



Date: 6/23/2016

Project Name: Upgrade primary electrical switchgear and distribution and provide additional high voltage feeder to facility

Project No. 688-16-005

### **A/E SCOPE OF WORK:**

Area of Work: Primary Electrical Switchgear and Distribution, Washington D.C. VA Medical Center

### **PROJECT UNDERSTANDING**

The project scope is to investigate the complex of buildings and electrical power systems located on the DC VAMC to understand their compliance with NFPA 70 National Electrical Code, NFPA 99 Health Care Facilities Code Chapter 6 Electrical Systems, and VA Electrical Design Manual, through corrective action to engineer, correct and upgrade:

- Equipment locations that are under rated with respect to fault current
- Issues related to coordination and protection
- Issues with respect to arc flash hazards
- Equipment assessment issues
- Correct short-circuit case: Utility fault current

A/E is to provide comprehensive design investigation and technical services to bring the electrical systems and affected components into compliance with the Code and Design Manual. The electrical system for hospitals must comply with the Type 1 system as defined in NFPA 99. The scope of services required but not limited include survey, redesign, circuit tracing, relocation of existing/or provide new electrical circuits and breakers, updated single/secondary line diagram records, replacement of equipment due to age or condition, correct electrical ratings, enforce arc flash hazard analysis, and devise phasing plan to minimize outage impacts during construction. The Engineer on Record for design must be a Registered Professional Electrical Engineer and Architect must be AIA. A/E is responsible to provide phasing plan with an individualized equipment plan to guarantee minimal outage impacts during construction.

Below are some of the Significant Action Items that will require investigation and to be address in the project documents:

- Design and provide additional fourth (4<sup>th</sup>) high voltage feeder/main gear from Pepco to serve facility for redundancy
- Repair oil seal on primary transformer fed from PEPCO feeder # 14028. (Section 7.2par7.10)
- Investigate and determine breaker trip features and settings on two Satin America trip units on Switchgear A&B. (Section 4.3)
- Both the NHCU and Research Building generator systems should have the same in-depth evaluation of the GFP, ground and neutral systems
- Replace LV panels noted as inadequate with respect to fault current rating. (see Short-Circuit Comparison Tables)
- Replace MCC 1 due to age and lack of ratings available
- Replace MCC E1 due to age and lack of ratings available
- Install all new relay and breaker settings as recommended in the table in Section 4.4. Overcurrent Device Setting Tables

- Preventive maintenance is due on the major LV distribution equipment: Switchgear A & B, New Switchgear Addition (1979), NHCU Switchboard, Research Building Switchboard, and Main Chiller Building

#### Undervoltage Protection:

- There is no undervoltage protection on the Main Switchgear Addition, Nursing Home LV distribution gear, and Research Building LV distribution gear. Addition of undervoltage protection on the secondary main breakers located in the previous listed gear would respond to “single-phasing” and thus minimize motor winding damage. Consideration should be given to the impact of interruption to non-motor loads such as lighting. An alternative would be to install undervoltage alarm devices and not protective devices to trip the breakers.

#### Automatic Transfer Switch (ATS) Application:

- Hospital ATS-7, 8, and 9 are three pole devices that feed four wire loads. These three ATS's should be replaced with four pole transfer switches. Further, devices have the normal power and generator power neutrals bonded together in their enclosures. This condition can lead to poor GFP performance due to parallel ground fault current paths. (These neutral bonds in the enclosures are isolated from ground.)

#### Ground Fault Protection (GFP):

- Main Hospital generator gear breakers have neutral sensors for GFP on each breaker for tripping purposes. Drawings and visual inspection do not identify the location of neutral to ground bonds. Performance of this GFP system is dependent on the location and quality of the neutral to ground bond points. An in-depth ground fault system evaluation is recommended on this system. This evaluation would include inter-ground bond and neutral-to-ground bond resistance measurements as part of grounding system assessment, primary current injection of current transformers, and function test of protective circuit.
- Both the NHCU and Research Building generator systems should have the same in depth evaluation of the GFP, ground and neutral systems.
- Switchgear A and B do not have GFP. Addition of GFP is recommended for both main and feeder breakers to provide selectivity between the breakers.

#### Basic Code Deficiencies and Routine Corrective Actions listed by room and device name

- Hospital, ATS #2: A phase, on normal side switch has heat discoloration signs on bolted connection. Facility staff should check and monitor with thermal “gun.”
- Hospital, Panel EMA: Left and right cable cover plates are missing.
- Main Chiller Building, Chiller starter cabinet: Small amount of metal shavings in the bottom of cabinet.
- Hospital Basement, room GE201, Panel ELH-2-BD: Main Neutral cable termination is loose and needs to be repaired.
- Hospital Basement, room GG123: Panel NLA cover is blocked by brackets that support transformer and restricts removal of panel cover. Same transformer needs a “knock-out” hole cover installed. Panel R-LA has a rubber cord installed on top with connector and should be removed.
- Hospital Basement, room GE106, Panel DUL-1-BE: Panel has cable entering panel between cover and can. Cable needs to be properly routed.
- Hospital Basement, room GE114, Panel UL-2-BE: Panel needs breaker blanks installed for removed breakers.
- Hospital – Lab Area, room GB116A: Panel has an improper neutral to ground bond that should isolate.
- Hospital Basement, room GB133: Panel ELH-2-BB and 15kV transformer have loose covers and need to be secured.
- Hospital, room GA133P: New panel has an improper neutral to ground bond that should isolate.
- Hospital, room GA130: Panel UL-3 has a piece of cardboard between the cables of B and C phases. Cardboard should be removed and proper separation between cables should be created. Further, Panel UL-3 has an improper neutral to ground bond that should isolate. Panel EL-H-2A is missing the interior cover.
- Hospital, room 1G319: Panel ELL-2-1D needs breaker blanks installed.

