS (AUG 2000)

(a) The Government will provide to the Contractor, without charge, one set of contract drawings and specifications, except publications incorporated into the technical provisions by reference, in electronic or paper media as chosen by the Contracting Officer.

(b) The Contractor shall--

(1) Check all drawings furnished immediately upon receipt;

(2) Compare all drawings and verify the figures before laying out the work;

(3) Promptly notify the Contracting Officer of any discrepancies;

(4) Be responsible for any errors that might have been avoided by complying with this paragraph (b); and

(5) Reproduce and print contract drawings and specifications as needed.

(c) In general--

(1) Large-scale drawings shall govern small-scale drawings; and

(2) The Contractor shall follow figures marked on drawings in preference to scale measurements.

(d) Omissions from the drawings or specifications or the misdescription of details of work that are manifestly necessary to carry out the intent of the drawings and specifications, or that are customarily performed, shall not relieve the Contractor from performing such omitted or misdescribed details of the work. The Contractor shall perform such details as if fully and correctly set forth and described in the drawings and specifications.

(e) The work shall conform to the specifications and the contract drawings identified on the following index of drawings:

Title	File	Drawing No.
See list of drawings at the end of this section.		

(End of clause)

#### 252.236-7004 PAYMENT FOR MOBILIZATION AND DEMOBILIZATION. (DEC 1991)

(a) The Government will pay all costs for the mobilization and demobilization of all of the Contractor's plant and equipment at the contract lump sum price for this item.

(1)        percent of the lump sum price upon completion of the contractor's mobilization at the work site.

(2) The remaining        percent upon completion of demobilization.

(b) The Contracting Officer may require the Contractor to furnish cost data to justify this portion of the bid if the Contracting Officer believes that the percentages in paragraphs (a) (1) and (2) of this clause do not bear a reasonable relation to the cost of the work in this contract.

(1) Failure to justify such price to the satisfaction of the Contracting Officer will result in payment, as determined by the Contracting Officer, of --

(i) Actual mobilization costs at completion of mobilization;

(ii) Actual demobilization costs at completion of demobilization; and

(iii) The remainder of this item in the final payment under this contract.

(2) The Contracting Officer's determination of the actual costs in paragraph (b)(1) of this clause is not subject to appeal.

#### 52.242-13 BANKRUPTCY (JUL 1995)

In the event the Contractor enters into proceedings relating to bankruptcy, whether voluntary or involuntary, the Contractor agrees to furnish, by certified mail or electronic commerce method authorized by the contract, written notification of the bankruptcy to the Contracting Officer responsible for administering the contract. This notification shall be furnished within five days of the initiation of the proceedings relating to bankruptcy filing. This notification shall include the date on which the bankruptcy petition was filed, the identity of the court in which the bankruptcy petition was filed, and a listing of Government contract numbers and contracting offices for all Government contracts against which final payment has not been made. This obligation remains in effect until final payment under this contract.

(End of clause)

#### 52.242-14 SUSPENSION OF WORK (APR 1984)

(a) The Contracting Officer may order the Contractor, in writing, to suspend, delay, or interrupt all or any part of the work of this contract for the period of time that the Contracting Officer determines appropriate for the convenience of the Government.

(b) If the performance of all or any part of the work is, for an unreasonable period of time, suspended, delayed, or interrupted (1) by an act of the Contracting Officer in the administration of this contract, or (2) by the Contracting Officer's failure to act within the time specified in this contract (or within a reasonable time if not specified), an adjustment shall be made for any increase in the cost of performance of this contract (excluding profit) necessarily caused by the unreasonable suspension, delay, or interruption, and the contract modified in writing accordingly. However, no adjustment shall be made under this clause for any suspension, delay, or interruption to the extent that performance would have been so suspended, delayed, or interrupted by any other cause, including the fault or negligence of the Contractor, or for which an equitable adjustment is provided for or excluded under any other term or condition of this contract. (c) A claim under this clause shall not be allowed (1) for any costs incurred more than 20 days before the Contractor shall have notified the Contracting Officer in writing of the act or failure to act involved (but this requirement shall not apply as to a claim resulting from a suspension order), and (2) unless the claim, in an amount stated, is asserted in writing as soon as practicable after the termination of the suspension, delay, or interruption, but not later than the date of final payment under the contract.

#### 52.243-4 CHANGES (AUG 1987)

(a) The Contracting Officer may, at any time, without notice to the sureties, if any, by written order designated or indicated to be a change order, make changes in the work within the general scope of the contract, including changes--

- (1) In the specifications (including drawings and designs);
- (2) In the method or manner of performance of the work;
- (3) In the Government-furnished facilities, equipment, materials, services, or site; or
- (4) Directing acceleration in the performance of the work.

(b) Any other written or oral order (which, as used in this paragraph (b), includes direction, instruction, interpretation, or determination) from the Contracting Officer that causes a change shall be treated as a change order under this clause; provided, that the Contractor gives the Contracting Officer written notice stating

- (1) the date, circumstances, and source of the order and
- (2) that the Contractor regards the order as a change order.

(c) Except as provided in this clause, no order, statement, or conduct of the Contracting Officer shall be treated as a change under this clause or entitle the Contractor to an equitable adjustment.

(d) If any change under this clause causes an increase or decrease in the Contractor's cost of, or the time required for, the performance of any part of the work under this contract, whether or not changed by any such order, the Contracting Officer shall make an equitable adjustment and modify the contract in writing. However, except for an adjustment based on defective specifications, no adjustment for any change

under paragraph (b) of this clause shall be made for any costs incurred more than 20 days before the Contractor gives written notice as required. In the case of defective specifications for which the Government is responsible, the equitable adjustment shall include any increased cost reasonably incurred by the Contractor in attempting to comply with the defective specifications.

(e) The Contractor must assert its right to an adjustment under this clause within 30 days after

(1) receipt of a written change order under paragraph (a) of this clause or (2) the furnishing of a written notice under paragraph (b) of this clause, by submitting to the Contracting Officer a written statement describing the general nature and amount of the proposal, unless this period is extended by the Government. The statement of proposal for adjustment may be included in the notice under paragraph (b) above.

(f) No proposal by the Contractor for an equitable adjustment shall be allowed if asserted after final payment under this contract.

#### 252.243-7001 PRICING OF CONTRACT MODIFICATIONS (DEC 1991)

When costs are a factor in any price adjustment under this contract, the contract cost principles and procedures in FAR part 31 and DFARS part 231, in effect on the date of this contract, apply.

#### 252.243-7002 REQUESTS FOR EQUITABLE ADJUSTMENT (MAR 1998)

(a) The amount of any request for equitable adjustment to contract terms shall accurately reflect the contract adjustment for which the Contractor believes the Government is liable. The request shall include only costs for performing the change, and shall not include any costs that already have been reimbursed or that have been separately claimed. All indirect costs included in the request shall be properly allocable to the change in accordance with applicable acquisition regulations.

(b) In accordance with 10 U.S.C. 2410(a), any request for equitable adjustment to contract terms that exceeds the simplified acquisition threshold shall bear, at the time of submission, the following certificate executed by an individual authorized to certify the request on behalf of the Contractor:

I certify that the request is made in good faith, and that the supporting data are accurate and complete to the best of my knowledge and belief.

-----  
(Official's Name)

-----  
(Title)

(c) The certification in paragraph (b) of this clause requires full disclosure of all relevant facts, including--

(1) Cost or pricing data if required in accordance with subsection 15.403-4 of the Federal Acquisition Regulation (FAR); and

(2) Information other than cost or pricing data, in accordance with subsection 15.403-3 of the FAR, including actual cost data and data to support any estimated costs, even if cost or pricing data are not required.

(d) The certification requirement in paragraph (b) of this clause does not apply to----

- (1) Requests for routine contract payments; for example, requests for payment for accepted supplies and services, routine vouchers under a cost-reimbursement type contract, or progress payment invoices; or
- (2) Final adjustment under an incentive provision of the contract.

#### 52.245-1 PROPERTY RECORDS (APR 1984)

The Government shall maintain the Government's official property records in connection with Government property under this contract. The Government Property clause is hereby modified by deleting the requirement for the Contractor to maintain such records.

#### 52.246-12 INSPECTION OF CONSTRUCTION (AUG 1996)

(a) Definition. "Work" includes, but is not limited to, materials, workmanship, and manufacture and fabrication of components.

(b) The Contractor shall maintain an adequate inspection system and perform such inspections as will ensure that the work performed under the contract conforms to contract requirements. The Contractor shall maintain complete inspection records and make them available to the Government. All work shall be conducted under the general direction of the Contracting Officer and is subject to Government inspection and test at all places and at all reasonable times before acceptance to ensure strict compliance with the terms of the contract.

(c) Government inspections and tests are for the sole benefit of the Government and do not--

- (1) Relieve the Contractor of responsibility for providing adequate quality control measures;
- (2) Relieve the Contractor of responsibility for damage to or loss of the material before acceptance;
- (3) Constitute or imply acceptance; or
- (4) Affect the continuing rights of the Government after acceptance of the completed work under paragraph (i) of this section.

(d) The presence or absence of a Government inspector does not relieve the Contractor from any contract requirement, nor is the inspector authorized to change any term or condition of the specification without the Contracting Officer's written authorization.

(e) The Contractor shall promptly furnish, at no increase in contract price, all facilities, labor, and material reasonably needed for performing such safe and convenient inspections and tests as may be required by the Contracting Officer. The Government may charge to the Contractor any additional cost of inspection or test when work is not ready at the time specified by the Contractor for inspection or test, or when prior rejection makes reinspection or retest necessary. The Government shall perform all inspections and tests in a manner that will not unnecessarily delay the work. Special, full size, and performance tests shall be performed as described in the contract.

(f) The Contractor shall, without charge, replace or correct work found by the Government not to conform to contract requirements, unless in the public interest the Government consents to accept the work with an appropriate adjustment in contract price. The Contractor shall promptly segregate and remove rejected material from the premises.

(g) If the Contractor does not promptly replace or correct rejected work, the Government may (1) by contract or otherwise, replace or correct the work and charge the cost to the Contractor or (2) terminate for default the Contractor's right to proceed.

(h) If, before acceptance of the entire work, the Government decides to examine already completed work by removing it or tearing it out, the Contractor, on request, shall promptly furnish all necessary facilities, labor, and material. If the work is found to be defective or nonconforming in any material respect due to the fault of the Contractor or its subcontractors, the Contractor shall defray the expenses of the examination and of satisfactory reconstruction. However, if the work is found to meet contract requirements, the Contracting Officer shall make an equitable adjustment for the additional services involved in the examination and reconstruction, including, if completion of the work was thereby delayed, an extension of time.

(i) Unless otherwise specified in the contract, the Government shall accept, as promptly as practicable after completion and inspection, all work required by the contract or that portion of the work the Contracting Officer determines can be accepted separately. Acceptance shall be final and conclusive except for latent defects, fraud, gross mistakes amounting to fraud, or the Government's rights under any warranty or guarantee.

#### 52.246-21 WARRANTY OF CONSTRUCTION (MAR 1994)

(a) In addition to any other warranties in this contract, the Contractor warrants, except as provided in paragraph (i) of this clause, that work performed under this contract conforms to the contract requirements and is free of any defect in equipment, material, or design furnished, or workmanship performed by the Contractor or any subcontractor or supplier at any tier.

(b) This warranty shall continue for a period of 1 year from the date of final acceptance of the work. If the Government takes possession of any part of the work before final acceptance, this warranty shall continue for a period of 1 year from the date the Government takes possession.

(c) The Contractor shall remedy at the Contractor's expense any failure to conform, or any defect. In addition, the Contractor shall remedy at the Contractor's expense any damage to Government-owned or controlled real or personal property, when that damage is the result of--

- (1) The Contractor's failure to conform to contract requirements; or
- (2) Any defect of equipment, material, workmanship, or design furnished.

(d) The Contractor shall restore any work damaged in fulfilling the terms and conditions of this clause. The Contractor's warranty with respect to work repaired or replaced will run for 1 year from the date of repair or replacement.

(e) The Contracting Officer shall notify the Contractor, in writing, within a reasonable time after the discovery of any failure, defect, or damage.

(f) If the Contractor fails to remedy any failure, defect, or damage within a reasonable time after receipt of notice, the Government shall have the right to replace, repair, or otherwise remedy the failure, defect, or damage at the Contractor's expense.

(g) With respect to all warranties, express or implied, from subcontractors, manufacturers, or suppliers for work performed and materials furnished under this contract, the Contractor shall--

- (1) Obtain all warranties that would be given in normal commercial practice;
- (2) Require all warranties to be executed, in writing, for the benefit of the Government, if directed by the Contracting Officer; and
- (3) Enforce all warranties for the benefit of the Government, if directed by the Contracting Officer.

(h) In the event the Contractor's warranty under paragraph (b) of this clause has expired, the Government may bring suit at its expense to enforce a subcontractor's, manufacturer's, or supplier's warranty.

(i) Unless a defect is caused by the negligence of the Contractor or subcontractor or supplier at any tier, the Contractor shall not be liable for the repair of any defects of material or design furnished by the Government nor for the repair of any damage that results from any defect in Government-furnished material or design.

(j) This warranty shall not limit the Government's rights under the Inspection and Acceptance clause of this contract with respect to latent defects, gross mistakes, or fraud.

(End of clause)

#### 52.247-63 PREFERENCE FOR U.S.-FLAG AIR CARRIERS (JAN 1997)

(a) "International air transportation," as used in this clause, means transportation by air between a place in the United States and a place outside the United States or between two places both of which are outside the United States.

"United States," as used in this clause, means the 50 States, the District of Columbia, the Commonwealth of Puerto Rico, and possessions of the United States.

"U.S.-flag air carrier", as used in this clause, means an air carrier holding a certificate under 49 U.S.C. Chapter 411.

(b) Section 5 of the International Air Transportation Fair Competitive Practices Act of 1974 (49 U.S.C. 40118) (Fly America Act) requires that all Federal agencies and Government contractors and subcontractors use U.S.-flag air carriers for U.S. Government-financed international air transportation of personnel (and their personal effects) or property, to the extent that service by those carriers is available. It requires the Comptroller General of the United States, in the absence of satisfactory proof of the necessity for foreign-flag air transportation, to disallow expenditures from funds, appropriated or otherwise established for the account of the United States, for international air transportation secured aboard a foreign-flag air carrier if a U.S.-flag air carrier is available to provide such services.

(c) The Contractor agrees, in performing work under this contract, to use U.S.-flag air carriers for international air transportation of personnel (and their personal effects) or property to the extent that service by those carriers is available.

(d) In the event that the Contractor selects a carrier other than a U.S.-flag air carrier for international air transportation, the Contractor shall include a statement on vouchers involving such transportation essentially as follows:

#### STATEMENT OF UNAVAILABILITY OF U.S.-FLAG AIR CARRIERS

International air transportation of persons (and their personal effects) or property by U.S.-flag air carrier was not available or it was necessary to use foreign-flag air carrier service for the following reasons (see section 47.403 of the Federal Acquisition Regulation): [State reasons]: \_\_\_\_\_

(End of statement)

(e) The Contractor shall include the substance of this clause, including this paragraph (e), in each subcontract or purchase under this contract that may involve international air transportation.

252.247-7023 TRANSPORTATION OF SUPPLIES BY SEA (MAR 2000)

(a) Definitions. As used in this clause --

(1) "Components" means articles, materials, and supplies incorporated directly into end products at any level of manufacture, fabrication, or assembly by the Contractor or any subcontractor.

(2) "Department of Defense" (DoD) means the Army, Navy, Air Force, Marine Corps, and defense agencies.

(3) "Foreign flag vessel" means any vessel that is not a U.S.-flag vessel.

(4) "Ocean transportation" means any transportation aboard a ship, vessel, boat, barge, or ferry through international waters.

(5) "Subcontractor" means a supplier, materialman, distributor, or vendor at any level below the prime contractor whose contractual obligation to perform results from, or is conditioned upon, award of the prime contract and who is performing any part of the work or other requirement of the prime contract.

(6) "Supplies" means all property, except land and interests in land, that is clearly identifiable for eventual use by or owned by the DoD at the time of transportation by sea.

(i) An item is clearly identifiable for eventual use by the DoD if, for example, the contract documentation contains a reference to a DoD contract number or a military destination.

(ii) "Supplies" includes (but is not limited to) public works; buildings and facilities; ships; floating equipment and vessels of every character, type, and description, with parts, subassemblies, accessories, and equipment; machine tools; material; equipment; stores of all kinds; end items; construction materials; and components of the foregoing.

(7) "U.S.-flag vessel" means a vessel of the United States or belonging to the United States, including any vessel registered or having national status under the laws of the United States.

(b)(1) The Contractor shall use U.S.-flag vessels when transporting any supplies by sea under this contract.

(2) A subcontractor transporting supplies by sea under this contract shall use U.S.-flag vessels if--

(i) This contract is a construction contract; or

(ii) The supplies being transported are--

(A) Noncommercial items; or

(B) Commercial items that--

(1) The Contractor is reselling or distributing to the Government without adding value (generally, the Contractor does not add value to items that it contracts for f.o.b. destination shipment);

(2) Are shipped in direct support of U.S. military contingency operations, exercises, or forces deployed in humanitarian or peacekeeping operations; or

(3) Are commissary or exchange cargoes transported outside of the Defense Transportation System in accordance with 10 U.S.C. 2643.

(c) The Contractor and its subcontractors may request that the Contracting Officer authorize shipment in

foreign-flag vessels, or designate available U.S.-flag vessels, if the Contractor or a subcontractor believes that --

- (1) U.S.-flag vessels are not available for timely shipment;
  - (2) The freight charges are inordinately excessive or unreasonable; or
  - (3) Freight charges are higher than charges to private persons for transportation of like goods.
- (d) The Contractor must submit any request for use of other than U.S.-flag vessels in writing to the Contracting Officer at least 45 days prior to the sailing date necessary to meet its delivery schedules. The Contracting Officer will process requests submitted after such date(s) as expeditiously as possible, but the Contracting Officer's failure to grant approvals to meet the shipper's sailing date will not of itself constitute a compensable delay under this or any other clause of this contract. Requests shall contain at a minimum --

- (1) Type, weight, and cube of cargo;
- (2) Required shipping date;
- (3) Special handling and discharge requirements;
- (4) Loading and discharge points;
- (5) Name of shipper and consignee;
- (6) Prime contract number; and
- (7) A documented description of efforts made to secure U.S.-flag vessels, including points of contact (with names and telephone numbers) with at least two U.S.-flag carriers contacted. Copies of telephone notes, telegraphic and facsimile message or letters will be sufficient for this purpose.

(e) The Contractor shall, within 30 days after each shipment covered by this clause, provide the Contracting Officer and the Division of National Cargo, Office of Market Development, Maritime Administration, U.S. Department of Transportation, Washington, DC 20590, one copy of the rated on board vessel operating carrier's ocean bill of lading, which shall contain the following information --

- (1) Prime contract number;
- (2) Name of vessel;
- (3) Vessel flag of registry;
- (4) Date of loading;
- (5) Port of loading;
- (6) Port of final discharge;
- (7) Description of commodity;
- (8) Gross weight in pounds and cubic feet if available;
- (9) Total ocean freight in U.S. dollars; and
- (10) Name of the steamship company.

(f) The Contractor agrees to provide with its final invoice under this contract a representation that to the best of its knowledge and belief --

(1) No ocean transportation was used in the performance of this contract;

(2) Ocean transportation was used and only U.S.-flag vessels were used for all ocean shipments under the contract;

(3) Ocean transportation was used, and the Contractor had the written consent of the Contracting Officer for all non-U.S.-flag ocean transportation; or

(4) Ocean transportation was used and some or all of the shipments were made on non-U.S.-flag vessels without the written consent of the Contracting Officer. The Contractor shall describe these shipments in the following format:

ITEM DESCRIPTION	CONTRACT LINE ITEMS	QUANTITY
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

TOTAL \_\_\_\_\_

(g) If the final invoice does not include the required representation, the Government will reject and return it to the Contractor as an improper invoice for the purposes of the Prompt Payment clause of this contract. In the event there has been unauthorized use of non-U.S.-flag vessels in the performance of this contract, the Contracting Officer is entitled to equitably adjust the contract, based on the unauthorized use.

(h) The Contractor shall include this clause, including this paragraph (h), in all subcontractors under this contract that--

(1) Exceed the simplified acquisition threshold in Part 2 of the Federal Acquisition Regulation; and

(2) Are for a type of supplies described in paragraph (b)(3) of this clause.

(End of clause)

252.247-7024 NOTIFICATION OF TRANSPORTATION OF SUPPLIES BY SEA (MAR 2000)

(a) The Contractor has indicated by the response to the solicitation provision, Representation of Extent of Transportation by Sea, that it did not anticipate transporting by sea any supplies. If, however, after the award of this contract, the Contractor learns that supplies, as defined in the Transportation of Supplies by Sea clause of this contract, will be transported by sea, the Contractor --

(1) Shall notify the Contracting Officer of that fact; and

(2) Hereby agrees to comply with all the terms and conditions of the Transportation of Supplies by Sea clause of this contract.

(b) The Contractor shall include this clause; including this paragraph (b), revised as necessary to reflect the relationship of the contracting parties--

(1) In all subcontracts under this contract, if this contract is a construction contract; or

(2) If this contract is not a construction contract, in all subcontracts under this contract that are for--

(i) Noncommercial items; or

(ii) Commercial items that--

(A) The Contractor is reselling or distributing to the Government without adding value (generally, the Contractor does not add value to items that it subcontracts for f.o.b. destination shipment);

(B) Are shipped in direct support of U.S. military contingency operations, exercises, or forces deployed in humanitarian or peacekeeping operations; or

(C) Are commissary or exchange cargoes transported outside of the Defense Transportation System in accordance with 10 U.S.C. 2643.

(End of clause)

52.248-3 VALUE ENGINEERING--CONSTRUCTION (FEB 2000) - ALTERNATE I (APR 1984)

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

(b) Definitions. "Collateral costs," as used in this clause, means agency costs 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 savings, whether or not the acquisition cost changes.

"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.

"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 logistic support. The term does not include the normal administrative costs of processing the VECP.

"Instant contract savings," as used in this clause, means the estimated reduction in Contractor cost of performance resulting from acceptance of the VECP, minus allowable Contractor's development and implementation costs, including subcontractors' development and implementation costs (see paragraph (h) below).

"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 contract price or estimated cost without impairing essential functions or characteristics; provided, that it does not involve a change--

(i) In deliverable end item quantities only; or

(ii) 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 (7) 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 that proposed, the comparative advantages and disadvantages of each, a justification when an item's function or characteristics are being altered, and the effect of the change on the end item's performance.

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

(3) 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 paragraph (h) below.

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

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

(6) 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.

(7) Identification of any previous submissions 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 Resident Engineer at the worksite, with a copy to the 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. The Contracting Officer may accept the VECP, even though an agreement on price reduction has not been reached, by issuing the Contractor a notice to proceed with the change. Until a notice to proceed is issued or a contract modification applies a VECP to this contract,

the Contractor shall perform in accordance with the existing contract. The decision to accept or reject all or part of any VECP is a unilateral decision made solely at the discretion of the Contracting Officer.

(f) Sharing.

(1) Rates. The Government's share of savings is determined by subtracting Government costs from instant contract savings and multiplying the result by (i) 45 percent for fixed-price contracts or (ii) 75 percent for cost-reimbursement contracts.

(2) Payment. Payment of any share due the Contractor for use of a VECP on this contract shall be authorized by a modification to this contract to--

(i) Accept the VECP;

(ii) Reduce the contract price or estimated cost by the amount of instant contract savings; and

(iii) Provide the Contractor's share of savings by adding the amount calculated to the contract price or fee.

(g) Subcontracts. The Contractor shall include an appropriate value engineering clause in any subcontract of \$50,000 or more and may include one in subcontracts of lesser value. In computing any adjustment in this contract's price under paragraph (f) above, the Contractor's allowable development and implementation costs shall include any subcontractor's allowable development and implementation costs clearly resulting from a VECP accepted by the Government under this contract, but shall exclude any value engineering incentive payments to a subcontractor. The Contractor may choose any arrangement for subcontractor value engineering incentive payments; provided, that these payments shall not reduce the Government's share of the savings resulting from the VECP.

(h) 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--Construction 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.)

(j) Collateral savings. If a VECP is accepted, the Contracting Officer will increase the instant contract amount 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 will not exceed the contract's firm-fixed-price or estimated cost, at the time the VECP is accepted, or \$100,000, whichever is greater. The Contracting Officer will be the sole determiner of the amount of collateral savings.

(End of clause)

52.249-2 TERMINATION FOR CONVENIENCE OF THE GOVERNMENT (FIXED-PRICE) (SEP 1996)  
- ALTERNATE I (SEP 1996)

(a) The Government may terminate performance of work under this contract in whole or, from time to time, in part if the Contracting Officer determines that a termination is in the Government's interest. The Contracting Officer shall terminate by delivering to the Contractor a Notice of Termination specifying the extent of termination and the effective date.

(b) After receipt of a Notice of Termination, and except as directed by the Contracting Officer, the Contractor shall immediately proceed with the following obligations, regardless of any delay in determining or adjusting any amounts due under this clause:

(1) Stop work as specified in the notice.

(2) Place no further subcontracts or orders (referred to as subcontracts in this clause) for materials, services, or facilities, except as necessary to complete the continued portion of the contract.

(3) Terminate all subcontracts to the extent they relate to the work terminated.

(4) Assign to the Government, as directed by the Contracting Officer, all right, title, and interest of the Contractor under the subcontracts terminated, in which case the Government shall have the right to settle or to pay any termination settlement proposal arising out of those terminations.

(5) With approval or ratification to the extent required by the Contracting Officer, settle all outstanding liabilities and termination settlement proposals arising from the termination of subcontracts; the approval or ratification will be final for purposes of this clause.

(6) As directed by the Contracting Officer, transfer title and deliver to the Government (i) the fabricated or unfabricated parts, work in process, completed work, supplies, and other material produced or acquired for the work terminated, and (ii) the completed or partially completed plans, drawings, information, and other property that, if the contract had been completed, would be required to be furnished to the Government.

(7) Complete performance of the work not terminated.

(8) Take any action that may be necessary, or that the Contracting Officer may direct, for the protection and preservation of the property related to this contract that is in the possession of the Contractor and in which the Government has or may acquire an interest.

(9) Use its best efforts to sell, as directed or authorized by the Contracting Officer, any property of the types referred to in subparagraph (b)(6) of this clause; provided, however, that the Contractor (i) is not required to extend credit to any purchaser and (ii) may acquire the property under the conditions prescribed by, and at prices approved by, the Contracting Officer. The proceeds of any transfer or disposition will be applied to reduce any payments to be made by the Government under this contract, credited to the price or cost of the work, or paid in any other manner directed by the Contracting Officer.

(c) The Contractor shall submit complete termination inventory schedules no later than 120 days from the effective date of termination, unless extended in writing by the Contracting Officer upon written request of the Contractor within this 120-day period.

(d) After expiration of the plant clearance period as defined in Subpart 45.6 of the Federal Acquisition Regulation, the Contractor may submit to the Contracting Officer a list, certified as to quantity and quality, of termination inventory not previously disposed of, excluding items authorized for disposition by the Contracting Officer. The Contractor may request the Government to remove those items or enter into an agreement for their storage. Within 15 days, the Government will accept title to those items and remove them or enter into a storage agreement. The Contracting Officer may verify the list upon removal of the items, or if stored, within 45 days from submission of the list, and shall correct the list, as necessary, before final settlement.

(e) After termination, the Contractor shall submit a final termination settlement proposal to the Contracting Officer in the form and with the certification prescribed by the Contracting Officer. The Contractor shall submit the proposal promptly, but no later than 1 year from the effective date of termination, unless extended in writing by the Contracting Officer upon written request of the Contractor within this 1-year period. However, if the Contracting Officer determines that the facts justify it, a termination settlement proposal may be received and acted on after 1 year or any extension. If the Contractor fails to submit the proposal within the time allowed, the Contracting Officer may determine, on the basis of information available, the amount, if any, due the Contractor because of the termination and shall pay the amount determined.

(f) Subject to paragraph (e) of this clause, the Contractor and the Contracting Officer may agree upon the whole or any part of the amount to be paid or remaining to be paid because of the termination. The amount may include a reasonable allowance for profit on work done. However, the agreed amount, whether under this paragraph (g) or paragraph (g) of this clause, exclusive of costs shown in subparagraph (g)(3) of this clause, may not exceed the total contract price as reduced by (1) the amount of payments previously made and (2) the contract price of work not terminated. The contract shall be modified, and the Contractor paid the agreed amount. Paragraph (g) of this clause shall not limit, restrict, or affect the amount that may be agreed upon to be paid under this paragraph.

(g) If the Contractor and Contracting Officer fail to agree on the whole amount to be paid the Contractor because of the termination of work, the Contracting Officer shall pay the Contractor the amounts determined as follows, but without duplication of any amounts agreed upon under paragraph (f) of this clause:

(1) For contract work performed before the effective date of termination, the total (without duplication of any items) of--

(i) The cost of this work;

(ii) The cost of settling and paying termination settlement proposals under terminated subcontracts that are properly chargeable to the terminated portion of the contract if not included in subdivision (g)(1)(i) of this clause; and

(iii) A sum, as profit on subdivision (g)(1)(i) of this clause, determined by the Contracting Officer under 49.202 of the Federal Acquisition Regulation, in effect on the date of this contract, to be fair and reasonable; however, if it appears that the Contractor would have sustained a loss on the entire contract had it been completed, the Contracting Officer shall allow no profit under this subdivision (iii) and shall reduce the settlement to reflect the indicated rate of loss.

(2) The reasonable costs of settlement of the work terminated, including--

(i) Accounting, legal, clerical, and other expenses reasonably necessary for the preparation of termination settlement proposals and supporting data;

(ii) The termination and settlement of subcontracts (excluding the amounts of such settlements); and

(iii) Storage, transportation, and other costs incurred, reasonably necessary for the preservation, protection, or disposition of the termination inventory.

(h) Except for normal spoilage, and except to the extent that the Government expressly assumed the risk of loss, the Contracting Officer shall exclude from the amounts payable to the Contractor under paragraph (g) of this clause, the fair value, as determined by the Contracting Officer, of property that is destroyed, lost, stolen, or damaged so as to become undeliverable to the Government or to a buyer.

(i) The cost principles and procedures of Part 31 of the Federal Acquisition Regulation, in effect on the date of this contract, shall govern all costs claimed, agreed to, or determined under this clause.

(j) The Contractor shall have the right of appeal, under the Disputes clause, from any determination made by the Contracting Officer under paragraph (e), (g), or (l) of this clause, except that if the Contractor failed to submit the termination settlement proposal or request for equitable adjustment within the time provided in paragraph (e) or (l), respectively, and failed to request a time extension, there is no right of appeal.

(k) In arriving at the amount due the Contractor under this clause, there shall be deducted--

(1) All unliquidated advance or other payments to the Contractor under the terminated portion of this contract;

(2) Any claim which the Government has against the Contractor under this contract; and

(3) The agreed price for, or the proceeds of sale of, materials, supplies, or other things acquired by the Contractor or sold under the provisions of this clause and not recovered by or credited to the Government.

(l) If the termination is partial, the Contractor may file a proposal with the Contracting Officer for an equitable adjustment of the price(s) of the continued portion of the contract. The Contracting Officer shall make any equitable adjustment agreed upon. Any proposal by the Contractor for an equitable adjustment under this clause shall be requested within 90 days from the effective date of termination unless extended in writing by the Contracting Officer.

(m)(1) The Government may, under the terms and conditions it prescribes, make partial payments and payments against costs incurred by the Contractor for the terminated portion of the contract, if the Contracting Officer believes the total of these payments will not exceed the amount to which the Contractor will be entitled.

(2) If the total payments exceed the amount finally determined to be due, the Contractor shall repay the excess to the Government upon demand, together with interest computed at the rate established by the Secretary of the Treasury under 50 U.S.C. App. 1215(b)(2). Interest shall be computed for the period from the date the excess payment is received by the Contractor to the date the excess is repaid. Interest shall not be charged on any excess payment due to a reduction in the Contractor's termination settlement proposal because of retention or other disposition of termination inventory until 10 days after the date of the retention or disposition, or a later date determined by the Contracting Officer because of the circumstances.

(n) Unless otherwise provided in this contract or by statute, the Contractor shall maintain all records and documents relating to the terminated portion of this contract for 3 years after final settlement. This includes all books and other evidence bearing on the Contractor's costs and expenses under this contract. The Contractor shall make these records and documents available to the Government, at the Contractor's office, at all reasonable times, without any direct charge. If approved by the Contracting Officer, photographs, microphotographs, or other authentic reproductions may be maintained instead of original records and documents.

#### 52.249-10 DEFAULT (FIXED-PRICE CONSTRUCTION) (APR 1984)

(a) If the Contractor refuses or fails to prosecute the work or any separable part, with the diligence that will insure its completion within the time specified in this contract including any extension, or fails to complete the work within this time, the Government may, by written notice to the Contractor, terminate the right to proceed with the work (or the separable part of the work) that has been delayed. In this event, the Government may take over the work and complete it by contract or otherwise, and may take possession of and use any materials, appliances, and plant on the work site necessary for completing the work. The Contractor and its sureties shall be liable for any damage to the Government resulting from the Contractor's refusal or failure to complete the work within the specified time, whether or not the

Contractor's right to proceed with the work is terminated. This liability includes any increased costs incurred by the Government in completing the work.

(b) The Contractor's right to proceed shall not be terminated nor the Contractor charged with damages under this clause, if--

(1) The delay in completing the work arises from unforeseeable causes beyond the control and without the fault or negligence of the Contractor. Examples of such causes include

(i) acts of God or of the public enemy,

(ii) acts of the Government in either its sovereign or contractual capacity,

(iii) acts of another Contractor in the performance of a contract with the Government,

(iv) fires,

(v) floods,

(vi) epidemics,

(vii) quarantine restrictions,

(viii) strikes,

(ix) freight embargoes,

(x) unusually severe weather, or delays of subcontractors or suppliers at any tier arising from unforeseeable causes beyond the control and without the fault or negligence of both the Contractor and the subcontractors or suppliers; and

(2) The Contractor, within 10 days from the beginning of any delay (unless extended by the Contracting Officer), notifies the Contracting Officer in writing of the causes of delay. The Contracting Officer shall ascertain the facts and the extent of delay. If, in the judgment of the Contracting Officer, the findings of fact warrant such action, the time for completing the work shall be extended. The findings of the Contracting Officer shall be final and conclusive on the parties, but subject to appeal under the Disputes clause.

(c) If, after termination of the Contractor's right to proceed, it is determined that the Contractor was not in default, or that the delay was excusable, the rights and obligations of the parties will be the same as if the termination had been issued for the convenience of the Government.

The rights and remedies of the Government in this clause are in addition to any other rights and remedies provided by law or under this contract.

#### 52.253-1 COMPUTER GENERATED FORMS (JAN 1991)

(a) Any data required to be submitted on a Standard or Optional Form prescribed by the Federal Acquisition Regulation (FAR) may be submitted on a computer generated version of the form, provided there is no change to the name, content, or sequence of the data elements on the form, and provided the form carries the Standard or Optional Form number and edition date.

(b) Unless prohibited by agency regulations, any data required to be submitted on an agency unique form prescribed by an agency supplement to the FAR may be submitted on a computer generated

version of the form provided there is no change to the name, content, or sequence of the data elements on the form and provided the form carries the agency form number and edition date.

(c) If the Contractor submits a computer generated version of a form that is different than the required form, then the rights and obligations of the parties will be determined based on the content of the required form.

#### S-28.10 OFFER GUARANTEE (APR 1984)

(a) Failure to furnish an offer guarantee in the proper form and amount, by the time set for receipt of proposals, may be cause for rejection of the offer.

(b) The offeror shall furnish an offer 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 offer guarantees, other than bid bonds, (1) to unsuccessful offeror upon execution of contractual documents and bonds (including any necessary coinsurance or reinsurance agreements), as required by the offer as accepted.

(c) If the successful offeror, upon acceptance of its offer 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) In the event that the contract is terminated for default, the offeror is liable for any cost of acquiring the work that exceeds the amount of its offer, and the offer guarantee is available to offset the difference.

(End of clause)  
(R 7-2003.25 1964 JUN)

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## SECTION 00800 Special Contract Requirements

### CLAUSES INCORPORATED BY FULL TEXT

#### S-36.9 AS-BUILT DRAWINGS (OCT 1999)

The Contractor shall keep on the job site two complete sets of drawings. These drawings will be identified as working 'As-Built' drawings and shall be used to record all changes from the original drawings and specifications, the exact 'As-Built' locations, sizes and types of equipment, etc. These working 'As-Built' drawings shall be corrected daily and the quality of draftsmanship shall be compatible with the draftsmanship of the original drawings.

The working As-Built drawings will be reviewed monthly by the Contracting Officer's Representative (COR) to assure satisfactory performance in maintaining an accurate and current recording of as-built conditions. Failure to maintain an accurate and current recording of as-built conditions, as determined by the COR, shall be cause for appropriate action by the Contracting Officer, including withholding a part of contract payment until such time as the deficiencies have been corrected.

At the final inspection or upon beneficial occupancy of the facility by the user, whichever comes first, the Contractor shall provide one of the two sets of working As-Built drawings to the COR for turnover with the facility. The Contractor shall continue to maintain the remaining set of working As-Built drawings until such time the COR expects no more additional changes and or modifications to the project. Contractor shall obtain a copy of the CADD files from the COR. Within 20 calendar days of receipt of a request by the COR, the Contractor shall submit to the Contracting Officer one (1) full set of CADD files in TYPE OF CADD FORMAT format on CD-ROM. The contractor modifications to the CADD files shall be completed with native TYPE OF CADD FORMAT vector graphic Commands. The as-built drawings shall be a record of the construction as installed and completed by the Contractor. They shall include all the information shown on the contract set of drawings and a record of all deviations, modifications, or changes from those drawings, however minor, which were incorporated in the work, all additional work not appearing on the contract drawings, and all changes which are made after final inspection of the contract work.

In the event the Contractor accomplishes additional work which changes the as-built conditions of the facility after submission of the as-built drawings, the Contractor shall furnish revised and/or additional drawings as required to depict as-built conditions. The requirements for these additional drawings will be the same as for the as-built drawings included in the original submission.

[End of Statement]

#### S-36.8 GROUND-FAULT CIRCUIT INTERRUPTERS

Ground-fault circuit interrupters for all 125-volt single phase 15- and 20-ampere receptacle outlets which are not part of the permanent wiring of the building or structure shall be provided by the Contractor in accordance with Section 305-6 of the 1999 National Electrical Code.

[End of Statement]

S-36.7 IDENTIFICATION OF EMPLOYEES

The Contractor shall be responsible for furnishing to each employee and for requiring each employee engaged on the work to display such identification as may be approved and directed by the Contracting Officer. All prescribed identification shall immediately be delivered to the Contracting Officer for cancellation upon the release of any employee. When required by the Contracting Officer, the Contractor shall obtain and submit fingerprints of all persons employed or to be employed on the project.

[End of Statement]

S-36.6 CERTIFICATES OF COMPLIANCE

Any certificates required for demonstrating proof of compliance of materials with specification requirements shall be executed in five (5) copies. Each certificate shall be signed by an official authorized to certify in behalf of the manufacturing company and shall contain the name and address of the Contractor, the project name and location, and the quantity and date or dates of shipment or delivery to which the certificates apply. Copies of laboratory test reports submitted with certificates shall contain the name and address of the testing laboratory and the date or dates of the tests to which the report applies. Certification shall not be construed as relieving the Contractor from furnishing satisfactory material, if after tests are performed on selected samples, the material is found not to meet the specific requirements.

[End of Statement]

S-36.5 TIME EXTENSIONS FOR UNUSUALLY SEVERE WEATHER

1. This provision specifies the procedure for determination of time extensions for unusually severe weather in accordance with the contract clause entitled DEFAULT (FIXED-PRICE CONSTRUCTION). In order for the Contracting Officer to award a time extension under this clause, the following conditions must be satisfied:

a. The weather experienced at the project site during the contract period must be found to be unusually severe, that is, more severe than the adverse weather anticipated for the project location during any given month.

b. The unusually severe weather must actually cause a delay to the completion of the project. The delay must be beyond the control and without the fault or negligence of the Contractor.

2. The following schedule of monthly anticipated adverse weather delays is based on National Oceanic and Atmospheric Administration (NOAA) or similar data for the project location and will constitute the base line for monthly weather time evaluations. The Contractor's progress schedule must reflect these anticipated adverse weather delays in all weather dependent activities.

MONTHLY ANTICIPATED ADVERSE WEATHER DELAY  
WORK DAYS BASED ON \*\*01 DAY WORK WEEK

JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC

3. Upon acknowledgment of the Notice to Proceed (NTP) and continuing throughout the contract, the Contractor will record on the daily CQC report, the occurrence of adverse weather and resultant impact to normally scheduled work. Actual adverse weather delay days must prevent work on critical activities for 50 percent or more of the Contractor's scheduled work day. The number of actual adverse weather delay days shall include days impacted by actual adverse weather (even if adverse weather occurred in previous month), be calculated chronologically from the first to the last day of each month, and be recorded as full days. If the number of actual adverse weather delay days exceeds the number of days anticipated in paragraph 2, above, the Contracting Officer will convert any qualifying delays to calendar days, giving full consideration for equivalent fair weather work days, and issue a modification in accordance with the contract clause entitled DEFAULT (FIXED-PRICE CONSTRUCTION). [ER 415-1-15, 31 Oct 89]

#### S-36.34 VEHICLE REGISTRATION

1. All vehicles operating on Army Installations must have a valid registration, valid certificate of insurance, current safety inspection and be operated by a licensed driver. Vehicle operators shall be prepared to present these documents when requested by the security guard.
2. Contractor vehicles utilized in performance of the contract shall be registered with the Installation Provost Marshal for entry into any Army Installation. This includes contractor employees' privately-owned vehicles (POVs) used to travel to and from the job site. Employees will be allowed to register only one vehicle. It shall be the sole responsibility of the contractor to register vehicles with the Provost Marshal.
3. Prior to contract performance, the contractor shall provide the Contracting Officer with a list of company-owned vehicles, employee POVs, and any subcontractor vehicles to be registered. The Contracting Officer will prepare a request for vehicle registration to the Provost Marshal. Upon receipt of the signed request the contractor shall report directly to the Provost Marshal for vehicle registration. Contractor employees must report in person for registration of their POVs. The following documents will be required to be presented to the Provost Marshal for vehicle registration:
  - a. Contracting Officer's request for vehicle registration.
  - b. Valid Vehicle registration
  - c. Valid Certificate of Insurance
  - d. Current Safety Inspection
  - e. Valid driver's license
4. At any time contractor employees (or subcontractor employees) are operating contractor-owned vehicles on an Army Installation, they shall have in their possession a letter signed by a corporate officer authorizing the individual to drive the vehicle.
5. The Contracting Officer and the Provost Marshal office shall be notified of any changes in vehicles within three business days of the change.
6. In the event the Provost Marshal issues extended passes for vehicles, lost passes shall be reported immediately, in writing, to the appropriate Provost Marshal Office, in order to obtain new passes. Notification shall include all circumstances surrounding the loss of the original passes. All vehicle passes issued shall be returned to the Provost Marshal upon completion of the contract, termination of an employee or discontinued use of the registered vehicles.

7. Failure to follow the procedures outlined above may result in delays in entering Army Installations. The Government is not responsible for any adverse impact on the contractor or its operation as a result of delays due to the failure to register vehicles.

#### S-36.22 NOTICE OF PARTNERING

The Government intends to encourage the foundation of a cohesive partnering arrangement with the contractor and its subcontractors. This partnering arrangement will be structured to draw on the strengths of each organization to identify and achieve reciprocal goals. The objectives are effective and efficient contract performance intended to achieve completion within budget, on schedule, and in accordance with contract plans and specifications. This partnering arrangement will be bilateral in membership. To implement this partnering initiative, it is anticipated that within 60-days of Notice to Proceed, the contractor and Government management teams to include on-site and off-site management will attend a 2 day partnering development seminar/team building workshop. Any costs associated with the partnering workshop, excluding salaries, travel, lodging, and food for Government personnel, shall be borne by the contractor. The facilitator for the workshop shall be an objective and neutral third party participant, skilled in team building and group dynamics, who has no vested interest in the decisions reached by the group. Up to 20 Government personnel will attend this workshop. The partnering workshop will be held in Kwajalein at a date to be determined later.

[End of Statement]

#### S-36.21 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, 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.

(c) Schedule of utilities available from the Government without charge: **connections to water and electricity lines can be made, however, metering is required.**

[End of Statement]

#### S-36.20 PERFORMANCE OF WORK BY THE CONTRACTOR - DEFINED (NOV 1998)

(a) "Work," means physical work activities, involving any of the trades required to directly place the construction required by the contract. It also includes physical activities that directly support the work, such as: (1) warehousing; (2) maintenance of equipment; (3) procurement and transportation of supplies or construction materials to the site for use by the contractor; (4)

procuring, transporting and providing equipment for use by the contractor; (5) logistical activities that directly support the contractor's employees; and (6) similar activities. The meaning of the term does not include: (1) physical work performed by subcontractors; (2) procurement and transportation of supplies or construction materials to the site for use by subcontractors; (3) procuring, transporting and providing equipment for use by subcontractors; logistical activities undertaken by subcontractors for the benefit of contractor or subcontractor employees; (4) superintendence, quality control, clerical or similar activities; or (5) other activities of a similar nature.

Work will be quantified in terms of its monetary cost to the contractor, and will be compared to the total direct costs that the contractor incurs in performing the contract.

(b) "On the site" means the area within the construction limits depicted or described in the contract drawings or specifications. Activities such as transportation, maintenance and logistics that take place outside of the construction limits depicted or described are still "on the site," if in direct support of activities within the construction limits.

(c) "The contractor's own organization" means those individuals who are employed and paid by the contractor, whether full or part time. If a joint venture or partnership, members (and their paid employees) of the joint venture or partners are considered part of "the contractor's own organization." If a corporation, wholly-owned subsidiary elements of the corporation and their paid employees, are considered part of "the contractor's own organization." Any individual who is employed or paid, even on an occasional basis by an entity other than the contractor (such as a subcontractor), or any subcontractor or supplier to the contractor, is not considered part of "the contractor's own organization."

[End of Statement]

#### S-36.19 PROGRESS CHARTS

If the Government revises the work to be accomplished by issuing a Notice to Proceed with a change to the contract which would affect the order of work or duration of time for completing the work, the progress chart prepared by the Contractor pursuant to the Contract Clause entitled 'SCHEDULE FOR CONSTRUCTION CONTRACTS' shall be revised promptly by the Contractor by adding to, deleting, or rescheduling the affected features to indicate the Contractor's current plans for completing the work as revised. The cost for this revision of the schedule is a part of the cost of the change. Revisions to the progress charts shall be made no later than the next regular progress updating following notice to proceed with the change, whether or not the formal modification to the contract has been issued. If the Contractor fails or refuses to incorporate the changed work in the progress chart, the Contracting Officer may furnish revisions which the Contractor shall include and use in the progress chart until the modification is settled or until actual dates supersede the estimated data. If the Contractor objects to the changes furnished by the Contracting Officer, it shall submit such objections in writing along with a counterplan within 20 days after the date suggested revisions were furnished by the Contracting Officer. Failure to submit objections and counterplan within the 20 days will be deemed to indicate the Contractor's concurrence in the Contracting Officer's suggested revisions. The schedule into which these revisions have been incorporated shall become the current schedule for continued evaluation of progress and the document which will be used to evaluate impact on the Contractor's work for time extensions.

[End of Statement]

#### S-36.18 ACCIDENT PREVENTION PLAN (DEC 1998)

Within 15 days after receipt of Notice of Award of the contract, and at least 7 days prior to the preconstruction conference, four copies of the Accident Prevention Program shall be submitted to the Contracting Officer for review and acceptance. The program shall consist of the following forms and documents:

(a) An executed POD Form 248-R Rev (1 Jun 98), Accident Prevention Program, Administrative Plan.

(b) An executed POD Form 184-R Rev (16 Oct 98), Activity Hazard Analysis. (At the Contracting Officer's discretion, the Contractor may submit its Activity Hazard Analysis only for the first phase of construction provided that it is accompanied by an outline of the remaining phases of construction. All remaining phases shall be submitted and accepted prior to the beginning of work in each phase.)

(c) A copy of company policy statement of accident prevention and any other guidance statements normally provided new employees.

Contractor shall not commence physical work at the site until the program has been accepted by the Contracting Officer, or his authorized representative. In developing and implementing its Accident Prevention Program, the Contractor is also responsible for reviewing Section 1 of the most current edition (Sep 1996) of US Army Corps of Engineers Safety and Health Requirements Manual, Engineer Manual 385-1-1. [See paragraph entitled, SAFETY STANDARDS, in Section 00800]

[End of Statement]

#### S-36.17 EQUIPMENT OWNERSHIP AND OPERATING EXPENSE SCHEDULE (AUG 1999)

Whenever a contract or modification of contract price is negotiated, the Contractor's cost proposals for equipment ownership and operating expenses shall be determined in accordance with the requirements of Special Contract Requirements statement, entitled "EQUIPMENT OWNERSHIP AND OPERATING EXPENSE SCHEDULE," of this solicitation. EP 1110-1-8 "Construction Equipment Ownership and Operating Expense Schedule" is available at [http://www.usace.army.mil/inet/usace-docs/eng-pamphlets/ep1110-1-8\(vol10\)/toc.htm](http://www.usace.army.mil/inet/usace-docs/eng-pamphlets/ep1110-1-8(vol10)/toc.htm) for State of Hawaii (Region 10) and at [http://www.usace.army.mil/inet/usace-docs/eng-pamphlets/ep1110-1-8\(vol12\)/toc.htm](http://www.usace.army.mil/inet/usace-docs/eng-pamphlets/ep1110-1-8(vol12)/toc.htm) for Kwajalein Island, Roi-Namur Island, and Meck Island (Area 12), including Guam, American Samoa, and Johnston Island). [FAR 31.105(d)(2)(i) and EFARS 31.105(d)(2)(i)(b)].

[End of Statement]

#### S-36.12 PROJECT SIGN

A project sign shall be fabricated and erected at a location designated by the Contracting Officer. The sign shall be constructed as shown on Drawing No. 40-21-06 copies of which are provided at the end of this section. The sign shall be erected as soon as possible and within 15 days after the date of notice to proceed. Upon completion of the project, the sign shall be removed and disposed of.

[End of Statement]

#### S-36.11 POSTERS AND NOTICES

Wage Rate, Equal Employment Opportunity, and Nondiscrimination in Employment Posters and Notices will be provided to the Contractor by the Contracting Officer. The Contractor shall mount these posters and notices, together with the wage determination decision, under weatherproof, transparent, protective covering, in one or more conspicuous places, as approved, and readily available to employees.

[End of Statement]

S-36.10 WARRANTY IMPLEMENTATION (MARCH 2000)

(a) The Contractor shall designate a representative within the State of Hawaii to implement the Warranty of Construction clause. The Contractor may designate himself provided he has a permanent office in the State of Hawaii. The Contractor may designate different representatives for separate specialties of work.

(b) The name, address, telephone number of each representative, and nomenclature of warranty item shall be submitted to the Contracting Officer's representative at least 30 days prior to the contract completion date or beneficial occupancy of the work or part thereof. For the purposes of paragraph f of the warranty clause, a reasonable time shall be considered to be as follows:

(1) 21 calendar days from the receipt of a written notification of any failure, defect, or damage of such nature that the work remains functional or habitable or both, as applicable.

(2) 24 hours for failures, defects or damages which render the work nonfunctional or uninhabitable or both, as applicable. Response in this instance starts from receipt of verbal notification from an authorized Government representative. Written confirmation will follow the initial verbal request.

[End of Statement]

S-28.8 PERFORMANCE AND PAYMENT BONDS (OCT 1995)

(Applicable to contracts exceeding \$100,000)

Within fourteen (14) calendar days after the date of contract award, the bidder to whom award is made shall furnish the Government with two bonds, each with good and sufficient surety or sureties acceptable to the Government; namely, a Performance Bond (Standard Form 25) and a Payment Bond (Standard Form 25-A).

Any bonds furnished will be furnished by the Contractor to the Government prior to issuance of a Notice to Proceed by the Government. [FAR 28.102-3]

[End of Statement]

S-28.6 REQUIRED INSURANCE

A. The contractor shall provide and maintain, during the entire performance of this contract, at least the following kinds and amounts of insurance pursuant to the clause in Section 00700 entitled "Insurance--Work On A Government Installation":

Type	Amount
1. Comprehensive General Liability	\$500,000 per occurrence
2. Comprehensive Automobile Liability:	
(a) Bodily Injury or Death	\$200,000 per person \$500,000 per occurrence
(b) Property Damage	\$20,000 per occurrence

B. Additionally the contractor shall provide, before commencing performance under this contract, such workers' compensation insurance or security as the Defense Base Act (42 U.S.C. 1651, et seq.) requires and continue to maintain it until performance is completed pursuant to the clause in 00700 entitled "Workers' Compensation Insurance (Defense Base Act)".

C. Before commencing performance under this contract, the contractor shall submit to the Contracting Officer a written certification that the insurance or security required under the foregoing paragraphs has been obtained along with the evidence thereof.

