

**DESIGN-BUILD IN THE COMMONWEALTH OF
MASSACHUSETTS**

A Masters Thesis

submitted to the faculty of the

WORCESTER POLYTECHNIC INSTITUTE

in partial fulfillment of the requirements for the

DEGREE OF MASTER OF SCIENCE

IN

CONSTRUCTION MANAGEMENT

by

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May 2003

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KEY WORDS

Alternative project delivery methods; Design-build; Filed sub-bid; Legislation;
Massachusetts General Laws

ABSTRACT

Massachusetts General Laws (M.G.L.'s) require state agencies to procure construction contracts using the design-bid-build project delivery system, unless special legislation is enacted to allow the use of alternative methods. Considering the wide range of alternative delivery methods for construction contracts, this thesis focuses on design-build on public projects. Even though Massachusetts laws do not expressly prohibit design-build, they do preclude its use indirectly by requiring the separation of design and construction services, and by requiring that construction contracts be awarded to the lowest responsible bidder only after the project is fully designed.

The objectives of this study are to specifically examine the reasons behind the legislature unwillingness to allow design-build as a conventional project delivery method; and to determine the likelihood that design-build will become a conventional delivery system in Massachusetts in the future. For this purpose, several academic research papers, case studies and industry reports have been reviewed. As well, pertinent sections of the M.G.L.'s and other references have been examined. Personal interviews were conducted with key representatives of the public and private sectors, who provided valuable input regarding design-build on public projects.

The analysis of the information collected reveals that three principal areas seem to hinder any successful attempts to enact a legislation making design-build a conventional

delivery method. These areas can be summarized as (1) loss of opportunities for the design and construction community, (2) technical and management issues at the public sector level, and (3) nature of the political environment in Massachusetts. Due to the unpredictable political environment, and the competing interests within the private sector, within the public sector, and between the private and public sectors, it is highly unlikely that design-build will become a conventional delivery method for public projects in the near future.

The report concludes with recommendations to increase the likelihood of design-build to become a conventional project delivery method, considering the issues denoted above.

ACKNOWLEDGEMENTS

I dedicate this thesis to my beloved, late sister, Fadia, who encouraged me to pursue a master degree; to my beloved husband, Gaby, for his unconditional love and support throughout my studies; and to my beloved baby-daughter, Talia, hoping that she “reaches for the sky” when she grows up.

I am thankful to Dr. Guillermo Salazar for his invaluable support and encouragement, his patience and his kindness; to Dr. Roberto Pietroforte for his invaluable advice and encouragement throughout my studies for my master degree; and to Dr. Leonard Albano and Mr. Frederic Mulligan for their valuable input and critique of my work.

I am also thankful to Mr. Helmut Ernst, Ms. Mary Gately, Ms. Abbie Goodman, Ms. Monica Lawton, Mr. Michael McKimmey, Mr. Jeff Quick, and Mr. Kevin Sullivan who contributed their expertise and time for this research. Without their input and guidance, and their willingness to participate, this thesis would not have been possible.

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CHAPTER 1. INTRODUCTION

Major reforms in the statutes governing construction procurement methods for public projects in Massachusetts were enacted as a result of the study performed by the Ward Commission in 1978, subsequent to a series of scandals in the design and construction of public buildings. The changes effectively revised the laws to curb corrupt practices and misadministration of public design and construction projects, while presumably preserving fairness and open competition in the procurement process.

As currently formulated, the Massachusetts General Laws require state agencies to procure construction contracts using the design-bid-build project delivery method, unless special legislation is enacted to allow the use of alternative delivery methods. Although fundamentally enacted to regulate and streamline the contracting process, and eliminate corruption, some aspects of these laws are thought to be a hindrance to the smooth progress of a public construction project. Specifically, the requirement for the selection of the lowest “responsible and eligible” contractor-bidder, the requirement for the selection of a design consultant to complete the feasibility study and another design consultant to complete the design, and the requirement for filed subcontractor bids introduce inefficiencies in the construction process which ultimately result in considerably more expensive public projects.

In 1999, the state administration attempted to introduce major reforms to the public construction laws. In particular, it proposed enabling agencies and public authorities to use alternative project delivery methods, such as design-build, without the need to file a special legislation. The proposed reforms were based upon the recommendations of the Construction Reform Task Force as detailed within its 1998 report (*Commonwealth of Massachusetts, 1998*). The administration's attempts failed due to strong opposition by the legislature and other stakeholders.

The objectives of this report are to specifically examine the reasons behind the legislature unwillingness to allow design-build as a conventional project delivery method; and to determine the likelihood that design-build will become a conventional project delivery system in Massachusetts in the future.

For this purpose, several academic research papers, case studies and industry reports have been reviewed. As well, pertinent sections of the Massachusetts General Laws and other references have been examined. This research has established the groundwork for an in-depth evaluation of current public construction delivery methods in Massachusetts and associated issues, with a focus on design-build. The current state of public design-build projects in the Commonwealth is reviewed, and factors that may be preventing the enactment of a legislation to make design-build a conventional delivery method are presented.

To further understand the reasons behind the unwillingness of the legislature to change the status quo, a questionnaire was developed, and personal interviews were conducted with key representatives of the private and public sectors in Massachusetts. The questionnaire covered issues in the state's public procurement methods in general, and issues related to design-build and its applicability on public projects in Massachusetts. The analysis of the issues discussed during the interviews reveal that the positions of the public and private sectors regarding public design-build projects in Massachusetts are not necessarily aligned, as one may think. A comprehensive review of these interviews points to three areas that seem to hinder successful attempts to enact a legislation making design-build a mainstream project delivery method: the loss of opportunity for the design and construction community, the technical and management issues at the public sector level, and the nature of the political environment in Massachusetts.

The report concludes with an evaluation of the likelihood that design-build will eventually become a mainstream and regulated project delivery method for public projects, like design-bid-build; and recommendations to increase the likelihood of design-build to become a conventional project delivery method, should there be a desire to do so.

CHAPTER 2. THE DESIGN-BUILD PROJECT DELIVERY SYSTEM

Overview

Achieving a quality project on time and within the budget constraints is typically the goal of all owners. Although the effective selection of the project participants and the proficient execution of the project are important, the selection of the optimum project delivery method is critical.

In selecting a contracting methodology for any type of project, the owner should consider a number of factors including the ability to define criteria of what is to be built, unforeseen conditions, potential changes in the work, funding, allocation of risk, cost, schedule constraints, constructability issues, and so on. In order to focus the efforts of the project team to produce a quality product at a reasonable cost and within a pre-established schedule, each member of the team must work under a process that guarantees the ability to manage risks and that deals with issues in a positive, cooperative manner.

Further, the owner is typically looking for the delivery of a product (a constructed project in this case), based upon predetermined requirements including function(s), quality, budget, and schedule. To obtain this desired product, the owner has to buy the services of a group of professionals, a process partly relying on assumptions made regarding the

capabilities, performance and competence of this group, and surrounded with uncertainties due to factors related to market conditions and project-specific conditions.

For this reason, the selection of the proper project delivery method is of primary importance. It establishes the foundation for a successful and equitable relationship allowing all stakeholders to achieve their objectives, while at the same time fulfilling the intent of the contract documents.

Considering the myriad of alternative project delivery methods that are available, there is no clear-cut “formula” for the selection of one versus the other. Increasing requirements for reduced project costs, fewer claims, better quality and improved schedules have pushed the owners to look for innovative project delivery methods which could help achieve these objectives. These alternative methods include construction management, design-build, and design-build-finance.

Several approaches have been developed to aid owners in the selection of a project delivery method. For example, the Report on Design-Build as an Alternative Construction Delivery Method for Public Owners indicates that the selection of the optimum contract method should be based on weighted influences of certain factors that can be analyzed by the owner for each particular project (*Building Futures Council, 1995*). These factors include primarily: Timing and schedule demands, state and local laws, funding and financial constraints, construction industry market, project complexity,

and contract experience. According to this report, by establishing the importance of each one of these factors, the degree of risk associated with the selection of a given procurement process, as well as the consequences of failure could be evaluated. The Construction Industry Institute (CII), through its study on the CM at risk, design-build and design-bid-build project delivery systems (*CII, 1997*), attempts to provide the construction industry with “considerations to aid in delivery method selection.” Dr. K. Molenaar, Dr. A. Songer and Mr. M. Barash, in their peer-reviewed paper entitled “Public-Sector Design-Build Evolution and Performance” (*Molenaar, K. R., Songer, A. D., and Barash, M., 1999*) provide a “design-build benchmark for public sector agencies” to develop guidelines and practices for the use of design-build. In the following paragraphs, the design-build project delivery method is presented in general. Extensive literature is available for an in-depth review of this method.

The Design-Build Project Delivery Method

Design-build is one of the alternative project delivery methods that has been gaining in popularity in recent years, particularly in the private sector. Fundamentally, design-build embraces architectural, engineering and construction services under a single contract, thereby combining the vital roles of the designer and the constructor. Under the design-build delivery system, the owner executes a single contract with a single entity, the design-builder. Design/build contracts often assume one of the following four forms: Either a single firm has both design and construction capabilities in-house, or a joint-

venture is forged between a designer and a contractor, or the project team is led by a contractor, or the project team is led by a designer. Thus, design and construction are combined into a single stage procurement, with no separate bid for construction based on 100% complete design (including plans and specifications).

Typically, a design-build contract is procured through a two-step process which includes a request for qualifications (RFQ), followed by a request for proposal (RFP). During the RFQ stage, potential design-builders submit a statement of qualifications to the owner, as required by the RFQ. The owner reviews these statements with respect to pre-established criteria, and selects the potential candidates. During the RFP process, the prequalified design-builders prepare a technical and a price proposals based on conceptual plans and / or performance specifications. The level of completion of these plans and specifications can vary from 5 to 50 percent. Again, at this stage, the owner reviews the proposals and determine their level of responsiveness to the RFP. In general, the design-build contract is awarded to the proposer who provides the best value to the owner with respect to design solution, cost, schedule, and quality.

Similar to other project delivery methods, design-build has advantages and disadvantages that should be carefully evaluated prior to using it for a particular project. Various research studies, including ones performed by organizations such as the Construction Industry Institute and the National Society of Professional Engineers, outlined these

advantages and disadvantages. The following sections summarize the main advantages and disadvantages of design-build.

Advantages of Design-Build

- 1- Constructability review: Design-build allows constructability review by the contractor during the design development, which may result in developing value engineered solutions for the project. Typically, construction specialists form an integral part of the design team, so that the construction implications are addressed early in the design process. The design-build team works together to decide the most cost effective materials and methods of delivery before the design is finalized. This enables the design-build team to accurately determine the cost and the schedule duration. Also, this fosters consideration of construction efficiency and cost saving methods, as well as economical design features.
- 2- Owner risk mitigation / Single source responsibility: Because the design-builder is accountable for both the design and the construction of the project, the risk of cost overruns from design errors and omissions or poor coordination is transferred from the owner to the design-builder.
- 3- Selection of best team: Typically, the design-build delivery method consists of a two-step process: a technical qualifications proposal and a cost proposal. Consequently, this method allows the selection of the best qualified team to perform the project.

- 4- Schedule reduction: Design-build can reduce the overall duration of a project. Design and construction are combined into a single stage procurement. Design and construction can be also overlapped, which allows the project to be fast-tracked; the long lead materials and equipment procurement can begin early during the design phase.
- 5- Reduction in change order rate: Because the design and construction of the project is the sole responsibility of the design-builder, the design-builder is responsible for any design errors and omissions or inconsistencies in the design; this, in turn, results in less change orders.
- 6- Cost reduction: To be competitive, the design-builder must develop design solutions that are cost effective while complying with the owner's requirements. The possibility of overlapping design and construction are often considered since a reduced schedule results in overhead cost savings.
- 7- Reduction of shop drawings review: Involving the construction specialists, such as steel manufacturers and mechanical contractors, in the development of the design details, aids the designer in delivering a more accurate and better coordinated design. This, evidently, leads to significantly more accurate shop drawings.
- 8- Early knowledge of firm price: Continuous and concurrent estimating during the development of the design results in more accurate construction costs and schedule.

- 9- Value Engineering: Design and construction personnel, working and communicating as a team, can evaluate alternative systems, materials and methods efficiently and accurately. Operating expenses can be evaluated against capital costs to optimize the project's life-cycle costs.
- 10- Continuity of key personnel: The continuity of key personnel has been long viewed as an important feature for any project delivery process. Owners recognize the added value of maintaining the designer's role during construction, which is possible on a design-build project.

Disadvantages of Design-Build

- 1- Changed role of the designer: In a conventional design-bid-build project, the designer often monitors the progress of construction on behalf of the owner to ensure that the final product conforms with the detailed plans and specifications for the project. In a design-build project, however, the designer is a member of the contractor's team. Under this contractual agreement, the designer does not necessarily represent the owner's interests in designing the project, nor can the owner rely on the designer to detect and report construction defects. Therefore, there is an inherent conflict of interest for the designer who is ethically bound to protect the owner's interest through the design, and ensure that the construction quality is maintained, but who also seeks to maximize the profit for the design-builder.

- 2- Incomplete design, incomplete project concept: There is an inherent conflict in developing a request for proposal (RFP) for design-build projects. The main challenge facing the owner is the ability to determine the level of detail and specificity to include in the RFP, such that it conveys the project's requirements without risking misinterpretation. After all, it is to the owner's advantage to provide the prospective design-builders with sufficient latitude for design creativity and value engineering.
- 3- Loss of control and traditional checks and balances: In the design-build approach, many owner decisions are required to be expedited, creating a fast-paced project environment. The owner's ability to monitor and control the design details is limited. Further, the owner can not rely on the designer to report construction defects, since the designer does not represent the owner. The design-builder, in this case, is responsible for the quality control of the project. Under these circumstances, the owner needs independent oversight to monitor and ensure the project's quality.
- 4- Potential for cost escalation due to contingencies: In the absence of complete plans and specifications, the design-builder's price often includes a large contingency as protection against future disputes with the owner. The owner may also be vulnerable to further price increases stemming from disputes with the design-builder over the final building systems and materials.
- 5- Costly delays during construction phase: Because construction may begin before the completion of plans and specifications, unresolved permitting, environmental

and owner preference issues may cause costly delays and changes. The traditional design-bid-build delivery method allows for the resolution of these issues during the less expensive design phase.

- 6- Limited competition: The high cost of preparing proposals limits competition, particularly among qualified smaller design and construction firms.

Application of Design-Build on Public Projects in the U.S.

Design-build is increasingly becoming the project delivery system of choice for many private owners, as well as public owners across the United States. A survey published by the Design Build Institute of America (DBIA) in April 1996 regarding state procurement laws affecting design-build showed that seventeen states do not permit the use of combined design and construction contracts, and twenty-seven do permit it. Seven states did not respond to the survey (*DBIA, 1996*). DBIA performed the survey again in 2002, in an effort to “continue to measure the acceptance and use of alternative and innovative contracting methods permitted by state governments.” This most recent survey showed that fourteen states do not permit the use of combined design and construction contracts, and thirty-seven do permit it (*DBIA, 2002*).

The Federal Acquisition Reform Act of 1996 was signed into law in 1996, giving federal authorities legal authority to engage in design-build projects. As a result, the Federal Government standardized the design-build process through the issuance of new Federal

Acquisition Regulations defining a two-step process including prequalifications of bidders (*Molenaar, Songer, and Barash, 1999*).