- Hospital, room 1E393: Panel ELL-1-1F, section A is missing the interior cover.
- Hospital, room 1E216: Panel UL-2-1E is missing the interior cover, missing outer panel screws, and has an improper neutral to ground bond that facility staff should isolate.
- Hospital, room 1E228: High transformer noise perceived during inspection on the 45kV unit. Loading and connections should be checked.
- Hospital, lobby closet on first floor: Six disconnect rule violation. A main disconnect should be added.
- Hospital, Pharma. Closet, 1st Floor, fed from GE118: Covers are missing from time clocks, lighting contactors and panels.
- Hospital, room 1C116: Two unmarked panels need to be identified.
- Hospital, room 2C132: Cover screws missing on panel
- Hospital, room 2E101: Panel LH-1-2A cover door latch is defective.
- Hospital, room 2E225: Breaker blanks are missing on an unlabeled panel. Transformer does not have fused protection on primary side. Protection should be added.
- Hospital, room 3C230: Panel UL-2-#C, is missing the interior cover.
- Hospital, room 2E230: Panel ELH-1-3E interior label is marked at a different voltage than the nominal voltage.
- Hospital, room 2B225: Panel UL-2-3B and/or conduit needs additional support.
- Hospital, room 3D227: Room contains an unmarked panel.
- Hospital, room 4E136: Panel UL-2-4E is missing breaker blanks and right side panel door is not operational.
- Hospital, room 4E230: Panel UL-1-4E door is not operational. Additional support required on conduits.
- Hospital, room 4B132: Panel EUL-1-4B, A section cover is not secure and the interior cover is missing.
- Hospital, Penthouse: MCC-EP has several missing covers and several doors that do not latch.
- Hospital, OR Mechanical room: Additional room lighting is recommended.
- NHCUC, room BK107: Relatively large room used for storage with panels DP-5 and PP-5. Working clearances around panels need to be maintained.
- NHCUC, ATS#2: N1 cable shows signs of heating. Panel D, ATS 3 & 4 cables appear to be "cut-down" or strands trimmed to fit breakers. Recommend further inspection and correction.
- NHCUC, room BH254: Panel LU-1C needs breaker blanks.
- NHCUC, room 1H203: Panel L4 and PNL#2 are missing breaker blanks.
- NHCUC, room 1K115: Panel L3, section 2 has rubber cords entering between can and cover that should be removed. Panel H-3, section 2 is missing breaker blanks.
- NHCUC, room 2H207: Panel L2, section 1 door is missing from front cover.
- NHCUC, room BK103: 100A panel is missing breaker blanks.
- Research Building, Outdoor Generator: Fence and gear doors should be locked. There are past signs of fuel oil leakage; facility staff has made corrective actions to fix this condition.

#### Equipment Maintenance

- The MV switchgear breakers and relays were tested in 2000 and April 2003. Typical frequency for maintenance on this type of equipment is two to three years.
- Preventive maintenance is due on the major LV distribution equipment: Switchgear A & B, New Switchgear Addition (1979), NHCUC Switchboard, Research Building Switchboard, and Main Chiller Building.

#### Equipment Condition:

- Overcurrent and ground fault protective relays should be added to the MV feeders to provide selectivity and better coordination between the Hospital spot networks and the Research and NHCUC substations.
- Switchgear A and B date from the original construction of the early 1960's or from expansions in the 1970's. Additionally, the calculated short-circuit levels are above the known or surmised ratings of this equipment. This equipment is obsolete and should be refurbished. A

recommended solution is to retro-fill the cells with modern breakers that meet the short-circuit rating. Further, the Modify switchgear to meet the required SC rating.

- Building 6 Westinghouse gear includes 1500KVA 13.2KV-480V transformers dated 1982. Equipment has exceeded service life
- Distribution panels D-1, 2, 3, 4 and 5 date from the original construction of the early 1960's or from expansions in the 1970's. This equipment is obsolete and should be replaced. Additionally, the short-circuit calculated levels are above the known or surmised ratings of this equipment.
- The Onan, ATS-1, 2, 3, 4, 5, and 6 have been reported by VAMC facility personnel to generate higher than expected heat that may shorten equipment life span. One to three draw-out transfer switches have been repaired. VAMC facility personnel are tracking this issue. Consideration should be given to the repair and downtime frequency and costs compared to replacement with larger frame devices.
- Distribution panels E-1, 2, 3, and 4 were upgraded/added in the early 1990's. This equipment is in good condition and adequately rated.
- The downstream ITE panels located in the hospital are obsolete and are beyond the expected life of this type of equipment. Additionally, several of these panels are rated for less than the calculated short-circuit current.
- The facility power cable that dates from the original construction is a impregnated paper type that has an expected life beyond its current +40 years when not mechanically or thermally stressed. However, replacement of distribution panels D-1, 2, 3, and 4 and downstream ITE panels would mechanically stress this cable as it is physically handled. This cable should be replaced at the same time as the associated panels.
- Hospital Mechanical Room, MCC 1 and MCC E1 data from original facility construction. Replacement due to age should be considered.
- The primary oil filled switch on the transformer fed from PEPCO feeder #14028 in the Research Building is leaking oil from the top seals where the cable enters. Switch needs to be drained for repair of seal gasket.
- Research Building #4 LV switchgear breaker trip-units are obsolete. Recommend refurbishment and upgrading trip-units to modern electronic units.

## **SCOPE OF SERVICES**

A/E is to provide the Scope of Services description below:

- Part A; Investigation/Preliminary Plans; Special Services  
Existing building base drawing creation
- Part I; Preparation of Contract Drawings and Specifications including: project schedule, phasing, and cost estimates. Work will include consulting with VA Design Team in the configuration of the new electrical single/secondary line system. Once the system is finalized, the preparation of the deliverables will begin.
- Part II; Construction Period Services and Administration
- Part III; Site Visits and Meetings

### **Part A; Investigation/Preliminary Plans; Special Services**

#### **Existing building base drawing creation**

A/E shall provide Pre-Design Services for the Project based upon the above Project Understanding.

- Review the existing documentation provided by the DC VAMC to include: as-built, electrical line diagrams, CAD files, Schneider Electric Power System Engineering Report July 18 2014, Square D Company Power System Analysis June 2003
- Perform a comprehensive site survey to evaluate the Electrical System infrastructure
- Investigate and formulate design solutions consistent with action items
- Create base drawings to complement the existing record drawings of the Electrical System
- Prepare schematic drawings and provide initial summary report for implementing Primary Electrical Switchgear and Distribution deficiencies. The summary report should outline the existing condition assessment as well as design recommendations to alter the electrical systems and anticipated work. The report will include concept sketches for the engineering recommendations
- Provide statement of probable construction cost

### **Part I; Preparation of Contract Drawings and Specifications**

#### **Design Development Phase**

Based upon the approved Schematic Design and report, A/E shall provide

- Development of project design components, including typical systems and construction standards and details
- Preliminary contact and coordination with Authorities Having Jurisdiction (AHJ) over the project
- Update to statement of probable construction cost
- One progress meeting during the Design Development Phase
- Deliverables include design development drawings, design project manual including specifications, and cost estimate
- One comment review meeting following the VA review Period

#### **65% Construction Documents Phase**

Based upon the approved Design Development documents, A/E will proceed with preparation of construction documents in sufficient detail to communicate the scope and intent of the Project for construction by qualified contractor(s).

