AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. CONTRACT ID CODE	PAGE OF PAGES
	1 2

2. AMENDMENT/MODIFICATION NO.	3. EFFECTIVE DATE	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO.(If applicable)
0003	05-Sep-2003		

6. ISSUED BY	CODE	7. ADMINISTERED BY (If other than item 6)	CODE
USA ENGINEER DISTRICT, SEATTLE ATTN: CENWS-CT P.O. BOX 3755 SEATTLE WA 98124-3755	DACA67	**See Item 6**	

8. NAME AND ADDRESS OF CONTRACTOR (No., Street, County, State and Zip Code)		
	X	9A. AMENDMENT OF SOLICITATION NO. DACA67-03-R-0223
	X	9B. DATED (SEE ITEM 11) 08-Aug-2003
		10A. MOD. OF CONTRACT/ORDER NO.
		10B. DATED (SEE ITEM 13)
CODE / FACILITY CODE		

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

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

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

12. ACCOUNTING AND APPROPRIATION DATA (If required)

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

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

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

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

[ ] D. OTHER (Specify type of modification and authority)

E. IMPORTANT: Contractor [ ] is not, [ ] is required to sign this document and return _____ copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)

DACA67-03-R-0223, Renovate Dormitory 737, Malmstrom AFB, Montana

1. This amendment three (0003) provides for the following changes:

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

15A. NAME AND TITLE OF SIGNER (Type or print)		16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) TEL: EMAIL:	
15B. CONTRACTOR/OFFEROR _____ (Signature of person authorized to sign)	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA BY _____ (Signature of Contracting Officer)	16C. DATE SIGNED 05-Sep-2003

EXCEPTION TO SF 30
APPROVED BY OIRM 11-84

30-105-04

STANDARD FORM 30 (Rev. 10-83)
Prescribed by GSA
FAR (48 CFR) 53.243

SECTION SF 30 BLOCK 14 CONTINUATION PAGE

(a) Revisions to SECTION 00800A INDEX OF DRAWINGS, SECTION 02080 ASBESTOS ABATEMENT AND SECTION 08800 GLAZING.

(b) SECTION 08520 ALUMINUM WINDOWS

Add: 2.2G. Provide a subframe and subsill as required by manufacture for installation at E.I.F.S. and split faced CMU wall systems.

(c) SECTION 08711 DOOR HARDWARE

2.2 A. 1, b and c. Delete reference to Cal-Royal Products Inc. and Stanley Commercial Hardware

2. The attached revised sections are to be replaced in their entirety. Specifications changes are generally identified, for convenience, either by strikeout for deletions, and double underlining of text for additions or a single dark line in the right hand margin. All portions of the revised or new pages shall apply whether or not changes have been indicated.

3. The proposal submittal time and date of September 9, 2003 at 2:00 p.m. LOCAL TIME remains the same.

4. NOTICE TO OFFERORS: Offerors must acknowledge receipt of this amendment by number and date on offer or by telegram. Please mark outside of envelope in which your offer is enclosed to show amendment received.

Encl:

Section 00800A (revised)
Section 02080 (revised)
Section 08800 (revised)

INDEX OF DRAWINGS

RENOVATE DORMITORY 737,
MALMSTROM AFB, MONTANA
DRAWING NO. 93-9012

SHEET NUMBER	PLATE NUMBER	TITLE	REVISION NUMBER	DATE
	GENERAL			
1	G-1	Cover Sheet/Sheet Index		4/03/03
	CIVIL			
2	C-0	Site Demo Plan		4/03/03
3	C-1	Site/Grading Plan		4/03/03
	LANDSCAPING			
4	L-1	Planting Plan		4/03/03
5	L-2	Irrigation Plan		4/03/03
6	L-3	Planting Details		4/03/03
7	L-4	Irrigation Details		4/03/03
	FIRE PROTECTION			
8	F-1	Fire Plans		4/03/03
	ABATEMENT			
9	AB-1	Roof & First Floor Abatement Plans		4/03/03
	ARCHITECTURAL			
10	A-1	First Floor Demo Plan		4/03/03
11	A-2	Second & Third Floor Demo Plans		4/03/03
12	A-3	First Floor Plan		4/03/03
13	A-4	Second & Third Floor Plans		4/03/03
14	A-5	Exterior Elevations		4/03/03
15	A-6	Building Sections		4/03/03
16	A-7	Building Section/Wall Sections		4/03/03
17	A-8	Wall Sections/Details		4/03/03

SHEET NUMBER	PLATE NUMBER	TITLE	REVISION NUMBER	DATE
18	A-9	Roof Plans/Details		4/03/03
19	A-10	1st Floor Finish Plan/Details		4/03/03
20	A-11	2nd & 3rd Floor Finish Plans		4/03/03
21	A-12	Enlarged Plans/Modules/Equip. Schedules		4/03/03
22	A-13	Interior Elevations/Casework Details		4/03/03
23	A-14	Door Schedule/ Elevations/Details		4/03/03
24	A-15	Window Elevations/Details		4/03/03
25	A-16	1st Floor Reflected Ceiling Plan/Details		4/03/03
26	A-17	2nd & 3rd Floor Reflected Ceiling Plans		4/03/03
27	A-18	Miscellaneous Details		4/03/03
	STRUCTURAL			
28	S-0	Structural General Notes		4/03/03
29	S-1	Foundation/2nd & 3rd Floor Framing		4/03/03
30	S-2	Roof Framing/Snow Drift Plan/Truss Elevation		4/03/03
31	S-3	Detail Sheet		4/03/03
	FIRE PROTECTION			
32	FP-1	Site Plan, Riser Detail, Legend, Notes		4/03/03
33	FP-2	First Floor Fire Sprinkler Plan		4/03/03
34	FP-3	Second & Third Floor Fire Sprinkler Plan		4/03/03
	PLUMBING			
35	P-1	Plumbing Legends And Schedules		4/03/03
36	P-2	First Floor Plumbing Demolition Plans		4/03/03
37	P-3	Plumbing Demolition Plans		4/03/03
38	P-4	First Floor Plumbing Remodel Plans		4/03/03
39	P-5	Plumbing Remodel Plans		4/03/03
40	P-6	Plumbing Isometrics		4/03/03
41	P-7	Plumbing Details		4/03/03

SHEET NUMBER	PLATE NUMBER	TITLE	REVISION NUMBER	DATE
	MECHANICAL			
42	M-1	Mechanical Schedules & Legends		4/03/03
43	M-2	1st Mech. Demo Plan		4/03/03
44	M-3	2nd And 3rd Mech. Demo Plans		4/03/03
45	M-4	Mechanical Hvac Plans And Enlarged Plans		4/03/03
46	M-5	Mechanical Hvac Plans		4/03/03
47	M-6	Mechanical Piping Plans And Riser Diagrams		4/03/03
48	M-7	Mechanical Piping Plans		4/03/03
49	M-8	Flow Diagrams & Details		4/03/03
50	M-9	Mechanical Details		4/03/03
51	M-10	Temperature Control Schematics (STAFA)		4/03/03
52	M-11	Temperature Control Schematics (HSQ)		4/03/03
53	M-12	Mechanical Sections & Details		4/03/03
	ELECTRICAL			
54	E-1	Electrical Legends, Schedules And Details		4/03/03
55	E-2	Demo, New One Lines, Riser Diagrams		4/03/03
56	E-3	Panel Schedules		4/03/03
57	E-4	Panel Schedules And Details		4/03/03
58	E-5	1st Floor Electrical Demo Plan		4/03/03
59	E-6	2nd & 3rd Floor Electrical Demo Plan		4/03/03
60	E-7	1st Floor Lighting Plan		4/03/03
61	E-8	2nd & 3rd Floor Lighting Plan		4/03/03
62	E-9	1st Floor And Roof Power Plans		4/03/03
63	E-10	2nd & 3rd Floor Power Plans		4/03/03
64	E-11	1st Floor & Roof Special Systems Plan		4/03/03
65	E-12	2nd Floor & 3rd Floor Special Systems Plans		4/03/03

REVISIONS TO DRAWINGS

Plate C.1

At notation for gazebo which reads “GAZEBO PROPOSAL OPTION #1 CLIN 0004 SEE 7 & 8/ L-3.” change to read “GAZEBO - OPTIONAL ITEM; SEE 7 & 8/ L-3.”

Plate L.1

At notation for gazebo which reads “GAZEBO IN PROPOSAL OPTION #1 CLIN 0004.” change to read “GAZEBO - OPTIONAL ITEM.”

Plate L.2

At notation for gazebo which reads “INSTALL SPRINKLERS THIS AREA AS SHOWN IF PROPOSAL ITEM #1 CLIN 0004 - GAZEBO IS NOT BUILT.” change to read “INSTALL SPRINKLERS THIS AREA AS SHOWN IF GAZEBO OPTIONAL ITEM IS NOT BUILT.”

Plate L.3

Refer to title of Detail 7 and change to read “GAZEBO PLAN / OPTIONAL ITEM.”

Plate A-13

Add “SHEET WORK NOTES” # 1 to read “At interior elevations 1, 2, and 15 /A13 referenced details 21 and 22 /A13 are similar except base cabinets are to be 24 inches wide by 36 inches high to match adjacent cabinets.

PLATE A-14

DOOR, FRAME, HARDWARE SCHEDULE

1. At Doors 101-1, 103-1, and 129-2 Delete General Note #4.

2. At Door 152-1 Delete General Note #3

3. At Doors 121-1, 122-1, 122-2, 123-1, 126-1, 128-2, 138-1, 221-1, 223-1, 225-1, 236-1, 327-1, 328-1, 330-1, 339-1 add general note #3.

4. At Door 331-1 revise lockset to #4 in Lieu of lockset #1.

5. At Door 104-1 and 331-1 add note #1 to the weather strip column.

6. At door hinges, delete reference to Stanley. Provide hinge sizes as indicated.

7. General notes listed are indicated on the Door, Frame, Hardware Schedule in the Hardware Notes column in the right side column.

Plate E-11

Under "SHEET WORK NOTES" add # 4 to read "At detail 3/E-11. No conduit or power shall be run to individual dormitory Rooms/Suites. Conduit and power is required at the exterior doors as indicated in the Door hardware schedule and specifications. All HT-24 locks are Battery powered."

