

GAO

Testimony

Before the Subcommittee on the  
Legislative Branch, Committee on  
Appropriations, U.S. Senate

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# CAPITOL VISITOR CENTER

## Schedule Delays Continue; Reassessment Underway

Statement of Bernard L. Ungar, Director  
Terrell Dorn, Assistant Director  
Physical Infrastructure Issues



G A O

Accountability \* Integrity \* Reliability

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Mr. Chairman and Members of the Subcommittee:

We are pleased to be here today to assist the Subcommittee in monitoring progress on the Capitol Visitor Center (CVC) project. Our remarks will focus on (1) the Architect of the Capitol's (AOC) progress in managing the project's schedule since the Subcommittee's July 14 hearing on the project; (2) our estimate of a general time frame for completing the base project's construction and the preliminary results of our assessment of the risks associated with AOC's July 2005 schedule for the base project; and (3) the project's costs and funding, including the potential impact of scheduling issues on cost.<sup>1</sup> However, we will not, as originally planned, provide specific estimated completion dates because AOC's contractors revised the schedule in August to reflect recent delays, but AOC has not yet evaluated the revised schedule. AOC believes that the time added to the schedule by its contractors is unreasonable. Until AOC completes its evaluation and we assess it, any estimates of specific completion dates are, in our view, tentative and preliminary. Similarly, we will wait until the schedule is stabilized to update our November 2004 estimate of the cost to complete the project. Currently, AOC and its consultant, McDonough Bolyard Peck (MBP), are still developing their cost-to-complete estimates.

Our remarks today are based on our review of schedules and financial reports for the CVC project and related records maintained by AOC and its construction management contractor, Gilbane Building Company; our observations on the progress of work at the CVC construction site; and our discussions with CVC project staff (including AOC, its major CVC contractors, and representatives of MBP), AOC's Chief Fire Marshal, and officials responsible for managing the Capitol Power Plant. We also reviewed applicable appropriations legislation. Appendix I provides more detailed information on our assessment of the project's schedule. We did not perform an audit; rather, we performed our work to assist Congress in conducting its oversight activities.

In summary, although AOC and its construction contractors have continued to make progress since the Subcommittee's July 14 CVC hearing, several delays have occurred and more are expected. These delays could postpone the base project's completion significantly beyond

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<sup>1</sup>See GAO, *Capitol Visitor Center: Update on Status of Project's Schedule and Costs*, [GAO-05-910T](#) (Washington, D.C.: July 14, 2005).

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September 15, 2006, the date targeted in AOC's July 2005 schedule.<sup>2</sup> Although not yet fully reviewed and accepted by AOC, the schedule that AOC's contractors revised in August 2005 shows February 26, 2007, as the base project's completion date. The contractors reported this revised date largely because some key activities associated with the heating, ventilation, and air-conditioning (HVAC) and fire protection systems had not been included in previous schedules and because delays were occurring, both in constructing the utility tunnel and in completing interior stonework.

According to our preliminary analysis of the project's July 2005 schedule, the base project is more likely to be completed sometime in the spring or summer of 2007 than by September 15, 2006. Unless the project's scope is changed or extraordinary actions are taken, the base project is likely to be completed later than September 15, 2006, for the reasons cited by the contractors and for other reasons, such as the optimistic durations estimated for a number of activities and the risks and uncertainties facing the project. AOC believes that the contractors added too much time to the schedule in August for activities not included in the schedule and that it can expedite the project by working concurrently rather than sequentially and by taking other actions. While AOC may not need all of the time added for the missing activities, CVC project personnel believe that more time will be needed than is currently scheduled for other activities, such as the utility tunnel, interior finishes and stonework, and the East Front. Because of the uncertainty surrounding the base project's construction schedule, we cannot estimate a specific completion date at this time. Additionally, we are concerned about actions that have been, or could be, proposed to accelerate work to meet the September 15, 2006, target date. While such actions could expedite the project and save some costs, they could also increase other costs or adversely affect the CVC facility's quality, functionality, or life safety provisions. The project's schedule also raises a number of management concerns, including the potential for delays

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<sup>2</sup>AOC set September 15, 2006, as the contractual date for completing the base project's construction and for opening the CVC facility to the public. The House and Senate expansion spaces were scheduled to be completed after that date. AOC set the September contract completion date in November 2004, when it reached agreement with the contractor on a new date for starting sequence 2 that reflected the delays experienced on sequence 1. On September 6, 2005, AOC informed Capitol Preservation Commission representatives that it still expected the base project's construction to be substantially complete on September 15, 2006, but was postponing the date for opening the facility to the public to December 15, 2006, so that it could complete system tests, minor punch-list work, and preparations for operations.

