

**SECTION 01 00 00
GENERAL REQUIREMENTS**

TABLE OF CONTENTS

1.1 GENERAL INTENTION	1
1.2 STATEMENT OF BID ITEM(S)	1
1.3 SPECIFICATIONS AND DRAWINGS FOR CONTRACTOR	7
1.4 CONSTRUCTION SECURITY REQUIREMENTS	7
1.5 FIRE SAFETY	8
1.6 OPERATIONS AND STORAGE AREAS.....	11
1.7 ALTERATIONS	16
1.8 INFECTION PREVENTION MEASURES	17
1.9 DISPOSAL AND RETENTION	20
1.10 PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS	20
1.11 RESTORATION.....	21
1.12 PHYSICAL DATA	22
1.13 PROFESSIONAL SURVEYING SERVICES	22
1.14 LAYOUT OF WORK.....	22
1.15 AS-BUILT DRAWINGS	23
1.16 USE OF ROADWAYS.....	24
1.17 PROJECT ENGINEER'S FIELD OFFICE.....	24
1.18 TEMPORARY USE OF MECHANICAL AND ELECTRICAL EQUIPMENT	24
1.19 TEMPORARY USE OF EXISTING ELEVATORS	25
1.20 TEMPORARY USE OF NEW ELEVATORS	25
1.21 TEMPORARY TOILETS.....	26
1.22 AVAILABILITY AND USE OF UTILITY SERVICES	27
1.23 NEW TELEPHONE EQUIPMENT	28

1.24 TESTS..... 28

1.25 INSTRUCTIONS..... 29

1.26 GOVERNMENT-FURNISHED PROPERTY..... 30

1.27 RELOCATED EQUIPMENT AND ITEMS 31

1.28 STORAGE SPACE FOR DEPARTMENT OF VETERANS AFFAIRS EQUIPMENT 31

1.29 CONSTRUCTION SIGN 31

1.30 SAFETY SIGN 32

1.31 CONSTRUCTION DIGITAL IMAGES 33

1.32 FINAL ELEVATION Digital Images..... 33

1.33 HISTORIC PRESERVATION 33

1.34 INFECTION CONTROL REQUIREMENTS 33

1.35 ASBESTOS FREE CONSTRUCTION MATERIALS

1.36 HAZARDOUS MATERIALS

1.37 GREEN ENVIRONMENTAL MANAGEMENT SYSTEM (GEMS)

SECTION 01 00 00
GENERAL REQUIREMENTS

1.1 GENERAL INTENTION

- A. Contractor shall completely prepare site for building operations, including demolition and removal of existing structures, and furnish labor and materials and perform work for Project 668-309, “Construct Endoscopy / Central Processing” as required by the project drawings and specifications.
- B. Visits to the site by Bidders may be made only by appointment with the Medical Center Engineering Officer.
- C. Offices of NAC, Architecture, as Architect Engineers, will render certain technical services during construction. Such services shall be considered as advisory to the Government and shall not be construed as expressing or implying a contractual act of the Government without affirmations by Contracting Officer or his duly authorized representative.
- D. All employees of general contractor and subcontractors shall comply with VA security management program and obtain permission of the VA police, be identified by project and employer, and restricted from unauthorized access.
- E. Prior to commencing work, general contractor shall provide proof that a OSHA certified “competent person” (CP) (29 CFR 1926.20(b)(2) will maintain a presence at the work site whenever the general or subcontractors are present.
- F. Training:
 - 1. All employees of general contractor or subcontractors shall have the 10-hour OSHA certified Construction Safety course and /or other relevant competency training, as determined by VA CP with input from the ICRA team. All contractor Supervisors and Foremen who oversee construction work shall have the 30-hour OSHA certified Construction Safety course.
 - 2. Submit training records of all such employees for approval before the start of work.

1.2 STATEMENT OF BID ITEM(S):

- A. **ITEM 1 - Base Bid:** All work as defined within the project drawings and specifications.
- B. **BID OPTION ITEMS:**

1. DEFINITIONS

- a. Option Items: An Option Item is an amount proposed by the Contractor for certain construction activities defined in the Contract Documents that may be added or deducted from the contract amount if the Owner decides to accept a corresponding change in either the amount of construction to be completed, or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.
- b. Option Items are not hierarchical in order and the Government may choose to proceed with as few or as many Option Items, in any order they so choose.
- c. Work described as part of the Base Bid under each Option Item is only work affected by that option item. All other work contained in the construction documents not specifically mentioned under the description is to be provided under the Base Bid.

2. PROCEDURES

- a. Coordination: Coordinate related Work and modify or adjust adjacent Work as required to ensure that Work affected by each chosen Option Item is complete and fully integrated into the Project.
- b. Option Item Proposals: Include all costs for labor, materials, and equipment necessary for a complete working system, assembly, or component as applicable to Option Item specified, including costs to all trades to modify adjacent materials and/or assemblies affected by the Option Item.
 1. All indirect costs shall be included in each Proposal.
 2. Include as part of each option Item Proposal, miscellaneous devices, appurtenances, and similar items incidental to or required for a complete installation, whether or not mentioned as part of the Option Item description.
 3. Execute chosen Option Items under the same conditions as other Work of this Contract.

C. OPTION ITEM 1, DEDUCT WEST ELEVATOR AND TOWER:

1. Under the Base Bid, provide the following:
 - a. Provide the Three Stop, Service Size Hydraulic Elevator at the West Addition, new elevator shaft and pit and surrounding construction, including Elevator Vestibules B01, 119A and C2E6A. Refer to Architectural Drawing Sheets AS111, AS113, AS115, AS120, AS122, AS124, AS202, AS303 and all associated Details and Sections and Specification Section 14 24 00. Include all associated Structural Construction (refer to drawings SB102, SF102, SF104 and all associated Details and Sections) and Mechanical and Electrical Construction as indicated on the drawings and as specified.
2. Under this Option Item, state the dollar amount to be DEDUCTED FROM the Base Bid to omit the work described in part 1. Under this Option Item, provide the following:
 - a. General Construction:
 - 1) Sheet AS102: DO NOT demolish the site items indicated as "Bid Option #1" on Detail 1, Enlarged Demolition Site Plan – West. DO NOT provide the new site construction indicated as "Bid Option #1" on Detail 2, Enlarged Site Plan – West.

- 2) Sheet AD101: DO NOT demolish the existing stair and dumbwaiter or surrounding construction indicated as “Bid Option #1” on the Partial Basement Floor Demolition Plan - West and the Partial First Floor Demolition Plan – West.
- 3) Sheet AS111, Basement Floor Plan - West: DO NOT provide the new construction indicated as “Bid Option #1”. Existing construction to remain as-is.
- 4) Sheet AS113, First Floor Plan - West: DO NOT provide the new construction indicated as “Bid Option #1”. Existing construction to remain as-is.
- 5) Sheets AS120, AS122 and AS124: DO NOT make the ceiling changes in the existing building nor add the new ceilings in the areas indicated as “Bid Option #1”.
- 6) Sheet AS202, Elevations 4, 5, 6 and 7: DO NOT provide the Elevator and Elevator Vestibule Tower indicated as “Bid Option #1”. Under this Bid Option, Extend new wall construction adjacent to the tower along Grid W1 through the area where the tower is omitted. Extend foundation and roof parapet through to match adjacent new construction.
- 7) Sheets SB102, SF102, SF104 and associated Structural Details and Sections: DO NOT provide the new construction indicated as “Bid Option #1”

b. Mechanical Construction:

- 1) Omit roof and overflow roof drainage with piping down to lower roof area.
- 2) Sheet MH101: DO NOT provide the new electric wall heater EWH-1.

c. Electrical Construction:

- 1) Do not install fire alarm devices associated with the elevator.

d. Fire Protection:

- 1) Sheets FP101, FP103, and FP105: omit the fire protection work indicated in the construction surrounding the elevator.

D. OPTION ITEM 2, DEDUCT CART LIFT (DUMBWAITER) AND ENCLOSURE:

1. Under the Base Bid, provide the following:

- a. Provide the Two Stop, Traction Material (Cart) Lift System and new shaft in the existing Tower and surrounding construction, including Cart Lift Vestibules E200, A802 and Control Room A802A. Refer to Drawing Sheets AS114, AS115, AS116, AS117, AS118, AS121, AS123, AS306 and all associated Details, Sections and Specification Section 14 21 11. Include all associated Structural Construction (refer to drawings SF101 and SF103 and all associated Details and Sections), and Mechanical and Electrical Construction as indicated on the drawings and as specified. Include all associated demolition required as indicated on sheets AD101, AD102, AS112 and AS118.

2. Under this Option Item, state the dollar amount to be DEDUCTED FROM the Base Bid to omit the work described in part 1. Under this Option Item, provide the following:

a. General Construction:

- 1) All existing construction shown to be demolished on the sheets indicated above directly for the installation of the Two Stop, Traction Material (Cart) Lift System in the existing Tower and surrounding construction, including Cart Lift Vestibules E200, A802 and Control Room A802A is to remain AS-IS.

b. Mechanical Construction:

- 1) Omit necessary water and/or waste/vent piping reroutes as previously required to maintain existing piping systems fully operational.
- 2) All existing mechanical systems construction shown on MD102 and MD103 to be demolished shall remain AS-IS.
- 3) DO NOT reroute ductwork and piping as shown on MH103, MH105, MH107 and MP101.

c. Electrical Construction:

- 1) Do not install fire alarm devices associated with the Cart Lift.

d. Fire Protection:

- 1) Sheets FP102, FP104, and FP106: omit the work indicated at the areas surrounding the Two Stop Lift.

E. OPTION ITEM 3, DEDUCT MASONRY VENEER AT EXISTING WEST BUILDING:

1. Under the Base Bid, provide the following:

- a. Provide the new concrete supports, Masonry Veneer and rigid insulation applied over the existing West Building (Specialty Care) at the north and west concrete walls. Also provide new EIFS and rigid insulation over the concrete wall on the south side as shown by cross-hatched area on elevation 4/AS202.. Refer to Drawing Sheets AS111, AS113, AS202 (areas indicated as Bid Option #3), and all associated Details and Sections. Include all associated Structural Construction to support the masonry veneer (refer to drawings SB102 and SF103 and all associated Details and Sections). Include all associated demolition required as indicated on sheet AD103 and indicated on the new construction details.

2. Under this Option Item, state the dollar amount to be DEDUCTED FROM the Base Bid to omit the work described in part 1. Under this Option Item, provide the following:

a. General Construction:

- 1) At bottom of EIFS above the omitted masonry veneer, provide factory finished flashing/drip. The existing concrete below remains. Extend EIFS down to top of existing concrete wall at locations where masonry is shown higher than the wall. At the south side, DO NOT install EIFS over existing concrete wall as shown by cross-hatched area on elevation 4/AS202.

F. OPTION ITEM 4, DEDUCT CLERESTORY AT EAST ADDITION:

1. Under the Base Bid, provide the following:

- a. Provide the Clerestory including Roof, overhangs and clerestory glazing system above the East Addition, Second Floor, centered on Grid EE from Grid E0 to Grid E4. Refer to Drawing Sheets AS116, AS123, AS201 and all associated Details, Sections and Specification Sections. Include all associated Structural Construction (refer to drawings SF103 and all associated Details and Sections), and Mechanical and Electrical Construction as indicated on the drawings and as specified.