STANDARD DETAILS BOUND IN THE SPECIFICATIONS

DRAWING NUMBER	SHEET NUMBER	TITLE	DATE
SECTION 01501 - CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS			
	1	Hard Hat Sign	10SEP90
	1 & 2	U.S. Air Force Project Construction Sign	84JUN20

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DIVISION 2 - SITE WORK

SECTION 02080 - ASBESTOS ABATEMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and General Provisions of the Contract, including General and Special Conditions Sections, apply to this Section.

B. The project work areas have been inspected by an independent consultant for the presence of asbestos-containing materials (ACM). The survey and test results are available for review.

1.2 DESCRIPTION OF THE WORK

A. This asbestos abatement project consists of the removal of asbestos-containing pipe fitting insulation, cement asbestos board (Transite®) soffits, and built-up roofing materials from select locations at Building 737, Dormitory, Malmstrom Air Force, MT.

B. Total estimated quantities of the various materials to be abated are listed below. Coordinate all work with the Contracting Officer. Estimated quantities are engineer's estimate of quantity but the contractor is solely responsible for determining exact quantities and the engineer and United States Air Force make no warranty as to the accuracy or completeness of the estimate. For additional information concerning the location and quantities of materials to be removed, refer to the drawings.

All containment areas will require clearance air sampling as outlined in Section 1.2.F of this specification. It is anticipated that only the Boiler Room will require a full containment.

C. The abatement work to be performed in this project is described in this specification. Remove and Dispose as ACM, the following materials:

Location(s)	Material	Estimated Quantity
Boiler Room	Mudded Pipe Fittings	25 Each
Front and Rear Soffits	Cement Asbestos Board (Transite)	200 SF
Roof - Select Areas	Built-up Roofing Materials	250 SF

D. The work shall be executed as follows:

1. The work included in this project is described in these specifications and the accompanying drawings and notes. Contractors must site verify material quantities and site conditions that will affect the bid prices.
2. OSHA Class I asbestos abatement must be accomplished using a negative-pressure enclosure as specified herein utilizing standard removal methods or by using alternative methods; whichever method would be the most efficient.
3. Employ sufficient HEPA filtered local exhaust ventilation machinery to maintain a negative pressure gradient of minimum 0.02 inches water column vs. the outside of the containment, and effect a minimum of four air exchanges per hour. The enclosed area must have critical barriers and containment liners as necessary, waste-water filtration devices and other temporary installations to comply with regulations for proper asbestos removal. Install make-up air vents with HEPA filters in temporary barrier walls as necessary to ensure adequate air movement within containment areas.
4. Each enclosed area (only Class I work will be enclosed) must be equipped with a decontamination unit. Decontamination units for Class I work areas must include clean room, shower and equipment room. Decontamination units for Class II work areas must consist of a minimum clean room and equipment room. Employ bag-out units where feasible with respect to space, bag-outs must be minimum two stage. Equip points of entry/exit and barriers to occupied spaces with proper warning signs. Decontamination units located in exterior or interior locations accessible to the public must be constructed of solid sheeting, have lockable doors and be constructed with materials sufficient to provide off hours site security.
5. All work must be coordinated with the Government and the Contracting Officer, including work hours, site access, scheduling, and general project phasing.
6. Remove the asbestos materials in accordance with standard industry methods; wet removal techniques must be used.
7. Bag or containerize all RACM and Category 2 asbestos waste in impermeable, labeled approved bags or containers. Removed asbestos material must not be allowed to accumulate in the work area, but collected and contained on a continuous basis. Ensure the material is adequately wet at time of containerization. Category 1 materials (roofing materials) may be placed in lined roll-off containers until time of disposal.
8. Abatement Contractor shall coordinate all work, phasing and scheduling with the Contracting Officer. Coordinate exact start dates, the number of mobilizations required and the scope of the work with the Contracting Officer.
9. Training requirements for workers is set forth in “Contractor Accreditation and Experience”, Section 1.5(2), of this document.
10. Abatement requirements for roofing materials and Transite® panels (soffits) are set forth in “Removal of Asbestos on Building Exterior”, Section 3.6(A and B).

E. Air Monitoring - General

1. The asbestos-abatement contractor shall perform, throughout abatement work, monitoring of contractor personnel's exposure, review and testing inside the work area in accordance with OSHA requirements and these specifications. The contractor's accredited supervisor ("competent person") shall personally review conditions inside the work area to ensure compliance with these specifications. In addition, the accredited supervisor shall personally manage air sample collection, analysis and evaluation for personnel samples and work area samples to satisfy OSHA requirements. Additional inspection and testing requirements are specified in other parts of this section.

   The accredited supervisor is responsible for managing all personnel monitoring, inspection and testing required by these specifications, the OSHA regulation 29 CFR 1926.1101, and for continuous monitoring of all sub-systems and procedures affecting the safety of the contractor's employees. Safety of the contractor's employees and providing safe conditions inside the work area for all persons entering is the exclusive responsibility of the contractor. The person performing the personnel and exterior perimeter monitoring of the work area (OSHA "Competent Person") shall be an accredited asbestos contractor/supervisor who shall be trained and shall have field experience in air sampling. Keep a daily log of personnel and area samples taken and analyzed and make such log available to the Government. The log shall contain information on the persons breathing zone sampled, activities being performed, the date of sample collection, the time of sample start and finish, flow rate, sample volume and fibers/cc. The log shall also contain information on area samples showing location of sample, date sample was taken, activities being performed, start and finish times for sample, flow rate, volume and fibers/cc. Take and analyze personnel samples for at least one of the workers in each shift. In addition to the continuous monitoring required, the contractor's accredited supervisor will perform review and testing at the final stages of abatement for each work area or building as specified elsewhere in this section.
2. The Contractor ~~Government~~ will employ an independent industrial hygiene consultant (IHC) to perform various services on behalf of the Contractor ~~Government~~. The IHC will perform the necessary monitoring, review, testing and other support services to document that the abatement work proceeds in accordance with these specifications, that areas outside the work areas do not become contaminated, and that the abated areas have been successfully decontaminated. The work of the IHC in no way relieves the abatement contractor from his responsibility to perform his work in accordance with contract documents, to perform continuous review, monitoring, and testing for the safety of his employees, and to perform other such services as specified in this section. The initial cost of the IHC and his services will be borne by the Contractor ~~Government~~.
3. If airborne fiber levels outside the work area documented by the IHC during abatement work exceed the specified respective limits, the contractor shall stop work. Asbestos contractor may request confirmation of above results by analysis of samples with Transmission Electron Microscopy (TEM) with the cost to be borne by the contractor. Request must be submitted to the Government. Confirmation sampling and analysis will be the responsibility of the accredited supervisor with review and approval by the IHC. An

agreement between the two IH's will be reached on the exact details of the confirmation effort and put in writing including such things as number of samples, location, collection, quality control on site, analytical laboratory, interpretation of results and follow-up action. This written agreement shall be cosigned by both parties and delivered to the Government.

F. Air Monitoring - Clearance

1. Clearance air monitoring will be performed in all areas from which asbestos-containing materials were removed from within full containments. Clearance will be performed aggressively in areas where friable asbestos was removed. Samples collected for clearance purposed will be analyzed using Phase Contrast Microscopy (PCM).

   The Government will pay for air monitoring services and analysis of the first round of clearance air samples. In the event that re-testing is required due to failure of the initial samples to meet clearance criteria, the Contractor shall pay all costs associated with the additional testing.

2. The abatement will be determined to be complete, and the area cleared, when the abatement area has been cleaned, a visual inspection has been performed and passed, a coat of penetrating encapsulant has been applied to all areas from which asbestos was removed and the airborne fiber concentration inside the abatement area meets the following criteria: The concentration of each of the five samples collected in the work area, having sample volumes of at least 1,200 liters, is no greater than 0.01 fibers per cubic centimeter. The procedures for sampling, and analyzing air tests are as described in Administrative Rules of Montana 16.47.310.

   Clearance air sampling will begin after the visual inspection has passed, encapsulant has been applied, and the negative air machines have operated for at least 48 air changes.

3. If release criteria are not met, the contractor shall repeat final cleaning and continue the decontamination procedure from that point. Additional review and testing will be at the expense of the contractor until release criteria are met. If results of samples analyzed by PCM are satisfactory the contractor shall remove the critical barriers and shut down and remove HEPA units.

G. Sequencing/Scheduling:

1. The Contractor shall coordinate all scheduling with the Contracting Officer.

1.3 APPLICABLE PUBLICATIONS

This section sets forth governmental regulations and industry standards, which are included and incorporated herein by reference and made a part of the specifications. This section also sets forth those notices and permits, which are known to the Government and which either must be applied for and received, or which must be given to governmental agencies before start of work.

General Applicability of Codes, Regulations, and Standards: Except to the extent that more explicit or more stringent requirements are written directly into the contract documents, all applicable codes, regulations, and standards have the same force and effect (and are made a part of the contract documents by reference) as if copied directly into the contract documents, or as if published copies are bound herewith. Publications shall be the current edition in effect.

Contractor Responsibility: The Contractor shall assume full responsibility and liability for the compliance with all applicable Federal, State, and local regulations pertaining to work practices, hauling, disposal, and protection of workers, visitors to the site, and persons occupying areas adjacent to the site. The Contractor is responsible for providing medical examinations and maintaining medical records of personnel as required by the applicable Federal, State, and local regulations. The Contractor shall hold the Government and Government's representatives harmless for failure to comply with any applicable work, hauling, disposal, safety, health, or other regulation on the part of himself, his employee, or his subcontractors.

