

Combined Heat and Power Plant  
at the Newington, CT VA  
VA Project No. VA701-13-J-0023

09-06-13  
Addendum No. 02

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Boston, Massachusetts 02210

**Combined Heat and Power Plant  
at the Newington, CT VA**  
555 Willard Ave  
Newington, CT 06111

VA Project No. VA701-13-J-0023

Date: September 04, 2013

ADDENDUM NUMBER 02

The Drawings and Specifications for the above project, dated July 19, 2013, are modified and supplemented with this Addendum.

SPECIFICATION ITEMS

**ITEM-1 REVISED SPECIFICATIONS**

- I. Delete in their entirety the Specification Sections listed below and substitute the revised Specification Sections, dated September 06, 2013, which are attached and are made a part of this Addendum.

<u>Section No.</u>	<u>Section Title</u>
01 00 00	GENERAL REQUIREMENTS
01 32 16.13	NETWORK ANALYSIS SCHEDULES
11 12 00	PARKING CONTROL EQUIPMENT
22 40 00	PLUMBING FIXTURES

Note: Revisions to Sections are annotated in the following manner:

- Modified portions of text are annotated with a vertical line in the margin.
- New text is underlined (i.e. New text).
- Deleted text is indicated by strikethrough (i.e. ~~Deleted text~~).

END OF ADDENDUM

**SECTION 01 00 00**  
**GENERAL REQUIREMENTS**

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**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 construction of the combined heat and power plant at the Newington, Connecticut, VA as required by drawings and specifications.
- B. Visits to the site by Bidders may be made only by appointment with the Medical Center Facility Management Service Section.
- C. Offices of TRO Jung|Brannen, Inc., 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 designated "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 or 30-hour OSHA Construction Safety course and other relevant competency training, as determined by Resident Engineer/COR acting as the Construction Safety Officer with input from the facility Construction Safety Committee. Contractor's staff involved with or responsible for management and safety duties shall have 30 hours OSHA Construction Safety Training.

2. Submit training records of all such employees for approval before the start of work.

H. VHA Directive 2011-36, Safety and Health during Construction, dated 9/22/2011 in its entirety is made a part of this section

#### **1.2 STATEMENT OF BID ITEM(S)**

- A. ITEM I, GENERAL CONSTRUCTION: Work includes general construction, alterations, roads, walks, grading, drainage, mechanical and electrical work, utility systems, necessary removal of existing structures and construction and certain other items.

#### **1.3 SPECIFICATIONS AND DRAWINGS FOR CONTRACTOR**

- A. AFTER AWARD OF CONTRACT, specifications and drawings will be furnished electronically.

#### **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. Executive Order 12989, amended in 2008 requires contractors who perform business with the government to verify their employees are eligible to work in the United States of America.

##### **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.
2. For working outside the "regular hours" as defined in the contract, The General Contractor shall give three (3) days notice to the Contracting Officer and his duly authorized representative 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 and his duly authorized representative.
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.
5. The Contractor shall post Police Emergency extension numbers on site in full view as directed by the Contracting Officer or his duly authorized representative.

C. Key Control:

1. The General Contractor shall provide duplicate keys and lock combinations to the Resident Engineer/COR for the purpose of security inspections of every area of project including tool boxes and parked machines.
2. The General Contractor shall turn over all permanent lock cylinders to the VA locksmith through the Contracting Officer's duly authorized representative for permanent installation. See Section 08 71 00, DOOR HARDWARE and coordinate.
3. The General Contractor shall provide three (3) call back numbers where they can be reached "off hours, 24/7" for the purpose of contacting them in the event of a situation or an emergency on the job site.

D. Document Control:

1. Before starting any work, the General Contractor/Sub Contractors shall submit an electronic security memorandum describing the approach to following goals and maintaining confidentiality of "sensitive information".
2. The General Contractor is responsible for safekeeping of all drawings, project manual and other project information. This

information shall be shared only with those with a specific need to accomplish the project.

3. Certain documents, sketches, videos or photographs and drawings may be marked "Law Enforcement Sensitive" or "Sensitive Unclassified". Secure such information in separate containers and limit the access to only those who will need it for the project. Return the information to the Contracting Officer or his duly authorized representative upon request.
4. These security documents shall not be removed or transmitted from the project site without the written approval of Contracting Officer.
5. All paper waste or electronic media such as CD's and diskettes shall be shredded and destroyed in a manner acceptable to the VA.
6. Notify Contracting Officer, his duly authorized representative and Site Security Officer immediately when there is a loss or compromise of "sensitive information".
7. All electronic information shall be stored in specified location following VA standards and procedures using an Engineering Document Management Software (EDMS).
  - a. Security, access and maintenance of all project drawings, both scanned and electronic shall be performed and tracked through the EDMS system.
  - b. "Sensitive information" including drawings and other documents may be attached to e-mail provided all VA encryption procedures are followed.

#### E. Motor Vehicle Restrictions

1. Vehicle authorization request shall be required for any vehicle entering the site and such request shall be submitted three (3) business days 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):

E84-2009.....Surface Burning Characteristics of Building  
Materials

2. National Fire Protection Association (NFPA):

10-2010.....Standard for Portable Fire Extinguishers

30-2008.....Flammable and Combustible Liquids Code

51B-2009.....Standard for Fire Prevention During Welding,  
Cutting and Other Hot Work

70-2011.....National Electrical Code

241-2009.....Standard for Safeguarding Construction,  
Alteration, and Demolition Operations

3. Occupational Safety and Health Administration (OSHA):

29 CFR 1926.....Safety 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 Resident Engineer/COR 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 Resident Engineer/COR 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 Heating and Electrical: Install, use and maintain installations in accordance with 29 CFR 1926, NFPA 241 and NFPA 70.
- F. Means of Egress: Do not block exiting for occupied buildings, including paths from exits to roads. Minimize disruptions and coordinate with Resident Engineer/COR.
- G. Egress Routes for Construction Workers: Maintain free and unobstructed egress. Inspect daily. Report findings and corrective actions weekly to Resident Engineer/COR.
- H. Fire Extinguishers: Provide and maintain extinguishers in construction areas and temporary storage areas in accordance with 29 CFR 1926, NFPA 241 and NFPA 10.
- I. Flammable and Combustible Liquids: Store, dispense and use liquids in accordance with 29 CFR 1926, NFPA 241 and NFPA 30.
- J. Hot Work: Perform and safeguard hot work operations in accordance with NFPA 241 and NFPA 51B. Coordinate with Resident Engineer/COR. Obtain permits from facility Safety Manager at the beginning of the shift when hot-work will be performed.
- K. Fire Hazard Prevention and Safety Inspections: Inspect entire construction areas weekly. Coordinate with, and report findings and corrective actions weekly to Resident Engineer/COR.
- L. 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.

- M. Dispose of waste and debris in accordance with NFPA 241. Remove from buildings daily.
- N. 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 or his duly authorized representative. 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 his duly authorized representative 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.
- D. Working space and space available for storing materials shall be as determined by the Resident Engineer/COR.
- 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.
1. Do not store materials and equipment in other than assigned areas.
- G. Construction Fence: Before construction operations begin, Contractor shall provide and install a chain link construction fence, 2.1m (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 375mm (15 inches). Bottom of fences shall extend to 25mm (one inch) above grade. Remove the fence when directed by Resident Engineer/COR.
- H. 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.
- I. 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 Resident Engineer/COR.
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 Resident Engineer/COR. 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 Resident Engineer/COR, in writing, fifteen (15) calendar days 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. In case of a contract construction emergency, service will be interrupted on approval of Resident Engineer/COR. Such approval will be confirmed in writing as soon as practical.
  5. 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.
- J. 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.

Where applicable, dead end runs shall be pulled back to the main and terminated accordingly.

K. 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 or an approved alternate path of travel must be implemented.
2. Method and scheduling of required cutting, altering and removal of existing roads, walks and entrances must be approved by the Resident Engineer/COR.

L. Coordinate the work for this contract with other construction operations as directed by Resident Engineer/COR. This includes the scheduling of traffic and the use of roadways, as specified in Article, USE OF ROADWAYS.

#### **1.7 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. Prior to start of work, prepare a plan detailing project-specific dust protection measures, including periodic status reports, and submit to Resident Engineer/COR 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 activity shall be educated and trained in infection prevention measures established by the medical center.

#### **1.8 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 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 Resident Engineer/COR.
2. Items not reserved shall become property of the Contractor and be removed by Contractor from Medical Center.

#### **1.9 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.

- 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.
- D. Refer to FAR clause 52.236-7, "Permits and Responsibilities," which is included in General Conditions. A National Pollutant Discharge Elimination System (NPDES) permit is required for this project. The Contractor is considered an "operator" under the permit and has extensive responsibility for compliance with permit requirements. VA will make the permit application available at the (appropriate medical center) office. The apparent low bidder, contractor and affected subcontractors shall furnish all information and certifications that are required to comply with the permit process and permit requirements. Many of the permit requirements will be satisfied by completing construction as shown and specified. Some requirements involve the Contractor's method of operations and operations planning and the Contractor is responsible for employing best management practices. The affected activities often include, but are not limited to the following:
- Designating areas for equipment maintenance and repair;
  - Providing waste receptacles at convenient locations and provide regular collection of wastes;
  - Locating equipment wash down areas on site, and provide appropriate control of wash-waters;
  - Providing protected storage areas for chemicals, paints, solvents, fertilizers, and other potentially toxic materials; and
  - Providing adequately maintained sanitary facilities.

#### **1.10 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 prior approval of the

Resident Engineer/COR. Existing work to be altered or extended and that is found to be defective in any way, shall be reported to the Resident Engineer/COR 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).

#### **1.11 PHYSICAL DATA**

- A. Data and information furnished or referred to below is for the Contractor's information. The Government shall not be responsible for any interpretation of or conclusion drawn from the data or information  
1. The indications of physical conditions on the drawings and in the specifications are the result of site investigations by project design team.

#### **(FAR 52.236-4)**

- B. Subsurface conditions have been developed by core borings and test pits. Logs of subsurface exploration are shown diagrammatically on drawings.



- C. A copy of the soil report titled "Geotechnical Engineering Report: Combined Heat and Power System (CHP) at the Newington VAMC" dated February 13, 2013, will be made available for inspection by bidders upon request to the Resident Engineer/COR, and shall be considered part of the contract documents.
- D. Government does not guarantee that other materials will not be encountered nor that proportions, conditions or character of several materials will not vary from those indicated by explorations. Bidders are expected to examine site of work and logs of borings; and, after investigation, decide for themselves character of materials and make their bids accordingly. Upon proper application to Department of Veterans Affairs, bidders will be permitted to make subsurface explorations of their own at site.

#### **1.12 PROFESSIONAL SURVEYING SERVICES**

A registered professional land surveyor or registered civil engineer 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.

#### **1.13 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 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 and his duly authorized representative. The Contractor shall also be responsible for maintaining and preserving all stakes and other marks established by the Contracting Officer and his duly authorized representative 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 and his duly authorized representative 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 Resident Engineer/COR before any work (such as footings, floor slabs, columns, walls, utilities and other major controlling features) is placed.
- D. During progress of work, and particularly as work progresses from floor to floor, Contractor shall have line grades and plumbness of all major form work checked and certified by a registered land surveyor or registered civil engineer as meeting requirements of contract drawings. Furnish such certification to the Resident Engineer/COR before any major items of concrete work are placed. In addition, Contractor shall also furnish to the Resident Engineer/COR 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.
  4. Lines of elevations of all swales and interment areas.
  5. Lines and elevations of roads, streets and parking lots.
- 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 Resident Engineer/COR.
- 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".