D. The contractor shall insert this clause in all subcontracts under this contract.

[End of Statement]

S-19 SAFETY STANDARDS

The successful offeror will be required to comply with Chapter 396 of the Hawaii Occupational Safety and Health Act (OSHA) standards and Title 12 Department of Labor and Industrial Relations, Subtitle 8 Division of Occupational Safety and Health, Part 2 General Industry Standards as well as with the Corps of Engineers Manual 385-1-1, Safety and Health Requirements Manual. [Title 29, CFR, Chap 18, Part 1910 (OSHA)]

[End of Statement]

S-19A U.S. ARMY CORPS OF ENGINEERS SAFETY AND HEALTH REQUIREMENTS MANUAL, EM 385-1-1 (FEB 01)

This paragraph applies to contracts and purchase orders that require the contractor to comply with EM 385-1-1 (e.g., contracts that include the Accident Prevention clause at FAR 52.236-13 and/or other safety provisions.) EM 385-1-1 and its changes are available at the following web site:

[http://www.hq.usace.army.mil/soh/hqusace\\_soh.htm](http://www.hq.usace.army.mil/soh/hqusace_soh.htm)

The Contractor shall be responsible for complying with the current edition and all changes posted on the web as of the effective date of this solicitation.

[End of Statement]

## S-1a REPORTING OF CONTRACTOR MANPOWER DATA ELEMENTS (FEB 2001)

(a) Scope. The following sets forth contractual requirements for reporting of contractor labor work year equivalents (also called Contractor Man-year Equivalents (CMEs)) in support of the Army, pursuant to 10 U.S.C. 129a, 10 U.S.C. 2461(g), Section 343 of P.L. 106-65, and 32 CFR 668. Reporting shall be accomplished electronically by direct contractor submission to the secure Army Web Site: <https://contractormanpower.us.army.mil>. (Note: In order to access this secure site, the Windows browser software must be upgraded to support 128-bit encryption)

Information on the background, purposes, and significance of this reporting requirement, and the 32 CFR 668 Final Rule as published in the Federal Register, can be found at this Web Site. In addition, a Help Desk function, detailed instructions on what and how to report, FAQs, and a site demonstration are available. The Army's objective is to collect as much significant CME data as possible to allow accurate reporting to Congress and for effective Army planning. The reporting data elements should not be viewed as an "all or nothing" requirement. Even partial reporting, e.g., direct labor hours, appropriation data, place of performance, Army customer, etc., will be helpful.

(b) Applicability. This reporting requirement applies to services covered by Federal Supply Class or Service codes for "Research and Development," and "Other Services and Construction." Report submissions shall not contain classified information. (Also see "Exemptions" at (d) below.)

For indefinite-delivery indefinite-quantity contracts, this reporting requirement will only apply to task orders exceeding \$25,000.

(c) Requirements. The contractor is required to report the following contractor manpower information, associated with performance of this contract action in support of Army requirements, for all covered contracts, to the Office, Assistant Secretary of the Army (Manpower and Reserve Affairs) (ASA(M&RA)), using the secure Army data collection web-site at <https://contractormanpower.us.army.mil>. (Other information requirements associated with the manpower data collection (contract and task or delivery order numbers; appropriation data and amounts; total estimated value of contract; federal supply class or service code; major Army organizational element receiving or reviewing work; beginning and ending date for reporting period; place of performance; name, address, and point of contract for contractor; etc.) are specified and explained at the web site.)

(1) Labor Hours. Composite direct labor hours and the value of those hours. Composite indirect labor hours associated with the reported direct hours, and the value of those indirect labor hours plus compensation related costs for direct labor hours ordinarily included in the indirect pools.

(2) Rates. Alternatively, contractors may report two distinct, relevant (annualized) composite or average indirect labor rates in lieu of raw indirect labor hours and the value of those indirect hours. Such rates shall be annualized average estimates for the reporting contractor and need not be developed for each reporting period. Either method chosen should be consistently reported.

(d) Exemption(s). If the contractor is unable to comply with these reporting requirements without creating a whole new cost allocation system or system of records (such as a payroll accounting system), or due to similar insurmountable practical or economic reasons, the contractor may claim an exemption to at least a portion of the reporting requirement by certifying in writing to the contracting officer the clear underlying reason(s) for exemption from the specified report data element(s), and further certifying that they do not otherwise have to provide the exempted

information, in any form, to the United States Government. The "self-exemption" will apply to all contract actions involving the contractor and will be reviewed and approved by the Deputy Assistant Secretary of the Army (Procurement), in coordination with the Deputy Assistant Secretary of the Army (Force Management and Resources), whose decision is final in this matter.

(e) Uses and Safeguarding of Information. The information submitted will be treated as contractor proprietary information when associated with a contractor name or contract number.

(f) Subcontract Data. The contractor shall ensure that all reportable subcontract data is timely reported to the data collection web site (citing this contract/order number). At the discretion of the prime contractor, this reporting may be done directly by subcontractors to the data collection site; or by the prime contractor after consolidating and rationalizing all significant data from their subcontractors.

(g) Report schedule. The contractor is required to report the required information to the ASA(M&RA) data collection web site generally contemporaneous with submission of a request for payment (for example, voucher, invoice, or request for progress payment), but not less frequently than quarterly, retroactive to October 1, 1999, or the start of the contract/order, whichever is later. Deviation from this schedule requires approval of the contracting officer.

**The contractor shall include a statement in their payment request that Contractor Manpower Reporting has been completed by their firm and applicable subcontractors. Government officials will verify prime contractor and subcontractor compliance with the reporting requirement. Compliance with this requirement is an integral part of the performance of this contract and will be reflected in the performance evaluation of this contract.**

(h) Reporting Flexibility. Contractors are encouraged to communicate with the Help Desk identified at the data collection web site to resolve reporting difficulties. The web site reporting pages include a "Remarks" field to accommodate non-standard data entries if needed to facilitate simplified reporting and to minimize reporting burdens arising out of unique circumstances. Changes to facilitate reporting may be authorized by the contracting officer or the Help Desk (under HQDA policy direction and oversight). Help Desk may be contacted as follows:

Technical Help Desk: (703) 790-5289 or e-mail to: [contractormanpowertech@hqda.army.mil](mailto:contractormanpowertech@hqda.army.mil)  
Functional Help Desk: e-mail to: [contractormanpowertech@hqda.army.mil](mailto:contractormanpowertech@hqda.army.mil)

[End of Statement]

52.231-5000 EQUIPMENT OWNERSHIP AND OPERATING EXPENSE SCHEDULE.

EQUIPMENT OWNERSHIP AND OPERATING EXPENSE SCHEDULE (MAR 1995) — EFARS

(a) This clause does not apply to terminations. See 52.249-5000, Basis for settlement of proposals and FAR Part 49.

(b) Allowable cost for construction and marine plant and equipment in sound workable condition owned or controlled and furnished by a contractor or subcontractor at any tier shall be based on actual cost data for each piece of equipment or groups of similar serial and series for which the Government can determine both ownership and operating costs from the contractor's accounting records. When both ownership and operating costs cannot be determined for any piece of equipment or groups of similar serial or series equipment from the contractor's accounting records, costs for that equipment shall be based upon the applicable provisions of EP 1110-1-8, Construction Equipment Ownership and Operating Expense Schedule, Region *[insert Roman numeral for the appropriate region of the schedule]*. Working conditions shall be considered to be

average for determining equipment rates using the schedule unless specified otherwise by the contracting officer. For equipment not included in the schedule, rates for comparable pieces of equipment may be used or a rate may be developed using the formula provided in the schedule. For forward pricing, the schedule in effect at the time of negotiations shall apply. For retroactive pricing, the schedule in effect at the time the work was performed shall apply.

(c) Equipment rental costs are allowable, subject to the provisions of FAR 31.105(d)(ii) and FAR 31.205-36. Rates for equipment rented from an organization under common control, lease-purchase arrangements, and sale-leaseback arrangements, will be determined using the schedule, except that actual rates will be used for equipment leased from an organization under common control that has an established practice of leasing the same or similar equipment to unaffiliated lessees.

(d) When actual equipment costs are proposed and the total amount of the pricing action exceeds the small purchase threshold, the contracting officer shall request the contractor to submit either certified cost or pricing data, or partial/limited data, as appropriate. The data shall be submitted on Standard Form 1411, Contract Pricing Proposal Cover Sheet.

(End of clause)

#### 52.249-5000 BASIS FOR SETTLEMENT OF PROPOSALS.

##### BASIS FOR SETTLEMENT OF PROPOSALS

"Actual costs will be used to determine equipment costs for a settlement proposal submitted on the total cost basis under FAR 49.206-2(b). In evaluating a terminations settlement proposal using the total cost basis, the following principles will be applied to determine allowable equipment costs:

(1) Actual costs for each piece of equipment, or groups of similar serial or series equipment, need not be available in the contractor's accounting records to determine total actual equipment costs.

(2) If equipment costs have been allocated to a contract using predetermined rates, those charges will be adjusted to actual costs.

(3) Recorded job costs adjusted for unallowable expenses will be used to determine equipment operating expenses.

(4) Ownership costs (depreciation) will be determined using the contractor's depreciation schedule (subject to the provisions of FAR 31.205-11).

(5) License, taxes, storage and insurance costs are normally recovered as an indirect expense and unless the contractor charges these costs directly to contracts, they will be recovered through the indirect expense rate."

(End of Statement)

#### K-6 UTILITY OUTAGES

Interruptions to existing utilities shall be held to a minimum. Outages to facilitate connections to existing systems shall be scheduled to take place during periods of minimum demand and during non-mission periods, at no additional cost to the Government. Due to the sensitivity of mission related computers and instrumentation, any contract electrical work or testing which includes any risk of an electrical interruption shall require the contractor to schedule for an electrical outage.

a. Prior to beginning work, the contractor shall submit to the Contracting Officer a master plan schedule for all utility outages anticipated to be required during the contract performance period. As a minimum, the master plan schedule shall be keyed to the contractor's progress schedule and include the following outage details:

- (1) Narrative of work activities requiring an outage.
- (2) Approximate date of each outage.
- (3) Anticipated duration of each outage.

b. The contractor shall specify in the master plan schedule the name of an on site company representative who will be the designated point of contact (POC) for the follow-on coordination of specific utility outages during construction. During the follow-on coordination for each outage, the contractor's POC shall be responsible to ensure that all outage details, to include affected facilities and specific dates, time and duration, are coordinated with the USAKA Logistics Contractor's Utilities Manager and all affected users. This coordination effort shall be documented by using a form format similar to the 'Utility Outage Coordination Record', which is included as an attachment at the end of this section. The completed document must be submitted to the Contracting Officer not less than 10 days in advance of the intended outage.

c. No outage will be permitted without the Contracting Officer's Approval. Subsequent to this approval, the contractor shall arrange for announcements of the outage to be carried by local media sources.

[End of Statement]

#### K-7 UTILIZATION OF MARSHALL ISLANDS SUBCONTRACTORS AND EMPLOYMENT OF MARSHALL ISLANDS PERSONNEL (March 1999)

(a) In accordance with Article IV, "Utilization of Contractors and Employment of Labor," of the Status of Forces Agreement (the SOFA) concluded pursuant to Section 323 of the Compact of Free Association (Title II of the Compact of Free Association Act of 1985, Pub. L. 99- 239), employment preference shall be given by the Contractor, without discrimination, to citizens, nationals, and permanent resident aliens of the Marshall Islands and of the United States. Subcontracts placed under this contract shall reference Article IV of the SOFA and include a statement that the employment preference provisions of Paragraph 1(a), Article IV of the SOFA apply to persons hired under the subcontract. Furthermore, for its subcontracts, the Contractor shall utilize without discrimination, consistent with the laws and regulations of the United States, qualified local contractors and contractors which are legally entities of the United States. Subcontracts placed under this contract shall include a statement that subcontractors, for their subcontracts, shall utilize without discrimination, consistent with the laws and regulations of the United States, qualified local contractors and contractors which are legal entities of the United States.

(b) The Contractor hereby agrees to carry out the policy stated in subparagraph (a) above in the awarding of subcontracts and in the hiring of labor to the fullest extent practicable. The Contractor further agrees to cooperate in any studies or surveys that may be conducted by the United States and/or the Republic of the Marshall Islands as may be necessary to determine the extent of the Contractor's compliance with this clause.

(c) Definitions. For the purposes of this clause, the following terms shall have the following meanings:

- (1) The term, local contractor means a local firm incorporated in the Marshall Islands , or otherwise legally organized under the laws of the Marshall Islands, that--

- (i) Is more than 50 percent owned by citizens of the Marshall Islands; or
- (ii) Complies with the following:

(A) The firm has done business in the Marshall Islands on a continuing basis for not less than 3 years prior to the date of issuance of this solicitation;

(B) Substantially all of the firm's directors of local operations, senior staff, and operating personnel are resident in the Marshall Islands or are U.S. citizens; and

(C) Most of the operating equipment and physical plant are in the Marshall Islands.

(2) The term, United States contractor, means a firm incorporated in the United States that complies with the following:

(i) The corporate headquarters are in the United States;

(ii) The firm has filed corporate and employment tax returns in the United States for a minimum of 2 years (if required), has filed State and Federal income tax returns (if required) for 2 years, and has paid any taxes due as a result of these filings; and

(iii) The firm employs United States citizens in key management positions; or which is otherwise an entity (such as but not limited to a sole proprietorship, joint venture or other partnership), legally organized and existing under the laws of the United States, its territories or possessions, the majority ownership interest in which is held by an entity (or entities) which (1) have their business headquarters in the United States, (2) have filed income and employment tax returns in the United States for a minimum of two years (if required), have filed state and federal income tax returns (if required) for two years, and have paid any taxes due as a result of these filings; and (3) employ United States citizens in key management positions.

(3) The term "Marshall Islands personnel" means citizens, nationals and lawfully admitted permanent resident aliens of the Republic of the Marshall Islands.

(4) The term "the Contract" means this contract.

(5) The term "subcontract" means any agreement (other than one involving an employer-employee relationship) entered into by the Contractor or any subcontractor calling for supplies or services required for performance of the Contract or any of its subcontracts.

(6) The term "the Plan" means the Subcontracting and Hiring Plan described in this clause.

(7) The term "failed to make good faith effort to comply with the Plan" means a willful or intentional failure to perform in accordance with the requirements of the Subcontracting and Hiring Plan approved under this clause.

(d) For the purposes of compliance with this clause only, contractors acting in good faith may rely on written representations by their subcontractors regarding their status as local contractors, and on written representations by their employees regarding their citizenship and/or alien status.

(e) Prior to receiving award of any contract, resulting from this solicitation, the apparently successful offeror must submit for the Contracting Officer's approval a Subcontracting and Hiring Plan (the Plan) which addresses the contractor's plan as to how it will subcontract and employ, as much as reasonably practicable, local contractors and Marshall Islands personnel. The Plan should separately describe the contractor's plan for subcontracting and employing local contractors and Marshall Islands personnel, broken down between the basic contract and any options, if options are included in the solicitation. No award will be made to the apparently successful offeror unless and until it submits a Plan that is satisfactory to and approved by the Contracting Officer.

(f) The Plan shall include the following:

(1) Goals, expressed in terms of percentages of total planned subcontracting dollars, for the use of local contractors as subcontractors. These goals shall pertain to all subcontracts that contribute to contract performance, and may include a proportionate share of products and services that are normally accounted for as indirect costs in the offeror's estimating and accounting systems.

(2) Goals, expressed in terms of percentages of total planned personnel at the jobsite, for the hiring of Marshall Islands personnel by the Contractor.

(3) A statement of-

(i) Total dollars planned to be subcontracted;

(ii) Total dollars planned to be subcontracted to local contractors;

(iii) Total number of personnel expected to be hired by the Contractor for work at the jobsite; and

(iv) Total number of Marshall Islands personnel planned to be hired by the Contractor for work at the jobsite.

(4) A description of the principal types of supplies and services to be subcontracted, and an identification of the types of supplies and services planned to be subcontracted to local contractors.

(5) A description of the method used to develop the subcontracting and hiring goals in (1) above.

(6) A description of the method used to identify potential sources of supplies and services, for solicitation purposes.

(7) A statement as to whether or not the offeror has included indirect costs in establishing subcontracting goals, and a description of the method used to determine the proportionate share of indirect costs allocable to the local contractors.

(8) The name of the individual(s) employed by the offeror who will administer the offeror's subcontracting and hiring programs, and a description of the duties of such individual(s).

(9) A description of the efforts the offeror will make to assure that local contractors have a fair opportunity to compete for subcontracts.

(10) Assurances that the offeror will include a clause similar to this one in all subcontracts that offer further subcontracting opportunities, and that the offeror will require all subcontractors who receive subcontracts in excess of \$500,000 to adopt a Subcontracting and Hiring Plan similar to the Plan agreed to by the offeror and approved by the Contracting Officer.

(11) Assurances that the offeror will cooperate in any studies or surveys as may be required and submit periodic reports in order to allow the Government to determine the extent of compliance by the offeror with the Plan.

(12) A recitation of the types of records the offeror will maintain to demonstrate procedures that have been adopted to comply with the requirements and goals in the Plan, including establishing source lists; and a description of its efforts to locate local contractors and award subcontracts to them. These records shall include at least the following on a company-wide basis:

(i) Source lists, guides, and other data that identify local contractors.

(ii) Organizations contacted in an attempt to locate local contractors.

(iii) Records on each subcontract solicitation resulting in an award of more than \$100,000, indicating (A) whether local contractors were solicited and if not, why not, and (B) if applicable, the reason award was not made to a local contractor.

(iv) On a contract-by-contract basis, records to support award data submitted by the offeror to the Government, including the name, address, and business size of each subcontractor.

(g) In order to effectively implement the Plan to the extent consistent with efficient contract performance, the Contractor shall perform the following functions:

(1) Assist local contractors by arranging solicitations, time for the preparation of bids, quantities, specifications, and delivery schedules so as to facilitate the participation by such local contractors.

(2) Counsel and discuss subcontracting opportunities with representatives of local contractors.

(h) Prior compliance of the offeror with other subcontracting plans under previous contracts will be considered by the Contracting Officer determining the responsibility of the offeror for award of the Contract.

(i) The failure of the Contractor or any of its subcontractors to comply in good faith with (1) this clause, or (2) the approved Plan required by this clause, may be considered to be a material breach of the Contract and shall be an element listed in the evaluation of the Contractor's performance under the Contract.

(j) If, at Contract completion, the Contractor has failed to meet its subcontracting or hiring goals and the Contracting Officer decides in accordance with paragraph (k) of this clause that the Contractor has failed to make good faith effort to comply with the Plan, the Contracting Officer may determine that the Contractor's performance under the Contract is unsatisfactory.

(k) Before the Contracting Officer makes a final determination that the Contractor has failed to make a good faith effort to comply with the Plan, the Contracting Officer shall give the Contractor written notice specifying the failure and providing the Contractor a reasonable opportunity to demonstrate what good faith efforts have been made. Failure to respond to such a notice within a reasonable time may be taken as an admission that no valid explanation exists.

[End of Statement]

#### K-8 AVAILABILITY AND USE OF UTILITY SERVICES (DEC 1998)

a. The Government shall make all reasonably required amounts of utilities available to the Contractor from existing outlets and supplies. 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, at rates in accordance with the Financial Policy and Rate Manual. 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.

c. Schedule of utilities available from the Government without charge: None. The Government requires reimbursement for utilities used.

[End of Statement]

#### K-9 CLEARANCE, ENTRY AND SECURITY REQUIREMENTS (March 1999)

(a) Entry Requirements. To be admitted to the site of the work, employees or representatives of the Contractor must provide the Commander, USAKA: (1) If United States citizens satisfactory proof of citizenship; (2) If permanent resident aliens of the United States satisfactory proof of legal permanent residency; (3) If citizens, nationals or legal permanent resident aliens of the Republic of the Marshall Islands satisfactory proof of such citizenship, nationality or legal permanent residency; and (4) If third country nationals (nationals who are neither citizens or legal permanent resident aliens of the United States nor citizens, nationals or legal permanent resident aliens of the Republic of the Marshall Islands) possession of a valid passport and visa, satisfactorily evidencing authorization to enter and reside permanently in the Republic of the Marshall Islands.

(b)(1) Entry authorization. Prior to entering any area under the control of United States Army, Kwajalein Atoll (USAKA), any contractor employee or representative who is not a citizen, national or legal permanent resident alien of the Republic of the Marshall Islands, as set forth in subparagraph (a)(3) above, must obtain an entry authorization from the Commander, USAKA. The Contractor must, on behalf of the employee or representative, submit a written entry authorization request to: Commander, USAKA, Attn: SMDAC-K-C-S, P.O. Box 26, APO AP 96555-2526. The Commander, USAKA may be reached (for information only) by telephoning (805) 238-7994, ext. 3449. The Contractor must provide a copy of each entry authorization request that it submits to USAKA to: U.S. Army Engineer District, Honolulu, Kwajalein Resident Office (CEPOH-KR), Box 28, APO AP 96555-2528.

(2) Entry Authorization Request Documentation. Submit a written request for each individual for which authorization is sought which includes:

- a. Full Name;
- b. Grade (if applicable);
- c. Social Security Number;
- d. Date of Birth;
- e. Place of Birth;
- f. Company/Unit, or Employer;
- g. Reason for Visit;
- h. Date of Entry;
- i. Date of Exit;
- j. Means of Travel; and
- k. USAKA POC and Contract Number.

(3) NOTE: The contractor is responsible for all travel arrangements and expenses incurred by its employees and representatives as a result of the travel.

(4) Requests for entry authorizations must be submitted so as to reach the Commander, USAKA, at least 14 days prior to the desired entry date.

(5) In the event a contractor employee or representative intends to stay in USAKA for 90 days or more, the entry authorization request should list permanent change of station (PCS) as the Reason for Visit. The entry authorization request must list the employee's or representative's approximate departure date, if known.

(6) Entry authorizations are issued on a per-visit basis and cannot be used for multiple visits. Entry authorizations are issued with specific arrival and departure dates. These dates will not always match the dates requested by the Contractor because of limited transportation to and from Kwajalein and other factors. However, arrivals to and departures from Kwajalein must take place on the dates specified on the entry authorization. If an employee is unable to arrive or depart on the specified dates, the Contractor shall notify the USAKA Provost Marshall's Office immediately.

(c) Employment of third country nationals. Procedures for obtaining entry authorization for third country national contractor employees (as described in subparagraph (a)(4) above) are the same as set forth in subparagraph (b) of this Clause. However, requirements for authorization to employ third country national employees at the site of the work are separate from requirements to gain entry authorization for such persons, and are set forth in paragraph 2, Article IV, Utilization of Contractors and Employment of Labor, of the Status of Forces Agreement, which is reproduced at the end of this Section. The Contractor must adhere to the requirements contained therein. The Contractor must notify the Kwajalein Project Office in writing (at the address listed in subparagraph (b)(1) above) of its intent to employ for work in the Republic of the Marshall Islands under the contract any third country national (including citizens of the Federated States of Micronesia residing in the Republic of the Marshall Islands); this notification of intent must be made at least thirty (30) calendar days prior to arrival of such employee at the site of the work. This written notification shall include a description of the nature of the work to be performed by each prospective third country national employee.

(d) Applicability of USAKA/KMR Regulation 210-10. Entry, clearance and security requirements, to which the contractor must adhere, are set forth in USAKA/KMR Regulation 210-10, which is incorporated into this contract in full text.

[End of Statement]

#### K-10 RESTRICTIONS ON LOCAL HIRE

(a) Local hire is limited to Marshallese and to citizens or legal alien residents of the United States, and shall be subject to the written approval of the Commander of USAKA. Where local hire is required, priority for hiring shall be given to Marshallese. However, the contractor is advised that there may be limited numbers of skilled Marshallese available for hire for this Contract.

(b) The Contractor is advised that consistent with Sections 321 and 323 of Title Three, Article II of the Compact of Free Association Act of 1985, PL 99-239, the United States has entered into two agreements with the Government of the Republic of the Marshall Islands, concerning United States use and operation of the USAKA. These implementing agreements are: (1) the Military Use and Operating Rights Agreement (MUORA) and (2) the Status of Forces Agreement (SOFA). The Contractor must ensure that its performance under this contract is in compliance with all applicable provisions of the Compact of Free Association and its implementing agreements.

(c) The Contractor is advised that there may be policies and procedures, applicable to the hiring and housing of Marshallese, which are promulgated and enforced by the local civilian government. It is the responsibility of the Contractor to comply with such policies and procedures. All requests for written approval of the Commander of USAKA for the local hire of Marshallese shall be accompanied by evidence of appropriate work permits issued by the Kwajalein Atoll Local Government and any other applicable permits necessary under local policies and procedures and the Government of the Marshall Islands policies and procedures.

(d) Persons who are not United States citizens or legal alien residents of the United States will not be permitted to reside on any United States defense site in the Kwajalein Atoll without written permission from the Commander of USAKA, but will be permitted to take meals at the Pacific Dining Room, the Kwajalein Snack Bar, and other USAKA facilities on a per-meal cash basis.

[End of Statement]

#### K-11 MOVEMENT OF CARGO VIA CONTRACTOR-CHARTERED COMMERCIAL VESSELS

(a) With respect to Contractor cargo to be moved by the Contractor to Kwajalein on a commercial vessel from any port, the Contractor shall submit to the Contracting Officer at least twenty (20) days prior to arrival of such vessel at Kwajalein, a written report giving type cargo, long tons, measurement tons, port of loading, expected date of arrival of vessel and estimated time of arrival. The Contractor shall arrange to have Masters of vessels make periodic reports en route informing the port of destination of any change of hour and date of arrival at Kwajalein.

(b) Due to limited berthing facilities at the main cargo pier at Kwajalein, the Contractor shall be responsible for checking the Military Sealift Command (MSC) Schedule and shall coordinate commercial vessel shipments so that there will be no conflict in MSC and Commercial vessel arrival and use of the cargo pier facilities.

[End of Statement]

#### K-13 ON-LOADING AND OFF-LOADING OF CARGO FROM SURFACE VESSELS OR AIRCRAFT; TRANSPORTATION TO JOBSITE

(a) The Contractor shall be responsible for all costs associated with on-loading and/or off-loading of construction or contract related material and equipment at Kwajalein involving vessels or aircraft. The Contractor shall be responsible for all movement and handling of material from dockside, aircraft or the USAKA staging area at Kwajalein to the construction storage areas at the jobsite, including all associated costs.

(b) If inter-island transportation is required in this contract, the Contractor shall be responsible for all inter-island transportation of construction personnel, material and equipment, including on-loading and/or off-loading of material and equipment between Kwajalein Atoll project sites, and for all associated costs. USAKA marine vessels may be used on a space required basis for the inter-island transportation of construction material and equipment at the Contractor's expense. Space required surface transportation must be coordinated through the USAKA Transportation Branch (CSSD-KA-LS) at least 10 working days prior to the Contractor's actual shipping requirement. Information concerning travel times and cargo capacities of the available USAKA marine vessels is listed at the end of this section.

(c) Weekly scheduled round trip surface transportation is operated by USAKA between Kwajalein, Meck and Roi Namur. This scheduled transportation is available to the Contractor for transporting construction material and equipment on a space available basis, without charge to the Contractor. NOTE: Cargo deck space for space available shipment of construction material and equipment is very limited since USAKA shipments have priority.

(d) Air transportation of Contractor personnel by fixed-wing aircraft to Roi Namur or by helicopter to other outer islands is permissible on a space available/no priority basis, without charge to the Contractor.

[End of Statement]

#### K-14 HOUSING FACILITIES - CONTRACTOR PROVIDED MANCAMP (JAN 1999)

(a) The Government will not provide housing for the Contractor's personnel. Housing shall be provided by the Contractor. A mancamp site is available on Kwajalein. The approximate location of the mancamp site is on the map at the end of this section. The mancamp shall be approved by the Contracting Officer.

(b) Spaces for contractor family housing trailers within the existing family housing trailer area on Kwajalein Island are limited to a maximum of three trailers (single wide). Trailers shall be new and not exceed 12' x 60'.

(c) Any quarters other than those addressed in subparagraph (a) above which are required by the contractor must be provided by the Contractor. All work required to hook up to existing utilities is to be performed by the Contractor as approved by the Contracting Officer. Temporary quarters will be removed by the Contractor upon completion of the project (final inspection/BOD), and the site restored to the condition in which it was found by the Contractor. Utility hook-ups are available in the vicinity of the mancamp; however, the Government makes no representation as to the condition and adequacy of the existing utilities in the mancamp areas.

(d) The Contractor shall adhere to all rules and regulations enforced by USAKA that may pertain to housing personnel in mancamp sites. Additionally, the Contractor's temporary quarters will be constructed and maintained in accordance with the following:

- (1) EM 385-1-1 Corps of Engineers "Safety and Health Requirements Manual".
- (2) Federal Manufactured Housing Construction and Safety Standards (FMHCSS)
- (3) National Electric Code
- (4) Uniform Plumbing Code
- (5) Uniform Building Code
- (6) NFPA 101 Life Safety Code

(e) The Contractor shall submit to the Contracting Officer a plan of the temporary quarters installed, which shows all utilities, within 30 days after installation of the temporary quarters.

(f) Third country Nationals will not be housed on lands that are under the control of the U.S. Army Kwajalein Atoll.

(g) After final inspection/BOD, temporary quarters shall be dismantled or demolished at the Contractor's expense and properly disposed of. The mancamp area shall be restored to the condition in which found by the Contractor, including restoration of vegetation to preexisting type and density.

#### K-15 COMPLIANCE WITH LOCAL LAWS

(a) Contractor and subcontractor employees, and their dependents if authorized, shall be governed by, and subject to the military rules and regulations, and to the laws and regulations of the Marshall Islands and its political subdivisions applicable to the islands on which construction under this contract is performed. Infraction of such laws and regulations or such other conduct as may render employees and dependents undesirable, may be cause for removal from the project site or the Marshall Islands. The Contractor shall take immediate action in such matters as may be directed by the Contracting Officer. It is the Contractor's responsibility to ensure that all Contractor and subcontractor personnel are thoroughly instructed regarding applicable laws and regulations, and it shall be his responsibility to effect adequate policing of such personnel to avoid infractions.

(b) Dependents of employees who are not usually residents on the islands on which construction is performed will be authorized to accompany such employees under applicable Marshall Islands' laws and regulations only if approved by the Contracting Officer in consideration of the availability of facilities for their residence.

[End of Statement]

#### K-16 DEPENDENTS

Dependents of Contractor personnel, either United States citizens or alien residents of the U.S., will be permitted to reside only on Kwajalein Island, unless otherwise authorized by the Commander, USAKA and by the Contracting Officer.

[End of Statement]

#### K-17 MEDICAL AND DENTAL SERVICES

Medical and dental facilities will be made available to Contractor personnel at Kwajalein Island only at the current established rates. The Contractor will be responsible for insuring payment of medical and dental

bills incurred by his employees and their dependents.

[End of Statement]

#### K-18 POSTAL FACILITIES

Postal service, in accordance with regulations promulgated by the U.S. Postal Service, will be available at Kwajalein Island only.

[End of Statement]

#### K-19 MANAGEMENT AT JOBSITE (NOV 1998)

(a) General. The superintendent provided by the Contractor under the Contract Clauses and Special Contract Requirements paragraphs shall be an individual or individuals fully qualified by training and experience to provide competent and authoritative overall management of the project in all its aspects and at all times during the progress of the work. The name or names of such individuals and the qualifications of each shall be submitted to the Contracting Officer for review prior to commencement of any work at the site. The Contractor's superintendence force shall be satisfactory to the Contracting Officer.

(b) Authority. The superintendent or superintendents shall be vested with full authority to act for the Contractor at the site to provide for smooth and decisive management of the job without the necessity of reporting to the Contractor's "home office" for decisions. He shall be authorized to execute modifications for amounts up to at least \$100,000 and to negotiate and accept for the Contractor time extensions granted under the various clauses of the Contract Clauses. The management responsibilities of the superintendent shall include complete supervision of the Contractor work force, supervision over the work of all subcontractors, coordination of all subcontract operations, close adherence to the Network Analysis System or Progress Charts provided under the Special Contract Requirements paragraph, management of a field office staff to provide support to accomplish contract requirements and implementation and enforcement of the Contractor's Safety Program.

(c) Availability. The Superintendent or superintendents shall be available at the sites of work at all times during working hours to direct and manage the project(s) to assure that schedules are being maintained and that the jobsite conditions are in accordance with contract requirements, as well as to receive directives, instructions, or complaints from the Chief, Quality Control or the Contracting Officer so that prompt and satisfactory action is insured.

(d) Daily Progress Report. The Contractor's supervisory staff shall provide a daily progress report outlining the equipment on-site, including equipment being repaired, manpower, utilization of manpower and equipment for each work activity and work performed on each jobsite keyed to the index of the Technical Specifications. This report is separate from and in addition to reporting requirements under Quality Control. The report shall be furnished in two copies (one reproducible by standard office copier equipment) at the jobsite to the Government with the Quality Control report not later than the first working day from the day the work was performed. Negative reports are required for all calendar days during which there is no activity on the project site with an explanation why no work was performed. Administrative work activities shall be included within the report. The reports shall be typewritten in an acceptable format to the Government.

[End of Statement]

K-20 POL PRODUCTS

(a) Bulk POL products will be made available to the Contractor from Government sources in the Kwajalein Atoll for use as required in his operations. It will be the Contractor's responsibility to make arrangements and payments pursuant to established Government procedures.

(b) Payments by the Contractor to the Government will be made on a monthly basis, or other convenient basis, at the discretion of Contracting Officer.

(c) The procedure provided for herein (i) is authorized by Public Law 85-804, 50 U.S.C. 1431--1435, and Executive Order No. 10789, (ii) is justified because of the isolated location of the contract work and the nonavailability from a local commercial source and the availability from Government sources of POL Products, and (iii) will facilitate the National Defense.

(d) POL products will be provided by the logistics support Contractor as required at POL dispensing facilities in Kwajalein Island.

[End of Statement]

K-21 ORDNANCE DISPOSAL

The island(s) on which construction is to be performed were occupied by military forces during World War II and were within the combat zone. A demolition crew has removed visible ordnance from the islands. However, additional unexploded ordnance including bombs, shells, etc., may be encountered during the Contractor's operations. Should any such objects be encountered, the Contractor will take immediate action to prevent disturbance of or tampering with such objects, and shall report the discovery to the USAKA Security and Law Enforcement Contractor and the Explosive Ordnance Disposal (EOD) office for disposal action.

K-22 STORM PROTECTION

Should warning of winds of gale force or stronger be issued, the Contractor shall take every practicable precaution to minimize danger to persons, to the work, and to adjacent property. These precautions shall include, but are not limited to, closing all openings as required to protect work in place, removing all loose materials, tools, and/or equipment from exposed locations, and removing or securing scaffolding and other temporary work.

[End of Statement]

~~\*K-23 CHOICE OF LAW (DELETED)~~

~~All rights, obligations and remedies are governed by the terms and provisions of this Contract.~~

~~The validity and interpretation of the terms and provisions of this Contract and all rights, obligations and remedies thereunder shall be construed in accordance with the laws of the United States of America.~~

\_\_\_\_\_ [End of Statement]

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(AM-0005)

K-24 FOREIGN CONSTRUCTION MATERIALS - KWAJALEIN

The following foreign construction materials are allowed in the performance of this contract.

- (1) Structural Steel
- (2) Reinforcing Steel
- (3) Cement and cement products
- (4) Metal fasteners (nails, nuts/bolts, screws)
- (5) Bulk construction materials: sand, gravel, other soil materials, stone, concrete masonry units, ready-mixed asphalt, portland cement concrete and fired brick.
- (6) Electrical and plumbing conduits (pvc, galv. emt, etc.)
- (7) Precast panel members

[End of Statement]

K-25 MECHANICAL DIGGING PERMITS (NOV 1998)

a. To protect piping, electrical, or communications gear, no mechanical digging shall be performed without a Mechanical Digging Permit. The Contractor shall submit a drawing/sketch of the work area with its application for a permit, utilizing KLS Form 1310-A at the end of this section. The Contractor must ensure that the Heavy Equipment Operator maintains in his possession the drawing/sketch of the work area and the Mechanical Digging Permit onsite during the digging operation. It shall be the responsibility of the activity completing the project to update the drawing/sketch before returning it to the Facilities Operation and Maintenance (FOM) office of issue.

b. It shall be the responsibility of the Logistics/Engineering Contractor (LEC) Production Scheduler for FOM at Kwajalein and the Scheduler for Roi Namur FOM to provide underground locating services pertaining to the Mechanical Digging Permits at USAKA. The above individuals shall have the responsibility for obtaining the necessary signature approvals for the KLS Form 1310-A before authorizing any mechanical digging operation.

c. Point of contact with LEC for Mechanical Digging Permit initiation and coordination is:

1. Kwajalein - Mr. John Hefner, extension 5-3311
2. Roi-Namur - Ms. Anita Davis, extension 5-6361

[End of Statement]

K-28 MARSHALLESE INCOME TAX

Contractor is advised that, under the terms of Article V of the Status of Forces Agreement, United States contractor personnel and dependents who are also United States contractor personnel are not exempt from a personal income tax generally applicable within the Marshall Islands up to a level of five percent of their annual income derived from their employment in the Marshall Islands by United States contractors. Marshallese personnel are subject to income tax generally applicable in the Marshall Islands, without limitation. Accordingly, the contractor must withhold income tax from the compensation paid to all employees, as appropriate, and in accordance with applicable laws of the Republic of the Marshall Islands.

With respect to United States taxes, the Contractor must make its own determination, considering its own legal status, as to whether withholding or payment of such taxes is required.

[End of Statement]

#### K-29 RESTRICTIONS ON HAULING

(a) Hauling of materials through the family housing area at Kwajalein shall be restricted to the following times:

- (1) When school is in session - 0830-1130 hours and 1230-1430 hours.
- (2) When school is out of session - 0800-1130 hours and 1230-1630 hours.

(b) Hauling of materials using vehicles which are 10 feet wide or greater will require convoy procedures. The Contractor shall provide a lead vehicle and rear escort for the convoy; the rear escort shall be responsible for cleaning up any convoy debris. Radio communication between the convoy and the Bucholz Army Airfield control tower will be required to coordinate convoy movements near the airfields on Kwajalein. The Contractor shall submit written convoy procedures to the Contracting Officer at least 14 days prior to the onset of operations.

[End of Statement]

#### K-30 MESSING FACILITIES

(a) Existing messing facilities on Kwajalein and Roi-Namur will be made available to Contractor employees in connection with the prosecution of the work under this contract. Meals will be served to Contractor employees cafeteria style in the Government-operated mess halls at the current established rates.

(b) The Contractor will be responsible for payment of messing bills incurred by his employees.

(c) Contractor messing facilities will be maintained in accordance with the most current EM 385-1-1, Corps of Engineers "Safety and Health Requirements Manual". Refer to paragraph entitled "Accident Prevention Plan" in Section 00800 to determine the latest version of the manual.

(d) If the Contractor desires to purchase bulk food supplies from USAKA, he must request supplies at least 90 days prior to actual requirements.

(e) Messing rates are contained in the Financial Policy & Rate Manual.

[End of Statement]

#### K-31 WARRANTY IMPLEMENTATION

1. The Contractor shall designate a company representative to implement the warranties included in this contract. This representative shall be stationed on Kwajalein throughout the entire warranty period and must possess the capability and knowledge required to correct all warranty deficiencies. The Contractor may designate different representatives for separate specialties of work. If approved by the Contracting Officer, any other Corps construction contractor performing work on Kwajalein may be utilized for warranty implementation.

2. The name, address, telephone number of the representative(s), and nomenclature of warranty item shall be submitted to the Contracting Officer's representative at least 30 days prior to the contract completion date or beneficial occupancy of the work or part thereof. For the purposes of paragraph f of the warranty clause, a reasonable time shall be considered to be as follows:

- a. Seven (7) calendar days from the receipt of a written notification of any failure, defect, or damage caused by a warranty defect of such nature that the work remains functional or habitable or both, as applicable.
- b. Twenty-four (24) hours for any failure, defect or damage caused by a warranty defect which renders the work nonfunctional or uninhabitable or both, as applicable. Response in this instance starts from receipt of verbal notification from a Government authorized representative. Written confirmation will follow the initial verbal request.
- c. One-half (1/2) hour for any failure, defect or damage caused by a warranty defect which creates a health and/or safety hazard that could endanger personnel or cause serious property damage. This type of warranty item shall be categorized as EMERGENCY WORK. Response in this instance starts from receipt of verbal notification from a Government authorized representative. Written confirmation will follow the initial verbal request.
- d. The Contractor shall place equipment warranty stickers on all warranted equipment in the location designated by the Contracting Officer's representative. The Contracting Officer will furnish the stickers and the Contractor shall fill out the required information and place the stickers on the equipment.
- e. No contractual warranty arrangements with the USAKA operating contractor will be allowed.

[End of Statement]

#### K-32 RATES FOR VARIOUS PRODUCTS AND SERVICES

a. Airlift of cargo to Kwajalein on Air Mobility Command (AMC) flights out of Hickam AFB, Hawaii, requires the prior assignment to the Contractor of certain identification codes by Government agencies. Upon award of contract, a Contractor anticipating cargo airlift is advised to submit an early request for assignment of the codes. Rates for passenger and cargo on AMC flights out of Hickam AFB, Hawaii, may be obtained from Unit Movement, Directorate of Logistics, United States Army Garrison, Hawaii, at (808)438-9756.

b. Various products and services are available at Kwajalein at pre-determined rates from the U.S. Army Kwajalein Atoll (USAKA) Logistic Support Contractor (LSC). The rates are published in the Financial Policy and Rate Manual, U.S. Army Kwajalein Atoll, and are subject to change. However, bulk POL (petroleum, oils and lubricant) prices are subject to change at any time. Pursuant to the above-mentioned Manual, there is an advance deposit requirement on users of the various products and services. A copy of the Manual is located at the end of this section. Any conclusions or interpretations made from the data in the Manual are the Contractor's responsibility.

Some items of particular interest to Contractors are given below.

(1) Bulk POL - Price for bulk POL products are based on prevailing rates, periodically updated.

(2) Telephone -

(a) Current rates for basic services are given in the Financial Policy and Rate Manual.

(b) Non-direct access to Department of Defense existing AUTOVON (Automatic Voice Network) telephone service, between Oahu, Hawaii and Kwajalein (both directions) will be provided to the Contractor at no charge. Non-direct access to AUTOVON by the Contractor shall be restricted to essential communication required in the performance of this contract.

(3) Housing Rental Rates -

Current rates for housing on Kwajalein Island are given in the Financial Policy and Rate Manual. The specific types of housing are subject to availability and will be assigned at the discretion of USAKA.

(4) Dining Rates -

Current rates for dining on Kwajalein and Roi-Namur are given in the Financial Policy and Rate Manual.

(5) School Tuition -

The USAKA school consisting of an elementary school encompassing kindergarten through sixth grade and a junior-senior high school is an accredited member of the North Central Association of Colleges and Secondary Schools. School tuition is determined annually. Either the sponsoring organization or the individual must reimburse USAKA at the tuition rate.

c. Equipment and facilities owned by the U.S. Army Kwajalein Atoll and operated by the USAKA Logistic Support Contractor (LSC) may be available at a cost to the Corps of Engineers Contractor on a non-interference basis. Corps of Engineers Contractor's use of USAKA equipment shall not interfere with USAKA/LSC operations. Any USAKA equipment rented shall be subject to recall by USAKA/LSC for their use at any time. Arrangements including determination of cost and maintenance responsibilities are a matter between the Contractor and USAKA/LSC, not the Corps of Engineers. These arrangements are not covered in the Financial Policy and Rate Manual. The Contractor is advised not to count on this type of support. The Corps of Engineers and USAKA will not be liable for any delay resulting from the use of USAKA equipment.

[End of Statement]

K-33 SAILING INSTRUCTIONS, PORT OF KWAJALEIN

1. The following is a listing of conditions which must be met prior to U.S. Army Kwajalein Atoll (USAKA) accepting marine cargo for discharge at either Kwajalein, Roi-Namur, or Meck Islands. They are as follows:

a. Vessel must meet the International Safety of Life at Sea Safety Standards (SOLAS). Vessel Master must be capable of presenting, upon request of the USAKA Pilot, SOLAS safety certificate.

b. Vessel Master must accept the USAKA Pilot as outlined in U.S. Sailing Directions for the Pacific Islands, volume 126, page 134.

c. Upon request of the USAKA Pilot, the Vessel Master must present 3 copies of the crew manifest and certificate certifying that the crew is free of communicable diseases. They will also be required to request free pratique on arrival.

d. Vessel Master must contact the USAKA Harbor Control 72 hours prior to arrival at the Pilot station. The USAKA Harbor Control can be reached on frequency 2716.0 kilocycles (USB) or Kwajalein Tech Control on MHz 82961.0 (USB). Vessel Master must provide USAKA Harbor Control with the following information 72 hours prior to arrival: (1) Draft fore and aft, (2) Nature of cargo to be discharged/loaded, (3) Plus any change in logistic requirements which would include provisions for water and fuel, and any special cargo handling requirements. Vessel Master will update draft data not later than 24 hours prior to arrival at the Pilot station.

- e. Vessel Master is cautioned that maximum draft is 27 feet at the port of Kwajalein.
  - f. Vessel must be insured by a recognized marine underwriter such as Lloyd's of London. Insurance certificates may be requested upon arrival by USAKA Pilot.
  - g. Vessel must be of internationally recognized register. Vessel Master may be requested to present registration certificates to USAKA Pilot.
  - h. Ship's crew assigned to assist with discharge/loading of cargo must comply with USAKA safety regulations which requires use of approved hard hats, safety shoes, and gloves.
  - i. Vessel must have internationally registered 406 MHz Emergency Position Indicating Beacon(s).
  - j. Vessel Master must comply with direction from the USAKA Pilot regarding Pilot station, use of mooring facilities, and lagoon entry access.
  - k. Vessel Master must insure that barge and tow complies with American Bureau of Standards (ABS) and that ABS certificate is current and available for inspection by the USAKA Pilot upon request.
  - l. Vessel Master will be responsible for repatriation of crew members from Kwajalein. Vessel Master must insure that adequate U.S. currency is available for same.
  - m. Vessel Master may be required to settle all outstanding debts accumulated while in port at the direction of the vessel's agent.
  - n. USAKA Marine Department and Pilot may be contacted telephonically at (805)238-7994, extension 2182, facsimile extension 1814.
  - o. Vessel's agent will be required to repatriate USAKA Pilot should Pilot be required to remain with the vessel under circumstances which are beyond his control.
  - p. The port of USAKA is a drug-free facility. All vessels will be inspected by a drug dog team prior to being cleared into the port.
2. The USAKA points of contact are Marine Operations, DSN 480-3421, and Engineering, DSN 480-3779.

[End of Statement]

#### K-34 TRANSPORTATION AND PROCESSING OF PERSONNEL, MATERIALS AND EQUIPMENT

The Contractor shall be responsible for transportation of his personnel, materials, supplies and equipment. In the event Air Mobility Command (AMC) furnished facilities are available to move or process such personnel, materials, and equipment, the Government agrees to make available such transportation to the extent possible. However, it will be the Contractor's responsibility to make arrangements and payments for such transportation pursuant to established AMC procedures.

[End of Statement]

#### \*K-12 COMMUNICATION FACILITIES

(a) Arrangements may be made through the Contracting Officer or his authorized representative for the installation of a limited number of telephones at desired locations on Kwajalein. There will be an installation charge and monthly service charge for each telephone instrument, based on prevailing rates, and the Contractor shall make payment for such services in a manner as determined and approved by the Contracting Officer.

(b) Approved communication facilities for safety purposes will be provided by the Contractor with work parties at isolated locations.

[End of Statement]

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(AM-0002)

**SECTION 00900**  
**RESPONSES TO QUESTIONS**  
**SUBMITTED BY VARIOUS PLANHOLDERS**  
**FOR**  
**RFP DACA83-02-R-0003**

**NOTES:**

**A. QUESTIONS ARE NOT LISTED IN ANY SPECIFIC ORDER. THE PLANHOLDERS WHO SUBMITTED THE QUESTIONS ARE INDICATED.**

**B. QUESTIONS RECEIVED MAY OR MAY NOT RECEIVE RESPONSES PRIOR TO THE PROPOSAL DUE DATE. THEREFORE, OFFERORS SHOULD DEVELOP THEIR PROPOSALS AS THEY INTERPRET THE SITUATION DESCRIBED IN THE DOCUMENTS AVAILABLE.**

**J.A. JONES CONSTRUCTION QUESTIONS:**

1. Drawing S-4, Tank Structural Notes under item C., note # 5 states that the Contractor shall include costs for monitoring cultural resources. Please clarify this statement regarding the inclusion of cost and advise if any particular requirements are different under this contract from the previous customary practices in Kwajalein. ***RESPONSE: This drawing note has been deleted by amendment. Refer to contract specifications regarding cultural resources.***

2. Note # 6 under the same drawing noted in 1. above states Contractor is to include costs for asbestos coated underground pipe. Can the Government provide an approximate quantity of hazardous pipe expected underground?  
***RESPONSE: This drawing note has been revised by amendment. No asbestos-containing materials are anticipated for the underground pipe.***

3. Drawing S-1 indicates that only 6 panels can be removed from the existing tank covers for access to execute construction work. If the Contractor can obtain approval from TEMCOR, would it be acceptable to remove more than 6 panels for improved access purposes?  
***RESPONSE: Yes, more panels can be removed, if approved by tank dome cover manufacturer, TEMCOR.***

4. Drawing S-4, item H for tank testing requires the following. Fill the tank to complete capacity and monitor water level drop until ½ inch develops or three days elapse, whichever occurs first. This note and related testing criteria further states that adjustments will be made for evaporation and temperature during testing. What will the evaporation and temperature formula basis be to measure against the tank water loss? The climate varies little in Kwajalein. What is the allowable evaporation loss if calculated today?  
***RESPONSE: Refer to ACI 350 1.R (to be added as a reference by amendment).***

5. Drawing S-7 (As Built) and Plans Sections. Details and Notes contain the following information, which is confusing and conflicting with the other documents. This drawing

shows a “SCHEDULE OF WORK” and TYP PLAN FOR TANKS. In this table, 15 tanks are listed with conflicting information. For example, it states that all tanks are to get a new FML floor system. We believe this drawing has many other notes and requirements which do not apply. Please advise what portions of Drawing S-7 and other “As Built” Drawings are applicable for this RFP.

***RESPONSE: Sheets S-5 through S-9 are reference asbuilt drawings, and are provided in the contract for general reference (informational) purposes only. These are provided to assist the contractor with planning demolition and new work. New contract actual physical work requirements are not shown on the reference asbuilt drawings but are indicated on Sheets S-1 through S-4.***

6. Drawing S4, note F -3 states that the Contractor will assume 150 gallons of epoxy for 500 If of shrinkage cracks per tank for 500 if of cracks. A similar note exists under item 4. for the floor slab, i.e., 500 gallons of epoxy for 3480 If of shrinkage cracks. Will the contract be modified if the quantities vary? If so, what will be the basis of measurement and payment?

***RESPONSE: These notes regarding quantities of epoxy will be deleted by amendment. Contract requires extraordinary procedures to eliminate concrete shrinkage cracks. Any shrinkage cracks that develop after the new concrete floor slab has been cured will be considered the responsibility of the contractor to repair by epoxy injection. The contractor will be required to determine the amount of epoxy required to repair shrinkage cracks. Existing walls are not expected to have shrinkage cracks that cause water leaks.***

7. Section 03300, 1.7.3 mentions that Air Entrainment shall be required. Section 03300, 2.3.1 mentions that Air-Entrainment Admixture shall not be used. Section 03300, 3.14.4 and 3.14.5 mention the use of Air-Entrainment agents or admixture. Please indicate which spec is the required.

***RESPONSE:***

8. It is our understanding that there are no items required for handover as Government salvage at the existing Cold Storage Warehouse. Is our understanding correct?

***RESPONSE: Correct.***

9. Detail 1 of Drawing A-9 indicates a double layer of 6 mil Polyethylene sheets with tapped or folded staggered joints under the 89 mm thick cement grout layer with the radiant tubing of the Freezer Slab system. On the other hand, the typical slab details shown on Drawing S-2 do not show these sheets. Only a 15 mil Polyolefin Geomembrane is shown as a vapor barrier for the Office, Mechanical and Electrical Rooms. Spec Section 07225 – REFRIGERATED FLOOR INSULATION, Paragraph 3.2.1 indicates to provide Vapor Barrier (Black polyvinyl chloride, 0.75 mm thick) and Slip Sheet beneath the entire concrete floor slab and floor insulation as indicated. Please clarify if the Polyethylene sheets are to be installed according to Drawing A-9 or beneath the insulation as indicated in Section 07225. Please send a detail for a better understanding.

***RESPONSE:***

10. Section 03300, 1.6.2.1 - Strength Requirements - indicates a compressive strength of 27.5 Mpa for the Concrete Topping over Refrigeration and Freezer Floors. Section 03300, 1.7.3 – Mix Design for Topping for Refrigeration and Freezer Floors asks for a 28-day strength of at least 34.5 Mpa. Please define which strength is correct.