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caused by not allowing enough time to address potential problems or to complete critical activities. Since the Subcommittee's July 14 hearing, we have discussed several actions with AOC that we believe are needed to address the CVC project's schedule problems and our concerns. These actions include

- evaluating the project's revised schedule, including the activity durations, to ensure that adequate time is provided;
- analyzing the impact of various factors on the schedule and the adequacy of the resources scheduled to be applied to meet completion dates;
- carefully considering the costs, benefits, and risks associated with proposals to accelerate work or reduce its scope and ensuring that appropriate management controls are in place to prevent or minimize the possible adverse consequences of such actions, if taken;
- proposing a CVC opening date that allows reasonable time between the completion of construction and the facility's opening to address problems that may arise;
- ensuring that delays and their causes are adequately determined and documented on an ongoing basis; and
- advising Congress of any plans for accelerating work or reducing its scope so that Congress can be involved in such decisions.

AOC agreed with our suggestions.

Fiscal year 2006 appropriations have provided sufficient funds to cover AOC's request for CVC construction funding as well as additional funds for some risks and uncertainties that may arise, such as costs associated with additional sequence 2 delays or unexpected conditions. Although sequence 2 delays have been occurring, the extent to which the government is responsible for their related costs is not clear at this time. Additional funding may be necessary if the government is responsible for significant delay-related costs or if significant changes are made to the project's design or scope or to address unexpected conditions. In addition, we and AOC identified some CVC construction activities that received duplicate funding. AOC has discussed this issue with the House and Senate Appropriations Committees.

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## Work on the Project Is Progressing, but Delays Continue

AOC and its contractors have continued to make progress on the project since the Subcommittee's July 14 hearing. However, mostly because some key activities associated with the HVAC and fire protection systems were not included in earlier schedules and because delays occurred in installing stonework and excavating the utility tunnel, the sequence 2 contractor's August schedule shows the expected completion date for the base project as February 26, 2007. As discussed at the Subcommittee's July 14 hearing, AOC recognized some delays in its June 2005 schedule, which showed the base project's expected completion date as October 19, 2006. Although AOC has not evaluated the contractor's August schedule, it does not believe that so much additional time will be needed. Furthermore, as discussed in the next section, AOC maintains that work could be accelerated to meet the September 15, 2006, target date.

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## Project's Schedule, Including Possible Actions to Accelerate Work, Raises Management Concerns

According to our analysis of the CVC project's schedule, the base project is unlikely to be completed by the September 15, 2006, target date for several reasons. AOC believes that it could take actions to complete the project by then, but these actions could have negative as well as positive consequences. These and other schedule-related issues raise a number of management concerns. We have discussed actions with AOC officials that we believe are necessary to address problems with the schedule and our concerns. AOC generally agreed with our suggestions.

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## Base Project's Construction Is Likely to Be Completed Later Than Scheduled for Several Reasons

For several reasons, we believe that the base project is more likely to be completed sometime in the spring or summer of 2007 than by September 15, 2006:

- As we have previously testified, AOC's sequence 2 contractor, Manhattan Construction Company, has continued to miss its planned dates for completing activities that we and AOC are tracking to assist the Subcommittee in measuring the project's progress. For example, as of September 8, the contractor had completed 7 of the 16 selected activities scheduled for completion before today's hearing (see app. II); however, none of the 7 activities was completed on time. Unforeseen site conditions, an equipment breakdown, delays in stone deliveries, and a shortage of stone masons for the interior stonework were among the reasons given for why the work was not completed on time.<sup>3</sup> Our analysis

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<sup>3</sup>Also see, for example, GAO, *Capitol Visitor Center: Effective Schedule Management and Updated Cost Information Needed*, [GAO-05-811T](#) (Washington, D.C.: June 14, 2005).