- Prepare 65% construction documents for architectural and engineering aspects of the project
- Update the specifications
- One progress meeting during the 65% Construction Documents Phase
- Deliverables include 65% Construction Drawings, 65% Project Manual including Specifications, 65% cost estimate
- One comment review meeting following the VA review Period

#### 100% Construction Documents Phase

Based upon the approved 65% Construction documents, A/E will proceed with preparation of construction documents in sufficient detail to communicate the scope and intent of the Project for construction by qualified contractor(s).

- Prepare construction documents for architectural and engineering aspects of the project
- Update and finalize specifications
- One progress meeting during the 100% Construction Documents Phase
- Deliverables include 100% Construction Drawings, 100% Project Manual including Specifications, 100% cost estimate
- One comment review meeting following the VA review Period

#### **Cost Estimate**

The A/E shall retain the services of an established cost estimating company to provide cost estimating services for each phase listed below. In the event projected costs exceed project budget, a value engineering exercise will be completed to align anticipated construction budget with proposed budget.

#### **CONSTRUCTION PERIOD SERVICES**

A/E shall advise and consult with the Owner during the Construction Phase Services and, upon selection of the contractor, provide administration services as set forth in the Agreement. The following activities constitute this phase:

##### Bidding and Negotiation

- Provide clarification to the construction documents through issuance of addenda or response to RFIs
- Attendance at one pre-bid conference, and provision of appropriate information and advice to prospective bidders and contractors
- Review of Alternates and substitutions to the base documents as allowed by the construction documents

##### Construction Administration

- Attendance at a single preconstruction meeting
- 12 Site Visits are proposed, the number may be more or less based on VA preference. These site visits include issuance of Field Observation Reports
- Submittal Review
- Response to contractor's Requests for Information
- Issuance of supplemental drawings and bulletins if clarification of documented work is warranted
- Review of Contractor Change Proposals
- One visit for Substantial Completion Issuance of Certificate of Substantial Completion
- One visit for punch listing
- Assist in review of Contractor's closeout submittals

#### **INTERSTITIAL/MER FIELD INVESTIGATION**

Asbestos is found in various materials, i.e. insulation and floor tile/mastic throughout the Medical Center. A 2011 asbestos survey report is available and will be provided if desired. Surveying and bulk sampling analysis will be performed by the VAMC. A/E is responsible to include abatement references, drawings and specifications into construction documents to require contractor to abate and remove during construction. If necessary, the CIH services will be provided by the VAMC during construction abatement.

#### **DESIGN PACKAGE REFERENCES**

Design shall consist of a thorough review of facility drawings, physical on-site field investigations to determine actual conditions, and interviews with appropriate engineering and maintenance personnel (VA Design Team) and applicable stakeholders.

The A/E shall meet with VA staff to review available as built drawings and tour all MER and electrical closets, develop new single/secondary line electrical diagram per circuit tracing, and confirm validity against VA Electrical Design Manual: <http://www.cfm.va.gov/til/dManual/dmELhosp.pdf>. As-built drawings of the facility may not be accurate as the building is in a constant state of construction. ALL EXISTING CONDITIONS SHALL BE FIELD VERIFIED PRIOR TO DOCUMENT PRODUCTION. A/E is responsible to conduct physical on-site investigations. The consultant is advised to utilize prior field verified information as a reference point.

Existing VA CAD software is Autodesk Autocad 2010. VAMC Washington DC will furnish limited "as-built," both paper copy and electronic background reference database to prepare the design package. In possible, provide Newforma (Project Information Management Software – online) to allow for digital management of project and exchange documents. Drawings shall be prepared using the VA Standard Details and CAD Standards. All line work is to be consistent with the layers assigned by the VA layer assignment. All final .dwg files are to be saved as file extension (.dwg Autocad) & (.pdf Adobe), no x-ref files will be accepted.

The A/E shall provide space planning, conceptual, schematic, design development, construction drawings, details, specifications, and cost estimates as applicable for the project. Drawings shall be CAD generated, 30" x 42" size 'E' sheets and half-size sheets. All Work to be transferable by means of CD Disc, PDF Format, and Internet via E-Mail Address: [walter.swasdibutra@va.gov](mailto:walter.swasdibutra@va.gov).

Construction drawings must be prepared separating all plan views i.e. (Architectural Demo/New; Ref. Ceiling Demo/New; HVAC Demo/New; Plumbing Demo/New; Lighting/Power/Signal Demo/New; Standard Details; Elevations and Schedules as required. All dimensions are to be dual English/Metric equivalent format.

In addition, at final 100% construction drawing delivery a composite cad file of all (NEW) disciplines is to be created via insert binding. All disciplines are to be aligned on top of a common reference point i.e. cross grid. This file will adhere to the VA Layer assignments with all relative construction notes being removed and will be exploded with no x-references or layers other than the VA Layer Assignment attached. Final payment will be retained until approval of this file.

Specifications must be compiled from VA Master Specifications, which are provided <http://www.cfm.va.gov/til/spec.asp>. Specifications must be provided in Microsoft Word and PDF formats. Sections not developed as VA standards shall be prepared by the A/E using the Un-edited Specification in the CSI format. Specifications will be clearly printed double sided on 8 1/2" x 11" white bond paper front & back for each section suitable for reproduction. Specifications will consist of the general and technical provisions. Specifications shall be in courier 10 font.

Cost estimates will be clearly typed on VA Form 10-6238 Estimate Worksheet or submitted in a spreadsheet format that is similar in appearance to the 10-6238. Estimates will be sectioned in accordance with the technical specifications. A summary sheet will be provided to show division totals, contingency, overhead, profit, and escalation.

The design must conform to the latest editions of the Uniform Building Code, AIA Guidelines for Design and Construction of Hospital and Healthcare Facilities, Zone 4 Seismic Requirements, all local regulatory requirements, NFPA 99, NFPA 110, NFPA 70, and VA Design Manuals. In addition, the latest edition of the National Fire Codes (A compilation of National Fire Protection Association Codes, Standards, Recommended Practices, and Manuals) is adopted for the design of all fire safety features. Fire protection features not included in the National Fire Codes shall be designed in accordance with the requirements of the latest edition of the Uniform Building Code (International Conference of Building Officials). Variances are made to the adopted codes where specific requirements have been adopted by the VA and are called for in the VA Construction Standards or design criteria documents. Up to date information is available on the web at: <http://www.cfm.va.gov/cfm/TIL/>

## **DESIGN REVIEW & SUBMISSION REQUIREMENTS**

The following schedule shall apply:

A/E to conduct comprehensive survey, create base drawings, stakeholder meetings and develop essential concept sketches

A/E to submit 100% Schematic Submission

Blackline prints (2)30x42 (1)15x22; Deliverables include 100% Schematics, summary report, cost estimate  
30 Calendar Days

