ZETLIN & DE CHIARA LLP

ZETLIN & DE CHIARA LLP
REVIEW

CURRENT LEGAL AND BUSINESS DEVELOPMENTS AFFECTING THE DESIGN, CONSTRUCTION AND REAL ESTATE INDUSTRIES

2012 VOL. 25 NO. 2

Integrated Project Delivery (IPD) is a transformative construction management approach that outlines best practices for multi-functional teams to collaborate effectively on sophisticated projects.

Zetlin & De Chiara has taken the lead in advising clients on how best to navigate issues specific to implementing the IPD approach in order to deliver best in class construction projects.

ONE-ON-ONE MICHAEL S. ZETLIN & PALMINA TETA-WHELAN

A NEW CONSTRUCTION PARADIGM: INTEGRATED PROJECT DELIVERY

Palmina Teta-Whelan, Senior Project Manager, Corporate Real Estate Facilities, American Airlines (AA) talks IPD with Michael S. Zetlin, Founding Partner, Zetlin & De Chiara LLP.

Michael S. Zetlin, Esq., Zetlin & De Chiara LLP (MSZ) American Airlines is serving as a trailblazer in the Northeast by pursuing projects which are pure IPD and not IPD-light. How do you explain AA's early adoption of IPD instead of implementing the more traditional design-bid-build model?

Palmina Teta-Whelan, American Airlines (PTW) As an owner, we are always looking to find a more efficient way of conducting business. Integrated Project Delivery resonated with our company as an efficient and resourceful construction approach. We are always seeking to be cost-effective, build a more efficient product, and, most importantly, get product out to market faster. With IPD, the collaboration of the team members facilitates a better method to control our costs, avoid or reduce potential risks, and maximize value on our construction dollar.

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MSZ What types of IPD projects does AA have planned for New York?

PTW The two projects we are currently implementing through IPD are both located at La Guardia Airport, which is one of our hubs as well as an important terminal. The first project is our American Eagle Admirals Club, which consists of a 4,000 SF build-out of a premium lounge, and the other is the 20,000 SF interior renovation of Concourse C.

ADAPTABLE MODEL

MSZ Do you think IPD has application for particular types of projects or is it a model that can be used universally?

PTW It really depends on the owner and his/her personal preference. When AA was first introduced to IPD, we were advised against trying it on a smaller project because IPD, at that point, had only been used on larger scale projects ($200 million or more). It was our opinion that this form of delivery would work on any size of project, so we accepted the challenge, implemented it on our "smaller" projects, and have been very pleased with the results. IPD consists of a fairly flexible set of principles applicable to any size of project. However, since the size of the project determines the tiers of vested players and the level of profit and loss shared among them, there may be less profit shared overall.

MSZ This relationship rearrangement truly is a paradigm shift from what we've all experienced historically. How do the IPD projects with American Airlines alter the approach of past experiences?

PTW As the owner, we are responsible for seeking and securing capital construction projects. IPD has instilled a greater level of confidence in presenting the funding request. Unlike earlier experiences, I no longer request a value that is unknown with the underlying fear that I may have to embarrassingly repeat these same steps for supplemental funds. The IPD process eliminates many unknowns, helps to identify the real-life conditions you're working with, and reveals whether those conditions will support your project.

MSZ How did the IPD process transform the value engineering process?

PTW During the project design, the team brings **all** the knowledge and expertise to the table – cost and construction technology from sub-consultants, subcontractors and manufacturers are brought into the design and the decision-making process. As a result, we end up with a value-based sustainable design. We make smarter decisions. IPD removes having to compromise; we have the opportunity to understand what we are building and make holistic decisions. Simply put, we know what we are getting, and how we got to where we are.

THE OWNER'S NEW ROLE IN IPD

MSZ From your perspective, how do you make sure the design team and contracting team "play nice in the sandbox" during the design stage and even during the construction phase? Can you describe your role as the owner in this new process?

PTW We have been fortunate on both projects that the team members respectfully embraced each other's roles. I needed to remind myself that we are all team members and that I alone am not leading this ship. Some may consider it a mini-vacation, not always having to be the judge and jury during the process. In my experience, it produced a level of confidence which enabled me to express my vision to the team, who then informed me whether that vision was constructible or told me how to make it so.