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of the sequence 2 contractor's production pace between November 2004 and July 2005 indicates that the base project's construction is unlikely to be finished by September 15, 2006, if the contractor continues at the same pace or even accelerates the work somewhat. In fact, at the current or even a slightly accelerated pace, the base project would be completed several months after September 15, 2006. To finish the base project's construction by that date, our analysis shows that the sequence 2 contractor would have to recover 1 day for every 8 remaining days between July 2005 and September 2006 and could incur no further delays.<sup>4</sup>

- We continue to believe that the durations scheduled for a number of sequence 2 activities are unrealistic. According to CVC project team managers and staff, several activities, such as constructing the utility tunnel; testing the fire protection system; testing, balancing, and commissioning the HVAC system; installing interior stonework; and finishing work in some areas are not likely to be completed as indicated in the July 2005 schedule. Some of these are among the activities whose durations we identified as optimistic in early 2004 and that we and AOC's construction management contractor identified as contributing most to the project's schedule slippage in August 2005; these activities also served as the basis for our March 2004 recommendation to AOC that it reassess its activity durations to see that they are realistic and achievable at the budgeted cost. Because AOC had not yet implemented this recommendation and these activities were important to the project's completion, we suggested in our May 17 testimony before the Subcommittee that AOC give priority attention to this recommendation.<sup>5</sup> AOC's construction management contractor initiated such a review after the May 17 hearing. Including more time in the schedule to complete these activities could add many more weeks to the project's schedule.
- AOC's more aggressive schedule management is identifying significant omissions of activities and time from the sequence 2 schedule. AOC's approach, though very positive, is coming relatively late in the project. For example, several detailed activities associated with testing, balancing, and commissioning the CVC project's HVAC and fire protection system were added to the schedule in July and August, extending the schedule by several months. AOC believes, and we agree, that some of this work may be done concurrently, rather than sequentially as shown in the August

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<sup>4</sup>This analysis assumes the 60-day delay shown in the project's July schedule.

<sup>5</sup>GAO, *Capitol Visitor Center: Priority Attention Needed to Manage Schedules and Contracts*, [GAO-05-714T](#) (Washington, D.C.: May 17, 2005).

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schedule, thereby saving some of the added time. However, until more work is done to further develop this part of the schedule, it is unclear how much time could be saved. Furthermore, the July schedule does not appear to include time to address significant problems with the HVAC or fire alarm systems should they occur during testing.

- In August 2005, CVC project personnel identified several risks and uncertainties facing the project that they believed could adversely affect its schedule. Examples include additional unforeseen conditions in constructing the utility and House Connector tunnels; additional delays in stonework due to slippages in stone deliveries, shortages of stone masons, or stop-work orders responding to complaints about noise from work in the East Front; and problems in getting the HVAC and fire protection systems to function properly, including a sophisticated air filtration system that has not been used before on such a large scale. Providing for these risks and uncertainties in the schedule could add another 60 to 90 days to the completion date, on top of the additional time needed to perform activities that were not included in the schedule or whose durations were overly optimistic.
- Over the last 2 months, AOC's construction management contractor has identified 8 critical activity paths that will extend the base project's completion date beyond September 15, 2006, if lost time cannot be recovered or further delays cannot be prevented. These 8 activity paths are in addition to 3 that were previously identified by AOC's construction management contractor. In addition, the amount of time that has to be recovered to meet the September 15 target has increased significantly. The activity paths include work on the utility tunnel and testing and balancing the HVAC system; procuring and installing the control wiring for the air handling units; testing the fire alarm system; millwork and casework in the orientation theaters and atrium; and stonework in the East Front, orientation theaters, and exhibit gallery. Having so many critical activity paths complicates project management and makes on-time completion more difficult.

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### Possible Actions to Accelerate Work Raise Concerns

AOC believes it can recover much of the lost time and mitigate remaining risks and uncertainties through such actions as using temporary equipment, adding workers, working longer hours, resequencing work, or performing some work after the CVC facility opens. AOC said that it is also developing a risk mitigation plan that should contain additional steps it can take to address the risks and uncertainties facing the project. Various AOC actions could expedite the project and save costs, but they could also have less positive effects. For example, accelerating work on the utility

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tunnel could save costs by preventing or reducing delays in several other important activities whose progress depends on the tunnel's completion. Conversely, using temporary equipment or adding workers to overcome delays could increase the project's costs if the government is responsible for the delays. Furthermore, (1) actions to accelerate the project may not save time; (2) the time savings may be offset by other problems; or (3) working additional hours, days, or shifts may adversely affect the quality of the work or worker safety. In our opinion, decisions to accelerate work must be carefully made, and if the work is accelerated, it must be tightly managed.

Possible proposals from contractors to accelerate the project by changing the scope of work or its quality could compromise the CVC facility's life safety system, the effective functioning of the facility's HVAC system, the functionality of the facility to meet its intended purposes, or the life-cycle costs of materials. In August, project personnel raised such possibilities as lessening the rigor of systems' planned testing, opening the facility before all planned testing is done, or opening the facility before completing all the work identified by Capitol Preservation Commission representatives as having to be completed for the facility to open. While such measures could save time, we believe that the risks associated with these types of actions need to be carefully considered before adoption and that management controls need to be in place to preclude or minimize any adverse consequences of such actions, if taken.

