AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. CONTRACT ID CODE	PAGE	OF PAGES
	1	6

2. AMENDMENT/MODIFICATION NO.	3. EFFECTIVE DATE	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO. *(If applicable)*
0008	4/18/01		

6. ISSUED BY CODE

U. S. Army Engineer District, Honolulu
Attn: CEPOH-CT-C
Building 230
Fort Shafter, Hawaii 96858-5440

7. ADMINISTERED BY *(If other than Item 6)* CODE

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

CODE FACILITY CODE

(√) X

9A. AMENDMENT OF SOLICITATION NO.
DACA83-01-R-0001

9B. DATED *(SEE ITEM 11)*
11/1/00

10A. MODIFICATION OF CONTRACTS/ORDER NO.

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.

Offers 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 ACKNOWLEDGMENT 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.)*

FY00 MCA PN 46902, Whole Barracks Renewal, Phase 2A, Schofield Barracks, Oahu, Hawaii

See attached 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 CONTRACTING OFFICER *(Type or print)*	
15B. CONTRACTOR/OFFEROR *(Signature of person authorized to sign)*	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA BY *(Signature of Contracting Officer)*	16C. DATE SIGNED

1. Attached hereto are revised and new pages to Sections 00010, 00100, 00700, 00800, and 00900. The revision mark "(AM-0008)" is shown on each page.

a. REVISED PAGES. The following are revised pages to the solicitation. Changes are indicated in bold.

Section 00010: SF 1442
SF 1442 - Blocks 11 and 13 are revised

Section 00100: Pages 1-22
Evaluation Factors For Award is revised
S-36.37, Notification to Offerors - Access to Army Installations is added

Section 00700: Pages 6, 21, 82, 83, and 110
52.204-1, Approval of Contract (Dec 1989) is added
52.211-10, Commencement, Prosecution, and Completion of Work (Apr 1984) is revised
252.232-7007, Limitation of Government's Obligation (Aug 1993) is revised

Section 00800: Pages 2 and 18
S-36.28, Vehicle Registration is added

b. NEW PAGES. The following pages are added to the solicitation.

Section 00800: Page 19

Section 00900: Attachment A.1, Pages 21-24
Questions and Answers 118-134 are added

2. CHANGES TO SPECIFICATIONS. Attached hereto are revised pages of the specifications. Revised pages replace like-numbered pages. The revision mark "(Am-0008)" is shown on each revised page. Changes are indicated in **bold** print

Section 15895 pages 1-38 (paragraph 2.10.2.6(k))

3. CHANGES TO DRAWINGS.

a. REVISED DRAWINGS (NOT ISSUED). Following are revisions made to drawings listed. These revised drawings will not be issued with this amendment but will be furnished to the successful bidder at the time of award of the Contract.

FY00 MCA PN46902 PH2A2 WHOLE BARRACKS RENEWAL

RING NO.	DWG. NO.	SHEET NO.	TITLE
55	721-11-14	AW-45	"BN-1" COLOR & MATERIAL SCHEDULE
424	721-11-14	AWR-45	"BN-2" COLOR & MATERIAL SCHEDULE

At Zone G5: REVISE wallcovering WC-1 and WC-2, types and descriptions as follows:

CODE: WC-1
TYPE: 100% vinyl
DESCRIPTION: Operable Wall at Classrooms: Modernfold Quicksilver (N) 5-12.

CODE:WC-2
TYPE: 15 oz. Random matched 100% vinyl, 53/54" wide, backing: 60% polyester, 40% cotton, scrim, Class A fire rating.
DESCRIPTION: Typical Office Walls: Maharam, 393901 Wynnewood 005 Spring Leaf.

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

FY00 MCA PN46902 PH2A2 WHOLE BARRACKS RENEWAL

Note: An SV-Notice: Error loading overlay image: "K:_CDBURN\10491741\CDLABE~1\CASTLE.JPG" will appear on the screen when opening up the MASTER.SVD file for "PH2A2". The contractor shall disregard this notice simply by clicking on the "ok" button. This SV-Notice error message has no technical impact to the revised drawings in this amendment.

TITLE SHEETS

RING NO.	DRAWING NO.	SHEET NO.	LTR	REVISION DATE
3	721-11-14	TW-3	d	10 APR 01
4	721-11-14	TW-4	d	10 APR 01
5	721-11-14	TW-5	d	10 APR 01
7	721-11-14	TW-7	d	10 APR 01
8	721-11-14	TW-8	d	10 APR 01

LARGE BATTALION HEADQUARTERS BUILDING “BN-1”

RING NO.	DRAWING NO.	SHEET NO.	LTR	REVISION DATE
ARCHITECTURAL “BN-1”				
35	721-11-14	AW-25	d	10 APR 01
FIRE PROTECTION “BN-1”				
111	721-11-14	FW-3	d	10 APR 01

200 PN BARRACKS BUILDING “BK-1”

RING NO.	DRAWING NO.	SHEET NO.	LTR	REVISION DATE
ARCHITECTURAL “BK-1”				
130	721-11-14	AB-1	d	10 APR 01
131	721-11-14	AB-2	d	10 APR 01
132	721-11-14	AB-3	d	10 APR 01
137	721-11-14	AB-8	d	10 APR 01
FIRE PROTECTION “BK-1”				
210	721-11-14	FB-4	d	10 APR 01
ELECTRICAL “BK-1”				
227	721-11-14	EB-13	d	10 APR 01

400 PN SOLDIER COMMUNITY BUILDING “SCB-1”

RING NO.	DRAWING NO.	SHEET NO.	LTR	REVISION DATE
241	721-11-14	AC-9	d	10 APR 01
242	721-11-14	AC-10	d	10 APR 01
243	721-11-14	AC-11	d	10 APR 01
247	721-11-14	AC-15	d	10 APR 01
257	721-11-14	AC-25	d	10 APR 01
258	721-11-14	AC-26	d	10 APR 01
259	721-11-14	AC-27	d	10 APR 01

LARGE BATTALION HEADQUARTERS - REVERSED “BN-2”

RING NO.	DRAWING NO.	SHEET NO.	LTR	REVISION DATE
ARCHITECTURAL “BN-2”				
404	721-11-14	AWR-25	d	10 APR 01
FIRE PROTECTION “BN-2”				
480	721-11-14	FWR-3	d	10 APR 01

200 PN BARRACKS – REVERSED “BK-2”

RING NO.	DRAWING NO.	SHEET NO.	LTR	REVISION DATE
ARCHITECTURAL “BK-2”				
499	721-11-14	ABR-1	d	10 APR 01
500	721-11-14	ABR-2	d	10 APR 01
501	721-11-14	ABR-3	d	10 APR 01
506	721-11-14	ABR-8	d	10 APR 01

FIRE PROTECTION “BK-2”

579	721-11-14	FBR-4	d	10 APR 01

ELECTRICAL “BK-2”

596	721-11-14	EBR-13	d	10 APR 01

FY00 MCA PN46902 PH2A3 WHOLE BARRACKS RENEWAL

RING NO.	DRAWING NO.	SHEET NO.	LTR	REVISION DATE
2	141-85-01	T-2	d	10 APR 01
3	141-85-01	T-3	d	10 APR 01

BUILDING “COF-4”
ARCHITECTURAL

10	141-85-01	AL-5	d	10 APR 01
13	141-85-01	AL-7	d	10 APR 01

BUILDING “COF-5” AND COF-7”
ARCHITECTURAL

101	141-85-01	AJ-5	d	10 APR 01
104	141-85-01	AJ-7	d	10 APR 01
110	141-85-01	AJ-12	d	10 APR 01

BUILDING “COF-6”
ARCHITECTURAL

193	141-85-01	AM-5	d	10 APR 01
198	141-85-01	AM-10	d	10 APR 01

FY00 MCA PN46902 PH2A4 WHOLE BARRACKS RENEWAL

RING NO.	DRAWING NO.	SHEET NO.	LTR	REVISION DATE

GENERAL “DN-1”

2	722-10-05	TX-2	d	10 APR 01
5	722-10-05	TX-5	d	10 APR 01

ARCHITECTURAL “DN-1”

9	722-10-05	AD-2	d	10 APR 01
16	722-10-05	AD-8	d	10 APR 01
45a	722-10-05	AD-38	d	10 APR 01

ARCHITECTURAL “COF-2”

207	722-10-05	AK-5	d	10 APR 01
211	722-10-05	AK-9	d	10 APR 01

4. The hour and date specified for receipt of Offers is extended. Offers are due May 31, 2001, 2:00 p.m. (Hawaii Standard Time).

SOLICITATION, OFFER, AND AWARD *(Construction, Alteration, or Repair)*	1. SOLICITATION NO.	2. TYPE OF SOLICITATION	3. DATE ISSUED	PAGE OF PAGES
	DACA83-01-R-0001	☐ SEALED BID *(IFB)* ☒ NEGOTIATED *(RFP)*	11/1/00	1

IMPORTANT - The "offer" section on the reverse must be fully completed by offeror.

4. CONTRACT NO.	5. REQUISITION/PURCHASE REQUEST NO.	6. PROJECT NO.

7. ISSUED BY CODE	8. ADDRESS OFFER TO
U. S. Army Engineer District, Honolulu Attn: CEPOH-CT-C Building 230 Fort Shafter, Hawaii 96858-5440	U. S. Army Engineer District, Honolulu Attn: CEPOH-CT-C Building 230 Fort Shafter, Hawaii 96858-5440 (Deliver hand-carried proposals to Building 200, Fort Shafter, Hawaii)

9. FOR INFORMATION CALL:	A. NAME	B. TELEPHONE NO. *(Include area code) (NO COLLECT CALLS)*
	Lynn Arakaki	(808)438-8564

SOLICITATION

NOTE: In sealed bid solicitations "offer" and "offeror" mean "bid" and "bidder".

10. THE GOVERNMENT REQUIRES PERFORMANCE OF THE WORK DESCRIBED IN THESE DOCUMENTS *(Title, identifying no., date):*

FY00 MCA PN 46902, Whole Barracks Renewal, Phase 2A, Schofield Barracks, Oahu, Hawaii

11. The Contractor shall begin performance within 7 calendar days and complete it within 1135 calendar days after receiving

☐ award, ☒ notice to proceed. This performance period is ☒ mandatory, ☐ negotiable. *(See* clause 52.211-10 *.)*

12A. THE CONTRACTOR MUST FURNISH ANY REQUIRED PERFORMANCE AND PAYMENT BONDS? *(If "YES," indicate within how may calendar days after award in Item 12B.)*	12B. CALENDAR DAYS
☒ YES ☐ NO	14

13. ADDITIONAL SOLICITATION REQUIREMENTS:

A. Sealed offers in original and 2 copies to perform the work required are due at the place specified in Item 8 by 2:00 pm HST *(hour)* local time 5/31/01 *(date).* If this is a sealed bid solicitation, offers will be publicly opened at that time. Sealed envelopes containing offers shall be marked to show the offeror's name and address, the solicitation number, and the date and time offers are due.

B. An offer guarantee ☒ is, ☐ is not required.

C. All offers are subject to the (1) work requirements, and (2) other provisions and clauses incorporated in the solicitation in full text or by reference.

D. Offers providing less than 90 calendar days for Government acceptance after the date offers are due will not be considered and will be rejected.

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Appendix A - Sample Small Business Subcontracting Plan

Appendix B - Price Breakdown

SECTION 00100 Instructions to Offerors

CLAUSES INCORPORATED BY FULL TEXT

52.204-6 DATA UNIVERSAL NUMBERING SYSTEM (DUNS) NUMBER (JUN 99)

(a) Contractor identification is essential for complying with statutory contract reporting requirements. Therefore, the offeror is requested to enter, in the block with its name and address on the Standard Form 33 or similar document, the annotation "DUNS" followed by the DUNS number which identifies the offeror's name and address exactly as stated in the offer.

(b) If the offeror does not have a DUNS number, it should contact Dun and Bradstreet directly to obtain one. A DUNS number will be provided immediately by telephone at no charge to the offeror. For information on obtaining a DUNS number, the offeror, if located within the United States, should call Dun and Bradstreet at 1-800-333-0505. The offeror should be prepared to provide the following information:

(1) Company name.

(2) Company address.

(3) Company telephone number.

(4) Line of business.

(5) Chief executive officer/key manager.

(6) Date the company was started.

(7) Number of people employed by the company.

(8) Company affiliation.

(c) Offerors located outside the United States may obtain the location and phone number of the local Dun and Bradstreet Information Services office from the Internet Home Page at http://www.customerservice@dnb.com/. If an offeror is unable to locate a local service center, it may send an e-mail to Dun and Bradstreet at globalinfo@dnb.com.
(End of provision)

252.204-7001 COMMERCIAL AND GOVERNMENT ENTITY (CAGE) CODE REPORTING (AUG 199)

(a) The offeror is requested to enter its CAGE code on its offer in the block with its name and address. The CAGE code entered must be for that name and address. Enter “CAGE” before the number.

(b) If the offeror does not have a CAGE code, it may ask the Contracting Officer to request one from the Defense Logistics Information Service (DLIS). The Contracting Officer will--

(1) Ask the Contractor to complete section B of a DD Form 2051, Request for Assignment of a Commercial and Government Entity (CAGE) Code;

(2) Complete section A and forward the form to DLIS; and

(3) Notify the Contractor of its assigned CAGE code.

(c) Do not delay submission of the offer pending receipt of a CAGE code.
(End of provision)

52.211-2 AVAILABILITY OF SPECIFICATIONS LISTED IN THE DOD INDEX OF SPECIFICATIONS AND STANDARDS (DODISS) AND DESCRIPTIONS LISTED IN THE ACQUISITION MANAGEMENT SYSTEMS AND DATA REQUIREMENTS CONTROL LIST, DOD 5010.12-L (DEC 1999)

Copies of specifications, standards, and data item descriptions cited in this solicitation may be obtained--

(a) From the ASSIST database via the Internet at http://assist.daps.mil; or

(b) By submitting a request to the--Department of Defense Single Stock Point (DoDSSP), Building 4, Section D, 700 Robbins Avenue, Philadelphia, PA 19111-5094, Telephone (215) 697-2667/2179, Facsimile (215) 697-1462.
(End of provision)

52.211-14 NOTICE OF PRIORITY RATING FOR NATIONAL DEFENSE USE (SEP 1990)

Any contract awarded as a result of this solicitation will be ____ DX rated order; __X__ DO rated order certified for national defense use under the Defense Priorities and Allocations System (DPAS) (15 CFR 700), and the Contractor will be required to follow all of the requirements of this regulation. [Contracting Officer check appropriate box.]
(End of clause)

52.215-1 INSTRUCTIONS TO OFFERORS--COMPETITIVE ACQUISITION (FEB 2000)

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

“Discussions” are negotiations that occur after establishment of the competitive range that may, at the Contracting Officer's discretion, result in the offeror being allowed to revise its proposal.

“In writing or written” means any worded or numbered expression which can be read, reproduced, and later communicated, and includes electronically transmitted and stored information.

“Proposal modification” is a change made to a proposal before the solicitation's closing date and time, or made in response to an amendment, or made to correct a mistake at any time before award.

“Proposal revision” is a change to a proposal made after the solicitation closing date, at the request of or as allowed by a Contracting Officer as the result of negotiations.

“Time”, if stated as a number of days, is calculated using calendar days, unless otherwise specified, and will include Saturdays, Sundays, and legal holidays. However, if the last day falls on a Saturday, Sunday, or legal holiday, then the period shall include the next working day.

(b) Amendments to solicitations. If this solicitation is amended, all terms and conditions that are not amended remain unchanged. Offerors shall acknowledge receipt of any amendment to this solicitation by the date and time specified in the amendment(s).

(c) Submission, modification, revision, and withdrawal of proposals. (1) Unless other methods

(e.g., electronic commerce or facsimile) are permitted in the solicitation, proposals and modifications to proposals shall be submitted in paper media in sealed envelopes or packages (i) addressed to the office specified in the solicitation, and (ii) showing the time and date specified for receipt, the solicitation number, and the name and address of the offeror. Offerors using commercial carriers should ensure that the proposal is marked on the outermost wrapper with the information in paragraphs (c)(1)(i) and (c)(1)(ii) of this provision.

(2) The first page of the proposal must show--

(i) The solicitation number;

(ii) The name, address, and telephone and facsimile numbers of the offeror (and electronic address if available);

(iii) A statement specifying the extent of agreement with all terms, conditions, and provisions included in the solicitation and agreement to furnish any or all items upon which prices are offered at the price set opposite each item;

(iv) Names, titles, and telephone and facsimile numbers (and electronic addresses if available) of persons authorized to negotiate on the offeror's behalf with the Government in connection with this solicitation; and

(v) Name, title, and signature of person authorized to sign the proposal. Proposals signed by an agent shall be accompanied by evidence of that agent's authority, unless that evidence has been previously furnished to the issuing office.

(3) Submission, modification, or revision, of proposals.

(i) Offerors are responsible for submitting proposals, and any modifications, or revisions, so as to reach the Government office designated in the solicitation by the time specified in the solicitation. If no time is specified in the solicitation, the time for receipt is 4:30 p.m., local time, for the designated Government office on the date that proposal or revision is due.

(ii)(A) Any proposal, modification, or revision received at the Government office designated in the solicitation after the exact time specified for receipt of offers is “late” and will not be considered unless it is received before award is made, the Contracting Officer determines that accepting the late offer would not unduly delay the acquisition; and--

(1) If it was transmitted through an electronic commerce method authorized by the solicitation, it was received at the initial point of entry to the Government infrastructure not later than 5:00 p.m. one working day prior to the date specified for receipt of proposals; or

(2) There is acceptable evidence to establish that it was received at the Government installation designated for receipt of offers and was under the Government's control prior to the time set for receipt of offers; or

(3) It is the only proposal received.

(B) However, a late modification of an otherwise successful proposal that makes its terms more favorable to the Government, will be considered at any time it is received and may be accepted.

(iii) Acceptable evidence to establish the time of receipt at the Government installation includes the time/date stamp of that installation on the proposal wrapper, other documentary evidence of receipt maintained by the installation, or oral testimony or statements of Government personnel.

(iv) If an emergency or unanticipated event interrupts normal Government processes so that proposals cannot be received at the office designated for receipt of proposals by the exact time specified in the solicitation, and urgent Government requirements preclude amendment of the solicitation, the time specified for receipt of proposals will be deemed to be extended to the same time of day specified in the solicitation on the first work day on which normal Government processes resume.

(v) Proposals may be withdrawn by written notice received at any time before award. Oral proposals in response to oral solicitations may be withdrawn orally. If the solicitation authorizes facsimile proposals, proposals may be withdrawn via facsimile received at any time before award, subject to the conditions specified in the provision at 52.215-5, Facsimile Proposals. Proposals may be withdrawn in person by an offeror or an authorized representative, if the identity of the person requesting withdrawal is established and the person signs a receipt for the proposal before award.

(4) Unless otherwise specified in the solicitation, the offeror may propose to provide any item or combination of items.

(5) Offerors shall submit proposals in response to this solicitation in English, unless otherwise permitted by the solicitation, and in U.S. dollars, unless the provision at FAR 52.225-17, Evaluation of Foreign Currency Offers, is included in the solicitation.

(6) Offerors may submit modifications to their proposals at any time before the solicitation closing date and time, and may submit modifications in response to an amendment, or to correct a mistake at any time before award.

(7) Offerors may submit revised proposals only if requested or allowed by the Contracting Officer.

(8) Proposals may be withdrawn at any time before award. Withdrawals are effective upon receipt of notice by the Contracting Officer.

(d) Offer expiration date. Proposals in response to this solicitation will be valid for the number of days specified on the solicitation cover sheet (unless a different period is proposed by the offeror).

(e) Restriction on disclosure and use of data. Offerors that include in their proposals data that they do not want disclosed to the public for any purpose, or used by the Government except for evaluation purposes, shall--

(1) Mark the title page with the following legend: This proposal includes data that shall not be disclosed outside the Government and shall not be duplicated, used, or disclosed--in whole or in part--for any purpose other than to evaluate this proposal. If, however, a contract is awarded to this offeror as a result of--or in connection with-- the submission of this data, the Government shall have the right to duplicate, use, or disclose the data to the extent provided in the resulting contract. This restriction does not limit the Government's right to use information contained in this data if it is obtained from another source without restriction. The data subject to this restriction are contained in sheets [insert numbers or other identification of sheets]; and

(2) Mark each sheet of data it wishes to restrict with the following legend: Use or disclosure of data contained on this sheet is subject to the restriction on the title page of this proposal.

(f) Contract award. (1) The Government intends to award a contract or contracts resulting from this solicitation to the responsible offeror(s) whose proposal(s) represents the best value after evaluation in accordance with the factors and subfactors in the solicitation.

(2) The Government may reject any or all proposals if such action is in the Government's interest.

(3) The Government may waive informalities and minor irregularities in proposals received.

(4) The Government intends to evaluate proposals and award a contract without discussions with offerors (except clarifications as described in FAR 15.306(a)). Therefore, the offeror's initial proposal should contain the offeror's best terms from a cost or price and technical standpoint. The Government reserves the right to conduct discussions if the Contracting Officer later determines them to be necessary. If the Contracting Officer determines that the number of proposals that would otherwise be in the competitive range exceeds the number at which an efficient competition can be conducted, the Contracting Officer may limit the number of proposals in the competitive range to the greatest number that will permit an efficient competition among the most highly rated proposals.

(5) The Government reserves the right to make an award on any item for a quantity less than the quantity offered, at the unit cost or prices offered, unless the offeror specifies otherwise in the proposal.

(6) The Government reserves the right to make multiple awards if, after considering the additional administrative costs, it is in the Government's best interest to do so.

(7) Exchanges with offerors after receipt of a proposal do not constitute a rejection or counteroffer by the Government.

(8) The Government may determine that a proposal is unacceptable if the prices proposed are materially unbalanced between line items or subline items. Unbalanced pricing exists when, despite an acceptable total evaluated price, the price of one or more contract line items is significantly overstated or understated as indicated by the application of cost or price analysis techniques. A proposal may be rejected if the Contracting Officer determines that the lack of balance poses an unacceptable risk to the Government.

(9) If a cost realism analysis is performed, cost realism may be considered by the source selection authority in evaluating performance or schedule risk.

(10) A written award or acceptance of proposal mailed or otherwise furnished to the successful offeror within the time specified in the proposal shall result in a binding contract without further action by either party.

(11) The Government may disclose the following information in postaward debriefings to other offerors:

(i) The overall evaluated cost or price and technical rating of the successful offeror;

(ii) The overall ranking of all offerors, when any ranking was developed by the agency during source selection;

(iii) A summary of the rationale for award; and

(iv) For acquisitions of commercial items, the make and model of the item to be delivered by the successful offeror.

(End of provision)

52.216-1 TYPE OF CONTRACT (APR 1984)

The Government contemplates award of a firm fixed price contract resulting from this solicitation.
(End of clause)

52.219-24 SMALL DISADVANTAGED BUSINESS PARTICIPATION PROGRAM--TARGETS (OCT 2000)

(a) This solicitation contains a source selection factor or subfactor related to the participation of small disadvantaged business (SDB) concerns in the contract. Credit under that evaluation factor or subfactor is not available to an SDB concern that qualifies for a price evaluation adjustment under the clause at FAR 52.219-23, Notice of Price Evaluation Adjustment for Small Disadvantaged Business Concerns, unless the SDB concern specifically waives the price evaluation adjustment.

(b) In order to receive credit under the source selection factor or subfactor, the offeror must provide, with its offer, targets, expressed as dollars and percentages of total contract value, for SDB participation in any of the North American Industry Classification System (NAICS Industry Subsectors as determined by the Department of Commerce. The targets may provide for participation by a prime contractor, joint venture partner, teaming arrangement member, or subcontractor; however, the targets for subcontractors must be listed separately.
(End of provision)

52.222-23 NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION TO ENSURE EQUAL EMPLOYMENT OPPORTUNITY FOR CONSTRUCTION (FEB 1999)

(a) The offeror's attention is called to the Equal Opportunity clause and the Affirmative Action Compliance Requirements for Construction clause of this solicitation.