#### **1.14 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 Resident Engineer/COR's review, as often as requested.
- C. Contractor shall deliver two approved completed sets of as-built drawings to the Resident Engineer/COR within fifteen (15) calendar days after each completed phase and after the acceptance of the project by the Resident Engineer/COR.
- D. Paragraphs A, B, & C shall also apply to all shop drawings.

#### **1.15 USE OF ROADWAYS**

- A. For hauling, use only established public roads and roads on Medical Center property and, when authorized by the Resident Engineer/COR, 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.

#### **1.16 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 Resident Engineer/COR. If the equipment is not installed and maintained in accordance with the following provisions, the Resident Engineer/COR 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 Resident Engineer/COR. Boilers, pumps, feedwater heaters and auxiliary equipment must be operated as a complete system and be fully maintained by operating personnel. Boiler water must be given complete and continuous chemical treatment.
- 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.

#### **1.17 TEMPORARY TOILETS**

- A. Provide where directed by Resident Engineer/COR, (for use of all Contractor's workmen) ample temporary sanitary toilet accommodations; provide suitable self-contained, single-occupant, toilet units. Provide toilet tissue, hand sanitizer, and similar disposable materials for each facility. Maintain adequate supply. Keep such places clean and free from flies, and temporary toilets are to be removed prior to completion of contract, and premises left perfectly clean.

#### **1.18 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 utility 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 and his duly authorized representative, shall install and maintain all necessary temporary connections and distribution lines, and meters required to measure the amount of utilities used for the purpose of determining charges. Before final acceptance of the work by the Government, the Contractor shall remove all the temporary connections, distribution lines, meters, and associated paraphernalia.
- C. 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.
- D. Electricity (for Construction and Testing): Furnish all temporary electric services.
  - 1. Obtain electricity by connecting to the local municipal system. Pay electric power service use charges, whether metered or otherwise, for electricity used by all entities engaged in construction project activities at Project site.
  - 2. **Provide weatherproof, grounded electric power service and distribution system of sufficient size, capacity, and power characteristics during construction period. Include meters, transformers, overload-protected disconnecting means, automatic ground-fault interrupters, and main distribution switchgear.**
- E. 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 Resident Engineer/COR's discretion)  
of use of water from Medical Center's system.

- F. Steam: Furnish steam system for testing required in various sections of specifications.
1. Obtain steam for testing by connecting to the Medical Center steam distribution system. Steam 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 Resident Engineer/COR's discretion), of use of steam from the Medical Center's system.
- G. 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.

#### **1.19 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.

#### **1.20 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.

#### **1.21 INSTRUCTIONS**

- A. Contractor shall furnish Maintenance and Operating manuals (hard copies and electronic) and verbal instructions when required by the various sections of the specifications and as hereinafter specified.
  - 1. Prior to delivery and installation, sample manuals for each piece of equipment shall be submitted to the Resident Engineer/COR for approval.
- B. Manuals: Maintenance and operating manuals and one compact disc (four hard copies and one electronic copy each) for each separate piece of equipment shall be delivered to the Resident Engineer/COR 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 and shall include classroom training, demonstrations, and specialized diagnostic equipment required to maintain equipment. These requirements are more specifically detailed in the various technical sections. Instructions for different items of equipment that are component parts of a complete system, shall be given in an integrated, progressive manner. All instructors for every piece of component equipment in a system shall be available until instructions for all items included in the system have been completed. 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 Resident Engineer/COR and shall be considered concluded only when the Resident Engineer/COR 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 Resident Engineer/COR, does not demonstrate sufficient qualifications in accordance with requirements for instructors above.

#### **1.22 GOVERNMENT-FURNISHED PROPERTY**

- A. The Government shall deliver to the Contractor, the Government-furnished property shown on the drawings.
- B. Equipment furnished by Government to be installed by Contractor will be furnished to Contractor at the Medical Center.

- C. Contractor shall be prepared to receive this equipment from Government and store or place such equipment not less than ninety (90) days before Completion Date of project.
- D. Notify Contracting Officer and his duly authorized representative in writing, sixty (60) days in advance, of date on which Contractor will be prepared to receive equipment furnished by Resident Engineer/COR. 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 the Resident Engineer/COR. At such time the Contractor shall acknowledge receipt of equipment described, make notations, and immediately furnish the Resident Engineer/COR 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 Resident Engineer/COR.
- 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.

### **1.23 CONSTRUCTION SIGN**

- A. Provide a Construction Sign where directed by the Resident Engineer/COR. 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.
- 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 Resident Engineer/COR.
- D. Detail Drawing of construction sign showing required legend and other characteristics of sign will be provided by the Architect.

### **1.24 SAFETY SIGN**

- A. Provide a Safety Sign where directed by Resident Engineer/COR. 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 Resident Engineer/COR.
- D. Standard Detail Drawing Number SD10000-02 (Found on VA TIL) of safety sign showing required legend and other characteristics of sign
- E. Post the number of accident free days on a daily basis.

### **1.25 PHOTOGRAPHIC DOCUMENTATION**

- A. Prior to commencement of construction activities, take photographs to show pre-existing conditions of the project site within the construction limit lines, roadways and access to the site.

B. During the construction period through completion, provide photographic documentation of construction progress and at selected milestones including electronic indexing, navigation, storage and remote access to the documentation, as per these specifications. The commercial photographer or the subcontractor used for this work shall meet the following qualifications:

1. Demonstrable minimum experience of three (3) years in operation providing documentation and advanced indexing/navigation systems including a representative portfolio of construction projects of similar type, size, duration and complexity as the Project.
2. Demonstrable ability to service projects throughout North America, which shall be demonstrated by a representative portfolio of active projects of similar type, size, duration and complexity as the Project.

C. Photographic documentation elements:

1. Each digital image shall be taken with a professional grade camera with minimum size of 6 megapixels (MP) capable of producing 200x250mm (8 x 10 inch) prints with a minimum of 2272 x 1704 pixels and 400x500mm (16 x 20 inch) prints with a minimum 2592 x 1944 pixels.
2. Indexing and navigation system shall utilize actual AUTOCAD construction drawings, making such drawings interactive on an on-line interface. For all documentation referenced herein, indexing and navigation must be organized by both time (date-stamped) and location throughout the project.
3. Documentation shall combine indexing and navigation system with inspection-grade digital photography designed to capture actual conditions throughout construction and at critical milestones. Documentation shall be accessible on-line through use of an internet connection. Documentation shall allow for secure multiple-user access, simultaneously, on-line.
4. Before construction, the ~~building pad, adjacent streets, roadways, parkways, driveways, curbs, sidewalks, landscaping, adjacent utilities and adjacent structures surrounding the building pad and~~ site shall be documented. ~~Overlapping photographic techniques shall~~

- ~~be used to insure maximum coverage. Indexing and navigation accomplished through interactive architectural drawings. If site work or pad preparation is extensive, this documentation may be required immediately before construction and at several pre-determined intervals before building work commences.~~
5. ~~Construction progress for all trades shall be tracked at pre-determined intervals, but not less than once every thirty (30)-calendar days ("Progressions"). Progression documentation shall track both the exterior and interior construction of the building. Exterior Progressions shall track 360 degrees around the site and each building. Interior Progressions shall track interior improvements beginning when stud work commences and continuing until Project completion.~~ Document open excavations prior to concrete placement.
  6. ~~As-built condition of pre-slab utilities and site utilities shall be documented prior to pouring slabs, placing concrete and/or backfilling. This process shall include all~~ Document ~~underground and in-slab utilities within the building(s) envelope(s) and utility runs in the immediate vicinity of the building(s) envelope(s) footprint. This may also include utilities enclosed in slab-on-deck in multi-story buildings. Overlapping photographic techniques shall be used to insure maximum coverage. Indexing and navigation accomplished through interactive site utility plans.~~
  7. ~~As-built conditions of mechanical, electrical, plumbing and all other systems shall be documented post-inspection and pre-insulation, sheet rock or dry wall installation. This process shall include all finished systems located in the walls and ceilings of all buildings at the Project. Overlapping photographic techniques shall be used to insure maximum coverage. Indexing and navigation accomplished through interactive architectural drawings.~~ Document structural steel erection.
  8. ~~As-built conditions of exterior skin and elevations shall be documented with an increased concentration of digital photographs as directed by the Resident Engineer/COR in order to capture pre-determined focal points, such as waterproofing, window flashing, radiused steel work, architectural or Exterior Insulation and Finish~~

- ~~Systems (EIFS) detailing. Overlapping photographic techniques shall be used to insure maximum coverage. Indexing and navigation accomplished through interactive elevations or elevation details.~~Document slab-on-grade and suspended slabs, prior to concrete placement.
9. ~~As-built finished conditions of the interior of each building including floors, ceilings and walls shall be documented at certificate of occupancy or equivalent, or just prior to occupancy, or both, as directed by the Resident Engineer/COR. Overlapping photographic techniques shall be used to insure maximum coverage. Indexing and navigation accomplished through interactive architectural drawings.~~Document roof insulation and drains.
10. ~~Miscellaneous events that occur during any Contractor site visit, or events captured by the Department of Veterans Affairs independently, shall be dated, labeled and inserted into a Section in the navigation structure entitled "Slideshows," allowing this information to be stored in the same "place" as the formal scope.~~Document roofing.
11. ~~Customizable project-specific digital photographic documentation of other details or milestones. Indexing and navigation accomplished through interactive architectural plans.~~Document monthly, exterior elevations.
12. ~~Monthly (29 max) exterior progressions (360 degrees around the project) and slideshows (all elevations and building envelope). The slideshows allow for the inclusion of Department of Veterans Affairs pictures, aerial photographs, and timely images which do not fit into any regular monthly photopath.~~Document fire protection, plumbing, mechanical and electrical overhead rough-in and in-wall rough-in.
13. ~~Weekly (21 Max) Site Progressions - Photographic documentation capturing the project at different stages of construction. These progressions shall capture underground utilities, excavation, grading, backfill, landscaping and road construction throughout the duration of the project.~~Document equipment installations.
14. ~~Regular (8 max) interior progressions of all walls of the entire project to begin at time of substantial framed or as directed by the~~

~~Resident Engineer/COR through to completion.~~Document underground utilities trenching and manhole structures.

~~15. Detailed Exact-Built of all Slabs for all project slab pours just prior to placing concrete or as directed by the Resident Engineer/COR.~~Document stored materials off site.