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## Project's Schedule Presents Other Management Concerns

AOC's schedule presents other management issues, including some that we have discussed in earlier testimonies.

- AOC tied the date for opening the CVC facility to the public to September 15, 2006, the date in the sequence 2 contract for completing the base project's construction. Joining these two milestones does not allow any time for addressing unexpected problems in completing the construction work or in preparing for operations. AOC has since proposed opening the facility to the public on December 15, 2006, but the schedule does not yet reflect this proposed revision. Specifically, on September 6, 2005, AOC told Capitol Preservation Commission representatives that it was still expecting the CVC base project to be substantially completed by September 15, 2006, but it proposed to postpone the facility's opening for 3 months to provide time to finish testing CVC systems, complete punch-list work, and prepare for operating the facility. In our view, allowing some time to address unexpected problems is prudent.



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- AOC's and its contractors' reassessment of activity durations in the August schedule may not be sufficiently rigorous to identify all those that are unrealistic. In reassessing the project's schedule, the construction management contractor found some durations to be reasonable that we considered likely to be too optimistic. Recently, AOC's sequence 2 and construction management contractors reported that, according to their reassessment, the durations for interior stonework were reasonable. We previously found that these durations were optimistic, and CVC project staff we interviewed in August likewise believed they were unrealistic.
  - We have previously expressed concerns about a lack of sufficient or timely analysis and documentation of delays and their causes and determination of responsibility for the delays, and we recommended that AOC perform these functions more rigorously. We have not reassessed this area recently. However, given the project's uncertain schedule, we believe that timely and rigorous analysis and documentation of delays and their causes and determination of responsibility for them are critical. We plan to reexamine this area again in the next few weeks.
  - The uncertainty associated with the project's construction schedule increases the importance of having a summary schedule that integrates the completion of construction with preparations for opening the facility to the public, as the Subcommittee has requested and we have recommended.<sup>6</sup> Without such a schedule, it is difficult to determine whether all necessary activities have been identified and linked to provide for a smooth opening or whether CVC operations staff will be hired at an appropriate time. In early September, AOC gave a draft operations schedule to its construction management contractor to integrate into the construction schedule.
  - As we noted in our July 14 testimony, AOC could incur additional costs for temporary work if it opens the CVC facility to the public before the construction of the House and Senate expansion spaces is substantially complete. As of last week, AOC's contractors were still evaluating the construction schedule for the expansion spaces, and it was not clear what needs AOC would have for temporary work. The schedule, which we received in early September, shows December 2006 as the date for completing the construction of the expansion spaces. We have not yet assessed the likelihood of the contractor's meeting this date.

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<sup>6</sup>See, for example, [GAO-05-714T](#).

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- Finally, we are concerned about the capacity of the Capitol Power Plant (CPP) to provide adequately for cooling, dehumidifying, and heating the CVC facility during construction and when it opens to the public. Delays in completing CPP's ongoing West Refrigeration Plant Expansion Project, the removal from service of two chillers because of refrigerant gas leaks, fire damage to a steam boiler, management issues, and the absence of a CPP director could potentially affect CPP's ability to provide sufficient chilled water and steam for the CVC facility and other congressional buildings. These issues are discussed in greater detail in appendix III.

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### **Actions Are Needed and Being Taken to Move the Project Forward and Address Concerns**

Since the Subcommittee's July 14 CVC hearing, we have discussed a number of actions with AOC officials that we believe are necessary to address problems with the project's schedule and our concerns. AOC generally agreed with our suggestions, and a discussion of them and AOC's responses follows.

- By October 31, 2005, work with all relevant stakeholders to reassess the entire project's construction schedule, including the schedule for the House and Senate expansion spaces, to ensure that all key activities are included, their durations are realistic, their sequence and interrelationships are appropriate, and sufficient resources are shown to accomplish the work as scheduled. Specific activities that should be reassessed include testing, balancing, and commissioning the HVAC and filtration systems; testing the fire protection system; constructing the utility tunnel; installing the East Front mechanical (HVAC) system; installing interior stonework and completing finishing work (especially plaster work); fabricating and delivering interior bronze doors; and fitting out the gift shops. AOC agreed and has already asked its construction management and sequence 2 contractors to reassess the August schedule. AOC has also asked the sequence 2 contractor to show how it will recover time lost through delays.
- Carefully consider the costs, benefits, and risks associated with proposals to change the project's scope, modify the quality of materials, or accelerate work, and ensure that appropriate management controls are in place to prevent or minimize any adverse effects of such actions. AOC agreed. It noted that the sequence 2 contractor had already begun to work additional hours to recover lost time on the utility tunnel. AOC also noted that its construction management contractor has an inspection process in place to identify problems with quality and has recently enhanced its efforts to oversee worker safety.