2. Under this Option Item, state the dollar amount to be DEDUCTED FROM the Base Bid to omit the work described in part 1. Under this Option Item, provide the following:

- a. General Construction:
 - 1) Sheet AS116: Omit the Clerestory from Grids E0 to E4 and centered on Grid EE. Extend Ridge Line shown at lower roof, south to Grid E0. Omit the two roof drains and overflows shown on the Clerestory roof and associated piping to mains. Provide Roofing system and crickets to match adjacent low roof where Clerestory is omitted.
 - 2) Lower the roof over the East Stair S201 so that the top of its parapet aligns with the adjacent lower roof area parapet. Provide crickets at roof over Stair so that water flows to drains on adjacent main roof.
 - 3) Sheet AS123: Extend ceiling type C-6 at 9'-0" above the floor through the area of the removed Clerestory and omit the Gyp Bd soffits and Joist wraps around the beams.
- b. Mechanical Construction:
 - 1) Sheet PL302: Omit Roof Drains shown on top of the Clerestory and associated piping to mains.
 - 2) Sheet MH104: Omit sidewall supply and return grilles at the Clerestory and provide ceiling mounted supply and return air grilles.
- c. Electrical Construction:
 - 1) Omit the lighting shown in the Clerestory and provide 2x4 fixtures spaced similarly as remainder of the room..
- d. Fire Protection:
 - 1) Sheet FP104: Omit sprinklers in the clerestory area as indicated and replace with sprinklers in suspended ceiling type C-6.

G. OPTION ITEM 5, DEDUCT OVERHANGING SECOND FLOOR AT WEST ADDITION:

- 1. Under the Base Bid, provide the following:
 - a. Provide all construction including Structural, Architectural, Mechanical, Electrical and Fire Protection to provide the Overhanging Second Floor space at the West Addition. In general, this space includes Rooms E204, E206, E208, E210, E212, E214, E216, E218 and E220.
- 2. Under this Option Item, state the dollar amount to be DEDUCTED FROM the Base Bid to omit the work described in part 1. Under this Option Item, provide the following:
 - a. General Construction:
 - 1) Sheet AS115: Relocate the Exterior Wall assembly including windows on Grid W7, from Match Line, 13'-10" south of Grid WK to concrete wall 7'-6-1/2" north of Grid WE west to set on top of existing concrete walls below similar to exterior wall on Grid WA. At jog in wall on Grid WJ, provide similar exterior wall construction with no windows.
 - b. Mechanical Construction:
 - 1) Sheets MH103, MH105, MP102 and FP105: Omit HVAC and Fire Sprinklers to rooms E204, E206, E208, E210, E212, E214, E216, E218 and E220, including terminal reheat box TUE.29 and EF-2.15.

- 2) Omit approximately 13 feet of 3" roof overflow drain leader relocating 3" downspout nozzle to grid line W5.5 in two places

c. Electrical Construction:

- 1) Omit the lighting, systems and power to rooms E204, E206, E208, E210, E212, E214, E216, E218 and E220.

H. OPTION ITEM 6, DEDUCT CONTRACTOR FURNISHED EQUIPMENT:

1. Under the Base Bid, provide the following:

- a. Provide and install all equipment indicated on Drawing Sheets AS601, AS602 and AS603 as CFCI (Contractor Furnished, Contractor Installed) and specified in Division 11 Sections of the Specifications.
2. Under this Option Item, state the dollar amount to be DEDUCTED FROM the Base Bid to omit only the furnishing of the equipment. Under this Bid Option, all of the equipment indicated on Drawing Sheets AS601, AS602 and AS603 as CFCI (Contractor Furnished, Contractor Installed) and specified in Division 11 Sections of the Specifications will be furnished by the Owner and installed by the Contractor (OFCI).

J. OPTION ITEM 7, ADD WEST CANOPY AND ASSOCIATED SITE WORK:

1. Under the Base Bid, DO NOT remove the existing canopy and Storefront at Bldg 27 from the SW corner eastward to the start of the ramp, and DO NOT provide the new Canopy, structure or associated site work, including replacing of stairs, ramps, walks, guardrails and hand rails, as shown on Drawing sheets AS102, AS103, AS104 and AS105 indicated as Bid Option #7. Under the Base Bid, DO NOT provide the demolition of existing construction and DO NOT provide the new lighting for the Canopy as shown on the Electrical Drawings.
2. Under this Option Item, state the dollar amount to be ADDED TO the Base Bid to provide and install the Canopy and associated site work as described above, including required demolition and electrical for new lighting.

K. OPTION ITEM 8, ADD REPLACING OF EXISTING CANOPIES AND ASSOCIATED SITE WORK:

1. Under the Base Bid, DO NOT remove the existing canopies eastward from the top of the ramp at Bldg 27, including associated lighting, exhaust fan and radiant heaters as shown on Drawing sheets AS102, AS103, AS104 and AS105 indicated as Bid Option #8. (NOTE that the existing canopy over the north exit door from Specialty Care IS to be removed under the Base Bid). Under the Base Bid, DO NOT provide the demolition of existing construction and DO NOT provide the new lighting, radiant heaters or exhaust fan as indicated on the Mechanical and Electrical Drawings.
2. Under this Option Item, state the dollar amount to be ADDED TO the Base Bid to provide and install the work as described in part 1.
 - a. Mechanical Construction:
 - 1) Sheet MH103: Omit HVAC work for electric radiant heaters and roof mounted exhaust fan.

1.3 SPECIFICATIONS AND DRAWINGS FOR CONTRACTOR

A. Contractor shall obtain drawings and specifications by accessing the “Fed Biz Opps” website (http://www2.fbo.gov/spg/VA/SpVAMC/postdatePrevDays_1.html) and printing documents as needed.

1.4 CONSTRUCTION SECURITY REQUIREMENTS

A. Security Plan:

1. The security plan defines both physical and administrative security procedures that will remain effective for the entire duration of the project.
2. The General Contractor is responsible for assuring that all sub-contractors working on the project and their employees also comply with these regulations.

B. Security Procedures:

1. General Contractor’s employees shall not enter the project site without appropriate badge. They may also be subject to inspection of their personal effects when entering or leaving the project site. Contractor badges can be obtained at the Projects office.
2. For working outside the “regular hours” as defined in the contract, The General Contractor shall give 3 days notice to the Contracting Officer so that security arrangements can be provided for the employees. This notice is separate from any notices required for utility shutdown described later in this section.
3. No photography of VA premises is allowed without written permission of the Contracting Officer. Site specific photographs of contractor’s work are authorized.
4. VA reserves the right to close down or shut down the project site and order General Contractor’s employees off the premises in the event of a national emergency. The General Contractor may return to the site only with the written approval of the Contracting Officer.

C. Guards: Not Applicable

D. Key Control:

1. The General Contractor shall provide duplicate keys and lock combinations to the Project Engineer for the purpose of security inspections of every area of project including tool boxes.
2. The General Contractor shall turn over all permanent lock cylinders to the VA locksmith for permanent installation. See Section 08 71 00, DOOR HARDWARE and coordinate.

E. Document Control: (Not Applicable)

F. Motor Vehicle Restrictions

1. Vehicle authorization request shall be required for any vehicle entering the site and such request shall be submitted 24 hours before the date and time of access. Access shall be restricted to picking up and dropping off materials and supplies.
2. Separate permits shall be issued for General Contractor and its employees for parking in designated areas only.

1.5 FIRE SAFETY

A. Applicable Publications: Publications listed below form part of this Article to extent referenced. Publications are referenced in text by basic designations only.

1. American Society for Testing and Materials (ASTM):

E84-2007Surface Burning Characteristics of Building Materials

2. National Fire Protection Association (NFPA):

10-2006.....Standard for Portable Fire Extinguishers

30-2003.....Flammable and Combustible Liquids Code

51B-2003Standard for Fire Prevention During Welding, Cutting and Other
Hot Work

70-2005.....National Electrical Code

241-2004.....Standard for Safeguarding Construction, Alteration, and
Demolition Operations

3. Occupational Safety and Health Administration (OSHA):

29 CFR 1926Safety and Health Regulations for Construction

B. Fire Safety Plan: Establish and maintain a fire protection program in accordance with 29 CFR 1926. Prior to start of work, prepare a plan detailing project-specific fire safety measures, including periodic status reports, and submit to Project Engineer and Facility Safety Officer for review for compliance with contract requirements in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES. Prior to any worker for the contractor or subcontractors beginning work, they shall undergo a safety briefing provided by the general

contractor's competent person per OSHA requirements. This briefing shall include information on the construction limits, VAMC safety guidelines, means of egress, break areas, work hours, locations of restrooms, use of VAMC equipment, etc. Documentation shall be provided to the Project Engineer that individuals have undergone contractor's safety briefing.

- C. **Site and Building Access:** Maintain free and unobstructed access to facility emergency services and for fire, police and other emergency response forces in accordance with NFPA 241.
- D. **Separate temporary facilities,** such as trailers, storage sheds, and dumpsters, from existing buildings and new construction by distances in accordance with NFPA 241. For small facilities with less than 6 m (20 feet) exposing overall length, separate by 3m (10 feet).
- E. **Temporary Construction Partitions:**
 - 1. Install and maintain temporary construction partitions to provide smoke-tight separations between construction areas and adjoining areas per infection control requirements outlined in section 1.34 "Infection Control Requirements."
 - 2. Install two-hour fire-rated temporary construction partitions as shown on drawings to maintain integrity of existing exit stair enclosures, exit passageways, fire-rated enclosures of hazardous areas, horizontal exits, smoke barriers, vertical shafts and openings enclosures.
 - 3. Close openings in smoke barriers and fire-rated construction to maintain fire ratings. Seal penetrations with listed through-penetration firestop materials in accordance with Section 07 84 00, FIRESTOPPING.
- F. **Temporary Heating and Electrical:** Install, use and maintain installations in accordance with 29 CFR 1926, NFPA 241 and NFPA 70.
- G. **Means of Egress:** Do not block exiting for occupied buildings, including paths from exits to roads unless approved by the Project Engineer and facility Safety Officer. Minimize disruptions and coordinate with Project Engineer and facility Safety Officer.
- H. **Egress Routes for Construction Workers:** Maintain free and unobstructed egress. Inspect daily. Report findings and corrective actions weekly to Project Engineer and facility Safety Officer .
- I. **Fire Extinguishers:** Provide and maintain extinguishers in construction areas and temporary storage areas in accordance with 29 CFR 1926, NFPA 241 and NFPA 10.
- J. **Flammable and Combustible Liquids:** Store, dispense and use liquids in accordance with 29 CFR 1926, NFPA 241 and NFPA 30.

