U.S. Department
of Veterans Affairs

A/E Submission Requirements for National Cemetery Projects

Program Guide PG 18-15 Volume D

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FOREWORD

This document states the minimum requirements for each submission in the production of VA Master Plans, Schematic Design, Design Development, Construction Documents, and Record Documents for National Cemetery Projects. It will give VA reviewers and Architects and Engineers a clear understanding of the minimum submission requirements of the A/E, including level of detail expected for each stage of design, itemized for each discipline. The A/E Submission Instructions is one part of the project design contracting documents, which also includes the Statement of Work and VA and NCA design criteria.

This guide contains the vast majority of submission requirements for each discipline and the expected level of development at each phase of a national cemetery design project. It is not intended to be project specific. Not all disciplines will be involved in all projects. Therefore it is recommended that the project specific Statement of Work be the starting point for determining the actual submission requirements for each project.

This document does not relieve A/E firms of their professional responsibility to produce a correct, complete, and fully coordinated set of construction documents for the successful completion of a project.

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A/E SUBMISSION INSTRUCTIONS FOR NATIONAL CEMETERY PROJECTS

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I. GENERAL

A. INTRODUCTION

1. This document contains the minimum submission requirements for the master plan and design phases of National Cemetery Administration (NCA) projects.

2. The Department of Veterans Affairs (VA) may contract for any portion of national cemetery design: Master Plan, Schematic Design, Design Development, Construction Documents, Record Documents, or a combination of these. For national cemetery projects where VA is contracting with the A/E for Design Development and/or Construction Documents only, VA will provide the necessary documents in support of the scope of work for the project.

3. The A/E is responsible for producing the Basis of Design (BOD) reports, which provide the information necessary to evaluate the proposed project from a technical perspective. The BOD addresses technical issues and the A/E's design decisions, assumptions, and methods. The A/E also is responsible for producing a complete set of drawings, calculations, sample boards, specifications, equipment catalog cuts, performance curves, dimensions, and capacity ratings, all in accordance with VA criteria. The A/E is responsible for obtaining and using all VA and NCA design criteria and information included or linked on the VA Office of Construction & Facilities Management (CFM) Technical Information Library (TIL) website, available at http://www.cfm.va.gov/til.

4. Quality control for the design integrity and the completeness of project documents are the responsibility of the A/E. The A/E shall have a Quality Control Plan (QCP) in effect during all design phases. Plans, specifications, calculations, reports, and other items or documents delivered to VA for review shall be clearly addressed in the quality control plan established for the work. The QCP shall contain an appropriate checklist to assure product quality and control. The A/E shall deliver to VA a project specific QCP including a checklist at a date to be specified by the VA Project Manager (PM). VA will review the QCP and checklist for acceptability.

5. All submittals to VA from the A/E shall include a completed checklist. The A/E PM must sign the checklist to certify completeness and accuracy of the submittal. Incomplete submittals will not be accepted by VA for review. Review will not commence until all the required documents have been received and verified complete by VA.

6. VA will provide current record documents, if available. The A/E shall field verify their accuracy and make the changes necessary to show the actual existing conditions.

7. "Major Projects" are those that are managed by CFM and have a construction cost of more than $10 million. "Minor Projects," construction cost of $10 million or less, are managed by NCA Design and Construction Service. "Non Recurring Maintenance" (NRM) projects are managed by NCA Memorial Network offices. Project requirements may vary depending on whether they are classified as Major, Minor, or NRM.

B. SUBMISSIONS AND REVIEWS

1. VA is responsible for reviewing and commenting on all design submissions promptly after receipt. VA may engage the services of peer reviewers to review the submissions. A value engineering review may be performed at each review stage. VA shall submit review comments to the A/E in electronic format. The A/E shall consolidate all the review comments and distribute them to their subconsultants. The A/E must respond to all VA comments in

writing using the electronic format. The A/E shall not move forward into the next design phase until all changes based on the review have been made on the drawings/specifications or a response has been provided using the electronic review and correction tracking system.

2. Specific intervals are designated for review of the project work. These reviews are joint consultations to exchange information, reconcile differing views on meeting the objectives, judge the quality and completeness at each stage, ensure that previously noted changes have been incorporated, and identify departures from criteria or standards and determine whether they are acceptable.

3. There are five Master Plan submissions (MP 1 - MP 5), two Schematic Design submissions (SD 1 & SD 2), two Design Development submissions (DD 1 & DD 2), and three Construction Document submissions (CD 1, CD 2 & BD) indicated in this program guide. At each submission, all material shall be dated and presented on VA standard size drawings that are appropriately labeled, for example, “MASTER PLAN 1 (MP 1) SUBMISSION”, "DESIGN DEVELOPMENT 2 (DD 2) SUBMISSION", in large block letters above the VA standard drawing title block. In each submission, the A/E shall incorporate the corrections, adjustments, and changes made by VA at the previous review. All review submissions shall include an index to the drawings in that set. The index will be updated for each submission to reflect added and deleted drawings.

4. Each set of drawings shall have a cover sheet that indicates: project title; VA project number; index of drawings in the set; names, addresses and phone numbers of all architectural and engineering firms involved in preparation of the documents; vicinity map; site location map; cemetery map showing project location; summary table of all gravesites developed in the project with breakdown by type; and other pertinent project information. A complete legend of drawing abbreviations and drafting symbols for all disciplines shall be included either on the cover sheet or on a second sheet immediately following the cover.

5. The A/E shall provide individually packaged submissions to each unit specified in the "Distribution of A/E Material" section.

C. SUMMARY OF A/E SUBMISSIONS

The table below is a summary of submission milestones and their associated submissions. Refer to submission specific sections of this Program Guide for a complete description of submission requirements.

MASTER PLAN		
DESIGN PHASE	**COMPONENTS OF SUBMISSION:**	**REVIEW FORMAT:**
MP 1	- Meeting agenda - Site visit by A/E and VA team - Topographic, utility & landscape survey - Site characteristics report - Geotechnical soil survey - Evaluation of Environmental Impact Statement - Status of site with respect to historic preservation requirements - Presentation of concept studies (minimum 3) - Discussion of concept studies - Cost estimate	- On-site meeting of VA and A/E team - Presentations by A/E - Group discussions - Selection of one master plan concept

MP 2	- Record of team meeting including: - Alternatives as presented at meeting - Selected master plan concept, as modified at meeting - Cost estimate for selected master plan concept - Update of previously submitted documents	- NCA/CFM briefing for management at VA Central Office (VACO) - Written comments to A/E
MP 3	- Draft master plan and schematic block plans for Phase 1 buildings (development of selected alternative) - Updated reports, calculations, and narratives - Cost estimate	- Internal VA review - A/E meeting at VACO - Written comments to A/E
MP 4	- Final master plan and schematic drawings for all disciplines with all comments incorporated - Updated reports, calculations, and narratives - Environmental considerations and mitigation requirements - Cost estimate - Color boards	- Internal VA review - A/E presentation to management - A/E meeting with VA - Written comments to A/E
MP 5	- Final (100%) master plan with all comments incorporated - Mylar originals - CAD files	- Record submission only - No comments

SCHEMATIC DESIGN		
DESIGN PHASE	**COMPONENTS OF SUBMISSION:**	**REVIEW FORMAT:**
SD 1	- Concept plan alternatives if not previously developed - Environmental and historic status analyses - Code analysis - Geotechnical reports if not previously developed - Schematic site development and analysis - Schematic building plans and elevations - Narratives and reports - Other specified requirements for interior design, engineering, cost estimate and CPM	- Internal VA review - A/E meeting with VA - Written comments to A/E
SD 2	- Schematic site development with all comments incorporated - Schematic architectural layout with all comments incorporated - Updated narratives and reports - Updated color boards - Other specified requirements for interior design, engineering, cost estimate and CPM	- Internal VA review - A/E meeting with VA - Written comments to A/E

DESIGN DEVELOPMENT		
DESIGN PHASE	**COMPONENTS OF SUBMISSION:**	**REVIEW FORMAT:**
DD 1	- Design Development documents based on approved Schematic Design or master plan - Updated reports and narratives - Cost estimate - Updated color boards	- Internal VA review - A/E meeting with VA - Written comments to A/E

DD 2	- Final Design Development drawings, specifications and cost estimate with all comments incorporated - Updated reports and narratives - Updated color boards - Cost estimate	- Internal VA review - A/E meeting with VA - Written comments to A/E

CONSTRUCTION DOCUMENTS		
DESIGN PHASE	**COMPONENTS OF SUBMISSION:**	**REVIEW FORMAT:**
CD 1	- 90% Construction Documents - Final reports and narratives - Final color boards - Cost estimate	- Internal VA review - Peer review - A/E meeting with VA - Written comments to A/E
CD 2	- 100% Construction Documents - Final reports and narratives - Final color boards - Final cost estimate	- Final internal VA review for resolution of prior comments - Written comments to A/E
BD	- Final Construction Documents, signed and sealed - Electronic files for drawings and specifications	- Record submission only - No comments

RECORD DOCUMENTS		
DESIGN PHASE	**COMPONENTS OF SUBMISSION:**	**REVIEW FORMAT:**
Record Documents	- Record documents printed on Mylar - CAD files for drawings - Project Manual - Warranties	- Record submission only

D. COMPUTER AIDED DESIGN AND DRAFTING (CAD) REQUIREMENTS

1. The A/E shall supply all CAD data in accordance with the latest version of the U.S. National CAD Standard (NCS) and PG 18-4, Standard Details and CAD Standards.

2. If the Architect/Engineer team members use more than one CAD format in preparation of the documents, the electronic file compact disk submission to the National Cemetery Administration shall be in only one unified CAD format. The conversion and the integrity of the drawings is solely the responsibility of the Architect/Engineer. All CAD files created for this project shall be the property of the Department of Veterans Affairs and the National Cemetery Administration.

3. All drawings that form the Master Plan (MP) set will be identified by the symbol "MP" followed by the number of the drawing.

4. Each set of drawings will have a cover sheet which indicates: project title, VA project number, index of drawings in the set, names, addresses and phone numbers of all architectural and engineering firms involved in preparation of the documents, vicinity map, site location map, cemetery map showing project location, summary table of all gravesites developed in the project, with breakdown by type and other pertinent project information. A complete legend of drawing abbreviations and drafting symbols for all disciplines will be included either on the cover sheet or on a second sheet immediately following the cover.

5. The external label for the electronic submittal shall contain at a minimum:
    - VA Project Number, project name, and date of documents
    - Format and version of the operating system software used
    - Name and version of utility software used for preparation (e.g., compression/decompression, if applicable) and copying files to media
    - Sequence number of the digital media (Disk 1 of 3, Disk 2 of 3, etc.)
    - Limitations on distribution or reproduction if applicable

II. PRE-NEGOTIATION PROJECT TEAM KICKOFF MEETING (VA AND A/E)

After A/E selection but prior to fee negotiations, the A/E shall attend a technical meeting at VA Central Office (VACO) with Office of Construction & Facilities Management (CFM) and National Cemetery Administration (NCA) to clarify project goals and design intent, scope, schedule, and specific requirements based on VA needs and criteria. Individual roles, responsibilities, points of contact, project objectives, and technical guidance shall be established.

The VA Project Manager (PM) shall lead this meeting and remain as lead throughout the project. The PM serves as the liaison between the A/E and NCA and Cemetery staffs. It is the PM's responsibility to keep the project on schedule and within budget with no change in scope beyond refinement unless dictated by a program change.

As appropriate, and to the extent the information is available, VA will make available the following:

1. Current Facility Master Plan
2. Narrative and/or graphic description of existing buildings and site conditions
3. Requirements for space planning
4. Seismic evaluation reports to include but not be limited to: seismic site evaluation, seismic vulnerability study summary, seismic strengthening study summary, subsurface investigation reports, and record structural drawings
5. Utility studies
6. Environmental assessment/NEPA report, Environmental Impact Statement (EIS), and historical site assessment reports
7. Historic structure status

The VA PM shall advise the A/E regarding potential special studies that may be required, together with all Federal Mandates and VA criteria. The need to complete all special studies shall be discussed and agreed upon during the Pre-Negotiation Project Team Kickoff Meeting. Special studies may include but are not limited to:

1. Boundary survey
2. Topographic survey
3. Site utility survey
4. Geotechnical investigation
5. Parking and traffic circulation study (pedestrian and vehicular)
6. Traffic impact analysis
7. Historical analysis
8. Environmental survey
9. Seismic study
10. Severe weather vulnerability study
11. Hazardous material survey (lead, asbestos, etc.)

After the Pre-Negotiation Project Team Kickoff Meeting but prior to preparation of the fee proposal, the A/E shall provide the VA PM with a list of the design and construction standards and a list of the requirements for each technical discipline that will be applicable in the preparation of documents for the project.

III. MASTER PLAN

A. GENERAL

The goal of the Master Plan is to present a comprehensive, long-range development plan for the national cemetery. The Master Plan shall provide an orderly, professional, and aesthetic development plan, with associated present day cost estimates, for the entire cemetery site.

General Requirements

1. The Master Plan shall consider and address the following:

    a. Site requirements such as stormwater management, wetlands, and utility distribution.
    b. Pedestrian and vehicular access, circulation, and wayfinding.
    c. Neighborhood and community concerns.
    d. Architectural character of buildings with respect to historic context and local culture.
    e. Landscape materials with consideration for indigenous plants.
    f. Sustainability features.
    g. Security of site and buildings.

2. The Master Plan shall include Schematic Design (SD 1 and SD 2) documents for each structure included in Phase 1, enabling VA to proceed directly to Design Development for each phase of cemetery development.
3. The A/E shall visit the project site prior to beginning the master planning process.
4. The A/E shall provide renderings to be incorporated into a cemetery pamphlet prepared by NCA.

B. PLANNING APPROACH

1. The development of the Master Plan is an interactive process between VA and the A/E. The Master Plan shall incorporate the elements listed in the Scope of Work for the project.
2. The site analysis process shall evaluate all man-made and natural site features. The A/E shall document findings of the analysis in the Site Characteristics Report.
3. Relationships between structures, circulation, and site features shall be combined to produce both a functional and aesthetic plan. The plan shall reflect the history of the region, the culture of the people and veterans of the area. Materials used shall convey strength, and permanence, and reflect the regional design vernacular.
4. Agency consulting/review/approval services include: agency consultations, research of critical applicable regulations, and appearance at agency and community meetings/hearings as requested by VA.

C. SUBMISSION REQUIREMENTS

1. Drawings shall have graphic scales, north arrow (either true north or plan north; orientation shall be consistent throughout drawings unless approved by the VA Project Manager [PM]), title block, and key plan. Each drawing, booklet, and other supporting submittal, including cover sheets shall be clearly and consistently identified throughout the design process with the project title, location, building, phase, section, and segment.
2. All submitted documents shall be updated as per written comments from previous reviews.
3. Completed quality control checklist from the Quality Control Plan (QCP) shall be included with each submission.

4. Specifications shall be prepared using the most recent National Cemetery Administration (NCA) Master Construction Specifications. Submissions shall show changes to the master by using the

"Track Changes" function. Each submission of specifications shall indicate changes from the previous submission, not all changes to the master. Specifications submitted at the end of each phase (not for each review) shall include all changes.

5. Dimensions shall be provided in soft metric (S.I.) units followed by English units, unless otherwise specified by the PM.
6. In advance of each meeting to be led or moderated by the A/E, the A/E shall prepare an agenda and submit it to the VA PM sufficiently in advance of the meeting to facilitate participation by necessary VA representatives.
7. The A/E shall prepare and submit minutes of its meetings with VA, VA's other contractors, and for A/E coordination meetings.
8. All drawings that form the Master Plan (MP) set will be identified by the symbol "MP" followed by the number of the drawing.

D. MASTER PLAN 1 [MP 1]

During the MP 1 phase, the A/E shall prepare a minimum of three concept studies of the site and prepare them according to the schedule established in the contract. The A/E, after having prepared the studies, will conduct an on-site workshop with the VA team at which the A/E shall present the concept studies. The purpose of this workshop is to have an informed discussion that will result in the selection of a preferred development concept or elements from multiple concepts that can be combined to create a single preferred concept. No advance submittal of material other than the agenda described below is required.

The A/E shall submit a draft agenda for approval one week prior to workshop. As a minimum, the draft agenda shall include discussion of the following topics:

1. Findings of the site studies and survey information.
2. Design process used in developing each of the development studies.
3. Advantages and disadvantages of each study.
4. Proposed phasing plan.
5. Site visit by the VA and A/E team.

1. ARCHITECTURAL

Reports

Submit a discussion of architectural concepts supported by graphics/images to convey concepts.

2. COMMISSIONING

No requirements.

3. COST ESTIMATING

Reports

Submit:

a. Order of magnitude cost estimate for each concept study. There shall be two estimates for each concept: one for Phase 1 and the other for full development of the facility. Provide a subtotal for each project element (site preparation and grading, landscaping, irrigation, crypts, columbaria, committal shelters, parking, roads, buildings, etc.) to identify and evaluate each major cost driver, and a summary of total construction cost.
b. Narrative that discusses assumptions used for phasing and a schedule of anticipated contract award dates for calculation of escalation.
c. Market survey in accordance with Manual for Preparation of Cost Estimates.

4. CRITICAL PATH METHOD (CPM)

No requirements.

5. ELECTRICAL

No requirements.

6. ENVIRONMENTAL IMPACT

Reports

Submit an evaluation of Environmental Impact Statement (EIS) and Environmental Assessments (EA) and how they influence the development of the site.

7. EQUIPMENT

No requirements.

8. FIRE PROTECTION

Reports

Identify available water pressure for fire protection.

9. HEATING, VENTILATING & AIR CONDITIONING (HVAC)

No requirements.

10. HISTORIC PRESERVATION

Reports

Submit:

a. Status of site with respect to historic districts and historic structures.
b. Identification of authorities that must review and approve design.

11. PLUMBING

No requirements

12. SECURITY (PHYSICAL)

Reports

Identify physical security requirements for site and buildings.

13. SITE DEVELOPMENT AND UTILITIES

Reports

Submit:

a. Site Characteristics Report from an analysis of the EIS and EA data gathered from site visits and the topographic, utility, and landscape surveys. The site analysis process should reflect an understanding of all natural systems of the site. The report shall document the analysis process and shall contain:
   - Graphic and narrative description of the cemetery site.
   - Graphic and narrative description of the vicinity relationships with the cemetery site. The resulting vicinity map will also be used in the set of Master Plan drawings.
   - Site Analysis Plans that illustrate:
     - Significant constraints for construction and burials that must be considered during the planning of the site. Include site and utility constraints in adjacent off-site areas, steep grades (15% slope is maximum for interment areas), flood plains, rock outcroppings, etc.
     - Potential entrances for public and maintenance traffic. Show the primary access routes to and around the property with notations of any traffic control signals and future plans for adjacent development and roadway improvements that might affect the site and proposed cemetery.
     - Potential site organization - burial, maintenance and staff. Public traffic includes funeral participants and cemetery visitors. Maintenance traffic includes headstone delivery, soil spoils, grounds maintenance supplies and equipment and casketed remains, after the committal service.