Codes, Standards and Regulations: which govern asbestos abatement work or hauling and disposal of asbestos waste materials include but are not limited to the following:

A. Code of Federal Regulations (CFR) Publications:

OSHA

29 CFR 1926.1101	Construction Industry Standard (1994)
29 CFR 1926.500	Guardrails, Handrails, and Covers
29 CFR 1910.134	Respiratory Protection
29 CFR 1910.145	Specifications for Accident Prevention Signs and Tags

EPA

40 CFR 61 Subpart A	General Provisions
40 CFR 61 Subpart M	National Emission Standard for Hazardous Air Pollutants
40 CFR 763.120, 121	Asbestos Abatement Projects
40 CFR 763 Subpart E	AHERA, Asbestos-containing Materials in Schools

B. American National Standard Institute (ANSI) Publications:

Z9.2-1979	Fundamentals Governing the Design and Operations of Local Exhaust Systems
Z88.2-1980	Practices for Respiratory Protection National Institute for Occupational

Safety and Health (NIOSH) Revised Recommended Asbestos Standard

C. Environmental Protection Agency (EPA):

560/5-85-024 Guidance for Controlling Friable Asbestos-Containing Materials in Buildings

D. State Requirements:

16.47.310 Administrative Rules of Montana

1.4 AUTHORITIES OF THE INDUSTRIAL HYGIENE CONSULTANT

A. The purpose of the work of the IHC is to: observe the contractor's work and monitor air adjacent to the work area to maintain his efforts to prevent the spread of contamination beyond the work area. In addition, the consultant's work includes performance of final review and testing to determine whether a space, containment, or a building has been adequately decontaminated. All air monitoring is to be done utilizing PCM, except where the IHC determines that TEM monitoring is necessary. The IHC will perform the following tasks:

1. Task 1: Collect and analyze pre-abatement air samples in areas where abatement work will be performed and clearance air samples will be required.
2. Task 2: Perform monitoring, inspection, and testing as necessary outside the work area during actual abatement work to detect any faults in the work area isolation and any adverse impact of surroundings from work area activities.
3. Task 3: Perform unannounced site visits to spot check overall compliance of work with contract documents. These visits may include inspection, monitoring and testing inside and outside the work area and all aspects of operation except personnel monitoring.
4. Task 4: Provide support to the Government such as evaluation of submittals from the abatement contractor, resolution of unforeseen developments in abatement work, etc.
5. Task 5: Perform, in the presence of the Government’s representative, final review of a decontaminated area at the conclusion of the abatement and clean-up work.
6. Task 6: Collect and analyze clearance air samples in areas, which will be re-occupied following the asbestos abatement.

B. Make available all data, review results and testing results generated by the IHC to the contractor for information and consideration. Contractor shall provide cooperation and support to the IHC for efficient and smooth performance of their work.

C. Monitoring and review results of the IHC will be used by the Government to issue any stop removal orders to the contractor during abatement work and to accept or reject areas as decontaminated. The IHC will, upon request, make available to the contractor the plan for sample collection and analysis for monitoring outside the work areas and the plan of final review for each space prior to executing each plan. Plan will include location of samples,

name and qualification of person taking samples, whether on site analysis and/or lab analysis will be utilized, methodology of analysis, lab information and qualifications of on-site analyst.

D. Stop the abatement work at any time it is determined that conditions are not within the specifications and applicable regulations. The stoppage of work shall continue until conditions have been corrected and corrective steps have been taken to the satisfaction of the IHC. Standby time required to resolve violations shall be at the Contractor's expense.

1.5 CONTRACTOR ACCREDITATION AND EXPERIENCE

Proof of experience of the proposed Asbestos Abatement Contractor is required and will be based upon submission by Contractor of the following:

A. Experience:

Ability and proof of the contractor and his employees to perform asbestos abatement activities by submitting evidence of the successful completion of training courses covering asbestos removal as set forth by the appropriate Federal and State Codes and Regulations pertinent to asbestos abatement. Name and location of at least two asbestos abatement projects involving significant risks of fiber release with the name and telephone number of purchaser of abatement services.

B. Personnel:

1. General Superintendent

General Superintendent: Provide a full-time General Superintendent who is experienced in administration and supervision of asbestos abatement projects including work practices, protective measures for building and personnel, disposal procedures, etc. This person is the Contractor's Representative responsible for compliance with all applicable federal, state and local regulations, particularly those relating to asbestos-containing materials.

Experience and Training: The General Superintendent must have completed a course at an EPA-Approved Training Center or equivalent certificate course in asbestos abatement procedures, and have had a minimum of two (2) years on-the-job training in asbestos abatement procedures and hold a State of Montana card in the proper discipline.

Accreditation: The General Superintendent is to be accredited as a competent person as required by OSHA, NESHAP and State of Montana regulations.

2. Workers Performing Friable and Non-Friable Asbestos Removal

Accreditation: Submit copies of certificates of accreditation as required by OSHA and the State of Montana.

Training for Class I work shall be equivalent in curriculum, training method and length to the EPA Model Accreditation Plan (MAP) asbestos workers training (40 CFR Part 763, subpart E, appendix C).

Training for Class II work, where critical barriers and/or negative pressure enclosures are not required, consists of an 8-hour course, including material specific hands-on training and all the elements of (k)(9)(viii) in OSHA's Construction in Industry Standard (29 CFR 1926.1101, will be required.

1.6 INSURANCE REQUIREMENTS

A. Insurance, General: the Contractor shall maintain for the duration of the contract, at its cost and expense, insurance as specified in the FAR; and

B. Asbestos Liability Insurance

Contractor shall carry Asbestos Liability Insurance covering damage by reason of any negligent act, error, or omission committed or alleged to have been committed by the Contractor or anyone for whom the Contractor is legally liable, including coverage for liability assumed by contract. Such insurance shall be true occurrence form and shall clearly state on the certificate that asbestos work is included.

1. Each Occurrence	$1,000,000
2. Aggregate	$1,000,000

1.7 REMOVAL AND DISPOSAL GENERAL REQUIREMENTS

A. Description of Work:

The work covered by this section includes the removal and handling of friable materials and non-friable materials which may become friable by the actions of the removal work, and the incidental procedures and equipment required to protect workers and occupants of the area, or both, from contact with airborne asbestos fibers. The work includes the disposal of the removed asbestos-containing materials.
The material removal procedures and work locations are explained in this project manual.

B. Definitions Relative to Asbestos Abatement:

1. Aerosol: A system consisting of particles, solid or liquid, suspended in air.
2. ACGIH: American conference of Governmental Industrial Hygienists.
3. Air Cell: Insulation normally used on pipes and duct work that is comprised of corrugated cardboard which is frequently comprised of asbestos combined with cellulose or refractory binders.

4. Airlock: A system for permitting ingress or egress without permitting air movement between a contaminated area and a non-contaminated area, typically consisting of two curtained doorways at least 6 feet (2 meters) apart.
5. Air Monitoring: The process of measuring the fiber content of a specific volume of air.
6. Amended Water: Water to which a wetting agent or surfactant has been added.
7. Area Monitoring: Sampling of fiber concentrations within the asbestos removal area, which is representative of the airborne concentrations of asbestos fibers, which may reach the breathing zone.
8. Asbestos: The asbestiform varieties of serpentinite (chrysotile), riebeckite (crocidolite), cummingtonite grunerite, anthophyllite, amosite and actinolite-tremolite. For purposes of determining respiratory and worker protection, both the asbestiform and non-asbestiform varieties of the above minerals and any of these materials that have been chemically treated and/or altered shall be considered as asbestos.
9. Asbestos Fibers: This expression refers to all fibers having an aspect ratio of 3:1 and longer than 5 micrometers.
10. Asbestos-Containing Waste Material: Any material, which is or is suspected of being or any material contaminated with an asbestos-containing material which is to be removed from a work area for disposal.
11. Authorized Visitor: The Government, the Government's Representative, testing lab personnel, the Engineer, Industrial Hygiene Consultant, or representative of any Federal, State, and local regulatory or other agency having authority over the project.
12. Barrier: Any surface that seals off the work area to inhibit the movement of fibers.
13. Breathing Zone: A hemisphere forward of the shoulders with a radius of approximately 6 to 9 inches.
14. Bridging Encapsulant: A liquid material, which can be applied to asbestos-containing materials, which controls the possible release of asbestos fibers by creating a membrane over the surface.
15. Ceiling Concentration: The concentration of an airborne substance that shall not be exceeded at any time during an 8-hour shift.
16. Certified Industrial Hygienist (CIH): An industrial hygienist certified in the comprehensive practice of industrial hygiene by the American Board of Industrial Hygiene.
17. Class I Removal: Class I asbestos work means activities involving the removal of TSI and surfacing ACM and PACM.
18. Class II Removal: Class II asbestos work means activities involving the removal of ACM that is not thermal system insulation or surfacing material. This includes, but is not limited to asbestos-containing wallboard, floor tile and sheeting, roofing and siding shingles, and construction mastics.
19. Class III Removal: Class III asbestos work means repair and maintenance operations, where ACM including thermal system insulation and surfacing material is likely to be disturbed.
20. Clean Room: An uncontaminated area or room, which is part of the worker decontamination enclosure system, with provisions for storage of workers' street clothes and protective equipment.

21. Curtained Doorway: A device to allow ingress or egress from one room to another while permitting minimal air movement between the rooms, typically constructed by placing two overlapping sheets of plastic sheet over an existing or temporarily framed doorway, securing each along the top of the doorway, securing the vertical edge of one sheet along one vertical side of the doorway, and securing the vertical edge of the other sheet along the opposite vertical side of the doorway. Two curtained doorways spaced a minimum of 6 feet (2 meters) apart form an airlock.
22. Decontamination Enclosure System: A series of connected rooms with curtained doorways between any two adjacent rooms for the decontamination of workers or of materials and equipment. A decontamination enclosure system always contains at least one airlock.
23. Demolition: The wrecking or taking out of any building component, system, finish or assembly of a facility together with any related handling operations.
24. Disposal Bag: 6 mil thick leak-tight plastic bags used for transporting asbestos waste from work and to disposal site. Each is labeled as follows:

DANGER
CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST
CANCER AND LUNG DISEASE HAZARD

And shall also be labeled per NESHAP and DOT regulations.

25. Encapsulation: Treatment of asbestos-containing materials, with an encapsulant.
26. Enclosure: The construction of an air-tight, impermeable, permanent barrier around asbestos-containing material to control the release of asbestos fibers into the air.
27. Equipment Decontamination Enclosure System: A decontamination enclosure system for materials and equipment, typically consisting of a designated area of the work area, a washroom, a holding area and an uncontaminated area.
28. Equipment Room: A contaminated area or room that is part of the worker decontamination enclosure system, with provisions for storage of contaminated clothing and equipment.
29. Filter: A media component used in respirators to remove solid or liquid particles from the inspired air.
30. Friable Asbestos Material: Material that contains more than 1.0% asbestos by weight, and that can be crumbled, pulverized, or reduced to powder by hand pressure when dry.
31. Glovebag: A sack (typically constructed of 6 mil transparent polyethylene or polyvinylchloride plastic) with two inward projecting long sleeve gloves, which is designed to enclose an object from which an asbestos-containing material is to be removed.
32. HEPA Filter: A High Efficiency Particulate Absolute (HEPA) filter capable of trapping and retaining 99.97% of asbestos fibers greater than 0.3 microns in length.
33. HEPA Filter Vacuum Collection Equipment (or vacuum cleaner): High efficiency particulate air (absolute) filtered vacuum collection equipment with a filter system capable of collecting and retaining asbestos fibers. Filters should be of 99.97% efficiency for retaining fibers of 0.3 microns or larger.
34. High-Efficiency Filter: A filter which removes from air 99.97% or more of monodisperse dioctyl phthalate (DOP) particles having a mean particle diameter of 0.3 micrometer.