~~16. Detailed Interior exact built overlapping photos of the entire building to include documentation of all mechanical, electrical and plumbing systems in every wall and ceiling, to be conducted after rough-ins are complete, just prior to insulation and or drywall, or as directed by Resident Engineer/COR.~~

~~17. Finished detailed Interior exact built overlapping photos of all walls, ceilings, and floors to be scheduled by Resident Engineer/COR prior to occupancy.~~

~~18. In event a greater or lesser number of images than specified above are required by the Resident Engineer/COR, adjustment in contract price will be made in accordance with clause entitled "CHANGES" (FAR 52.243-4 and VAAR 852.236-88).~~

- D. Images shall be taken by a commercial photographer and must show distinctly, at as large a scale as possible, all parts of work embraced in the picture.
- E. Coordination of photo shoots is accomplished through Resident Engineer/COR. Contractor shall also attend construction team meetings as necessary. Contractor's operations team shall provide regular updates regarding the status of the documentation, including photo shoots concluded, the availability of new Progressions or Exact-Built's viewable on-line and anticipated future shoot dates.
- F. Contractor shall provide all on-line domain/web hosting, security measures, and redundant server back-up of the documentation.
- G. Contractor shall provide technical support related to using the system or service.
- H. Upon completion of the project, final copies of the documentation (the "Permanent Record") with the indexing and navigation system embedded

(and active) shall be provided in an electronic media format, typically a DVD or external hard-drive. Permanent Record shall have Building Information Modeling (BIM) interface capabilities. On-line access terminates upon delivery of the Permanent Record.

#### **1.26 FINAL ELEVATION DIGITAL IMAGES**

- A. A minimum of four (4) images of each elevation shall be taken with a minimum 6 MP camera, by a professional photographer with different settings to allow the Resident Engineer/COR to select the image to be printed. All images are provided to the RE on a CD.
- B. Photographs shall be taken upon completion, including landscaping. They shall be taken on a clear sunny day to obtain sufficient detail to show depth and to provide clear, sharp pictures. Pictures shall be 400 mm x 500 mm (16 by 20 inches), printed on regular weight paper, matte finish archival grade photographic paper and produced by a RA4 process from the digital image with a minimum 300 PPI. Identifying data shall be carried on label affixed to back of photograph without damage to photograph and shall be similar to that provided for final construction photographs.
- C. Furnish six (6) 400 mm x 500 mm (16 by 20 inch) color prints of the following buildings constructed under this project (elevations as selected by the RE from the images taken above). Photographs shall be artistically composed showing full front elevations. All images shall become property of the Government. Each of the selected six (6) prints shall be place in a frame with a minimum of two (2) inches of appropriate matting as a border. Provide a selection of a minimum of three (3) different frames from which the SRE will select one style to frame all six prints. Photographs with frames shall be delivered to the Resident Engineer/COR in boxes suitable for shipping.

#### **1.27 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 Resident Engineer/COR verbally, and then with a written follow up.

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**SECTION 01 32 16.13**  
**NETWORK ANALYSIS SCHEDULES**

**PART 1- GENERAL**

**1.1 DESCRIPTION:**

- A. The Contractor shall develop a Network Analysis System (NAS) plan and schedule demonstrating fulfillment of the contract requirements, shall keep the network up-to-date in accordance with the requirements of this section and shall utilize the plan for scheduling, coordinating and monitoring work under this contract (including all activities of subcontractors, equipment vendors and suppliers). Conventional Critical Path Method (CPM) Precedence Diagramming Method (PDM) technique will be utilized to satisfy both time and cost applications. All schedule data and reports required under this specification section shall be based upon regular total float, not relative total float schedules.

**1.2 CONTRACTOR'S REPRESENTATIVE:**

- A. The Contractor shall designate an authorized representative in the firm who will be responsible for the preparation of the network diagram, review and report progress of the project with and to the Contracting Officer's representative.
- B. The Contractor's representative shall have direct project control and complete authority to act on behalf of the Contractor in fulfilling the requirements of this specification section and such authority shall not be interrupted throughout the duration of the project.

**1.3 CONTRACTOR'S CONSULTANT:**

- A. To prepare the network diagram, and compact disk(s), which reflects the Contractor's project plan, the Contractor shall engage an independent CPM consultant who is skilled in the time and cost application of scheduling using (PDM) network techniques for construction projects, the cost of which is included in the Contractor's bid. This consultant shall not have any financial or business ties to the Contractor, and shall not be an affiliate or subsidiary company of the Contractor, and shall not be employed by an affiliate or subsidiary company of the Contractor.
- B. Prior to engaging a consultant, and within ten (10) calendar days after award of the contract the Contractor shall submit to the Contracting Officer:
1. The name and address of the proposed consultant.

2. Sufficient information to show that the proposed consultant has the qualifications to meet the requirements specified in the preceding paragraph.
  3. A list of prior construction projects, along with selected PDM network diagram samples on current projects which the proposed consultant has performed complete project scheduling services. These network diagram samples must show complete project planning for a project of similar size and scope as covered under this contract.
- C. The Contracting Officer and his duly authorized representative have the right to approve or disapprove employment of the proposed consultant, and will notify the Contractor of the VA decision within seven (7) calendar days from receipt of information. In case of disapproval, the Contractor shall resubmit another consultant within ten (10) calendar days for renewed consideration. The Contractor must have their CPM Consultant approved prior to submitting any diagram.

#### **1.4 COMPUTER PRODUCED SCHEDULES**

- A. The contractor shall provide to the VA, Resident Engineer/COR and CPM Schedule Analyst or the Commissioning Agent, monthly computer processing of all computer-produced time/cost schedules and reports generated from monthly project updates. This monthly computer service will include: three (3) copies of up to five (5) different reports (inclusive of all pages) available within the user defined reports of Primavera (P3 or P6) to the contracting officer's representative; a hard copy listing of all project schedule changes, and associated data, made at the update and an electronic file of this data in Primavera (P3 or P6) batch format; and the resulting monthly updated schedule in a compressed electronic file in Primavera (P3 or P6), (PDM) format. These must be submitted with and substantively support the contractor's monthly payment request and the signed lookahead report. The Resident Engineer/COR and the Commissioning Agent shall identify the five different report formats that the contractor shall provide based upon the monthly schedule updates.
- B. The contractor is responsible for the correctness and timeliness of the computer-produced reports. The Contractor is also responsible for the accurate and timely submittal of the updated project schedule and all CPM data necessary to produce the computer reports and payment request that is specified.

- C. The Contracting Officer or his duly authorized representative shall report errors in computer-produced reports to the Contractor's representative within ten (10) calendar days from receipt of reports. The Contractor will reprocess the computer-produced reports and associated compact disk(s), when requested by the Contracting Officer's representative, to correct errors which affect the payment and schedule for the project.

#### 1.5 THE COMPLETE PROJECT NETWORK DIAGRAM SUBMITTAL

- A. Within ~~forty-five (45) calendar days (60 calendar days on projects over \$50,000,000) after receipt of Notice to Proceed~~thirty (30) calendar days of commencement of Work, the Contractor shall submit for the Contracting Officer's and Commissioning Agent's review, a general schedule for overall project, including construction period, submittal period, equipment delivery period, start up and commissioning, testing, and punch list. ~~Provide~~ three blue line copies each of the complete network diagram on sheets of paper 765 x 1070 mm (30 x 42 inches) and an electronic file in a compressed Primavera (P3 or P6), (PDM) format. ~~The submittal shall also include three copies each of a computer-produced activity/event ID schedule showing project duration; phase completion dates; and other data, including event cost. Each activity/event on the computer-produced schedule shall contain as a minimum, but not limited to, activity/event ID, duration, predecessor and successor relationships, trade code, area code, description, budget amount, early start date, early finish date, late start date, late finish date and total float. Work activity/event relationships shall be restricted to finish-to-start and start-to-start without lead or lag constraints. The lead or lag for the SS relationships may only be allowed in limited basis if justified in writing and must be approved by the Contracting Officer and his duly authorized representative. Activity/event date constraints, not required by the contract, will not be accepted unless submitted to and approved by the Contracting Officer. The contractor shall make a separate written detailed request to the Contracting Officer and his duly authorized representative identifying these date constraints and secure the Contracting Officer's written approval before incorporating them into the network diagram. The Contracting Officer's separate approval of the network diagram shall not excuse the contractor of this requirement. Logic events (non-~~

~~work) will be permitted where necessary to reflect proper logic among work events, but must have a zero duration. The complete working network diagram shall reflect the Contractor's approach to scheduling the complete project. The final network diagram in its original form shall contain no contract changes or delays which may have been incurred during the final network diagram development period and shall reflect the entire contract duration as defined in the bid documents. These changes/delays shall be entered at the first update after the final network diagram has been approved. The Contractor should provide their requests for time and supporting time extension analysis for contract time as a result of contract changes/delays, after this update, and in accordance with Article, ADJUSTMENT OF CONTRACT COMPLETION.~~

1. Provide a separate schedule for long lead items, equipment, including time required for submittals, review, manufacturing and delivery.
2. Provide schedule to complete work every two weeks at site meeting to be reviewed with Contracting Officer and Architect-Engineer.
3. Provide submittal schedule including time for Resident Engineer/COR and Architect-Engineer to review.
4. Provide schedule for all shut downs in the existing buildings and on site.
5. Provide advance schedule notice (minimum 2 weeks) for work items outside of Project Area proper (West of Cooling Towers) that may/can impact on daily operation of Hospital.

B. Within thirty (30) calendar days after receipt of the complete project network diagram, the Contracting Officer or his representative, will do one or both of the following:

1. Notify the Contractor concerning his actions, opinions, and objections.
2. A meeting with the Contractor at or near the job site for joint review, correction or adjustment of the proposed plan will be scheduled if required. Within fourteen (14) calendar days after the joint review, the Contractor shall revise and shall submit three blue line copies of the revised network diagram, three copies of the revised computer-produced activity/event ID schedule and a revised electronic file as specified by the Contracting Officer. The revised

submission will be reviewed by the Contracting Officer and his duly authorized representative and, if found to be as previously agreed upon, will be approved.

- C. The approved baseline network diagram schedule and the corresponding computer-produced schedule(s) shall constitute the approved baseline schedule until subsequently revised in accordance with the requirements of this section.