- K. Standpipes: Install and extend standpipes up with each floor in accordance with 29 CFR 1926 and NFPA 241. Do not charge wet standpipes subject to freezing until weather protected.
- L. Sprinklers: Install, test and activate new automatic sprinklers prior to removing existing sprinklers unless otherwise approved by Project Engineer and facility Safety Officer. Removal of existing automatic sprinklers prior to installation of new sprinkler system will require an alternate fire detection/suppression system or 24 hour fire watch.
- M. Existing Fire Protection: Do not impair automatic sprinklers, smoke and heat detection, and fire alarm systems, except for portions immediately under construction, and temporarily for connections. Provide fire watch for impairments more than 4 hours in a 24-hour period. Request interruptions in accordance with Article, OPERATIONS AND STORAGE AREAS, and coordinate with Project Engineer and facility Safety Officer . All existing or temporary fire protection systems (fire alarms, sprinklers) located in construction areas shall be tested as coordinated with the medical center policies. Parameters for the testing and results of any tests performed shall be recorded by the contractor and copies provided to the Project Engineer.
- N. Smoke Detectors: Prevent accidental operation. Remove temporary covers at end of work operations each day. Coordinate with Project Engineer and facility Safety Officer .
- O. Hot Work: Perform and safeguard hot work operations in accordance with NFPA 241 and NFPA 51B. Coordinate with Project Engineer. Obtain permits from Project Engineer or facility Safety Officer at least 4 hours in advance .
 - 1. HOT WORK PRACTICES: The following procedures will be followed regarding hot work at the Medical Center. Hot work is defined as cutting with a torch, arc welding, T.I.G. welding, soldering with an open flame, and any other operations involving an open flame.
 - 2. The Contractor is required to obtain a permit for hot work from the Project Engineer. (Obtain form from Project Engineer)The Contractor and the Project Engineer will evaluate each situation and decide on the proper course of action. If there is combustible debris, combustible material adjacent to the work area, or holes in walls or floors, any of which could be flammable, the Contractor will provide a continuous fire watch, a fire extinguisher, and obtain a permit from the Project Engineer as required.
 - 3. The fire watch will inspect the area for both obvious and concealed sources of combustion during and for a minimum of thirty (30) minutes after completion of the work.

- P. Fire Hazard Prevention and Safety Inspections: Inspect entire construction areas weekly. Coordinate with, and report findings and corrective actions weekly to Project Engineer and facility Safety Officer .
- Q. Smoking: Smoking is prohibited in and adjacent to construction areas inside existing buildings and additions under construction. In separate and detached buildings under construction, smoking is prohibited except in designated smoking rest areas.
- R. Dispose of waste and debris in accordance with NFPA 241. Remove from buildings daily.
- S. Perform other construction, alteration and demolition operations in accordance with 29 CFR 1926.

1.6 OPERATIONS AND STORAGE AREAS

- A. The Contractor shall confine all operations (including storage of materials) on Government premises to areas authorized or approved by the Contracting Officer. The Contractor shall hold and save the Government, its officers and agents, free and harmless from liability of any nature occasioned by the Contractor's performance.
- B. Temporary buildings (e.g., storage sheds, shops, offices) and utilities may be erected by the Contractor only with the approval of the Contracting Officer and shall be built with labor and materials furnished by the Contractor without expense to the Government. The temporary buildings and utilities shall remain the property of the Contractor and shall be removed by the Contractor at its expense upon completion of the work. With the written consent of the Contracting Officer, the buildings and utilities may be abandoned and need not be removed.
- C. The Contractor shall, under regulations prescribed by the Contracting Officer, use only established roadways, or use temporary roadways constructed by the Contractor when and as authorized by the Contracting Officer. When materials are transported in prosecuting the work, vehicles shall not be loaded beyond the loading capacity recommended by the manufacturer of the vehicle or prescribed by any Federal, State, or local law or regulation. When it is necessary to cross curbs or sidewalks, the Contractor shall protect them from damage. The Contractor shall repair or pay for the repair of any damaged curbs, sidewalks, or roads. Contractor will contact local transit authority if work will impact public transportation.

(FAR 52.236-10)

- D. Working space and space available for storing materials shall be as shown on the drawings. and/or as determined by the Project Engineer.

- E. Workmen are subject to rules of Medical Center applicable to their conduct.
- F. Execute work so as to interfere as little as possible with normal functioning of Medical Center as a whole, including operations of utility services, fire protection systems and any existing equipment, and with work being done by others. Use of equipment and tools that transmit vibrations and noises through the building structure, are not permitted in buildings that are occupied, during construction, jointly by patients or medical personnel, and Contractor's personnel, except as permitted by Project Engineer where required by limited working space.
 - 1. Do not store materials and equipment in other than assigned areas.
 - 2. Schedule delivery of materials and equipment to immediate construction working areas within buildings in use by Department of Veterans Affairs in quantities sufficient for not more than two work days. Provide unobstructed access to Medical Center areas required to remain in operation.
 - 3. Where access by Medical Center personnel to vacated portions of buildings is not required, storage of Contractor's materials and equipment will be permitted subject to fire and safety requirements.
- G. Utilities Services: Where necessary to cut existing pipes, electrical wires, conduits, cables, etc., of utility services, or of fire protection systems or communications systems (except telephone), they shall be cut and capped at suitable places where shown; or, in absence of such indication, where directed by Project Engineer. All such actions shall be coordinated with the Utility Company involved:
 - 1. Whenever it is required that a connection fee be paid to a public utility provider for new permanent service to the construction project, for such items as water, sewer, electricity, gas or steam, payment of such fee shall be the responsibility of the Government and not the Contractor.
- H. Phasing: To insure such executions, Contractor shall furnish the Project Engineer with a schedule of approximate dates on which the Contractor intends to accomplish work in each specific area of site, building or portion thereof. In addition, Contractor shall notify the Project Engineer two weeks in advance of the proposed date of starting work in each specific area of site, building or portion thereof. Arrange such dates to insure accomplishment of this work in successive phases mutually agreeable to Medical Center Director, Project Engineer and Contractor, as follows:

Phase I: Submittals (30 Calendar Days)

Phase II: Construction of new Building and remodeled areas (545 Calendar days.)

A total of 575 calendar days will be allowed for the construction process as outlined above.

- I. 1. **Work under the contract shall be conducted between the hours of 7:00 AM and 4:30 PM Monday thru Friday with the exception of work which generates noise thru the building structure (i.e. jackhammering, rotohammering, sledgehammer work, installation of powder driven fasteners, etc.) which shall be conducted between the hours of 4:30 PM and 9:00 PM Monday thru Friday or during normal working hours on weekends. Work may be conducted on weekends with prior approval of the Resident Engineer. The work shifts outlined above will be subject to intermittent cessation of noise generating activities due to emergency surgeries, etc., which may occur at random times during the period. No additional contract costs will be entertained based upon this item of coordination for premium and/or overtime. Work conducted on weekends and holidays must have prior approval from the Resident Engineer.**

2. **All equipment, including cranes, must be outfitted with catalytic convertors or use other means such as electric motors to prevent exhaust fumes from entering the intakes of the existing Air Handling Units serving occupied areas of the building. Carbon filters will be required to be installed at any intakes where exhaust fumes may enter.**

- J. Building No. 1 will be occupied during performance of work . ; but immediate areas of alterations will be vacated. Refer to the phasing notes on the drawings for additional information regarding phasing and work restrictions on construction activities in occupied areas of the Hospital.

1. Contractor shall take all measures and provide all material necessary for protecting existing equipment and property in affected areas of construction against dust and debris, so that equipment and affected areas to be used in the Medical Centers operations will not be hindered. Contractor shall permit access to Department of Veterans Affairs personnel and patients through other construction areas which serve as routes of access to such affected areas and equipment. Coordinate alteration work in areas occupied by Department of Veterans Affairs so that Medical Center operations will continue during the construction period.
2. Immediate areas of alterations not mentioned in preceding Subparagraph 1 will be temporarily vacated while alterations are performed.

- K. Construction Fence: Before construction operations begin, Contractor shall provide a chain link construction fence, 2100 mm (seven feet) minimum height, around the construction area indicated on the drawings. Provide gates as required for access with necessary hardware, including hasps and padlocks. Fasten fence fabric to terminal posts with tension bands and to line posts and top and bottom rails with tie wires spaced at maximum 15 inches. Bottom of fences shall extend to one inch above grade. Remove the fence when directed by Project Engineer. All entrances from construction and lay down areas will have a tire wash station as detailed in the contract drawings.
- L. When a building is turned over to Contractor, Contractor shall accept entire responsibility therefore.
1. Contractor shall maintain a minimum temperature of 4 degrees C (40 degrees F) at all times, except as otherwise specified.
 2. Contractor shall maintain in operating condition existing fire protection and alarm equipment. In connection with fire alarm equipment, Contractor shall make arrangements for pre-inspection of site with Fire Department or Company (Department of Veterans Affairs or municipal) whichever will be required to respond to an alarm from Contractor's employee or watchman.
- M. Utilities Services: Maintain existing utility services for Medical Center at all times. Provide temporary facilities, labor, materials, equipment, connections, and utilities to assure uninterrupted services. Where necessary to cut existing water, steam, gases, sewer or air pipes, or conduits, wires, cables, etc. of utility services or of fire protection systems and communications systems (including telephone), they shall be cut and capped at suitable places where shown; or, in absence of such indication, where directed by Project Engineer.
1. No utility service such as water, gas, steam, sewers or electricity, or fire protection systems and communications systems may be interrupted without prior approval of Project Engineer. Electrical work shall be accomplished with all affected circuits or equipment de-energized. When an electrical outage cannot be accomplished, work on any energized circuits or equipment shall not commence without the Medical Center Director's prior knowledge and written approval. Refer to specification Sections 26 05 11, REQUIREMENTS FOR ELECTRICAL INSTALLATIONS, 27 05 11 REQUIREMENTS FOR COMMUNICATIONS INSTALLATIONS and 28 05 11, REQUIREMENTS FOR ELECTRONIC SAFETY AND SECURITY INSTALLATIONS for additional requirements.

2. Contractor shall submit a request to interrupt any such services to Project Engineer, in writing, 48 hours in advance of proposed interruption. Request shall state reason, date, exact time of, and approximate duration of such interruption.
 3. Contractor will be advised (in writing) of approval of request, or of which other date and/or time such interruption will cause least inconvenience to operations of Medical Center. Interruption time approved by Medical Center may occur at other than Contractor's normal working hours.
 4. Major interruptions of any system must be requested, in writing, at least 15 calendar days prior to the desired time and shall be performed as directed by the Project Engineer.
 5. In case of a contract construction emergency, service will be interrupted on approval of Project Engineer. Such approval will be confirmed in writing as soon as practical.
 6. Whenever it is required that a connection fee be paid to a public utility provider for new permanent service to the construction project, for such items as water, sewer, electricity, gas or steam, payment of such fee shall be the responsibility of the Government and not the Contractor.
- N. Abandoned Lines: All service lines such as wires, cables, conduits, ducts, pipes and the like, and their hangers or supports, which are to be abandoned but are not required to be entirely removed, shall be sealed, capped or plugged. The lines shall not be capped in finished areas, but shall be removed and sealed, capped or plugged in ceilings, within furred spaces, in unfinished areas, or within walls or partitions; so that they are completely behind the finished surfaces. If shut-off valves are concealed, such as in acoustical ceilings, a sign will be placed in a visible location.
- O. To minimize interference of construction activities with flow of Medical Center traffic, comply with the following:
1. Keep roads, walks and entrances to grounds, to parking and to occupied areas of buildings clear of construction materials, debris and standing construction equipment and vehicles. Wherever excavation for new utility lines cross existing roads, at least one lane must be open to traffic at all times.
 2. Method and scheduling of required cutting, altering and removal of existing roads, walks and entrances must be approved by the Project Engineer.
- P. Coordinate the work for this contract with other construction operations as directed by Project Engineer. This includes the scheduling of traffic and the use of roadways, as specified in Article, USE OF ROADWAYS.