(b) The goals for minority and female participation, expressed in percentage terms for the Contractor's aggregate workforce in each trade on all construction work in the covered area, are as follows:

Goals for minority participation for each trade	Goals for female participation for each trade
69.1%	6.9%

These goals are applicable to all the Contractor's construction work performed in the covered area. If the Contractor performs construction work in a geographical area located outside of the covered area, the Contractor shall apply the goals established for the geographical area where the work is actually performed. Goals are published periodically in the Federal Register in notice form, and these notices may be obtained from any Office of Federal Contract Compliance Programs office.

(c) The Contractor's compliance with Executive Order 11246, as amended, and the regulations in 41 CFR 60-4 shall be based on (1) its implementation of the Equal Opportunity clause, (2) specific affirmative action obligations required by the clause entitled "Affirmative Action Compliance Requirements for Construction," and (3) its efforts to meet the goals. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade. The Contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor, or from project to project, for the sole purpose of meeting the Contractor's goals shall be a violation of the contract, Executive Order 11246, as amended, and the regulations in 41 CFR 60-4. Compliance with the goals will be measured against the total work hours performed.

(d) The Contractor shall provide written notification to the Deputy Assistant Secretary for Federal Contract Compliance, U.S. Department of Labor, within 10 working days following award of any construction subcontract in excess of $10,000 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the --

(1) Name, address, and telephone number of the subcontractor;

(2) Employer's identification number of the subcontractor;

(3) Estimated dollar amount of the subcontract;

(4) Estimated starting and completion dates of the subcontract; and

(5) Geographical area in which the subcontract is to be performed.

(e) As used in this Notice, and in any contract resulting from this solicitation, the "covered area" is Schofield Barracks, Oahu, Hawaii.

52.225-12 NOTICE OF BUY AMERICAN ACT/BALANCE OF PAYMENTS PROGRAM REQUIREMENT-- CONSTRUCTION MATERIALS UNDER TRADE AGREEMENTS (FEB 2000)

(a) Definitions. Construction material, designated country construction material, domestic construction material, foreign construction material, and NAFTA country construction material, as used in this provision, are defined in the clause of this solicitation entitled “Buy American Act--Balance of Payments Program--Construction Materials under Trade Agreements” (Federal Acquisition Regulation (FAR) clause 52.225-11).

(b) Requests for determination of inapplicability. An offeror requesting a determination regarding the inapplicability of the Buy American Act or Balance of Payments Program should submit the request to the Contracting Officer in time to allow a determination before submission of offers. The offeror shall include the information and applicable supporting data required by paragraphs (c) and (d) of FAR clause 52.225-11 in the request. If an offeror has not requested a determination regarding the inapplicability of the Buy American Act or Balance of Payments Program before submitting its offer, or has not received a response to a previous request, the offeror shall include the information and supporting data in the offer.

(c) Evaluation of offers. (1) The Government will evaluate an offer requesting exception to the requirements of the Buy American Act or Balance of Payments Program, based on claimed unreasonable cost of domestic construction materials, by adding to the offered price the appropriate percentage of the cost of such foreign construction material, as specified in paragraph (b)(4)(i) of FAR clause 52.225-11.

(2) If evaluation results in a tie between an offeror that requested the substitution of foreign construction material based on unreasonable cost and an offeror that did not request an exception, the Contracting Officer will award to the offeror that did not request an exception based on unreasonable cost.

(d) Alternate offers. (1) When an offer includes foreign construction material, other than designated country or NAFTA country construction material, that is not listed by the Government in this solicitation in paragraph (b)(3) of FAR clause 52.225-11, the offeror also may submit an alternate offer based on use of equivalent domestic, designated country, or NAFTA country construction material.

(2) If an alternate offer is submitted, the offeror shall submit a separate Standard Form 1442 for the alternate offer, and a separate price comparison table prepared in accordance with

paragraphs (c) and (d) of FAR clause 52.225-11 for the offer that is based on the use of any foreign construction material for which the Government has not yet determined an exception applies.

(3) If the Government determines that a particular exception requested in accordance with paragraph (c) of FAR clause 52.225-11 does not apply, the Government will evaluate only those offers based on use of the equivalent domestic, designated country, or NAFTA country construction material, and the offeror shall be required to furnish such domestic, designated country, or NAFTA country construction material. An offer based on use of the foreign construction material for which an exception was requested--

(i) Will be rejected as nonresponsive if this acquisition is conducted by sealed bidding; or

(ii) May be accepted if revised during negotiations.
(End of provision)

52.233-2 SERVICE OF PROTEST (AUG 1996)

(a) Protests, as defined in section 33.101 of the Federal Acquisition Regulation, that are filed directly with an agency, and copies of any protests that are filed with the General Accounting Office (GAO), shall be served on the Contracting Officer (addressed as follows) by obtaining written and dated acknowledgment of receipt from:

U.S. Army Engineer District, Honolulu
Corps of Engineers, Bldg 230
ATTN: Directorate of Contracting, CEPOH-CT
Fort Shafter, HI 96858-5440

(b) The copy of any protest shall be received in the office designated above within one day of filing a protest with the GAO.
(End of provision)

52.236-27 SITE VISIT (CONSTRUCTION) (FEB 1995) – ALTERNATE I (FEB 1995)

(a) The clauses at 52.236-2, Differing Site Conditions, and 52.236-3, Site Investigations and Conditions Affecting the Work, will be included in any contract awarded as a result of this solicitation. Accordingly, offerors or quoters are urged and expected to inspect the site where the work will be performed.

(b) An organized site visit has been scheduled for January 10, 2001, 9:00 a.m. Identify facilities that you would like access to; arrangements will be made to accommodate your request as much as possible. Please furnish your request by December 4, 2000 to the address in S-36.4, Pre-Proprosal Conference.

(c) Participants will meet at Quad K, Building 860, Schofield Barracks, Hawaii.

52.236-28 PREPARATION OF PROPOSALS--CONSTRUCTION (OCT 1997)

(a) Proposals must be (1) submitted on the forms furnished by the Government or on copies of those forms, and (2) manually signed. The person signing a proposal must initial each erasure or change appearing on any proposal form.

(b) The proposal form may require offerors to submit proposed prices for one or more items on various bases, including--

(1) Lump sum price;

(2) Alternate prices;

(3) Units of construction; or

(4) Any combination of paragraphs (b)(1) through (b)(3) of this provision.

(c) If the solicitation requires submission of a proposal on all items, failure to do so may result in the proposal being rejected without further consideration. If a proposal on all items is not required, offerors should insert the words “no proposal” in the space provided for any item on which no price is submitted.

(d) Alternate proposals will not be considered unless this solicitation authorizes their submission. (End of provision)

S-36.4 PRE-PROPOSAL CONFERENCE (JUL 1995)

a. A pre-proposal conference will be conducted by the Government on January 10, 2001 starting at 1:00 p.m. at Building 230, Room 322, Fort Shafter, Hawaii. All planholders (prime contractors, subcontractors, and suppliers) are urged to attend this conference. Planholders who plan to attend should notify the Government of the number of attendees by January 2, 2001. Notification can be made as follows:

(1) Facsimile: (808) 438-8588
Point of Contact: Lynn Arakaki

(2) Mail: U.S. Army Engineer District, Honolulu
Corps of Engineers, Bldg 230
ATTN: CEPOH-CT-C (Lynn Arakaki)
Fort Shafter, Hawaii 96858-5440

b. Any questions planholders may have concerning the project, plans, or specifications should be submitted in writing, on letterhead stationery, sufficiently in advance of the conference, to permit preparation of answers, which will be provided at the conference. The questions should be faxed as soon as possible, and followed by an original through mail. Use the facsimile number and address shown in paragraph a. above. During the conference, written, signed questions will be accepted, and will be answered during the conference if time permits.

c. Questions raised by planholders and answers provided by the Government, will be furnished to all planholders. However, any answer, clarification, or explanation given at the conference will not qualify or change the terms of the request for proposal (including the plans and specifications). Unless the request for proposal is amended in writing, it will remain unchanged. If an amendment to the request for proposal is issued as a result of the conference, normal procedures relating to issuance and acknowledgement of receipt will apply.

d. All costs incurred to attend and participate in the pre-proposal conference and any site visits (see paragraph e. below) will be at the expense of the planholder. This includes, but is not limited to, the cost of transportation, per diem, and hotel accommodations.

e. Refer to provision entitled SITE VISIT (CONSTRUCTION) in Section 00100 for information on the pre-proposal site visit.

[End of Statement]

S-36.2 MAGNITUDE OF THE PROPOSED PROJECT [FAR 36.204]

(a) Physical Characteristics:

Work will consist of the construction of two multi-story barracks for 400 soldiers (approximately 130,000 sf), a soldiers community building (approximately 17,000 sf), six company operations buildings (approximately 96,000 sf), two battalion headquarters buildings (approximately 31,000 sf), remote switching building (approximately 1,000 sf), dining facility for 1,300 soldiers, training building (approximately 13,000 sf), central chill/hot water plant, roads, parking, utilities, landscaping and associated appurtenances.

(b) Estimated Price Range: The estimated price range of this work is between $25,000,000.00 and $100,000,000.00.

[End of Statement]

~~S-3 PRE-AWARD INFORMATION~~

~~Each bidder or offeror shall, upon request of the contracting officer, furnish information on whether he is now or ever has been engaged in any work similar to that covered by the specifications herein, the dollar value thereof, the year in which such work was performed, and the manner of its execution, and giving such other information as will tend to show the bidder's or offeror's ability to prosecute the required work. The 'such other information' referred to above shall include but is not limited to the following:~~

~~a. The name and address of the office or firm under which such similar work was performed.~~

~~b. A list of key personnel available for the instant project and their qualifications.~~

~~c. A copy of bidder's or offeror's last three (3) financial statements, including the names of banks or other financial institutions with which the bidder or offeror conducts business. If the latest financial statement is more than 60 days old, a certificate should be attached stating that the financial condition is substantially the same, or if not the same, the changes that have taken place. Such statement will be treated as confidential.~~

~~d. A list of present commitments, including the dollar value thereof, and name of office under which the work is being performed.~~

~~[End of Statement]~~

S-28.3 PENAL SUM AND FORM OF OFFER GUARANTEE

(Applicable to offers exceeding $100,000)
Each offeror shall submit with its offer a separate offer guarantee using Standard Form 24, Bid Bond, with good and sufficient surety or sureties acceptable to the Government, or other security as provided in the clause entitled OFFER GUARANTEE in the CONTRACT CLAUSES section. This security shall be in the form of twenty percent (20%) of the offered price or three million dollars ($3,000,000), whichever is less. The penal sum of the bond may be expressed in terms of a percentage of the offered price or may be expressed in dollars and cents.

Failure to submit a offer guarantee by the time and date set for receipt of proposals may be cause for rejection of a proposal, except as provided in provision 52.215-1, Instructions to Offerors--Competitive Acquisition.

[End of Statement]

S-2 ASBESTOS ABATEMENT (AUG 1996)

Asbestos abatement is part of the scope of work for the proposed contract. Refer to paragraphs entitled, "ASBESTOS --- (OCCUPATIONAL HEALTH AND ENVIRONMENTAL)" in Section 00800 and applicable sections of the technical specifications and drawings. The Contractor shall inform responsible representatives of their insurer(s)/surety(ies) that asbestos abatement is required for the proposed contract.

[End of Statement]

S-19.3 SMALL DISADVANTAGED BUSINESS GOAL FOR SMALL BUSINESS SUBCONTRACTING PLAN

When a small business subcontracting plan is required by FAR clause entitled, “SMALL BUSINESS SUBCONTRACTING PLAN”, the minimum goal that will be accepted for subcontracting with Small Disadvantaged Business is five percent (5%).

[End of Statement]

S-19.1 APPROVAL OF SUBCONTRACTING PLAN

If the Contract Clause in this solicitation entitled "Small Business Subcontracting Plan" or its Alternate I or II applies, no award will be made until the subcontracting plan under the stated clause is approved. See sample Small Business Subcontracting Plan at Appendix A.

[End of Statement]

PRICE BREAKDOWN OF PROPOSAL SCHEDULE

An original and a copy of the offeror’s price breakdown in the format as set forth in Appendix B of this section shall be submitted with the offeror’s proposal schedule.

EVALUATION FACTORS FOR AWARD

I. GENERAL:

1.1 Cost of Preparing Proposals: The Government will not reimburse any Offeror its costs incurred in submitting an offer in response to this solicitation.

1.2 Inquires: Address all inquiries regarding this Request for Proposals to:

U.S. Army Engineer District, Honolulu
Attn: Ms. Lynn Arakaki (CEPOH-CT-C)
Building S-200
Fort Shafter, Hawaii 96858-5440
Phone No. (808) 438-8564
Fax No. (808) 438-8588
E-Mail: lynn.arakaki@usace.army.mil

1.3 Proposal submission and sequence of evaluation:

1.3.1 The Government will evaluate offers in accordance with the NON-PRICE EVALUATION FACTORS (the technical proposal) and the offeror’s price, as set forth in this Provision.

1.3.2 During proposal evaluation, the NON-PRICE EVALUATION FACTORS will be evaluated by a Source Evaluation Board (SEB) utilizing an adjectival rating method described below.

1.3.2.1 Rating Method.

1.3.2.1.1 TECHNICAL MERIT. The following adjectival rating and description will be used to rate each non-price evaluation factor, except Past Performance :

1.3.2.1.1.1 Excellent: The proposal is outstanding; proposal demonstrates excellent understanding of requirements and greatly exceeds the Government's minimum requirements. Offeror's proposed capability or proposed effort is of the highest quality and thoroughly justified or substantiated. Total internal consistency and no incompatibility with other portions of proposed efforts. Proposal has significant strength(s) in meeting the Request for Proposal (RFP) requirements, which is not offset by a weakness(es).

1.3.2.1.1.2 Highly Acceptable: Proposal is good; proposal demonstrates good understanding of requirements and exceeds the Government's minimum requirements. Offeror's proposed capability or proposed effort is high quality and well justified or substantiated. No or very minor inconsistencies or incompatibilities with other portions of proposed efforts. Proposal has a strength(s) in meeting the requirements of the RFP, which is not offset by a weakness(es) or has only minor weakness(es).

1.3.2.1.1.3 Acceptable: Proposal is acceptable; proposal demonstrates acceptable understanding of requirements and meets the Government's minimum requirements. Offeror's proposed capability or proposed effort is of an acceptable level of quality and justified or substantiated. No significant inconsistencies or incompatibilities with other portions of proposed efforts. Proposal may have a strength(s) in meeting the requirements of the RFP and/or may have a weakness(es).

1.3.2.1.1.4 Marginal: Proposal is susceptible for improvement; proposal demonstrates shallow understanding of requirements; Government's minimum requirements are not met. Insufficient evidence that offeror's proposed capability or proposed effort is of an acceptable level of quality. Inconsistencies and incompatibilities with other portions of the proposal exist. Proposal may have a strength(s) in meeting the requirements of the RFP; however, they are offset by either significant weakness(es), and deficiency(ies). Although a major rewrite is not required, substantial revisions are required to correct weakness(es) and deficiency(ies) to make the proposal acceptable.

1.3.2.1.1.5 Unacceptable: Proposal is unacceptable; Government's minimum requirements are not met and substantial effort would be required to meet the Government's minimum requirements. The Offeror's proposal lacks evidence of capability to perform proposed effort. Numerous major inconsistencies, weaknesses, and significant deficiency(ies). Proposal has minimal or no chance of success; correction would require extensive revision, a major rewrite, to be rated as acceptable.

1.3.2.1.2 PROPOSAL RISK. Each non-price evaluation factor, except Past Performance, will be evaluated for degree of risk and will be rated using the following ratings and descriptions:

1.3.2.1.2.1 LOW: Any proposal weaknesses have little potential to cause disruption of schedule, increase in cost, or degradation of performance. Normal contractor effort and normal Government monitoring will probably minimize any difficulties.

1.3.2.1.2.2 MODERATE: Proposal has weaknesses that can potentially cause some disruption of schedule, increase in cost, or degradation of performance. However, special contractor emphasis and close Government monitoring will probably minimize difficulties.

1.3.2.1.2.3 HIGH: Proposal has weaknesses that have the potential to cause serious disruption of schedule, increase in cost, or degradation of performance even with special contractor emphasis and close Government monitoring.

1.3.2.1.3 PERFORMANCE RISK. Past performance will be rated using the following adjectival ratings and definitions:

1.3.2.1.3.1 Very Low Risk: Offeror's past performance record provides essentially no doubt that the offeror will successfully perform the required effort.

1.3.2.1.3.2 Low Risk: Offeror's past performance record provides little doubt that the offeror will successfully perform the required effort.

1.3.2.1.3.3 Moderate Risk: Offeror's past performance record provides some doubt that the offeror will successfully perform the required effort.

1.3.2.1.3.4 High Risk: Offeror's past performance record provides substantial doubt that the offeror will successfully perform the required effort.

1.3.2.1.3.5 Very High Risk: Offeror's past performance record provides extreme doubt that the offeror will successfully perform the required effort.

1.3.2.1.3.6 Neutral Risk: The offeror has no relevant performance record. The offeror has not provided past performance information and/or Government was unable to find any past performance information.

1.3.3 The Offeror's price proposal will not be scored, but will be evaluated, separately from the offeror's technical proposal. The Government shall compare the competing prices proposed by all the offerors, together with the Government's Estimate, to establish price reasonableness. Cost analysis will not likely be performed under this solicitation, however, the offerors' price breakdown will be evaluated. Each offer's price proposal will be considered approximately equally weighted to the offeror's technical proposal.

1.3.4 Upon completion of separate evaluation of all technical and price proposals, the SEB will then evaluate each Offeror's technical and price proposal together, determining the relative strengths, deficiencies, significant weaknesses and risks that each total proposal presents to the Government. The Government will make award to the Offeror whose proposal represents the best value to the government, considering both price and non-price factors. In its evaluation of all the offers, the Government will weight price and technical offers

approximately equally, but may give greater consideration to technical factors when price offers tend to be equal and may give greater consideration to price when technical offers tend to be equal.

1.3.5 Upon completion of evaluation of all proposals and their ranking, the Contracting Officer will, in accordance with the provisions of this solicitation and applicable acquisition regulations, proceed to award without discussions. Offerors are advised that the Government intends to award without discussions. However, if discussions are determined to be necessary, the Contracting Officer will establish a competitive range and conduct discussions with those Offerors within the competitive range. Upon conclusion of discussions, if necessary, the Contracting Officer will request final proposal revisions from the Offerors remaining in the competitive range and may, upon receipt of final proposal revisions, proceed to award a contract without further discussions or notice.

2. PROPOSAL SUBMISSION REQUIREMENTS

2.1 General Requirements for Proposals:

2.1.1 Submission requirements for proposals.

2.1.1.1 Technical Proposals:

Submit one (1) original proposal and four (4) copies, in the format for Technical Proposals as set forth in this Provision.

2.1.1.2 Price Proposals:

2.1.1.2.1 Complete and submit one (1) original and two (2) copies of Section 00010, the Price Proposal Schedule, which is found in this solicitation.

2.1.1.2.2 Submit one (1) original and one (1) copy of the Offeror's Price Breakdown in the format as set forth in Appendix B to Section 00100. Indicate on the Price Breakdown whether or not Facilities Capital Cost of Money is included in the contractor's costs of performing the work. Proposals that state that Facilities Capital Cost of Money is not included in the contractor's costs of performing the work—or proposals that don't state anything at all about Facilities Capital Cost of Money—will be deemed to have waived Facilities Capital Cost of Money.

2.1.1.2.3 Submit with the Price Proposal:

2.1.1.2.3.1 One (1) original and two (2) copies of the Offeror's completed Standard Form (SF) 1442, using a printed copy of the SF 1442 that has been issued under this solicitation;

2.1.1.2.3.2 One (1) copy (certified as a true copy) of the Offeror's executed joint venture agreement (if the Offeror is a joint venture);

2.1.1.2.3.3 One (1) copy of the Offeror's completed Section 00600, Representations and Certifications, using a printed copy of Section 00600 that has been issued under this solicitation; and

2.1.1.2.3.4 One (1) copy of the Offeror's completed (if applicable) SF LLL, Disclosure of Lobbying Activities, using a printed copy of the SF LLL which is found in Appendix A to Section 00600.

2.1.1.2.3.5 One (1) copy of the Offeror's Small Business Subcontracting Plan if the Offeror is a large business concern. A sample plan can be found in Appendix A to Section 00100.

2.2 Format Requirements for Proposals:

2.2.1 Any information, presented with a proposal that an Offeror wants to have safeguarded from disclosure to other parties must be identified and labeled in accordance with the requirements of Provision "52.215-1, Instructions to Offerors—Competitive Acquisition (Feb 2000)," subparagraph (e), which is found in Section 00100 of this solicitation. The Government will endeavor to honor the restrictions against release requested by Offerors, to the extent permitted under United States law and regulations.

2.2.2 Prepare proposals in the English language.

2.2.3 Type or print all information presented in the proposal, to the extent possible. Use clear, simple English letters and numbers. Laser printer-quality printing is adequate for the proposals. Elaborate calligraphy is not desired. Do not use size printing or typing less than 10 pitch (United States). Use black characters on white paper as much as possible. Color should be used for clarity, not for purposes of decoration. Do not use colors that do not reproduce legibly using standard office or commercial facsimile or copying machines. Prepare technical proposals on standard (United States), letter-sized (8.5 x 11 inches) or substantially similar international/metric-sized pages. Use only one side of the page. Use non-glossy paper of good weight and quality. Expensive or elaborate paper stock is not desired.

2.2.4 Submit proposal packages to the US Army Corps of Engineers ("the Government") as shown in Block 8 of Standard Form 1442.

2.2.5 Proposals received by the Government after the date and time set for receipt of proposals will be handled in accordance with the requirements of Provision "52.215-1, Instructions to Offerors—Competitive Acquisition (Feb 2000)," subparagraph (c), found in Section 00100.

2.3 Specific Requirements for Technical Proposals:

2.3.1 Submit technical proposals in a narrative format, organized and titled so that each section of the proposal follows the order and format of the factors and subfactors set forth below in paragraph 4. "Technical Evaluation Factors and Submission Requirements."

2.3.2 Information presented in the technical proposal should be sufficiently detailed in order to clearly describe how the technical proposal addresses the technical proposal evaluation factors. Professional looking and well organized (as opposed to poorly prepared and haphazardly organized) proposals will likely be considered to reflect more favorably on the capabilities of the Offeror; however, it is not the Government's intent to require elaborate "magazine-style" proposals. It is not necessary, nor desired, that Offerors prepare elaborate or lengthy proposals.

2.3.3 There is no limit to the size of technical proposals, or the amount of information that may be submitted to the Government. However, information should be concisely presented, to the extent possible. Information presented should be organized so as to pertain to only the evaluation factor or subfactor in which section the information is presented. Information pertaining to more than one evaluation factor or subfactor should be repeated for each factor or subfactor.

2.3.4 The proposal must set forth full, accurate, and complete information as required by this solicitation. The Government will rely on such information in the award of a

contract. By submission of an offer, the Offeror agrees that all items in its proposal (key managerial and technical home office and on-site personnel, subcontractors, targets for utilization of eligible SDB concerns, etc.) will be used throughout the duration of the contract and any substitutions of items will require prior approval by the Contracting Officer.

3. RELATIVE WEIGHTS OF TECHNICAL EVALUATION FACTORS

3.1 When the technical proposal is evaluated as a whole, Evaluation Factor (1) is greater in weight than Evaluation Factor (2) and Evaluation Factor (3). Evaluation Factor (2) is greater in weight than Evaluation Factor (3).