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- Propose a CVC opening date to Congress that allows a reasonable amount of time between the completion of the base project's construction and the CVC facility's opening to address any likely problems that are not provided for in the construction schedule. The December 15, 2006, opening date that AOC proposed earlier this month would provide about 90 days between these milestones if AOC meets its September 15, 2006, target for substantial completion. However, we continue to believe that AOC will have difficulty meeting the September 15 target, and although the 90-day period is a significant step in the right direction, an even longer period is likely to be needed.
  - Give priority attention to effectively implementing our previous recommendations that AOC (1) analyze and document delays and the reasons and responsibility for them on an ongoing basis and analyze the impact of scope changes and delays on the project's schedule at least monthly and (2) advise Congress of any additional costs it expects to incur to accelerate work or perform temporary work to advance the CVC facility's opening so Congress can weigh the advantages and disadvantages of such actions. AOC agreed.

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## Project Costs and Funding Provided as of September 2005

AOC is still updating its estimate of the cost to complete the CVC project, including the base project and the House and Senate expansion spaces. As a result, we have not yet had an opportunity to comprehensively update our November 2004 estimate that the project's estimated cost at completion will likely be between \$515.3 million without provision for risks and uncertainties and \$559 million with provision for risks and uncertainties. Since November 2004, we have added about \$10.3 million to our \$515.3 million estimate to account for additional CVC design and construction work. (App. IV provides information on the project's cost estimates since the original 1999 estimate.) However, our current \$525.6 million estimate does not include costs that AOC may incur for delays beyond those delay costs included in our November 2004 estimate. Estimating the government's costs for delays that occurred after November 2004 is difficult because it is unclear who ultimately will bear responsibility for various delays. Furthermore, AOC's new estimates may cause us to make further revisions to our cost estimates.

To date, about \$528 million has been provided for CVC construction. (See app.V.) This amount does not include about \$7.8 million that was made

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available for either CVC construction or operations.<sup>7</sup> In late August, we and AOC found that duplicate funding had been provided for certain CVC construction work. Specifically, about \$800,000 was provided in two separate funding sources for the same work. The House and Senate Committees on Appropriations were notified of this situation and AOC's plan to address it. The funding that has been provided and that is potentially available for CVC construction covers the current estimated cost of the facility at completion and provides some funds for risks and uncertainties. However, if AOC encounters significant additional costs for delays or other changes, more funding may be needed.

Because of the potential for coordination problems with a project as large and complex as CVC, we had recommended in July that AOC promptly designate responsibility for integrating the planning and budgeting for CVC construction and operations. In late August, AOC designated a CVC staff member to oversee both CVC construction and operations funding. AOC had also arranged for its operations planning consultant to develop an operations preparation schedule and for its CVC project executive and CVC construction management contractor to prepare an integrated construction and operations schedule. AOC has received a draft operations schedule and has given it to its construction management contractor to integrate into the construction schedule. Pending the hiring of an executive director for CVC, which AOC would like to occur by the end of January 2006, the Architect of the Capitol said he expects his Chief Administrative Officer, who is currently overseeing CVC operations planning, to work closely with the CVC project executive to integrate CVC construction and operations preparations.

Work and costs could also be duplicated in areas where the responsibilities of AOC's contractors overlap. For example, the contracts or planned modification for both AOC's CVC construction design contractor and CVC operations contractor include work related to the gift shop's design and wayfinding signage. We discussed the potential for duplication with AOC, and it agreed to work with its operations planning contractor to clarify the contractor's scope of work, eliminate any duplication, and adjust the operations contract's funding accordingly.

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<sup>7</sup>Public Law 108-447, enacted in December 2004, provided that up to \$10.6 million could be so transferred upon the approval of the House and Senate Committees on Appropriations for the use of the CVC project. In June 2005, AOC received approval to use about \$2.8 million of this \$10.6 million, leaving a balance of about \$7.8 million that can be used in the future.