- On-site utility service studies consisting of establishing requirements and preparing initial designs for electrical service and distribution, natural gas service and distribution, water supply and distribution, potable/non-potable irrigation, site drainage, sanitary sewer system and disposal, process waste water treatment for irrigation, stormwater collection and disposal, security, pollution control, site illumination, and communications systems.
- Off-site utility studies including location, size and adequacy of utilities serving the site, the requirements for connections to the utilities, planning for off-site utility extensions, and design of off-site utility extensions.
- Color photographs in sufficient quantity to show the character of the site. These photos shall be at least 130 mm x 180 mm (5" x 7"). Include at least one color aerial photograph at least 200 mm x 250 mm (8" x 10"), depicting the entire cemetery site and immediate surroundings. Provide electronic files of all photographs to VA.
- Format: 210 mm x 297 mm (8-1/2" x 11") narrative report with 297 mm x 420 mm (11" x 17") fold-out graphics, as needed. Provide a large format drawing that summarizes the site analysis as part of the Master Plan drawing set. Large format drawings will meet the same requirements as topographic, utility, and landscape survey drawings.
- Off-site land uses with potential impact to NCA (e.g. commercial, industrial, residential, military).

b. If wells are required for water source, obtain water analysis and expected yield in gallons per minute with considerations for requirements at each stage of development.

Calculations

Submit a preliminary determination of stormwater management requirements.

Drawings

Submit:

a. Topographic, Utility, and Landscape Surveys: Documents prepared by licensed surveyors to provide a topographic, utility, and landscape survey of the entire site. Specific survey requirements are detailed in the Site Development Design Criteria for National Cemetery Projects. General requirements for the survey are provided here. All elevations will be based on U.S.C.&G. Survey benchmarks. A permanent U.S.C.&G. Benchmark and permanent property corner monuments shall be established on the cemetery site if they do not already exist. The topographic survey shall include all features affecting site development, such as contours at an appropriate interval approved by VA (approximate interval is 150 mm (.5 feet) to 1500 mm (5 feet)). Significant stands and prominent trees/plant materials shall be shown with size and species identification. All property lines, building line setbacks, and any leases, rights-of-way or easements within the limits of this survey shall be located and shown. Surrounding land uses and property owners by name, historic/archaeological sites, natural land features (lakes, rivers, flood plains, wetlands, etc.) and other features or land uses that may affect NCA operations shall be identified. The locations and sizes of any utilities will be shown. The survey plans shall be made part of the Master Plan drawing set.
   - Format: Use two scales: 1:400 (approximately 1" = 30'), and the largest conventional engineering scale (i.e., 1:1200 (1" = 100') or 1:2400 (1" = 200'), etc.) that allows the entire cemetery site to fit on a single sheet. Show survey information compositely on a single sheet, hard-line finish, on an Orthophoto Base Topographic Map. Also provide survey information compositely at a scale of 1:400 (approximately 1" = 30'). Use match lines for orientation and alignment.

b. Minimum of three distinct, alternative development studies for presentation and discussion at the on-site workshop.
   - For each study, show the location of proposed structures, interment areas, number of gravesites, and design elements.

- Study subsurface conditions for the suitability of burials in 1500 mm (five feet) single depth and 2100 mm (seven feet) double-depth gravesites and for installation of crypts.
- Show spot grades for critical areas, proposed on-site roadways, parking areas, primary entrances and exits, and any other site/building features.
- Indicate the primary access routes to and around the site along with notations of any proposed future plans for roadway improvements, traffic control signals, or other traffic circulation changes that might affect the existing site and proposed planning. Indicate proposed land utilization for the entire site, pedestrian and vehicular circulation, utility systems, ecological requirements, planting concepts, grading concept, phasing with narrative, and estimates.
- Format: A/E choice of sketch-type materials and size.

14. ENVIRONMENTAL

Reports

Identify:

a. Areas of potential wetlands and/or flood plain impact.
b. Authorities that will review and approve environmental permits, including contact information.

15. SPECIFICATIONS

No requirements.

16. STRUCTURAL

Reports

Submit a Geotechnical Soil Survey for Buildings and Burial Sites: Follow the criteria in the NCA Facilities Design Guide requirements in Chapter 5.1, Site Development Criteria. General requirements for the survey are provided here. Obtain a report of subsurface investigations to include seismic data and geologic formations, analysis of soil fertility, organic content, and pH measurement. Depths to rock, ground water, and the existence of aquifers and perched water tables or springs and percolation locations will be identified. Soil pits shall be accomplished to a depth of 2400 mm (8 feet) below existing grade or to bedrock. Soil borings shall be drilled to a depth of 9 M (30 feet) below existing grade or to bedrock. Soil pits and/or borings shall be made in as many areas as the A/E considers necessary and as VA approves in order to obtain a good understanding of the soil and rock conditions of the site for double- or single-depth burial. Identify rock strata and prepare a profile illustrating their depth below surface. Study the depth of ground water during wet and dry periods. If ground water investigation is performed during dry season, use mottling to determine seasonal level of water table.

The format shall be 210 mm x 297 mm (8-1/2" x 11") narrative report with 297 mm x 420 mm (11" x 17") fold out graphics, as needed. Drawings indicating locations of borings and soil analysis shall be made part of the MP set. Large format drawings will meet the same requirements as topographic, utility and landscape survey drawings.

Drawings

Submit proposed soil boring locations for each study alternative.

17. SUSTAINABILITY

Reports

Identify sustainability goals related to Green Globes or LEED certification for each alternative.

18. TELECOMMUNCATIONS

No requirements

E. MASTER PLAN 2 [MP 2]

The purpose of this submission is to document the decisions made at the on-site workshop and to obtain VA final approval for the selected Master Plan alternative and to select a preferred architectural style.

The A/E shall submit the selected site development alternative and the other developed alternatives to VA in Washington, DC. The material for the selected alternative shall be presentation quality; the other alternatives may be in an informal format showing a level of development that accurately describes the salient features and characteristics of each.

1. ARCHITECTURAL

Reports

Submit a narrative incorporating the results of the "informed discussion" that took place during the on-site workshop for MP 1.

Drawings

Submit:

a. Sketches of proposed architectural plan and elevation alternatives at no less than 1:200 (1/16"=1'-0). Identify proposed materials.
b. Interior design sketches at no less than 1:200 (1/16"=1'-0) to indicate the design direction.

2. COMMISSIONING

No requirements.

3. COST ESTIMATING

Reports

Submit an updated MP 1 submission.

4. CPM

No requirements.

5. ELECTRICAL

No requirements.

6. ENVIRONMENTAL IMPACT

Reports

a. Notify VA contracting officer immediately upon discovery of any environmental or site data that may warrant investigation.
b. Update previously submitted documents based on the MP 1 on-site workshop.

7. EQUIPMENT

No requirements.

8. FIRE PROTECTION

Reports

Update previously submitted documents based on the MP 1 on-site workshop.

9. HVAC

No requirements.

10. HISTORIC PRESERVATION

Reports

Update previously submitted documents based on the MP 1 on-site workshop.

11. PLUMBING:
No requirements.

12. SECURITY (PHYSICAL)
Reports
Update previously submitted documents based on the MP 1 on-site workshop.

13. SITE DEVELOPMENT AND UTILITIES
Reports
Submit:

a. Update of previously submitted documents based on the MP 1 on-site workshop.
b. Outline of phasing requirements for the project based on meetings with the VA PM and VA representatives of CPM and NCA. Describe the general sequence of the project work, estimated duration, and what Government constraints will exist that will influence the Contractor's approach to the construction project.

Calculations
Update previously submitted documents based on the MP 1 on-site workshop.

Drawings
Submit:

a. Update previously submitted documents based on the MP 1 on-site workshop.
b. Phasing plans on drawings large enough to clearly describe the sequencing of each 10-year phase.

14. ENVIRONMENTAL
Update previously submitted documents based on the MP 1 on-site workshop.

15. SPECIFICATIONS
No requirements.

16. STRUCTURAL
Reports
Update previously submitted documents based on the MP 1 on-site workshop.

Drawings
Update previously submitted documents based on the MP 1 on-site workshop.

17. SUSTAINABILITY
Reports
Update previously submitted documents based on the MP 1 on-site workshop.

18. TELECOMMUNCATIONS
No requirements.

F. MASTER PLAN 3 [MP 3]

1. Submit the approved Master Plan alternative incorporating all comments received on the previous submission. This review will concentrate on refinements as shown on the documents identified below.
2. In addition to the submission requirements shown below, include with this submission all items shown in the SD 1 submission for the Phase 1 buildings.
3. Participate in a review at VACO in Washington, DC. Drawings/studies shall be prepared on standard VA sheets.

1. ARCHITECTURAL

Reports

Submit:

a. Summary of space by function with net areas, gross area, and net-to-gross ratio for each building. Submit in tabular form with subtotal for each building.
b. Show on the floor plan the net program area required for each area and the actual designed area. Indicate the total gross area of each building.

Drawings

Submit:

a. Refinement of the selected architectural concept with floor plans and elevations. Floor plans shall be at a scale that will permit an entire floor plan to fit on a standard VA sheet, normally 1:100 (1/8" = 1'-0") or 1:50 (1/4" = 1'-0"), one building per sheet.
b. The size of all spaces listed in the Square Footage Requirements of the scope of work.
c. Accessible routes.
d. The interior design scheme and a floor plan indicating generic furniture placement.
e. Renderings of primary building facades.
f. Study/massing model for site and buildings to be constructed if required by scope of work. Show designated areas for graves, columbaria, stormwater management, and administrative and service buildings.
g. Preliminary discussion about the required renderings, which include the Entrance, Flag/Assembly Area, Committal Service Shelter, and either the Administration Building or the Columbarium. The A/E and the PM will agree to the specific views and vantage points to be used. Reductions of selected renderings will be incorporated by NCA into the Cemetery Pamphlet.

2. COMMISSIONING

No requirements.

3. COST ESTIMATING

Reports

Submit an updated MP 2 submission.

4. CPM

No requirements except as required for SD 1.

5. ELECTRICAL

No requirements except as required for SD 1.

6. ENVIRONMENTAL IMPACT

Reports

a. Notify VA contracting officer immediately upon discovery of any environmental or site data that may warrant investigation.
b. Update previously submitted documents to reflect comments on MP 2 submission.

7. EQUIPMENT

No requirements.

8. FIRE PROTECTION

Reports

Update previously submitted documents to reflect comments on MP 2 submission.

9. HVAC

No requirements except as required for SD 1.

10. HISTORIC PRESERVATION

No requirements except as required for SD 1.

11. PLUMBING

No requirements except as required for SD 1.

12. SECURITY (PHYSICAL)

Reports

Update previously submitted documents to reflect comments on MP 2 submission.

13. SITE DEVELOPMENT AND UTILITIES

Reports

Submit:

a. Narrative description of natural gas and water sources, disposal methods of sewage and stormwater, and proposed natural gas, domestic water, irrigation, storm drainage, and sanitary sewage systems. Indicate if on-site water or sewage treatment is necessary. Describe gasoline and fuel oil facilities. Indicate if existing utilities and equipment can be used.
b. Letters (Memoranda of Understanding) from all affected utilities stating availability and connection potential.
c. Statement indicating presence and availability of any existing electrical service and related major equipment, and their capacity to supply the new load.
d. Irrigation concept narrative.

Calculations

Submit:

a. Required load calculations and ability to obtain required service from existing utilities.
b. Update stormwater management calculations.

Drawings

a. Overall site development plans including number of gravesites and narrative.
b. Phasing plans on drawings large enough to clearly describe the sequencing of each 10-year phase.
c. Electrical site plan the location of major existing and proposed service equipment including power transformers, switches, etc.
d. Irrigation concept plan.

14. ENVIRONMENTAL

Reports

Discuss and quantify impacts to wetlands, floodplains, forested areas, wildlife, and endangered species habitats. Discuss mitigation techniques and identify general areas of possible mitigation.

15. SPECIFICATIONS

No requirements except as required for SD 1.

16. STRUCTURAL

Reports

Update previously submitted documents to reflect comments on MP 2 submission.

Drawings

Update previously submitted documents to reflect comments on MP 2 submission.

17. SUSTAINABILITY

Update previously submitted documents to reflect comments on MP 2 submission.

18. TELECOMMUNCATIONS

No requirements except as required for SD 1.

G. MASTER PLAN 4 [MP 4]

1. All documents submitted for the MP 4 review shall incorporate responses to comments received on the MP 3 submission. The MP 4 submission shall include all items required for the complete Master Plan.

2. In addition to submission requirements shown below, include with this submission all items shown in SD 2 submission for the buildings to be developed in Phase 1.

3. The A/E shall participate in a presentation of the master plan in Washington, DC to the senior management staff including the Undersecretary for Memorial Affairs and others as identified by the VA PM. The presentation shall have the features and characteristics described below.

   a. The presentation by the A/E will be approximately 30 minutes with additional time for a question and answer period. It may include drawings, renderings, models, PowerPoint slides or some combination of these tools as may be necessary to fully illustrate the selected Master Plan, the basis for its development, and the phases of development in order to achieve a completed facility. It may incorporate any relevant, incidental materials developed while preparing the Master Plan.
   b. The presentation shall include general cost information such as average gravesite cost, approximate individual building costs, approximate costs of the initial development phase and total build-out cost for the completed cemetery.
   c. A draft presentation shall be submitted to the VA PM for review and comment prior to the meeting with the senior management staff. In advance of the presentation to senior management staff, the A/E shall make a "dry run" of the proposed presentation to the CFM and NCA staffs.

1. ARCHITECTURAL

Reports

Submit:

a. Updated and further developed interior design narrative.
b. Summary of space by function with net areas, gross area, and net-to-gross ratio for each building. Submit in tabular form with subtotal for each building.

Drawings

Submit:

a. Floor plans, roof plans, and elevations. Plans and elevations shall be at a scale that will permit an entire floor plan to fit on a standard VA sheet, normally 1:100 (1/8" = 1'-0") or 1:50 (1/4" = 1'-0"), one building per sheet. Show location of mechanical and electrical equipment rooms and closets on the floor plans.
b. Sections and details. Include building sections at 1:50 (1/4”=1’-0”) and typical wall sections. Wall sections and details shall be of sufficient size to clearly explain the construction and conditions being presented.
c. Proposed materials and finishes for the structures.
d. Furniture plan.
e. Sample board illustrating the interior design scheme and specific types of furniture selections.

2. COMMISSIONING

No requirements except as required for SD 2.

3. COST ESTIMATING

Reports

Submit an updated MP 3 submission.

4. CPM

No requirements except as required for SD 2.

5. ELECTRICAL

No requirements except as required for SD 2.

6. ENVIRONMENTAL IMPACT

Reports

a. Notify VA contracting officer immediately upon discovery of any environmental or site data that may warrant investigation.
b. Update previously submitted documents to reflect comments on MP 3 submission.

Calculations

Update previously submitted documents to reflect comments on MP 3 submission.

7. EQUIPMENT

No requirements.

8. FIRE PROTECTION

Reports

Update previously submitted documents to reflect comments on MP 3 submission.

9. HVAC

Reports

a. Provide a description of the HVAC systems and equipment in accordance with latest ASHRAE Standards and VA criteria.
b. Investigate the availability of utilities (natural or propane gas, electricity, steam, or hot water) for the HVAC equipment and provide description of their status.
c. Indicate the tentative locations of HVAC equipment, including any outdoor equipment.

10. HISTORIC PRESERVATION

Reports

Submit documentation required by local State Historic Preservation Office (SHPO).

Drawings

Submit documentation required by local SHPO.

11. PLUMBING

Reports

Provide description of plumbing systems. Indicate if existing plumbing equipment, fixtures, and piping are adequate for this project.

12. SECURITY (PHYSICAL)

No requirements except as required for SD 2.

13. SITE DEVELOPMENT AND UTILITIES

Reports

Provide previous utility descriptions with updates.

Drawings

Submit:

a. Overall site development plan illustrating all of the program elements including Phase 1 development.

b. Updated phasing plan for the entire site, illustrating the distinct phases and their order of development, based on demographic projections provided by NCA.
c. Roadway system, including horizontal layout and typical cross sections.
d. Burial sections, numbered and illustrating limits of gravesites, and approximate yield (number of gravesites per section).
e. Planting plan indicating location of trees, shrubs, and ground covers with a schedule of proposed species.
f. Irrigation layout of main lines, submains, a typical lateral block layout, master valves and valve concept.
g. Grading and drainage plan with rough grading of roads and interment areas, proposed first floor elevations of the architectural elements and special site features and other critical grades.
h. Topographic, utility, boundary, and landscape surveys.
i. Site furnishings plan and details.
j. Signage/wayfinding plan and details.
k. Site plan enlargement of all features:
   i. Flag assembly area
   ii. Entrance feature
   iii. Buildings
   iv. Columbaria

Calculations
Update previously submitted stormwater management calculations.

14. ENVIRONMENTAL

Reports

a. Where the project scope includes building renovation and known or suspected asbestos material is involved, a Professional Industrial Hygienist shall prepare required information for all design submissions in accordance with VA guidelines for asbestos abatement.
b. Update previously submitted documents to reflect comments on MP 3 submission.

15. SPECIFICATIONS

No requirements except as required for SD 2.

16. STRUCTURAL

No requirements except as required for SD 2.

17. SUSTAINABILITY

Update previously submitted documents to reflect comments on MP 3 submission.

18. TELECOMMUNCATIONS

No requirements except as required for SD 2.

H. MASTER PLAN 5 [MP 5]

This is a record submittal; no review comments are expected if A/E has incorporated all previously identified requirements. Include renderings, suitable for inclusion in the Cemetery Pamphlet, of the Entrance, Flag/Assembly Area, Committal Service Shelter, and either the Administration Building or the Columbarium.

IV. SCHEMATIC DESIGN

A. GENERAL

The Schematic Design (SD) phase documents are to be developed from the VA-selected concept approved in the Master Plan 1 (MP 1) and Master Plan 2 (MP 2) phases. SD further develops the concept plan to a level of detail that includes specific functional and adjacency requirements and establishes the aesthetics of the design.

