

2. AMENDMENT/MODIFICATION NO. 0007	3. EFFECTIVE DATE 29 January 2003	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO. <i>(If applicable)</i>
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6. ISSUED BY LOS ANGELES DISTRICT, COE CESPL-CT-WEST REGION BRANCH P.O. BOX 532711 LOS ANGELES, CA 90053-2325	7. ADMINISTERED BY <i>(If other than Item 6)</i>
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8. NAME AND ADDRESS OF CONTRACTOR <i>(No., street, county, State and ZIP Code)</i>	(✓)	9A. AMENDMENT OF SOLICITATION NO. DACW09-02-B-0004
	X	9B. DATED <i>(SEE ITEM 11)</i> 17 OCTOBER 2002
		10A. MODIFICATION OF CONTRACTS/ORDER NO.
		10B. DATED <i>(SEE ITEM 13)</i>

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 1 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: <i>(Specify authority)</i> 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 <i>(such as changes in paying office, appropriation date, etc.)</i> 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 <i>(Specify type of modification and authority)</i>

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.)*
PRADO DAM EMBANKMENT AND OUTLET WORKS, RIVERSIDE COUNTY, CA

This amendment is issued to:

- a. CHANGE Bid Opening Date to 13 February, 2003
- b. REPLACE project_6.pdf with project_7.pdf; PROJECT TABLE OF CONTENTS
- c. REPLACE the following Specification Sections in the Solicitation with the enclosed Specification Sections:
 - 00010_7.pdf; SECTION 00010, BID SCHEDULE
 - 00100_7.pdf; SECTION 00100, Instructions to Bidders
 - 01200_7.pdf; SECTION 01200, General Requirements
 - 15080_7.pdf; SECTION 15080, Thermal Insuation for Mechanical Systems
 - 15895_7.pdf; SECTION 15895, Air Supply, Distribution, Ventilation, and Exhaust System

(CONTINUED ON NEXT SHEET)

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

Amendment 0007

January 29, 2003

DACW09-02-B-0004

PRADO DAM EMBANKMENT AND OUTLET WORKS, RIVERSIDE COUNTY, CA

BLOCK 14 – Continued

d. REPLACE the following Plans/Drawings in the Solicitation with the enclosed Plans/Drawings:

<u>File No.</u>	<u>Sheet No.</u>	<u>Drawing Title</u>
121/116 Rev. C	C-2	INDEX TO CONTRACT DRAWINGS, GENERAL LEGEND AND ABBREVIATIONS
121/118 Rev. B	C-4	SITE MAP
121/205 Rev. B	S3	REGULATING INTAKE STRUCTURE – STRUCTURAL SECTIONS 1
121/220 Rev. B	S-18	REGULATING INTAKE STRUCTURE – STRUCTURAL ELEVATION REINFORCEMENT 3

- END OF SF 30 -

SOLICITATION, OFFER, AND AWARD <i>(Construction, Alteration, or Repair)</i>	1. SOLICITATION NO. DACW09-02-B-0004	2. TYPE OF SOLICITATION <input checked="" type="checkbox"/> SEALED BID (IFB) <input type="checkbox"/> NEGOTIATED (RFP)	3. DATE ISSUED 29 January 2003	PAGE OF PAGES
	IMPORTANT - The "offer" section on the reverse must be fully completed by offeror.			

4. CONTRACT NO.	5. REQUISITION/PURCHASE REQUEST NO.	6. PROJECT NO. Prado Dam Embankment and Outlet Works
7. ISSUED BY U.S. Army Corps of Engineers Los Angeles District, West Region Branch P. O. Box 532711, CESPL-CT-W Los Angeles, CA 90053-2325	CODE	8. ADDRESS OFFER TO U.S. Army Corps of Engineers Los Angeles District, West Region Branch P. O. Box 532711, CESPL-CT-W Los Angeles, CA 90053-2325

9. FOR INFORMATION CALL: <input checked="" type="checkbox"/> A. NAME Cindy Myrtetus	B. TELEPHONE NO. (Include area code) (NO COLLECT CALLS) 213/452-3247; cynthia.h.myrtetus@usace.army.mil
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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):

PRADO DAM EMBANKMENT AND OUTLET WORKS, RIVERSIDE COUNTY, CALIFORNIA

This project consists of raising the existing earthen dam approximately 28' and the construction of a new gated outlet works. Work will include earth & rock work, construction of concrete control tower & channel structures, steel access bridge, mechanical, plumbing & electrical work for the control structure, fabrication & installation of regulating outlet gates, instrumentation, demolition of the existing control tower, sewer line relocation, site clearing, excavation and fill, A.C. paving and appurtenant work. The estimated cost range of the project is between \$25,000,000.00 and \$100,000,000.00.

This is an UNRESTRICTED procurement; all responsible sources may submit an offer.

This amendment is issued to reference new specifications as indicated on SF30, attached*

The bid opening date is changed to 13 February 2003*

* Denotes items changed.

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

award, notice to proceed. This performance period is mandatory, negotiable. (See *SECTION 00800.)

12A. THE CONTRACTOR MUST FURNISH ANY REQUIRED PERFORMANCE AND PAYMENT BONDS? (If "YES," indicate within how many calendar days after award in Item 12B.) <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	12B. CALENDAR DAYS 10
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13. ADDITIONAL SOLICITATION REQUIREMENTS:

A. Sealed offers in original and 0 copies to perform the work required are due at the place specified in Item 8 by 1:00 pm (hour) local time 13 FEBRUARY 2003 (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 60 calendar days for Government acceptance after the date offers are due will not be considered and will be rejected.

PROJECT TABLE OF CONTENTS

DIVISION 00 - BIDDING REQUIREMENTS, CONTRACTS FORMS AND CONTRACT CONDITIONS

- 00010 BID SCHEDULE**
- 00100 INSTRUCTIONS TO BIDDERS**
- 00600 REPRESENTATIONS & CERTIFICATIONS
- 00700 CONTRACT CLAUSES
- 00800 SPECIAL CONTRACT REQUIREMENTS
- 00850 WAGE RATES

DIVISION 01 - GENERAL REQUIREMENTS

- 01090 SOURCES FOR REFERENCE PUBLICATIONS
- 01151 SARI RELOCATION GEOTECHNICAL INVESTIGATION
- 01200 GENERAL REQUIREMENTS**
- 01230 SAFETY REQUIREMENTS
- 01270 MEASUREMENT AND PAYMENT
- 01312 RESIDENT MANAGEMENT SYSTEM (RMS)
- 01320 PROJECT SCHEDULE
- 01330 SUBMITTAL PROCEDURES
- 01356 STORM WATER POLLUTION PREVENTION MEASURES
- 01410 ENVIRONMENT PROTECTION
- 01451 CONTRACTOR QUALITY CONTROL
- 01500 QUALITY ASSURANCE
- 01702 AS-BUILT DRAWINGS

DIVISION 02 - SITE WORK

- 02100 CLEAR SITE AND REMOVE OBSTRUCTIONS
- 02130 DIVERSION AND CONTROL OF WATER
- 02200 EXCAVATION
- 02212 EMBANKMENT
- 02250 FILLS AND SUBGRADE PREPARATION
- 02316 EXCAVATION, TRENCHING, AND BACKFILLING FOR UTILITIES SYSTEMS
- 02378 GEOTEXTILES USED AS FILTERS
- 02410 SUBDRAINAGE SYSTEM
- 02480 MECHANICALLY STABILIZED EARTH WALLS
- 02510 WATER DISTRIBUTION SYSTEM
- 02521 WATER WELLS
- 02522 OBSERVATION WELLS
- 02531 SANITARY SEWERS
- 02551 BITUMINOUS PAVING FOR ROADS, STREETS AND OPEN STORAGE AREAS
- 02600 STONE PROTECTION
- 02612 PVC LINED REINFORCED CONCRETE SEWER PIPE
- 02623 HIGH DENSITY POLYETHYLENE (HDPE) PIPE
- 02650 GROUTING STONE PROTECTION
- 02720 STORM-DRAIN SYSTEM AND CULVERTS
- 02722 AGGREGATE AND/OR GRADED-CRUSHED AGGREGATE BASE COURSE
- 02821 FENCING
- 02900 HYDROSEEDING

DIVISION 03 - CONCRETE

- 03101 FORMWORK FOR CONCRETE
- 03150 EXPANSION JOINTS, CONTRACTION JOINTS, AND WATERSTOPS
- 03200 CONCRETE REINFORCEMENT
- 03230 STEEL STRESSING TENDONS AND ACCESSORIES FOR PRESTRESSED CONCRETE

03305 CAST-IN-PLACE STRUCTURAL CONCRETE
03310 ROOF DECKING, CAST-IN-PLACE LIGHT WEIGHT CONCRETE
03371 SHOTCRETE
03415 PRECAST-PRESTRESSED CONCRETE

DIVISION 04 - MASONRY

04200 MASONRY

DIVISION 05 - METALS

05120 STRUCTURAL STEEL
05501 METALWORK FABRICATION, MACHINE WORK, MISCELLANEOUS PROVISIONS
05615 STOPLOGS

DIVISION 07 - THERMAL & MOISTURE PROTECTION

07510 BUILT-UP ROOFING

DIVISION 08 - DOORS & WINDOWS

08110 STEEL DOORS AND FRAMES
08330 OVERHEAD SECTIONAL DOORS

DIVISION 09 - FINISHES

09310 CERAMIC TILE
09880 PVC LINERS FOR CONCRETE PIPE AND STRUCTURES
09920 COATING SYSTEMS
09940 PAINTING - HYDRAULIC STRUCTURES AND APPURTENANT WORKS
09950 INORGANIC ZINC COATING

DIVISION 10 - SPECIALTIES

10800 WASHROOM ACCESSORIES

DIVISION 11 - EQUIPMENT

11290 HYDRAULIC POWER SYSTEMS FOR REGULATING OUTLET GATES

DIVISION 13 - SPECIAL CONSTRUCTION

13080 SEISMIC PROTECTION FOR MECHANICAL, ELECTRICAL EQUIPMENT
13120 DIGITAL PHOTO DOCUMENTATION
13210 MONUMENTATION AND INSTRUMENTATION
13310 ULTRASONIC MULTI-PATH FLOWMETER
13851 FIRE DETECTION AND ALARM SYSTEM
13853 CENTRAL FIRE ALARM SYSTEM, DIGITAL ALARM COMMUNICATOR TYPE

DIVISION 14 - CONVEYING SYSTEMS

14210 ELEVATORS, ELECTRIC
14320 GATE ROOM UNDERHUNG CRANE

DIVISION 15 - MECHANICAL

15080 THERMAL INSULATION FOR MECHANICAL SYSTEMS

15095 EMERGENCY CLOSURE GATES FOR REGULATING OUTLETS
15096 MAINTENANCE BULKHEAD FOR LOW FLOW OUTLETS
15097 REGULATING OUTLET SLIDE GATES
15098 BUTTERFLY SHUTOFF VALVE, OPERATORS AND ACCESSORIES
15099 LOW FLOW OUTLET KNIFE GATE THROTTLING VALVES AND OPERATORS
15100 VALVES
15120 PIPING SPECIALTIES
15300 PIPING SYSTEMS - GENERAL
15301 FILLING SYSTEMS FOR REGULATING AND LOW FLOW OUTLETS
15400 PLUMBING, GENERAL PURPOSE
15895 AIR SUPPLY, DISTRIBUTION, VENTILATION, AND EXHAUST SYSTEM
15950 HEATING, VENTILATING AND AIR CONDITIONING (HVAC) CONTROL SYSTEMS
15990 TESTING, ADJUSTING, AND BALANCING OF HVAC SYSTEMS
15995 COMMISSIONING OF HVAC SYSTEMS

DIVISION 16 - ELECTRICAL

16051 CONTROL SYSTEM - REGULATING OUTLET GATES
16052 CONTROL SYSTEM - LOW FLOW OUTLET THROTTLING AND SHUT-OFF VALVES
16264 DIESEL-GENERATOR SET, STATIONARY 15-300 KW, STANDBY APPLICATIONS
16375 ELECTRICAL DISTRIBUTION SYSTEM, UNDERGROUND
16410 AUTOMATIC TRANSFER SWITCH AND BY-PASS/ISOLATION SWITCH
16415 ELECTRICAL WORK, INTERIOR
16475 COORDINATED POWER SYSTEM PROTECTION

-- End of Project Table of Contents --

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SECTION 00010 - BID SCHEDULE

Item No.	Description	Estimated Quantity	Unit	Unit Price	Estimated Amount
1	Mobilization and Preparatory Work	1	L.S.	_____	_____
2	Diversion and Control of Water	1	L.S.	_____	_____
3	Clear Site and Remove Obstructions - Outlet Works, Approach Channel, & Abutments	1	L.S.	_____	_____
4	Clear Site and Remove Obstructions - Borrow Areas	1	L.S.	_____	_____
5	Demolition of Existing Intake Structure and Access Bridge	1	L.S.	_____	_____
6	Abandon Existing Outlet Conduit	1	L.S.	_____	_____
7	Excavation, Outlet Works - Sta. 0+00 to Sta. 10+00	692,100	C.Y.	_____	_____
8	Excavation, Outlet Works - Sta. 10+00 to Sta. 18+13.5	470,700	C.Y.	_____	_____
9	Excavation, Outlet Works - Sta. 18+13.5 to Sta. 49+93	317,000	C.Y.	_____	_____
10	Excavation, Outlet Works - Sta. 49+93 to Sta. 54+00	48,000	C.Y.	_____	_____
11	Derrick Stone	9,700	Tons	_____	_____
12	Excavation, Removal of Gravel Blanket	80,200	Tons	_____	_____
13	Excavation, Removal of Stone Protection	6,300	Tons	_____	_____
14	Excavation, Stripping	3,000	C.Y.	_____	_____
15	Excavation, Toe	8,100	C.Y.	_____	_____
16	Excavation, Existing Embankment Crest	51,500	C.Y.	_____	_____
17	Foundation Preparation, Zone II Contact Area	1,200	S.Y.	_____	_____
18	Embankment, Zone I Material	1,132,400	C.Y.	_____	_____
19	Embankment, Zone II Material	233,600	C.Y.	_____	_____
20	Embankment, Transition Zone Material	257,700	C.Y.	_____	_____
21	Additional Rolling	60	Hours	_____	_____
22	Compacted Fill, Levee	82,000	C.Y.	_____	_____
23	Structural Backfill	23,500	C.Y.	_____	_____
24	Miscellaneous Fill	208,500	C.Y.	_____	_____
25	Mitigation Fill	4,900	C.Y.	_____	_____
26	Subdrainage System, Outlet Works	1	L.S.	_____	_____
27	Aggregate Base Course	6,000	Tons	_____	_____
28	Asphalt Concrete Pavement	3,300	Tons	_____	_____
29	Stone Protection	108,800	Tons	_____	_____
30	Gravel Blanket Protection	37,500	Tons	_____	_____
31	Bedding Material for Stone Protection	54,400	Tons	_____	_____