#### **1.6 WORK ACTIVITY/EVENT COST DATA**

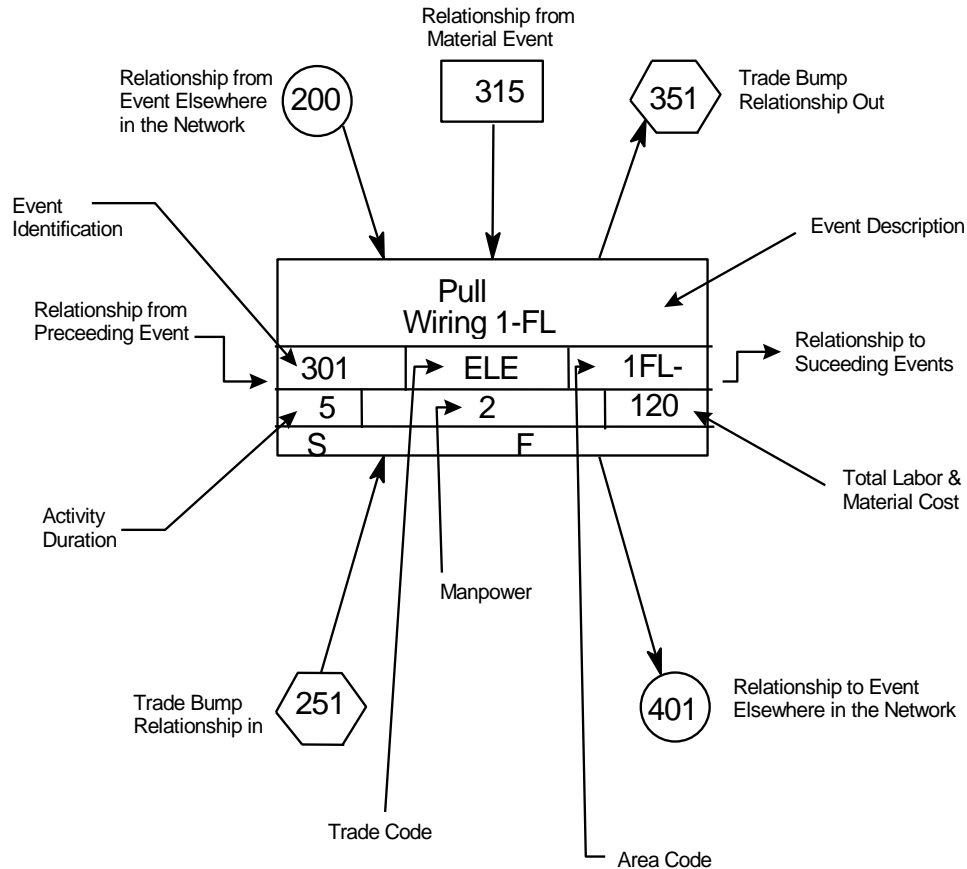
- A. The Contractor shall cost load all work activities/events except procurement activities. The cost loading shall reflect the appropriate level of effort of the work activities/events. The cumulative amount of all cost loaded work activities/events (including alternates) shall equal the total contract price. Prorate overhead, profit and general conditions on all work activities/events for the entire project length. The contractor shall generate from this information cash flow curves indicating graphically the total percentage of work activity/event dollar value scheduled to be in place on early finish, late finish. These cash flow curves will be used by the Contracting Officer to assist him in determining approval or disapproval of the cost loading. In the event of disapproval, the Contractor shall revise and resubmit in accordance with Article, THE COMPLETE PROJECT NETWORK DIAGRAM SUBMITTAL. Negative work activity/event cost data will not be acceptable, except on VA issued contract changes.
- B. The Contractor shall cost load work activities/events for guarantee period services, test, balance and adjust various systems in accordance with the provisions in the FAR 52.232 - 5 (PAYMENTS UNDER FIXED-PRICE CONSTRUCTION), Article, and VAAR 852.236 - 83 (PAYMENTS UNDER FIXED-PRICE CONSTRUCTION).
- C. In accordance with Article PERFORMANCE OF WORK BY THE CONTRACTOR in FAR 52.236 - 1 and VAAR 852.236 - 72, the Contractor shall submit, simultaneously with the cost per work activity/event of the construction schedule required by this Section, a responsibility code for all activities/events of the project for which the Contractor's forces will perform the work.
- D. Work activities/events for Contractor bond shall have a trade code and area code of BOND.

### 1.7 NETWORK DIAGRAM REQUIREMENTS

- A. Show on the network diagram the sequence and interdependence of work activities/events required for complete performance of all items of work. In preparing the network diagram, the Contractor shall:
1. Exercise sufficient care to produce a clear, legible and accurate network diagram, refer to the drawing, CPM-1 (Sample CPM Network). Computer plotted network diagrams shall legibly display and plot all information required by the VA CPM activity/event legend or the computer plotted network diagram will not be acceptable. If the computer plotted network diagram is not found acceptable by the contracting officer's representative or Commissioning Agent, then the network diagram will need to be hand drafted and meet legibility requirements. Group activities related to specific physical areas of the project, on the network diagram for ease of understanding and simplification. Provide a key plan on each network diagram sheet showing the project area associated with the work activities/events shown on that sheet.
  2. Show the following on each work activity/event:
    - a. Activity/Event ID number.
    - b. Concise description of the work represented by the activity/event. (35 characters or less including spaces preferred).
    - c. Performance responsibility or trade code (five alpha characters or less): GEN, MECH, ELEC, CARP, PLAST, or other acceptable abbreviations.
    - d. Duration (in work days.)
    - e. Cost (in accordance with Article, ACTIVITY/EVENT COST DATA of this section and less than \$9,999,999 per activity).
    - f. Work location or area code (five characters or less), descriptive of the area involved.
    - g. Manpower required (average number of men per day).
    - h. The SYMBOL LEGEND format shown below and on the drawing, CPM-1 (Sample CPM Network) is mandatory and shall be followed in preparing final network diagrams.

## SYMBOL LEGEND

Show Network Diagram page number location(s) for all incoming/outgoing node connector(s).



3. Show activities/events as:

- a. Contractor's time required for submittal of shop drawings, templates, fabrication, delivery and similar pre-construction work.
- b. Contracting Officer's and Architect-Engineer's review and approval of shop drawings, equipment schedules, samples, template, or similar items.
- c. Interruption of VA Medical Center utilities, delivery of Government furnished equipment, and rough-in drawings, project phasing and any other specification requirements.
- d. Test, balance and adjust various systems and pieces of equipment, maintenance and operation manuals, instructions and preventive maintenance tasks.

- e. **Commissioning Activities** - Based upon the project specific Commissioning plan and the specification section 01 91 00, the contractor shall include in the **Day 1 CPM Diagram all the systems commissioning activities (see systems covered in Division 7, 8, 21, 22, 23, 26, 28, 31 and others as specified)** such as start up, Pre-functional check list, Pre -test, individual component and system level Functional test, Operator's training, O.& M. Manuals etc. (including any deficiency correction and re-testing). **The majority of commissioning activities should be completed as part of the normal construction schedule and finalized prior to the construction contract completion date.** To this end, it is imperative that the Commissioning Agent and the Contractor collaborate to integrate commissioning activities into the Contractor's overall construction schedule. All commissioning activities shall be cost loaded as required in the earlier paragraphs.
- f. The Commissioning Plan will identify critical commissioning activities and associated construction/start up tasks that must precede these activities to allow for successful execution of the commissioning activities. In order to coordinate these activities with the construction schedule, a **Commissioning Duration Schedule** should be provided by the Commissioning Agent to the Resident Engineer/COR and the Contractor to provide a rational basis for integration of commissioning into the Day 1 diagram and the construction schedule. The Commissioning Duration Schedule should include the following information:
- 1) Description of Commissioning Activity
  - 2) Prerequisite Construction Tasks Required to Execute the Cx Activity
  - 3) Elapsed Time Duration of Each Activity
  - 4) Documentation Associated with Each Task/Document Responsibility
- g. Once the duration schedule is delivered to the Contractor, the Commissioning Agent will collaborate with the Contractor to integrate all commissioning activities into the fixed duration construction schedule in accordance with VA NAS requirements for scheduling the project.



4. Show not only the activities/events for actual construction work for each trade category of the project, but also trade relationships to indicate the movement of trades from one area, floor, or building, to another area, floor, or building, for at least five trades who are performing major work under this contract.
  5. Break up the work into activities/events of a duration no longer than twenty (20) work days each, except as to non-construction activities/events (i.e., procurement of materials, delivery of equipment, concrete and asphalt curing) and any other activities/events for which the Contracting Officer may approve the showing of a longer duration. The duration for VA approval of any required submittal, shop drawing, or other submittals shall not be less than twenty (20) work days. Refer to drawing CPM-1 for VA approval activities/events which will require minimum duration longer than twenty (20) workdays. The construction time as determined by the CPM schedule from early start to late finish for any sub-phase, phase or the entire project shall not exceed the contract time(s) specified or shown.
  6. Describe work activities/events clearly, so the work is readily identifiable for assessment of completion. Activities/events labeled "start," "continue," or "completion," are not specific and will not be allowed. Lead and lag time activities will not be acceptable.
  7. Uniquely number each activity/event with numbers ranging from 1 (or 00001) to 99998 only. The network diagram should be generally numbered in such a way to reflect either discipline, phase or location of the work.
- B. Submit the following supporting data in addition to the network diagram, activity/event ID schedule and electronic file (s). **Failure of the Contractor to include this data will delay the review of the submittal until the Contracting Officer is in receipt of the missing data:**
1. The proposed number of working days per week.
  2. The holidays to be observed during the life of the contract (by day, month, and year).
  3. The planned number of shifts per day.
  4. The number of hours per shift.

5. List the major construction equipment to be used on the site, describing how each piece relates to and will be used in support of the submitted network diagram work activities/events.
6. Provide a typed, doubled spaced, description, at least one page in length, of the plan and your approach to constructing the project.
- C. To the extent that the network diagram or any revised network diagram shows anything not jointly agreed upon, it shall not be deemed to have been approved by the Contracting Officer. Failure to include any element of work required for the performance of this contract shall not excuse the Contractor from completing all work required within any applicable completion date of each phase regardless of the Contracting Officer's approval of the network diagram.
- D. Compact Disk Requirements and CPM Activity/Event Record Specifications: Submit to the VA (Resident Engineer/COR and CPM Schedule Analyst or Commissioning Agent) an electronic file(s) containing one file of the data required to produce a Primavera (P3 or P6), (PDM) produced schedule, reflecting all the activities/events of the complete project network diagram being submitted.

#### 1.8 PAYMENT TO THE CONTRACTOR:

- A. Monthly, the contractor shall submit the AIA application and certificate for payment documents G702 & G703 reflecting updated schedule activities and cost data in accordance with the provisions of the following Article, PAYMENT AND PROGRESS REPORTING, as the basis upon which progress payments will be made pursuant to Article FAR 52.232 - 5 (PAYMENTS UNDER FIXED-PRICE CONSTRUCTION), and VAAR 852.236 - 83 (PAYMENTS UNDER FIXED-PRICE CONSTRUCTION). The Contractor is entitled to a monthly progress payment upon approval of estimates as determined from the currently approved updated computer-produced calendar-dated schedule unless, in special situations, the Contracting Officer permits an exception to this requirement. Monthly payment requests shall include: three copies of up to five different reports (inclusive of all pages) available within the user defined reports of Primavera (P3 or P6), (PDM) to the contracting officer's representative; a listing of all project schedule changes, and associated data, made at the update; and an electronic file (s) of the resulting monthly updated schedule in a compressed Primavera (P3 or P6), (PDM) format. These must be submitted with and substantively

support the contractor's monthly application and certificate for payment request documents. All email attached document submissions shall be in PDF format where applicable. If size of documentation prevents transfer per email, transfer by FTP site or compact disk is acceptable.

- B. When the Contractor fails or refuses to furnish to the Contracting Officer the information and the associated updated Primavera (P3 or P6), (PDM) schedule in electronic format, which, in the sole judgment of the Contracting Officer, is necessary for processing the monthly progress payment, the Contractor shall not be deemed to have provided an estimate and supporting schedule data upon which progress payment may be made.

#### **1.9 PAYMENT AND PROGRESS REPORTING**

- A. Bi-weekly (with the option of weekly if deemed critical by the Contracting Officer or his duly authorized representative) job site progress meetings shall be held on dates mutually agreed to by the Contracting Officer (or Contracting Officer's representative) and the Contractor. Contractor and the CPM consultant will be required to attend all progress meetings. Presence of Subcontractors during progress meeting is optional unless required by the Contracting Officer (or Contracting Officer's representative). The Contractor shall update the project schedule and all other data required by this section shall be accurately filled in and completed prior to the monthly progress meeting. The Contractor shall provide this information to the Contracting Officer and his duly authorized representative in completed form three (3) work days in advance of the progress meeting. Job progress will be reviewed to verify:

1. Actual start and/or finish dates for updated/completed activities/events.
2. Remaining duration, required to complete each activity/event started, or scheduled to start, but not completed.
3. Logic, time and cost data for change orders, and supplemental agreements that are to be incorporated into the network diagram and computer-produced schedules. Changes in activity/event sequence and duration which have been made pursuant to the provisions of following Article, ADJUSTMENT OF CONTRACT COMPLETION.
4. Percentage for completed and partially completed activities/events.

