

## **Boston Central Artery/Tunnel Project Roles and Responsibilities**

The Boston Central Artery/Tunnel (CA/T) project was planned, designed, and constructed over a period of 20 years from 1985 through 2006. The CA/T project adopted a conventional design-bid-build approach to the various project sections and was set up with layers of public oversight and checks and balances. This broad overview of project roles and responsibilities is intended to make these subjects more understandable, in full knowledge that no brief review can do full justice to the detailed interactions of all the contracts let and executed by the Massachusetts Department of Public Works (DPW) and the Massachusetts Highway Department (MHD) with various project participants, including 16 separate work programs with Bechtel/Parsons Brinckerhoff (B/PB).

In its role as management consultant, B/PB was accountable initially to DPW, then after 1992 to MHD, and after 1997, to the Massachusetts Turnpike Authority (MTA). DPW/MHD/MTA, in the role of owner, was responsible for oversight of B/PB and all significant decisions concerning what got built, when, how, and for how much. B/PB assisted in the decision-making process by developing alternatives and presenting recommendations to the owner on appropriate solutions. Subject to the owner's oversight, B/PB functioned as the owner's representative in specified areas concerning day-to-day administration of DPW/MHD's design and construction contracts. As part of its oversight role, DPW/MHD/MTA engineers and project management staffs reviewed and evaluated B/PB's work. The Federal Highway Administration (FHWA) also participated in reviews and oversight of almost all major B/PB recommendations and DPW/MHD/MTA decisions.

As management consultant, B/PB prepared the concept studies and preliminary design basis for the CA/T, representing about 25% of the total design effort. DPW/MHD contracted with a number of section design consultants (SDCs) selected by section-specific panels of public employees and approved by the DPW/MHD's Architect & Engineering Board. The selected SDC reviewed the preliminary design, resolving as needed any concerns or alternative preferences, and prepared and stamped a final detailed design. Each SDC was then responsible for the correctness, completeness and quality of the detailed final design, as well as for construction specifications; B/PB's review of the SDC's design focused on conformance with project scope, DPW/MHD and project standards, design criteria and interfacing requirements.

It should be recognized that MTA substantially altered B/PB's role in 1998 by combining key B/PB personnel with those of the MTA in an Integrated Project Organization (IPO). MTA's stated goal was to streamline project management and improve cost-effectiveness.

After MTA assumed overall management in 1997, MHD remained responsible for contracting with SDCs and construction contactors. With B/PB's assistance, MHD advertised the SDC's final design and specifications for competitive tender, typically receiving bids from three or more construction contractors. The contractor selected and

contracted by MHD was then responsible for constructing the section in accordance with the contract design and specifications and its own quality control (QC) program – and certifying that it had done so. Prior to commencement of portions of the work, B/PB reviewed the contractor's project-specific quality control (QC) program for conformance to standards set out in the contract. During construction, the contractor performed the QC, including as necessary the provision of material certificates and proof testing by an independent agency approved by MHD. Certain materials used in the contractor's work were also tested by the CA/T project's construction laboratory, which was managed by B/PB, certified by the American Association of State Highway and Transportation Officials, and independently assessed by MHD.

As part of the CA/T project's quality assurance (QA) program, B/PB (and from 1998, the IPO) performed quality assurance checks of the contractor's work for general compliance with contractual requirements and approved submittals, as well as with the contractor's QC program. Responsibility for control of quality belonged to the contractor, however, in accordance with its contract with DPW/MHD and general industry practice. Contractor questions or requests for information or clarification relating to the SDC's final design were typically referred back to the SDC for resolution. Accordingly, the SDC remained actively engaged throughout the construction phase, as the engineer of record.

As appropriate, B/PB facilitated the resolution of issues between or among contractors, SDCs, and DPW/MHD/MTA. In addition, significant issues and challenges that arose during the design and construction of the CA/T project were typically brought to the attention of the Project Interface Committee, comprised of the MTA/MHD, FHWA and B/PB, which met weekly.

With respect to the I-90 connector, B/PB completed the preliminary design, including the ceiling, in 1992. MHD selected and contracted with Gannett Fleming as an SDC in 1993 and added the tunnel finishes for the I-90 connector portal area, including the ceiling design, to this contract in 1997. MHD awarded Modern Continental the construction contract in 1998. B/PB served in its role as management consultant as described above until MTA assumed responsibility for operations, inspections, and maintenance of the I-90 Connector in January 2003.