32 Stone for Grouted Stone Protection	8,000	Tons	_____	_____
33 Grouting Stone Protection	2,000	C.Y.	_____	_____
34 Concrete, Intake Tower Structure				
a. Concrete, Intake Tower Structure - Elev. 545' and Below	22,300	C.Y.	_____	_____
b. Concrete, Intake Tower Structure - Above Elev. 545'	970	C.Y.	_____	_____
c. Concrete, Float Well Intake	230	C.Y.	_____	_____
35 Concrete, Transition Structure	15,260	C.Y.	_____	_____
36 Concrete, Outlet Conduit	17,855	C.Y.	_____	_____
37 Concrete, Stilling Basin				
a. Concrete, Stilling Basin Invert - Sta.18+13.50 to Sta.21+02.50	8,400	C.Y.	_____	_____
b. Concrete, Stilling Basin	6,600	C.Y.	_____	_____
38 Concrete, Drop Structure Retaining Wall	467	C.Y.	_____	_____
39 Concrete, Outlet Works Sta. 21+02 to Sta. 49+93	24,500	C.Y.	_____	_____
40 Concrete, Access Road	230	C.Y.	_____	_____
41 Concrete, Stop Log Pads	35	C.Y.	_____	_____
42 Concrete, Lean Mix Concrete Backfill	7,200	C.Y.	_____	_____
43 Concrete Reinforcement	6,418	Tons	_____	_____
44 Structural Steel	34	Tons	_____	_____
45 Miscellaneous Steel and Metal Work	1	L.S.	_____	_____
46 Interceptor Drain	288	L.F.	_____	_____
47 V-Ditch	445	L.F.	_____	_____
48 Control House Access Bridge	1	L.S.	_____	_____
49 Stilling Basin Access Road Bridge	1	L.S.	_____	_____
50 Mechanically Stabilized Earth Walls	18,535	S.F.	_____	_____
51 MSE Instrumentation	1	L.S.	_____	_____
52 42" Culvert Extension	1	L.S.	_____	_____
53 Outlet Works Side Drain, Sta. 33+68	1	L.S.	_____	_____
54 Outlet Works Side Drain, Sta. 35+38	1	L.S.	_____	_____
55 Outlet Works Side Drain, Sta. 41+60	1	L.S.	_____	_____
56 Accusonic Flow Meters	1	L.S.	_____	_____
57 SAWPA Relocation/Protection				
a. 60-inch Sewer Pipe Encasement	299	L.F.	_____	_____
b. Raise Exist. 48-inch Dia. Precast Concrete Manhole	1	L.S.	_____	_____
c. SARI Pipeline Reaches IV-A and IV-B Relocation	1	L.S.	_____	_____
d. Abandonment of Existing 60-inch SARI Pipeline	1	L.S.	_____	_____

e.	Dual 48-inch HDPE Pipeline in Existing Outlet Structure	1	L.S.	_____	_____
f.	48-inch PVC Lined RCP, Fittings and Valves	1	L.S.	_____	_____
58 Water Distribution System					
a.	Chlorination Equipment	1	L.S.	_____	_____
b.	Pressurized Water Storage Tank	1	L.S.	_____	_____
c.	Water System Piping, Valves, and Appurtenances	1	L.S.	_____	_____
d.	Concrete Well Slab Foundation	1	L.S.	_____	_____
e.	3" Dia. PVC Well Discharge Pipe	1,746	L.F.	_____	_____
59 Water Well System					
a.	Bore Hole and Well Development	1	L.S.	_____	_____
b.	Well System Electrical Distribution	1	L.S.	_____	_____
60	Observation Well	8	EA.	_____	_____
61	Double Cable Trash Boom	1	L.S.	_____	_____
62	Metal Beam Guard Rail	3,063	L.F.	_____	_____
63 Chain Link Fence and Gates					
a.	5' Chain Link Fence	1,780	L.F.	_____	_____
b.	6' Chain Link Fence	2,820	L.F.	_____	_____
c.	6' Chain Link Fence w/ Slats	66	L.F.	_____	_____
d.	Barbed Wire Fence	654	L.F.	_____	_____
e.	6' Chain Link Gate (W=10')	1	EA.	_____	_____
f.	6' Chain Link Gate (W=20')	1	EA.	_____	_____
64	Pipe Gate	1	EA.	_____	_____
65	Settlement Plates	25	EA.	_____	_____
66	Survey Monuments	3	EA.	_____	_____
67	Staff Gages	26	EA.	_____	_____
68 Hydroseeding					
a.	First 62 Acres	62	Acre	_____	_____
b.	Over 62 Acres	85	Acre	_____	_____
69 Hydroseeding Maintenance					
a.	First 62 Acres	62	Acre	_____	_____
b.	Over 62 Acres	85	Acre	_____	_____
70	Generator and Storage Building	1	L.S.	_____	_____
71	Gaging Station	1	L.S.	_____	_____
72	Gage Station Electrical Distribution	1	L.S.	_____	_____
73	Seismic Instrumentation	1	L.S.	_____	_____

74 Stop Logs	16	EA.	_____	_____
75 Regulating Outlet Slide Gates	6	EA.	_____	_____
76 Emergency Closure Gates	2	EA.	_____	_____
77 Low-Flow Outlet Control Valves	2	EA.	_____	_____
78 Low-Flow Outlet Shut-Off Valves	2	EA.	_____	_____
79 Low-Flow Bulkhead	1	L.S.	_____	_____
80 Underhung Crane	1	L.S.	_____	_____
81 Piping Systems	1	L.S.	_____	_____
82 Plumbing	1	L.S.	_____	_____
83 Washroom Accessories	1	L.S.	_____	_____
84 Septic System	1	L.S.	_____	_____
85 HVAC System	1	L.S.	_____	_____
86 Power Distribution System	1	L.S.	_____	_____
87 Generator Set	1	L.S.	_____	_____
88 Fire Protection System	1	L.S.	_____	_____
89 Passenger Elevator	1	L.S.	_____	_____
90 Quality Assurance Support	1	L.S.	_____	_____
91 As-built Drawings	1	L.S.	_____	_____

SUB TOTAL ESTIMATED AMOUNT OF BASE BID (LINE ITEMS 0001-0091): \$ -

Bid Item 92 - ALTERNATIVE 1

a. Cement, low heat	130,475	Cwt	_____	_____
b. Fly Ash	3,300	Tons	_____	_____
c. Water Reducing Admixture	959	Gal	_____	_____

SUBTOTAL ESTIMATED AMOUNT OF ALTERNATIVE 1 (LINE ITEMS 0092A-0092C): \$ -

Bid Item 93 - ALTERNATIVE 2

a. Cement, regular heat	49,120	Cwt	_____	_____
b. Ground Granulated Blast Furnace Slag	5,526	Tons	_____	_____
c. Water Reducing Admixture	1,139	Gal	_____	_____

SUBTOTAL ESTIMATED AMOUNT OF ALTERNATIVE 2 (LINE ITEMS 0093A-0093C): \$ -

BIDDERS ARE TO SUBMIT PRICES ON ALL LINE ITEMS IN THE BASE BID (0001-0091). IN ADDITION, BIDDERS MUST SUBMIT PRICES ON ALTERNATIVE 1 (0092A-0092C) OR ALTERNATIVE 2 (0093A-0093C) NOT BOTH. THE GOVERNMENT CONTEMPLATES AWARD OF ONE CONTRACT TO THE RESPONSIVE, RESPONSIBLE BIDDER WHO SUBMIT THE LOWEST BID FOR THE BASE BID AND ALTERNATIVE 1; OR THE LOWEST BID FOR THE BASE BID AND ALTERNATIVE 2. ANY BIDDER WHO SUBMITS A BID FOR BOTH ALTERNATIVE 1 AND ALTERNATIVE 2 WILL BE DEEMED NON-RESPONSIVE AND THEIR BID WILL BE REJECTED.

SECTION 00010 Bidders Notes/Bid Schedule

1. All extensions of the unit prices shown will be subject to verification by the Government. In case of variation between the unit price and the extension, the unit price will be considered to be the bid.
2. If a modification to a bid based on unit prices is submitted which provides for a lump sum adjustment to the total estimated amount, the application of the lump sum adjustment to each unit price in the Price Schedule must be stated. If it is not stated, the bidder agrees that the lump sum adjustment shall be applied on a pro rata basis to every unit price in the Price Schedule.
3. Prices must be submitted on all individual items of the Price Schedule, otherwise the bid will be considered non-responsive and will be rejected.
4. For the purpose of initial evaluation of bids, the following will be utilized in resolving arithmetic discrepancies found on the face of the Price Schedule as submitted by the bidder:
 - a. Obviously misplaced decimal points will be corrected;
 - b. In case of discrepancy between the unit price and the extended price, the unit price will govern;
 - c. Apparent errors in extensions of unit prices will be corrected;
 - d. Apparent errors in addition of lump sum and extended prices will be corrected.
5. For the purpose of bid evaluation, the Government will proceed on the assumption that the bidder intends the bid to be evaluated on the basis of unit prices the totals arrived at by the resolution of arithmetic discrepancies as provided above and the bid will be so reflected on the abstract of bids.
6. The lump sum "LS" line items in the Price Schedule are not "Estimated Quantity" line items and are not subject to the "Variation in Estimated Quantity" contract clause.
7. The Contract Clause 52.232-27, "Prompt Payment for Construction Contracts" requires that the name and address of the contractor official, to whom payment is to be sent, be the same as that in the contract or in a proper Notice of Assignment.
8. Principal Contracting Officer. The Contracting Officer who signs this contract will be the Principal Contracting Officer for this contract. However, any Contracting Officer assigned to the Los Angeles District, contracting within his authority, may take formal action on this contract when the Principal Contracting Officer is unavailable and the action needs to be taken.
9. Amounts and prices shall be indicated in either words or figures, NOT BOTH.
10. Payment of Electronic Funds Transfer (EFT) is the mandatory method of payment. The Contractors attention is directed to Contract Clause NO. 52.232-33 "Mandatory Information for Electronic Funds Transfer" located in Section 00700.
11. The bidder shall distribute his indirect costs (overhead, profit, bond, etc.,) over all items in the Price Schedule. The Government will review all submitted Price Schedules for any unbalancing of the items. Any submitted Price Schedule determined to be unbalanced may be considered non-responsive and cause the bidder to be ineligible for contract award.
12. The bidder shall furnish all plant, labor, material, equipment, etc., necessary to perform all work in strict accordance with the terms and conditions set forth in the contract in include all attachments thereto.
13. Some quantities are ESTIMATED, the bidders prices MUST BE FIRM.
14. Bidder is cautioned to check his Price Schedule carefully prior to submission. If the Price Schedule contains unit prices, they should be round off to the second decimal point only NOT EXTENDED FUTHER.

15. Bidders attention is directed to Section 00100 "Instructions to Bidders" Clause No. 52.0214-4001, entitled "Directions for Submitting Bids". Please note that there are Special Instructions Pertaining to Hand-Carried Bids.

16. Contractor is required to fill in Cage code (Reference Section 00600, entitled "Required Central Contractor Registration" Mar 1998) and DUNS Number (Reference Section 00600, entitled, "Data Universal Numbering System (DUNS) Number" Jun1999) in Block No. 15 on Standard Form 1442, Name and Address Block (Cage Code under Code and DUNS No. under Facility Code respectively).

17. Bidders are to submit prices on all line items in the Base Bid (0001-0091). In addition, bidders must submit prices on Alternative 1 (0092A-0092C) or Alternative 2 (0093A-0093C) NOT BOTH. The Government contemplates award of one contract to the responsive, responsible bidder who submit the lowest bid for the Base Bid and Alternative 1; or the lowest bid for the Base Bid and Alternative 2. Any bidder who submits a bid for BOTH Alternative 1 and Alternative 2 will be deemed non-responsive and their bid will be rejected.

CERTIFICATE OF CORPORATE PRINCIPAL

1) IF THE OFFEROR IS A JOINT VENTURE, COMPLETE THE FOLLOWING:

(Company Name) (Signature) (Title)

(Company Name) (Signature) (Title)

(Company Name) (Signature) (Title)

2) IF THE OFFEROR IS PARTNERSHIP, LIST FULL NAME OF ALL PARTNERS:

(Company Name) (Signature) (Title)

(Company Name) (Signature) (Title)

(Company Name) (Signature) (Title)

3) IF THE OFFEROR IS A CORPORATION, THE FOLLOWING CERTIFICATION SHOULD BE COMPLETED:

CERTIFICATION AS TO CORPORATE PRINCIPAL

I, _____, certify that I am the Secretary of the corporation named as principal in the within contract; that _____, who signed the said contract on behalf of the principal, was the _____ of the corporation; that I know his signature and that his signature is genuine; and that said contract was duly signed, sealed and attested for in behalf of said corporation by authority of its governing body.

CORPORATE PRINCIPAL

CORPORATE SEAL

SECRETARY _____

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Section 00100

52.0000-4010 INQUIRIES

Perspective bidders/offerors should submit inquiries related to this solicitation by writing or calling the following (collect calls will not be accepted:

(1) For inquiries of a contractual nature (solicitation requirements, interpretation of contractual language) call:
Cindy Myrtetus
213-452-3247

For bid results only, call (213) 452-3235.

(2) All technical questions on the specification or drawings will be submitted in writing to:
Address:

USAED – Los Angeles District, ATTN: Steve Vaughn
P. O. Box 532711, ED-DA
Los Angeles, CA 90053-2325

Facsimile Number: 213-452-4248
e-mail address: stephen.h.vaughn@usace.army.mil

(3) Please include the solicitation number, project title and location of project with your questions. Written inquiries must be received by this office not later than 14 calendar days prior to bid opening date/date set for receipt of offers.

(4) Oral explanations or instructions are not binding. Any information given to a bidder/offeror which impacts the bid/offer will be given in the form of a written amendment to the solicitation.

52.0000-4023 SAFETY REQUIREMENTS

The bidder's attention is directed to the latest version of U.S Army Corps of Engineers Safety and Health Manual, EM 385-1-1, which will be strictly enforced. This publication may be obtained from the US Army Engineer District, Los Angeles, ATTN: Safety Office, P.O. Box 532711, Los Angeles, California 90053-2325.

52.0001-4004 BID RESULTS

The telephone number for bid results after the opening is Area Code (213) 452-3245.

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)

52.214-1 SOLICITATION DEFINITIONS--SEALED BIDDING (JUL 1987)

"Government" means United States Government.

"Offer" means "bid" in sealed bidding.

"Solicitation" means an invitation for bids in sealed bidding.

(End of provision)

52.214-3 AMENDMENTS TO INVITATIONS FOR BIDS (DEC 1989)

(a) If this solicitation is amended, then all terms and conditions which are not modified remain unchanged.

(b) Bidders shall acknowledge receipt of any amendment to this solicitation (1) by signing and returning the amendment, (2) by identifying the amendment number and date in the space provided for this purpose on the form for submitting a bid, (3) by letter or telegram, or (4) by facsimile, if facsimile bids are authorized in the solicitation. The Government must receive the acknowledgment by the time and at the place specified for receipt of bids.

(End of provision)

52.214-4 FALSE STATEMENTS IN BIDS (APR 1984)

Bidders must provide full, accurate, and complete information as required by this solicitation and its attachments. The penalty for making false statements in bids is prescribed in 18 U.S.C. 1001.

(End of provision)

52.214-5 SUBMISSION OF BIDS (MAR 1997)

(a) Bids and bid modifications shall be submitted in sealed envelopes or packages (unless submitted by electronic means) (1) addressed to the office specified in the solicitation, and (2) showing the time and date specified for receipt, the solicitation number, and the name and address of the bidder.

(b) Bidders using commercial carrier services shall ensure that the bid is addressed and marked on the outermost envelope or wrapper as prescribed in subparagraphs (a)(1) and (2) of this provision when delivered to the office specified in the solicitation.

(c) Telegraphic bids will not be considered unless authorized by the solicitation; however, bids may be modified or withdrawn by written or telegraphic notice.

(d) Facsimile bids, modifications, or withdrawals, will not be considered unless authorized by the solicitation.

(e) Bids submitted by electronic commerce shall be considered only if the electronic commerce method was specifically stipulated or permitted by the solicitation.

52.214-6 EXPLANATION TO PROSPECTIVE BIDDERS (APR 1984)

Any prospective bidder desiring an explanation or interpretation of the solicitation, drawings, specifications, etc., must request it in writing soon enough to allow a reply to reach all prospective bidders before the submission of their bids. Oral explanations or instructions given before the award of a contract will not be binding. Any information given a prospective bidder concerning a solicitation will be furnished promptly to all other prospective bidders as an amendment to the solicitation, if that information is necessary in submitting bids or if the lack of it would be prejudicial to other prospective bidders.

(End of provision)

52.214-7 LATE SUBMISSIONS, MODIFICATIONS, AND WITHDRAWALS OF BIDS (NOV 1999)

(a) Bidders are responsible for submitting bids, and any modifications or withdrawals, so as to reach the Government office designated in the invitation for bids (IFB) by the time specified in the IFB. If no time is specified in the IFB, the time for receipt is 4:30 p.m., local time, for the designated Government office on the date that bids are due.

(b)(1) Any bid, modification, or withdrawal received at the Government office designated in the IFB after the exact time specified for receipt of bids is "late" and will not be considered unless it is received before award is made, the Contracting Officer determines that accepting the late bid would not unduly delay the acquisition; and--

(i) If it was transmitted through an electronic commerce method authorized by the IFB, 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 bids; or

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

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

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

(d) If an emergency or unanticipated event interrupts normal Government processes so that bids cannot be received at the Government office designated for receipt of bids by the exact time specified in the IFB and urgent Government requirements preclude amendment of the IFB, the time specified for receipt of bids 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.

(e) Bids may be withdrawn by written notice received at any time before the exact time set for receipt of bids. If the IFB authorizes facsimile bids, bids may be withdrawn via facsimile received at any time before the exact time set for receipt of bids, subject to the conditions specified in the provision at 52.214-31, Facsimile Bids. A bid may be withdrawn in person by a bidder or its authorized representative if, before the exact time set for receipt of bids, the identity of the person requesting withdrawal is established and the person signs a receipt for the bid.

(End of provision)

52.214-9 Failure to Submit Bid. (JUL 1995)

Recipients of this solicitation not responding with a bid should not return this solicitation, unless it specifies otherwise. Instead, they should advise the issuing office by letter, postcard, or established electronic commerce methods, whether they want to receive future solicitations for similar requirements.

52.214-18 PREPARATION OF BIDS--CONSTRUCTION (APR 1984)

(a) Bids 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 bid must initial each erasure or change appearing on any bid form.

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

(1) Lump sum bidding;

(2) Alternate prices;

(3) Units of construction; or

(4) Any combination of subparagraphs (1) through (3) above.

(c) If the solicitation requires bidding on all items, failure to do so will disqualify the bid. If bidding on all items is not required, bidders should insert the words "no bid" in the space provided for any item on which no price is submitted.

(d) Alternate bids will not be considered unless this solicitation authorizes their submission.