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Mr. Chairman, this concludes our statement. We would be pleased to answer any questions that you or Members of the Subcommittee may have.

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## Contacts and Acknowledgments

For further information about this testimony, please contact Bernard Ungar at (202) 512-4232 or Terrell Dorn at (202) 512-6923. Other key contributors to this testimony include Shirley Abel, Michael Armes, John Craig, George Depaoli, Jr., Maria Edelstein, Elizabeth Eisenstadt, Brett Fallavollita, Jeanette Franzel, Jackie Hamilton, Bradley James, Scott Riback, and Kris Trueblood.

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# Appendix I: Risk Assessment Methodology

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With the assistance of a contractor, Hulett & Associates, we assessed the risks associated with the Architect of the Capitol's (AOC) July 2005 schedule for the Capitol Visitor Center (CVC) project and used the results of our assessment to estimate a time frame for completing the base CVC project with and without identified risks and uncertainties.<sup>1</sup> In August 2005, we and the contractor interviewed project managers and team members from AOC and its major CVC contractors, a representative from the Army Corps of Engineers, and AOC's Chief Fire Marshal to determine the risks they saw in completing the remaining work and the time they considered necessary to finish the CVC project and open it to the public. Using the project's July 2005 summary schedule (the most recent schedule available when we did our work), we asked the team members to estimate how many workdays would be needed to complete the remaining work. More specifically, for each summary-level activity that the members had a role or expertise in, we asked them to develop three estimates of the activity's duration—the least, most likely, and longest time needed to complete the activity. We planned to estimate the base project's most likely completion date without factoring in risks and uncertainties using the most likely activity durations estimated by the team members. In addition, using these three-point estimates and a simulation analysis to calculate different combinations of the team's estimates that factored in identified risks and uncertainties, we planned to estimate completion dates for the base project at various confidence levels.

In August 2005, AOC's construction management and sequence 2 contractors were updating the July project schedule to integrate the construction schedule for the House and Senate expansion spaces, reflect recent progress and problems, and incorporate the results to date of their reassessment of the time needed for testing, balancing, and commissioning the heating, ventilation and air-conditioning, (HVAC) system and for fire alarm testing.<sup>2</sup> This reassessment was being done partly to implement a recommendation we had made to AOC after assessing the project's schedule in early 2004 and finding that the scheduled durations for these and other activities were optimistic. AOC's construction management and

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<sup>1</sup>We did not include the schedule for work on the House and Senate expansion spaces in our assessment because the schedule was not completed in time for analysis before the Subcommittee's September hearing.

<sup>2</sup>AOC's sequence 2 contractor was unable to integrate the detailed schedule for the expansion spaces into the overall project schedule because of a number of problems, but plans to do so in the September schedule.

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sequence 2 contractors found that key detailed activities associated with the HVAC system had not been included in the schedule and that the durations for a number of activities were not realistic. Taking all of these factors into account, AOC's contractors revised the project's schedule in August. AOC believes that the revised schedule, which shows the base project's completion date slipping by several months, allows too much time for the identified problems. As a result of this problem and others we brought to AOC's attention, AOC has asked its contractors to reassess the schedule. AOC's construction management contractor believes that such a reassessment could take up to 2 months. In our opinion, there are too many uncertainties associated with the base project's schedule to develop reliable estimates of specific completion dates, with or without provisions for risks and uncertainties.

# Appendix II: Capitol Visitor Center Critical Construction Milestones, July-September 2005

Activity	Location	Scheduled completion	Actual completion
Wall Stone Area 8 Layout	Great Hall	6/20/05	7/25/05
Wall Stone Area 9 Layout	Great Hall	6/24/05	7/28/05
Wall Stone Area 3a	Great Hall	7/06/05	7/22/05
Wall Stone Area 2a	Great Hall	7/06/05	7/25/05
Drill/Set Soldier Piles Sta. 0:00-1:00	Utility Tunnel	6/08/05	
Wall Stone Area 9 Pedestals	Great Hall	7/05/05	
Wall Stone Area 1	Cong. Auditorium	8/08/05	
Wall Stone Area 2	Cong. Auditorium	8/22/05	
Bridge Over First Street	Utility Tunnel	8/02/05	8/12/05
Wall Stone Area 3	Cong. Auditorium	9/06/05	
Excavate and Lag Stations 1:00-2:00	Utility Tunnel	8/02/05	8/24/05
Wall Stone Area 4a	Great Hall	7/15/05	8/30/05
Excavate and Shore Sta. 0:00-1:00	Utility Tunnel	7/21/05	
Concrete Working Slab First Street	Utility Tunnel	7/26/05	
Waterproof Working Slab Sta. 0:00-1:00	Utility Tunnel	7/29/05	
Wall Stone Area 9 Base	Great Hall	7/15/05	

Source: AOC's April 2005 CVC sequence 2 construction schedule for the scheduled completion dates and AOC and its construction management contractor for the actual completion dates.