1.7 ALTERATIONS

- A. Survey: Before any work is started, the Contractor shall make a thorough survey with the Project Engineer and a representative of VA Acquisition and Material Management Service, of buildings and/or areas of buildings in which alterations occur and areas which are anticipated routes of access, and furnish a report, with digital photos, signed by all three, to the Contracting Officer. This report shall list by rooms and spaces:
1. Existing condition and types of resilient flooring, doors, windows, walls and other surfaces not required to be altered throughout affected areas of buildings.
 2. Existence and conditions of items such as plumbing fixtures and accessories, electrical fixtures, equipment, venetian blinds, shades, etc., required by drawings to be either reused or relocated, or both.
 3. Shall note any discrepancies between drawings and existing conditions at site.
 4. Shall designate areas for working space, materials storage and routes of access to areas within buildings where alterations occur and which have been agreed upon by Contractor and Project Engineer.
- B. Any items required by drawings to be either reused or relocated or both, found during this survey to be nonexistent, or in opinion of Project Engineer, to be in such condition that their use is impossible or impractical, shall be furnished and or replaced by Contractor with new items in accordance with specifications which will be furnished by Government. Provided the contract work is changed by reason of this subparagraph B, the contract will be modified accordingly, under provisions of clause entitled "DIFFERING SITE CONDITIONS" (FAR 52.236-2) and "CHANGES" (FAR 52.243-4 and VAAR 852.236-88) of Section 00 72 00, GENERAL CONDITIONS.
- C. Re-Survey: Thirty days before expected partial or final inspection date, the Contractor and Project Engineer together shall make a thorough re-survey of the areas of buildings involved. They shall furnish a report, with digital photos, on conditions then existing, of resilient flooring, doors, windows, walls and other surfaces as compared with conditions of same as noted in first condition survey report:
1. Re-survey report shall also list any damage caused by Contractor to such flooring and other surfaces, despite protection measures; and, will form basis for determining extent of repair

work required of Contractor to restore damage caused by Contractor's workmen in executing work of this contract.

D. Protection: Provide the following protective measures:

1. Wherever existing roof surfaces are disturbed they shall be protected against water infiltration. In case of leaks, they shall be repaired immediately upon discovery.
2. Temporary protection against damage for portions of existing structures and grounds where work is to be done, materials handled and equipment moved and/or relocated.
3. Protection of interior of existing structures at all times, from damage, dust and weather inclemency. Wherever work is performed, floor surfaces that are to remain in place shall be adequately protected prior to starting work, and this protection shall be maintained intact until all work in the area is completed.

1.8 INFECTION PREVENTION MEASURES

- A. Implement the requirements of VAMC's Infection Control Risk Assessment (ICRA) team. ICRA Group may monitor dust in the vicinity of the construction work and require the Contractor to take corrective action immediately if the safe levels are exceeded.
- B. Establish and maintain a dust control program as part of the contractor's infection preventive measures in accordance with the guidelines provided by ICRA Group as specified here. Prior to start of work, prepare a plan detailing project-specific dust protection measures, including periodic status reports, and submit to Project Engineer and Facility ICRA team for review for compliance with contract requirements in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES.
 1. All personnel involved in the construction or renovation activity shall be educated and trained in infection prevention measures established by the medical center.
- C. Medical center Infection Control personnel shall monitor for airborne disease (e.g. aspergillosis) as appropriate during construction. A baseline of conditions may be established by the medical center prior to the start of work and periodically during the construction stage to determine impact of construction activities on indoor air quality. In addition:
 1. The Project Engineer and VAMC Infection Control personnel shall review pressure differential monitoring documentation to verify that pressure differentials in the construction zone and in the patient-care rooms are appropriate for their settings. The requirement for

- negative air pressure in the construction zone shall depend on the location and type of activity. Upon notification, the contractor shall implement corrective measures to restore proper pressure differentials as needed.
2. In case of any problem, the medical center, along with assistance from the contractor, shall conduct an environmental assessment to find and eliminate the source.
- D. In general, following preventive measures shall be adopted during construction to keep down dust and prevent mold.
1. Dampen debris to keep down dust and provide temporary construction partitions in existing structures where directed by Project Engineer. Blank off ducts and diffusers to prevent circulation of dust into occupied areas during construction.
 2. Do not perform dust producing tasks within occupied areas without the approval of the Project Engineer. For construction in any areas that will remain jointly occupied by the medical Center and Contractor's workers, the Contractor shall:
 - a. Provide dust proof one-hour minimum fire-rated/ temporary drywall construction barriers rated as appropriate, to completely separate construction from the operational areas of the hospital in order to contain dirt debris and dust. Barriers shall be sealed and made presentable on hospital occupied side. Install a self-closing rated door in a metal frame, commensurate with the partition, to allow worker access. Maintain negative air at all times. Openings in the temporary one-hour wall shall be protected with assemblies having a minimum fire protection rating of 45-minutes. A fire retardant polystyrene, 6-mil thick or greater plastic barrier meeting local fire codes may be used where dust control is the only hazard, and an agreement is reached with the Project Engineer and Medical Center.
 - b. HEPA filtration is required where the exhaust dust may reenter the breathing zone. Contractor shall verify that construction exhaust to exterior is not reintroduced to the medical center through intake vents, or building openings. Install HEPA (High Efficiency Particulate Accumulator) filter vacuum system rated at 95% capture of 0.3 microns including pollen, mold spores and dust particles. Insure continuous negative air pressures occurring within the work area. HEPA filters should have ASHRAE 85 or other prefilter to extend the useful life of the HEPA. Provide both primary and secondary filtrations units. Exhaust hoses shall be heavy duty, flexible steel reinforced and exhausted so that dust is not reintroduced to the medical center.

- c. Adhesive Walk-off/Carpet Walk-off Mats, minimum 600mm x 900mm (24" x 36"), shall be used at all interior transitions from the construction area to occupied medical center area. These mats shall be changed as often as required to maintain clean work areas directly outside construction area at all times.
 - d. Vacuum and wet mop all transition areas from construction to the occupied medical center at the end of each workday. Vacuum shall utilize HEPA filtration. Maintain surrounding area frequently. Remove debris as they are created. Transport these outside the construction area in containers with tightly fitting lids.
 - e. The contractor shall not haul debris through patient-care areas without prior approval of the Project Engineer and the Medical Center. When, approved, debris shall be hauled in enclosed dust proof containers or wrapped in plastic and sealed with duct tape. No sharp objects should be allowed to cut through the plastic. Wipe down the exterior of the containers with a damp rag to remove dust. All equipment, tools, material, etc. transported through occupied areas shall be made free from dust and moisture by vacuuming and wipe down.
 - f. Using a HEPA vacuum, clean inside the barrier and vacuum ceiling tile prior to replacement. Any ceiling access panels opened for investigation beyond sealed areas shall be sealed immediately when unattended.
 - g. There shall be no standing water during construction. This includes water in equipment drip pans and open containers within the construction areas. All accidental spills must be cleaned up and dried within 12 hours. Remove and dispose of porous materials that remain damp for more than 72 hours.
 - h. At completion, remove construction barriers and ceiling protection carefully, outside of normal work hours. Vacuum and clean all surfaces free of dust after the removal.
- E. Final Cleanup:
1. Upon completion of project, or as work progresses, remove all construction debris from above ceiling, vertical shafts and utility chases that have been part of the construction.
 2. Perform HEPA vacuum cleaning of all surfaces in the construction area. This includes walls, ceilings, cabinets, furniture (built-in or free standing), partitions, flooring, etc.
 3. All new air ducts shall be cleaned prior to final inspection.

1.9 DISPOSAL AND RETENTION

- A. Materials and equipment accruing from work removed and from demolition of buildings or structures, or parts thereof, shall be disposed of as follows:
1. Reserved items which are to remain property of the Government are identified by attached tags or noted on drawings or in specifications as items to be stored. Items that remain property of the Government shall be removed or dislodged from present locations in such a manner as to prevent damage which would be detrimental to re-installation and reuse. Store such items where directed by Project Engineer.
 2. Items not reserved shall become property of the Contractor and be removed by Contractor from Medical Center.
 3. Items of portable equipment and furnishings located in rooms and spaces in which work is to be done under this contract shall remain the property of the Government. When rooms and spaces are vacated by the Department of Veterans Affairs during the alteration period, such items which are NOT required by drawings and specifications to be either relocated or reused will be removed by the Government in advance of work to avoid interfering with Contractor's operation.

1.10 PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS

- A. The Contractor shall preserve and protect all structures, equipment, and vegetation (such as trees, shrubs, and grass) on or adjacent to the work site, which are not to be removed and which do not unreasonably interfere with the work required under this contract. The Contractor shall only remove trees when specifically authorized to do so, and shall avoid damaging vegetation that will remain in place. If any limbs or branches of trees are broken during contract performance, or by the careless operation of equipment, or by workmen, the Contractor shall trim those limbs or branches with a clean cut and paint the cut with a tree-pruning compound as directed by the Contracting Officer.
- B. The Contractor shall protect from damage all existing improvements and utilities at or near the work site and on adjacent property of a third party, the locations of which are made known to or should be known by the Contractor. The Contractor shall repair any damage to those facilities, including those that are the property of a third party, resulting from failure to comply with the requirements of this contract or failure to exercise reasonable care in performing the work. If the

Contractor fails or refuses to repair the damage promptly, the Contracting Officer may have the necessary work performed and charge the cost to the Contractor.

(FAR 52.236-9)

- C. Refer to Section 01 57 19, TEMPORARY ENVIRONMENTAL CONTROLS, for additional requirements on protecting vegetation, soils and the environment. Refer to Articles, "Alterations", "Restoration", and "Operations and Storage Areas" for additional instructions concerning repair of damage to structures and site improvements.

1.11 RESTORATION

- A. Remove, cut, alter, replace, patch and repair existing work as necessary to install new work. Except as otherwise shown or specified, do not cut, alter or remove any structural work, and do not disturb any ducts, plumbing, steam, gas, or electric work without approval of the Project Engineer. Existing work to be altered or extended and that is found to be defective in any way, shall be reported to the Project Engineer before it is disturbed. Materials and workmanship used in restoring work, shall conform in type and quality to that of original existing construction, except as otherwise shown or specified.
- B. Upon completion of contract, deliver work complete and undamaged. Existing work (walls, ceilings, partitions, floors, mechanical and electrical work, lawns, paving, roads, walks, etc.) disturbed or removed as a result of performing required new work, shall be patched, repaired, reinstalled, or replaced with new work, and refinished and left in as good condition as existed before commencing work.
- C. At Contractor's own expense, Contractor shall immediately restore to service and repair any damage caused by Contractor's workmen to existing piping and conduits, wires, cables, etc., of utility services or of fire protection systems and communications systems (including telephone) which are indicated on drawings and which are not scheduled for discontinuance or abandonment.
- D. Expense of repairs to such utilities and systems not shown on drawings or locations of which are unknown will be covered by adjustment to contract time and price in accordance with clause entitled "CHANGES" (FAR 52.243-4 and VAAR 852.236-88) and "DIFFERING SITE CONDITIONS" (FAR 52.236-2) of Section 00 72 00, GENERAL CONDITIONS.

1.12 PHYSICAL DATA (NOT APPLICABLE_

1.13 PROFESSIONAL SURVEYING SERVICES

A registered professional land surveyor or registered civil engineer, with current Washington State registration, whose services are retained and paid for by the Contractor, shall perform services specified herein and in other specification sections. The Contractor shall certify that the land surveyor or civil engineer is not one who is a regular employee of the Contractor, and that the land surveyor or civil engineer has no financial interest in this contract.