52.214-19 CONTRACT AWARD--SEALED BIDDING--CONSTRUCTION (AUG 1996)

(a) The Government will evaluate bids in response to this solicitation without discussions and will award a contract to the responsible bidder whose bid, conforming to the solicitation, will be most advantageous to the Government, considering only price and the price-related factors specified elsewhere in the solicitation.

(b) The Government may reject any or all bids, and waive informalities or minor irregularities in bids received.

(c) The Government may accept any item or combination of items, unless doing so is precluded by a restrictive limitation in the solicitation or the bid.

(d) The Government may reject a bid as nonresponsive if the prices bid are materially unbalanced between line items or subline items. A bid is materially unbalanced when it is based on prices significantly less than cost for some work and prices which are significantly overstated in relation to cost for other work, and if there is a reasonable doubt that the bid will result in the lowest overall cost to the Government even though it may be the low evaluated bid, or if it is so unbalanced as to be tantamount to allowing an advance payment.

52.214-34 SUBMISSION OF OFFERS IN THE ENGLISH LANGUAGE (APR 1991)

Offers submitted in response to this solicitation shall be in the English language. Offers received in other than English shall be rejected.

(End of provision)

52.214-35 SUBMISSION OF OFFERS IN U.S. CURRENCY (APR 1991)

Offers submitted in response to this solicitation shall be in terms of U.S. dollars. Offers received in other than U.S. dollars shall be rejected.

(End of provision)

52.0214-4001 DIRECTIONS FOR SUBMITTING BIDS (MAR 2002)

Envelopes containing bids must be sealed, marked and addressed as follows:

MARK ENVELOPES:

Bid under IFB No. **DACW09-02-B-0004**
Bid Opening Date: **February 13, 2003 AT 1:00 PM**

ADDRESS ENVELOPES TO:

Department of the Army
U. S. Army Engineer District, Los Angeles
ATTN: Contracting Division
C/O: CINDY MYRTETUS
P. O. Box 532711
Los Angeles, CA 90053-2325

SPECIAL INSTRUCTIONS PERTAINING TO HAND-CARRIED BIDS:

Due to security precautions, all Corps of Engineers visitors/couriers are now required to check in at the Public Affairs Office (PAO), Suite 980, Wilshire Blvd, Los Angeles, CA. Bidders are no longer permitted to hand-carry their bids directly to Contracting Division without an authorized escort. **Bids may NOT be left unattended at the Public Affairs Office (PAO), Suite 980.**

Bidders who desire to hand-deliver their bids prior to the scheduled bid opening time/date must notify the Contracting Division to arrange for receipt of their bid by Contracting Division personnel. Normally the contact will be the Contract Specialist designated above. In the event the Contract Specialist cannot be reached, please call the main Contracting Division telephone number, 213-452-3231 or the following alternative telephone numbers -3233, -3245, -3234, or -3235, in order to request assistance.

30 minutes prior to the scheduled bid opening time/date, the Bid Opening Officer will be in the Public Affairs Office (PAO) Suite 980, to accept bids. After visitor in-processing, all bidders will subsequently be escorted to Bid Opening Room, where the bids will be publicly opened and read.

In order to expedite visitor processing, bidders are encouraged to complete the information requested on the Notice of Visitor(s) Form (attached). The completed form can be faxed to the Contract Specialist at (213)452-4184 or 4187, prior to the date for receipt of bids. In addition, no more than 2 visitors per firm will be permitted within the building. No exceptions will be made. The offeror is responsible for compliance with the security requirements and shall ensure that any company representative, courier or delivery personnel are aware of these special procedures pertaining to hand carried bids.

NOTICE OF VISITOR(S)

1. Date(s) of Visit (<i>Inclusive</i>)		2. Arrival Time	
3. Name of Visitor(s) (<i>Last, First</i>)		4. Agency/Company of Visitor	
5. Name of Person Being Visited (<i>Include Div, Br, Sec</i>)	6. Suite Number	7. Telephone Number	
8. Contact Person (<i>if other than Person Being Visited</i>)		9. Telephone Number	
10. Other Comments or Instructions			
<ul style="list-style-type: none"> - All visitors must report to the Public Affairs Office, Suite 980 - Visitors must use the Visitor Tag provided. - Visitors must be escorted to Corps of Engineers floors - Parking validation is only available for Engineering Division, Construction-Operations, and Information Management field personnel. - Delivery personnel will be validated for 30 minutes only. 			

52.214-5000 ARITHMETIC DISCREPANCIES EFARS 52.214-5000

(a) For the purpose of initial evaluation of bids, the following will be utilized in resolving arithmetic discrepancies found on the face

of the bidding schedule as submitted by bidders:

- (1) Obviously misplaced decimal points will be corrected;
- (2) Discrepancy between unit price and extended price, the unit price will govern;
- (3) Apparent errors in extension of unit prices will be corrected;
- (4) Apparent errors in addition of lump sum and extended prices will be corrected.

(b) For the purpose of bid evaluation, the Government will proceed on the assumption that the bidder intends his bid to be evaluated on the basis of the unit prices, the totals arrived at by resolution of arithmetic discrepancies as provided above and the bid will be so reflected on the abstract of bids.

(c) These correction procedures shall not be used to resolve any ambiguity concerning which bid is low.

(End of statement)

52.0214-4583 TELEGRAPHIC BIDS/OFFERS ARE NOT ACCEPTABLE

Any telegram to modify or withdraw a bid/offer sent to this office must be physically delivered to the office designated for receipt of bid/offer by the date and time set for bid opening/receipt of proposals.

No one from this office will be dispatched to the local telegraph office to pick up any telegram for any reason.

52.0214-4584 FACSIMILE BIDS/OFFERS

Facsimile bids/offers, modifications thereto, or cancellations of bids/offers will not be accepted.

52.0214-4599 EVALUATION FOR AWARD

The Government contemplates award of one contract to the responsive, responsible bidder who submits the low bid for the total of all the items in the Bidding Schedule.

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)

52.225-12 NOTICE OF BUY AMERICAN ACT 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)

52.228-1 BID GUARANTEE (SEP 1996)

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

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

(c) The amount of the bid guarantee shall be 20% percent of the bid price or \$3,000,000.00, whichever is less.

(d) If the successful bidder, upon acceptance of its bid by the Government within the period specified for acceptance, fails to execute all contractual documents or furnish executed bond(s) within 10 days after receipt of the forms by the bidder, the Contracting Officer may terminate the contract for default.

(e) In the event the contract is terminated for default, the bidder is liable for any cost of acquiring the work that exceeds the amount of its bid, and the bid guarantee is available to offset the difference.

52.228-4506 INDIVIDUAL SURETIES IN SUPPORT OF BID BONDS

Bidder/offerors utilizing individual sureties in support of a bid bond shall include a Standard Form (SF) 28 (Affidavit of Individual Surety), accompanied by a pledge of acceptable assets from each person acting as an individual surety, and include these with the SF 24 (Bid Bond), and the bid itself (see clause titled "Pledges of Assets," FAR 52.228-11). Pledges of acceptable assets shall be in the form of (1) evidence of an escrow account and/or (2) a recorded lien on real estate. If this is an RFP, failure to provide required documentation described herein may cause the offeror to be deemed "unacceptable".

52.228-4507 BID GUARANTEE FORM AND AMOUNT

When bids/proposals exceed \$100,000, the offeror shall furnish a separated bid guarantee in accordance with the solicitation provision titled "Bid Guarantee", FAR 52.228-1. In accordance with FAR 28.101-2 the bid guarantee amount shall be a least 20 percent of the "bid price" but shall not exceed \$3 million. When the penal sum is expressed as a percentage, a maximum dollar limitation may be stated. If there are

option line items on the Pricing Schedule (Schedule B), the term "bid price" is hereby defined as the total bid not to include any amount for line items designated as "options". In bids/proposals that contain "additives", the "bid price" is defined as the total of all bid items including additive line items. FAR 28.106-1 states that a Standard Form (SF) 24 shall be used for the bid bond. In accordance with FAR 28.202(a)(1), corporate sureties utilized must appear on the list contained in the Department of Treasury Circular 570 titled "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and Acceptable Reinsuring Companies."

52.232-38 SUBMISSION OF ELECTRONIC FUNDS TRANSFER INFORMATION WITH OFFER (MAY 1999)

The offeror shall provide, with its offer, the following information that is required to make payment by electronic funds transfer (EFT) under any contract that results from this solicitation. This submission satisfies the requirement to provide EFT information under paragraphs (b)(1) and (j) of the clause at 52.232-34, Payment by Electronic Funds Transfer--Other than Central Contractor Registration.

- (1) The solicitation number (or other procurement identification number).
- (2) The offeror's name and remittance address, as stated in the offer.
- (3) The signature (manual or electronic, as appropriate), title, and telephone number of the offeror's official authorized to provide this information.
- (4) The name, address, and 9-digit Routing Transit Number of the offeror's financial agent.
- (5) The offeror's account number and the type of account (checking, savings, or lockbox).
- (6) If applicable, the Fedwire Transfer System telegraphic abbreviation of the offeror's financial agent.
- (7) If applicable, the offeror shall also provide the name, address, telegraphic abbreviation, and 9-digit Routing Transit Number of the correspondent financial institution receiving the wire transfer payment if the offeror's financial agent is not directly on-line to the Fedwire and, therefore, not the receiver of the wire transfer payment.

(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 Lucia A. Carvajal, P. O. Box 532711, Los Angeles, CA 90053-2325

(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)

(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) Site visits may be arranged during normal duty hours by contacting Julie Martinez at 562. 861.1094. An organized site visit will be held on November 7, 2002 at 10:00 AM. Please meet at the following location:

2493 Pomona-Rincon Rd
Corona, CA
(which is at the entrance gate of the facility)

52.211-5000 EVALUATION OF SUBDIVIDED ITEMS (MAR 1995)—EFARS

Item Nos. 0068, and 0069 are subdivided into two or more estimated quantities and are to be separately priced. The Government will evaluate each of these items on the basis of total price of its sub-items.
(End of clause)

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 - 1.20.1 Documentation and Reports
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PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION (NOT APPLICABLE)

-- End of Section Table of Contents --

SECTION 01200

GENERAL REQUIREMENTS

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.

ENGINEERING MANUALS (EM)

EM 385-1-1 (1996) U.S. Army Corps of Engineers Safety and Health Requirements Manual

FEDERAL SPECIFICATIONS (FS)

FS FF-B-575 (Rev C) Bolts, Hexagon and Square
FS FF-N-105 (Rev B; Am 3 Int Am 4) Nails, Brads, Staples and Spikes: Wire, Cut and Wrought
FS FF-N-836 (Rev B; Am 2) Nut: Square, Hexagon, Cap, Slotted, Castle, Knurled, Welding and Single Ball Seat
FS MM-L-751 (Rev H) Lumber; Softwood
FS TT-E-529 (Rev D) Enamel, Alkyd, Semi-Gloss
FS TT-P-25 (Rev E; Am 2) Primer Coating, Exterior (Undercoat for Wood, Ready-Mixed, White and Tints)

NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY (NIST)

NIST PS 1 (1983) Construction and Industrial Plywood

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Location of Contractor's Office

SD-02 Shop Drawings

Temporary Access and Haul Roads; G.

1.3 CONSTRUCTION SIGNS

The Contractor shall construct and/or erect the following signs. The signs shall be erected as soon as possible and within 15 days after commencement of work under this contract.

1.3.1 Construction Signs Shall Meet The Following Material Requirements

- a. Lumber shall conform to FS MM-L-751, and shall be seasoned Douglas Fir, S4S, Grade D or better except that posts, braces and spacers shall be construction Grade (WCLB).
- b. Plywood shall conform to NIST PS 1, grade A-C, Group 1, exterior type.
- c. Bolts, Nuts and Nails. Bolts shall conform to FS FF-B-575, nuts shall conform to FS FF-N-836, and nails shall conform to FS FF-N-105.
- d. Paints and Oils. Paints shall conform to FS TT-P-25 for primer and FS TT-E-529 for finish paint and lettering.

1.3.2 The Following Construction Signs Shall Be Constructed

- a. One project sign at location designated by the Contracting Officer. The project sign shall be constructed as detailed in Figure 1 and Figure 2.
- b. Eight hard hat signs at locations directed. Hard hat signs shall be constructed as detailed in Figure 3. Decals and safety signs will be furnished by the Contracting Officer.
- c. Warning Signs facing approaching traffic on all haul roads crossing under overhead power transmission lines.
- d. Warning Signs shall be constructed of plywood not less than ½ inch thick and shall be securely bolted to the supports with the bottom of the sign face 3 feet above the ground. The sign face shall be 2 x 4 feet and all letters shall be 4 inches in height. The text of the "Powerline" warning signs shall be "WARNING: OVERHEAD TRANSMISSION LINES".
- e. Warning signs shall be placed indicating that explosives are being used in the area at locations designated by the Contracting Officer. The text of the "Explosives" warning signs shall be "WARNING: EXPLOSIVES BEING USED IN AREA".

1.3.3 Painting

All exposed surfaces and edges of plywood shall be given one coat of linseed oil and be wiped prior to applying primer. All exposed surfaces of signs and supports shall be given one coat of primer and 2 finish coats of white paint. Except as otherwise indicated, lettering on all signs shall be black and sized as indicated.

1.3.4 Bulletin Board at the Contractor's Office

A weatherproof bulletin board, approximately 36 inches wide and 30 inches high, with hinged glass door shall be provided adjacent to or mounted on the Contractor's project office. If adjacent to the office, the bulletin board shall be securely mounted on no less than 2 posts. Bulletin board and posts shall be painted or have other approved factory finish. The bulletin board shall be easily accessible at all times and shall contain wage rates, equal opportunity notice, and such other items required to be posted

1.4 LOCATION OF CONTRACTOR'S OFFICE

Location of the Contractor's Office shall be approved by the Contracting Officer. The Contractor's job site office shall be located so that people visiting, such as salespersons or personnel seeking employment, will not have to enter the work area to get to the office. No parking of private vehicles shall be permitted in the working areas except as otherwise approved. At approved locations, adequate parking areas shall be constructed for the Contractor's and subcontractor's employees. The office site and parking areas shall be adequately drained and have suitable access.

1.5 MAINTENANCE OF PROJECT FACILITIES

The Contractor shall maintain project facilities in good condition throughout the life of the project. Upon completion of work under this contract, facilities covered under this section will remain the property of the Government.

1.5.1 General

The Contractor shall be responsible for maintaining all project facilities, including the existing Prado Dam Resident Office and the laboratory buildings.

1.5.2 Maintenance Requirements

Maintenance of the project facilities shall include daily janitorial service, including cleaning of tile floors and washing of windows twice a month. Toilet facilities shall be kept clean and sanitary and fully supplied at all times. All janitorial services shall be performed at such a time and in such manner to least interfere with the use of the Government facilities, but only during periods when the building and trailers are occupied. Maintenance includes providing potable bottled water service, trash removal, servicing of sewage tank, monthly air conditioning service, and the payment of monthly billings associated with these utilities and services with the exception of the telephone and power billings. The project facilities shall be kept clear of debris. Trash service shall also be provided (3 cy trash dumpster with weekly pickups). The Contractor shall remove and dispose of all broken test cylinders from the testing laboratory bi-weekly. Any required replacement and/or repairs for the project facilities or grounds shall be performed by the Contractor at no additional cost to the Government. Maintenance shall also include bi-annual pest control service for all buildings and trailers.

1.6 SECURITY GUARD SERVICE

The Contractor shall provide 24 hour a day, seven day a week security guard service for the Prado Dam construction site. The security guard service shall perform hourly checks of various locations throughout the project

site, as directed by the Contracting Officer, to assure overall security and prevent vandalism and theft during non duty hours. A security guard shall be assigned to control the entrance gate to Prado Dam.

1.7 PROTECTION OF EXISTING WORK

Before beginning any cutting or removal work, the Contractor shall carefully survey the existing work and examine the drawings and specifications to determine the extent of the work. The Contractor shall take all necessary precautions to insure against damage to existing work to remain in place, to be reused, or to remain the property of the Government, and any damage to such work shall be repaired or replaced as approved by the Contracting Officer at no additional cost to the Government. The Contractor shall carefully coordinate the work of this section with all other work and construct and maintain shoring, bracing and supports, as required. The Contractor shall insure that structural elements are not overloaded and be responsible for increasing structural supports or adding new supports as may be required as a result of any cutting, removal, or demolition work performed under any part of this Contract.

1.8 PUBLIC UTILITIES, NOTICES, AND RESTRICTIONS

1.8.1 General

The approximate location of all pipe lines, power and communication lines, and other utilities known to exist within the limits of the work are indicated on the drawings. The sizes, locations, and names of owners of such utilities are given from available information, but their accuracy is not guaranteed. Except as otherwise indicated on the drawings, all existing utilities will be left in place and the Contractor shall conduct his operations in such a manner that the utilities will be protected from damage at all times, or arrangements shall be made by the Contractor for their relocation at the Contractor's own expense. The Contractor shall be responsible for any damage to utilities known to exist and shall reimburse the owners for such damage caused by his operations.