3.1.1 Evaluation Factor (1) - Past Performance/Experience. Subfactor (1)(a) is greater in weight than Subfactor (1)(b).

3.1.2 Evaluation Factor (2) - Personnel experience, qualifications and organization. Subfactor (2)(a) is greater in weight than Subfactor (2)(b).

3.1.3 Evaluation Factor (3) - Small Business Program. Subfactor (3)(a) and Subfactor (3)(b) are equally weighted. Subfactor (3)(c) is greater in weight than Subfactor (3)(a) and Subfactor (3)(b). Subfactors (3)(c)(1), (3)(c)(2), and (3)(c)(3) are equally weighted.

4. TECHNICAL EVALUATION FACTORS AND SUBMISSION REQUIREMENTS

4.1 Evaluation Factor (1) - Past Performance/Experience

4.1.1 Subfactor (1)(a) - Offeror's past performance history in completing projects of similar scope, dollar value, and complexity during the past 5 years.

4.1.1.1 Submission Requirements for Evaluation Subfactor (1)(a) – Provide the following for each applicable project (including projects with the Federal, State, and Municipal Governments and private industry):

4.1.1.1.1 Contract Number, Project Description and Location,

4.1.1.1.2 Contracting Officer/Owner's Point of Contact, Telephone Number,

4.1.1.1.3 Original Contract Amount,

4.1.1.1.4 Final Contract Amount,

4.1.1.1.5 Final Completion Date (as established by contract modifications),

4.1.1.1.6 Actual Completion Date (date work accepted by Government or customer),

4.1.1.1.7 Estimated Percentage of Actual Construction Work that the Prime Contractor and its employees performed on the project,

4.1.1.1.8 Interim or Final Performance evaluation (if customer was the Federal Government, submit Standard Form 1420),

4.1.1.1.9. Letters of Appreciation/Commendation and Awards. Letters or other communications generated specifically for purposes of this solicitation may not be given as much weight as evaluations and other communications that are generated in the ordinary course of business.

4.1.1.1.10 Offerors that report an adverse or unfavorable interim or final performance evaluation should attach a narrative that explains, rebuts or describes lessons learned from the adverse or unfavorable evaluation.

4.1.1.1.11 If the Offeror proposes to subcontract part of the work, provide the same information as required above for Offeror's proposed subcontractors. This applies to any subcontractor which the offeror expects to perform more than 20 percent of the work under the contract, in terms of the relation of the subcontractor's price of doing the work compared to the offeror's overall cost of doing the work. Regardless of the percentage of the work they may undertake, the evaluation factor also applies to any electrical, mechanical, sheet metal roofing, structural steel, or masonry subcontractor.

4.1.1.1.12 For each completed project which the Offeror identifies as an example of past performance, describe the completed project's past performance relevance to the current, proposed project in terms of the Offeror's proposed use of the same key management personnel and subcontractors (including the proposed use of the same key personnel for subcontractors and the use of any same lower tier subcontractors).

4.1.1.2 The information provided by the Offeror will provide the major portion of the information used in the Government's evaluation for past performance. The Government may use other sources to assess past performance information such as the Construction Contractor Appraisal Support System (CCASS) and inquiries with previous customers/owners.

4.1.2 Subfactor (1)(b) - Offeror's experience in completing projects of similar scope, dollar value, and complexity in the past 5 years.

4.1.2.1 Submission Requirements for Evaluation Subfactor (1)(b) -

4.1.2.1.1 Describe projects of similar scope, dollar value, and complexity, on-going or completed within the past 5 years.

4.1.2.1.2 State why or how the Offeror's experience with the described projects is relevant to the Offeror's expectation of successful completion of this project.

4.1.2.1.3 If the Offeror proposes to subcontract part of the work, provide the same information as required above for the proposed subcontractors. This applies to any subcontractor which the offeror expects to perform more than 20 percent of the work under the contract, in terms of the relation of the subcontractor's price of doing the work compared to the offeror's overall cost of doing the work. Regardless of the percentage of the work they may undertake, the evaluation factor also applies to any electrical, mechanical, sheet metal roofing, structural steel, or masonry subcontractor.

4.2 Evaluation Factor (2) – Personnel experience, qualifications and organization.

4.2.1 Subfactor (2)(a) - Experience and qualifications of the Offeror's proposed key managerial and technical home office and on-site personnel to be used for the project that demonstrate the Offeror's ability to provide quality work within the project completion period, for the price offered.

4.2.1.1 Submission Requirements for Evaluation Subfactor (2)(a) –

4.2.1.1.1 Identify the key managerial and technical home office and on-site personnel who will be assigned to work under the contract.

4.2.1.1.2 For each person so identified, provide a resume or other information that describes his or her qualifications for the job(s) that the person will be performing, including any special skills or experiences deemed worthy of note.

4.2.1.1.3 Describe each person's familiarity with U.S. Government construction procedures, including Contractor Quality Control (CQC) procedures, if applicable to the position the person is to hold within Offeror's organization.

4.2.1.1.4 For all named, proposed subcontractors in Offeror's proposal, provide the same information as required in the preceding paragraphs for the subcontractors' proposed key managerial and technical home office and on-site personnel. This applies to any subcontractor which the offeror expects to perform more than 20 percent of the work under the contract, in terms of the relation of the subcontractor's price of doing the work compared to the offeror's overall cost of doing the work. Regardless of the percentage of the work they may undertake, the evaluation factor also applies to any electrical, mechanical, sheet metal roofing, structural steel, or masonry subcontractor.

4.2.2 Subfactor (2)(b) – The Offeror's proposed home office and on-site organization structure to be used under the contract that demonstrates the Offeror's ability to provide quality work within the contract completion period, for the price offered.

4.2.2.1 Submission Requirements for Evaluation Subfactor (2)(b) –

4.2.2.1.1 Describe the Offeror's proposed home office and job site organization.

4.2.2.1.2 Describe how the Offeror intends to monitor and control timeliness, quality and safety of the work at the job site, including the work of the subcontractors.

4.2.2.1.3 Incorporate into the description an organizational chart for home office and on-site managerial and technical staff, tying in the identities of the key managerial and technical personnel that are described in Subfactor (2)(a).

4.2.2.1.4. For all named, proposed subcontractors in Offeror's proposal, provide the same information as required in the preceding paragraphs for the subcontractors' proposed home office and on-site organization structure. This applies to any subcontractor which the offeror expects to perform more than 20 percent of the work under the contract, in terms of the relation of the subcontractor's price of doing the work compared to the offeror's overall cost of doing the work. Regardless of the percentage of the work they may undertake, the evaluation factor also applies to any electrical, mechanical, sheet metal roofing, structural steel, or masonry subcontractor.

4.3 Evaluation Factor (3) - Small Business Program.

4.3.1 Subfactor (3)(a) - Extent of proposed participation of Small Businesses, Small Disadvantaged Business, Veteran-owned Small Business, HUBZone Small Business, Women-Owned Small Business concerns and Historically Black Colleges or Universities/Minority Institutions in the performance of the contract.

4.3.1.1 Submission Requirements for Evaluation Subfactor (3)(a) -

4.3.1.1.1 Provide a list of names, addresses and telephone numbers of Small Businesses, Small Disadvantaged Businesses, Veteran-owned Small Businesses, HUBZone Small Businesses, Women-Owned Small Businesses and Historically Black Colleges or Universities/Minority Institutions which the Offeror proposes to use as a joint venture, teaming arrangement, or subcontractor if awarded a contract under this solicitation.

Note: Incorporate the list of proposed subcontractors under paragraph 4.3.1.1.1 into the Offeror's Small Business Subcontracting Plan, which is required under Clause 52.219-9 Small Business Subcontracting Plan (Oct 2000), Alternate II (Oct 2000).

4.3.1.1.2 Identify for each named proposed Small Business, Small Disadvantaged Business, Veteran-owned Small Business, HUBZone Small Business, Women-Owned Small Business, or Historically Black College or University/Minority Institution, whether the named party is a joint venture partner with the Offeror, has a teaming arrangement with the Offeror, or is a subcontractor of the Offeror.

4.3.2 Subfactor (3)(b) - Extent of participation of those proposed Small Businesses, Small Disadvantaged Business, Veteran-owned Small Business, HUBZone Small Businesses, Women-Owned Small Business concerns and Historically Black Colleges or Universities/Minority Institutions—listed under evaluation criteria 3(a) (paragraph 4.3.1.1.1)—in terms of the value of the total acquisition.

4.3.2.1 Submission Requirements for Evaluation Subfactor (3)(b) -

4.3.2.1.1 For each proposed Small Businesses, Small Disadvantaged Business, Veteran-owned Small Business, HUBZone Small Business, Women-Owned Small Business concern or Historically Black College or Universities/Minority Institution, provide:

4.3.2.1.2 The total estimated dollar amount of each proposed concern's joint venture or teaming arrangement share of contract proceeds or amount of the proposed concern's subcontract.

4.3.2.1.3 The estimated percentage (expressed as a percentage of the overall proposed contract price) of the value of all proposed joint ventures, teaming arrangements or subcontracts with Small Businesses, Small Disadvantaged Businesses, Veteran-owned Small Businesses, HUBZone Small Businesses, Women-Owned Small Business concerns or Historically Black Colleges or Universities/Minority Institutions.

4.3.3 Subfactor (3)(c) - Extent of participation of Eligible Small Disadvantaged Business concerns, in the performance of the contract.

Note: "Eligible Small Disadvantaged Business concerns" shall be those Small Disadvantaged Business concerns within industries identified in the Standard Industrial Classification (SIC) Major Groups, as determined by the Department of Commerce, in 64 FR 52806, September 30, 1999.

4.3.3.1. Subfactor (3)(c)(1) - Targets for utilization of Eligible Small Disadvantaged Business concerns, expressed as dollars and percentages of total contract value in each of the applicable authorized SIC Major Groups.

4.3.3.1.1 Submission Requirements for Evaluation Subfactor (3)(c)(1) - A narrative statement, containing proposed targets, expressed as dollars and percentages of Offeror's proposed total contract price for each applicable authorized SIC Major Group, proposed for use under the contract. Identify any Eligible Small Disadvantaged Business concern proposed for subcontracting under the project.

4.3.3.2 Subfactor (3)(c)(2) - Small Disadvantaged Business participation by the contractor, including joint venture partners and team members.

4.3.3.2.1 Submission Requirements for Evaluation Subfactor (3)(c)(2) - Submit a narrative statement identifying—if applicable—the Offeror's status as an Eligible Small Disadvantaged Business concern, or as a joint venture partnership or teaming arrangement containing Eligible Small Disadvantaged Business concerns. Identify all proposed joint venture partners or team members which are Eligible Small Disadvantaged Business concerns.

4.3.3.3 Subfactor (3)(c)(3) - Proposed Eligible Small Disadvantaged Business concern participation by subcontractors.

4.3.3.3.1 Submission Requirements for Evaluation Subfactor (3)(c)(3) - Submit a narrative statement identifying (if applicable) proposed Eligible Small Disadvantaged Business concerns with whom the Offeror intends to subcontract.

52.215-16 FACILITIES CAPITAL COST OF MONEY (OCT 1997)

(a) Facilities capital cost of money will be an allowable cost under the contemplated contract, if the criteria for allowability in subparagraph 31.205-10(a)(2) of the Federal Acquisition Regulation are met. One of the allowability criteria requires the prospective contractor to propose facilities capital cost of money in its offer.

(b) If the prospective Contractor does not propose this cost, the resulting contract will include the clause Waiver of Facilities Capital Cost of Money.
(End of provision)

S-36.27 NOTIFICATION TO OFFERORS – ACCESS TO ARMY INSTALLATIONS.

All vehicle operators must be prepared to provide a valid driver's license, vehicle registration, certificate of insurance and current safety inspection to the security guard prior to entry to the Installation. Offerors should anticipate a delay in entering the Installation and allow sufficient time when attending a site visit or pre-proposal conference or hand delivering an offer.

S-28.10 OFFER GUARANTEE (APR 1984)

52.219-4 NOTICE OF PRICE EVALUATION PREFERENCE FOR HUBZONE SMALL BUSINESS CONCERNS (JAN 1999)

52.204-1 APPROVAL OF CONTRACT (DEC 1989)

Appendix A - State of Hawaii General Decision Number HI010001
Appendix B - List of Drawings

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) 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 1135 calendar days after the date the Contractor receives the notice to proceed. 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 $1,310.00 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)

52.211-13 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)

52.211-18 VARIATION IN ESTIMATED QUANTITY (APR 1984)

If the quantity of a unit-priced item in this contract is an estimated quantity and the actual quantity of the unit-priced item varies more than 15 percent above or below the estimated quantity, an equitable adjustment in the contract price shall be made upon demand of either party. The equitable adjustment shall be based upon any increase or decrease in costs due solely to the variation above 115 percent or below 85 percent of the estimated quantity. If the quantity variation is such as to cause an increase in the time necessary for completion, the Contractor may request, in writing, an extension of time, to be received by the Contracting Officer within 10 days from the beginning of the delay, or within such further period as may be granted by the Contracting Officer before the date of final settlement of the contract. Upon the receipt of a written request for an extension, the Contracting Officer shall ascertain the facts and make an adjustment for extending the completion date as, in the judgement of the Contracting Officer, is justified.

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)

252.232-7007 LIMITATION OF GOVERNMENT'S OBLIGATION (AUG 1993)

(a) Contract line item(s) 1 through 2 are incrementally funded. For these item(s), the sum of $62,100,000.00 of the total price is presently available for payment and allotted to this contract. An allotment schedule is set forth in paragraph (i) of this clause.

(b) For item(s) identified in paragraph (a) of this clause, the Contractor agrees to perform up to the point at which the total amount payable by the Government, including reimbursement in the event of termination of those item(s) for the Government's convenience, approximates the total amount currently allotted to the contract. The Contractor will not be obligated to continue work on those item(s) beyond that point. The Government will not be obligated in any event to reimburse the Contractor in excess of the amount allotted to the contract for those item(s) regardless of anything to the contrary in the clause entitled "Termination for Convenience of the Government." As used in this clause, the total amount payable by the Government in the event of termination of applicable contract line item(s) for convenience includes costs, profit, and estimated termination settlement costs for those item(s).

(c) Notwithstanding the dates specified in the allotment schedule in paragraph (i) of this clause, the Contractor will notify the Contracting Officer in writing at least ninety days prior to the date when, in the Contractor's best judgment, the work will reach the point at which the total amount payable by the Government, including any cost for termination for convenience, will approximate 85 percent of the total amount then allotted to the contract for performance of the applicable item(s). The notification will state (1) the estimated date when that point will be reached and (2) an estimate of additional funding, if any, needed to continue performance of applicable line items up to the next scheduled date for allotment of funds identified in paragraph (i) of this clause, or to a mutually agreed upon substitute date. The notification will also advise the Contracting Officer of the estimated amount of additional funds that will be required for the timely performance of the item(s) funded pursuant to this clause, for a subsequent period as may be specified in the allotment schedule in paragraph (i) of this clause or otherwise agreed to by the parties. If after such notification additional funds are not allotted by the date identified in the Contractor's

notification, or by an agreed substitute date, the Contracting Officer will terminate any item(s) for which additional funds have not been allotted, pursuant to the clause of this contract entitled "Termination for Convenience of the Government."

(d) When additional funds are allotted for continued performance of the contract line item(s) identified in paragraph (a) of this clause, the parties will agree as to the period of contract performance which will be covered by the funds. The provisions of paragraphs (b) through (d) of this clause will apply in like manner to the additional allotted funds and agreed substitute date, and the contract will be modified accordingly.

(e) If, solely by reason of failure of the Government to allot additional funds, by the dates indicated below, in amounts sufficient for timely performance of the contract line item(s) identified in paragraph (a) of this clause, the Contractor incurs additional costs or is delayed in the performance of the work under this contract and if additional funds are allotted, an equitable adjustment will be made in the price or prices (including appropriate target, billing, and ceiling prices where applicable) of the item(s), or in the time of delivery, or both. Failure to agree to any such equitable adjustment hereunder will be a dispute concerning a question of fact within the meaning of the clause entitled "Disputes."

(f) The Government may at any time prior to termination allot additional funds for the performance of the contract line item(s) identified in paragraph (a) of this clause.

(g) The termination provisions of this clause do not limit the rights of the Government under the clause entitled "Default." The provisions of this clause are limited to the work and allotment of funds for the contract line item(s) set forth in paragraph (a) of this clause. This clause no longer applies once the contract is fully funded except with regard to the rights or obligations of the parties concerning equitable adjustments negotiated under paragraphs (d) and (e) of this clause.

(h) Nothing in this clause affects the right of the Government to terminate this contract pursuant to the clause of this contract entitled "Termination for Convenience of the Government."

(i) The parties contemplate that the Government will allot funds to this contract in accordance with the following schedule:

On execution of the contract: $62,100,000.00
By January 31, 2002: the balance of the contract price

(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

(1) Services (except construction), at least 50 percent of the cost of personnel for contract performance will be spent for employees of the concern or employees of other HUBZone small business concerns;

(2) Supplies (other than procurement from a nonmanufacturer of such supplies), at least 50 percent of the cost of manufacturing, excluding the cost of materials, will be performed by the concern or other HUBZone small business concerns;

(3) General construction, at least 15 percent of the cost of the contract performance incurred for personnel will be will be spent on the concern's employees or the employees of other HUBZone small business concerns; or

(4) Construction by special trade contractors, at least 25 percent of the cost of the contract performance incurred for personnel will be spent on the concern's employees or the employees of other HUBZone small business concerns.

(e) A HUBZone joint venture agrees that in the performance of the contract, the applicable percentage specified in paragraph (d) of this clause will be performed by the HUBZone small business participant or participants.

(f) A HUBZone small business concern nonmanufacturer agrees to furnish in performing this contract only end items manufactured or produced by HUBZone small business manufacturer concerns. This paragraph does not apply in connection with construction or service contracts.
(End of clause)

52.204-1 APPROVAL OF CONTRACT (DEC 1989)

This contract is subject to the written approval of the Commander, Honolulu Engineer District, Corps of Engineers, and shall not be binding until so approved.
(End of clause)

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SECTION 00800 Special Contract Requirements

CLAUSES INCORPORATED BY FULL TEXT

S-8 UTILITY OUTAGES

Utility outages shall be as hereinafter specified, unless otherwise indicated or specified. 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. The Contractor shall submit a planned schedule of outages to the Contracting Officer for proper coordination with existing facilities, and shall notify the Contracting Officer in writing not less than 45 days in advance of the intended interruptions. Planned schedule of outages shall include specific dates, times, and anticipated duration of proposed outages. In the event the proposed outages interfere with station operations, the Contracting Officer will consider or offer alternate dates and/or times. Outages may be permitted during off-peak hours, hours of darkness, weekends, and holidays, at no additional cost to the Government. Work shall be planned to minimize outages. No utility outage will be permitted until the Contractor receives written approval from the Contracting Officer.

[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 5 DAY WORK WEEK

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
4	5	6	4	3	3	3	4	3	5	4	7

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 criticial 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-36.26YEAR 2000 COMPLIANCE - CONSTRUCTION CONTRACTS (AUG 1998)~~

~~1. Definitions:~~

~~(a) "Information technology" means any equipment, or interconnected system(s) or subsystem(s) of equipment, that is used in the automatic acquisition, storage, manipulation, management, movement, control, display, switching, interchange, transmission, or reception of data or information by the agency. The term "information technology" includes hardware (e.g., computers, microprocessors, ancillary equipment), software, firmware, and related resources.~~

~~(b) "Embedded system" means any device, equipment or system that includes information technology (i.e., microprocessor chip) as an integral part of the operation of the equipment. "Embedded system" is also referred to as "microprocessor-based equipment". Examples of "embedded system" include, but are not limited to, HVAC system, energy control system, fire detection and control system, utility monitoring and control systems, intrusion detection system, emergency generators, uninterruptable power supplies, telecommunications switches, leak detection systems, automated sprinkler system, etc. Refer to Appendix, entitled "Examples of~~

~~Embedded Systems" at the back of Section 00800, Special Contract Requirements, for additional examples.~~

~~(c) "Year 2000 compliant" means information technology accurately processes date/time data (including, but not limited to, calculating, comparing, and sequencing) from, into, and between the twentieth and twenty-first centuries, and the years 1999 and 2000 and leap year calculations. Furthermore, Year 2000 compliant information technology when used in combination with other information technology shall accurately process date/time data if the other information technology properly exchanges date/time data with it.~~

~~2. In accordance with FAR 39.106, the contractor shall ensure that with respect to any design, construction, supplies, or services, as well as any subsequent task/delivery orders issued under this contract (if applicable), all information technology contained therein, including information technology in embedded systems, shall be Year 2000 compliant. Specifically, the contractor shall:~~

~~a. Perform, maintain, and provide an inventory of all major components to include structures, equipment, items, parts, and furnishing under this contract and each task/delivery order which may be affected by the Year 2000 compliance requirement.~~

~~b. Indicate whether each component is currently Year 2000 compliant or requires an upgrade for compliance prior to government acceptance.~~

~~c. Additional content of the inventory and submittal information is provided in Section 01600, YEAR 2000 COMPLIANCE.~~

~~[End of Statement]~~

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 one (1) 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 ten (10) Government personnel will attend this workshop. The partnering workshop will be held in Hawaii.

[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: Water and Electricity

[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 a 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 for State of Hawaii (Region 10) and at 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-36.15 AGGREGATE SOURCES

(a) deleted.

(b) Concrete aggregates meeting the requirements of Section 03300 of the Technical Requirements can be produced from the approved sources listed below:

Ameron HC&D, Ltd., Kapaa Quarry, Kailua, Oahu, Hawaii
Grace Pacific Corp., Puu Makakilo Quarry, Oahu, Hawaii
Hawaiian Cement, Halawa Quarry, Oahu, Hawaii

(c) Concrete aggregates may be furnished from any of the above listed sources or at the option of the contractor may be furnished from any other source designated by the contractor and approved by the Contracting Officer, subject to the conditions hereinafter stated.

(d) After the award of the contract, the contractor shall designate in writing only one source or combination of sources from which he proposes to furnish aggregates. If the contractor proposes to furnish aggregates from a source or from sources not listed above he may designate only a single source or single combination of sources for aggregates. Samples for acceptance testing shall be provided as required by Section 03300 of the Technical Requirements. If a source for coarse or fine aggregate so designated by the contractor is not approved for use by the Contracting Officer, the contractor may not submit for approval other sources but shall furnish the coarse or fine aggregate, as the case may be, from an approved source listed above at no additional cost to the Government.

(e) Listing of a concrete aggregate source is not to be construed as approval of all material from the source. The right is reserved to reject materials from certain localized areas, zones, strata, or channels, when such materials are unsuitable for concrete aggregate as determined by the Contracting Officer. Materials produced from an approved source shall meet all the requirements of Section 03300 of the Technical Requirements of these specifications.

[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 Nos. 40-21-01 and 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 offeror 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-28.7 REQUIRED INSURANCE (Dec 1993)

(The following is applicable when work is performed on a government installation.)

The minimum insurance requirements, pursuant to Section 00700, Contract Clause, "INSURANCE - - WORK ON A GOVERNMENT INSTALLATION" of this contract, are:

Workers' Compensation and Employer's Liability Insurance - Minimum coverage of $100,000.

Comprehensive General Liability Insurance - Minimum coverage of $500,000 per occurrence.

Automobile Liability Insurance

(1) Bodily Injury: Minimum coverage of $200,000 per person and $500,000 per occurrence.

(2) Property Damage: Minimum coverage of $20,000 per occurrence.