Most recently, the U.S. Department of Transportation's Federal Highway Administration published a final rule in the Federal Register to allow design-build contracting. The regulation allows states and local transportation agencies, but does not require them, the use of design-build contracting procedures. Recipients in the federal-aid highway program are able to use the design-build contracting method just as they would the traditional design-bid-build contracting method (*DOT News, 2002*).

CHAPTER 3. CURRENT CONSTRUCTION PROCUREMENT METHODS IN MASSACHUSETTS

Historical Overview

Public construction is a significant part of the construction industry in the Commonwealth of Massachusetts. The Brooks Architect/Engineer Act, which was enacted in 1972, forbid the competitive selection of design professionals on federal projects, and required that selection be based on professional qualifications only. The law's intent was to protect the public from potentially unsafe designs developed by poorly qualified designers or designers who can not thoroughly prepare their work because of competitive price pressure. Yet, most public agencies were required to award construction contracts on a low bid basis to ensure that the taxpayers' money is wisely spent (*Gransberg, 1999*).

In 1978, rocked by scandal that implicated its own members as well as awarding authorities and a wide segment of the private sector in the award of contracts for design and construction of public buildings, the Massachusetts legislature established a special commission, known as the Ward Commission. The Commission's role was to "investigate and study, as a basis for legislature action, the existence and extent of corrupt practices and misadministration concerning contracts related to the construction of state and county buildings" (*Gransberg, 1999*). Using the Commission's findings as a basis,

the legislature developed legal restrictions which were incorporated in the state's procurement system for design and construction projects, which is currently in effect. In general, "building" projects are governed by Chapter 149 of the Massachusetts General Laws, which mandates that these projects be awarded to the "lowest responsible and eligible" bidder; and "non-building" projects are governed by Chapter 30 of the Massachusetts General Laws. An overriding goal of the laws regulating the procurement process is the guarantee that all designers and contractors have equal access to an "objective" procurement process and stand a "fair" chance of being selected. Lengthy selection processes were established to assure "fairness" and "objectivity." (*Moore and Moscovitch, 1995*).

Current Construction Procurement Methods in Massachusetts

The procurement and contracting procedures required by public construction laws in Massachusetts differ depending upon whether the project entails vertical construction ("building" project) or horizontal construction ("non-building" project). Accordingly, the Commonwealth of Massachusetts instituted two major construction bid laws, included in the Massachusetts General Laws (M.G.L.):

- M.G.L. Chapter 149 Sections 44A – M, which generally applies to "building" projects whose estimated costs exceed \$25,000.

- M.G.L. Chapter 30 Section 39M which generally applies to “non-building” projects whose estimated costs exceed \$10,000, and small “building” projects whose costs range from \$10,000 to \$25,000.

Although the Massachusetts statutes do not define “building” projects, court decisions have indicated that the word is to be taken in its common and ordinary sense (*Cerasoli, 2000*). If a structure has walls and a roof, and encloses a space that is to be used for some purpose, it is a “building.” Size is irrelevant, and the building may be part of a larger “non-building” project. If a building is included in the project, and if the total contract cost is greater than \$25,000, the contract must be bid under M.G.L. Chapter 149. Exceptions apply, as is the case in certain sewer or water supply projects. Projects that do not include work on a building are considered “non-building,” or horizontal projects.

According to M.G.L. Chapter 149 Sections 44A – M, “Every contract for the construction, reconstruction, installation, demolition, maintenance or repair of any building by a public agency estimated to cost more than twenty-five thousand dollars ... shall be awarded to the lowest responsible and eligible general bidder on the basis of competitive bid.” The design and contracting process typically involves three sequential stages: planning, design, and construction. Three primary and distinct players are involved in this process: The public owner, the designer and the contractor. The public owner’s role is to define the scope, the budget, and the schedule, procure the design and construction services, and fund the project. The designer assists the owner in defining the

project's scope, budget and schedule, and prepares project drawings and specifications that are advertised and bid (the term "designer" refers to the individual or firm hired to perform preliminary planning and feasibility studies, and to the individual or firm hired to perform the architectural and engineering work); Major subcontracts are also advertised under the filed sub bidding system. The contractor provides labor, materials, and equipment to construct the project in accordance with the contract documents (drawings and specifications). This project delivery method is referred to as the design-bid-build method. The referenced sections of Chapter 149 further detail the procurement procedures for construction services, including preparation of the bidding packages, and procedures for advertising the work. Chapter 149 also includes provisions for filed sub-bid, which requires public agencies to award contracts to certain subcontractors in advance of making the award to the general contractor.

Similarly to M.G.L. Chapter 149, M.G.L. Chapter 30 Section 39M requires that public construction projects be awarded to the lowest responsible and eligible bidder.

Recognizing that alternative project delivery methods may be a better fit to certain public construction projects, especially when the owner can establish effective and measurable performance criteria, the Commonwealth of Massachusetts established specific requirements, which apply to these methods, in M.G.L. Chapter 29 Section 7E: "When an alternative mode of procurement is recommended, the governor and commissioner shall also recommend the method by which design and construction services shall be procured

for such project, provided that such method shall be compatible with the policies and procedures for the selection of designers in sections 38A to 38O, inclusive, of chapter 7 and with the policies and procedures for the selection of contractors in sections 44A to 44H, inclusive of chapter 149, to the extent feasible. If the governor or the commissioner should recommend a mode of procurement other than the sequential mode or a phasing of procurement other than approval of design and construction as a combined phase, each shall state in detail the reasons therefore.” The design-build method of procurement falls under this category.

Public agencies may procure modular buildings by following an alternative procurement process contained in M.G.L. Chapter 149 Section 44E. The modular procurement law defines a modular building as a pre-designed building or units of a pre-designed building assembled and equipped with internal plumbing, electrical and other similar systems prior to movement to site, where the units are attached to each other and the building is affixed to a foundation and connected to external utilities. The procedures included in Section 44E apply to the acquisition and installation of modular buildings, including the solicitation and evaluation of proposals, the award of contracts, and the installation of modular units (*Cerasoli, 2000*).

Issues in Massachusetts Construction Procurement Methods

The current public sector design and construction procedures in Massachusetts derive from the Ward Commission, which was formed in the late 70's after a series of scandals in the design and construction of buildings for the University of Massachusetts. As a result of the Commission's report, major reforms in the statutes governing public sector design and construction were enacted, and corruption was brought under control.

Many research studies have been conducted, and several reports have been written in recent years regarding the intricate design-bid-build construction contracting process in Massachusetts. In their "Construction Law 1995" seminar materials book, Mr. James Meyer and Mr. Christopher Noble state "Massachusetts has the dubious distinction of having the most regulated public construction contracting process in the country."

The review of the Massachusetts General Laws sections related to construction reveal that these laws may actually be a hindrance to the smooth progress of a project, although they were fundamentally enacted to regulate and streamline the contracting process, and eliminate corruption. Through the research studies and the reports reviewed for the purpose of this thesis, it appears that the factors that are thought to most significantly impede the efficiency of the construction process are the requirement for the selection of the lowest "responsible and eligible" contractor-bidder (M.G.L. Chapter 149 and Chapter 30), the requirement for the selection of a design consultant to complete the feasibility

study and another design consultant to complete the design (M.G.L. Chapter 7, Section 38H), and the requirement for filed subcontractor bids (M.G.L. Chapter 149). It should also be noted that the requirement for the selection of a design consultant to complete the feasibility study and another design consultant to complete the design was recently eliminated through the enactment of Chapter 159 of the Acts of 2000, which amended the M.G.L.

Although Massachusetts laws do not expressly prohibit design-build, they do preclude its use indirectly by requiring the separation of design and construction services, and by requiring that construction contracts be awarded to the lowest responsible bidder only after the project is fully designed. Massachusetts public agencies are not allowed to use alternative project delivery methods, such as design-build, unless special legislative authorization is provided.

In 1997, the Executive Office for Administration and Finance created the Construction Reform Task Force to review public agencies practices with regard to construction procurement and contract management practices. At the conclusion of its task, the Construction Reform Task Force published a report in 1998 (*Commonwealth of Massachusetts, 1998*) which outlined the issues identified in the procurement of public projects and in the management of these projects. The report also incorporated recommendations to improve the construction procurement processes. The key recommendations included: adapting the construction procurement process to the needs

of specific projects; using a two-step contractor selection process where specific expertise is needed (Quality-based selection, then price-based selection); improving the internal construction office staff expertise in project management and training the state agencies staff to successfully manage alternative delivery methods; raising the vertical construction threshold for filed sub-bid projects; structuring the project teams such that the project manager for the planning stage of a project remains as an active participant in the design phase; changing the law to allow the designer performing the project study to also perform the design; and consistently using standard contracts for both horizontal and vertical construction.

A research conducted by the Pioneer Institute for Public Policy Research (*Gransberg, 1999 and Gransberg, 2000*) echoes the findings of the Construction Reform Task Force. In terms of cost growth, time growth and cost per square foot, the Pioneer Institute's study determined that Massachusetts public construction industry is dramatically less efficient than the other states. The prime reasons for such inefficiencies were particularly attributed to two provisions of the M.G.L.: Chapter 7 which requires that the feasibility study and the final design for a project be completed by different designers; and the filed sub bid provisions of Chapter 149.

Despite the extensive research and the detailed report and recommendations developed by the Construction Reform Task Force, no legislative changes were enacted to amend the laws and provide flexibility for the procurement of design and construction services.

Within the following paragraphs, major aspects of the M.G.L., which are deemed to hinder the effectiveness of the design and construction process on public projects in the Commonwealth, are presented:

Requirement for the selection of lowest “responsible and eligible” bidder

M.G.L. Chapter 149 and Chapter 30 require that construction contracts be awarded to the lowest responsible and eligible contractor. “Responsible” means: Demonstrably possessing the skill, ability and integrity necessary to faithfully perform the work called for by a particular contract, based upon a determination of competent workmanship and financial soundness in accordance with the provisions of Section 44D of Chapter 149 (*Cerasoli, 2000*). “Eligible” means: Able to meet all requirements for bidders or offerers set forth in Sections 44A through 44H of this Chapter and not debarred from bidding under Section 44C of this Chapter or any other applicable law (*Cerasoli, 2000*).

To determine whether a contractor is “responsible and eligible,” the contract awarding authority reviews and evaluates the contractor’s Certificate of Eligibility and the Update Statement. The Certificate of Eligibility indicates whether a contractor has been certified to perform work for the state. The Update Statement includes project references, which permit the verification of the qualifications of the bidder.

For all practical purposes, state and local governments cannot bar a construction contractor from future work on the basis of poor performance on today's project. The total dependence on price in selecting construction contractors puts an extra premium on high quality design work, on detailed, well-prepared construction documents, and on supervision of the construction contractor by designers and state managers (*Moscovitch and Moore, 1995*).

Requirement for the selection of a design consultant to complete the feasibility study and another design consultant to complete the design

Chapter 7 Section 38H of the M.G.L. mandates that the study and design for a project be completed by two separate firms. This requirement is based upon the assumption that when study consultants recommend the scope and budget of the design contracts in which they have financial interest, sound planning can be undermined, and the project costs increase excessively. As a result of this requirement, the selection of each design firm may take four to eight months. In addition, once the feasibility study of the project is complete, the second design firm must become thoroughly familiar with the work performed by the first one before the design proceeds. This results in a lengthy and more expensive process (*Gransberg, 1999*).

Requirement for filed subcontractor bid

The filed subcontractor bidding provision of Chapter 149 requires public agencies to advertise contracts to subcontractors prior to advertising them for the general contractors. This law was passed in 1939 to make sure that subcontractors could maintain a foothold in public construction, since private construction projects were rare at the time.

The requirement for filed subcontractor bid is, no doubt, the most controversial constraint imposed by the M.G.L. on the procurement of public design-bid-build projects falling under Chapter 149 Section 44A – M. According to the Construction reform Task Force report, the general contractors are compelled to use low bidding subcontractors, as a result of this requirement, and can not develop team relationships with the subcontractors of their choice.

The following issues are identified within the report published by the Pioneer Institute (*Gransberg, 1999*) with respect to the requirement for filed sub-bid:

- The requirement for filed sub-bid creates an adversarial environment between the general contractor and the subcontractors.
- The general contractor is unable to form strategic, long-term relationships with the subcontractors.

- The requirement for filed sub-bid increases the cost of the project because the general contractor must consider the risks involved in hiring subcontractors whom they may not trust.
- The requirement for filed sub-bid increases the cost of design and the design schedule because the designer has to prepare stand-alone packages for each of the 17 sub trades. This ultimately increases the probability of design errors, deficiencies, and inconsistencies between the various design documents.
- The general contractors are chosen on the basis of the lowest bid rather than the overall package (qualifications, cost and schedule). Consequently, while not technically bound to select subcontractors with the lowest bids, they have little choice, practically speaking.

Requirement for using the design-bid-build method of procurement

Design-bid-build is a sequential method of delivery, which begins with the development of a complete design by the owner's designer, followed by the selection of a contractor through a bidding process, and the construction of the project.

This delivery method is often too restrictive as it reduces the integration of design and construction. It also does not permit a full understanding by the bidders of the requirements of the project (*Building Futures Council, 1995*).

Follow-Up Action(s) by the State

In April of 1999, Governor Argeo Paul Cellucci and Lieutenant Governor Jane Swift filed a legislation entitled “An Act Relative to Public Construction Reform.” This legislation incorporated the recommendations of the Construction Reform Advisory Board, which was chaired by former Administration and Finance Secretary Charles Baker. The introduction to this legislation states: “ It is time to give our state agencies, public authorities and municipalities the tools to bring us into the next millennium, without sacrificing the important safeguards that keep public construction honest, open and competitive” (*Commonwealth of Massachusetts, 1999*). The introduction also summarizes principal aspects of the legislation that would improve the procurement process:

- Permit agencies and public authorities to use proven alternative methods of public construction, such as design/build;
- Permit agencies with the biggest projects to procure construction services on the basis of "best value" and shortest project completion time when appropriate, rather than exclusively on low-bid;
- Eliminate current law’s “inefficiency” of requiring one architect to study a project’s feasibility and then a second architect to design the project, permitting instead that the same architect study feasibility and complete the design, thereby saving time and protecting project continuity;

- Ensure that public owners are able to contract with capable contractors and avoid contractors who perform poorly;
- Update the dollar thresholds triggering the law's various requirements to levels that reflect current business conditions more accurately.

As indicated previously, no legislative changes were enacted to amend the existing laws at that time. However, in 2000, Chapter 159 of the Acts 2000 specifically struck out the requirement to enlist the services of a design consultant to perform a feasibility study and then another consultant to perform the design services.

Why no further action(s) was taken by the legislature to address the issues denoted above, particularly regarding the enactment of a legislation providing more flexibility to public agencies to use alternative project delivery methods such as design-build? This study will address this question in detail within the following sections.

CHAPTER 4. CURRENT STATE OF PUBLIC DESIGN-BUILD PROJECTS IN MASSACHUSETTS

As indicated previously, the Commonwealth of Massachusetts recognizes that alternative procurement methods, such as design-build and construction manager at risk, are better suited for certain horizontal and vertical public projects. If a public agency determines that a project shall be procured using an alternative method, special legislation should be filed and enacted, as required by M.G.L. Chapter 29 Section 7E.