General Requirements

1. If not developed during the Master Plan phase nor furnished by VA, provide a minimum of three alternate development plans as described in MP 1 and MP 2. VA will review the alternate development plans and select one or a combination of several to be further developed for SD 2.
2. Drawings shall have graphic scales, north arrow (either true north or plan north; orientation shall be consistent throughout drawings unless approved by the VA Project Manager [PM]), title block, and key plan clearly identifying the drawing component within the overall plan. Each drawing, booklet, and other supporting submittal, including cover sheets, shall be clearly and consistently identified throughout the design process with the project title, location, building, phase, section, and segment.
3. All submitted documents shall be updated as per written responses in a mutually agreeable electronic review and correction tracking system to reflect review comments from previous phase and further development. The A/E shall verify that all changes based on the review of the previous phase have been entered into the electronic review and correction tracking system and approved by the VA PM.
4. Specifications shall be prepared using National Cemetery Administration (NCA) Master Construction Specifications. Submissions shall show changes to master by using the "Track Changes" function. Each submission shall indicate changes from the previous submission, not all changes to the master. Specifications submitted at the end of each phase (not for each review) shall include all changes.
5. Dimensions shall be provided in soft metric (S.I.) units followed by English units, unless otherwise specified by the VA PM.
6. Sustainable design requirements: Comply with the requirements of the VA Sustainable Design and Energy Reduction Manual.
7. The A/E shall prepare and submit minutes of its meetings with VA, VA's other contractors, and for A/E coordination meetings.

B. SCHEMATIC DESIGN 1 [SD 1]

1. ARCHITECTURAL

Reports

Submit:

a. Preliminary phasing narrative with preliminary phasing plans for site and building development.
b. Preliminary LEED or Green Globe checklist to establish basis for sustainability rating. See Section 17, Sustainability.
c. Summary of building features in tabular form: building height, gross area by floor.
d. Physical security requirements.
e. Narrative describing concept for interiors.
f. Signage and wayfinding concept.

Drawings

Submit:

a. Cover Sheet with project name and address, VA project title, project number, location map, signature block, name, address and telephone number of VA, architect, engineers, and other consultants, vicinity map, site location map, cemetery map showing project location, summary table of all gravesites developed in the project with breakdown by type, and other pertinent project information. .
b. Project Data Sheet with index of drawings, legend of abbreviations and drafting symbols for all disciplines, and code analysis.
c. Conceptual site plans (minimum of three) with building location, parking, pedestrian and vehicular circulation, and all other major landforms and site features. *This requirement is only applicable if not prepared as part of the MP 1 and MP 2 submissions.*
d. Conceptual floor plans showing functional adjacencies, internal organization, vertical and horizontal circulation, location of mechanical and electrical equipment rooms, entrances, receiving/shipping, and location of section cuts (min. 1:100 (1/8"=1'-0")). Include overall building dimensions.
e. Building elevations with fenestration, materials, finish-floor elevations, floor-to-floor heights, location of grade at building, overall building height, and location of section cuts (min. 1:100 (1/8"=1'-0")).
f. Minimum of two building sections through major portions of building (min. 1:100 (1/8"=1'-0")).
g. Generic furniture placement plan (min. 1:100 (1/8"=1'-0").

2. COMMISSIONING

Reports

Submit:

a. Identification of full commissioning team and team organization. Include team member roles and responsibilities, and lines of communication.
b. Basis of Design (BOD) report describing VA's Owner's Program Requirements (OPR), design narrative, and sustainability goals (LEED or Green Globes certification level). See Section 17, Sustainability.
c. Draft Commissioning Plan to include:
    - All systems, components, and features to be commissioned
    - Required documentation and schedule for implementation
    - Major concerns that could affect operations, maintenance or testing
    - Discrepancies between OPR and the Design Narrative
    - Updated design schedule and major milestones
d. Preliminary Design Phase Commissioning Issues Log.
e. Commissioning duration schedule.

3. COST ESTIMATING

Reports

Submit:

a. Work Breakdown Schedule (WBS) II Level 2 estimate.
b. Cost model based on project limitation of construction cost (cost target for construction).
c. Separate computations for site elements, crypts, columbaria, each building, new work, and renovations.
d. Updated market survey.

4. CRITICAL PATH METHOD (CPM)

Reports

Submit the updated BOD report including:

a. Project Master Schedule that identifies major design activities, procurement phase activities and construction phasing sequence with major milestones, and cemetery overlapping activation phase. Construction schedules shall be prepared using Primavera

software for major construction projects and Microsoft Project software for minor construction projects.

b. Detailed design schedule identifying major activities, submissions, participants, and milestones including bid and award. Show activities for each primary design discipline. At a minimum, include architectural, structural, mechanical, electrical, fire protection and life safety, plumbing, civil, and physical security. This schedule shall be in cost-loaded CPM format with interrelationships between activities and shall also be used as the basis for monthly payments to the A/E. In addition, this schedule shall be used as a basis for identifying and recording significant program and schedule risk factors based on site development and analysis and recommend mitigation plan.
c. Preliminary phasing narrative.
d. Phasing plans on reduced site plans.
e. Written list of systems divided by technical discipline, including temporary systems by phase.

In addition to updating information, each successive submission of Master Schedule, Design Schedule, and Risk Analysis shall provide an increased level of detail. Project Master Schedule and Design Schedule shall be produced using a computer program acceptable to VA and submitted as electronic files.

5. ELECTRICAL

Reports

Submit an updated BOD report, including:

a. Electrical design approach proposed in narrative form. Determine whether the existing site utility service and distribution, switchgear, primary feeders, power transformers, and distribution equipment are adequate for the new loads for normal, stand-by, and essential electrical systems.
b. Detailed description of the extent of new utility company work (if required). Provide copies of all correspondence and minutes of meetings with all utility company representatives.
c. Description of physical security requirements and implementation into electrical design.
d. Requirements for uninterruptible power system (UPS).

Calculations

Submit:

a. Existing peak demand readings at point of connection to serve new facilities.
b. Calculations to support preliminary mechanical equipment sizing and ratings, using square foot demand loads for lighting, general equipment, and approximate mechanical equipment loads for mechanical system equipment/elevators.
c. Requirements for emergency power and UPS.
d. Loads associated with emergency and stand-by electrical power systems to determine power generation capacity required.

Drawings

Submit:

a. Site plan showing impact of proposed new work on the existing site and distribution, indicating new and existing locations of incoming utility electrical power service, underground electrical vaults, manholes, duct banks, and utility tunnels. Show major electrical work with respect to locations of substations and transformers.
b. Proposed, conceptual one-line diagram for medium voltage (below 69kV) and low voltage (below 600V) electrical power distribution system. One-line diagram shall show major normal, emergency, and standby electrical system, main electrical components, and the correlation between the systems.
c. Plans showing locations of main electrical areas, such as main electrical switchgear, main electrical vaults, generator rooms, and/or energy center and indicating their approximate dimensions. Show outlines of major electrical equipment items in these rooms and

outlines of minimum working clearance as required by the applicable National Electrical Code.

6. ENVIRONMENTAL IMPACT

Reports

Notify the VA contracting officer immediately upon discovery of any environmental or site data, such as asbestos, that may warrant investigation.

7. EQUIPMENT

No requirements.

8. FIRE PROTECTION

Reports

Submit:

a. Survey and description of the existing fire alarm system in the building to be modernized and/or the base loop system to which the new construction shall interface.
b. Description of proposed options for new systems.
c. Description of building construction, fire sprinkler/standpipe systems, size of fire pumps (if required), water supply available/maximum demand, water flow testing results, and fire alarm systems. Indicate NFPA 220 and IBC fire resistive rating of the building, NFPA 101 occupancy type, and fire protection code analysis to assess compliance with NFPA 101.

Calculations

Submit calculations to size fire pumps (when required), water supply available/maximum demand, and water flow testing results raw data.

Drawings

Indicate estimated sizes of proposed main fire lines and proposed locations of connections to site utilities.

9. HEATING, VENTILATING & AIR CONDITIONING (HVAC)

Reports

Submit:

a. Condition and availability of the spare capacity of the existing systems. Include specific recommendations for meeting the HVAC needs of the project.
b. Description of the tentative zoning of the spaces, including those proposed with dedicated HVAC systems. Describe the locations of the equipment serving each zone, focusing on the serviceability and maintainability of each major piece of equipment.
c. Engineering criteria and rationale used for selecting HVAC system, including life cycle cost analysis. Coordinate with the NCA Design Guide Chapter 5.6 wherein the restrictions on the system type and the capacity limitations are outlined. Include all zone level and space level assumptions and parameters to be used in the analysis. Computerized analysis shall be prepared by using either a public domain program or the privately developed software programs. Submit the name and version of the program used for computerized analysis. (Prior approval by VA is required for the use of private programs, as opposed to public domain programs.)
d. Energy conservation measures proposed to be used in the HVAC system design. Refer to VA guidelines for the mandated energy conservation requirements and energy consumption goals. State the logic and criteria for selecting each conservation measure.

Calculations

Submit:

a. Estimated heating and cooling requirements of the existing and/or new buildings based on the gross square feet area of each unique function space.

b. 8,760-hour basis energy analyses for the sole purpose of optimizing the orientation and massing schemes being considered. Envelope and glazing are optimized; all other variables (occupancy, regulated and unregulated loads) in the energy model shall remain fixed for all schemes at this design phase submittal.
c. Potential impact of hurricanes on the HVAC equipment (in hurricane zones).

Drawings
Submit single-line air and water flow diagrams, air-handling processes, and zone level (not space level) air and water distribution for the proposed options.

10. HISTORIC PRESERVATION

Reports

a. Comply with contractual agreements for SD 1, when required, as developed with the VA contracting officer, the VA PM, and the VA cultural resources management officer.
b. Notify VA contracting officer immediately upon discovery of any historical or archeological data that may warrant investigation.
c. Documentation required for approval by the State Historic Preservation Office (SHPO) including Section 106 reviews.

11. PLUMBING

Reports
Submit:

a. Explanation and technical backup information as to how the project shall meet the project goal for hot water generation using renewable solar energy.
b. Potable water baseline and the required reduction target. Define strategies to achieve the reduction goals.
c. Graphical representation of energy and water usage savings with reference to the contributing technologies and their weighted contributions.

Calculations
Submit:

a. Approximate sizes of new equipment.
b. Potable water baseline and reduced consumption calculations.
c. Calculations to support the strategies to achieve the water consumption and energy reduction goals.

12. SECURITY (PHYSICAL)

Reports
Describe the basis for physical security requirements and an overview of the provisions to be implemented. Include setbacks, building envelope, structural system, monitoring, intrusion detection, and other systems required by the Physical Security Design Manual for Life Safety Protected Buildings that must be considered to develop a plan and a budget estimate.

13. SITE DEVELOPMENT AND UTILITIES

Reports
Submit:

a. Preliminary feasibility study of existing utilities (storm drainage, sanitary sewer, fire, water services, gas, and others), where applicable. Investigate the conditions and available capacity of existing utilities to service the project's needs; determine if improvements are needed; and describe the extent of off-site utility improvements, where required. Provide descriptions of the existing and proposed utilities: fuel gas, water sources, sewage disposal systems, irrigation, and water services. Indicate if existing utilities and equipment can be used for this project.

b. Detailed analysis of the site in relation to the surrounding community, including, for example, mass transit routes and utilities. Include restrictions, on and off site, zoning ordinances, easements, etc., that may impact the design and costs. Identify items of historical significance.
c. Description of disposal methods of sewage and stormwater. Indicate if water or sewage treatment, pumping, and storage are necessary.
d. Issues that may affect off-site roads and utilities as identified by local jurisdictions.
e. Phasing analysis to determine impacts of project construction on maintaining cemetery operations, ingress/egress of pedestrians and traffic flows, transportation and storage of construction materials, mitigation of air and noise pollution, sequencing of new conflicts, and areas of future construction.
f. Floodplains and wetlands.
g. Sediment and erosion control requirements.
h. Stormwater management requirements and intended methods of implementation.
i. Requirements for saving existing trees.

Drawings

Submit:

a. Topographic, utility, and landscape surveys at a scale of 1:400 (approximately 1" = 30'). Specific survey requirements are detailed in the Site Development Design Criteria for National Cemetery Projects.
b. Plans indicating existing and proposed utilities listed above and approximate size of proposed utilities. Indicate roughly where treatment facilities (if required) will be located and areas of lawn irrigation.
c. Circulation plan showing ingress/egress to the site by pedestrians (including persons with disabilities), cars and service vehicles.
d. Site plan showing proposed structures, interment areas, equipment at grade, and the other scope requirements including site preparation and demolition. Show expansion potential. Indicate first floor elevations for each proposed structure and spot elevations at critical locations; e.g., structure corners, entrances, intersections, and critical floor and grade elevations.
e. Plans indicating all existing, abandoned, and proposed utilities listed above including approximate size of proposed utilities. Locate roughly where sewage treatment facilities (if required), pump stations, and/or areas of lawn irrigation shall be located.
f. Types and sizes of existing, abandoned, and proposed utilities listed above.
g. Approximate location of treatment facilities and storage facilities (when required). Indicate any areas of specialty systems, such as irrigation.
h. Site security diagram indicating the primary physical security elements being implemented into the site design including standoff distances, barriers, access control, and vehicle stacking. (min. scale 1:1200 (1″=100′)). Coordinate with *Section 13. Security (Physical)*.
i. Site review checklist.

14. ENVIRONMENTAL

Reports

Submit:

a. Update previously submitted reports based on MP 1 on-site workshop.
b. BOD report including the extent of environmental permitting required for the project, current status of permitting efforts, and comments/feedback from regulatory agencies.
c. Floodplains, wetlands, waterways including limitations on times of year that work is permitted, and wildlife and endangered species habitats.

Calculations

Submit a flood plain study, if applicable.

Drawings

Submit:

a. Preliminary wetland mitigation plans.
b. Stream crossing/waterway impact locations.

15. SPECIFICATIONS

Reports

Submit a table of contents based on index of NCA master specifications.

16. STRUCTURAL

Reports

Submit:

a. Detailed listing of all applicable codes, design criteria, and national standards affecting the design.
b. Draft geotechnical report and recommendations.
c. Description of structural design loading information (include criteria and reference source). List all load combinations that shall be used and their source.
d. Building structural performance design criteria.
e. Recommendations for foundation system and, where necessary, mitigation of groundwater penetration.
f. Program to perform subsurface exploration and laboratory testing in the area of any proposed construction. Explain technical issues to be resolved, field and laboratory methods to be used, estimated number and depths of borings and other field methods, estimated laboratory testing, and reporting methods.
g. Detailed work plan, which shall include the results of previous investigations relevant to the project.

17. SUSTAINABILITY

Reports

Submit:

a. Summary of the results and conclusions of the final site selection analysis with respect to the VA sustainability criteria.
b. Graphical representation (e.g., pie or bar chart) and description comparing various water-use reduction strategies to achieve the reduction goals and mandated water-use reduction requirements as part of the selected third-party rating system and VA sustainability guidelines. Coordinate the reporting with the results from the plumbing and site/civil stormwater analysis to provide the potable water baseline and the required reduction target. Define strategies.
c. Graphical comparison (e.g., pie or bar chart) of the energy use intensity and energy consumption by end use for HVAC and lighting concepts evaluated as part of this phase of the project. Illustrate how the mandated energy conservation requirements, energy consumption and lighting design goals in VA design manuals and VA sustainability guidelines for the overall project are being achieved. Coordinate the reporting with the results from the energy and lighting analysis conducted as part of the mechanical and electrical/lighting systems evaluation.
d. Graphical summary (e.g., pie or bar chart) of the preliminary results and conclusions of the Indoor Environmental Quality (IEQ) impact of each of the HVAC concepts. In addition, provide a graphical representation of Green House Gas (GHG) emissions for the selected concepts as they relate to VA mandates.
e. Summary assessment and preliminary estimate of renewable energy capacity as part of the SD 1 concept evaluations relative to VA mandates and third-party sustainability goals. Renewable energy to be included in the assessment should include solar thermal, solar PV, wind, and geothermal. Coordinate with the plumbing submission and submit as needed the explanation and technical backup information regarding how the project shall meet the project goal for hot water generation using renewable solar energy.

Calculations
Submit:

a. Preliminary annual energy use for new buildings in accordance with the most current edition of ASHRAE 90.1 and VA required performance level of 30% less than the current ASHRAE 90.1.
b. Preliminary annual energy use for major renovations to reduce the energy use by 20% below the renovation 2003 baseline.
c. Preliminary water use reduction calculations based on third-party and VA guidelines. Coordinate calculation submission for the potable water baseline and reduced consumption calculations with the plumbing engineer. Coordinate calculation submissions with the plumbing engineer to support the strategies to achieve the water reduction goals.
d. Preliminary renewable energy calculations. Coordinate calculation submissions with the mechanical and electrical trades.

Green Globes (if applicable)
Reports
Submit:

a. Rating category under which the project shall be certified and submit the final input data for the project initiation, site analysis, and programming phases.
b. Final input parameters and assumptions for performing the Life Cycle Cost Assessment (LCA).

LEED (if applicable)
Reports
Submit LEED Certification preliminary LEED scorecard. Indicate where points are anticipated and provide a brief discussion describing why certain points are or are not achievable.

18. TELECOMMUNCATIONS

Reports
Submit:

a. Assessment of whether the existing telecommunications services are adequate for project needs.
b. Extent of utility company work required. Include copies of all correspondence and minutes of meetings with all utility company's representatives.

Drawings
Submit:

a. Location of incoming telecommunications services, manholes, and duct lines on the project site plan.
b. Conceptual telecommunications riser diagrams.
c. Provision for all telecommunications spaces on the Architectural drawings.

C. SCHEMATIC DESIGN 2 [SD 2]

The purpose of SD 2 is to further refine the solution developed in SD 1 and to validate that project goals and parameters are reflected in the design, which is further developed at a room-by-room level of detail.

1. ARCHITECTURAL

Reports
Submit:

a. Potential alternates for bidding development. The value of the alternates shall represent approximately 10% of the construction budget and determine if they shall be additive or deductive alternates.
b. Narrative describing materials and character of building facades.
c. Narrative of the interior design scheme and proposed finishes with a sample board to illustrate concept and palette.
d. Signage/wayfinding concept and catalog cuts for proposed signage system.

