

GAO

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CAPITOL VISITOR CENTER

Update on Status of Projects's Schedule and Cost As of May 24, 2006

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Physical Infrastructure Issues



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 the Architect of the Capitol's (AOC) progress in achieving selected project milestones and in managing the project's schedule since the Subcommittee's April 27, 2006, hearing on the project.¹ As part of this discussion, we will address a number of key challenges and risks that continue to face the project, as well as actions AOC has taken or plans to take to address these risks. In addition, we will discuss the status of the project's costs and funding.

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 the CVC team (AOC and its major CVC contractors), AOC's Chief Fire Marshal, and representatives from the U.S. Capitol Police. We also reviewed AOC's construction management contractor's periodic schedule assessments and daily reports on the progress of interior wall and floor stonework.

In summary:

Since the Subcommittee's April 27 CVC hearing, the CVC team has continued to move the project's construction forward, and AOC is still proposing the same opening dates—April 2007 for the base CVC project and May 2007 for the House and Senate expansion spaces—but we continue to believe, as we said at the March and April hearings, that the proposed opening dates do not allow enough time to complete several critical activities and to address problems, challenges, risks, and uncertainties. Since the April 27 hearing, the installation of critical interior wall and floor stone has continued, together with other interior and exterior construction work, and the sequence 2 contractor has further developed plans to prevent trade stacking² during finish work. Although

¹GAO, *Capitol Visitor Center: Update on Status of Project's Schedule and Cost as of April 27, 2006*, [GAO-06-665T](#) (Washington, D.C.: Apr. 27, 2006).

²Trade stacking can occur when workers from different trades, such as stone masons, electricians, plumbers, or plasterers, have to work in the same area at the same time to meet a schedule, sometimes making it difficult to ensure sufficient space and resources for concurrent work.

the sequence 2 contractor exceeded its installation target for interior wall stone during the last 4 weeks, the pace of floor stone installation remained far below the targeted pace; the dates for completing the construction of the overall base project and expansion spaces were extended; and several activities fell behind schedule—not enough to affect the overall completion dates based on the project schedule, but increasing the potential for future delays. In addition, the sequence 2 contractor met only one of the nine milestones being tracked for this hearing, and this contractor's monthly billings continue to indicate that construction work is not likely to be completed on schedule as AOC anticipated. The CVC's fire protection system has not yet been approved; critical building systems still have to be commissioned and tested; and although the project's overall design is essentially complete, certain design or work scope elements are still incomplete or are being clarified or refined. If the CVC team is successful in addressing these issues, we believe that the base CVC project can still possibly be opened to the public with a temporary cap on visitor occupancy in May 2007 and that the expansion spaces can likely be opened for occupancy beginning in mid-August to early September 2007. AOC may be able to reduce some of the time scheduled for the expansion spaces if it implements a phased opening plan and is able to perform acceptance testing of the CVC and the expansion spaces concurrently rather than sequentially—possibilities AOC is continuing to explore. However, the delays that have occurred since the Subcommittee's last CVC hearing compound the concern we previously expressed that AOC will be challenged to meet even the later dates we are projecting because of the problems, challenges, risks, and uncertainties facing the project. Accordingly, as we indicated during the Subcommittee's April 27 CVC hearing, we plan to reassess the project's schedule again this summer.

As we reported at the Subcommittee's March 15 and April 27 CVC hearings, we estimate that the total cost to complete the entire CVC project is about \$556 million without an allowance for risks and uncertainties and \$584 million with such an allowance. To date, about \$530 million has been provided for CVC construction. We continue to estimate that AOC will need about \$25.6 million more in CVC construction funds to complete the entire CVC project. This estimate does not allow for risks and uncertainties and takes into account funding that AOC plans to use from existing appropriations. In addition, as we indicated during the March 15 hearing, AOC preliminarily expects to need about \$950,000 in fiscal year 2007 AOC general administration appropriations that Congress has not yet provided. These funds are needed to pay for contractual support necessary to complete acceptance testing of the facility's fire protection system in time to meet the project's schedule. AOC plans to

determine if it can reduce the amount needed for this contractual support; we will keep the Subcommittee apprised of this situation. Furthermore, the CVC is likely to incur additional costs because of recent scope and design changes related to its security and fire protection systems and problems associated with the utility tunnel; however, our \$556 million cost-to-complete estimate may include sufficient contingency funds to cover these costs. We plan to reassess our cost-to-complete estimate this summer and will keep the Subcommittee apprised of our results.

AOC Has Moved Construction Forward, but Delays Continue and Risks and Uncertainties Remain

AOC and its contractors have continued to make progress in a number of areas since the Subcommittee's last CVC hearing, particularly in installing wall stone in the auditorium, the orientation and security lobby, and the south atrium. However, some milestones were pushed back in April. For example, according to AOC's April 2006 schedule, the base CVC project will have a temporary certificate of occupancy on February 23, 2007, 2 workdays later than indicated in the March 2006 schedule, and the House and Senate expansion spaces will be substantially complete on January 10, 2007, 15 workdays later than indicated in the March 2006 schedule. In addition, since the Subcommittee's last CVC hearing, AOC revised the schedule logic to remove a link between penthouse mechanical work and work associated with pretesting the East Front's fire alarm system. AOC removed this link—pending approval by AOC's Chief Fire Marshal—because the penthouse mechanical work is being done as an improvement to the Capitol Building and is not within the scope of the CVC project, although the work does affect the CVC. According to AOC's construction management contractor, if AOC had not removed this link, it would have had to extend the CVC's substantial completion date by 5 workdays because the penthouse mechanical work was delayed during April.³ AOC is still proposing an April 2007 opening date for the base project and a May 2007 occupancy date for the expansion spaces—dates that it believes will accommodate possible delays and allow start-up time for operations. AOC expects all construction work in the CVC, East Front, and expansion spaces to be completed by the April opening date for the base project, but

³Although the penthouse mechanical work, which includes the replacement of air handling units on the Capitol roof and related work, has been a separate project, it is related to the CVC because it will serve the East Front space that visitors will travel through to get from the CVC to the Capitol Building. AOC's removal of the linkage will require the Chief Fire Marshal's approval because certain elements of the East Front's fire protection system are not expected to be ready for testing until after the testing of the CVC's fire protection system begins.

the CVC's occupancy at any one time will be temporarily limited to 3,500, compared with about 4,200, the normal anticipated occupancy level.⁴ The delays that have occurred since the Subcommittee's March 15 CVC hearing, coupled with the challenges, risks, and uncertainties that continue to face the project, have heightened our concerns about AOC's ability to open the CVC to the public in April 2007. Consequently, as we indicated during our April 27 testimony, we plan to reassess the project's schedule again this summer.