However, in an effort to “immediately improve court facilities in the commonwealth,” Chapter 189 of the Acts of 1998, commonly called the bond bill of 1998, was enacted. It was declared an “emergency law, necessary for the immediate preservation of the public convenience” (*Chapter 189 of the Acts of 1998, 1998*). According to this Chapter, “the commissioner may select and contract with a single contractor to provide design/build services for the design and construction of the project; provided, however that the design/build contractor shall be certified by the commissioner to perform the work required and shall be selected through a competitive process.”

In 2002, this bond bill was revised through the enactment of Chapter 245 of the Acts of 2002, to allow the use of construction management at risk, in addition to design-build, without the requirement to file special legislation.

Since design-build is the focus of this study, a list of some of the most recently completed or ongoing design-build public construction projects, which were procured through special legislation, is presented herein. Information relevant to each project is included, such as scope of work, contract value, status, and name of the design-builder.

Route 3 Rehabilitation

Owner: Massachusetts Highway Department
Project Value: \$385 million
Status: Ongoing
Design-Builder: Modern Continental Construction Co., Inc.
Delivery Method: Design-Build-Finance-Operate

The 50-year old, four-lane, 21-mile segment, running from Interstate 95 to the New Hampshire border, is chronically congested. It was estimated that it would cost \$385 million and take nine years to overhaul the road using traditional procurement.

Faced with increasing financial impacts from the Central Artery / Tunnel project in Boston, growing traffic congestions, and rising local community support to complete the project as soon as possible, the state legislature passed special legislation, through Chapter 53 of the Acts of 1999, allowing the Massachusetts Highway Department to use design-build for the first time. This legislation also allowed the development of an

innovative private financing plan in which a private entity issues tax-exempt bonds to be reimbursed by the Commonwealth upon the completion of construction. This legislation allows EOTC/Mass Highway to address the needs of Route 3 North immediately and provides for an expedited construction schedule.

The notice to proceed for this project was issued in August 2000, with a completion date scheduled for the spring of 2004. The project is a design-build-finance-operate one. It includes adding a travel lane and two 10 ft shoulders in each direction, the replacement of 47 bridges, the construction of a visitor center, and a park and ride facility, as well as various environmental improvements.

Greenbush Commuter Rail Rehabilitation

Owner:	Massachusetts Bay Transportation Authority
Project Value:	\$250 million
Status:	Environmental permitting and design phase
Design-Builder:	Cashman/Balfour Beatty (A joint venture of Jay Cashman, Inc. and Balfour Beatty Construction, Inc.)
Delivery Method:	Design-Build

This project will restore commuter rail service on the existing right-of-way known as the Greenbush corridor through the towns of Braintree, Weymouth, Hingham, Cohasset and

Scituate. It involves the reconstruction of existing, largely out-of-service railroad right-of-way as a single track railroad with four controlled passing sidings of approximately 1 mile in length each. Seven new commuter rail stations will be constructed along the right-of-way, each with an 800-foot long high-level platform. New commuter parking lots at the stations ranging in size from 200 to 1000 spaces each will provide a total of approximately 3000 spaces corridor wide.

Once completed, the facility will be equipped with a new signal and communications system and end-of-the-line train lay-over facility. In addition, certain freight facilities in Braintree will be relocated off-line. The project includes extensive mitigation measures to address noise, vibration, wetland, and other impacts.

The MBTA provided a conceptual design (approximately 15%) to firms interested in participating in the project, at the request for proposal stage. In March 2002, MBTA awarded this design-build project to the Joint Venture of Jay Cashman Inc. and Beatty Balfour Inc. Construction Co. The notice to proceed for design was issued in early April 2002, with notice to proceed for construction to be granted at specific sites in the fall of 2002. Substantial completion is scheduled for the spring of 2005.

Norumbega Covered Storage Tank

Owner: Massachusetts Water Resources Authority

Project Value: \$89.4 million

Status: About 50% complete

Design-Builder: Norumbega Constructors (A joint venture of J.F. White Constructing Company and Slattery Skanska, Inc.)

Delivery Method: Design-Build

The 115 million gallon, below ground, Norumbega Covered Storage Tank is part of the Integrated Water Supply Improvement (IWSI) Program for the metropolitan Boston area. It will replace the existing 205 million gallon open Norumbega Reservoir. Requirements for a short project duration; lower overall project costs; and reduced owner risk exposure resulted in the project being procured in 1998 using the design/build delivery system, after Governor A. Paul Cellucci signed special legislation authorizing MWRA to use this procurement method in November 1997.

The project consists of a 115 million gallon reinforced concrete storage tank to be constructed west of Schenk's pond, between the existing Norumbega Reservoir and the Massachusetts Turnpike. This tank will cover approximately 19 acres and will be 25 ft deep. It will provide operational and emergency storage for the MWRA water distribution system. When constructed and placed in service, it will allow the MWRA to designate the existing open reservoir, which does not adequately protect the drinking water, and does not comply with the Federal Safe Drinking water Act, as an emergency backup supply. It will also protect the treated drinking water quality before distribution to

over 2 million people in 35 cities and towns in the West metropolitan Boston area, instead of the existing 205 million gallon “open” reservoir.

The Notice to Proceed on the \$89.4 million Norumbega project was issued by MWRA on November 2, 1999, with a total design and construction duration of 1824 days, including final acceptance. The project completion date is slated for October 30, 2004.

Brockton Courthouse

Owner:	Division of Capital Asset Management and Maintenance
Project Value:	\$28 million
Status:	Completed fourteen months late, and \$3 million over budget
Design-Builder:	Beacon Skanska Construction Co.
Delivery Method:	Design-Build

The Brockton Courthouse facility was built to house the District Court, the Juvenile Court, and a Division of the Plymouth Probate and Family Court. It consists of a multi-level building containing 13 courtrooms and related functional spaces, judiciary offices, transaction offices, detainee holding, public spaces and court and building operations support spaces. The facility’s total gross area is 144,500 square feet.

Chapter 277 of the Acts of 1995 authorized the Commissioner of the Division of Capital Planning and Operations (now called Division of Capital Asset Management and Maintenance) to procure the project using the design-build method. This delivery method was selected to achieve maximum program quality, cost savings, and efficient schedule, as well as improve the coordination between the designer and the builder, and between the team and the owner.

CHAPTER 5. ISSUES IN MASSACHUSETTS PUBLIC DESIGN-BUILD PROJECTS

As discussed previously, design-build is not technically allowed as a project delivery method unless special legislation is enacted or the project conforms with M.G.L. Chapter 149 Section 44E provisions for modular buildings.

Several public projects were undertaken in Massachusetts using design-build, or a variation of design-build, such as design-build-finance or design-build-finance-operate. If the design-bid-build procurement method was to be used, these projects would have followed the requirements of Chapter 149, with the exception of the Route 3 Rehabilitation project, which would have been covered by Chapter 30.

The inability of public agencies to procure construction projects using alternative delivery methods without special legislation is a clear indication that alternative methods in general, and design-build in particular, have not been recognized by the legislature as sound, mainstream procurement methods.

Through the review of several publications, research papers, reports, and case studies, factors that may be preventing the Commonwealth from enacting legislation to make design-build a conventional delivery method on public projects like design-bid-build, were identified. These factors include:

- Unsuccessful experience on past public projects
- Owner fear of lack of control over project
- Owner fear of diminished quality of end product
- Lobbying by the Associated Subcontractors of Massachusetts
- Inconclusive evidence, in general, that design-build should become a conventional delivery method

Each one of these factors is discussed in detail in the following paragraphs.

Unsuccessful Experience on Past Public Projects

Several public projects were undertaken using the design-build procurement method. Two of them in particular, which were completed beyond the contract completion date and well above the project's budget, were subject for scrutiny by the Office of the Inspector General: The Plymouth County Correctional Facility (a Lease-Purchase-Finance Design-Build Project), and the University of Massachusetts Computer Service Center (a design-build "modular" project). Subsequent to the investigative work conducted by the Office, case studies were developed and published (*Cerasoli, 1997; and Cerasoli, 2001*).

The \$115 million Plymouth County Correctional Facility was procured using a lease-purchase-finance design-build delivery method. The primary issues associated with this project were related to the method of financing the project. However, other issues associated with the procurement of the project and its mismanagement contributed to its increased cost and schedule. According to the report, the Commonwealth did not have the authority to oversee or approve the design-builder's work, and the fast track design-build process restricted public access to key project information. In fact, under the special legislation, the project was exempt from statutory provisions for supervision, oversight, approval, and control of state-funded construction projects by the Division of Capital Planning and Operations. Further, since design-build contracts are typically based on incomplete design documents, they often incorporate programs or planning documents specifying the functional requirements the facility must fulfill. This contract did not include any programming information. Shortly after the facility began operations, the Plymouth County officials concluded that the facility's administrative space was inadequate.

The \$9.2 million University of Massachusetts Computer Science Center project was procured as a modular building using M.G.L. Chapter 149 Section 44E. Unfortunately, the design-build approach, inherent to the use of the modular building procurement law, did not produce the anticipated time savings since the project was completed 10 months after the contract completion date. The project also fell short of the required quality standards established by the end-user.

According to the Office of the Inspector General's report, several issues led to the failure of the project to be completed on time, and within budget, including:

- Although the Division of Capital Asset Management and Maintenance (DCAM) used the modular building procurement statute to contract for this project, the facility was not a modular building.
- Most delays and cost overruns were caused by factors under the design-builder's control.
- The design-build approach was not appropriate for this project.
- Top DCAM management did not support efforts of DCAM project personnel to enforce contract requirements and maintain control over the project.

In reviewing the detailed analysis performed by the Office of the Inspector General for these two public projects, it becomes clear that the state's unsuccessful experience with design-build on past projects may have led public agencies and the legislature to be cautious about using this delivery method.

However, it should be recognized that the lack of success in using design-build on some public projects is due, to some extent, to factors that are within the control of the public agencies administering the design-build contract. These factors include the lack of experience of project management staff in managing a design-build project; the lack of

communication and collaboration between the end-user agency that will ultimately occupy the facility, the design-builder firm that designs and constructs the facility, and the public agency that manages the contract; the omission of the program details in the request for proposals which specify the functional requirements of the project; or the inclusion of inadequate performance specifications that balance specificity and detail for the project while providing sufficient latitude for design creativity on the other.

Owner Fear of Lack of Control over Project

In general, the design-bid-build project delivery method stems from the fear that a construction contractor will not adequately safeguard public health and safety; therefore, the contractor needs the close supervision of a design professional.

Because of the “package” deal involved in design-build, the owner gives up a substantial amount of control over the design and construction process. The RFP and proposal, which form the basis for the design-build contract, usually contain fairly limited levels of details and definition of the project (*Minden, 1986*). If the project’s scope of work, including the performance requirements for the end-product, are not adequately defined within the RFP, the owner is unable to forcefully control the design, and later construction. Changes may be perceived by the design-builder as modifications to the scope of work, which result in cost increases and/or schedule delays to be born by the owner.

Owner Fear of Diminished Quality of End Product

Design-build involves some degree of subjective judgment on quality (*Minden, 1986*). There is an inherent risk associated with basing a design-build proposal and contract on limited level of project definition. Disputes over quality may arise as a result of differing interpretations of the RFP and proposal. Typically, price and time are fixed in the design-build contract, the only way a design-builder can control cost overruns, or compensate for estimating errors, is by reducing profit or reducing quality. Since reducing profit is highly undesirable, the design-builder looks for savings opportunities through the use of more economical materials and construction methods on the project. If the cost factor supercedes the quality factor from the owner's perspective, no issues arise. However, if quality is of primary importance to the owner, disputes emerge, and the relationship between the owner and the design-builder becomes adversarial.

Obviously, to mitigate the risk of diminished quality of the end product, owners should seek to emphasize the quality requirements of the project within the RFP documents, and should carefully review the design-builder proposal during the procurement phase.

Lobbying by the Associated Subcontractors of Massachusetts

As indicated within Chapter 3, the requirement for filed subcontractor bid is, no doubt, the most controversial constraint imposed by the M.G.L. on the procurement of public design-bid-build projects falling under Chapter 149 Section 44A – M. Despite the recommendations of the Construction Reform Task Force and the Pioneer Institute’s report to eliminate this requirement (*EOAF, 1998 and Gransberg, 1999*), no action has ever been taken by the legislature.

The Associated Subcontractor’s of Massachusetts (ASM), which is an organization that represents subcontractors, suppliers and affiliated organizations in Massachusetts and surrounding states, is believed to be responsible for defeating all attempts to repeal the filed sub-bid law. Its mission is “to protect the interests of subcontractors and suppliers, and promote professionalism in construction through education, communication, government and industry advocacy.” One of ASM’s priorities is to “protect the filed sub-bid provisions in the public bidding law.” In short, the filed sub-bid law is viewed as one that ensures that subcontractors have the right to bid on public work, on an open and level playing field.

According to the ASM, the filed sub-bid law assures “fair, open and honest competition” for all bidders, general contractors and subcontractors alike; and guarantees the lowest

cost for taxpayers because all bidders know that they have only one chance to submit their best price (*ASM, 1997*).

Further, since in a design-build contract the RFP only includes the scope of work for the project, and sometimes limited design, the filed sub-bid law can not be applied. This is viewed by the ASM as an unfair practice to subcontractors, who perform, in most cases, 80% or more of the work on any construction project. Under the current filed sub-bid law, subcontractors bid directly to the awarding authority, which provides them with price protection. In a design-build arrangement, when the contract is typically negotiated between the design-builder and the awarding authority, the subcontractors are forced to negotiate their bid with the design-builder through bid shopping.

Finally, design-build eliminates the payment protections that subcontractors have under the bid law, which puts them at great financial risk (*ASM, 1997*).

The position of ASM with respect to design-build in the public sector is further discussed in a subsequent section through an interview conducted with the Executive Director of the organization.

Inconclusive Evidence that Design-Build Should Become a Conventional/Mainstream Delivery Method

The project life-cycle of a typical vertical Massachusetts public project consists a series of processes that begin with the identification of a requirement for a facility, followed by advertising and awarding a contract for the performance of a feasibility study, then the performance of this feasibility study, then the advertisement and award of the contract for complete design, then the advertisement of a solicitation for construction services, then the receipt of filed sub-bid, then the receipt of general contractors bids and the award of the contract for construction services, and finally the construction of the project. In general, public sector procurement is built upon unique restrictive construction procurement regulations to ensure “fairness” and “open competition,” in the spirit of the Ward Commission.

A study performed by the Pioneer Institute in 2000, following the release “The Cost of Inaction” white paper in September of 1999, shows that the estimated cost of Massachusetts vertical projects, in normalized terms, is about 40% higher than in Florida and Texas. Similarly, the award growth in Massachusetts is 19.67% compared to 2.17% and –5.95% in Texas and Florida respectively; the cost growth is 24.08% in Massachusetts compared to 2.53% and –1.08% in Texas and Florida respectively; and the time growth is 43.26% in Massachusetts compared to 2.58% and –2.85% in Texas and Florida respectively (*Gransberg, 2000*). According to this study, cost and time growth are

the best indicators of excessive change orders and/or the inability to deal with them effectively.

However, the higher cost of public construction in Massachusetts is partially attributable to the wage and cost-of-living differences, the unionization rates, and the climate considerations.

As such, and taking into consideration the factors presented in the previous paragraphs, it is difficult to decisively determine that there is a true need to amend the law to allow design-build to become a conventional delivery method like design-bid-build.