Drawings
Submit:

a. Dimensions for overall building, column centerlines, and critical building components and features
b. Floor plans for each floor, penthouses, and service areas (min. 1:100 (1/8"=1'-0")). Show room names, numbers, net area, columns and column grid, windows, and major building equipment. Identify limits of each department or service. Locate vertical circulation, mechanical rooms, electrical rooms and closets, and data closets. Show overall exterior dimensions of building(s).
c. Label each room or space with its name and the required program net area over the designed net area. Names on drawings shall be the same as those used in the Square Footage Requirements Worksheets. The area figures shall appear in fractional form, e.g., 400/390. Space provided but not called for in the Square Footage Requirements Worksheets shall be indicated as -/390. The designed net area shall exclude such circulation space within the room as is permitted by the space planning criteria.
d. Demolition floor plans (min. 1:100 (1/8"=1'-0")).
e. Preliminary Interim Life Safety Measures (ILSM) drawings for renovation areas only (min. 1:200 (1/16"=1'-0")).
f. Life safety plans showing means of egress, capacity, population, fire walls, and horizontal exits (min. 1:200 (1/16"=1'-0")).
g. Building elevations with fenestration, penthouses, materials, finish floor elevations, floor-to-floor heights, overall building height, adjacent grades, column centerlines, and section cut indications. (min. 1:100 (1/8"=1'-0")).
h. Building sections (min. 1:50 (1/4"=1'-0")) with location of section cuts identified on plans and elevations.
i. Interior elevations showing power, data, communications, equipment, and other built-in items (min. 1:50 (1/4"=1'-0")).
j. Floor plan indicating furniture placement with specific type of furniture selections.
k. Submit floor plans and sketches indicating finishes, signage, and wayfinding features.
l. Renderings of primary views of buildings, site, interment areas, and columbarium.

2. COMMISSIONING

Reports
Submit:

a. List of systems, components, and features to be commissioned.
b. Design Phase Commissioning Plan in its final form.
c. Updated Design Phase Commissioning Issues Log with proposed resolution/mitigation. Incorporate into electronic review and correction tracking system.
    - Identify major concerns that could affect operations, maintenance, or testing
    - Identify discrepancies between VA's project requirements and design narrative
    - Update roster of Commissioning Team members
d. Coordination Matrix for Commissioning Agent and A/E.

3. COST ESTIMATING

Reports
Submit:

a. WBS II Level 3 estimate.

b. All SD 1 submissions updated to reflect further development of project.

4. CPM

Reports

Submit:

a. Updated Project Master Schedule.
b. Updated Detailed Design Schedule.
c. Updated program and schedule risk factors and mitigation plan.
d. Phasing narrative.
e. Written list of systems, including temporary systems by phase and separated by technical discipline.

Drawings

Submit:

a. Phasing plans on reduced site plans.
b. Phasing diagram.
c. Phases marked on full size drawings for VA review.

5. ELECTRICAL

Reports

Submit:

a. Basic assumptions and points of interconnection with the existing electrical power distribution systems. Submit a statement describing the impact of the new construction work to the existing electrical power distribution systems.
b. Present demand load (medium voltage switchgear and primary feeder) and projected additional load of new construction.
c. Two design options for the electrical power distribution systems and a list of advantages and disadvantages for each. Include description of physical security requirements and implementation into electrical design alternatives.
d. Method by which fault current, protective device coordination, arc flash, generator sizing, load, feeder and equipment sizing, voltage drop, harmonic distortion, lightning protection risk analysis, and lighting calculations are prepared.
e. Report of the life cycle cost analyses for major electrical distribution system equipment options and lighting systems options. Indicate the recommended design and equipment.

Calculations

Submit:

a. Updated demand calculations to reflect decisions concluded in the SD 1 phase development.
b. Block area demand calculations based on area function for lighting and power, both normal and essential loads to establish closet equipment sizes and ratings.
c. Updated mechanical equipment loads for mechanical system equipment and elevators.
d. Updated critical electrical system and/or stand-by electrical power system loads to determine emergency and/or stand-by generation capacity required to support the building electrical power requirements.
e. Complete life cycle cost analyses for major electrical equipment and lighting systems.

Drawings

Submit:

a. Updated drawings including:
    - Indication of area functions and location, room titles, location and dimensions of electrical equipment rooms and electrical closets on drawings. Show all electrical power distribution equipment to scale. Include means and clearances for installation, maintenance, and operation of equipment.

- Site plan showing existing and proposed new underground work for electrical power distribution system and outdoor equipment.
- Preliminary demolition drawings, indicating scope of work for demolition, spaces to be made available from demolition, and construction phasing impacts of demolition.
- Concise, conceptual one-line and riser diagrams of the proposed normal, emergency and standby electrical power distribution systems. The diagram shall show the entire electrical power distribution system, incoming utility, medium electrical power, main switchgears, main switchboards, and transformers. Riser diagram shall include switchgear, transformers and low voltage main and/or distribution panels, branch panels, and representative methods of feeding 277/480-volt and 120/208-volt normal and essential electrical power/stand-by electrical power panels. Indicate ratings and locations of existing electrical devices to be reused.
- Floor plans and reflected ceiling plans showing lighting layout, power receptacles, exit lights, fire alarm, any relocated equipment, and any other special features. Show typical circuitry or branch circuits. Submit fixture cut sheets.

6. ENVIRONMENTAL IMPACT

Reports

Notify the VA contracting officer immediately upon discovery of any environmental or site data, such as asbestos, that may warrant investigation.

7. EQUIPMENT

No requirements.

8. FIRE PROTECTION

Reports

Submit:

a. Existing fire alarm system in the building to be modernized and/or the base loop system to which the new construction shall interface.
b. 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.
c. Proposed options for new systems.
d. Building construction, building fire and smoke separation, fire sprinkler/standpipe systems, size of fire pumps, water supply available/maximum demand, water flow testing results, fire alarm systems, and extinguishing systems. Indicate NFPA 220 and IBC fire resistive rating of the building, NFPA 101 occupancy type, and fire protection code analysis to access compliance with NFPA 101.

Calculations

Submit:

a. Updated calculations to size fire pumps, water supply available/maximum demand, and water flow testing results raw data.
b. Exit calculations for each floor that justify the number of exits provided.

Drawings

Submit:

a. Estimated sizes of the proposed main fire lines and proposed location of connections to site utility.
b. Sprinkler and fire alarm zones at a legible scale that shall show an entire floor per drawing, using VA standard symbols.

c. Existing areas that are completely sprinklered, location of building water supply, interior sprinkler supply lines, standpipes, fire extinguisher cabinets, exit paths from each zone, distances to the stair, and the occupancy of each area.

9. HVAC

Reports

Submit:

a. HVAC systems and equipment for each building.
b. Envelope and glazing properties identifying further energy use reductions necessary to achieve the federally mandated energy consumption targets.
c. Mechanical sequences of operation and the operational parameters represented by the energy model.
d. Summary of the life cycle cost analysis with specific recommendations.

Calculations

Submit:

a. Updated energy analysis including VA-mandated energy conservation measures. Optimize envelope and glazing properties and identify further energy-use reductions necessary to achieve the federally mandated energy consumption target. State all occupancy, regulated and unregulated load assumptions, and schedule parameters used in the analysis. State all modeled system operational characteristics. Supply air fan selection shall mandate multiple fan selections in which single and/or multiple plenum fans are compared with the conventional housed fans. Computerized selections showing project-specific sound power levels, power input, and overall dimensions shall be submitted for VA review and approval.
b. Complete life cycle cost analysis with specific recommendations and full back-up data. State the heating and cooling capacities of each functional area used in the life cycle cost analysis. State the block cooling and heating loads for each new and/or existing building.

Drawings

Submit:

a. Air and water flow diagrams for the existing systems and proposed options.
b. Tentative locations and sizes of all mechanical equipment rooms and principal vertical shafts.
c. Block layout of major pieces of equipment in each mechanical equipment room.
d. Outside air, exhaust air, and relief air louvers. Resolve various items affecting louver location, considering other factors such as visibility, historical considerations, wind direction, noise, physical security, hurricane and storms, and health hazard odors caused by short circuiting of air from emergency generators and truck waiting areas to intake.

10. HISTORIC PRESERVATION

Reports

a. Comply with contractual agreements for SD 2, as developed with the contracting officer, project manager, and VA cultural resources management officer.
b. Notify VA contracting officer immediately upon discovery of any historical or archeological data that may warrant investigation.

11. PLUMBING

Reports

Submit the updated BOD report including domestic (hot and cold) water, domestic hot water generation system narratives with justification for system selection and potential use of solar energy. Coordinate with municipal utilities to verify that needed capacity is available.

Calculations

Submit:

a. Updated calculations for sizing equipment.

b. Potable water baseline and update the reduced consumption calculations.
c. Updated calculations to support the strategies to achieve the water consumption and energy reduction goals. If potable water is being used to reduce energy, provide information regarding the use of life cycle cost effective water conservation measures to achieve the energy reduction.
d. Report on types and number of products that are water-efficient.

Drawings
Submit:
a. Preliminary layout of new utilities as they relate to sanitary, storm, and water.
b. Flow diagrams of domestic water.
c. 1:100 (1/8-inch) scale drawings indicating room names, locations of existing and new equipment, and plumbing fixtures using VA fixture numbers. Indicate interface of new systems with existing. Show location of sewage ejectors, domestic water heaters and main risers.
d. Plans showing incoming and leaving building services.

12. SECURITY (PHYSICAL)

Reports
Submit the updated physical security narrative. The report shall include:
a. Description of the overall proposed physical security approach and the building and site design elements being included for compliance to the applicable physical security standard.
b. Subsections corresponding to each of the applicable chapters in the VA Physical Security Design Manual for Life Safety Protected Facilities.

Drawings
Submit:
a. Site Plan (min. 1:1200 (1"=100')) showing:
   - Perimeter fence
   - Location of vehicle access points
   - Type of access control procedures and devices
   - Location of active and passive barriers
   - Vehicular circulation and parking.

b. Floor Plans (min. 1:100 (1/8"=1'-0")) showing:
   - Public entrances and lobbies
   - Staff entrances.

13. SITE DEVELOPMENT AND UTILITIES

Reports
Submit:
a. Discussion of physical security elements being included in the site layout design.
b. Phasing analysis of sequencing construction activities and cemetery expansion.
c. Criteria and proposed boring locations plan for a subsurface investigation to be used for road, and other paving design.
d. Proposed boring locations shall be coordinated with boring program for buildings. (See Section 16, Structural for requirements.)
e. Proposed boring locations for interment areas to establish water level and presence of rock.
f. Feasible stormwater management strategies based on SD 1 layout revisions. Some strategies require more land consumption than others and may require coordination with landscape architect. Preliminary computations and design criteria shall adhere with local, state, and federal guidelines for stormwater management practices, where applicable.
g. Irrigation design concept.

Calculations
Submit outdoor water consumption calculations for exterior water usage and recycling. Show plans to reduce water usage for landscaping by choosing plant materials that do not require on-going irrigation; where irrigation is required by specifying low irrigation strategies and recycling where appropriate.

Drawings
Submit:

a. Updated VA-selected alternative or VA-provided concept plan. Submit the topographic, utility, and landscape surveys. Submit proposed building locations, demolition, proposed sidewalks and roads, parking, entrances and exits, and all mechanical and electrical components on grade (with circulation patterns).
b. Grading plans of all proposed construction. Show spot grades at structure corners, entrances, and intersections. Provide first floor elevations for structures and equipment pads. Show erosion control and drainage, stormwater pollution prevention plan, staging areas, construction access and parking, and stockpile areas for earth and materials.
c. Landscape drawings showing plant groupings and a list of proposed plant materials. The plants selected must be native to the site climatic zone.
d. Obtain data from cemetery staff and indicate water pressure and flow at two fire hydrants serving each building in project and depth of cover for new water and fuel gas mains.
e. Where wells are required for a water source, install test well and obtain water analysis and expected yield in gallons per minute.
f. Irrigation design concept plan.
g. Burial sections, numbered and illustrating limits of gravesites, and approximate yield (number of gravesites per section).

14. ENVIRONMENTAL

Reports
Submit updated:

a. BOD Report including the extent of environmental permitting required for the project, current status of permitting efforts, and comments/feedback from regulatory agencies.
b. Description of floodplains, wetlands, waterways including limitations on times of year that work is permitted, wildlife, and endangered species habitats.

Calculations
Submit the updated flood plain study, if applicable.

Drawings
Submit the updated wetland mitigation plans and stream crossing/waterway impact locations.

15. SPECIFICATIONS

Reports
Submit:

a. List of sections including those that shall be written by A/E for the project. Include a justification for using sections that are not included in the NCA master specifications.
b. A few sample specification sections, such as site work, landscaping, building exterior materials and typical interior materials, using the "Track Changes" function.

16. STRUCTURAL

Reports
Submit:

a. Written description of the basic structural systems to be used on the project (foundations, substructure, superstructure, and lateral force resisting system). Include a short description of other options that were investigated for each system and why they were not

chosen. Provide enough detail to describe the system fully to an experienced engineer for review purposes.

b. Describe each type of construction proposed and reasons therefore, including the structural framing system. (The structural design should be carried to the point where the total framing systems are determined and a realistic cost estimate can be made.)
c. Structural material information:
    - Concrete: Basic material properties for concrete to be used, including compressive strength, entrained air content, maximum aggregate size, allowable water/cement ratio, unit weight or aggregate type, and anticipated admixtures.
    - Structural Steel: ASTM material designation for the steel to be used for each of the following items: steel columns, steel beams, base plates, built-up beams or girders, steel truss chord members, and lateral bracing system. Itemize by American Institute of Steel Construction (AISC) shape as applicable, including material types and sizes.
    - Steel Deck: Basic information on the anticipated steel decking to be used, including profile and depth, ASTM material designation, span condition, finishes and coatings, and method of attachment.
    - Masonry: ASTM International (ASTM) designations for typical Concrete Masonry Units (CMU) to be used.
    - Wood and Engineered Wood Products: Grade and species for all anticipated wood framing products.
    - Description of the design philosophy to limit the spread of damage from an extraordinary event.
d. Summary of the code analysis for each applicable code or standard.
e. Two copies of completed Geotechnical Report. A draft report, for review and comment, shall be submitted for approval. The final report shall include resolution of all comments. Investigation methods shall be tailored to the needs of the specific project. Ground water conditions shall be investigated for each project. The coordinates (northing, easting, elevation) of each boring or survey line shall be reported. Boring logs shall include soil descriptions, blow counts, and all other relevant information. Refusal and its relation to top of rock shall be carefully explained and correlated to seismic refraction survey if performed. Geophysical testing and evaluation shall be included where appropriate.
f. Recommendations for foundation system and, if necessary, mitigation of groundwater penetration.
g. Indication of whether special geotechnical investigation procedures, e.g. ,Shear Wave Velocity Measurements and/or Site Specific Study, shall be required for the determination of the more accurate Site Class required to assign Seismic Design Category.

Drawings

Provide drawings of the preferred structural system at the smallest scale that can clearly illustrate the concept (e.g., 1:200 (1/16″ =1′0″) for larger buildings and 1:100 (1/8″=1′-0″) for smaller buildings).The A/E and the VA PM need to concur on drawing scale for the submission. Include:

a. Foundation system including walls, footing, and pile locations.
b. Floor and roof framing system, including column, beam, and girder locations. Indicate lateral bracing system on the layout.

17. SUSTAINABILITY

Reports

Submit:

a. Water-use reduction strategies selected for the project, including preliminary life cycle cost analysis and how they achieve the reduction goals and mandated water-use reduction requirements as part of the selected third-party rating system and VA sustainability guidelines. Coordinate the reporting with the plumbing and site/civil stormwater analysis to provide a graphical representation (pie or bar chart) by end use of the potable water baseline versus the required reduction target and the selected strategies.

b. Summary of the energy-use intensity and energy consumption by end use and the life cycle cost for the selected HVAC and lighting concepts. Coordinate the reporting with the results from the energy and lighting system analysis conducted as part of the mechanical and electrical/lighting systems evaluation. The summary should graphically illustrate (e.g.: pie or bar chart) how the mandated energy conservation requirements, energy consumption, and lighting goals in VA design manuals, VA sustainability guidelines, and for the overall project are being achieved.
c. Preliminary summary of the Indoor Environmental Quality (IEQ) aspects of the selected concept. Provide a description and graphical representation of how VA and third-party sustainability system Green House Gas (GHG) emission reduction or elimination requirements for the selected concept are achieved.
d. Summary and estimate of renewable energy capacity as part of the SD 1 concept evaluations and as they relate to VA mandates and third-party sustainability goals. Renewable energy to be included in the assessment must include solar thermal, solar PV, wind, and geothermal. Also, coordinate with the plumbing submission and submit as needed the explanation and technical backup information as to how the project shall meet the project goal for hot-water generation utilizing renewable solar energy.

Calculations
Submit:
a. Water-use reduction calculations based on third-party and VA guidelines. Coordinate calculation submission for the potable water baseline and reduced consumption calculations with the plumbing engineer. Coordinate calculation submissions with the plumbing engineer to support the strategies to achieve the water reduction goals.
b. Preliminary GHG emissions reduction calculations supporting VA mandates.
c. Preliminary renewable energy calculations. Coordinate calculation submissions with the mechanical and electrical trades.

GREEN GLOBES (if applicable)
Reports
As part of the narrative BOD report, provide the following as it pertains to third-party Green Globes certification:
a. Final input data for the project initiation, site analysis, and programming phases.
b. Final input parameters and assumptions for performing the LCA.

LEED (if applicable)
Reports
As a part of the BOD report, submit a completed preliminary LEED score card as it pertains to third-party LEED certification. The score card shall indicate where points are anticipated and a brief discussion should be provided describing why or why not certain points are not achievable.

18. TELECOMMUNCATIONS

Reports
Submit:
a. Narrative describing the design, including basic assumptions, compatibility with existing equipment, and points of interconnection with the existing telecommunications systems.
b. Statement of the impact of the new construction to the existing telecommunications systems.
c. Copies of all correspondence and minutes of meetings with utility company representatives.

Drawings
Submit:
a. Room titles, area functions, location, and sizes of main computer and telephone rooms and telecommunications closets.

b. All major telecommunications equipment at scale. Include means and clearances for installation, maintenance, and removal/replacement of equipment.
c. Sheet for telecommunications symbols, notes and abbreviations.
d. Site plan showing existing and proposed telecommunications systems associated with the new construction.
e. Updated conceptual diagram of the proposed telecommunications systems.

V. DESIGN DEVELOPMENT

A. GENERAL

The Design Development (DD) phase documents shall be based on the final approved Schematic Design 2 (SD 2) phase documents. Any changes from the SD 2 documents must be approved by the VA Project Manager (PM) prior to proceeding with the DD documents. All documents shall be reviewed for functional and aesthetic relationships. The result of this phase shall be a set of design documents defined to the point that no further functional decisions are required.