A/E to submit 100% Design Development Submission

1 or as required Design Team Mtg

Blackline prints (1)30x42 (2)15x22; Deliverables include 100% design developmental Drawings, design development Project Manual including Specifications, cost estimate

45 Calendar Days

A/E to submit 65% Construction Drawing Submission

Blackline prints (1)30x42 (2)15x22; Deliverables include 65% Construction Drawings, 65% Project Manual including Specifications, 65% cost estimate

60 Calendar Days

A/E to deliver 100% Construction Drawing Submission

Blackline print sets (1)30x42 (1)15x22; Deliverables include 100% Construction Drawings (no stamp), 100% Project Manual including Specifications, 100% cost estimate

60 Calendar Days

A/E to deliver 100% Construction Bid Documents Final

Blackline print sets (3)30x42 (2)15x22; Deliverables include 100% Construction Drawings, 100% Project Manual including Specifications, 100% cost estimate, 1 set hardcopy specs double sided, Computer Disc with all drawings in Autocad 2010.dwg format per sheet (binded with no x-refs), all drawings in Adobe PDFformat collated, Specifications in MS Word format and PDF, construction cost estimate

10 Calendar Days

There will be a ten (10) day calendar review period for each submission (including 100% Construction documents), which will incorporate a five calendar day review period for the VA and a five calendar day period review for A/E to respond. At the completion of the review period, a comment review meeting will be held to review the comments and responses to gain consensus.

## **COST PROPOSAL**

After review of the project description and scope of work with the VA, complete an Architect-Engineer fee proposal, VA Form 08-6298, itemizing your proposed fees for the work involved.

## **A/E SUBMISSION INSTRUCTIONS (As Applicable):**

**A. ARCHITECTURAL:** Submit or show the following:

	Schematics*	DD**	CD***
Locations			
Rooms <sup>1</sup>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Doors <sup>2</sup>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Corridor(s) <sup>3</sup>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Basic column grid/sizes	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Expansion and seismic joints	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>



Electrical closets	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Equipment rooms	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Signal and telephone closets	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Mechanical shafts and space	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Stair(s)		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Ramp(s)		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Elevator(s)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Automatic Conveyances	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Floor Plans/Drawings			
All floors (new and renovated)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Penthouse	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Roof plan	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Pipe basement	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Pipe tunnel		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Reflected ceiling <sup>4</sup>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Equipment floor plans 1:50 (1/4 inch) scale <sup>5</sup>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Demolition plans <sup>6</sup>		<input checked="" type="checkbox"/>	
Room names and numbers <sup>7</sup>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Program net/designed net	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Exterior dimensions/total building gross area	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Size and shape of all departmental functions and services <sup>9</sup>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Exterior building elevations <sup>10</sup>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Finish floor elevations <sup>11</sup>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Door locations, sizes, and swings		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Wall thickness and chase walls		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Handrail location/dimensions		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

	Schematics*	DD**	CD***
Fixed equipment		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Equipment elevations and details			<input checked="" type="checkbox"/>
Plumbing fixtures		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Wheelchair accessible facilities		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Wall sections <sup>12</sup>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Building sections <sup>13</sup>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Finish grades at corners, entrances, exits, platforms and ramps		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Fire and smoke rated partitions <sup>14</sup>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Lead-lined and radio-frequency-shielded partitions <sup>14</sup>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Fire extinguisher cabinets <sup>14</sup>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Spray-on fire proofing (see fire protection)			
Construction details <sup>15</sup>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Drafting symbols, abbreviations, and general notes		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Door, window, and louver schedules			<input checked="" type="checkbox"/>
Interior details, elevations, sections			<input checked="" type="checkbox"/>

Finish schedule <sup>16</sup>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Graphics and signage <sup>17</sup>			<input checked="" type="checkbox"/>
Color rendering			<input checked="" type="checkbox"/>
Specifications (See Spec. Reqmt's)		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Lead abatement <sup>18</sup>	<input checked="" type="checkbox"/>		
Lead abatement specification <sup>19</sup>			<input checked="" type="checkbox"/>

\* Submit, as a minimum, a single line layout for at a scale not less than 1:100 (1/8 inch). A scale of 1:200 (1/16 inch) is acceptable for architectural floor layout if an entire floor cannot be shown on one sheet. Submit a complete double line layout of areas of critical importance, at a scale of 1:50 (1/4 inch) including equipment.

\*\* Submit minimum 1:100 (1/8 inch) scale floor plans, new and renovated, incorporating all of the revisions required by comments from schematics.

\*\*\* Submit fully dimensioned, complete, and coordinated 1:100 (1/8 inch) scale floor plans, incorporating all revisions required by comments from the design development phase.

## ARCHITECTURAL NOTES:

1. Use lines between spaces to indicate the centerline of the partition (for schematics only).
2. Indicate doors with a slash mark.
3. Along the corridor, the line shall represent the corridor side of the partition.
4. Indicate ceiling mounted equipment, lighting fixtures, air diffusers, registers, tracks, and other significant elements.
5. Identify all equipment for each room. Indicate and coordinate all equipment with the Equipment Guide List (Program Guide 7610) and Activated Equipment List. Use VA standard symbols and notation to distinguish between contractor-furnished and installed (CC), VA-furnished contractor-installed (VC), VA-furnished and installed (VV), VA-furnished with construction funds [VC(CF) and VV(CF)], and relocated (R) equipment.. Equipment floor plans are not required for the offices, consultation rooms, classrooms, conference rooms, and waiting rooms within the above departments. Draw equipment details which are necessary for major decisions, though complete detailing is not required for this submittal.
6. Indicate existing finish schedule and notes on plan.
7. Label as required for schematic drawings. Coordinate new room numbering with medical center.
8. Use the same names on drawings as those used in the space program. Provide area figures in fractional form, e.g., 400/390. Indicate space provided, but not called for in the space program, as: - /390.
9. Label each service or activity listed in the Project Scope Data of the Design Program and indicate boundaries with a distinctive line. Include the activity code number (see Handbook 7610).
10. If the project requires exterior work, show all facades indicating massing, proposed fenestration and the building relationship to adjacent structures and the finish grade. Show all significant building materials, including their colors, any proposed roof top mechanical equipment, architectural screens, skylights, and stacks on the elevation drawings. If building is designed for future expansion (vertical and/or horizontal), delineate elevations with and without the future expansion. If project is an addition, show elevations of the existing building in sufficient detail to illustrate the relationship between the new and existing in terms of scale, material, and detail.
11. Define the relationship of the finish ground floor to finish grade at major entrances and docks.
12. Indicate construction including fire resistance rating, building materials and systems, and proposed sill and head heights of openings. Indicate both new and renovated areas on form provided by VA
13. Define building configuration. Draw sections at the same scale as floor plans, normally 1:100 (1/8 inch). If the building abuts an existing structure, indicate in the section how the new floor elevations align with existing.
14. Identify psychiatric areas where special considerations are required to ensure the safety of patients (e.g. hard ceilings, safety glazing, etc.).