1.8.2 Relocation or Removal

Utilities to be relocated or removed not as part of this contract are designated "To be Relocated by Others" or "To be Removed by Others", respectively. Utilities shown on the plans and not so designated will be left in place and be subject to the provisions of the CONTRACT CLAUSE: PROTECTION OF EXISTING VEGETATION, STRUCTURES, UTILITIES, AND IMPROVEMENTS. The Contractor may make arrangements with the owner for the temporary relocation and restoration of utilities not designated to be relocated, or for additional work in excess of the work needed to relocate utilities designated for relocation at no additional cost to the Government.

1.8.3 Utilities Not Shown

If the Contractor encounters, within the construction limits of the entire project, utilities not shown on the plans and not visible as of the date of this contract and if such utilities will interfere with construction operations, he shall immediately notify the Contracting Officer in writing to enable a determination by the Contracting Officer as to the necessity for removal or relocation. If such utilities are left in place, removed or relocated, as directed by the Contracting Officer, the Contractor shall be entitled to an equitable adjustment for any additional work or delay.

1.8.4 Coordination

The Contractor shall consult and cooperate with the owner of utilities that are to be relocated or removed by others to establish a mutual performance schedule and to enable coordination of such work with the construction work. These consultations shall be held as soon as possible after award of the contract or sufficiently in advance of anticipated interference with construction operations to provide required time for the removal or relocation of affected utilities.

The Contractor shall be responsible for coordinating their activities with other contractors performing work in the area. This shall include, but is not limited to, coordination with Caltrans and their Contractor for work on the Highway 71 bridge crossing the Santa Ana River and the future expansion of the 71/91 interchange.

The Contractor shall be responsible to coordinate with the United States Geological Survey (USGS) for the removal of instruments within the seismic sheds. The USGS contact for removal of the instruments at Prado Dam is:

Mr. Arnie Acosta
Telephone: (626) 583-7234
Pager: (818) 542-4638

or

Edna Anjal
Telephone: (626) 583-7235

USGS shall be notified a minimum of 30 days prior to the removal of the seismic sheds. The Contractor shall not attempt to remove any of the instruments and associated hardware, however, what remains shall become the property of the contractor for removal and disposal.

1.8.5 Notices

1.8.5.1 Utilities to be Relocated or Protected

The Contractor shall notify the Contracting Officer, in writing, 14 calendar days prior to starting work on any utility to be relocated or protected. On each relocation, notification shall include dates on which the Contractor plans excavation, by-pass work, removal work and/or installation work, as applicable. The Contractor shall also notify the following representatives of utility owners not less than 30 days, unless otherwise specified, prior to start of work in the vicinity of their respective utilities:

Southern California Gas Company
Mr. Tim Pearce
Telephone: (213) 244-2269

Southern California Edison Company
Mr. Bob Patterson
Telephone: (909) 930-8432

Santa Ana Watershed Project Authority (For SARI sewer)
Mr. Lee Slate
Telephone (909) 354-4220

1.8.5.2 Telephone Lines

The Contractor shall notify, 60 calendar days prior to permanent installation of all telephone lines.

1.8.5.3 Contractor Shall Notify the Contracting Officer

The Contractor shall notify the Contracting Officer, in writing, not less than 14 days in advance of the date on which he will complete trenching, excavation, fill or rough grading, as applicable, at each location where such completed work is required for temporary or permanent relocations by others. The Contractor shall allow a period of 14 calendar days at each relocation, after which time the Contractor may resume his operations.

1.8.5.4 Existing Bench Marks and R/W Markers

The Contractor shall notify the Contracting Officer, in writing, 7 days in advance of the time he proposes to remove any bench mark or right-of-way marker.

1.8.5.5 Spill Reporting

The Contractor shall notify the Contracting Officer immediately after all spills, regardless of quantity, including all personnel exposures. The Contractor shall submit a written notification not later than 7 calendar days after the initial notification. The written notification shall include the following:

- a. Item spilled, leaked or releases in an unauthorized manner (Identification, Quantity and Manifest Numbers).
- b. Whether the amount spilled, leaked or released in an unauthorized manner is EPA reportable and, if reported, a copy of the report.
- c. Exact location of the spill, leak or unauthorized release.
- d. Nature of exposure to personnel.
- e. Containment procedures initiated.
- f. Anticipated cleanup and disposal procedures.
- g. Disposal location of spill, leak or unauthorized release residue.

1.8.6 Restrictions

1.8.6.1 Representatives of Other Agencies

Personnel representing owners and agencies may be present for various portions of the work. However, the Contractor will be responsible only to the Contracting Officer.

1.8.6.2 Working Hours

The Contractor shall restrict all construction activities, including warming equipment, to the following schedule:

Monday through Friday	7 a.m. to 7 p.m.
Saturday	9 a.m. to 6 p.m.

Access to the job site will be allowed 30 minutes prior to starting time unless otherwise approved by the Contracting Officer. No work will be permitted on Sundays or Federal Holidays.

1.8.6.3 Water for Construction

Reference is made to the clause of the contract entitled "Permits and Responsibilities," which obligates the Contractor to obtain all required licenses and permits for construction, including water for construction. The Contractor shall be responsible for obtaining and paying all costs and fees associated with the acquisition of water for construction. Water rights within the Prado Basin are owned by the Orange County Water District (OCWD). The Contractor shall not intercept existing surface or subsurface flows at any time during the contract performance period. All water from dewatering shall be returned to the streambed. Additionally, water from the water well shown on the drawings to be constructed by this contract can not be used by Contractor for any purpose.

1.9 ROADS AND CULVERTS

1.9.1 Existing Roads

The work shall be planned in such a manner that traffic on the existing roads outside the actual construction areas shall be maintained at all times. Maintenance shall be as specified in paragraph: Maintenance of Roads. The work area shall be examined carefully relative to the order and scope of work to be performed, with respect to the limiting provisions of the plans and specifications. Additional work on the existing roads may be done by others during the life of this contract.

1.9.1.1 Existing Sound Walls

The Contractor is responsible for maintaining required noise levels as stated in 01410 ENVIRONMENTAL PROTECTION.

1.9.2 Temporary Access and Haul Roads

Plans shall be submitted for approval on all proposed access and haul roads and all deviations, whether within or outside the limits of the construction area, at least fifteen (15) calendar days prior to construction of such roads. The plans shall indicate width of road, direction of traffic, road markings, type of guardrail, curves, grades, runouts, and other information in sufficient detail for studying safety of the proposed roads. The plans shall include details for removal and obliteration of haul roads and temporary access roads and restoration of the area as specified in paragraph: Post-Construction Cleanup and Obliteration.

1.9.2.1 Haul Road Design References

Design of haul roads shall meet or exceed the requirements of the Corps of Engineers Safety and Health Requirement Manual, Section 30.D (EM 385-1-1). An applicable design guide is the Surface Mine Haulage Road Design Study by Skelly and Loy of Harrisburg, PA, prepared for the Bureau of Mines, Washington, DC, dated June 1976.

1.9.2.2 Haul Road Design

Roads shall be designed for the type of vehicles in use. The maximum sustained grade shall not exceed 10% with an absolute maximum grade of 15% for a distance not to exceed 200 linear feet. Each lane of travel shall provide clearance that is equal to one-half of the widest vehicle in use (a 12 ft. wide vehicle will require a 24 ft. travel lane). The minimum horizontal curve radius shall not be less than 25 ft. on the inside of the curve. Vertical curves shall be a minimum of 100 ft. and be designed with consideration of the change in grades, height of the driver's eyes, height of an object a minimum of 6 inches above the road surface, and required stopping distance. Curve widening, proper cross slopes and superelevations shall be provided as necessary. Road ditches and culverts shall be included to control surface drainage away from erodible areas. Culverts shall be provided along natural water courses intersected by the haul road fill and shall be maintained as specified in paragraph: Culverts. Design shall also include provisions to control runaway vehicles on steep grades such as an escape lane. Design shall be subject to the Contracting Officer's approval.

1.9.3 Public and Private Access Roads

When it is necessary for heavy equipment to operate on or to cross project roads or arterial roads, flaggers, signs, lights, and/or other necessary safeguards shall be furnished to safely control and direct the flow of traffic. When it is necessary to operate on existing roads outside the construction area, all necessary permits shall be obtained from the appropriate private or public authority. Work shall be conducted in such manner so as to obstruct and inconvenience traffic on existing roads outside the construction limits as little as possible. Spillage of earth, dusty materials, boulders, and mud on project roads or other roads shall not be permitted. If spillage cannot be prevented, the spillage shall be immediately removed and such areas shall be kept clear throughout the workday. At the conclusion of each workday, such traveled areas shall be cleared of spillage, boulders, and mud.

1.9.4 Maintenance of Roads

All roads shall be maintained regularly to provide vehicular access for the Government's vehicles and the Contractor's vehicles and equipment during the contract performance period. Road maintenance shall include: clearing and disposal of rock/mud slides on the roads and drainage ditches, repair of washouts, repair of potholes and ruts, regrading, and any incident which would restrict vehicular/equipment access. Prior to any alterations of any road alignment the Contractor shall receive approval from the Contracting Officer. Road maintenance and alterations shall be performed by the Contractor at no additional cost to the Government.

1.9.5 Temporary Culverts

Culverts shall be provided as required for road drainage. Culverts shall be corrugated metal pipe of adequate diameter. Dump stone or other energy dissipating structures shall be provided at all outlets of culverts to prevent undermining of pipe. Exact locations of the culverts shall be subject to approval by the Contracting Officer.

1.9.5.1 Culvert Maintenance

All culverts within the construction area, including the borrow areas, shall be maintained to provide unrestricted flow through the culverts. Culvert maintenance shall include debris cleaning, repair of failures, and

extension of culverts due to road alterations. Culvert maintenance shall be performed by the Contractor at no additional cost to the Government.

1.10 TRAFFIC SAFETY

1.10.1 Warning Devices

In accordance with Contract Clause ACCIDENT PREVENTION, signs, barricades, and warning devices shall be provided, installed, and maintained as are required for protection of vehicular traffic at any location where operations interfere with public or private roads. Signs, barricades, lights, and signals shall be in conformance with Part VI of the U.S. Department of Transportation Manual on Uniform Traffic Control Devices for Streets and Highways.

1.10.2 Rock and Gravel

Rock and gravel for use on haul roads and other facilities may be obtained from any source within the excavation limits or stockpiles within the project boundaries not designated for other use. The use of any such source shall be subject to approval by the Contracting Officer.

1.11 WATER CONTAMINATION

In order to prevent contamination of water along waterways, all refuse, oil, greases, and other petroleum products; all toxic materials; all cement or concrete; or water containing such materials shall be disposed of in a manner to prevent their entry into the water along waterways.

1.12 SCRAP MATERIAL

Materials indicated to be removed and not indicated to be salvaged, stored or reinstalled are designated as scrap and shall become the property of the Contractor and be removed from the site of work. The Contractor by signing this contract hereby acknowledges that he made due allowance for value, if any, of such scrap in the contract price.

1.13 ARCHAEOLOGICAL FINDINGS DURING CONSTRUCTION

Should the Contractor or any of his employees in the performance of this contract find or uncover any archaeological remains, he shall notify the Project Engineer immediately. Such notification will be a brief statement in writing giving the location and nature of the findings. Should the discovery site require archaeological studies resulting in delays and/or additional work, the Contractor will be compensated by an equitable adjustment under the General Provisions of the contract.

1.14 POST-CONSTRUCTION CLEANUP AND OBLITERATION

The Contractor shall obliterate all signs of temporary construction facilities such as haul roads, access roads, work areas, structures, foundations of temporary structures, stockpiles of excess or waste materials, or any other vestiges of construction as directed by the Contracting Officer. Excavation, filling, regrading and plowing of roadways and other construction areas will require the areas to be restored to near natural conditions, which will permit the growth of vegetation thereon. The disturbed areas shall be graded and filled as required, and the areas scarified prior to placement of soil covering for hydroseeding.

1.15 PERMITS

1.15.1 General

Reference is made to the clause of the contract entitled "Permits and Responsibilities," which obligates the Contractor to obtain all required licenses and permits, including, but not necessarily limited to the following specified hereinbelow.

1.15.1.1 National Pollutant Discharge Elimination System (NPDES) Permit

The project requires an NPDES permit from the California State Water Resources Control Board, Division of Water Quality. The general permit requires development and implementation of Storm Water Pollution Prevention Plan (SWPPP) , which shall be maintained on-site throughout the construction period. Contractor shall comply with the requirements of SECTION 01356: STORM WATER POLLUTION PREVENTION MEASURES. Modifications to the plan as necessary to reflect Contractor's construction methods shall be submitted by the Contractor to the Government for approval.

1.15.2 Encroachment Permit and Traffic Detour Plan

The project has been designed to avoid construction on the shoulder and traveled way of the State Route 71. The Contractor is responsible for obtaining all permits for work on or around the SR 71 roadway. Information for an encroachment permit to implement a closure of the highway shoulder can be obtained at:

Office of Permits
Department of Transportation
464 W. Fourth Street, 6th Floor, MS 619
San Bernardino, CA 92401-1400
(909) 383-4536

Information for a traffic detour plan can be obtained at:

Operations Division
Department of Transportation
464 W. Fourth Street, 6th Floor, MS 619
San Bernardino, CA 92401-1400
(909) 383-5979

1.16 REQUIRED INSURANCE

1.16.1 General

The Contractor shall maintain insurance in full force and effect throughout the term of this contract. The policy or policies of insurance maintained by the Contractor shall provide the limits and coverages as set forth herein below.

1.16.2 Insurance

Insurance shall be in force the first day of the term of this contract.

1.16.3 Insurance Policy

Each insurance policy required by this contract shall contain the following three clauses:

- a. "This insurance shall not be canceled, limited in scope of coverage or non-renewed until after 30 days written notice has been given to (1) Riverside County Flood Control and Water Conservation District, Attn: Steve Thomas, 1995 Market Street, P.O. Box 1033, Riverside, CA 92502-1033, (2) San Bernardino County Flood Control District, Attn: Vana Olsen, 825 East Third Street, San Bernardino, CA 92415-0835, and (3) Orange County Public Facilities and Resources Department, Attn: Herb Nakasone, 300 North Flower Street., P.O. Box 4048, Santa Ana, CA 92702-4048.
- b. "All rights of subrogation are hereby waived against the County of Riverside, San Bernardino, and Orange and the members of the Board of Supervisors and elective or appointive officers or employees, when acting within the scope of their employment or appointment, and County Districts and their Board or Commissions which are governed by the County Board of Supervisors".
- c. "As respects operation of the named insured performed on behalf of the Government, the following are added as additional insureds:
 - 1. The San Bernardino County Flood Control District, County of San Bernardino, Orange County Public Facilities and Resources Department, County of Orange, Riverside County Flood Control and Water Conservation District, and the County of Riverside.
- d. "It is agreed that any insurance maintained by the Orange County Public Facilities and Resources Department, and the County of Orange will apply in excess of, and not contribute with, insurance provided by this policy.

LIABILITY INSURANCE

COVERAGE	MINIMUM LIMITS
Comprehensive General Liability single limit including Completed Operation and a Broad Form Property Endorsement and Comprehensive Automobile Liability	\$10,000,000 combined per occurrence.
Worker's Compensation	Statutory

1.16.4 Liability Insurance

Any liability insurance required by this contract shall not contain exclusions or endorsements which eliminate or limit coverage for the following:

- a. Claims of liability for bodily injury or property damage caused by, resulting from, attributable or contributed to, or aggravated by the subsidence or other movement of soils or land as a result of landslide, consolidation, expansion, creep, shifting, sinking, or mud flow;
- b. Claims of liability for bodily injury or property damage caused by, resulting from, attributable or contributed to, or aggravated by the actual, alleged, or threatened discharge, dispersal,

- release or escape of any pollutants;
- c. Completed Operations coverage;
- d. Products coverage;
- e. Broad Form Property Damage coverage;
- f. Blanket Contractual coverage.

1.16.5 Fire and Extended Coverage

The Contractor shall purchase a course of construction property insurance policy to cover structures (excluding reinforced concrete structures) being built under the terms of this contract to at least 90 percent of their replacement cost. As a minimum, coverage shall be provided for replacement cost and for fire and the extended coverage perils.

1.16.6 Worker's Compensation

Each liability and worker's compensation insurance policy required by this contract shall contain clause numbers 12.3 (a.) and 12.3 (c.) above, and the following clause: "It is agreed that any insurance maintained by the County of Riverside, San Bernardino, and Orange will apply in excess of, and not contribute with, insurance provided by this policy."

1.16.6.1 Procuring of Required Policy

The procuring of such required policy or policies of insurance shall not be construed to limit Contractor's liability hereunder not to fulfill the indemnification provisions and requirements of this contract.

1.16.6.2 Contractor Agrees to Indemnify

Contractor agrees to indemnify and save harmless agency, its officers, employees, agents and volunteers from and against any and all claims, actions, losses, damages and/or liability arising out of this contract from any cause whatsoever, including the acts, errors or omissions of any person, except where such indemnification is prohibited by law.