The Contractor shall insert the substance of this clause in subcontracts under this contract that require work on a Government installation. The Certificate Holder for Subcontractors' Certificates of Insurance shall be the U.S. Army Engineer District, Honolulu, Fort Shafter, Hawaii 96858-5440. [FAR 28.306 and 28.307-2]

[End of Statement]

S-23.1 Emergency Planning Community Right to Know Act (EPCRA) Extremely Hazardous Substances (EHS), CERCLA Hazardous Substances, and other OSHA Hazardous Chemicals (May 2000)

This applies to any contractor utilizing EPCRA EHS, CERCLA hazardous substances, and other OSHA hazardous chemicals in performance of any work while on any US Army Garrison, Hawaii (USAG-HI) installations. The EPCRA EHS are defined in EPA document EPA 550-B-98-017, Title III List of List, Consolidated List of Chemicals Subject to the Emergency Planning and Community Right to Know Act and Section 112(r) of the Clean Air Act Amended. Contractors are responsible for knowing which chemicals they may use or transport are contained on the list. For convenience, contractors may review a copy of the EPA document at the Directorate of Public Works (DPW) Environmental Department. To obtain a copy of the list, the document is also available at the U.S. Environmental Protection Agency (EPA) Web address http://www.epa.gov/ceppo/p-gen.htm. For contractors' information, the locations of these chemicals stored on USAG-HI installations are available upon request. To obtain the list of locations, forward request to the following E-mail address: takenakc@schofield-emh1.army.mil. Indicate name, company, contract awarded and description of contract. A data base of locations of chemicals will then be forwarded upon review and approval of request. Contractors working on USAG-HI installations are encouraged to review this database which will provide information where potentially hazardous chemicals are stored.

(1) Reporting. All spills of substances containing EPCRA EHS and CERCLA hazardous substances, and OSHA hazardous chemicals will be immediately reported to the Directorate of Public Works (DPW) Spill Response line at 656-1111 during normal working hours. After normal working hours or weekends/holidays, all spills will be reported to the DPW Work Order Desk at 656-1275. The Contracting Officer must be notified during the first business hour immediately after. All waste developed resulting from EPCRA EHS, CERCLA hazardous substances, and other OSHA hazardous chemicals being utilized will be immediately reported to the DPW Environmental Office, phone: 656-2878 x 1022 (Mr. Akasaki).

(2) All Contractors Utilizing Substances Containing EPCRA EHS, CERCLA hazardous substances, and other OSHA hazardous chemicals will perform the following prior to contract start.

(a) Review the Installation Spill Contingency Plan, the Installation Hazardous Waste Management Plan and the 40-hour Environmental Compliance Officer Course manual available at the DPW Environmental Department or at the Directorate of Contracting. Upon review, the contractor or designated responsible employee shall sign a certification statement that they have reviewed and understand the contents of these documents.

(b) Provide a list of all EPCRA EHS, CERCLA hazardous substances, and other OSHA hazardous chemicals projected to be utilized, the estimated quantities of each and the Material Safety Data Sheets to the DPW Environmental Department and also to building 6040 East Range for material bar-codes.

(c) Provide the name, phone number, and pager number of a company spill response point of contact. The point of contact must be trained in spill response.

(d) Provide a copy of an agreement with a hazardous materials spill response company in the event of a spill.

(e) Provide copies of training certificates on environmental training and spill response training.

(f) Appoint a primary and alternate Environmental Compliance Officer in writing.

(g) Develop a notification procedure in the event of a spill to include phone numbers of response personnel, support agencies, National Response Center, State Hazard Evaluation Emergency Response Office and Civil Defense.

(3) Annual Update. On an annual basis, but not later than 1 February of each year, provide DPW Environmental Department an updated list as referenced in (2)(b) above.

(4) Contractor Caused Spills or Waste Generated of Substances Containing EPCRA EHS, CERCLA Hazardous Substances, and OSHA Hazardous Chemicals.

(a) All spills caused by the contractor will be cleaned up under supervision of the contractor and a qualified hazardous materials spill response company, at no cost to the government, in accordance with all applicable laws and regulations and to the satisfaction of the DPW Environmental Department.

(b) Accomplish all spill notifications as required by the U.S. Environmental Protection Agency and State of Hawaii to the Hazard Evaluation Emergency Response Office, Local Emergency Response Commission and National Response Center.

(c) Pay for disposal cost of all contaminated materials to include but not limited to soil, sorbent materials, disposable equipment and other materials contaminated by the spill. Ensure all disposal is in accordance with all applicable laws and regulations at authorized disposal sites.

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-18 ASBESTOS --- (OCCUPATIONAL HEALTH AND ENVIRONMENTAL)

(a) THE CONTRACTOR IS WARNED THAT EXPOSURE TO AIRBORNE ASBESTOS HAS BEEN ASSOCIATED WITH FOUR DISEASES: LUNG CANCER, CERTAIN GASTROINTESTINAL CANCERS, PLEURAL OR PERITONEAL MESOTHELIOMA AND ASBESTOSIS. Studies indicate there are significantly increased health dangers to persons exposed to asbestos who smoke and further, to family members and other persons who become indirectly exposed as a result of the exposed worker bringing asbestos-laden work clothing home to be laundered.

(b) The Contractor is advised that friable and/or nonfriable asbestos containing material has been identified in area(s) where contract work is to be performed. Friable asbestos containing material means any material that contains more than 1 percent asbestos by weight that hand pressure can crumble, pulverize or reduce to powder when dry. Nonfriable asbestos containing materials do not release asbestos fiber during routine handling and end-use. However, excessive fiber concentrations may be produced during uncontrolled abrading, sanding, drilling, cutting, machining, removal, demolition or other similar activities.

(c) Care must be taken to avoid releasing, or causing to be released, asbestos fibers into the atmosphere where they may be inhaled or ingested. The Occupational Safety and Health

Administration (OSHA) has set standards at 29 CFR 1910.1001, for exposure to airborne concentrations of asbestos, fibers, methods of compliance, medical surveillance, housekeeping procedures and other measures that must be taken when working with or around asbestos containing materials which release airborne asbestos fibers at concentrations in excess of those established 29 CFR 1910.1001. 29 CFR 1910.1001 has been identified as applicable to construction (29 CFR 1926.55 gases, vapors, fumes, dusts and mists). The Environmental Protection Agency (EPA) has established standards at 40 CFR 61.140-156 for the control of asbestos emissions to the environment and the handling and disposal of asbestos wastes.

(d) When contract work activities are carried out in locations where the potential exists for exposure to airborne asbestos fibers as described in paragraph (b), or where asbestos waste will be generated, the Contractor shall assure that all measures necessary to provide effective protection to persons from exposure to asbestos fibers (and prevention of contamination to property, materials, supplies, equipment and the internal and external environment) are effectively instituted.

(e) As a minimum, the Contractor shall comply with the provisions of 29 CFR 1910.1001 and 1926.55; 49 CFR 72.101, 172.200-204, 172.316, 173.1090; 40 CFR 61.140-156; and any state implementing hazardous waste under the Resources Conservation and Recovery Act (RCRA) requirements and any other applicable federal, state or local requirements.

(f) In addition to the information required in Contract Clause, ACCIDENT PREVENTION, of this contract, the Contractor's Accident Prevention Plan must also fully address the following topics, and at the Contractor's option may include additional information as applicable.

(1) Medical Surveillance: (29 CFR 1910.1001(J)).

(2) Employee training: Prior to beginning work in asbestos containing material area(s) (29 CFR 1910.1001 and 29 CFR 1910.134).

(3) Respiratory protection: (29 CFR 1910.1001 and 29 CFR 1910.134)

(4) Personal protective clothing and equipment: (29 CFR 1910.1001(d)). The use of compressed air to remove asbestos from workers' clothing is prohibited. The Contractor shall specify the type of change room, wash facilities and laundering facilities as applicable.

(5) Airborne asbestos monitoring: 29 CFR 1910.1001(f)). Specify the monitoring and analytical procedures to be used before, during, and after completion of contract work in areas where asbestos containing materials are located. All asbestos monitoring shall be conducted under the guidance of an industrial hygienist certified by the American Board of Industrial Hygiene. Samples shall be analyzed by an American Industrial Hygiene Association (AIHA) accredited laboratory proficient in the analysis of asbestos and asbestos containing materials. Turn around time from end of sampling period to review of results of analyses by Contractor shall be no longer than 72 hours.

(6) Housekeeping: (29 CFR 1910.1001(h)). Dry sweeping of contract work areas contaminated with asbestos containing material is prohibited. The Contractor shall specify methods and materials used to package asbestos containing waste and plan to control any incidental airborne release or spill of asbestos containing material.

(7) Methods of compliance: (29 CFR 1910.1001(c)). Contractor shall include procedures relating to engineering controls, local exhaust ventilation, particular tools to be used and work practices (1910.1001(c)). Specify methods, materials and equipment to be used to prevent asbestos contamination to property, materials, supplies, equipment and the internal and external environment during maintenance, renovation or other contract activities. Local Exhaust ventilation equipment including power operated tools equipped with local exhaust ventilation shall

conform with the Standard Fundamentals Governing the Design and Operation of Local Exhaust Systems ANSI Z9.2 latest revised edition. Describe the type of high-efficiency filtered (HEPA) vacuum cleaners that shall be used to vacuum asbestos containing materials. Describe methods and materials to be used to assure all asbestos containing material will be thoroughly wetted by use of a wetting agent and water before removal and that airborne asbestos dust will be kept to a minimum.

(8) Methods and materials to be used to decontaminate any property, materials, supplies, equipment and the environment if asbestos contamination results. (29 CFR 1910.1001(c)).

(9) Recordkeeping procedures. (29 CFR 1910.1001(i) and 1910.20).

(10) Specific description of packaging, marking and shipping conveyances to be used to transport asbestos containing waste from the generation point to a storage or disposal facility in compliance with Department of Transportation requirements. (49 CFR 172.101, 172.200-204, 176,316, 173.1090).

(11) Emergency procedures that would be taken if an accident of spill of asbestos containing material occurs during the transport of asbestos containing waste. (40 CFR 61.20-25).

(12) Methods and equipment used to off load and bury asbestos containing waste control airborne emissions at the burial site. (40 CFR 61.20-25).

(g) The Contractor shall complete and return to the Contracting Officer within 15 working days after the completion of all airborne asbestos monitoring conducted under this contract, a 'Summarization of Airborne Asbestos Sampling Results' form (ENG Form 4921-R, Jan 86) provided by the Government. NOTE: This completed summarization form is to be used by the US Army Corps of Engineers for statistical information purposes and does not relieve the Contractor from his recordkeeping requirements as described in 29 CFR 1910.1001(i) and 1910.20.

(h) An industrial hygiene asbestos survey was conducted in the contract work area(s) to identify the presence of asbestos containing materials as described in paragraph (b) above. The data collected is contained in the ASBESTOS SURVEY REPORT.

(i) The industrial hygiene asbestos survey described in paragraph (h) may not have identified all asbestos containing materials in the contract work area(s). When contract work area(s) appear to have asbestos containing material not identified in the ASBESTOS SURVEY REPORT, the Contractor shall conduct an asbestos survey to identify such material(s) in a manner similar to that described in the ASBESTOS SURVEY REPORT.

[End of Statement]

52.231-5000 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 X. 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.

(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)

ASBESTOS PROHIBITION & CERTIFICATION (SEP 2000)

a. Materials or products containing more than one percent asbestos shall not be used in this project. The Contracting Officer, at any time prior to acceptance of the work, or during the period designated for warranty of the work, if any, may reject materials and products that contain asbestos in excess of one percent, and direct the removal of such materials and products from the jobsite, at the sole expense of the contractor, and without additional time granted for

performance of the work. After completion of this contract, if asbestos (exceeding 1%) is discovered in the products or materials (excluding items permitted by the exception) installed by the contractor, the Government reserves the right to direct the Contractor to perform asbestos abatement and restoration work, as required, at the Contractors' sole cost. Asbestos abatement work (removal and disposal of asbestos-containing materials and products) shall be accomplished in accordance with currently applicable United States Government and State of Hawaii standards for such work.

"Exception: Where suitable asbestos-free (equal to or less than 1% asbestos) substitutes do not exist for a material or product, the contractor may use a material or product containing asbestos in excess of 1%, with the prior written approval of the Contracting Officer. The Contractor shall submit a written request for such substitution, accompanied by a certification from the manufacturer of the material or product that shall set forth, in specific detail, the amount of asbestos present in the material or product. When available, laboratory analysis of the material or product for asbestos content shall be included with the submittal."

b. The Government may conduct asbestos testing on suspected asbestos-containing materials and products excluding items permitted by the "Exception", and such testing will be conducted at the expense of the Government. However, wherever destructive testing is required, or a material or product must be utilized by the Government for testing, the Contractor, shall, at its own expense, repair or replace the material or product, or the item of work that has been disturbed by testing, if the test results confirm presence of asbestos exceeding 1%. In the event test results indicate 1% or less asbestos content or complete absence of asbestos, the Contractor shall restore the test site to its original condition and the cost of restoration work, as approved by the Contracting Officer, shall be borne by the Government.

c. As a minimum, the Contractor shall furnish manufacturer's certification for the items listed below, excluding items permitted by the "Exception", certifying that they are asbestos free or do not contain asbestos in excess of 1%, as applicable. However, when presence of asbestos is suspected in other products and materials used in this project, the Contractor shall be required to provide such certification for those additional items when so directed by the Contracting Officer. Asbestos certification shall be required for the items applicable to this project only.

1. Vinyl sheet/vinyl tile flooring, including accessories and adhesives

2. Insulation materials including facing

3. Gaskets for piping and duct work

4. Acoustical Tiles

5. Firestopping materials

6. Fireproofing materials

7. Special Coating, including factory applied coatings, on sheetmetal roofing and siding

8. Wallboard for all interior and exterior applications including joint compounds

9. Adhesives (other than Item 1) used in the project

10. Tape materials used in the project

11. Roofing and Siding, nonmetallic

12. Felt materials and cushion materials

13. Pre-mixed mortars, grouts, leveling compounds, fillers, and other cementitious materials

14. Caulking and sealing materials

d. All submittals shall be accompanied by a certification from the manufacturer of the material or product that the material or product is asbestos-free; or shall set forth, in specific detail, the amount of asbestos present in the material or product. Documentary evidence of laboratory analysis of the material or product for asbestos content, conducted by an independent testing laboratory accredited for asbestos analysis by either the American Industrial Hygiene Association (AIHA) or the National Voluntary Laboratory Accreditation Program (NVLAP) administered by the National Institute of Standards and Technology (NIST).

e. The Contractor shall implement asbestos awareness and require all subcontractors, vendors, and suppliers to furnish materials and products free of asbestos except where and exception is warranted. The Contractor shall require all subcontractors, vendors, and suppliers to provide manufacturers certifications and data to support the exception. The request for exception shall be provided in writing to the Contracting Officer 30 days prior to commencement of any field work related to that product for which the exception is sought for the project.

f. The Contractor shall monitor all subcontractors, vendors, and suppliers to ensure asbestos containing building materials are not used in the project except those permitted by the Exception.

g. Recording

(1) The Contractor shall annotate on the as-built drawings the location where asbestos containing building materials and products have been used. The annotation shall contain the material and quantity.

(2) Where projects are completed using no asbestos, the Contractor shall prepare and sign a Certification of Asbestos Free Facility. The certification shall contain the project name, contract number, date of certification, and Contractor’s name. The certificate shall state that, to the best of Contractor’s knowledge, the facility has

been completed without the use of asbestos containing building materials and products. The certification shall be signed by the company president or principal or by an individual authorized to sign for the president or principal.

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
Functional Help Desk: e-mail to: contractormanpowertech@hqda.army.mil

[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`

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-36.28 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.**

HSI Electric, Feb 21:

Q118. HSI Electric is planning to submit a bid to supply Variable Frequency Drives associated with the subject solicitation. In reference to the subject solicitation, we have found several discrepancies on the following:

Section 15895 (Variable Frequency controller or Variable Frequency Drive)

a. Paragraph 2.10.2 indicate that the VFD shall operate at 3-phase, 208VAC, 60Hz but the original electrical drawings show that the input power for the Variable Frequency drive will be 3-phase, 480VAC, 60Hz. For example, refer to MW-9, MW-10, and EW-8 (PANEL 4A and PANEL 4B) shows input power for AHU-1 and AHU-2 as 3-phase, 480VAC. If the specs for the drive remain unchanged, the project will require an additional 3-phase step-down transformer from 480 Delta to 208Y (not shown) to operate each drive and associated motor at 208VAC.

b. Paragraph 2.10.2.6g requires a 115 VAC control transformer. The overall Variable Frequency Drive requirements did not include any additional augmentation that requires the need for a control transformer. In addition, the specifications did not include provisions for a Bypass package. Such a provision for a Bypass package with DRIVE-OFF-BYPASS selector switch that will allow the Variable Frequency drive to be taken offline (for servicing) while still able to operate the motor (at full speed) via a separate "across-the-line starter". When the Variable Frequency drive goes down, there is no other means of operating the AHU motor unless a Bypass package is specified. This unforeseen detail may compromise the comfort level of the building occupants.

c. There are other discrepancies found such as 1)Drawing No. MT-4 depicts the use of a Variable Frequency drive but Drawing No. MT-5 does not list a Variable Frequency drive in the equipment schedule.

d. Paragraph 2.10.2.1 requires that the Variable Frequency controller be enclosed in a NEMA 1 type enclosure. However, drawings nos. MW-16 and MWR-16 for Buildings BN-1 and BN-2, respectively indicated that the drives be enclosed in a NEMA 3 enclosure.

e. It appears that Variable Frequency drives were not specified for Building DN-1 and this detail might have been overlooked.

f. For consideration and additional protection of the electrical motor, we are recommending that a dV/dT filter be installed when the physical cabling distance between the Variable Drive output and the electrical motor exceeds 75-100 feet. The filter is primarily used to attenuate the voltage spikes, "smooth out" the drive output waveform, and prevent possible damage to the motor windings. Detailed information on this phenomena will be provided upon request.

A118.

a. This item was already addressed in Amendment #5.

b. The 115 volt transformer is only required if it is needed for the operation of the variable frequency drive provided. The spec can be clarified to address this item. We are not adding provisions for a bypass package as recommended by HSI.

c. Variable frequency drives are required for the Training Building as noted on sheet MT-4. HSI is correct that the variable frequency drive is not specified on the mechanical equipment schedule. No amendment required.

d. Spec needs to be revised to follow the contract drawings on the enclosure type for the variable frequency drive.

e. No variable frequency drive required for the Dining Facility. All air handling units are constant volume type and do not require a variable frequency drive.

f. The dV/dT filter recommended by HSI will not be added to the spec

Q119. Below is a projected schedule of the Variable Frequency drives for this project.

BLDG NO.	EQPT ID	LOCATION	HP	VOLTAGE	PH	HZ	ENCL.	Comments
BK-1	AHU-1		7.5 (5.5 kW)	208	3	60	NEMA 1	Conflict with Drive and motor specifications
BK-1	AHU-2		7.5 (5.5 kW)	208	3	60	NEMA 1	a. Should both motor & drive be 460V or 208V?
BK-1	AHU-3		7.5 (5.5 kW)	208	3	60	NEMA 1	b. Should all VFDs have NEMA 1 enclosures?
BK-1	AHU-4		7.5 (5.5 kW)	208	3	60	NEMA 1	c. Does all VFDs require a Bypass option?
BK-1	AHU-5		7.5 (5.5 kW)	208	3	60	NEMA 1	
BK-2	AHU-1		7.5 (5.5 kW)	208	3	60	NEMA 1	
BK-2	AHU-2		7.5 (5.5 kW)	208	3	60	NEMA 1	
BK-2	AHU-3		7.5 (5.5 kW)	208	3	60	NEMA 1	
BK-2	AHU-4		7.5 (5.5 kW)	208	3	60	NEMA 1	
BK-2	AHU-5		7.5 (5.5 kW)	208	3	60	NEMA 1	
BN-1	AHU-1	MECH RM. 112	25 (18.6 kW)	208	3	60	NEMA 3	
BN-1	AHU-2	MECH RM. 203	7.5 (5.5 kW)	208	3	60	NEMA 3	
BN-2	AHU-1	MECH RM. 112	25 (18.6 kW)	208	3	60	NEMA 3	
BN-2	AHU-2	MECH RM. 203	7.5 (5.5 kW)	208	3	60	NEMA 3	
MS-1	AHU-1		7.5 (5.5 kW)	208	3	60	NEMA 1	
MS-1	AHU-2		3.0 (2.2 kW)	208	3	60	NEMA 1	
DN-1	AHU-1		20 (15.0 kW)	460	3	60		Drive not specified ????
DN-1	AHU-2		15 (11.0 kW)	460	3	60		Drive not specified ????
DN-1	AHU-3		7.5 (5.5 kW)	460	3	60		Drive not specified ????

Request clarifications for the above discrepancies that were found and please provide a revise bid deadline for this project. Based on the list price schedule, the estimate cost difference be a drive operating at 460VAC versus a drive operating at 208VAC is $1000 per drive. Also based on the list price schedule, the estimated cost to add a bypass feature for each drive is $2700.00 per drive and $800.00 for a dV/dT filter (@208VAC).

A119. Response to be provided in future amendment.

JBL Hawaii, Ltd., Feb 21:

Questions 120 and 121 refer to Section 08110 Doors and Frames (page 4) Item 2.1. The specifications says G90 galvanizing required at the exterior and G60 at the interior doors and frames.

Q120. At Barracks Buildings BK-1 and BK-2, at the ground floor, all the common area steel doors and frames are to be G90 galvanized material. What about all the typical entry units steel door frames? Should they be G90 or G60 galvanized?

A120. Response to be provided in future amendment.

Q121. If the first floor entry steel door frames are to be G90 galvanized, then the 2nd thru 5th floor entry door frames are also to be G90 galvanized?

A121. Response to be provided in future amendment.

Island Pacific Dist., Inc., Feb 21:

Q122. G90 galvanized coating not recommended for steel doors and frames.

A122. Response to be provided in future amendment.

Window World, Inc., Feb 19:

Questions Q123 through Q126 are in reference to window covering Section 12490.
Q123. COF Units - Do windows get miniblinds or vertical blinds? Drawings indicate miniblinds. Specifications show verticals.

A123. Response to be provided in future amendment.

Q124. BN-2 & BN-1 - Window Types A, B, & C show miniblinds only, but floor plans show all windows. Please clarify. Also elevations show verticals not miniblinds. Specifications states blackout curtains. Also are there any blackout shades as indicated in specs?

A124. BN-1 & BN-2: All windows as shown on drawings AW-3 (Ring 13) and AW-6 (Ring 16) also AWR-3 (Ring 382) and AWR-6 (Ring 385) should be provided with horizontal miniblinds for Window types A thru K as indicated on drawings AW-30 (Ring 40) and AWR-30 (Ring 409). Horizontal miniblinds as shown on floor plans are correct. Omit reference to vertical blind track on Sheets AW-25 (Ring 35) on elevation B at Classrooms 113, 114 & 115. and AWR-25 (Ring 404). Specification Section 12490 for blackout drapes has been revised and blackout shades have been deleted, per Amendment No. AM-0005.

Q125. SCB-1 - Do all windows get vertical blinds or only Hall & Kit. areas as indicated on elevations?

A125. SCB-1: Provide vertical blinds on interior of all exterior windows throughout building. Provide horizontal miniblinds on all interior windows W14, W15, W18, W19 & W20. Add notation on Color Reference, Sheet AC-15 (Ring 247) as follows: "O-9: Horizontal miniblinds, ADM Int'l, Inc. Color: #011 Beige.

Q126. 858, 859, 860 - Drawings indicate drapery rods. What kind of rods are to be provided? Specifications do not indicate any drapery hardware. Also do Bath areas get similar rods?

A126. Response to be provided in future amendment.

Graybar, Feb 26:

Q127. I have attached specification 2.8.1 Cabinets and Boxes because the sheet metal factories do not manufacture cabinets and boxes that are Hot-Dip, Zinc Coated. They had too many problems with warping during the dipping process. The factories now offer galvanized sheet steel or stainless steel.