1.14 LAYOUT OF WORK

- A. The Contractor shall lay out the work from Government established base lines and bench marks, indicated on the drawings, and shall be responsible for all measurements in connection with the layout. **The contractor will provide a third party licensed (State of Washington) professional surveyor to verify all grades and building elevations through the course of the project, contractor to provide weekly survey reports on the findings, elevation and layout notes.** The Contractor shall furnish, at Contractor's own expense, all stakes, templates, platforms, equipment, tools, materials, and labor required to lay out any part of the work. The Contractor shall be responsible for executing the work to the lines and grades that may be established or indicated by the Contracting Officer. The Contractor shall also be responsible for maintaining and preserving all stakes and other marks established by the Contracting Officer until authorized to remove them. If such marks are destroyed by the Contractor or through Contractor's negligence before their removal is authorized, the Contracting Officer may replace them and deduct the expense of the replacement from any amounts due or to become due to the Contractor.

(FAR 52.236-17)

- B. Establish and plainly mark center lines for each building and/or addition to each existing building, and such other lines and grades that are reasonably necessary to properly assure that location, orientation, and elevations established for each such structure and/or addition, roads, parking lots, are in accordance with lines and elevations shown on contract drawings.
- C. Following completion of general mass excavation and before any other permanent work is performed, establish and plainly mark (through use of appropriate batter boards or other means) sufficient additional survey control points or system of points as may be necessary to assure proper alignment, orientation, and grade of all major features of work. Survey shall include, but

not be limited to, location of lines and grades of footings, exterior walls, center lines of columns in both directions, major utilities and elevations of floor slabs:

1. Such additional survey control points or system of points thus established shall be checked and certified by a registered land surveyor or registered civil engineer. Furnish such certification to the Project Engineer before any work (such as footings, floor slabs, columns, walls, utilities and other major controlling features) is placed.
- D. Contractor shall furnish to the Project Engineer certificates from a registered land surveyor or registered civil engineer that the following work is complete in every respect as required by contract drawings.
1. Lines of each building and/or addition.
 2. Elevations of bottoms of footings and tops of floors of each building and/or addition.
 3. Lines and elevations of sewers and of all outside distribution systems.
- E. Whenever changes from contract drawings are made in line or grading requiring certificates, record such changes on a reproducible drawing bearing the registered land surveyor or registered civil engineer seal, and forward these drawings upon completion of work to Project Engineer.
- F. The Contractor shall perform the surveying and layout work of this and other articles and specifications in accordance with the provisions of Article "Professional Surveying Services".

1.15 AS-BUILT DRAWINGS

- A. The contractor shall maintain two full size sets of as-built drawings which will be kept current during construction of the project, to include all contract changes, modifications and clarifications.
- B. All variations shall be shown in the same general detail as used in the contract drawings. To insure compliance, as-built drawings shall be made available for the Project Engineer's review, as often as requested.
- C. Contractor shall deliver two approved completed sets of as-built drawings to the Project Engineer within 15 calendar days after each completed phase and after the acceptance of the project by the Project Engineer.
- D. Paragraphs A, B, & C shall also apply to all shop drawings.

1.16 USE OF ROADWAYS

- A. For hauling, use only established public roads and roads on Medical Center property and, when authorized by the Project Engineer, such temporary roads which are necessary in the performance of contract work. Temporary roads shall be constructed by the Contractor at Contractor's expense. When necessary to cross curbing, sidewalks, or similar construction, they must be protected by well-constructed bridges.
- B. When new permanent roads are to be a part of this contract, Contractor may construct them immediately for use to facilitate building operations. These roads may be used by all who have business thereon within zone of building operations.
- C. When certain buildings (or parts of certain buildings) are required to be completed in advance of general date of completion, all roads leading thereto must be completed and available for use at time set for completion of such buildings or parts thereof.

1.17 PROJECT ENGINEER'S FIELD OFFICE (NOT APPLICABLE)

1.18 TEMPORARY USE OF MECHANICAL AND ELECTRICAL EQUIPMENT

- A. Use of new installed mechanical and electrical equipment to provide heat, ventilation, plumbing, light and power will be permitted subject to compliance with the following provisions:
 - 1. Permission to use each unit or system must be given by Project Engineer. If the equipment is not installed and maintained in accordance with the following provisions, the Project Engineer will withdraw permission for use of the equipment.
 - 2. Electrical installations used by the equipment shall be completed in accordance with the drawings and specifications to prevent damage to the equipment and the electrical systems, i.e. transformers, relays, circuit breakers, fuses, conductors, motor controllers and their overload elements shall be properly sized, coordinated and adjusted. Voltage supplied to each item of equipment shall be verified to be correct and it shall be determined that motors are not overloaded. The electrical equipment shall be thoroughly cleaned before using it and again immediately before final inspection including vacuum cleaning and wiping clean interior and exterior surfaces.
 - 3. Units shall be properly lubricated, balanced, and aligned. Vibrations must be eliminated.
 - 4. Automatic temperature control systems for preheat coils shall function properly and all safety controls shall function to prevent coil freeze-up damage.

5. The air filtering system utilized shall be that which is designed for the system when complete, and all filter elements shall be replaced at completion of construction and prior to testing and balancing of system.
 6. All components of heat production and distribution system, metering equipment, condensate returns, and other auxiliary facilities used in temporary service shall be cleaned prior to use; maintained to prevent corrosion internally and externally during use; and cleaned, maintained and inspected prior to acceptance by the Government.
- B. Prior to final inspection, the equipment or parts used which show wear and tear beyond normal, shall be replaced with identical replacements, at no additional cost to the Government.
- C. This paragraph shall not reduce the requirements of the mechanical and electrical specifications sections.

1.19 TEMPORARY USE OF EXISTING ELEVATORS

- A. Use of existing elevators for handling building materials and Contractor's personnel will **not** be permitted and subject to following provisions:
1. Contractor will provide all means of access to work areas by use of temporary stairs, lifts, hoists, cranes. Contractor may choose to construct the Permanent stair well for access to the site. The west site may use the existing stair well, if the remaining stairwell is constructed to the second floor. Existing access to building must be maintained and emergency exit will remain clear at all times.
 2. Once Building envelope is completed and a majority of the interior is complete, The VA will allow contractor use of the elevators, if Contractor covers and provides maximum protection of following elevator components:
 - a. Entrance jambs, heads soffits and threshold plates.
 - b. Entrance columns, canopy, return panels and inside surfaces of car enclosure walls.
 - c. Finish flooring.

1.20 TEMPORARY USE OF NEW ELEVATORS

- A. The Contractor and his personnel shall be permitted use of new elevator(s) subject to the following provisions:

1. Contractor shall make arrangements with the Project Engineer for use of elevator(s). Contractor may obtain elevator(s) for exclusive use.
2. Prior to the use of elevator(s), the Contractor shall have the elevator(s) inspected and accepted by an ASME accredited, certified elevator safety inspector. The acceptance report shall be submitted to the Project Engineer.
3. Submit to the Project Engineer the schedule and procedures for maintaining equipment. Indicate the day or days of the week and total hours required for maintenance. A report shall be submitted to the Project Engineer monthly indicating the type of maintenance conducted, hours used, and any repairs made to the elevator(s).
4. The Contractor shall be responsible for enforcing the maintenance procedures.
5. During temporary use of elevator(s) all repairs, equipment replacement and cost of maintenance shall be the responsibility of the Contractor.
6. Personnel for operating elevator(s) shall not be provided by the Department of Veterans Affairs.
7. Contractor shall cover and provide maximum protection of the entire elevator(s) installation.
8. The Contractor shall arrange for the elevator company to perform operation of the elevator(s) so that an ASME accredited, certified elevator safety inspector can evaluate the equipment. The Contractor shall be responsible for any costs of the elevator company.
9. All elevator(s) parts worn or damaged during temporary use shall be removed and replaced with new parts. This shall be determined by an ASME accredited certified elevator safety inspector after temporary use and before acceptance by the Government. Submit report to the Project Engineer for approval.
10. Elevator shall be tested as required by the testing section of the elevator(s) specifications before acceptance by the Department of Veterans Affairs.

1.21 TEMPORARY TOILETS

- A. Provide where directed, (for use of all Contractor's workmen) ample temporary sanitary toilet accommodations with suitable sewer and water connections; or, when approved by Project Engineer, provide suitable dry closets where directed. Keep such places clean and free from flies,

and all connections and appliances connected therewith are to be removed prior to completion of contract, and premises left perfectly clean.

- B. Contractor may have for use of Contractor's workmen, such toilet accommodations as may be assigned to Contractor by Medical Center . Contractor shall keep such places clean and be responsible for any damage done thereto by Contractor's workmen. Failure to maintain satisfactory condition in toilets will deprive Contractor of the privilege to use such toilets.

1.22 AVAILABILITY AND USE OF UTILITY SERVICES

- A. The Government shall make all reasonably required amounts of utilities available to the Contractor from existing outlets and supplies, as specified in the contract. The amount to be paid by the Contractor for chargeable electrical services shall be the prevailing rates charged to the Government. The Contractor shall carefully conserve any utilities furnished without charge.
- B. The Contractor, at Contractor's expense and in a workmanlike manner satisfactory to the Contracting Officer, shall install and maintain all necessary temporary connections and distribution lines, and all meters required to measure the amount of electricity used for the purpose of determining charges. Before final acceptance of the work by the Government, the Contractor shall remove all the temporary connections, distribution lines, meters, and associated equipment.
- C. Contractor shall install meters at Contractor's expense and furnish the Medical Center a monthly record of the Contractor's usage of electricity as hereinafter specified.
- D. Heat: Furnish temporary heat necessary to prevent injury to work and materials through dampness and cold. Use of open salamanders or any temporary heating devices which may be fire hazards or may smoke and damage finished work, will not be permitted. Maintain minimum temperatures as specified for various materials:
 - 1. Obtain heat by connecting to Medical Center heating distribution system.
- E. Electricity (for Construction and Testing): Furnish all temporary electric services.
 - 1. Obtain electricity by connecting to the Medical Center electrical distribution system. The Contractor shall meter and pay for electricity required for electric cranes and hoisting devices, electrical welding devices and any electrical heating devices providing temporary heat. Electricity for all other uses is available at no cost to the Contractor.
- F. Water (for Construction and Testing): Furnish temporary water service.

1. Obtain water by connecting to the Medical Center water distribution system. Provide reduced pressure backflow preventer at each connection. Water is available at no cost to the Contractor.
2. Maintain connections, pipe, fittings and fixtures and conserve water-use so none is wasted. Failure to stop leakage or other wastes will be cause for revocation (at Project Engineer's discretion) of use of water from Medical Center's system.
3. Any evidence of wasting water (i.e. Leaving unattended water hoses running) will result in metering the water use at the Contractor's expense and reimbursement of the water use to the VA.

G. Steam: Furnish steam system for testing required in various sections of specifications.

1. Steam for testing is available at no cost to the Contractor.
2. Maintain connections, pipe, fittings and fixtures and conserve steam-use so none is wasted. Failure to stop leakage or other waste will be cause for revocation (at Project Engineer's discretion), of use of steam from the Medical Center's system.

H. Fuel: Natural and LP gas and burner fuel oil required for boiler cleaning, normal initial boiler-burner setup and adjusting, and for performing the specified boiler tests will be furnished by the Government. Fuel required for prolonged boiler-burner setup, adjustments, or modifications due to improper design or operation of boiler, burner, or control devices shall be furnished by the Contractor at Contractor's expense.