35. Holding Area: A chamber between the washroom and an uncontaminated area in the equipment decontamination enclosure system. The holding area comprises an airlock.
36. MSHA: Mine Safety and Health Administration.
37. Negative Pressure: Air pressure lower than surrounding areas, generally caused by exhausting air from a sealed space (work area).
38. Negative Pressure Respirator: A respirator in which the air pressure inside the respiratory-inlet covering is positive during exhalation in relation to the air pressure of the outside atmosphere and negative during inhalation in relation to the air pressure of the outside atmosphere.
39. Negative Pressure Ventilation System: A local exhaust system, utilizing HEPA filtration capable of maintaining a negative pressure inside the work area and a constant air flow from adjacent areas into the work area and exhausting that air outside the work area.
40. NIOSH: National Institute for Occupational Safety and Health
41. Non-Friable Asbestos Materials: Material that contains asbestos in which the fibers have been locked in by a bonding agent, coating, binder, or other material so that the asbestos is well bound and will not release fibers in excess of the asbestos control limit during any appropriate use, handling, demolition, storage, transportation, processing, or disposal.
42. Personal Monitoring: Sampling of air in the breathing zone of individual workers to determine the concentration of fibers, longer than 5 micrometers, per cubic centimeter of air.
43. PACM: Presumed asbestos-containing material. Any surfacing or thermal system insulation that was installed in buildings no later than 1980 and that has not been tested for asbestos, must be presumed to contain asbestos until tested.
44. Protection Factor: The ratio of the ambient concentration of an airborne substance to the concentration of the substance inside the respirator at the breathing zone of the wearer. The protection factor is a measure of the degree of protection provided by a respirator to the wearer.
45. RACM: Regulated asbestos-containing material as defined by NESHAP. Any material that is friable or has become friable.
46. Regulated Area: Means an area established by the employer to demarcate areas where Class I, II and III asbestos work is conducted, and any adjoining area where debris and waste from such asbestos work accumulate; and a work area within which airborne concentrations of asbestos, exceed or there is a reasonable possibility they may exceed the permissible exposure limit.
47. Removal: All herein specified procedures necessary to strip all asbestos-containing materials from the designated areas and to dispose of these materials at an acceptable site.
48. Respirator: A device designed to protect the wearer from the inhalation of harmful atmospheres.
49. Shower Room: A room between the clean room and the equipment room in the worker decontamination enclosure system, with hot and cold or warm running water and suitably arranged for complete showering during decontamination. The shower room comprises an airlock between contaminated and clean areas.
50. Surfactant: A chemical wetting agent added to water to improve penetration, thus reducing the quantity of water required for a given operation or area.

51. Time Weighted Average (TWA): The TWA is an 8-hour time weighted average airborne concentration of fibers, longer than 5 micrometers, per cubic centimeter of air, calculated using formulas found in 29 CFR 1910.1000.
52. TSI: Thermal system insulation.
53. Visible Emissions: Any emissions containing particulate asbestos material that are visually detectable without the aid of instruments. This does not include condensed uncombined water vapor.
54. Washroom: A room between the work area and the holding area in the equipment decontamination enclosure system. The washroom comprises an airlock.
55. Wet Cleaning: The process of eliminating asbestos contamination from building surfaces and objects by using cloths, mops, or other cleaning utensils which have been dampened with amended water or diluted removal encapsulant and afterwards thoroughly decontaminated or disposed of as asbestos contaminated waste.
56. Work Area: The area where asbestos related work or removal operations are performed which is defined and/or isolated to prevent the spread of asbestos dust, fibers or debris, and entry by unauthorized personnel. Work area is a Regulated Area as defined by 29 CFR 1926.1101.
57. Worker Decontamination Enclosure System: A decontamination enclosure system for workers, typically consisting of a clean room, a shower room and an equipment room.

C. Medical Requirements: 29 CFR 1926.1101

1. Medical Examinations: Before exposure to airborne asbestos fibers, provide workers with a comprehensive medical examination as required by 29 CFR 1926.1101. This examination is not required if adequate records show the employee has been examined as required by 29 CFR 1926.1101 requirements within the past year.
2. Medical Records: Maintain complete and accurate records of employees' medical examinations for a period of 30 years after termination of employment and make records of the required medical examination available for inspection and copying to authorized representatives of: The Assistant Secretary of Labor for Occupational Safety and Health Administration (OSHA), and an employee's physician upon the request of the employee or former employee.

D. Permits and Notifications:

1. Secure necessary permits in conjunction with asbestos removal, hauling and disposition, and provide timely notification of such actions as may be required by Federal, State, regional and local authorities.
2. Send Written Notification as required by US EPA National Emission Standards for Hazardous Air Pollutants (NESHAP) Asbestos Regulations (40 CFR 61, Subpart M) to the regional Asbestos NESHAP Contact at least 10 days prior to beginning any work on asbestos-containing materials. Send notification to the following address:

Montana Department of Environmental Quality
Asbestos Control Program
Permitting and Compliance Division
PO Box 200901
Helena, MT 59620-0901
(406) 444-2690

E. Safety Compliance:

In addition to detailed requirements of this specification, comply with laws, ordinances, rules and regulations of storing, transporting and disposing of asbestos waste materials. Comply with 40 CFR Part 61. Submit matters of interpretation of standards to the appropriate administrative agency for resolution before starting the work. Where the requirements of this specification and referenced documents vary, the most stringent requirement shall apply.

F. Respirator Program:

Establish a written respirator program as required by 29 CFR 1910.134 and CFR 1926.1101. This program shall be posted in the clean room of the worker decontamination enclosure system.

1.8 SUBMITTALS

A. Make submittals required by the contract documents in a timely manner and at appropriate times in the execution of the work to allow for sufficient and prompt review by the Government and Asbestos Consultant. Revise and resubmit as necessary to establish compliance with the specified requirements.

B. Submit two complete bound sets of the submittals as described in this section. Submit separate sets entitled "Pre-Work Submittals" and "Final Submittals".

1. Submit Pre-Work submittals at the pre-construction meetings. Work may not proceed until the complete Pre-work Submittal package has been reviewed and approved by the Industrial Hygiene Consultant.
2. Submit Final Submittals to the Industrial Hygiene Consultant following completion of the work. Requests for final payment will not be processed until the final submittal package has been reviewed and approved by the Government and the Industrial Hygiene Consultant.

C. Pre-work Submittals

1. Project Schedule: Include information detailing sequencing and scheduling of asbestos work, and schedule coordination with the work of other trades.
2. Work Plan: Provide a detailed work plan, including sketches of intended work zones, layout of containment areas, and HEPA filtration setup. Delineate the portable HEPA

ventilation system and procedures for isolation and close out of the building's HVAC system.

3. Decontamination Procedure: Provide location and layout of decontamination areas, and explanation of intended decontamination sequence.
4. Methods: Provide a description of all asbestos removal methods to be used and sequence of activities. Include information detailing schedule coordination with the Contracting Officer and with other trades.
5. Subcontractors: Provide a listing of subcontractors, and interface of trades involved in the performance of work.
6. Safety Plan: Delineate the methods to be used to assure the safety of workers, building occupants, and visitors to the site.
7. Personnel Protective Equipment: Provide a description of protective clothing and approved respirators to be used.
8. Equipment: Provide manufacturer's specifications of all equipment, including respirators, to be used.
9. Vacuum Equipment: Submit specifications and product date for all vacuum equipment. Include evidence of approval and testing of HEPA exhaust filtration, and wetting and packaging methods for waste collection.
10. Asbestos Disposal Plan: Include explanation of handling, transport, and disposal of asbestos-contaminated waste. Identify any disposal site at which any waste material generated during the project will be disposed and furnish evidence of all necessary government approvals to dispose of the waste.
11. Project Staffing: Provide identity of project site supervisor, project manager, and list of trained workers to be used on project. Include documentation of appropriate training and certification for each employee.
12. Medical Examinations: Provide evidence of medical examinations for workers to be used on this project as required by OSHA. Include most recent written physicians' opinion regarding employees' fitness to work and utilization of mandatory protective equipment.
13. MSDS: Provide Material Safety Data Sheets for all chemicals (i.e., encapsulants, and surfactants) to be used on the project.
14. Cleanup: Provide a description of final cleanup procedures to be used.
15. Emergency Procedures: Provide a description of emergency procedures to be followed in case of injury, fire, temporary utility failures, and breach of barriers. Include evacuation procedures, source of medical assistance (names and phone numbers for Government's Representative, Asbestos Consultant, fire, police, emergency squad, local hospital, and Government), and procedures to be used for access by medical personnel (for example, rescue squad and physician).
16. OSHA Requirements: Submit a notarized certification signed by an officer of the abatement contracting firm that exposure measurements, medical surveillance, and worker training records are being kept in accordance with OSHA.
17. Laboratory Qualification Information: Submit proof of qualifications of testing laboratory and personnel. Certification that persons analyzing the samples have been judged proficient by successful participation in the National Institute for Occupational Safety and Health (NIOSH) Proficiency Analytical Testing (PAT) Program shall be considered sufficient proof of compliance.

18. Certificates of Compliance: Submit certification that vacuums, ventilation equipment, and other equipment required to contain airborne asbestos fibers conform to ANSI Z9.2.
19. Notifications and Policies: Submit copies of regulatory agency abatement permits and notifications, copies of all types of specified bonds and insurance, and notification of bonding and insurance companies indicating extent of coverage.

D. Final Submittals:

1. Certification: Provide written certification that Contractor has fully completed work in strict accordance with the Specifications.
2. Air Monitoring: Submit documentation of all employee personal air monitoring results relative to the OSHA respiratory protection level compliance. Include copies of all air monitoring data and analysis reports conducted at the site.
3. Project Record Documents: Provide record drawings and specifications of abatement work with all contract changes clearly indicated, project photographs, security log, safety log, sign-in sheets, supervisor's daily field reports, and similar final record documentation.
4. Disposal Manifests: Submit copies of all asbestos waste disposal transportation and disposal manifests including signed receipts from the landfill.