**CHAPTER 6. PRIVATE AND PUBLIC SECTORS PERCEPTION OF DESIGN-
BUILD AS A DELIVERY METHOD FOR PUBLIC PROJECTS IN
MASSACHUSETTS**

In an effort to further investigate the reasons behind not allowing design-build to become a conventional or mainstream delivery method in Massachusetts, interviews were conducted with representatives from the private and public sectors. The intent of these interviews was to specifically understand the interviewees perception of design-build and its applicability on public projects in Massachusetts. The selection of the interviewees was based on two primary factors:

- The interviewee should be a key representative of the private or public sector in Massachusetts.
- The interviewee should represent a major Massachusetts professional organization or Massachusetts public agency at stake.

As a result, the following individuals representing various public and private sector organizations were interviewed:

Mr. Helmut Ernst, Deputy Chief Engineer in Charge of Construction, Massachusetts Highway Department (MHD)

Ms. Mary Gately, Director of Market Services, Association of General Contractors of Massachusetts (AGC Massachusetts)

Ms. Abbie Goodman, Executive Director, American Council of Engineering Companies of Massachusetts (ACEC of Massachusetts)

Ms. Monica Lawton, Executive Director, Associated Subcontractors of Massachusetts (ASM)

Mr. Michael McKimney, Deputy Commissioner, Commonwealth of Massachusetts Division of Capital Asset Management and Maintenance (DCAM) - Office of Planning, Design and Construction

Mr. Jeff Quick, Director of Resource Management, Commonwealth of Massachusetts, Department of Correction (DOC)

Mr. Kevin Sullivan, Secretary, Commonwealth of Massachusetts, Executive Office for Administration and Finance (EOAF)

The interview questions were designed to cover issues associated with public project delivery methods in the Commonwealth, in general; and issues associated with design-build, as applicable to public projects, in particular.

In general, the interviews were developed according to the following. They begin with questions related to issues in the Massachusetts public design and construction procurement methods as identified by the Construction Reform Task Force. Then, they address the special legislation filed in 1999 to allow alternative delivery methods, including design-build, to be used when they are deemed adequate for a particular project. More specific questions regarding the design-build process in the Commonwealth, including the quality of the request for proposals, and the level of success of the design-build projects are included. The interviewees are then asked to provide their specific views regarding the applicability of design-build on public projects in Massachusetts. This is accomplished through a question soliciting their opinion about factors which were identified as having the potential to prevent the state from making design-build a mainstream delivery method. The interviews conclude with questions seeking the interviewees opinion with regard to the criteria that should be used to determine whether a project should be procured using design-build; and with regard to the viability of design-build as a delivery method on public projects.

As some of the questions do not apply to all of the interviewees, they were either altered, eliminated and/or replaced by ones that specifically target the organization or the agency being interviewed. Appendix "A" includes the interview questions which were addressed to each one of the above listed public and private sectors representatives.

In the following paragraphs, a summary of the interview conducted with each individual is provided. Each summary includes aspects of the interview that are deemed most reflective of the position of the organization represented. Appendix “A” includes the complete record of the interview minutes.

Interview with Mr. Helmut Ernst, Deputy Chief Engineer in Charge of Construction,

MHD

Mr. Helmut Ernst emphasized that the Rehabilitation of the Route 3 North project, currently under construction, is the first horizontal design-build project to be undertaken by the state. In an effort to mitigate the potential for change orders, a significant effort was expended during the development of the request for proposal to provide a detailed scope of work with clear requirements. Subsurface exploration information was also included.

Even though design-build has not been considered for other horizontal projects prior to the Route 3 North project, and considering that most of the state’s experience in design-build comes from “vertical” projects, Mr. Ernst believes that the legislature would have taken steps to enact a legislation making design-build a conventional delivery method if there was enough evidence that design-build is effective. In his opinion, the state agencies’ fear of diminished project quality comes next as a factor that may be preventing the state from making design-build a mainstream delivery method, followed by their fear

of lack of control over the project, then by their unsuccessful experience on past projects, and finally by the lobbying of the ASM to maintain filed sub-bid.

Interview with Ms. Mary Gately, Director of Market Services, Association of General Contractors of Massachusetts (AGC Massachusetts)

In general, Ms. Gately agrees that there are numerous deficiencies in the Commonwealth's public procurement methods that are driving public projects costs higher, and leading to excessive time growth. The lack of action on the part of the legislature to improve public procurement methods overall is mainly due to the lack of political thrust.

Ms. Gately further indicates that government agencies are so accustomed with the design-bid-build delivery method, to the point where the schedule and time constraints typically associated with a design-build project are not seriously taken into consideration when decisions need to be made.

In her opinion, the lobbying by the ASM to maintain the filed sub-bid law in effect plays a primary role in preventing the legislature from enacting a legislation to make design-build a conventional delivery method, like design-bid-build. The state's unsuccessful experience on past public design-build projects, and the state agencies fear of the lack of control over design-build projects are secondary factors. It should be noted that Ms.

Gately believes that the failure of public design-build projects can be attributed primarily to the lack of qualifications of project managers assigned to the projects by the public agencies, and the lack of communication and collaboration between the various stakeholders. Then comes the owner's fear of diminished quality of the end product, which she mainly attributes to the public agencies lack of understanding of the design-build process. Finally, the lack of evidence that design-build is an effective procurement method is the least important factor.

As a representative of the Association of General Contractors of Massachusetts, Ms. Gately states that AGC does not support any one project delivery method. Rather, the organization backs alternative procurement methods because they help move projects "faster and better." The ability of public agencies to prequalify contractors, and subcontractors in some cases, when an alternative delivery method is utilized, helps the state achieve better quality and more cost effective projects. In her view, design-bid-build will continue to be the most popular delivery method, followed by construction manager at risk, then design-build.

Ms. Gately believes that design-build requires a certain type of owner to be effectively used. An owner who:

- Can make decisions quickly.
- Has a specific type of project.

- Knows the design-build process.
- Is a little sophisticated.
- Can clearly define the parameters of the project.

Interview with Ms. Abbie Goodman, Executive Director, American Council of Engineering Companies of Massachusetts (ACEC of Massachusetts)

In addressing the deficiencies in public procurement identified by the Construction Reform Task Force, Ms. Goodman indicates that some improvements are being made. Particularly, she refers to the legislation passed to eliminate the “two-designer” requirement – M.G.L. Chapter 7 Section 38H in 2001 (i.e., one designer to perform the feasibility study, and another to perform the detailed design). However, comprehensive changes to public procurement methods can be very difficult to implement due to “the competing interests of different business groups and labor unions.” In her opinion, this is the primary reason behind the enactment of “alternative procurement bills for one project at a time.”

Ms. Goodman also notes that, in her opinion, the owner’s fear of lack of control over a project plays a primary role in preventing the legislature from enacting a legislation to make design-build a conventional delivery method, like design-bid-build. The owner’s fear of diminished quality comes next as a factor, followed by the lobbying of the ASM and building trade unions on filed sub-bid and prevailing wages, then by the inconclusive

evidence that design-build is effective and should become a conventional delivery method. The state's unsuccessful experience on past public design-build projects is considered the least important factor. Ms. Goodman states that, in general, "it is difficult to make any legislative change (except budget cuts), when you have well organized groups that oppose some or all of the change. The legislature, by its makeup of elected officials from different regions of the state with different priorities and issues, doesn't pass bills that make major changes in the way things are now if they hear a lot of organized opposition. They have too many other issues to handle, so they go for the issues they can fix."

Interview with Ms. Monica Lawton, Executive Director, Associated Subcontractors of Massachusetts (ASM)

Ms. Lawton has been involved in the debate over the need for the filed sub-bid law for a long time. She emphasizes that fairness and open competition are priorities in public construction in the Commonwealth, to protect it from corruption. It is questionable whether they can be maintained if alternative procurement methods, including design-build, are used. She indicates that, in the case of alternative procurement methods, the selection process is controlled by the awarding authority, instead of being strictly ruled by an impartial law. Therefore, it is difficult to maintain objectivity in the selection process, and strong political connections may lead to favoritism.

From Ms. Lawton's perspective, rating the factors that may be preventing the state from enacting legislation to make design-build a mainstream delivery method is a very difficult task. It depends on the agency in play. For the Division of Capital Asset Management and Maintenance, the agency's fear of lack of control over a project is the primary factor, followed by the agency's unsuccessful experience on past projects. However, from the legislative standpoint, the lack of sufficient evidence or track record to prove that design-build should become a conventional delivery method is the most important factor, followed by the state's unsuccessful experience on past projects.

Design-build is considered a viable alternative method by ASM; however, it is not supported by the organization because it does not ensure fairness and open competition in the procurement process. Specifically, design-build is not desirable for two main reasons: first, it presents a risk to the subcontractor; second, the subcontractor, in a design-build project, is invited to bid on a project, rather than have the right to bid on a project. Design-builders do control the award of the subcontracted work.

Interview with Mr. Michael McKimney, Deputy Commissioner, Commonwealth of Massachusetts Division of Capital Asset Management and Maintenance (DCAM) - Office of Planning, Design and Construction

In addressing the deficiencies in public procurement which were identified by the Construction Reform Task Force and the Pioneer Institute, Mr. McKimney emphasized

that the studies were performed out of context. Factors such as the requirement for prevailing wages, the high cost of living, and the dynamics of politics and funding of projects in the Commonwealth of Massachusetts, which significantly contribute to the high cost of public construction in the Commonwealth, were not taken into consideration in the analysis.

In his opinion, the reason why no legislative action was taken when the special legislation of 1999 was filed to allow alternative delivery methods to be used when they are deemed adequate for a particular project, is that it was so comprehensive, to the point where many groups at stake were affected. Political parties, backed by constituents with specific goals and views, hold the key to the success of a piece of legislation. In general, the power of unions and subcontractors should not be under-estimated.

Mr. McKimney recognizes that past design-build projects were not particularly successful for various reasons. The requests for proposals were not of high quality, and were not properly detailed. Also, some of the projects did not get sufficient attention from the agency's management. However, the design-build process is being continuously improved upon by improving the quality and level of detail of the requests for proposals, and by using an integrated project team approach when assigning state employees to the project.

With respect to the factors which may be preventing the state from enacting a legislation to make design-build a conventional delivery method, Mr. McKimney states that the lobbying of the ASM plays the most significant role. It is followed by the fear of the state agency at stake of lack of control over the project and of the diminished quality of the end product, then by the lack of sufficient evidence that design-build is an effective procurement method. Finally, the state's unsuccessful experience on past projects is considered the least important factor.

Mr. McKimney, as a representative of DCAM, does believe that design-build will become a viable procurement method, and will be used on public projects.

Interview with Mr. Jeff Quick, Director of Resource Management, Commonwealth of Massachusetts, Department of Correction (DOC)

Mr. Quick does not agree with the analysis and conclusions drawn by the Pioneer Institute's report regarding the higher cost growth in public construction projects in Massachusetts, as compared to Texas. After all, Texas "is a different economic market."

With respect to the failure of design-build projects undertaken by the state to date, he emphasizes that they "were unsuccessful partly because of the lack of experienced oversight in the state's construction management of the project."

In his opinion, the most important factor that may be preventing the state from enacting legislation to make design-build a conventional delivery method is the state agencies' fear of lack of control over the project. Then comes the owner's fear of diminished quality of the project, followed by the state's unsuccessful experience on past design-build projects. The inconclusive evidence that design-build should become a mainstream delivery method comes next, and finally, the lobbying by the ASM is the least important factor.

Mr. Quick adds that there is a potential for design-build to become a viable procurement method if "legislation were developed and passed which protected the state's interest and provided adequate oversight [for the project]."

Interview with Mr. Kevin Sullivan, Secretary, Commonwealth of Massachusetts, Executive Office for Administration and Finance (EOAF)

Mr. Sullivan believes that the Commonwealth must take action to reduce the cost growth and time growth on public projects. Recognizing that the low bid requirement of current procurement laws does not necessarily result in the delivery of a quality project, he supports best-value procurement. In his view, however, the legislature is primarily unable to alter current procurement laws, which derive from the 1980's Ward Commission's recommendations, for political reasons. In fact, no elected official wants to be viewed as

one who altered a piece of anti-corruption legislation, unless it is proven that the benefits outweigh the risks of introducing corruption.

With respect to rating factors believed to prevent the state from enacting legislation to make design-build a mainstream delivery method, he considers the state's unsuccessful experience on past public design-build projects and the lack of conclusive evidence that design-build is viable as a delivery method are the most important factors. They are followed by the strong lobbying of the ASM, then by the owner's fear of lack of control over the project and the fear of diminished quality of the end product.

Mr. Sullivan emphasizes the importance of involving "industry experts" in the procurement of a public project, rather than politicians. The procurement process should rely upon factors such as the experience and knowledge of the design and construction teams, the price, and the schedule; this is not consistent with the current requirements of the procurement laws which call for the selection of the lowest responsible and eligible bidder.

CHAPTER 7. ANALYSIS OF ISSUES IN MASSACHUSETTS PUBLIC DESIGN-BUILD PROJECTS

In the following paragraphs, the issues associated with design-build on public projects in Massachusetts, which were raised previously, are analyzed in light of the discussions held during the interviews with key representatives from the private and public sectors.

Position of Public and Private Sectors

In reviewing the outcome of the interviews, it becomes clear that views regarding design-build and its applicability on public projects in Massachusetts significantly differ between the public and the private sectors.

While representatives from the public sector, namely from the Executive Office of Administration and Finance (EOAF), the Division of Capital Asset Management (DCAM), the Massachusetts Highway Department (MHD), and the Department of Correction (DOC), are clear proponents of design-build as a delivery method for public construction projects, the position of the private sector varies from opposition to reservation.

On one hand, the EOAF, represented by Secretary Sullivan, supports “best-value” procurement, including design-build, which allows the state to consider quality,

efficiency and schedule, in addition to price, when selecting a contractor. In general, DCAM, represented by Mr. McKimney, believes that the agency has implemented effective changes that would improve the ability of the state to control and manage design-build projects, when undertaken. These efforts include improved project programming, better requests for proposals, prequalification of subcontractors, and effective staffing of the project. MHD, which is currently using design-build for the first time on the Route 3 North rehabilitation project, focuses its efforts during the programming and scope of work development phase to better define the project, and eliminate as many unknowns as possible. Finally, DOC, represented by Mr. Quick, emphasizes the criticalness of the experience of the management team assigned to oversee a design-build project.

On the other hand, the private sector has more reservation, in general, when it comes to the use of design-build as a delivery method on public projects. AGC of Massachusetts backs alternative project delivery methods in general. In the organization's view, as stated by Ms. Gately, alternative methods help projects "move faster and better." However, design-build is not considered the preferred alternative delivery method. Design-build, to be effectively undertaken, requires an owner who understands the design-build process and who can make decisions quickly. The state has yet to fully develop and effectively implement procedures allowing design-build projects to run smoothly.

ACEC of Massachusetts also has reservations regarding design-build. The organization, as stated by Ms. Goodman, “believes that alternative methods, including alternative financing, should be considered to make it possible to build some projects that might not otherwise be done under the state’s bond cap.” She further indicates that, while design firms support alternative methods, “some smaller firms are concerned that they would be left out of design-build teams, when they might have been selected to design a particular part of a project using more traditional methods.” It should be noted that, ACEC, in conjunction with the American Bar Association, has drafted a Model Design-Build Procurement Act. This Model emphasizes the importance of the design-bid-build delivery method. If design-build were to be considered, the state agency shall demonstrate, in writing, why the design-build delivery method is better suited for the project. The Model further outlines procedures for undertaking a design-build project, starting with the definition of a scope of work, including criteria and preliminary designs, general budget parameters, and schedule and delivery requirements; and concluding with the solicitation process and evaluation of the prospective design-builders.