5. Logic and duration revisions required by this section of the specifications.
  6. Activity/event duration and percent complete shall be updated independently.
- B. The Contractor shall submit a narrative report as a part of his progress review and update, in a form agreed upon by the Contractor and the Contracting Officer. The narrative report shall include a description of problem areas; current and anticipated delaying factors and their estimated impact on performance of other activities/events and completion dates; and an explanation of corrective action taken or proposed. **This report is in addition to the daily reports pursuant to the provisions of Article, DAILY REPORT OF WORKERS AND MATERIALS in the GENERAL CONDITIONS.**
- C. After completion of the joint review and the Contracting Officer's and his duly authorized representative's approval of all entries, the contractor will generate an updated computer-produced calendar-dated schedule and supply the Contracting Officer and his duly authorized representative with reports in accordance with the Article, COMPUTER PRODUCED SCHEDULES, specified.
- D. After completing the monthly schedule update, the contractor's scheduling consultant shall rerun all current period contract change(s) against the prior approved monthly project schedule. The analysis shall only include original workday durations and schedule logic agreed upon by the contractor and Resident Engineer/COR for the contract change(s). When there is a disagreement on logic and/or durations, the consultant shall use the schedule logic and/or durations provided and approved by the Resident Engineer/COR. After each rerun update, the resulting electronic project schedule data file shall be appropriately identified and submitted to the VA in accordance to the requirements listed in articles 1.4 and 1.7. This electronic submission is separate from the regular monthly project schedule update requirements and shall be submitted to the Resident Engineer/COR within fourteen (14) calendar days of completing the regular schedule update. **Before inserting the contract changes durations, care must be taken to ensure that only the original durations will be used for the analysis, not the reported durations after progress. In addition, once the final network diagram is approved, the contractor must recreate all manual progress payment**

**updates on this approved network diagram and associated reruns for contract changes in each of these update periods as outlined above for regular update periods. This will require detailed record keeping for each of the manual progress payment updates.**

- E. After VA acceptance and approval of the final network diagram, and after each monthly update, the contractor shall submit to the Contracting Officer and the Commissioning Agent three(3) blue line copies each of a revised complete network diagram showing all completed and partially completed activities/events, contract changes and logic changes made on the intervening updates or at the first update on the final diagram. The Contracting Officer may elect to have the contractor do this on a less frequent basis, but it shall be done on a quarterly basis as a minimum.
- F. Following approval of the CPM schedule, the VA, the General Contractor, its approved CPM Consultant, Commissioning Agent, and all subcontractors needed, as determined by the SRE, shall meet to discuss the monthly updated schedule. The main emphasis shall be to address work activities to avoid slippage of project schedule and to identify any necessary actions required to maintain project schedule during the reporting period. The Government representatives and the Contractor should conclude the meeting with a clear understanding of those work and administrative actions necessary to maintain project schedule status during the reporting period. This schedule coordination meeting will occur after each monthly project schedule update meeting utilizing the resulting schedule reports from that schedule update. If the project is behind schedule, discussions should include ways to prevent further slippage as well as ways to improve the project schedule status, when appropriate.

#### **1.10 RESPONSIBILITY FOR COMPLETION**

- A. Whenever it becomes apparent from the current monthly progress review meeting or the monthly computer-produced calendar-dated schedule that phasing or contract completion dates will not be met, the Contractor shall execute some or all of the following remedial actions:
  - 1. Increase construction manpower in such quantities and crafts as necessary to eliminate the backlog of work.

2. Increase the number of working hours per shift, shifts per working day, working days per week, the amount of construction equipment, or any combination of the foregoing to eliminate the backlog of work.
  3. Reschedule the work in conformance with the specification requirements.
- B. Prior to proceeding with any of the above actions, the Contractor shall notify and obtain approval from the Contracting Officer for the proposed schedule changes. If such actions are approved, the CPM revisions shall be incorporated by the Contractor into the network diagram before the next update, at no additional cost to the Government.

#### **1.11 CHANGES TO NETWORK DIAGRAM AND SCHEDULE**

- A. Within thirty (30) calendar days after VA acceptance and approval of any updated computer-produced schedule, the Contractor will submit a revised network diagram, the associated compact disk(s), and a list of any activity/event changes including predecessors and successors for any of the following reasons:
1. Delay in completion of any activity/event or group of activities/events, indicate an extension of the project completion by twenty (20) working days or ten (10) percent of the remaining project duration, whichever is less. Such delays which may be involved with contract changes, strikes, unusual weather, and other delays will not relieve the Contractor from the requirements specified unless the conditions are shown on the CPM as the direct cause for delaying the project beyond the acceptable limits.
  2. Delays in submittals, or deliveries, or work stoppage are encountered which make rescheduling of the work necessary.
  3. The schedule does not represent the actual prosecution and progress of the project.
  4. When there is, or has been, a substantial revision to the activity/event costs of the network diagram regardless of the cause for these revisions.
- B. CPM revisions made under this paragraph which affect the previously approved computer-produced schedules for Government furnished equipment, vacating of areas by the VA Medical Center, contract phase(s) and sub phase(s), utilities furnished by the Government to the

Contractor, or any other previously contracted item, must be furnished in writing to the Contracting Officer for approval.

- C. Contracting Officer's approval for the revised network diagram and all relevant data is contingent upon compliance with all other paragraphs of this section and any other previous agreements by the Contracting Officer or the VA representative.
- D. The cost of revisions to the network diagram resulting from contract changes will be included in the proposal for changes in work as specified in Article, FAR 52.243 -4 (CHANGES), VAAR 852.236 - 88 (CHANGES - SUPPLEMENTS), and will be based on the complexity of the revision or contract change, man hours expended in analyzing the change, and the total cost of the change.
- E. The cost of revisions to the network diagram not resulting from contract changes is the responsibility of the Contractor.

#### **1.12 ADJUSTMENT OF CONTRACT COMPLETION**

- A. The contract completion time will be adjusted only for causes specified in this contract. Request for an extension of the contract completion date by the Contractor shall be supported with a justification, CPM data and supporting evidence as the Contracting Officer may deem necessary for determination as to whether or not the Contractor is entitled to an extension of time under the provisions of the contract. Submission of proof based on revised activity/event logic, durations (in work days) and costs is obligatory to any approvals. The schedule must clearly display that the Contractor has used, in full, all the float time available for the work involved in this request. The Contracting Officer's determination as to the total number of days of contract extension will be based upon the current computer-produced calendar-dated schedule for the time period in question and all other relevant information.
- B. Actual delays in activities/events which, according to the computer-produced calendar-dated schedule, do not affect the extended and predicted contract completion dates shown by the critical path in the network, will not be the basis for a change to the contract completion date. The Contracting Officer will within a reasonable time after receipt of such justification and supporting evidence, review the facts and advise the Contractor in writing of the Contracting Officer's decision.

- C. The Contractor shall submit each request for a change in the contract completion date to the Contracting Officer in accordance with the provisions specified under Article, FAR 52.243 -4 (CHANGES), VAAR 852.236 - 88 (CHANGES - SUPPLEMENTS). The Contractor shall include, as a part of each change order proposal, a sketch showing all CPM logic revisions, duration (in work days) changes, and cost changes per line item for work in question and its relationship to other activities on the approved network diagram.
- D. All delays due to non-work activities/events such as RFI's, WEATHER, STRIKES, and similar non-work activities/events shall be analyzed on a month by month basis.

#### **1.13 CONSTRUCTION SCHEDULE RISK ANALYSIS / MITIGATION PLAN**

- A. Schedule Risk Analysis - The contractor shall conduct the statistical schedule risk analysis based on the above detailed construction activities in the Day 1 approved diagram, identifying major schedule risk areas and recommended risk mitigation plans as outlined below.
- B. The risk analysis shall be conducted by a person or firm skilled in the statistical method of schedule risk analysis based on the (PDM) network techniques for major construction projects, preferably in the major health care related projects. The cost of this service shall be included in the Contractor's proposal.
- C. The Contracting Officer has the right to approve or disapprove the Person or firm designated to perform the risk analysis.

#### **1.14 RISK ANALYSIS FORMAT / REQUIREMENTS / SUBMITTALS**

- A. Risk Analysis Software / Format - Within forty-five (45) calendar days (60 calendar days on projects over \$50,000,000) after receipt of Notice to Proceed, the Contractor shall submit for the Contracting Officer's and his duly authorized representative's review; a Risk Analysis software to be utilized, the method of performing the analysis, the format of presenting the data and the reports for VA approval.
- B. Conduct Risk Analysis / Submittals - **Based on the approved software / format, the consultant shall** perform statistical risk analysis on the detailed approved Day 1 diagram. The contractor shall review and utilize any previous Risk analysis performed by the A/E of record based on the "semi-detailed" (yet at an overall level) construction logic and schedule to ensure the continuity of previous schedule risk analysis. The contractor's project manager and Superintendent shall identify the



major schedule risk areas and possible risk mitigation strategy/plan and record it in a narrative format, with **electronic file submission** to the Contracting Officer and his duly authorized representative. **The risk analysis exercise shall be performed or updated monthly initially for a minimum of three (3) months and per mutual agreement until project completion at least on a quarterly basis or as directed by the Contracting officer and his duly authorized representative.**

- C. The submittal shall include three copies of a computer-produced risk analysis results, predicting the various meaningful probability curves of achieving the contract schedules. It shall also include a detailed narrative list of all major and minor potential and specific schedule and cost risk areas, and a contractor's recommendations of mitigating the identified risks which must be addressed by the Contracting Officer and his duly authorized representative as well as the Commissioning Agent to maintain the contract schedule.

- - - E N D - - -

**SECTION 11 12 00**  
**PARKING CONTROL EQUIPMENT**

**PART 1 GENERAL:**

**1.1 DESCRIPTION:**

A. Section Includes:

1. Automatic Barrier Gates.
2. Vehicle Detectors.
3. Touchpad Control Units.
4. Emergency Vehicle Priority Control System.

**1.2 RELATED WORK:**

- A. Asphaltic paving: Section 32 12 16, ASPHALT PAVING.
- B. Concrete paving: Section 32 05 23, CEMENT AND CONCRETE FOR EXTERIOR IMPROVEMENTS.
- C. Concrete foundation work: Section 03 30 00, CAST-IN-PLACE CONCRETE.
- D. Color and texture: Section 09 06 00, SCHEDULE FOR FINISHES.
- E. Conduit placement for equipment: Section 26 05 33, RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS, Section 27 05 33, RACEWAYS AND BOXES FOR COMMUNICATIONS SYSTEMS.
- F. Power supply to disconnect, junction box, in gate arm unit: Section 26 05 19, LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES (600 VOLTS AND BELOW), Section 27 10 00, STRUCTURED CABLING and Section 28 05 13, CONDUCTORS AND CABLES FOR ELECTRONIC SAFETY AND SECURITY.
- G. Electrical characteristics and wiring connections: Section 26 27 26, WIRING DEVICES.