1.17 PROGRESS PAYMENTS

1.17.1 Partial Pay Estimates

Partial pay estimates shall be submitted every month. The following items shall be submitted with the partial pay estimates to ensure prompt payment:

- a. Project schedule Narrative and Earnings Monthly update reports as specified in Section 01320 PROJECT SCHEDULE, paragraph: Contractor Prepared Network Analysis System (NAS).
- b. Safety report(s) in accordance with OSHA, CALOSHA, and the Corps of Engineers' EM 385-1-1.
- c. Updated/current submittal register as specified in Section 01330 SUBMITTAL PROCEDURES, paragraph: Submittal Register (ENG FORM 4288).
- d. Quality Control Reports as specified in Section 01451 CONTRACTOR

QUALITY CONTROL, paragraph: Documentation.

- e. Updated forecasting of expenditure worksheets as specified in the paragraph below

1.17.2 Forecasting of Future Progress Payments

By July 15th of each year, the Contractor shall give the Contracting Officer the projected monthly earnings for the upcoming fiscal year (fiscal year begins in November). The Contracting Officer will provide a spreadsheet to the Contractor showing the different funding categories and their respective percentages for each bid item for the total contract amount after the issuance of notice to proceed (See attached FIGURE 5). Similar accounting information will be contained in any subsequent contract modification issued for this contract. Each pay period the Contractor shall forecast his expenditures for the following 3 pay periods, indicating the funding requirement for each accounting category. The updated worksheet (see FIGURE 6) shall be submitted with each partial pay estimate (e.g., submittal for partial pay estimate for the period of 15 DEC to 15 JAN will include a forecast of expenditures for the period of 15 JAN to 15 APR). Forecasting of expenditures is needed to assure sufficient funding for future progress payments. If the contractor's actual earnings for any particular partial pay estimate exceed the funding available for payment due to inaccurate submittal of forecast expenditures, the contracting office can reject the contractor's invoice as defective, and require the contractor to resubmit the invoice of an amount not exceeding the previously submitted forecast amounts.

1.18 NOTICE OF PARTNERSHIP

The Government intends to encourage the foundation of a cohesive partnership with the Contractor and its subcontractors. This partnership 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 and intended to achieve completion within budget, on schedule, and in accordance with plans and specifications; and to develop a single cooperative management team focused on the success of the project to mutual benefit of all stakeholders. This partnership would be bilateral in makeup, and participation will be totally voluntary. Any cost associated with effectuating this partnership will be agreed to by both parties and will be shared equally with no change in contract price. An integral aspect of partnering is the resolution of disputes in a timely, professional, and non-adversarial manner through the use of issue clarification and problem solving. Alternate Dispute Resolution (ADR) methodologies will be encouraged in place of more formal dispute resolution procedures. ADR will assist in promoting and maintaining an amicable working relationship to preserve the partnership. ADR is a voluntary, nonbinding procedure available for use by the parties to this contract to resolve any dispute that may arise during performance. To implement this partnership initiative it is anticipated that within 60 days of Notice to Proceed the Contractor's on-site project manager and the Government's Resident Engineer would attend a two day partnership development seminar/team building workshop together with the Contractor's key on-site staff and key Government personnel. Follow-up workshops of 1 to 2 days duration would be held periodically throughout the duration of the contract as agreed to by the Contractor and Government.

1.19 ALTERNATIVE DISPUTES REVIEW PROCESS

In order to assist in the resolution of disputes or claims arising out of this project, this contract clause establishes an Alternative Disputes Review process. A Disputes Review Board will, by mutual agreement of the parties and in accordance with this clause, be established but is not intended to be a substitute for normal negotiated Government and Contractor dispute resolution. The parties shall establish the Board within 90 calendar days after the Notice to Proceed as set forth in Attachment 1. The Disputes Review Board will consider disputes referred to it and will provide non-binding recommendations to assist in the resolution of the differences between the Government and Contractor. The following alternative procedure may be used for dispute resolution. Specific procedures to be followed for disputes referred to the Disputes Review Board are set forth as attachments to this provision.

If the Contractor objects to any oral decision or order of the Contracting Officer or his Authorized Representative(s), the Contractor shall request in writing a written decision or order from the Government. Such request is not considered a dispute for purposes of the Contract Disputes Act.

After receipt of the Government's written decision or order the Contractor shall, if there is an objection to such decision or order, file a written protest with the Government, stating clearly and in detail the basis of the objection. The Government will consider any written protest and make a decision within 15 days from receipt of the written protest either agreeing or disagreeing with the protest. If there is not complete agreement, the matter can either be referred to the Disputes Review Board by mutual agreement of the Government and the Contractor, or the Contractor may request that the Contracting Officer issue a final decision on the matter, from which the contractor may pursue an appeal in accordance with the "Disputes" clause of the contract.

In the event the Government and the Contractor mutually agree to submit the dispute to the Disputes Review Board, the request for review must be instituted within 30 days of the date of receipt of the Government's last decision. Pending review by the Disputes Review Board of a dispute, the Contractor shall diligently proceed with the work as previously directed.

The Contractor and the Government shall each be afforded an opportunity to be heard by the Disputes Review Board and to offer evidence. The Disputes Review Board recommendations toward resolution of a dispute will be given in writing to both the Government and the Contractor within 30 days following conclusion of the proceedings before the Disputes Review Board.

Within 30 days of receiving the Dispute Review Board's recommendations, both the Government and the Contractor shall respond to the other in writing signifying that the dispute is either resolved or remains unresolved. If the Government and the Contractor are able to resolve their dispute, the Government will expeditiously process any required contract modifications. Should the dispute remain unresolved after 30 days following receipt of the Board's recommendations, the Contractor may submit a request for a Contracting Officer's decision under the "Disputes" clause of the contract.

The attached information at the end of this section forms a part of this Special Clause. The Alternative Disputes Review Process (Attachment 1) describes the purpose and function of the Disputes Review Board. The Disputes Review Board Three Party Agreement which sets out the terms between the parties (Attachment 2) must be completed and signed by both parties in accordance with the conditions in that Agreement. The Contract

Disputes Review Board Guidelines (Attachment 3) set forth the objective and responsibility of the Disputes Review Board. These attachments set out all the guidelines for this Special Clause providing an alternative disputes review process.

1.20 AVAILABILITY OF ADDITIONAL INFORMATION

1.20.1 Documentation and Reports

Additional design information and data are available through the Contracting Officer. Specific information available for review include: the Phase II GDM on the Santa Ana River Mainstem - Main Report & Supplemental Environmental Impact Statement, dated August 1988; the Supplemental Final Environmental Impact Statement/Environmental Impact Report for Prado Basin and Vicinity dated November 2001; the Draft Feature Design Memorandum No. 12 Prado Dam Outlet Works; selected as-built drawings from 1938 through 1940; pump test data, and groundwater data. It is emphasized that significant changes have been incorporated into the Plans and Specifications from the designs proposed in the design memorandums. The design memorandums and other data are available for information purposes only and are not a part of the contract documents since they have been superseded by the Plans and Specifications.

1.20.2 Field Investigations

Prior to bid opening, the Contractor may make arrangements to access the site to perform geotechnical investigations on the following conditions:

Coordinate with the Prado Resident Office, Fernando Cano or Bob Garda, 48 hours in advance for access to the site. Access would be limited to standard work hours, Monday through Friday. Submit a hazard analysis and layout of proposed work to the Prado Resident Office for approval prior to commencement of any work.

A Corps of Engineers geologist or one of his representatives will observe the investigations. Contractor shall notify POC Dave Lukesh, (213) 452-3577, 72 hours in advance.

Notify the Corps' Cultural Resources Specialist, Stephen Dibble, (213) 452-3849, 48 hours prior to commencing investigations.

Activities shall not take place or interfere with Endangered Species in standing water or other sensitive locations. As long as the proposed activities occur outside of the active stream channel, and outside of vireo nesting season (which begins March 1), that should satisfy most environmental concerns.

Standard requirements concerning equipment use must also be met (i.e., equipment must be properly tuned and maintained to minimize air pollution, avoid leaks/contamination of soil and groundwater, don't refuel within the river channel, etc.).

Corps Safety Standards EM-385-1-1 shall apply.

1.21 TIME EXTENSIONS FOR UNUSUALLY SEVERE WEATHER

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 anticipation 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.

1.21.1 Anticipated Adverse Weather Days

The following schedule of monthly anticipated adverse weather delays 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. **Adverse Weather Days were determined based on the following 3 elements:**

- a. Daily Precipitation \geq .10 inch
- b. Max. Daily Temperature \geq 100 degrees F
- c. Min. Daily Temperature \leq 32 degrees F

MONTHLY ANTICIPATED ADVERSE WEATHER DELAY WORK DAYS BASED ON FIVE (5) DAY WORK WEEK

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
4	4	3	1	1	3	7	6	4	2	2	4

1.21.2 Documentation

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. Actually adverse weather delay days must prevent work on critical activities for 50 percent or more of the Contractor's scheduled work day. The number of actual adverse weather 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 the subparagraph 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).

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION (NOT APPLICABLE)

ALTERNATIVE DISPUTES REVIEW PROCESS - ATTACHMENT 1

DISPUTES REVIEW BOARD

1. Purpose.

The Disputes Review Board is an advisory body which may be created by mutual agreement of the Government and the Contractor for a particular construction project. The Board's function will be to assist in the resolution of claims, disputes or controversy between the Contractor and the Government. Any recommendations made by the Board will be advisory, and will not be binding upon either party.

2. General.

a. Definition. The Disputes Review Board process is a voluntary, expedited procedure, whereby an independent three-party Board is established to evaluate contract disputes and provide recommendations to the Government and its Contractor with the objective of resolving disputes.

b. The Board will consider disputes referred to it, and will furnish recommendations to the Government and Contractor to assist in the resolution of the differences between them. The Board will provide technical expertise to assist and facilitate the resolution of disputes.

3. Board Membership.

a. The Disputes Review Board shall consist of three individuals respected in the field of engineering for their ability and integrity, who are experienced with the processes anticipated to be used to construct the project: one member shall be selected by the Government; one member shall be selected by the Contractor; and, one member shall be selected by these first two members. The first two members shall be mutually acceptable to both the Government and the Contractor. If the two parties are unable to agree on these first two members, the mutual decision to submit disputes to a Disputes Review Board shall be considered terminated.

b. The two members acceptable to the Government and the Contractor will independently select the third member. If the two members are unable to select an acceptable third member, the decision to submit disputes to a Disputes Review Board shall be considered terminated.

c. No member shall have a financial interest in the contract, except for payment for services on the Disputes Review Board. Except for fee-based consulting services on other projects, no Board member shall have been employed by either party within a period of two years prior to award of the contract. No member shall have had substantial prior involvement in the project that could compromise his ability to impartially participate in the Board's activities.

4. Selection of the Disputes Review Board Procedure.

If the parties mutually agree that a Disputes Review Board should be established for work performed under a contract, the Government and the Contractor shall negotiate an agreement with their member within 60 calendar days after execution of the contract. The selection of the Disputes Review Board Alternative Disputes Review procedure for resolution of contract disputes shall be void if the two members are unable to select a third member

within 30 calendar days.

5. Procedure for Submitting Dispute to the Board.

a. If the Contractor objects to any oral decision or order of the Contracting Officer or his Authorized Representative(s), the Contractor shall request in writing a written decision or order from the Government.

b. After receipt of the Government's written decision or order the Contractor shall, if there is an objection to such decision or order, file a written protest with the Government, stating clearly and in detail the basis of the objection. The Government will consider any written protest and make a decision within 15 days from receipt of the written protest either agreeing or disagreeing with the protest. If there is not complete agreement, the matter can either be referred to the Disputes Review Board by mutual agreement of the Government and the Contractor, or the Contractor may request that the Contracting Officer issue a final decision on the matter, from which the Contractor may pursue an appeal in accordance with the "Disputes" clause of the contract.

c. In the event the Government and Contractor mutually agree to submit the dispute to the Disputes Review Board, the request for review must be instituted within 30 days of the date of receipt of the Government's last decision. Pending review of the Disputes Review Board of a dispute, the Contractor shall diligently proceed with the work as previously directed.

d. The Contractor and the Government shall each be afforded an opportunity to be heard by the Disputes Review Board and to offer evidence. The Disputes Review Board shall submit in writing recommendations towards factual (as opposed to legal) resolution of a dispute to both the Government and the Contractor within 30 days following conclusion of the proceedings before the Disputes Review Board.

e. Within 30 days of receiving the Dispute Review Board's factual recommendations, both the Government and the Contractor shall respond to the other in writing signifying that the dispute is either resolved or remains unresolved. If the Government and the Contractor are able to resolve their dispute, the Government will expeditiously process any required contract modifications. Failure of either party to respond within 30 days following the receipt of the Board's recommendations will be deemed acceptance of the Board's recommendations.

f. In appropriate cases the Contractor and the Government may agree that a dispute should be submitted to the Disputes Review Board, but that the dispute only warrants the efforts of one Board Member. In such cases the third Board Member will mediate the dispute without participation of the other two members. Other than submitting the dispute to only the third Board Member, the procedural requirements of the Alternative Disputes Review Board Process as set forth in paragraph 7a-e above will be followed.

6. Board Procedures.

a. The Disputes Review Board will formulate its own rules of operation. In order to keep abreast of construction progress, it is recommended that the members, as a Board, will visit the project at least quarterly, keep a current file and regularly meet with representatives of the Government and the Contractor. More frequent than quarterly site visits shall be as agreed between the Government, the Contractor and the Board. The Board should take these opportunities to make recommendations to either or

both, the Government and the Contractor to facilitate the construction and/or prevent problems from occurring.

b. Should the need arise to appoint a replacement Board member, the replacement member shall be appointed in the same manner as the original Board members were appointed. The selection of a replacement Board member shall begin promptly upon notification of the necessity for a replacement, and shall be completed within 30 calendar days. The Disputes Board Three Party Agreement will be supplemented to indicate changes in Board membership.

c. For further description of work, responsibilities and duties of the Disputes Review Board, and the Government and Contractor's obligations and responsibilities with respect to each other and to the Disputes Review Board, see the "Disputes Board Three Party Agreement" as set forth in attachment 2.

7. Expenses of the Board and Board Members.

Compensation for the Disputes Review Board members, and the expenses of operation of the Board, shall be shared by the Government and Contractor in accordance with the following:

a. The fees and expenses of all three members of the DRB shall be shared equally by the Government and the Contractor. The Contractor shall pay the invoices of all DRB members after approval by both parties. The Government shall reimburse the Contractor for one half of the approved invoices.

b. The Government at its expense will provide administrative services, such as conference facilities and secretarial services, to the Board.

8. Three Party Agreement.

a. The Contractor, the Government and all three members of the Board shall execute the "Disputes Review Board Three Party Agreement" within 30 calendar days following the final selection of the third member.

b. The "Disputes Review Board Three Party Agreement" and the "Contract Disputes Review Board Guidelines" to said Agreement are set forth in attachments 2 and 3.

ALTERNATIVES DISPUTES REVIEW PROCESS - ATTACHMENT 2

THREE PARTY AGREEMENT

THIS THREE PARTY AGREEMENT, made and entered into this _____ day of _____, 200_, between: The United States Army Corps of Engineers, acting through the Contracting Officer of the U.S. Army Engineer District, Los Angeles, hereinafter called the CORPS; the _____ company, hereinafter called the "CONTRACTOR," and the Disputes Review Board, hereinafter called the "BOARD" consisting of three members; _____; _____, and _____.

WITNESSETH that,

WHEREAS, the CORPS and the CONTRACTOR are now engaged in the construction of the Prado Dam, Embankment, Outlet Works, and Appurtenances in Riverside County, California, under Contract No. DACW09-__-B-____; and

WHEREAS, the contract includes a provision authorizing, upon the mutual agreement of both the CORPS and the CONTRACTOR, the establishment and operation of a "Disputes Review Board" to assist in resolving disputes and claims; and

WHEREAS, the BOARD is composed of three members, one selected by the CORPS, one selected by the CONTRACTOR and the third member selected by these two;

NOW THEREFORE, in consideration of the terms, conditions, covenants and performance contained herein, or attached and incorporated and made a part hereof, the parties agree as follows:

I.

DESCRIPTION OF WORK

In order to assist upon mutual agreement by the CORPS and the CONTRACTOR in the resolution of disputes and claims between the CONTRACTOR and the CORPS, the contract provides for the establishment of a Disputes Review Board. The intent of the BOARD is to fairly and impartially consider any disputes mutually placed before it, and to provide written recommendations for resolution of such disputes to both the CORPS and the CONTRACTOR. The members of the BOARD shall perform all services necessary to participate in the BOARD's actions in accordance with the following Scope of Work.

II.

SCOPE OF WORK

The Scope of Work of the BOARD includes, but is not limited to, the following items of work.

A. Procedures.

Prior to consideration of an appeal, the BOARD shall establish rules that will govern the conduct of its business, and reporting procedures based upon guidelines which are made a part of the Special Clause entitled, "ALTERNATIVE REVIEW DISPUTES PROCESS." The BOARD's factual recommendations, resulting from their consideration of a dispute or claim, shall be furnished

in writing to the CORPS and the CONTRACTOR. The recommendations shall be based on the pertinent contract provisions and facts and circumstances involved in the dispute.