15. Indicate new building components and systems, such as window design, roofing system, special entryways, building "skin", and any special architectural elements for the project. Complete detailing of miscellaneous items is not required for this submission.
16. Indicate all building systems, materials, and future expansion, if applicable.
17. Submit a drawing for all which is part of the construction contract.
18. Provide square meters (feet) of lead paint and x-ray shielding to be removed.
19. Format provided in SPECIFICATIONS. If there is no VA master specification, develop contract specification that is in compliance with regulations of the Environmental Protection Agency.

**B. FIRE PROTECTION:** Submit the following:

	Schematics*	DD*	CD*
Fire protection narrative <sup>1</sup>	<input checked="" type="checkbox"/>		
Fire and smoke separation	<input checked="" type="checkbox"/>		
Fire sprinkler/standpipe system	<input checked="" type="checkbox"/>		
Size of fire pumps	<input checked="" type="checkbox"/>		
Water supply available/max. demand	<input checked="" type="checkbox"/>		
Water flow testing results	<input checked="" type="checkbox"/>		
Fire alarm systems <sup>2</sup>	<input checked="" type="checkbox"/>		
Existing to be modernized	<input checked="" type="checkbox"/>		
Base loop system for interface of new construction	<input checked="" type="checkbox"/>		
Kitchen extinguishing systems	<input checked="" type="checkbox"/>		
Size of air handling unit	<input checked="" type="checkbox"/>		
Exit paths from each zone	<input checked="" type="checkbox"/>		
Distances to stairs	<input checked="" type="checkbox"/>		
Occupancy of each area	<input checked="" type="checkbox"/>		
Exit calculations for each floor	<input checked="" type="checkbox"/>		
Smoke control features	<input checked="" type="checkbox"/>		
Floor Plans/Drawings <sup>3 &amp; 4</sup>			
Sprinkler zones	<input checked="" type="checkbox"/>		
Fire alarm zones	<input checked="" type="checkbox"/>		
Smoke zones			
Building water supply	<input checked="" type="checkbox"/>		
Standpipes	<input checked="" type="checkbox"/>		
Fire extinguisher cabinets	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Fireproofing of structural members	<input checked="" type="checkbox"/>		
Sprinkler/standpipe riser supply piping		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Termination of sprinkler main and inspector test drains		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Sprinkler alarm valves		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Waterflow and tamper switches		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Sprinkler system fire department connections		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Sprinkler design hazards per NFPA 13		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Exit signs and emergency lighting		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

	Schematics*	DD*	CD*

Occupied areas not protected by automatic sprinklers		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Calculations	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Estimated capacities for proposed air handling units in cubic meters (cubic feet) per minute		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Location of:			
Fire alarm system		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Annunciator panels		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Pull stations		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Flow switches		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Audio-visual devices		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Smoke detectors		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Duct smoke detectors		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Smoke dampers		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Fire dampers		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Fire alarm risers <sup>5</sup>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Exit signs		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Emergency lighting		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Fire sprinklers		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Standpipes		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Fire hydrants		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Fire pumps		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Post indicator valves		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Sectional valves		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Fire extinguisher cabinets		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Electromagnetic door hold open devices		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Wall sections indicating fire resistive ratings		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Staff sleeping rooms		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Excavation plan signage		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Door and window schedule with fire rating or fire rated glazing			<input checked="" type="checkbox"/>
Zoning of each fire alarm initiating device			<input checked="" type="checkbox"/>

	Schematics*	DD*	CD*
Details			
Fire pump system (capacity and pressure)			<input checked="" type="checkbox"/>
Elevation and isometric view of fire pump			<input checked="" type="checkbox"/>
Stairwell sign			<input checked="" type="checkbox"/>
Annunciator panel			<input checked="" type="checkbox"/>
Interconnection of fire alarm system with:			<input checked="" type="checkbox"/>
Smoke dampers			<input checked="" type="checkbox"/>
Air handlers			<input checked="" type="checkbox"/>
Elevator controls			<input checked="" type="checkbox"/>
Kitchen fire extinguishing and fire			<input checked="" type="checkbox"/>

pump system			
HVAC system with smoke duct detectors			<input checked="" type="checkbox"/>
Single line riser diagram for fire alarm system			<input checked="" type="checkbox"/>
Height/configuration of storage racks and shelving			<input checked="" type="checkbox"/>

\* Submit, as a minimum, a single line layout for at a scale not less than 1:100 (1/8 inch). Submit a complete double line layout of areas of critical importance, at a scale of 1:50 (1/4 inch) including equipment.

\*\* Submit minimum 1:100 (1/8 inch) scale floor plans, new and renovated, incorporating all of the revisions required by comments from schematics.

\*\*\* Submit fully dimensioned, complete, and coordinated 1:100 (1/8 inch) scale floor plans, incorporating all revisions required by comments from the design development phase.

#### **FIRE PROTECTION NOTES:**

1. Indicate NFPA 220 and UBC fire resistive rating of the building, NFPA 101 occupancy type, and fire protection code analysis to access compliance with NFPA 101.
2. Determine type, features, age, reliability, compliance with present day codes, capacity, zoning, supervision, control panel and power supplies, initiating devices and circuits, and auxiliary functions for existing fire alarm system. Indicate manufacturer, model number, voltage, and wiring style of existing alarm systems and devices. Provide recommendations for the proposed fire alarm work.
3. Provide information to meet JCAHO requirements; e.g. location of all fire rated barriers, smoke barriers, exit signs, fire extinguishers, manual pull stations, smoke detectors, and sprinkler flow switches. Show all interim life safety measures such as temp systems Fire Alarm Sprinkler, and Smoke.
4. At DD Submission, add room names, room numbers, door locations and swings, smoke and fire rated partitions, sprinkler/standpipe risers to floor plans. Identify psychiatric areas on drawings so areas for institutional type heads are identified. Add location of all valves (post indicator, sectional) and backflow preventer if provided.
5. Show new equipment and/or the necessary changes involved if modification to the existing system is required. Include any recommendations where certain requirements of VA criteria might be waived, in order to allow the existing equipment to be reused.