E. Contract Revisions: Provide documentation of all Modification Proposals and Change Orders.

PART 2 - PRODUCTS

2.1 EQUIPMENT

A. Compliance: Equipment, including protective clothing and respirators, used in the execution of this contract and provided to visitors to the site, shall comply with ASTM E 849 and with the applicable Federal, State, and local regulations. Respirators shall conform to the OSHA requirements in 29 CFR 1910.134. Use supplied air type (type "C") units during actual removal operations, except as approved by the Asbestos Consultant prior to the start of work.

B. Work Area Responsibility: It is the Contractor's responsibility to require that each person (worker or visitor) entering the work area wears an approved respirator and protective clothing. There shall be no exceptions to this requirement.

C. Protective Clothing: Provide approved protective clothing to all workers and to all official representatives of the Government, State, or other governmental entity, and the Asbestos Consultant who may inspect or visit the project.

D. Respirators: Respirators will be of a type approved by NIOSH and MSHA for use during asbestos removal operations. See Paragraph 2.2, "Respiratory Protection".

E. Miscellaneous Safety Equipment: Hardhats, protective eyewear, gloves, rubber boots or other footwear shall be provided as required for workers and authorized visitors. Safety shoes may be required for some activities. Protective equipment used in the removal of asbestos-

contaminated items and demolition activities shall be of proper materials to adequately protect the workers.

F. Disposal Bags: Polyethylene bags used for containing removed asbestos-containing materials shall be at least 6 mils thick and sufficiently large for their intended use. These bags should be printed with warning labels per OSHA regulations.

G. Vacuums: All vacuum cleaners must be equipped with HEPA filters.

H. Duct Tape: All tape shall be high quality duct tape. All spray-on adhesives, glue, and other barrier securing material shall be high quality products.

I. Inventory Maintenance: Provide and maintain sufficient inventory of protective clothing, respirators, filter cartridges, plastic sheeting of proper size and thickness, duct tape, glue, adhesives, disposable towels, and air filters for the work required and the numbers of workers, visitors, and inspection personnel entering the work areas.

J. Showers: Provide shower stalls constructed with opaque walls, and sufficient plumbing for these showers, including hot and cold running water and sufficient hose lengths and drain systems or an acceptable alternate such as a portable decontamination trailer with showers. Waste shower water shall be filtered through 5-um filters and disposed of in accordance with all Federal, State, and local regulations.

K. Demolition Equipment: Provide sufficient appropriate equipment for demolition of plaster, brick, and concrete walls, pipe chases and ceiling areas such that the work can be performed without hindering the project schedule.

L. Local Exhaust System & HEPA Filtration: Provide air filtering equipment capable of filtering asbestos fibers to 0.3 um at 99.97 percent efficiency and of sufficient quantity and capacity to cause a complete air change or total air filtration within the work area once every 15 minutes. Air shall flow into the work site through all openings, including the decontamination chamber and waste exit ports, and any areas in the work site where air leakage may occur. Air should exhaust through the local exhaust air filtration units by means of a high quality flexible or solid duct leading outside the building. If air exhaust outside the building is not feasible, the Asbestos Consultant shall determine where the exhaust shall be emitted outside the work area. The air-filtering equipment should be positioned at a maximum distance from the decontamination chamber to maximize filtration of airborne fibers. Local exhaust air filtration units shall be in operation at all times. One additional air filtration unit will be inside the work area as a backup unit.

M. Electrical Equipment: All electrical appliances used in conjunction with the removal will be used with ground fault interruption units. Each electrical appliance will have its own electrical outlet.

N. Fire Extinguishers: Fire extinguishers in sufficient quantity to deal with any small fires shall be kept in containment, minimum one per each homogeneous work area.

O. Encapsulants and Sealants: Encapsulant and sealant shall be commercially available and specifically designed for use as an asbestos sealant.

2.2 RESPIRATORY PROTECTION

Contractor shall select and provide respirators for all workers based on selection procedures outlined under current OSHA regulations. If contractor has properly documented historic personal exposures during abatement activities, respiratory protection may be based on this data. If adequate historic data is not available, all OSHA Class I work shall commence utilizing Type C supplied air respirators. Respiratory protection may be downgraded upon documentation that lower levels of respiratory protection will maintain personal exposures below the Permissible Exposure Limit and the Excursion Limit as set forth under 29 CFR 1926.1101.

A. Air Purifying Respirators

1. Provide one-half-face or full-face type respirators. The Mine Safety and Health Administration (MSHA) and the National Institute must approve all respirators for the use intended for Occupational Safety and Health (NIOSH).
2. Provide, at a minimum, filter cartridges labeled with the NIOSH and MSHA certification for Radionuclides, Radon Daughters, Dust, Fumes, and Mists and color coded in accordance with ANSI Z228.2 (P-100 Cartridges). In addition, a chemical cartridge may be added, if required, for solvents, etc. In this case, provide a combination cartridge labeled with the appropriate color code and MSHA/NIOSH certification. All cartridges shall be manufactured by the same manufacturer as the facepiece.
3. Provide sufficient filters for replacement as necessary by workers.
4. Single-use, disposable, or quarter-face respirators are not permitted.

B. Supplied-Air (Type C) Respirator Systems

1. Provide equipment capable of producing a continuous sufficient supply of Grade D breathing air as described in the Compressed Gas Association Commodity Specifications G-7.1.
2. Provide monitors who will shut down compressor and sound audible alarms if any of the following occur:

    a. Carbon Monoxide (CO) concentrations exceed five parts per million per volume of air in the airline.
    b. Compressor temperature exceeds normal operating range.

3. Provide full facepiece and hose by the same manufacturer. Facepiece and hose must be certified by MSHA/NIOSH as an approved Type C respirator assembly. Operate system in pressure demand mode with a positive pressure facepiece. Maximum hose length is 300 feet.

2.3 SPECIAL CLOTHING

A. Protective Clothing

Provide personnel exposed to airborne concentrations of asbestos fibers with fire retardant disposable protective whole body clothing, head coverings, gloves and foot coverings. One-piece clothing is acceptable and preferred. Provide disposable plastic or rubber gloves to protect hands. Cloth gloves may be worn inside the plastic or rubber gloves for comfort, but shall not be used alone.

Make sleeves secure at the wrists and make foot coverings secure at the ankles by the use of tape. Reusable type protective clothing and footwear shall be left in the contaminated equipment room until the end of the asbestos abatement work at which time such items shall be thoroughly cleaned of all asbestos-contaminated material or disposed as asbestos-contaminated waste.

B. Work Clothing:

Provide cloth work clothes for wear under the disposable protective coveralls and foot coverings.

2.4 WORKER DECONTAMINATION ENCLOSURE SYSTEM

A. Class I Work

Provide a decontamination unit consisting of a serial arrangement of rooms or spaces adjoining the work area or decontamination trailer if approved, for decontamination of workers conducting asbestos removal, and for any authorized visitor entering the work area. The decontamination unit or trailer shall conform to the following specifications:

1. Provide an adequate decontamination unit consisting of a serial arrangement of rooms or spaces adjoining the Work Area or a decontamination trailer. Each airlock shall be clearly identified and separated from the other by plastic sheet crossover doors, designed to minimize fiber and air transfer as people pass between areas. Decontamination chamber doors shall be of sufficient height and width to enable replacement of equipment that may fail and to safely stretcher and carry an injured worker from the site without destruction of the chamber or unnecessary risk to the integrity of the work area. At least two layers of 6 mil black plastic sheeting shall be required for walls and ceilings for on-site constructed decontamination units. Two layers of 6 mil clear plastic may be used for the floors. On-site constructed decontamination units must be able to withstand wind and rain if built

outdoors. Construction must use 2" x 3" or 2" x 4" framing or equivalent and must be large enough to accommodate large individuals adequately.

2. Required decontamination areas comprising the decontamination unit and their usage shall be as follows:

   a. Clean Room: In this room persons remove and leave all street clothes and put on clean disposable coveralls. Approved respiratory protection equipment is also picked up in this area. No asbestos contaminated items are permitted in this room.
   b. Shower room: In this room, personnel shower prior to exiting the containment.
   c. Equipment Room: Work equipment, footwear, and all other contaminated work clothing are left here. This is also a change and transit room for people. All areas between Shower Room and Work Area shall be considered part of the Equipment Room. Plastic floor and wall covering is required. This is a contaminated area.

Class II Work

All Class II work, specifically removal of Transite soffits and built-up roofing materials, will occur outside the building and use of a decontamination unit shall not required.

2.5 EQUIPMENT DECONTAMINATION ENCLOSURE SYSTEM

Install separate equipment and contamination enclosure system where allowed by available space and practical site considerations.

2.6 EYE PROTECTION

Provide goggles to personnel engaged in asbestos operations when the use of a full face respirator is not required.

2.7 WARNING SIGNS AND WARNING LABELS

Post warning signs conforming to the requirements of 29 CFR 1926.1101 and 40 CFR 763.120, 121, at all approaches to asbestos control areas. Locate signs at such a distance that personnel may read the sign and take the necessary protective steps. Provide warning labels and affix to all asbestos products contaminated with asbestos. Sign and label formats to conform to 29 CFR 1910.145(d)(4).

Warning Signs:

Provide signs of sufficient size to be clearly legible, displaying the following legend:

DANGER ASBESTOS
CANCER AND LUNG DISEASE HAZARD
AUTHORIZED PERSONNEL ONLY
RESPIRATORS AND PROTECTIVE CLOTHING ARE REQUIRED IN THIS AREA

Warning Labels:

Provide labels of sufficient size to be clearly legible, displaying the following legend:

DANGER
CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST
CANCER AND LUNG DISEASE
HAZARD

2.8 PLASTIC SHEET

Plastic sheet, of 4 mil (0.10 mm) and 6 mil (0.15 mm) thickness in sizes to minimize the frequency of joints for isolation and sealing of designated work areas. Plastic sheet may be either clear or opaque. Black plastic may only be used in the construction of decontamination units.

2.9 TAPE

Tape - capable of sealing joints of adjacent sheets of plastic sheets and for attachment of plastic sheet to finished or unfinished surfaces of dissimilar materials and capable of adhering under both dry and wet conditions, including use of amended water.