A127. Response to be provided in future amendment.

QN Electric, Inc., Mar 1:

Q128. Dwg. Sheet ES-1 Symbol List, last item “wooden pole” with 6.6m messenger strand. Would the messenger cable be ¼ inch or 6.6mm?

A128. Response to be provided in future amendment.

Q129. Dwg Sheet ES-23, Zone H1 indicates MH “14” as existing. Will MH remain or “demo and replace” similar to the other existing manholes along Menoher?

A129. Response to be provided in future amendment.

Q130. Dwg. Sheet ES-25 through ES-30 indicate 12 way ductline run between existing manholes. Are the additional raceways to be "added" to the existing ductline between manholes?

A130. Response to be provided in future amendment.

Q131. Dwg. Sheet ES-30, note states: Provide (1) innerduct in existing empty conduit. Sheet ES-31 through ES-43 same note states provide (1) each innerduct in existing duct. How many innerducts are required? Will you require an innerduct in all existing empty conduits and if you do how many empty conduits are there?

A131. Response to be provided in future amendment.

PELSA, Mar 5:

Q132. Division 16-Electrical, Section 16415, Electrical Work
Bldg DN-1 (Sheet No. ED-15). Type X: No detail drawing given to reference type of fixture required.

A132. Response to be provided in future amendment.

Island Lighting Co., Inc., Mar 6:

Q133. Per Sheet ET-4, Note 1 - There are 6 out of 7 classrooms that have three way switches. Would you like those 6 classrooms to be dimmed from both sides of the classroom or from just one side. Please clarify.

A133. Response to be provided in future amendment.

Architectural & Engineering Systems, Inc., Mar 15:

Q134. Spec 02555 2.4 End Seals
We represent Perma-Pipe/Ricwil, which is a manufacturer of the type of systems specified in Site Work 02555 Pre-Fabricated Underground Heating/Cooling Distribution System. The specification 2.4 END SEALS allows various types but 2.4.3 requires certain testing which cannot be accomplished with all the end seals specified.
To be specific 2.4.2 d allows the use of a waterproof mastic seal vapor barrier over the exposed insulation ends; but this type of end seal does not allow for the testing procedures in 2.4.3 Casing and End Seal Testing and Certification. We want to know if 2.4.2 d is acceptable since it is so stated and then 2.4.3 would have to be waived. There is a considerable cost difference namely higher for compliance with 2.4.3.
In addition under 2.4.2 c the use of elastomer-ring end seals with other than 2.4.2 d vapor barrier would not allow a functional leak proof system since a shrink end seal would change the casing to casing dimension and not allow the proper seal for the pipe.
All in all is 2.4.2 d, which is fairly standard industry usage allowable without compliance with 2.4.3, since c & d cannot comply with these requirements?

A134. Casing and End Seal testing and certification will be required for waterproof mastic vapor barrier end seals since other preinsulated pipe manufacturers can meet test certification requirements.

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SECTION 15895

AIR SUPPLY, DISTRIBUTION, VENTILATION, AND EXHAUST 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.

AIR CONDITIONING AND REFRIGERATION INSTITUTE (ARI)

ARI 350	(1986) Sound Rating of Non-Ducted Indoor Air-Conditioning Equipment
ARI ANSI/ARI 410	(1991) Forced-Circulation Air-Cooling and Air-Heating Coils
ARI ANSI/ARI 430	(1989) Central-Station Air-Handling Units
ARI ANSI/ARI 440	(1993) Room Fan-Coil and Unit Ventilator
ARI 880	(1994) Air Terminals
ARI Guideline D	(1987) Application and Installation of Central Station Air-Handling Units

AIR MOVEMENT AND CONTROL ASSOCIATION (AMCA)

AMCA ANSI/AMCA 210	(1985) Laboratory Methods of Testing Fans for Rating
AMCA 300	(1996) Reverberant Room Method for Sound Testing of Fans

AMERICAN BEARING MANUFACTURERS ASSOCIATION (ABEMA)

ABEMA Std 9	(1990) Load Ratings and Fatigue Life for Ball Bearings
ABEMA Std 11	(1990) Load Ratings and Fatigue Life for Roller Bearings

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 53	(1997) Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
ASTM A 123	(1989a) Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A 167	(1996) Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and

	Strip
ASTM A 181/A 181M	(1995b) Carbon Steel, Forgings for General-Purpose Piping
ASTM A 193/A 193M	(1997a) Alloy-Steel and Stainless Steel Bolting Materials for High-Temperature Service
ASTM A 234/A 234M	(1997) Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service
ASTM A 733	(1993) Welded and Seamless Carbon Steel and Austenitic Stainless Steel Pipe Nipples
ASTM A 924/A 924M	(1996a) General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process
ASTM B 62	(1993) Composition Bronze or Ounce Metal Castings
ASTM B 75	(1995a) Seamless Copper Tube
ASTM B 88	(1996) Seamless Copper Water Tube
ASTM B 88M	(1996) Seamless Copper Water Tube (Metric)
ASTM B 117	(1997) Operating Salt Spray (FOG) Apparatus
ASTM B 650	(1995) Electrodeposited Engineering Chromium Coatings on Ferrous Substrates
ASTM B 813	(1993) Liquid and Paste Fluxes for Soldering Applications for Copper and Copper Alloy Tube
ASTM C 1071	(1991) Thermal and Acoustical Insulation (Glass Fiber, Duct Lining Material)
ASTM D 520	(1984; R 1995) Zinc Dust Pigment
ASTM D 1654	(1992) Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments
ASTM D 3359	(1995a) Measuring Adhesion by Tape Test
ASTM E 437	(1992) Industrial Wire Cloth and Screens (Square Opening Series)
ASTM F 1199	(1988; R 1993) Cast (All Temperature and Pressures) and Welded Pipe Line Strainers (150 psig and 150 degrees F Maximum)

AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS (ASHRAE)

ASHRAE 52.1	(1992) Gravimetric and Dust-Spot Procedures for Testing Air-Cleaning Devices Used in General Ventilation for Removing Particulate Matter
ASHRAE ANSI/ASHRAE 68	(1986) Laboratory Method of Testing In-Duct Sound Power Measurement Procedures for Fans
ASHRAE 70	(1991) Method of Testing for Rating the Performance of Air Outlets and Inlets

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

ASME B1.20.1	(1983; R 1992) Pipe Threads, General Purpose (Inch)
ASME B16.3	(1992) Malleable Iron Threaded Fittings
ASME B16.5	(1996) Pipe Flanges and Flanged Fittings NPS 1/2 thru NPS 24
ASME B16.9	(1993) Factory-Made Wrought Steel Buttwelding Fittings
ASME B16.11	(1996) Forged Fittings, Socket-Welding and Threaded
ASME B16.18	(1984; R 1994) Cast Copper Alloy Solder Joint Pressure Fittings
ASME B16.21	(1992) Nonmetallic Flat Gaskets for Pipe Flanges
ASME B16.22	(1995) Wrought Copper and Copper Alloy Solder Joint Pressure Fittings
ASME B16.26	(1988) Cast Copper Alloy Fittings for Flared Copper Tubes
ASME B16.39	(1986; R 1994) Malleable Iron Threaded Pipe Unions Classes 150, 250, and 300
ASME B31.1	(1995; B31.1a; B31.1b; B31.1c) Power Piping
ASME B40.1	(1991) Gauges - Pressure Indicating Dial Type - Elastic Element
ASME BPV IX	(1998) Boiler and Pressure Vessel Code; Section IX, Welding and Brazing Qualifications

AMERICAN WELDING SOCIETY (AWS)

AWS D1.1	(1996) Structural Welding Code - Steel

COMMERCIAL ITEM DESCRIPTIONS (CID)

CID A-A-1419	(Rev D) Filter Element, Air Conditioning

	(Viscous-Impingement and Dry Types, Replaceable)

EXPANSION JOINT MANUFACTURERS ASSOCIATION (EJMA)

EJMA-01	(1993) EJMA Standards

MANUFACTURERS STANDARDIZATION SOCIETY OF THE VALVE AND FITTINGS INDUSTRY (MSS)

MSS SP-25	(1998) Standard Marking System for Valves, Fittings, Flanges and Unions
MSS SP-58	(1993) Pipe Hangers and Supports - Materials, Design and Manufacture
MSS SP-69	(1996) Pipe Hangers and Supports - Selection and Application
MSS SP-70	(1990) Cast Iron Gate Valves, Flanged and Threaded Ends
MSS SP-71	(1997) Cast Iron Swing Check Valves, Flanges and Threaded Ends
MSS SP-72	(1992) Ball Valves with Flanged or Butt-Welding Ends for General Service
MSS SP-80	(1997) Bronze Gate, Globe, Angle and Check Valves
MSS SP-85	(1994) Cast Iron Globe & Angle Valves, Flanged and Threaded Ends
MSS SP-110	(1996) Ball Valves Threaded, Socket-Welding, Solder Joint, Grooved and Flared Ends

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA MG 1	(1993; Rev 1; Rev 2; Rev 3) Motors and Generators

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70	(1996; Errata 96-4) National Electrical Code
NFPA 90A	(1996) Installation of Air Conditioning and Ventilating Systems
NFPA 96	(1994) Ventilation Control and Fire Protection of Commercial Cooking Equipment

SHEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION (SMACNA)

SMACNA-05	(1992) Fire, Smoke and Radiation Damper Installation Guide for HVAC Systems

SMACNA-06	(1995) HVAC Duct Construction Standards - Metal and Flexible
SMACNA-10	(1985) HVAC Air Duct Leakage Test Manual

UNDERWRITERS LABORATORIES (UL)

UL 94	(1996; Rev thru Jul 1997) Tests for Flammability of Plastic Materials for Parts in Devices and Appliances
UL 181	(1996; Rev Oct 1996) Factory-Made Air Ducts and Air Connectors
UL 214	(1997) Tests for Flame-Propagation of Fabrics and Films
UL 555	(1995) Fire Dampers
UL 586	(1996) High-Efficiency, Particulate, Air Filter Units
UL 705	(1994; Rev thru Mar 1996) Power Ventilators
UL 900	(1994; Rev thru Apr 1997) Test Performance of Air Filter Units
UL 1995	(1995; Rev thru Feb 97) Heating and Cooling Equipment
UL Bld Mat Dir	(1997) Building Materials Directory
UL Elec Const Dir	(1998) Electrical Construction Equipment Directory
UL Fire Resist Dir	(1998) Fire Resistance Directory (2 Vol.)

1.2 COORDINATION OF TRADES

Ductwork, piping offsets, fittings, and accessories shall be furnished as required to provide a complete installation and to eliminate interference with other construction.

1.3 DELIVERY AND STORAGE

Equipment delivered and placed in storage shall be stored with protection from the weather, humidity and temperature variations, dirt and dust, or other contaminants.

1.4 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-01 Data

Components and Equipment Data; FIO.

Manufacturer's catalog data shall be included with the detail drawings for the following items. The data shall be highlighted to show model, size, options, etc., that are intended for consideration. Data shall be adequate to demonstrate compliance with contract requirements for the following:

a. Piping Components

b. Ductwork Components

c. Air Systems Equipment

d. Air Handling Units

e. Terminal Units

SD-04 Drawings

Air Supply, Distribution, Ventilation, and Exhaust Equipment; FIO.

Drawings shall consist of equipment layout including assembly and installation details and electrical connection diagrams; ductwork layout showing the location of all supports and hangers, typical hanger details, gauge reinforcement, reinforcement spacing rigidity classification, and static pressure and seal classifications; and piping layout showing the location of all guides and anchors, the load imposed on each support or anchor, and typical support details. Drawings shall include any information required to demonstrate that the system has been coordinated and will properly function as a unit and shall show equipment relationship to other parts of the work, including clearances required for operation and maintenance.

SD-06 Instructions

Test Procedures; FIO.

Proposed test procedures for piping hydrostatic test, ductwork leak test, and performance tests of systems, at least 2 weeks prior to the start of related testing.

Welding Procedures; FIO.

A copy of qualified welding procedures, at least 2 weeks prior to the start of welding operations.

System Diagrams; FIO.

Proposed diagrams, at least 2 weeks prior to start of related testing. System diagrams that show the layout of equipment, piping, and ductwork, and typed condensed operation manuals explaining preventative maintenance procedures, methods of checking the system for normal, safe operation, and procedures for safely starting and stopping the system shall be framed under glass. After approval, these items shall be posted where directed.

SD-07 Schedules

Test Schedules; FIO.

Proposed test schedules for hydrostatic test of piping, ductwork leak test, and performance tests, at least 2 weeks prior to the start of related testing.

Field Training Schedule; FIO.

Proposed schedule for field training, at least 2 weeks prior to the start of related training.

SD-08 Statements

Similar Services; FIO.

Statement demonstrating successful completion of similar services on at least 5 projects of similar size and scope, at least 2 weeks prior to submittal of other items required by this section.

Welding Qualification; FIO.

A list of names and identification symbols of qualified welders and welding operators, at least 2 weeks prior to the start of welding operations.

SD-09 Reports

Test Reports; FIO.

Test reports for the piping hydrostatic test, ductwork leak test, and performance tests in booklet form, upon completion of testing. Reports shall document phases of tests performed including initial test summary, repairs/adjustments made, and final test results.

SD-13 Certificates

Bolts; FIO.

Written certification from the bolt manufacturer that the bolts furnished comply with the requirements of this specification. The certification shall include illustrations of product markings, and the number of each type of bolt to be furnished.

SD-19 Operation and Maintenance Manuals

Air Supply, Distribution, Ventilation, and Exhaust Manuals; FIO.

Six manuals listing step-by-step procedures required for system startup, operation, shutdown, and routine maintenance, at least 2 weeks prior to field training. The manuals shall include the manufacturer's name, model number, parts list, list of parts and tools that should be kept in stock by the owner for routine maintenance including the name of a local supplier, simplified wiring and controls diagrams, troubleshooting guide, and recommended service organization (including address and telephone number) for each item of equipment. Each service organization submitted shall be capable of providing 4 hour onsite response to a service call on an emergency basis. Instruction and maintenance manuals shall be submitted for approval 30 days following CQC approval of equipment/materials.

PART 2 PRODUCTS

2.1 STANDARD PRODUCTS

Components and equipment shall be standard products of a manufacturer regularly engaged in the manufacturing of products that are of a similar material, design and workmanship. The standard products shall have been in satisfactory commercial or industrial use for 2 years before bid opening. The 2-year experience shall include applications of components and equipment under similar circumstances and of similar size. The 2 years must be satisfactorily completed by a product which has been sold or is offered for sale on the commercial market through advertisements, manufacturers' catalogs, or brochures. Products having less than a 2-year field service record will be acceptable if a certified record of satisfactory field operation, for not less than 6000 hours exclusive of the manufacturer's factory tests, can be shown. The equipment items shall be supported by a service organization.

2.2 ASBESTOS PROHIBITION

Asbestos and asbestos-containing products shall not be used.

2.3 NAMEPLATES

Equipment shall have a nameplate that identifies the manufacturer's name, address, type or style, model or serial number, and catalog number. Equipment shall include air handling units fan coil units, fans, and dehumidifiers.

2.4 EQUIPMENT GUARDS AND ACCESS

Belts, pulleys, chains, gears, couplings, projecting setscrews, keys, and other rotating parts exposed to personnel contact shall be fully enclosed or guarded according to OSHA requirements. High temperature equipment and piping exposed to contact by personnel or where it creates a potential fire hazard shall be properly guarded or covered with insulation of a type specified.

2.5 PIPING COMPONENTS

2.5.1 Steel Pipe

Steel pipe shall conform to ASTM A 53, Schedule 40, Grade A or B, Type E or S.

2.5.2 Joints and Fittings For Steel Pipe

Joints shall be welded, flanged, threaded, as indicated. If not otherwise indicated, piping 25 mm (1 inch) and smaller shall be threaded; piping larger than 25 mm (1 inch) and smaller than 80 mm (3 inches) shall be either threaded, grooved, or welded; and piping 80 mm (3 inches) and larger shall be grooved, welded, or flanged. The manufacturer of each fitting shall be permanently identified on the body of the fitting according to MSS SP-25.

2.5.2.1 Welded Joints and Fittings

Welded fittings shall conform to ASTM A 234/A 234M, and shall be identified with the appropriate grade and marking symbol. Butt-welded fittings shall conform to ASME B16.9. Socket-welded fittings shall conform to ASME B16.11.

2.5.2.2 Flanged Joints and Fittings

Flanges shall conform to ASTM A 181/A 181M and ASME B16.5, Class 150. Gaskets shall be nonasbestos compressed material according to ASME B16.21, 2.0 mm thickness, full face or self-centering flat ring type. The gaskets shall contain aramid fibers bonded with styrene butadiene rubber (SBR) or nitrile butadiene rubber (NBR). Bolts, nuts, and bolt patterns shall conform to ASME B16.5. Bolts shall be high or intermediate strength material conforming to ASTM A 193/A 193M.

2.5.2.3 Threaded Joints and Fittings

Threads shall conform to ASME B1.20.1. Unions shall conform to ASME B16.39, Class 150. Nipples shall conform to ASTM A 733. Malleable iron fittings shall conform to ASME B16.3, type as required to match piping.

2.5.2.4 Dielectric Unions and Flanges

Dielectric unions shall have the tensile strength and dimensional requirements specified. Unions shall have metal connections on both ends threaded to match adjacent piping. Metal parts of dielectric unions shall be separated with a nylon insulator to prevent current flow between dissimilar metals. Unions shall be suitable for the required operating pressures and temperatures. Dielectric flanges shall provide the same pressure ratings as standard flanges and provide complete electrical isolation.

2.5.3 Copper Tube

Copper tube shall conform to ASTM B 88, and ASTM B 88M, Type K or L.

2.5.4 Joints and Fittings For Copper Tube

Wrought copper and bronze solder-joint pressure fittings shall conform to ASME B16.22 and ASTM B 75. Cast copper alloy solder-joint pressure fittings shall conform to ASME B16.18. Cast copper alloy fittings for flared copper tube shall conform to ASME B16.26 and ASTM B 62. Brass or bronze adapters for brazed tubing may be used for connecting tubing to flanges and to threaded ends of valves and equipment. Extracted brazed tee joints produced with an acceptable tool and installed as recommended by the manufacturer may be used.

2.5.5 Valves

Valves shall be Class 125 and shall be suitable for the intended application. Valves shall meet the material, fabrication and operating requirements of ASME B31.1. Chain operators shall be provided for valves located 3 meters or higher above the floor.

2.5.5.1 Gate Valves

Gate valves 65 mm (2-1/2 inches) and smaller shall conform to MSS SP-80 and shall be bronze with rising stem and threaded, solder, or flanged ends. Gate valves 80 mm (3 inches) and larger shall conform to MSS SP-70 and shall be cast iron with bronze trim, outside screw and yoke, and flanged or threaded ends.

2.5.5.2 Globe Valves

Globe valves 65 mm (2-1/2 inches) and smaller shall conform to MSS SP-80,

bronze, threaded, soldered, or flanged ends. Globe valves 80 mm (3 inches) and larger shall conform to MSS SP-85 and shall be cast iron with bronze trim and flanged, or threaded ends.

2.5.5.3 Check Valves

Check valves 65 mm (2-1/2 inches) and smaller shall conform to MSS SP-80 and shall be bronze with threaded, soldered, or flanged ends. Check valves 80 mm (3 inches) and larger shall conform to MSS SP-71and shall be cast iron with bronze trim and flanged or threaded ends.

2.5.5.4 Angle Valves

Angle valves 65 mm (2-1/2 inches) and smaller shall conform to MSS SP-80 and shall be bronze with threaded, soldered, or flanged ends. Angle valves 80 mm (3 inches) and larger shall conform to MSS SP-85and shall be cast iron with bronze trim and flanged, or threaded ends.

2.5.5.5 Ball Valves

Ball valves 15 mm (1/2 inch) and larger shall conform to MSS SP-72 or MSS SP-110, and shall be ductile iron or bronze with threaded, soldered, or flanged ends.

2.5.5.6 Butterfly Valves

Butterfly valves shall be 2 flange or lug wafer type, and shall be bubble-tight at 1.03 MPa. Valve bodies shall be cast iron or malleable iron. ASTM A 167, Type 404 or Type 316, corrosion resisting steel stems, bronze or corrosion resisting steel discs, and synthetic rubber seats shall be provided. Valves smaller than 200 mm (8 inches) shall have throttling handles with a minimum of seven locking positions. Valves 200 mm (8 inches) and larger shall have totally enclosed manual gear operators with adjustable balance return stops and position indicators. Valves in insulated lines shall have extended neck to accommodate insulation thickness.

2.5.5.7 Balancing Valves

Balancing valves 50 mm (2 inches) or smaller shall be bronze with NPT connections for black steel pipe and brazed connections for copper tubing. Valves 65 mm or larger may be all iron with threaded or flanged ends. The valves shall have a square head or similar device and an indicator arc and shall be designed for 120 degrees C. Iron valves shall be lubricated, nonlubricated, or tetrafluoroethylene resin-coated plug valves. In lieu of plug valves, ball valves may be used. Plug valves and ball valves 200 mm (8 inches) or larger shall be provided with manual gear operators with position indicators. Where indicated, automatic flow control valves may be provided to maintain constant flow, and shall be designed to be sensitive to pressure differential across the valve to provide the required opening. Valves shall be selected for the flow required and provided with a permanent nameplate or tag carrying a permanent record of the factory-determined flow rate and flow control pressure levels. Valves shall control the flow within 5 percent of the tag rating. Valves shall be suitable for the maximum operating pressure of 862 kPa (125 psig) or 150 percent of the system operating pressure, whichever is the greater. Where the available system pressure is not adequate to provide the minimum pressure differential that still allows flow control, the system pump head capability shall be appropriately increased. Where flow readings are

provided by remote or portable meters, valve bodies shall be provided with tapped openings and pipe extensions with shutoff valves outside of pipe insulation. The pipe extensions shall be provided with quick connecting hose fittings for a portable meter to measure the pressure differential across the automatic flow control valve. A portable meter furnished with accessory kit as recommended by the automatic valve manufacturer shall be provided. Automatic flow control valve specified may be substituted for venturi tubes or orifice plate flow measuring devices.

2.5.5.8 Air Vents

Manual air vents shall be brass or bronze valves or cocks suitable for pressure rating of piping system and furnished with threaded plugs or caps. Automatic air vents shall be float type, cast iron, stainless steel, or forged steel construction, suitable for pressure rating of piping system.

2.5.6 Strainers

Strainer shall be in accordance with ASTM F 1199, except as modified herein. Strainer shall be the cleanable, basket or "Y" type, the same size as the pipeline. The strainer bodies shall be fabricated of cast iron with bottoms drilled, and tapped. The bodies shall have arrows clearly cast on the sides indicating the direction of flow. Each strainer shall be equipped with removable cover and sediment screen. The screen shall be made of minimum 0.8 mm (22 gauge) corrosion-resistant steel, with small perforations numbering not less than 60 per square centimeter (400 per square inch) to provide a net free area through the basket of at least 3,300 times that of the entering pipe. The flow shall be into the screen and out through the perforations.

2.5.7 Backflow Preventers

Backflow preventers shall be according to Section 15400 PLUMBING, GENERAL PURPOSE.

2.5.8 Flexible Pipe Connectors

Flexible pipe connectors shall be designed for 862 kPa (125 psi) or 1034 kPa (150 psi) service as appropriate for the static head plus the system head, and 120 degrees C. The flexible section shall be constructed of rubber, tetrafluoroethylene resin, or corrosion-resisting steel, bronze or monel. The flexible section shall be suitable for intended service with end connections to match adjacent piping. Flanged assemblies shall be equipped with limit bolts to restrict maximum travel to the manufacturer's standard limits. Unless otherwise indicated, the length of the flexible connectors shall be as recommended by the manufacturer for the service intended. Internal sleeves or liners, compatible with circulating medium, shall be provided when recommended by the manufacturer. Covers to protect the bellows shall be provided where indicated.