1.23 NEW TELEPHONE EQUIPMENT

The contractor shall coordinate with the work of installation of telephone equipment by others. This work shall be completed before the building is turned over to VA.

1.24 TESTS

- A. Pre-test mechanical and electrical equipment and systems and make corrections required for proper operation of such systems before requesting final tests. Final test will not be conducted unless pre-tested.
- B. Conduct final tests required in various sections of specifications in presence of an authorized representative of the Contracting Officer. Contractor shall furnish all labor, materials, equipment, instruments, and forms, to conduct and record such tests.

- C. Mechanical and electrical systems shall be balanced, controlled and coordinated. A system is defined as the entire complex which must be coordinated to work together during normal operation to produce results for which the system is designed. For example, air conditioning supply air is only one part of entire system which provides comfort conditions for a building. Other related components are return air, exhaust air, steam, chilled water, refrigerant, hot water, controls and electricity, etc. Another example of a complex which involves several components of different disciplines is a boiler installation. Efficient and acceptable boiler operation depends upon the coordination and proper operation of fuel, combustion air, controls, steam, feedwater, condensate and other related components.
- D. All related components as defined above shall be functioning when any system component is tested. Tests shall be completed within a reasonably short period of time during which operating and environmental conditions remain reasonably constant.
- E. Individual test result of any component, where required, will only be accepted when submitted with the test results of related components and of the entire system.

1.25 INSTRUCTIONS

- A. Contractor shall furnish Maintenance and Operating manuals and verbal instructions when required by the various sections of the specifications and as hereinafter specified.
- B. Manuals: Maintenance and operating manuals (Two copies each) for each separate piece of equipment shall be delivered to the Project Engineer coincidental with the delivery of the equipment to the job site. Manuals shall be complete, detailed guides for the maintenance and operation of equipment. They shall include complete information necessary for starting, adjusting, maintaining in continuous operation for long periods of time and dismantling and reassembling of the complete units and sub-assembly components. Manuals shall include an index covering all component parts clearly cross-referenced to diagrams and illustrations. Illustrations shall include "exploded" views showing and identifying each separate item. Emphasis shall be placed on the use of special tools and instruments. The function of each piece of equipment, component, accessory and control shall be clearly and thoroughly explained. All necessary precautions for the operation of the equipment and the reason for each precaution shall be clearly set forth. Manuals must reference the exact model, style and size of the piece of equipment and system being furnished. Manuals referencing equipment similar to but of a different model, style, and size than that furnished will not be accepted.
- C. Instructions: Contractor shall provide qualified, factory-trained manufacturers' representatives to give detailed instructions to assigned Department of Veterans Affairs personnel in the operation and complete maintenance for each piece of equipment. All such training will be at the job site.

These requirements are more specifically detailed in the various technical sections. Instructors for all aspects in the operation of the provided equipment in a system shall be available until instructions for all items included in the system have been completed. Instructions shall be given in an integrated, progressive manner. This is to assure proper instruction in the operation of inter-related systems. All instruction periods shall be at such times as scheduled by the Project Engineer and shall be considered concluded only when the Project Engineer is satisfied in regard to complete and thorough coverage. The Department of Veterans Affairs reserves the right to request the removal of, and substitution for, any instructor who, in the opinion of the Project Engineer, does not demonstrate sufficient qualifications in accordance with requirements for instructors above.

1.26 GOVERNMENT-FURNISHED PROPERTY

- A. The Government shall deliver to the Contractor, the Government-furnished property shown on the Schedule and/or drawings.
- B. Equipment furnished by Government to be installed by Contractor will be furnished to Contractor at the Medical Center.
- C. Storage space for equipment will be provided by the Government and the Contractor shall be prepared to unload and store such equipment therein upon its receipt at the Medical Center.
- D. Notify Contracting Officer in writing, 60 days in advance, of date on which Contractor will be prepared to receive equipment furnished by Government. Arrangements will then be made by the Government for delivery of equipment.
 - 1. Immediately upon delivery of equipment, Contractor shall arrange for a joint inspection thereof with a representative of the Government. At such time the Contractor shall acknowledge receipt of equipment described, make notations, and immediately furnish the Government representative with a written statement as to its condition or shortages.
 - 2. Contractor thereafter is responsible for such equipment until such time as acceptance of contract work is made by the Government.
- E. Equipment furnished by the Government will be delivered in a partially assembled (knock down) condition in accordance with existing standard commercial practices, complete with all fittings, fastenings, and appliances necessary for connections to respective services installed under contract. All fittings and appliances (i.e., couplings, ells, tees, nipples, piping, conduits, cables, and the like) necessary to make the connection between the Government furnished equipment

item and the utility stub-up shall be furnished and installed by the contractor at no additional cost to the Government.

- F. Completely assemble and install the Government furnished equipment in place ready for proper operation in accordance with specifications and drawings.
- G. Furnish supervision of installation of equipment at construction site by qualified factory trained technicians regularly employed by the equipment manufacturer.

1.27 RELOCATED EQUIPMENT AND ITEMS

- A. Contractor shall disconnect, dismantle as necessary, remove and reinstall in new location, all existing equipment and other items shown to be relocated by the Contractor.
- B. Perform relocation of such equipment or items at such times and in such a manner as directed by the Project Engineer.
- C. Suitably cap existing service lines, such as steam, condensate return, water, drain, gas, air, vacuum and/or electrical, whenever such lines are disconnected from equipment to be relocated. Remove abandoned lines in finished areas and cap as specified herein before under paragraph "Abandoned Lines".
- D. Provide all mechanical and electrical service connections, fittings, fastenings and any other materials necessary for assembly and installation of relocated equipment; and leave such equipment in proper operating condition.
- E. Contractor shall employ services of an installation engineer, who is an authorized representative of the manufacturer of this equipment to supervise assembly and installation of existing STERIS and related processing equipment, required to be relocated.
- F. All service lines such as noted above for relocated equipment shall be in place at point of relocation ready for use before any existing equipment is disconnected. Make relocated existing equipment ready for operation or use immediately after reinstallation.

1.28 STORAGE SPACE FOR DEPARTMENT OF VETERANS AFFAIRS EQUIPMENT (NOT APPLICABLE)

1.29 CONSTRUCTION SIGN

- A. Provide a Construction Sign where directed by the Project Engineer. All wood members shall be of framing lumber. Cover sign frame with 0.7 mm (24 gage) galvanized sheet steel nailed

securely around edges and on all bearings. Provide three 100 by 100 mm (4 inch by 4 inch) posts (or equivalent round posts) set 1200 mm (four feet) into ground. Set bottom of sign level at 900 mm (three feet) above ground and secure to posts with through bolts. Make posts full height of sign. Brace posts with 50 x 100 mm (two by four inch) material as directed. Sign may be attached to temporary fence.

- B. Paint all surfaces of sign and posts two coats of white gloss paint. Border and letters shall be of black gloss paint, except project title which shall be blue gloss paint.
- C. Maintain sign and remove it when directed by the Project Engineer.
- D. Detail Drawing of construction sign showing required legend and other characteristics of sign is
- B. Paint all surfaces of sign and posts two coats of white gloss paint. Border and letters shall be of black gloss paint, except project title which shall be blue gloss paint.
- C. Maintain sign and remove it when directed by the Project Engineer.
- D. Construction sign shall include project information including at a minimum; Project Identification, Contractor, Client, Architect, Rendering of the project (PDF or JPEG file to be provided by the government) and other information as directed by the Project Engineer. Submit layout and included information for approval to the Project Engineer prior to fabrication.

1.30 SAFETY SIGN

- A. Provide a Safety Sign where directed by Project Engineer. Face of sign shall be 19 mm (3/4 inch) thick exterior grade plywood. Provide two 100 mm by 100 mm (four by four inch) posts extending full height of sign and 900 mm (three feet) into ground. Set bottom of sign level at 1200 mm (four feet) above ground.
- B. Paint all surfaces of Safety Sign and posts with one prime coat and two coats of white gloss paint. Letters and design shall be painted with gloss paint of colors noted.
- C. Maintain sign and remove it when directed by Project Engineer.
- D. Detail Drawing Number 45 of safety sign showing required legend and other characteristics of sign is shown on the drawings.
- E. Post the number of accident free days on a daily basis.

1.31 CONSTRUCTION DIGITAL IMAGES (NOT APPLICABLE)

1.32 FINAL ELEVATION DIGITAL IMAGES (NOT APPLICABLE)

1.33 HISTORIC PRESERVATION

Where the Contractor or any of the Contractor's employees, prior to, or during the construction work, are advised of or discover any possible archeological, historical and/or cultural resources, the Contractor shall immediately notify the Project Engineer verbally, and then with a written follow up.

1.34 INFECTION CONTROL REQUIREMENTS

Description of Required Infection Control Precautions for

SPD / Endoscopy second floor additions

1. An infection control risk assessment has been conducted for this project and Class IV Infection Control Precautions will be necessary as outlined below.

Description of Required Infection Control Precautions by Class IV

During Construction Project

Upon Completion of Project

CLASS IV

1. When applicable remove or Isolate HVAC system in area where work is being done to prevent contamination of duct system.
2. Adequate infection control barriers will be constructed to ensure no dust or debris enter the lab, pharmacy and or imaging area when removing windows and backfilling window void.
3. Complete all critical barriers i.e. sheetrock / plywood to seal area from non work area. During tie-in to corridor area on existing second floor, permanent barriers and ante room will be constructed to eliminate dust and debris from entering hospital.
4. Maintain negative air pressure within work site utilizing HEPA equipped air filtration units.
5. Seal holes, pipes, conduits, and punctures appropriately.
6. Waste will be removed through exterior means and NOT taken through the hospital during East and West additions. During corridor tie-in, contain construction waste before transport in tightly covered containers.
7. Cover transport receptacles or carts. Tape covering unless solid lid.
8. If there will be construction traffic from the construction area into occupied space, construct anteroom and require all personnel to pass through this room so they can be vacuumed using a HEPA vacuum cleaner before leaving work site or they can wear cloth or paper coveralls that are removed each time they leave the work site and enter a facility.
9. All VA personnel entering work site are required to wear shoe covers. Shoe covers must be used by construction workers each time they exit the work area into an occupied area.
10. Do not remove barriers from work area until completed project is inspected by the owner's Safety Department and Infection Control Department and thoroughly cleaned by the owner's Environmental Services Department.
11. Work after hours or on weekend to minimize patient care disruption.

1. Do not remove barriers from work area until completed project is inspected by the owner's Safety Department and Infection Control Department and thoroughly cleaned by the owner's Environmental Services Department.
2. Remove barrier materials carefully to minimize spreading of dirt and debris associated with construction.
3. Vacuum work area with HEPA filtered vacuums.
4. Wet mop area with disinfectant.
5. Remove isolation of HVAC system in areas where work is being performed.

Unit Below	Unit Above	Lateral	Lateral	Behind	Front
Pharmacy – High Risk ED – High Risk Specialty Clinics Medium risk	N/A	Imaging - Medium Risk	Lab – High Risk	N/A	N?A
Risk Group	Risk Group	Risk Group	Risk Group	Risk Group	Risk Group

Identify issues related to: ventilation, plumbing, electrical in terms of the occurrence of probable outages.

Tie-in will be coordinated with COTR seven days before the contractor expects them to take place

Identify containment measures, using prior assessment. What types of barriers? (Eg, solids wall barriers); Will HEPA filtration be required?