Our Analysis Indicates Later Opening Dates Than AOC Is Proposing

We continue to believe, as we testified in April, that the CVC is not likely to be ready for opening with a temporary certificate of occupancy before May 2007, about a month later than AOC is proposing. Our projected opening date is somewhat later than AOC's because (1) delays in completing interior stonework have delayed follow-on work for the base project and East Front, (2) delays have been continuing in other critical work, such as the utility tunnel, the fire protection system, and certain work in the expansion spaces; and (3) CVC team managers and members and AOC's Chief Fire Marshal believe that certain other work, such as finish work and acceptance testing of the CVC's fire protection system, will take more time than is scheduled to complete. Our projection also assumes that AOC will be able to address the challenges it faces and takes into account the time AOC believes is necessary to prepare for operations after construction work is completed. However, the delays in March and April raise concerns about AOC's ability to fully overcome these challenges. Similarly, we continue to believe that the House and Senate expansion spaces are more likely to be ready in mid-August or early September 2007 than in April or May 2007, as AOC is proposing. We consider the later time frames for the expansion spaces more likely for three reasons. First, AOC has scheduled the acceptance testing of the expansion spaces after the acceptance testing of the base project and, according to our analysis, the base project's testing will take longer than scheduled. Second, AOC's Chief Fire Marshal believes the acceptance testing of the expansion spaces will take longer than scheduled. Third,

⁴This temporary limit will be necessary because the "horizontal exits," or passages, through the expansion spaces, which the life safety code requires for exiting the base CVC project, will not be available until later. These horizontal exits cannot be used until the fire alarm system in the expansion spaces has been fully tested and accepted—work that is not slated to be completed until after the base CVC is scheduled to open. Some additional work will likely be required to provide temporary emergency exit routes from the CVC, but the CVC team does not believe that this work or its costs should be substantial.

several activities important to the on-time completion of expansion space work slipped in March and April; and at this time, the sequence 2 subcontractor responsible for this work believes that additional slippages in some of these activities are likely or possible. However, AOC has begun to address the problems affecting the progress of the expansion spaces and plans to reassess this situation as the construction work proceeds. The expansion spaces could be ready sooner than late summer 2007 if AOC succeeds in addressing the problems and starts acceptance testing sooner or opens the expansion spaces in phases—possibilities that AOC is continuing to explore.

Construction Work Is Progressing

According to AOC's construction management contractor, work on the project has advanced, in terms of both the dollar value of the work in place and individual project elements. In dollar terms, the overall CVC project was about 81 percent complete and the sequence 2 work was about 70 percent complete as of April 30—up from about 79 percent and 67 percent, respectively, as of March 31. Additionally, wall stone installation progressed substantially in the orientation and security lobby and in the south atrium and auditorium and continued in other areas, such as the great hall and the East Front's basement level. AOC's construction management contractor reported additional progress in the CVC's interior, including drywall installation in the great hall, the utility and House connector tunnels, and the House and Senate expansion spaces. AOC's construction management contractor also reported progress in the installation of stone pavers on the plaza over the auditorium. Finally, according to the construction management contractor, the CVC's electrical work continues to be ahead of schedule.

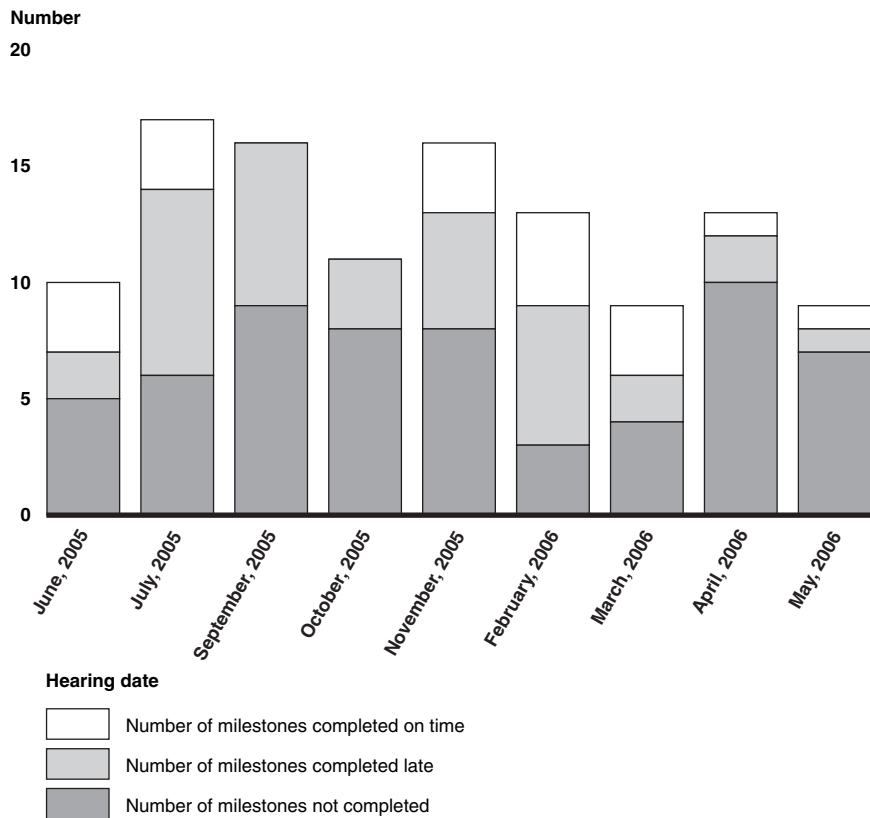
Indicators Raise Questions about Proposed Opening Dates

Despite the progress in these areas, problems and delays occurred in other areas, and several indicators of construction progress that we have been tracking for the Subcommittee continue to indicate that construction work is likely to be completed later than AOC currently anticipates. An update on these indicators follows.

Sequence 2 contractor continues to miss milestones, and completion dates are extended. Starting with the Subcommittee's June 2005 CVC hearing, at the Subcommittee's request, we and AOC have been selecting and tracking sequence 2 milestones to help the Subcommittee monitor construction progress. These milestones include activities that are either on the project's critical path or that we and AOC believe are critical to the project's timely completion. As figure 1 shows, the sequence 2 contractor has generally missed these milestones. For today's hearing, nine of these milestones were due to be completed, according to the project's January

2006 schedule. One was completed ahead of schedule; one was late; and none of the remaining seven had been completed as of May 22. (See app. I.) AOC's construction management contractor said that the sequence 2 contractor missed the milestones for reasons such as a need to do remedial or preparatory work in the East Front and the upper orientation and security lobby before installing wall stone, utility tunnel delays, and a lack of wall stone due to a change in the type of stone to be used.