Note: Actual completion information was obtained on September 8, 2005.

\*These activities are not critical. All other activities were critical in the April schedule or became critical in subsequent schedules.



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# Appendix III: Issues Affecting the Capitol Power Plant's Cooling and Heating Capacity

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Several issues could affect the capacity of the Capitol Power Plant (CPP) to provide sufficient chilled water and steam for the CVC facility and other congressional buildings. CPP produces chilled water for cooling and dehumidification and steam for heating Capitol Hill buildings.<sup>1</sup> To accommodate the CVC facility and meet other needs, CPP has been increasing its production capacity through the West Refrigeration Plant Expansion Project. This project, which was scheduled for completion in time to provide chilled water for the CVC facility during construction and when it opened, has been delayed. In addition, problems with aging equipment, fire damage, management weaknesses, and a leadership vacancy could affect CPP's ability to provide chilled water and steam. More specifically:

- In July, two chillers in CPP's East Refrigeration Plant were taken out of service because of a significant refrigerant gas leak. The refrigerant, whose use is being phased out nationally, escaped into the surrounding environment. Because of the chillers' age and use of an outdated refrigerant, AOC has determined that it would not be cost-effective to repair the chillers. CPP's chilled water production capacity will be further reduced between December 1, 2005, and March 15, 2006, when the West Refrigeration Plant is to be shut down to enable newly installed equipment to be connected to the existing chilled water system. However, the remainder of CPP's East Refrigeration Plant is to remain operational during this time, and AOC expects that the East Refrigeration Plant will have sufficient capacity to meet the lower wintertime cooling demands. Additionally, CPP representatives indicated that they could bring the West Refrigeration Plant back online to provide additional cooling capacity in an emergency. CPP is developing a cost estimate for this option.
- In June, one of two CPP boilers that burn coal to generate steam was damaged by fire. According to a CPP incident report, CPP operator errors contributed to the incident and subsequent damage. Both boilers were taken off-line for scheduled maintenance between July 1 and September 15, and CPP expects both boilers to be back online by September 30, thereby enabling CPP to provide steam to CVC when it is needed.
- Several management issues at CPP could further affect the expansion plant's and CPP's operational readiness:

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<sup>1</sup>The Capitol Power Plant is no longer used to generate electric power, but it does generate steam and chilled water to serve the heating and cooling needs of the U.S. Capitol and 23 surrounding facilities. These facilities include about 16 million square feet.

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- CPP has not yet developed a plan for staffing and operating the entire plant after the West Refrigeration Plant becomes operational or contracted for its current staff to receive adequate training to operate the West Refrigeration Plant's new, much more modern equipment.
  - CPP has not yet received a comprehensive commissioning plan from its contractor.
  - A number of procurement issues associated with the plant expansion project have arisen. We are reviewing these issues.
  - CPP has been without a director since May 2005, when the former director resigned. CPP is important to the functioning of Congress, and strong leadership is needed to oversee the completion of the expansion project and the integration, commissioning, and operation of the new equipment, as well as address the operational and management problems at the plant. Filling the director position with an experienced manager who is also an expert in the production of steam and chilled water is essential. AOC recently initiated the recruitment process.