**RESPONSE:**

11. Section 02754, 2.2.1. Can Round Concrete Aggregate be used in the pavement construction?

**RESPONSE:**

12. On sheet M-18 the schedule of unit coolers served by rack "A" is a total 92 tons of refrigeration and for rack "B" a total 50 tons. Then on sheet M-19 the schedule of compressor racks calls out rack A at 50 ton and rack B at 92 ton. Please clarify which is correct and verify the compressor sizing called out in the rack schedule.

**RESPONSE:**

### **DICK-PACIFIC CONSTRUCTION QUESTIONS:**

13. Please clarify if subcontracting plan require to submit as part of bid submittal, if yes, please provide us the requirements and standard forms.

**RESPONSE:** *No, the small business requirements (i.e., subcontracting plans) does not apply to this project.*

14. Please clarify if the general contractor require to provide full time QC manager and Safety officer for the duration of the project, if yes, what are the qualification.

**RESPONSE:** *CQC requirements have been added by amendment. Safety Officer must have at least 5 years of safety experience and be first-aid and CPR certified.*

15. On page 00800-24, K-21: Will the government to handle the UXO ordinance survey and clearance prior to contractor site clearing and grading?

**RESPONSE:** *Yes.*

16. On page 00700-64, 52.236 Permits Responsibility: Please clarify if general contractor require to secure building permit and pay all fees to government of Marshall Island?

**RESPONSE:** *Only the Marshallese income tax is required.*

17. Please extend the deadline of submission of question for another 4-weeks.

**RESPONSE:** *As stated at the pre-proposal conference, questions will continue to be accepted; however, there is no assurance that responses will be provided in sufficient time to allow appropriate adjustment of proposals.*

18. Existing buildings to be demolished: Is there a landfill area that we can use to dump materials or do all materials have to be removed from island.

**RESPONSE:** *The existing landfill will be available for appropriate materials.*

19. Asbestos: Can you please tell us what type and thickness of existing materials. Do these materials have to be removed from Island or again is there a landfill area that we can use.

**RESPONSE:** *See hazardous materials survey report. The asbestos must be removed from the island.*

20. Please provide specifications for the new FML waterproofing system

**RESPONSE:** *New FML waterproofing system is not required for the project. Detail 3/S-1/S-1 requires existing FML liner tank liner to be removed. Reference asbuilt drawing sheet S-6 shows the existing asbuilt condition of the FML tank liner.*

21. Will submitted bids for the water tanks be awarded at the same time with the cold storage facility or at a different date?

**RESPONSE:** *It is currently intended to award both projects at the same time, if funds are available.*

22. Please provide drawings for the three existing buildings to be demolished. (Floor plans, elevations, cross sections, and general mechanical, electrical layout plans)

**RESPONSE:** *Drawings and notes will be provided by amendment.*

23. Price breakdowns – Parts 1, 2, & 3, Parts 2 & 3 are the same and have no reference to solicitation numbers. Is Part 2 for the cold storage facility and Part 3 for the water tanks?

**RESPONSE:**

24. Drawing S-1 dome cover notes No. 3. Removal and replacement of dome tank cover by TEMCOR or by others: Please clarify who is responsible to the removal & replacement COST to be rendered by Temcor, the government or general contractor.

**RESPONSE:** *Note 3 reads in part as follows: "Removal and replacement of the tank cover panels for construction purposes shall be performed by the original tank cover manufacturer or if by others, shall be in accordance with and approved by the original tank cover manufacturer (TEMCOR)." The general contractor is responsible for cost to remove tank dome cover for construction purposes. The general contractor may perform this work himself, subcontract this work to TEMCOR or another subcontractor of his choice, however, removal of the tank dome cover must be performed in accordance with the original tank dome cover manufacturer procedures.*

25. Please confirm if water tanks # 966, 946 and 947 are the only three (3) tanks to be repaired under this contract.

**RESPONSE:** *Concur, only tanks 966, 946 and 947 are to be repaired under this contract.*

26. Drawing S-7 As-built Drawing, Schedule of works: Again, please re-clarify only tank #966, 946 & 947 are the tanks to be repaired, the other twelve (12) tanks that listed on the schedule are NOT part of the scope of work.

***RESPONSE: To re-clarify, only tanks 966, 946 and 947 are to be repaired under this contract. There seems to be some confusion of what is required by drawing sheet S-7. Please note that drawing sheets S-5 through S-9 are reference asbuilt drawings and only show existing asbuilt conditions. The reference asbuilt drawings are provided in the contract for general reference (informational) purposes only and are provided to assist the contractor with planning demolition and new work. New contract actual physical work requirements are not shown on the reference asbuilt drawings S-5 through S-9. Actual new work for tanks are indicated on Sheets S-1 through S-4.***

27. Drawing detail 2/S-1, what is the size/area of roof dome opening for construction access. Is the area of opening accessible to bring-in backhoe w/ breaker? Actual construction access dimensions should be coordinated with the original tank dome cover manufacturer, TEMCOR representative, (Mike Weitzenhoff, M & M tank, 808 845 7556).

***RESPONSE:***

28. Please clarify if the water tank need to install new FML liner system after removal of existing, if yes please provide materials specification.

***RESPONSE: New FML waterproofing system is not required for the project. Detail 3/S-1/S-1 requires existing FML liner tank liner to be removed. Reference asbuilt drawing sheet S-6 shows the existing asbuilt condition of the FML tank liner.***

29. Please clarify all information shown in "AS BUILT/ FOR REFERENCE ONLY" are not part of the scope of work under this contract.

***RESPONSE: Drawing sheets S-5 through S-9 are reference asbuilt drawings and only show existing asbuilt conditions. The reference asbuilt drawings are provided in the contract for general reference (informational) purposes only and are provided to assist the contractor with planning demolition and new work. New contract actual physical work requirements are not shown on the reference asbuilt drawings S-5 through S-9. Actual new work for tanks are indicated on Sheets S-1 through S-4.***

30. Drawing S-4, Note "I" Water Tank Disinfections: Please clarify where to dispose or drain approximately 18,000 Gallons of water during disinfection.

***RESPONSE: An amendment will be made to require disinfection by spraying with 500 ppm chlorine solution. After tank is sprayed with the disinfection solution, the tank would be filled with water to dilute the solution to 10 ppm concentration and then the solution would be used for potable water.***

31. Drawing S-1, Plastic Liner Removal Notes, Item 2. The liner shall be removed by method approved by the government to minimize damage to existing liners: Please provide information what is the acceptable removal method of the government.

***RESPONSE: Tank liner is loosely laid on tank floor, draped on the tank walls and held in place with embedded wall anchor bolts. Refer to reference asbuilt drawings sheet S-6. Method to remove tank liner work should be provided to the contracting officer representative for approval once project has been awarded.***

32. On drawing sheet C-3 Legend, indicated the 508mm and 205mm new un-reinforce concrete pavement, however on drawing sheet C-8 detail 20 & 21 indicated with reinforced concrete pavement. Please clarify which to follow.

**RESPONSE:**

### **BLACK CONSTRUCTION QUESTIONS:**

33. Light Fixture Type 'D' - Luminaire Details on Dwg. E-18 shows a surface mounted fixture (WideLite - FreezerLyte Model), which requires wiring and raceway below the insulated ceiling panel while mounting Det 5/E-3/E-10 shows pendant mounted (Widelite WarehouseLyte Model) with wiring and raceways above the insulated panels. Please clarify correct fixture model or mounting scheme.

**RESPONSE:** *The Type D Fixtures are installed inside of the refrigerated compartments, and must be supported independent of the freezer panels. The wiring between light fixtures should be run outside of the refrigerated box, and should not be attached to the freezer panels. Widelite WL Series (FreezerLyte) is correctly specified for light located inside refrigerated compartment. WideLite's "WarehouseLyte" series is not suitable for this application, and should not be used.*

34. Refrigerated Container Receptacles - Det 4/E-1/E-10 shows T&B MIPCO #333FC. Current T&B Catalogs show this item as obsolete. Suggested replacement is AMERACE #333FCV. Please check if acceptable. Also, Electrical Symbols on Dwg. E-7 and Diagram on Dwg. E-7 call for 60-Ampere while the above-specified model is a 32-Ampere Receptacle. Please Clarify.

**RESPONSE:** *Verified the part number with Matson in Honolulu. Verified with Wesco Hawaii (808 839-7261), that the part was listed in the current Mipco product catalog. The item is difficult to find, so the contractor should contact equipment supplier like Wesco to locate the item. Substitutions should be requested following the award.*

35. Transient Suppression Protection Unit - No specifications. Please provide.

**RESPONSE:** *An addition to the specifications for the Transient Voltage Surge Suppression (TVSS) Unit has been added by amendment.*

36. Disconnect, Switches - No specifications. Please provide.

**RESPONSE:** *An addition to the specifications for disconnect switches has been added by amendment.*

37. Is there any existing concrete batch plant facility in the island that a contractor can use? What is the production capacity.

**RESPONSE:** *The existing concrete batch plant will not be available.*

38. Is there any US Army owned heavy equipment available for contractor use? (I.e. crane, trucks/trailer, forklifts, backhoes, pumps, etc). Please provide list including rental rates if available.

***RESPONSE: The on-island Army-owned equipment will not be available.***

39. Can contractor buy gas/fuel for their equipment from U5 Army? Please provide cost of gas/fuel per gallon?

***RESPONSE: Gas and diesel fuel will be available for purchase by the contractor. The 2002 rate for gas is \$1.07 per gallon, and the price of diesel is \$0.96 per gallon. There is also \$0.16 per gallon handling fee.***

### **CLOSE CONSTRUCTION QUESTIONS:**

40. Environmental Report: Please advise how we can obtain a copy of the hazmat survey prepared by Brewer Environmental. This report is referenced in SPEC Sections 13281 (Asbestos), 13282 (Lead Containing Paint), and 13286 (PCB). Please refer to SPEC Section 13281, par 1.3, page 6 and 13286, para 1.2(a), page 3 for specific reference to this report by BES.

***RESPONSE: The survey report has been included in Amendment 0004.***

### **NELSON REFRIGERATION QUESTIONS:**

41. We are in receipt of Amend #4 on the above referenced project. We would like to clarify the requirements. The specification calls for all metals to be stainless steel if constructed in "exterior and non air conditioned space". Are the Cold-Storage Rooms (Prefabricated Panel Type) classified to be in a "non air conditioned space" requiring the metal clad skin to be stainless steel? Technically, the exterior side of the panels will not be in an air conditioned space.

***RESPONSE: Please refer to Section 13038, para. 2.1 "The cold storage room shall conform to NSF 7 and to MIL-R-43900..." MIL-R-43900 refers to aluminum cladding.***

42. Reference Specs: 15652 - 2.11 Ice Maker and Plans: Sht M-19 Ice Maker Schedule. The plans and specs call for (2) new ice makers. Although required capacities and accessories are provided a specific manufacturer "or equal" was not provided. Is there anyway the government can provide us with the manufacturer that the plans & specs where pattern on?

***RESPONSE: The specs were designed around Mannhardt and Vogt.***

### **PACIFIC INTERNATIONAL INC.**

43. Section K- 10, (a), notes: "However, the contractor is advised that there may be limited numbers of skilled Marshallese available for hire for this Contract." We agree that this is the case for Marshallese who are residents of Ebeye in the Kwajalein Atoll Our workforce includes skilled Marshallese who are not residents of Ebeye, and if we were to utilize them for this Contract, they would have to be housed. In reference to Section K-10, (d), please advise if Marshallese will be granted the necessary permission from the Commander USAKA to reside in Contractors camp on Kwajalein Island.

***RESPONSE:***



**RFP DACA83-02-R-0003  
FY02 MCA PN50846, COLD STORAGE FACILITY,  
AND  
FY01 RDT&E REPAIR WATER TANKS,  
KWAJALEIN ISLAND**

**PREPROPOSAL CONFERENCE AGENDA  
9 JANUARY 2002  
0830-1130**

1. Introduction & General Remarks
2. USAKA/Raytheon Logistics Overview
3. Kwajalein Construction Overview
4. Contracting Remarks
5. Evaluation/Selection Overview
6. Questions and Answers
7. Closing Remarks

(SITE VISIT TO TAKE PLACE 1230-1430)

1 APPEARANCES  
2 (In alphabetical order)

3 Lewis Askew, USACE HED, Kwajalein Resident Office  
4 Russ Camaucho, Raytheon Finance  
5 MAJ David Coffey, External Affairs/Host Nation  
6 Tom Dillon, Raytheon Marine Department  
7 Gene Dohrman, USAKA Public Works  
8 Darlene Duarte, USACE HED, Kwajalein Resident Office  
9 Jesse Duarte, USACE HED, Kwajalein Resident Office  
10 SFC Donell Jones, Provost Marshal Office  
11 David Y. Kam, USACE HED, Honolulu, Hawaii  
12 Rodney S.C. Leong, USACE HED, Honolulu, Hawaii  
13 Marty Olson, USACE HED, Kwajalein Resident Office  
14 Richard Say, USACE HED, Honolulu, Hawaii

11 ATTENDEES:

12 Mike Bradley, San Juan Construction  
13 Larry Cotton, San Juan Construction  
14 Sam Garcia, Nelson Refrigeration  
15 Frank Hawk, San Juan Construction  
16 David Kramer, Pacific International, Inc.  
17 Shuichi Kurosawa, Nippon Hodo Co., Ltd.  
18 Thomas Maddison, MIT-JENMEI J.V.  
19 Troy McAllister, San Juan Construction  
20 Brian Midyett, Kiewit Pacific Co.  
21 Roy Paris, Unitek Insulation, Inc.  
22 Frank Schumann, Unitek Technical Services  
23 Brent Smith, J.A. Jones  
24 Robert Toelkes, International Bridge Corp.  
25 Sammy Woodall, Dick Pacific

**REMINDER:** ONLY QUESTIONS THAT ARE SUBMITTED IN WRITING WILL BE GIVEN OFFICIAL RESPONSES IN AN AMENDMENT. IF THE SOLICITATION DOCUMENT REQUIRES REVISION, AMENDMENT(S) WILL BE ISSUED.

Jan 02

Work Order No. \_\_\_\_\_

Job Title \_\_\_\_\_

EQUIPMENT NUMBER	NOMENCLATURE	REACH FEET	ACQUISITION COST	MAINT/OP COST PER HOUR *	DEPRECIATION COST PER HOUR	TOTAL COST
C-2	Grane, Whl Mtd 12.5 Ton	12'	56,004	18.95	3.65	
C-21	Meck Grane, Whl Mtd 40 Ton	60'	196,815	65.90	11.50	
C-22	Grane, Whl Mtd 65 Ton	87-111'	196,815	65.90	11.50	
C-27	Grane, Grawler 150 Ton	210'	1,211,882	332.25	68.95	
C-28	Grane, Whl Mtd 80 Ton	157-181	550,297	148.35	32.00	
C-29	Meck Grane, Whl Mtd 7.5 Ton	20'	54,000	18.95	3.65	
C-30	Marine Grane, Whl Mtd 7.5 Ton	20'	54,000	18.95	3.65	
C-32	Grane, Whl Mtd 50 Ton	150-184	371,401	110.50	22.50	
C-35	Roi Grane, Whl Mtd 90 Ton	181-211	610,078	167.90	35.50	
C-40/41	Grader, Road Motorized		67,724	23.40	4.80	
C-45	Loader, Scoop 3-1/4 Yd		101,993	36.40	6.50	
C-46	Loader, Scoop 3-1/4 Yd		39,000	13.70	3.00	
C-49/51	Mixer, Concrete, Trk Mtd		109,900	36.40	7.00	
C-53	Roller, Steel Motorized		39,670	13.70	3.00	
C-54	Roller, Vibratory		58,700	20.35	3.95	
C-55/56	Loader, Scoop 2.5 Yd		58,890	20.35	3.95	
C-64/65	Tractor, Full Track 78 Ton		90,375	29.25	5.95	
C-111	Compressor, Air 750 CFM		30,850	10.45	2.40	
C-122/126	Compressor, Air 750 CFM		36,600	12.05	2.70	
C-132	Bobcat 1/3 Yd		12,110	4.20	1.10	
C-154/155	Tractor, Backhoe 1-3/4 Yd		31,522	10.45	2.40	
C-156	Tractor, Backhoe 1-3/4 Yd		58,694	20.35	3.95	
C-157/158	Tractor, Backhoe 1-3/4 Yd		67,585	23.40	4.80	
C-162/165/167	Compressor, Air 250 CFM		17,638	6.65	1.55	
C-223	Sweeper, Rotary Truck		90,000	29.25	5.95	
C-262	Krems Platform Aerial "Condor"	150'	477,011	131.50	28.50	
C-266	Krems Platform Aerial "Condor"	150'	502,706	133.50	28.85	
C-267	Krems Trk Maint Aerial Platform	65'	53,997	18.95	3.65	
C-268	Krems Trk Svc Platform "Condor"	150'	601,187	167.90	35.50	
C-275	Wtr Pit Truck, Pump, Sludge		94,658	29.25	5.95	
TMS-8 (C-276)	Truck, Sewer		36,422	12.05	2.70	
C-700/701	Platform Aerial	40'	32,832	12.05	2.70	
C-704	Meck Platform Aerial	40'	40,722	13.70	3.00	
C-705/706	Platform Aerial Lift	120'	173,298	56.05	10.05	
C-707	Platform Aerial Lift	150'	346,597	110.50	22.50	
S-702	Meck Platform Aerial	45'	39,499	13.70	3.00	
S-703	Roi Platform Aerial	40'	32,832	12.05	2.70	

\* The above equipment maintenance and operation costs include depreciation.

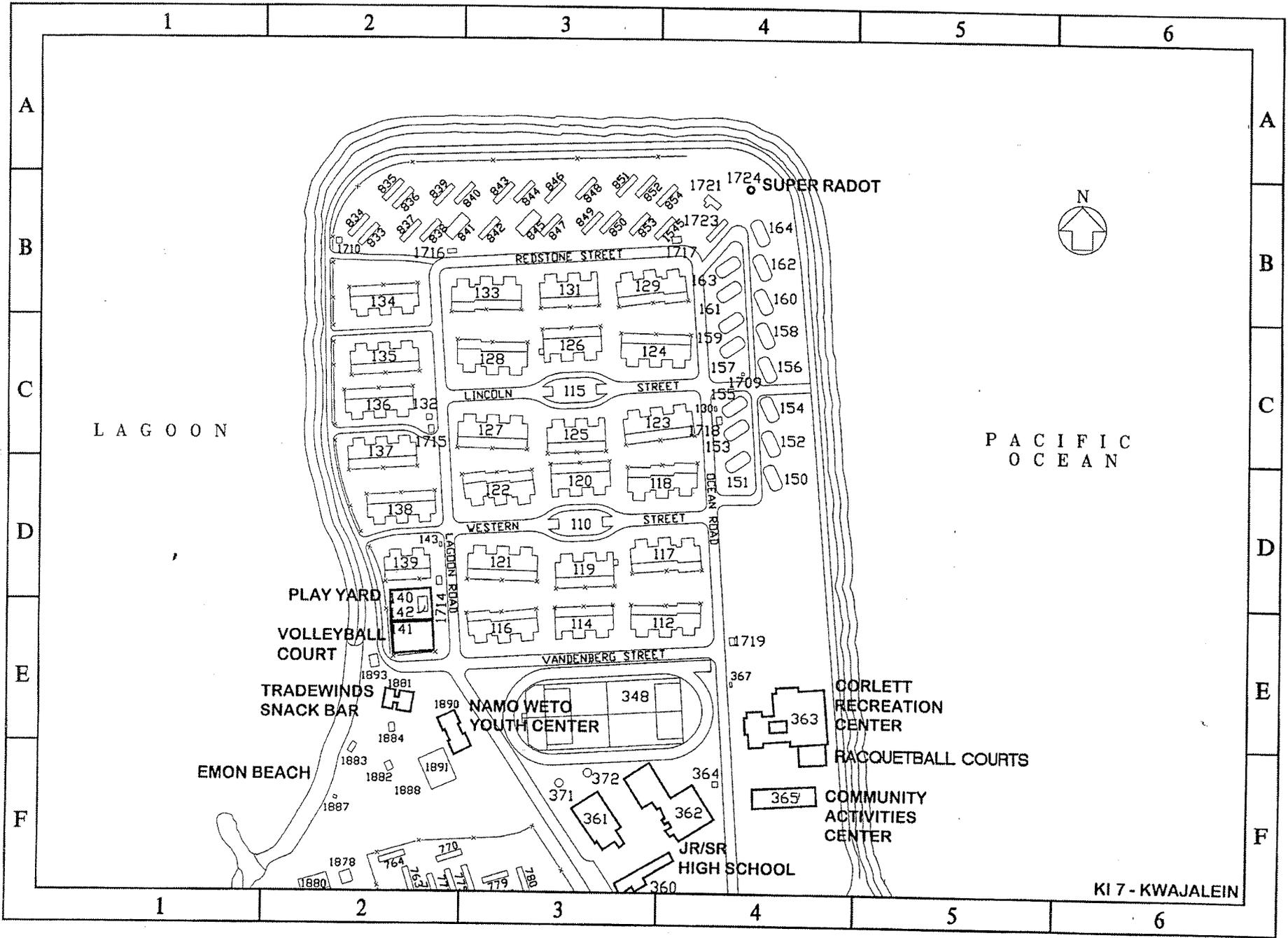


# Kwajalein Locator Guide

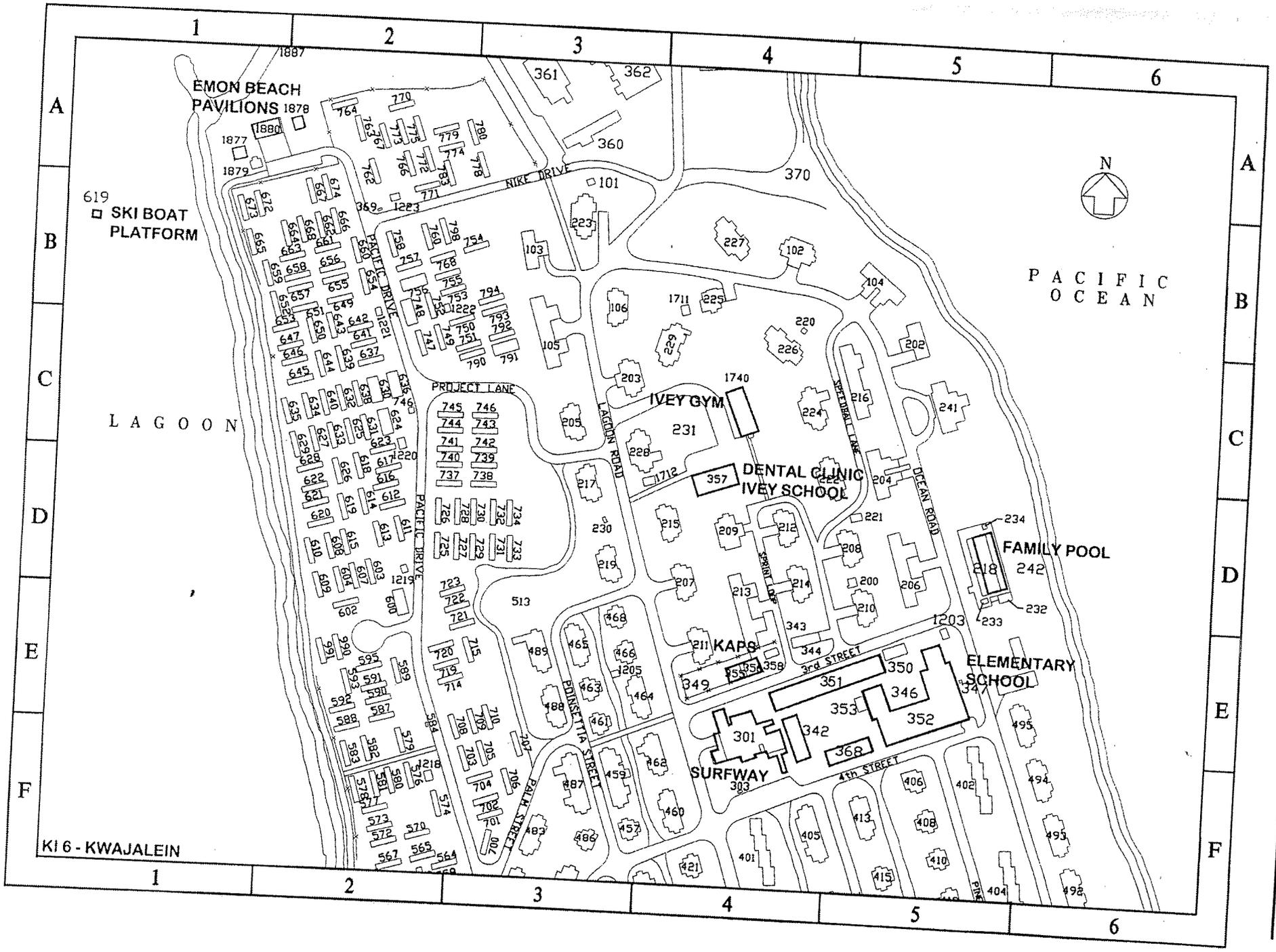
<u>FACILITY</u>	<u>BLDG</u>	<u>MAP REF</u>	<u>FACILITY</u>	<u>BLDG</u>	<u>MAP REF</u>
Adult Swimming Pool	801	KI 4 A-6	Laser Disk Club	357	KI 4 A-5
AFRTS*	805	KI 4 B-4	Macy's Retail Store	704	KI 6 D-4
Air Terminal	901	KI 4 D-6	Macy's West	729	KI 5 F-5
Arts and Crafts Annex	828	KI 4 B-4	Macy's Warehouse	816	KI 4 A-4
Atoll Terminal	688	KI 4 D-5	Man Camp		KI 3 C-1
Automotive Maintenance Shops	808	KI 4 C-3	Mt Olympus		KI 1 E-2
Aviation Maintenance Shops	900	KI 4 D-4	Namo Weto Youth Center	1890	KI 7 E-3
Bachelor Recreation Center	511	KI 5 E-5	Ocean Bachelor Quarters	560	KI 5 E-5
Bakery	703	KI 4 A-4	Oceanview Club (Snake Pit)	1418	KI 5 E-6
Bank of Guam	704	KI 5 F-5	Pacific Bachelor Quarters	708	KI 5 F-5
Barge Slip Ramp (BSR)	1000	KI 1 C-3	Pacific Club	1049	KI 5 E-6
BCB (HF Transmitter Bldg)	1017	KI 1 C-3	Palm Bachelor Quarters	561	KI 5 E-4
Beauty Shop	712	KI 5 F-5	Photo Lab (Special Services)	805	KI 4 B-4
Bowling Center	805	KI 4 B-4	Photo Lab (USAKA)	1002	KI 1 D-3
Brandon Field	660	KI 4 B-4	Play Yard	140	KI 7 E-2
Cafe Pacific (PDR)	703	KI 4 A-4	Police Station (CIS)	807	KI 4 B-4
Calibration Lab (CAL LAB)	988	KI 4 E-1	Post Office	706	KI 4 A-5
Camp Hamilton	878	KI 3 B-1	Power Plant No 1A	994	KI 3 B-2
Chapel	683	KI 4 C-5	Power Plant No 1B	994	KI 3 B-2
COE (Corps of Engineers)	894	KI 2 A-6	Power Plant No 2	1013	KI 1 D-4
Communications Center	1008	KI 2 B-5	RMI Office**	901	KI 4 D-6
Community Activities Center	365	KI 7 F-4	Racquetball Courts (Indoor)	363	KI 7 E-4
Coral Bachelor Quarters	563	KI 5 D-4	Racquetball Courts (Outdoor)	567	KI 4 B-5
Coral Sands Beach		KI 2 B-3	Ragan Field	661	KI 4 C-4
Corlett Recreation Center (CRC)	363	KI 7 E-4	Range Command	1010	KI 2 B-5
Country Club	879	KI 3 D-4	Range Operations Control Center (ROCC)	1009	KI 2 B-5
Dally Field	1645	KI 4 B-5	Reef Bachelor Quarters	564	KI 5 E-5
DCCB	1500	KI 1 B-1	Refuse and Waste Disposal		KI 1 D-2
Dental Clinic	357	KI 6 D-4	Religious Education	671	KI 4 C-5
Document Control	1075	KI 2 C-4	Richardson Theater	662	KI 4 C-5
Dock Security Checkpoint (DSC)	623	KI 5 E-2	Rifle & Pistol Range	1050	KI 1 A-1
Echo Pier	1385	KI 5 F-1	Roundhouse	987	KI 4 E-1
Emon Beach		KI 7 F-2	Sands Bachelor Quarters	565	KI 5 D-5
Emon Pavilion	1877/78/79/80/	KI 6 A-1	SCUBA Club Tank House	787	KI 4 A-2
Family Pool	218	KI 6 D-5	Self Help Store	779	KI 4 D-4
Finance Office	900	KI 4 C-4	Shark Pit	1103	KI 1 F-2
Fire Station	904	KI 4 E-3	Shell Bachelor Quarters	562	KI 5 E-5
Fixed Wing Aircraft Hangar	898	KI 4 D-4	Ski Platform	619	KI 6 B-1
FOM Maintenance Shops	804	KI 4 B-3	Small Boat Marina	1390	KI 4 A-2
Freshwater Production	855	KI 3 B-2	Snack Bar	704	KI 5 F-5
Gas Station	809	KI 4 B-3	Special Services*	805	KI 4 B-4
Gear Locker	670	KI 4 B-4	Stereo & TV Repair	1402	KI 5 E-4
General Supply, Kwajalein (GSK)	602	KI 5 E-3	Super RADOT	1724	KI 7 B-4
George Seitz Elementary School	352	KI 6 E-5	Surf Bachelor Quarters	501	KI 5 C-4
Golf Club House	882	KI 3 D-4	Surfway Food Store	301	KI 6 E-4
Grace Sherwood Library	805	KI 4 B-4	Tape Escape Video Rentals	712	KI 5 F-5
Ham Radio Shack	557	KI 4 B-5	Ten-Ten	786	KI 5 F-4
Helicopter Hangar	997	KI 3 C-3	Tennis Courts	802	KI 4 A-5
Hobby Shop	815	KI 4 B-4	Tennis Courts	634	KI 5 D-3
Holmberg Fairways Golf Course		KI 3 E-3	Tradewinds Snack Bar	1881	KI 7 E-2
Hospital	603	KI 5 E-5	Travel Center	712	KI 5 F-5
Hourglass Office*	805	KI 4 B-4	Tropics Bachelor Quarters	501	KI 5 C-5
Human Resources Office (HRO)	700	KI 4 B-4	Turtle Pond	896	KI 3 C-1
Ice Plant	701	KI 5 F-4	USAKA Headquarters**	901	KI 4 D-6
Ivey School	357	KI 6 D-4	Veterans Club	976	KI 3 A-4
Ivey Gym	1740	KI 6 C-4	Visitor Quarters		KI 5 C-5
Job Corps	1051	KI 3 C-1	Volleyball Court	141	KI 7 E-2
Jr-Sr High School	360	KI 7 F-3	Weather Station	907	KI 2 D-6
KAPS Pre-School	356	KI 6 E-4	Work Control	1759	KI 4 A-3
Kwaj Lodge	908	KI 4 C-6	Yacht Club	872	KI 3 B-1
Laundry & Dry Cleaning	710	KI 5 F-4	Yokwe Yuk Club	502	KI 5 D-5
Laundrette	717	KI 5 F-4	Yokwe Yuk Theater	1872	KI 5 D-5
			ZAR Building	993	KI 3 B-2

\* Special Services

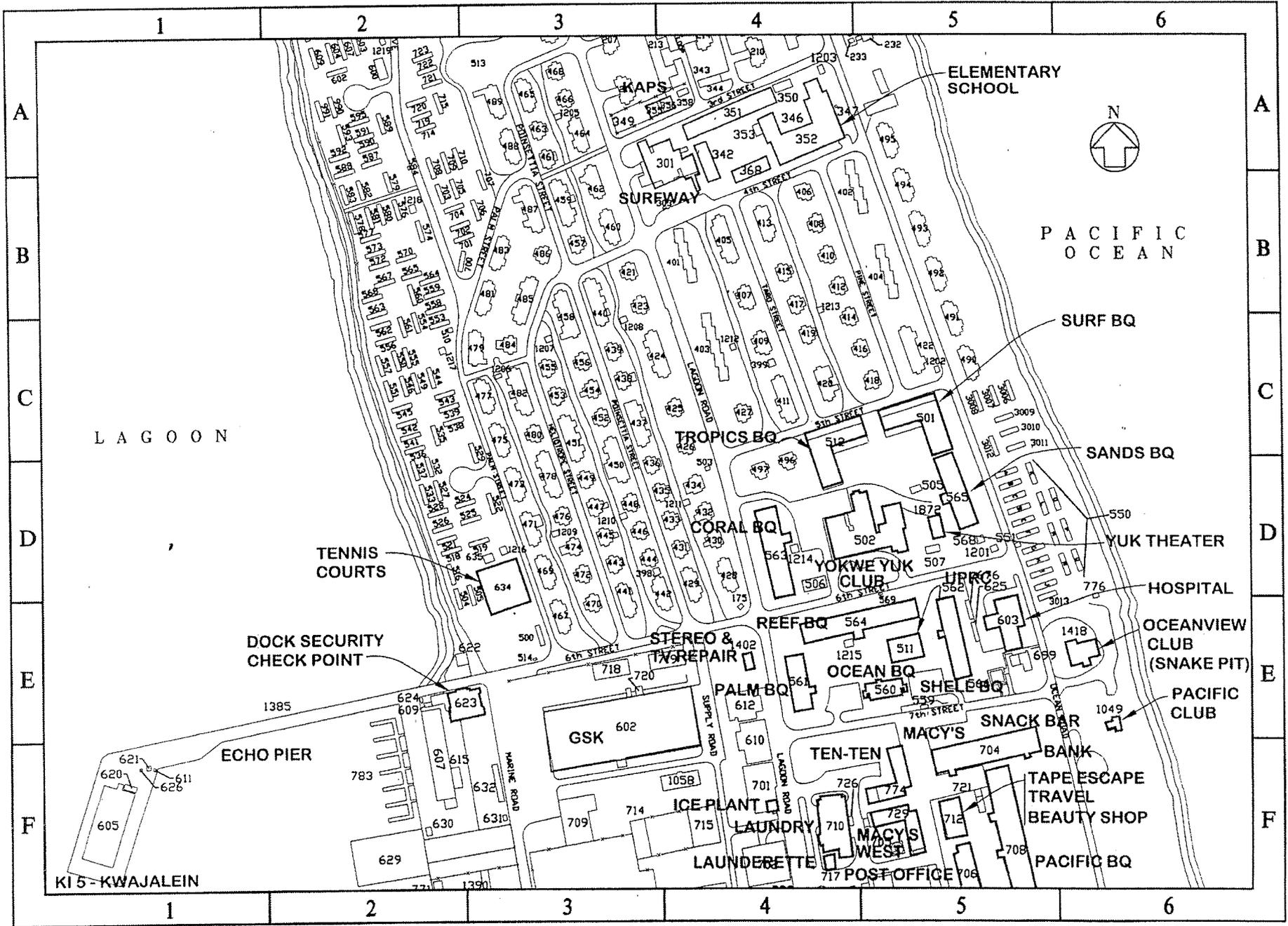
\*\*Air Terminal

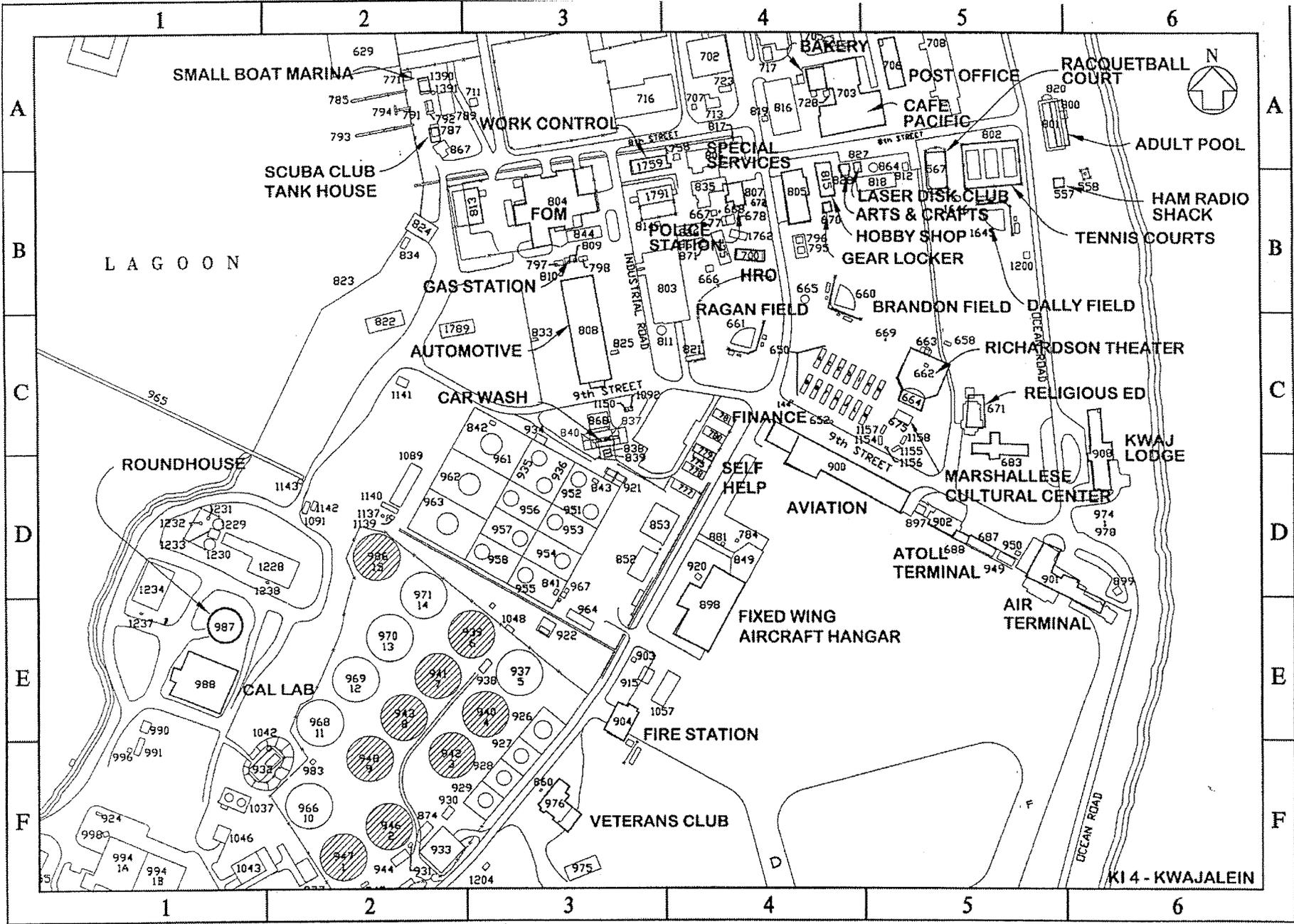


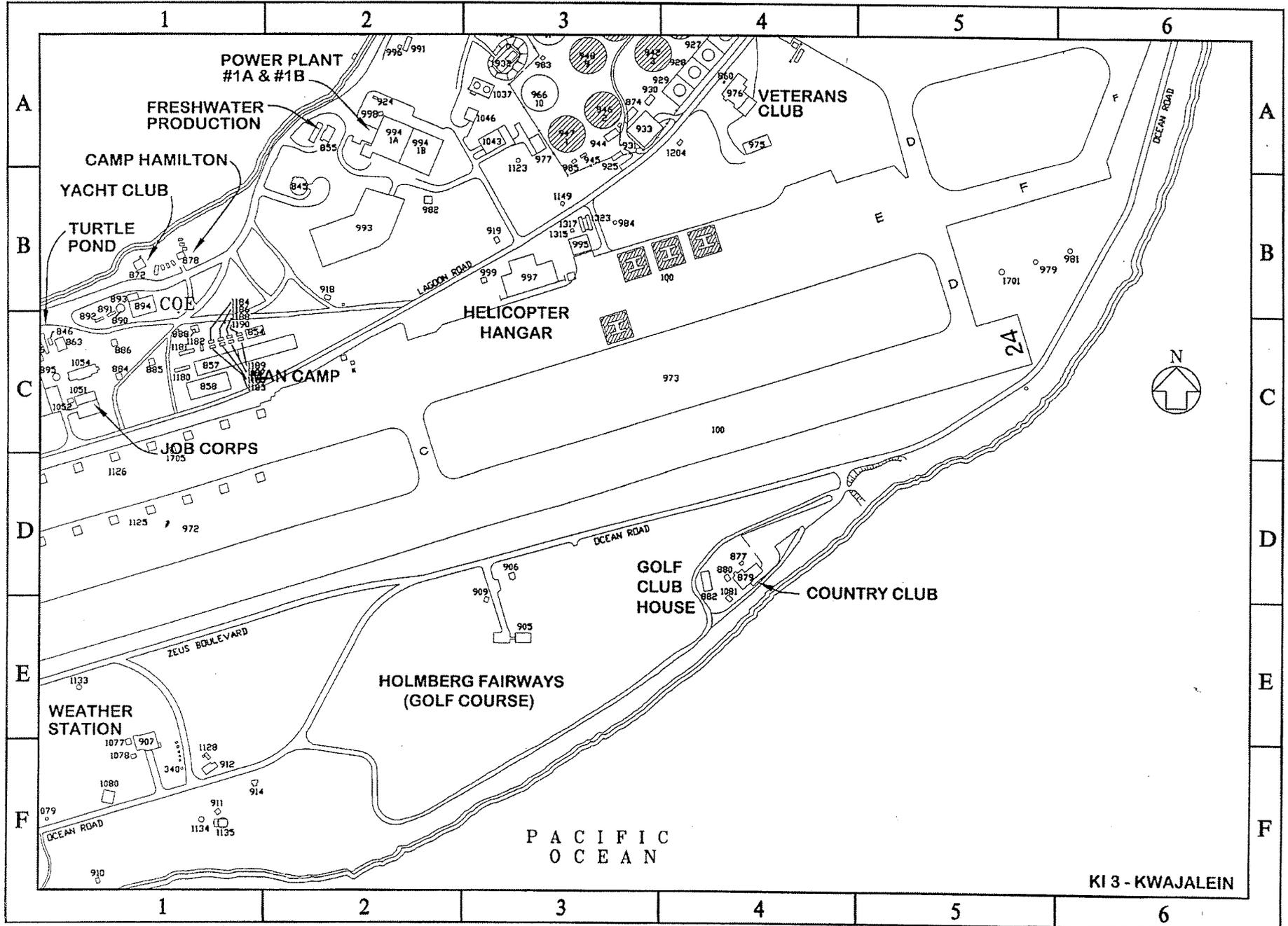
KI 7 - KWAJALEIN

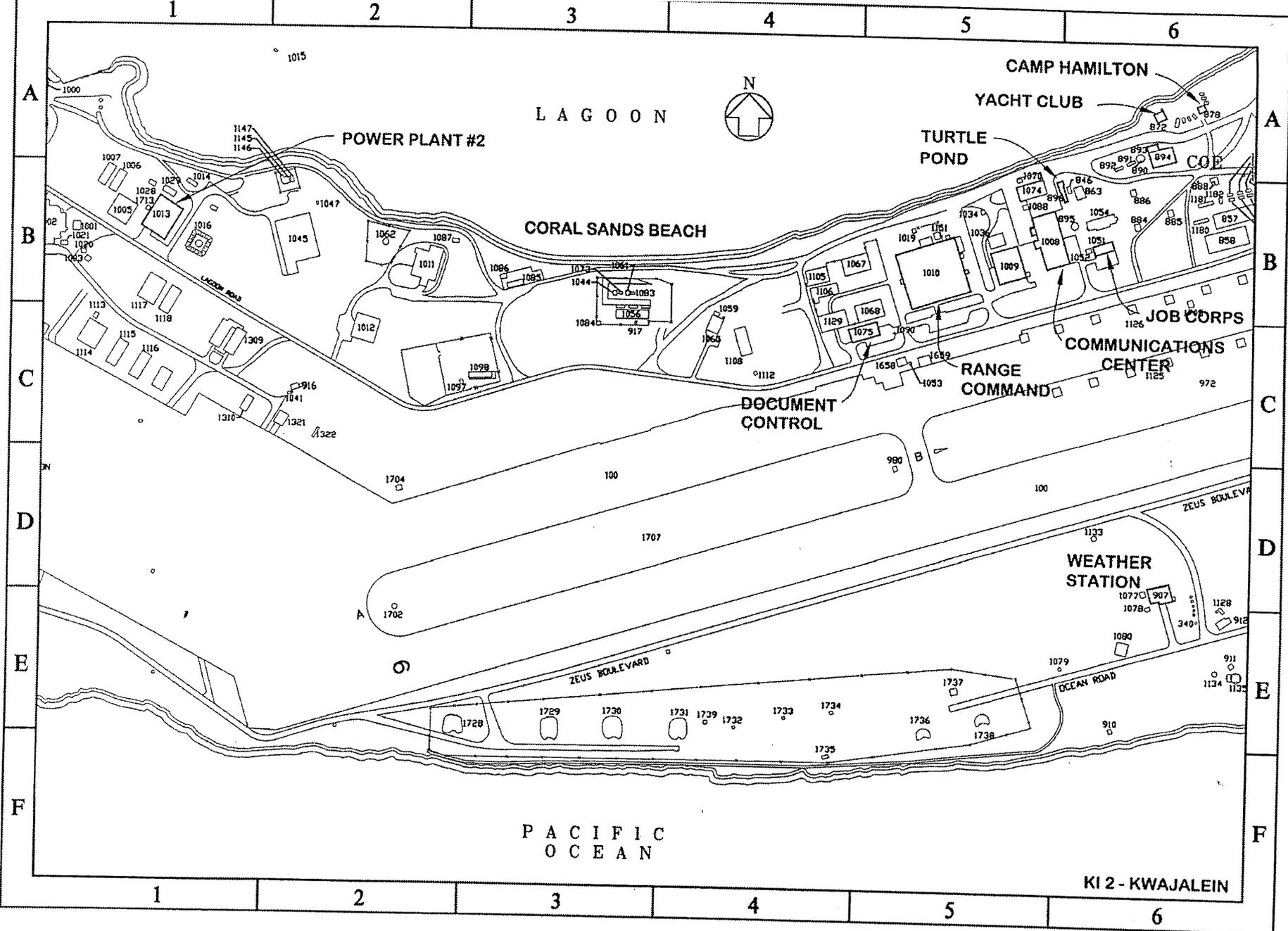


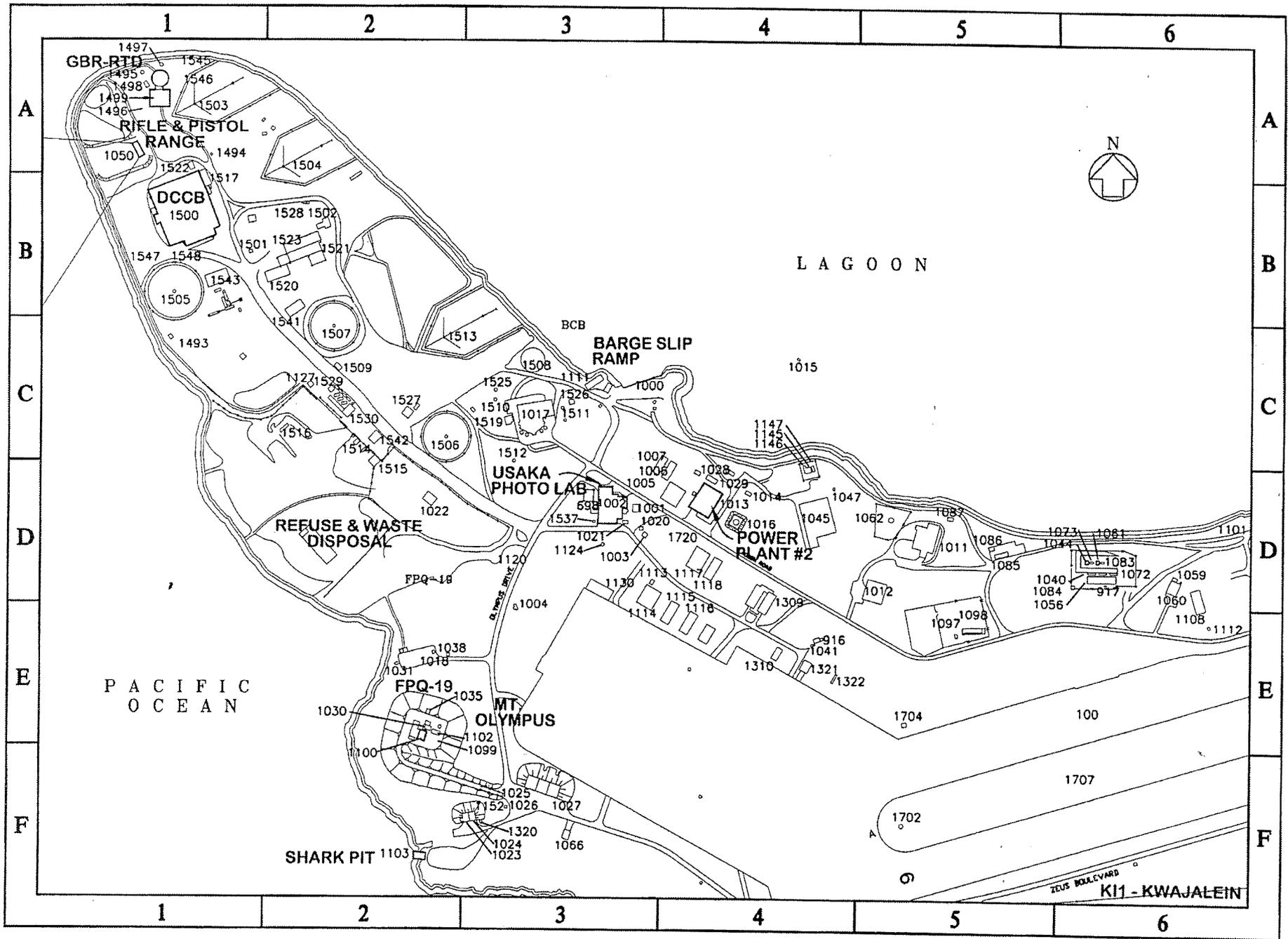
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RFP DACA83-02-R-0003

## PREPROPOSAL CONFERENCE ATTENDEES

NAME	COMPANY	PHONE NO.	FAX NO.	E-MAIL ADDRESS
Rodney Leong	HED	(808) 438-6940	(808) 438-8865	rodney.s.leong@pohphi.usace.army.mil
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Troy McCallister	San Juan Const.	805-355-1006	805-355-2006	troycallister@aol.com
Frank Hawks	San Juan Const.	970-249-6881	970-249-8783	FHawks001@aol.com
Michael BRADLEY	SAN JUAN CONST	805-355-1006	805-355-2006	MDO03B@aol.com
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ROBERT TOELKES	INTL. Bridge Corp	671 646-4370	671 646-5954	ilcexec@att.net
SHUICHI KUROSAWA	NIPPON HODO CO LTD	813 3563 6743	813 3567 7058	KUROSAWA-shuichi@nipponHodo.jp
Thomas Maddison	Jenmei-MIT J.V.	808-521-4711	808-538-3269	1100 Blakely St. Hono. HI 96813 (Kalamazoo 98)
ROY A PAULS JR	UNITEK INSULATION	808-831-3076	808-831-3080	RAPJR@RIE.COM
FRANK SCHUMANN	UNITEK TECHNICAL SVCS.	808-831-3076	808-831-3080	FSCHUMANN@Hawaii.ri.com.
DAVID KRAMER	PACIFIC INTL ENCL.	692 625 3122	692 625 3476	Piimaj@ntamar.com
BRIAN MIDYETT	KIEWIT PACIFIC CO.	808 674 1088	808-674-1236	BMIDYETT@KIEWIT-PSD.COM
JESSE DUARTE	HED	805 355 2183	805 355 2217	JESSE.E.DUARTE@pohphi.usace.army.mil
Marty O'SON	HED	805-355-2246	" " "	GEOFFRE.M.O'SON@POMBA.USACE.ARMY.MIL
Darlene Duarte	HED	805-355-2151	805-355-2217	Darlene.S.Duarte@pohphi.usace.army.mil
Gene Dohrman	USAKA	805 355-3778	805 355-4524	gene.dohrman@usaka.smdc.army.mil
D. Jones	USAKA			
D. Coffey	Host Nations			



DEPARTMENT OF THE ARMY  
UNITED STATES ARMY KWAJALEIN ATOLL/KWAJALEIN MISSILE RANGE  
POST OFFICE BOX 26  
APO AP 96555  
August 5, 2000

Office of the Commander

TO ALL USAKA/KMR VISITORS:

Welcome to the U.S. Army Kwajalein Atoll/Kwajalein Missile Range! As you'll see, the Kwajalein community is a great place to live and work. Our goal during your visit will be to assist you in every manner possible to ensure your stay is pleasant, productive, and safe.