Figure 1: Sequence 2 Contractor's Progress in Meeting Selected Milestones as of CVC Hearing Dates



Source: Sequence 2 contractor, AOC and its construction management contractor, and GAO.

According to AOC's construction management contractor, the base project's overall completion date fell another 2 workdays behind in April, from February 21 to February 23, 2007. February 13, 2007, was the completion date set in the project's January 2006 schedule, and that completion date was changed to February 21, 2007, in March. The 2-

workday delay in April is the net result of delays in activities on multiple activity paths. In addition, delays occurred on 16 of 21 critical and near-critical paths that AOC's construction management contractor identified as important to meeting the base project's overall completion date.⁵ These delays occurred in, but were not limited to, work on the utility tunnel, the fire protection system, the East Front, the upper level of the orientation and security lobby, the auditorium, the assembly room, and the orientation theaters, and AOC's construction management contractor reported that they ranged from 1 to 33 workdays. According to the CVC team, these project delays occurred for a variety of reasons, such as design changes, problematic sequence 1 work, late submissions of shop drawings, changes in the sequence of work activities by the sequence 2 contractor, and inaccessible work areas. Even more important than the individual delays themselves, however, is their likely impact on the CVC team's ability to complete construction work on schedule. So many activities have now fallen behind schedule that even relatively short additional delays could push back the CVC's overall completion date. According to the construction management contractor, there are eight critical and near-critical activity paths in the project's April schedule that have so little slack time that an additional delay of 1 to 30 workdays could delay the base project's overall completion date. There were nine such paths in the project's March schedule, according to AOC's construction management contractor.

Work on the House and Senate expansion spaces fell 15 workdays behind schedule in March, AOC's construction management contractor reported.⁶ Additionally, and of even greater concern to us, are delays in a number of

⁵Construction projects typically have one critical path, which is the sequence of activities having the longest duration through the schedule. There is no slack time associated with these activities, meaning that a delay in a critical path activity will delay the entire project unless a way is found to reduce the time required for other activities along the critical path. Some projects have multiple critical paths simultaneously; in March, the CVC essentially had two concurrent critical paths—(1) East Front mechanical and (2) East Front fire acceptance testing. According to AOC's construction management contractor, after AOC removed the link with the penthouse mechanical path, as discussed, the base project had one critical path for April—the utility tunnel and air handling units being mechanically ready—and 20 near-critical activity paths, which have little slack time. Generally, the more critical and near-critical activities a project has, the greater is the risk of late completion because there are more opportunities for slight delays that can adversely affect the project's completion.

⁶According to the project's March and April schedules, the date for completing the House and Senate expansion spaces was extended from May 2, 2007, in March to May 25, 2007, in April. The contract completion date for this work is March 12, 2007.

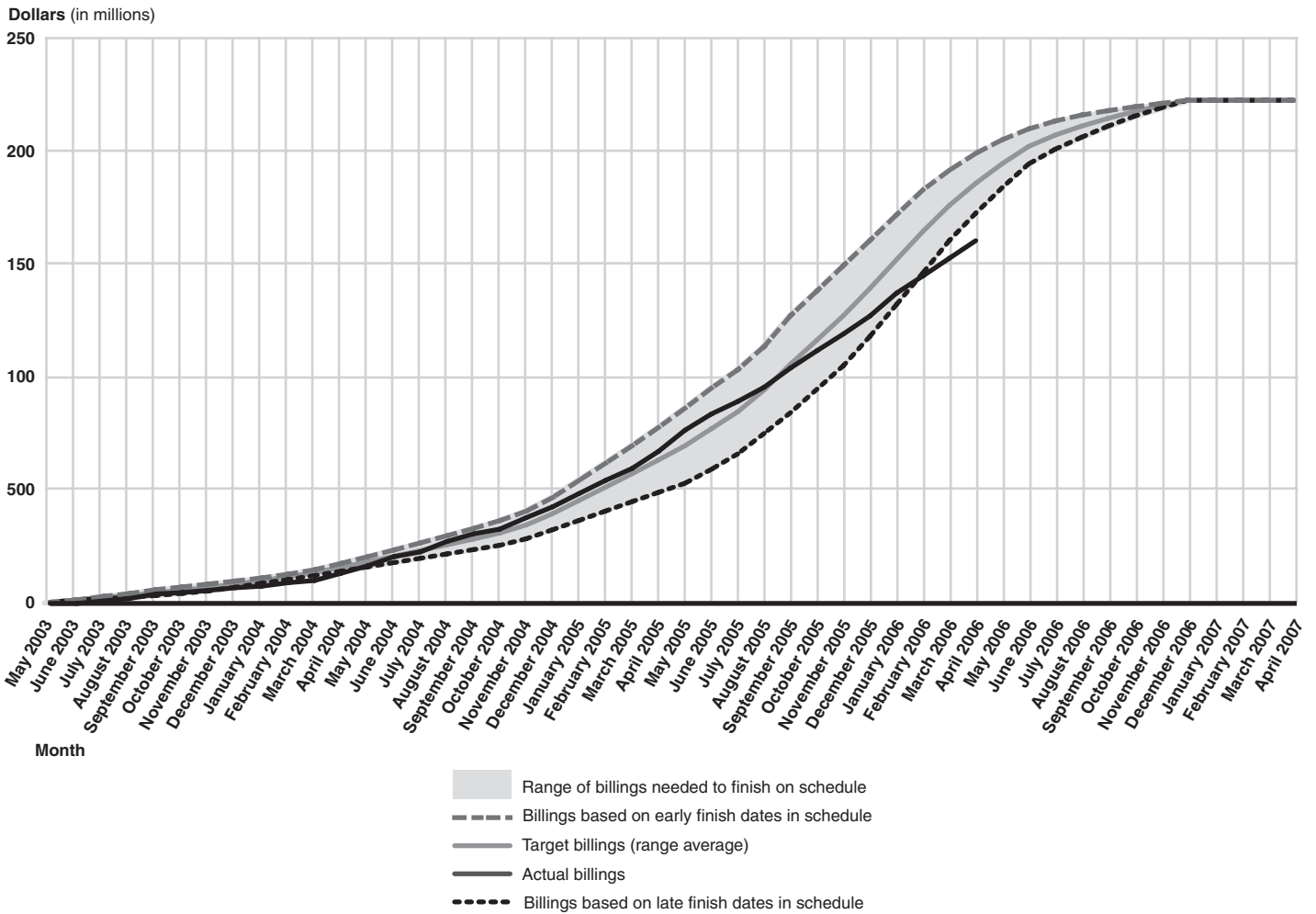
near-critical paths, particularly those paths that will affect the CVC's opening date. Some of the near-critical paths slipped as much as 23 workdays in April, according to the construction management contractor. Among the activities that were delayed in April were the installation of ceiling tile and the commissioning of certain air-handling units needed for the CVC's opening; electrical and audio-visual related work in the Senate lower level; plumbing work in space intended for use by the U.S. Capitol Police; and drywall installation in the House lower and service levels. According to the CVC team, these activities fell behind schedule because of delays in getting design decisions (which were provided at the end of April), problems with site conditions due to sequence 1 or 2 work, and the need to shift crews to do other work.