Finally, ASM, represented by Ms. Lawton, firmly asserts that her organization does not support design-build as a delivery method for public projects. From ASM’s perspective, design-build does not ensure fairness and open competition in the procurement process, as would the design-bid-build process. It presents a risk to the subcontractor who is forced to bid on incomplete project documents. It also excludes many subcontractors

from bidding because they are typically invited to bid on the project; these subcontractors are otherwise qualified to perform the work, and have the “right to bid.”

Rating of Factors Presumed to Prevent Massachusetts from Enacting Design-Build Legislation

Although the factors presumed to prevent Massachusetts from enacting a legislation that makes design-build a conventional project delivery method on public projects, as noted within Chapter 5, have been acknowledged by all interviewees, opinions regarding their relative impact is noticeably different.

An evaluation of the rating (from most important to least important) of the factors identified previously indicates that the Owner’s fear of lack of control over the design-build project, the lobbying by ASM and the inconclusive evidence that design-build should become a conventional delivery method are the most important factors.

Deductions from Interviews

A closer and comprehensive review of the interviews points to three general areas that seem to hinder successful attempts to enact a legislation making design-build a mainstream project delivery method, like design-bid-build. These areas are the potential loss of opportunities for the design and construction community, the technical and

management issues associated with design-build at the public sector level, and the political environment in the Commonwealth.

Loss of Opportunities for the Design and Construction Community

As indicated within previous chapters, public construction procurement laws in Massachusetts are based upon fairness and open competition. “As such, procurement must be sufficiently transparent so as to allow systematic verification that waste, fraud, and abuse have not been committed. This implies that any decision making process involving procurement should minimize subjective, individual judgement, and maximize objective, quantifiable facts and procedures as a basis for action. Therefore, there is a strong preference for methods which provide for competition among the widest possible group of offerors” (*Minden, 1986*).

The procurement of a design-build project significantly differs from the procurement of a typical design-bid-build one. It is based on incomplete project information, giving the competing design-builders enough flexibility to develop proposals in accordance with the request for proposal requirements. The criteria used to evaluate and select the design-builder rely primarily on the rating of the reviewers. This rating is, to a large extent, subjective; it is based on the individual judgement of the reviewer(s).

Further, design-bid-build is the most common project delivery method. Contractor, designers, and owners are accustomed to managing and controlling projects, of all magnitudes, which are procured in this manner. Design-build can be considered a niche in the design and construction industry. Therefore, the design and construction community fears that the use of design-build on public projects will, inevitably, result in a restricted pool of competitors pursuing these projects. Obviously, this defeats the purpose of public procurement laws.

From another perspective, small designers, who are otherwise well qualified to pursue public design-build projects, may not be able to compete; they may not be able to afford the costs associated with the preparation of elaborate proposals, as typically required for design-build projects. Additionally, small general contractors, who do not have the experience or the financial and technical capabilities to undertake design-build projects, are unable to compete against larger general contractors.

Finally, with the filed sub-bid law applicable to design-bid-build projects, subcontractors can submit their bids for any public construction project. In a design-build environment, subcontractors are typically invited to bid on a project, rather than have the right to bid. The design-builder controls the award of the subcontracted work, and may elect to “bid shop” before selecting a subcontractor for a particular trade.

Technical and Management Issues at the Public Sector Level

The undertaking of a design-build project requires certain technical and management skills, on the part of the public agency at stake, to ensure a successful completion of the project.

Through the review of case studies, and through the interviews conducted with representatives from the public and private sectors, it is apparent that the lack of technical and management skills does affect the outcome of a design-build project. The main issues that are negatively affecting public design-build projects are:

Quality of Requests for Proposals

When a RFP for a design-build project is not properly prepared, and the project design parameters are poorly defined, the risks of conflicts between the awarding authority and the design-builder increase considerably. These conflicts may be due to the misinterpretation of the RFP requirements, or the failure of the design-builder to meet the expectations of the awarding authority and/or the end user. They typically arise during the design phase of the project, and may well continue during the construction phase as the end user realizes that the facility does not meet his needs in some or all respects.

Managing Public Design-Build Projects

Design-bid-build is the most commonly used project delivery method on public projects. It is strictly regulated through the Massachusetts General Laws. The project management staff of public agencies is required to manage its design and construction projects in accordance with the regulations. To assist the staff in understanding the legal requirements and adequately managing the projects, the Office of the Inspector General published a guide on “recommended practices;” this guide is entitled “Designing and Constructing Public Facilities (*Cerasoli, 2000*).

However, procedures for managing public design-build projects have not been established. The project management staff representing the various agencies should have the management skills and the experience required to effectively oversee and control design-build projects.

Communication and Collaboration

Design-build projects are typically fast-tracked. Decisions have to be made expeditiously to mitigate potential delays during the design and construction phases. However, in the midst of all the ongoing activities, it is easy to overlook the importance of communication between the various project stakeholders. Unfortunately, the lack of effective and timely communication, as well as the lack of

collaboration between the awarding authority, the end user, the designer and the constructor negatively affect the project; they often lead to costly and unwelcome changes.

Political Environment

The political environment in Massachusetts has a significant effect on the enactment of legislations. A legislation making design-build a mainstream delivery method on public construction projects is no exception.

Partisan Politics and Organized Opposition

In looking back at the position of the public and private sectors regarding design-build, which was discussed previously, one can not help but recognize that partisan politics does play a major role in defining the future of alternative project delivery methods in general, and design-build in particular in the state.

The executive branch of the administration, which currently consists primarily of followers of the republican party, fully supports design-build as a delivery method on public projects. However, the legislative branch, which currently consists primarily of followers of the democratic party, is largely backed by the constituents of the Commonwealth. These constituents have specific views, goals and issues that are

important to them; they hold the key to the success of a piece of legislation. Organized groups, such as the Associated Subcontractors of Massachusetts (ASM), can be powerful and influential parties. Since they represent a large group of stakeholders, their lobbying against design-build does affect any legislative enactment. Accordingly, the legislative branch has no choice but follow the needs and desires of these constituents.

CHAPTER 8. CONCLUSIONS AND RECOMMENDATIONS

Future of Design-Build on Public Projects

Amidst the debate of why design-build has been unsuccessful on many public design-build projects, and the differences in how various public and private entities view design-build and its applicability on public projects, the question remains: What is the likelihood that design-build will eventually become a mainstream (or conventional) and regulated project delivery method for public projects, like design-bid-build currently is?

In looking back at the issues discussed previously regarding the use of design-build on public projects in Massachusetts, the competing interests within the private sector, represented by designers, contractors (including design-builders), and subcontractors; within the public sector, represented by the executive branch and the legislative branch; and between the private and public sectors, are evident. On one hand, some private organizations, such as the Associated General Contractors of Massachusetts and the American Council of Engineering Companies of Massachusetts, show flexibility in their position relative to the use of design-build on public projects as discussed previously; other private organizations, such as the Associated Subcontractors of Massachusetts, do not support design-build on public projects. On the other hand, there is a divergence between the view of the state executive branch, which is in favor of making design-build a mainstream project delivery method; and that of the state legislative branch, which is

reluctant to revise the Massachusetts laws to allow the use of design-build without the need for a special legislation.

From an analytical point of view, an effective statistical analysis of the interviews conducted with representatives of various private and public entities can not be performed to draw conclusions; This is primarily due to the limited statistical sample involved in the study.

From a general perspective, it is evident that the interviewees shared their personal opinion regarding the subject. Certainly, their subjective opinion does not directly affect the decisions made at the government level. However, their views are speculations based on an informed assessment of the current political environment, and a thorough understanding of the design and contracting business. With the change of state administration and legislature, the political environment in Massachusetts is subject to change. This may affect any decisions made in the future regarding the viability of design-build.

Considering the information collected during the course of the research, it is highly unlikely that design-build will become a conventional delivery method like design-bid-build, at least for the near future. In summary, lobbying by the opposition against design-build is strong; the reports and case studies published by the Office of the Inspector General on select public design-build projects are negative; the legislature is not

convinced of the need to make design-build a mainstream delivery method; the executive branch is unable to convince the legislature of the latter; and major private entities such as ACEC of Massachusetts and AGC of Massachusetts are cautious, at best, about design-build.

However, in its attempt to address the current fiscal crisis in the Commonwealth, the administration, once again, is actively pursuing reforms in the area of procurement of public project. In fact, Governor Mitt Romney, who was elected Governor of the Commonwealth of Massachusetts in November 2002, recently filed a proposed legislation to eliminate the filed sub-bid requirement for local municipal projects, and to allow the use of design-build for local municipal projects also. Would this proposal have a better chance for survival than its predecessor, which was filed by Governor Cellucci in 1999, given the current fiscal crisis? The fate of this proposed legislation remains to be seen.

Conclusions and Recommendations

Evidently, design-build on public projects is a controversial topic of discussion. The views of the public and private sectors differ regarding its level of success on previously completed or ongoing public projects, and its effectiveness and viability as a project delivery method in general.

It is difficult to assess the success and viability of design-build as an alternative procurement method without having a control reference to compare the design-build projects to. As indicated by Minden (*Minden, 1986*), “the problem is how to define and measure the success in a meaningful and objective way... Ideally, one would like to have two projects with identical contingency factors, apply design-build to one and the traditional [design-bid-build] method to the other; then measure the projects’ outcomes in terms of the critical variables of time, cost and quality, as well as public accountability.” Theoretically, this approach is very logical. However, it is not realistic nor feasible.

Just like other project delivery methods, design-build has its advantages and disadvantages, as previously discussed. The main challenge for the contract awarding authority is to be able to thoroughly assess the project requirements and needs for integration of design and construction, and carefully identify and evaluate the time, schedule and quality constraints of the project prior to selecting design-build as the preferred delivery method.

Should there be a desire to increase the likelihood of design-build to become a conventional project delivery method, the sensitive design-build issues brought up in Chapter 7 should be addressed. Following are recommendations which would help achieve this goal:

Loss of Opportunities for the Design and Construction Community

The concerns presented by various private entities, including designers, contractors and subcontractors, regarding the potential loss of opportunities when design-build is used as a delivery method on public projects, can be alleviated by implementing the following:

- Offering an honorarium to help offset the cost of proposal preparation for small designers who do not have sufficient financial capabilities, but who are otherwise well qualified technically to design the project;
- Establish reasonable, fair, and objective criteria for the selection of the design-builder, to ensure fairness in the selection process.
- Establish reasonable, fair, and objective criteria for prequalifying subcontractors who would be eligible to work on the design-build project. The design-builder would be required to select subcontractors from this pool of prequalified ones.

Technical and Management Issues at the Public Sector Level

Quality of Requests for Proposals

When a RFP is properly prepared, and the project design parameters are well defined, the risks of conflicts between the awarding authority and the design-builder are minimized. The design phase of the project progresses smoothly, and no delays in the start of

construction are encountered. Despite the fact that “the quality of the RFP depends on the quality of the designer,” as indicated by Mr. McKimney (DCAM), several controls and check points can be established by the public agency during the development of the RFP to ensure its adequacy and correctness. Additionally, a thorough review and evaluation of the design-build proposals will minimize the risk of disputes after the award of the project.

Managing Public Design-Build Projects

To effectively manage a design-build project, the awarding agency must understand the intricacies of the design-build delivery method. If critical decisions about design or construction issues are not made expeditiously, the project schedule and budget suffer. Therefore, it is important to assign competent staff, experienced in managing and controlling design-build projects. Further, procedures and guidelines can be developed for effectively managing design-build projects. If the public agency does not have qualified staff to manage the design-build project, or if its staff is limited, it should consider hiring a construction management firm to act on its behalf.

Communication and Collaboration

The key to the success of a design-build project is to maintain open lines of communication between the various project stakeholders, including the end user, the

awarding authority, and the design-builder. Open communication facilitates collaboration, which helps with the resolution of issues arising during the design and/or construction phases, and which ultimately results in the successful completion of the project. The lack of communication between the stakeholders inevitably leads to increased project costs and delays. These increased costs and delays in the project schedule are primarily due to changes to the scope of work to meet the expectations or changed requirements of the end user.

Political Environment

The political environment in Massachusetts is very complex. Partisanship does play a role in the decision making process. It is in the best interest of the state to address technical issues, such as the applicability of project delivery methods to public projects, separately from political issues. Politicians are the ones making the final decision, and enacting laws at the legislative level. However, not all of them possess the technical knowledge and / or background, and yet they have to make a decision when it comes to technical matters such as design-build on public projects. Therefore, it is important for them to become informed and be educated on the benefits and disadvantages of various project delivery methods, including design-build. Without a clear understanding of the issues, how could a legislation be enacted?

Suggestions for Future Research/Study

Design-build, and its applicability as a project delivery method, have been subjects of discussion and research by various groups and organizations, including the Design-Build Institute of America, the Association of General Contractors, and the Construction Industry Institute. A lot has been written on the advantages of design-build when used on private, as well as public projects. Still, Massachusetts, through its legislature, seems to be skeptical about it, and continues to allow it only through the enactment of special legislations.

Even though several public projects have been procured using the design-build delivery method, little has been written about the lessons learned through the process. It would be informative and useful to review the details of each one of these projects, including the scope of work, the design development process, the budget and schedule constraints, and other factors that potentially affect the outcome of the project and determine its level of success; and study the reasons behind any cost and/or time growths (e.g., errors and omissions, owner-initiated changes, requirement for accelerated design and/or construction schedules, differing site conditions, claims, etc.). Criteria could be derived of this review to gage the success of each public design-build project once completed.

Further, recognizing that design-build has been embraced by many other states as a conventional delivery method on public projects, researching the factors that lead these

states to do so and reviewing their methods and procedures may help Massachusetts increase the likelihood of success of its projects.