General Requirements

1. Drawings shall have graphic scales, north arrow (either true north or plan north; consistent for similar plan types), and key plan clearly identifying the drawing component within the overall plan.
2. Each submission shall build on the previous submission. Drawings required by previous submissions shall be included in subsequent submission whether or not specifically identified as a requirement.
3. Submit all previous comments from VA reviewers. All comments shall be resolved before moving into the next submission stage. For major issues, the A/E must respond to comments with written resolution; responding to important comments simply with “agreed” or “disagreed” is not acceptable. Any deviation from VA criteria shall be identified, justified, and documented with VA’s approval.
4. All previously submitted documents shall be updated with written responses to reflect review comments and further development. The A/E shall verify that all changes based on the review of the previous phase have been entered into the electronic review and correction tracking system and approved by the VA PM.
5. Specifications shall be prepared using National Cemetery Administration (NCA) Master Construction Specifications. Submissions shall show changes to master by using the "Track Changes" function. Each submission shall indicate changes from the previous submission, not all changes to master. The final submission shall not show changes.
6. Dimensions shall be provided in soft metric (S.I.) units followed by English units, unless otherwise specified by the VA PM.
7. All previously submitted documents shall be updated to reflect review comments and further development.
8. The A/E shall prepare and submit minutes of its meetings with VA, VA's other contractors, and for A/E coordination meetings.
9. All cost estimates shall be developed in accordance with the Manual for Preparation of Cost Estimates and Related Documents for VA Facilities.
10. All sustainable design components shall be developed in accordance with NCA’s Facilities Design Guide.

B. DESIGN DEVELOPMENT 1 [DD 1]

The DD 1 phase adds an increased level of detail for all aspects of the project to further define the design. During DD 1, the team shall refine the visualization of the project to communicate the character of the interior and exterior spaces.

1. ARCHITECTURAL

Reports

Submit:

a. Architectural Narrative.
b. Alternates including a written description. Continue cost evaluation.
c. Furniture presentation including cut sheets of furniture selected.
d. Sample board showing building interior and exterior colors and materials.

e. Samples of all furniture fabrics and finishes/colors.
f. Preliminary cost estimate of furnishings. A furniture cost estimate shall not be included in the construction cost estimate for the project.

Drawings
Submit:

a. Updated floor plans to include each floor, penthouses and service areas (min. 1:100 (1/8"=1'-0")). Show room names and numbers, door numbers, net area of each room, column grid, columns, windows, millwork, casework, plumbing fixtures, and major and fixed equipment. Show proposed future expansion, if any. Demolition floor and ceiling plans for areas to be renovated and (min. 1:100 (1/8"=1'-0")) with finish schedule and partition types.
b. Life safety plans showing means of egress, capacity, population, path of travel, travel distances, fire rated partitions, exit signs, and fire extinguishers (min. 1:200 (1/16"=1'-0")).
c. Building elevations with fenestration, penthouses, materials, finish floor elevations, floor-to-floor heights, overall building height, window and louver types, entrances, canopies, and adjacent grades (min. 1:100 (1/8"=1'-0")). Include separate elevations indicating base building with expansion shown on floor plans.
d. Building sections (min. 1:100 (1/8"=1'-0")).
e. Typical wall sections (min. 1:15 (3/4"=1'-0")).
f. Interior elevations showing power, data, communications, millwork, casework, equipment and other built-in items (min. 1:50 (1/4"=1'-0")).
g. Partition type details (min. 1:10 (1"=1'-0")).
h. Reflected ceiling plans (architectural only) (min. 1:100 (1/8"=1'-0")).
i. Finish schedule.
j. Develop alternates in narratives and estimates.

2. COMMISSIONING

Reports
Submit:

a. Updated Design Narrative.
b. Updated Design Phase Commissioning Plan.
c. Updated Design Phase Commissioning Issues Log with proposed resolution/mitigation incorporated into electronic review and correction tracking system. Also:
    - Identify major concerns that could affect operations, maintenance or testing.
    - Identify discrepancies between Owner's Project Requirements (OPR) and Design Narrative.
    - Update design schedule and key milestones.
    - Update roster of Commissioning Team members.
d. Coordination Matrix for Commissioning Agent and the A/E.
e. Draft Construction Phase Commissioning Plan including systems to be commissioned, an outline of construction phase roles and responsibilities, and an outline of required system documentation requirements.

3. COST ESTIMATING

Reports
Submit:

a. WBS II Level 4 estimate.
b. Cost model budget tracking.
c. Separate computations for site elements, crypts, columbaria, each building, renovations, and alternates, as applicable.
d. All SD 2 submissions updated to reflect further development of the project.
e. Updated market survey.

4. CRITICAL PATH METHOD (CPM)

Reports

Submit the updated narrative Basis of Design (BOD) report including:

a. Project Master Schedule.
b. Detailed Design Schedule.
c. Program and schedule risk factors and mitigation plan.
d. Identification of anticipated midpoint of construction and escalation factors in determining construction cost. Coordinate with Section 3, Cost Estimating.
e. Permitting timeframes.
f. Phasing narrative.
g. Phasing plans on reduced site plans.
h. Phasing diagram.
i. Phases marked on full size drawings for VA review.
j. Written list of systems including temporary systems by phase and separated by technical discipline.

5. ELECTRICAL

Reports

Submit the updated BOD report including:

a. Previous submission documents modified to meet the utility company's requirements.
b. Proposed electrical service/methods/equipment based on discussions and agreements with the electrical utility.
c. Major equipment cut sheets for primary and secondary electrical distribution systems.

Calculations

Submit:

a. Updated demand and connected load calculations to reflect the project's development.
b. Estimated connected loads based on panel schedules for each area function's lighting and power, normal and essential electrical systems.
c. Panel and switchboard schedules for load analysis.
d. Generator selection calculation based on input loads by Automatic Transfer Switch (ATS) system, load steps. Apply seasonal demands to narrow down the generation capacity of the essential power system.
e. Preliminary or sample calculations for fault current, protective device coordination, arc flash, generator sizing, load, feeder and equipment sizing, voltage drop, harmonic distortion, lightning protection risk analysis, and lighting.
f. Uninterruptible Power Supply (UPS) load requirements.

Drawings

Submit updated drawings to include:

a. Area functions and location, room titles, location, and dimensions of electrical equipment rooms and electrical closets on drawings. Show all electrical power distribution equipment to scale. Include means and clearances for installation, maintenance, and operation of equipment
b. Final locations of primary distribution switchgear/switchboard, engine-generator sets, unit substations, pad mounted transformers, manholes and all other major items drawn to scale. Include clearance and removal paths for equipment.
c. Reconnection of existing to new equipment on plans.
d. Electrical equipment, e.g., panelboards and transformers, to be installed in proposed electrical closets based on the preliminary riser diagram.
e. One-line and riser diagrams of the normal electrical power distribution system, stand-by power, and the essential electrical systems. Locate all equipment.
f. Updated demolition plans to indicate the complete electrical work in all areas to be renovated.
g. Electrical site plan including site lighting and electrical equipment locations. Coordinate with Section 13, Site Development and Utilities.

h. Photometric analysis of site lighting. Lighting shall meet the requirements of the NCA Facilities Design Guide.

6. ENVIRONMENTAL IMPACT

Reports

Notify the VA PM immediately upon discovery of any environmental or site data, such as asbestos, that may warrant investigation.

7. EQUIPMENT

Reports

Submit a project equipment list in Excel format.

8. FIRE PROTECTION

Reports

Submit the updated BOD report including integration of new fire alarm system and/or other systems with existing system in the facility.

Calculations

Update calculations to reflect comments from SD 2 and evolved design.

Drawings

Submit:

a. List of edited VA standard symbols, abbreviations, and standard details.
b. Room names, room numbers, door locations and swings, fire-rated partitions, and sprinkler/standpipe risers to floor plans. Fire alarm risers showing new equipment and/or necessary changes if modification to the existing system is required. Include recommendations if certain requirements of VA criteria might be waived to allow existing equipment to be reused.
c. Fire- and smoke-control aspects of the HVAC system design on the floor plans. Show duct-mounted smoke dampers, smoke detectors, and fire dampers. Include a written description of the smoke-control features. Describe each designated smoke zone and its interaction with the HVAC systems.
d. Estimated capacities of proposed air-handling units in cubic meters (cubic feet) per minute.
e. Location of fire extinguishers and fire hose cabinets.
f. Fireproofing of structural members where applicable.

9. HEATING, VENTILATING & AIR CONDITIONING (HVAC)

Reports

Submit the updated BOD report including:

a. List of systems designed to incorporate energy conservation, renewable energy use, and the use of recycled materials and media. Identify specific systems and include a short description of methods and means to accomplish each of these goals.
b. The interaction between the existing HVAC systems and the new requirements. State the impact on the existing HVAC systems and the project cost. Examples include additional testing, adjusting, and balancing effort, replacement of components, suspended ceiling, painting, and fixtures.
c. Seismic criteria on the HVAC systems, if applicable.
d. Mechanical sequences of operation. State that the energy model represents these operational parameters and uses actual equipment performance curves from the design selections (mechanical, plumbing, and lighting).

Calculations

Submit:

a. First version of the detailed zone heating and cooling load calculations for each zone including:
   - Architectural drawings (1:100 (1/8" = 1'0") scale) showing correlation between each zone boundary and the floor area. and abbreviated/coded room numbers used with computer input data sheets.
   - Input manuals for the computer programs with indications of the capabilities and limitations of the programs.
   - Level of detail of the calculations consistent with the development of the architectural drawings.

b. For air-handling units, heating and ventilating units, and exhaust air systems, estimate capacities in cubic meters (cubic feet) per minute, static pressure, and required fan-motor horsepower.

c. For the heating system submit:
   - Total heating load based on the available information of the space heating requirements, domestic hot water load, and humidification loads.
   - Written description of the proposed zoning of the heating system indicating such features as distribution of ventilation load, perimeter heat load, and reheat load associated with air terminal units.

d. Updated energy analysis including:
   - Optimized envelope and glazing properties, and all reductions necessary to achieve the federally mandated energy consumption target.
   - All occupancy, regulated and unregulated load assumptions, and schedule parameters used in the analysis.
   - All modeled system operational characteristics. Use actual equipment performance curves from the design selections (mechanical, plumbing, and lighting).

e. Available preliminary electrical power (normal and emergency) data to the electrical discipline.

Drawings

Submit:

a. Applicable VA standard symbols and abbreviations.

b. 1:100 (1/8 inch) scale HVAC floor plans for typical areas showing the proposed routing of the main air distribution and piping layouts. Ductwork and piping may be shown in single line.

c. Fire and smoke partitions on HVAC floor plans. Show necessary smoke and fire dampers and smoke detectors on floor plans, per applicable NFPA codes. For buildings not equipped with quick response sprinklers, describe each designated smoke zone's interaction with the building's HVAC systems.

d. Equipment schedule for each major piece of equipment.

e. Updated flow and riser diagrams for each type of the typical air handling systems, exhaust (general and special) systems, and all hydronic systems such as hot water system and glycol heat recovery system. Submit existing capacities of these systems, where applicable, and new estimated loads with pumping arrangement, and control valves for complete understanding of existing systems to be used or interfaced with the new systems.

f. Schematic control diagrams for each type of typical air and hydronic systems. 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, and duct detectors.

10. HISTORIC PRESERVATION

Reports

a. Comply with contractual agreements as developed with the VA contracting officer, the VA PM, and the VA cultural resources management officer.

b. Notify the VA contracting officer immediately upon discovery of any historical or archeological data that may warrant investigation.

c. Documentation required by the State Historic Preservation Office (SHPO).

11. PLUMBING

Reports

Submit the updated BOD report including:

a. Coordination of plumbing/utilities requirements
b. Recommendations for installing insulation on the domestic water and horizontal storm drainage piping for the prevention of condensation within buildings.
c. Graphical representation of energy and water usage savings with reference to the contributing technologies.
d. Coordination with utility companies, where applicable.
e. Plumbing fixture catalog cuts.

Calculations

Submit:

a. Updated calculations for sizing all systems and equipment.
b. Updated calculations to support the strategies to achieve the water consumption and energy reduction goals.
c. Fixture schedule and list of equipment requiring plumbing and gas connections.

Drawings

Submit:

a. Plumbing riser diagrams and 1:100 (1/8" = 1'0") scale floor plans. Identify existing plumbing fixtures that shall be affected by new construction. Add new equipment using VA fixture numbering system.
b. Roof drains and connections to site utilities.

12. SECURITY (PHYSICAL)

Reports

Submit the updated BOD report to include:

a. Physical security narrative.
b. Description of the overall proposed physical security approach and the building and site design elements being included for compliance to the applicable Physical Security Design Manual for Life Safety Protected Facilities.
c. Subsections corresponding to each of the chapters of the Physical Security Design Manual for Life Safety Protected Facilities, i.e., Site Considerations, Building Entrances and Exits, Functional Areas, and Building Envelope.
d. Catalog cuts for proposed security equipment including CCTV, monitors, access control systems, and screening equipment.
e. Crime Prevention Through Environmental Design (CPTED) narrative.

Drawings

Submit:

a. Physical security plan showing location of security cameras, card readers, and screening equipment (min. 1:100 (1/8"=1'-0")).
b. Site Plan (min. 1:1200 (1"=100')) including:
    - Perimeter fence with pedestrian access points
    - Location of vehicle access points - private, public, commercial
    - Guard stations, vehicle barriers, inspection facilities, and vehicle stacking areas.
    - Site lighting
    - Camera locations
    - Landscaping
    - Storage/Maintenance Yards
c. Floor Plans (min. 1:100 (1/8"=1'-0")) for each building.
d. Coordination with Section 1, Architectural; Section 5, Electrical; and Section 13, Site Development and Utilities.

13. SITE DEVELOPMENT AND UTILITIES

Reports

Submit the updated BOD report including:

a. Completed subsurface investigation report for road, parking, other paving design and gravesite design purposes.
b. Irrigation system recommendations and cut sheets on irrigation equipment.
c. Letters from local utility owners indicating that adequate water and sanitary service is available to the site. For well water or on-site sewerage disposal facilities, indicate approval from the governing authority of adequate yield and capacity, respectively.
d. Analysis of outfalls for all stormwater discharges leaving the site.
e. Permitting process including contact names, required fees, prerequisites, etc. that must occur with local, state or federal agencies for construction of the cemetery.
f. Status of public hearings, if applicable.

Calculations

Submit:

a. Updated stormwater computations, sizing calculations, and site analysis to comply with local, state, and federal regulations. Indicate methodology or software used.
b. Water model of domestic water distribution throughout the cemetery that includes pressure and flow at each building connection. Coordinate with Section 11, Plumbing.
c. Calculation for irrigation systems indicating preliminary line sizes, flows, and required pressures and booster pump sizing, if required.

Drawings

Submit:

a. Site plans including demolition, locations of structures, parking, roads, service areas, walks, plazas, buffers/tree groupings, landscape screening, other site/building features, and updated tree save plan. Indicate locations of accessible parking spaces and number of handicapped accessible and van accessible parking spaces on site plan.
b. Grading plan including existing and proposed contours at 250-mm (1-foot) intervals of the entire area affected by the site work. Show spot elevations at structure corners, entrances, equipment pads, other critical areas, and floor elevations for all floors with direct access to grade.
c. Planting plan with list of suggested plant materials for various landscaping needs such as open area plazas, courts, atriums, entryways, and other various exterior/interior features. Indicate proposed materials to be used for each element. Show planting irrigation areas.
d. Topographic, boundary, utility, and landscape survey drawings prepared during the SD phase.
e. Plan showing all new and existing utilities (storm drainage, sanitary sewer, water, and gas) from building connections to mains. Coordinate with other trades such as electric and communications to avoid conflicts.
f. Potable water distribution lines indicating lengths, size, hydrant locations, if applicable, and material.
g. Rim and invert elevations for sanitary and storm sewers, pipe lengths, size, and materials, where known. See Section 11, Plumbing for plumbing/utility requirements.)
h. Landscape plan showing site amenities.
i. A phasing plan, if required, of construction impacts on existing cemetery operations, traffic and the environment to reduce conflicts.

14. ENVIRONMENTAL

Reports

Submit the updated BOD report to include the following:

a. Extent of environmental permitting required for the project.
b. The current status of the permitting efforts.
c. Comments/feedback from regulatory agencies to date.

d. Impacts to floodplains, wetlands, waterways, wildlife, and endangered species habitats as applicable, and associated mitigation. Description of construction activities in wetlands or waterways including limitations on times of the year work is allowed.

Calculations
Submit floodplain study, if applicable.

Drawings
Submit:
a. Wetland mitigation plans, if applicable.
b. Stream crossing/waterway construction plans showing forms of flow bypass, if applicable.
c. Plans showing location and scale of floodplain compensatory storage.

15. SPECIFICATIONS
Submit:
a. Draft specifications for all disciplines using the "Track Changes" function.
b. Outline specifications for those sections that are written by the A/E.

16. STRUCTURAL
Reports
Submit:
a. Updated BOD report to include a description of how the DD 1 documents address further developments in design characteristics; code compliance issues; and description of how the design meets or differs from the requirements of VA's Statement of Work.
b. Method used to resist lateral loads.
c. Structural material information including:
    - Concrete:
        - Potential for fly ash or other suitable cement replacement substitution
        - Concrete mixtures to be used for footings, foundations walls, slab on grade, elevated slabs, roof slabs. For rebar, identify bar and welded wire fabric requirements
        - ASTM material designation for the rebar to be used. Indicate the anticipated uses and locations for special rebar types (epoxy coated, galvanized, and high strength)
        - Floor flatness requirements
    - Structural Steel:
        - Type of anticipated structural steel connections and anticipated type of moment connection
        - Project welding materials
        - Type of base plate/anchor rod assembly. Include material type and sizes
        - Priming/painting of steel members including materials, locations, and slip coefficients
    - Steel Deck:
        - Required shoring
        - Deflection criteria to be considered
    - Masonry:
        - Various types of mortar to be used
        - Lintel materials, ties, and anchor
        - Masonry tolerances to be used
        - Hot and cold weather installation techniques to be used
- Wood and Engineered Wood Products:

Engineering design requirements for engineered wood products
- Typical spacing for framing members
- Special treatment requirements such as pressure treated and fire resistive
- Requirements for wood sheet goods (oriented strand board (OSB), plywood), thicknesses, and locations for use (roof deck, floor deck, exterior sheathing).