For the safety of all our residents and visitors, many recreational activities are regulated. Of particular concern to us, is that you are aware of our water safety requirements. Authorized activity areas for water sports are shown in the USAKA/KMR Telephone Directory. The USAKA/KMR Regulation 385-9, available at the Kwaj Lodge registration desk, provides additional details. These restrictions are meant to protect you from the heavy wave action and coral reef in some areas, and boat traffic in other areas. The following water safety rules apply:

- a. In-water activities are allowed only on the lagoon side of Kwajalein.
- b. Flotation vests are required for all areas other than Emon Beach and the swimming pools.
- c. Official TDY personnel may rent snorkeling gear from the Small Boat Marina.
- d. The "buddy system" is required for all locations where a lifeguard is not on-duty.
- e. You are not allowed to go ashore on any island except Kwajalein or Roi-Namur without proper written permission.
- f. Scuba diving requires special "check-out" procedures. Contact any Scuba Club dive examiner for validation.

If you are unsure of the rules or wish more information, please contact the USAKA/KMR Safety Office staff at extension 5-1516 for assistance.

Again, I welcome you to Kwajalein. If there is anyway my staff or I can assist during your time on island, please contact me.

Sincerely,

A handwritten signature in black ink, appearing to read "Curtis L. Wrenn, Jr." with a stylized flourish at the end.

Curtis L. Wrenn, Jr.  
Colonel, U.S. Army  
Commanding Officer



**DEPARTMENT OF THE ARMY**  
UNITED STATES ARMY KWAJALEIN ATOLL / KWAJALEIN MISSILE RANGE  
BOX 26, APO AP 96555-2526

August 9, 2000

PROVOST MARSHAL OFFICE

SUBJECT: United States Army Kwajalein Atoll/Kwajalein Missile Range (USAKA/KMR) Rules, Regulations and Policies.

Dear Visitor/New Arrival:

I would like to welcome you to USAKA/KMR, and provide you with some important information concerning the rules, regulations and policies that govern this installation.

Personnel on USAKA/KMR are subject to several sets of laws and regulations. Personnel are subject to the Hawaii Revised Statutes, United States Federal Code, United States Federal Maritime Code and all USAKA/KMR policies and regulations. Additionally, military personnel are subject to the Uniform Code of Military Justice (UCMJ).

USAKA/KMR is a U.S. Army installation with retail facilities that provide goods and services for its residents and TDY personnel. The Marshallese people who reside on islands other than Kwajalein or Roi-Namur are not authorized to shop in USAKA/KMR retail facilities. The rules governing the purchase, resale and transfer of goods are outlined in USAKA/KMR Regulation 190-41. USAKA/KMR residents or TDY personnel who are apprehended for transferring retail goods to indigenous personnel are subject to adverse administrative action, as outlined in the regulation. This could include being barred from USAKA/KMR.

The purchase of retail goods also includes alcohol. USAKA/KMR residents or TDY personnel are not allowed to purchase alcohol for, or transfer alcohol to non-residents. Additionally, liquor (twenty-percent (20% alcohol content by volume) is rationed. Individuals 21 years of age or older can purchase up to six (6) liquor units per month. The locations where you can purchase and consume alcohol are outlined in USAKA/KMR Regulation 210-21. Individuals apprehended for violation of this regulation are subject to adverse administrative action as outlined in the regulation. This, too, could include being barred from USAKA/KMR.

To obtain copies of these USAKA/KMR regulations, or any other pertinent policy, contact your Human Resource Office or sponsor.

Again, welcome to USAKA/KMR. We hope you will enjoy your stay here, and we appreciate your cooperation in following the established rules and regulations for our small community. If you have any questions regarding any USAKA/KMR regulations or law, please feel free to contact my office at extension 5-2109 or the Kwajalein Police Department at extension 5-4445.

Sincerely,

A handwritten signature in black ink that reads "Paul Bezzek".

Paul Bezzek  
Major, U.S. Army  
Provost Marshal

When the state of affairs in the world dictate that more stringent security measures are required the Department of Defense will initiate the next threat level, FPCON BRAVO. All the measure required by FPCON ALPHA must continue to be followed and the following measures will also be implemented:

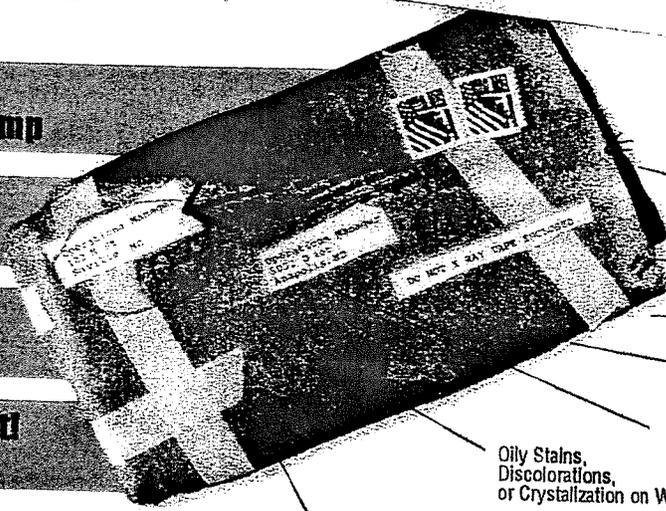
11. All personnel designated to work in the USAKA Emergency Operations Center (EOC) will be on a 30 minute recall status.
12. BFPMs will ensure that automobiles, golf carts and objects that could be used to conceal explosives (such as trash containers and crates) are moved away from all buildings to a distance of approximately 25 meters wherever possible. Golf carts may be parked near buildings after duty hours for charging if necessary.
13. At the beginning and end of each workday and at frequent intervals, BFPMs will inspect the interior and exterior of buildings in regular use for suspicious activity or packages, or signs of tampering, or indications of unauthorized entry.
14. KPD will augment activity supervisors with both overt and covert security force surveillance of MEVAs, food service facilities, retail, clubs, libraries, schools and other common use facilities by activity supervisors to identify explosive and incendiary devices.
15. The Provost Marshal will brief all KPD personnel, guards, and security augmentation force personnel concerning the threat and policies governing use of force/rules of engagement. Repeat this briefing periodically.
16. All personnel will lock parked vehicles and inspect vehicles for suspicious items before entering and driving them.
17. MEVA BFPMs will restrict entry to all MEVAs to single point access and secure (lock) all other entry points, where possible within given safety rules.
18. MEVA BFPMs will conduct 100% recognition or ID check for anyone entering any MEVA. The electronic security system at Bldg 1010 meets this requirement. All other MEVAs require observation of the single entry point.
19. The Logistics Support Contractor will conduct a 100% ID check at the entrance to all retail and food services, not just at the checkout counter.
20. The RMI Commute List access program will be suspended. No laundry will be allowed to pass through the DSCs.
21. KPD will conduct frequent, random searches of parcels, bags, etc passing through Dock Security Checkpoints.
22. The Logistical Support Contractor will test the attack warning system and will review supporting evacuation plans, to ensure proficiency and appropriate Operations Security (OPSEC).
23. KPD will notify RMI police concerning FPCON CHARLIE and DELTA measures that, if implemented, could impact on their operations locally. USAKA Host Nation Office will notify KALGOV and GRMI concerning FPCON CHARLIE and DELTA measures that, if implemented, could impact on RMI government and civilian programs and activities.
24. Everyone who lives and works at USAKA should review all measures associated with implementation of FPCON CHARLIE.

# FBI Advisory

If you receive a suspicious letter or package

## What should you do?

- 1 Handle with care  
Don't shake or bump
- 2 Isolate and look for indicators
- 3 Don't Open, Smell or Taste
- 4 Treat it as Suspect!  
Call 911



- No Return Address
- Restrictive Markings
- Possibly Mailed from a Foreign Country
- Excessive Postage
- PERSONAL
- SPECIAL DELIVERY
- Misspelled Words
- Addressed to Title Only or Incorrect Title
- Badly typed or written
- Protruding Wires
- Lopsided or Uneven
- Rigid or Bulky
- Strange Odor
- Wrong Title with Name
- Oily Stains, Discolorations, or Crystallization on Wrapper
- Excessive Tape or String

## If parcel is open and/or a threat is identified...

### For a Bomb

Evacuate Immediately  
Call 911

### For Radiological

Limit Exposure - Don't Handle  
Distance (Evacuate area)  
Shield yourself from object  
Call 911

### For Biological or Chemical

Isolate - Don't Handle  
Call 911  
Wash your hands with soap and warm water



Police Department \_\_\_\_\_

Fire Department 911 \_\_\_\_\_

Local FBI Office \_\_\_\_\_

## CENTER FOR DISEASE CONTROL HEALTH ADVISORY

### HOW TO HANDLE ANTHRAX AND OTHER BIOLOGICAL AGENT THREATS

#### DO NOT PANIC

1. Anthrax organisms can cause infection in the skin, gastrointestinal system, or the lungs. To do, so the organism must be rubbed into abraded skin, swallowed, or inhaled as a fine, aerosolized mist. Disease can be prevented after exposure to the anthrax spores by early treatment with the appropriate antibiotics. Anthrax is not spread from one person to another person.
2. For anthrax to be effective as a covert agent, it must be aerosolized into very small particles. This is difficult to do, and requires a great deal of technical skill and special equipment. If these small particles are inhaled, life-threatening lung infection can occur, but prompt recognition and treatment are effective.

#### **Suspicious Unopened letter or PACKAGE MARKED WITH THREATENING MESSAGE SUCH AS "ANTHRAX":**

1. Do not shake or empty the contents of any suspicious envelope or package.
2. PLACE the envelope or package in a plastic bag or some other type of container to prevent leakage of contents.
3. If you do not have any container, then COVER the envelope or package with anything (e.g., clothing, paper, trashcan, etc.) and do not remove this cover.
4. Then LEAVE the room and CLOSE the door, or section off the area to prevent others from entering (i.e., keep others away).
5. WASH your hands with **soap and water** to prevent spreading any powder to your face.
6. What to do next...
  - If you are at **HOME**, **dial "911"** to report the incident.
  - If you are at **WORK**, **dial "911"** to report the incident, **and** notify your force protection building manager, **and** available supervisor.
7. LIST all people who were in the room or area when this suspicious letter or package was recognized. Give this list to both the local public health authorities and law enforcement officials for follow-up investigations and advice.

#### **ENVELOP WITH POWDER AND POWDER SPILLS OUT ONTO THE SURFACE:**

1. DO NOT try to CLEAN UP the powder. COVER the spilled contents immediately with anything (e.g., clothing, paper, trashcan, etc.) and do not remove this cover!
2. Then LEAVE the room and CLOSE the door, or section off the area to prevent others from entering (i.e., keep others away).
3. WASH your hands with **soap and water** to prevent spreading any powder to your face.
4. What to do next...
  - If you are at **HOME**, **dial "911"** to report the incident.
  - If you are at **WORK**, **dial "911"** to report the incident, **and** notify your force protection building manager, **and** available supervisor.
5. REMOVE heavily contaminated clothing as soon as possible and place in a plastic bag, or some other container that can be sealed. This clothing bag should be given to the emergency responders for proper handling.
6. SHOWER with **soap and water** as soon as possible. *Do Not Use Bleach Or Other Disinfectant On Your Skin.*

7. If possible, list all people who were in the room or area, especially those who had actual contact with the powder. Give this list to both the local public health authorities so that proper instructions can be given for medical follow-up, and to law enforcement officials for further investigation.

#### **QUESTION OF ROOM CONTAMINATION BY AEROSOLIZATION:**

For example: small device triggered, warning that air-handling system is contaminated, or warning that a biological agent released in a public space.

1. Turn off local fans or ventilation units in the area.
2. LEAVE area immediately.
3. CLOSE the door, or section off the area to prevent others from entering (i.e., keep others away).
4. What to do next...
  - If you are at **HOME**, dial **"911"** to report the incident.
  - If you are at **WORK**, dial **"911"** to report the incident, **and** notify your force protection building manager, **and** available supervisor.
5. SHUT down air handling system in the building, if possible.
6. If possible, list all people who were in the room or area. Give this list to both the local public health authorities so that proper instructions can be given for medical follow-up, and to law enforcement officials for further investigation.

#### ***How can I identify suspicious packages and letters?***

Some characteristics of suspicious packages and letters include the following...

- Excessive postage
- Handwritten or poorly typed addresses
- Incorrect titles
- Title, but no name
- Misspellings of common words
- Oily stains, discolorations or odor
- No return address
- Excessive weight
- Lopsided or uneven envelope
- Protruding wires or aluminum foil
- Excessive security material such as masking tape, string, etc.
- Visual distractions
- Ticking sound
- Marked with restrictive endorsements, such as "Personal" or "Confidential"
- Shows a city or state in the postmark that does not match the return address

#### ***Where can I get more information?***

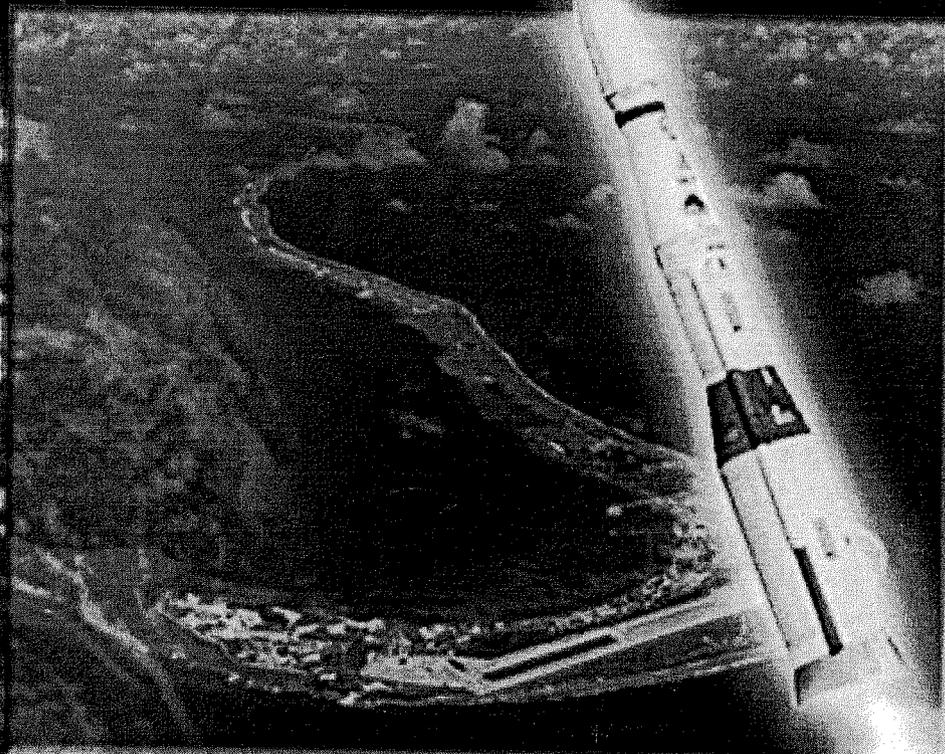
The CDC has a URL specific to biological terrorism (<http://www.cdc.gov/>). Another useful web site is The Center for Civilian Biodefense at Johns Hopkins University (<http://www.hopkins-biodefense.org>). These comprehensive sites provide detailed information about many biological and chemical agents, as well as the overall strategic plan for preparedness and response at a national and local level.

Sources: Health Alert Network, *Centers for Disease Control and Prevention (CDC)*. October 12, 2001

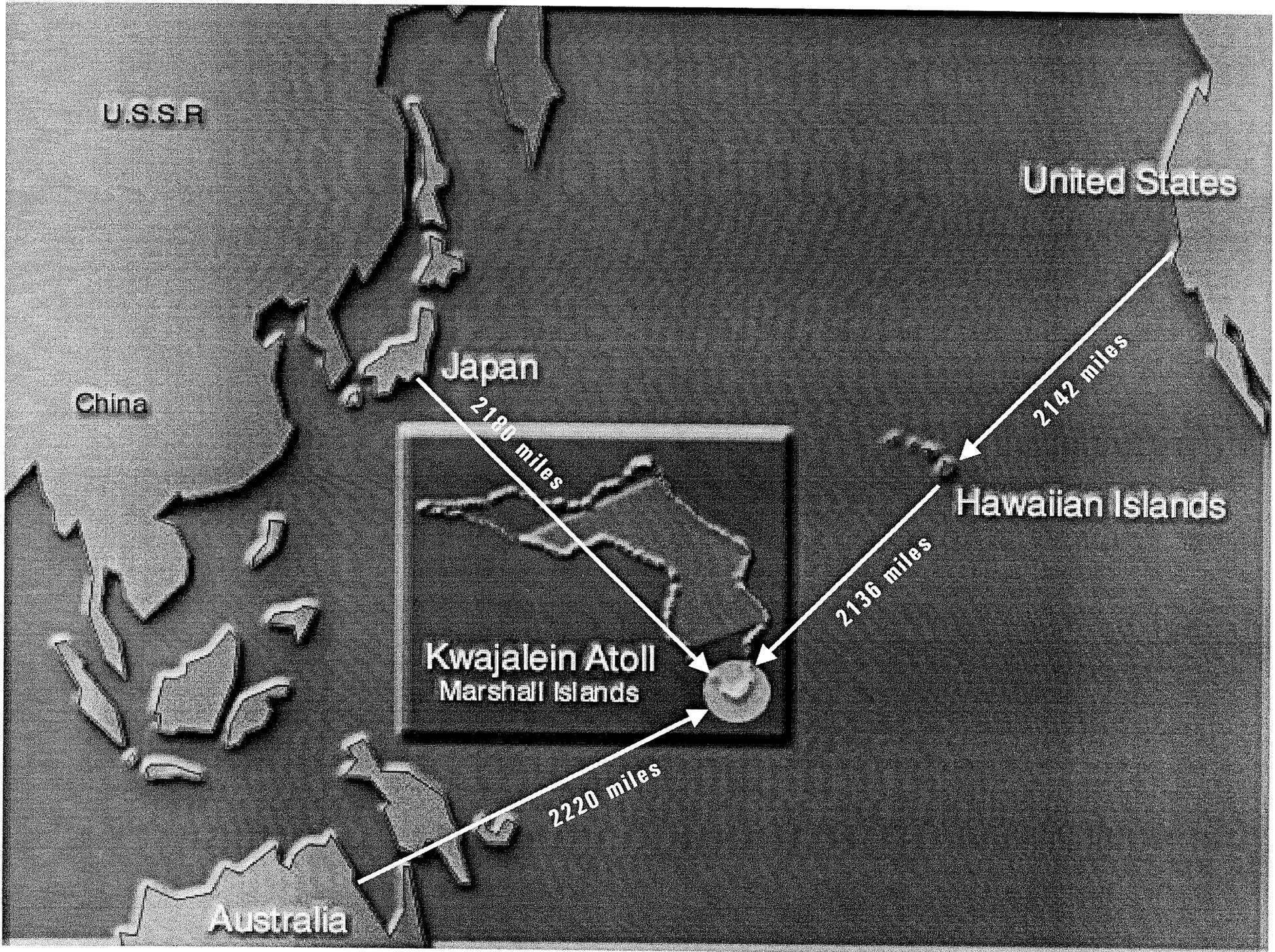
*Johns Hopkins Center for Biodefense Studies*

PCHI focus. *Partners Community HealthCare, Inc.* October 5, 2001

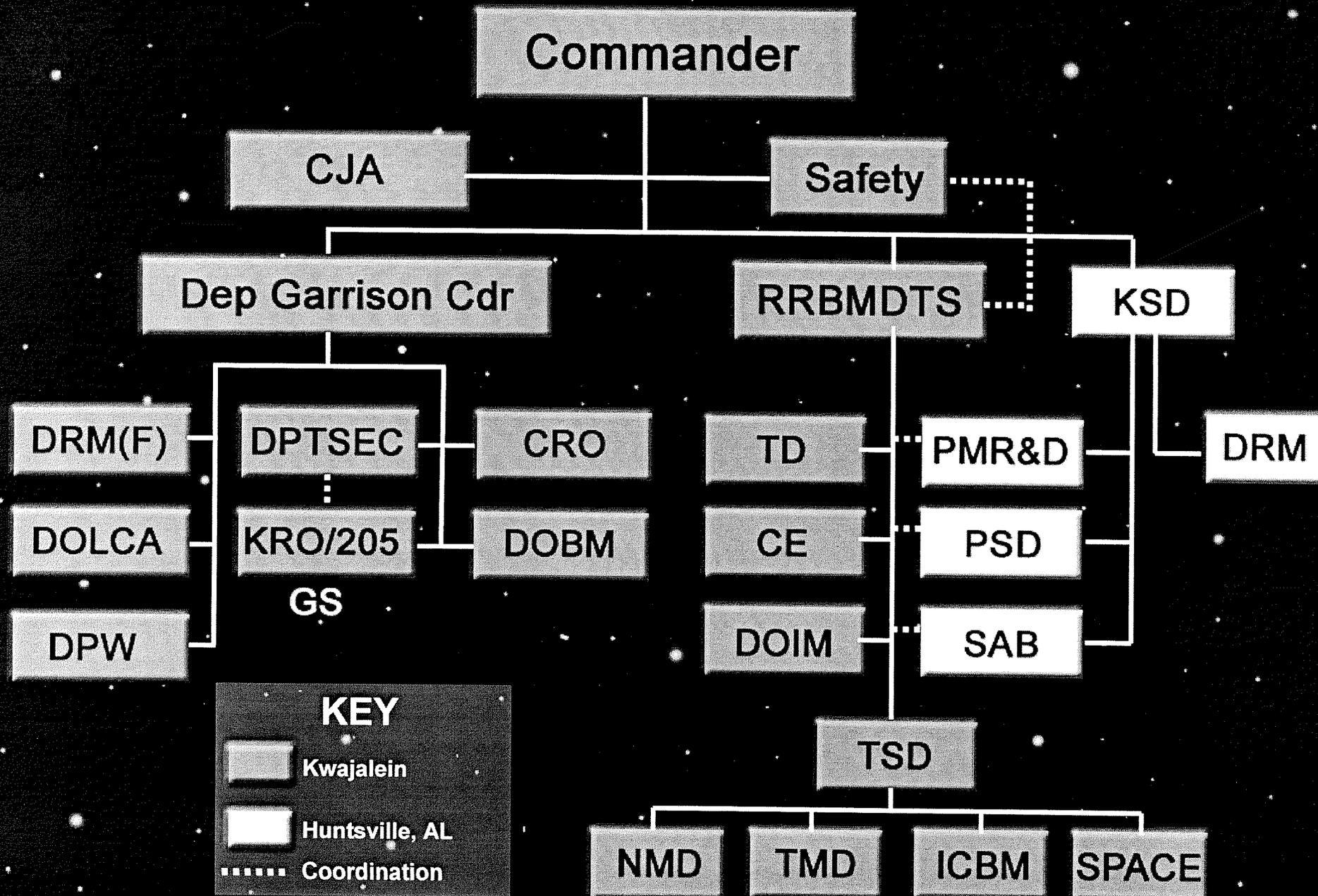
# US Army Kwajalein Atoll



**COL Curtis L. Wrenn, Jr.**  
**Commanding**



# USAKA Organization Chart





# GOALS

## SMDC Strategic Goals

1. Deliver World Class Space Support to the Warfighter and National Space Interests
2. Provide the World's Foremost Integrated Missile Defense to Protect the Nation, the Warfighter, and Other National Interests
3. Provide the Nation, the Department of Defense, and the Army with Leading Edge Technologies to Meet National and Warfighter Space and Missile Requirements
4. Enhance Workforce Excellence to Ensure Continued US Leadership in Space and Missile Defense
5. Enhance the Quality of Life for Soldiers, Civilians, and Family Members

## USAKA/RTS Nested Goals

1. Reduce USAKA/RTS costs and share savings with customers
2. Increase our external customer base
3. Expand product and services capabilities
4. Continuously Improve the Living and Working Conditions at Kwajalein Atoll
5. Enhance Our Partnership with The RMI

# USAKA Personnel Summary

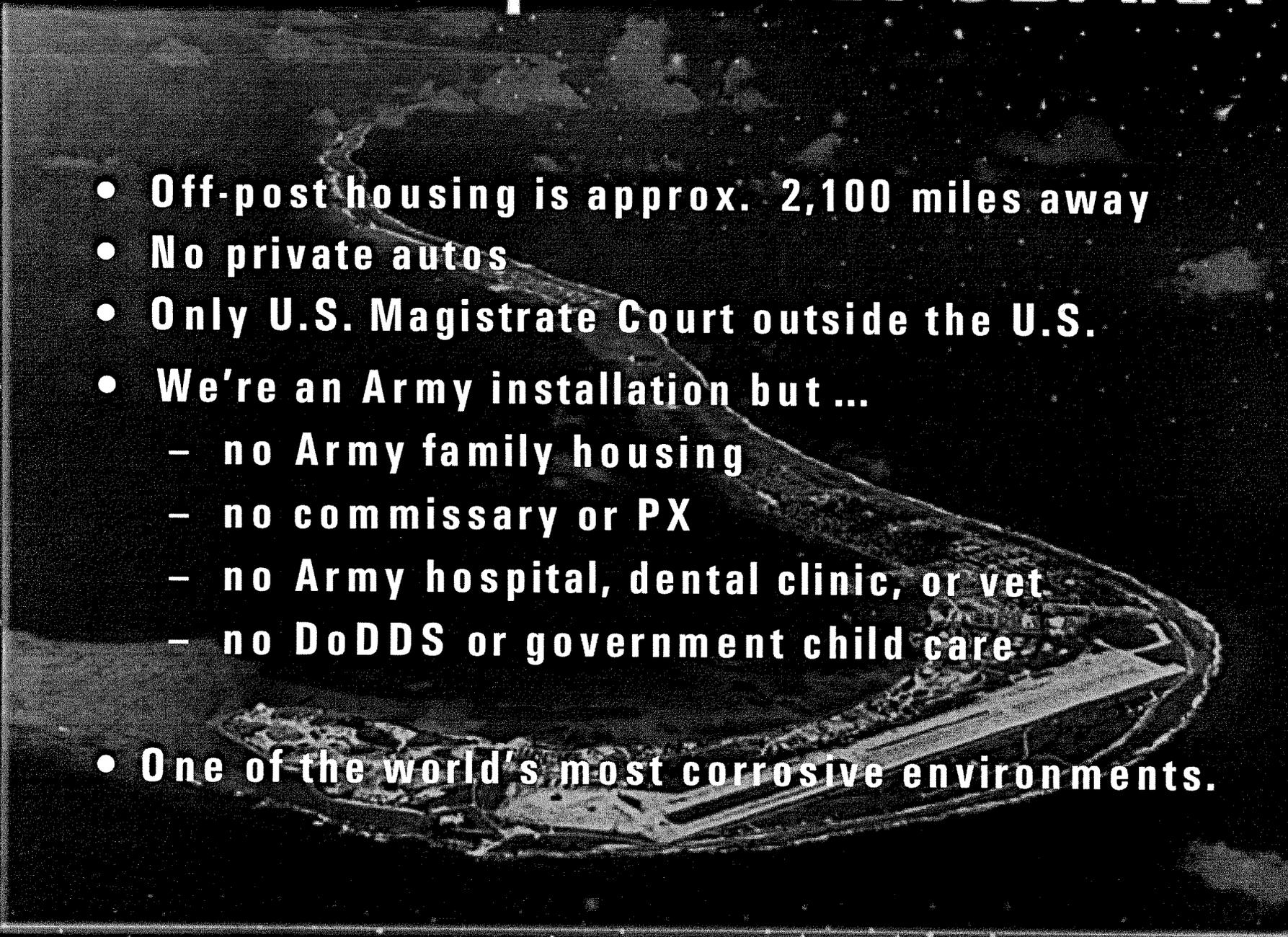
An aerial photograph of a coastal area, likely a military installation, showing a runway, various buildings, and a shoreline. The image is in black and white and has a grainy, high-contrast appearance.

<b>Military</b>	<b>23</b>
<b>Civilian</b>	<b>77</b>
<b>Contractors (US)</b>	<b>~1,200</b>
<b>Contractors (Marshallese)</b>	<b>~1,400</b>
<b>Family Members</b>	<b>~<u>1,000</u></b>
<b>Total</b>	<b>~3,700</b>

# What's unique about USAKA.

- We're a small town of 2,300 people, but ...
  - we're spread over *850 square miles*
  - we run our own airline and stores
  - international airport and harbor
  - police and fire department
  - 15-bed hospital
  - K-12 school
  - power, water, and sewage plants
  - Armed Forces Radio & Television Service
  - US Post Office

# What's unique about USAKA.

- Off-post housing is approx. 2,100 miles away
  - No private autos
  - Only U.S. Magistrate Court outside the U.S.
  - We're an Army installation but ...
    - no Army family housing
    - no commissary or PX
    - no Army hospital, dental clinic, or vet
    - no DoDDS or government child care
  - One of the world's most corrosive environments.
- 
- An aerial photograph of a coastal installation, likely a military base, with a large body of water in the foreground. The installation includes various buildings, roads, and a large rectangular structure. The background shows a dark, starry sky.

# Merchandising & Provisioning



- Macy's and Macy's West Retail Stores
- Ten Ten Convenience Store
- Surfway Grocery Store
- Surfway Taxi
- Gimbels Retail Store
- Internet Retail
- Laundry/Laundrette
- Cobbler/Tailor
- Beauty/Barber Shops
- Tape Escape Video Outlet
- Vending Services
- Bank of Guam
- Miscellaneous (GSK Sales, Bike, TV Repair, etc.)

# Food Services



## Kwajalein

- Café Pacific
- Yokwe Yuk Club
- Oceanview Club
- Three Palms Snack Bar
- Country Club Snack Bar
- Sunrise Bakery
- Enra Food Truck

## Roi-Namur

- Café Roi
- Outrigger Club
- Main Snack Bar
- Tradewinds Snack Bar
- Roi-Namur Snack Bar

*Over 57,000 meals served monthly in dining rooms*

# Recreation



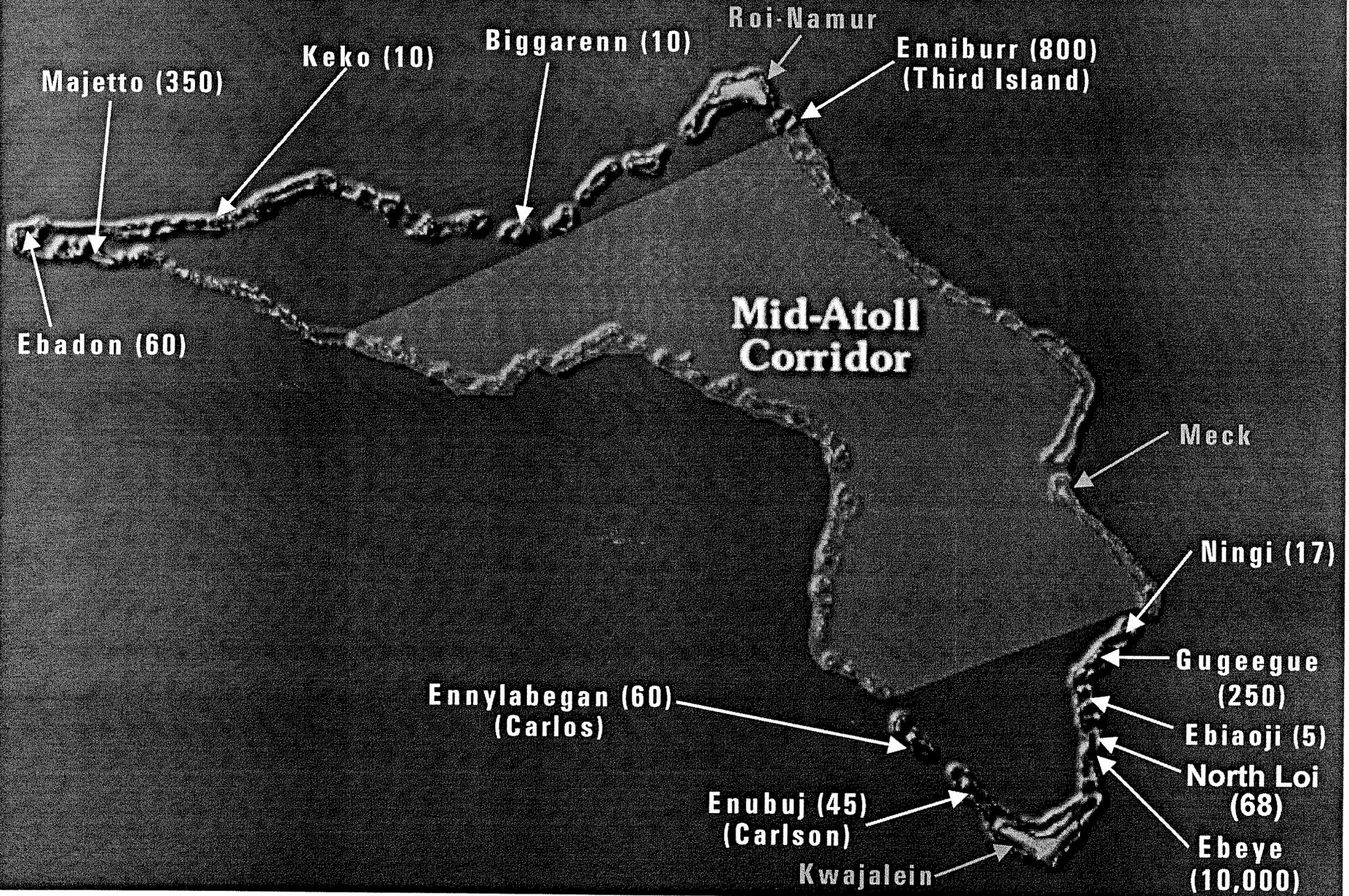
- **Outdoor Pools (Family/Adult)**
- **Outdoor Athletic Fields**
- **Tennis, Basketball & Racquetball Courts**
- **Two 9-Hole Golf Courses**
- **Recreation Centers (Community/Unaccompanied Personnel)**
- **Hobby Shops (Woodwork, Ceramics, Photo)**
- **Physical Fitness Centers/Weight Rooms/Aerobic Programs**
- **Youth Center**
- **Bowling Center (8 lanes)**
- **Movie Theaters**
- **Small Boat Marina**
- **Library**
- **Sports Leagues**
- **Gear Locker**

# USAKA

## International Responsibilities

- **Compact of Free Association with RMI -- 1986**
    - U.S. has full defense authority/responsibility
    - 15 year option exercised to 2016
    - Negotiations for add'l 15 year compact funding levels began 21 Oct 99
  - **Income to RMI**
    - 2nd largest employer in RMI (approximately 1400, \$18.2M/year)
    - \$14M Kwajalein related payments
    - \$2.5M/year income tax from U.S. contract employees
- CINCPAC Representative to RMI/Kiribati**

# Marshallese Inhabited Islands



# RMI Demographics

## RMI

Population - as of  
1999 --- 51,000

1.5% Growth/Year

Average Age 15+

## Ebeye

12/Household (650 sf)

### Population

1952 30

1983 7,500

1988 8,500

1999 10,000

Population Density:  
66,750 per sq mile

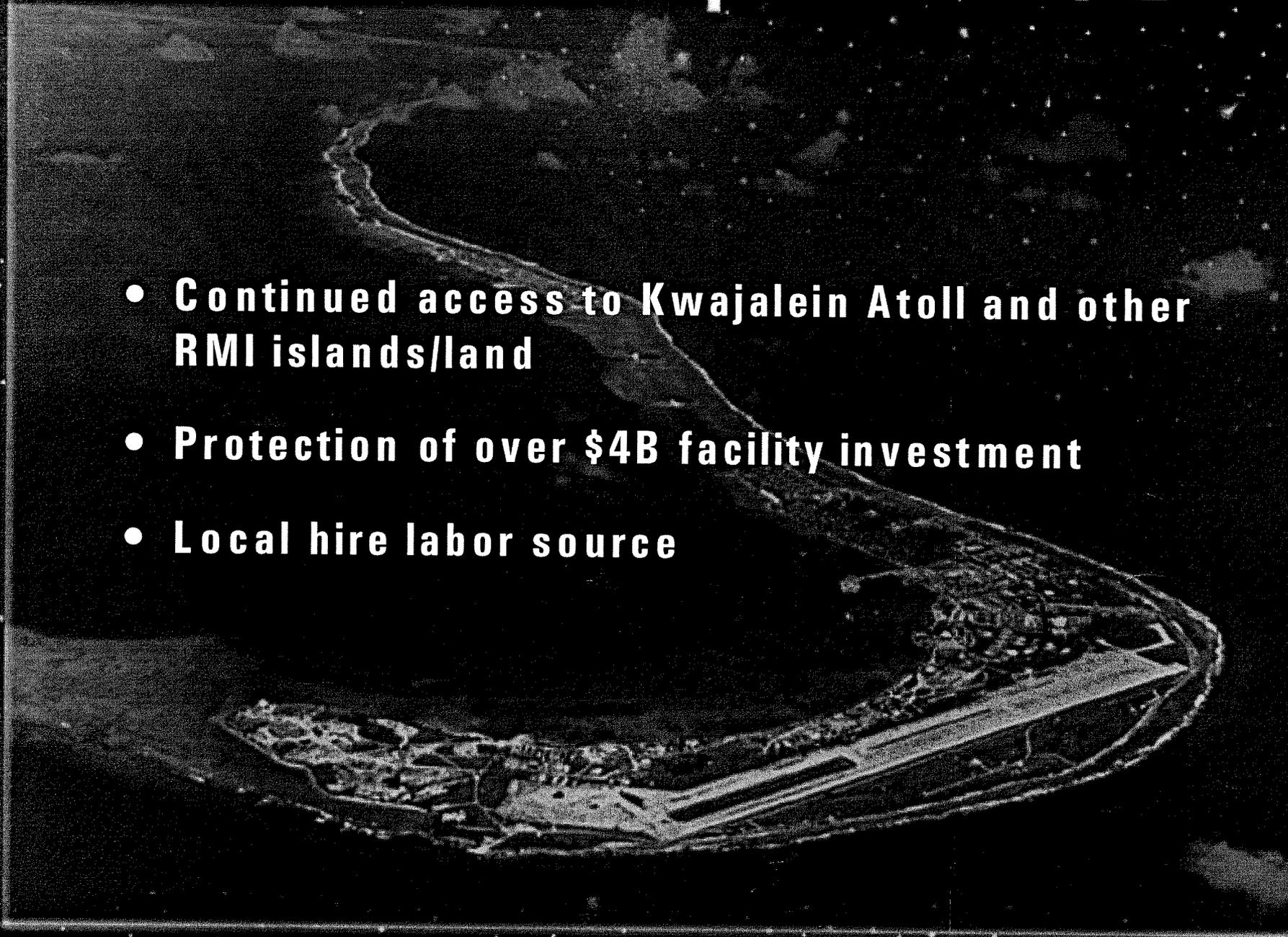
# Ebeye

- **Infrastructure Problems**
  - Power plant
  - Water supply
  - Sewage treatment
  - Hospital

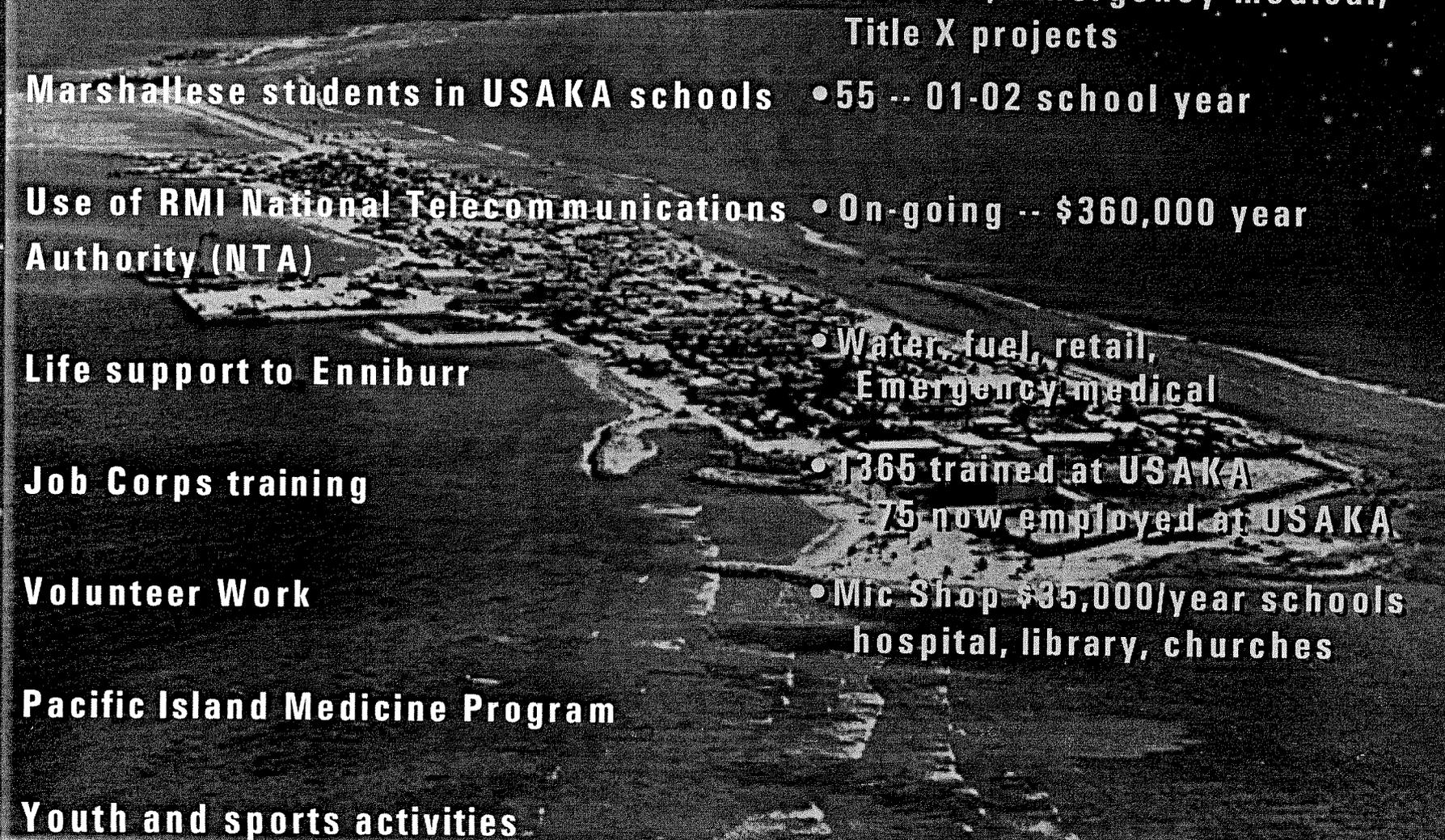


# Benefits of Compact to US

- Continued access to Kwajalein Atoll and other RMI islands/land
- Protection of over \$4B facility investment
- Local hire labor source



# Benefits to RMI



**Equipment sales/donations**

- Excess Government Property  
Medical, educational

**Humanitarian assistance**

- Medivac, Emergency medical,  
Title X projects

**Marshallese students in USAKA schools**

- 55 -- 01-02 school year

**Use of RMI National Telecommunications  
Authority (NTA)**

- On-going -- \$360,000 year

**Life support to Enniburr**

- Water, fuel, retail,  
Emergency medical

**Job Corps training**

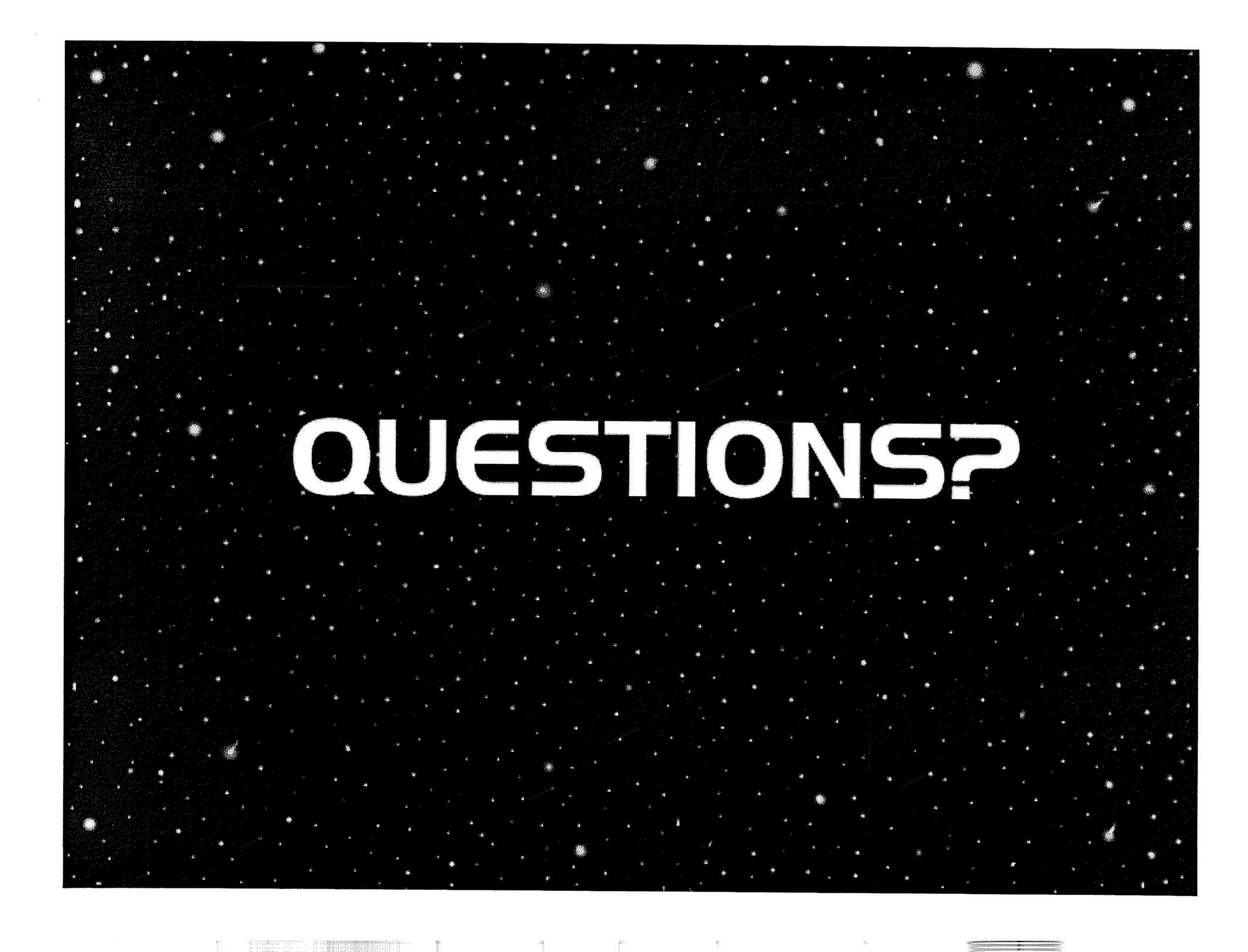
- 1365 trained at USAKA  
75 now employed at USAKA

**Volunteer Work**

- Mic Shop \$35,000/year schools  
hospital, library, churches

**Pacific Island Medicine Program**

**Youth and sports activities**



**QUESTIONS?**

PROJECT TABLE OF CONTENTS

DIVISION 3 - CONCRETE	
03200	CONCRETE REINFORCEMENT
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13038	COLD-STORAGE ROOMS (PREFABRICATED PANEL TYPE)
DIVISION 16 - MECHANICAL	
16375	ELECTRIC DISTRIBUTION SYSTEM, UNDERGROUND
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DIVISION 03 - CONCRETE

SECTION 03200

CONCRETE REINFORCEMENT

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- 3.4 SPECIAL INSPECTION AND TESTING FOR SEISMIC-RESISTING SYSTEMS

-- End of Section Table of Contents --

## SECTION 03200

## CONCRETE REINFORCEMENT

## PART 1 GENERAL

## 1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

## ACI INTERNATIONAL (ACI)

ACI 318M (1995) Building Code Requirements for Structural Concrete and Commentary (Metric)

## AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 615/A 615M (1996a) Deformed and Plain Billet-Steel Bars for Concrete Reinforcement

ASTM A 706/A 706M (1998) Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement

ASTM A 767/A 767M (1997) Zinc-Coated (Galvanized) Steel Bars in Concrete Reinforcement

ASTM A 884/A 884M (1996a<sup>el</sup>) Epoxy-Coated Steel Wire and Welded Wire Fabric for Reinforcement

ASTM A 934/A 934M (2001) Standard Specification Epoxy-Coated Prefabricated Steel Reinforcing Bars

## AMERICAN WELDING SOCIETY (AWS)

AWS D1.4 (1998) Structural Welding Code - Reinforcing Steel

## CONCRETE REINFORCING STEEL INSTITUTE (CRSI)

CRSI MSP-1 (1996) Manual of Standard Practice

## 1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Reinforcement; G, RE

Detail drawings showing reinforcing steel placement, schedules, sizes, grades, and splicing and bending details. Drawings shall show support details including types, sizes and spacing.

SD-03 Product Data

Welding; G, RE

A list of qualified welders names.

SD-07 Certificates

Reinforcing Steel; G, RE

Certified copies of mill reports attesting that the reinforcing steel furnished contains no less than 25 percent recycled scrap steel and meets the requirements specified herein, prior to the installation of reinforcing steel.

### 1.3 WELDING

Welders shall be qualified in accordance with AWS D1.4. Qualification test shall be performed at the worksite and the Contractor shall notify the Contracting Officer 24 hours prior to conducting tests. Special welding procedures and welders qualified by others may be accepted as permitted by AWS D1.4.

### 1.4 DELIVERY AND STORAGE

Reinforcement and accessories shall be stored off the ground on platforms, skids, or other supports.

## PART 2 PRODUCTS

### 2.1 REINFORCING STEEL

**Reinforcing steel shall be deformed bars conforming to ASTM A 615/A 615M, epoxy-coated in accordance with ASTM A 934/A 934M, or zinc-coated in accordance with ASTM A 767/A 767M. Reinforcing steel to be welded shall conform to ASTM A 706/A 706M.**

### 2.2 WELDED WIRE FABRIC

Welded wire fabric shall conform to ASTM A 884/A 884M.

### 2.3 WIRE TIES

Wire ties shall be 16 gauge or heavier black annealed steel wire, epoxy coated.

### 2.4 SUPPORTS

Bar supports for formed surfaces shall be designed and fabricated in accordance with CRSI MSP-1 and shall be steel or precast concrete blocks. Precast concrete blocks shall have wire ties and shall be not less than 100 by 100 mm when supporting reinforcement on ground. Precast concrete block

shall have compressive strength equal to that of the surrounding concrete. Where concrete formed surfaces will be exposed to weather or where surfaces are to be painted, steel supports within 13 mm of concrete surface shall be galvanized, plastic protected or of stainless steel. Concrete supports used in concrete exposed to view shall have the same color and texture as the finish surface. For slabs on grade, supports shall be precast concrete blocks, plastic coated steel fabricated with bearing plates, or specifically designed wire-fabric supports fabricated of plastic.

## PART 3 EXECUTION

### 3.1 REINFORCEMENT

Reinforcement shall be fabricated to shapes and dimensions shown and shall conform to the requirements of ACI 318M. Reinforcement shall be cold bent unless otherwise authorized. **Bending shall be accomplished at the mill.** Bars shall not be bent after embedment in concrete. Safety caps shall be placed on all exposed ends of vertical concrete reinforcement bars that pose a danger to life safety. Wire tie ends shall face away from the forms.

#### 3.1.1 Placement

Reinforcement shall be free from loose rust and scale, dirt, oil, or other deleterious coating that could reduce bond with the concrete. Reinforcement shall be placed in accordance with ACI 318M at locations shown plus or minus one bar diameter. Reinforcement shall not be continuous through expansion joints and shall be as indicated through construction or contraction joints. Concrete coverage shall be as indicated or as required by ACI 318M. If bars are moved more than one bar diameter to avoid interference with other reinforcement, conduits or embedded items, the resulting arrangement of bars, including additional bars required to meet structural requirements, shall be approved before concrete is placed.

#### 3.1.2 Splicing

Splices of reinforcement shall conform to ACI 318M and shall be made only as required or indicated. Splicing shall be by lapping or by mechanical connection; except that lap splices shall not be used for bars larger than No. 11 unless otherwise indicated. Lapped bars shall be placed in contact and securely tied or spaced transversely apart to permit the embedment of the entire surface of each bar in concrete. Lapped bars shall not be spaced farther apart than one-fifth the required length of lap or 150 mm. Mechanical butt splices shall be in accordance with the recommendation of the manufacturer of the mechanical splicing device. Butt splices shall develop 125 percent of the specified minimum yield tensile strength of the spliced bars or of the smaller bar in transition splices. Bars shall be flame dried before butt splicing. Adequate jigs and clamps or other devices shall be provided to support, align, and hold the longitudinal centerline of the bars to be butt spliced in a straight line.

### 3.2 WELDED-WIRE FABRIC PLACEMENT

Welded-wire fabric shall be placed in slabs as indicated. Fabric placed in slabs on grade shall be continuous between expansion, construction, and contraction joints. Fabric placement at joints shall be as indicated. Lap splices shall be made in such a way that the overlapped area equals the

distance between the outermost crosswires plus 50 mm. Laps shall be staggered to avoid continuous laps in either direction. Fabric shall be wired or clipped together at laps at intervals not to exceed 1.2 m. Fabric shall be positioned by the use of supports.