In early April 2006, we told AOC we were concerned about the increasing number of delays in expansion space activities and the potential impact of these delays on the completion of the expansion space work. As further cause for concern, we noted that the sequence 2 subcontractor doing the expansion space work was expecting additional delays in some of these activities and that, in our view, additional design or scope changes were possible. Although AOC is not planning to open the expansion spaces until May 2007, timely completion of the expansion space work is important because certain expansion space work must be completed before the CVC can be opened to the public. AOC agreed that continued delays in the expansion space work are of concern and recognized that risks and uncertainties associated with the work could cause the work to fall farther behind. AOC has begun to work with the rest of the CVC team to identify and address problems that have arisen and risks that threaten the work's on-time completion.

Value of completed work indicates completion later than scheduled. Another indicator of construction progress that we and AOC's construction management contractor have been tracking is the value of the completed construction work billed to the government each month. Both we and the construction management contractor believe that the sequence 2 contractor's monthly billings, including the bills for March and April 2006, indicate that AOC is not likely to meet its currently scheduled completion date. While this indicator has some limitations (for example, billings lag behind construction and the contract's total value does not include the value of modifications that are beyond modification number 85), it is generally regarded in the construction industry as a useful measure of how likely a project is to be completed on time. Figure 2 compares the sequence 2 contractor's billings since May 2003 with the project's scheduled completion date and indicates that the sequence 2

contractor is not likely to finish construction work by December 2006, as AOC expects, unless the value of completed work increases significantly. We believe that a significant increase will be difficult, given the limited number of areas that will be ready for finish work at any given time.

Figure 2: Total Billings by the Sequence 2 Contractor for the Entire CVC Project Compared with the Billings Needed to Finish Construction Work on Schedule



Source: AOC's construction management contractor.

Notes:

The early and late lines on this figure reflect the cumulative billings that would be required to complete the project through contract modification 85 (\$222.8 million total contract value) by the early and late finish dates shown in the sequence 2 contractor's schedule.

The actual line reflects the sequence 2 contractor's actual monthly billings.

Although bills are typically submitted for payment after work is completed, it is often likely that construction work will be completed on schedule when the actual billing line falls between the early and late lines in the figure. With respect to the CVC, the actual billing line has been trending below, and in March 2006 went below, the late finish line, where it remained in April 2006. Even with the lag in billings, this trend indicates that the amount of work being completed each month is not sufficient to finish the project on schedule.

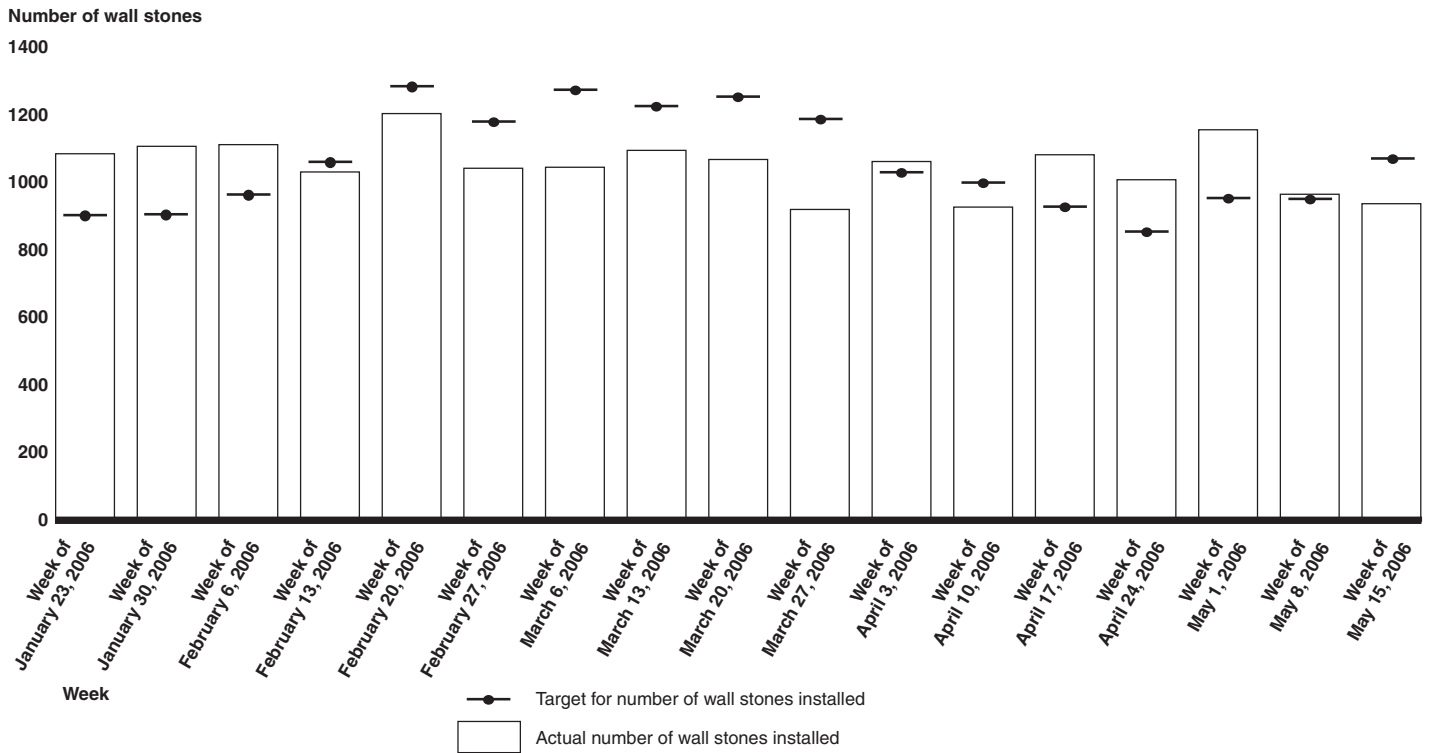
Interior stone installation is progressing, but taking longer than expected. Overall, about 72 percent of the CVC's interior wall stone has been installed, according to AOC's construction management contractor, and the sequence 2 contractor installed 4,082 pieces of interior wall stone during the last 4 weeks, exceeding its 3,817-piece production target. In contrast, during the same period, the sequence 2 contractor installed about 1,885 square feet of floor stone, or about 24 percent of the 7,870 square feet specified in a preliminary floor stone installation plan that the contractor provided to AOC shortly after the February 15 CVC hearing. In addition, 5 of the 9 schedule milestones that AOC and we have been tracking for the Subcommittee for today's hearing are related to interior wall stone installation, and the sequence 2 contractor did not meet any of these 5 milestones. According to the CVC team, the sequence 2 contractor has missed its stone installation targets for a variety of reasons, including the need to correct problematic sequence 1 work or properly prepare certain spaces for the installation of wall or floor stone, a change in wall stone design, late delivery of floor stone for the exhibit gallery, or delays in some spaces in finishing certain work, such as ceiling work, that usually precedes floor stone installation. As we have discussed in the Subcommittee's previous CVC hearings, delays in wall stone installation can lead to additional delays in completing follow-on work, such as floor stone installation and finish work. Although the CVC team has identified unforeseen conditions and problematic sequence 1 work as risks that could affect the pace of wall stone installation, the team's efforts to address the risks have not fully prevented these types of problems from recurring or adversely affecting the project's schedule. Figures 3 and 4 show the sequence 2 contractor's progress in installing interior wall and floor stone since January 23 and February 13, 2006, respectively. Although the sequence 2 contractor has exceeded its aggregate numerical target for wall stone installation since the last CVC hearing, it did not meet the milestones for wall stone installation that we are tracking for the Subcommittee because it had its masons doing noncritical wall stone installation in other areas. The masons were doing this noncritical work while remedial or preparatory work was being performed in the East Front and atrium areas so that wall stone installation could start or continue in those areas, according to AOC's construction management contractor. In addition, wall stone for the remaining work in the upper level orientation