2.10 SURFACTANT (WETTING AGENT)

Surfactant (wetting agent) shall consist of 50% polyoxyethylene ether and 50% of polyoxyethylene or polyglycol ester, or equivalent, and shall be mixed with water to provide a concentration of one ounce surfactant to 5 gallons of water.

2.11 IMPERMEABLE CONTAINERS

Impermeable containers shall be 6 mil plastic bags of size to fit within the drum listed hereafter and capable of being sealed and 55 gallon (200 l) capacity metal or fiber drums with tightly fitting lids. The containers shall be labeled in accordance with OSHA Regulation 29 CFR 1926.1101. Containers must be both air and watertight.

2.12 SEALABLE PLASTIC DISPOSAL BAGS

Sealable plastic bags of 6 mil minimum thickness for transportation and disposal of asbestos-contaminated material.

2.13 ENCAPSULANT PRODUCTS

Penetrating and bridging encapsulant and sealant (lock down) products shall be commercially available and specifically designed for use as an asbestos sealant. The Contractor shall submit product data for any materials proposed for use. Approval of "or equal" products will not include substitution of product lines where compatibility for successive applications may be violated.

2.14 REMOVAL GLOVEBAGS

Bags of heavy plastic construction designed to permit isolation of a section of pipe insulation and with integral gloves and fittings for a spray nozzle extending into the bag. Glovebags shall only be used under the direction of a qualified superintendent, and within a containment or partial containment with differential pressure and air filtration.

PART 3 - EXECUTION

3.1 EXECUTION OF REMOVAL

Removal and disposal of all asbestos-containing materials is to be performed in accordance with the following procedures.

3.2 PROJECT SITE CONDITIONS

Means of Egress: Establish and maintain emergency and fire exits from the work area.

A. Use of Existing Facilities

1. Water Supply: The Government will provide access to water either via outdoor faucets or at designated outlets in the building. The Contractor shall connect to the building's system at locations as allowed by the Government after review of the work plan indicating desired locations of connection. Contractor is responsible for installation and maintenance of back flow prevention devices on all water connections. Contractor is responsible for any damage resulting from leaking hoses, connections, or from other water supply system components under the direct control of Contractor.
2. Electricity: The Government will provide access to an electric panel. Contractor will be responsible for making necessary connections to the service, providing appropriate temporary breaker panels, and all extension cords necessary to perform the work. All electrical connections to the building’s electric service must be made by a licensed electrician of at least journeyman level experience. The Contractor must provide emergency power in the event power failure occurs in the facility. Contractor must provide adequate electricity in all locations to allow IHC to operate air pumps for routine and clearance air sampling. Adequate power and lighting must be maintained in all work areas until visual clearance inspections have been performed.
3. Toilets: Coordinate with Government’s representative regarding use of temporary restroom facilities.

4. Waste Storage: Asbestos waste must be either placed in impermeable, labeled double bags, double wrapped and labeled, or the bags must be in labeled metal drums prior to their transport to the transport vehicle. If not removed from the site each day, waste must be stored in a labeled, locked, plastic-lined dumpster in a location approved by the Government's representative.

B. Environmental Conditions to be Maintained: Outside Asbestos Work Area: Air concentrations of asbestos shall be maintained at 8-hour time weighted average below 0.01 fiber (longer than 5 microns) per cubic centimeter of air.

C. Access to Work Area: Access to work area shall be controlled through the use of signs, barricades, or other means as appropriate. Whenever possible, all access shall be through decontamination areas. The following shall have access to work area: EPA and OSHA inspectors, Government's representative, and on-site representative (IHC). These persons shall be the only non-asbestos specialist personnel who shall be permitted access while work is in progress.

3.3 WORK PRACTICES

A. Preparation for Class I Containments:

1. Post warning signs meeting the specifications of OSHA 1926.1101 at any location and approaches to the location of the asbestos removal area. Signs shall be posted at a distance sufficiently far enough away from the work area to permit an employee to read the sign and take the necessary protective measures to avoid exposure. Additional signs may need to be posted following construction of workplace enclosure barriers.
2. Coordinate with the Contracting Officer the shut down and lock out of electric power to all work areas. Contractor is to witness and verify shut down and lockout. Provide temporary power and lighting. Coordinate temporary power hookups with the Government's representative. Insure safe installation (including ground faulting) of temporary power sources and equipment by compliance with all applicable electrical codes, requirements and OSHA requirements for temporary electrical systems. The Government shall pay for all costs for electric service.
3. Seal off all openings between the work area and uncontaminated areas outside of the work area by installing 4-mil polyethylene sheeting and tape or fire-retardant caulk as needed to form critical barriers.
4. Before work is begun, clean all removable items and equipment. Remove these items and store as directed.

B. Isolation of the Work Area - Class I Work Areas Where Glove Bags are Used:

1. Construct isolation and negative pressure containment barriers as follows:

a. Seal all vertical and horizontal surfaces except those of asbestos-containing materials with 1 layers of 4-mil watertight polyethylene plastic sheeting on the walls and 1 layer

of 6-mil watertight polyethylene plastic sheeting on the floor and/or fire-retardant caulk except as provided in b. below.

b. Sole permissible exceptions to total enclosures are: (1) an entrance airlock with showers and a decontamination chamber, (2) a debris removal airlock for cleaning and asbestos waste removal, (3) staircases, and (4) emergency exits. Emergency exits shall be marked by spray-painted arrows and doorway outline, with a knife present to cut the plastic.

c. Wet clean and/or HEPA vacuum all non-removal and non-asbestos items such as boilers, piping, heat exchangers, tanks and other equipment in the Work Area. After cleaning, wrap articles to remain in the room such that they are adequately protected from damage.

d. As all existing ventilation systems in the Work Area are to be sealed throughout the removal operation, an alternate system shall be utilized. Install approved negative air filtration units utilizing appropriate HEPA filters to exhaust air from the Work Area. Negative air filtration units shall be of sufficient number and capacity to ensure that total air volume is exchanged once every 15 minutes. A negative static pressure 0.02 inches of water column shall be maintained as measured by a manometer.

e. A written log shall be maintained for all units utilizing a HEPA filter. This log shall include, but not be limited to, hours of operation, time of filter changes, pressure gauge readings, and current location of the unit.

f. Replacement air shall enter the Work Area through the decontamination facility and the make-up air vents, in order to reduce the possible escape of contaminated air. Install and have operating the entire alternate ventilating system prior to commencement of asbestos abatement.

3.4 REMOVAL OF ASBESTOS IN NEGATIVE PRESSURE CONTAINMENT PROCEDURE

A. This section shall apply to the removal of TSI pipe fitting insulation.

1. Clean and isolate the work area in accordance with Section 3.3 A. Isolation in accordance with Section 3.3B will be required for asbestos removal inside containments.
2. Wet all asbestos-containing material with an amended water solution using equipment capable of providing a fine spray mist, in order to reduce airborne fiber concentrations when the material is disturbed. Saturate the material; however, do not allow excessive water to accumulate in the work area. Keep all removed material wet enough to prevent fiber release until it can be containerized for disposal. Maintain a high humidity in the work area by misting or spraying to assist in fiber settling and reduce airborne concentrations. Wetting procedures are not equally effective on all types of asbestos-containing materials but shall nonetheless be used in all cases.
3. Saturated asbestos-containing material shall be removed in manageable sections. Removed material should be containerized before moving to a new location for continuance of work. Surrounding areas shall be periodically sprayed and maintained in a wet condition until visible material is cleaned up.

4. Apply spray-encapsulant to all exposed surfaces from which ACM has been removed after final clearance visual inspection.

3.5 GLOVEBAG REMOVAL

A. Application: This section applies to the removal of materials that can be accommodated by a glovebag, including straight run and pipe fitting insulation.

B. Preparation: The preparation of the Work Area for glovebag removal shall include the requirements of Paragraph 3.3.A above.

C. Workers: A minimum of two persons are required to perform a glove bag removal project. A third person will be required to control access to the work area, to conduct air monitoring and assist with supplies.

D. Work Area Isolation: The Work Area where the technique is to be utilized shall be isolated in accordance with 3.3.B above.

E. Local Exhaust System: HEPA filter equipped negative air machines shall be placed in operation as close as is feasible throughout the glovebag removal process.

F. Materials & Equipment: All necessary materials, equipment, and supplies shall be brought into the Work Area before any removal begins. The following is a list of recommended equipment and tools for the removal of asbestos by the glovebag technique:

1. The glovebag, which consists of a 6 mil bag fitted with long sleeve gloves, a tool pouch, and a 2-inch opening used for water application.
2. A pump-up sprayer (garden type) with a 2- or 3-gallon capacity.
3. Wetting Agent: Amended water (water with a surfactant) or a removal encapsulant.
4. Six mil polyethylene disposal bags with the proper markings for asbestos waste.
5. A HEPA filtered vacuum with a capillary tube for insertion into the glovebag.
6. Tools such as a small scrub brush, a utility knife for cutting the insulation, a stapler, wire cutters, smoke tubes with aspirator bulb, tin snips, duct tape, and wettable cloths.
7. A roll of 6 mil polyethylene.
8. An encapsulant.

G. Glovebag Removal procedures shall be conducted as follows:

1. Preparation: A visual inspection of the pipe where the work will be performed shall be made to determine if any damaged pipe covering (broken lagging, hanging, etc.) exists. If there is, the pipe shall be wrapped in polyethylene plastic and fully secured

with duct tape. This procedure will prevent high airborne fiber concentrations from occurring during the glovebag work caused by pipe lagging, hanging several feet or even several yards away, which may be jarred loose by the abatement work activities. Debris on the floor and other surfaces that has accumulated and contains asbestos must be cleaned up as necessary. If the pipe is undamaged, one layer of duct tape shall be placed around the pipe at each end of where the glovebag will be attached. This permits a good surface to which to seal the ends of the glovebag and it minimizes the chance of releasing fibers when the tape at the ends of the glovebag is peeled off at the completion of the job. Place one layer of 6 mil plastic underneath the Work Area, extending at least 6 feet in all directions.