### 3.3 DOWEL INSTALLATION

Dowels shall be installed in slabs on grade at locations indicated and at right angles to joint being doweled. Dowels shall be accurately positioned and aligned parallel to the finished concrete surface before concrete placement. Dowels shall be rigidly supported during concrete placement. One end of dowels shall be coated with a bond breaker.

### 3.4 SPECIAL INSPECTION AND TESTING FOR SEISMIC-RESISTING SYSTEMS

Special inspections and testing for seismic-resisting systems and components shall be done in accordance with Section 01452 SPECIAL INSPECTION FOR SEISMIC-RESISTING SYSTEMS.

-- End of Section --

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DIVISION 13 - SPECIAL CONSTRUCTION

SECTION 13038

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- 2.2 PALLET STORAGE RACKS
- 2.3 REFRIGERATION EQUIPMENT
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- 2.5 WET PIPE SPRINKLER SYSTEM
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PART 3 EXECUTION

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  - 3.1.1 Epoxy Filled Anchor Installation
- 3.2 MANUFACTURER'S FIELD SERVICES
- 3.3 TESTS
  - 3.3.1 Start-Up and Operational Tests
  - 3.3.2 Performance Tests
- 3.4 OPERATING INSTRUCTIONS
- 3.5 CLEANING
- 3.6 INSTRUCTING OPERATING PERSONNEL

-- End of Section Table of Contents --

## SECTION 13038

## COLD-STORAGE ROOMS (PREFABRICATED PANEL TYPE)

## PART 1 GENERAL

## 1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

## AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 580/A 580M (1994) Stainless and Heat-Resistant Steel Wire

ASTM E 580 (1991) Application of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Requiring Seismic Restraint

## MILITARY SPECIFICATIONS (MS)

MIL-R-43900 (Rev. B) Refrigerators, Freezers, Prefabricated, Mechanical, Commercial, Walk-In

## NSF INTERNATIONAL (NSF)

NSF 7 (1997) Commercial Refrigerators and Storage Freezers

## 1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES: Submit the following in accordance with Section 01330, "Submittal Procedures."

## SD-02 Shop Drawings

## Cold storage rooms

Submit shop drawings for cold storage rooms, indicating wall and ceiling panels, refrigerated doors, pallet storage racks, refrigeration equipment, fire protection systems, electrical lighting, and other associated construction.

## SD-03 Product Data

## Cold storage rooms

Submit manufacturer's catalog data for cold storage rooms.

## SD-08 Manufacturer's Instructions

Cold storage rooms

Submit manufacturer's installation instructions for cold storage rooms.

## SD-10 Operation and Maintenance Data

Cold storage rooms, G, ED

Submit operation and maintenance data for cold storage rooms.

## PART 2 PRODUCTS

## 2.1 COLD STORAGE ROOMS

The cold storage room shall conform to NSF 7 and to MIL-R-43900, factory-fabricated type, and modified as required with the following requirements:

- a. Type I - Chill Rooms, and Type II - Freezer.
- b. Style A, floorless design.
- c. Insulated Wall and Ceiling Panels: **Wall panels shall be 6,706 mm (22'-0") high from exterior face of ceiling panel to finish floor for chilled and freezer rooms, and 4,200 mm (14'-0") inside clear for the ice storage room and issue/receive area.** Modular prefabricated insulated wall and ceiling panels shall be designed for accurate and easy field erection. Panels shall be inset ribbed panels exactly formed with metal dies to ensure panel uniformity and assure interchangeability with like panels. Metal panels shall have an inside preparation coat of bonding agent to create a stable adhesion with the foam insulation. Panels shall be made without internal wood or metal structural members, with 100% of each panel exclusive of metal pans and locking devices being of foam polyurethane insulation. Panel edges shall be tongue and groove configuration lap design or other configurations to assure proper alignment and airtight, vaporproof joints. In addition to the standard live loads, design ceiling panels to withstand loads, not less than 120 kilograms, derived from maintenance personnel walking on top of ceiling panels to service equipment and piping.
- d. Wall and Ceiling Fastening System: All modular panel sections shall be locked securely together with cam-lock fasteners for tongue and groove configuration or with self tapping screws for lap design configuration. Cam-locking fasteners shall consist of a cam action, positioned in the groove section. Locking arm and metal rod shall be contained within metal housing. By the rotation of the locking arm, the hook shall engage over the rod and draw the panel section tightly together. Locking arm shall be by means of a standard hexagonal wrench. Pres-fit caps shall be provided to close wrench holes. There shall be not less than three cam-lock fasteners in each vertical and horizontal joint. Horizontal placement of cam-locks at wall/ceiling or wall/floor juncture shall not exceed 600 mm. Spacing of self tapping screws for lap design configuration panels shall be in accordance with

manufacturer' s printed instructions.

- e. Fasteners: Fasteners for attachment to structural supports and fasteners for attachment to adjoining panels shall be as approved, and in accordance with the manufacturer's recommendation. Unless specified otherwise herein, the fasteners shall be bolts and nuts, No 14 self tapping screws, and/or expansion type fasteners. Fasteners shall be stainless steel, except, for expansion type fasteners, which shall be stainless steel and aluminum. All fasteners shall have composite metal and polychloroprene washers.
- f. Outside Insulated Panel Supports: Provide structural support system outside of the refrigerated space. The support system shall be designed and as recommended by the insulated panel system manufacturer. Suspension systems for insulated ceiling panels shall be fabricated from aluminum with clear anodized finish or Type 316 stainless steel, designed, sized to meet load requirements, and meet seismic requirements conforming to ASTM E 580. Epoxy filled anchors with self-contained epoxy or polyester resin capsule shall be threaded stainless steel anchor rod. Hanger wires, if required, shall be stainless steel conforming to ASTM A 580/A 580M, not less than (10-1/2 gage) 3 mm diameter. Hanger rods, if required, shall be not less than (3/8") 9 mm diameter Type 316 stainless steel. All fasteners and anchors shall be Type 316 stainless steel.
- g. Swinging doors shall be single and double swing types with right-handed and left-handed openings as indicated. Sliding doors shall be electric operated, bi-parting, and manual operated, single slide. Sizes and heights of door openings shall be as indicated. Doors and frames shall be stainless steel construction, except where ABS constructed doors are indicated.
- h. Electrical characteristics as indicated.
- i. Preservation and packing shall be Level A, overseas shipment.
- j. Provide recording thermometer.
- k. Provide temperature alarm system with connector for remote temperature alarm.
- l. Provide interior lighting.

## 2.2 PALLET STORAGE RACKS

Pallet storage racks shall be specified in section 11551 PALLET STORAGE RACKS.

## 2.3 REFRIGERATION EQUIPMENT

Refrigeration equipment shall be as indicated and as specified in Section 15652 COLDSTORAGE REFRIGERATION SYSTEMS.

## 2.4 HYDRONIC FLOOR WARMING SYSTEM

Hydronic floor warming system below freezer floors shall be as indicated and as specified in Section 13040 HYDRONIC FLOOR WARMING SYSTEM.

## 2.5 WET PIPE SPRINKLER SYSTEM

Wet pipe sprinkler system shall be as indicated and as specified in Section 13930 WET PIPE SPRINKLER SYSTEM, FIRE PROTECTION.

## 2.6 FIRE ALARM DEVICES

Provide special fastening system for the fire alarm devices as specified in Section 13851 FIRE DETECTION AND ALARM SYSTEM, ADDRESSABLE.

# PART 3 EXECUTION

## 3.1 INSTALLATION

Installation procedures shall conform to NSF 7, and the manufacturer's instructions. Submit a set of instructions covering both assembly of the rooms and installation of the refrigeration equipment before starting installation.

### 3.1.1 Epoxy Filled Anchor Installation

Install epoxy filled anchors at precast prestressed concrete tees in accordance with the manufacturer's printed instructions. The anchor studs shall be clean of dirt, dust, paint, grease, oil, rust, or other contamination or other coating which would prevent direct coating adhesion. Drill proper sized holes. Clean out hole with wire brush and blowout-bulb or blowout hose attached to the injector tool. Prior to injection, discharge approximately one fluid ounce of epoxy; the epoxy color shall match the color band on the nozzle valve nut. Insert the nozzle into the bottom of the hole and fill the hole to 1/2 the hole depth. Insert the selected rod slowly by hand into the bottom of the hole using a slow twisting motion to ensure the epoxy fills the voids and crevices. Hardening will begin in approximately 7 minutes at room temperature. Install and tighten steel members after 24 hours of curing.

## 3.2 MANUFACTURER'S FIELD SERVICES

Furnish manufacturer's representatives who are trained to perform the services specified. The representatives shall furnish and services on the following matters:

- a. Erection, alignment, and testing.
- b. Charging equipment with refrigerant and oil.
- c. Starting equipment and training government personnel as to its proper care, operation, and maintenance.

## 3.3 TESTS

Perform the tests for each room and provide everything required. Notify the Contracting Officer 10 days before performing the tests. Tests shall be performed in the presence of a manufacturer's representative.

### 3.3.1 Start-Up and Operational Tests

Start up and initially operate the systems upon completion of the installation of the equipment and refrigerant piping. Adjust the safety

and automatic controls to place them in operation and sequence. Record manufacturer's recommended readings hourly. Operational tests shall cover a period of not less than 24 hours.

### 3.3.2 Performance Tests

Upon completion of the operational tests the systems shall be performance tested. Test duration shall not be less than 8 hours. Tests shall include the following information to be in the report with conclusions regarding the adequacy of the systems:

- a. Time, dates and duration of tests.
- b. Inside dry-bulb and wet-bulb temperatures maintained in each room during the tests employing recording instruments calibrated before the tests.
- c. Outside dry-bulb and wet-bulb temperatures obtained from recording instruments calibrated and checked hourly with a sling psychrometer.
- d. Evaporator and condenser entering and leaving temperatures taken hourly with the compressors in operation.
- e. The make, model and capacity of each evaporator and condensing unit.
- f. Voltmeter and ammeter readings for condensing units and evaporators.

### 3.4 OPERATING INSTRUCTIONS

Provide a framed and glassed control chart indicating a layout of the refrigeration systems, including piping, valves, wiring, and control mechanisms. Install control chart where directed. Submit printed instructions covering the maintenance and operation of refrigeration equipment. Tag shutoff valves in accordance with the printed instructions.

Provide special tools as necessary for repair and maintenance of the equipment.

### 3.5 CLEANING

Remove masking-protection from stainless steel and other finished surfaces.

Wash and clean floors, walls, shelves, and ceilings inside rooms and exposed surfaces on the outside. Clean glass, fixtures and fittings.

### 3.6 INSTRUCTING OPERATING PERSONNEL

Upon completion of the work and at a time designated by the Contracting Officer, provide for the instruction of Government personnel in the operation and maintenance of each refrigeration system. The period of instruction shall be for not less than one 8-hour working day.

-- End of Section --

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## SECTION 16375

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## SECTION 16375

## ELECTRICAL DISTRIBUTION SYSTEM, UNDERGROUND

## PART 1 GENERAL

## 1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

## AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI C29.1	(1988; R 1996) Electrical Power Insulators - Test Methods
ANSI C80.1	(1995) Rigid Steel Conduit - Zinc Coated
ANSI C119.1	(1986) Sealed Insulated Underground Connector Systems Rated 600 Volts
ANSI O5.1	(1992) Specifications and Dimensions for Wood Poles

## AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 123/A 123M	(1997a) Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A 153/A 153M	(1995) Zinc Coating (Hot-Dip) on Iron and Steel Hardware
ASTM B 3	(1995) Soft or Annealed Copper Wire
ASTM B 8	(1993) Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft
ASTM B 117	(1997) Operating Salt Spray (Fog) Apparatus
ASTM B 496	(1992) Compact Round Concentric-Lay-Stranded Copper Conductors
ASTM D 1654	(1992) Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments

## ASSOCIATION OF EDISON ILLUMINATING COMPANIES (AEIC)

AEIC CS5	(1994) Cross-linked Polyethylene Insulated Shielded Power Cables Rated 5 Through 46 kV
AEIC CS6	(1996) Ethylene Propylene Rubber Insulated Shielded Power Cables Rated 5 Through 69 kV

## FACTORY MUTUAL ENGINEERING AND RESEARCH (FM)

FM P7825a (2001) Approval Guide Fire Protection

## INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)

IEEE C2 (1997) National Electrical Safety Code

IEEE Std 48 (1996) Standard Test Procedures and Requirements for Alternating-Current Cable Terminations 2.5 kV through 765 kV

IEEE Std 81 (1983) Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Ground System (Part 1)

IEEE Std 100 (1996) IEEE Standard Dictionary of Electrical and Electronics Terms

IEEE Std 404 (1993; errata) Cable Joints for Use with Extruded Dielectric Cable Rated 5000 V through 138 000 V and Cable Joints for Use with Laminated Dielectric Cable Rated 2500 V Through 500 000 V

IEEE Std 592 (1990; R 1996) Exposed Semiconducting Shields on Premolded High Voltage Cable Joints and Separable Insulated Connectors

## NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA FB 1 (1993) Fittings, Cast Metal Boxes and Conduit Bodies for Conduit and Cable Assemblies

NEMA WC 7 (1991; Rev 1) Cross-Linked-Thermosetting-Polyethylene-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy

NEMA WC 8 (1991; Rev 1; Rev 2) Ethylene-Propylene-Rubber-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy

## NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70 (1999) National Electrical Code

## UNDERWRITERS LABORATORIES (UL)

UL 6 (1997) Rigid Metal Conduit

UL 467 (1993; Rev thru Aug 1996) Grounding and Bonding Equipment

UL 486A	(1997) Wire Connectors and Soldering Lugs for Use with Copper Conductors
UL 486B	(1997; Rev Jun 1997) Wire Connectors for Use with Aluminum Conductors
UL 510	(1994; Rev thru Nov 1997) Polyvinyl Chloride, Polyethylene and Rubber Insulating Tape
UL 514A	(1996; Rev Jul 1998) Metallic Outlet Boxes
UL 651	(1995; Rev thru Oct 1998) Schedule 40 and 80 Rigid PVC Conduit
UL 1072	(1995; Rev Mar 1998) Medium-Voltage Power Cable
UL 1242	(1996; Rev Apr 1997) Intermediate Metal Conduit

## 1.2 GENERAL REQUIREMENTS

### 1.2.1 Terminology

Terminology used in this specification is as defined in IEEE Std 100.

### 1.2.2 Service Conditions

Items provided under this section shall be specifically suitable for the following service conditions.

- a. Altitude 1 m
- b. Ambient Temperature 35 degrees C
- d. Frequency 60 hZ
- g. Humidity Control
- h. Corrosive Areas

## 1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

### SD-02 Shop Drawings

Electrical Distribution System; G, RE

Detail drawings consisting of equipment drawings, illustrations, schedules, instructions, diagrams manufacturers standard installation drawings and other information necessary to define the installation and enable the Government to check conformity with the requirements of the contract drawings.

If departures from the contract drawings are deemed necessary by the Contractor, complete details of such departures shall be included with the detail drawings. Approved departures shall be made at no additional cost to the Government.

Detail drawings shall show how components are assembled, function together and how they will be installed on the project. Data and drawings for component parts of an item or system shall be coordinated and submitted as a unit. Data and drawings shall be coordinated and included in a single submission. Multiple submissions for the same equipment or system are not acceptable except where prior approval has been obtained from the Contracting Officer. In such cases, a list of data to be submitted later shall be included with the first submission. Detail drawings shall consist of the following:

a. Detail drawings showing physical arrangement, construction details, connections, finishes, materials used in fabrication, provisions for conduit or busway entrance, access requirements for installation and maintenance, physical size, electrical characteristics, foundation and support details, and equipment weight. Drawings shall be drawn to scale and/or dimensioned. All optional items shall be clearly identified as included or excluded.

b. Internal wiring diagrams of equipment showing wiring as actually provided for this project. External wiring connections shall be clearly identified.

Detail drawings shall as a minimum depict the installation of the following items:

a. Medium-voltage cables and accessories including cable installation plan.

b. Refrigerated Container Receptacle.

As-Built Drawings; G, RE

The as-built drawings shall be a record of the construction as installed. The drawings shall include the information shown on the contract drawings as well as deviations, modifications, and changes from the contract drawings, however minor. The as-built drawings shall be a full sized set of prints marked to reflect deviations, modifications, and changes. The as-built drawings shall be complete and show the location, size, dimensions, part identification, and other information. Additional sheets may be added. The as-built drawings shall be jointly inspected for accuracy and completeness by the Contractor's quality control representative and by the Contracting Officer prior to the submission of each monthly pay estimate. Upon completion of the work, the Contractor shall provide three full sized sets of the marked prints to the Contracting Officer for approval. If upon review, the as-built drawings are found to contain errors and/or omissions, they will be returned to the Contractor for correction. The Contractor shall correct and return the as-built drawings to the Contracting Officer for approval within 10 calendar days from the time the drawings are returned to the Contractor.

## SD-03 Product Data

Fault Current Analysis; G,RE.  
Protective Device; G, RE

The study shall be submitted with protective device equipment submittals. No time extension or similar contract modifications will be granted for work arising out of the requirements for this study. Approval of protective devices proposed shall be based on recommendations of this study. The Government shall not be held responsible for any changes to equipment, device ratings, settings, or additional labor for installation of equipment or devices ordered and/or procured prior to approval of the study.

## Nameplates.

Catalog cuts, brochures, circulars, specifications, product data, and printed information in sufficient detail and scope to verify compliance with the requirements of the contract documents.

## Material and Equipment.

A complete itemized listing of equipment and materials proposed for incorporation into the work. Each entry shall include an item number, the quantity of items proposed, and the name of the manufacturer of each such item.

## General Installation Requirements

As a minimum, installation procedures for transformers, substations, switchgear, and medium-voltage cable terminations and splices.

Procedures shall include cable pulling plans, diagrams, instructions, and precautions required to install, adjust, calibrate, and test the devices and equipment.

## SD-06 Test Reports

## Factory Tests.

Certified factory test reports shall be submitted when the manufacturer performs routine factory tests, including tests required by standards listed in paragraph REFERENCES. Results of factory tests performed shall be certified by the manufacturer, or an approved testing laboratory, and submitted within 7 days following successful completion of the tests. The manufacturer's pass-fail criteria for tests specified in paragraph FIELD TESTING shall be included.

## Field Testing

A proposed field test plan, 30 days prior to testing the installed system. No field test shall be performed until the test plan is approved. The test plan shall consist of complete field test procedures including tests to be performed, test equipment required, and tolerance limits.

Six copies of the information described below in 215.9 by 279.4

mm (8-1/2 by 11 inch) binders having a minimum of three rings, including a separate section for each test. Sections shall be separated by heavy plastic dividers with tabs.

- a. A list of equipment used, with calibration certifications.
- b. A copy of measurements taken.
- c. The dates of testing.
- d. The equipment and values to be verified.
- e. The condition specified for the test.
- f. The test results, signed and dated.
- g. A description of adjustments made.

#### Cable Installation

Six copies of the information described below in 215.9 by 279.4 mm (8-1/2 by 11 inch) binders having a minimum of three rings from which material may readily be removed and replaced, including a separate section for each cable pull. Sections shall be separated by heavy plastic dividers with tabs, with all data sheets signed and dated by the person supervising the pull.

- a. Site layout drawing with cable pulls numerically identified.
- b. A list of equipment used, with calibration certifications. The manufacturer and quantity of lubricant used on pull.
- c. The cable manufacturer and type of cable.
- d. The dates of cable pulls, time of day, and ambient temperature.
- e. The length of cable pull and calculated cable pulling tensions.
- f. The actual cable pulling tensions encountered during pull.

#### SD-07 Certificates

##### Material and Equipment

Where materials or equipment are specified to conform to the standards of the Underwriters Laboratories (UL) or to be constructed or tested, or both, in accordance with the standards of the American National Standards Institute (ANSI), the Institute of Electrical and Electronics Engineers (IEEE), or the National Electrical Manufacturers Association (NEMA), the Contractor shall submit proof that the items provided conform to such requirements.

The label of, or listing by, UL will be acceptable as evidence that the items conform. Either a certification or a published catalog specification data statement, to the effect that the item is in accordance with the referenced ANSI or IEEE standard, will be acceptable as evidence that the item conforms. A similar certification or published catalog specification data statement to

the effect that the item is in accordance with the referenced NEMA standard, by a company listed as a member company of NEMA, will be acceptable as evidence that the item conforms. In lieu of such certification or published data, the Contractor may submit a certificate from a recognized testing agency equipped and competent to perform such services, stating that the items have been tested and that they conform to the requirements listed, including methods of testing of the specified agencies. Compliance with above-named requirements does not relieve the Contractor from compliance with any other requirements of the specifications.

#### Cable Joints

A certification that contains the names and the qualifications of people recommended to perform the splicing and termination of medium-voltage cables approved for installation under this contract. The certification shall indicate that any person recommended to perform actual splicing and terminations has been adequately trained in the proper techniques and have had at least three recent years of experience in splicing and terminating the same or similar types of cables approved for installation. In addition, any person recommended by the Contractor may be required to perform a practice splice and termination, in the presence of the Contracting Officer, before being approved as a qualified installer of medium-voltage cables. If that additional requirement is imposed, the Contractor shall provide short sections of the approved types of cables along with the approved type of splice and termination kits, and detailed manufacturer's instruction for the proper splicing and termination of the approved cable types.

#### Cable Installer Qualifications

##### 1.3.1 Cable Installer Qualifications

The Contractor shall provide at least one onsite person in a supervisory position with a documentable level of competency and experience to supervise all cable pulling operations. A resume shall be provided showing the cable installers' experience in the last three years, including a list of references complete with points of contact, addresses and telephone numbers.

#### SD-10 Operation and Maintenance Data

##### Electrical Distribution System

Six copies of operation and maintenance manuals, within 7 calendar days following the completion of tests and including assembly, installation, operation and maintenance instructions, spare parts data which provides supplier name, current cost, catalog order number, and a recommended list of spare parts to be stocked. Manuals shall also include data outlining detailed procedures for system startup and operation, and a troubleshooting guide which lists possible operational problems and corrective action to be taken. A brief description of all equipment, basic operating features, and routine maintenance requirements shall also be included. Documents shall be bound in a binder marked or identified on the spine and front cover. A table of contents page

shall be included and marked with pertinent contract information and contents of the manual. Tabs shall be provided to separate different types of documents, such as catalog ordering information, drawings, instructions, and spare parts data. Index sheets shall be provided for each section of the manual when warranted by the quantity of documents included under separate tabs or dividers.

Three additional copies of the instructions manual shall be provided within 30 calendar days following the manuals.

#### 1.4 DELIVERY, STORAGE, AND HANDLING

Devices and equipment shall be visually inspected by the Contractor when received and prior to acceptance from conveyance. Stored items shall be protected from the environment in accordance with the manufacturer's published instructions. Damaged items shall be replaced. Oil filled transformers and switches shall be stored in accordance with the manufacturer's requirements. Wood poles held in storage for more than 2 weeks shall be stored in accordance with ANSI O5.1. Handling of wood poles shall be in accordance with ANSI O5.1, except that pointed tools capable of producing indentations more than 25 mm in depth shall not be used. Metal poles shall be handled and stored in accordance with the manufacturer's instructions.

#### 1.5 EXTRA MATERIALS

One additional spare fuse or fuse element for each furnished fuse or fuse element shall be delivered to the contracting officer when the electrical system is accepted. Two complete sets of all special tools required for maintenance shall be provided, complete with a suitable tool box. Special tools are those that only the manufacturer provides, for special purposes (to access compartments, or operate, adjust, or maintain special parts).

### PART 2 PRODUCTS

#### 2.1 STANDARD PRODUCT

Material and equipment shall be the standard product of a manufacturer regularly engaged in the manufacture of the product and shall essentially duplicate items that have been in satisfactory use for at least 2 years prior to bid opening. Items of the same classification shall be identical including equipment, assemblies, parts, and components.

#### 2.2 NAMEPLATES

##### 2.2.1 General

Each major component of this specification shall have the manufacturer's name, address, type or style, model or serial number, and catalog number on a nameplate securely attached to the equipment. Nameplates shall be made of noncorrosive metal. Equipment containing liquid dielectrics shall have the type of dielectric on the nameplate. Sectionalizer switch nameplates shall have a schematic with all switch positions shown and labeled. As a minimum, nameplates shall be provided for transformers, circuit breakers, meters, switches, and switchgear.

#### 2.3 CORROSION PROTECTION

### 2.3.1 Aluminum Materials

Aluminum shall not be used in contact with earth or concrete. Aluminum conductors shall not be used.

### 2.3.2 Ferrous Metal Materials

#### 2.3.2.1 Hardware

Ferrous metal hardware shall be hot-dip galvanized in accordance with ASTM A 153/A 153M and ASTM A 123/A 123M.

#### 2.3.2.2 Equipment

Equipment and component items, including but not limited to transformer stations and ferrous metal luminaries not hot-dip galvanized or porcelain enamel finished, shall be provided with corrosion-resistant finishes which shall withstand 480 hours of exposure to the salt spray test specified in ASTM B 117 without loss of paint or release of adhesion of the paint primer coat to the metal surface in excess of 1.6 mm (1/16 inch) from the test mark. The scribed test mark and test evaluation shall be in accordance with ASTM D 1654 with a rating of not less than 7 in accordance with TABLE 1, (procedure A). Cut edges or otherwise damaged surfaces of hot-dip galvanized sheet steel or mill galvanized sheet steel shall be coated with a zinc rich paint conforming to the manufacturer's standard.

### 2.3.3 Finishing

Painting required for surfaces not otherwise specified and finish painting of items only primed at the factory shall be as specified in Section 09900 PAINTING, GENERAL.

## 2.4 CABLES

Cables shall be single conductor type unless otherwise indicated.

### 2.4.1 Medium-Voltage Cables

#### 2.4.1.1 General

Cable construction shall be Type MV, conforming to NFPA 70 and UL 1072. Cables shall be manufactured for use in duct applications as indicated.

#### 2.4.1.2 Ratings

Cables shall be rated for a circuit voltage of 15 kV.

#### 2.4.1.3 Conductor Material

Underground cables shall be soft drawn copper complying with ASTM B 3 and ASTM B 8 for regular concentric and compressed stranding or ASTM B 496 for compact stranding.

#### 2.4.1.4 Insulation

Cable insulation shall be ethylene-propylene-rubber (EPR) insulation conforming to the requirements of NEMA WC 8 and AEIC CS6. A 133 percent insulation level shall be used on 5 kV, 15 kV and 25 kV rated cables.

#### 2.4.1.5 Shielding

Cables rated for 2 kV and above shall have a semiconducting conductor shield, a semiconducting insulation shield, and an overall copper tape shield for each phase. The shield tape shall be sized to meet IEEE C2 requirements for a ground fault availability of 10,000 amperes.

#### 2.4.1.6 Neutrals

Neutral conductors shall be copper employing the same insulation and jacket materials as phase conductors, except that a 600-volt insulation rating is acceptable.

#### 2.4.1.7 Jackets

Cables shall be provided with a PVC jacket.

#### 2.4.2 Low-Voltage Cables

Cables shall be rated 600 volts and shall conform to the requirements of NFPA 70, and must be UL listed for the application or meet the applicable section of either ICEA or NEMA standards.

##### 2.4.2.1 Conductor Material

Underground cables shall be annealed copper complying with ASTM B 3 and ASTM B 8. Intermixing of copper and aluminum conductors is not permitted.

##### 2.4.2.2 Insulation

Insulation must be in accordance with NFPA 70, and must be UL listed for the application or meet the applicable sections of either ICEA, or NEMA standards.

##### 2.4.2.3 In Duct

Cables shall be single-conductor cable, in accordance with NFPA 70.

#### 2.5 CABLE JOINTS, TERMINATIONS, AND CONNECTORS

##### 2.5.1 Medium-Voltage Cable Joints

Medium-voltage cable joints shall comply with IEEE Std 404 and IEEE Std 592.

Medium-voltage cable terminations shall comply with IEEE Std 48. Joints shall be the standard products of a manufacturer and shall be either of the factory preformed type or of the kit type containing tapes and other required parts. Joints shall have ratings not less than the ratings of the cables on which they are installed. Splice kits may be of the heat-shrinkable type for voltages up to 15 kV, of the premolded splice and connector type, the conventional taped type, or the resin pressure-filled overcast taped type for voltages up to 35 kV; except that for voltages of 7.5 kV or less a resin pressure-filled type utilizing a plastic-tape mold is acceptable. Joints used in manholes, handholes, vaults and pull boxes shall be certified by the manufacturer for waterproof, submersible applications.

##### 2.5.2 Low-Voltage Cable Splices

Low-voltage cable splices and terminations shall be rated at not less than

600 Volts. Splices in conductors No. 10 AWG and smaller shall be made with an insulated, solderless, pressure type connector, conforming to the applicable requirements of UL 486A. Splices in conductors No. 8 AWG and larger shall be made with noninsulated, solderless, pressure type connector, conforming to the applicable requirements of UL 486A and UL 486B.

Splices shall then be covered with an insulation and jacket material equivalent to the conductor insulation and jacket. Splices below grade or in wet locations shall be sealed type conforming to ANSI C119.1 or shall be waterproofed by a sealant-filled, thick wall, heat shrinkable, thermosetting tubing or by pouring a thermosetting resin into a mold that surrounds the joined conductors.

### 2.5.3 Terminations

Terminations shall be in accordance with IEEE Std 48, Class 1 or Class 2; of the molded elastomer, wet-process porcelain, prestretched elastomer, heat-shrinkable elastomer, or taped type. Acceptable elastomers are track-resistant silicone rubber or track-resistant ethylene propylene compounds, such as ethylene propylene rubber or ethylene propylene diene monomer. Separable insulated connectors may be used for apparatus terminations, when such apparatus is provided with suitable bushings. Terminations shall be of the outdoor type, except that where installed inside outdoor equipment housings which are sealed against normal infiltration of moisture and outside air, indoor, Class 2 terminations are acceptable. Class 3 terminations are not acceptable. Terminations, where required, shall be provided with mounting brackets suitable for the intended installation and with grounding provisions for the cable shielding, metallic sheath, and armor.

#### 2.5.3.1 Factory Preformed Type

Molded elastomer, wet-process porcelain, prestretched, and heat-shrinkable terminations shall utilize factory preformed components to the maximum extent practicable rather than tape build-up. Terminations shall have basic impulse levels as required for the system voltage level. Leakage distances shall comply with wet withstand voltage test requirements of IEEE Std 48 for the next higher Basic Insulation Level (BIL) level. Anti-tracking tape shall be applied over exposed insulation of preformed molded elastomer terminations.

#### 2.5.3.2 Taped Terminations

Taped terminations shall use standard termination kits providing terminal connectors, field-fabricated stress cones, and rain hoods. Terminations shall be at least 510 mm (1.2 m) long from the end of the tapered cable jacket to the start of the terminal connector, or not less than the kit manufacturer's recommendations, whichever is greater.

## 2.6 CONDUIT AND DUCTS

Ducts shall be single, round-bore type, with wall thickness and fittings suitable for the application. Duct lines shall be concrete-encased.

### 2.6.1 Metallic Conduit

Intermediate metal conduit shall comply with UL 1242. Rigid galvanized steel conduit shall comply with UL 6 and ANSI C80.1. Metallic conduit fittings and outlets shall comply with UL 514A and NEMA FB 1.

## 2.6.2 Nonmetallic Ducts

### 2.6.2.1 Concrete Encased Ducts

UL 651 Schedule 40.

### 2.6.2.2 Direct Burial

UL 651 Schedule 80.

## 2.6.3 Conduit Sealing Compound

Compounds for sealing ducts and conduit shall have a putty-like consistency workable with the hands at temperatures as low as 2 degrees C (35 degrees F), shall neither slump at a temperature of 150 degrees C (300 degrees F), nor harden materially when exposed to the air. Compounds shall adhere to clean surfaces of fiber or plastic ducts; metallic conduits or conduit coatings; concrete, masonry, or lead; any cable sheaths, jackets, covers, or insulation materials; and the common metals. Compounds shall form a seal without dissolving, noticeably changing characteristics, or removing any of the ingredients. Compounds shall have no injurious effect upon the hands of workmen or upon materials.

## 2.7 MANHOLES, HANDHOLES, AND PULLBOXES

Manholes, handholes, and pullboxes shall be as indicated on drawings.

## 2.8 REFRIGERATED CONTAINER RECEPTACLE

Refrigerated container receptacle shall be rated at 32 amperes, 600 VAC. Contractor shall coordinate with Matson Navigation Co. Refrigerated Container Maintenance Section to verify exact type and dimensions of plugs. Receptacle shall be complete with cast metal body receptacle and cover.

## 2.9 GROUNDING AND BONDING

### 2.9.1 Driven Ground Rods

Ground rods shall be copper-clad steel conforming to UL 467 not less than 19 mm (3/4 inch) in diameter by 3.1 m (10 feet) in length. Sectional type rods may be used.

### 2.9.2 Grounding Conductors

Grounding conductors shall be bare, except where installed in conduit with associated phase conductors. Insulated conductors shall be of the same material as phase conductors and green color-coded, except that conductors shall be rated no more than 600 volts. Bare conductors shall be ASTM B 8 soft-drawn unless otherwise indicated. Aluminum is not acceptable.

## 2.10 CONCRETE AND REINFORCEMENT

Concrete work shall have minimum 20 MPa compressive strength and conform to the requirements of Section 03300 CAST-IN-PLACE STRUCTURAL CONCRETE. Concrete reinforcing shall be as specified in Section 03200 CONCRETE REINFORCEMENT.

## 2.11 PADLOCKS

Padlocks shall comply with Section 08700 'Builders' Hardware

## 2.12 CABLE FIREPROOFING SYSTEMS

Cable fireproofing systems shall be listed in FM P7825a as a fire-protective coating or tape approved for grouped electrical conductors and shall be suitable for application on the type of medium-voltage cables provided. After being fully cured, materials shall be suitable for use where exposed to oil, water, gases, salt water, sewage, and fungus and shall not damage cable jackets or insulation. Asbestos materials are not acceptable.

### 2.12.1 Fireproof Coating

Cable fireproofing coatings shall be compounded of water-based thermoplastic resins, flame-retardant chemicals, and inorganic noncombustible fibers and shall be suitable for the application methods used. Coatings applied on bundled cables shall have a derating factor of less than 5 percent, and a dielectric strength of 95 volts per mil minimum after curing.

### 2.12.2 Fireproofing Tape

Fireproofing tape shall be at least 50 mm (2 inches) wide and shall be a flexible, conformable, polymeric, elastomer tape designed specifically for fireproofing cables.

### 2.12.3 Plastic Tape

Preapplication plastic tape shall be pressure sensitive, 0.254 mm (10 mil) thick, conforming to UL 510.

## 2.13 FACTORY TESTS

Factory tests shall be performed, as follows, in accordance with the applicable publications and with other requirements of these specifications. The Contracting Officer shall be notified at least 10 days before the equipment is ready for testing. The Contracting Officer reserves the right to witness the tests.

- a. Factory Preformed Terminations: Wet withstand voltage tests in accordance with IEEE Std 48 for the next higher BIL level.
- b. Electrical Power Insulators: Manufacturer's standard tests in accordance with ANSI C29.1.

## PART 3 EXECUTION

### 3.1 GENERAL INSTALLATION REQUIREMENTS

Equipment and devices shall be installed and energized in accordance with the manufacturer's published instructions. Steel conduits installed underground shall be installed and protected from corrosion in conformance with the requirements of Section 16415 ELECTRICAL WORK, INTERIOR. Except as covered herein, excavation, trenching, and backfilling shall conform to the requirements of Section 02316 EXCAVATION, TRENCHING, AND BACKFILLING FOR UTILITIES SYSTEMS. Concrete work shall have minimum 20 MPa compressive strength and conform to the requirements of Section 03300 CAST-IN-PLACE STRUCTURAL CONCRETE.

### 3.1.1 Conformance to Codes

The installation shall comply with the requirements and recommendations of NFPA 70 and IEEE C2 as applicable.

### 3.1.2 Verification of Dimensions

The Contractor shall become familiar with details of the work, shall verify dimensions in the field, and shall advise the Contracting Officer of any discrepancy before performing any work.

### 3.1.3 Disposal of Liquid Dielectrics

PCB-contaminated dielectrics must be marked as PCB and transported to and incinerated by an approved EPA waste disposal facility. The Contractor shall furnish certification of proper disposal. Contaminated dielectrics shall not be diluted to lower the contamination level.

## 3.2 CABLE INSTALLATION

The Contractor shall obtain from the manufacturer an installation manual or set of instructions which addresses such aspects as cable construction, insulation type, cable diameter, bending radius, cable temperature, lubricants, coefficient of friction, conduit cleaning, storage procedures, moisture seals, testing for and purging moisture, etc. The Contractor shall then prepare a checklist of significant requirements which shall be submitted along with the manufacturers instructions in accordance with SUBMITTALS.

### 3.2.1 Cable Installation Plan and Procedure

Cable shall be installed strictly in accordance with the cable manufacturer's recommendations. Each circuit shall be identified by means of a fiber, laminated plastic, or non-ferrous metal tags, or approved equal, in each manhole, handhole, junction box, and each terminal. Each tag shall contain the following information; cable type, conductor size, circuit number, circuit voltage, cable destination and phase identification.

#### 3.2.1.1 Cable Inspection

The cable reel shall be inspected for correct storage positions, signs of physical damage, and broken end seals. If end seal is broken, moisture shall be removed from cable in accordance with the cable manufacturer's recommendations.

#### 3.2.1.2 Duct Cleaning

Duct shall be cleaned with an assembly that consists of a flexible mandrel (manufacturers standard product in lengths recommended for the specific size and type of duct) that is 6.4 mm (1/4 inch) less than inside diameter of duct, 2 wire brushes, and a rag. The cleaning assembly shall be pulled through conduit a minimum of 2 times or until less than a volume of 131 cubic centimeters (8 cubic inches) of debris is expelled from the duct.

#### 3.2.1.3 Duct Lubrication

The cable lubricant shall be compatible with the cable jacket for cable that is being installed. Application of lubricant shall be in accordance

with lubricant manufacturer's recommendations.

#### 3.2.1.4 Cable Installation

The Contractor shall provide a cable feeding truck and a cable pulling winch as required. The Contractor shall provide a pulling grip or pulling eye in accordance with cable manufacturer's recommendations. The pulling grip or pulling eye apparatus shall be attached to polypropylene or manilla rope followed by lubricant front end packs and then by power cables. A dynamometer shall be used to monitor pulling tension. Pulling tension shall not exceed cable manufacturer's recommendations. The Contractor shall not allow cables to cross over while cables are being fed into duct. For cable installation in cold weather, cables shall be kept at 10 degrees C (50 degrees F) temperature for at least 24 hours before installation.

#### 3.2.1.5 Cable Installation Plan

The Contractor shall submit a cable installation plan for all cable pulls in accordance with the detail drawings portion of paragraph SUBMITTALS. Cable installation plan shall include:

- a. Site layout drawing with cable pulls identified in numeric order of expected pulling sequence and direction of cable pull.
- b. List of cable installation equipment.
- c. Lubricant manufacturer's application instructions.
- d. Procedure for resealing cable ends to prevent moisture from entering cable.
- e. Cable pulling tension calculations of all cable pulls.
- f. Cable percentage conduit fill.
- g. Cable sidewall thrust pressure.
- h. Cable minimum bend radius and minimum diameter of pulling wheels used.
- i. Cable jam ratio.
- j. Maximum allowable pulling tension on each different type and size of conductor.
- k. Maximum allowable pulling tension on pulling device.

#### 3.2.2 Duct Line

Cables shall be installed in duct lines where indicated. Cable splices in low-voltage cables shall be made in manholes and handholes only, except as otherwise noted. Cable joints in medium-voltage cables shall be made in manholes or approved pullboxes only. Neutral and grounding conductors shall be installed in the same duct with their associated phase conductors.

#### 3.2.3 Electric Manholes

Cables shall be routed around the interior walls and securely supported from walls on cables racks. Cable routing shall minimize cable crossover,

provide access space for maintenance and installation of additional cables, and maintain cable separation in accordance with IEEE C2.

### 3.3 CABLE JOINTS

Medium-voltage cable joints shall be made by qualified cable splicers only. Qualifications of cable splicers shall be submitted in accordance with paragraph SUBMITTALS. Shields shall be applied as required to continue the shielding system through each entire cable joint. Shields may be integrally molded parts of preformed joints. Shields shall be grounded at each joint or in accordance with manufacturer's recommended practice. Cable joints shall provide insulation and jacket equivalent to that of the associated cable. Armored cable joints shall be enclosed in compound-filled, cast-iron or alloy, splice boxes equipped with stuffing boxes and armor clamps of a suitable type and size for the cable being installed.

### 3.4 FIREPROOFING

Each medium-voltage cable and conductor in manholes shall be fire-proofed for their entire length within the manhole. Where cables and conductors have been lubricated to enhance pulling into ducts, the lubricant shall be removed from cables and conductors exposed in the manhole before fireproofing. Fire-stops shall be installed in each conduit entering or leaving a manhole.

#### 3.4.1 Tape Method

Before application of fireproofing tape, plastic tape wrapping shall be applied over exposed metallic items such as the cable ground wire, metallic outer covering, or armor to minimize the possibility of corrosion from the fireproofing materials and moisture. Before applying fireproofing tape, irregularities of cables, such as at cable joints, shall be evened out with insulation putty. A flexible conformable polymeric elastomer fireproof tape shall be wrapped tightly around each cable spirally in 1/2 lapped wrapping or in 2 butt-jointed wrappings with the second wrapping covering the joints of the first.

#### 3.4.2 Sprayable Method

Manholes shall be power ventilated until coatings are dry and dewatered and the coatings are cured. Ventilation requirements shall be in accordance with the manufacturer's instruction, but not less than 10 air changes per hour shall be provided. Cable coatings shall be applied by spray, brush, or glove to a wet film thickness that reduces to the dry film thickness approved for fireproofing by FM P7825a. Application methods and necessary safety precautions shall be in accordance with the manufacturers instructions. After application, cable coatings shall be dry to the touch in 1 to 2 hours and fully cured in 48 hours, except where the manufacturer has stated that because of unusual humidity or temperature, longer periods may be necessary.

### 3.5 DUCT LINES

#### 3.5.1 Requirements

Numbers and sizes of ducts shall be as indicated. Duct lines shall be laid with a minimum slope of 100 mm per 30 m. Depending on the contour of the finished grade, the high-point may be at a terminal, a manhole, a handhole,

or between manholes or handholes. Short-radius manufactured 90-degree duct bends may be used only for pole or equipment risers, unless specifically indicated as acceptable. The minimum manufactured bend radius shall be 450 mm (18 inches) for ducts of less than 80 mm (3 inch) diameter, and 900 mm (36 inches) for ducts 80 mm (3 inches) or greater in diameter. Otherwise, long sweep bends having a minimum radius of 7.6 m shall be used for a change of direction of more than 5 degrees, either horizontally or vertically. Both curved and straight sections may be used to form long sweep bends, but the maximum curve used shall be 30 degrees and manufactured bends shall be used. Ducts shall be provided with end bells whenever duct lines terminate in manholes or handholes.

### 3.5.2 Treatment

Ducts shall be kept clean of concrete, dirt, or foreign substances during construction. Field cuts requiring tapers shall be made with proper tools and match factory tapers. A coupling recommended by the duct manufacturer shall be used whenever an existing duct is connected to a duct of different material or shape. Ducts shall be stored to avoid warping and deterioration with ends sufficiently plugged to prevent entry of any water or solid substances. Ducts shall be thoroughly cleaned before being laid. Plastic ducts shall be stored on a flat surface and protected from the direct rays of the sun.

### 3.5.3 Concrete Encasement

Ducts requiring concrete encasements shall comply with NFPA 70, except that electrical duct bank configurations for ducts 150 mm (6 inches) in diameter shall be determined by calculation and as shown on the drawings. The separation between adjacent electric power and communication ducts shall conform to IEEE C2. Duct line encasements shall be monolithic construction. Where a connection is made to a previously poured encasement, the new encasement shall be well bonded or doweled to the existing encasement. The Contractor shall submit proposed bonding method for approval in accordance with the detail drawing portion of paragraph SUBMITTALS. At any point, except railroad and airfield crossings, tops of concrete encasements shall be not less than the cover requirements listed in NFPA 70. At railroad and airfield crossings, duct lines shall be encased with concrete and reinforced as indicated to withstand specified surface loadings. Tops of concrete encasements shall be not less than 1.5 m below tops of rails or airfield paving unless otherwise indicated. Where ducts are jacked under existing pavement, rigid steel conduit will be installed because of its strength. To protect the corrosion-resistant conduit coating, predrilling or installing conduit inside a larger iron pipe sleeve (jack-and-sleeve) is required. For crossings of existing railroads and airfield pavements greater than 15 m in length, the predrilling method or the jack-and-sleeve method will be used. Separators or spacing blocks shall be made of steel, concrete, plastic, or a combination of these materials placed not farther apart than 1.2 m on centers. Ducts shall be securely anchored to prevent movement during the placement of concrete and joints shall be staggered at least 150 mm vertically.

### 3.5.4 Installation of Couplings

Joints in each type of duct shall be made up in accordance with the manufacturer's recommendations for the particular type of duct and coupling selected and as approved.

#### 3.5.4.1 Plastic Duct

Duct joints shall be made by brushing a plastic solvent cement on insides of plastic coupling fittings and on outsides of duct ends. Each duct and fitting shall then be slipped together with a quick 1/4-turn twist to set the joint tightly.

#### 3.5.5 Duct Line Markers

A 0.127 mm (5 mil) brightly colored plastic tape, not less than 75 mm (3 inches) in width and suitably inscribed at not more than 3 m (10 feet) on centers with a continuous metallic backing and a corrosion-resistant 0.0254 mm (1 mil) metallic foil core to permit easy location of the duct line, shall be placed approximately 300 mm below finished grade levels of such lines.

### 3.6 MANHOLES, HANDHOLES, AND PULLBOXES

#### 3.6.1 General

Manholes shall be constructed approximately where shown. The exact location of each manhole shall be determined after careful consideration has been given to the location of other utilities, grading, and paving. The location of each manhole shall be approved by the Contracting Officer before construction of the manhole is started. Manholes shall be the type noted on the drawings and shall be constructed in accordance with the applicable details as indicated. Top, walls, and bottom shall consist of reinforced concrete. Walls and bottom shall be of monolithic concrete construction. The Contractor may at his option utilize monolithically constructed precast-concrete manholes having the required strength and inside dimensions as required by the drawings or specifications. In paved areas, frames and covers for manhole and handhole entrances in vehicular traffic areas shall be flush with the finished surface of the paving. In unpaved areas, the top of manhole covers shall be approximately 15 mm above the finished grade. Where existing grades that are higher than finished grades are encountered, concrete assemblies designed for the purpose shall be installed to elevate temporarily the manhole cover to existing grade level. All duct lines entering manholes must be installed on compact soil or otherwise supported when entering a manhole to prevent shear stress on the duct at the point of entrance to the manhole. Duct lines entering cast-in-place concrete manholes shall be cast in-place with the manhole. Duct lines entering precast concrete manholes through a precast knockout penetration shall be grouted tight with a portland cement mortar. PVC duct lines entering precast manholes through a PVC endbell shall be solvent welded to the endbell. A cast metal grille-type sump frame and cover shall be installed over the manhole sump. A cable-pulling iron shall be installed in the wall opposite each duct line entrance.

#### 3.6.2 Handholes

Handholes shall be located approximately as shown. Handholes shall be of the type noted on the drawings and shall be constructed in accordance with the details shown.

#### 3.6.3 Pullboxes

Pullbox tops shall be flush with sidewalks or curbs or placed 15 mm above surrounding grades when remote from curbed roadways or sidewalks. Covers shall be marked "Low-Voltage" and provided with 2 lifting eyes and 2

hold-down bolts. Each box shall have a suitable opening for a ground rod. Conduit, cable, ground rod entrances, and unused openings shall be sealed with mortar.

#### 3.6.4 Ground Rods

A ground rod shall be installed at the manholes, handholes and pullboxes. Ground rods shall be driven into the earth before the manhole floor is poured so that approximately 100 mm of the ground rod will extend above the manhole floor. When precast concrete manholes are used, the top of the ground rod may be below the manhole floor and a No. 1/0 AWG ground conductor brought into the manhole through a watertight sleeve in the manhole wall.

### 3.7 CONNECTIONS TO BUILDING

**Cables shall be extended into the building as indicated, and shall be connected to the first applicable termination point.** Interfacing with building interior conduit systems shall be at conduit stubouts terminating 1.5 m outside of a building and 600 mm below finished grade as specified and provided under Section 16415 ELECTRICAL WORK, INTERIOR. After installation of cables, conduits shall be sealed with caulking compound to prevent entrance of moisture or gases into buildings.

### 3.8 GROUNDING ELECTRODES

Grounding electrodes shall be installed as shown on the drawings and as follows:

- a. Driven rod electrodes - Unless otherwise indicated, ground rods shall be driven into the earth until the tops of the rods are approximately 300 mm below finished grade.
- b. Additional electrodes - When the required ground resistance is not met, additional electrodes shall be provided interconnected with grounding conductors to achieve the specified ground resistance. The additional electrodes will be up to three, 3 m (10 feet) rods spaced a minimum of 3 m apart driven perpendicular to grade coupled and driven with the first rod. If the resultant resistance exceeds 25 ohms measured not less than 48 hours after rainfall, the Contracting Officer shall be notified immediately.

#### 3.8.1 Grounding and Bonding Connections

Connections above grade shall be made by the fusion-welding process or with bolted solderless connectors, in compliance with UL 467, and those below grade shall be made by a fusion-welding process. Where grounding conductors are connected to aluminum-composition conductors, specially treated or lined copper-to-aluminum connectors suitable for this purpose shall be used.

#### 3.8.2 Grounding and Bonding Conductors

Grounding and bonding conductors include conductors used to bond transformer enclosures and equipment frames to the grounding electrode system. Grounding and bonding conductors shall be sized as shown, and located to provide maximum physical protection. Bends greater than 45 degrees in ground conductors are not permitted. Routing of ground conductors through concrete shall be avoided. When concrete penetration is

necessary, nonmetallic conduit shall be cast flush with the points of concrete entrance and exit so as to provide an opening for the ground conductor, and the opening shall be sealed with a suitable compound after installation.

### 3.8.3 Manhole, Handhole, or Concrete Pullbox Grounding

Ground rods installed in manholes, handholes, or concrete pullboxes shall be connected to cable racks, cable-pulling irons, the cable shielding, metallic sheath, and armor at each cable joint or splice by means of a No. 4 AWG braided tinned copper wire. Connections to metallic cable sheaths shall be by means of tinned terminals soldered to ground wires and to cable sheaths. Care shall be taken in soldering not to damage metallic cable sheaths or shields. Ground rods shall be protected with a double wrapping of pressure-sensitive plastic tape for a distance of 50 mm above and 150 mm below concrete penetrations. Grounding electrode conductors shall be neatly and firmly attached to manhole or handhole walls and the amount of exposed bare wire shall be held to a minimum.

## 3.9 FIELD TESTING

### 3.9.1 General

Field testing shall be performed in the presence of the Contracting Officer. The Contractor shall notify the Contracting Officer 5 days prior to conducting tests. The Contractor shall furnish all materials, labor, and equipment necessary to conduct field tests. The Contractor shall perform all tests and inspections recommended by the manufacturer unless specifically waived by the Contracting Officer. The Contractor shall maintain a written record of all tests which includes date, test performed, personnel involved, devices tested, serial number and name of test equipment, and test results. Field test reports shall be signed and dated by the Contractor.

### 3.9.2 Safety

The Contractor shall provide and use safety devices such as rubber gloves, protective barriers, and danger signs to protect and warn personnel in the test vicinity. The Contractor shall replace any devices or equipment which are damaged due to improper test procedures or handling.

### 3.9.3 Ground-Resistance Tests

The resistance of each grounding electrode system shall be measured using the fall-of-potential method defined in IEEE Std 81. Ground resistance measurements shall be made before the electrical distribution system is energized and shall be made in normally dry conditions not less than 48 hours after the last rainfall. Resistance measurements of separate grounding electrode systems shall be made before the systems are bonded together below grade. The combined resistance of separate systems may be used to meet the required resistance, but the specified number of electrodes must still be provided.

- a. Single rod electrode - 25 ohms.
- b. Multiple rod electrodes - 25 ohms.

### 3.9.4 Medium-Voltage Cable Test

After installation and before the operating test or connection to an existing system, the medium-voltage cable system shall be given a high potential test. Direct-current voltage shall be applied on each phase conductor of the system by connecting conductors as one terminal and connecting grounds or metallic shieldings or sheaths of the cable as the other terminal for each test. Prior to making the test, the cables shall be isolated by opening applicable protective devices and disconnecting equipment. The test shall be conducted with all splices, connectors, and terminations in place. The method, voltage, length of time, and other characteristics of the test for initial installation shall be in accordance with NEMA WC 7 or NEMA WC 8 for the particular type of cable installed, except that 28 kV and 35 kV insulation test voltages shall be in accordance with either AEIC CS5 or AEIC CS6 as applicable, and shall not exceed the recommendations of IEEE Std 404 for cable joints and IEEE Std 48 for cable terminations unless the cable and accessory manufacturers indicate higher voltages are acceptable for testing. Should any cable fail due to a weakness of conductor insulation or due to defects or injuries incidental to the installation or because of improper installation of cable, cable joints, terminations, or other connections, the Contractor shall make necessary repairs or replace cables as directed. Repaired or replaced cables shall be retested.