2.5.9 Pressure Gauges

Gauges shall conform to ASME B40.1 and shall be provided with throttling type needle valve or a pulsation dampener and shut-off valve. Gauge shall be a minimum of 85 mm in diameter and shall have a range from 0 kPa to approximately 1.5 times the maximum system working pressure.

2.5.10 Thermometers

Thermometers shall have brass, malleable iron, or aluminum alloy case and frame, clear protective face, permanently stabilized glass tube with indicating-fluid column, white face, black numbers, and a 225 mm (9 inch) scale, and shall have rigid stems with straight, angular, or inclined pattern.

2.5.11 Escutcheons

Escutcheons shall be chromium-plated iron or chromium-plated brass, either one piece or split pattern, held in place by internal spring tension or setscrews.

2.5.12 Pipe Hangers, Inserts, and Supports

Pipe hangers, inserts, and supports shall conform to MSS SP-58 and MSS SP-69.

2.5.13 Expansion Joints

2.5.13.1 Slip Joints

Expansion joints shall provide for either single or double slip of the connected pipes, as required or indicated, and for not less than the traverse indicated. The joints shall be designed for working temperature and pressure suitable for the application, but not less than 1034 kPa (150 psig), and shall be according to applicable requirements of EJMA-01 and ASME B31.1. End connections shall be flanged or beveled for welding as indicated. Joint shall be provided with an anchor base where required or indicated. Where adjoining pipe is carbon steel, the sliding slip shall be seamless steel plated with a minimum of 0.058 mm of hard chrome according to ASTM B 650. All joint components shall be suitable for the intended service. Initial setting shall be made according to the manufacturer's recommendations to compensate for ambient temperature at time of installation. Pipe alignment guides shall be installed as recommended by the joint manufacturer, but in any case shall be not more than 1.5 m from expansion joint except that in lines 100 mm (4 inches) or smaller, guides shall be installed not more than 600 mm from the joint. Service outlets shall be provided where indicated.

2.5.13.2 Flexible Ball Joints

Flexible ball joints shall conform to EJMA-01 and ASME B31.1 and be constructed of alloys as appropriate for the service intended. Where so indicated, the ball joint shall be designed for packing injection under full line pressure to contain leakage. The joint ends shall be threaded to 50 mm (2 inches) only, grooved, flanged, or beveled for welding as indicated or required and shall be capable of absorbing a minimum of 15-degree angular flex and 360 degree rotation. Balls and sockets shall be suitable for the intended service. The exterior spherical surface of carbon steel balls shall be plated with mils of hard chrome according to ASTM B 650. The ball type joints shall be designed and constructed according to EJMA-01 and ASME B31.1 where applicable. Where required, flanges shall conform to ASME B16.5.

2.5.13.3 Bellows Type Joints

Bellows type joints shall be flexible, guided expansion joints. The expansion element shall be stabilized corrosion resistant steel. Bellows type expansion joints shall conform to the applicable requirements of EJMA-01 with internal sleeves. Guiding of piping on both sides of

expansion joint shall be according to the published recommendations of the manufacturer of the expansion joint. The joints shall be designed for the working temperature and pressure suitable for the application but not less than 1034 kPa (150 psig).

2.5.14 Insulation

Shop and field applied insulation shall be as specified in Section 15080 THERMAL INSULATION FOR MECHANICAL SYSTEMS.

2.5.15 Condensate Drain Lines

Condensate drainage shall be provided for each item of equipment that generates condensate as specified for drain, waste, and vent piping systems in Section 15400 PLUMBING, GENERAL PURPOSE.

2.6 ELECTRICAL WORK

Electrical motor-driven equipment specified shall be provided complete with motor, motor starter, and controls. Unless otherwise specified, electric equipment, including wiring and motor efficiencies, shall be according to Section 16415 ELECTRICAL WORK, INTERIOR. Electrical characteristics and enclosure type shall be as shown. Unless otherwise indicated, motors of 745 W and above shall be high efficiency type. Motor starters shall be provided complete with thermal overload protection and other appurtenances necessary. Each motor shall be according to NEMA MG 1 and shall be of sufficient size to drive the equipment at the specified capacity without exceeding the nameplate rating of the motor. Manual or automatic control and protective or signal devices required for the operation specified, and any control wiring required for controls and devices, but not shown, shall be provided. Where two-speed or variable-speed motors are indicated, solid-state variable-speed controller may be provided to accomplish the same function. Solid-state variable-speed controllers shall be utilized for motors rated 7.45 kW (10 hp) or less. Adjustable frequency drives shall be used for larger motors.

2.7 CONTROLS

Controls shall be provided as specified in Section 15951 DIRECT DIGITAL CONTROL FOR HVAC.

2.8 DUCTWORK COMPONENTS

2.8.1 Metal Ductwork

All aspects of metal ductwork construction, including all fittings and components, shall comply with SMACNA-06 unless otherwise specified. Elbows shall be radius type with a centerline radius of 1-1/2 times the width or diameter of the duct where space permits. Otherwise, elbows having a minimum radius equal to the width or diameter of the duct or square elbows with factory fabricated turning vanes may be used. Static pressure up to Class 500 Pa (2 inch w.g.) ductwork shall meet the requirements of Seal Class C. Class 750 through 1500 Pa (3 through 6 inch) shall meet the requirements of Seal Class A. Sealants shall conform to fire hazard classification specified in Section 15080 THERMAL INSULATION FOR MECHANICAL SYSTEMS. Pressure sensitive tape shall not be used as a sealant. Spiral lock seam duct, and flat oval shall be made with duct sealant and locked with not less than 3 equally spaced drive screws or other approved methods indicated in SMACNA-06. The sealant shall be applied to the exposed male

part of the fitting collar so that the sealer will be on the inside of the joint and fully protected by the metal of the duct fitting. One brush coat of the sealant shall be applied over the outside of the joint to at least 50 mm band width covering all screw heads and joint gap. Dents in the male portion of the slip fitting collar will not be acceptable. Outdoor air intake ducts and plenums shall be fabricated with watertight soldered or brazed joints and seams.

2.8.1.1 Transitions

Diverging air flow transitions shall be made with each side pitched out a maximum of 15 degrees, for an included angle of 30 degrees. Transitions for converging air flow shall be made with each side pitched in a maximum of 30 degrees, for an included angle of 60 degrees, or shall be as indicated. Factory-fabricated reducing fittings for systems using round duct sections when formed to the shape of the ASME short flow nozzle, need not comply with the maximum angles specified.

2.8.1.2 Metallic Flexible Duct

Metallic type duct shall be single-ply galvanized steel, self supporting to 2.4 m spans. Duct shall be of corrugated/interlocked, folded and knurled type seam construction, bendable without damage through 180 degrees with a throat radius equal to 1/2 duct diameter. Duct shall conform to UL 181and shall be rated for positive or negative working pressure of 3.75 kPa (15 inches water gauge) at 177 degrees C (350 degrees F) when duct is aluminum, and 343 degrees C (650 degrees F) when duct is galvanized steel or stainless steel.

2.8.1.3 Insulated Nonmetallic Flexible Duct Runouts

Flexible duct runouts shall be used only where indicated. Runout length shall be as shown on the drawings, but shall in no case exceed 3 m. Runouts shall be preinsulated, factory fabricated, and shall comply with NFPA 90A and UL 181. Either field or factory applied vapor barrier shall be provided. Where coil induction or high velocity units are supplied with vertical air inlets, a streamlined and vaned and mitered elbow transition piece shall be provided for connection to the flexible duct or hose. The last elbow to these units, other than the vertical air inlet type, shall be a die-stamped elbow and not a flexible connector. Insulated flexible connectors may be used as runouts. The insulated material and vapor barrier shall conform to the requirements of Section 15080 THERMAL INSULATION FOR MECHANICAL SYSTEMS. The insulation material surface shall not be exposed to the air stream.

2.8.1.4 General Service Duct Connectors

A flexible duct connector approximately 150 mm in width shall be provided where sheet metal connections are made to fans or where ducts of dissimilar metals are connected. For round/oval ducts, the flexible material shall be secured by stainless steel, clinch-type draw bands. For rectangular ducts, the flexible material locked to metal collars shall be installed using normal duct construction methods. The composite connector system shall comply with UL 214 and be classified as "flame-retarded fabrics" in UL Bld Mat Dir.

2.8.1.5 High Temperature Service Duct Connections

Material shall be approximately 2.38 mm thick, 1.2 to 1.36 kg per square

meter (35 to 40-ounce per square yard) weight, plain weave fibrous glass cloth with, nickel/chrome wire reinforcement for service in excess of 650 degrees C.

2.8.2 Ductwork Accessories

2.8.2.1 Duct Access Doors

Access doors shall be provided in ductwork and plenums where indicated and at all air flow measuring primaries, automatic dampers, fire dampers, coils, thermostats, and other apparatus requiring service and inspection in the duct system, and unless otherwise shown, shall conform to SMACNA-06. Access doors shall be provided upstream and downstream of air flow measuring primaries and heating and cooling coils. Doors shall be minimum 375 x 450 mm, unless otherwise shown. Where duct size will not accommodate this size door, the doors shall be made as large as practicable. Doors 600 x 600 mm or larger shall be provided with fasteners operable from both sides. Doors in insulated ducts shall be the insulated type.

2.8.2.2 Fire Dampers

Fire dampers shall be 1-1/2 hour fire rated unless otherwise indicated. Fire dampers shall conform to the requirements of NFPA 90A and UL 555. Fire dampers shall be automatic operating type and shall have a dynamic rating suitable for the maximum air velocity and pressure differential to which it will be subjected. Fire dampers shall be approved for the specific application, and shall be installed according to their listing. Fire dampers shall be equipped with a steel sleeve or adequately sized frame installed in such a manner that disruption of the attached ductwork, if any, will not impair the operation of the damper. Sleeves or frames shall be equipped with perimeter mounting angles attached on both sides of the wall or floor opening. Ductwork in fire-rated floor-ceiling or roof-ceiling assembly systems with air ducts that pierce the ceiling of the assemblies shall be constructed in conformance with UL Fire Resist Dir. Fire dampers shall be curtain type with damper blades out of the air stream. Dampers shall not reduce the duct or the air transfer opening cross-sectional area. Dampers shall be installed so that the centerline of the damper depth or thickness is located in the centerline of the wall, partition or floor slab depth or thickness. Unless otherwise indicated, the installation details given in SMACNA-05 and in manufacturer's instructions for fire dampers shall be followed.

2.8.2.3 Splitters and Manual Balancing Dampers

Splitters and manual balancing dampers shall be furnished with accessible operating mechanisms. Where operators occur in finished portions of the building, operators shall be chromium plated with all exposed edges rounded. Splitters shall be operated by quadrant operators or 5 mm (3/16 inch) rod brought through the side of the duct with locking setscrew and bushing. Two rods are required on splitters over 200 mm (8 inches). Manual volume control dampers shall be operated by locking-type quadrant operators. Dampers and splitters shall be 2 gauges heavier than the duct in which installed. Unless otherwise indicated, multileaf dampers shall be opposed blade type with maximum blade width of 300 mm. Access doors or panels shall be provided for all concealed damper operators and locking setscrews. Unless otherwise indicated, the locking-type quadrant operators for dampers, when installed on ducts to be thermally insulated, shall be provided with stand-off mounting brackets, bases, or adapters to provide

clearance between the duct surface and the operator not less than the thickness of the insulation. Stand-off mounting items shall be integral with the operator or standard accessory of the damper manufacturer. Volume dampers shall be provided where indicated.

2.8.2.4 Air Deflectors and Branch Connections

Air deflectors shall be provided at duct mounted supply outlets, at takeoff or extension collars to supply outlets, at duct branch takeoff connections, and at 90 degree elbows, as well as at locations as indicated on the drawings or otherwise specified. Conical branch connections or 45 degree entry connections may be used in lieu of deflectors or extractors for branch connections. All air deflectors, except those installed in 90 degree elbows, shall be provided with an approved means of adjustment. Adjustment shall be made from easily accessible means inside the duct or from an adjustment with sturdy lock on the face of the duct. When installed on ducts to be thermally insulated, external adjustments shall be provided with stand-off mounting brackets, integral with the adjustment device, to provide clearance between the duct surface and the adjustment device not less than the thickness of the thermal insulation. Air deflectors shall be factory-fabricated units consisting of curved turning vanes or louver blades designed to provide uniform air distribution and change of direction with minimum turbulence or pressure loss. Air deflectors shall be factory or field assembled. Blade air deflectors, also called blade air extractors, shall be approved factory fabricated units consisting of equalizing grid and adjustable blade and lock. Adjustment shall be easily made from the face of the diffuser or by position adjustment and lock external to the duct. Stand-off brackets shall be provided on insulated ducts and are described herein. Fixed air deflectors, also called turning vanes, shall be provided in 90 degree elbows.

2.8.3 Duct Sleeves, Framed Prepared Openings, Closure Collars

2.8.3.1 Duct Sleeves

Duct sleeves shall be provided for round ducts 375 mm in diameter or less passing through floors, walls, ceilings, or roof, and installed during construction of the floor, wall, ceiling, or roof. Round ducts larger than 375 mm in diameter and square, rectangular, and oval ducts passing through floors, walls, ceilings, or roof shall be installed through framed prepared openings. The Contractor shall be responsible for the proper size and location of sleeves and prepared openings. Sleeves and framed openings are also required where grilles, registers, and diffusers are installed at the openings. Framed prepared openings shall be fabricated from 1.0 mm (20 gauge) galvanized steel, unless otherwise indicated. Where sleeves are installed in bearing walls or partitions, black steel pipe, ASTM A 53, Schedule 20 shall be used. Sleeve shall provide 25 mm clearance between the duct and the sleeve or 25 mm clearance between the insulation and the sleeve for insulated ducts.

2.8.3.2 Framed Prepared Openings

Openings shall have 25 mm clearance between the duct and the opening or 25 mm clearance between the insulation and the opening for insulated ducts.

2.8.3.3 Closure Collars

Collars shall be fabricated of galvanized sheet metal not less than 100 mm

wide, unless otherwise indicated, and shall be installed on exposed ducts on each side of walls or floors where sleeves or prepared openings are provided. Collars shall be installed tight against surfaces. Collars shall fit snugly around the duct or insulation. Sharp edges of the collar around insulated duct shall be ground smooth to preclude tearing or puncturing the insulation covering or vapor barrier. Collars for round ducts 375 mm in diameter or less shall be fabricated from 1.0 mm (20 gauge) galvanized steel. Collars for round ducts larger than 375 mm and square, and rectangular ducts shall be fabricated from 1.3 mm (18 gauge) galvanized steel. Collars shall be installed with fasteners on maximum 150 mm centers, except that not less than 4 fasteners shall be used.

2.8.4 Diffusers, Registers, and Grilles

Units shall be factory-fabricated of steel, corrosion-resistant steel, or aluminum and shall distribute the specified quantity of air evenly over space intended without causing noticeable drafts, air movement faster than 0.25 m/s (50 fpm) in occupied zone, or dead spots anywhere in the conditioned area. Outlets for diffusion, spread, throw, and noise level shall be as required for specified performance. Performance shall be certified according to ASHRAE 70. Inlets and outlets shall be sound rated and certified according to ASHRAE 70. Sound power level shall be as indicated. Diffusers and registers shall be provided with volume damper with accessible operator, unless otherwise indicated; or if standard with the manufacturer, an automatically controlled device will be acceptable. Volume dampers shall be opposed blade type for all diffusers and registers, except linear slot diffusers. Linear slot diffusers shall be provided with round or elliptical balancing dampers. Where the inlet and outlet openings are located less than 2 m above the floor, they shall be protected by a grille or screen according to NFPA 90A.

2.8.4.1 Diffusers

Diffuser types shall be as indicated. Ceiling mounted units shall be furnished with anti-smudge devices, unless the diffuser unit minimizes ceiling smudging through design features. Diffusers shall be provided with air deflectors of the type indicated. Air handling troffers or combination light and ceiling diffusers shall conform to the requirements of UL Elec Const Dir for the interchangeable use as cooled or heated air supply diffusers or return air units. Ceiling mounted units shall be installed with rims tight against ceiling. Sponge rubber gaskets shall be provided between ceiling and surface mounted diffusers for air leakage control. Suitable trim shall be provided for flush mounted diffusers. Duct collar connecting the duct to diffuser shall be airtight and shall not interfere with volume controller. Return or exhaust units shall be similar to supply diffusers.

2.8.4.2 Registers and Grilles

Units shall be four-way directional-control type, except that return and exhaust registers may be fixed horizontal or vertical louver type similar in appearance to the supply register face. Registers shall be provided with sponge-rubber gasket between flanges and wall or ceiling. Wall supply registers shall be installed at least 150 mm below the ceiling unless otherwise indicated. Return and exhaust registers shall be located 150 mm above the floor unless otherwise indicated. Four-way directional control may be achieved by a grille face which can be rotated in 4 positions or by adjustment of horizontal and vertical vanes. Grilles shall be as specified for registers, without volume control damper.

2.8.5 Louvers

Louvers for installation in exterior walls which are associated with the air supply and distribution system shall be as specified in Section 07600 SHEET METALWORK, GENERAL.

2.8.6 Air Vents, Penthouses, and Goosenecks

Air vents, penthouses, and goosenecks shall be fabricated from galvanized steel or aluminum sheets with galvanized or aluminum structural shapes. Sheet metal thickness, reinforcement, and fabrication shall conform to SMACNA-06. Louver blades shall be accurately fitted and secured to frames. Edges of louver blades shall be folded or beaded for rigidity and baffled to exclude driving rain. Air vents, penthouses, and goosenecks shall be provided with bird screen.

2.8.7 Bird Screens and Frames

Bird screens shall conform to ASTM E 437, Type I, Class 1, 2 by 2 mesh, 1.6 mm diameter aluminum wire or 0.8 mm inch diameter stainless steel wire. Frames shall be removable type or stainless steel or extruded aluminum.

2.9 AIR SYSTEMS EQUIPMENT

2.9.1 Fans

Fans shall be tested and rated according to AMCA ANSI/AMCA 210. Fans may be connected to the motors either directly or indirectly with V-belt drive. V-belt drives shall be designed for not less than 140 percent of the connected driving capacity. Motor sheaves shall be variable pitch for 11 kW (15 hp) and below and fixed pitch as defined by ARI Guideline D. Variable pitch sheaves shall be selected to drive the fan at a speed which will produce the specified capacity when set at the approximate midpoint of the sheave adjustment. When fixed pitch sheaves are furnished, a replaceable sheave shall be provided when needed to achieve system air balance. Motors for V-belt drives shall be provided with adjustable rails or bases. Removable metal guards shall be provided for all exposed V-belt drives, and speed-test openings shall be provided at the center of all rotating shafts. Fans shall be provided with personnel screens or guards on both suction and supply ends, except that the screens need not be provided, unless otherwise indicated, where ducts are connected to the fan. Fan and motor assemblies shall be provided with vibration-isolation supports or mountings as indicated. Vibration-isolation units shall be standard products with published loading ratings. Each fan shall be selected to produce the capacity required at the fan static pressure indicated. Sound power level shall be as indicated. The sound power level values shall be obtained according to AMCA 300. Standard AMCA arrangement, rotation, and discharge shall be as indicated.

2.9.1.1 Centrifugal Fans

Centrifugal fans shall be fully enclosed, single-width single-inlet, or double-width double-inlet, AMCA Pressure Class I, II, or III as required or indicated for the design system pressure. Impeller wheels shall be rigidly constructed, accurately balanced both statically and dynamically. Fan blades may be backward-inclined or airfoil design in wheel sizes up to 750 mm (30 inches). Fan blades for wheels over 750 mm (30 inches) in diameter shall be backward-inclined or airfoil design. Booster fans for

exhaust dryer systems shall be the open-wheel radial type. These fans shall be suitable for conveying lint and the temperatures encountered. The fan shaft shall be provided with a heat slinger to dissipate heat buildup along the shaft. An access (service) door to facilitate maintenance shall be supplied with these fans. Fan wheels over 900 mm (36 inches) in diameter shall have overhung pulleys and a bearing on each side of the wheel. Fan wheels 900 mm (36 inches) or less in diameter may have one or more extra long bearings between the fan wheel and the drive. Bearings shall be sleeve type, self-aligning and self-oiling with oil reservoirs, or precision self-aligning roller or ball-type with accessible grease fittings or permanently lubricated type. Grease fittings shall be connected to tubing and serviceable from a single accessible point. Bearing life shall be L50 rated at not less than 200,000 hours as defined by ABEMA Std 9 and ABEMA Std 11. Fan shafts shall be steel, accurately finished, and shall be provided with key seats and keys for impeller hubs and fan pulleys. Each fan outlet shall be of ample proportions and shall be designed for the attachment of angles and bolts for attaching flexible connections. Manually operated outlet dampers shall be provided. Motors, unless otherwise indicated, shall not exceed 1800 rpm and shall have open dripproof enclosures. Motor starters shall be manual across-the-line type with general-purpose enclosure. Remote manual switch shall be provided where indicated.

2.9.1.2 In-Line Centrifugal Fans

In-line fans shall have centrifugal backward inclined blades, stationary discharge conversion vanes, internal and external belt guards, and adjustable motor mounts. Fans shall be mounted in a square, heavy gauge galvanized steel housing. Air shall enter and leave the fan axially. Inlets shall be streamlined with conversion vanes to eliminate turbulence and provide smooth discharge air flow. Fan bearings and drive shafts shall be enclosed and isolated from the air stream. Fan bearings shall be sealed against dust and dirt and shall be permanently lubricated, and shall be precision self aligning ball or roller type. Bearing life shall be L50 rated at not less than 200,000 hours as defined by ABEMA Std 9 and ABEMA Std 11. Motors shall have open dripproof enclosure. Motor starters shall be manual across-the-line with general-purpose enclosures. Remote manual switch shall be provided where indicated.

2.9.1.3 Panel Type Power Wall Ventilators

Fans shall be propeller type, assembled on a reinforced metal panel with venturi opening spun into panel. Fans with wheels less than 600 mm (24 inches) diameter shall be direct or V-belt driven and fans with wheels 600 mm (24 inches) diameter and larger shall be V-belt drive type. Fans shall be furnished with wall mounting collar. Lubricated bearings shall be provided. Fans shall be fitted with wheel and motor side metal or wire guards which have a corrosion-resistant finish. Motor enclosure shall be dripproof type. Gravity backdraft dampers shall be provided where indicated.

2.9.1.4 Centrifugal Type Power Wall Ventilators

Fans shall be direct or V-belt driven centrifugal type with backward inclined, non-overloading wheel. Motor housing shall be removable and weatherproof. Unit housing shall be designed for sealing to building surface and for discharge and condensate drippage away from building surface. Housing shall be constructed of heavy gauge aluminum. Unit shall be fitted with an aluminum or plated steel wire discharge bird screen,

anodized aluminum wall grille, manufacturer's standard gravity damper, an airtight and liquid-tight metallic wall sleeve. Motor enclosure shall be dripproof type. Lubricated bearings shall be provided.

2.9.1.5 Centrifugal Type Power Roof Ventilators

Fans shall be direct or V-belt driven with backward inclined, non-overloading wheel. Motor compartment housing shall be hinged or removable and weatherproof, constructed of heavy gauge aluminum. Fans shall be provided with birdscreen, disconnect switch, gravity motorized dampers, roof curb, and extended base when indicated. Motors enclosure shall be dripproof type. Grease-laden kitchen exhaust fans shall be centrifugal type according to UL 705 and fitted with V-belt drive, round hood, and windband upblast discharge configuration, integral residue trough and collection device, motor and power transmission components located in outside positively air ventilated compartment. Lubricated bearings shall be provided.