**1.3 QUALITY CONTROL:**

A. Qualifications:

1. Approval by Contracting Officer is required of products or service of proposed manufacturer, suppliers, and installers, and will be based upon submission by Contractor of certification that:
  - a. Installer: Approved by manufacturer of materials and has technical qualifications, experience, trained personnel and facilities to install specified items.
  - b. Manufacturer's product submitted has been in satisfactory operation, on three installations similar and equivalent in size to this project, for three years. Submit list of installations.

2. Maintenance Proximity: Installer shall maintain a place of business with maintenance facilities not more than two (2) hours normal travel time from project site.
3. UL and NEMA Compliance: Provide internal electrical components required as part of parking control equipment that are listed by UL and comply with applicable NEMA standards.
4. Single-Source Responsibility: Obtain parking control equipment from one source and from a single manufacturer.

**1.4 SUBMITTALS:**

- A. In accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES, submit following:
  1. Manufacturer's Literature and Data:
    - a. Description of parking control equipment material and accessories to be provided.
    - b. Provide data on operating equipment, characteristics and limitations, and operating temperature ranges.
  2. Samples:
    - a. Submit two samples of access cards and security program, illustrating size, and coding method.
  3. Shop Drawings and Certificates: Indicate plan layout of equipment access lanes, mounting bolt dimensions, conduit and outlet locations, power requirements, and conformation of building electrical requirements. Provide Contractor with mounting bolt template in time for installation.
  4. Wiring Diagrams: Detailing wiring for parking control equipment operator, signal, and control systems differentiating clearly between manufacturer-installed wiring and field-installed wiring.
    - a. Show locations of connections to electrical service provided as a unit of work under other Divisions.
  5. Maintenance Data: For parking control equipment components for inclusion in Operating and Maintenance Manuals, include the following:
    - a. Maintenance Instructions: Provide manufacturer's instructions for maintenance of parking control equipment.
      - 1) Include recommended methods and frequency for maintaining equipment in optimum operating condition under anticipated traffic and use conditions.

- 2) Include precautions against materials and methods that may be detrimental to finishes and performance.
- 3) Lubrication Schedule and Information: Provide lubrication and periodic maintenance requirement schedules including parts list and parts numbers.
6. Operation Data: Provide operating data for operating equipment, including clock timer, changing security access code, and any other pertinent information required for Government operation.
7. Certificates: Quality Control Certificate Submittals and lists specified in paragraph, QUALIFICATIONS.
- B. In accordance with Section 00 72 00, GENERAL CONDITIONS, submit following at project closeout: Guaranty.
- C. In accordance with Section 01 00 00, GENERAL REQUIREMENTS, submit following at project closeout:
  1. Project Record Documents: Record actual locations of concealed conduit and vehicle detection activators.

**1.5 REGULATORY REQUIREMENTS:**

- A. Products Requiring Electrical Connection: Listed and classified by UL as suitable for purpose specified and indicated.

**1.6 PROJECT CONDITIONS:**

- A. Coordinate placement of conduit, accessories, and power wiring to operating equipment.
- B. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.

**1.7 DELIVERY, STORAGE AND HANDLING:**

- A. Deliver materials to site in original sealed packages or containers; labeled for identification with manufacturer's name and brand.
- B. Store materials in weathertight and dry storage facility. Protect from damage due to handling, weather, and construction operations before, during and after installation.

**1.8 APPLICABLE PUBLICATIONS:**

- A. Publications listed below form a part of this specification to extent referenced. Publications are referenced in text by basic designation only.
- B. American Society for Testing Materials (ASTM):  
A153/A153M-09.....Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

A500-10.....Standard Specification for Cold-Formed Welded  
and Seamless Carbon Steel Structural Tubing in  
Rounds and Shapes.

A653/A653M-10.....Standard Specification for Steel Sheet, Zinc-  
Coated (Galvanized) by the Hot-Dip Process,  
Structural (Physical) Quality.

C. National Electrical Manufacturers Association (NEMA):

MG 1-09(R2010).....Motors and Generators.

D. National Fire Protection Association (NFPA):

70-11.....National Electrical Code.

E. Underwriters Laboratories Inc. (UL):

Electrical Appliance and Utilization Equipment Directory.

#### **1.9 SYSTEM DESCRIPTION:**

A. Parking Control System: Automatic operation.

B. Design: Protect against interference or damage by lightning or other  
electrical influence; include fuse, over-voltage protection, flash-over  
protection, and line filter.

C. Entry - Automatic Gate Arm Control: Electrically operated by  
reprogrammable touchpad access system.. Activate automatic arm  
reversing switch if an obstacle is sensed in downward motion.

D. Exit - Automatic Gate Arm Control: Electrically operated upon detection  
of vehicle by sensing loop buried in pavement . Activate automatic arm  
reversing switch if an obstacle is sensed in the downward motion.

#### **1.10 WARRANTY**

A. Submit manufacturer's written warranty for materials and installation  
in accordance with FAR clause 52.246-21.

1. Warranty: Cover keeping equipment operational.

2. Final Acceptance: Requirement for final acceptance shall be  
continued acceptable use of parking control equipment without a  
breakdown or stoppage for a period of fifteen (15) calendar days  
after final acceptance of project by Government.

### **PART 2 PRODUCTS**

#### **2.1 MATERIALS:**

A. Iron and Steel Hardware: ASTM A153; Zinc coating (hot-dip) on iron and  
steel hardware.

B. Steel: ASTM A653/A653M; Galvanized to G90.

C. Structural tubing in rounds and shapes: A500; Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.

D. Wood: Clear fir.

## **2.2 AUTOMATIC GATE:**

A. Provide UL approved automatic barrier gate parking access-control system.

B. Cabinet: 1.9 mm, (0.075 inch) minimum cold-rolled steel sheet cabinet, welded and weather tight seams, reinforced internally with welded steel angle framing, thermally insulated to permit heater to maintain cabinet temperature to equipment operating minimum, flush access doors and panels, tamper proof hardware, weather tight gaskets, master keyed locks; furnish two (2) keys. Conceal mounting bolts inside units:  
1. Finish cabinet, interior and exterior, with manufacturer's standard white baked enamel finish over primer system.

C. Arm Control: Mechanism to raise and lower arm by instant reversing electric motor, enclosed speed reducer operated by self contained, plug-in replaceable controller. Design mechanism with slip clutch to prevent breakage if arm is forced, and to permit manual operation if required. Arm movement to stop and start at reduced speed. Components of zinc coated steel.

D. Electrical Components: Self-contained, plug-in, replaceable components. Include wiring for control units, zinc plated connection box, grounded convenience outlet, switch for automatic or manual operation, switch to disconnect power unit, thermostatically controlled minimum 250 Watt heater strip with control switch and preset thermostat, and thermal protection disconnect for motor.

## **2.3 ELECTRICAL CHARACTERISTICS AND COMPONENTS:**

A. Electrical Characteristics:

1. Provide 1/3 hp, 115 volts AC, single phase, 60 Hz.
2. Refer to Section 26 27 26, WIRING DEVICES: Electrical connections.

B. Motor: Instant reversing motor for operation of gate arm. Section 22 05 12, GENERAL MOTOR REQUIREMENTS FOR PLUMBING EQUIPMENT, Section 23 05 12, GENERAL MOTOR REQUIREMENTS FOR HVAC AND STEAM GENERATION EQUIPMENT and Section 26 29 21, ENCLOSED SWITCHES AND CIRCUIT BREAKERS. NEMA MG1.

C. Controls: Transmit power to gate arm drive shaft through a harmonic acting crank and connecting rod. Fabricate cranks, rod, and drive shaft of galvanized solid bar steel.

D. Wiring Terminations: Provide terminal lugs to match branch circuit conductor quantities, sizes, and materials indicated. Enclose terminal lugs in terminal box sized to NFPA 70.

E. Disconnect Switch: Factory mount disconnect switch in control panel.

#### **2.4 ARM AND SUPPORT:**

A. Gate Arm: Fabricate gate arm of nominal 25 mm (1 inch) thick, length as indicated, of Wood, one piece arm, and automatic instant reversing arm mechanism that stops downward motion of gates if arm strikes an object, and returning arm immediately to upward position. Equip mechanism with a 0 to 60 second variable time reset device.

1. Finish with manufacturer's standard coating system with black and yellow diagonal stripes on traffic side face.

B. Arm Clamp: Cast metal, quick change clamp and hub bracket, to permit rapid replacement of arm without fitting or drilling. Provide breakaway feature to ensure clean break if arm is struck.

#### **2.5 ACCESS CONTROL UNIT:**

A. General: Provide pedestal mounted reprogrammable touchpad control units to activate barrier gates with intercom.

B. Control Unit: To activate gate arm when authorized code is entered on keypad .

C. Cabinet: 1.9 mm (0.075 inch) minimum welded cold-rolled steel sheet, weather tight seams; thermally insulated to permit heater to maintain cabinet temperature to equipment operating minimum, flush access doors and panels, tamper proof flush mounted lock hardware and two (2) keys master keyed to operate access panel, weather tight gaskets. Conceal mounting bolts inside units.

1. Mount housing on a 50 mm (2 inch) square steel tube pedestal with a curved top to receive housing, and a trim plate to cover anchor bolts.

2. Finish interior and exterior of cabinet with manufacturer's standard baked enamel finish over primer.

D. Touchpad: Mount 910 mm, 36 inches above vehicle pavement surface.

#### **2.6 VEHICLE DETECTION:**

A. Vehicle Detection: For use in temperature range of -40 to 71 °C; (-40 to 160 °F) to consist of detector unit in conjunction with sensing loop to activate barrier gate when vehicle enters or exits.

- B. Loop Wire: 14 gage, XHWN or THWN copper; loop size of 1 200 X 1 800 mm, (48 X 72 inches).
- C. Loop Groove Fill: Cold poured rubberized asphalt emulsion.

## **2.7 EMERGENCY VEHICLE ACCESS SYSTEM**

- A. Detector: Compact receiver designed to detect flashing optical light signal (strobe emitters) on approaching emergency vehicles, to activate barrier gate. Detector to have 200-foot activation range, with 10 degree vertical and 90 degree horizontal field of view.
  - 1. Frequency: F14 - 14.035 Hz +/- .25 Hz (high priority); F10 - 10.0 Hz +/- .25 Hz (low priority).
- B. Power Module: 12-24VDC AC/DC; DPDT relay output 2A @ 30 VDC, 0.6A @ 120 VAC. 0-30 minute time delay plus continuous latch mode. Remote reset.
- C. Unit to have red LED that illuminates when proper optical signal is received. LED to be visible through viewport from distance of not less than 25-feet.

## **2.7-8 FINISHES:**

- A. Gate Arm: Two coat enamel with reflective black and yellow diagonal stripes both sides of arm.
- B. Gate Posts and Cabinets: Baked enamel on steel, color as selected.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION:**

- A. Verification of existing conditions before starting work:
  - 1. Prior to beginning installation, examine areas to receive parking control equipment. Verify that critical dimensions are correct and that conditions are acceptable:
    - a. Do not proceed with installation of parking control equipment until unsatisfactory conditions have been corrected.
- B. Verify that anchor bolts, are ready to receive work and dimensions are as indicated on shop drawings.
- C. Verify that electric power is available and of correct characteristics.