Calculations

Submit calculations for primary structural members and calculations supporting the drawings below.

Drawings
Submit:

a. 1:100 (1/8" = 1'0") scale drawings showing the selected structural systems. The drawings shall be appropriately advanced from the SD 2 submission and coordinated with all disciplines.
b. Typical details showing relationship of structure with architectural and mechanical features, and new and existing construction features.
c. Updated list of the drawings, general notes, abbreviations, legends, key notes, symbol keys, key plans, column lines, north arrow, and coordinated backgrounds.
d. Coordinated drawings with respect to reference symbols, notes, abbreviations, specification sections, schedules, and other disciplines.
e. Foundation plans.

17. SUSTAINABILITY

Reports
Submit a Basis of Design Sustainability (BOD) report describing the proposed sustainability features of the project with following updates as required:

a. Description of the water-use reduction strategies selected for the project including life cycle cost analysis and how they achieve the reduction goals and mandated water use reduction. Include requirements as part of the selected third-party rating system and VA sustainability guidelines. Coordinate reporting with the plumbing and site/civil stormwater analysis to provide a graphical representation (pie or bar chart) by end use of the potable water baseline versus the required reduction target and the selected strategies.
b. Summary of the energy-use intensity and energy consumption by end use and the life cycle cost for the final selected HVAC and lighting concept. Coordinate the reporting with updated results from the energy and lighting analysis conducted as part of the mechanical and electrical/lighting systems. The update should graphically illustrate (pie or bar chart) how the mandated energy conservation requirements, energy consumption and lighting goals in the NCA's Facilities Design Guide for the overall project are being achieved.
c. Estimate of renewable energy capacity for solar thermal, solar PV, wind, and geothermal as they relate to VA mandates and third-party sustainability goals. Coordinate the update with the plumbing submission and submit as needed the final explanation and technical backup information as to how the project shall meet the project goal for hot water generation using renewable solar energy.

Calculations
Submit updated:

a. Water-use reduction calculations based on third-party and VA guidelines. Coordinate the update calculations for the potable water baseline and reduced consumption calculations with the plumbing engineer. Update the calculation submission with the plumbing engineer to support the strategies to achieve the water reduction goals.
b. GHG-emissions reduction calculations supporting VA mandates.
c. Renewable energy calculations. Coordinate the update calculations with the mechanical and electrical trades.

GREEN GLOBES (if applicable)
Reports
As part of the BOD report, document and discuss the preliminary input and output from the Life Cycle Cost Assessment (LCA) for the selected concept as it pertains to third party Green Globes certification.

Calculations
Submit the preliminary input and results of the LCA calculations.

LEED (if applicable)
Reports
As part of the BOD report, provide the following as it pertains to third-party LEED certification:

a. Preliminary LEED score card. Indicate anticipated points for the design and construction phases and provide a brief discussion on why or why not certain points are not achievable.
b. Assumptions for input into LEED template calculations for all attempted credits.

18. TELECOMMUNICATIONS

Reports
Submit the updated BOD report including a written summary of any conversations with the telecommunications utilities.

Drawings
Submit:

a. Telecom riser diagrams.
b. Locations of major equipment drawn to scale. Indicate equipment to be installed in the proposed computer room, if applicable, and telecommunications closets.
Demolition plans indicating the complete telecommunications work in all areas to be renovated.

C. DESIGN DEVELOPMENT 2 [DD 2]

The DD 2 phase adds an increased level of detail for all aspects of the project to further define the design. Submissions at this stage must show coordination of trades and clarity of scope and design intent. The team shall refine visualization of the project to communicate the character of the interior and exterior spaces and confirm that the design is on budget. All value engineering shall be completed by the end of this phase, and no functional changes are anticipated after the DD 2 review.

1. ARCHITECTURAL

Reports
Submit:

a. Updated Architectural Narrative.
b. Updated and further developed alternates on drawings and in specifications with updated cost evaluation.
c. Finishes sample board that will not be returned. Keep a duplicate set of sample boards.
d. Furniture and Finishes Package – The VA PM must confirm the inclusion of furniture and furnishings in the project prior proceeding. The A/E shall select all furnishings from the Federal Supply Schedule (FSS) to submit cut sheets of all furniture, accessories, art, and planters. Submit samples of all fabrics and furnishes finishes.

Drawings
Submit:

a. All previously submitted drawings updated to reflect review comments and further development
b. Floor plans updated from the DD 1 submission to include each floor, (min. 1:100 (1/8"=1'-0")). Identify partition types, section cut locations, interior and exterior elevation locations, detail locations, and large scale plans. Include interior and exterior dimensions and general notes.
c. Interim Life Safety Measures (ILSM) drawings (min. 1:200 (1/16"=1'-0")).
d. Demolition floor and ceiling plans for areas to be renovated (min. 1:100 (1/8"=1'-0")) with finish schedule and partition types. Coordinate with phasing plans and provide written description of demolition work.
e. Life safety plans showing means of egress, capacity, population, path of travel, travel distances, common paths of travel, fire-rated partitions, exit signs, fire extinguishers, fire hose cabinets, areas of refuge, and horizontal exits (min. 1:200 (1/16"=1'-0")). Coordinate with Section 8, Fire Protection.

f. Physical security plan showing location of security cameras, card readers, and screening equipment (min. 1:100 (1/8"=1'-0")) Coordinate with Section 12, Security (Physical).
g. Building elevations with fenestration, penthouses, materials, finish floor elevations, floor-to-floor heights, overall building height, window and louver types, entrances, canopies, skylights, and adjacent grades with relevant existing grades at corners, entrances, platforms and ramps. (min. 1:100 (1/8"=1'-0")). Indicate locations of wall section cuts.
h. Building sections (min. 1:50 (1/4"=1'-0")).
i. Wall sections (min. 1:15 (3/4"=1'-0")).
j. Construction details at scale large enough to clearly show components and assembly: windows, storefront, waterproofing, roof accessories, and equipment mounting and suspension shielding.
k. Interior elevations showing power, data, communications, millwork, casework, equipment, exact location of all art, and other built-in items (min. 1:50 (1/4"=1'-0")).
l. Partition type and fireproofing details (min. 1:10 (1"=1'-0")).
m. Reflected ceiling plans (architectural and M/E/P) (min. 1:100 (1/8"=1'-0")). Identify bulkheads, light fixtures, supply and return grilles, ceiling mounted equipment, exit lights, and other devices. Locate ceiling grid and show ceiling height on these plans
n. Door schedule with door and hollow metal frame details. Indicate door type, size, rating, material, glazing, security requirements, and hardware set.
o. Updated alternates. Continue to develop.
p. Details for required millwork.
q. Furnishings plan, include separate plans with codes for furniture, window treatments, accessories, art and plants.

2. COMMISSIONING

Reports

Submit:

a. Updated Design Narrative.
b. Updated Design Phase Commissioning Plan.
c. Updated Design Phase Commissioning Issues Log with proposed resolution/mitigation. Incorporate into electronic review and correction tracking system.
   - Identify major concerns that could affect operations, maintenance, or testing.
   - Identify discrepancies between OPR and Design Narrative.
   - Update design schedule and key milestone.
   - Update roster of Commissioning Team members.
d. Coordination matrix for Commissioning Agent and the A/E.
e. Selected control system type, configuration, and capabilities together with key decisions about equipment and systems sequences of operation.
f. Review of technical sections of the specifications to coordinate O&M manual requirements.
g. Appropriate training and demonstration requirements for VA's personnel. Include complete list of all types of equipment/systems and what training and demonstration is required.
h. Updated Construction Phase elements of the Commissioning Plan including systems to be commissioned, outline of construction phase roles and responsibilities, and outline of required system documentation requirements.

3. COST ESTIMATING

Reports

Submit:

a. WBS II Level 4 estimate.
b. Cost model budget tracking.
c. Separate computations for site elements, crypts, columbaria, each building, renovations, and alternates, as applicable.
d. Updated market survey.

4. CPM

Reports
Submit the updated BOD report including:

a. Master project schedule with increased detail.
b. Design schedule with increased detail.
c. Program and schedule risk factors with increased detail in new risks and mitigation plan.
d. Permitting timeframes.
e. Phasing narrative.
f. Phasing diagram.
g. List of systems including temporary systems by phase and separated by technical discipline.

Drawings
Submit full-size contract drawings for the CPM phasing plans. One drawing shall include reflect several reduced site plans.

5. ELECTRICAL

Reports
Submit the updated BOD report including copies of all correspondence and minutes of meetings with all utility company representatives.

Calculations
Submit:

a. Final load calculations based on connected equipment schedules. Apply appropriate demands and diversities to reflect the equipment sizing selected.
b. Equipment and panel schedules to verify that equipment and feeders are sized per *National Electric Code* for lighting and power, normal and essential loads.
c. Final generator sizing including starting calculations to substantiate generator selection
d. Generator fuel storage requirements.
e. Fault current, protective device coordination, arc flash, voltage drop, harmonic distortion, and lighting calculations.

Drawings
Submit:

a. Updated list of symbols and abbreviations.
b. Updated detailed electrical site plan with updated photometric calculations.
c. All transformers vaults and transformers shall be indicated on the electric floor plans or electrical site plans.
d. Full set of floor plans showing locations of primary distribution switchgear, engine generator sets, and other major items of equipment. Submit 1:50 (1/4″ = 1′0″) scale plans of all electrical and tele/data closets with equipment and clearances for equipment drawn to scale.
e. Indicated room titles on electrical floor plans. Show location of all equipment, lighting fixtures, outlets, tele/data outlets and devices.
f. Finalized one-line and riser diagrams of the normal electrical power distribution system and the emergency power system. Locate, size, and identify all equipment. Provide a detailed proposed phasing scheme of electrical work, if applicable.

6. ENVIRONMENTAL IMPACT

Notify the VA PM immediately upon discovery of any environmental or site data that may warrant investigation.

7. EQUIPMENT

Reports
Submit an updated project equipment list in Excel format.

8. FIRE PROTECTION

Reports

Submit the updated BOD report.

Calculations
Update calculations to reflect comments from DD 1 and evolved design.

Drawings
Submit:

a. Sprinkler/standpipe risers supply piping.
b. Terminations of sprinkler main and inspector test drain.
c. Sprinkler alarm valve(s) and water-flow and tamper switches.
d. Sprinkler system fire department connection.
e. Sprinkler design hazards per NFPA 13.
f. Fire extinguisher and fire hose cabinets.
g. Exit signs and emergency lighting.
h. Specific occupied areas *not* to be protected by automatic sprinklers.
i. Interconnection of HVAC system (dampers, fans) with duct smoke detectors and/or fire alarm system.
j. Interface of new and existing fire alarm system.
k. Fire control room.
l. Refer to Section 1, Architectural; Section 5, Electrical; and Section 11, Plumbing.

9. HVAC

Reports
Submit the updated BOD report. Coordinate with the Architect and equipment specialists to accommodate equipment, specified for the project. Present all VA-approved deviations from HVAC design criteria.

Calculations
Submit:

a. Final version of the room-by-room heating and cooling load calculations:
   - Ensure compliance with VA HVAC design requirements. These calculations shall be accompanied with the architectural drawings correlating each HVAC zone boundary and the floor area, and a room schedule correlating architectural room numbers and abbreviated/coded room numbers used with computer input data sheets. Submit input manuals, if not submitted during DD 1, for the computer programs with indications of the capabilities and limitations of the programs.
   - Show derivation of all U-factors for building elements based on the actual building construction and published window data. The accuracy and the level of detail of the calculations shall be consistent with the development of the architectural drawings and include calculations for:
     - Peak zone-by-zone heating and cooling loads
     - Building block heating and cooling loads
     - Psychrometric chart for each air-handling unit showing cooling and heating coil condition and computation of humidification loads
     - Coil entering and leaving conditions and fan-motor heat gains for supply and return air fans
     - Room-by-room air balance sheet for each air-handling unit showing supply, return, exhaust, make-up, and transfer air quantities with the required air balance, that is, positive, negative, or zero with respect to adjoining spaces
     - Indoor and outdoor design temperatures
b. Excel spreadsheet for each air-handling system. Provide the details of supply, return, exhaust, make-up, and relief air, for each room. In addition, for each room provide area, height, volume, value of one air change per hour, actual calculated air changes per hour, and required minimum air changes per hour.

c. Complete engineering calculations and selection of major HVAC equipment, air-handling units, heating and ventilating units, return and exhaust fans, circulating pumps, and energy recovery equipment, heat exchangers, PRV stations, and humidification equipment.
d. Catalog cuts for all selected equipment.
e. Coordination with electrical and plumbing, disciplines by compiling and distributing pertinent information, such as normal and emergency power requirements, for all HVAC and kitchen equipment.
f. Updated sound/acoustic and dispersion analyses to ensure that the noise generated by the air-handling units and the fans comply with VA requirements and the design does not pose any potential for short-circuiting of air or health hazard due to emissions by cooling tower, emergency generator, or boilers.
g. Updated energy analysis to indicated and incorporate adjustments during this phase of design.
h. Metering requirements and provide the finite scope of work by a single line schematic diagram. showing components and the interface between numerous systems.

Drawings

Submit:

a. 1:100 (1/8′ = 1′0″) scale HVAC floor plans for all areas showing, at a minimum, main supply, return, and exhaust air ductwork with sizes based on the updated calculations. Include:
   - Duct and ceiling clearances, where ductwork crosses, with 1:50 (1/4′ = 1′0″) scale local sections. Show all ductwork, regardless of sizes and/or complexity of layout, in double line. Show 150 mm (6 inch) and larger piping in double line. Coordinate with Section 5, Electrical; Section 8, Fire Protection; and Section 11, Plumbing.
   - Individual room air distribution and temperature control arrangement on duct and piping layouts.
   - Separate floor plan drawings for layouts of air distribution and piping systems Coordinate duct sizing criteria with VA requirements.
   - Flow diagrams for air supply, return, and exhaust for all HVAC systems.
   - Temperature Control Diagrams and Sequence of Operation for all HVAC systems. Show Sequence of Operations on drawings alongside the control diagrams.
b. Updated, 1:50 (1/4′ = 1′0″) scale, typical mechanical equipment room plans with resolution of review comments made during previous submission.
c. Updated typical schematic and riser diagrams for air-handling systems and hydronic systems by providing quantities and sizes to reflect the latest engineering calculations. Show locations of all exhaust fans. Show the locations of all major components, with respect to the building floor and each other.
d. Final demolition drawings indicating scope of work for demolition.
e. HVAC work associated with phasing plan. Updated control diagrams for each type of typical air and hydronic system used for development in previous submission by providing written description of the sequence of operation on the floor plans. Explain the function and role of each control device and describe the safety/alarms and normal operating controls of each system. Submit a schedule showing electrical control interlock of each component. Submit a single-line diagram of the direct digital control architecture.
f. VA Standard details and other necessary details.
g. General notes, symbols and abbreviations.
h. Demolition of existing HVAC work, if applicable.

10. HISTORIC PRESERVATION

Reports

a. Comply with contractual agreements for DD 2 as developed with the VA contracting officer, the VA PM, and the VA cultural resources management officer.
b. Notify the VA contracting officer immediately upon discovery of any historical or archeological data that may warrant investigation.
c. Submit documentation required by the SHPO.

11. PLUMBING

Reports

Submit the updated BOD report incorporating previous comments

Calculations

Submit:

a. Updated calculations for sizing all systems and equipment.
b. Updated calculations to support the strategies to achieve the water consumption and energy reduction goals.

Drawings

Submit:

a. 1:100 (1/8″ = 1′0″) floor plans indicating plumbing requirements of previous review. Add plumbing piping; pipe sizes are required. Coordinate quantities with architect. Submit schedule for equipment on drawings.
b. 1:50 (1/4″ = 1′0″) plans showing location and sizing of new equipment.
c. System riser diagrams with calculations and equipment selections
d. Contract utility drawings at the same scale as required for site development and environmental drawings. Size mains at the building. Include:
    - Water (domestic and fire)
    - Fuel gas
    - Gasoline
    - Fuel oil.
e. Sizing of water, fuel gas, and fuel oil piping.
f. Location and sizing of pumps, storage facilities, and treatment equipment.

12. SECURITY (PHYSICAL)

Reports

Submit the updated BOD report that includes a physical security narrative completed by a qualified security specialist and includes:

a. Catalog cuts for proposed security equipment: CCTV, monitors, access control systems, and screening equipment.
b. Connection matrix for security devices.
c. Description of the overall proposed physical security approach and the building and site design elements being included for compliance to the applicable Physical Security Design Manual for Life Safety Protected Facilities.
d. Subsections corresponding to each of the chapters of the Physical Security Design Manual for Life Safety Protected Facilities, i.e., Site Considerations, Building Entrances and Exits, Functional Areas, and Building Envelope.

Drawings

Submit physical security plan for each floor and site showing location of security cameras, card readers, and screening equipment (min. 1:100 (1/8"=1'-0")).

13. SITE DEVELOPMENT AND UTILITIES

Reports:

Submit:

a. Signage plan and schedule, substantially complete, with site locations, construction details, and sign face graphics.
b. Final Stormwater Pollution Prevention Plan (SWPPP) report, where applicable. Submit SWPPP, required drawings, and calculations to regulatory review agencies, if applicable.
c. Notice of Intent (NOI) application for any soil disturbing activities within the project site in accordance with the National Pollutant Discharge Elimination System (NPDES), where applicable.

d. Finalized stormwater management practices with landscape architect and/or plumbing engineer, where applicable.
e. Crime Prevention Through Environmental Design (CPTED) narrative.

Calculations
Submit:
a. Provide final stormwater computations, sizing calculation, and site analysis to comply with local, state, and federal regulations.

Drawings
Submit:
a. Topographic, boundary, utility, and landscape survey drawings.
b. Complete grading plans of the entire project, including large-scale drawings of major site elements. Include spot elevations at structure corners, entrances, other critical areas, and all first floor elevations. Show rim and invert elevations on all storm drainage structures. Show demolition, erosion, and sediment control as well as stormwater management practices. If rock excavation is required for site grading, indicate quantity on grading plans.
c. Vertical profile and horizontal alignment for roads. Indicate all traversed utilities.
d. Large-scale plans, where necessary, of concrete or other paving joint patterns.
e. Layout plan, substantially complete, showing locations of buildings, inlets, equipment at grade, and landscape features. Include dimensioning of parking lots, service courts, and other major elements of the site design. Indicate contractor's staging area.
f. Site Plan and details, including:
    - Fence construction details
    - Guard station and vehicle barrier design
    - Location of cameras, access control and screening equipment
    - Site lighting
    - Vehicle barrier design
    - Landscaping.
g. Construction details for major site amenities, landscape components, utilities and stormwater management practices.
h. Planting plan, substantially complete, with symbols showing location of all trees, shrubs, planting beds, and lawns. Provide a complete planting list and planting details with common name, genus and species, size/caliper, and special comments at a minimum. Check plants for suitability to the microclimate and availability. Indicate any areas to be irrigated.
i. Stormwater management plans.
j. Security features.
k. Utilities drawing showing incoming and outgoing with connections to mains, fuel and water storage.
l. Areas/zones of irrigation systems. Describe system design (automatic, manual, quick coupler, master, satellite or both controls).