#### **C. INTERIOR DESIGN:** Submit the following:

	Schematics*	DD*	CD*
Written interior design concept <sup>1</sup>	<input checked="" type="checkbox"/>		
Illustrate overall design solution <sup>2</sup>	<input checked="" type="checkbox"/>		
Material and finish samples	<input checked="" type="checkbox"/>		
Sketches	<input checked="" type="checkbox"/>		
Design solution for interior spaces		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Perspectives		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Plans		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Details		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Elevations		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Sections		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Wayfinding		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Floor patterns		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Wall patterns		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Lighting		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Signage		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Handrails		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Bumper guards		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Specification section 09050		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Finish schedule		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Exterior colors and materials		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Sample boards for interior and exterior materials, products, and finishes		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Edited carpet and wallcovering specifications		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Keyed Finnish plans			<input checked="" type="checkbox"/>
Interior design details, elevations, and sections			<input checked="" type="checkbox"/>

\* Submit, as a minimum, a single line layout for at a scale not less than 1:100 (1/8 inch). Submit a complete double line layout of areas of critical importance, at a scale of 1:50 (1/4 inch) including equipment.

\*\* Submit minimum 1:100 (1/8 inch) scale floor plans, new and renovated, incorporating all of the revisions required by comments from schematics.

\*\*\* Submit fully dimensioned, complete, and coordinated 1:100 (1/8 inch) scale floor plans, incorporating all revisions required by comments from the design development phase.

#### INTERIOR DESIGN NOTES:

1. Provide a document of data collected in interior design programming. Include collection and analysis of data from the VAMC project coordinator and interior designer. Data includes, but is not limited to the following: existing interior and exterior design and materials, light, safety, patient profile, customer's "vision" or desired image, public vs. private spaces, complete signage package, goals of customer, relationship to existing facilities, future expansion/renovation plans, regional influences, etc.
2. Discuss and illustrate the overall design solution for the primary areas of the project using marked-up floor plans, loose sketches, and material and finish samples. Use broad categories of materials, finishes, color palettes, patterns, textures, and scales. Separately group all major neutral background materials and finishes that will be used and discuss how they will be integrated with all other materials and finishes on the project. Include all primary and secondary corridors, typical patient and toilet rooms, lobbies, atriums, eating spaces, chapels, waiting rooms, and exam rooms. Show the relationship among departments and functions, and between public and private spaces.

#### D. STRUCTURAL: Submit the following:

	Schematics*	DD**	CD***
Supporting calculations <sup>2</sup>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Cost estimates for each system <sup>3</sup>	<input checked="" type="checkbox"/>		
Recommend preferred system	<input checked="" type="checkbox"/>		
Structural plans <sup>6</sup>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Sections		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Details		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Lateral load resisting elements		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Elevations			<input checked="" type="checkbox"/>
Schedules			<input checked="" type="checkbox"/>
General notes			<input checked="" type="checkbox"/>

\* Submit, as a minimum, a single line layout for at a scale not less than 1:100 (1/8 inch). Submit a complete double line layout of areas of critical importance, at a scale of 1:50 (1/4 inch) including equipment.

\*\* Submit minimum 1:100 (1/8 inch) scale floor plans, new and renovated, incorporating all of the revisions required by comments from schematics.

\*\*\* Submit fully dimensioned, complete, and coordinated 1:100 (1/8 inch) scale floor plans, incorporating all revisions required by comments from the design development phase.

## STRUCTURAL NOTES:

1. When only one structural system is possible due to other project requirements, include an explanatory statement and submit only that structural system.
2. Include vertical and lateral load design for CD submission.
3. Include foundation and fireproofing.
4. Indicate existing utilities and structures within, adjacent, or contiguous to the new construction.
5. Upon approval of the subsurface investigation criteria, submit qualifications of at least three consultants being considered for the work together with the proposal of the consultant recommended as most qualified.
6. If there is only a CD submission, provide a Structural Engineering Analysis Submission with six weeks from the notice to proceed including sketches, calculations, and cost estimates of three alternative structural systems for typical bays, boring location plan for subsurface investigation, and consultant qualifications. For vertical expansion projects, analyze existing structure for structural feasibility.

## E. PLUMBING: Submit the following:

	Schematics*	DD**	CD***
Narrative	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Existing plumbing systems to be used and necessary modifications	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
New plumbing systems	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
New or modified water treatment	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Floor Plans/Drawings:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Room names	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Identify			
Existing plumbing fixtures w/VA numbering system	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
New plumbing fixtures w/VA numbering system	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Existing equipment	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
New equipment	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
New medical gas outlets		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
New laboratory gas outlets		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Plumbing piping	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Size of pipe		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Equipment schedule		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Fire & smoke partitions	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Demolition plans		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Riser diagrams			<input checked="" type="checkbox"/>
Legend, notes, and details			<input checked="" type="checkbox"/>
Location and size of sprinkler riser, standpipes, and fire pumps (see fire			

protection)			
Location of emergency eyewash and shower equipment			
Calculations (equipment & piping)		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

\* Submit, as a minimum, a single line layout for at a scale not less than 1:100 (1/8 inch).

\*\* Submit minimum 1:100 (1/8 inch) scale floor plans, new and renovated, incorporating all of the revisions required by comments from schematics phase.

\*\*\* Submit fully dimensioned, complete, and coordinated 1:100 (1/8 inch) scale floor plans, incorporating all revisions required by comments from the design development phase. Submit a complete double line layout of areas of critical importance, at a scale of 1:50 (1/4 inch).

**F. SANITARY:** Submit the following:

	Schematics*	DD**	CD***
Narrative:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Existing sanitary systems: underground water, sanitary sewers, storm sewers, & fuel gas with sources, disposal methods, storage, pressures, condition, etc.		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
New sanitary systems	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Provide water analysis & expected yield if well required	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Circulation study to assess emergency vehicle access	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Install test well, if well is required.	<input checked="" type="checkbox"/>		
Utility Plans/Drawings showing existing and new sanitary systems:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Size of pipes	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Invert elevations of sewers	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Locate/size			
Pumps	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Storage facilities	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Treatment equipment	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Fire hydrants		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Sectional and post indicator valves		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Backflow preventer		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Areas of new irrigation system	<input checked="" type="checkbox"/>		
New irrigation system			<input checked="" type="checkbox"/>
Profiles of sanitary & storm sewers			<input checked="" type="checkbox"/>
Demolition Plans		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Legend, notes, and details			<input checked="" type="checkbox"/>
Point of connection to sprinkler system	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Calculations		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

\* Submit utility drawings at same scale as provided for Site Development drawings.

\*\* Submit utility drawings at same scale as provided for Site Development drawings, incorporating all of the revisions required by comments from the schematics phase.

\*\*\* Submit utility drawings at same scale as provided for Site Development drawings, incorporating all of the revisions required by comments from the design development phase. Submit legend, notes, and details at a scale not less than 1:100 (1/8 inch).