B. Construction Site Visits.

The members as a BOARD shall visit the project site at least quarterly to keep abreast of construction activities and to develop a familiarity for the work in progress. More frequent site visits may be warranted. The frequency, exact time and duration of these visits shall be as mutually agreed between the CORPS, the CONTRACTOR and the BOARD. The Board should take these opportunities to make recommendations to either or both, the Government and the Contractor to facilitate the construction and/or prevent problems from occurring.

C. BOARD Consideration of a Dispute or Claim.

In the event of a claim or dispute, the CORPS and the CONTRACTOR may mutually agree to submit such claim or dispute to the BOARD. Upon receipt by the BOARD of a written claim or dispute, the BOARD shall convene to review and consider the matter. Both the CORPS and the CONTRACTOR shall be given the opportunity to present their evidence at these meetings. It is expressly understood that the BOARD members are to act impartially and independently in consideration of the contract provisions and the facts and conditions surrounding any written claim or dispute presented by the CORPS or the CONTRACTOR. The BOARD's factual recommendations concerning any such claim or dispute are advisory and non-binding upon both the CORPS and the CONTRACTOR.

D. Time and Place of Board Meetings.

The time and location of BOARD meetings shall be determined by the BOARD.

III.

CONTRACTOR RESPONSIBILITY

The CONTRACTOR shall furnish one copy of all pertinent documents it might have, other than those furnished by the CORPS, which are or may become pertinent to the performance of the BOARD. Pertinent documents are any drawings or sketches, calculations, procedures, schedules or estimates or other documents which are used in the performance of the work or in justifying or substantiating the Contractor's position.

IV.

CORPS RESPONSIBILITIES

The CORPS shall furnish the following services and items.

A. Contract Related Documents.

The CORPS Shall furnish the BOARD three copies of the Contract documents, change orders, written instructions issued by the CORPS to the Contractor or other documents pertinent to the performance of the contract and therefore, necessary to the BOARD's work.

B. Coordination and Services.

The CORPS Contracting Officer's Representative for the contract will, in cooperation with the CONTRACTOR, coordinate the operations of the BOARD. The CORPS, acting through the Contracting Officer's Representative, will arrange or provide conference facilities at or near the contract site and provide secretarial and copying services.

C. BOARD Cost Records.

The Board will maintain complete cost records, which will be available for inspection by either party. Shared expenses include the members' wages and travel expense, local lodging and subsistence for the BOARD members, and direct non-salary costs associated with BOARD operations.

V.

COMPENSATION

A. Payment for services of the CORPS and CONTRACTOR appointed members of the BOARD and the third appointed member will be at the rates agreed to between the CORPS and the CONTRACTOR (for the third appointed member) and between each of them and their respective appointed member.

Compensation, travel, and costs, for the BOARD members, and the expenses of operation of the BOARD, shall be shared by the CORPS and the CONTRACTOR in accordance with the following:

a. The CORPS and the CONTRACTOR shall share equally in the BOARD members' wages, expenses, and travel.

b. The CORPS and the CONTRACTOR shall share equally the other reasonable and necessary expenses of the BOARD.

B. Fee - Third Appointed Member.

Payment for services rendered by the third member of the BOARD shall not exceed the daily billing rate of \$_____, including travel time. This daily rate includes all direct labor costs, overhead and profit. Travel and subsistence expenses will be reimbursed at the actual cost, but shall not exceed the allowable amounts as provided by the Government's Joint Travel Regulations in effect at the time the expenses are incurred.

C. Direct Non-Salary Costs.

Direct non-salary costs of the BOARD will be reimbursed at the actual cost to the BOARD. These charges may include, but are not limited to; printing, long distance telephone calls, supplies, etc. The billing for non-salary costs, directly identifiable with the project, shall be an itemized listing to the charges supported by the original bills, invoices, expense accounts and miscellaneous supporting data retained by the BOARD members. Copies of the original supporting documents shall be supplied to the parties upon request.

D. Maximum Total Amount Payment.

The maximum total amount payable under this AGREEMENT for the BOARD's fee and travel costs, and the BOARD's direct non-salary costs, shall not exceed \$_____, unless a prior supplemental AGREEMENT has been negotiated and executed by the CORPS and the CONTRACTOR.

E. Payments.

The BOARD may submit invoices to the CONTRACTOR for partial payment for work completed by the BOARD not more than once per month during the progress of the work. Such invoices shall be accompanied by a general description of activities performed during the billing period. The value of the work accomplished for partial payment shall be established by the billing from the BOARD members, and itemized direct non-salary costs incurred by the Board. The CONTRACTOR shall pay the invoices of the BOARD after approval by both parties. The CORPS shall reimburse the CONTRACTOR for one half of the approved invoices.

F. Inspection of Cost Records.

The BOARD shall keep available for inspection by representatives of the CORPS for a period of three years after final payment the cost records and accounts pertaining to this AGREEMENT.

VI.

TERMINATION OF AGREEMENT

The parties of this AGREEMENT mutually agree that this AGREEMENT may be terminated at any time by written notice by the CORPS or CONTRACTOR to the other party. BOARD members may withdraw from the BOARD by providing notice. BOARD members may be terminated for cause only by their original appointor. Therefore, the CORPS may only terminate the CORPS appointed member, the CONTRACTOR may only terminate the CONTRACTOR appointed member, and the first two members must agree to terminate the third member.

VII.

LEGAL RELATIONS

The parties hereto mutually understand and agree that the third BOARD member in the performance of any duties on the BOARD is acting in the capacity of an independent Contractor and not as an employee of either the CORPS or the CONTRACTOR. The board members are absolved of any personal or professional liability arising from the activities and recommendations of the BOARD.

VIII.

DISPUTES

Any dispute between the parties hereto, arising out of the work or other terms of this AGREEMENT, which cannot be resolved by negotiation and mutual concurrence between the parties, shall render this AGREEMENT terminated.

IX.

GENERAL

A. Notices.

All notices to be given herein shall be effective upon receipt and shall be in writing and personally delivered or mailed, first class,, postage

prepaid or given by telegram, facsimile or other similar means (followed by a confirmation by mail) to the parties. As the case may be, at the following address or such other address as may hereafter be designated, by the parties:

- a. If to the CORPS:
Address to be provided.
- b. If to the Contractor:
Address to be provided.
- c. If to the BOARD Members:
Address to be provided.

B. Confidentiality.

No BOARD Member shall disclose to any person proprietary or confidential information of the CORPS or the Contractor, except as may be required by law.

In WITNESS WHEREOF, the parties hereto have executed this AGREEMENT as of the day and year first above written.

BOARD MEMBER

By: _____

Title: _____

BOARD MEMBER

By: _____

Title: _____

BOARD MEMBER

By: _____

Title: _____

CONTRACTOR

By: _____

Title: _____

U.S. ARMY CORPS OF ENGINEERS

By: _____

Title: Contracting Officer

ALTERNATIVE DISPUTES REVIEW PROCESS - ATTACHMENT 3

CONTRACT DISPUTES REVIEW BOARD

GUIDELINES

I.

OBJECTIVE

The principal objective of the Disputes Review Board (BOARD) is to provide technical advice to both parties that will assist in the resolution of disputes which would otherwise likely be resolved through the traditional litigative processes. If this objective is achieved, such disputes can be resolved promptly, with minimum expense, and with minimum disruption to the administration and performance of the work. It is not intended for the GOVERNMENT or the CONTRACTOR to default on their normal responsibility to amicably and fairly settle their differences by indiscriminately assigning disputes to the BOARD. It is intended that if mutually agreed to by the parties to constitute a Disputes Review Board for the purpose of attempting to resolve contract disputes, that the mere existence of the BOARD will encourage the CORPS and the CONTRACTOR to resolve potential disputes without the necessity of resorting to the formal appeal procedure under the "Disputes" clause of the contract.

II.

RESPONSIBILITY OF THE BOARD

A. The BOARD will provide technical advice and recommendations concerning controversy between the CONTRACTOR and the CORPS from construction arising under the contract. Primarily, the BOARD will consider interpretation of the plans and/or specifications, delays, acceleration of the work, scheduling, classification of extra work, changed conditions, design changes, and the like. During its regular visits to the job site, the BOARD will encourage the resolution of differences at the job level. The Board should take these opportunities to make recommendations to either or both, the Government and the Contractor to facilitate the construction and/or prevent problems from occurring.

B. During the period when the BOARD is in effect, other than by formal factual recommendations to both the CORPS and the CONTRACTOR, the BOARD will refrain from giving any advice or consultative services to either party. The BOARD members will act in a completely independent manner and will have no consultative or business connections with either party during their tenure as BOARD members.

C. Normally, the third BOARD member selected by the first two will act as Chairman for all activities. However, this may be delegated to another member from time to time.

III.

REGULAR CONSTRUCTION PROGRESS MEETINGS

A. All regular meetings will be held at or near the job site. Each meeting will consist of a round table discussion and a field inspection of the work being performed. The round table discussion will be conducted by a member of

the CORPS and will be attended by selected personnel from the CORPS and the CONTRACTOR. The agenda will generally be as follows:

1. Opening remarks by the CORPS Representative.
 2. A description by the CORPS of work accomplished since the last meeting, the current status of the work, schedule-wise, and a forecast for the coming period.
 3. An outline, by the CONTRACTOR, of potential problems and a description of proposed solutions.
 4. An outline by the CORPS' Contracting Officer, or his authorized representative, as to the status of the work as he views it including potential problems and proposed solutions.
 5. A brief description of potential claims or disputes which have surfaced since the last meeting.
 6. A summary of the status of past disputes and claims.
- B. The CORPS will prepare minutes of all regular meetings and circulate them for revision and/or approval by all concerned.
- C. The field inspection will cover all active segments of the work, the BOARD being accompanied by both the CORPS and CONTRACTOR personnel.
- D. The Board should take these opportunities to make recommendations to either or both, the Government and the Contractor to facilitate the construction and/or prevent problems from occurring.

IV.

HANDLING OF WRITTEN APPEALS

- A. When a written appeal is referred to the BOARD by either party, it shall first decide when to conduct a hearing. For an urgent matter the BOARD should convene at its earliest convenience. All hearings shall commence no later than 30 days following transmittal of a dispute to the BOARD.
- B. The BOARD may request that written documentation and arguments from both parties be sent to each individual member for study before the hearing begins.
- C. Normally, the hearing will last no more than 2 days, and would be conducted at the job site. However, any location which would be more convenient to all parties and still provide all required facilities and access to necessary documentation would be satisfactory.
- D. For hearings, the third member of the BOARD will act as Chairman, or he may appoint one of the other members. The CORPS and the CONTRACTOR shall have representatives at all hearings. The party initiating the dispute to the BOARD will discuss the dispute followed by the other party, each party being allowed equal time. Each party will then be allowed one or more rebuttals until all aspects are thoroughly covered. Each time a person testifies the BOARD members may ask questions, request clarification, or ask for further data. In large or complex cases more than two days of additional hearings may be necessary in order to consider all the evidence presented by both parties. However, no hearing on any single dispute will last for more

than 4 calendar days.

E. After the hearings are concluded, the BOARD shall meet in private and reach a conclusion supported by two or more members. Its factual (as opposed to legal) findings and recommendations, together with its reasons, shall then be submitted as a written report to both the CORPS and the CONTRACTOR within 30 days following completion of the hearings. The Board's recommendations shall be based on the pertinent contract provisions and facts and circumstances involved in the dispute.

F. The BOARD should make every effort to reach a unanimous decision. If this proves impossible, the dissenting member may prepare a minority report.

G. Although both parties should place weight upon the BOARD's recommendations, they are not binding. Either party may request the BOARD to reconsider its recommendation.

H. Position papers or other written material supplied to the BOARD are admissible in a subsequent proceeding unless the submitting party designates that they are submitted for settlement purposes only; in addition, any written report of the BOARD shall be admissible in such subsequent proceedings and each party hereby stipulates to its admissibility; and provided, further that if settlement is reached as a result of the recommendations of the BOARD, any material presented to the BOARD, as well as the recommended settlement, may be used to justify any contract modification which may result from the settlement.

I. It may not be necessary for the BOARD to keep a formal record of its sessions during the consideration of a dispute. This would depend partly upon the nature and magnitude of the dispute and upon the attitude of the parties.

V.

MISCELLANEOUS

It is not desirable to adopt hard and fast rules for the functioning of the BOARD. The entire procedure should be kept flexible so that it can adapt to changing situations. The BOARD should initiate, with the other parties' concurrence, new rules or modifications to old ones whenever this is deemed necessary. It is desirable to keep the hearings informal.

-- End of Section --

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SECTION 15080

THERMAL INSULATION FOR MECHANICAL SYSTEMS

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. At the discretion of the Government, the manufacturer of any material supplied will be required to furnish test reports pertaining to any of the tests necessary to assure compliance with the standard or standards referenced in this specification.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 167	(1999) Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip
ASTM B 209	(1996) Aluminum and Aluminum-Alloy Sheet and Plate
ASTM C 195	(1995) Mineral Fiber Thermal Insulating Cement
ASTM C 534	(1999) Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form
ASTM C 547	(1995) Mineral Fiber Pipe Insulation
ASTM C 552	(1991) Cellular Glass Thermal Insulation
ASTM C 647	(1995) Properties and Tests of Mastics and Coating Finishes for Thermal Insulation
ASTM C 795	(1998e1) Thermal Insulation for Use in Contact With Austenitic Stainless Steel
ASTM C 916	(1985; R 1996e1) Adhesives for Duct Thermal Insulation
ASTM C 920	(1998) Elastomeric Joint Sealants
ASTM C 921	(1989; R 1996) Determining the Properties of Jacketing Materials for Thermal Insulation
ASTM E 84	(2000a) Surface Burning Characteristics of Building Materials

ASTM E 96	(1995) Water Vapor Transmission of Materials
MANUFACTURERS STANDARDIZATION SOCIETY OF THE VALVE AND FITTINGS INDUSTRY (MSS)	
MSS SP-69	(1996) Pipe Hangers and Supports - Selection and Application
MIDWEST INSULATION CONTRACTORS ASSOCIATION (MICA)	
MICA Insulation Stds	(1993) National Commercial & Industrial Insulation Standards
NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)	
NFPA 90A	(1999) Installation of Air Conditioning and Ventilating Systems
UNDERWRITERS LABORATORIES (UL)	
UL 723	(1996; Rev thru Dec 1998) Test for Surface Burning Characteristics of Building Materials
UL Fire Resist Dir	(1999) Fire Resistance Directory (2 Vol.)

1.2 SYSTEM DESCRIPTION

Field-applied insulation and accessories on mechanical systems shall be as specified herein; factory-applied insulation is specified under the piping, duct or equipment to be insulated. Field applied insulation materials required for use on Government-furnished items as listed in the SPECIAL CONTRACT REQUIREMENTS shall be furnished and installed by the Contractor.

1.3 GENERAL QUALITY CONTROL

1.3.1 Standard Products

Materials shall be the standard products of manufacturers regularly engaged in the manufacture of such products and shall essentially duplicate items that have been in satisfactory use for at least 2 years prior to bid opening.

1.3.2 Installer's Qualifications

Qualified installers shall have successfully completed three or more similar type jobs within the last 5 years.

1.3.3 Surface Burning Characteristics

Unless otherwise specified, insulation not covered with a jacket shall have a flame spread index no higher than 75 and a smoke developed index no higher than 150. The outside surface of insulation systems which are located in air plenums, in ceiling spaces, and in attic spaces shall have a flame spread index no higher than 25 and a smoke developed index no higher than 50. Insulation materials located exterior to the building perimeter are not required to be fire-rated. Flame spread and smoke developed

indexes shall be determined by ASTM E 84. Insulation shall be tested in the same density and installed thickness as the material to be used in the actual construction. Jackets shall comply with the flame spread and smoke developed ratings required by ASTM C 921.

1.3.4 Identification of Materials

Packages or standard containers of insulation, jacket material, cements, adhesives, and coatings delivered for use, and samples required for approval shall have manufacturer's stamp or label attached giving the name of the manufacturer and brand, and a description of the material.

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-04 Samples

Thermal Insulation Materials

A complete list of materials, including manufacturer's descriptive technical literature, performance data, catalog cuts, and installation instructions. Materials furnished under this section of the specification shall be submitted at one time. A schedule indicating the product number, k-value, thickness and furnished accessories for each mechanical system requiring insulation shall be included.

After approval of materials and prior to applying insulation a booklet shall be prepared and submitted for approval. The booklet shall contain marked-up MICA Insulation Stds plates (or detail drawings showing the insulation material and insulating system) for each type of equipment required to be insulated per this specification. The MICA plates shall be marked up showing the materials to be installed in accordance with the requirements of this specification for the specific insulation application. The Contractor shall submit all MICA Plates required to show the entire insulating system, including Plates required to show insulation penetrations, vessel bottom and top heads, legs, and skirt insulation as applicable. If the Contractor elects to submit detailed drawings instead of marked-up MICA Plates, the detail drawings shall show cut-away, section views, and details indicating each component of the insulation system and showing provisions for insulating jacketing, and sealing portions of the equipment. For each type of insulation installation on the drawings, provide a label which identifies each component in the installation (i.e., the duct, insulation, adhesive, vapor retarder, jacketing, tape, mechanical fasteners, etc.) Indicate insulation by type and manufacturer. Three copies of the booklet shall be submitted at the jobsite to the Contracting Officer. One copy of the approved booklet shall remain with the insulation Contractor's display sample and two copies shall be provided for Government use.