14. ENVIRONMENTAL

Reports
Submit the updated BOD.

Calculations
Update previous, as required.

Drawings
Submit update previously submitted drawings incorporating review agency comments.

15. SPECIFICATIONS

Submit:

a. Update of all previously submitted documents to reflect review comments and further development.
b. Final draft of specifications for all disciplines, including Division 1 and those written by the A/E for the project.

16. STRUCTURAL

Reports

Submit the updated BOD report.

Calculations

Submit calculations covering all parts of the structure and miscellaneous facilities. For computer-generated results, provide copies of computer input data and output summaries in user-friendly language, accompanied by diagrams that identify joints, members, and areas, according to the notations used in the data listings. Calculations shall include:

a. Gravity load and lateral load calculations for the majority of the framing members.
b. Foundation calculations.
c. Adequacy of existing structure, where applicable, to account for new functional loads or new criteria.
d. Seismic calculations.

Drawings

Submit updated and developed drawings, including:

a. Foundation system.
    - Wall and slab-on-grade thickness
    - Brick shelf locations
    - Slab-on-grade construction is shown
    - Footing steps and elevator pits are located
    - Waterproofing and water stop systems are defined, coordinated, and shown on the architectural drawings
    - Footing schedule is completed and shown on the drawings
b. All building expansion joints. Foundation wall and slab-on-grade construction and control joints are shown.
c. Structural steel superstructure, showing:
    - All columns and beams
    - Column sizes and orientation
    - Beam sizes.
    - Lateral bracing system
    - Connection moments, vertical, and lateral loads
    - Column schedule
    - Base plates and anchor bolts
    - Steel beam camber
    - Shear stud type and length
    - Approximate locations and support for major mechanical equipment. Identify and label equipment and weights over 1,000 lbs. on MEP drawings
d. Elevated slab-on-deck, including:
    - Slab thickness and typical reinforcing
    - Steel decking configuration, gauge, and orientation
    - Changes in top-of-slab elevation
    - Verification that thickness is coordinated with fire-rating requirements
e. Masonry systems, including:
    - Typical masonry thickness, reinforcing, and spacing requirements for loadbearing walls

Assist the architect in reinforcing and spacing requirements for non-loadbearing walls shown on architectural drawings
- Masonry seismic anchorage and lateral support requirements
- Masonry bond beam requirements

f. Seismic design.

17. SUSTAINABILITY

Reports

Submit the final BOD report describing the final sustainability features of the project, including:

a. Water-use reduction strategies selected for the project including life cycle cost analysis and how they achieve the reduction goals and mandated water use reduction requirements as part of the selected third-party rating system and VA sustainability guidelines. Coordinate the reporting with the final plumbing and site/civil stormwater analysis to provide a graphical representation (pie or bar chart) by end use of the potable water baseline versus the required reduction target and the selected strategies.
b. Summary of the energy use intensity and energy consumption by end use and the life cycle cost for the final selected HVAC and lighting concept. Coordinate the reporting with the results from the energy analysis conducted as part of the mechanical systems evaluation and the lighting analysis conducted by the lighting/electrical engineer. The update should graphically illustrate (pie or bar chart) how the mandated energy conservation requirements and energy consumption goals in the VA design manuals, VA sustainability guidelines, and for the overall project are being achieved.
c. Summary of the Indoor Environmental Quality (IEQ) aspects of the project. Submit the description and graphical representation of how requirements for VA and third-party sustainability system GHG emission-reduction or -elimination requirements for the selected concept are achieved.
d. Renewable energy capacity for solar thermal, solar PV, wind, and geothermal as they relate to VA mandates and third-party sustainability goals. Coordinate with the plumbing submission and submit as needed the final explanation and technical backup information as to how the project shall meet the project goal for hot-water generation using renewable solar energy.

Calculations

Submit final:

a. Water-use reduction calculations based on third party and VA guidelines. Coordinate with calculations for the potable water baseline and reduced consumption calculations performed by the plumbing engineer.
b. GHG emissions-reduction calculations supporting VA mandates.
c. Renewable energy calculations. Coordinate the update calculations with the mechanical and electrical trades.

GREEN GLOBES (if applicable)

Report

As part of the BOD report, provide the following as it pertains to third-party Green Globes certification:

a. Preliminary input information for the Construction Documents Questionnaire and a preliminary copy of the Automatic Output Reports from the online GBI Assessment Tool.
b. Documentation and discussion of the input and output from the LCA for the selected concept.

Calculations

Submit the input and results of the LCA calculations.

LEED (if applicable)
Reports
As part of the BOD report, submit the following as it pertains to third-party LEED certification:

a. Updated LEED score card. Indicate anticipated points for the design and construction phases and provide a brief discussion on why or why not certain points are not achievable.
b. Documented input into LEED template calculations for all attempted credits.

Calculations
Submit preliminary template calculations as required for all credits being attempted.

18. TELECOMMUNICATIONS

Reports
Provide copies of all correspondence and minutes of meetings with utility company representatives.

Drawings
Submit:

a. Detailed telecommunications site plan.
b. Finalized one-line and riser diagrams of the normal electrical power and the emergency power distribution. Locate, size, and identify equipment.
c. Full set of floor plans. Indicate room and show locations of equipment, outlets, and major interconnecting conduits.
d. Proposed phasing scheme for telecommunications work, if applicable.

VI. CONSTRUCTION DOCUMENTS

A. GENERAL

1. The Construction Documents phase involves the production of complete drawings, specifications, and other documents necessary for the bidding and construction of the project, prepared from the approved Design Development 2 (DD 2) phase documents. Also included at this phase are the final cost estimate and the construction schedule.
2. It is the A/E's responsibility to provide a quality set of documents that are complete, fully coordinated, and ready for reproduction for bidding.
3. Prior to reproduction for issue for construction bids, the A/E shall make any changes to the documents identified as necessary during the review conference with VA Central Office.
4. A peer review, if required, will be conducted as part of the CD 1 phase activities.

General Requirements

1. Drawings shall have graphic scales, north arrow (either true north or plan north; arrows must be consistent for similar plans), and key plan.
2. Each submission shall build on the previous submission. Drawings required by previous submissions shall be included in subsequent submissions whether or not specifically identified as a requirement.
3. Submit all previous comments from VA and peer reviewers. All comments shall be resolved before moving into the next submission stage. For major issues, the A/E must respond to comments with written resolution; responding to important comments simply with "agreed" or "disagreed" is not acceptable. Any deviation from VA criteria shall be identified, justified, and documented with VA's approval.
4. All previously submitted documents shall be updated with written responses to reflect review comments and further development. The A/E shall verify that all changes based on the review of the previous phase have been entered into the electronic review and correction tracking system and approved by the VA Project Manager (PM).
5. Specifications shall be prepared using National Cemetery Administration (NCA) Master Construction Specifications. Submissions shall show changes to master by using the "Track Changes" function. Each submission shall indicate changes from the previous submission, not all changes to master. The final submission shall not show changes.
6. Dimensions shall be provided in soft metric (S.I.) units followed by English units unless otherwise specified by the VA PM.
7. The A/E shall prepare and submit minutes of its meetings with VA, VA's other contractors, and for A/E coordination meetings.
8. All sustainable design components shall be developed in accordance with NCA's Facilities Design Guide.
9. Drawings and specifications shall be complete to the level appropriate for the submission and fully coordinated prior to distribution to VA.

B. CONSTRUCTION DOCUMENTS [CD 1]

The purpose of the CD 1 phase is to add to the level of detail required for construction of the project, to coordinate the trades, and to clarify the project's scope and intent. This includes refinement of design details and specifications that the project can achieve its highest value and performance suitable for a 50+-year building. If a peer review is to be performed, CD 1 documents will be the basis of this review.

Drawings and specifications shall be 90% complete and fully coordinated prior to submission.

1. ARCHITECTURAL

Reports

Submit the updated Basis of Design (BOD) report including:

a. Cost evaluation for alternates.
b. Equipment catalog cuts.

Drawings

Submit:

a. Complete drawings, fully coordinated with other disciplines and suitable for bidding and approval by Authorities Having Jurisdiction. The documents shall be 90% complete with no additional coordination, information, drawings, or specifications required.
b. Updated floor plans from the DD 2 submission to include each floor, penthouses and service areas (min. 1:100 (1/8"=1'-0")). Identify partition types, section cut locations, interior and exterior elevation locations, detail locations, and large scale plans. Include interior and exterior dimensions and general notes.
c. Demolition floor and ceiling plans for areas to be renovated (min. 1:100 (1/8"=1'-0")) with finish schedule and partition types. Coordinate with phasing plans and Interim Life Safety Measures (ILSM) drawings.
d. ILSM drawings (min. 1:200 (1/16"=1'-0")).
e. Life safety plans showing means of egress, capacity, population, path of travel, travel distances, fire rated partitions, exit signs, and fire extinguishers (min. 1:200 (1/16"=1'-0")) Coordinate with Section 8, Fire Protection.
f. Physical security plan showing location of security cameras, etc. (min. 1:100 (1/8"=1'-0")) Coordinate with Section 12, Security (Physical).
g. Building elevations with fenestration, penthouses, materials, finish floor elevations, floor-to-floor heights, overall building height, window and louver types, glazing materials, entrances, canopies, skylights, and adjacent grades (min. 1:100 (1/8"=1'-0")). Indicate locations of wall section cuts.
h. Building sections (min. 1:50 (1/4"=1'-0")).
i. Wall sections (min. 1:15 (3/4"=1'-0")).
j. Construction details at a scale large enough to clearly show components and assembly: windows, storefront, waterproofing, roof accessories, equipment mounting and suspension, and shielding.
k. Interior elevations showing power, data, communications, millwork, casework, equipment, and other built-in items (min. 1:50 (1/4"=1'-0")).
l. Partition type and fireproofing details (min. 1:10 (1"=1'-0")). Indicate sound attenuation and fire ratings. Identify UL or other acceptable testing agency design number.
m. Reflected ceiling plans (min. 1:100 (1/8"=1'-0")). Identify bulkheads, light fixtures, supply and return grilles, ceiling mounted equipment, exit lights, and other devices.
n. Door schedule with door and hollow metal frame details and threshold details. Indicate door type, size, thickness, rating, material, glazing, security requirements, and hardware set.
o. Completely developed alternates on drawings.
p. 1:50 (1/4" = 1'-0") scale equipment plans and details.
q. Graphics/Signage plan per NCA standards.
r. Finish sample boards.
s. Final color rendering, if required.
t. Furniture and Furnishings Package: If furnishings are included in the contract, provide the following:
    - Specification section 09060 revised to address comments from the DD 2 phase review.
    - Revised 90% complete furnishing layout plan including plans with codes for furniture, window treatments, art, accessories, and plants.
    - Final furniture specifications with all necessary information required on the specification form. A separate form shall be used for each different item except for similar accessories

that may be grouped on one form. The furnishing specifications shall be submitted to the Interior Design office, and shall not be included in the contract specifications.

2. COMMISSIONING

Reports

Submit the updated narrative BOD report including the Commissioning Agent's report of document review and statement indicating how each of the items in the report shall be or has been addressed. Include:

a. Updated Design Narrative.
b. Final Design Phase Commissioning Plan. Include revisions to Commissioning Team Members, Schedules and other modifications required by the progress of the project.
c. Updated Design Phase Commissioning Issues Log with mitigation incorporated into electronic review and correction tracking system. Verify that discrepancies between OPR and the Design Narrative have been resolved.
d. Coordination Matrix for Commissioning Agent and A/E.
e. Final determination of control system type, configuration, and capabilities together with key decisions about equipment and systems sequences of operation.
f. Discussion of technical sections of the specifications to coordinate O&M Manual requirements.
g. Description of required training and demonstration requirements for VA's personnel. Include complete list of all types of equipment/systems and what training and demonstration is required.
h. Updated Construction Phase Commissioning Plan including systems to be commissioned, an outline of construction phase roles and responsibilities, and an outline of required system documentation requirements.

Drawings

Submit documents fully coordinated with other disciplines and suitable for bidding and approval by Authorities Having Jurisdiction. The drawings shall be 90% complete with no additional coordination or information required.

3. COST ESTIMATING

Reports

Submit:

a. WBS II Level 4 estimate.
b. Cost model budget tracking.
c. Separate computations for site elements, crypts, columbaria, each building, new work, renovations, alternates, and furnishings.
d. Updated market survey.

4. CRITICAL PATH METHOD (CPM)

Reports

Submit the updated BOD report including:

a. Updated project master schedule with increased detail.
b. Updated program and schedule risk factors identifying new risks and mitigation actions, particularly in construction areas.
c. Updated phasing narrative.
d. Updated phasing diagram.
e. Full-size contract drawings for the CPM phasing plans. (One drawing may include several reduced site plans.)
f. Written list of systems, including temporary systems by phase, and separated by technical discipline.

5. ELECTRICAL

Reports

Submit the updated narrative BOD report including:

a. Written approval by the utility company of the design of the electrical incoming service.
b. Copies of pertinent correspondence.

Calculations

Submit final:

a. Load calculations for record including review comment changes and final connected equipment schedule loads, demands, and diversities.
b. Equipment/panel schedules that represent loading.
c. Mechanical motor loads for mechanical and elevator power schedules.
d. Generator sizing, including starting calculations to substantiate generator selection.
e. UPS load calculations and sizing.

Drawings

Submit:

a. 90% complete and coordinated drawings, including complete legend symbol list, details, and schedules. Schedules shall include transformer, distribution switchboard, distribution panelboards, and branch-circuit panel board load schedules.
b. Coordinated drawings showing all new services to site and buildings; all new high voltage cable installations; all manholes, ductbanks, transformers, roadway, parking, and grounds lighting; and the medium voltage service point on the electrical site plan.
c. Completed building electrical floor plans. Indicate all lighting and power, data, communications, and fire alarm circuit systems. Show motor protective devices, and controller and feeder sizes. Locate all panels, transformers, and other major electrical components.
d. Completed one-line and riser diagrams including quantity and sizing of all conduit, cables/conductors, ground wire, and equipment sizes. Indicate nominal transformer impedance voltage.
e. Transformers, panel boards, and feeders shown in respective positions.
f. Descriptions/names of all electrical power distribution equipment shown on plans and on one-line/riser diagrams.
g. Emergency and standby power systems.

6. ENVIRONMENTAL IMPACT

Reports

Notify the VA PM immediately upon discovery of any environmental or site data that may warrant investigation.

Drawings

Submit asbestos abatement drawings, if applicable.

7. EQUIPMENT

No requirements.

8. FIRE PROTECTION

Reports

Submit the updated narrative BOD report.

Calculations

Submit finalized calculations to reflect comments from the DD 2 phase and evolved design.

Drawings

Submit 90% complete and coordinated fire protection drawings, including:

a. Details of the fire pump system, including elevation and detail of fire pump, if applicable.
b. Zoning of each fire alarm initiating device.
c. Single-line riser diagram for the fire alarm system.
d. Location and detail of enunciator panel.
e. Reference notes to HVAC drawings that indicate interconnection of the HVAC system (dampers, fans) with duct smoke detectors and/or fire alarm system.

9. HEATING, VENTILATING & AIR CONDITIONING

Reports

Submit the updated narrative BOD report including an updated energy modeling report. State that the energy model represents the operational parameters of all designed systems and uses actual equipment performance curves from the design selections (mechanical, plumbing, and lighting). Discuss any adjustments and their effects from the previous submittal.

Calculations

Submit complete and final energy and engineering calculations of all systems. In addition to room-by-room heating and cooling calculations, submit:

a. Final selection of all pumps with the pump head calculations based on the actual piping layout and takeoffs, and pressure drop through the equipment selected for the systems.
b. Final selection of all fans with the fan static pressure calculations based on the actual duct layouts and takeoffs, and static pressure drop through the equipment for the systems. (Detailed calculations are required even if variable speed drives are used.)
c. Sizing and selection of all expansion tanks based on the actual piping layout and volume computation.
d. Sizing and selection of all steam to hot water convertors and heat exchangers based on the flow requirement of each terminal unit, i.e., duct-mounted reheat coil, box (air terminal unit). mounted reheat coil, unit heaters, convectors, finned tube radiators, and radiant ceiling panels.
e. Acoustic analysis of all systems and steps taken to ensure compliance with the specified noise levels.
f. Complete selection data including catalog cuts and calculations for all HVAC equipment and drawings, showing all equipment schedules.
g. Complete coordination with equipment by providing utility connections, interface between the local controls, trend log and recording requirements, and local and remote alarms.

Drawings

Submit 90% complete and coordinated drawings including:

a. Complete coordination with the architectural drawings (louvers, ceiling access panels, and reflected ceiling plans) and structural drawings (operating weights of ceiling and floor mounted equipment, concrete and steel supports, and roof and floor openings).
b. HVAC floor plans for all areas showing all ductwork and piping at 1:100 (1/8 inch) scale. Include:
    - Ductwork and piping on separate drawings.
    - Duct pressure classification on the floor plans for all air distribution systems. Identify the duct sections with demarcation symbols where the change in pressure rating takes place.
    - All duct/pipe sizes and air/fluid quantities.
    - Air quantities for each room and each air inlet/outlet, expressed in cubic meters (feet) per minute, and fluid quantity (where required) in liters per second (gallons per minute).
    - All volume dampers, fire dampers, automatic control dampers, rises and drops in ductwork, and air inlets/outlets on the air distribution floor plans.
    - All piping specialties, such as expansion loops, anchors, valves, drip assemblies, and balancing fittings, on the piping floor plans and drain valves at low-points.
    - All architectural room names and numbers.
    - All fire barriers.
c. HVAC floor plans for all mechanical equipment rooms, with at least two cross-sections taken at right angles to each other at 1:50 (1/4″ = 1′0″) scale. Show all equipment located on roof and/or grade. Coordinate to show the walking pads on the architectural drawings.

d. Updated fire partitions in HVAC floor plans as described in DD 2.
e. Automatic temperature control drawings. Show all duct detectors, control valves/dampers static pressure sensors, and differential pressure control assemblies, whose actual physical location is critical for the intended sequence of operation on floor plans. The written sequence of operation describing the role of each individually numbered device should be shown on the floor plans on the same drawing on which the control schematic diagram is shown. Do not write the sequence in the specifications. Each sequence should describe the start-up, capacity control, safeties, morning warm-up cycle where applicable, and night setback cycle where applicable.
f. Standard detail drawings. Edit VA details to suit the project. Include any special details deemed useful and necessary for the project.
g. HVAC demolition drawings showing the extent of demolition work. Indicate sizes of ductwork and piping to be dismantled. Show capacities and sizes of the existing equipment to be removed. Show points of connection, disconnection, blankoffs, and dead-end flanges with isolating valves. Coordinate demolition and restoration work with other disciplines. State the revised capacities of the existing systems affected by the demolition work together with additional efforts involved in testing, balancing, and adjusting them.
h. Previously submitted drawings with comments of the last review incorporated.