lobby was not yet on site because of a change in the type of stone to be used.

The sequence 2 contractor missed its target for floor stone installation in the exhibit gallery because it ran out of floor stone for that area from May 9 to May 16, just as it did during the week of April 10. According to the sequence 2 contractor, the supplier of floor stone for the exhibit gallery is a small company that has not been able to fabricate the floor stone as quickly as needed. The sequence 2 contractor received an additional shipment on May 16 and was expecting another truckload of exhibit gallery floor stone this week. The final shipment is expected around June 12. The sequence 2 contractor did not expect this delay to adversely affect the overall completion of the exhibit gallery.

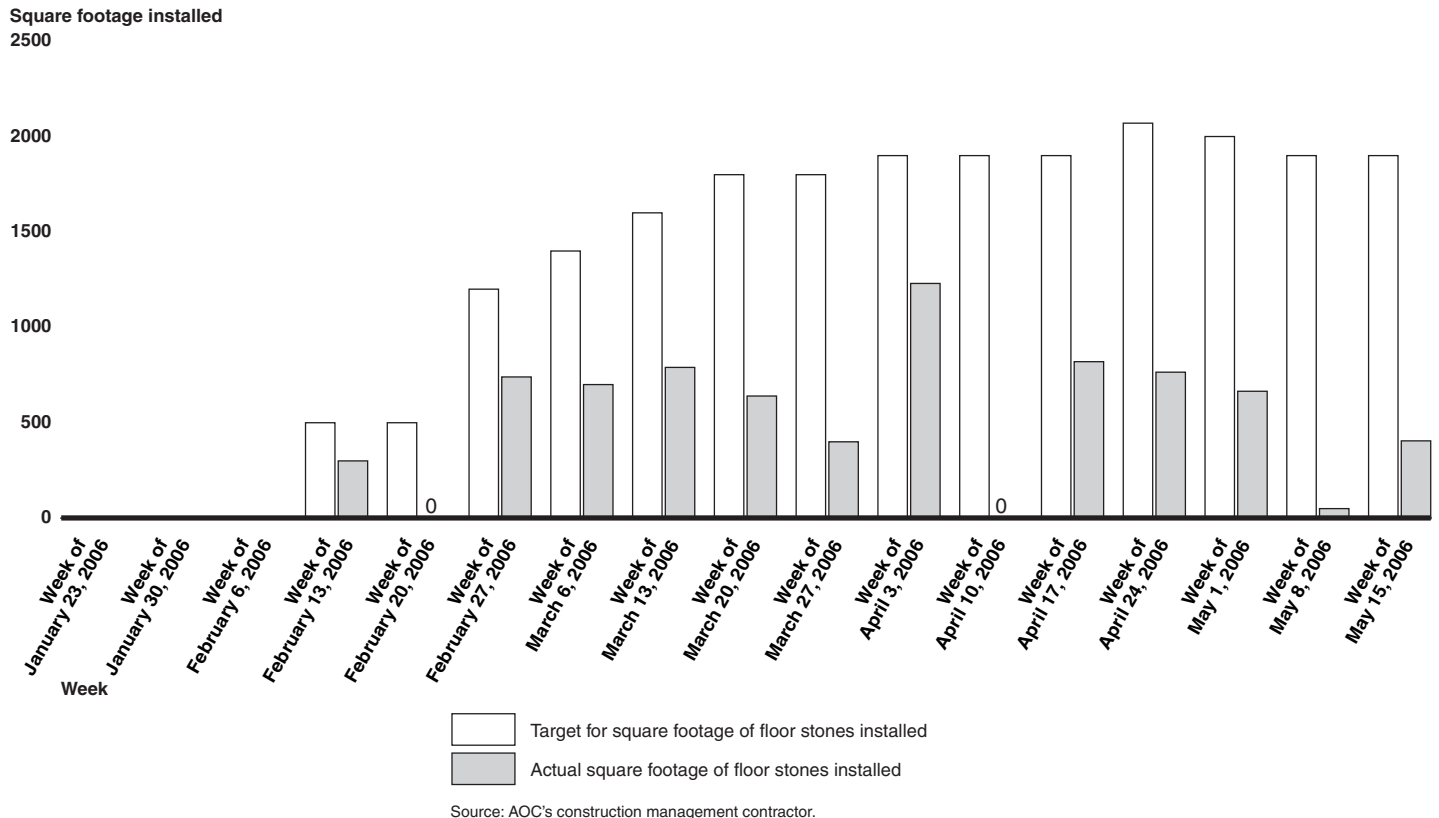
To finish installing floor stone in other areas of the CVC, the sequence 2 contractor said that it (1) plans to move many of the masons installing wall stone to floor stone installation soon and (2) is preparing a new set of targets for floor stone installation. We plan to review the contractor's revised targets when they are completed and will track the contractor's performance against its revised targets for the Subcommittee's subsequent CVC hearings. Finally, AOC's construction management contractor reports that over 60 percent of the CVC's interior floor stone has been fabricated, and the sequence 2 contractor does not anticipate future problems with floor stone supply.