**G. HVAC:** Submit the following:

	Schematics*	DD*	CD*
Description of HVAC systems	<input checked="" type="checkbox"/>		
Equipment for each functional space	<input checked="" type="checkbox"/>		
Life cycle cost analysis <sup>1</sup>	<input checked="" type="checkbox"/>		
Tentative location/sizes			
Mechanical equipment room	<input checked="" type="checkbox"/>		
Principal vertical shafts	<input checked="" type="checkbox"/>		
Block layout of equipment	<input checked="" type="checkbox"/>		
Louvers <sup>2</sup>			
Outside air	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Exhaust air	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Relief air	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Engineering calculations <sup>3</sup>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Selection of HVAC equipment		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Catalog cuts of equipment		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Room by room heating and cooling loads		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Zone by zone heating & cooling loads		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Building block heating & cooling loads		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Tabulation of steam consumption		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Psychometric chart for air handling unit		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Coil entering and leaving conditions		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Fan motor heat gains		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Consumption of humidification loads		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Sound/acoustic analysis		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Room-by-room air balance charts <sup>4</sup>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Chilled water plant <sup>5</sup>			
Quantity and type of chillers		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Capacity in tons of refrigeration		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Electrical equipment		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Heating system			
Total heating load		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Domestic hot water load		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Humidification load		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Equipment steam demand		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Zoning of heating system		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

	Schematics*	DD*	CD*
HVAC floor plan <sup>6</sup>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Main supply, return and exhaust ductwork		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Volume dampers		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Fire and smoke partitions		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Fire and smoke dampers		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Smoke detectors		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Automatic control dampers		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Air quantities for each room		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Air inlets/outlets		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Rises and drops in ductwork		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Expansion loops		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Anchors		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Vales		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Drip assemblies		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Balancing fittings		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Interconnection of HVAC equipment with fire protection equipment (see fire protection)			
Plan/section of mechanical equipment rooms		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Schematic flow and riser diagrams <sup>7</sup>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Schematic control diagrams <sup>8</sup>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
HVAC demolition drawings		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Phasing plan		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Equipment schedule		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Seismic bracing		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
VA symbols and abbreviation		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Selection of			
Pumps			<input checked="" type="checkbox"/>
Fans			<input checked="" type="checkbox"/>
Sizing and selection of			
Expansion tanks			<input checked="" type="checkbox"/>
Steam to hot water convertors			<input checked="" type="checkbox"/>
Heat exchangers			
Sound analysis			<input checked="" type="checkbox"/>

	Schematics*	DD*	CD*
Complete selection data			<input checked="" type="checkbox"/>
Outside chilled water and condenser water distribution <sup>9</sup>			<input checked="" type="checkbox"/>
Standard detail drawings			<input checked="" type="checkbox"/>
Automatic temperature control drawings <sup>10</sup>			<input checked="" type="checkbox"/>

\* Submit, as a minimum, a single line layout for at a scale not less than 1:100 (1/8 inch). Submit a complete double line layout of areas of critical importance, at a scale of 1:50 (1/4 inch) including equipment.

\*\* Submit minimum 1:100 (1/8 inch) scale floor plans, new and renovated, incorporating all of the revisions required by comments from schematics.

\*\*\* Submit fully dimensioned, complete, and coordinated 1:100 (1/8 inch) scale floor plans, incorporating all revisions required by comments from the design development phase.

#### HVAC NOTES:

1. Provide specific recommendations and full back-up data. State heating and cooling capacities of each functional area. State the block cooling and heating loads for each new and/or existing building.
2. The locations of these louvers must not allow short circuiting of air from emergency generator exhaust or truck waiting and loading dock areas into air intake etc. Consider factors affecting louver

- location such as visibility, historical considerations, wind direction, and nuisance and health hazard odors (from emergency generator or truck exhausts).
3. Include room-by-room, peak zone-by-zone, and building block heating and cooling loads. Provide a tabulation of steam consumption based on data from all sources. Show correlation between each HVAC zone boundary and architectural floor area correlation between the architectural room numbers and abbreviated/coded room numbers used with computer input data sheets.
  4. Show supply, return, exhaust, make-up, and transfer quantities with intended pressure relationships, i.e. positive, negative, or zero with respect to adjoining spaces.
  5. Provide pertinent data on accessories such as pumps and cooling tower etc. Show the extent of the outside chilled water and condenser water piping. Clearly show how the piping will be laid in tunnels, trenches, or by direct burial.
  6. Show ceiling clearances, at locations where ducts cross each other, by providing 1:50 (1/4 inch) scale local sections. Show all ductwork, and piping 150 mm (6 inch) and larger in double line. Show separate floor plans for air distribution and piping unless waived by VA. Show clearances required for access and maintenance with coil and tube pull.
  7. Show typical air handling systems and all hydronic systems with existing capacities and new estimated loads. Verify actual operating conditions and capacities of HVAC systems prior to design.
  8. Show control devices, such as, thermostats, humidistats, flow control valves, dampers, freezestats, operating and high limit sensors for all air systems and fluids, smoke dampers, duct detectors etc. Provide a written description of the sequence of operation on the floor plans. Detail the scope of work involved with the Central Engineering Center (CEC), and address if enough spare capacity is available or a new CEC is required. Show a point schedule for analog/digital input/output to be included in CEC.
  9. Show pipe sizes and insulation with plans, profile, sections, details, and all accessories, such as, anchors, expansion loops/joints, valves, manholes, capped and flanged connections, interface between the new and existing work (if any). Clearly indicate interferences (if any) with the existing utilities and/or landscape elements on outside piping layout drawings. Show rerouting any utilities, cuttings of roads, pavements, trees, etc., and the extent of new and demolition work. Establish outside utility drawings on the study of the latest site drawings, discussions with engineering personnel, and actual site inspection of the existing utility.
  10. Show all duct detectors, control valves/dampers static pressure sensors, differential pressure control assemblies, etc., whose actual physical location is critical for the intended sequence of operation on floor plans.