2.9.1.6 Air-Curtain Fans

Air curtains shall be provided with a weatherproof housing constructed of high impact plastic or minimum 1.3 mm (18 gauge) rigid welded steel. Fan wheels shall be backward curved, non-overloading, centrifugal type and accurately balanced statically and dynamically. Motors shall have totally enclosed fan cooled enclosures. Motor starters shall be remote manual type with weather-resistant enclosure actuated when the doorway served is open. The air curtains shall attain the air velocities specified within 2 seconds following activation. Air intake and discharge openings shall be protected by bird screens. Air curtain unit or a multiple unit installation shall be at least as wide as the opening to be protected. The air discharge openings shall be so designed and equipped as to permit outward adjustment of the discharge air. Adjustment and installation placement shall be according to the manufacturer's written recommendation. Directional controls on air curtains for service windows shall be designed to be easily cleanable or readily removable. Air curtains shall be designed to prevent the adjustment of the air velocities specified. The interior surfaces of the air curtain units shall be accessible for cleaning. Certified test data indicating that the fan will provide the air velocities required when fan is mounted as indicated shall be furnished. Air curtains designed as fly fans shall be provided where indicated. Air curtains designed for use in service entranceways shall develop an air curtain not less than 75 mm thick at the discharge nozzle. The air velocity shall be not less than 8 m/s across the entire entryway when measured 900 mm above the floor. Air curtains designed for use on customer entranceways shall develop an air curtain not less than 200 mm thick at the discharge opening. The velocity shall be not less than 3 m/s across the entire entryway when measured 900 mm above the floor. Recirculating type air curtains shall be equipped with readily removable filters, or the filters shall be designed for in-position cleaning. The air capture compartment shall be readily accessible and easily cleanable or designed for in-position cleaning. Air curtains designed for use on service windows shall develop an air curtain not less than 200 mm thick at the discharge opening. The air velocity shall be not less than 3 m/s across the entire opening of the service window measured 900 mm below the air discharge opening.

2.9.1.7 Ceiling Exhaust Fans

Suspended cabinet-type ceiling exhaust fans shall be centrifugal type, direct-driven. Fans shall have acoustically insulated housing. Integral

backdraft damper shall be chatter-proof. The integral face grille shall be of egg-crate design or louver design. Fan motors shall be mounted on vibration isolators. Unit shall be provided with mounting flange for hanging unit from above. Fans shall be U.L. listed.

2.9.2 Coils

Coils shall be fin-and-tube type constructed of seamless copper tubes and copper fins mechanically bonded or soldered to the tubes. Coils shall be protected with a minimum 0.076 mm thick flood coated phenolic coating. Casing and tube support sheets shall be not lighter than 1.6 mm (16 gauge) galvanized steel, formed to provide structural strength. When required, multiple tube supports shall be provided to prevent tube sag. Each coil shall be tested at the factory under water at not less than 2.76 MPa (400 psi) air pressure and shall be suitable for 1.38 MPa (200 psi) working pressure. Coils shall be mounted for counterflow service. Coils shall be rated and certified according to ARI ANSI/ARI 410.

2.9.2.1 Direct-Expansion Coils

Direct-expansion coils shall be suitable for the refrigerant involved. Suction headers shall be seamless copper tubing or seamless or resistance welded steel tube with copper connections. Supply headers shall consist of a distributor which shall distribute the refrigerant through seamless copper tubing equally to all circuits in the coil. Tubes shall be circuited to ensure minimum pressure drop and maximum heat transfer. Circuiting shall permit refrigerant flow from inlet to suction outlet without causing oil slugging or restricting refrigerant flow in coil. Each coil to be field installed shall be completely dehydrated and sealed at the factory upon completion of pressure tests.

2.9.2.2 Water Coils

Water coils shall be circuited for a suitable water velocity without excessive pressure drop. Headers shall be constructed of cast iron, welded steel or copper. Each coil shall be provided with a plugged vent and drain connection extending through the unit casing.

2.9.3 Air Filters

Air filters shall be listed according to requirements of UL 900, except high efficiency particulate air filters of 99.97 percent efficiency by the DOP Test method shall be as listed under the Label Service and shall meet the requirements of UL 586.

2.9.3.1 Extended Surface Pleated Panel Filters

Filters shall be 50 mm (2 inch) depth, sectional, disposable type of the size indicated and shall have an average efficiency of 25 to 30 percent when tested according to ASHRAE 52.1. Initial resistance at 2.54 m/s (500 feet per minute) shall not exceed 9 mm water gauge. Filters shall be UL Class 2. Media shall be nonwoven cotton and synthetic fiber mat. A wire support grid bonded to the media shall be attached to a moisture resistant fiberboard frame. All four edges of the filter media shall be bonded to the inside of the frame to prevent air bypass and increase rigidity.

2.9.3.2 Range and Griddle Hood Service

Filter shall be sectional, permanent, washable, all metallic media type,

nominal thick, with suitable metal frames, designed for extraction of grease from grease-laden air. Clean filter static pressure drop shall not exceed Home Ventilating Institute rating when handling 165 L/s (350 cfm) air.

2.9.3.3 Holding Frames

Frames shall be fabricated from not lighter than 1.6 mm (16 gauge) sheet steel with rust-inhibitor coating. Each holding frame shall be equipped with suitable filter holding devices. Holding frame seats shall be gasketed. All joints shall be airtight.

2.9.3.4 Filter Gauges

Filter gauges shall be dial type, diaphragm actuated draft and shall be provided for all filter stations, including those filters which are furnished as integral parts of factory fabricated air handling units. Gauges shall be at least 98 mm (3-7/8 inches) in diameter, shall have white dials with black figures, and shall be graduated in 0.25 mm (0.01 inch), and shall have a minimum range of 25 mm beyond the specified final resistance for the filter bank on which each gauge is applied. Each gauge shall incorporate a screw operated zero adjustment and shall be furnished complete with two static pressure tips with integral compression fittings, two molded plastic vent valves, two 1.5 m (5 foot) minimum lengths of 6.35 mm (1/4 inch) diameter aluminum tubing, and all hardware and accessories for gauge mounting.

2.10 AIR HANDLING UNITS

2.10.1 Factory-Fabricated Air Handling Units

Units shall be single-zone draw-through type as indicated. Units shall include fans, coils, airtight insulated casing, adjustable V-belt drives, belt guards for externally mounted motors, access sections where indicated, combination sectional filter-mixing box, vibration-isolators, and appurtenances required for specified operation. Vibration isolators shall be as indicated. Each air handling unit shall have physical dimensions suitable to fit space allotted to the unit and shall have the capacity indicated. Air handling unit shall have published ratings based on tests performed according to ARI ANSI/ARI 430.

2.10.1.1 Casings

Casing sections shall be 2 inch double wall type constructed of a minimum 18 gauge galvanized steel, or 18 gauge steel outer casing protected with a corrosion resistant paint finish according to paragraph FACTORY PAINTING. Casing shall be designed and constructed with an integral structural steel frame such that exterior panels are non-load bearing. Exterior panels shall be individually removable. Removal shall not affect the structural integrity of the unit. Casings shall be provided with inspection doors, access sections, and access doors as indicated. Inspection and access doors shall be insulated, fully gasketed, double-wall type, of a minimum 1.3 mm (18 gauge) outer and 1.0 mm (20 gauge) inner panels. Doors shall be rigid and provided with heavy duty hinges and latches. Inspection doors shall be a minimum 300 mm wide by 300 mm high. Access doors shall be minimum 600 mm wide and shall be the full height of the unit casing or a minimum of 1800 mm, whichever is less. Access Sections shall be according to paragraph AIR HANDLING UNITS. Drain pan shall be double-bottom type constructed of 16 gauge stainless steel, pitched to the drain connection.

Drain pans shall be constructed water tight, treated to prevent corrosion, and designed for positive condensate drainage. When 2 or more cooling coils are used, with one stacked above the other, condensate from the upper coils shall not flow across the face of lower coils. Intermediate drain pans or condensate collection channels and downspouts shall be provided, as required to carry condensate to the unit drain pan out of the air stream and without moisture carryover. Each casing section handling conditioned air shall be insulated with not less than 25 mm (1 inch) thick, 24 kg per cubic meter (1-1/2 pound density) coated fibrous glass material having a thermal conductivity not greater than 0.033 W/m-K (0.23 Btu/hr-sf-F). Casing shall be insulated to prevent any sweating on the exterior of the casing. Factory applied fibrous glass insulation shall conform to ASTM C 1071, except that the minimum thickness and density requirements do not apply, and shall meet the requirements of NFPA 90A. Foam-type insulation is not acceptable. Foil-faced insulation shall not be an acceptable substitute for use on double-wall access doors and inspections doors and casing sections. Duct liner material, coating, and adhesive shall conform to fire-hazard requirements specified in Section 15080 THERMAL INSULATION FOR MECHANICAL SYSTEMS. Exposed insulation edges and joints where insulation panels are butted together shall be protected with a metal nosing strip or shall be coated to conform to meet erosion resistance requirements of ASTM C 1071. A latched and hinged inspection door, shall be provided in the fan and coil sections.

2.10.1.2 Cooling Coils

Coils shall be provided as specified in paragraph AIR SYSTEMS EQUIPMENT, for types indicated.

2.10.1.3 Air Filters

Air filters shall be as specified in paragraph AIR SYSTEMS EQUIPMENT for types and thickness indicated.

2.10.1.4 Fans

Fans shall be double-inlet, centrifugal type with each fan in a separate scroll. Fans and shafts shall be dynamically balanced prior to installation into air handling unit, then the entire fan assembly shall be statically and dynamically balanced at the factory after it has been installed in the air handling unit. Fans shall be mounted on steel shafts accurately ground and finished. Fan bearings shall be sealed against dust and dirt and shall be precision self-aligning ball or roller type. Bearing life shall be L50 rated at not less than 200,000 hours as defined by ABEMA Std 9 and ABEMA Std 11. Bearings shall be permanently lubricated or lubricated type with lubrication fittings readily accessible at the drive side of the unit. Bearings shall be supported by structural shapes, or die formed sheet structural members, or support plates securely attached to the unit casing. Bearings may not be fastened directly to the unit sheet metal casing. Fans and scrolls shall be furnished with zinc chromate primer and an enamel finish coat. Fans shall be driven by a unit-mounted or a floor-mounted motor connected to fans by V-belt drive complete with belt guard for externally mounted motors. Belt guards shall be the three sided enclosed type with solid or expanded metal face. Belt drives shall be designed for not less than a 1.3 service factor based on motor nameplate rating. Motor sheaves shall be variable pitch for 20 kW and below and fixed pitch above 20 kW as defined by ARI Guideline D. Where fixed sheaves are required, variable pitch sheaves may be used during air balance, but shall be replaced with an appropriate fixed sheave after air

balance is completed. Variable pitch sheaves shall be selected to drive the fan at a speed that will produce the specified capacity when set at the approximate midpoint of the sheave adjustment. Motors for V-belt drives shall be provided with adjustable bases. Fan motors shall have splashproof enclosures. Motor starters shall be magnetic across-the-line type with general-purpose enclosure. Unit fan or fans shall be selected to produce the required capacity at the fan static pressure. Sound power level shall be as indicated. The sound power level values shall be obtained according to AMCA 300 or ASHRAE ANSI/ASHRAE 68.

2.10.1.5 Access Sections and Filter/Mixing Boxes

Access sections shall be provided where indicated and shall be furnished with access doors as shown. Access sections and filter/mixing boxes shall be constructed in a manner identical to the remainder of the unit casing and shall be equipped with access doors. Mixing boxes shall be designed to minimize air stratification and to promote thorough mixing of the air streams.

2.10.1.6 Dampers

Dampers shall be as specified in paragraph CONTROLS.

2.10.2 Variable Frequency Controller

The variable speed motor controller shall convert utility power shown on the mechanical drawings plus 15 percent, minus 5 percent, three phase, 60 Hz (plus or minus 2 Hz) to adjustable voltage/frequency, three phase, ac power for stepless motor control form 5 percent to 105 percent of base speed.

2.10.2.1 Description

The variable speed drive shall produce an adjustable ac voltage/frequency output for complete motor speed control. The variable speed drive shall be automatically controlled by a grounded electronic control signal. The variable speed drive shall be self contained, totally enclosed in a NEMA MG 1, ventilated cabinet and capable of operation between 0 and 40 degrees C. The variable speed drive maximum output current rating shall be equal to or exceed the motor nameplate full load. The manufacturer shall advise the maximum recommended motor sine wave current for each controller rating. Variable speed drive multiple motor operation at same frequency/speed shall be possible as long as the sum of connected motor full load sine wave currents are less than or equal to the variable speed drive maximum continuous current rating. Variable speed drive shall be 95 percent efficient at 100 percent rated output power, 60 Hz.

2.10.2.2 Governing Requirements

Variable speed drives shall conform to the following requirements:

a. Variable speed drive shall comply with 47 CFR 15 regulation of RF1/EM1 emission limits for Class A computing devices. The FCC label of compliance shall be displayed on the variable speed drive.

b. The variable speed drive and options shall comply with the applicable requirements and the standards of the American National Standards Institute (ANSI).

c. Variable speed drive and option design and construction thereof shall comply with all applicable provisions of NFPA 70, Article 43D, Sections A-L.

2.10.2.3 Quality Assurance

To ensure quality the variable speed drive shall be subject to the following tests:

a. The integrated circuits shall undergo a 160-hour "burn-in" to test reliability. During the "burn-in" the temperature shall be cycled between 0 and 70.0 degrees C (32 and 158 degrees F).

b. The completed unit shall undergo a fully loaded 24-hour "burn-in".

c. The unit shall be subject to a series of in-plant quality controlled inspections before approval for shipment form manufacturer's facilities.

2.10.2.4 Service

The variable speed drive shall be supplied with the following:

a. One-year parts and labor warranty.

b. A troubleshooting guide to help the building operator determine what steps must be taken to correct any problem that may exist in the system.

2.10.2.5 Basic Features

The variable speed drive shall have the following basic features:

a. Hand/Off/Auto Operation.

b. Manual/Auto speed reference switch.

c. Minimum/maximum adjustable speeds.

d. Speed potentiometer.

e. Auto restart.

f. Linear timed acceleration and deceleration for soft starting/stopping.

g. 3-63 Hz controlled speed range. (Factory set at 15 Hz minimum).

h. Terminal connections for time clock control and smoke detectors.

i. Output frequency terminal for remote metering.

2.10.2.6 Protective Circuit and Features

The variable speed drive controller shall include the following protective circuits/features.

a. Current limits to 100 percent design by slowing down motor.

b. Instantaneous Electronic Trip - automatically shutdown motor if current exceed 120 percent of design or phase-to-phase output short circuit occurs.

c. The variable speed drive will restart automatically when input line returns to normal in the event of intermittent power outage or phase loss or overvoltage shutdown.

d. Input power protection shuts down the unit if the following faults occur; low input line voltage or loss of an input phase.

e. Insensitive to incoming power phase.

f. Fast acting current limiting input fuses, (Class J) rated with 200,000 interrupting amperes capability.

g. Isolated 115 volt control circuit and dedicated control transformer, if required for variable speed drive controller operation.

h. Line-to-line fault protection.

i. Line-to-ground short circuiting and accidental motor grounding protection.

j. Output thermal overload relay trip.

2.10.2.7 Adjustments

The variable speed drive has the following adjustments available via potentiometers located on the faceplate of a single, regulator printed circuit board.

a. Minimum speed: 0-75 percent.

b. Maximum speed: 100 percent.

2.11 TERMINAL UNITS

2.11.1 Room Fan-Coil Units

Base units shall include galvanized coil casing, coil assembly drain pan valve and piping package, air filter, fans, motor, fan drive, and motor switch, plus an enclosure for cabinet models and casing for concealed models. Leveling devices integral with the unit shall be provided for vertical type units. Sound power levels shall be as indicated. Sound power level data or values for these units shall be obtained according to test procedures based on ARI 350. Sound power values apply to units provided with factory fabricated cabinet enclosures and standard grilles. Values obtained for the standard cabinet models will be acceptable for concealed models without separate test provided there is no variation between models as to the coil configuration, blowers, motor speeds, or relative arrangement of parts. Automatic valves and controls shall be provided as specified in paragraph CONTROLS. Each unit shall be fastened securely to the building structure. Capacity of the units shall be as indicated. Room fan-coil units shall be certified as complying with ARI ANSI/ARI 440, and shall meet the requirements of UL 1995.

2.11.1.1 Enclosures

Enclosures shall be fabricated of not lighter than 1.3 mm (18 gauge) steel, reinforced and braced. Front panels of enclosures shall be removable and provided with 13 mm (1/2 inch) thick dual density fibrous glass insulation. The exposed side shall be high density, erosion-proof material suitable for use in air streams with velocities up to 23 m/s (4,500 fpm). Discharge grille shall be adjustable and shall be of such design as to properly distribute air throughout the conditioned space. Plastic discharge and return grilles are acceptable provided the plastic material is certified by the manufacturer to be classified as flame resistant according to UL 94 and the material shall comply with the heat deflection criteria specified in UL 1995. Ferrous metal surfaces shall be galvanized or factory finished with corrosion resistant enamel. Access doors or removable panels shall be provided for piping and control compartments. Duct discharge collar shall be provided for concealed models. Enclosures shall have easy access for filter replacement.

2.11.1.2 Fans

Fans shall be galvanized steel or aluminum, multiblade, centrifugal type. In lieu of metal, fans and scrolls may be non-metallic materials of suitably reinforced compounds. Fans shall be dynamically and statically balanced. Surfaces shall be smooth. Assemblies shall be accessible for maintenance. Disassembly and re-assembly shall be by means of mechanical fastening devices and not by epoxies or cements.

2.11.1.3 Coils

Coils shall be constructed of not less than 10 mm (3/8 inch) outside diameter seamless copper tubing, with copper or aluminum fins mechanically bonded or soldered to the tubes. Coils shall be provided with not less than 12 mm (1/2 inch) outside diameter flare or sweat connectors, accessory piping package with thermal connections suitable for connection to the type of control valve supplied, and manual air vent. Coils shall be tested hydrostatically at 2000 kPa (300 psi) or under water at 1700 kPa (250 psi) air pressure and suitable for 1400 kPa (200 psi) working pressure. Provisions shall be made for coil removal.

2.11.1.4 Drain Pans

Drain and drip pans shall be sized and located to collect all water condensed on and dripping from any item within the unit enclosure or casing. Drain pans shall be constructed of not lighter than 0.9 mm (21 gauge) steel, galvanized after fabrication, thermally insulated to prevent condensation. Insulation shall have a flame spread rating not over 25 without evidence of continued progressive combustion, a smoke developed rating no higher than 50, and shall be of a waterproof type or coated with a waterproofing material. In lieu of the above, drain pans may be constructed of die-formed 0.85 mm (22 gauge) steel, formed from a single sheet, galvanized after fabrication, insulated and coated as specified for the 0.9 mm (21 gauge) material or of die-formed 0.9 mm (21 gauge) type 304 stainless steel, insulated as specified above. Drain pans shall be pitched to drain. Minimum 20 mm (3/4 inch) NPT or 15 mm (5/8 inch) OD drain connection shall be provided in drain pan. Auxiliary drain pans to catch drips from control and piping packages, eliminating insulation of the packages, may be plastic; if metal, the auxiliary pans shall comply with the requirements specified above. Insulation at control and piping

connections thereto shall extend 25 mm minimum over the auxiliary drain pan.

2.11.1.5 Manually Operated Outside Air Dampers

Manually operated outside air dampers shall be provided according to the arrangement indicated. Dampers shall be parallel airfoil type and of galvanized construction. Blades shall rotate on stainless steel or nylon sleeve bearings.

2.11.1.6 Filters

Filters shall be of the fiberglass disposable type, 25 mm (1 inch) thick, conforming to CID A-A-1419. Filters in each unit shall be removable without the use of tools.

2.11.1.7 Motors

Motors shall be of the permanent split-capacitor type with built-in thermal overload protection, directly connected to unit fans. Motor switch shall be two or three speeds and off, manually operated, and shall be mounted on an identified plate adjacent to the room thermostat or as indicated. In lieu of the above fan speed control, a solid-state variable-speed controller having a minimum speed reduction of 50 percent may be provided. Motors shall have permanently-lubricated or oilable sleeve-type or combination ball and sleeve-type bearings with vibration isolating mountings suitable for continuous duty. Motor power consumption, shown in watts, at the fan operating speed selected to meet the specified capacity shall not exceed the following values:

Unit Capacity (L/s)	Maximum Power Consumption (Watts)
94	55
142	60
189	65
283	80
378	130
472	130
566	130

2.11.2 Variable Air Volume (VAV) Terminal Units

VAV terminal units shall be the type, size, and capacity shown and shall be mounted in the ceiling and shall be suitable for single duct system applications. Actuators and controls shall be as specified in paragraph CONTROLS. Unit enclosures shall be constructed of galvanized steel not lighter than 0.85 mm (22 gauge) or aluminum sheet not lighter than 1.3 mm (18 gauge). Single or multiple discharge outlets shall be provided as required. Units with flow limiters are not acceptable. Unit air volume shall be factory preset and readily field adjustable without special tools. A flow chart shall be attached to each unit. Acoustic performance of the terminal units shall be based upon units tested according to ARI 880. Sound power level shall be as indicated. Discharge sound power shall be shown for minimum and 250 Pa (1 inch water gauge) inlet static pressure. Acoustical lining shall be according to NFPA 90A.

2.11.2.1 Variable Volume, Single Duct

Variable volume, single duct, terminal units shall be provided with a

calibrated air volume sensing device, air valve or damper, actuator, and accessory relays. Units shall control air volume to within plus or minus 5 percent of each air set point volume as determined by the thermostat with variations in inlet pressures from 200 to 1500 Pa (3/4 to 6 inch water gauge). Internal resistance of units shall not exceed 100 Pa (0.4 inch water gauge) at maximum flow range. External differential pressure taps separate from the control pressure taps shall be provided for air flow measurement with a 0 to 250 Pa (0 to 1 inch water gauge) range. Unit volume controller shall be normally closed upon loss of electricity.

2.12 FACTORY PAINTING

Units which are not of galvanized construction according to ASTM A 123 or ASTM A 924/A 924M shall be factory painted with a corrosion resisting paint finish. Internal and external ferrous metal surfaces shall be cleaned, phosphatized and coated with a paint finish which has been tested according to ASTM B 117, ASTM D 1654, and ASTM D 3359. Evidence of satisfactory paint performance for a minimum of 125 hours for units to be installed indoors and 500 hours for units to be installed outdoors shall be submitted. Rating of failure at the scribe mark shall be not less than 6, average creepage not greater than 3 mm. Rating of the inscribed area shall not be less than 10, no failure. On units constructed of galvanized steel which have been welded, exterior surfaces of welds or welds that have burned through from the interior shall receive a final shop docket of zinc-rich protective paint according to ASTM D 520 Type I.

2.13 REFRIGERANT LEAK DETECTOR

A refrigerant leak detection shall be provided in the mechanical room which houses a liquid chiller. The detector shall be located where refrigerant is likely to concentrate. The detector shall be a Halogen-specific detector which shall be specifically designed for area monitoring. The detector shall have an adjustable sensitivity such that it can detect refrigerant at or above 3 ppm. The detector shall energize the local mechanical ventilation system and initiate an audible and visible alarm upon detecting a refrigerant level greater than 10 ppm. The detector shall be capable of sensing two different types of refrigerant.

2.13.1 Refrigerant Monitor Performance

2.13.1.1 Refrigerant Monitor

Refrigerant monitor shall be capable of detecting concentration of 3 ppm for low-level leak detection and for insuring the safety of operations. It shall be supplied factory-calibrated for the appropriate refrigerant.