Figure 3: Progress of CVC Interior Wall Stone Installation Compared with Targets Set by the Sequence 2 Contractor



Source: AOC's construction management contractor.

Figure 4: Progress of CVC Interior Floor Stone Installation Compared with Preliminary Targets Set by the Sequence 2 Contractor



Project's Schedule Remains Vulnerable to Problems, Challenges, Risks, and Uncertainties, despite Actions AOC Has Taken and Plans to Take

As we have indicated since the Subcommittee's February 15 CVC hearing, we continue to believe that AOC will be challenged to meet even the later opening dates we have identified, given the problems, challenges, risks, and uncertainties facing the project. A brief update on these and AOC's plans for addressing them follows:

- *Trade stacking could delay completion.* As we discussed during the Subcommittee's previous CVC hearings, trade stacking could hold up finish work, such as drywall or ceiling installation, electrical and plumbing work, plastering, or floor stone installation. This work could be stacked because of delays in wall stone installation. According to AOC's construction management contractor, the pace of wall stone installation has not been sufficient to eliminate the risk of trade stacking and delays in finish work. Such a situation could also increase the risk of accidents and

injuries. Hence, it remains important, as we said at previous CVC hearings, for the CVC team to closely monitor construction to identify potential trade stacking and promptly take steps to address it. The CVC team has also identified trade stacking as a high risk, and in its April progress report, AOC's construction management contractor expressed concern about having enough workers to do ceiling work because much of the wall stone work is to be finished at the same time, making several areas available for ceiling work at the same time. The sequence 2 contractor has developed plans that show when various subcontractors will be working in each area of the CVC except the East Front, which the sequence 2 contractor does not expect to be ready for finish work for several weeks. The sequence 2 contractor has also had its drywall and plaster subcontractor working overtime in the great hall to expedite the work so the scaffolding can be removed and the floor stone installation can begin. According to the sequence 2 contractor, it intends to continue meeting regularly with its subcontractors to review and update the area plans and to have the area plan for the East Front done before finish work begins there. The sequence 2 contractor pointed out that these plans add more detail to the project's schedule and will serve as a tool for addressing the trade-stacking issue. Although we and AOC agree that these area-by-area plans are important and should be helpful, we are still concerned about the potential for trade stacking because of the delays that have already occurred and future delays that could occur in such work as testing, balancing, and commissioning the CVC's air handling units or making changes to the CVC's fire protection system resulting from the Chief Fire Marshal's review of the shop drawings for the system.

- *Complex building systems remain a significant risk.* The CVC will house complex building systems, including systems for heating, air conditioning, and ventilation; fire protection; and security. These systems not only have to perform well individually, but their operation also has to be integrated. If the CVC team encounters any significant problems with their functioning, either individually or together, during commissioning or acceptance testing, the project could be seriously delayed. During the Subcommittee's March 15 CVC hearing, we noted that the sequence 2 contractor planned to submit the shop drawings for the CVC's fire protection system for review by March 17. However, the contractor did not submit the drawings for the base project until the end of April, in part because more time was needed to incorporate changes, AOC's construction management contractor said. The drawings were given to AOC's Chief Fire Marshal on May 1. Delays could arise if the proposed system does not meet the project's design specifications or the fire

protection code's requirements.⁷ AOC's Chief Fire Marshal plans to complete his review of the drawings by June 1. In addition, the Chief Fire Marshal notes that delays could occur if the CVC team does not adequately pretest the system and correct any problems found during the pretesting. On March 23, AOC's commissioning contractor submitted its plan for testing the performance of the CVC's smoke control system, which is a critical component of the CVC's fire protection system and must work properly before the CVC can be opened to the public. This plan has not yet been approved. In addition, as we have previously noted, the Chief Fire Marshal's timely completion of the fire protection system's acceptance testing depends on his ability to obtain sufficient funding for a contractor to help perform the tests. Furthermore, the CVC team recently resolved outstanding issues with the U.S. Capitol Police on the numbers, types, and locations of security equipment to be installed and on the design of the CVC's fire alarm system. According to AOC's construction management contractor, certain changes to the scope of the security work and to the fire alarm system's design resulting from the resolution are likely to set the schedule back to some extent.