Solid Barriers shall be constructed at corridor tie-ins and window voids. Negative pressure will be required once corridor tie-ins have been accomplished. HEPA filtration will not be required

Work hours:

Work will be accomplished during normal working hours. However, work that is unusually loud or disruptive will be accomplished from 1630-2000

Plan to discuss the following containment issues with the project team.

Eg, traffic flow, housekeeping, debris removal (how and when)

Construction will be accomplished outside of the existing hospital. Once it is deemed by Infection Control and Engineering that corridor tie-ins are necessary, temporary barriers will be constructed to eliminate dust entering the existing hospital.

PreConstruction

Prior to the start of work a meeting will be conducted with the contractor, applicable hospital managers, project engineer, contracting officer, safety officer, and infection control nurse as outlined below.

A. Pre-Demolition and Construction: The contractor will submit a plan for dust, chemical, and noise control prior to the start of demolition. This plan will include:

(1) Methods to prevent construction related dust and debris from being tracked out of the construction area.

(2) Dust and debris control when working in an occupied area.

(3) Material Safety Data Sheets for all chemical compounds planned for use during the project.

(4) Collection, storage and disposal process for oil and any hazardous materials collected from existing medical air compressors.

(5) Work schedule planned to reduce disruption of patient care during periods of activities such as loud noise, work in occupied areas, etc.

(6) During the physical tie-in to bldg 1 work will need to be completed off-hours. Furthermore Infection Control barriers will need to be in place to ensure dust and debris does not spread. The safety and IC staff will need to inspect the area before cutting begins.

B. Plan Review: Upon submittal of the above, the contractor will meet with the VA Contracting Officer, VA project manager, safety officer, and infection control nurse to review the control plan. A union representative will also be offered the opportunity to attend this meeting. Once the plan has been approved, an Infection Control Construction Permit will be issued to the contractor. No work shall begin until the permit is issued.

C. The safety officer, safety specialist and/or infection control nurse will perform daily inspections during construction for compliance with the approved control plan. Any deficiencies noted are to be corrected immediately.

1.35 ASBESTOS FREE CONSTRUCTION MATERIALS

The General contractor shall ensure that no materials containing asbestos are installed under this contract. General Contractor shall be liable for all costs associated with the removal and replacement of any such materials placed regardless of the date of discovery.

1.36 HAZARDOUS MATERIALS

The General Contractor is required to obtain and maintain a comprehensive file on the jobsite of "Material Safety Data Sheets" (MSDS) for all hazardous or potentially hazardous materials utilized in the construction process. Copies of the individual MSDS sheets will be transmitted to the Project Engineer as they are obtained. Any hazardous or potentially hazardous materials will not be transported to or utilized on the jobsite without the applicable MSDS sheets being on file. The Contractor shall take all precautions identified by the MSDS for hazardous materials to insure the safety and health of all Contractor employees, VA employees, patients, and visitors.

1.37 GREEN ENVIRONMENTAL MANAGEMENT SYSTEM (GEMS)

GEMS Awareness Training required for Contractors

All federal agencies are required by Executive Order to implement an Environmental Management System, reduce waste, reduce quantity of toxic and hazardous chemical and materials acquired, used or disposed of, increase diversion of solid waste by recycling, and use sustainable environmental practices (acquisition of bio-based, environmentally preferable, energy-efficient, water-efficient and recycled-content products).

The Department of Veterans Affairs has chosen the term GEMS to refer to the department's Green Environmental Management System. Green Environmental Management Systems have been shown to be a valuable tool to lessen negative impacts on the environment, and create more efficient, cost effective means of providing service to our veterans. **The GEMS program emphasizes importance of compliance to federal, state, and local regulations; encourages pollution prevention strategies whenever possible; and focuses on continued improvement on environmental issues.** The GEMS Program is based on ISO 14001, which relates to Environmental Management Systems (EMS). The EMS

provides a framework to review activities performed by, or on behalf of the organization, including work performed by contractors.

Any parties, including contractors, who perform an activity identified as being significant based on the impact on the environment, environmental compliance, exposure risk, etc., must be aware of our facility GEMS program and ways to reduce the environmental impacts. Training for contractors and each member of their staff who is involved in significant activities should include operational controls used to reduce the environmental impacts.

The following construction activities have been identified as significant based on potential environmental impacts:

- Chemical Storage (potential for spills) Hazardous chemicals, if no alternative is available, must be stored in accordance with OSHA, EPA (49 CFR 265 Subpart I), and NFPA requirements. Any hazardous chemicals and wastes must be stored in a manner which would prevent release into the environment and must be disposed of in accordance with local, state and federal regulations. 40 CFR Parts 262-268. See list below of construction waste that is potentially hazardous waste.
- Asbestos Abatement activities 29 CFR 1926.1101
- Activities involving lead, i.e. lead based paint 29 CFR 1926.62
- Recyclable material. All contractors should recycle as much material as possible. The records of materials recycled must be submitted to the COTR for recordkeeping.
- Activities which may result in contaminants (oils, fuel, chemicals, debris) flowing down the storm sewer or on ground surface. 40 CFR 112
- Activities which involve handling of universal wastes (batteries, fluorescent lamps, mercury containing devices-switches, pesticides). 40 CFR Part 273
- Work on refrigerator, air conditioners, other chiller units or other sources of ozone depleting substances. 40 CFR Section 82

Cc: Chief, Projects Engineering

Maintenance & Operations

GEMS Program Manager

Examples of Construction Waste that is Potentially Hazardous Waste
Used oil, hydraulic fluid, diesel fuel, or jet fuel
Soil contaminated with toxic or hazardous pollutants, like those listed above
Waste paints, varnish, solvents, sealers, thinners, resins, roofing cement, adhesives, machinery lubricants, and caulk
Clean up materials (such as rags) contaminated with the items listed above
Drums and containers that once contained the items listed above
Waste carpeting (due to formaldehyde contents)
Lead-based paint, lead flashing or lead solder
Computer monitors and televisions with cathode ray tubes
Gypsum drywall (due to sulfate)
Mercury-containing demolition wastes, (e.g. fluorescent bulbs, broken mercury switches, batteries or thermostats)
Other items that may have inseparable hazardous constituents
Examples of Items that may be reused*
Doors (if in good shape), door locks
Light fixtures, electronics (nurse call wiring, other wiring, etc.), electrical panels, breakers
Sinks, toilets, plumbing fixtures, power pools
Accessories (mirrors and towel dispensers)
Handrails and possibly corner guards
*Items that no longer meet codes, safety or other requirements may not be reused.

--- E N D ---

**PROJECT
688-309**

Construct Endoscopy and Central Processing Addition

**SECTION 22 07 00
PLUMBING INSULATION**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Cellular Foam
- B. Glass Fiber
- C. Inserts and Shields – Installation
- D. Jackets and Fitting Covers

1.2 RELATED SECTIONS

- A. Section 20 10 00 – General Requirements
- B. Section 20 10 06 – Project Finalization
- C. Section 22 05 03 – Plumbing Piping and Valves
- D. Section 22 05 29 – Supports, Anchors, Curbs, Seals, and Flashings
- E. Section 22 05 53 – Mechanical Identification

1.3 REFERENCES

- A. General
 - 1. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials
 - 2. ASTM E96 - Standard Test Methods for Water Vapor Transmission of Materials
 - 3. NFPA 255 - Standard Method of Test of Surface Burning Characteristics of Building Materials
 - 4. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials
- B. Cellular Foam
 - 1. ASTM C534 - Standard Specification for Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form
 - 2. ASTM D1056 - Standard Specification for Flexible Cellular Materials - Sponge or Expanded Rubber
- C. Glass Fiber

1. ASTM C547 - Standard Specification for Mineral Fiber Preformed Pipe Insulation

D. Jackets and Fitting Covers

1. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate
2. ASTM C921 - Standard Practice for Determining the Properties of Jacketing Materials for Thermal Insulation
3. ASTM D1784 - Standard Specification for Rigid PolyVinyl Chloride (PVC) Compounds Chlorinated PolyVinyl Chloride (CPVC) Compounds

1.4 SUBMITTALS FOR REVIEW (REFER TO SECTION 20 10 00)

- A. For each insulation type, provide material characteristics, minimum and maximum service temperatures, moisture absorption characteristics, thermal and vapor transmission characteristics.
- B. Provide a schedule indicating insulation type and thickness for all pipe sizes of all piping systems.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.
- B. Applicator Qualifications: Company specializing in performing the work of this section with minimum three (3) years documented experience and who is authorized by the manufacturer.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Transport, handle, store, and protect products in accordance with Section 20 10 00.
- B. Accept materials on site, labeled with manufacturer's identification, product density, and thickness.

1.7 ENVIRONMENTAL REQUIREMENTS

- A. Maintain ambient conditions required by manufacturers of each product.
- B. Maintain temperature before, during, and after installation for minimum of twenty-four (24) hours.

1.8 SECTION INCLUDES

- A. Aluminum Jackets
- B. Cellular Foam
- C. Glass Fiber

D. Lace-On Blankets

1.9 REGULATORY REQUIREMENTS

A. Conform to flame spread/smoke developed rating of 25/50 in accordance with ASTM E84, NFPA 255, and UL 723. This shall apply to insulation as well as to all accessories including but not limited to adhesives, mastics, jackets, cements, tapes, cloth for fittings, etc.

PART 2 PRODUCTS

2.1 CELLULAR FOAM INSULATION (PIPING)

A. Manufacturers (Refer to Section 20 10 00):

1. Armstrong, Armaflex-AP
2. Halstead

B. Insulation: ASTM C534; flexible; cellular elastomeric; molded or sheet; *k* factor: ASTM C177, 0.27 Btu-in/(h-ft²·°F) at 75 °F/0.039 (W/(MK) AT 24 °C; -70 °F/-56 °C minimum service temperature; 220 °F/104 °C maximum service temperature; maximum moisture absorption: ASTM D1056, 5.0 percent (pipe) by weight; 6.0 percent (sheet) by volume; moisture vapor transmission: ASTM E96, 0.10 perm-inches/0.15 NG/(S×M×PA).

C. Connection: Waterproof vapor barrier contact adhesive compatible with the insulation. Armstrong 520 adhesive or approved equal.

2.2 GLASS FIBER INSULATION (PIPING)

A. Manufacturers (Refer to Section 20 10 00):

1. Schuller, Micro-Lok, AP-T Plus
2. Knauf
3. Owens Corning

B. Insulation: ASTM C547; rigid molded; noncombustible; *k* factor: ASTM C177, 0.24 Btu-in/(h-ft²·°F) at 75 °F/0.035 (W/(MK) AT 24 °C; 850 °F/454 °C maximum service temperature; 0.2 percent maximum moisture absorption by volume.

C. Vapor Barrier Jacket: White kraft paper with glass fiber yarn; bonded to aluminized film with pressure sensitive tape lap sealing system; moisture vapor transmission: ASTM E96; 0.02 perm-inches/0.029 NG/(S×M×PA).