**H. ELECTRICAL:** Submit the following:

	Schematics*	DD*	CD*
Narratives:			
Design <sup>1</sup>	<input checked="" type="checkbox"/>		
Life cycle analysis for electrical systems	<input checked="" type="checkbox"/>		
Location and size of:			
Electrical equipment <sup>2</sup>	<input checked="" type="checkbox"/>		
Electric closets <sup>3</sup>	<input checked="" type="checkbox"/>		
Telephone closets <sup>3</sup>	<input checked="" type="checkbox"/>		
Signal closets <sup>3</sup>	<input checked="" type="checkbox"/>		
Electrical distribution equipment			
Drawings showing:			
Electrical plot plan of existing and proposed underground power (including manholes)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Telephone systems	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Signal inter-building systems	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Proposed electrical system <sup>4</sup>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Electric symbols	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Lighting fixture schedule	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Emergency Life Safety Equipment (see fire protection)			
Symbols, note, abbreviations		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
List of specialty areas	<input checked="" type="checkbox"/>		
Method of short-circuit calculations	<input checked="" type="checkbox"/>		
Method of voltage drop and demand calculations	<input checked="" type="checkbox"/>		
Utility company correspondence	<input checked="" type="checkbox"/>		
Utility company requirements		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Load calculations for normal & emergency use	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Drawings:			
Lighting layouts		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Power layouts		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Signal layouts		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Specialty area layouts		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Demolition plans		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Riser diagrams		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

	Schematics*	DD*	CD*
Branch circuit wiring (typ.)		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Location and size of:			
Primary distribution switchgear/switchboard		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Engine-generator sets		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Substation/padmounted transformer		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Manholes		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Location of smoke dampers and duct smoke detectors			<input checked="" type="checkbox"/>
Interconnection of electrical control equipment with HVAC equipment (see fire protection)			<input checked="" type="checkbox"/>
Smoke partitions and fire alarm zones	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Fire alarm and signal riser diagrams (see fire protection)		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Calculations for emergency generator(s)		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Phasing scheme		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Electrical details			<input checked="" type="checkbox"/>

\* Submit, as a minimum, a single line layout for at a scale not less than 1:100 (1/8 inch). Submit a complete double line layout of areas of critical importance, at a scale of 1:50 (1/4 inch) including equipment.

\*\* Submit minimum 1:100 (1/8 inch) scale floor plans, new and renovated, incorporating all of the revisions required by comments from schematics.

\*\*\* Submit fully dimensioned, complete, and coordinated 1:100 (1/8 inch) scale floor plans, incorporating all revisions required by comments from the design development phase.

**ELECTRICAL NOTES:**

1. Include basic assumptions, points of interconnection, impact of new construction to existing electrical distribution system, current demand loading (high voltage switchgear and primary feeder), and projected load of new construction. Propose various feasible electrical systems for project and provide advantages/disadvantages.
2. Include means and clearances for installation, maintenance, and removal/replacement of equipment.
3. Electrical, signal and telephone closets must stack vertically.
4. Include high voltage and low voltage switchgear, transformers and low voltage main and/or distribution panels, branch panels and methods of feeding 277/480 volt and 120/208 volt normal and emergency panels.

**I. SPACE PLANNING:** Submit the following:

	Schematics	DD	CD
Space-Accounting Summary Table	<input checked="" type="checkbox"/> <sup>1</sup>	<input checked="" type="checkbox"/> <sup>2</sup>	<input checked="" type="checkbox"/> <sup>3</sup>

**SPACE PLANNING NOTES:**

1. Provide a tabular table with columns entitled Departmental Function, H-7610 Requirements, Approved Space Program [Net Square Meters [Feet (NSF)], Variance Between H-7610 and Approved Space Program, Departmental Conversion Factor, Planned Departmental Gross Square Meters (Feet); column totals; and a Total Project Net to Gross Factor. Also, list separately the area required for additions to the program, unassigned space, major circulation (inter-departmental corridors, stairs, and elevators), major mechanical and electrical spaces, exterior walls, connecting corridors to other buildings, space for future mechanical system expansion, and similar special requirements.
2. Update table. Justify in writing substantial deviations from the approved space program.
3. Update table.

**J. SPECIFICATIONS:** Submit the following:

	Schematics	DD	CD
Specifications (All Disciplines)		<input checked="" type="checkbox"/> <sup>1, 2, &amp; 3</sup>	<input checked="" type="checkbox"/>

**SPECIFICATION NOTES:**

1. Comply with the requirements of the VA Manual for Preparation and Issuance of Construction Solicitation and Contract Documents.
2. Submit for all technical disciplines the original VA Master Specification section drafts marked-up with pencil showing the editing for the project. Clearly identify modifications, deletions and insertions. Assure the specification drafts have been edited and tailored in their application to represent accurate coordination between drawings and specifications.
3. When no VA Master Construction Specification exists for a "unit of work", prepare the specification section consistent with VA Master Construction Specifications format.
  - a. Use generic or non-proprietary specifications describing the minimal acceptable product criteria level where no "Standard" exists to define quality and workmanship levels.
  - b. Use applicable "Standards" to define quality and workmanship when these publications exists. List complete designation and title of each publication used in Part 1; follow format in VA Master Construction Specifications for Applicable Publications.
  - c. Do not use proprietary specifications or systems that restrict competition unless authorization in writing has been received from the VA Project Manager for such proprietary specification. See the Federal Acquisition Regulation (FAR) Part 10, Part 14, and Part 36.

- d. Do not use trade names or manufacturers brand names, except as previously noted or required
- e. When a deviation is requested, define and specify the minimum acceptable levels of essential criteria in descriptive, physical, functional, or performance requirements.

**K. ESTIMATING:** Submit the following:

	Schematics	DD	CD
Cost estimate in compliance with Manual for Preparation of Estimates (separate estimates for new construction and alteration work)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Level "A" Summary Sheets for building	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Level "A" Summary Sheets for sitework	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Building gross area computation (new)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Building gross area computation (alteration work)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Project Data Sheet 1	<input checked="" type="checkbox"/>		
Project Data Sheet 1 and 2		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Asbestos abatement		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Detailed estimate take-off sheets			<input checked="" type="checkbox"/>
Level "B" Summary Sheets for buildings			<input checked="" type="checkbox"/>
Level "B" Summary Sheets for sitework			<input checked="" type="checkbox"/>
Supplement A to SF 252			<input checked="" type="checkbox"/>
Detail Market Analysis			<input checked="" type="checkbox"/>

**L. ASBESTOS ABATEMENT:** Submit the following:

	Schematics*	DD*	CD*
Asbestos abatement report including: 1. Summary results of building records 2. Summary results of station personnel interview 3. determination of materials known to contain asbestos 4. visual inspection of building to determine location and condition of asbestos 5. sample strategy on the extent of asbestos present	<input checked="" type="checkbox"/>		
Name and location of qualified laboratory for sample analysis	<input checked="" type="checkbox"/>		
Asbestos abatement drawing		<input checked="" type="checkbox"/>	
Total cost of abatement <sup>2</sup>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Asbestos abatement drawings including: 1. Plans of encasement of existing trusses			<input checked="" type="checkbox"/>

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\*\* Submit minimum 1:100 (1/8 inch) scale floor plans, new and renovated, incorporating all of the revisions required by comments from schematics.

\*\*\* Submit fully dimensioned, complete, and coordinated 1:100 (1/8 inch) scale floor plans, incorporating all revisions required by comments from the design development phase.

1. Provide a copy of the summary to the construction cost estimator for inclusion as a separate bid item in the project estimate.
2. Include any cost for decontamination of equipment and fixtures.