# Appendix IV: Cost Growth for the CVC Project

Dollars in millions			
Factors	Cost increase	Subtotal	Total
Project budget, original (1999)			<b>\$265.0</b>
Factors beyond or largely beyond AOC's control			
5 additional scope items <sup>a</sup>	\$29.7		
House and Senate expansion spaces	70.0		
Air filtration system funded by Dep't. of Defense (DOD)	33.3		
Enhanced fire safety and security	13.7		
		\$146.7	
Bid prices exceeding estimates, preconstruction costs exceeding budgeted costs, unforeseen field conditions,	46.0		
		46.0	
Other factors (costs associated with delays and design-to-budget overruns)		57.6	<b>250.3</b>
Project budget after increases (as of November 2004)			<b>\$515.3</b>
GAO-projected costs to complete after proposed scope changes (as of June 2005, excluding risks and uncertainties) <sup>b</sup>		7.2	<b>\$522.5</b>
Additional cost-to-complete items (as of August 2005)			
Design of the Library of Congress tunnel (Funds from Capitol Preservation Fund)	0.7		
Wayfinding fabrication and installation	1.0		
Gift shop design	0.1		
Gift shop construction and fit-out	1.3		
GAO-projected costs to complete (as of August 2005, excluding risks and uncertainties) <sup>c</sup>		3.1	<b>\$525.6</b>
Potential additional costs associated with risks and uncertainties (as of November 2004) <sup>d</sup>	43.5		
Less: Risks and uncertainties GAO believes the project faced in November 2004 [Congressional seals, orientation film, and backpack storage space (\$4.2) + US Capitol Police security monitoring (\$3.0)]	(7.2)		
Less: Additional cost-to-complete items (as of August 2005)	(3.1)		
Potential remaining costs related to risks and uncertainties		33.2	
GAO estimate of total cost to complete			<b>\$558.8</b>

Sources: AOC and its contractors.

<sup>a</sup>The five additional scope items are the House connector tunnel, the East Front elevator extension, the Library of Congress tunnel, temporary operations, and enhanced perimeter security.

<sup>b</sup>The proposed scope changes totaling \$7.2 million include \$4.2 million for congressional seals, an orientation film, and backpack storage space and \$3 million for U.S. Capitol Police security monitoring.

<sup>c</sup>Because of rounding dollars in tenths of millions, this estimate excludes \$2,892 for CVC ceremonial groundbreaking activities.

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<sup>d</sup>Risks and uncertainties can include shortages in skilled stone masons and stone, security and life safety changes, unknown operator requirements, unforeseen conditions, and contractor coordination issues.

# Appendix V: Current Funding Provided to the CVC Project

Dollars in millions			
Project	Funding	Subtotal	Total
Funding as of June 2005			
<b>Base project (as of November 2004)</b>			<b>\$351.1</b>
Expansion spaces			
House	\$35.0		
Senate	35.0		
		\$70.0	
Filtration system	33.3		
US Capitol Police security monitoring	3.0		
		36.3	
Transfer of emergency response funds	26.3		
<b>Current funding provided (as of June 2005) <sup>a</sup></b>			<b>\$483.7</b>
Funding provided for FY 2006 <sup>b c</sup>		41.9	
Design of Library of Congress tunnel (funds from the Capitol Preservation Fund) <sup>b</sup>		0.7	
Construction-related funding provided in operations obligation plan:			
Gift shop <sup>b</sup>	0.7		
Wayfinding <sup>b c</sup>	0.3		
Commissioning systems <sup>b c</sup>	0.2		
Miscellaneous design and construction <sup>b c</sup>	0.4		
Construction-related funding provided in operations		1.6	
Other funding provided		2.3	
Additional funding			<b>44.2</b>
<b>Current funding provided (as of August 2005) <sup>d</sup></b>			<b>\$527.9</b>

Sources: Legislation, Conference Reports, and AOC.

<sup>a</sup>Because of rounding dollars in tenths of millions, the \$483.7 million does not include \$2,892 made available by the Capitol Preservation Commission from the Capitol Preservation Fund in October 2000 for the groundbreaking ceremony.

<sup>b</sup>Fiscal year 2006 CVC construction funding does not include some construction-related items funded from other sources. Funds for these items include \$700,000 for the Library of Congress tunnel provided by the Capitol Preservation Fund and \$1.6 million provided in CVC's June 2005 operations obligation plan. The \$1.6 million is part of the \$10.6 million made available in December 2004 by Public Law 108-447 for both CVC construction and operations.

<sup>c</sup>Funds were provided for certain items that duplicated funding already provided in fiscal year 2006 CVC construction funding. The \$41.9 million represents fiscal year 2006 funding made available for CVC construction-related activity. Included in this \$41.9 million fiscal year 2006 funding are some construction-related items (i.e., \$150,000 for wayfinding design, \$232,000 for commissioning systems, and \$423,000 for miscellaneous design and construction) totaling \$805,000 for which AOC received the duplicative funding. These items had also been included in the \$2.8 million operations obligation plan approved in June 2005. AOC has stated that it will not use fiscal year 2006 funding for these items. Thus, \$805,000 of the \$41.9 million fiscal year 2006 funding will be available for other uses.

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<sup>d</sup>Two construction-related items have not yet been fully funded. These are the gift shop construction (approximately \$771,000) and wayfinding fabrication and installation (approximately \$800,000).

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