D. Provide with GreenGuard Certification for Children and Schools.

2.3 JACKETS AND FITTING COVERS (PIPING)

A. PVC Plastic Jacket and Fitting Covers (Interior Applications):

1. Manufacturers (Refer to Section 20 10 00):
 - a. Zeston 2000

2. Jackets and fitting covers: ASTM D1784; one piece molded type fitting covers and sheet material; off-white color; minimum service temperature: 0 °F-18 °C; maximum service temperature: 450 °F230° C; thickness: 20 mil0.50 MM.
3. Jackets and fitting covers (vapor barrier jackets): ASTM D1784; one piece molded type fitting covers and sheet material; off-white color; minimum service temperature: 0 °F-18 °C; maximum service temperature: 450 °F230 °C; moisture vapor transmission - ASTM E96 - 0.002 perm-inches0.0029 NG/(S×M×PA); thickness: 20 mil0.50 MM.
4. Connections: Pressure sensitive color matching vinyl tape

B. Aluminum Jacket (Exterior Applications): ASTM B209

1. Manufacturers (Refer to Section 20 10 00):
 - a. Childers
 - b. Pabco
2. Jacket: Thickness: 0.016 inch0.40 MM sheet; finish: smooth; joining: Longitudinal slip joints and 2 inch50 MM laps.
3. Fittings: 0.016 inch0.4 MM thick die shaped fitting covers with factory attached protective liner.
4. Metal Jacket Bands: 3/8 inch10 MM wide; 0.015 inch0.38 MM thick aluminum.

2.4 INSERTS AND SHIELDS

- A. Inserts: Heavy density insulation which will not crush from weight of pipe. Locate between shield and pipe. Inserts are furnished in this Section 22 07 00 and installed in Section 22 05 29.
- B. Shields: Galvanized steel between pipe hangers or pipe hanger rolls and insulation. Shields are furnished and installed under Section 22 05 29.

2.5 GLASS FIBER INSULATION (EQUIPMENT)

- A. Manufacturers (Refer to Section 20 10 00):
 1. Schuller - Pipe and Tank Insulation
 2. Owens Corning
- B. Insulation: Semi-rigid, noncombustible; *k* factor: ASTM C335 0.27 Btu-in/(h-ft²·°F) at 75 °F0.039 (W/(MK) AT 24 °C; maximum service temperature: 650 °F340 °C; density: 3.0 pounds/foot³48 KG/M³.
- C. Vapor Barrier Jacket: White kraft paper with glass fiber yarn, bonded to aluminized film with pressure sensitive tape lap sealing system; moisture vapor transmission: ASTM E96; 0.02 perm-inches0.029 NG/(S×M×PA).

2.6 LACE-ON BLANKETS (EQUIPMENT)

- A. Manufacturers (Refer to Section 20 10 00):
 1. Insulation

- a. Kaowool Cerablanket
- 2. Fabric
 - a. JP Stevens Glass-TEX Fabric Style 9987
 - b. Alpha Maritex Style 3200-SA
- B. Materials: 0.008 inch0.2 MM thick type 304 stainless steel knitted wire mesh inner liner 8 pounds/foot³128 KG/M³ density insulation, ½ inch13MM thick; oil and water resistant exterior protective fabric.
- C. Construction: Blankets shall be sewn together. Lacing anchors shall be 2½ inch64 MM stainless steel secured with 12 gauge2.78 MM stainless steel washers. Blankets shall have stainless steel wire installed for draw cords.

PART 3 EXECUTION

3.1 EXAMINATION – GENERAL

- A. Verify that piping has been tested and approved before applying insulation materials.
- B. Verify that surfaces are clean and dry, with foreign material removed.

3.2 INSTALLATION – GENERAL (PIPING)

- A. Continue insulation with vapor barrier through penetrations.
- B. On exposed piping in finished areas, locate insulation and cover seams in least visible locations.
- C. Insulate pipes in accordance with the insulation schedule.
- D. On insulated piping with vapor barrier, insulate fittings, valves, unions, flanges, strainers, flexible connections and expansion joints.
- E. On insulated piping without vapor barrier for pipes conveying fluids 180° F82° C or less, do not insulate flanges and unions at equipment, but bevel and seal ends of insulation at such locations.
- F. Install materials in accordance with the manufacturer’s instructions.
- G. Pipe Exposed in Tunnels and Mechanical Equipment Rooms and in Finished Spaces less than 10 feet3 METERS above finished floor: Finish with PVC jacket and fitting covers.
- H. Continue insulation through walls, sleeves, pipe hangers, and other pipe penetrations. Finish at supports, protrusions, and interruptions.
- I. Insulation on all cold water systems shall be applied with a continuous unbroken vapor seal. Do not allow hangers, supports, anchors etc., to come in direct contact with the pipe.

- J. Insulate entire system including fittings, unions and flexible connections, flanges and expansion joints. For insulation of valves and other pieces of equipment, see Section 22 07 00. At fire separations, Refer to Section 22 05 29 and 07 84 00 - Fire Stopping.
- K. Exterior Applications: Cover glass fiber insulation with aluminum jacket with seams located on bottom side of horizontal piping. Apply sealing compound and closures to make weathertight.
- L. Heat Traced Piping: Insure that any required heat trace is installed prior to insulation. Heat trace is not provided under Mechanical. Insulate fittings, joints, and valves with insulation of like material, thickness, and finish as adjoining pipe. Size large enough to enclose pipe and heat tracer. Cover with aluminum jacket with seams located on bottom side of horizontal piping.
- M. Insulation shall not be applied until system is tested, cleaned and approved.

3.3 CELLULAR FOAM INSULATION (PIPING)

- A. Cover pipe and fittings with insulation in thickness scheduled.
- B. Insulation shall fit in snug contact with pipe and be installed in accordance with the manufacturer's recommendations.
- C. Slip insulation on tubing before tubing sections and fittings are assembled keeping slitting of insulation to a minimum.
- D. Seal joints in insulation with adhesive.
- E. Insulate fittings with pre-molded covers or sheet insulation.
- F. Stagger joints on layered insulation.
- G. Insulation exposed outside shall have "slit" joint seams places on the bottom side of the pipe.
- H. Paint exterior exposed insulation with two coats of gray finish recommended by the Insulation manufacturer to protect from weather and sunlight.
- I. Buried piping: insulate with molded fitting covers.

3.4 GLASS FIBER INSULATION (PIPING)

- A. Cover pipe with glass fiber insulation in thickness scheduled.
- B. When vapor barrier is required, adhere factory applied vapor barrier jacket lap smoothly and securely at longitudinal laps with pressure sensitive strip. Adhere self-sealing butt joint strips over end joints. No staples will be allowed.
- C. Insulate fittings and joints with molded insulation of like material and thickness of adjacent pipe with ends of insulation tucked snugly into throat of fitting and edges adjacent to pipe insulation tufted and tucked in.

- D. Cover insulation with one piece PVC fitting covers.

3.5 JACKETS AND FITTING COVERS (PIPING)

- A. Indoor, concealed pipes above ambient temperature: Standard jacket; with or without vapor barrier; factory-applied.
- B. Indoor, concealed pipes below ambient temperature: Vapor barrier jacket; factory-applied.
- C. Indoor, exposed applications: Standard or vapor barrier jacket in accordance with concealed applications; covered with PVC jacket.
- D. Exterior applications: Vapor barrier jacket, covered with aluminum jacket
- E. Secure with stainless steel tacks and wrap seams and tacks with vinyl tape.

3.6 INSERTS AND SHIELDS

- A. Inserts: Heavy density insulation which will not crush from weight of pipe. Locate between shield and pipe. Inserts are furnished in this Section 22 07 00 and installed in Section 22 05 29.
- B. Shields: Galvanized steel between pipe hangers or pipe hanger rolls and insulation. Shields are furnished and installed under Section 22 05 29.

3.7 ROOF DRAIN SUMPS

- A. Insulate with fiberglass batt sealed with tape and adhesive vapor tight.

3.8 EXAMINATION (EQUIPMENT)

- A. Verify that equipment has been tested before applying insulation materials.
- B. Verify that surfaces are clean and dry, with foreign material removed.

3.9 INSTALLATION (EQUIPMENT)

- A. General
 - 1. Provide materials in accordance with the manufacturer's recommendations.
 - 2. Factory Insulated Equipment: Do not insulate.
 - 3. Finish insulation at supports, protrusions, and interruptions.
 - 4. Nameplates and ASME Stamps: Bevel and seal insulation around with a mastic. Do not insulate over.
 - 5. Exposed Equipment in Finished Areas: Locate insulation and cover seams in least visible locations.
 - 6. Equipment Requiring Access for Maintenance, Repair, or Cleaning: Insulate with Lace-On Blanket.
 - a. Install in single or multiple layers to match scheduled insulation thickness.

b. Blankets shall be removable and re-useable.

7. Cover field insulated tanks with aluminum jackets.

3.10 CELLULAR FOAM INSULATION (EQUIPMENT)

- A. Cover equipment in thickness scheduled.
- B. Insulation shall fit in snug contact with equipment and be installed in accordance with the manufacturer's recommendations.
- C. Seal joints in insulation with adhesive.
- D. Stagger joints on layered insulation.
- E. Paint exterior exposed insulation with two coats of gray finish recommended by the Insulation Manufacturer to protect from weather or sunlight.

3.11 GLASS FIBER INSULATION (EQUIPMENT)

- A. Cover equipment with glass fiber insulation in thickness scheduled.
- B. Provide vapor barrier jackets. Adhere factory applied vapor barrier jacket lap smoothly and securely at longitudinal laps with pressure sensitive strip. Adhere self-sealing butt joint strips over end joints. No staples will be allowed.

3.12 LACE-ON BLANKETS (EQUIPMENT)

- A. Install in single or multiple layers to match scheduled insulation thickness for associated piping system.
- B. Blankets shall be removable and reusable.

3.13 HANDICAPPED FIXTURES

- A. All exposed hot and drain piping at Handicap fixtures shall be insulated with a neatly installed removable type ADA – approved insulation kit equal to Basin Guard, PorWrap, etc.

PART 4 SCHEDULES

4.1 SCHEDULES

- A. Insulate equipment including valves, tanks, air removal devices, etc.
- B. Insulate pumps which deliver fluid below ambient temperature.
- C. Plumbing equipment, pressure tanks, softeners, filters, etc., not factory insulated, shall be insulated under this section.
- D. Expansion tanks and similar equipment not receiving fluid directly from the system do not require insulation.

- E. Valves, traps, pressure reducing valves, pumps, convertors, expansion joints, etc.: Extend insulation 6 inches 150 MM beyond flanges.
- F. Systems Above Ambient Temperature: 2 inch 50 MM thick glass fiber insulation with vapor barrier.
- G. Systems Below Ambient Temperature: ½ inch 13 MM thick glass fiber insulation with vapor barrier. Exception: Insulate pump bodies on systems below ambient temperature with 1 inch 25 MM thick cellular foam insulation.
- H. All equipment requiring access for maintenance, repair or cleaning shall be insulated with lace-on blankets.

4.2 SCHEDULES - PIPING

Insulation Schedule - Piping					
System	Operating Temperature (degrees F)	Insulation Type	Pipe Size (inches)	Insulation Thickness (inches)	Notes
Domestic hot water, hot water re-circ and Non-Potable hot water (above ground)	105 to 140	glass fiber	Under 1½	1	—
			1½ and greater	1½	
	141 to 200	glass fiber	Under 1½	1½	
			1½ and greater	2	
Domestic Cold water and Non-Potable cold water (above ground)	—	glass fiber	all	½	—
Domestic Hot Water (below ground)	105 and greater	cellular foam	all	1	—
Domestic Cold Water (below ground)	—	cellular foam	all	½	—
Roof and Overflow Drain Piping and Roof Drain Sumps	—	Glass fiber	all	1	—

END OF SECTION 22 07 00