After approval of materials actual sections of installed systems

properly insulated in accordance with the specification requirements shall be displayed. Such actual sections must remain accessible to inspection throughout the job and will be reviewed from time to time for controlling the quality of the work throughout the construction site. Each material used shall be identified, by indicating on an attached sheet the specification requirement for the material and the material by each manufacturer intended to meet the requirement. Display sample sections will be inspected at the jobsite by the Contracting Officer. Approved display sample sections shall remain on display at the jobsite during the construction period. Upon completion of construction, the display sample sections will be closed and sealed.

Pipe Insulation Display Sections: Display sample sections shall include as a minimum an elbow or tee, a valve, dielectric unions and flanges, a hanger with protection shield and insulation insert, or dowel as required, at support point, method of fastening and sealing insulation at longitudinal lap, circumferential lap, butt joints at fittings and on pipe runs, and terminating points for each type of pipe insulation used on the job, and for hot pipelines and cold pipelines, both interior and exterior, even when the same type of insulation is used for these services.

Duct Insulation Display Sections: Display sample sections for rigid and flexible duct insulation used on the job. A display section for duct insulation exposed to weather shall be protected by enclosing with a temporary covering.

1.5 STORAGE

Materials shall be delivered in the manufacturer's unopened containers. Materials delivered and placed in storage shall be provided with protection from weather, humidity, dirt, dust and other contaminants. Insulation material and supplies that become dirty, dusty, wet, or otherwise contaminated may be rejected by the Contracting Officer.

PART 2 PRODUCTS

2.1 GENERAL MATERIALS

Materials shall be compatible and shall not contribute to corrosion, soften, or otherwise attack surfaces to which applied in either the wet or dry state. Materials to be used on stainless steel surfaces shall meet ASTM C 795 requirements. Materials shall be asbestos free and conform to the following:

2.1.1 Adhesives

2.1.1.1 Acoustical Lining Insulation Adhesive

Adhesive shall be a nonflammable, fire-resistant adhesive conforming to ASTM C 916, Type I.

2.1.1.2 Mineral Fiber Insulation Cement

Cement shall be in accordance with ASTM C 195.

2.1.1.3 Contact Adhesive

Adhesive shall be Type II, Class 1.

2.1.1.4 Lagging Adhesive

Lagging adhesives shall be nonflammable, fire-resistant in accordance with NFPA 90A, UL 723, and ASTM E 84. Adhesives shall be either the Class 1 or Class 2 type. Class 1 adhesive shall be pigmented white and be suitable for bonding fibrous glass cloth to faced and unfaced fibrous glass insulation board; for bonding cotton brattice cloth to faced and unfaced fibrous glass insulation board; for sealing edges of and bounding fibrous glass tape to joints of fibrous glass board; or for bonding lagging cloth to thermal insulation. Class 2 adhesive shall be pigmented white and be suitable for attaching fibrous glass insulation to metal surfaces. Lagging adhesives shall be applied in strict accordance with the manufacturer's recommendations.

2.1.2 Contact Adhesive

Adhesive may be dispersed in a nonhalogenated organic solvent with a low flash point (flash point plus or minus 25 degrees F) or, dispersed in a nonflammable organic solvent which shall not have a fire point below 200 degrees F. The adhesive shall not adversely affect, initially or in service, the insulation to which it is applied, nor shall it cause any corrosive effect on metal to which it is applied. Any solvent dispersing medium or volatile component of the adhesive shall have no objectionable odor and shall not contain any benzene or carbon tetrachloride. The dried adhesive shall not emit nauseous, irritating, or toxic volatile matters or aerosols when the adhesive is heated to any temperature up to 2.2 degrees F. The adhesive shall be nonflammable, fire resistant conforming to ASTM E 84.

2.1.3 Caulking

ASTM C 920, Type S, Grade NS, Class 25, Use A.

2.1.4 Corner Angles

Nominal 0.016 inch aluminum 1 x 1 inch with factory applied kraft backing. Aluminum shall be ASTM B 209, Alloy 3003, 3105, or 5005.

2.1.5 Finishing Cement

Mineral fiber hydraulic-setting thermal insulating cement ASTM C 449.

2.1.6 Glass Tape

Glass tape shall meet the requirements of UL 723 and ASTM E 84.

2.1.6.1 Plain Weave, Untreated

The ends shall be properly interlocked with the picks to ensure that there shall be no raveling of the tape edges. It shall have an average weight of 5.8 plus or minus 10 percent ounces per square yard, an average thickness of 0.007 plus or minus 0.001 inches, warp ends/wales of 42 plus or minus 2 per inch or filling picks/courses of 32 plus or minus 2 per inch, a minimum breaking strength of 150 pounds per inch of width, and after heating to 900 degrees F for 2 hours a minimum breaking strength of 40 pounds per inch of width.

2.1.6.2 Knitted, Untreated

The wales shall be properly interlocked with the courses to ensure that there shall be no raveling of the tape edges. It shall have an average weight of 4.5 plus or minus 10 percent ounces per square yard, an average thickness of 0.007 plus or minus 0.001 inches, warp end/wales of 16 plus or minus 2 per inch, a minimum breaking strength of 40 pounds per inch of width, and after heating to 900 degrees F for 2 hours a minimum breaking strength of 21 pounds per inch of width.

2.1.6.3 Distortion Requirements

There shall be no distortion of the tape when a sample 24 inches in length is spread across a flat horizontal surface and observed for evidence of distortion (such as tendency to curl rather than lie flat). The width tolerance is plus or minus 1/8 inch.

2.1.7 Staples

Outward clinching type ASTM A 167, Type 304 or 316 stainless steel.

2.1.8 Jackets

ASTM C 921, Type I, moisture vapor transmission maximum 0.02 perms, puncture resistance minimum 50 Beach units on all surfaces except concealed ductwork, where a minimum puncture resistance of 25 Beach units is allowable, tensile strength minimum 35 pound/inch width; Type II, puncture resistance minimum 25 Beach units, tensile strength minimum 20 pound/inch width. Aluminum jackets shall be corrugated, embossed or smooth sheet, 0.016 inch nominal thickness; ASTM B 209, Temper H14, Temper H16, Alloy 3003, 5005, or 3105 with factory applied moisture barrier. Corrugated aluminum jacket shall not be used outdoors. Aluminum jacket securing bands shall be Type 304 stainless steel, 0.015 inch thick, 1/2 inch wide for pipe under 12 inch diameter and 3/4 inch wide for pipe over 12 inch diameter. Aluminum jacket circumferential seam bands shall be 2 by 0.016 inch aluminum matching jacket material. Bands for insulation below ground shall be 3/4 by 0.020 inch thick stainless steel, or fiberglass reinforced tape. The jacket may, at the option of the Contractor, be provided with a factory fabricated Pittsburg or "Z" type longitudinal joint. When the "Z" joint is used, the bands at the circumferential joints shall be designed by the manufacturer to seal the joints and hold the jacket in place. Polyvinyl chloride (PVC) jacket and fitting covers shall be FS L-P-535, Composition A, Type II, with minimum thickness 0.030 inch. Insulation under PVC jacket shall meet jacket manufacturer's written recommendations.

2.1.9 Vapor Barrier Coating

The vapor retarder coating shall be fire and water resistant and appropriately selected for either outdoor or indoor service. Color shall be white. The water vapor permeance of the compound shall not exceed 0.05 perm and shall be determined according to procedure B of ASTM E 96 utilizing apparatus described in ASTM E 96. The coating shall be a nonflammable, fire resistant type conforming to ASTM E 84, NFPA 90A, and UL 723. The flash point of the compound shall not be less than 80 degrees F and shall be determined in accordance with ASTM D 3278. All other application and service properties shall be in accordance with ASTM C 647.

2.1.10 Wire

Soft annealed ASTM A 580 Type 302, 304 or 316 stainless steel, 16 or 18 gauge.

2.2 PIPE INSULATION MATERIALS

Pipe insulation materials shall be limited to those listed herein and shall meet the following requirements:

2.2.1 Aboveground Cold Pipeline

Insulation for minus 30 degrees to plus 60 degrees F for outdoor, indoor, exposed or concealed applications,, shall be as follows:

- a. Cellular Glass: ASTM C 552, Type II, and Type III.
- b. Flexible Cellular Insulation:ASTM C 534, Type I.
- d. Mineral Fiber: ASTM C 547, Class 1 for use up to 450 degrees F and Class 2 for use up to 650 degrees F.

PART 3 EXECUTION

3.1 APPLICATION - GENERAL

3.1.1 Installation

Except as otherwise specified, material shall be installed in accordance with the manufacturer's written instructions. Insulation materials shall not be applied until tests specified in other sections of this specification are completed. Material such as rust, scale, dirt and moisture shall be removed from surfaces to receive insulation. Insulation shall be kept clean and dry. Insulation shall not be removed from its shipping containers until the day it is ready to use and shall be returned to like containers or equally protected from dirt and moisture at the end of each workday. Insulation that becomes dirty shall be thoroughly cleaned prior to use. If insulation becomes wet or if aforementioned cleaning does not restore the surfaces to like new condition, the insulation will be rejected, and shall be immediately removed from the jobsite. Joints shall be staggered on multi layer insulation. Mineral fiber thermal insulating cement shall be mixed with demineralized water when used on stainless steel surfaces. Insulation, jacketing and accessories shall be installed in accordance with MICA Insulation Stds standard plates except where modified herein or on the drawings.

3.1.2 Firestopping

Where pipes and ducts pass through fire walls, fire partitions, above grade floors, and fire rated chase walls, the penetration shall be sealed with fire stopping materials. **Firestopping materials shall consist of commercially manufactured, asbestos-free products that have a flame spread of 25 or less, and a smoke developed rating of 50 or less, when tested in accordance with ASTM E 84 or UL 723. Material shall be an approved firestopping material as listed in UL Fire Resist Dir or by a nationally recognized testing laboratory.**

3.1.3 Painting and Finishing

Painting shall be as specified in Section 09900 PAINTING, GENERAL.

3.1.4 Installation of Flexible Cellular Insulation

Flexible cellular insulation shall be installed with seams and joints sealed with a contact adhesive. Flexible cellular insulation shall not be used on surfaces greater than 200 degrees F. Insulation exposed to weather and not shown to have jacketing shall be protected with two coats of UV resistant finish as recommended by the manufacturer after the adhesive is dry.

3.1.5 Welding

No welding shall be done on piping without written approval of the Contracting Officer. The capacitor discharge welding process may be used for securing metal fasteners to duct.

3.2 PIPE INSULATION INSTALLATION

3.2.1 Pipe Insulation

3.2.1.1 General

Pipe insulation shall be continuous and installed on fittings and appurtenances unless specified otherwise. Installation shall be with full length units of insulation and using a single cut piece to complete a run. Cut pieces or scraps abutting each other shall not be used. Pipe insulation shall be omitted on the following:

- a. Chromium plated pipe to plumbing fixtures. However, fixtures for use by the physically handicapped shall have the hot water supply and drain, including the trap, insulated where exposed.
- b. Vertical portions of interior roof drains.
- c. Sanitary drain lines.

3.2.1.2 Pipes Passing Through Sleeves

- a. Pipe insulation shall be continuous through the sleeve.
- f. Where penetrating exterior walls, the aluminum jacket required for pipe exposed to weather shall continue through the sleeve to a point 2 inches beyond the interior surface of the wall.

3.2.1.3 Pipes Passing Through Hangers

- a. Insulation, whether hot or cold application, shall be continuous through hangers. All horizontal pipes 2 inches and smaller shall be supported on hangers with the addition of a Type 40 protection shield to protect the insulation in accordance with MSS SP-69. Whenever insulation shows signs of being compressed, or when the insulation or jacket shows visible signs of distortion at or near the support shield, insulation inserts as specified below for piping larger than 2 inches shall be installed.
- b. Horizontal pipes larger than 2 inches at 60 degrees F and above shall be supported on hangers with the addition of a Type 39 saddle in accordance with MSS SP-69

- d. Vertical pipes shall be supported with either Type 8 or Type 42 riser clamps with the addition of two Type 40 protection shields in accordance with MSS SP-69 covering the 360 degree arc of the insulation. An insulation insert of cellular glass or calcium silicate shall be installed between each shield and the pipe. The insert shall cover the 360 degree arc of the pipe. Inserts shall be the same thickness as the insulation, and shall extend 2 inches on each end beyond the protection shield. When insulation inserts are required per the above, and the insulation thickness is less than 1 inch, wooden or cork dowels or blocks may be installed between the pipe and the shield to prevent the hanger from crushing the insulation, as an option instead of installing insulation inserts. The insulation jacket shall be continuous over the wooden dowel, wooden block, or insulation insert. The vertical weight of the pipe shall be supported with hangers located in a horizontal section of the pipe. When the pipe riser is longer than 30 feet, the weight of the pipe shall be additionally supported with hangers in the vertical run of the pipe which are directly clamped to the pipe, penetrating the pipe insulation. These hangers shall be insulated and the insulation jacket sealed as indicated herein for anchors in a similar service.
- e. Inserts shall be covered with a jacket material of the same appearance and quality as the adjoining pipe insulation jacket, shall overlap the adjoining pipe jacket 1-1/2 inches, and shall be sealed as required for the pipe jacket. The jacket material used to cover inserts in flexible cellular insulation shall conform to ASTM C 921, Type 1, and is allowed to be of a different material than the adjoining insulation material.

3.2.1.4 Flexible Cellular Pipe Insulation

Flexible cellular pipe insulation shall be tubular form for pipe sizes 5 inches and less. Sweat fittings shall be insulated with miter-cut pieces the same size as on adjacent piping. Screwed fittings shall be insulated with sleeved fitting covers fabricated from miter-cut pieces and shall be overlapped and sealed to the adjacent pipe insulation.

3.2.2 Aboveground Cold Pipelines

The following cold pipelines shall be insulated per Table I minus 30 degrees to plus 60 degrees F:

- a. Domestic cold and chilled drinking water.

3.2.2.1 Insulation Thickness

Insulation thickness for cold pipelines shall be determined using Table I.

TABLE I

Service or Range of Temp (degrees F)	Run- outs*	Pipe Size (Inches)					
		1/4 to 1-1/2	1/4 to 1-1/4	1-1/2 to 3	3-1/2 to 5	6 to 10	11 to 24
60 to 35 (FC)	1/2	1	1				
(CG)		1-1/2	1-1/2	2	2	2	2
(MF)		1	1	1-1/2	1-1/2	1-1/2	1-1/2
34 to 0 (CG)		2-1/2	2-1/2	2-1/2	3	3	3-1/2
(MF)		1-1/2	1-1/2	2	2	2-1/2	2-1/2
-1 to -30 (CG)		3	3	3	3-1/2	3-1/2	4
(MF)		1-1/2	2	2-1/2	2-1/2	3	3
Domestic (FC)		1/2	1/2	1/2			
Cold Water (CG)		1	1	1	1-1/2	1-1/2	1-1/2
and Interior (MF)		1/2	1/2	1/2	1	1	1
Roof Drain Lines (Horizontal portions only)							

*When runouts to terminal units exceed 12 feet, the entire length of runout shall be insulated like main feed pipe.

LEGEND:

CG - Cellular Glass
 MF - Mineral Fiber
 FC - Flexible Cellular

3.2.2.2 Jacket for Fibrous and Cellular Glass Insulated Pipe

Insulation shall be covered with a factory applied vapor retarder jacket or field applied seal welded PVC jacket. Insulation inside the building shown to be protected with an aluminum jacket shall have the insulation and vapor barrier jacket installed as specified herein. The aluminum jacket shall be installed as specified for piping exposed to weather, except sealing of the laps of the aluminum jacket is not required.

3.2.2.3 Insulation for Straight Runs (Fibrous and Cellular Glass)

- a. Insulation shall be applied to the pipe with joints tightly butted. The ends of fibrous insulation shall be sealed off with vapor barrier coating at intervals not to exceed 15 feet.
- b. Longitudinal laps of the jacket material shall overlap not less than 1-1/2 inches. Butt strips 3 inches wide shall be provided for circumferential joints.
- c. Laps and butt strips shall be secured with adhesive and stapled on 4 inch centers if not factory self-sealing.

- d. Factory self-sealing lap systems may be used when the ambient temperature is between 40 degrees and 120 degrees F during installation. The lap system shall be installed in accordance with manufacturer's recommendations. Stapler shall be used only if specifically recommended by the manufacturer. Where gaps occur, the section shall be replaced or the gap repaired by applying adhesive under the lap and then stapling.
- e. All Staples, including those used to repair factory self-seal lap systems, shall be coated with a vapor barrier coating. All seams, except those on factory self-seal systems shall be coated with vapor barrier coating.
- f. Breaks and punctures in the jacket material shall be patched by wrapping a strip of jacket material around the pipe and securing it with adhesive, stapling, and coating with vapor barrier coating. The patch shall extend not less than 1-1/2 inches past the break.
- g. At penetrations such as thermometers, the voids in the insulation shall be filled and sealed with vapor barrier coating.