### 3.9.5 Low-Voltage Cable Test

Low-voltage cable, complete with splices, shall be tested for insulation resistance after the cables are installed, in their final configuration, ready for connection to the equipment, and prior to energization. The test voltage shall be 500 volts dc, applied for one minute between each conductor and ground and between all possible combinations conductors in the same trench, duct, or cable, with all other conductors in the same trench, duct, or conduit. The minimum value of insulation shall be:

$R$  in megohms = (rated voltage in kV + 1) x 304,800/(length of cable in meters)

Each cable failing this test shall be repaired or replaced. The repaired cable shall be retested until failures have been eliminated.

### 3.10 ACCEPTANCE

Final acceptance of the facility will not be given until the Contractor has successfully completed all tests and after all defects in installation, material or operation have been corrected.

-- End of Section --

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## SECTION 16415

## ELECTRICAL WORK, INTERIOR

## PART 1 GENERAL

## 1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

## AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI C39.1	(1981; R 1992) Requirements for Electrical Analog Indicating Instruments
ANSI C78.1	(1991; C78.1a; R 1996) Fluorescent Lamps - Rapid-Start Types - Dimensional and Electrical Characteristics
ANSI C78.20	(1995) Electric Lamps - Characteristics of Incandescent Lamps A, G, PS, and Similar Shapes with E26 Medium Screw Bases
ANSI C78.21	(1995) Physical and Electrical Characteristics - Incandescent Lamps - PAR and R Shapes
ANSI C78.1350	(1990) 400-Watt, 100-Volt, S51 Single-Ended High-Pressure Sodium Lamps
ANSI C78.1351	(1989) 250-Watt, 100-Volt S50 Single-Ended High-Pressure Sodium Lamps
ANSI C78.1352	(1990) 1000-Watt, 250-Volt, S52 Single-Ended High-Pressure Sodium Lamps
ANSI C78.1355	(1989) 150-Watt, 55-Volt S55 High-Pressure Sodium Lamps
ANSI C78.1375	(1996) 400-Watt, M59 Single-Ended Metal-Halide lamps
ANSI C78.1376	(1996) 1000-Watt, M47 Single-Ended Metal-Halide Lamps
ANSI C80.5	(1995) Rigid Aluminum Conduit
ANSI C82.1	(1997) Specifications for Fluorescent Lamp Ballasts
ANSI C82.4	(1992) Ballasts for High-Intensity-Discharge and Low-Pressure

## Sodium Lamps (Multiple-Supply Type)

## AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM B 1	(1995) Hard-Drawn Copper Wire
ASTM B 8	(1999) Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft
ASTM B 187	(1994) Copper Bar, Bus Bar, Rod and Shapes
ASTM D 709	(1992; R 1997) Laminated Thermosetting Materials

## CODE OF FEDERAL REGULATIONS (CFR)

47 CFR 18	Industrial, Scientific, and Medical Equipment
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## INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)

IEEE C57.13	(1993) Instrument Transformers
IEEE C62.41	(1991; R 1995) Surge Voltages in Low-Voltage AC Power Circuits
IEEE Std 81	(1983) Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Ground System (Part 1)

## NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA AB 1	(1993) Molded Case Circuit Breakers and Molded Case Switches
NEMA FU 1	(1986) Low Voltage Cartridge Fuses
NEMA ICS 1	(1993) Industrial Control and Systems
NEMA ICS 2	(1993) Industrial Control and Systems Controllers, Contactors, and Overload Relays Rated Not More Than 2,000 Volts AC or 750 Volts DC
NEMA ICS 3	(1993) Industrial Control and Systems Factory Built Assemblies
NEMA ICS 6	(1993) Industrial Control and Systems Enclosures
NEMA LE 4	(1987) Recessed Luminaires, Ceiling Compatibility
NEMA OS 1	(1996) Sheet-Steel Outlet Boxes, Device Boxes, Covers, and Box Supports
NEMA PB 1	(1995) Panelboards

NEMA RN 1 (1989) Polyvinyl-Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit

NEMA ST 20 (1992) Dry-Type Transformers for General Applications

NEMA TC 2 (1990) Electrical Polyvinyl Chloride (PVC) Tubing (EPT) and Conduit (EPC-40 and EPC-80)

NEMA WD 1 (1983; R 1989) General Requirements for Wiring Devices

NEMA WD 6 (1988) Wiring Devices - Dimensional Requirements

## NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70 (1999) National Electrical Code

NFPA 101 (2001; Errata 97-1; TIA 97-1) Life Safety Code

## UNDERWRITERS LABORATORIES (UL)

UL 1 (1993; Rev thru Jan 1995) Flexible Metal Conduit

UL 6 (1997) Rigid Metal Conduit

UL 20 (1995; Rev thru Oct 1998) General-Use Snap Switches

UL 44 (1997; Rev Mar 1999) Thermoset-Insulated Wires and Cables

UL 50 (1995; Rev thru Oct 1997) Enclosures for Electrical Equipment

UL 67 (1993; Rev thru Nov 1995) Panelboards

UL 83 (1998) Thermoplastic-Insulated Wires and Cables

UL 98 (1994; R thru Jun 1998) Enclosed and Dead-Front Switches

UL 198B (1995) Class H Fuses

UL 198C (1986; Rev thru Feb 1998) High-Interrupting-Capacity Fuses, Current-Limiting Types

UL 198D (1995) Class K Fuses

UL 198E (1988; Rev Jul 1988) Class R Fuses

UL 198G (1988; Rev May 1988) Fuses for

	Supplementary Overcurrent Protection
UL 198H	(1988; Rev thru Nov 1993) Class T Fuses
UL 360	(1996; Rev thru Oct 1997) Liquid-Tight Flexible Steel Conduit
UL 467	(1993; Rev thru Aug 1996) Grounding and Bonding Equipment
UL 486A	(1997; Rev thru Dec 1998) Wire Connectors and Soldering Lugs for Use with Copper Conductors
UL 486C	(1997; Rev thru Aug 1998) Splicing Wire Connectors
UL 486E	(1994; Rev thru Feb 1997) Equipment Wiring Terminals for Use with Aluminum and/or Copper Conductors
UL 489	(1996; Rev thru Dec 1998) Molded-Case Circuit Breakers, Molded-Case Switches, and Circuit-Breaker Enclosures
UL 506	(1994; Rev Oct 1997) Specialty Transformers
UL 508	(1999) Industrial Control Equipment
UL 510	(1994; Rev thru Apr 1998) Polyvinyl Chloride, Polyethylene, and Rubber Insulating Tape
UL 512	(1993; R Dec 1995) Fuseholders
UL 514A	(1996; Rev Jul 1998) Metallic Outlet Boxes
UL 514B	(1997; Rev Oct 1998) Fittings for Cable and Conduit
UL 542	(1994; Rev thru Jul 1998) Lampholders, Starters, and Starter Holders for Fluorescent Lamps
UL 651	(1995; Rev thru Oct 1998) Schedule 40 and 80 Rigid PVC Conduit
UL 651A	(1995; Rev thru Apr 1998) Type EB and A Rigid PVC Conduit and HDPE Conduit
UL 797	(1993; Rev thru Mar 1997) Electrical Metallic Tubing
UL 844	(1995; Rev thru Aug 1997) Electric Lighting Fixtures for Use in Hazardous (Classified) Locations
UL 845	(1995; Rev Feb 1996) Motor Control Centers

UL 854	(1996; Rev Apr 1998) Service-Entrance Cables
UL 924	(1995; Rev thru Oct 97) Emergency Lighting and Power Equipment
UL 943	(1993; Rev thru May 1998) Ground-Fault Circuit-Interrupters
UL 1022	(1998) Line Isolation Monitors
UL 1029	(1994; Rev thru Dec 1997) High-Intensity-Discharge Lamp Ballasts
UL 1047	(1995; Rev Jul 1998) Isolated Power Systems Equipment
UL 1236	(1994; Rev thru Dec 1997) Battery Chargers for Charging Engine-Starter Batteries
UL 1242	(1996; Rev Mar 1998) Intermediate Metal Conduit
<b>UL 1283</b>	<b>(1998) Electromagnetic Interference Filters</b>
<b>UL 1449</b>	<b>(1996; Rev thru Oct 1998) Transient Voltage Surge Suppressors</b>
UL 1564	(1993; Rev Sep 1998) Industrial Battery Chargers
UL 1570	(1995; Rev thru Jun 1997) Fluorescent Lighting Fixtures
UL 1572	(1995; Rev thru Jun 1997) High Intensity Discharge Lighting Fixtures
UL 1660	(1994; Rev Apr 1998) Liquid-Tight Flexible Nonmetallic Conduit
UL Elec Const Dir	(1998) Electrical Construction Equipment Directory

## 1.2 GENERAL

### 1.2.1 Rules

The installation shall conform to the requirements of NFPA 70 and NFPA 101, unless more stringent requirements are indicated or shown.

### 1.2.2 Coordination

The drawings indicate the extent and the general location and arrangement of equipment, conduit, and wiring. The Contractor shall become familiar with all details of the work and verify all dimensions in the field so that the outlets and equipment shall be properly located and readily accessible.

Lighting fixtures, outlets, and other equipment and materials shall be carefully coordinated with mechanical or structural features prior to installation and positioned according to architectural reflected ceiling

plans; otherwise, lighting fixtures shall be symmetrically located according to the room arrangement when uniform illumination is required, or asymmetrically located to suit conditions fixed by design and shown. Raceways, junction and outlet boxes, and lighting fixtures shall not be supported from sheet metal roof decks. If any conflicts occur necessitating departures from the drawings, details of and reasons for departures shall be submitted and approved prior to implementing any change. The Contractor shall coordinate the electrical requirements of the mechanical work and provide all power related circuits, wiring, hardware and structural support, even if not shown on the drawings.

### 1.2.3 Special Environments

#### 1.2.3.1 Weatherproof Locations

Wiring, Fixtures, and equipment in designated locations shall conform to NFPA 70 requirements for installation in damp or wet locations.

#### 1.2.3.2 Ducts, Plenums and Other Air-Handling Spaces

Wiring and equipment in ducts, plenums and other air-handling spaces shall be installed using materials and methods in conformance with NFPA 70 unless more stringent requirements are indicated in this specification or on the contract drawings.

### 1.2.4 Standard Products

Material and equipment shall be a standard product of a manufacturer regularly engaged in the manufacture of the product and shall essentially duplicate items that have been in satisfactory use for at least 2 years prior to bid opening.

### 1.2.5 Nameplates

#### 1.2.5.1 Identification Nameplates

Major items of electrical equipment and major components shall be permanently marked with an identification name to identify the equipment by type or function and specific unit number as indicated. Designation of motors shall coincide with their designation in the motor control center or panel. Unless otherwise specified, identification nameplates shall be made of laminated plastic in accordance with ASTM D 709 with black outer layers and a white core. Edges shall be chamfered. Plates shall be fastened with black-finished round-head drive screws, except motors, or approved nonadhesive metal fasteners. When the nameplate is to be installed on an irregular-shaped object, the Contractor shall devise an approved support suitable for the application and ensure the proper installation of the supports and nameplates. In all instances, the nameplate shall be installed in a conspicuous location. At the option of the Contractor, the equipment manufacturer's standard embossed nameplate material with black paint-filled letters may be furnished in lieu of laminated plastic. The front of each panelboard, motor control center, switchgear, and switchboard shall have a nameplate to indicate the phase letter, corresponding color and arrangement of the phase conductors. The following equipment, as a minimum, shall be provided with identification nameplates:

Minimum 6.4 mm  
High Letters

Minimum 3.2 mm  
High Letters

Panelboards  
Starters  
Safety Switches  
Motor Control Centers  
Transformers  
Equipment Enclosures  
Switchgear  
Switchboards  
Motors

Control Power Transformers  
Control Devices  
Instrument Transformers

**Transient Voltage  
Surge Suppression Unit**

Each panel, section, or unit in motor control centers, switchgear or similar assemblies shall be provided with a nameplate in addition to nameplates listed above, which shall be provided for individual compartments in the respective assembly, including nameplates which identify "future," "spare," and "dedicated" or "equipped spaces."

1.2.6 As-Built Drawings

Following the project completion or turnover, within 30 days the Contractor shall furnish 2 sets of as-built drawings to the Contracting Officer.

1.2.7 Recessed Light Fixtures (RLF) Option

The Contractor has the option to substitute inch-pound (I-P) RLF to metric RLF. This option shall be coordinated with Section 09510 ACOUSTICAL CEILINGS.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Emergency Power Supply (EPS); G, RE  
Interior Electrical Equipment; G, RE

1.3.1 Interior Electrical Equipment

Detail drawings consisting of equipment drawings, illustrations, schedules, instructions, diagrams, and other information necessary to define the installation. Detail drawings shall show the rating of items and systems and how the components of an item and system are assembled, function together, and how they will be installed on the project. Data and drawings for component parts of an item or system shall be coordinated and submitted as a unit. Data and drawings shall be coordinated and included in a single submission. Multiple submissions for the same equipment or system are not acceptable except where prior approval has been obtained from the Contracting Officer. In such cases, a list of data to be submitted later shall be included with the first submission. Detail drawings shall show

physical arrangement, construction details, connections, finishes, materials used in fabrication, provisions for conduit or busway entrance, access requirements for installation and maintenance, physical size, electrical characteristics, foundation and support details, and equipment weight. Drawings shall be drawn to scale and/or dimensioned. Optional items shall be clearly identified as included or excluded. Detail drawings shall as a minimum include:

- 1) Transformers.
- 2) Panelboards
- 3) Battery system including calculations for the battery and charger.
- 4) Safety switches
- 5) Motor controllers
- 6) Compression terminals
- 7) Enclosed breakers
- 8) Single line electrical diagrams including primary, metering, sensing and relaying, control wiring, and control logic.
- 9) Sway bracing for suspended luminaires.
- 10) Transient Voltage Surge Suppression Unit**

- a. Structural drawings showing the structural or physical features of major equipment items, components, assemblies, and structures, including foundations or other types of supports for equipment and conductors. These drawings shall include accurately scaled or dimensioned outline and arrangement or layout drawings to show the physical size of equipment and components and the relative arrangement and physical connection of related components. Weights of equipment, components and assemblies shall be provided when required to verify the adequacy of design and proposed construction of foundations or other types of supports. Dynamic forces shall be stated for switching devices when such forces must be considered in the design of support structures. The appropriate detail drawings shall show the provisions for leveling, anchoring, and connecting all items during installation, and shall include any recommendations made by the manufacturer.
- b. Electrical drawings including single-line and three-line diagrams, and schematics or elementary diagrams of each electrical system; internal wiring and field connection diagrams of each electrical device when published by the manufacturer; wiring diagrams of cabinets, panels, units, or separate mountings; interconnection diagrams that show the wiring between separate components of assemblies; field connection diagrams that show the termination of wiring routed between separate items of equipment; internal wiring diagrams of equipment showing wiring as actually provided for this project. Field wiring connections shall be clearly identified.
- c. If departures from the contract drawings are deemed necessary by the Contractor, complete details of such departures, including changes in related portions of the project and the reasons why, shall be submitted with the detail drawings. Approved departures shall be made at no additional cost to the Government.

#### SD-03 Product Data

Manufacturer's Catalog  
Material, Equipment, and Fixture Lists  
Installation Procedures

As-Built Drawings  
Onsite Tests; G, RE.

1.3.2 Manufacturer's Catalog

Data composed of catalog cuts, brochures, circulars, specifications, product data, and printed information in sufficient detail and scope to verify compliance with the requirements of the contract documents.

1.3.3 Material, Equipment, and Fixture Lists

A complete itemized listing of equipment and materials proposed for incorporation into the work. Each entry shall include an item number, the quantity of items proposed, and the name of the manufacturer of each item.

1.3.4 Installation Procedures

Installation procedures for transformers, and battery systems. Procedures shall include diagrams, instructions, and precautions required to install, adjust, calibrate, and test devices and equipment.

1.3.5 As-Built Drawings

The as-built drawings shall be a record of the construction as installed. The drawings shall include all the information shown on the contract drawings, deviations, modifications, and changes from the contract drawings, however minor. The as-built drawings shall be kept at the job site and updated daily. The as-built drawings shall be a full-sized set of prints marked to reflect all deviations, changes, and modifications. The as-built drawings shall be complete and show the location, size, dimensions, part identification, and other information. Additional sheets may be added. The as-built drawings shall be jointly inspected for accuracy and completeness by the Contractor's quality control representative and by the Contracting Officer prior to the submission of each monthly pay estimate. Upon completion of the work, the Contractor shall submit three full sized sets of the marked prints to the Contracting Officer for approval. If upon review, the as-built drawings are found to contain errors and/or omissions, they will be returned to the Contractor for correction. The Contractor shall correct and return the as-built drawings to the Contracting Officer for approval within ten calendar days from the time the drawings are returned to the Contractor.

1.3.6 Onsite Tests

A detailed description of the Contractor's proposed procedures for on-site tests.

SD-06 Test Reports

Factory Test Reports; G, RE.  
Field Test Plan; G, RE.  
Field Test Reports; G, RE

1.3.7 Factory Test Reports

Six copies of the information described below in 216 x 280 mm binders having a minimum of 5 rings from which material may readily be removed and replaced, including a separate section for each test. Sections shall be separated by heavy plastic dividers with tabs.

- a. A list of equipment used, with calibration certifications.
- b. A copy of measurements taken.
- c. The dates of testing.
- d. The equipment and values to be verified.
- e. The conditions specified for the test.
- f. The test results, signed and dated.
- g. A description of adjustments made.

#### 1.3.8 Field Test Plan

A detailed description of the Contractor's proposed procedures for onsite test submitted 30 days prior to testing the installed system. No field test will be performed until the test plan is approved. The test plan shall consist of complete field test procedures including tests to be performed, test equipment required, and tolerance limits.

#### 1.3.9 Field Test Reports

Six copies of the information described below in 216 x 280 mm binders having a minimum of 5 rings from which material may readily be removed and replaced, including a separate section for each test. Sections shall be separated by heavy plastic dividers with tabs.

- a. A list of equipment used, with calibration certifications.
- b. A copy of measurements taken.
- c. The dates of testing.
- d. The equipment and values to be verified.
- e. The conditions specified for the test.
- f. The test results, signed and dated.
- g. A description of adjustments made.
- h. Final position of controls and device settings.

#### SD-07 Certificates

##### Materials and Equipment

The label or listing of the Underwriters Laboratories, Inc., will be accepted as evidence that the materials or equipment conform to the applicable standards of that agency. In lieu of this label or listing, a statement from a nationally recognized, adequately equipped testing agency indicating that the items have been tested in accordance with required procedures and that the materials and equipment comply with all contract requirements will be accepted. However, materials and equipment installed in hazardous locations must bear the UL label unless the data

submitted from other testing agency is specifically approved in writing by the Contracting Officer. Items which are required to be listed and labeled in accordance with Underwriters Laboratories must be affixed with a UL label that states that it is UL listed. No exceptions or waivers will be granted to this requirement. Materials and equipment will be approved based on the manufacturer's published data.

For other than equipment and materials specified to conform to UL publications, a manufacturer's statement indicating complete compliance with the applicable standard of the American Society for Testing and Materials, National Electrical Manufacturers Association, or other commercial standard, is acceptable.

#### 1.4 WORKMANSHIP

Materials and equipment shall be installed in accordance with NFPA 70, recommendations of the manufacturer, and as shown.

### PART 2 PRODUCTS

Products shall conform to the respective publications and other requirements specified below. Materials and equipment not listed below shall be as specified elsewhere in this section. Items of the same classification shall be identical including equipment, assemblies, parts, and components.

#### 2.1 CABLES AND WIRES

Conductors No. 8 AWG and larger diameter shall be stranded. Conductors No. 10 AWG and smaller diameter shall be solid, except that conductors for remote control, alarm, and signal circuits, classes 1, 2, and 3, shall be stranded unless specifically indicated otherwise. Conductor sizes and ampacities shown are based on copper, unless indicated otherwise. All conductors shall be copper.

##### 2.1.1 Equipment Manufacturer Requirements

When manufacturer's equipment requires copper conductors at the terminations or requires copper conductors to be provided between components of equipment, provide copper conductors or splices, splice boxes, and other work required to meet manufacturer's requirements.

##### 2.1.2 Aluminum Conductors

Aluminum conductors shall not be used.

##### 2.1.3 Insulation

Unless indicated otherwise, or required by NFPA 70, power and lighting wires shall be 600-volt, Type THWN, THHN, or THW conforming to UL 83, RHW conforming to UL 44, except that grounding wire may be type TW conforming to UL 83; remote-control and signal circuits shall be Type TW, THW or TF, conforming to UL 83. Where lighting fixtures require 90-degree Centigrade (C) conductors, provide only conductors with 90-degree C insulation or better.

##### 2.1.4 Bonding Conductors

ASTM B 1, solid bare copper wire for sizes No. 8 AWG and smaller diameter;  
ASTM B 8, Class B, stranded bare copper wire for sizes No. 6 AWG and larger  
diameter.

#### 2.1.5 Service Entrance Cables

Service entrance (SE) and underground service entrance (USE) cables, UL 854.

#### 2.2 CHARGERS, BATTERY

UL 1236, UL 1564. Battery chargers shall be general purpose, continuous  
current output, with solid state rectifiers. Means shall be provided to  
regulate and to adjust the dc output voltage. Chargers shall have  
continuous current ratings of 10 to 15 percent higher than battery current  
outputs based upon an 8-hour discharge.

#### 2.3 CIRCUIT BREAKERS

##### 2.3.1 Molded-Case Circuit Breakers

Molded-case circuit breakers shall conform to NEMA AB 1 and UL 489 for  
circuit breakers. Circuit breakers may be installed in panelboards,  
switchboards, enclosures, or combination motor controllers.

##### 2.3.1.1 Construction

Circuit breakers shall be suitable for mounting and operating in any  
position. Lug shall be listed for copper conductors only in accordance  
with UL 486E. Single-pole circuit breakers shall be full module size with  
not more than one pole per module. Multi-pole circuit breakers shall be of  
the common-trip type having a single operating handle such that an overload  
or short circuit on any one pole will result in all poles opening  
simultaneously. Sizes of 100 amperes or less may consist of single-pole  
breakers permanently factory assembled into a multi-pole unit having an  
internal, mechanical, nontamperable common-trip mechanism and external  
handle ties. All circuit breakers shall have a quick-make, quick-break  
overcenter toggle-type mechanism, and the handle mechanism shall be  
trip-free to prevent holding the contacts closed against a short-circuit or  
sustained overload. All circuit breaker handles shall assume a position  
between "ON" and "OFF" when tripped automatically. All ratings shall be  
clearly visible.

##### 2.3.1.2 Ratings

Voltage ratings shall be not less than the applicable circuit voltage. The  
interrupting rating of the circuit breakers shall be at least equal to the  
available short-circuit current at the line terminals of the circuit  
breaker and correspond to the UL listed integrated short-circuit current  
rating specified for the panelboards and switchboards. Molded-case circuit  
breakers shall have nominal voltage ratings, maximum continuous-current  
ratings, and maximum short-circuit interrupting ratings in accordance with  
NEMA AB 1. Ratings shall be coordinated with system X/R ratio.

##### 2.3.1.3 Cascade System Ratings

Circuit breakers used in series combinations shall be in accordance with UL  
489. Equipment, such as switchboards and panelboards, which house  
series-connected circuit breakers shall be clearly marked accordingly.

Series combinations shall be listed in the UL Recognized Component Directory under "Circuit Breakers-Series Connected."

#### 2.3.1.4 Thermal-Magnetic Trip Elements

Thermal magnetic circuit breakers shall be provided as shown. Automatic operation shall be obtained by means of thermal-magnetic tripping devices located in each pole providing inverse time delay and instantaneous circuit protection. The instantaneous magnetic trip shall be adjustable and accessible from the front of all circuit breakers on frame sizes above 150 amperes.

#### 2.3.2 Solid-State Trip Elements

Solid-state circuit breakers shall be provided as shown. All electronics shall be self-contained and require no external relaying, power supply, or accessories. Printed circuit cards shall be treated to resist moisture absorption, fungus growth, and signal leakage. All electronics shall be housed in an enclosure which provides protection against arcs, magnetic interference, dust, and other contaminants. Solid-state sensing shall measure true RMS current with error less than one percent on systems with distortions through the 13th harmonic. Peak or average actuating devices are not acceptable. Current sensors shall be torodial construction, encased in a plastic housing filled with epoxy to protect against damage and moisture and shall be integrally mounted on the breaker. Where indicated on the drawings, circuit breaker frames shall be rated for 100 percent continuous duty. Circuit breakers shall have tripping features as shown on the drawings and as described below:

- a. Long-time current pick-up, adjustable from 50 percent to 100 percent of continuous current rating.
- b. Adjustable long-time delay.
- c. Short-time current pick-up, adjustable from 1.5 to 9 times long-time current setting.
- d. Adjustable short-time delay.
- e. Short-time  $I^2 t$  switch.
- f. Instantaneous current pick-up, adjustable from 1.5 to 9 times long-time current setting.
- g. Ground-fault pick-up, adjustable from 20 percent to 60 percent of sensor rating, but not greater than 1200 amperes. Sensing of ground-fault current at the main bonding jumper or ground strap will not be permitted. Zone-selective interlocking shall be provided as shown.
- h. Adjustable ground-fault delay.
- i. Ground-fault  $I^2 t$  switch.
- j. Overload and ground-fault trip indicators shall be provided.

#### 2.3.3 Current-Limiting Circuit Breakers

Current-limiting circuit breakers shall be provided as shown.

Current-limiting circuit breakers shall limit the let-through  $I^2t$  to a value less than the  $I^2t$  of one-half cycle of the symmetrical short-circuit current waveform. On fault currents below the threshold of limitation, breakers shall provide conventional overload and short-circuit protection. Integrally-fused circuit breakers shall not be used.

#### 2.3.4 Ground Fault Circuit Interrupters

UL 943. Breakers equipped with ground fault circuit interrupters shall have ground fault class, interrupting capacity, and voltage and current ratings as indicated.

### 2.4 CONDUIT AND TUBING

#### 2.4.1 Electrical, Zinc-Coated Steel Metallic Tubing (EMT)

UL 797

#### 2.4.2 Flexible Conduit, Steel and Plastic

General-purpose type, UL 1; liquid tight, UL 360, and UL 1660.

#### 2.4.3 Intermediate Metal Conduit

UL 1242.

#### 2.4.4 PVC Coated Rigid Steel Conduit

NEMA RN 1.

#### 2.4.5 Rigid Aluminum Conduit

ANSI C80.5 and UL 6.

#### 2.4.6 Rigid Metal Conduit

UL 6.

#### 2.4.7 Rigid Plastic Conduit

NEMA TC 2, UL 651 and UL 651A.

### 2.5 CONDUIT AND DEVICE BOXES AND FITTINGS

#### 2.5.1 Boxes, Metallic Outlet

NEMA OS 1 and UL 514A.

#### 2.5.2 Boxes, Switch (Enclosed), Surface-Mounted

UL 98.

#### 2.5.3 Fittings for Conduit and Outlet Boxes

UL 514B.

#### 2.5.4 Fittings, PVC, for Use with Rigid PVC Conduit and Tubing

UL 514B.

## 2.6 CONNECTORS, WIRE PRESSURE

### 2.6.1 For Use With Copper Conductors

UL 486A.

## 2.7 ELECTRICAL GROUNDING AND BONDING EQUIPMENT

UL 467.

### 2.7.1 Ground Rods

Ground rods shall be of copper-clad steel conforming to UL 467 not less than 19.1 mm in diameter by 3.1 meter in length of the sectional type driven full length into the earth.

### 2.7.2 Ground Bus

The ground bus shall be bare conductor or flat copper in one piece, if practicable.

## 2.8 ENCLOSURES

NEMA ICS 6 (classified) unless otherwise specified.

### 2.8.1 Cabinets and Boxes

Cabinets and boxes with volume greater than 0.0164 cubic meters shall be in accordance with UL 50, hot-dip, zinc-coated, if sheet steel.

### 2.8.2 Circuit Breaker Enclosures

UL 489.

## 2.9 LIGHTING FIXTURES, LAMPS, BALLASTS, EMERGENCY EQUIPMENT, CONTROLS AND ACCESSORIES

The following specifications are supported and supplemented by information and details on the drawings. Additional fixtures, if shown, shall conform to this specification. Lighting equipment installed in classified hazardous locations shall conform to UL 844. Lamps, lampholders, ballasts, transformers, electronic circuitry and other lighting system components shall be constructed according to industry standards. Equipment shall be tested and listed by a recognized independent testing laboratory for the expected installation conditions. Equipment shall conform to the standards listed below.

### 2.9.1 Lamps

Lamps shall be constructed to operate in the specified fixture, and shall function without derating life or output as listed in published data. Lamps shall meet the requirements of the Energy Policy Act of 1992.

- a. Incandescent and tungsten halogen lamps shall be designed for 125 volt operation (except for low voltage lamps), shall be rated for minimum life of 2,000 hours, and shall have color temperature between 2,800 and 3,200 degrees Kelvin. Tungsten halogen lamps

shall incorporate quartz capsule construction. Lamps shall comply with ANSI C78.20 and sections 238 and 270 of ANSI C78.21.

- b. Fluorescent lamps shall have color temperature of 3,500 degrees Kelvin. They shall be designed to operate with the ballasts and circuitry of the fixtures in which they will be used. Fluorescent lamps, including spares, shall be manufactured by one manufacturer to provide for color and performance consistency. Fluorescent lamps shall comply with ANSI C78.1. Fluorescent tube lamp efficiencies shall meet or exceed the following requirements.

T8, 32 watts	(4' lamp)	2800 lumens
T8,59 watts	(8' lamp)	5700 lumens

(1) Linear fluorescent lamps, unless otherwise indicated, shall be 1219 mm long 32 watt T8, 265 mA, 3500k, with minimum CRI of 75. Lamps of other lengths or types shall be used only where specified or shown. Lamps shall deliver rated life when operated on instant start ballasts.

- c. High intensity discharge lamps, including spares, shall be manufactured by one manufacturer in order to provide color and performance consistency. High intensity discharge lamps shall be designed to operate with the ballasts and circuitry of the fixtures in which they will be used and shall have wattage, shape and base as shown. High intensity discharge lamps, unless otherwise shown, shall have medium or mogul screw base and minimum starting temperature of -29 degrees C. Metal halide lamps, unless otherwise shown, shall have minimum CRI of 65; color temperature of 4,300 degrees Kelvin; shall be -BU configuration if used in base-up position; and shall be -H or high output configuration if used in horizontal position. Lamps shall comply with all applicable ANSI C78.1350, ANSI C78.1351, ANSI C78.1352, ANSI C78.1355, ANSI C78.1375, and ANSI C78.1376.

#### 2.9.2 Ballasts and Transformers

Ballasts or transformers shall be designed to operate the designated lamps within their optimum specifications, without derating the lamps. Lamp and ballast combinations shall be certified as acceptable by the lamp manufacturer.

- a. Fluorescent ballasts shall comply with ANSI C82.1 and shall be mounted integrally within fluorescent fixture housing unless otherwise shown. Ballasts shall have maximum current crest factor of 1.7; high power factor; Class A sound rating; maximum operating case temperature of 25 degrees C above ambient; and shall be rated Class P. Unless otherwise indicated, the minimum number of ballasts shall be used to serve each individual fixture. A single ballast may be used to serve multiple fixtures if they are continuously mounted, identically controlled and factory manufactured for that installation with an integral wireway.

(2) Electronic fluorescent ballasts shall comply with 47 CFR 18 for electromagnetic interference. Ballasts shall withstand line transients per IEEE C62.41, Category A. Ballasts shall have total

harmonic distortion between 10 and 20%; minimum frequency of 20,000Hz; filament voltage between 2.5 and 4.5 volts; maximum starting inrush current of 20 amperes; and shall comply with the minimum Ballast Efficacy Factors shown in the table below. Minimum starting temperature shall be 10 degrees C . Ballasts shall carry a manufacturer's full warranty of three years, including a minimum \$10 labor allowance per ballast.

## ELECTRONIC FLUORESCENT BALLAST EFFICACY FACTORS

LAMP TYPE	TYPE OF STARTER & LAMP	NOMINAL OPERATIONAL VOLTAGE	NUMBER OF LAMPS	MINIMUM BALLAST EFFICACY FACTOR
32W T8	rapid start	120 or 277 V	1	2.54
	linear & U-tubes		2	1.44
			3	0.93
			4	0.73
59W T8	rapid start linear	120 or 277 V	2	0.80

- c. High intensity discharge ballasts shall comply with UL 1029 and, if multiple supply types, with ANSI C82.4. Ballasts shall have minimum ballast factor of 0.9; high power factor; Class A sound rating; and maximum operating case temperature of 25 degrees C above ambient.

(1) Magnetic high intensity discharge ballasts shall have a minimum starting temperature of -29 degrees C .

## 2.9.3 Fixtures

Fixtures shall be in accordance with the size, shape, appearance, finish, and performance shown. Unless otherwise indicated, lighting fixtures shall be provided with housings, junction boxes, wiring, lampholders, mounting supports, trim, hardware and accessories for a complete and operable installation. Recessed housings shall be minimum 20 gauge cold rolled or galvanized steel as shown. Extruded aluminum fixtures shall have minimum wall thickness of 3 mm . Plastic lenses shall be 100% virgin acrylic or as shown. Glass lenses shall be tempered. Heat resistant glass shall be borosilicate type. Conoid recessed reflector cones shall be Alzak with clear specular low iridescent finish.

- a. Fluorescent fixtures shall comply with UL 1570. Recessed ceiling fixtures shall comply with NEMA LE 4. Fixtures shall be plainly marked for proper lamp and ballast type to identify lamp diameter, wattage, color and start type. Marking shall be readily visible to service personnel, but not visible from normal viewing angles. Fluorescent fixture lens frames on recessed and surface mounted troffers shall be one assembly with mitered corners. Parabolic louvers shall have a low iridescent finish and 45 degree cut-off. Louver intersection joints shall be hairline type and shall conceal mounting tabs or other assembly methods. Louvers shall be

free from blemishes, lines or defects which distort the visual surface. Integral ballast and wireway compartments shall be easily accessible without the use of special tools. Housings shall be constructed to include grounding necessary to start the lamps. Open fixtures shall be equipped with a sleeve, wire guard, or other positive means to prevent lamps from falling. Medium bi-pin lampholders shall be twist-in type with positive locking position. Long compact fluorescent fixtures and fixtures utilizing U-bend lamps shall have clamps or secondary lampholders to support the free ends of the lamps.

- b. High intensity discharge fixture shall comply with UL 1572. Recessed ceiling fixtures shall comply with NEMA LE 4. Reflectors shall be anodized aluminum. Fixtures for horizontal lamps shall have position oriented lampholders. Lampholders shall be pulse-rated to 5,000 volts. Fixtures indicated as classified or rated for hazardous locations or special service shall be designed and independently tested for the environment in which they are installed. Recessed lens fixtures shall have extruded aluminum lens frames. Ballasts shall be integral to fixtures and shall be accessible without the use of special tools. Remote ballasts shall be encased and potted. Lamps shall be shielded from direct view with a UV absorbing material such as tempered glass, and shall be circuited through a cut-off switch which will shut off the lamp circuit if the lens is not in place.
- c. Emergency lighting fixtures and accessories shall be constructed and independently tested to meet the requirements of applicable codes. Batteries shall be Nicad or equal with no required maintenance, and shall have a minimum life expectancy of five years and warranty period of three years.
- d. Exit Signs

Exit signs shall be ENERGY STAR compliant, thereby meeting the following requirements. Input power shall be less than 5 watts per face. Letter size and spacing shall adhere to NFPA 101. Luminance contrast shall be greater than 0.8. Average luminance shall be greater than 15 cd/m<sup>2</sup> measured at normal (0 degree) and 45 degree viewing angles. Minimum luminance shall be greater than 8.6 cd/m<sup>2</sup> measured at normal and 45 degree viewing angles. Maximum to minimum luminance shall be less than 20:1 measured at normal and 45 degree viewing angles. The manufacturer warranty for defective parts shall be at least 5 years.

#### 2.9.4 Lampholders, Starters, and Starter Holders

UL 542

#### 2.10 LOW-VOLTAGE FUSES AND FUSEHOLDERS

##### 2.10.1 Fuses, Low Voltage Cartridge Type

NEMA FU 1.

##### 2.10.2 Fuses, High-Interrupting-Capacity, Current-Limiting Type

Fuses, Class G, J, L and CC shall be in accordance with UL 198C.

## 2.10.3 Fuses, Class K, High-Interrupting-Capacity Type

UL 198D.

## 2.10.4 Fuses, Class H

UL 198B.

## 2.10.5 Fuses, Class R

UL 198E.

## 2.10.6 Fuses, Class T

UL 198H.

## 2.10.7 Fuses for Supplementary Overcurrent Protection

UL 198G.

## 2.10.8 Fuseholders

UL 512.

## 2.11 INSTRUMENTS, ELECTRICAL INDICATING

ANSI C39.1.

## 2.12 MOTOR CONTROLS

## 2.12.1 General

NEMA ICS 1, NEMA ICS 2, NEMA ICS 3 and NEMA ICS 6, and UL 508 and UL 845. Panelboards supplying non-linear loads shall have neutrals sized for 200 percent of rated current.

## 2.12.2 Motor Starters

Combination starters shall be provided with circuit breakers.

## 2.12.3 Thermal-Overload Protection

Each motor of 93 W (1/8 hp) or larger shall be provided with thermal-overload protection. Polyphase motors shall have overload protection in each ungrounded conductor. The overload-protection device shall be provided either integral with the motor or controller, or shall be mounted in a separate enclosure. Unless otherwise specified, the protective device shall be of the manually reset type. Single or double pole tumbler switches specifically designed for alternating-current operation only may be used as manual controllers for single-phase motors having a current rating not in excess of 80 percent of the switch rating.

## 2.12.4 Low-Voltage Motor Overload Relays

## 2.12.4.1 General

Thermal overload relays shall conform to NEMA ICS 2 and UL 508. Overload protection shall be provided either integral with the motor or motor controller, and shall be rated in accordance with the requirements of NFPA

70. Standard units shall be used for motor starting times up to 7 seconds.

#### 2.12.4.2 Construction

Manual reset type thermal relay shall be bimetallic construction. Automatic reset type thermal relays shall be bimetallic construction. Magnetic current relays shall consist of a contact mechanism and a dash pot mounted on a common frame.

#### 2.12.4.3 Ratings

Voltage ratings shall be not less than the applicable circuit voltage. Trip current ratings shall be established by selection of the replaceable overload device and shall not be adjustable. Where the controller is remotely-located or difficult to reach, an automatic reset, non-compensated overload relay shall be provided. Manual reset overload relays shall be provided otherwise, and at all locations where automatic starting is provided. Where the motor is located in a constant ambient temperature, and the thermal device is located in an ambient temperature that regularly varies by more than minus 10 degrees C, an ambient temperature-compensated overload relay shall be provided.

#### 2.12.5 Automatic Control Devices

##### 2.12.5.1 Pilot-Relay Control

Where the automatic-control device does not have such a rating, a magnetic starter shall be used, with the automatic-control device actuating the pilot-control circuit.

##### 2.12.5.2 Manual/Automatic Selection

- a. Where combination manual and automatic control is specified and the automatic-control device operates the motor directly, a double-throw, three-position tumbler or rotary switch (marked MANUAL-OFF-AUTOMATIC) shall be provided for the manual control.
- b. Where combination manual and automatic control is specified and the automatic-control device actuates the pilot control circuit of a magnetic starter, the magnetic starter shall be provided with a three-position selector switch marked MANUAL-OFF-AUTOMATIC.
- c. Connections to the selector switch shall be such that; only the normal automatic regulatory control devices will be bypassed when the switch is in the Manual position; all safety control devices, such as low-or high-pressure cutouts, high-temperature cutouts, and motor-overload protective devices, shall be connected in the motor-control circuit in both the Manual and the Automatic positions of the selector switch. Control circuit connections to any MANUAL-OFF-AUTOMATIC switch or to more than one automatic regulatory control device shall be made in accordance with wiring diagram approved by the Contracting Officer unless such diagram is included on the drawings. All controls shall be 120 volts or less unless otherwise indicated.

#### 2.13 PANELBOARDS

Dead-front construction, NEMA PB 1 and UL 67.

Panelboards shall consist of assemblies of molded-case circuit breakers with buses and terminal lugs for the control and protection of branch circuits to motors, heating devices and other equipment operating at 480 volts ac or less. Panelboards shall be UL 67 labeled. "Loadcenter" type panels are not acceptable. Panelboards shall be designed for installation in surface-mounted or flush-mounted cabinets accessible from the front only, as shown on the drawings. Panelboards shall be fully rated for a short-circuit current as noted on the drawings.

#### 2.13.1 Enclosure

Enclosures shall meet the requirements of UL 50. All cabinets shall be fabricated from sheet steel of not less than 3.5 millimeters (No. 10 gage) if flush-mounted or mounted outdoors, and not less than 2.7 millimeters (No. 12 gage) if surface-mounted indoors, with full seam-welded box ends. Cabinets mounted outdoors or flush-mounted shall be hot-dipped galvanized after fabrication. Cabinets shall be painted in accordance with paragraph PAINTING. Outdoor cabinets shall be of NEMA 3R raintight and conduit hubs welded to the cabinet a removable steel plate 7 millimeters (1/4 inch) thick in the bottom for field drilling for conduit connections. Front edges of cabinets shall be form-flanged or fitted with structural shapes welded or riveted to the sheet steel, for supporting the panelboard front. All cabinets shall be so fabricated that no part of any surface on the finished cabinet shall deviate from a true plane by more than 3 millimeters (1/8 inch). Holes shall be provided in the back of indoor surface-mounted cabinets, with outside spacers and inside stiffeners, for mounting the cabinets with a 15 millimeter (1/2 inch) clear space between the back of the cabinet and the wall surface. Flush doors shall be mounted on hinges that expose only the hinge roll to view when the door is closed. Each door shall be fitted with a combined catch and lock, except that doors over 600 millimeters (24 inches) long shall be provided with a three-point latch having a knob with a T-handle, and a cylinder lock. Two keys shall be provided with each lock, and all locks shall be keyed alike. Finished-head cap screws shall be provided for mounting the panelboard fronts on the cabinets. Enclosure shall have nameplates in accordance with paragraph NAMEPLATES. Directory holders, containing a neatly typed or printed directory under a transparent cover, shall be provided on the inside of panelboard doors.

#### 2.13.2 Buses

All panelboards shall be of the dead-front type with buses and circuit breakers mounted on a plate or base for installation as a unit in a cabinet. All buses shall be of copper. Copper aluminum bars and shapes for bus conductors shall conform to the applicable requirements of ASTM B 187. The sizes of buses and the details of panelboard construction shall meet or exceed the requirements of NEMA PB 1. Suitable provisions shall be made for mounting the bus within panelboards and adjusting their positions in the cabinets. Terminal lugs required to accommodate the conductor sizes shown on the drawing, shall be provided for all branch circuits larger than No. 10 AWG. A grounding lug suitable for 1/0 AWG wire shall be provided for each panelboard.

#### 2.13.3 Components

Each branch circuit, and the main buses where so specified or shown on the drawings, shall be equipped with molded-case circuit breakers having overcurrent trip ratings as shown on the drawings. The circuit breakers shall be of a type designed for bolted connection to buses in a panelboard

assembly, and shall meet the requirements of paragraph MOLDED CASE CIRCUIT BREAKERS. Circuit breakers of the same frame size and rating shall be interchangeable. Bell alarm contacts shall be furnished as indicated on the drawings and shall be wired to terminal blocks mounted in the cabinet. Terminal blocks shall conform to requirements of paragraph TERMINAL BLOCKS.

## 2.14 RECEPTACLES

### 2.14.1 Heavy Duty Grade

NEMA WD 1. Devices shall conform to all requirements for heavy duty receptacles.

### 2.14.2 Ground Fault Interrupters

UL 943, Class A or B.

### 2.14.3 NEMA Standard Receptacle Configurations

NEMA WD 6.

#### a. Single and Duplex, 15-Ampere and 20-Ampere, 125 Volt

15-ampere, non-locking: NEMA type 5-15R, locking: NEMA type L5-15R,  
20-ampere, non-locking: NEMA type 5-20R, locking: NEMA type L5-20R.

#### b. 15-Ampere, 250 Volt

Two-pole, 3-wire grounding, non-locking: NEMA type 6-15R, locking: NEMA type L6-15R. Three-pole, 4-wire grounding, non-locking: NEMA type 15-15R, locking: NEMA type L15-15R.

#### c. 20-Ampere, 250 Volt

Two-pole, 3-wire grounding, non-locking: NEMA type 6-20R, locking: NEMA type L6-20R. Three-pole, 4-wire grounding, non-locking: NEMA type 15-20R, locking: NEMA type L15-20R.

#### d. 30-Ampere, 125/250 Volt

Three-pole, 3-wire, non-locking: NEMA type 10-30R, locking: NEMA type L10-30R. Three-pole, 4-wire grounding, non-locking: NEMA type 14-30R, locking: NEMA type L14-30R.

#### e. 30-Ampere, 250 Volt

Two-pole, 3-wire grounding, non-locking: NEMA type 6-30R, locking: NEMA type L6-30R. Three-pole, 4-wire grounding, non-locking: NEMA type 15-30R, locking: NEMA type L15-30R.

#### f. 50-Ampere, 125/250 Volt

Three-pole, 3-wire: NEMA type 10-50R. Three-pole, 4-wire grounding: NEMA type 14-50R.

#### g. 50-Ampere, 250 Volt

Two-pole, 3-wire grounding: NEMA type 6-50R. Three-pole, 4-wire grounding: NEMA type 15-50R.

## 2.15 SPLICE, CONDUCTOR

UL 486C.

## 2.16 SNAP SWITCHES

UL 20.

## 2.17 TAPES

## 2.17.1 Plastic Tape

UL 510.

## 2.17.2 Rubber Tape

UL 510.

## 2.18 TRANSFORMERS

Single- and three-phase transformers shall have two windings per phase. Full-capacity standard NEMA taps shall be provided in the primary windings of transformers unless otherwise indicated. Three-phase transformers shall be configured with delta-wye windings, except as indicated. "T" connections may be used for transformers rated 15 kVA or below. Transformers supplying non-linear loads shall be UL listed as suitable for supplying such loads with a total K-factor not to exceed K-13 and have neutrals sized for 200 percent of rated current.

## 2.18.1 Transformers, Dry-Type

Transformers shall have 220 degrees C insulation system for transformers 15 kVA and greater, and shall have 180 degrees C insulation system for transformers rated 10 kVA and less, with temperature rise not exceeding 80 degrees C under full-rated load in maximum ambient temperature of 40 degrees C. Transformer of 80 degrees C temperature rise shall be capable of carrying continuously 130 percent of nameplate kVA without exceeding insulation rating.

## a. 600 Volt or Less Primary:

NEMA ST 20, UL 506, general purpose, dry-type, self-cooled, epoxy-resin cast coil,. Transformers shall be provided in NEMA 1 enclosure. Transformers shall be quiet type with maximum sound level at least 3 decibels less than NEMA standard level for transformer ratings indicated.

## 2.18.2 Average Sound Level

The average sound level in decibels (dB) of transformers shall not exceed the following dB level at 300 mm for the applicable kVA rating range listed unless otherwise indicated:

kVA Range	dB Sound Level
1-50	50
51-150	55
151-300	58
301-500	60

kVA Range	dB Sound Level
501-700	62
701-1000	64
1001-1500	65
1501 & above	70

## 2.19 ISOLATED POWER SYSTEM EQUIPMENT

UL 1047, with monitor UL 1022.

## 2.20 EMERGENCY POWER SUPPLY (EPS)

Unit shall be complete with inverter, batteries, battery charger, and output circuit breakers, housed in factory-constructed enclosures. Fully automatic system operation, with continuous self-diagnostic monitoring of operations. Unit shall supply a digitally generated sinusoidal output waveform with less than 5 percent total harmonic distortion at rated load. Operation time shall be a minimum of 90 minutes, at full load. Input voltage shall be 120/240 volts, single phase, 60Hz. Unit output voltage shall be 120/240 volts, single phase, 60 Hz. Conforming to UL 924.

### 2.20.1 System Diagnostics

a. Unit shall have a User Interface Display consisting of LED lights, a 2 line, 40 character LCD display and keypad. Display shall scroll through the following meter functions:

- 1) Input AC voltage, Output voltage, Battery Voltage, battery charging amps, Battery discharge amps, AC output amps, Output voltage-amps, Output watts, power factor, percent loading, ambient temperature, battery temperature, input frequency, output frequency, system run time, date and time.

b. The system shall continuously monitor all sub-systems, with memory log of last twenty events. EPS unit shall recharge batteries to full charge within 24 hours. Charger shall be software controlled, and continuously charge batteries during normal operation.

c. Batteries shall be long life, sealed lead-calcium type. Unit provided with output circuit breakers.

d. Number of breakers and rating as designed on the drawings. Normally off output type breaker for emergency luminaires.

e. Two year warranty on electronics, and pro-rata warranty of batteries.

## 2.21 WIRING DEVICES

NEMA WD 1 for wiring devices, and NEMA WD 6 for dimensional requirements of wiring devices.

## 2.22 DISCONNECT SWITCHES

**Heavy-duty, horsepower rated when used as a motor disconnect, lever-operated contacts, spring loaded, NEC standard fuse rejection type holders when used with current limiting fuses. NEMA 1 Type enclosures for indoor installations, and NEMA 4X enclosures for outdoor locations.**

## 2.23 TRANSIENT VOLTAGE SURGE SUPPRESSION (TVSS) UNIT

Transient Voltage Surge Suppression (TVSS) Unit: Unit shall consist of multiple surge current diversion modules, using metal oxide varistors (MOV). All suppression, monitoring and filtering components shall be individually fused to the maximum surge current level. Unit shall be separately enclosed in a NEMA12 enclosure. Unit shall have operation indicator lights, with dry contacts for remote monitoring. Unit shall monitor current status and functionality, under voltage, loss of phase, and loss of power. Follow manufacturer's recommendations for sizing of interconnecting wiring from load size of switchboard main breaker to TVSS unit. Provide UL 1449 and UL 1283 listed for TVSS, with a minimum surge capacity range of 300,000 amperes per phase. Operating voltage range (Vrms) shall be 120 through 600 volts. Operating frequency range, minimum of 48-62 Hz. Response time shall be less than one nanosecond, with +/- 20% sine wave tracking. Guaranteed to withstand a minimum of 1000 sequential category C3 bi-wave impulses. Warranty shall be for a minimum of five years.

## PART 3 EXECUTION

### 3.1 GROUNDING

Grounding shall be in conformance with NFPA 70, the contract drawings, and the following specifications.

#### 3.1.1 Grounding Conductors

A green equipment grounding conductor, sized in accordance with NFPA 70 shall be provided, regardless of the type of conduit. Equipment grounding bars shall be provided in all panelboards. The equipment grounding conductor shall be carried back to the service entrance grounding connection or separately derived grounding connection. All equipment grounding conductors, including metallic raceway systems used as such, shall be bonded or joined together in each wiring box or equipment enclosure. Metallic raceways and grounding conductors shall be checked to assure that they are wired or bonded into a common junction. Metallic boxes and enclosures, if used, shall also be bonded to these grounding conductors by an approved means per NFPA 70. When switches, or other utilization devices are installed, any designated grounding terminal on these devices shall also be bonded to the equipment grounding conductor junction with a short jumper.

### 3.2 WIRING METHODS

Wiring shall conform to NFPA 70, the contract drawings, and the following specifications. Unless otherwise indicated, wiring shall consist of insulated conductors installed in rigid zinc-coated steel conduit, rigid plastic conduit, electrical metallic tubing and intermediate metal conduit. Where cables and wires are installed in cable trays, they shall be of the type permitted by NFPA 70 for use in such applications. Nonmetallic-sheathed cables or metallic-armored cables may be installed in areas permitted by NFPA 70. Wire fill in conduits shall be based on NFPA 70 for the type of conduit and wire insulations specified. Wire fill in conduits located in Class I or II hazardous areas shall be limited to 25 percent of the cross sectional area of the conduit.