### **3.2 PREPARATION**

Provide templates for anchor bolts and other items encased in concrete or below finished surfaces in sufficient time so as not to delay work.

### **3.3 INSTALLATION**

- A. Install parking control system and components in accordance with manufacturer's instructions and placement drawings.



- B. Cut grooves in pavement surface, install vehicle detection loops and lead-in wires, and fill grooves with loop filler.
- C. Install internal electrical wiring, conduit, junction boxes, transformers, circuit breakers, and auxiliary components required.

### **3.4 ADJUSTING**

- A. Prior to final acceptance of project adjust system components for smooth operation.
- B. Fit and adjust hardware for ease of operation.
  - 1. Lubricate hardware and other moving parts.
  - 2. Readjust parking control system and components at completion of project.

### **3.5 CLEANING**

- A. Clean metal surfaces promptly after installation, exercising care to avoid damage to coatings. Touch up damaged shop-applied finishes as required to restore damaged areas.
- B. Follow recommendations of manufacturer in selection of cleaning agents. Do not use cleaning agents containing ammonia or other compounds that might damage finished metal surfaces.

### **3.6 FIELD QUALITY CONTROL**

- A. Tests:
  - 1. Test operating functions in accordance with manufacturer's printed checklist.
  - 2. Correct defects revealed by tests. Retest corrected areas until functions are operating properly.

### **3.7 DEMONSTRATION, TESTING AND ACCEPTANCE**

- A. Instruct Owner's personnel in proper operation and maintenance of parking control equipment. Train personnel in procedures to follow in event of operational failures or malfunctions.
- B. Acceptance: At completion of project, and as a condition of acceptance, parking control equipment and systems shall be operated for a period of fifteen (15) consecutive calendar days without breakdown.

### **3.8 PROTECTION:**

- A. Protect parking control equipment finished surfaces from damage during erection, and after completion of work until final inspection and acceptance.

- - - END - - -

SECTION 22 40 00  
PLUMBING FIXTURES

**PART 1 - GENERAL**

**1.1 DESCRIPTION**

- A. Plumbing fixtures, associated trim and fittings necessary to make a complete installation from wall or floor connections to rough piping, and certain accessories.

**1.2 RELATED WORK**

- A. Sealing between fixtures and other finish surfaces: Section 07 92 00, JOINT SEALANTS.
- B. Flush panel access doors: Section 08 31 13, ACCESS DOORS AND FRAMES.
- C. Through bolts: Section 10 21 13, TOILET COMPARTMENTS.
- D. Section 22 05 11, COMMON WORK RESULTS FOR PLUMBING.
- E. SECTION 22 08 00, COMMISSIONING OF PLUMBING SYSTEMS.  
Requirements for commissioning, systems readiness checklist, and training.

**1.3 SUBMITTALS**

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Submit plumbing fixture information in an assembled brochure, showing cuts and full detailed description of each fixture.

**1.4 APPLICABLE PUBLICATIONS**

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.
- B. American National Standard Institute (ANSI):  
The American Society of Mechanical Engineers (ASME):  
A112.6.1M-02(R2008).....Floor Affixed Supports for Off-the-Floor  
Plumbing Fixtures for Public Use  
A112.19.1M-08 .....Enameled Cast Iron Plumbing Fixtures

- A112.19.2M-03.....Vitreous China Plumbing Fixtures  
A112.19.3-2001(R2008)...Stainless Steel Plumbing Fixtures (Designed for  
Residential Use)
- C. American Society for Testing and Materials (ASTM):  
A276-2010 .....Stainless and Heat-Resisting Steel Bars and  
Shapes  
WW-P-541-E/GEN .....Plumbing Fixtures with Amendment 1
- D. National Association of Architectural Metal Manufacturers (NAAMM): NAAMM  
AMP 500-505  
Metal Finishes Manual (1988)
- E. American Society of Sanitary Engineers (ASSE):  
1016-05.....Performance Requirements for Individual  
Thermostatic, Pressure Balancing and Combination  
Pressure Balancing and Thermostatic Control  
Valves for Individual Fixture Fittings
- F. National Sanitation Foundation (NSF)/American National Standards  
Institute (ANSI):  
61-2009 .....Drinking Water System Components-Health Effects
- G. American with Disabilities Act (A.D.A) Section 4-19.4 Exposed Pipes and  
Surfaces
- H. Environmental Protection Agency EPA PL 93-523 1974; A 1999) Safe  
Drinking Water Act.
- I. International Building Code, ICC IPBC 2009.

## **PART 2 - PRODUCTS**

### **2.1 STAINLESS STEEL**

- A. Corrosion-resistant Steel (CRS):
1. Plate, Sheet and Strip: CRS flat products shall conform to chemical composition requirements of any 300 series steel specified in ASTM A276.
  2. Finish: Exposed surfaces shall have standard polish (ground and polished) equal to NAAMM finish Number 4.
- B. Die-cast zinc alloy products are prohibited.

## **2.2 STOPS**

- A. Provide lock-shield loose key or screw driver pattern angle stops, straight stops or stops integral with faucet, with each compression type faucet whether specifically called for or not, including sinks in wood and metal casework, laboratory furniture and pharmacy furniture. Locate stops centrally above or below fixture in accessible location.
- B. Furnish keys for lock shield stops to Resident Engineer.
- C. Supply from stops not integral with faucet shall be chrome plated copper flexible tubing or flexible stainless steel with inner core of non-toxic polymer.
- D. Supply pipe from wall to valve stop shall be rigid threaded IPS copper alloy pipe, i.e. red brass pipe nipple, chrome plated where exposed.
- E. Psychiatric Area: Provide stainless steel drain guard for all lavatories not installed in casework.

## **2.3 ESCUTCHEONS**

- A. Heavy type, chrome plated, with set screws. Provide for piping serving plumbing fixtures and at each wall, ceiling and floor penetrations in exposed finished locations and within cabinets and millwork.

## **2.4 LAMINAR FLOW CONTROL DEVICE**

- A. Smooth, bright stainless steel or satin finish, chrome plated metal laminar flow device shall provide non-aeration, clear, coherent laminar flow that will not splash in basin. Device shall also have a flow control restrictor and have vandal resistant housing.
- B. Flow Control Restrictor:
  - 1. Capable of restricting flow from 95 ml/s to 110 ml/s (1.5 gpm to 1.7 gpm) for lavatories; 125 ml/s to 140 ml/s (2.0 gpm to 2.2 gpm) for sinks P-505 through P-520, P-524 and P-528; and 170 ml/s to 190 ml/s (2.75 gpm to 3.0 gpm) for dietary food preparation and rinse sinks or as specified.

2. Compensates for pressure fluctuation maintaining flow rate specified above within 10 percent between 170 kPa and 550 kPa (25 psi and 80 psi).
3. Operates by expansion and contraction, eliminates mineral/sediment build-up with self-cleaning action, and is capable of easy manual cleaning.

## 2.5 CARRIERS

- A. ASME/ANSI A112.6.1M, with adjustable gasket faceplate chair carriers for wall hung closets with auxiliary anchor foot assembly, hanger rod support feet, and rear anchor tie down.
  - B. ASME/ANSI A112.6.1M, lavatory, chair carrier for thin wall construction. All lavatory chair carriers shall be capable of supporting the lavatory with a 250-pound vertical load applied at the front of the fixture.
  - C. Where water closets, lavatories or sinks are installed back-to-back and carriers are specified, provide one carrier to serve both fixtures in lieu of individual carriers. The drainage fitting of the back to back carrier shall be so constructed that it prevents the discharge from one fixture from flowing into the opposite fixture.
  - C. (P-103) Water Closet (Wall Hung, ASME/ANSI A112.19.2M, Figure 9) office and industrial, elongated bowl, siphon jet 6 L (1.6 gallons) per flush, wall outlet. Top of rim shall be between 406 mm and 432 mm (16 inches and 17 inches) above finished floor. Handicapped water closet shall have rim set 457 mm (18 inches) above finished floor.
1. Seat: Institutional/Industrial, extra heavy duty, chemical resistant, solid plastic, open front less cover for elongated bowls, integrally molded bumpers, concealed check hinge with stainless steel post. Seat shall be posture contoured body design. Color shall be white.
  2. Fittings and Accessories: Gaskets - neoprene; bolts with chromium plated caps nuts and washers.
  3. Flush valve: Large chloramines resistant diaphragm, semi-red brass valve body, exposed chrome plated, battery powered active infra-red sensor for automatic operation with courtesy flush button for manual operation water saver design 6 L (1.6 gallons) per flush with maximum 10 percent variance 25 mm (1 inch) screwdriver back check angle stop with vandal resistant cap, adjustable tailpiece, a high back pressure vacuum breaker, spud coupling for 38 mm (1 1/2 inches) top spud, wall and spud flanges, and sweat solder adapter with cover tube and set

screw wall flange. Valve body, cover, tailpiece and control stop shall be in conformance with ASTM alloy classification for semi-red brass. Seat bumpers shall be integral part of flush valve. Set centerline of inlet 292 mm (11 1/2 inches) above rim.

## 2.7 URINALS

- A. (P-202) Urinal (Wheelchair, Wall Hung, ANSI A112.19.2M, Figure 30) bowl with integral flush distribution, wall to front of flare 356 mm (14 inches). Wall hung with integral trap, siphon jet flushing action 4 L (1.0 gallon per flush) with 51 mm (2 inches) back outlet and 19 mm (3/4 inch) top inlet spud.
1. Support urinal with chair carrier and install with rim 381 mm (15 inches) above finished floor.
  2. Flushing Device: Large chloramines resistant diaphragm, semi-red brass body, exposed flush valve, // electronic sensor operated // battery powered active infrared sensor for automatic operation // non-hold-open, water saver design, 19 mm (3/4 inch) capped screwdriver angle stop valve. Set centerline of inlet 292 mm (11 1/2 inches) above urinal. Valve body, cover, tailpiece and control stop shall be in conformance with ASTM alloy classification for semi-red brass.

## 2.9 LAVATORIES

- A. Dimensions for lavatories are specified, Length by width (distance from wall) and depth.
- B. Brass components in contact with water shall contain no more than 3 percent lead content by dry weight.
- C. (P-418) Lavatory (Metering Faucet) straight back, approximately 508 mm by 457 mm (20 inches by 18 inches) and a 102 mm (4 inches) minimum apron, first quality vitreous china with punching for gooseneck spout. Set rim 864 mm (34 inches) above finished floor.
1. Faucet: Solid cast brass construction, chrome plated, manual mixing faucet with temp limit stop and closure cartridge. Provide laminar flow control device.
  2. Drain: Cast or wrought brass with flat grid strainer with offset tailpiece, brass, chrome plated.