2.13.1.2 Monitors

All monitors shall be capable of continuously monitoring the mechanical room for the refrigerant used in the system. Monitor design and construction shall be compatible with temperature humidity, barometric pressure and voltage fluctuations of the mechanical room operating environment.

2.13.1.3 Refrigerant Monitor

The refrigerant monitor shall provide an alarm relay output which energizes when the monitor detects a refrigerant level at or above the TLV-TWA (Threshold Limit Value - Time Weighed Average) or toxicity measurement

consistent therewith. This relay shall be used to initiate the following events:

a. Energize an alarm consistent with other warning devices in the building to signal machinery room occupants.

b. Energize a light on or near the monitoring device; a second light, outside the mechanical room entrance, shall be used to provide an additional warning.

c. Energize the exhaust for required to achieve the maximum rate of exhaust. Exhaust fan shall remain energized until manually deactivated by an operator.

PART 3 EXECUTION

3.1 INSTALLATION

Work shall be installed as shown and according to the manufacturer's diagrams and recommendations.

3.1.1 Piping

Pipe and fitting installation shall conform to the requirements of ASME B31.1. Pipe shall be cut accurately to measurements established at the jobsite, and worked into place without springing or forcing, completely clearing all windows, doors, and other openings. Cutting or other weakening of the building structure to facilitate piping installation will not be permitted without written approval. Pipe or tubing shall be cut square, shall have burrs removed by reaming, and shall permit free expansion and contraction without causing damage to the building structure, pipe, joints, or hangers. Changes in direction shall be made with fittings, except that bending of pipe 100 mm (4 inches) and smaller will be permitted, provided a pipe bender is used and wide sweep bends are formed. The centerline radius of bends shall not be less than 6 diameters of the pipe. Bent pipe showing kinks, wrinkles, flattening, or other malformations will not be accepted. Horizontal supply mains shall pitch down in the direction of flow as indicated. The grade shall be not less than 2 mm in 1 m. Reducing fittings shall be used for changes in pipe sizes. Open ends of pipelines and equipment shall be capped or plugged during installation to keep dirt or other foreign materials out of the system. Pipe not otherwise specified shall be uncoated. Connections to appliances shall be made with malleable iron unions for steel pipe 65 mm (2-1/2 inches) or less in diameter, and with flanges for pipe 80 mm (3 inches) and larger. Connections between ferrous and copper piping shall be electrically isolated from each other with dielectric unions or flanges. All piping located in air plenums shall conform to NFPA 90Arequirements. Pipe and fittings installed in inaccessible conduits or trenches under concrete floor slabs shall be welded. Buried piping shall be installed per granular termite barrier manufacturer's recommendations.

3.1.1.1 Joints

a. Threaded Joints: Threaded joints shall be made with tapered threads and made tight with a stiff mixture of graphite and oil or polytetrafluoroethylene tape or equivalent thread joint compound or material, applied to the male threads only.

b. Soldered Joints: Joints in copper tubing shall be cut square with

ends reamed, and all filings and dust wiped from interior of pipe. Joints shall be soldered with 95/5 solder or brazed with silver solder applied and drawn through the full fitting length. Care shall be taken to prevent annealing of tube or fittings when making connections. Joints 65 mm (2-1/2 inches) and larger shall be made with heat uniformly around the entire circumference of the joint with a multi-flame torch. Connections in floor slabs shall be brazed. Excess solder shall be wiped from joint before solder hardens. Solder flux shall be liquid or paste form, non-corrosive and conform to ASTM B 813.

c. Welded Joints: Welding shall be according to qualified procedures using qualified welders and welding operators. Procedures and welders shall be qualified according to ASME BPV IX. Welding procedures qualified by others and welders and welding operators qualified by another operator may be permitted by ASME B31.1. Structural members shall be welded according to Section 05120 STRUCTURAL STEEL. All welds shall be permanently identified by imprinting the welder's or welding operator's assigned symbol adjacent to the weld. Welded joints shall be fusion welded unless otherwise required. Changes in direction of piping shall be made with welding fittings only; mitering or notching pipe to form elbows and tees or other similar type construction will not be permitted. Branch connections may be made with either welding tees or branch outlet fittings. Branch outlet fittings shall be forged, flared for improvement of flow where attached to the run, and reinforced against external strains. Beveling, alignment, heat treatment and inspection of weld shall conform to ASME B31.1. Weld defects shall be removed and repairs made to the weld, or the weld joints shall be entirely removed and rewelded. Electrodes shall be stored and dried according to AWS D1.1 or as recommended by the manufacturer. Electrodes that have been wetted or that have lost any of their coating shall not be used.

3.1.1.2 Flanges and Unions

Except where copper tubing is used, union or flanged joints shall be provided in each line immediately preceding the connection to each piece of equipment or material requiring maintenance such as coils, pumps, control valves, and other similar items.

3.1.2 Supports

3.1.2.1 General

Hangers used to support piping 50 mm (2 inches) and larger shall be fabricated to permit adequate adjustment after erection while still supporting the load. Pipe guides and anchors shall be installed to keep pipes in accurate alignment, to direct the expansion movement, and to prevent buckling, swaying, and undue strain. Piping subjected to vertical movement when operating temperatures exceed ambient temperatures shall be supported by variable spring hangers and supports or by constant support hangers.

3.1.2.2 Seismic Requirements (Pipe Supports and Structural Bracing)

Piping and attached valves shall be supported and braced to resist seismic loads as specified under Section 13080 SEISMIC PROTECTION FOR MECHANICAL, ELECTRICAL EQUIPMENT. Structural steel required for reinforcement to

properly support piping, headers, and equipment but not shown shall be provided under this section. Material used for support shall be as specified under Section 05210 STEEL JOISTS.

3.1.2.3 Pipe Hangers, Inserts and Supports

Pipe hangers, inserts, and supports shall conform to MSS SP-58 and MSS SP-69, except as modified herein. Types 5, 12, and 26 shall not be used.

a. Hangers: Type 3 shall not be used on insulated piping.

b. Inserts: Type 18 inserts shall be secured to concrete forms before concrete is placed. Continuous inserts which allow more adjustment may be used if they otherwise meet the requirements for Type 18 inserts.

c. C-Clamps: Type 19 and 23 C-clamps shall be torqued per MSS SP-69 and have both locknuts and retaining devices, furnished by the manufacturer. Field-fabricated C-clamp bodies or retaining devices are not acceptable.

d. Angle Attachments: Type 20 attachments used on angles and channels shall be furnished with an added malleable-iron heel plate or adapter.

e. Hangers: Type 24 may be used only on trapeze hanger systems or on fabricated frames.

f. Type 39 saddles shall be used on all insulated pipe 100 mm (4 inches) and larger when the temperature of the medium is above 15.5 degrees C. Type 39 saddles shall be welded to the pipe.

g. Type 40 shields shall:

(1) be used on all insulated pipes less than 100 mm (4 inches).

(2) be used on all insulated pipes 100 mm (4 inches) and larger when the temperature of the medium is 15.5 degrees C or less.

(3) have a high density insert for pipe 50 mm (2 inches) and larger, and for smaller pipe when the insulation shows signs of being visibly compressed, or when the insulation or jacket shows visible signs of distortion at or near the type 40 shield. High density inserts shall have a density of 144 kg/cubic meter (9 pcf) or greater.

h. Horizontal Pipe Supports: Horizontal pipe supports shall be spaced as specified in MSS SP-69 and a support shall be installed not over 300 mm (1 foot) from the pipe fitting joint at each change in direction of the piping. Pipe supports shall be spaced not over 1.5 m apart at valves. Pipe hanger loads suspended from steel joist with hanger loads between panel points in excess of 220 N (50 pounds) shall have the excess hanger loads suspended from panel points.

i. Vertical Pipe Supports: Vertical pipe shall be supported at each floor, except at slab-on-grade, and at intervals of not more than 5 m, not more than 2.4 m from end of risers, and at vent terminations.

j. Pipe Guides: Type 35 guides using steel reinforced polytetrafluoroethylene (PTFE) or graphite slides shall be provided where required to allow longitudinal pipe movement. Lateral restraints shall be provided as required. Slide materials shall be suitable for the system operating temperatures, atmospheric conditions, and bearing loads encountered.

k. Steel Slides: Where steel slides do not require provisions for restraint of lateral movement, an alternate guide method may be used. On piping 100 mm (4 inches) and larger with medium 15.5 degrees C or greater, a Type 39 saddle may be welded to the pipe and freely rest on a steel plate. On piping under 100 mm (4 inches), a Type 40 protection shield may be attached to the pipe or insulation and freely rest on a steel slide plate.

l. High Temperature Guides with Cradles: Where there are high system temperatures and welding to piping is not desirable, the Type 35 guide shall include a pipe cradle, welded to the guide structure and strapped securely to the pipe. The pipe shall be separated from the slide material by at least 100 mm, or by an amount adequate for the insulation, whichever is greater.

m. Insulated Pipe: Insulation on horizontal pipe shall be continuous through hangers for hot and cold piping. Other requirements on insulated pipe are specified in Section 15080 THERMAL INSULATION FOR MECHANICAL SYSTEMS.

3.1.3 Anchors

Anchors shall be provided wherever necessary or indicated to localize expansion or to prevent undue strain on piping. Anchors shall consist of heavy steel collars with lugs and bolts for clamping and attaching anchor braces, unless otherwise indicated. Anchor braces shall be installed in the most effective manner to secure the desired results using turnbuckles where required. Supports, anchors, or stays shall not be attached where they will injure the structure or adjacent construction during installation or by the weight of expansion of the pipeline.

3.1.4 Pipe Sleeves

Sleeves shall not be installed in structural members except where indicated or approved. Rectangular and square openings shall be as detailed. Each sleeve shall extend through its respective wall, floor, or roof, and shall be cut flush with each surface. Pipes passing through concrete or masonry wall or concrete floors or roofs shall be provided with pipe sleeves fitted into place at the time of construction. Unless otherwise indicated, sleeves shall provide a minimum of 6 mm all-around clearance between bare pipe and sleeves or between jacket over insulation and sleeves. Sleeves in bearing walls, waterproofing membrane floors, and wet areas shall be steel pipe or cast iron pipe. Sleeves in non-bearing walls, floors, or ceilings may be steel pipe, cast iron pipe, galvanized sheet metal with lock-type longitudinal seam and of the metal thickness indicated, or moisture resistant fiber or plastic. Except in pipe chases or interior walls, the annular space between pipe and sleeve or between jacket over insulation and sleeve, in non-fire rated walls, shall be sealed as indicated and specified in Section 07900 JOINT SEALING. Pipes passing through wall waterproofing membrane shall be sleeved as specified above, and a waterproofing clamping flange shall be installed as indicated.

3.1.4.1 Roof and Floor Sleeves

Pipes passing through roof or floor waterproofing membrane shall be installed through a 17-ounce copper sleeve within an integral skirt or flange. Flashing sleeve shall be suitably formed, and skirt or flange shall extend not less than 200 mm from the pipe and shall be set over the roof or floor membrane in a troweled coating of bituminous cement. Unless otherwise shown, the flashing sleeve shall extend up the pipe a minimum of 50 mm above highest floor level or a minimum of 250 mm above the roof. The annular space between the flashing sleeve and the bare pipe or between the flashing sleeve and the metal-jacket-covered insulation shall be sealed as indicated. Pipes up to and including 250 mm (10 inches) in diameter passing through roof or floor waterproofing membrane may be installed through a cast iron sleeve with caulking recess, anchor lugs, flashing clamp device, and pressure ring with brass bolts. Waterproofing membrane shall be clamped into place and sealant shall be placed in the caulking recess. In lieu of a waterproofing clamping flange and caulking and sealing of annular space between pipe and sleeve or conduit and sleeve, a modular mechanical type sealing assembly may be installed. Seals shall consist of interlocking synthetic rubber links shaped to continuously fill the annular space between the pipe/conduit and sleeve with corrosion protected carbon steel bolts, nuts, and pressure plates. Links shall be loosely assembled with bolts to form a continuous rubber belt around the pipe with a pressure plate under each bolt head and each nut. After the seal assembly is properly positioned in the sleeve, tightening of the bolt shall cause the rubber sealing elements to expand and provide a watertight seal between the pipe/conduit and the sleeve. Each seal assembly shall be sized as recommended by the manufacturer to fit the pipe/conduit and sleeve involved.

3.1.4.2 Fire Seal

Where pipes pass through firewalls, fire partitions, or floors, a fire seal shall be provided as specified in Section 07840 FIRESTOPPING.

3.1.4.3 Escutcheons

Escutcheons shall be provided at finished surfaces where exposed piping, bare or insulated, passes through floors, walls, or ceilings except in boiler, utility, or equipment rooms. Where sleeves project slightly from floors, special deep-type escutcheons shall be used. Escutcheons shall be secured to pipe or pipe covering.

3.1.5 Condensate Drain Lines

Water seals shall be provided in the condensate drain from all units. The depth of each seal shall be 50 mm plus 0.1 mm for each Pa, of the total static pressure rating of the unit to which the drain is connected. Water seals shall be constructed of 2 tees and an appropriate U-bend with the open end of each tee plugged. Pipe cap or plug cleanouts shall be provided where indicated. Drains indicated to connect to the sanitary waste system shall be connected by an indirect waste fitting. Air conditioner drain lines shall be insulated as specified in Section 15080 THERMAL INSULATION FOR MECHANICAL SYSTEMS.

3.1.6 Pipe-Alignment Guides

Pipe-alignment guides shall be provided where indicated for expansion

loops, offsets, and bends and as recommended by the manufacturer for expansion joints, not to exceed 1.5 m on each side of each expansion joint, and in lines 100 mm (4 inches) or smaller not more than 600 mm on each side of the joint.

3.1.7 Air Vents and Drains

3.1.7.1 Vents

Air vents shall be provided at high points, on water coils, and where indicated to ensure adequate venting of the piping system.

3.1.7.2 Drains

Drains shall be provided at low points and where indicated to ensure complete drainage of the piping. Drains shall be accessible, and shall consist of nipples and caps or plugged tees unless otherwise indicated.

3.1.8 Valves

Isolation gate or ball valves shall be installed on each side of each piece of equipment such as pumps, heaters, heating or cooling coils, and other similar items, at the midpoint of all looped mains, and at any other points indicated or required for draining, isolating, or sectionalizing purposes. Isolation valves may be omitted where balancing cocks are installed to provide both balancing and isolation functions. Each valve except check valves shall be identified. Valves in horizontal lines shall be installed with stems horizontal or above.

3.1.9 Equipment and Installation

Frames and supports shall be provided for tanks, pumps, valves, air handling units, fans, coils, dampers, and other similar items requiring supports. Air handling units shall be floor mounted. The method of anchoring and fastening shall be as detailed. Floor-mounted equipment, unless otherwise indicated, shall be set on not less than 150 mm (6 inch) concrete pads or curbs doweled in place. Concrete foundations for circulating pumps shall be heavy enough to minimize the intensity of the vibrations transmitted to the piping and the surrounding structure, as recommended in writing by the pump manufacturer. In lieu of a concrete pad foundation, a concrete pedestal block with isolators placed between the pedestal block and the floor may be provided. The concrete foundation or concrete pedestal block shall be of a mass not less than three times the weight of the components to be supported. Lines connected to the pump mounted on pedestal blocks shall be provided with flexible connectors. Foundation drawings, bolt-setting information, and foundation bolts shall be furnished prior to concrete foundation construction for all equipment indicated or required to have concrete foundations. Concrete for foundations shall be as specified in Section 03300 CAST-IN-PLACE STRUCTURAL CONCRETE.

3.1.10 Access Panels

Access panels shall be provided for concealed valves, vents, controls, dampers, and items requiring inspection or maintenance. Access panels shall be of sufficient size and located so that the concealed items may be serviced and maintained or completely removed and replaced. Access panels shall be as specified in Section 05500 MISCELLANEOUS METALS.

3.1.11 Flexible Connectors

Pre-insulated flexible connectors and flexible duct shall be attached to other components in accordance with the latest printed instructions of the manufacturer to ensure a vapor tight joint. Hangers, when required to suspend the connectors, shall be of the type recommended by the connector or duct manufacturer and shall be provided at the intervals recommended.

3.1.12 Sleeved and Framed Openings

Space between the sleeved or framed opening and the duct or the duct insulation shall be packed as specified in Section 07840 FIRESTOPPING for fire rated penetrations. For non-fire rated penetrations, the space shall be packed as specified in Section 07900 JOINT SEALING.

3.1.13 Metal Ductwork

Installation shall be according to SMACNA-06 unless otherwise indicated. Duct supports for sheet metal ductwork shall be according to SMACNA-06, unless otherwise specified. Friction beam clamps indicated in SMACNA-06 shall not be used. Risers on high velocity ducts shall be anchored in the center of the vertical run to allow ends of riser to move due to thermal expansion. Supports on the risers shall allow free vertical movement of the duct. Supports shall be attached only to structural framing members and concrete slabs. Supports shall not be anchored to metal decking unless a means is provided and approved for preventing the anchor from puncturing the metal decking. Where supports are required between structural framing members, suitable intermediate metal framing shall be provided. Where C-clamps are used, retainer clips shall be provided.

3.1.14 Kitchen Exhaust Ductwork

3.1.14.1 Ducts Conveying Smoke and Grease Laden Vapors

Ducts conveying smoke and grease laden vapors shall conform to requirements of NFPA 96. Seams, joints, penetrations, and duct-to-hood collar connections shall have a liquid tight continuous external weld. Duct material shall be minimum 1.3 mm (18 gauge), Type 304L or 316L, stainless steel. Duct construction shall include external perimeter angle sized in accordance with SMACNA-06, except welded joint reinforcement shall be on maximum of 600 mm centers; continuously welded companion angle bolted flanged joints with flexible ceramic cloth gaskets where indicated; pitched to drain at low points; welded pipe coupling-plug drains at low points; welded fire protection and detergent cleaning penetration; steel framed, stud bolted, and flexible ceramic cloth gasketed cleaning access provisions where indicated. Angles, pipe couplings, frames, bolts, etc., shall be same material as that specified for the duct unless indicated otherwise.

3.1.14.2 Exposed Ductwork

Exposed ductwork shall be fabricated from minimum 1.3 mm (18 gauge), Type 304L or 316L, stainless steel with continuously welded joints and seams. Ducts shall be pitched to drain at hoods and low points indicated. Surface finish shall match hoods.

3.1.14.3 Concealed Ducts Conveying Moisture Laden Air

Concealed ducts conveying moisture laden air shall be fabricated from minimum 1.3 mm (18 gauge), Type 300 series, stainless steel. Joints shall

be continuously welded, brazed, or soldered to be liquid tight. Duct shall be pitched to drain at points indicated. Transitions to other metals shall be liquid tight, companion angle bolted and gasketed.

3.1.14.4 Kitchen Hood

Kitchen hoods shall be as specified in Section 11400, FOOD SERVICE EQUIPMENT.

3.1.15 Dust Control

To prevent the accumulation of dust, debris and foreign material during construction, temporary dust control protection shall be provided. The distribution system (supply and return) shall be protected with temporary seal-offs at all inlets and outlets at the end of each day's work. Temporary protection shall remain in place until system is ready for startup.

3.1.16 Insulation

Thickness and application of insulation materials for ductwork, piping, and equipment shall be according to Section 15080 THERMAL INSULATION FOR MECHANICAL SYSTEMS. Outdoor air intake ducts and plenums shall be externally insulated up to the point where the outdoor air reaches the conditioning unit.

3.1.17 Duct Test Holes

Holes with closures or threaded holes with plugs shall be provided in the main supply and return ducts of the air handling units for the use of pitot tube in balancing the air system. Extensions, complete with cap or plug, shall be provided where the ducts are insulated.

3.1.18 Power Roof Ventilator Mounting

Foamed 13 mm (1/2 inch) thick, closed-cell, flexible elastomer insulation shall cover width of roof curb mounting flange. Where wood nailers are used, holes shall be pre-drilled for fasteners.

3.1.19 Power Transmission Components Adjustment

V-belts and sheaves shall be tested for proper alignment and tension prior to operation and after 72 hours of operation at final speed. Belts on drive side shall be uniformly loaded, not bouncing. Alignment of direct driven couplings shall be to within 50 percent of manufacturer's maximum allowable range of misalignment.

3.2 FIELD PAINTING AND PIPING IDENTIFICATION

Finish painting of items only primed at the factory or surfaces not specifically noted otherwise and identification for piping are specified in Section 09900 PAINTING, GENERAL.

3.3 PIPING HYDROSTATIC TEST

After cleaning, water piping shall be hydrostatically tested at a pressure equal to 689 kPa (100 psi) for period of time sufficient to inspect every joint in the system and in no case less than 2 hours. Leaks shall be repaired and piping retested until test is successful. No loss of pressure

will be allowed. Leaks shall be repaired by re-welding or replacing pipe or fittings. Caulking of joints will not be permitted. Concealed and insulated piping shall be tested in place before covering or concealing.

3.4 DUCTWORK LEAK TEST

Ductwork leak test shall be performed for the entire air distribution and exhaust system, including fans, coils, filters, etc. Test procedure, apparatus, and report shall conform to SMACNA-10. The maximum allowable leakage rate is 5 percent of total airflow. Ductwork leak test shall be completed with satisfactory results prior to applying insulation to ductwork exterior.

3.5 CLEANING AND ADJUSTING

Pipes shall be cleaned free of scale and thoroughly flushed of foreign matter. A temporary bypass shall be provided for water coils to prevent flushing water from passing through coils. Strainers and valves shall be thoroughly cleaned. Prior to testing and balancing, air shall be removed from water systems by operating the air vents. Temporary measures, such as piping the overflow from vents to a collecting vessel shall be taken to avoid water damage during the venting process. Air vents shall be plugged or capped after the system has been vented. Inside of room fan-coil units ducts, plenums, and casing shall be thoroughly cleaned of debris and blown free of small particles of rubbish and dust and then shall be vacuum cleaned before installing outlet faces. Equipment shall be wiped clean, with traces of oil, dust, dirt, or paint spots removed. Temporary filters shall be provided prior to startup of all fans that are operated during construction, and new filters shall be installed after all construction dirt has been removed from the building, and the ducts, plenums, casings, and other items specified have been vacuum cleaned. System shall be maintained in this clean condition until final acceptance. Bearings shall be properly lubricated with oil or grease as recommended by the manufacturer. Belts shall be tightened to proper tension. Control valves and other miscellaneous equipment requiring adjustment shall be adjusted to setting indicated or directed. Fans shall be adjusted to the speed indicated by the manufacturer to meet specified conditions.

3.6 TESTING, ADJUSTING, AND BALANCING

Testing, adjusting, and balancing shall be as specified in Section 15990 TESTING, ADJUSTING AND BALANCING OF HVAC SYSTEMS. Testing, adjusting, and balancing shall begin only when the air supply and distribution, including controls, has been completed, with the exception of performance tests.

3.7 PERFORMANCE TESTS

After testing, adjusting, and balancing has been completed as specified, each system shall be tested as a whole to see that all items perform as integral parts of the system and temperatures and conditions are evenly controlled throughout the building. Corrections and adjustments shall be made as necessary to produce the conditions indicated or specified. Capacity tests and general operating tests shall be conducted by an experienced engineer. Tests shall cover a period of not less than 1 day for each system and shall demonstrate that the entire system is functioning according to the specifications. Coincidental chart recordings shall be made at points indicated on the drawings for the duration of the time period and shall record the temperature at space thermostats or space sensors, the humidity at space humidistats or space sensors and the ambient

temperature and humidity in a shaded and weather protected area.

3.8 FIELD TRAINING

The Contractor shall conduct a training course for operating and maintenance personnel as designated by the Contracting Officer. Training shall be provided for a period of 16 hours of normal working time and shall start after the system is functionally complete but prior to the performance tests. The field instruction shall cover all of the items contained in the approved Operating and Maintenance Instructions.

-- End of Section --