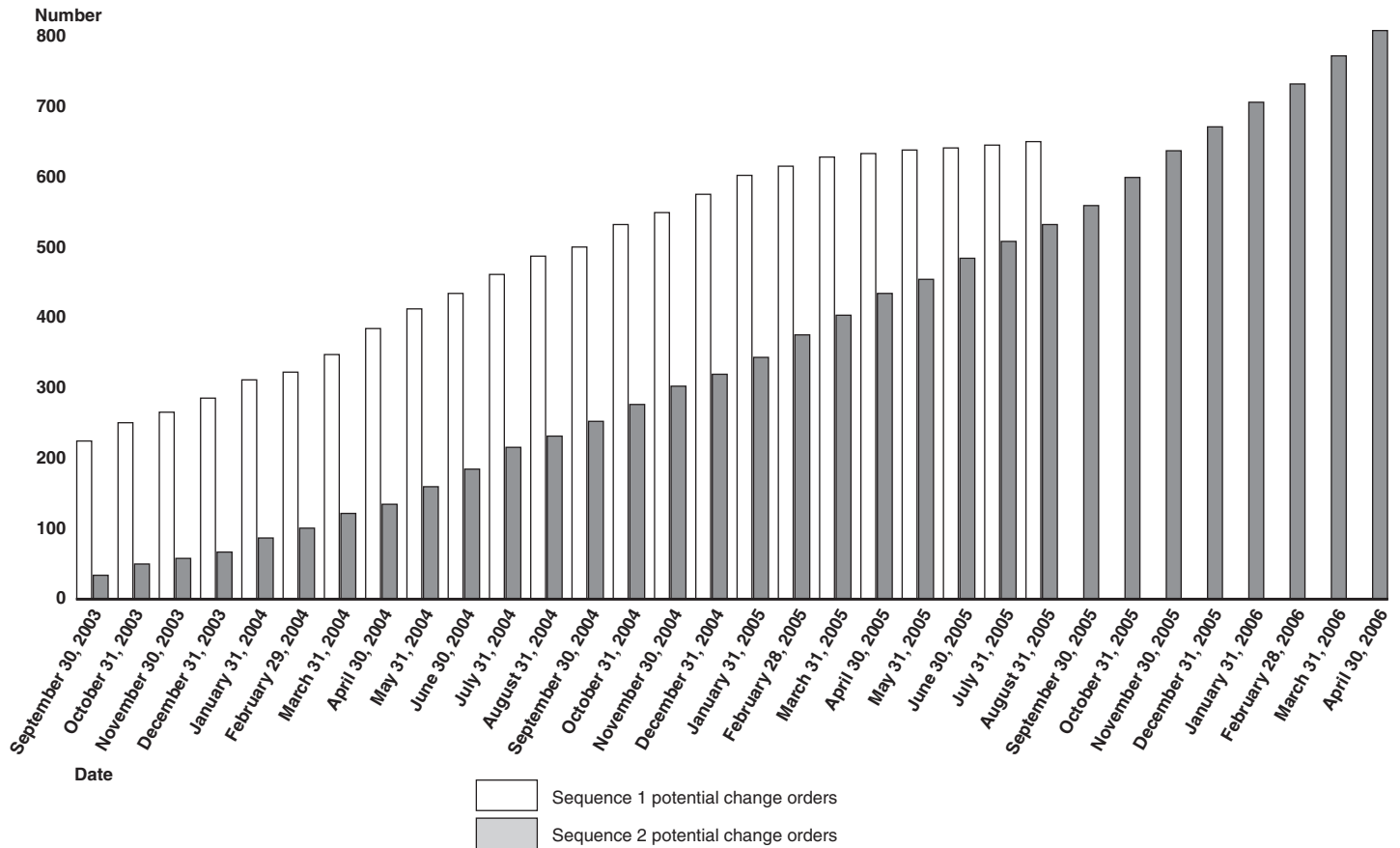
- *Building design and work scope continue to evolve.* The CVC has undergone a number of design and work scope changes. Since the Subcommittee's April 27 CVC hearing, AOC's architectural contractor has issued five design changes or clarifications. As of May 19, 2006, this contractor reported, another 11 were in process and requests for 3 more were awaiting AOC's approval to proceed. In addition, since the project began, AOC has executed more than 80 sequence 2 contract modifications for work that was not anticipated.⁸ Some of these changes, such as changes in the exhibit gallery and in the East Front, have resulted in delays. In addition, shop drawings for a number of project elements, such as the facility's fire protection system, millwork in the food service area, and certain portions of the exhibit gallery, have not yet been fully approved and are subject to change, and additional design or scope changes are likely given the project's experience to date. Project design

⁷According to the sequence 2 subcontractor that is fitting out the House and Senate expansion spaces, the delays in getting approved shop drawings for the fire protection system have already postponed ceiling close ins in the expansion spaces, and AOC believes that such further delays, along with possible requests for design changes, pose the greatest risks to the completion schedule for the expansion spaces.

⁸These data exclude sequence 2 contract modifications for work that was planned but not included in the sequence 2 base contract. Examples include the fit-out of the House and Senate expansion spaces, the construction of the utility tunnel, and the purchase and installation of food service equipment.

and scope changes are typically reflected in the development of potential change orders (PCO), many of which result in contract modifications. Figure 5 shows the PCOs submitted for consideration for sequences 1 and 2 since September 2003. Although PCOs are not always approved, they are often regarded as a reasonably good indicator of likely future design or scope changes that can affect a project's cost and schedule. Even more important, the adverse impact of scope and design changes on a project's schedule is likely to increase as the project moves toward completion. For example, certain changes to the fire protection system currently being discussed are likely, if made, to adversely affect the project's schedule, according to AOC.

Figure 5: Cumulative Number of Potential Change Orders Submitted for CVC Sequences 1 and 2 between September 2003 and April 2006



Source: AOC's construction management contractor.

As the figure indicates, new PCOs for sequence 1 were submitted until shortly before, and even for several months after, November 2004, when AOC determined that the sequence 1 contract work was substantially complete. Similarly, PCOs for sequence 2 are still being submitted, and we have seen no indication that their submission is likely to stop soon. It therefore appears likely to us that some of the design or scope changes indicated in PCOs could lead to contract modifications that will affect the project's schedule. AOC agrees that it is important to minimize the impact of proposed design and scope changes.

Two new issues associated with the CVC's new utility tunnel are likely to result in additional work. First, AOC has requested design work to begin extending the CVC's sprinkler system into the new utility tunnel to

enhance worker safety. Although the design work for this change has not yet been completed, AOC does not believe the extension will delay the project. Second, AOC recently identified a complication that is affecting work on the new CVC utility tunnel. Specifically, AOC found that potential asbestos and other safety-related problems in an older tunnel that intersects the new utility tunnel will have to be addressed before other work needed for the utility tunnel's operation can proceed in the older tunnel. This additional safety-related work is contributing to the slippage in the utility tunnel's completion discussed earlier in our testimony.

- *Opening the CVC and expansion spaces at different times is likely to result in a temporary cap on CVC occupancy and increase costs.* As we reported during previous Subcommittee CVC hearings, AOC's current plan to open the CVC in April 2007 before the expansion spaces are scheduled for completion is likely to result in a temporary cap on CVC visitor occupancy and a need to construct temporary emergency exits for fire and life safety protection.⁹ AOC is proposing this sequential approach because it believes that conducting acceptance testing for the fire protection system for the CVC and the expansion spaces concurrently would delay opening the CVC to the public. AOC's proposed April 2007 opening date for the CVC depends on the timely completion of work not only on the base project but also on the expansion spaces, since certain expansion space work must be completed before the CVC's opening. Inasmuch as work on both the base project and the expansion spaces was delayed in March and April, we believe that it will be especially important to monitor the progress of construction to determine what additional work (and funding) may be needed to meet AOC's planned date for opening the CVC, including what temporary work may be required in the expansion spaces for the CVC to open before the expansion space work is complete. AOC's construction management contractor is monitoring this situation and said in its April 2006 schedule report that concurrent acceptance testing of the CVC's and the expansion spaces' fire protection systems may be difficult because of the 15-workday delay in the expansion space schedule that occurred in April.
- *Risks from insufficient stone deliveries remain, but may be diminishing.* According to AOC's construction management contractor,

⁹According to AOC, the CVC's occupancy at any one time would be temporarily limited to 3,500, compared with about 4,200, the normal anticipated occupancy level, until acceptance testing of the fire protection system for the expansion spaces has been completed. Although AOC anticipates the need for some temporary work, it does not believe that the associated costs will be substantial.