3.2.2.4 Insulation for Fittings and Accessories

- a. Pipe insulation shall have ends thoroughly coated with a vapor barrier coating not more than 6 inches from each flange, union, valve, anchor, or fitting in all directions.
- b. Insulation may be premolded or segmented. Insulation of the same thickness and conductivity as the adjoining pipe insulation shall be used. If nesting size insulation is used, the insulation should be overlapped 2 inches or one pipe diameter. Loose fill mineral fiber or insulating cement shall be used to fill the voids. Insulation for elbows less than 3 inch size shall be premolded. Insulation for elbows 3 inch size and larger shall be either premolded or segmented. Elbows insulated using segments shall not have less than 3 segments per elbow. Insulation may be secured by wire or tape until finish is applied.
- c. Upon completion of insulation installation on flanges, unions, valves, anchors, fittings and accessories, terminations and insulation not protected by factory vapor barrier jackets or PVC fitting covers shall be protected with two coats of vapor barrier coating with a minimum total thickness of 1/16 inch, applied with glass tape embedded between coats. Tape seams shall overlap 1 inch. The coating shall extend out onto the adjoining pipe insulation 2 inches.
- d. Anchors attached directly to the pipe shall be insulated for a sufficient distance to prevent condensation but not less than 6 inches from the insulation surface.
- e. Flexible connections at pumps and other equipment shall be insulated with 1/2 inch flexible cellular insulation, unless otherwise indicated.
- f. Insulation shall be marked showing the location of unions, strainers, and check valves.

3.2.2.5 Optional PVC Fitting Covers

At the option of the Contractor, premolded, one or two piece PVC fitting covers may be used in lieu of the vapor barrier and embedded glass tape. Factory premolded insulation segments shall be used under the fitting covers for elbows. Insulation segments shall be the same thickness as adjoining pipe insulation and the insulation shall be protected with one coat of vapor barrier coating under the PVC cover. The covers shall be secured by PVC vapor barrier tape, adhesive, seal-welding or with tacks made for securing PVC covers. Seams in the cover, and tacks and laps to adjoining pipe insulation jacket, shall be sealed with vapor barrier tape to ensure that the assembly has a continuous vapor seal. Factory or fieldcut blanket insulation shall not be used on pipe below 60 degrees F.

-- End of Section --

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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 Guideline D (1996) Application and Installation of Central Station Air-Handling Units

AIR DIFFUSION COUNCIL (ADC)

ADC 1062:GRD (1984) Test Codes for Grilles, Registers and Diffusers

AIR MOVEMENT AND CONTROL ASSOCIATION (AMCA)

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 (ABMA)

AFBMA Std 9 (1990) Load Ratings and Fatigue Life for Ball Bearings

AFBMA Std 11 (1990) Load Ratings and Fatigue Life for Roller Bearings

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 53 (1999b) Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless

ASTM A 123 (2000) Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products

ASTM A 181 (2000) Carbon Steel Forgings for General-Purpose Piping

ASTM A 193 (2000) Alloy-Steel and Stainless Steel

	Bolting Materials for High-Temperature Service
ASTM A 234	(2000) Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service
ASTM A 525	(1993) General Requirement for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process
ASTM A 733	(1999) Welded and Seamless Carbon Steel and Austenitic Stainless Steel Pipe Nipples
ASTM B 117	(1997) Operating Salt Spray (Fog) Apparatus
ASTM D 520	(2000) Zinc Dust Pigment
ASTM D 1654	(1992) Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments
ASTM D 3359	(1997) Measuring Adhesion by Tape Test
ASTM E 437	(1992; R 1997) Industrial Wire Cloth and Screens (Square Opening Series)

ASME INTERNATIONAL (ASME)

ASME B1.20.1	(1983; R 1992) Pipe Threads, General Purpose (Inch)
ASME B16.3	(1998) Malleable Iron Threaded Fittings
ASME B16.5	(1996; B16.5a) 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 B16.21	(1992) Nonmetallic Flat Gaskets for Pipe Flanges
ASME B16.39	(1998) Malleable Iron Threaded Pipe Unions Classes 150, 250, and 300
ASME B31.1	(1998) Power Piping
ASME BPV IX	(1998) Boiler and Pressure Vessel Code; Section IX, Welding and Brazing Qualifications

AMERICAN WELDING SOCIETY (AWS)

AWS D1.1	(2000) Structural Welding Code - Steel
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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

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA MG 1	(1998) Motors and Generators
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NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 90A	(1999) Installation of Air Conditioning and Ventilating Systems
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SHEET METAL & AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION
(SMACNA)

SMACNA HVAC Duct Const Stds	(1995; Addenda Nov 1997) HVAC Duct Construction Standards - Metal and Flexible
SMACNA Install Fire Damp HVAC	(1992) Fire, Smoke and Radiation Damper Installation Guide for HVAC Systems
SMACNA Leakage Test Mnl	(1985) HVAC Air Duct Leakage Test Manual

UNDERWRITERS LABORATORIES (UL)

UL 214	(1997) Tests for Flame-Propagation of Fabrics and Films
UL 555	(1999) Fire Dampers
UL Bld Mat Dir	(1999) Building Materials Directory

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 "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be

submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Drawings; G
Installation; G

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. 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-03 Product Data

Components and Equipment; G

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. Ductwork Components
- b. Air Systems Equipment
- c. Electric Unit Heaters

Test Procedures

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

Welding Procedures

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

System Diagrams; G

Proposed diagrams, at least 2 weeks prior to start of related testing. System diagrams that show the layout of equipment, 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 or laminated plastic. After approval, these items shall be posted where directed.

Similar Services

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.

Welded Joints

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

Testing, Adjusting and Balancing

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

Field Training

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

SD-06 Test Reports

Performance Tests

Test reports for the 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-07 Certificates

Bolts

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-10 Operation and Maintenance Data

Operating and Maintenance Instructions; G

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.

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.

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, or grooved as indicated. If not otherwise indicated, piping 1 inch and smaller shall be threaded; piping larger than 1 inch and smaller than 3 inches shall be either threaded, grooved, or welded; and piping 3 inches and larger shall be grooved, welded, or flanged. Rigid grooved mechanical joints and fittings may only be used in serviceable aboveground locations where the temperature of the circulating medium does not exceed 230 degrees F. Flexible grooved joints shall be used only as a flexible connector with grooved pipe system. Unless otherwise specified, grooved piping components shall meet the corresponding criteria specified for the similar welded, flanged, or threaded component specified herein. 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, 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 and ASME B16.5, Class 150. Gaskets shall be nonasbestos compressed material according to ASME B16.21, 1/16 inch 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.

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.

2.5.3 Pipe Hangers, Inserts, and Supports

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

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 1 hp 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 10 hp or less. Adjustable frequency drives shall be used for larger motors.

2.7 CONTROLS

Controls shall be provided as specified in Section 15950 HEATING, VENTILATING AND AIR CONDITIONING (HVAC) CONTROL SYSTEMS.

2.8 DUCTWORK COMPONENTS

2.8.1 Metal Ductwork

All aspects of metal ductwork construction, including all fittings and components, shall comply with SMACNA HVAC Duct Const Stds 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 Class 1/2, 1, and 2 inch w.g. ductwork shall meet the requirements of Seal Class C. Class 3 through 10 inch shall meet the requirements of Seal Class A. Sealants shall have maximum 25 flame spread rating and 50

smoke developed rating (dry state). 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 HVAC Duct Const Stds. 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 2 inch 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 General Service Duct Connectors

A flexible duct connector approximately 6 inches 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 or zinc-coated, iron 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.

2.8.2 Ductwork Accessories

2.8.2.1 Duct Access Doors

Access doors shall be provided in ductwork and plenums where indicated, fire dampers, and other apparatus requiring service and inspection in the duct system, and unless otherwise shown, shall conform to SMACNA HVAC Duct Const Stds. Doors shall be minimum 15 x 18 inches, unless otherwise shown.

Where duct size will not accommodate this size door, the doors shall be made as large as practicable. Doors 24 x 24 inches or larger shall be provided with fasteners operable from both sides.

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. Fire dampers shall be curtain type with damper

blades in 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. Unless otherwise indicated, the installation details given in SMACNA Install Fire Damp HVAC 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 3/16 inch rod brought through the side of the duct with locking setscrew and bushing.

Two rods are required on splitters over 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 12 inches. Access doors or panels shall be provided for all concealed damper operators and locking setscrews. 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 outlet 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 15 inches in diameter or less passing through floors, walls, or roof, and installed during construction of the floor, wall, or roof. Round ducts larger than 15 inches 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 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 1 inch clearance between the duct and the sleeve or 1 inch clearance between the insulation and the sleeve for insulated ducts.

2.8.3.2 Framed Prepared Openings

Openings shall have 1 inch clearance between the duct and the opening or 1 inch 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 4 inches 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 15 inches in diameter or less shall be fabricated from 20 gauge galvanized steel. Collars for round ducts larger than 15 inches and square, and rectangular ducts shall be fabricated from 18 gauge galvanized steel. Collars shall be installed with fasteners on maximum 6 inch centers, except that not less than 4 fasteners shall be used.

2.8.4 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 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 ADC 1062:GRD. Inlets and outlets shall be sound rated and certified according to ADC 1062:GRD. Sound power level shall be as indicated. 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 registers. Where the inlet and outlet openings are located less than 7 feet above the floor, they shall be protected by a grille or screen according to NFPA 90A.

Units shall be four-way directional-control type, except that 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. Wall supply registers shall be installed at least 6 inches below the ceiling unless otherwise indicated. Exhaust registers shall be located 6 inches 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

All louvers shall be fabricated of extruded aluminum sections complying to FS QQ-A-200/GEN and FS QQ-A-200/9. Louvers shall be 4-inch deep of the storm proof and vandal-proof type. Louvers shall consist of heavy extruded aluminum frame with fixed horizontal blades, minimum thickness .125 inches, braced as required to eliminate vibrations. All sections shall have reinforcing bosses hidden from view on the exposed surfaces. Frames shall have mitered and welded corners in addition to a perimeter caulking slot, to ensure a weathertight seal between louver frame and opening. Sills shall be painted with a baked epoxy coating. Where shown the louver shall have a bird screen mounted on the inside. Where indicated on the plans, bullet resistant material shall also be installed at the louvers.

2.8.6 Bird Screens and Frames

Bird screens shall conform to ASTM E 437, Type I, Class 1, 2 by 2 mesh, 0.063 inch diameter aluminum wire or 0.031 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 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 150 percent of the connected driving capacity. Motor sheaves shall be variable pitch for 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 and be single-width single-inlet for the design system pressure. Impeller wheels shall be rigidly constructed, accurately balanced both statically and dynamically. Fan blades may be forward curved, backward-inclined or airfoil design. Fan wheel 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 AFBMA Std 9 and AFBMA 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. Motors, unless otherwise indicated, shall not exceed 1800 rpm and shall have dripproof enclosures. Motor starters shall be as indicated in Division 16.

2.9.1.2 Centrifugal Type Power Roof Ventilators

Fans shall be 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, and gravity dampers. Motors enclosure shall be dripproof type. Lubricated bearings shall be provided.

2.10 TERMINAL UNITS

2.10.1 Electric Unit Heaters

Units shall include an enclosure, metal casing with oven baked polyester paint finish, resistance heating coil assembly, fan assembly, motor, and controls. 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, when handling standard flow for which the unit air capacity is rated. Each unit shall be secured to the building structure. Capacity of the unit shall be as indicated. Unit shall be of draw-thru horizontal discharge type with automatic controls arranged to properly heat the room. All units shall have single supply circuit with fuses as required by NEC for element and motor protection. Automatic controls shall be provided as specified in paragraph: CONTROLS. Sequence of control shall be any one of the standard ANSI cycles specified in paragraph: CONTROLS. Units shall be furnished with wall mounting hardware and common remote room thermostat(1 thermostat to control 2 units).

2.10.1.1 Enclosures

Enclosures shall be fabricated of not lighter than 16 gauge galvanized steel, reinforced and braced, or all welded framework with panels to provide equivalent strength. The exposed side shall be high density, erosion-proof material suitable for use in air streams with velocities up to 4,500 fpm. Front panel shall be designed for easy removal by one person. Discharge grilles shall have adjustable vanes and shall properly distribute air throughout the space. Plastic discharge or return grilles are not acceptable. Removable panels or access doors shall be provided for service and control compartments. Fan switch shall be key operated or accessible through a locked access panel. Gaskets shall be provided at the back and bottom of the unit for effective air seal, as required.

2.10.1.2 Electric Resistance Heating Elements

Electric resistance heating elements shall be of the sheathed, finned, tubular type, or of the open resistance type designed for direct exposure to the air stream. Heating element electrical characteristics shall be as indicated. Where fan motor or control voltage is lower than required for the electric resistance heating element, a fused factory mounted and wired transformer shall be provided. Provide reset thermal cutouts to protect from over-temperature.

2.10.1.3 Fans

Fans shall be of the galvanized steel or aluminum, multiblade, centrifugal type, dynamically and statically balanced. Fan housings shall be provided with resilient mounted, self-aligning permanently lubricated ball bearings, sleeve bearings, or combination ball and sleeve bearings, capable of not less than 2000 hours of operation on one oiling. Fans shall be direct-connected. Fans shall have a thermal delay switch for energy savings.

2.10.1.4 Motors

Motors shall be of the permanent split-capacitor type with built-in thermal overload protection and automatic reset. Motor shall be isolated from the casing and shall be suitable for operation on electric service available.

2.11 FACTORY PAINTING

Units which are not of galvanized construction according to ASTM A 123 or ASTM A 525 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 1/8 inch. 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.

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 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 1 inch in 40 feet. 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 2-1/2 inch or less in diameter, and with flanges for pipe 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 90A requirements. Pipe and fittings installed in inaccessible conduits or trenches under concrete floor slabs shall be welded.

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.
- 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. 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 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 Sections 13080 SEISMIC PROTECTION FOR MISCELLANEOUS EQUIPMENT. Structural steel required for reinforcement to properly support piping, headers, and equipment but not shown shall be provided under this section.

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.

- 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.
- h. Horizontal Pipe Supports: Horizontal pipe supports shall be spaced as specified in MSS SP-69 and a support shall be installed not over 1 foot from the pipe fitting joint at each change in direction of the piping. Pipe supports shall be spaced not over 5 feet apart at valves. Pipe hanger loads suspended from steel joist with hanger loads between panel points in excess of 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 15 feet, not more than 8 feet 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 4 inches and larger with medium 60 degrees F or greater, a Type 39 saddle may be welded to the pipe and freely rest on a steel plate. On piping under 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 4 inches, or by an amount adequate for the insulation, whichever is greater.

3.1.3 Equipment and Installation

Frames and supports shall be provided for fans and other similar items requiring supports. Electrical unit heaters shall be wall mounted as indicated. The method of anchoring and fastening shall be as detailed. Floor-mounted equipment, unless otherwise indicated, shall be set on not less than 4 inch concrete pads or curbs doweled in place. The concrete foundation shall be of a mass not less than three times the weight of the components to be supported. 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 03305 CONCRETE.

3.1.4 Access Panels

Access panels shall be provided for concealed 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.

3.1.5 Flexible Connectors

Flexible connectors 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.

3.1.6 Sleeved and Framed Openings

Space between the sleeved or framed opening and the duct or the duct insulation shall be packed for fire rated penetrations. For non-fire rated penetrations, the space shall be packed with a sealant.

3.1.7 Metal Ductwork

Installation shall be according to SMACNA HVAC Duct Const Stds unless otherwise indicated. Duct supports for sheet metal ductwork shall be according to SMACNA HVAC Duct Const Stds, unless otherwise specified. Friction beam clamps indicated in SMACNA HVAC Duct Const Stds shall not be used. 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.

3.1.8 Duct Test Holes

Holes with closures or threaded holes with plugs shall be provided in ducts and plenums as indicated or where necessary 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.

3.1.9 Power Roof Ventilator Mounting

Foamed 1/2 inch thick, closed-cell, flexible elastomer insulation shall cover width of roof curb mounting flange.

3.1.10 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 COLOR CODE MARKING

Finish painting of items only primed at the factory, surfaces not specifically noted otherwise, and color code marking for piping shall be as specified in Section 09900 PAINTING, GENERAL.

3.3 PIPING HYDROSTATIC TEST

After cleaning, water piping shall be hydrostatically tested at a pressure equal to 150 percent of the total system operating pressure 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. Test procedure, apparatus, and report shall conform to SMACNA Leakage Test Mnl. Ductwork leak test shall be completed with satisfactory results prior to applying insulation to ductwork exterior.

3.5 CLEANING AND ADJUSTING

Inside of 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. 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. 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 2 days 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 ambient temperature 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 40 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 --