3. Stops: Angle type. See paragraph 2.2.Stops
  4. Trap: Cast copper alloy, 38 mm by 32 mm (1 1/2 inches by 1 1/4 inches)P-trap. Adjustable with connected elbow and 17 gage tubing extension to wall. Exposed metal trap surface and connection hardware shall be chrome plated with a smooth bright finish. Set trap parallel to wall.
  5. Provide cover for drain, stops and trap per A.D.A 4-19.4.
- D. (P-418A) Lavatory (Metering Faucet) Lavatory bowl is integral with the counter top as provided by the General Contractor. The plumbing Contractor shall install faucet, trim and drain associated.
- 1.Faucet: Solid cast brass construction, chrome plated, manual mixing faucet with temp limit stop and closure cartridge. Provide laminar flow control device.
  2. Drain: Cast or wrought brass with flat grid strainer with offset tailpiece, brass, chrome plated.
  3. Stops: Angle type. See paragraph 2.2.Stops
  4. Trap: Cast copper alloy, 38 mm by 32 mm (1 1/2 inches by 1 1/4 inches)P-trap. Adjustable with connected elbow and 17 gage tubing extension to wall. Exposed metal trap surface and connection hardware shall be chrome plated with a smooth bright finish. Set trap parallel to wall.
  5. Provide cover for drain, stops and trap per A.D.A 4-19.4.

## 2.10 SINKS

- A. Dimensions for sinks and laundry tubs are specified, length by width (distance from wall) and depth.
- B. (P-502) Service Sink (Corner, Floor Mounted) stain resistant terrazzo, 711 mm by 711 mm by 305 mm (28 inches by 28 inches by 12 inches) with 152 mm (6 inches) drop front. Terrazzo, composed of marble chips and white Portland cement, shall develop compressive strength of 20684 kPa (3000 psi) seven days after casting. Provide extruded aluminum cap on front side.
1. Faucet: Solid brass construction, combination faucet with replaceable monel seat, removable replacement unit containing all parts subject to wear, integral stops, mounted on wall above sink. Spout shall have a pail hook, 19 mm (3/4 inch) hose coupling threads, vacuum breaker,

- and top or bottom brace to wall. Four-arm handles on faucets shall be cast, formed, or drop forged copper alloy. Escutcheons shall be either forged copper alloy or CRS. Exposed metal parts, including exposed part under valve handle when in open position, shall have a smooth bright finish. Provide 914 mm (36 inches) hose with wall hook. Centerline of rough in is 1219 mm (48 inches) above finished floor.
2. Drain: Seventy six millimeter (3 inches) cast brass drain with nickel bronze strainer.
  3. Trap: P-trap, drain through floor.
- C. (P-528) Sink (CRS, Single Compartment, Counter Top ASME/ANSI A112.19.2M, Kitchen Sinks, Figure 5) self rimming, back faucet ledge, approximately 533 mm by 559 mm (21 inches by 22 inches) with single compartment inside dimensions approximately 406 mm by 483 mm by 191 mm (16 inches by 19 inches by 7 1/2 inches) deep. Shall be minimum of 1.3 mm thick (18 gauge) CRS. Corners and edges shall be well rounded:
1. Faucet: Solid brass construction, deck mounted combination faucet with monel or ceramic seats, removable replacement unit containing all parts subject to ware, swivel gooseneck spout with approximately 203 mm (8 inches) reach with spout outlet 152 mm (6 inches) above deck and 102 mm (4 inches) wrist blades with hose spray. Faucet shall be polished chrome plated.
  2. Drain: Drain plug with cup strainer, stainless steel.
  3. Trap: Cast copper alloy 38 mm (1 1/2 inches) P-trap with cleanout plug. Provide wall connection and escutcheon.
  4. Provide cover for drain, stops and trap per A.D.A 4-19.4.
  5. Provide cover for drain, stops and trap per A.D.A 4-19.4.
- D. (P-529) Sink (electronic faucet) Sink bowl is integral with the epoxy counter top. Plumbing contractor shall install the faucet, trim, waste and emergency eyewasher.
1. Faucet: Battery operated sensor gooseneck faucet with thermostatic mixing valve below sink.
  2. Drain: Drain plug with cup strainer, stainless steel.
  3. Trap: Cast copper alloy 38 mm (1 1/2 inches) P-trap with cleanout plug. Provide wall connection and escutcheon.
  4. Provide cover for drain, stops and trap per A.D.A 4-19.4.
  5. Provide cover for drain, stops and trap per A.D.A 4-19.4.



6. Provide a chrome plated deck (P-710) mounted eye/face, left sided sink top mounted. Swing operation with a thermostatic emergency type mixing valve below sink.

## 2.11 DISPENSER, DRINKING WATER

- A. Standard rating conditions: 10 degrees C (50 degrees F) water with 27 degrees C (80 degrees F) inlet water temperature and 32 degrees C (90 degrees F) ambient air temperature.
- B. (P-609) Electric Water Cooler: Mechanically cooled, self contained, wheel chair, bubbler style fully exposed dual height stainless steel fountain, recessed in wall refrigeration system, stainless steel grille, stainless steel support arm, wall mounting box, energy efficient cooling system consisting of a hermetically sealed reciprocating type compressor, 115v, 60 Hz, single phase, fan cooled condenser, permanently lubricated fan motor. Set highest bubbler 1016 mm (40 inches) above finished floor.

## 2.12 SHOWER UNIT ~~BATH~~ FIXTURE

- A. (P-704) Shower Unit ~~Bath~~ -Fixture and Trim ~~(Wall Mounted, Concealed Supplies, Hose Spray):~~

1. Shower ~~Installation:~~ Unit: Accessible acrylic one piece open top transfer shower stall with 2-inch threshold for pit detail installation, 2-inch drain opening, 36" by 36" by 78" high with valve, shower head, diverter, hand held shower, slide bar, weighted curtain, curtain rod, hooks, grab bars and seat to suit ADA. Provide ~~W~~ wall mounted showerhead connected to shower arm.
2. Shower Heads: Chrome plated metal head, adjustable ball joint, self cleaning head with automatic flow control device to limit discharge to not more than ~~three~~ 2.5 gpm. Body, internal parts of shower head and flow control fittings shall be copper alloy or CRS. Install showerhead 1829 mm (72 inches) above finished floor.
3. Valves: Type T/P combination temperature and pressure balancing, with chrome plated metal lever type operating with adjustment for rough-in variations handle and chrome plated metal or CRS face plate. Install diverter selector valve and elevated vacuum breaker to provide

tempered water to shower head and hose spray. Valve body shall be any suitable copper alloy. Internal parts shall be copper nickel alloy, CRS or thermoplastic material. Valve inlet and outlet shall be 13 mm (1/2 inch) IPS. Provide external screwdriver check stops, and temperature limit stops. Set stops for a maximum temperature of 105 degrees F. All exposed fasteners shall be vandal resistant. Valve shall provide a minimum of 160 ml/s at 310 kPa (2.5 gpm at 45 psi) pressure drop.

4. Spray Assembly: Shall consist of a 1524 mm (60 inches) length of rubber lined CRS, chrome plated metal flexible, or white vinyl reinforced hose with coupling for connection to 13 mm (1/2 inch) hose supply elbow protruding through wall. Spray shall consist of a self-closing, lever-handle, faucet with thumb control having open-shut positions and intermediate positions for regulating water flow and elevated pressure type vacuum breaker. Provide wall hook for faucet.

## **2.13 EMERGENCY FIXTURES**

### **A. (P-707) Emergency Shower and Eye and Face Wash (Free Standing):**

1. Shower Head: Polished chrome plated, 203 mm (8 inches) in diameter, install head 2134 mm (84 inches) above floor. Equip with stay-open ball valve, chrome plated. Operate valve with 610 mm (24 inches) stainless steel pull-rod with triangle handle. Pull-down opens valve; push-up closes valve.
2. Emergency Eye and Face Wash: CRS receptor. Equipment with a 13 mm (1/2 inch) stay open ball valve operated by push flag handle. Mount eye and face wash spray heads 1067 mm (42 inches) above finished floor.
3. Shower head and emergency eye and face wash shall be mounted to stanchion with floor flange through floor waste connection and P-trap. Paint stanchion same color as room interior.

## **2.14 HYDRANT, HOSE BIBB AND MISCELLANEOUS DEVICES**

- ### **A. (P-801) Wall Hydrant:** Cast bronze non-freeze hydrant with detachable T-handle. Brass operating rod within casing of bronze pipe of sufficient length to extend through wall and place valve inside building. Brass valve with coupling and union elbow having metal-to-metal seat. Valve

rod and seat washer removable through face of hydrant; 19 mm (3/4 inch) hose thread on spout; 19 mm (3/4 inch) pipe thread on inlet. Finish may be rough; exposed surfaces shall be chrome plated. Set not less than 457 mm (18 inches) nor more than 914 mm (36 inches) above grade. On porches and platforms, set approximately 762 mm (30 inches) above finished floor. Provide integral vacuum breaker which automatically drains when shut off.

- B. (P-802) Hose Bibb (Combination Faucet, Wall Mounted to Concealed Exposed Supply Pipes): Cast or wrought copper alloy, combination faucet with replaceable monel seat, removable replacement unit containing all parts subject to wear, mounted on wall 914 mm (36 inches) above floor to concealed supply pipes. Provide faucet without top or bottom brace and with 19 mm (3/4 inch) hose coupling threads on spout, integral stops and vacuum breaker. Design valves with valve disc arranged to eliminate rotation on seat. Four-arm handles on faucets shall be cast, formed or drop forged copper alloy. Escutcheons shall be either forged copper alloy or CRS.

### **PART 3 - EXECUTION**

#### **3.1 INSTALLATION**

- A. Fixture Setting: Opening between fixture and floor and wall finish shall be sealed as specified under Section 07 92 00, JOINT SEALANTS.
- B. Supports and Fastening: Secure all fixtures, equipment and trimmings to partitions, walls and related finish surfaces. Exposed heads of bolts and nuts in finished rooms shall be hexagonal, polished chrome plated brass with rounded tops.
- C. Through Bolts: For free standing marble and metal stud partitions refer to Section 10 21 13, TOILET COMPARTMENTS.
- D. Toggle Bolts: For hollow masonry units, finished or unfinished.
- E. Expansion Bolts: For brick or concrete or other solid masonry. Shall be 6 mm (1/4 inch) diameter bolts, and to extend at least 76 mm (3 inches) into masonry and be fitted with loose tubing or sleeves extending into masonry. Wood plugs, fiber plugs, lead or other soft metal shields are prohibited.
- F. Power Set Fasteners: May be used for concrete walls, shall be 6 mm (1/4 inch) threaded studs, and shall extend at least 32 mm (1 1/4 inches) into wall.

- G. Tightly cover and protect fixtures and equipment against dirt, water and chemical or mechanical injury.
- H. Where water closet waste pipe has to be offset due to beam interference, provide correct and additional piping necessary to eliminate relocation of water closet.
- I. Do not use aerators on lavatories and sinks.

### **3.2 CLEANING**

- A. At completion of all work, fixtures, exposed materials and equipment shall be thoroughly cleaned.

### **3.3 COMMISSIONING**

- A. Provide commissioning documentation in accordance with the requirements of Section 22 08 00 - COMMISSIONING OF PLUMBING SYSTEMS for all inspection, startup, and contractor testing required above and required by the System Readiness Checklist provided by the Commissioning Agent.
- B. Components provided under this section of the specification will be tested as part of a larger system. Refer to Section 22 08 00 - COMMISSIONING OF PLUMBING SYSTEMS and related sections for contractor responsibilities for system commissioning.

- - - E N D - - -