REFERENCES

Documents

1. American Consulting Engineers Council of New England. (1994). "Qualifications Based Selection (QBS) - Owners Manual." Boston, MA
2. Angelo, W. J. (2002). "Bay State Road Job Wins Design-Build Converts." News Article, Design-Build Supplement to Engineering News Record, The McGraw-Hill Companies, New York, NY
3. Associated General Contractors of Massachusetts. "Recommended Practices on Public Sector Building Projects in Massachusetts." Joint Committee of the Associated General Contractors of Massachusetts, the Boston Society of Architects, and the American Consulting Engineers Council of New England, Boston, MA
4. Associated General Contractors of Massachusetts / Boston Society of Architects. (1997). "BSA/AGC Joint Position on the Use of Design-Build in the Public Sector." Boston, MA
5. Associated General Contractors of Massachusetts / Boston Society of Architects. (2000). "Design-Build: Procurement, Team-Building and Risk Management (Draft)." AGC/BSA Design-Build Task Force, Boston, MA
6. Associated Subcontractors of Massachusetts. (1997). "Analysis of Current Efforts to Replace Competitive Bidding with Design-Build Process." Boston, MA
7. Beckwith, G. (2002). Letter to Ms. Lida Harkins, Chair, House Working Committee on Local Aid. Boston, MA
8. Building Futures Council. (1995). "Report on Design-Build as an Alternative Construction Delivery Method for Public Owners." Committee on Management and Contracting Alternatives, Georgetown, MD
9. Carlson, Jr., J. (1992). "Innovative Approaches to Alternative Methods of Project Delivery." Center for Construction Research and Education MIT, Symposium on the Construction Industry in the Northeast: Opportunities for the 21st Century, Boston, MA
10. Cassidy, R. (2002). "DBIA White Paper Looks at Specialty Contractor Role." News Article, Building Design and Construction, Reed Business Information, Highland Ranch, CO
11. Cerasoli, R. A. (1997). "Lease-Purchase Financing of a Design/Build Project: The Plymouth County Correctional Facility." Case Study, Commonwealth of Massachusetts Office of the Inspector General, Boston, MA

12. Cerasoli, R. A. (2000). "Designing and Constructing Public Facilities – Legal Requirements, Recommended Practices, Sources of Assistance." Commonwealth of Massachusetts, Office of the Inspector General, Boston, MA
13. Cerasoli, R. A. (2001). "A Report on the Design and Construction of the University of Massachusetts Computer Science Center." Case Study, Commonwealth of Massachusetts, Office of the Inspector General, Boston, MA
14. Commonwealth of Massachusetts. (1990). "Case Studies in Public Construction – The Impact of Chapter 579 of the Acts of 1980." Senate Committee on Post Audit and Oversight, Boston, MA
15. Commonwealth of Massachusetts. (1996). "Request for Proposals for Design-Build for a New Brockton Trial Court." Executive Office for Administration and Finance (EOAF), Boston, MA
16. Commonwealth of Massachusetts. (1998). "Construction Reform Task Force – Final Report." Executive Office for Administration and Finance (EOAF), Boston, MA
17. Commonwealth of Massachusetts. (1998). "Public Construction Reform in Massachusetts. Executive Summary." Executive Office for Administration and Finance (EOAF), Boston, MA
18. Commonwealth of Massachusetts. (1999). "Construction Reform Legislation." Boston, MA
19. Construction Industry Institute. (1997). "Project Delivery Systems: CM at Risk, Design-Build, Design-Bid-Build." Research Summary 133-1, Design-Build Research Team, Austin, TX
20. D'Alessandro, M. R. "Strategies for Successful Design-Build Project Delivery." Research Paper
21. Department of Transportation. (2002). "FHWA Approves Final Rule For Innovative Contracting Method Aimed at Saving Time, Money." DOT News Article
22. Design-Build Institute of America. (1996). "Survey of State Procurement Laws Affecting Design-Build." Washington, DC
23. Design-Build Institute of America. (2002). "Survey of State Procurement Laws Affecting Design-Build (Combined Design and Construction Contracting)." Washington, DC
24. Design-Build Institute of America. (2001). "DBIA and PMI Join to Define Competencies of Design-Build Project Managers." News Article, Design-Build Dateline, Washington, DC
25. Design-Build Institute of America. (2001). "FHWA Publishes Proposed Design-Build Contracting Rules for Public Comment." News Article, Design-Build Dateline, Washington, DC

26. Gransberg, D. D. (1999). "The Cost of Inaction – Does Massachusetts Need Public Construction Reform?" White Paper No. 7, Pioneer Institute for Public Policy Research, Boston, MA
27. Gransberg, D. (2000) "Vertical Construction Performance in Massachusetts Lags Far Behind Other States." Pioneer Institute for Public Policy Research, Boston, MA
28. Kocian, L. (2002). "School Bidding Rules May Be Eased." News Article, Boston Globe, Boston, MA
29. Korman, R., and Rosen, D. (1992). "Bid-Shopping, Bid-Peddling, Bid-Cutting: Cutthroat Practices are Running Rampant in the Industry, Stirring Anger and Ill Will." News Article, Engineering News Record, The McGraw-Hill Companies, New York, NY
30. Lawton, M. (1999). "Pioneer Institute Report – Commentary." Associated Subcontractors of Massachusetts, Boston, MA
31. Lawton, M. (2000). "Pioneer Institute Report – Commentary." Associated Subcontractors of Massachusetts, Boston, MA
32. Lawton, M. (2001). "Opposition to H.4816, Authorizing Alternative Methods of Construction on MWRA Projects." Letter to the Honorable Stephen M. Brewer, Senate Chairman, Associated Subcontractors of Massachusetts, Boston, MA
33. Lawton, M. (2001). "Testimony in Opposition to H.4775, Re. Contract for Construction of Sunderland Safety Complex." Associated Subcontractors of Massachusetts, Boston, MA
34. Lawton, M. (2002). "Construction Reforms Makes No Sense." Press Release, Associated Subcontractors of Massachusetts, Boston, MA
35. Linsky, D. (2002). "Local Aid Working Group Chapter 70 Sub-Committee Meeting Report." Memorandum to Majority Whip Lida Harkins, Boston, MA
36. Massachusetts General Laws Chapter 29 § 7E
37. Massachusetts General Laws Chapter 29 § 8B
38. Massachusetts General Laws Chapter 30B
39. Massachusetts General Laws Chapter 30 § 39M
40. Massachusetts General Laws Chapter 149 § 44 A through M
41. Massachusetts General Laws Chapter 189 of the Acts of 1998
42. Massachusetts General Laws Chapter 159 of the Acts of 2000
43. Massachusetts General Laws Chapter 245 of the Acts of 2002
44. Meyer, J. J., and Noble, C. L. (1995). "Massachusetts Construction Law 1995." Seminar Materials, Professional Education Systems, Inc., Eau Claire, WI

45. Minden, S. D. (1986). "Design-Build in the Public Sector: A Case Study of the Commonwealth of Massachusetts Division of Capital Planning and Operations (DCPO) Design-Build Project for Three Correctional Facilities." M.S. in Civil Engineering, Massachusetts Institute of Technology, Boston, MA
46. Molenaar, K. R., Songer, A. D., and Barash, M. (1999). "Public Sector Design/Build Evolution and Performance." Journal of Management in Engineering, ASCE
47. Moore, C., and Moscovitch, E. (1995). "Public Sector Design in Massachusetts. A Review of the Architectural/Engineering Industry and Public Contracting."
48. National Society of Professional Engineers. "Public Sector Design-Build, Is it Right for You?" Brochure, Government Relations Committee of the Professional Engineers in Private Practice
49. Silver, E. S. (2002). "Union Labor Starts Design-Build Drive." News Article, Design-Build Supplement to Engineering News Record, The McGraw-Hill Companies, New York, NY

Websites

1. ACEC: www.acec.org/programs/brooks2.htm
2. ACEC: www.acec.org/advocacy/procpubs.cfm
3. ACEC: www.acec.org/advocacy/doc/mpcfinal.doc
4. ACEC: www.acec.org/advocacy/pdf/vbdsqa.pdf
5. Associated Subcontractors of Massachusetts: www.associatedsubs.com
6. Beacon Hill Institute Press release on Project Labor Agreements (PLA's): www.beaconhill.org/NewsReleases/PLAPressRelease12803dgtfc.htm
7. Boston Business Journal Editorial on PLA's: boston.bizjournals.com/boston/stories/2002/08/12/editorial2.html
8. Building and Construction Trades Department, AFL-CIO: www.bctd.org
9. Commonwealth of Massachusetts: www.state.ma.us
10. Commonwealth of Massachusetts – Executive Office for Administration and Finance: www.state.ma.us/eoaf/construction
11. Commonwealth of Massachusetts – Office of the Inspector General: www.state.ma.us/ig
12. Construction Industries of Massachusetts: www.cimass.org
13. Design-Build Institute of America: www.dbia.org
14. Division of Capital Asset Management and Maintenance: www.state.ma.us/cam
15. Executive Office of Transportation and Construction: www.state.ma.us/eotc
16. Greenbush Project: www.mbta.com/projects_underway/greenbush.asp
17. Greenbush Project: www.cbbgreenbush.com/town_weymouth.html
18. Haskell Company: www.thehaskellco.com
19. Massachusetts Bay Transportation Authority: www.mbta.com

20. Norumbega Covered Storage Facility:
www.mwra.state.ma.us/water/html/norumbeg.htm
21. Pioneer Institute for Public Policy Research: www.pioneerinstitute.org
22. Route 3 Rehabilitation Project: www.widen3.com
23. Zweig White: www.zweigwhite.com

APPENDIX “A” - INTERVIEW MINUTES

Massachusetts Highway Department

Mr. Helmut Ernst – Deputy Chief Engineer in Charge of Construction

Interview Date: October 30, 2002 (Phone interview)

Preamble

Mr. Ernst started the discussion by providing brief information regarding the Route 3 N project, which is the first DB project undertaken by the Massachusetts Highway Department (MHD):

- Modern Continental is the design-builder
- URS is the lead designer
- The project value is \$300M approximately

A- The Construction Reform Task Force conducted a research on public procurement methods and found lot of deficiencies in the process, including:

- 1- Requirement for the selection of the lowest responsible, eligible bidder**
- 2- Requirement for the selection of one designer for the feasibility study, and another for the complete design**
- 3- Requirement for filed subcontractor bid**
- 4- Use of the design-bid-build as the mainstream project delivery method**
- 5- Lack of proper evaluation of the contractors at the end of the project**

A research conducted by Pioneer Institute determined that Massachusetts has an average project time growth of 43.26%, an average project cost growth of 24%, and a cost per sf of \$202; Compared to Texas, which relies on the design-bid-build project delivery system (no filed sub-bid law), and where the project time growth is 2.58%, the project cost growth is 2.53%, and the cost per sf is \$114, don't you think this is enough evidence that action must be taken in Massachusetts?

- This question doesn't really apply to MHD because the Construction Reform Task Force findings apply mainly to vertical construction.
- In Mr. Ernst's opinion, the increase in change orders is mainly due to errors and omissions by the designer or additional SOW requested by the owner.

B- Special legislation was filed in April of 1999 to allow alternative procurement methods, including design-build, to be used when they are deemed adequate for a particular project. This legislation was filed after the Construction Reform Task Force completed its report. Why, in your opinion, no action was taken by the legislation?

- He does not know why no legislative action was taken.
- MHD pursued design-build-finance as a project delivery method for the Route 3 N project to secure the financing of the project; That was mainly due to the state's bond cap that would prevent a project as expensive as this one to be undertaken. The project developer is actually financing the project.

C- The construction process should be a function of time, quality and price, not solely price-driven. Design-bid-build can ensure that quality projects are delivered on time and in accordance with budget. If design-build allows the delivery of a quality project, while reducing its duration and cost, wouldn't it be considered a valid alternative procurement method?

- The state does not have enough data to support this claim, particularly for horizontal construction. So MHD can not draw conclusions yet.

D- How do you rate the Request For Proposals prepared by the state for design-build projects?

- **Level of detail**
- **Clarity of requirements (performance specifications, program, etc.)**
- **Amendments**
- The RFP for the Route 3 N project is very detailed, with very clear requirements, and very few amendments.
- The RFP was prepared jointly by the EOTC and MHD. MHD provided the environmental permits and the results of the subsurface exploration. No initial layout was developed.

E- Are you aware of any successful public design-build projects? Why do you think they were successful?

- This question is not applicable to MHD.
- Mr. Ernst mentioned the I15 project in Utah, which is claimed to be a very successful DB project. Florida also uses DB on many horizontal projects.

F- Are you aware of any unsuccessful public design-build projects? Why do you think they were unsuccessful?

- No.

G- In my research to date, I have identified several factors that may be preventing the state from enacting a legislation that makes design-build a conventional project delivery method on public projects. These factors include:

- 1- **Unsuccessful experience on past public projects**
- 2- **Owner fear of lack of control over project**

- 3- **Owner fear of diminished quality of end product**
- 4- **Lobbying by the Associated Subcontractors of Massachusetts to maintain filed sub bid**
- 5- **Inconclusive evidence of the merit of the case (i.e., that design-build should become a conventional delivery method)**

Please rate these factors in descending order from most important to least important. In your opinion, are there any other factors that are applicable?

In Mr. Ernst opinion,

- 5 is really the most important factor. If there was enough evidence that DB is effective, action would have been taken by the legislature.
- 3 comes next, from the state's perspective.
- Then 2, then 1, and finally 4.

It should be noted that MHD has experience with only one project.

H- In your opinion, what are the criteria that would make you select design-build versus another procurement method for a particular project?

- In his opinion, the project's scope of work should be very well-defined. That's one of the reasons why MHD provided subsurface investigation information in the RFP; MHD wanted to eliminate the unknowns from the onset of the process.
- If Route 3 N project is successful, other DB (horizontal) projects will be considered as viable.
- The project's schedule is also a factor and should be taken into consideration by the awarding authority. On a DBB project, the state resources are maximized, while on a DB project, the contractor's resources are maximized.
- Fast tracking is feasible on horizontal projects.

I- Do you personally think that design-build will become a viable procurement method in the future? Under what circumstances?

- Yes, it is viable option.
- If Route 3 N project is not successful, it does not necessarily mean that DB won't be considered for other MHD projects. There must be a valid reason(s) for the failure of a project, which should serve as a learning lesson for the future.

J- If design-build became a conventional procurement method under the Massachusetts law, will you use it in the next five years?

- Yes. Refer to the answer to Question I.

Association of General Contractors of Massachusetts
Ms. Mary Gately – Director of Market Services

Interview Date: November 22, 2002 (Phone interview)

Preamble

- Ms. Gately started the discussion by providing her general view on design-build (DB). In her opinion, DB requires a certain type of owner who:
 - 1- Can make decisions quickly.
 - 2- Has a specific type of project – if the project is sophisticated or requires a complicated design, or if international architects are involved, it would be very difficult to use a DB project delivery method.
 - 3- Knows the DB process.
 - 4- Is a little sophisticated.
 - 5- Can clearly define the parameters of the project, to be able to effectively manage the architect.

- Owner must be sophisticated in the design-build process and pick a design-build team that is also seasoned in the fast-track design-build process

A- The Construction Reform Task Force conducted a research on public procurement methods and found lot of deficiencies in the process, including:

- 1- Requirement for the selection of the lowest responsible, eligible bidder**
- 2- Requirement for the selection of one designer for the feasibility study, and another for the complete design**
- 3- Requirement for filed subcontractor bid**
- 4- Use of the design-bid-build as the mainstream project delivery method**
- 5- Lack of proper evaluation of the contractors at the end of the project**

A research conducted by Pioneer Institute determined that Massachusetts has an average project time growth of 43.26%, an average project cost growth of 24%, and a cost per sf of \$202; Compared to Texas, which relies on the design-bid-build project delivery system (no filed sub-bid law), and where the project time growth is 2.58%, the project cost growth is 2.53%, and the cost per sf is \$114, don't you think this is enough evidence that action must be taken in Massachusetts?

- Ms. Gately stated that she agrees with the Pioneer Institute report on lot of things in general. She agrees that the statistics were challenged at some point because they were flawed and the results distorted; she stated that conducting business in Texas is different from conducting business in Massachusetts: labor is paid less, the cost of living is less, and the filed sub bid laws do not apply. Additionally, Florida is considered the “right-to-work” state, where unions and open shops co-exist. Massachusetts is a “union” state mostly.

- In her view, alternative delivery methods should be made available, and the state should not rely solely on filed sub bid.

B- Special legislation was filed in April of 1999 to allow alternative procurement methods, including design-build, to be used when they are deemed adequate for a particular project. This legislation was filed after the Construction Reform Task Force completed its report. Why, in your opinion, no action was taken by the legislation?