### 3.2.1 Conduit and Tubing Systems

Conduit and tubing systems shall be installed as indicated. Conduit sizes shown are based on use of copper conductors with insulation types as described in paragraph WIRING METHODS. Minimum size of raceways shall be 15 mm. Only metal conduits will be permitted when conduits are required for shielding or other special purposes indicated, or when required by conformance to NFPA 70. Nonmetallic conduit and tubing may be used in damp, wet or corrosive locations when permitted by NFPA 70 and the conduit or tubing system is provided with appropriate boxes, covers, clamps, screws or other appropriate type of fittings. Electrical metallic tubing (EMT) may be installed only within buildings. EMT may be installed in concrete and grout in dry locations. EMT installed in concrete or grout shall be provided with concrete tight fittings. EMT shall not be installed in damp or wet locations, or the air space of exterior masonry cavity walls. Bushings, manufactured fittings or boxes providing equivalent means of protection shall be installed on the ends of all conduits and shall be of the insulating type, where required by NFPA 70. Only UL listed adapters shall be used to connect EMT to rigid metal conduit, cast boxes, and conduit bodies. Aluminum conduit may be used only where installed exposed in dry locations. Nonaluminum sleeves shall be used where aluminum conduit passes through concrete floors and firewalls. Penetrations of above grade floor slabs, time-rated partitions and fire walls shall be firestopped in accordance with Section 07840 FIRESTOPPING. Except as otherwise specified, IMC may be used as an option for rigid steel conduit in areas as permitted by NFPA 70. Raceways shall not be installed under the firepits of boilers and furnaces and shall be kept 150 mm away from parallel runs of flues, steam pipes and hot-water pipes. Raceways shall be concealed within finished walls, ceilings, and floors unless otherwise shown. Raceways crossing structural expansion joints or seismic joints shall be provided with suitable expansion fittings or other suitable means to compensate for the building expansion and contraction and to provide for continuity of grounding. Wiring installed in conduits below the finish floor or in the floor slabs shall be suitable for installation in wet locations.

#### 3.2.1.1 Pull Wires

A pull wire shall be inserted in each empty raceway in which wiring is to be installed if the raceway is more than 15 meters in length and contains more than the equivalent of two 90-degree bends, or where the raceway is more than 45 meters in length. The pull wire shall be of No. 14 AWG zinc-coated steel, or of plastic having not less than 1.4 MPa (200 psi) tensile strength. Not less than 254 mm of slack shall be left at each end of the pull wire.

#### 3.2.1.2 Conduit Stub-Ups

Where conduits are to be stubbed up through concrete floors, a short elbow shall be installed below grade to transition from the horizontal run of conduit to a vertical run. A conduit coupling fitting, threaded on the inside shall be installed, to allow terminating the conduit flush with the finished floor. Wiring shall be extended in rigid threaded conduit to equipment, except that where required, flexible conduit may be used 150 mm above the floor. Empty or spare conduit stub-ups shall be plugged flush with the finished floor with a threaded, recessed plug.

#### 3.2.1.3 Below Slab-on-Grade or in the Ground

Electrical wiring below slab-on-grade shall be protected by a conduit

system. Conduit passing vertically through slabs-on-grade shall be rigid steel or IMC. Rigid steel or IMC conduits installed below slab-on-grade or in the earth shall be field wrapped with 0.254 mm thick pipe-wrapping plastic tape applied with a 50 percent overlay, or shall have a factory-applied polyvinyl chloride, plastic resin, or epoxy coating system.

#### 3.2.1.4 Installing in Slabs Including Slabs on Grade

Conduit installed in slabs-on-grade shall be rigid steel or IMC. Conduits shall be installed as close to the middle of concrete slabs as practicable without disturbing the reinforcement. Outside diameter shall not exceed 1/3 of the slab thickness and conduits shall be spaced not closer than 3 diameters on centers except at cabinet locations where the slab thickness shall be increased as approved by the Contracting Officer. Where conduit is run parallel to reinforcing steel, the conduit shall be spaced a minimum of one conduit diameter away but not less than 25.4 mm from the reinforcing steel.

#### 3.2.1.5 Changes in Direction of Runs

Changes in direction of runs shall be made with symmetrical bends or cast-metal fittings. Field-made bends and offsets shall be made with an approved hickey or conduit-bending machine. Crushed or deformed raceways shall not be installed. Trapped raceways in damp and wet locations shall be avoided where possible. Lodgment of plaster, dirt, or trash in raceways, boxes, fittings and equipment shall be prevented during the course of construction. Clogged raceways shall be cleared of obstructions or shall be replaced.

#### 3.2.1.6 Supports

Metallic conduits and tubing, and the support system to which they are attached, shall be securely and rigidly fastened in place to prevent vertical and horizontal movement at intervals of not more than 3 meters and within 900 mm of boxes, cabinets, and fittings, with approved pipe straps, wall brackets, conduit clamps, conduit hangers, threaded C-clamps, beam clamps, or ceiling trapeze. Loads and supports shall be coordinated with supporting structure to prevent damage or deformation to the structure. Loads shall not be applied to joist bridging. Attachment shall be by wood screws or screw-type nails to wood; by toggle bolts on hollow masonry units; by expansion bolts on concrete or brick; by machine screws, welded threaded studs, heat-treated or spring-steel-tension clamps on steel work. Nail-type nylon anchors or threaded studs driven in by a powder charge and provided with lock washers and nuts may be used in lieu of expansion bolts or machine screws. Raceways or pipe straps shall not be welded to steel structures. Cutting the main reinforcing bars in reinforced concrete beams or joists shall be avoided when drilling holes for support anchors. Holes drilled for support anchors, but not used, shall be filled. In partitions of light steel construction, sheet-metal screws may be used. Raceways shall not be supported using wire or nylon ties. Raceways shall be independently supported from the structure. Upper raceways shall not be used as a means of support for lower raceways. Supporting means shall not be shared between electrical raceways and mechanical piping or ducts. Cables and raceways shall not be supported by ceiling grids. Except where permitted by NFPA 70, wiring shall not be supported by ceiling support systems. Conduits shall be fastened to sheet-metal boxes and cabinets with two locknuts where required by NFPA 70, where insulating bushings are used, and where bushings cannot be brought into firm contact with the box; otherwise, a single locknut and bushing may

be used. Threadless fittings for electrical metallic tubing shall be of a type approved for the conditions encountered. Additional support for horizontal runs is not required when EMT rests on steel stud cutouts.

#### 3.2.1.7 Exposed Raceways

Exposed raceways shall be installed parallel or perpendicular to walls, structural members, or intersections of vertical planes and ceilings. Raceways under raised floors and above accessible ceilings shall be considered as exposed installations in accordance with NFPA 70 definitions.

#### 3.2.1.8 Exposed Risers

Exposed risers in wire shafts of multistory buildings shall be supported by U-clamp hangers at each floor level, and at intervals not to exceed 3 meters.

#### **3.2.1.9 DELETE**

#### 3.2.1.10 Communications Raceways

See Section 16710 PREMISES DISTRIBUTION SYSTEM

#### 3.2.2 Cables and Conductors

Installation shall conform to the requirements of NFPA 70. Covered, bare or insulated conductors of circuits rated over 600 volts shall not occupy the same equipment wiring enclosure, cable, or raceway with conductors of circuits rated 600 volts or less.

##### 3.2.2.1 Sizing

Unless otherwise noted, all sizes are based on copper conductors and the insulation types indicated. Sizes shall be not less than indicated. Branch-circuit conductors shall be not smaller than No. 12 AWG. Conductors for branch circuits of 120 volts more than 30 meters long and of 277 volts more than 70 meters long, from panel to load center, shall be no smaller than No. 10 AWG. Class 1 remote control and signal circuit conductors shall be not less than No. 14 AWG. Class 2 remote control and signal circuit conductors shall be not less than No. 16 AWG. Class 3 low-energy, remote-control and signal circuits shall be not less than No. 22 AWG.

##### 3.2.2.2 Use of Aluminum Conductors in Lieu of Copper

Aluminum conductors shall not be used.

##### 3.2.2.3 Cable Systems

Cable systems shall be installed where indicated. Cables shall be installed concealed behind ceiling or wall finish where practicable. Cables shall be threaded through holes bored on the approximate centerline of wood members; notching of surfaces will not be permitted. Sleeves shall be provided through bond beams of masonry-block walls for threading cables through hollow spaces. Exposed cables shall be installed parallel or at right angles to walls or structural members. In rooms or areas not provided with ceiling or wall finish, cables and outlets shall be installed

so that a room finish may be applied in the future without disturbing the cables or resetting the boxes. Exposed nonmetallic-sheathed cables less than 1.2 meters above floors shall be protected from mechanical injury by installation in conduit or tubing.

#### 3.2.2.4 Cable Splicing

Splices shall be made in an accessible location. Crimping tools and dies shall be approved by the connector manufacturer for use with the type of connector and conductor.

- a. Copper Conductors, 600 Volt and Under: Splices in conductors No. 10 AWG and smaller diameter shall be made with an insulated, pressure-type connector. Splices in conductors No. 8 AWG and larger diameter shall be made with a solderless connector and insulated with tape or heat-shrink type insulating material equivalent to the conductor insulation.
- c. Greater Than 600 Volt: Cable splices shall be made in accordance with the cable manufacturer's recommendations and Section 16375 ELECTRICAL DISTRIBUTION SYSTEM, UNDERGROUND.

#### 3.2.2.5 Conductor Identification and Tagging

Power, control, and signal circuit conductor identification shall be provided within each enclosure where a tap, splice, or termination is made.

Where several feeders pass through a common pull box, the feeders shall be tagged to indicate clearly the electrical characteristics, circuit number, and panel designation. Phase conductors of low voltage power circuits shall be identified by color coding. Phase identification by a particular color shall be maintained continuously for the length of a circuit, including junctions.

- a. Color coding shall be provided for service, feeder, branch, and ground conductors. Color shall be green for grounding conductors and white for neutrals; except where neutrals of more than one system are installed in the same raceway or box, other neutral shall be white with colored (not green) stripe. The color coding for 3-phase and single-phase low voltage systems shall be as follows:  
  
120/208-volt, 3-phase: Black(A), red(B), and blue(C).  
277/480-volt, 3-phase: Brown(A), orange(B), and yellow(C).  
120/240-volt, 1-phase: Black and red.
- b. Conductor phase and voltage identification shall be made by color-coded insulation for all conductors smaller than No. 6 AWG. For conductors No. 6 AWG and larger, identification shall be made by color-coded insulation, or conductors with black insulation may be furnished and identified by the use of half-lapped bands of colored electrical tape wrapped around the insulation for a minimum of 75 mm of length near the end, or other method as submitted by the Contractor and approved by the Contracting Officer.
- c. Control and signal circuit conductor identification shall be made by color-coded insulated conductors, plastic-coated self-sticking printed markers, permanently attached stamped metal foil markers, or equivalent means as approved. Control circuit terminals of

equipment shall be properly identified. Terminal and conductor identification shall match that shown on approved detail drawings. Hand lettering or marking is not acceptable.

### 3.3 BOXES AND SUPPORTS

Boxes shall be provided in the wiring or raceway systems where required by NFPA 70 for pulling of wires, making connections, and mounting of devices or fixtures. Pull boxes shall be furnished with screw-fastened covers. Indicated elevations are approximate, except where minimum mounting heights for hazardous areas are required by NFPA 70. Unless otherwise indicated, boxes for wall switches shall be mounted 1.2 meters above finished floors.

Switch and outlet boxes located on opposite sides of fire rated walls shall be separated by a minimum horizontal distance of 600 mm. The total combined area of all box openings in fire rated walls shall not exceed 0.0645 square meters per 9.3 square meters. Maximum box areas for individual boxes in fire rated walls vary with the manufacturer and shall not exceed the maximum specified for that box in UL Elec Const Dir. Only boxes listed in UL Elec Const Dir shall be used in fire rated walls.

#### 3.3.1 Box Applications

Each box shall have not less than the volume required by NFPA 70 for number of conductors enclosed in box.

Boxes for metallic raceways shall be listed for the intended use when located in normally wet locations, when flush or surface mounted on outside of exterior surfaces, or when located in hazardous areas. Boxes installed in wet locations and boxes installed flush with the outside of exterior surfaces shall be gasketed. Boxes for mounting lighting fixtures shall be not less than 102 mm square, or octagonal, except smaller boxes may be installed as required by fixture configuration, as approved. Cast-metal boxes with 2.4 mm wall thickness are acceptable. Boxes in other INTERIOR locations shall be sheet steel. Boxes and enclosures surface mounted on the exterior of buildings shall be type 316 stainless steel with hinted covers. Waterproof type enclosures with gasket. Boxes for use in masonry-block or tile walls shall be square-cornered, tile-type, or standard boxes having square-cornered, tile-type covers.

#### 3.3.2 Brackets and Fasteners

Boxes and supports shall be fastened to wood with wood screws or screw-type nails of equal holding strength, with bolts and metal expansion shields on concrete or brick, with toggle bolts on hollow masonry units, and with machine screw or welded studs on steel work. Threaded studs driven in by powder charge and provided with lockwashers and nuts, or nail-type nylon anchors may be used in lieu of expansion shields, or machine screws. Penetration of more than 38.1 mm (1-1/2 inches) into reinforced-concrete beams or more than 19.1 mm (3/4 inch) into reinforced-concrete joists shall avoid cutting any main reinforcing steel. The use of brackets which depend on gypsum wallboard or plasterboard for primary support will not be permitted. In partitions of light steel construction, bar hangers with 25 mm long studs, mounted between metal wall studs or metal box mounting brackets shall be used to secure boxes to the building structure. When metal box mounting brackets are used, additional box support shall be provided on the side of the box opposite the brackets. This additional box support shall consist of a minimum 300 mm long section of wall stud, bracketed to the opposite side of the box and secured by two screws through the wallboard on each side of the stud. Metal screws may be used in lieu

of the metal box mounting brackets.

### 3.3.3 Mounting in Walls, Ceilings, or Recessed Locations

In walls or ceilings of concrete, tile, or other non-combustible material, boxes shall be installed so that the edge of the box is not recessed more than 6 mm from the finished surface. Boxes mounted in combustible walls or ceiling material shall be mounted flush with the finished surface. The use of gypsum or plasterboard as a means of supporting boxes will not be permitted. Boxes installed for concealed wiring shall be provided with suitable extension rings or plaster covers, as required. The bottom of boxes installed in masonry-block walls for concealed wiring shall be mounted flush with the top of a block to minimize cutting of the blocks, and boxes shall be located horizontally to avoid cutting webs of block. Separate boxes shall be provided for flush or recessed fixtures when required by the fixture terminal operating temperature, and fixtures shall be readily removable for access to the boxes unless ceiling access panels are provided.

### 3.3.4 Installation in Overhead Spaces

In open overhead spaces, cast-metal boxes threaded to raceways need not be separately supported except where used for fixture support; cast-metal boxes having threadless connectors and sheet metal boxes shall be supported directly from the building structure or by bar hangers. Hangers shall not be fastened to or supported from joist bridging. Where bar hangers are used, the bar shall be attached to raceways on opposite sides of the box and the raceway shall be supported with an approved type fastener not more than 600 mm from the box.

## 3.4 DEVICE PLATES

One-piece type device plates shall be provided for all outlets and fittings. Plates on unfinished walls and on fittings shall be of zinc-coated sheet steel, cast-metal, or impact resistant plastic having rounded or beveled edges. Plates on finished walls shall be of satin finish corrosion resistant steel or satin finish chromium plated brass. Screws shall be of metal with countersunk heads, in a color to match the finish of the plate. Plates shall be installed with all four edges in continuous contact with finished wall surfaces without the use of mats or similar devices. Plaster fillings will not be permitted. Plates shall be installed with an alignment tolerance of 1.6 mm. The use of sectional-type device plates will not be permitted. Plates installed in wet locations shall be gasketed and provided with a hinged, gasketed cover, unless otherwise specified.

## 3.5 RECEPTACLES

### 3.5.1 Single and Duplex, 20-ampere, 125 volt

Single and duplex receptacles shall be rated 20 amperes, 125 volts, two-pole, three-wire, grounding type with polarized parallel slots. Bodies shall be of ivory to match color of switch handles in the same room or to harmonize with the color of the respective wall, and supported by mounting strap having plaster ears. Contact arrangement shall be such that contact is made on two sides of an inserted blade. Receptacle shall be side- or back-wired with two screws per terminal. The third grounding pole shall be connected to the metal mounting yoke. Switched receptacles shall be the same as other receptacles specified except that the ungrounded pole of each

suitable receptacle shall be provided with a separate terminal. Only the top receptacle of a duplex receptacle shall be wired for switching application. Receptacles with ground fault circuit interrupters shall have the current rating as indicated, and shall be UL Class A type unless otherwise shown. Ground fault circuit protection shall be provided as required by NFPA 70 and as indicated on the drawings.

### 3.5.2 Clock Outlet

Clock outlet, for use in other than a wired clock system, shall consist of an outlet box, a plaster cover where required, and a single receptacle with clock-outlet plate. The receptacle shall be recessed sufficiently within the box to allow the complete insertion of a standard cap, flush with the plate. A suitable clip or support for hanging the clock shall be secured to the top of the plate. Material and finish of the plate shall be as specified in paragraph DEVICE PLATES.

### 3.5.3 Floor Outlets

Floor outlets shall be provided as indicated on the drawings.

### 3.5.4 Weatherproof Applications

Weatherproof receptacles shall be suitable for the environment, damp or wet as applicable, and the housings shall be labeled to identify the allowable use. Receptacles shall be marked in accordance with UL 514A for the type of use indicated; "Damp locations", "Wet Locations", "Wet Location Only When Cover Closed". Assemblies shall be installed in accordance with the manufacturer's recommendations.

#### 3.5.4.1 Damp Locations

Receptacles in damp locations shall be mounted in an outlet box with a gasketed, weatherproof, cast-metal cover plate (device plate, box cover) and a gasketed cap (hood, receptacle cover) over each receptacle opening. The cap shall be either a screw-on type permanently attached to the cover plate by a short length of bead chain or shall be a flap type attached to the cover with a spring loaded hinge.

#### 3.5.4.2 Wet Locations

Receptacles in wet locations shall be installed in an assembly rated for such use whether the plug is inserted or withdrawn, unless otherwise indicated. In a duplex installation, the receptacle cover shall be configured to shield the connections whether one or both receptacles are in use.

### 3.5.5 Special-Purpose or Heavy-Duty Receptacles

Special-purpose or heavy-duty receptacles shall be of the type and of ratings and number of poles indicated or required for the anticipated purpose. Contact surfaces shall be either round.

## 3.6 WALL SWITCHES

Wall switches shall be of the totally enclosed tumbler type. The wall switch handle and switch plate color shall be ivory. Wiring terminals shall be of the screw type or of the solderless pressure type having suitable conductor-release arrangement. Not more than one switch shall be

installed in a single-gang position. Switches shall be rated 20-ampere 277-volt for use on alternating current only. Pilot lights indicated shall consist of yoke-mounted candelabra-base sockets rated at 75 watts, 125 volts, and fitted with glass or plastic jewels. A clear 6-watt lamp shall be furnished and installed in each pilot switch. Jewels for use with switches controlling motors shall be green, and jewels for other purposes shall be red. Dimming switches shall be solid-state flush mounted, sized for the loads.

### 3.7 PANELBOARDS

Circuit breakers and switches used as a motor disconnecting means shall be capable of being locked in the open position. Door locks shall be keyed alike. Nameplates shall be as approved. Directories shall be typed to indicate loads served by each circuit and mounted in a holder behind a clear protective covering. Busses shall be copper.

Panelboards shall be circuit breaker equipped as indicated on the drawings.

### 3.8 UNDERGROUND SERVICE

Unless otherwise indicated, interior conduit systems shall be stubbed out 1.5 m beyond the building wall and 600 mm below finished grade, for interface with the exterior service lateral conduits and exterior communications conduits. Outside conduit ends shall be bushed when used for direct burial service lateral conductors. Outside conduit ends shall be capped or plugged until connected to exterior conduit systems. Underground service lateral conductors will be extended to building service entrance and terminated in accordance with the requirements of Section 16375 ELECTRICAL DISTRIBUTION SYSTEM, UNDERGROUND and NFPA 70.

### 3.9 MOTOR CONTROL

Motor controllers shall be provided as indicated on the drawings. Each motor or group of motors requiring a single control shall be provided under other sections of these specifications with a suitable controller and devices that will perform the functions as specified for the respective motors. Each motor of 93 W (1/8 hp) or larger shall be provided with thermal-overload protection. Polyphase motors shall have overload protection in each ungrounded conductor. The overload-protection device shall be provided either integral with the motor or controller, or shall be mounted in a separate enclosure. Unless otherwise specified, the protective device shall be of the manually reset type. Single or double pole tumbler switches specifically designed for alternating-current operation only may be used as manual controllers for single-phase motors having a current rating not in excess of 80 percent of the switch rating. Automatic control devices such as thermostats, float or pressure switches may control the starting and stopping of motors directly, provided the devices used are designed for that purpose and have an adequate kilowatt rating. When the automatic-control device does not have such a rating, a magnetic starter shall be used, with the automatic-control device actuating the pilot-control circuit. When combination manual and automatic control is specified and the automatic-control device operates the motor directly, a double-throw, three-position tumbler or rotary switch shall be provided for the manual control; when the automatic-control device actuates the pilot control circuit of a magnetic starter, the latter shall be provided with a three-position selector switch marked MANUAL-OFF-AUTOMATIC. Connections to the selector switch shall be such that only the normal automatic regulatory control devices will be bypassed when the switch is in

the Manual position; all safety control devices, such as low- or high-pressure cutouts, high-temperature cutouts, and motor-overload protective devices, shall be connected in the motor-control circuit in both the Manual and the Automatic positions of the selector switch. Control circuit connections to any MANUAL-OFF-AUTOMATIC switch or to more than one automatic regulatory control device shall be made in accordance with wiring diagram approved by the Contracting Officer unless such diagram is included on the drawings. All controls shall be 120 volts or less unless otherwise indicated.

#### 3.9.1 Contacts

Unless otherwise indicated, contacts in miscellaneous control devices such as float switches, pressure switches, and auxiliary relays shall have current and voltage ratings in accordance with NEMA ICS 2 for rating designation B300.

#### 3.10 MOTOR-DISCONNECT MEANS

Each motor shall be provided with a disconnecting means when required by NFPA 70 even though not indicated. For single-phase motors, a single or double pole toggle switch, rated only for alternating current, will be acceptable for capacities less than 30 amperes, provided the ampere rating of the switch is at least 125 percent of the motor rating. Switches shall disconnect all ungrounded conductors.

#### 3.11 TRANSFORMER INSTALLATION

Three-phase transformers shall be connected only in a delta-wye or wye-delta configuration as indicated except isolation transformers having a one-to-one turns ratio. "T" connections may be used for transformers rated at 15 kVA or below. Dry-type transformers shown located within 1.5 meters of the exterior wall shall be provided in a weatherproof enclosure. Transformers to be located within the building building and vault may be provided in the manufacturer's standard, ventilated indoor enclosure designed for use in 40 degrees C ambient temperature, unless otherwise indicated.

#### 3.12 LIGHTING FIXTURES, LAMPS AND BALLASTS

This paragraph shall cover the installation of lamps, lighting fixtures and ballasts in interior or building mounted applications.

##### 3.12.1 Lamps

Lamps of the type, wattage, and voltage rating indicated shall be delivered to the project in the original cartons and installed just prior to project completion. Lamps installed and used for working light during construction shall be replaced prior to turnover to the Government if more than 15% of their rated life has been used. Lamps shall be tested for proper operation prior to turn-over and shall be replaced if necessary with new lamps from the original manufacturer. 10% spare lamps of each type, from the original manufacturer, shall be provided.

##### 3.12.2 Lighting Fixtures

Fixtures shall be as shown and shall conform to the following specifications and shall be as detailed on the drawings. Illustrations shown on the drawings are indicative of the general type desired and are

not intended to restrict selection to fixtures of any particular manufacturer. Fixtures of similar designs and equivalent energy efficiency, light distribution and brightness characteristics, and of equal finish and quality will be acceptable if approved. In suspended acoustical ceilings with fluorescent fixtures, the fluorescent emergency light fixtures shall be furnished with self-contained battery packs.

#### 3.12.2.1 Accessories

Accessories such as straps, mounting plates, nipples, or brackets shall be provided for proper installation.

#### 3.12.2.2 Ceiling Fixtures

Ceiling fixtures shall be coordinated with and suitable for installation in, on or from the ceiling as shown. Installation and support of fixtures shall be in accordance with NFPA 70 and manufacturer's recommendations. Where seismic requirements are specified herein, fixtures shall be supported as shown or specified. Recessed fixtures shall have adjustable fittings to permit alignment with ceiling panels. Recessed fixtures installed in fire-resistive ceiling construction shall have the same fire rating as the ceiling or shall be provided with fireproofing boxes having materials of the same fire rating as the ceiling, in conformance with UL Elec Const Dir. Surface-mounted fixtures shall be suitable for fastening to the ceiling panel structural supports.

#### 3.12.2.3 Fixtures for Installation in Grid Type Ceilings

Fixtures for installation in grid type ceilings which are smaller than a full tile shall be centered in the tile. 305 by 1219 mm fixtures shall be mounted along the grid rail as shown. Work above the ceiling shall be coordinated among the trades to provide the lighting layout shown. Fixtures mounted to the grid shall have trim exactly compatible with the grid. Contractor shall coordinate trims with ceiling trades prior to ordering fixtures. Metric fixtures shall be designed to fit the metric grid specified. Fixtures in continuous rows shall be coordinated between trades prior to ordering. Fixtures shall be mounted using independent supports capable of supporting the entire weight of the fixture. No fixture shall rest solely on the ceiling grid. Recessed fixtures installed in seismic areas should be installed utilizing specially designed seismic clips. Junction boxes shall be supported at four points.

#### 3.12.2.4 Suspended Fixtures

Suspended fixtures shall be provided with swivel hangers or hand-straightens so that they hang plumb. Pendants, rods, or chains 1.2 meters or longer excluding fixture shall be braced to prevent swaying using three cables at 120 degrees of separation. Suspended fixtures in continuous rows shall have internal wireway systems for end to end wiring and shall be properly aligned to provide a straight and continuous row without bends, gaps, light leaks or filler pieces. Aligning splines shall be used on extruded aluminum fixtures to assure hairline joints. Steel fixtures shall be supported to prevent "oil-canning" effects. Fixture finishes shall be free of scratches, nicks, dents, and warps, and shall match the color and gloss specified. Pendants shall be finished to match fixtures. Aircraft cable shall be stainless steel. Canopies shall be finished to match the ceiling and shall be low profile unless otherwise shown. Maximum distance between suspension points shall be 3.1 meters or as recommended by the manufacturer, whichever is less.

Suspended fixtures installed in seismic areas shall have 45% swivel hangers and shall be located with no obstructions within the 45% range in all directions. The stem, canopy and fixture shall be capable of 45% swing.

### 3.12.3 Ballasts

Remote type ballasts or transformers, where indicated, shall be mounted in a well ventilated, easily accessible location, within the maximum operating distance from the lamp as designated by the manufacturer.

### 3.12.4 Emergency Light Sets

Emergency light sets shall conform to UL 924 with the number of heads as indicated. Sets shall be permanently connected to the wiring system by conductors installed in short lengths of flexible conduit.

### 3.13 BATTERY CHARGERS

Battery chargers shall be installed in conformance with NFPA 70.

### 3.14 EQUIPMENT CONNECTIONS

Wiring not furnished and installed under other sections of the specifications for the connection of electrical equipment as indicated on the drawings shall be furnished and installed under this section of the specifications. Connections shall comply with the applicable requirements of paragraph WIRING METHODS. Flexible conduits 2 m or less in length shall be provided to all electrical equipment subject to periodic removal, vibration, or movement and for all motors. All motors shall be provided with separate grounding conductors. Liquid-tight conduits shall be used in damp or wet locations.

#### 3.14.1 Motors and Motor Control

Motors and motor controls shall be installed in accordance with NFPA 70, the manufacturer's recommendations, and as indicated. Wiring shall be extended to motors, motor controls, and motor control centers and terminated.

#### 3.14.2 Installation of Government-Furnished Equipment

Wiring shall be extended to the equipment and terminated.

### 3.15 CIRCUIT PROTECTIVE DEVICES

The Contractor shall calibrate, adjust, set and test each new adjustable circuit protective device to ensure that they will function properly prior to the initial energization of the new power system under actual operating conditions.

### 3.16 PAINTING AND FINISHING

Field-applied paint on exposed surfaces shall be provided under Section 09900 PAINTING, GENERAL.

### 3.17 REPAIR OF EXISTING WORK

The work shall be carefully laid out in advance, and where cutting,

channeling, chasing, or drilling of floors, walls, partitions, ceiling, or other surfaces is necessary for the proper installation, support, or anchorage of the conduit, raceways, or other electrical work, this work shall be carefully done, and any damage to building, piping, or equipment shall be repaired by skilled mechanics of the trades involved at no additional cost to the Government.

### 3.18 FIELD TESTING

Field testing shall be performed in the presence of the Contracting Officer. The Contractor shall notify the Contracting Officer 10 days prior to conducting tests. The Contractor shall furnish all materials, labor, and equipment necessary to conduct field tests. The Contractor shall perform all tests and inspection recommended by the manufacturer unless specifically waived by the Contracting Officer. The Contractor shall maintain a written record of all tests which includes date, test performed, personnel involved, devices tested, serial number and name of test equipment, and test results. All field test reports will be signed and dated by the Contractor.

#### 3.18.1 Safety

The Contractor shall provide and use safety devices such as rubber gloves, protective barriers, and danger signs to protect and warn personnel in the test vicinity. The Contractor shall replace any devices or equipment which are damaged due to improper test procedures or handling.

#### 3.18.2 Ground-Resistance Tests

The resistance of each grounding electrode or each grounding electrode system shall be measured using the fall-of-potential method defined in IEEE Std 81. Soil resistivity in the area of the grid shall be measured concurrently with the grid measurements. Ground resistance measurements shall be made before the electrical distribution system is energized and shall be made in normally dry conditions not less than 48 hours after the last rainfall. Resistance measurements of separate grounding electrode systems shall be made before the systems are bonded together below grade. The combined resistance of separate systems may be used to meet the required resistance, but the specified number of electrodes must still be provided.

- a. Single rod electrode - 25 ohms

#### 3.18.3 Cable Tests

The Contractor shall be responsible for identifying all equipment and devices that could be damaged by application of the test voltage and ensuring that they have been properly disconnected prior to performing insulation resistance testing. An insulation resistance test shall be performed on all low and medium voltage cables after the cables are installed in their final configuration and prior to energization. The test voltage shall be 500 volts DC applied for one minute between each conductor and ground and between all possible combinations of conductors. The minimum value of resistance shall be:

$$R \text{ in megohms} = (\text{rated voltage in kV} + 1) \times 304.8 / (\text{length of cable in meters})$$

Each cable failing this test shall be repaired or replaced. The repaired

cable system shall then be retested until failures have been eliminated.

#### 3.18.3.1 Medium Voltage Cable Tests

- a. Continuity test.
- b. Insulation resistance test.
- c. DC high-potential test.

#### 3.18.3.2 Low Voltage Cable Tests

- a. Continuity test.
- b. Insulation resistance test.

#### 3.18.4 Metal Enclosed Bus Duct Tests

- a. Insulation Resistance phase-to-phase, all combinations.
- b. Insulation resistance phase-to-ground, each phase.
- c. AC or DC high-potential test.
- d. Phase rotation test.

#### 3.18.5 Motor Tests

- a. Phase rotation test to ensure proper directions.
- b. Operation and sequence of reduced voltage starters.
- c. High potential test on each winding to ground.
- d. Insulation resistance of each winding to ground.
- e. Vibration test.
- f. Dielectric absorption test on motor and starter.

#### 3.18.6 Dry-Type Transformer Tests

The following field tests shall be performed on all dry-type transformers 30 kVA and above.

- a. Insulation resistance test phase-to-ground, each phase.
- b. Turns ratio test.

#### 3.18.7 Circuit Breaker Tests

The following field tests shall be performed on circuit breakers.

##### 3.18.7.1 Circuit Breakers, Molded Case

- a. Insulation resistance test phase-to-phase, all combinations.
- b. Insulation resistance test phase-to-ground, each phase.

- c. Closed breaker contact resistance test.
- d. Manual operation of the breaker.

#### 3.18.8 Protective Relays

Protective relays shall be visually and mechanically inspected, adjusted, tested, and calibrated in accordance with the manufacturer's published instructions. These tests shall include pick-up, timing, contact action, restraint, and other aspects necessary to insure proper calibration and operation. Relay settings shall be implemented in accordance with the coordination study. Relay contacts shall be manually or electrically operated to verify that the proper breakers and alarms initiate. Relaying current transformers shall be field tested in accordance with IEEE C57.13.

#### 3.19 OPERATING TESTS

After the installation is completed, and at such time as the Contracting Officer may direct, the Contractor shall conduct operating tests for approval. The equipment shall be demonstrated to operate in accordance with the specified requirements. An operating test report shall be submitted in accordance with paragraph FIELD TEST REPORTS.

#### 3.20 ACCEPTANCE

Final acceptance of the facility will not be given until the Contractor has successfully completed all tests and after all defects in installation, material or operation have been corrected.

-- End of Section --

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## SECTION 16710

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## SECTION 16710

## PREMISES DISTRIBUTION SYSTEM

## PART 1 GENERAL

## 1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

## ELECTRONIC INDUSTRIES ALLIANCE (EIA)

ANSI/TIA/EIA-568-A	(1995) Commercial Building Telecommunications Cabling Standard
ANSI/TIA/EIA-568-A-5	(2000) Transmission Performance Specifications for 4-pair 100 ohm Category 5E Cabling
ANSI/TIA/EIA-569-A	(1998) Commercial Building Standard for Telecommunications Pathways and Spaces
ANSI/TIA/EIA-606	(1993) Administration Standard for the Telecommunications Infrastructure of Commercial Buildings
ANSI/TIA/EIA-607	(1994) Commercial Building Grounding and Bonding Requirements for Telecommunications
TIA/EIA TSB 67	(1995) Transmission Performance Specifications for Field Testing of Unshielded Twisted-Pair Cabling Systems

## INSULATED CABLE ENGINEERS ASSOCIATION (ICEA)

ICEA S-80-576	(1994) Communications Wire and Cable for Wiring of Premises
ICEA S-83-596	(1994) Fiber Optic Premises Distribution Cable

## NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70	(1999) National Electrical Code
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## UNDERWRITERS LABORATORIES (UL)

UL 50	(1995; Rev thru Nov 1999) Enclosures for Electrical Equipment
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## 1.2 SYSTEM DESCRIPTION

The premises distribution system shall consist of inside-plant horizontal, riser, and backbone cables and connecting hardware to transport telephone and data (including LAN) signals between equipment items in a building.

### 1.3 ENVIRONMENTAL REQUIREMENTS

Connecting hardware shall be rated for operation under ambient conditions of 0 to 60 degrees C and in the range of 0 to 95 percent relative humidity, noncondensing.

### 1.4 QUALIFICATIONS

#### 1.4.1 Minimum Contractor Qualifications

All work under this section shall be performed by and all equipment shall be furnished and installed by a certified Telecommunications Contractor, hereafter referred to as the Contractor. The Contractor shall have the following qualifications in Telecommunications Systems installation:

- a. Contractor shall have a minimum of 3 years experience in the application, installation and testing of the specified systems and equipment.
- b. All supervisors and installers assigned to the installation of this system or any of its components shall have factory certification from each equipment manufacturer that they are qualified to install and test the provided products.
- c. All installers assigned to the installation of this system or any of its components shall have a minimum of 3 years experience in the installation of the specified copper and fiber optic cable and components.

#### 1.4.2 Minimum Manufacturer Qualifications

The equipment and hardware provided under this contract will be from manufacturers that have a minimum of 5 years experience in producing the types of systems and equipment specified.

### 1.5 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

#### SD-02 Shop Drawings

Premises Distribution System; G, RE.

Detail drawings including a complete list of equipment and material. Detail drawings shall contain complete wiring and schematic diagrams and other details required to demonstrate that the system has been coordinated and will function properly as a system. Drawings shall include vertical riser diagrams, equipment rack details, elevation drawings of telecommunications closet walls, outlet face plate details for all outlet configurations, sizes and types of all cables, conduits, and cable trays.

Drawings shall show proposed layout and anchorage of equipment and appurtenances, and equipment relationship to other parts of the work including clearance for maintenance and operation.

Record Drawings; G, RE.

#### 1.5.1 Installed Wiring system Infrastructure

Record drawings for the installed wiring system infrastructure per ANSI/TIA/EIA-606. The drawings shall show the location of all cable terminations and location and routing of all backbone and horizontal cables. The identifier for each termination and cable shall appear on the drawings.

##### SD-03 Product Data

Record Keeping and Documentation; G, RE.

Documentation on cables and termination hardware in accordance with ANSI/TIA/EIA-606.

Manufacturer's Recommendations; G, RE.

Where installation procedures, or any part thereof, are required to be in accordance with the recommendations of the manufacturer of the material being installed, printed copies of these recommendations, prior to installation shall be provided. Installation of the item will not be allowed to proceed until the recommendations are received and approved.

Qualifications; G, RE.

The qualifications of the Manufacturer, Contractor, and the Installer to perform the work specified herein. This shall include proof of the minimum qualifications specified herein.

Test Plan; G, RE.

Spare Parts

#### 1.5.2 Test plan Defining the Tests Required

Test plan defining the tests required to ensure that the system meets technical, operational and performance specifications, 60 days prior to the proposed test date. The test plan must be approved before the start of any testing. The test plan shall identify the capabilities and functions to be tested, and include detailed instructions for the setup and execution of each test and procedures for evaluation and documentation of the results.

#### 1.5.3 Spare Parts

Lists of spare parts, tools, and test equipment for each different item of material and equipment specified, after approval of detail drawings, not later than 2 months prior to the date of beneficial occupancy. The data shall include a complete list of parts and supplies, with current unit prices and source of supply, and a list of spare parts recommended for stocking.

SD-06 Test Reports

## Test Reports.

### 1.5.4 Test Reports

Test reports in booklet form with witness signatures verifying execution of tests. Test results will also be provided on 89 mm diskettes in ASCII format. Reports shall show the field tests performed to verify compliance with the specified performance criteria. Test reports shall include record of the physical parameters verified during testing. Test reports shall be submitted within 14 days after completion of testing.

#### SD-07 Certificates

##### Premises Distribution System.

Written certification that the premises distribution system complies with the ANSI/TIA/EIA-568-A, ANSI/TIA/EIA-569-A, and ANSI/TIA/EIA-606 standards.

##### Materials and Equipment.

Where materials or equipment are specified to conform, be constructed or tested to meet specific requirements, certification that the items provided conform to such requirements. Certification by a nationally recognized testing laboratory that a representative sample has been tested to meet the requirements, or a published catalog specification statement to the effect that the item meets the referenced standard, will be acceptable as evidence that the item conforms. Compliance with these requirements does not relieve the Contractor from compliance with other requirements of the specifications.

##### Installers; G, RE.

The Contractor shall submit certification that all the installers are factory certified to install and test the provided products.

### 1.6 DELIVERY AND STORAGE

Equipment delivered and placed in storage shall be stored with protection from the weather, humidity and temperature variation, dirt and dust or other contaminants.

### 1.7 OPERATION AND MAINTENANCE MANUALS

Commercial off the shelf manuals shall be furnished for operation, installation, configuration, and maintenance for all products provided as a part of the premises distribution system. Specification sheets for all cable, connectors, and other equipment shall be provided.

### 1.8 RECORD KEEPING AND DOCUMENTATION

#### 1.8.1 Cables

A record of all installed cable shall be provided in hard copy format per ANSI/TIA/EIA-606. The cable record shall include the required data fields for each cable and complete end-to-end circuit report for each complete circuit from the assigned outlet to the entry facility per ANSI/TIA/EIA-606.

### 1.8.2 Termination Hardware

A record of all installed patch panels and outlets shall be provided in hard copy format per ANSI/TIA/EIA-606. The hardware records shall include only the required data fields per ANSI/TIA/EIA-606.

## PART 2 PRODUCTS

### 2.1 MATERIALS AND EQUIPMENT

Materials and equipment shall be the standard products of a manufacturer regularly engaged in the manufacture of the products and shall be the manufacturer's latest standard design that has been in satisfactory use for at least 1 year prior to installation. Materials and equipment shall conform to the respective publications and other requirements specified below and to the applicable requirements of NFPA 70.

### 2.2 UNSHIELDED TWISTED PAIR CABLE SYSTEM

#### 2.2.1 Backbone Cable

Backbone cable shall meet the requirements of ICEA S-80-576 and ANSI/TIA/EIA-568-A for Category 5 100-ohm unshielded twisted pair cable. Cable shall be label-verified. Cable jacket shall be factory marked at regular intervals indicating verifying organization and performance level. Conductors shall be solid untinned copper 22 AWG. Cable shall be rated CMP per NFPA 70.

#### 2.2.2 Horizontal Cable

Horizontal cable shall meet the requirements of ANSI/TIA/EIA-568-A-5 for Category 5e. Cable shall be label-verified. Cable jacket shall be factory marked at regular intervals indicating verifying organization and performance level. Cable shall be rated CMP CMG or CMP, as appropriate, per NFPA 70.

#### 2.2.3 Connecting Hardware

Connecting and cross-connecting hardware shall be the same category as the cable it serves. Hardware shall be in accordance with ANSI/TIA/EIA-568-A.

##### 2.2.3.1 Telecommunications Outlets

Wall and desk outlet plates shall come equipped with two modular jacks, with the top or left jack labeled "voice" and the bottom or right jack labeled "data" and two fiber optic SC type connectors with the top or left connector labeled A and the bottom or right connector labeled B. Modular jacks shall be the same category as the cable they terminate and shall meet the requirements of ANSI/TIA/EIA-568-A. Modular jack pin/pair configuration shall be T568A per ANSI/TIA/EIA-568-A. Modular jacks shall be keyed. Faceplates shall be provided and shall be ivory in color, impact resistant plastic. Mounting plates shall be provided for system furniture and shall match the system furniture in color. Outlet assemblies used in the premises distribution system shall consist of modular jacks assembled into both simplex and duplex outlet assemblies in single or double gang covers as specified in this section. The modular jacks shall conform to the requirements of ANSI/TIA/EIA-568-A, and shall be rated for use with

Category 5e cable in accordance with ANSI/TIA/EIA-568-A-5 and shall meet the Link Test parameters as listed in TIA/EIA TSB 67 and supplemented by ANSI/TIA/EIA-568-A-5.

#### 2.2.3.2 Patch Panels

Patch panels shall consist of eight-position modular jacks, with rear mounted type 110 insulation displacement connectors, arranged in rows or columns on wall mounted panels. Jack pin/pair configuration shall be T568A per ANSI/TIA/EIA-568-A. Jacks shall be keyed. Panels shall be labeled with alphanumeric x-y coordinates. The modular jacks shall conform to the requirements of ANSI/TIA/EIA-568-A, and shall be rated for use with Category 5e cable in accordance with ANSI/TIA/EIA-568-A-5 and shall meet the Link Test parameters as listed in TIA/EIA TSB 67 and supplemented by ANSI/TIA/EIA-568-A-5.

#### 2.2.3.3 Patch Cords

Patch cords shall be cable assemblies consisting of flexible, twisted pair stranded wire with eight-position plugs at each end. Cable shall be label-verified. Cable jacket shall be factory marked at regular intervals indicating verifying organization and performance level. Patch cords shall be wired straight through; pin numbers shall be identical at each end and shall be paired to match T568A patch panel jack wiring per ANSI/TIA/EIA-568-A. Patch cords shall be keyed. Patch cords shall be factory assembled. Patch cords shall conform to the requirements of ANSI/TIA/EIA-568-A-5 for Category 5e.

#### 2.2.3.4 Terminal Blocks

Terminal blocks shall be wall mounted rack mounted wire termination units consisting of insulation displacement connectors mounted in plastic blocks, frames or housings. Blocks shall be type 110 66 which meet the requirements of ANSI/TIA/EIA-568-A, and shall be rated for use with Category 5e cable in accordance with ANSI/TIA/EIA-568-A-5 and shall meet the Link Test parameters as listed in TIA/EIA TSB 67 and supplemented by ANSI/TIA/EIA-568-A-5. Blocks shall be mounted on standoffs and shall include cable management hardware. Insulation displacement connectors shall terminate 22 or 24 gauge solid copper wire as a minimum, and shall be connected in pairs so that horizontal cable and connected jumper wires are on separate connected terminals.

### 2.3 FIBER OPTIC CABLE SYSTEM

#### 2.3.1 Backbone Cable

##### 2.3.1.1 Multimode

Multimode fiber optic backbone cable shall meet the requirements of ANSI/TIA/EIA-568-A and ICEA S-83-596 for 62.5/125 micrometer multimode graded index optical fiber cable. Numerical aperture for each fiber shall be a minimum of 0.275. Cable construction shall be tight buffered type. Individual fibers shall be color coded for identification. Cable shall be imprinted with fiber count and aggregate length at regular intervals. Cable shall be rated OFNP per NFPA 70.

#### 2.3.2 Horizontal Distribution Cable

##### 2.3.2.1 Multimode

Multimode fiber optic horizontal cable shall meet the requirements of ANSI/TIA/EIA-568-A and ICEA S-83-596 for 62.5/125 micrometer multimode graded index optical fiber cable. Numerical aperture for each fiber shall be a minimum of 0.275. Cable construction shall be tight buffered type, two strands. Individual fibers shall be color coded for identification. **Cable shall be imprinted with fiber count, fiber type, and aggregate length at regular intervals of 0.611 m.** Cable shall be rated and marked OFNP OFNG per NFPA 70.

### 2.3.3 Connecting Hardware

#### 2.3.3.1 Connectors

Connectors shall be SC type with ceramic ferrule material with a maximum insertion loss of .5 dB. Connectors shall meet performance requirements of ANSI/TIA/EIA-568-A. Connectors shall be field installable. Connectors shall utilize adhesive for fiber attachment to ferrule. Connectors shall terminate fiber sizes as required for the service. Station cable faceplates shall be provided and shall be ivory in color, impact resistant plastic, double gang, with double-sided female SC coupler. Mounting plates shall be provided for system furniture and shall match the furniture system in color.

#### 2.3.3.2 Patch Panels

Patch panels shall be a complete system of components by a single manufacturer, and shall provide termination, splice storage, routing, radius limiting, cable fastening, storage, and cross-connection. Patch panels shall be wall mounted panels. Patch panels shall provide strain relief for cables. Panels shall be labeled with alphanumeric x-y coordinates. Patch panel connectors and couplers shall be the same type and configuration as used elsewhere in the system.

#### 2.3.3.3 Patch Cords

Patch cords shall be cable assemblies consisting of flexible optical fiber cable with connectors of the same type as used elsewhere in the system. Optical fiber shall be the same type as used elsewhere in the system. Patch cords shall be complete assemblies from manufacturer's standard product lines.

## 2.4 EQUIPMENT RACKS

### 2.4.1 Wall Mounted Open Frame

Wall mounted open frame equipment racks shall be aluminum relay racks to mount equipment 580 mm (23 inches) wide with standoff brackets for wall mounting. Uprights shall be drilled and tapped 12-24 in a 13 mm pattern. Standoff brackets shall be of sufficient length for a 150mm clearance between rack and wall. Wall mounted open frame racks shall be hinged. AC outlets shall be provided as shown.

### 2.4.2 Cable Guides

Cable guides shall be specifically manufactured for the purpose of routing cables, wires and patch cords horizontally and vertically on 580 mm (23 inch) equipment racks. Cable guides shall consist of ring or bracket-like devices mounted on rack panels for horizontal use or individually mounted

for vertical use. Cable guides shall mount to racks by screws and/or nuts and lockwashers.

#### 2.4.3 Wall Mounted Cabinets

Wall mounted cabinets shall conform to UL 50 and have boxes constructed of zinc-coated sheet steel with dimensions not less than shown on drawings. Trim shall be fitted with hinged door and flush catch. Doors shall provide maximum openings to the box interiors. Boxes shall be provided with 19 mm plywood backboard painted white or a light color. A duplex AC outlet shall be installed within the cabinet.

#### 2.5 EQUIPMENT MOUNTING BACKBOARD

Plywood backboards shall be provided, sized as shown, painted with white or light colored paint.

#### 2.6 TELECOMMUNICATIONS OUTLET BOXES

Electrical boxes for telecommunication outlets shall be 117 mm square by 53 mm deep with minimum 9 mm deep single or two gang plaster ring as shown. Provide a minimum 25 mm conduit.

### PART 3 EXECUTION

#### 3.1 INSTALLATION

System components and appurtenances shall be installed in accordance with NFPA 70, manufacturer's instructions and as shown. Necessary interconnections, services, and adjustments required for a complete and operable signal distribution system shall be provided. Components shall be labeled in accordance with ANSI/TIA/EIA-606. Penetrations in fire-rated construction shall be firestopped in accordance with Section 07840 FIRESTOPPING. Conduits, outlets and raceways shall be installed in accordance with Section 16415 ELECTRICAL WORK, INTERIOR. Wiring shall be installed in accordance with ANSI/TIA/EIA-568-A and as specified in Section 16415 ELECTRICAL WORK, INTERIOR. Wiring, and terminal blocks and outlets shall be marked in accordance with ANSI/TIA/EIA-606. Cables shall not be installed in the same cable tray, utility pole compartment, or floor trench compartment with ac power cables. Cables not installed in conduit or wireways shall be properly secured and neat in appearance and, if installed in plenums or other spaces used for environmental air, shall comply with NFPA 70 requirements for this type of installation.

##### 3.1.1 Horizontal Distribution Cable

The rated cable pulling tension shall not be exceeded. Cable shall not be stressed such that twisting, stretching or kinking occurs. Cable shall not be spliced. Telecommunications cables shall be installed in conduit. Cables shall be terminated; no cable shall contain unterminated elements. Minimum bending radius shall not be exceeded during installation or once installed. Cable ties shall not be excessively tightened such that the transmission characteristics of the cable are altered.

##### 3.1.2 Riser and Backbone Cable

Vertical cable support intervals shall be in accordance with manufacturer's recommendations. Cable bend radius shall not be less than ten times the outside diameter of the cable during installation and once installed.

Maximum tensile strength rating of the cable shall not be exceeded. Cable shall not be spliced.

### 3.1.3 Telecommunications Outlets

#### 3.1.3.1 Faceplates

As a minimum each jack shall be labeled as to its function and a unique number to identify cable link.

#### 3.1.3.2 Cables

Unshielded twisted pair and fiber optic cables shall have a minimum of 150 mm of slack cable loosely coiled into the telecommunications outlet boxes. Minimum manufacturers bend radius for each type of cable shall not be exceeded.

#### 3.1.3.3 Pull Cords

Pull cords shall be installed in all conduit serving telecommunications outlets which do not initially have fiber optic cable installed.

#### 3.1.4 Terminal Blocks

Terminal blocks shall be mounted in orderly rows and columns. Adequate vertical and horizontal wire routing areas shall be provided between groups of blocks. Industry standard wire routing guides shall be utilized.

#### 3.1.5 Unshielded Twisted Pair Patch Panels

Patch panels shall be mounted in equipment racks with sufficient modular jacks to accommodate the installed cable plant plus 10 percent spares. Cable guides shall be provided above, below and between each panel.

#### 3.1.6 Fiber Optic Patch Panels

Patch panels shall be mounted in equipment racks with sufficient ports to accommodate the installed cable plant plus 10 percent spares. A slack loop of fiber shall be provided within each panel. Loop shall be provided as recommended by the manufacturer. The outer jacket of each cable entering a patch panel shall be secured to the panel to prevent movement of the fibers within the panel, using clamps or brackets specifically manufactured for that purpose.

#### 3.1.7 Equipment Racks

Wall mounted racks shall be secured to the mounting surface to prevent fully loaded racks from separating from the mounting surface.

#### 3.1.8 Rack Mounted Equipment

Equipment to be rack mounted shall be securely fastened to racks by means of the manufacturer's recommended fasteners.

### 3.2 TERMINATION

Cables and conductors shall sweep into termination areas; cables and conductors shall not bend at right angles. Manufacturer's minimum bending radius shall not be exceeded. When there are multiple system type drops to

individual workstations, relative position for each system shall be maintained on each system termination block or patch panel.

### 3.2.1 Unshielded Twisted Pair Cable

Each pair shall be terminated on appropriate outlets, terminal blocks or patch panels. No cable shall be unterminated or contain unterminated elements. Pairs shall remain twisted together to within the proper distance from the termination as specified in ANSI/TIA/EIA-568-A. Conductors shall not be damaged when removing insulation. Wire insulation shall not be damaged when removing outer jacket.

### 3.2.2 Fiber Optic Cable

Each fiber shall have connectors installed. The pull strength between the connector and the attached fiber shall be not less than 11.3 kg. The mated pair loss, without rotational optimization, shall not exceed 1.0 dB. Fiber optic connectors shall be installed per ANSI/TIA/EIA-568-A.

## 3.3 GROUNDING

Signal distribution system ground shall be installed in the telecommunications entrance facility and in each telecommunications closet in accordance with ANSI/TIA/EIA-607 and Section 16415 ELECTRICAL WORK, INTERIOR. Equipment racks shall be connected to the electrical safety ground.

## 3.4 ADDITIONAL MATERIALS

The Contractor shall provide the following additional materials required for facility startup.

- a. 10 of each type outlet.
- b. 10 of each type cover plate.
- c. 1 of each type terminal block for each telecommunications closet.
- d. 4 Patch cords of 3 m for each telecommunications closet.
- e. 1 Set of any and all special tools required to establish a cross connect and to change and/or maintain a terminal block.

## 3.5 ADMINISTRATION AND LABELING

### 3.5.1 Labeling

#### 3.5.1.1 Labels

All labels shall be in accordance with ANSI/TIA/EIA-606.

#### 3.5.1.2 Cable

All cables will be labeled using color labels on both ends with encoded unencoded identifiers per ANSI/TIA/EIA-606.

#### 3.5.1.3 Termination Hardware

All workstation outlets and patch panel connections will be labeled using

color coded labels with unencoded identifiers per ANSI/TIA/EIA-606.