2. Installation and Removal: Install the glovebag according to manufacturer's recommendations. Cut covering on the insulation along the top seam to allow wetting of the insulation, and cut cover all around sections to be removed. Remove material in small sections. Lower the material carefully inside the glovebag. Do not permit it to drop.
3. Removal of Glovebag and Disposal: Following ACM removal, ensure that all visible material is inside the bag. Spray all tools in glovebag with amended water while it is still attached. Evacuate bag with portable HEPA vacuum and while the bag is collapsed, squeeze bag below tool pouch, and twist bag. Seal bag with tape or locking ties, separating the waste from the removal area. Vacuum the inside of the top of the glovebag and unsealed portion of the glovebag below. Keep HEPA vacuum connected until the glovebag is removed. Replace HEPA filters as recommended by manufacturer. Cut the glovebag along the top and sides, and then remove it from the pipe. Wet pipe and wash all tools and removal area thoroughly.

H. Immediately remove any asbestos-containing debris which collects on the drop sheet either by using a HEPA vacuum or by spraying with amended water or removal encapsulant, collecting with wet towels, placing in a disposal bag while still wet, and cleaning the surface of the plastic sheet with wet towels.

I. Upon completion of the work, fold the drop sheet and all of its contents toward the center. Place the sheet in a properly labeled 6 mil polyethylene disposal bag. Neck down the bag and collapse it with the HEPA vacuum. Twist the bag shut, fold over and seal with duct tape by wrapping around the bag neck at least three times.

J. Clean all surfaces of the work area by use of a HEPA filter vacuum and/or wet wiping until no visible residue remains.

K. Dispose of glovebag, waste material, disposable clothing, and contaminated equipment in accordance with all applicable regulations and Paragraph 3.8.

L. Upon completion of abatement, conduct final cleanup, encapsulation and clearance procedures as described in Paragraph 3.7.

3.5 ALTERNATIVE PROCEDURES

A. Procedures described in this specification are to be utilized at all times.

B. If specified procedures cannot be utilized, a request must be made in writing to the IHC providing details of the problem encountered and recommended alternatives.

C. Any alternative procedure must be approved in writing by the IHC prior to implementation.

3.6 REMOVAL OF ASBESTOS ON BUILDING EXTERIOR

A. This section shall apply to the removal of built-up roofing.

1. Roofing materials shall be removed in an intact state to the extent feasible.
2. Wet methods shall be used to remove roofing materials that are not intact, or that will be rendered not intact during removal, unless such wet methods are not feasible or will create safety hazards.
3. Cutting machines shall be continuously misted during use, unless a competent person determines that misting substantially decreases worker safety.
4. When removing built-up roofing with asbestos-containing roofing felts and an aggregate surface using a power roof cutter, a HEPA dust collector shall collect all dust resulting from the cutting operation, or shall be HEPA vacuumed by vacuuming along the cut line.
5. Asbestos-containing material that has been removed from a roof shall not be dropped or thrown to the ground. Unless the material is carried or passed to the ground by hand, it shall be lowered to the ground via covered, dust-tight chute, crane or hoist:

    a. Any ACM that is not intact shall be lowered to the ground a soon as is practicable, bin in any event no later than the end of the work shift. While the material remains on the roof it shall either be kept we, placed in an impermeable waste bag, or wrapped in plastic sheeting.
    b. Intact ACM shall be lowered to the ground as soon as is practicable, but in any event no later than the end of the work shift.

6. Upon being lowered, unwrapped material shall be transferred to a closed receptacle in such manner so as to preclude the dispersion of dust.
7. Roof level heating and ventilation air intake sources shall be isolated or the ventilations system shall be shut down.

B. This section shall apply to the removal of Transite® soffits.

1. Cutting, abrading or breaking Transite® panels shall be prohibited unless the Contractor can demonstrate that methods less likely to result in asbestos fiber release cannot be used.

2. Each panel shall be sprayed with amended water prior to removal.
3. Unwrapped or un-bagged panels shall be immediately lowered to the ground via covered dust-tight chute, crane or hoist, or placed in an impervious waste bag or wrapped in plastic sheeting and lowered to the ground no later than the end of the work shift.
4. Nails shall be cut with flat, sharp instruments.

3.7 FINAL CLEANUP PROCEDURES

A. Remove and containerize all visible accumulations of asbestos-containing material and asbestos contaminated debris utilizing rubber dust pans and rubber squeegees to move material around. Do not use metal shovels to pick up or move accumulated waste.

B. Remove all containerized waste from the work area.

C. Decontaminate all tools and equipment and remove at appropriate time in cleaning sequence.

D. Inspect the work area for visible residue. If any accumulation of residue is observed, it will be assumed to be asbestos and the cleaning cycle repeated.

E. The work area shall be cleaned until it is visually clean as determined by the assigned IHC. Additional cleaning cycles shall be provided as necessary at no cost to the Government until cleaning is satisfactory.

F. The contractor shall notify the Government's representative (IHC) 24 hours in advance for the performance of the final visual review and testing. The final visual review and testing will be performed by the IHC. Air sample collection will commence no sooner than 24 hours after conclusion of the contractor's final cleaning or sooner upon agreement with the contractor if the work area is dry.

G. Final inspection will include the entire work area, the personnel decontamination facility, all plastic sheeting, seals over ventilation openings, doorways, windows, other openings, and all surfaces from which asbestos-containing material has been removed. Contractor must provide adequate lighting to perform visual inspections. If any debris, residue on surfaces, dust, or other matter is found, repeat final cleaning and continue decontamination. When the work area is visually clean, notify the Government's representative. Visual inspection is not complete until confirmed in writing, by the Government's representative. Visual inspections will be performed in accordance with the "Standard Practice for Visual Inspection of Asbestos Abatement Projects", ASTM Designation E1368-90.

H. After the visual inspection is complete and has been verified by the Governments representative, perform a lock-down encapsulation of all surfaces from which ACM was removed. Apply encapsulant in accordance with the manufacturer's printed instructions for use and apply with an airless spray gun, air pressure and nozzle orifice as recommended by the encapsulant manufacturer. Maintain negative pressure in work area during encapsulant work.

I. Operate HEPA filtered fan unit in space for 48 air changes minimum.

J. When the encapsulant has completely dried, clearance air samples may be collected in accordance with the procedures for PCM specified elsewhere in this section.

K. Failure of general areas to meet the specification requirements for cleanliness will require further area cleaning at the contractor's expense.

3.8 DISPOSAL OF ASBESTOS-CONTAINING MATERIALS

A. Permits and Notifications: Secure necessary permits in conjunction with asbestos removal, hauling and disposition and provide timely notification of such actions, as may be required by Federal, State, regional, and local authorities. Notify the Regional Office of the United States Environmental Protection Agency and provide copies of the notification to the Government/IHC a minimum of 10 working days prior to the commencement of the work. Provide notification in accordance with 40 CFR 61.22(d) (1).

B. Disposal of Asbestos: Collect and dispose of all RACM, Category I and Category II asbestos waste, scrap, debris, bags, containers, equipment, and asbestos-contaminated clothing which may produce airborne concentrations of asbestos fibers in sealed impermeable bags or drums. Prior to placing in bags or containers, wet down asbestos wastes to reduce airborne concentrations. Waste asbestos material shall be disposed of in accordance with EPA and Montana Department of Health and Environmental Sciences requirements at a Class II landfill. The "small quantity exclusion" of the regulations shall not apply to disposal of waste asbestos materials. Establish a temporary holding area approved by the Government for properly packaged asbestos waste. This area is only to be used during the regular Asbestos Abatement Contractor's work hours.

END OF SECTION 02080

DIVISION 8 - DOORS AND WINDOWS

SECTION 08800 - GLAZING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes glazing for the following products and applications, including those specified in other Sections where glazing requirements are specified by reference to this Section:

1. Windows.
2. Doors - vision lites.
3. Storefront framing.

1.2 DEFINITIONS

A. Manufacturer: A firm that produces primary glass or fabricated glass as defined in referenced glazing publications.

B. Deterioration of Coated Glass: Defects developed from normal use that are attributed to the manufacturing process and not to causes other than glass breakage and practices for maintaining and cleaning coated glass contrary to manufacturer's written instructions. Defects include peeling, cracking, and other indications of deterioration in metallic coating.

C. Deterioration of Laminated Glass: Defects developed from normal use that are attributed to the manufacturing process and not to causes other than glass breakage and practices for maintaining and cleaning laminated glass contrary to manufacturer's written instructions. Defects include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated-glass standard.

D. Deterioration of Insulating Glass: Failure of the hermetic seal under normal use that is attributed to the manufacturing process and not to causes other than glass breakage and practices for maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is the obstruction of vision by dust, moisture, or film on interior surfaces of glass.

1.3 PERFORMANCE REQUIREMENTS

A. General: Provide glazing systems capable of withstanding normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, and installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.

B. Glass Design: Glass thicknesses indicated are minimums and are for detailing only. Confirm glass thicknesses by analyzing Project loads and in-service conditions. Provide glass lites for various size openings in nominal thicknesses indicated, but not less than thicknesses and in strengths (annealed or heat treated) required.

1. Glass Thicknesses: Select minimum glass thicknesses to comply with ASTM E 1300, according to the following requirements:

a. Minimum glass thickness, normally, of lites in exterior walls is 1/4 inch.
b. Thickness of Tinted and Heat-Absorbing Glass: Provide the same thickness for each tint color indicated throughout Project.

1.4 SUBMITTALS

A. Hi-lite all descriptive literature to accomplish identification of specific components/items which are proposed to be furnished. Government will not react to descriptive material/literature which has not been hi-lited, except to reject the Submittal.

B. Product Data: For each glass product and glazing material indicated.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has completed glazing similar in material, design, and extent to that indicated for Project and whose work has resulted in construction with a record of successful in-service performance.

B. Single Source Responsibility for Glass:

1. Primary glass of each (ASTM C 1036).
2. Heat treated glass of each (ASTM C 1048).
3. Laminated glass of each (ASTM C 1172).
4. Insulated glass of each construction indicated.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Protect glazing materials according to manufacturer's written instructions and as needed to prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.

B. For insulating-glass units that will be exposed to substantial altitude changes, comply with insulating-glass manufacturer's written recommendations for venting and sealing to avoid hermetic seal ruptures.

1.7 PROJECT CONDITIONS

A. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.

1.8 WARRANTY

A. General Warranty: Special warranties specified in this Article shall not deprive Government of other rights Government may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

B. Manufacturer's Special Warranty on Laminated Glass: Written warranty, made out to Government and signed by laminated-glass manufacturer agreeing to furnish replacements for laminated-glass units that deteriorate as defined in "Definitions" Article, f.o.b. the nearest shipping point to Project site, within specified warranty period indicated below.