10. HISTORIC PRESERVATION

Reports

a. Comply with contractual agreements for CD 1 developed with the VA contracting officer, the VA PM, and the VA cultural resources management officer.
b. Notify the VA contracting officer immediately upon discovery of any historical or archeological data that may warrant investigation.
c. Documentation required by State Historic Preservation Office.

11. PLUMBING

Reports

Submit the updated BOD including:

a. Graphical representation of energy and water usage savings with reference to the contributing technologies and their weighted contributions.
b. Written approval by utility companies or regulatory review agencies, where applicable.

Calculations

Submit:

a. Final calculations for sizing all systems and equipment.
b. Final calculations to support strategies to achieve the water consumption and energy reduction goals.

Drawings

Submit 90% complete and coordinated drawings including:

a. Legend, notes, and details.
b. Demolition plumbing floor plans shown at 1:100 (1/8" = 1'0") scale.
c. All equipment shown and piping sized.
d. Finalized riser diagrams.
e. Special systems: floor and roof drains, and overflow protection.

12. SECURITY (PHYSICAL)

Reports

Submit the updated BOD report including the 100-percent-complete physical security narrative, completed by a qualified security specialist. Submit:

a. Updated description of the overall proposed physical security approach and the building and site design elements being included for compliance to the applicable Physical Security Design Manual for Life Safety Protected Facilities.

b. Subsections corresponding to each of the chapters of the Physical Security Design Manual for Life Safety Protected Facilities, i.e., Site Considerations, Building Entrances and Exits, Functional Areas, and Building Envelope.
c. Letter from the security specialists affirming that they have performed a back-check to confirm that all the physical security elements have been incorporated into the construction documents.

Drawings
Submit 90% complete construction documents.

13. SITE DEVELOPMENT/UTILITES

Reports
Submit a copy of approved Stormwater Pollution Prevention Plan (SWPPP).

Drawings
Submit:

a. 90% complete and coordinated site and landscape contract drawings. Expand the approved DD 2 drawings to the level of detail necessary for construction.
b. Stormwater management drawings.
c. Final approved drawings from approving authority for on-site water supply system and sewerage disposal system, if applicable.
d. Sizes, rims, and invert elevations, pipe lengths, and materials of storm and sanitary sewer systems.
e. Irrigation system at the same scale as storm sewer drawings.
f. Profiles of storm and sanitary sewers.
g. Gravesite layout drawing including numbering plan for crypt sections.
h. Signage layout plan and signage schedule.

14. ENVIRONMENTAL

Reports
Submit approval from authorities having jurisdiction for floodplain impacts, wetland impacts, erosion and sediment control.

Drawings
Submit:

a. 90% complete and coordinated erosion and sediment control plans. Expand the approved DD 2 drawings to the level of detail necessary for construction.
b. Approved wetland mitigation plans and waterway construction plans, if applicable.

15. SPECIFICATIONS

Submit:

a. All technical disciplines, Division 1 and Commissioning section drafts edited with the “Track Changes” function. 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 and that proper provisions have been provided in specifications to include required submittals for the purposes of achieving the project’s LEED goals. All previous comments shall be addressed.
b. Documents fully coordinated with other disciplines and suitable for bidding and approval by Authorities Having Jurisdiction. The specifications should be considered 90% complete with no additional coordination or information required.
c. When no VA Master Construction Specification exists for a "unit of work", prepare the specification section in the three-part section format.
    - Use generic or non-proprietary specifications describing the minimal acceptable product criteria level where no "Standard" exists to define quality and workmanship levels.

- Use applicable "Standards" to define quality and workmanship when these publications exist. List complete designation and title of each publication used in Part 1; follow format in VA Master Construction Specifications for applicable publications.
- Do not use proprietary specifications or systems that restrict competition unless authorization in writing has been received from the VA Contracting Officer for such proprietary specification. See Federal Acquisition Regulation (FAR) Part 10, Part 14, and Part 36.
- Do not use trade names or manufacturers' brand names except as previously noted.
- When a new product or system is used, define and specify the minimum acceptable levels of essential criteria in descriptive, physical, functional, or performance requirements.

16. STRUCTURAL

Reports

Submit an updated BOD report.

Calculations

Submit final calculations:

a. Incorporate all resolved comments and corrections of the DD 2 Submittal.
b. Each calculation sheet shall be initialed and dated by the engineer(s) assigned as Design Checker(s) for that portion of the work. Final calculations shall be indexed, sealed, and signed by the engineer whose name appears on the Design Calculations index. Observe the following guidelines:
    - State assumptions and design criteria prior to the presentation of the calculations.
    - Individual calculations to verify sizes, bolts, and welds, shall be provided with all details.
    - Sketches used to describe the basis of calculations shall be drawn to approximate proportions.

Drawings

Submit updated and developed drawings provided at the DD 2 submission, complete and ready for bidding. Drawings shall be fully coordinated with all disciplines and ready for approval to bid.

a. Concrete Foundation/Framing Drawings
    - Typical details for concrete footings, beams, columns, slabs, and walls as required for the project; include only details that apply to the scope of work.
    - Completed concrete column, beam, pilaster, and footing schedules. Indicate information for concrete slab construction including:
        - Slab joint pattern for concrete slabs-on-grade
        - Slab thickness and top of slab elevations
        - Slab reinforcing including sizes, spacing, placement, and clearances
        - Typical slab construction details, including construction and control joint details, typical details at slab-column isolation joints, slab-wall joint details
        - Indicate all changes in slab elevations, including depressions and pits. indicate all sloped slab locations with both beginning and ending slope elevations
    - Continuous and isolated footings:
        - Footing sizes and locations
        - Top of footing elevations
        - Step-footing locations and the top of footing elevations at each step
        - Footing reinforcing sizes, spacing, and clearances
        - Required keyways and dowels
    - Foundation walls:
        - Elevation at top of wall
        - Elevation at top of brick shelf or other supports
        - Elevation at beam pockets and changes in wall heights
        - Wall thickness and location to column lines
        - Wall reinforcing size, direction, spacing, and clearances

- Integral pier or pilaster size, location, reinforcing, and elevation
- Wall penetrations including size, locations, and additional reinforcing
- Locations and details for embedded items such as connection plates or anchors
- Coordinate with waterproofing and waterstop systems defined and shown on the architectural drawings

b. Steel Frame Drawings
   - Steel framing member sizes including all shear stud and camber information for floor framing members
   - Connection design loads including vertical reactions and design moments for moment connections
   - Column orientation on framing plans
   - Locations requiring the installation of slip-critical bolts
   - Bridging and bracing member sizes, locations, and connections
   - Metal decking sizes, span criteria, and direction
   - Relevant typical details. Include only details that apply to the project
   - Complete column schedule, including member sizes, splice locations and types, base plate sizes and orientation, and column loads and heights
   - Anchor bolt sizes, hardware, and patter
   - Non-typical or non-standard connection details.
   - Dunnage and support steel members. Provide sizes and details
   - Lintels (loose and attached) and support angles

c. Masonry Drawings
   - Typical masonry reinforcing and spacing requirements for load bearing walls. Assist the architect in reinforcing and spacing requirements for load non-bearing walls shown on architectural drawings
   - Masonry seismic anchorage and lateral support requirements
   - Masonry bond beam requirements

17. SUSTAINABILITY

Reports

No submission required.

Calculations

Submit:

a. Final water use reduction calculations based on third-party and VA guidelines. Coordinate with calculations for the potable water baseline and reduced consumption calculations performed by the plumbing engineer.
b. Final GHG emissions reduction calculations supporting VA mandates.
c. Final renewable energy calculations.
d. Updated calculations coordinated with the mechanical and electrical trades.

Green Globes (if applicable)

Reports

Submit the following as it pertains to 3rd Party Green Globes Certification:

a. Final input information for the Construction Documents Questionnaire and submit a final copy of the Automatic Output Reports from the online GBI Assessment Tool.
b. Documentation and discussion of the final input and output from the Life Cycle Cost Assessment (LCA) for the selected concept.

Calculations

Submit the final input and results of the LCA calculations.

LEED (if applicable)

Reports
Submit Construction Documents LEED score card. Indicate where points are achieved by the design and anticipated for construction and provide a brief discussion describing why or why not certain points are not achievable.

Calculations
Submit final LEED template calculations as required for all design level credits being attempted.

18. TELECOMMUNICATIONS

Reports
Submit:

a. Written approval by the telecommunications utility companies of the design for incoming services.
b. Copies of pertinent correspondence.

Drawings
Submit:

a. 90% complete drawings, including complete legend symbol list, details, and schedules.
b. All new telecommunications services to site and buildings, all new fiber and copper cabling installations, all manholes and ductbanks.
c. Complete telecommunications riser diagrams.
d. Complete building telecommunications floor plans.

C. CONSTRUCTION DOCUMENTS [CD 2]

The purpose of the CD 2 phase is to permit a final review of the documents by VA to confirm compliance with the recommendations of the peer review and the CD 1 review comments, and to ensure that the estimate of construction cost at award (ECCA) does not exceed the budget.

Drawings and specifications shall be 100% complete and fully coordinated prior to submission.

General

a. Drawings shall have graphic scale, north arrow (either true north or plan north), and key plan.
b. The submission shall incorporate changes required by the peer and VA reviews.
c. Specifications for the CD 2 submission shall not show changes.

Reports
Submit:

a. Written responses to review comments from previous submission and peer review.
b. All previously submitted documents updated to reflect review comments CD 1 review comments.
c. Final WBS II Level 4 cost estimate incorporating all changes to CD 1 documents.

Drawings
Submit all previously submitted drawings updated to reflect review comments from CD 1 submission and peer review.

Specifications
Submit all previously submitted documents updated to reflect review comments from CD 1 submission and peer review.

D. CONSTRUCTION DOCUMENTS FINAL/BID [BD]

The drawings and specifications shall be 100% complete, fully coordinated and ready for bidding. They shall have been updated to address all CD 2 submission review comments.

General

Submit:

a. Written confirmation that all review comments from CD 2 submission have been addressed in the documents.
b. CD/DVD containing all drawings in AutoCAD and .pdf format and specifications in MS Word format. The drawing format shall be in conformance with the U.S. National CAD Standard.

Drawings

Submit:

a. All previously submitted drawings updated to reflect review comments from CD 2 submission.
b. Drawings with signature and seal of an architect, landscape architect, or professional engineer of record, all registered in the jurisdiction where the project is to be built.
c. Signatures of designated VA representatives.

Specifications

Submit:

a. All previously submitted documents updated to reflect review comments from CD 2 submission.
b. Final Project Manual with signature and seal of architect of record on the cover.

VII. RECORD DOCUMENTS

A. GENERAL

Based on changes made during construction and existing conditions that differed from those known at the time Construction Documents were prepared, the A/E shall revise Construction Documents to reflect conditions at the completion of construction. Record documents shall incorporate information gathered from the following sources:

1. Contractor's and Resident Engineer's field set of Construction Documents annotated to show changes made during construction.
2. Drawings and instructions issued during construction as responses to Requests for Information (RFIs) or supplemental instructions.
3. Change Orders.
4. Substitutions.

B. SUBMISSION REQUIREMENTS

1. Complete set of drawings printed on Mylar.
2. Project Manual.
3. Electronic files for drawings.
4. Warranties.

VIII. DISTRIBUTION OF A/E MATERIAL

A. GENERAL

1. Mylar - Mylar prints shall be full size positive-type with lines printed on the face of the print.
2. Black & white prints - Shall be full size or reduced to half size.
3. All drawings, manuals, and reports shall be bound into sets. Drawings shall be prepared in accordance with PG 18-4, Standard Details and CAD Standards, and organized in the following sequence:
    - Cover and Index of Drawings
    - Critical Path Method
    - Site Development and Environment
    - Subsurface Investigation and Topographic Survey
    - Asbestos Removal
    - Architectural
    - Plumbing
    - Sanitary
    - Structural
    - Heating, Ventilating and Air Conditioning
    - Electrical
    - Fire Protection
4. The A/E shall contact the VA Project Manager (PM) for the address of the appropriate Memorial Service Network (MSN) Director and Cemetery Director, if applicable.

B. SYMBOL IDENTIFICATION OF MASTER PLAN DRAWINGS

All drawings that form the Master Plan (MP) set will be identified with the symbol “MP” followed by the number of the drawing.

C. DISTRIBUTION OF A/E MATERIALS

The A/E shall prepare and distribute documents for each project stage in accordance with the table below.

Distribution of A/E Materials

ORGANIZATION		NCA			CFM						NCA			
VA OFFICE		OFFICE OF DESIGN & CONSTRUCTION (41F1)	MEMORIAL SERVICE NETWORK OFFICE (MSN)	NATIONAL CEMETERY	PROJECT MANAGER (CPM)	CONSULTING SUPPORT SERVICES (CPM)	FACILITIES QUALITY SERVICE	COMMISSIONING CONSULTANT	PEER REVIEW CONSULTANT	CONTRACTING OFFICE	OFFICE OF DESIGN & CONSTRUCTION (41F1)	MEMORIAL SERVICE NETWORK OFFICE (MSN)	NATIONAL CEMETERY	FIELD PROGRAMS OFFICE (41A1)
DESIGN PHASE		MINOR CONST. PROJECTS			MAJOR CONSTRUCTION PROJECTS									
Master Plan	MP2	RC, CE, DF, DH & RM	RC, CE, DH & RM	RC, DF & RM	RC, DF, DH & RM		CE				RC, CE, DF, DH & RM	RC, CE, DH & RM	RC, DF & RM	RC, DH & RM
	MP3	RC, CE, DF, DH	RC, CE & DH	RC & DF	RC, DF & DH		CE				RC, CE, DF, DH	RC, CE & DH	RC & DF	RC & DH
	MP4	RC, CE, DF & DH	RC, CE & DH	RC & DF	RC, DF & DH	CPM & DH	CE				RC, CE, DF & DH	RC, CE & DH	RC & DF	RC & DH
	MP5	RC, CB, CE, DF, DH, MD, RDR & EF	RC, CB, CE, DH, MD & EF	RC & DF	RC, DF, DH, RDR & EF	CPM & DH	CE				RC, CB, CE, DF, DH, MD & EF	RC, CB, CE, DH, MD & EF	RC & DF	RC & DH
Schematic Design	SD1	RC, CE, DF, DH & S	RC, CE, DH & S	RC & DF	RC, DF & DH	CPM & DH	CE				RC, CE, DF, DH & S	RC, CE, DH & S	RC & DF	RC & DH
	SD2	RC, CB, CE, DF, DH, S & EF	RC, CB, CE, DH, S & EF	RC & DF	RC, CB, DF, DH & EF	CPM & DH	CE	C			RC, CB, CE, DF, DH, S & EF	RC, CB, CE, DH, S & EF	RC & DF	RC & DH
Design Development	DD1	RC, CB, CE, DF, DH & S	RC, CB, CE, DH & S	RC & DF	RC, CB, DF, DH & S	CPM & DH	CE	C			RC, CB, CE, DF, DH & S	RC, CB, CE, DH & S	RC & DF	RC & DH
	DD2	RC, CB, CE, DF, DH, S & EF	RC, CB, CE, DH, S & EF	RC & DF	RC, CB, DF, DH, S & EF	CPM & DH	CE	C			RC, CB, CE, DF, DH, S & EF	RC, CB, CE, DH, S & EF	RC & DF	RC & DH
Construction Documents	CD1	RC, CB, CE, DF, DH & S	RC, CB, CE, DH & S	RC & DF	RC, CB, DF, DH & S	CPM & DH	CE	C	RC, CE, DF & S *		RC, CB, CE, DF, DH & S	RC, CB, CE, DH & S	RC & DF	RC & DH
	CD2	RC, CB, CE, DF, DH & S	RC, CE, DH, CB & S	RC & DF	RC, CB, DF, DH & S	CPM & DH	CE	C	RC, CE, DF & S *		RC, CB, CE, DF, DH & S	RC, CE, DH, CB & S	RC & DF	RC & DH
	BID DOCUMENTS	RC, CB, CE, DF, DH, S & EF	RC, CB, CE, DH, S & EF	RC & DF	RC, CB, DF, DH, S & EF	CPM & DH	CE	C		S & EF	RC, CB, CE, DF, DH, S & EF	RC, CB, CE, DH, S & EF	RC & DF	RC & DH
	RECORD DRWGS	MD, DH, S & EF	MD, DH, DF, S, WM & EF	WM & DF							MD, DH, S & EF	MD, DH, DF, S, WM & EF	WM & DF	

KEY:

1) C: COMMISSIONING DOCUMENTS
2) CB: COLOR BOARDS
3) CE: COST ESTIMATE DOCUMENTS (CD/DVD CONTAINING COMPLETE SET OF DRAWINGS, COST ESTIMATE AND MARKET SURVEY)
4) CPM: CPM SCHEDULE
5) DF: COMPLETE FULL-SIZE SET OF DRAWINGS (B & W PRINTS)
6) DH: COMPLETE HALF-SIZE SET OF DRAWING (B & W PRINTS)
7) EF: ELECTRONIC FILES (CD/DVD CONTAINING COMPLETE SET OF AUTOCAD DRAWINGS, PDF DRAWINGS, MS WORD SPECIFICATIONS, PDF SPECIFICATIONS)
8) MD: MYLAR DRAWINGS (B & W PRINTS)
9) RC: REPORTS AND CALCULATIONS
10) RDR: RENDERINGS
11) RM: RECORD OF TEAM MEETING
12) S: SPECIFICATIONS
13) WM: WARRANTIES, SUBMITTALS, O & M MANUALS

* PEER REVIEW is project-specific at the discretion of the PM