### 3.6 TESTING

Materials and documentation to be furnished under this specification are subject to inspections and tests. All components shall be terminated prior to testing. Equipment and systems will not be accepted until the required inspections and tests have been made, demonstrating that the signal distribution system conforms to the specified requirements, and that the required equipment, systems, and documentation have been provided.

#### 3.6.1 Unshielded Twisted Pair Tests

All metallic cable pairs shall be tested for proper identification and continuity. All opens, shorts, crosses, grounds, and reversals shall be corrected. Correct color coding and termination of each pair shall be verified in the communications closet and at the outlet. Horizontal wiring shall be tested from and including the termination device in the communications closet to and including the modular jack in each room. Backbone wiring shall be tested end-to-end, including termination devices, from terminal block to terminal block, in the respective communications closets. These test shall be completed and all errors corrected before any other tests are started.

#### 3.6.2 Category 5e Circuits

All category 5e circuits shall be tested using a test set that meets the Class II accuracy requirements of TIA/EIA TSB 67 standard, including the additional tests and test set accuracy requirements of ANSI/TIA/EIA-568-A-5. Testing shall use the Basic Link Test procedure of TIA/EIA TSB 67, as supplemented by ANSI/TIA/EIA-568-A-5.. Cables and connecting hardware which contain failed circuits shall be replaced and retested to verify the standard is met.

#### 3.6.3 Fiber Optic Cable

Unless stated otherwise, tests shall be performed from both ends of each circuit. Connectors shall be visually inspected for scratches, pits or chips and shall be reterminated if any of these conditions exist. Each circuit leg and complete circuit shall be tested for insertion loss at 850 and 1300 nm using a light source similar to that used for the intended communications equipment. High-resolution optical time domain reflectometer (OTDR) tests shall be performed from one end of each fiber. Scale of the OTDR trace shall be such that the entire circuit appears over a minimum of 80 percent of the X-axis.

-- End of Section --

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SECTION 03314

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## SECTION 03314

## CONCRETE WATER TANK TESTING AND DISINFECTION

## PART 1 GENERAL

## 1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

## ACI INTERNATIONAL (ACI)

ACI 350.1R (1993) Testing Reinforced Concrete Structures for Watertightness

## AMERICAN WATER WORKS ASSOCIATION (AWWA)

AWWA C652 Disinfection of Water-Storage Facilities

## 1.2 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES.

## SD-06 Test Reports

Test reports for watertightness of concrete water tanks; FIO

## PART 2 PRODUCTS (Not Applicable)

## PART 3 EXECUTION

## 3.1 CONCRETE WATERTIGHTNESS TESTING

## 3.1.1 Start Of Testing

Completed tank shall be cured for a period of 60 days prior to testing for watertightness.

## 3.1.2 Repair Of Concrete Cracks

All visible shrinkage cracks shall be sealed with epoxy injection in existing walls and new concrete floor slab

## 3.1.3 Watertightness Test Procedures

Testing of water tank shall be in accordance with ACI 350.1R. (attached)

## 3.1.4 Minimum Water Level Drop For Testing

The filled tank shall be monitored until water level drops  $\frac{1}{2}$ " or over a

period of three days, whichever comes first.

3.1.5 Maximum Allowable Leakage For Testing

Maximum allowable leakage is 0.1% per 24 hour period (adjusted upward for evaporation and temperature)

3.1.6 Repair Of Leaks

If tank does not meet leakage criteria, water shall be pumped to another tank for reuse. Sealants shall be inspected and repaired as necessary. Tank shall be retested after repairs have been made. Process shall be repeated until concrete tank has passed test for watertightness

3.2 DISINFECTION

3.2 Disinfection Procedures

All concrete tank surfaces in contact with water shall be disinfected in accordance with AWWA C652 (attached) except that disinfection shall be with a sprayed 500 ppm chlorine solution.

3.3 Environmental Permits For Disposal Of Chlorine Solution

Contractor shall obtain all necessary environmental permits required for disposal of used chlorine disinfection solution.

# Testing Reinforced Concrete Structures for Watertightness

Reported by ACI Committee 350/AWWA Committee 400

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*The recommendations included in this report are applicable to cast-in-place reinforced concrete water containment structures including tanks, reservoirs, basins, conduits, etc. The recommendations are for structures containing water or wastewater. The recommendations are not necessarily applicable to the containment of other fluids, as the viscosities of other fluids are different. However, the watertightness test may be used to indicate the tightness, relative to water, for structures containing other fluids. The recommendations are not intended for prestressed concrete structures, for precast concrete structures such as culverts or pipes, for concrete paved structures such as channels and impoundments, for hazardous material containment structures, or for gaseous containment structures.*

**Keywords:** leakage rate; leakage test; reservoirs; tanks (containers); tests; watertightness; watertightness criteria.

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Reference to this document shall not be made in contract documents. If items found in this document are desired by the Architect/Engineer to be a part of the contract documents, they shall be restated in mandatory language for incorporation by the Architect/Engineer.

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ACI 350.1R/AWWA 400-93 became effective August 1, 1993.  
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### CHAPTER 1—GENERAL

#### 1.1—Introduction

The American Concrete Institute Committee 350, Environmental Engineering Concrete Structures, recognized the need for standardized criteria and a standardized method of testing reinforced concrete structures for watertightness. The American Water Works Association Committee 400, Waterproofing, was also interested in documenting the state of the art of watertightness testing and criteria for reinforced concrete tanks. A joint subcommittee was formed to prepare a report containing recommendations on watertightness for reinforced concrete containment structures.

The recommendations included in this report are applicable to cast-in-place reinforced concrete water containment structures, including tanks, reservoirs, basins, conduits, etc. The recommendations are for structures containing water or wastewater. The recommendations are not necessarily applicable to the containment of other fluids, as the viscosities of other fluids are different. However, the watertightness test may be used to indicate the tightness, relative to water, for structures containing other fluids. The recommendations are not intended for prestressed concrete structures, for precast concrete structures such as culverts and pipes, for concrete paved structures such as channels and impoundments, for hazardous material containment structures, or for gaseous containment structures.

#### 1.2—Objectives

The objectives of this report are to provide guidance on watertightness criteria and watertightness testing of cast-in-place, reinforced concrete structures.

#### 1.3—Background

Recommendations on watertightness of concrete structures by other national and international technical organizations were considered by the Committee prior to making the recommendations in this report. The recommendations of the other technical organizations are briefly described in the following paragraphs.

The American Water Works Association Committee on Concrete Water-Holding Structures published a summary report<sup>1</sup> containing a recommendation that "a leakage allowance of 0.1 percent of total volume for 24 hours, as measured by the drop in water surface over a period of not less than five days" be used as a maximum allowable leakage rate. The Committee indicated that

leakage allowance for concrete water-holding structures "has not been covered in the literature and about which there is no general agreement among engineers."

ACI 350R<sup>2</sup> indicated that a 0.1 percent leakage rate in any 24-hr period (after absorption and stabilization) would be generally acceptable for a water reservoir. Visible leakage or dampness should not be considered acceptable. The report also indicated that "acceptable leakage volume will vary depending on the specific application."

The 1976 British Standards Institution Code of Practice for the Structural Use of Concrete for Retaining Aqueous Liquids<sup>3</sup> specified a maximum drop in liquid level of 0.4 in. in 7 days. This was amended in 1982 to a maximum rate of 0.4 in. or 0.2 percent in 7 days, the lower amount to govern. The 1987 British standard<sup>4</sup> specified stabilizing periods according to the design crack width.

### CHAPTER 2—CRITERIA

#### 2.1—General

Watertightness criteria should consider those properties that could cause loss of water by leakage from an in-service structure. No concrete structure will be perfectly watertight. Some loss of water will occur at incidental defects, joints, and fittings. The amount of leakage will be dependent upon the water pressure at these locations. The leakage will be reduced by the presence of a waterproofing coating or lining. Recommended design procedures for watertightness of reinforced concrete structures are not included in this report. Watertightness design procedures are contained in ACI 350R.<sup>2</sup>

#### 2.2—Leakage

**2.2.1 Cracks**—Design procedures in ACI 350R<sup>2</sup> for water containment concrete structures describe methods of minimizing cracking. The recommendations include the control of concrete tensile stresses, the placement of concrete joints, the provision of a minimum percentage of steel reinforcement, the control of the concrete materials, and the use of details that do not concentrate cracking in the concrete. Cracks with visible water flow should not be allowed in the completed structure. The presence of fine or nonvisible cracks are considered in the watertightness criteria.

**2.2.2 Joints**—Almost all concrete structures contain joints. The joints may be present to facilitate the construction, to aid in the control of concrete shrinkage and thermal stresses, or to control stresses due to the differences in support of the structure. Each joint has a potential for the leakage of water. Joints require more careful attention during construction than other concrete areas, since joints have a higher probability of leakage. The more complex the joint, the higher the probability of defects and leakage. An expansion joint is more apt to leak than a contraction or control joint, all of which are more apt to leak than a construction joint.

Waterstops are normally placed in joints of water

containment structures to minimize leakage. Care must be taken in placing concrete around the waterstop to prevent waterstop displacement and the formation of an escape path for the water by the presence of holes or voids. The probability of some loss of water around or through waterstops is considered in the watertightness criteria.

**2.2.3 Permeability**—Permeability refers to flow through uncracked concrete and is not to be confused with measurable leakage. Concrete will not be completely impermeable. Permeability will vary according to the particular proportions of the constituents used in the concrete. However, the permeability of concrete normally used for water containment structures will result in a very small loss of water.

**2.2.4 Fittings**—Fittings refer to foreign or different materials inserted in, embedded in, or passing through the concrete. The fittings may be placed to support items during construction or in the final structure, or the fittings may be piping passing through the concrete. Each fitting has the potential for allowing water to follow along the contact surface between the fitting and the concrete. Through wall (or floor) fittings frequently contain cutoff collars, waterbars, waterstops, or water-seals to reduce this potential. The criteria recognize this potential. The criteria do not allow for visible leakage at fittings. One other factor that is considered in quantifying potential leakage is that metal fittings, unlike concrete, do not change in volume during wetting or drying.

### 2.3—Water pressure

**2.3.1 Internal pressure**—The leakage rate will be proportional to the depth of water over the point of leakage. Defects in the floor will therefore generally contribute more to total leakage than similar defects in the walls. The water pressure will not only force the water through some leaking joints, but the pressure may also widen the joint opening. This indicates that joints may be a prime factor in leakage from a structure.

Watertightness tests have been performed on a number of structures. The results of these tests aid in the establishment of leakage criteria. However, most of these tests have been on structures containing water depths of less than 30 ft, with the majority of tests having less than 25 ft of water depth. Because the depth of water has a major effect on the rate of leakage, criteria for acceptable leakage from unlined concrete water containment structures has been limited to a maximum water depth of approximately 25 ft, until more data on deeper tanks are available.

**2.3.2 External pressure**—Leakage from in-ground or buried water containment structures will be affected if the ground water level is above the floor elevation. The ground water will cause a back pressure at any concrete defect or void below the ground water elevation, thus reducing the effective pressure pushing the water through the defect or void. The recognition that ground water can reduce leakage should not be taken as a recommendation

to use ground water for this purpose or to indicate that water containment structures with minimal leakage due to the presence of ground water are acceptable. On the contrary, it is recommended that the watertightness criteria be applied to the structure without the mitigating effect of the presence of ground water. This can be accomplished by artificially lowering the ground water during any watertightness testing of the structure.

### 2.4—Waterproofing

**2.4.1 General**—Waterproofing refers to coatings or linings applied to the interior face of the concrete of water containment structures. In prior portions of this chapter, the committee has assumed that the concrete is not coated or lined. The application of coatings or linings to the interior face of the concrete will place a barrier over some of the defects, thereby reducing the leakage rate.

**2.4.2 Coatings**—Coatings are applied to the surface of the concrete by brush, roller, or spray. Coatings form a surface covering or film that may even intrude into the surface pores of the concrete, seal minor nonmoving cracks, and will usually reduce the leakage from a structure. However, coatings generally cannot bridge over working cracks and moving joints. The watertightness criteria therefore are not more stringent for coated structures than for uncoated structures. The main benefit in applying a coating with respect to watertightness is to aid the structure in meeting the criteria.

**2.4.3 Linings**—Linings are continuous membranes used on the interior surface of the concrete. Linings may be attached to the concrete by adhesives or by mechanical means. Membranes, being essentially independent barriers to the passage of water, can bridge cracks and moving joints. The allowable watertightness criteria for lined structures therefore are more stringent than for nonlined structures.

**2.4.4 Partial linings**—Some water containment structures have linings installed only on the floor of the structure. Where the floor lining is properly and effectively sealed to the wall, the watertightness criteria are more stringent than for nonlined structures, but less stringent than for fully lined structures. The perimeter of the lining should be sealed to the wall in such a manner that the contained water cannot bypass the liner during the expected life of the structure. Structures with lined walls only are likely to have more leakage than structures with lined floors only.

### 2.5—Quantitative criteria

The allowable leakage rate for unlined concrete water containment structures, with a side water depth of 25 ft or less, should not exceed 0.1 percent of the water volume in 24 hr.

The allowable leakage rate for concrete water containment structures, with lined walls and a side water depth of 30 ft or less, should not exceed 0.06 percent of the water volume in 24 hr.

The allowable leakage rate for concrete water containment structures, with lined floors and a side water depth of 30 ft or less, should not exceed 0.04 percent of the water volume in 24 hr.

The allowable leakage rate for fully lined concrete water containment structures should not exceed 0.025 percent of the water volume in 24 hr.

The allowable leakage rate for concrete water containment structures, with greater side water depths than just indicated, should be selected using engineering judgment with special consideration given to the tank floor and the location and type of concrete joints.

## CHAPTER 3—WATERTIGHTNESS TEST

### 3.1—General

A watertightness test should be performed on concrete water containment structures to insure that incidental and undetected defects are not allowing undue leakage. The tested structures should not have a leakage rate in excess of the criteria given in Chapter 2 of this report. The method of testing should exclude or minimize those factors that affect the water surface elevation during the test but are not due to leakage. The method of preparing for the test should eliminate or minimize the loss of water from the structure due to items or elements that are not considered part of the actual structural containment.

### 3.2—Structure condition

The containment structure should be structurally complete and capable of resisting the hydrostatic pressure of the test water. Preferably, backfill should not be present around the structure (provided the design of the structure included this condition). Visible leakage can then be observed and surface dampness can be determined. The ground water at the structure should be below the containment floor and preferably below any underdrain system. The underdrain discharge line or point, adjacent to the structure, should be exposed to view so that flow in the system can be monitored during the test. All temporary bulkheads, cofferdams, pipe blind flanges, and closed valves should be checked to see that they form a complete seal at these outlets and, if possible, these outlets should be observed during the actual test.

### 3.3—Factors affecting the test

**3.3.1 Absorption**—Water containment structures that have been previously drained for a significant period of time, or have not been previously filled, will absorb water into the concrete during and after filling. The absorption of the water into the concrete will not only remove water from the containment but will also result in some increase in volume of the concrete. The saturation of the concrete with water may also initiate autogenous healing of fine cracks in the concrete. The absorption of water into the concrete will continue over a long period of time. However, the potentially significant effects occur

soon after filling. For normal concrete water containment structures, a 3-day interval is recommended between the time the structure is filled with water and the start of the watertightness test. This time interval should be sufficient to minimize the effect of absorption on the test results. If more stringent watertightness criteria are specified, a longer time interval of 7 or more days should be used.

**3.3.2 Structure deflection**—The structure will deflect due to the applied pressure of the water. The initial deflection of the concrete may be different from the final deflection. Microcracking, relaxation, and creep of the concrete redistribute the strains and stresses and alter the deflection. The time interval between the completion of filling the tank and the start of the test recommended for absorption stabilization should be sufficient to remove any significant effect of structural deflection on the test results.

**3.3.3 Temperature**—Water changes in volume with changes in temperature. Under normal temperature variations and with the usual size of containment structures, the change in volume of water should not have a significant effect on the water level and test result. An example of its effect is that a change in average water temperature from 70 to 68 F in a 200 by 200-ft tank with a water depth of 20 ft would drop the water surface approximately  $1/32$  in. If this temperature change occurred over a 3-day period, this would amount to a rate of volume reduction of 0.008 percent in 24 hr. However, to minimize the effect of temperature change, readings of water surface elevation should be taken at 24-hr intervals. This time interval will result in readings taken during the same time each day and at approximately the same temperature conditions. Tests should not be scheduled when a major change in the average daily temperature is predicted. In the event that very stringent leakage criteria are specified, the test results should be corrected for the change in water temperature.

**3.3.4 Evaporation and precipitation**—For covered water containment structures, precipitation should not affect the test results and evaporation should not have a significant effect. However, evaporation could have a measurable effect if the structure has good venting and is located in a semiarid or arid region.

Evaporation and precipitation will have a definite effect on the water level in uncovered water containment structures. It is recommended that the test results be corrected for observations of the gain in water due to precipitation or the loss of water due to evaporation. This can be accomplished with a partially filled, calibrated, transparent, floating, open container in the water containment structure. The container should be positioned away from the sides of the structure and any overhead members that may shield or shade the container. The container should have sufficient freeboard to accommodate the precipitation from normal rainfall and not be overtopped by waves generated by the wind.

### 3.4—Test procedure

3.4.1 *Test preparation*—Preferably, backfill should not be placed around the water containment structure prior to the test. Inspection access points should be open to all piping, channels, and conduits that leave the structure, including any underdrain outlets. When the structure has gained sufficient strength to withstand the test load and after all outlets have been securely sealed, the structure should be filled with water. During filling, the outlets should be monitored for watertightness, the underdrain outlet monitored for any increase in flow, and the structure, especially the concrete joints, monitored for any visible leakage from the structure. If any visible leakage from the structure or increase in flow from the underdrain system is observed, the condition may be corrected prior to the start of the test measurements. However, no allowance should be made in the test measurements for uncorrected point source leakage. When the test preparations are acceptable, the structure should be kept full of water for a minimum of 3 days prior to starting the test.

3.4.2 *Test measurements*—The location of the water surface in new structures should be measured at a minimum of two points 180 deg apart, and preferably at four points 90 deg apart, at the start of the test. Measurements taken at these locations will usually minimize the effect of differential settlement of a tank on the computed values. The water temperature, at a depth of approximately 18 in. below the water surface, should be recorded. If the specified leakage criteria for the structure are very stringent, the water temperature should be recorded at 5-ft intervals of depth. A partially filled, calibrated, open container for evaporation/precipitation measurement should be positioned in uncovered water containment structures and the water level in the container recorded. The measurements should be recorded at 24-hr intervals. The structure exterior should be inspected daily for indications of leakage.

The test should be continued for a period of time sufficient to produce at least a one-half-in. drop in the water surface based on the leakage occurring at the maximum allowable rate.

*Example 1*—The structure is a flat bottom, unlined, reinforced concrete tank with a 20-ft water depth. The allowable leakage rate is 0.1 percent of the water volume in 24 hr.

*Duration of test*

$$\frac{0.5 \text{ in.}}{0.001 \text{ in./in./day} \times 20 \text{ ft} \times 12 \text{ in./ft}} = 2.08 \text{ days}$$

Measurements are taken at 24-hr intervals; therefore, the test duration should be a minimum of 3 days.

*Example 2*—The structure is a conical or pyramidal bottom, unlined, reinforced concrete tank with a 15-ft sidewater depth and a maximum depth of 21 ft. The allowable leakage rate is 0.1 percent of the water volume in 24 hr.

*Equivalent depth:*  $A$  = surface area;  $d$  = equivalent

depth

$$d = \frac{15 \text{ ft} \times A \text{ ft}^2 + \frac{(21 \text{ ft} - 15 \text{ ft}) A \text{ ft}^2}{3}}{A \text{ ft}^2} = 15 + 2 = 17 \text{ ft}$$

*Duration of test*

$$\frac{0.5 \text{ in.}}{0.001 \text{ in./in./day} \times 17 \text{ ft} \times 12 \text{ in./ft}} = 2.45 \text{ days}$$

Measurements are taken at 24-hr intervals; therefore, the test duration should be a minimum of 3 days.

At the end of the test period, the location of the water surface should be recorded at the location of the original measurements. The water temperature and the water surface in the evaporation/precipitation measurement device should also be recorded. The leakage rate from the tank should be computed, corrected for evaporation or precipitation as applicable, and, if necessary, temperature. If the rate exceeds the criteria indicated in Chapter 2 or the criteria specified, the structure should be considered to have failed the test. The structure should also be considered to have failed the test if water is observed flowing from the structure (other than from the underdrain system) or if moisture, other than from precipitation or condensation, can be transferred to a dry hand from the exterior surfaces.

Any structure failing the test should be repaired and retested. The repair work may include dewatering the structure and inspecting the interior for defects that cause leakage.

## CHAPTER 4—REFERENCES

### 4.1—Cited references

1. "Summary Report on Concrete Water-Holding Structures," AWWA Committee on Concrete Water Holding Structures, *American Water Works Association Journal*, Aug. 1978, Denver.
2. ACI Committee 350, "Environmental Engineering Concrete Structures (ACI 350R-89)," American Concrete Institute, Detroit, 1989, 20 pp.
3. "Code of Practice for the Structural Use of Concrete for Retaining Aqueous Liquids (BS 5337:1976)," British Standards Institution, London, 1976.
4. "British Standard Code of Practice for Design of Concrete Structures for Retaining Aqueous Liquids (BS 8007:1976)," British Standards Institution, London, 1987.

### CONVERSION FACTORS

$$\begin{aligned} 1 \text{ in.} &= 25.4 \text{ mm} \\ 1 \text{ ft} &= 0.305 \text{ m} \\ t_F &= 1.8t_c + 32 \end{aligned}$$

This report was submitted to letter ballot of the committee and approved in accordance with ACI balloting procedures. Concurrence for publication has been received from the American Water Works Association.

American Water Works Association  
**ANSI/AWWA C652-92**  
(Revision of ANSI/AWWA C652-86)



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**AWWA STANDARD**  
FOR  
**DISINFECTION OF WATER-STORAGE  
FACILITIES**



*Effective date: Feb. 1, 1993.*

*First edition approved by AWWA Board of Directors June 15, 1980.*

*This edition approved June 18, 1992.*

*Approved by American National Standard Institute Inc., Dec. 8, 1992.*

**AMERICAN WATER WORKS ASSOCIATION**

6666 West Quincy Avenue, Denver, Colorado 80235

## AWWA Standard

This document is an American Water Works Association (AWWA) standard. It is not a specification. AWWA standards describe minimum requirements and do not contain all of the engineering and administrative information normally contained in specifications. The AWWA standards usually contain options that must be evaluated by the user of the standard. Until each optional feature is specified by the user, the product or service is not fully defined. AWWA publication of a standard does not constitute endorsement of any product or product type, nor does AWWA test, certify, or approve any product. The use of AWWA standards is entirely voluntary. AWWA standards are intended to represent a consensus of the water supply industry that the product described will provide satisfactory service. When AWWA revises or withdraws this standard, an official notice of action will be placed on the first page of the classified advertising section of *Journal AWWA*. The action becomes effective on the first day of the month following the month of *Journal AWWA* publication of the official notice.

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\*Alternate

†Liaison, nonvoting

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# Foreword

*This foreword is for information only and is not a part of AWWA C652.*

**I. History of Standard.** This standard was first approved on June 15, 1980, under the designation AWWA D105, Standard for Disinfection of Water Storage Facilities. The 1980 edition was developed from information originally contained in AWWA D102-64, modified to include disinfection of water-storage facilities constructed of steel or other materials. The standard was redesignated AWWA C652 with the 1986 edition.

**II. Advisory Information on Use of This Standard.** This standard describes methods of disinfecting water-storage facilities that are newly constructed, have been entered for construction or inspection purposes, or that continue to show the presence of coliform bacteria during normal operation. In addition, the standard defines disinfection procedures for underwater inspections because water utilities increasingly are employing divers to conduct underwater inspections of on-line potable-water-storage facilities to minimize water loss and downtime normally associated with necessary maintenance inspections. The standard does not cover the type and technical requirements of underwater inspection, or the required skill level of the diving inspector.

A storage facility is defined as a reservoir from which water, without further treatment, is supplied directly to the distribution piping system for domestic use. From a practical standpoint, this standard applies to the disinfection of covered storage facilities constructed of steel, concrete, or materials that would provide a similar structure from a water quality standpoint. Since wood may support the growth of coliform bacteria, it is recommended that any submerged wood surface (columns, baffles, and so forth) be coated with epoxy or other durable, effectively impermeable paint or coating approved for domestic water use.

Parts of this standard may be applicable to the disinfection of large, finished-water, open storage reservoirs, such as reservoirs formed by concrete or earth dams, but such applications are incidental, and this standard is not intended to cover those kinds of storage facilities.

Three methods of chlorinating storage facilities are described in this standard. Each utility should decide which method is most suitable for a given situation. In selecting the method to be used, the utility should consider the availability of materials and equipment for disinfection, the training of personnel who will perform the disinfection, and safety. For example, gas chlorination should be used only when properly designed and constructed equipment is available; makeshift equipment is not acceptable when liquid-chlorine cylinders are used. Spray equipment should be used inside the storage facility only when thorough ventilation is assured or when appropriate protection is provided by the use of canister-type gas masks or self-contained breathing units. If a chlorination method is selected that requires the draining of a storage facility in order to dispose of highly chlorinated water, then thorough consideration should be given to the effect on the receiving environment. If there is any question as to whether a chlorinated-waste discharge may cause damage to fish life, plant life, physical installations, or other downstream water uses of any type, then an adequate amount of a reducing agent should be applied to the discharged water in order to thoroughly neutralize the chlorine residual.

**III. Acceptance.** In May 1985, the US Environmental Protection Agency (USEPA) entered into a cooperative agreement with a consortium led by NSF International (NSF) to develop voluntary third-party consensus standards and a certification program for all direct and indirect drinking water additives. Other members of the consortium included the American Water Works Association Research Foundation (AWWARF), the Conference of State Health and Environmental Managers (COSHEM), the American Water Works Association (AWWA), and the Association of State Drinking Water Administrators (ASDWA). The consortium is responsible for the cooperative effort of manufacturers, regulators, product users, and other interested parties that develop and maintain the NSF standards.

In the United States, authority to regulate products for use in, or in contact with, drinking water rests with individual states.\* Local agencies may choose to impose requirements more stringent than those required by the state. To evaluate the health effects of products and drinking water additives from such products, state and local agencies may use various references, including

1. An advisory program formerly administered by USEPA, Office of Drinking Water, discontinued on Apr. 7, 1990.

2. Specific policies of the state or local agency.

3. Two standards developed under the direction of NSF, ANSI†/NSF‡ 60, Drinking Water Treatment Chemicals—Health Effects, and ANSI/NSF 61, Drinking Water System Components—Health Effects.

4. Other references, including AWWA standards, *Food Chemicals Codex*, *Water Chemicals Codex*,§ and other standards considered appropriate by the state or local agency.

Various certification organizations may be involved in certifying products in accordance with ANSI/NSF 60. Individual states or local agencies have authority to accept or accredit certification organizations within their jurisdiction. Accreditation of certification organizations may vary from jurisdiction to jurisdiction.

Appendix A, "Toxicology Review and Evaluation Procedures," to ANSI/NSF 60 does not stipulate a maximum allowable level (MAL) of a contaminant for substances not regulated by a USEPA final maximum contaminant level (MCL). The MALs of an unspecified list of "unregulated contaminants" are based on toxicity testing guidelines (noncarcinogens) and risk characterization methodology (carcinogens). Use of Appendix A procedures may not always be identical, depending on the certifier.

AWWA C652 does not address additives requirements. Thus, users of this standard should consult the appropriate state or local agency having jurisdiction in order to

1. Determine additives requirements, including applicable standards.

2. Determine the status of certifications by all parties offering to certify products for contact with, or treatment of, drinking water.

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\*Persons in Canada, Mexico, and non-North American countries should contact the appropriate authority having jurisdiction.

†American National Standards Institute, 11 W. 42nd St., New York, NY 10036.

‡NSF International, 3475 Plymouth Rd., Ann Arbor, MI 48106.

§Both publications available from National Academy of Sciences, 2102 Constitution Ave. N.W., Washington, DC 20418.

3. Determine current information on product certification.

**IV. Information Required for Use of This Standard.** This standard is written as though the work will be done by the purchaser's personnel. If the purchaser is contracting for such work to be done, appropriate provisions should be included in the contract agreement to ensure that the constructor is specifically instructed as to his responsibilities. At the least, the purchaser should specify the following:

1. Standard used—that is, AWWA C652-92, Standard for Disinfection of Water-Storage Facilities.

2. Method of disinfection to be used.

3. Any required disposal and precautions to be taken in disposing of chlorinated water in the storage facility.

4. Bacteriological testing and method to be used.

5. Redisinfection procedure if required.

**V. Modification to Standard.** Any modification of the provisions, definitions, or terminology in this standard must be provided in the purchaser's specifications.

**VI. Major Revisions.** Major changes made in this revision of AWWA C652 are as follows:

1. Section II, Advisory Information on Use of This Standard, was added to the foreword.

2. Section III, Acceptance, was added to the foreword.

3. Section V, Modification to Standard, was added to the foreword.

4. Section 5, Disinfection Procedures When Conducting Underwater Inspection of Potable-Water-Storage Facilities, was added.

5. Table A.2, Amounts of Chemicals Required to Give Chlorine Concentrations of 200 mg/L in Various Volumes of Water, was added.



ANSI/AWWA C652-92  
(Revision of ANSI/AWWA C652-86)

# AWWA STANDARD FOR DISINFECTION OF WATER-STORAGE FACILITIES

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## SECTION 1: GENERAL

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### Sec. 1.1 Scope

This standard for disinfection of water-storage facilities covers materials, facility preparation, application of disinfectant to interior surfaces of facilities, and sampling and testing for the presence of coliform bacteria. The standard also includes disinfection procedures for underwater inspection of on-line, potable-water-storage facilities, but does not cover the technical aspects of underwater inspection. All new storage facilities shall be disinfected before they are placed in service. All storage facilities taken out of service for inspecting, repairing, painting, cleaning, or other activity that might lead to contamination of water shall be disinfected before they are returned to service.

### Sec. 1.2 References

This standard references the following documents. The latest current edition of each document forms a part of this standard where and to the extent specified herein. In case of any conflict, the requirements of this standard shall prevail.

ANSI\*AWWA B300—Standard for Hypochlorites.

ANSI/AWWA B301—Standard for Liquid Chlorine.

*Standard Methods for the Examination of Water and Wastewater.* APHA,†  
AWWA, and WEF.‡ Washington, D.C. (18th ed., 1992).

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\*American National Standards Institute Inc., 11 W. 42nd St., New York, NY 10036.

†American Public Health Association, 1015 15th St. N.W., Washington, DC 20005.

‡Water Environment Federation, 601 Wythe St., Alexandria, VA 22314.

Additional materials relating to activity under this standard include the following:

*Chlorine Manual*—Chlorine Institute Inc.\*

*Introduction to Water Treatment*, WSO Series, Vol. 2. AWWA, Denver (1984).

Material safety data sheets for forms of chlorine used (provided by suppliers).

*Safety Practice for Water Utilities*. AWWA Manual M3. AWWA, Denver (1990).

*Water Chlorination Principles and Practices*. AWWA Manual M20. AWWA, Denver (1973).

*Water Quality and Treatment*. AWWA, Denver (4th ed., 1990).

### Sec. 1.3 Record of Compliance

The record of compliance shall be the bacteriological test results certifying that the water held in the storage facility is free of coliform bacteria contamination.

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## SECTION 2: CLEANING

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All scaffolding, planks, tools, rags, and other materials not part of the structural or operating facilities of the tank shall be removed. Then the surfaces of the walls, floor, and operating facilities of the storage facility shall be cleaned thoroughly using a high-pressure water jet, sweeping, scrubbing, or equally effective means. All water, dirt, and foreign material accumulated in this cleaning operation shall be discharged from the storage facility or otherwise removed.

### Sec. 2.1 Other Materials

Following the cleaning operation, the vent screen, overflow screen, and any other screened openings shall be checked and put in satisfactory condition to prevent birds, insects, and other possible contaminants from entering the facility. Any material required to be in the operating storage facility after the cleaning procedure has been completed shall be clean and sanitary when placed in the facility. In such instances, care shall be taken to minimize the introduction of dirt or other foreign material. (For example, placing a layer of limestone granules on the unpainted bottom of the storage facility to prevent corrosion.)

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## SECTION 3: FORMS OF CHLORINE FOR DISINFECTION

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The forms of chlorine that may be used in the disinfecting operations are liquid chlorine, sodium hypochlorite solution, and calcium hypochlorite granules or tablets.

### Sec. 3.1 Liquid Chlorine

Liquid chlorine conforming to ANSI/AWWA B301 contains 100 percent available chlorine and is packaged in steel containers usually of 100-lb, 150-lb, or 1-ton (45.4-kg, 68.0-kg, or 907.2-kg) net chlorine weight. Liquid chlorine shall be used only (1) in combination with appropriate gas-flow chlorinators and ejectors to provide a

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\*Chlorine Institute Inc., 2001 L St. N.W., Washington, DC 20036.

controlled high-concentration solution feed to the water to be chlorinated; (2) under the direct supervision of a person who is familiar with chlorine's physiological, chemical, and physical properties, and who is trained and equipped to handle any emergency that may arise; and (3) when appropriate safety practices are observed to protect working personnel and the public.

### Sec. 3.2 Sodium Hypochlorite

Sodium hypochlorite conforming to ANSI/AWWA B300 is available in liquid form in glass, rubber-lined, or plastic containers typically ranging in size from 1 qt (0.95 L) to 5 gal (18.92 L). Containers of 30 gal (113.6 L) or larger may be available in some areas. Sodium hypochlorite contains approximately 5 percent to 15 percent available chlorine by volume, and care must be taken to control storage conditions and length of storage to minimize its deterioration.

### Sec. 3.3 Calcium Hypochlorite

Calcium hypochlorite conforming to ANSI/AWWA B300 is available in granular form or in small tablets, and contains approximately 65 percent available chlorine by weight. The material should be stored in a cool, dry, dark environment to minimize its deterioration.

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## SECTION 4: ALTERNATIVE METHODS OF CHLORINATION

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Three methods of chlorination are explained in this standard. Typically, only one method will be used for a given storage-facility disinfection, but combinations of the methods may be used. The three methods are (1) chlorination of the full storage facility such that, at the end of the appropriate retention period, the water will have a free chlorine residual of not less than 10 mg/L; (2) spraying or painting of all storage facility water-contact surfaces with a solution of 200-mg/L available chlorine; and (3) chlorination of full storage facility with water having a free chlorine residual of 2 mg/L after 24 h.\*

### Sec. 4.1 Chlorination Method 1

The water-storage facility shall be filled to the overflow level with potable water to which enough chlorine is added to provide a free chlorine residual in the full facility of not less than 10 mg/L at the end of the appropriate 6-h or 24-h period, as described in Sec. 4.1.4. The chlorine, either as calcium hypochlorite, sodium hypochlorite, or liquid chlorine, shall be introduced into the water as described hereafter.

4.1.1 *Liquid-chlorine use.* Liquid chlorine shall be introduced into the water filling the storage facility in such a way as to give a uniform chlorine concentration during the entire filling operation. Portable chlorination equipment shall be carefully operated and shall include a liquid-chlorine cylinder, gas-flow chlorinator, chlorine ejector, safety equipment, and an appropriate solution tube to inject the high-concentration chlorine solution into the filling water. The solution tube shall be

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\*For reference, amounts of chemicals needed for various chlorine concentrations are shown in appendix A, Table A.1.

inserted through an appropriate valve located on the inlet pipe and near the storage facility such that the chlorine solution will mix readily with the inflowing water.

4.1.2 *Sodium hypochlorite use.* Sodium hypochlorite shall be added to the water entering the storage facility by means of a chemical-feed pump, or shall be applied by hand-pouring into the storage facility and allowing the inflowing water to provide the desired mixing.

4.1.2.1 When a chemical-feed pump is used, the concentrated chlorine solution shall be pumped through an appropriate solution tube so as to inject the high-concentration chlorine solution at a rate that will give a uniform chlorine concentration in the filling water. The solution tube shall be inserted through an appropriate valve located on the inlet pipe and near the storage facility, or through an appropriate valve located on the storage facility such that the chlorine solution will mix readily with the filling water.

4.1.2.2 When the sodium hypochlorite is poured into the storage facility, the filling of the storage facility shall begin immediately thereafter or as soon as any removed manhole covers can be closed. The sodium hypochlorite may be poured through the cleanout or inspection manhole in the lower course or level of the storage facility, in the riser pipe of an elevated tank, or through the roof manhole. The sodium hypochlorite shall be poured into water in the storage facility when such water is not more than 3 ft (0.9 m) in depth, nor less than 1 ft (0.3 m) in depth or as close thereto as manhole locations permit.

4.1.3 *Calcium hypochlorite use.* Calcium hypochlorite granules or tablets broken or crushed to sizes not larger than 1/4-in. (6.4-mm) maximum dimension may be poured or carried into the storage facility through the cleanout or inspection manhole in the lower course or level of the storage facility, into the riser pipe of an elevated tank, or through the roof manhole. The granules or tablet particles shall be placed in the storage facility before flowing water into it. The granules or tablets shall be located so that the inflowing water will ensure a current of water circulating through the calcium hypochlorite, dissolving it during the filling operation. The calcium hypochlorite shall be placed only on dry surfaces unless adequate precautions are taken to provide ventilation or protective breathing equipment.

4.1.4 *Retention period.* After the storage facility has been filled with the disinfecting water, it shall stand full as follows: (1) for a period of not less than 6 h when the water entering the storage facility has been chlorinated uniformly by gas-feed equipment or chemical pump, or (2) for a period of not less than 24 h when the storage facility has been filled with water that has been mixed with sodium hypochlorite or calcium hypochlorite within the storage facility as described in Sec. 4.1.2 and Sec. 4.1.3.

4.1.5 *Handling of disinfection water.* After the retention period stated in Sec. 4.1.4, the free chlorine residual in the storage facility shall be reduced to a concentration appropriate for distribution (not more than 2 mg/L) by completely draining the storage facility and refilling with potable water, or by a combination of additional holding time and blending with potable water having a low chlorine concentration. When an appropriate chlorine concentration is reached and subject to satisfactory bacteriological testing and acceptable aesthetic quality, such water may be delivered to the distribution system.

4.1.5.1 The environment into which the chlorinated water is to be discharged shall be inspected, and if there is any likelihood that the chlorinated discharge will cause damage, then a reducing agent shall be applied to the water to be wasted to thoroughly neutralize the chlorine residual in the water. Federal, state, or local

environmental regulations may require special provisions or permits prior to disposal of highly chlorinated water. The proper authorities should be contacted prior to disposal of highly chlorinated water.

## Sec. 4.2 Chlorination Method 2

A solution of 200-mg/L available chlorine shall be applied directly to the surfaces of all parts of the storage facility that would be in contact with water when the storage facility is full to the overflow elevation.

4.2.1 *Method of application.* The chlorine solution may be applied with suitable brushes or spray equipment. The solution shall thoroughly coat all surfaces to be treated, including the inlet and outlet piping, and shall be applied to any separate drain piping such that it will have available chlorine of not less than 10 mg/L when filled with water. Overflow piping need not be disinfected.

4.2.2 *Retention.* The disinfected surfaces shall remain in contact with the strong chlorine solution for at least 30 min, after which potable water shall be admitted, the drain piping purged of the 10-mg/L chlorinated water, and the storage facility then filled to its overflow level. Following this procedure, and subject to satisfactory bacteriological testing and acceptable aesthetic quality, such water may be delivered to the distribution system.

## Sec. 4.3 Chlorination Method 3

Water and chlorine shall be added to the storage facility in amounts such that the solution will initially contain 50 mg/L available chlorine and will fill approximately 5 percent of the total storage volume. This solution shall be held in the storage facility for a period of not less than 6 h. The storage facility shall then be filled to the overflow level by flowing potable water into the highly chlorinated water. It shall be held full for a period of not less than 24 h. All highly chlorinated water shall then be purged from the drain piping. Following this procedure, and subject to satisfactory bacteriological testing and acceptable aesthetic quality, the remaining water may be delivered to the distribution system.

4.3.1 *Adding chlorine.* Chlorine shall be added to the storage facility by the method described in Sec. 4.1.1, Sec. 4.1.2, or Sec. 4.1.3. The actual volume of the 50-mg/L chlorine solution shall be such that, after the solution is mixed with filling water and the storage facility is held full for 24 h, there will be a free-chlorine residual of not less than 2 mg/L.

## Sec. 4.4 Bacteriological Sampling and Testing

After the chlorination procedure is completed, and before the storage facility is placed in service, water from the full facility shall be sampled and tested for coliform organisms in accordance with the latest edition of *Standard Methods for the Examination of Water and Wastewater*. The testing method used shall be either the multiple-tube fermentation technique or the membrane-filter technique.

4.4.1 *Test for odor.* The water in the full facility should also be tested to assure that no offensive odor exists due to chlorine reactions or excess chlorine residual.

4.4.2 *Results of testing.* If the test for coliform organisms is negative, then the storage facility may be placed in service. If the test shows the presence of coliform bacteria, then the situation shall be evaluated by a qualified engineer. In any event, repeat samples shall be taken until two consecutive samples are negative, or the storage facility shall again be subjected to disinfection.

4.4.3 *Care in sampling.* The samples shall be taken from a sample tap on the outlet piping from the storage facility or from a sample tap connected directly to the storage facility. In either case, the operation shall be such as to ensure that the sample collected is actually from water that has been in the storage facility.

4.4.4 *Recommended additional samples.* During the disinfection operation and the required sampling of water from the storage facility, it is recommended that samples be taken from water inflowing to the storage facility to determine if coliforms are present in the typical potable water source.

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## SECTION 5: DISINFECTION PROCEDURES WHEN CONDUCTING UNDERWATER INSPECTION OF POTABLE-WATER-STORAGE FACILITIES

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Increasingly, utilities are using divers to conduct underwater inspections of isolated, on-line, potable-water reservoirs to minimize water wastage and downtime associated with necessary storage-facility maintenance. This section sets forth disinfection procedures for conducting underwater inspections of potable-water-storage facilities. These disinfection procedures are required to assure that the potable quality of the reservoir contents is not compromised by underwater inspection work performed by divers.

This section does not address the following items, each of which must be specified by the purchaser:

1. The type of inspection to be performed (structural, coating, bottom sediment, cathodic protection, bacteriological, and so forth).
2. The technical requirements of the inspection.
3. Skill levels required of the diving inspector.

Generally, the water-storage facility shall be removed from service prior to the inspection and the free chlorine residual of the contents determined. All diving and inspection equipment and clothing used by the diver(s) shall be disinfected immediately prior to use within the water-storage facility. Debris and other contamination shall be prevented from blowing or falling into the facility at all times during inspection. Following the dive, adequate disinfection and bacteriological testing of the water in the facility shall be successfully completed before placing the facility back in service.

### Sec. 5.1 Storage-Facility Isolation

The water-storage facility shall be removed from service and isolated from the system prior to the inspection by closing all inlet and outlet valves. Flowmeters and the tank level should be monitored to verify that the facility has been isolated. The underwater inspection should be made with the water-storage facility as full as possible. If the reservoir inlet/outlet valve(s) must be inspected in the open position, system valves farther upstream (and downstream) should be closed.

On-line inspection of storage facilities without isolation should be avoided. However, if special conditions necessitate underwater inspection without isolation, then the diving work should only be done during periods when flow rates into or out of the water-storage facility are minimal. For underwater inspection of nonisolated

facilities having a common inlet-outlet pipe, it is recommended that a positive flow into the storage facility be maintained during the dive.

### **Sec. 5.2 Storage-Facility Access**

Before the facility access hatch is opened, the hatch and immediate area should be cleaned of all loose dirt and debris. The working area in the immediate vicinity of the access hatch shall be covered with a protective plastic sheet, which, once in place, should be washed with the disinfectant solution (see Sec. 5.6).

Wind screens or other protective devices should be provided to prevent wind-blown or dropped contaminants from entering the storage facility after the hatch is opened.

### **Sec. 5.3 Initial Water Quality**

The first step of any underwater inspection project shall be to establish the free chlorine residual in the reservoir contents before entering the reservoir for any other purpose. Representative water samples shall be taken from several locations and analyzed for free chlorine residual. The results shall be recorded for future reference.

### **Sec. 5.4 Equipment and Personnel Requirements**

**5.4.1 Equipment and clothing.** All diving and inspection equipment and clothing to be used for underwater inspection of potable-water-storage facilities shall be dedicated for that purpose only. Only external-air-supplied equipment shall be used. Certification of equipment and clothing-use history shall be provided to the water utility, and the items shall be available for inspection. All equipment and clothing shall be suitable for disinfection. Diving clothing shall be of the dry-suit type and shall be in good condition, free from tears, scrapes, unrepaired areas, or other imperfections that may impair the integrity of the suit. The diver and the clothing shall be disinfected after the diver is suited up. Between uses, all equipment and clothing dedicated for potable-water, underwater inspection work shall be stored in a manner that prevents both chemical and bacteriological contamination.

**5.4.2 Personnel requirements.** It is recommended that the dive team performing the work should include a minimum of two SCUBA-certified divers (one being a standby diver), each with diving experience in closed, confined spaces, and experience in the use of the underwater inspection equipment. Unless otherwise specified by the purchaser, the standby diver need not be suited up and, in case of emergency, is not required to undergo disinfection procedures before entering the water-storage facility.

All personnel on the dive team shall be free of communicable diseases and shall not have been under a physician's care within the seven-day period prior to entering the facility. No person who knowingly has an abnormal temperature or symptoms of illness shall work in a water-storage facility. The water utility has the right to request a physician's assurance (based on an examination within the 48-h period immediately prior to the time the diver enters the water-storage facility) that all inspection personnel are free of water-transferable communicable diseases.

**5.4.3 Safety.** The team shall comply with all related local, state, and federal safety requirements and provide all necessary safety equipment suitable for the specific access opening, depth to water, and other aspects of the water-storage facility to be inspected.

5.4.4 *Pre-dive meeting.* A pre-dive meeting involving the dive team and water utility representatives shall be held to ensure that the divers understand the configuration of the reservoir and any underwater appurtenances, any time restrictions, diving conditions, and inspection requirements. Any problems associated with dive logistics should be resolved at this time.

### **Sec. 5.5 Equipment Disinfection**

The diving suit and all equipment to be used within the water-storage facility must be disinfected immediately prior to the diver's entrance into the potable-water reservoir. Equipment to be used for nondiving inspection of a water-storage facility, such as a rubber boat used for survey, shall be disinfected in a manner similar to disinfection of the diver's equipment. All equipment to be in contact with the water, such as diving apparatus and clothing, inspection equipment, boats, paddles, ropes, and so forth, shall be disinfected.

The method of equipment disinfection can be submersion in, spraying with, or sponging with disinfectant solution as defined in Sec. 5.6. The preferred methods are

1. Complete immersion of equipment in the disinfectant solution.
2. Thorough and complete sponging of the diver with disinfectant solution after suiting up and again after donning all equipment.
3. Providing a foot bath containing disinfectant solution for the diver to submerge the flippers prior to entry. After the foot bath, the diver should immediately enter the storage facility to avoid contamination.

Care must be taken when applying disinfectant solution to the diver and equipment so that any excess, runoff, or spillage is controlled and disposed of in an environmentally sound manner acceptable to the local regulatory authorities. Care should also be taken when applying the disinfectant solution to the diver to avoid contact with the eyes or prolonged contact with the skin.

### **Sec. 5.6 Disinfectant Solution**

The disinfectant solution shall have a minimum of 200 mg/L free available chlorine. The type and amount of chemical required to produce the required 200-mg/L concentration in various quantities of water are presented in Table A.2 of appendix A. The strength of the disinfectant solution shall be verified with a chlorine test kit before use.

### **Sec. 5.7 Postinspection Chlorine Residual and Bacteriological Testing**

If proper disinfection procedures are followed, there should be no need to increase the chlorine residual in the storage facility after completion of the inspection. However, after all divers and equipment are removed from the water-storage facility, the chlorine residual in the facility shall be retested. If the chlorine residual has dropped from that indicated by the initial test made prior to entry, sufficient chlorine solution or granules shall be added to the storage facility to return the free chlorine residual to preentry levels, but not to exceed a free chlorine concentration of 2 mg/L. Disinfectant shall be added in a manner to achieve maximum distribution over the surface and achieve all possible mixing. Adequate mixing can be promoted by recirculation, if available, or with portable mixers or portable pumps suitably disinfected. (NOTE: The pre- and post-dive residuals may not match exactly due to sampling and analytical variability.)

With the chlorine residual at preentry levels, samples for coliform organisms should be taken and analyzed in accordance with Sec. 4.4.

If the chlorine residual in the storage facility did not drop during the inspection, the facility can be returned to service as soon as the bacteriological samples have been confirmed as acceptable. However, if it was necessary to rebuild the chlorine residual in the storage facility after completion of the diver's work, then the storage facility should not be placed in service until after completion of a satisfactory bacteriological analysis.

## APPENDIX A

### Chlorine Dosages

*This appendix is for information only and is not a part of AWWA C652.*

**Table A.1** Amounts of chemicals required to give various chlorine concentrations in 100,000 gal (378.5 m<sup>3</sup>) of water\*

Desired Chlorine Concentration in Water <i>mg/L</i>	Sodium Hypochlorite Required								Calcium Hypochlorite Required	
	Liquid Chlorine Required		5 Percent Available Chlorine		10 Percent Available Chlorine		15 Percent Available Chlorine		65 Percent Available Chlorine	
	<i>lb</i>	<i>(kg)</i>	<i>gal</i>	<i>(L)</i>	<i>gal</i>	<i>(L)</i>	<i>gal</i>	<i>(L)</i>	<i>lb</i>	<i>(kg)</i>
2	1.7	(.77)	3.9	(14.7)	2.0	(7.6)	1.3	(4.9)	2.6	(1.18)
10	8.3	(3.76)	19.4	(73.4)	9.9	(37.5)	6.7	(25.4)	12.8	(5.81)
50	42.0	(19.05)	97.0	(367.2)	49.6	(187.8)	33.4	(126.4)	64.0	(29.03)

\*Amounts of sodium hypochlorite are based on concentrations of available chlorine by volume. For either sodium hypochlorite or calcium hypochlorite, extended or improper storage of chemicals may have caused a loss of available chlorine.

**Table A.2** Amounts of chemicals required to give chlorine concentrations of 200 mg/L in various volumes of water\*

Volume of Water		Sodium Hypochlorite Required								Calcium Hypochlorite Required	
		Liquid Chlorine Required		5 Percent Available Chlorine		10 Percent Available Chlorine		15 Percent Available Chlorine		65 Percent Available Chlorine	
<i>gal</i>	<i>(L)</i>	<i>lb</i>	<i>(g)</i>	<i>gal</i>	<i>(L)</i>	<i>gal</i>	<i>(L)</i>	<i>gal</i>	<i>(L)</i>	<i>lb</i>	<i>(g)</i>
10	(37.9)	0.02	(9.1)	0.04	(.15)	0.02	(.08)	0.02	(.08)	0.03	(13.6)
50	(189.3)	0.1	(45.4)	0.2	(.76)	0.1	(.38)	0.07	(.26)	0.15	(68.0)
100	(378.5)	0.2	(90.7)	0.4	(1.51)	0.2	(.76)	0.15	(.57)	0.3	(136.1)
200	(757.1)	0.4	(181.4)	0.8	(3.03)	0.4	(1.51)	0.3	(1.14)	0.6	(272.2)

\*Amounts of sodium hypochlorite are based on concentrations of available chlorine by volume. For either sodium hypochlorite or calcium hypochlorite, extended or improper storage of chemicals may have caused a loss of available chlorine.

## APPENDIX B

### Disposal of Heavily Chlorinated Water

*This appendix is for information only and is not a part of AWWA C652.*

1. Check with local sewer department for conditions of disposal to sanitary sewer, and with the state regulatory agency for conditions of disposal to natural drainage courses.

2. Chlorine residual of disposed water will be neutralized by treating with one of the chemicals listed in Table B.1.

Table B.1 Amounts of chemicals required to neutralize various residual chlorine concentrations in 100,000 gal (378.5 m<sup>3</sup>) of water

Residual Chlorine Concentration <i>mg/L</i>	Chemical Required							
	Sulfur Dioxide (SO <sub>2</sub> )		Sodium Bisulfite (NaHSO <sub>3</sub> )		Sodium Sulfite (Na <sub>2</sub> SO <sub>3</sub> )		Sodium Thiosulfate (Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> ·5H <sub>2</sub> O)	
	<i>lb</i>	<i>(kg)</i>	<i>lb</i>	<i>(kg)</i>	<i>lb</i>	<i>(kg)</i>	<i>lb</i>	<i>(kg)</i>
1	0.8	(.36)	1.2	(.54)	1.4	(.64)	1.2	(.54)
2	1.7	(.77)	2.5	(1.13)	2.9	(1.32)	2.4	(1.09)
10	8.3	(3.76)	12.5	(5.67)	14.6	(6.62)	12.0	(5.44)
50	41.7	(18.91)	62.6	(28.39)	73.0	(33.11)	60.0	(27.22)