the sequence 2 contractor has, since the week of April 24, received 2 of the 10 truckloads of interior wall stone it was expecting from the wall stone fabricator. The sequence 2 contractor said that the lack of wall stone deliveries has not adversely affected wall stone installation recently. AOC's construction management contractor reported that as of last week, almost all—over 99 percent—of the wall stone needed for the core CVC itself was on site (either installed or awaiting installation); nearly 80 percent of the wall stone needed for the atriums and about 35 percent of the wall stone needed for the East Front were on site; and none of the wall stone for the House connector, Library of Congress, and Cannon tunnels had been delivered. The sequence 2 contractor said that truck scheduling issues, not fabrication delays, had caused the lapse in wall stone deliveries over the last 4 weeks and that the delays in installing East Front wall stone have been related more to site conditions than to stone supply. Furthermore, the sequence 2 contractor said that given the East Front wall stone supply on site, the shipments expected, and the pace of installation, it does not foresee any further delays in the CVC work due to a lack of wall stone. The sequence 2 contractor received two wall stone truckloads on May 22 and expects to receive all of the remaining wall stone needed for the base project by June 30, 2006. According to AOC and its construction management contractor, although the supply of interior wall stone was insufficient in late 2005 and early 2006, it is adequate for the CVC at this time, given the amount of space available for wall stone installation and the quantity of stone on hand—about 4,500 pieces as of May 19—and expected. Also, although none of the wall stone for the House and Senate expansion spaces was on site yet, the subcontractor responsible for this work is not anticipating delivery problems at this time. On the other hand, AOC's construction management contractor reported that no floor stone was installed in the exhibit gallery during the week of April 10 or between May 9 and May 17 because the installers ran out of floor stone for that area. As indicated earlier in our testimony, the sequence 2 contractor received a shipment of floor stone for the exhibit gallery on May 16 and expects another shipment this week and the final shipment by mid-June.

Finally, as we have said in previous discussions with AOC, its construction management contractor, and the Subcommittee, it will be important for AOC to have adequate analysis and documentation of the reasons and responsibilities for delays.¹⁰ On April 11, 2006, AOC executed a contract

¹⁰See for example: GAO, *Capitol Visitor Center: Effective Schedule Management and Updated Cost Information Are Important*, [GAO-05-811T](#) (Washington, D.C.: June 14, 2005).

modification authorizing its construction management contractor to have one of its managers who has not been involved in the CVC project assess the adequacy of this type of information. The manager expects to complete his work by the end of this week.

Estimated Project Cost and Funding

As we testified during the Subcommittee's last three CVC hearings, we estimate that the total cost to complete the entire CVC project will be about \$556 million without an allowance for risks and uncertainties and could be as much as about \$584 million with such an allowance. To date, about \$530 million has been provided for CVC construction. This amount includes about \$3.6 million that was made available for either CVC construction or operations and has been approved for CVC construction by the House and Senate Committees on Appropriations.¹¹ To obtain the additional funding that it expected to need to complete the project's construction, AOC, in December 2005, requested \$20.6 million as part of its budget request for fiscal year 2007. This request was based, in part, on discussions with us and took into account our November 16, 2005, estimate of the cost to complete the project's construction without an allowance for risks and uncertainties and funding from existing appropriations. Our subsequent work—completed in preparation for the Subcommittee's February 15 and March 15 CVC hearings—indicated that AOC would need about \$5 million more, or about \$25.6 million in additional CVC construction funds, to complete construction without an allowance for risks and uncertainties. AOC plans to request the additional \$5 million as a supplement to its fiscal year 2007 budget for CVC construction. This would bring its total request for fiscal year 2007 CVC construction funds to \$25.6 million. In addition, AOC has indicated that it plans to use about \$950,000 of the fiscal year 2007 general administration appropriations it has requested for contractual support for its Fire Marshal Division.

¹¹Public Law 108-447, enacted on December 8, 2004, provided that up to \$10.6 million could be transferred from AOC's Capitol Building appropriation account for the use of the CVC project. The use of the amount transferred is subject to the approval of the House and Senate Committees on Appropriations. In June 2005, AOC received approval to use about \$2.8 million (including about \$1.6 million for CVC construction) of this \$10.6 million, leaving a balance of about \$7.7 million that could be used in the future after a rescission amounting to \$84,800. AOC recently received approval to use about an additional \$2 million of these funds for CVC construction, including, for example, the fabrication and installation of wayfinding signage and the fit-out of the gift shops, and about \$2.3 million for CVC operations. Thus, about \$3.4 million of the \$10.6 million remains available for approval for use for CVC construction or operations.

As we stated in our March 15 and April 27 testimonies, AOC believes that it may be able to reduce the amount of funds it will need in fiscal year 2007 for contractual support in testing the CVC's fire protection system and plans to explore ways to do so. AOC's Chief Fire Marshal received the shop drawings for the CVC's fire protection system on May 1 and believes that his office will complete its review by June 1. His office then plans to determine how much contractual support it will need to test the system and to explore cost savings possibilities. We plan to monitor these costs and report on them to the Subcommittee as soon as AOC has a firmer estimate. In addition, AOC is likely to incur additional costs from recent scope and design changes related to the CVC's security and fire protection systems and from problems associated with the utility tunnel. Sufficient contingency funding may be available for these items within our \$556 million estimate of the cost to complete the project. We plan to reassess our cost-to-complete estimate this summer and will keep the Subcommittee apprised of our results.

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

Contacts and Acknowledgments

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Appendix I: Capitol Visitor Center Critical Construction Milestones April 28, 2006-May 24, 2006

Activity	Location	Scheduled completion	Actual completion
Plaster Ceiling	East Front Basement	5/01/06	
Wall Stone Area 3	East Front Ground	5/01/06	
Wall Stone Area 1	Atrium South Lower Level	5/01/06	
Controls Pt. to Pt. Check	AHU-01	5/05/06	
OH Fire Protection Rough In and Hydrostatic Test	Exhibit Gallery	5/09/06	3/21/06 ^a
Wall Stone Area 5	Orientation Lobby Upper Level	5/12/06	5/22/06
Wall Stone Area 2	Atrium South Lower Level	5/15/06	
Plaster Ceiling	West Lobby Assembly	5/22/06	
Wall Stone Area 1	East Front Principal	5/22/06	

Source: AOC's January 2006 CVC sequence 2 construction schedule for the scheduled completion dates and AOC and its construction management contractor for the actual completion dates as of May 22, 2006.

^aWhile noting that the sequence 2 contractor had completed this work ahead of schedule, AOC's construction management contractor said that the sequence 2 contractor would have to perform the hydrostatic test again because of an oversight by the exhibit contractor that resulted in its design being too tall and interfering with the fire protection system.

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