1. Warranty Period: Five years from date of Substantial Completion.

C. Manufacturer's Special Warranty on Insulating Glass: Written warranty, made out to Government and signed by insulating-glass manufacturer agreeing to furnish replacements for insulating-glass units that deteriorate as defined in "Definitions" Article, f.o.b. the nearest shipping point to Project site, within specified warranty period indicated below.

1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PRODUCTS AND MANUFACTURERS

A. Products: Subject to compliance with requirements, provide one of the products indicated in schedules at the end of Part 3.

2.2 PRIMARY FLOAT GLASS

A. Float Glass: ASTM C 1036, Type I (transparent glass, flat), Quality q3 (glazing select); class as indicated in schedules at the end of Part 3.

2.3 HEAT-TREATED FLOAT GLASS

A. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed, unless otherwise indicated.

1. Comply with ASTM C 1048; Type I (transparent glass, flat); Quality 83.

2.4 WIRED GLASS

A. Wired Glass: ASTM C 1036, Type II (patterned and wired glass, flat), Class 1 (clear), Quality q8 (glazing); 6.4 mm thick; of form and mesh pattern indicated below:

1. Polished Wired Glass: Form 1 (wired, polished both sides), and as follows:

a. Mesh m1 (diamond).

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Polished Wired Glass:

a. Ashai Glass Co./Ama Glass Corp.
b. Central Glass Co., Ltd.
c. Nippon Sheet Glass Co., Ltd.
d. Pilkington Glass Ltd.

2.5 LAMINATED GLASS

A. Laminated Glass: Comply with ASTM C 1172 for kinds of laminated glass indicated and other requirements specified, including those in the Laminated-Glass Schedule at the end of Part 3.

B. Interlayer: Interlayer material as indicated below, clear or in colors, and of thickness indicated with a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after laminating glass lites and installation.

1. Interlayer Material: Polyvinyl butyral sheets.

C. Laminating Process: Fabricate laminated glass to produce glass free of foreign substances and air or glass pockets as follows:

1. Laminate lites with polyvinyl butyral interlayer in autoclave with heat plus pressure.

2.6 INSULATING GLASS

A. Insulating-Glass Units: Preassembled units consisting of sealed lites of glass separated by a dehydrated interspace, and complying with ASTM E 774 for Class CBA units and with requirements specified in this Article and in the Insulating-Glass Schedule at the end of Part 3.

1. Provide Kind HS (heat-strengthened) float glass in place of annealed glass where needed to resist thermal stresses induced by differential shading of individual glass lites and to comply with glass design requirements specified in "Performance Requirements" Article. Provide Kind FT (fully tempered) where safety glass is indicated.

B. Spacer Specifications: Manufacturer's standard spacer material and construction.

C. All exterior insulated glass to have laminated glass on interior lite.

2.7 ELASTOMERIC GLAZING SEALANTS

A. General: Provide products of type indicated, complying with the following requirements:

1. Compatibility: Select glazing sealants that are compatible with one another and with other materials they will contact, including glass products, seals of insulating-glass units, and glazing channel substrates, under conditions of service

and application, as demonstrated by sealant manufacturer based on testing and field experience.

2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.
3. Colors of Exposed Glazing Sealants: As indicated by manufacturer's designations.

B. Elastomeric Glazing Sealant Standard: Comply with ASTM C 920 and other requirements indicated for each liquid-applied, chemically curing sealant in the Glazing Sealant Schedule at the end of Part 3, including those referencing ASTM C 920 classifications for type, grade, class, and uses.

1. Additional Movement Capability: Where additional movement capability is specified in the Glazing Sealant Schedule, provide products with the capability, when tested for adhesion and cohesion under maximum cyclic movement per ASTM C 719, to withstand the specified percentage change in the joint width existing at time of installation and remain in compliance with other requirements in ASTM C 920 for uses indicated.

2.8 GLAZING TAPES

A. Expanded Cellular Glazing Tape: Closed-cell, PVC foam tape; factory coated with adhesive on both surfaces; packaged on rolls with release liner protecting adhesive; and complying with AAMA 800 for the following types:

1. Type 1, for glazing applications in which tape acts as the primary sealant.

2.9 GLAZING GASKETS

A. Dense Compression Gaskets: Molded or extruded gaskets of material indicated below, complying with standards referenced with name of elastomeric indicated below, and of profile and hardness required to maintain watertight seal:

1. Neoprene, ASTM C 864.
2. EPDM, ASTM C 864.
3. Silicone, ASTM C 1115.
4. Thermoplastic polyolefin rubber, ASTM C 1115.
5. Any material indicated above.

2.10 MISCELLANEOUS GLAZING MATERIALS

A. General: Provide products of material, size, and shape complying with referenced glazing standard, requirements of manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.

B. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.

C. Setting Blocks: Elastomeric material with a Shore A durometer hardness of 85, plus or minus 5.

D. Spacers: Elastomeric blocks or continuous extrusions with a Shore A durometer hardness required by glass manufacturer to maintain glass lites in place for installation indicated.

E. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine framing glazing, with Installer present, for compliance with the following:

1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
2. Presence and functioning of weep system.
3. Minimum required face or edge clearances.
4. Effective sealing between joints of glass-framing members.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.

3.3 GLAZING, GENERAL

A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.

B. Glazing channel dimensions, as indicated on Drawings, provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances. Adjust as required by Project conditions during installation.

C. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass is glass with edge damage or other imperfections that, when installed, could weaken glass and impair performance and appearance.

D. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction sealant-substrate testing.

E. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.

F. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.

G. Provide spacers for glass lites where the length plus width is larger than 50 inches as follows:

1. Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances, unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.
2. Provide 1/8-inch minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.

H. Provide edge blocking as recommended by glass manufacturer and according to requirements in referenced glazing publications.

I. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.

3.4 TAPE GLAZING

A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.

B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.

C. Where framing joints are vertical, cover these joints by applying tapes to heads and sills first and then to jambs. Where framing joints are horizontal, cover these joints by applying tapes to jambs and then to heads and sills.

D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.

E. Do not remove release paper from tape until just before each glazing unit is installed.

F. Apply heel bead of elastomeric sealant.

G. Center glass lites in openings on setting blocks and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.

H. Apply cap bead of elastomeric sealant over exposed edge of tape.

3.5 GASKET GLAZING (DRY)

A. Fabricate compression gaskets in lengths recommended by gasket manufacturer to fit openings exactly, with stretch allowance during installation.

B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.

C. Install gaskets so they protrude past face of glazing stops.

3.6 PROTECTION AND CLEANING

A. Protect exterior glass from damage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels, and clean surfaces.

B. Protect glass from contact with contaminating substances resulting from construction operations, including weld splatter. If, despite such protection, contaminating substances do come into contact with glass, remove them immediately as recommended by glass manufacturer.

C. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for build-up of dirt, scum, alkaline deposits, or stains; remove as recommended by glass manufacturer.

D. Remove and replace glass that is broken, chipped, cracked, abraded, or damaged in any way, including natural causes, accidents, and vandalism, during construction period.

E. Wash glass on both exposed surfaces in each area of Project not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended by glass manufacturer.

PRODUCT DATA SHEET 1 - PRIMARY CLEAR FLOAT GLASS

A. Primary Clear Float Glass Designation:

B. Class: Class 1 (clear) float glass.

C. Nominal Performance Characteristics are as indicated below:

1. Visible Light Transmittance: 89 percent.
2. Shading Coefficient: .98.
3. Outdoor Visible Reflectance: 8 percent.

D. Available Product(s):

1. PPG Industries.
2. Libbey Owens Ford.
3. AFG Industries.
4. Ford.

PRODUCT DATA SHEET 2 - WIRE GLASS UNITS

A. Polished Wire-Glass Units - Form 1 (wire glass, polished both sides), Quality - Q8, Mesh-Diamond.

B. Manufacturers: Subject to compliance with requirements. Provide products by one of the following:

1. Polished Wire Glass:

a. Ashai Glass Corp.
b. Central Glass Co. LTD.
c. Nippon Sheet Glass Co. LTD.
d. Pilkington Glass LTD.

PRODUCT DATA SHEET 3 - LAMINATED GLASS

A. Kind of Laminated Glass per ASTM C 1172: Kind LA (two lites of annealed Type I glass).

1. Clear Inner Lite: Glass 1 (clear) float glass, with a thickness of 0.12 inch.
2. Clear Outer Lite: Class 1 (clear) float glass, with a thickness of 0.12 inch.
3. Total Thickness of Laminate: 7/32 inch.
4. Thickness of Plastic Interlayer: 0.030 inch.
5. Color of Plastic Interlayer: 99 percent.

a. Visible Light Transmittance: 83 percent.
b. Outdoor Visible Reflectance: 12 percent.

B. Available Products:

1. Northwestern Industries, Seattle, WA.

PRODUCT DATA SHEET 4 - INSULATING GLASS

A. Insulating Glass Unit Designation: Window Type A, B, C, F, G, J, I, H.

1. Type B units to have obscure glazing. Glazing on exterior lite.
   a. Color No: P-516
   b. Thickness: 5.0 mm.
   c. Low – Emissivity coating not required.

B. Classification of Units: Class CBA per ASTM E 774.

C. Air Space Width: Nominal 1/2 inch measured perpendicularly from surfaces of glass lites at unit's edge.

D. Gas Filling: Fill air space with argon.

E. Sealing System: Manufacturer's standard sealants, polysulfide, polyurethane.

F. Spacer Specifications: Manufacturer's standard metal.

1. Desiccant: Either molecular sieve or silica gel or blend of both.
2. Corner Construction: Manufacturer's standard corner construction.

G. Glass Specifications: Comply with the following requirements:

1. Thickness of each unit: 1 inch.
2. Laminated Interior Lite: Class 1 (clear) float glass, complying with requirements specified for laminated glass products.
3. Low-Emissivity Coating: Pyrolytic on second surface.
4. Nominal Performance Characteristics are as indicated below:

   a. Visible Light Transmittance: 53 percent.
   b. Summer Daytime U-Value: 0.34.
   c. Winter Nighttime U-Value: 0.30.
   d. Shading Coefficient: 0.40.
   e. Outdoor Visible Reflectance: 12 percent.

H. Available Products:

1. Northwest Glass.
2. Associated Glass.
3. Northwestern Industries.

END OF SECTION 08800