- There was really no champion to push this special legislation. Governor Cellucci formed a group to pursue it, but then he left office. If there is no one entity to push it through the legislature, this legislation won't pass, because it needs a political thrust. It should be noted that the IG has taken pieces of the Construction Reform Task Force findings, and has attempted to file legislation using these pieces – results to date unknown by Ms. Gately.
- Mr. Robert Petrucelli, President and CEO of AGC Massachusetts, was a member of the Construction Reform Task Force, and may be able to shed more light on this subject.
- Ms. Gately agrees that this piece of legislation was trying to accomplish too much at once. Unfortunately, the legislature can not approve pieces of it (i.e., it is a “take it” all or “leave it” matter).

C- The construction process should be a function of time, quality and price, not solely price-driven. Design-bid-build can ensure that quality projects are delivered on time and in accordance with budget. If design-build allows the delivery of a quality project, while reducing its duration and cost, wouldn't it be considered a valid alternative procurement method?

- Government agencies became so accustomed with the design-bid-build (DBB) delivery method, to the point where schedule/time is not taken into consideration when decisions need to be made. The public agencies' staff should understand the DB process, and should take responsibility to make quick decisions when needed.
- As an example, DCAM's project managers should learn and know the DB process. They should take the initiative to understand what the end user is looking for and become familiar with the scope of work (SOW). AGC has not seen that yet on DCAM's DB projects.
- Massachusetts needs to establish a process for DB.
- She would like to see an open procurement process, with alternative methods available, not only DB. So do architects and contractors.

D- How do you rate the Request For Proposals prepared by the state for design-build projects?

- **Level of detail**
- **Clarity of requirements (performance specifications, program, etc.)**

- **Amendments**

- Ms. Gately has noticed that the SOW has improved, and the level of detail of the Request for Proposals (RFP) is better. In general, the Massachusetts State College Building Authority (MSCBA) is preparing better RFP's, and has been including the proposal rating criteria in each RFP. However, it should be noted that the procurement method used by the MSCBA is not really DB. This Authority is trying to steer the architect and the contractor on a given project to work together from the onset of the project, while issuing two different contracts: one for design services, and another for construction services.
- DCAM has not improved their RFP's significantly yet.
- DCAM and Massport, as an example, don't define proposal rating criteria for DB projects.

E- Are you aware of any successful public design-build projects? Why do you think they were successful?

- No.

F- Are you aware of any unsuccessful public design-build projects? Why do you think they were unsuccessful?

- Ms. Gately mentioned the Brockton Courthouse. The inability of DCAM to make decisions in a timely manner, and the continuous design changes requested by the end-user were two of the major issues that led to the increase in the project's cost and duration.

G- In my research to date, I have identified several factors that may be preventing the state from enacting a legislation that makes design-build a conventional project delivery method on public projects. These factors include:

- 1- Unsuccessful experience on past public projects
- 2- Owner fear of lack of control over project
- 3- Owner fear of diminished quality of end product
- 4- Lobbying by the Associated Subcontractors of Massachusetts to maintain filed sub bid
- 5- Inconclusive evidence of the merit of the case (i.e., that design-build should become a conventional delivery method)

Please rate these factors in descending order from most important to least important. In your opinion, are there any other factors that are applicable?

In Ms. Gately's view,

- 4 is the most important factor.
- Then 1 and 2 (*rated identically*)

- Then 3. It should be noted that this is probably due to the lack of understanding of the DB process.
- Finally, 5. Ironically, legislature has passed so many other legislations without really having enough evidence proving that they were adequate.

Ms. Gately added that the failure of public DB projects can be attributed primarily to the lack of qualifications of project managers assigned to the projects by public agencies, and the lack of collaboration and communication between the various stakeholders.

H- Why does the industry want the Commonwealth of Massachusetts to make design-build a conventional procurement method?

- AGC does not support any one project delivery method. AGC backs alternative procurement methods, not only DB. Alternative methods help projects move faster, and better.
- The industry wants DB and other alternative methods because the filed sub bid law proved that it does not work that well.
- If the state continues to use lowest price as the selection criteria, contentious situations may develop. Change orders and price would increase, and quality would suffer. This is why the prequalification of contractors is a better alternative. In fact, the state will be prequalifying subcontractors on some of the projects where alternative methods are utilized.
- The file sub-bid law throws subs together with contractors – all who have developed the lowest price. Each could attempt to cut corners to garner profit for their firm (These are all for-profit companies). This engenders adversarial relationships between the contractors, the architect and the owner. Quality, time and cost can suffer. It does not happen all the time, but it does not make for a good collaborative effort.

I- In your opinion, what are the criteria that would make you select design-build versus another procurement method for a particular project?

In Ms. Gately's view, DB requires a certain type of owner who:

1. Can make decisions quickly.
2. Has a specific type of project – if the project is sophisticated or requires complicated design, or if international architects are involved, it would be very difficult to pursue a DB procurement method.
3. Knows the DB process.
4. Is a little sophisticated.
5. Can clearly define the parameters of the project, to be able to effectively manage the architect

J- Do you personally think that design-build will become a viable procurement method in the future? Under what circumstances?

- Ms. Gately thinks that design-bid-build will continue to be the most popular delivery method. Construction Manager at Risk comes second in line, and DB is last. It will really take a while before DB can be effectively used by the Commonwealth.
- The legislature approved the DB delivery method for the Route 3 N project to test the process on horizontal projects. If the project succeeds, the legislature would probably approve DB for other horizontal projects.
- A legislation will be filed by December 4 by the Massachusetts Municipal Association to allow the use of DB on horizontal projects for towns and cities. The IG office will train the towns and cities to understand DB and use it.
- When asked about the Greenbush project, Ms. Gately said that MBTA is a quasi-public agency. It is different from MHD, and has more latitude in using alternative delivery methods.
- AGC Massachusetts prefers that DB be considered for a project when all other alternative methods are deemed unsuitable, unless significant progress is made in the way the Commonwealth manages the DB process.
- Ms. Gately also indicated that state employees assigned to public projects are subject to lot of pressure because of the statutes by which they should abide.

Final note:

- Ms. Gately mentioned that the Speaker of the House of Representatives, Mr. Thomas Finneran, formed policy groups to investigate ways to save money for the state. One of the groups was focusing on local aid to cities and towns. Lida Harkins is the chair of this group. At the conclusion of its work, this group issued a brief letter report (around March 2002). One of the recommendations included in this report is to use DB. This is what prompted the Massachusetts Municipal Association to file legislation to allow the use of DB.

American Council of Engineering Companies of Massachusetts (ACEC Massachusetts)

Ms. Abbie Goodman, Executive Director

Interview Date: November 27, 2002 (E-mail correspondence)

A- The Construction Reform Task Force conducted a research on public procurement methods and found lot of deficiencies in the process, including:

- 1- Requirement for the selection of the lowest responsible, eligible bidder**
- 2- Requirement for the selection of one designer for the feasibility study, and another for the complete design**
- 3- Requirement for filed subcontractor bid**
- 4- Use of the design-bid-build as the mainstream project delivery method**
- 5- Lack of proper evaluation of the contractors at the end of the project**

A research conducted by Pioneer Institute determined that Massachusetts has an average project time growth of 43.26%, an average project cost growth of 24%, and a cost per sf of \$202; Compared to Texas, which relies on the design-bid-build project delivery system (no filed sub-bid law), and where the project time growth is 2.58%, the project cost growth is 2.53%, and the cost per sf is \$114, don't you think this is enough evidence that action must be taken in Massachusetts?

ACEC/MA agrees that action needs to be taken in the areas identified. The legislature actually eliminated the two designer requirement several years ago. Here's the information on that piece:

Single Design Law-FY2001 Budget

The elimination of the two-designer requirement passed in the FY2001 budget. <http://www.state.ma.us/legis/laws/mgl/7-38H.htm> is the hyperlink that lists "no subsection (d)." What happened: the legislature struck out subsection (d) of Section 38H of Chapter 7 of the General Laws, which read: "a designer or programmer appointed to do a feasibility study, master plan, or program for a project shall be ineligible for appointment to perform the design services for that project, unless the study, master plan, or program is limited to the repair, renovation, or the identification and correction of deficiencies in an already existing building or its equipment, and the fee for the combined study and design of repairs is less than one hundred thousand dollars." The governor did not veto this section from the FY2001 budget, and it is included in the enacted version of the budget. MGL Chapter 7, Section 38H no longer includes subsection d.

Some state agencies, such as DCAMM, have created new evaluation tools to evaluate both designers and contractors at the end of a project, so some improvements are being made in that area.

The other issues are important, but it can be very difficult to make these changes due to the competing interests of different business groups and labor unions.

B- Special legislation was filed in April of 1999 to allow alternative procurement methods, including design-build, to be used when they are deemed adequate for a particular project. This legislation was filed after the Construction Reform Task Force completed its report. Why, in your opinion, no action was taken by the legislation?

Due to the competing interests of different groups, as noted above, it is difficult to pass a bill that would make sweeping changes in procurement. That's why we're seeing alternative procurement bills for one project at a time.

C- The construction process should be a function of time, quality and price, not solely price-driven. Design-bid-build can ensure that quality projects are delivered on time and in accordance with budget. If design-build allows the delivery of a quality project, while reducing its duration and cost, wouldn't it be considered a valid alternative procurement method?

I believe that the legislature's view is that the state hasn't done enough pilot projects using design build in this state to prove that it would reduce duration and cost while maintaining high quality for a project. The largest DB project now is Route 3 North. It has run into unforeseen conditions and it is hard to say whether costs will stay down.

D- How do you rate the Request For Proposals prepared by the state for design-build projects?

- Level of detail
- Clarity of requirements (performance specifications, program, etc.)
- Amendments

N/A

E- Are you aware of any successful public design-build projects? Why do you think they were successful?

N/A

F- Are you aware of any unsuccessful public design-build projects? Why do you think they were unsuccessful?

N/A

G- In my research to date, I have identified several factors that may be preventing the state from enacting a legislation that makes design-build a conventional project delivery method on public projects. These factors include:

- 1- Unsuccessful experience on past public projects

- 2- Owner fear of lack of control over project
- 3- Owner fear of diminished quality of end product
- 4- Lobbying by the Associated Subcontractors of Massachusetts to maintain filed sub bid
- 5- Inconclusive evidence of the merit of the case (i.e., that design-build should become a conventional delivery method)

Please rate these factors in descending order from most important to least important. In your opinion, are there any other factors that are applicable?

Most important to least important:

- 2
- 3
- 4 and lobbying by some building trades unions on filed sub bid and on prevailing wages
- 5
- 1

Here's the general reason: It is difficult to make any legislative change (except budget cuts), when you have well organized groups that oppose some or all of the change. The legislature, by its makeup of elected officials from different regions of the state with different priorities and issues, doesn't pass bills that make major changes in the way things are now if they hear a lot of organized opposition. They have too many other issues to handle, so they go for the issues they can fix.

H- Why does the industry want the Commonwealth of Massachusetts to make design-build a conventional procurement method?

The industry is not unified on this. Many large contractors believe it is the most productive method. ACEC/MA believes that alternative methods, including alternative financing, should be considered to make it possible to build some projects that might not otherwise be done under the state's bond cap. Many small contractors don't like design build; they can't take the risk. Design firms have different views on this; while they support alternative methods, some smaller firms are concerned that they would be left out of DB teams, when they might have been selected to design a particular part of a project using more traditional methods.

I- In your opinion, what are the criteria that would make you select design-build versus another procurement method for a particular project?

When the state has the flexibility to also include alternative financing as part of the project or when there is such compelling evidence for a particular project that the state would save significant money.

J- Do you personally think that design-build will become a viable procurement method in the future? Under what circumstances?

I think it will continue to be done on a pilot project basis for the foreseeable future.

Associated Subcontractors of Massachusetts
Ms. Monica Lawton - Executive Director

Interview Date: October 29, 2002 (Phone interview)

THE REVIEW OF THE INTERVIEW MINUTES REQUIRES PRIOR APPROVAL BY MS. MONICA LAWTON.

A- Special legislation was filed in April of 1999 to allow alternative procurement methods, including design-build, to be used when they are deemed adequate for a particular project. This legislation was filed after the Construction Reform Task Force completed its report on public procurement in Massachusetts. Why, in your opinion, no action was taken by the legislation?

B- The construction process should be a function of time, quality and price, not solely price-driven. Design-bid-build can ensure that quality projects are delivered on time and in accordance with budget. If design-build allows the delivery of a quality project, while reducing its duration and cost, don't you think that it would be worth considering it as a valid alternative procurement method? Why?

C- In my research to date, I have identified several factors that may be preventing the state from enacting a legislation that makes design-build a conventional project delivery method on public projects. These factors include:

- 1- Unsuccessful experience on past public projects**
- 2- Owner fear of lack of control over project**
- 3- Owner fear of diminished quality of end product**
- 4- Lobbying by the Associated Subcontractors of Massachusetts to maintain filed sub bid**
- 5- Inconclusive evidence of the merit of the case (i.e., that design-build should become a conventional delivery method)**

Please rate these factors in descending order from most important to least important. In your opinion, are there any other factors that are applicable?

D- M.G.L. Chapter 149 Section 44E provisions regulate modular construction. These provisions do not require the submission of filed subcontractor bids. What is ASM's position relative to this matter?

E- Ms. Lawton, of Associated Subcontractors of Massachusetts, was quoted saying of the elimination of filed sub-bid that the only benefits of the proposed change would go to the general contractors not the communities. In your opinion, how would the change benefit the general contractors but not the communities?

F- Do you personally think that design-build will become a viable procurement method in the future? Under what circumstances?

Commonwealth of Massachusetts Division of Capital Asset Management and Maintenance - Office of Planning, Design and Construction

Mr. Michael McKimmey - Deputy Commissioner

Interview Date: November 19, 2002 (Face-to-face meeting)

A- The Construction Reform Task Force conducted a research on public procurement methods and found lot of deficiencies in the process, including:

- 1- Requirement for the selection of the lowest responsible, eligible bidder**
- 2- Requirement for the selection of one designer for the feasibility study, and another for the complete design**
- 3- Requirement for filed subcontractor bid**
- 4- Use of the design-bid-build as the mainstream project delivery method**
- 5- Lack of proper evaluation of the contractors at the end of the project**

A research conducted by Pioneer Institute determined that Massachusetts has an average project time growth of 43.26%, an average project cost growth of 24%, and a cost per sf of \$202; Compared to Texas, which relies on the design-bid-build project delivery system (no filed sub-bid law), and where the project time growth is 2.58%, the project cost growth is 2.53%, and the cost per sf is \$114, don't you think this is enough evidence that action must be taken in Massachusetts?

- Mr. McKimmey started by explaining that DCAM rebutted the Pioneer Institute's report, which was performing the study out of context. In fact, the statistics were trying to compare Massachusetts to Florida and Texas (i.e., comparing apples with oranges). While the filed sub bid law applies in Massachusetts, it does not in the other states. Additionally, Massachusetts has a requirement for prevailing wages, and has a significantly higher cost of living with respect to the other states. Also, the dynamics of the politics and the funding of projects are different in Massachusetts.
- The requirement for the selection of one designer for the feasibility study and another for the detailed design was a major deficiency in the Massachusetts laws. Now, however, with the enactment of Chapter 159 of the Acts of 2000, this requirement has been eliminated. This lead to a reduction in project time growth because the same designer is performing the study and the detailed design.
- In the 1980's, the Ward Commission recommended the elimination of the filed sub bid; however, this recommendation was not adopted primarily because of the lobbying by the unions and ASM.
- The Ward Commission came up with a series of processes to eliminate corruption. The Ward Commission's procedures needed to be rigid at the time so as to weed out the corruption in the system. However, 20 years have passed, the corruption in the system no longer exists, and a number of the procedures need to be updated and streamlined so as to expedite the design and construction process.
- The quality of the designs provided by the designers has been deteriorating. DCAM is using Redi-Check as well as some other firms, to provide an

independent coordination check of drawings. It seems ludicrous, but even the large design firms that DCAM deals with are saying that they don't have the time/staffing to perform a proper coordination check on their drawings.

- The state needs to properly evaluate the performance of the designers and contractors, and carefully select the designer.
- The evaluation and certification of contractors is now taken very seriously by DCAM. DCAM's project managers are required to complete these evaluations and certifications.
- The Commissioner has the right not to award a project to a "bad" contractor if enough written evidence against this contractor is provided.
- At the Office of planning, Design and Construction, there are two teams established for each project: one team handles design, the other handles construction. However, both teams work together from the onset of the project. The construction team participates in the programming process. It is a "Single Project," integrated team approach.

B- Special legislation was filed in April of 1999 to allow alternative procurement methods, including design-build, to be used when they are deemed adequate for a particular project. This legislation was filed after the Construction Reform Task Force completed its report. Why, in your opinion, no action was taken by the legislation?

- This legislation was never really pushed through. Politics play a major role in such matters. Political parties, backed by constituents with specific goals and views, hold the key to the success of a piece of legislation.
- The April 1999 legislation was similar to an omnibus act. It covered so much ground, and was so comprehensive, to the point where so many groups at stake were affected. Since the legislature can either approve the whole bill or nothing, it chose not to approve it. Now, the legislature is trying to make a little change at a time.
- In general, the power of unions and subcontractors should not be underestimated.

C- The construction process should be a function of time, quality and price, not solely price-driven. Design-bid-build can ensure that quality projects are delivered on time and in accordance with budget. If design-build allows the delivery of a quality project, while reducing its duration and cost, wouldn't it be considered a valid alternative procurement method?

- In the past, the end results of DB projects were fair to poor. Now, they can be considered fair to good. Designers and other entities at stake are more familiar with the DB process.
- Typically, RFP's for correctional facilities include 25 to 30% design development. The quality of the RFP's depends on the quality of the designer.

- The Brockton Courthouse's RFP did not include any design drawings. The design-builder took liberty in interpreting the requirements to their advantage.
- A RFP for a DB courthouse project in Taunton is slated for April 2003. DCAM is planning on providing 30% design, which will help define the project requirements.

D- How do you rate the Request For Proposals prepared by the state for design-build projects?

- **Level of detail**
 - **Clarity of requirements (performance specifications, program, etc.)**
 - **Amendments**
- The level of detail is poor, but it is improving.

E- Are you aware of any successful public design-build projects? Why do you think they were successful?

- Correctional facilities have been successful in general. The Massachusetts Correctional Institute at Shirley is considered a successful project, despite some operational issues which were encountered at its completion.

F- Are you aware of any unsuccessful public design-build projects? Why do you think they were unsuccessful?

- The UMass Computer Center project was not successful. The project did not get enough support and attention from DCAM.
- The Brockton Courthouse also was not successful.
- The Middlesex House of Correction in Billerica is an ongoing DB, modular project; its value is \$45M approximately. Suffolk Construction is the design-builder. The project is going well so far.

G- In my research to date, I have identified several factors that may be preventing the state from enacting a legislation that makes design-build a conventional project delivery method on public projects. These factors include:

- 1- **Unsuccessful experience on past public projects**
- 2- **Owner fear of lack of control over project**
- 3- **Owner fear of diminished quality of end product**
- 4- **Lobbying by the Associated Subcontractors of Massachusetts to maintain filed sub bid**
- 5- **Inconclusive evidence of the merit of the case (i.e., that design-build should become a conventional delivery method)**

Please rate these factors in descending order from most important to least important. In your opinion, are there any other factors that are applicable?

In Mr. McKimmey's view,

- 4 is the most important factor.
 - Then 2 and 3 (*identical rating*)
 - Then 5.
 - Finally, 1.
-
- Mr. McKimmey indicated that some individuals do not recommend DB as a delivery method because of their unsuccessful personal past experience on a project. When considering an alternative delivery method, one cannot be subjective.
 - The inexperience of some individuals with DB is also a factor that is negatively affecting a DB project.
 - DCAM believes that it has control over a project if the design parameters are well defined, the project well staffed, the programming done well, and the RFP properly written.
 - The IG's office is working with DCAM to understand the various sections of the legislation which are related to procurement. The IG's office is a proponent of DB and CM at risk. In general, all entities support DB except unions and subcontractors.

H- In your opinion, what are the criteria that would make you select design-build versus another procurement method for a particular project?

- Two primary factors are considered: the need for fast-tracking a project, and the ability to define the project clearly.

I- Do you personally think that design-build will become a viable procurement method in the future? Under what circumstances?

- Yes, it will become a viable procurement method. The state is making some progress with the subcontractors already. DCAM has a requirement to prequalify subcontractors on one of the projects. By setting precedence to prequalify subcontractors, DCAM believes that the subcontractors will feel more comfortable with DB.

J- If design-build became a conventional procurement method under the Massachusetts law, will you use it in the next five years?

- Sure. DCAM will use DB.

Commonwealth of Massachusetts, Department of Correction
Mr. Jeff Quick - Director

Interview Date: October 30, 2002 (E-mail correspondence)

A- The Construction Reform Task Force conducted a research on public procurement methods and found lot of deficiencies in the process, including:

- 1- Requirement for the selection of the lowest responsible, eligible bidder**
- 2- Requirement for the selection of one designer for the feasibility study, and another for the complete design**
- 3- Requirement for filed subcontractor bid**
- 4- Use of the design-bid-build as the mainstream project delivery method**
- 5- Lack of proper evaluation of the contractors at the end of the project**

A research conducted by Pioneer Institute determined that Massachusetts has an average project time growth of 43.26%, an average project cost growth of 24%, and a cost per sf of \$202; Compared to Texas, which relies on the design-bid-build project delivery system (no filed sub-bid law), and where the project time growth is 2.58%, the project cost growth is 2.53%, and the cost per sf is \$114, don't you think this is enough evidence that action must be taken in Massachusetts?

- No. Texas is a different economic market. About 27% of the difference is related to cost.
- The individuals managing the projects for the state lack the proper construction management skills to oversee DB projects (for the most part).

B- Special legislation was filed in April of 1999 to allow alternative procurement methods, including design-build, to be used when they are deemed adequate for a particular project. This legislation was filed after the Construction Reform Task Force completed its report. Why, in your opinion, no action was taken by the legislation?

- The DB process did not reap the time savings that the state had anticipated, and it cost more. Adding to the legislative fears is a very negative IG report on the Plymouth County facility which put this on the back burner.

C- The construction process should be a function of time, quality and price, not solely price-driven. Design-bid-build can ensure that quality projects are delivered on time and in accordance with budget. If design-build allows the delivery of a quality project, while reducing its duration and cost, wouldn't it be considered a valid alternative procurement method?

- Yes, if it met the above criteria, which, for Massachusetts correctional facilities built under design-build, it has not.

D- How do you rate the Request For Proposals prepared by the state for design-build projects?

- **Level of detail**
- **Clarity of requirements (performance specifications, program, etc.)**
- **Amendments**

- The level of detail is marginal at best.
- In most cases, clarity of the requirements is not the issue, but adherence to the specifications is.
- The range of amendments is dependent on the project.

E- Are you aware of any successful public design-build projects? Why do you think they were successful?

- I am not familiar with any. Higher education may have had some.

F- Are you aware of any unsuccessful public design-build projects? Why do you think they were unsuccessful?

- Yes. They were unsuccessful partly because of the lack of experienced oversight in the state's construction management of the project.

G- In my research to date, I have identified several factors that may be preventing the state from enacting a legislation that makes design-build a conventional project delivery method on public projects. These factors include:

- 1- **Unsuccessful experience on past public projects**
- 2- **Owner fear of lack of control over project**
- 3- **Owner fear of diminished quality of end product**
- 4- **Lobbying by the Associated Subcontractors of Massachusetts to maintain filed sub bid**
- 5- **Inconclusive evidence of the merit of the case (i.e., that design-build should become a conventional delivery method)**

Please rate these factors in descending order from most important to least important. In your opinion, are there any other factors that are applicable?

- The factors are rated in the following descending order from most important to least important: 2, then 3, then 1, then 5, and finally 4.
- The lack of trained personnel in the design-build process to oversee the public design-build projects should be added as a factor.

H- In your opinion, what are the criteria that would make you select design-build versus another procurement method for a particular project?

- If the state could complete a team which had the experience and desire to oversee the project and adhere to the specifications (RFP).

I- Do you personally think that design-build will become a viable procurement method in the future? Under what circumstances?

- There is a potential it could if legislation were developed and passed which protected the state's interest and provided adequate oversight.

J- If design-build became a conventional procurement method under the Massachusetts law, will you use it in the next five years?

- Yes, if funding is available.

Commonwealth of Massachusetts, Executive Office for Administration and Finance
Mr. Kevin Sullivan - Secretary

Interview Date: November 19, 2002 (Face-to-face meeting)

Preamble

- Mr. Sullivan emphasized the role that the Ward Commission played in the 1980's in developing Massachusetts laws, to regulate the procurement of design and construction projects after the UMass scandal.
- He indicated that the Route 3 N project was a quality-based bid.
- He indicated that a new DB project has been approved recently for MBTA: the New Bedford/Fall River Commuter Rail Extension Project, South Coast Bridges, New Bedford, MA.
- In his opinion, the more DB projects are completed, the less "sacred" the conventional procurement method will become.
- Unions believe in the filed sub bid law. To get the unions vote, the legislature must support filed sub bid.
- When asked about the role of EOAF, he stated that each capital agency has to submit to his secretariat a fiscal year spending plan for approval, because capital spending funds are used. The projected cash flow should also be submitted to his office. EOAF issues the Notice to Proceed (NTP) for a project. No project can proceed without this NTP.
- When an alternative delivery method is being contemplated for a particular project, DCAM's Commissioner should submit to EOAF language to be incorporated in a legislative bill.

A- The Construction Reform Task Force conducted a research on public procurement methods and found lot of deficiencies in the process, including:

- 1- Requirement for the selection of the lowest responsible, eligible bidder**
- 2- Requirement for the selection of one designer for the feasibility study, and another for the complete design**
- 3- Requirement for filed subcontractor bid**
- 4- Use of the design-bid-build as the mainstream project delivery method**
- 5- Lack of proper evaluation of the contractors at the end of the project**

A research conducted by Pioneer Institute determined that Massachusetts has an average project time growth of 43.26%, an average project cost growth of 24%, and a cost per sf of \$202; Compared to Texas, which relies on the design-bid-build project delivery system (no filed sub-bid law), and where the project time growth is 2.58%, the project cost growth is 2.53%, and the cost per sf is \$114, don't you think this is enough evidence that action must be taken in Massachusetts?

- Action must definitely be taken by the Commonwealth. The Ward commission slowed down corruption, but did not really eliminate it.

- Mr. Sullivan supports the elimination of filed sub bid and project labor agreements with unions because they limit competition.
- He is a “fan” of best-value procurement. He recognizes that the lowest price does not necessarily mean that the state is getting the best product.
- He believes in the prequalification process.
- He believes that value engineering is a good concept.
- Experience, price, knowledge, and schedule are all factors to be taken into consideration when procuring design and construction services for a project.
- He believes that DB is good for complex projects.

B- Special legislation was filed in April of 1999 to allow alternative procurement methods, including design-build, to be used when they are deemed adequate for a particular project. This legislation was filed after the Construction Reform Task Force completed its report. Why, in your opinion, no action was taken by the legislation?

- Mr. Sullivan believes that lobbying by the unions was the main factor contributing to the failure of this legislation.
- We commonly hear the stereotype that, if you eliminate the requirement for awarding the job to the lowest responsible and eligible bidder, the project cost will increase. However, one should look for better quality, high efficiency, and fast track schedule, not necessarily better price.
- No elected official wants to be viewed as one who altered a piece of anti-corruption legislation, unless it is proven that the benefits outweigh the risks of introducing corruption.

C- The construction process should be a function of time, quality and price, not solely price-driven. Design-bid-build can ensure that quality projects are delivered on time and in accordance with budget. If design-build allows the delivery of a quality project, while reducing its duration and cost, wouldn't it be considered a valid alternative procurement method?

This question was not discussed due to time constraints. However, the subject was generally covered by Mr. Sullivan through his response to other questions.

D- How do you rate the Request For Proposals prepared by the state for design-build projects?

- **Level of detail**
- **Clarity of requirements (performance specifications, program, etc.)**
- **Amendments**
- From the technical point of view, they are properly prepared.

E- Are you aware of any successful public design-build projects? Why do you think they were successful?

- The Route 3 N project is doing well.

F- Are you aware of any unsuccessful public design-build projects? Why do you think they were unsuccessful?

- Mr. Sullivan indicated that he is not aware of any unsuccessful DB projects.
- He indicated that, in the public sector, there is a tendency to focus on the cost of a project rather than the output (e.g., good quality, reduced life-cycle cost, low maintenance, etc.)
- Unsuccessful projects probably lack good initial work (e.g., Carefully written RFP).

G- In my research to date, I have identified several factors that may be preventing the state from enacting a legislation that makes design-build a conventional project delivery method on public projects. These factors include:

- 1- Unsuccessful experience on past public projects
- 2- Owner fear of lack of control over project
- 3- Owner fear of diminished quality of end product
- 4- Lobbying by the Associated Subcontractors of Massachusetts to maintain filed sub bid
- 5- Inconclusive evidence of the merit of the case (i.e., that design-build should become a conventional delivery method)

Please rate these factors in descending order from most important to least important. In your opinion, are there any other factors that are applicable?

In Mr. Sullivan's view:

- 1 and 5 get the same rating, and are the most important factors.
- Then 4.
- Then 2 and 3, which get the same rating. It should be noted that EOAF has staff reviewing and approving construction work prior to making progress payments. There is also a resident engineer assigned to each project to monitor the work.

H- One of the Executive Office for Administration and Finance priorities is to ensure efficiency and effectiveness of the state government. Design-build is one way to ensure efficiency and effectiveness in procuring construction projects. In your opinion, why isn't design-build supported by the legislature?

This question was not discussed due to time constraints. However, the subject was generally covered by Mr. Sullivan through his response to other questions.

I- In your opinion, what are the criteria that would make you select design-build versus another procurement method for a particular project?

Mr. Sullivan indicated that lot of factors should be addressed when considering DB as a delivery method for a project, including:

- Prequalify the design-builders.
- Have industry experts, not politicians, get involved in the project during the procurement process and the submittal of proposals.
- Conduct face-to-face meetings with the DB team.
- Make sure the proposal content is specific (in DBB, this is done during the preconstruction meeting).
- Look for designer/contractor compatibility.
- Have experts in the design and construction industries rank the design-builders.
- The goal is really to get enough pre-design work done so that the owner can control the cost.

J- Do you personally think that design-build will become a viable procurement method in the future? Under what circumstances?

- Yes, absolutely. The more DB projects are undertaken, the more public and private entities will realize that it is a viable procurement method.