MSZ You are a strong-willed individual with a forceful presence. If I was a contractor or design professional, I know I'd be doing everything in my power to keep you happy. Have you needed to exert your strengths to keep the process in check? Were there times when you had to remind everyone that we're partners, not adversaries?

PTW It is human nature for us to be creatures of habit, and yes, each one of us at some point had to remind the other that we are partners and not adversaries. Because we were all so determined to try this new delivery method, it was not difficult to get back on track.

SHARED RISK

MSZ All owners fear that claims and change orders will lead to painful cost overruns that can ruin the economics of a project. All contractors want to be compensated for design errors or omissions that lead to extra work. All design professionals want to be compensated for the extra time they spend responding to needless RFIs or developing solutions to construction deficiencies. IPD promises to limit or even eliminate these types of situations. Explain your thoughts and concerns about sharing responsibility of all costs associated with design errors, construction errors, or other influences that could lead to cost overruns.

PTW Any owner who implements large capital projects will always fear the unknown financial impacts that cannot be accounted for; and, in truth, owners want to control their costs. Our industries, both aviation and construction, are not in the position to face continuous cost impacts. We do not have that luxury, not ever, and especially not during these stressful economic conditions.

With IPD, the team is given the opportunity to conduct preconstruction services, to investigate and assess conditions, and to thoroughly research the project prior to commencing drawings. This allows for the sharing of findings, the determination of what is constructible, the voicing of concerns, the pooling of general knowledge, etc. – all of which contributes to an efficiently executed product. We are all sitting at the same table with the same knowledge and equal votes.

A NEW DECISION-MAKING PROCESS

MSZ Let's focus on the decision-making process for the projects and how it worked for these two jobs. Please explain how the committee concept has worked in practice.

PTW IPD requires that a team is formed. In our projects, our teams include the Executive Leadership Team (ELT) and the Project Leadership Team (PLT). The ELT serves as a governing authority that oversees the PLT. The PLT carries out the necessary steps to properly and successfully execute the project.

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Summary of Presentation made by
Brent Diemer, Vice President, CH2M HILL

> "At CH2M HILL, our highest priority is client satisfaction. We are continually evaluating opportunities to enhance the project delivery process to the benefit of our clients; Integrated Project Delivery is one of the newer options we've incorporated as a US construction alternative to achieve outstanding project outcomes."

HOW DOES IPD WORK?

Integrated Project Delivery (IPD) is a project delivery approach that uses several unique tools to enhance collaboration and transparency among all – owner, architect, engineer, contractor, subcontractors and sub-consultants. IPD is a viable option to consider for projects that are schedule-driven and require a high degree of flexibility, creativity, innovation and complexity. When applied successfully, IPD will achieve behavioral alignment among all parties, thus enhancing the collaborative delivery environment and establishing a platform for overall project delivery success.

A NEW TEAMING MODEL

IPD is a unique delivery model in which the delivery team not only operates as an integrated joint venture, but also adds the owner as an active project delivery participant. The active participation of the owner in the delivery team provides unique access to end-user resources and stakeholders, as well as dynamic project perspectives and ideas. We find that once the owner is brought to the table as an active delivery participant, options and solutions for total project success increase significantly.

IPD is different from a traditional build in several ways. In traditional design-bid-build and design-build projects, silo environments are created, risk is allocated to the specific entities, and communication is typically confined to narrow contractual channels. In a successful IPD, each party's goals and incentives are consolidated into a single set of project performance criteria, Key Performance Indicators (KPIs), shared by all parties. This set of goals is linked to a single incentive compensation approach to drive behavioral alignment among all delivery partners. This alignment establishes an environment for creativity and collaboration ultimately driving toward project success.

FLEXIBLE, PERFORMANCE-ORIENTED, ALIGNED TEAM MEMBERS

IPD is a very flexible approach. There will always be unforeseen delivery issues and IPD is no exception; however, once issues are encountered in IPD, the delivery team works with the owner to solve them with a "Best for Project Outcome." Knowing each participant is governed by the same set of project goals and incentives is a key driver for solution success. In IPD, the compensation model is built around the delivery team's agreed-to set of project goals. If the team is successful, the entire team will benefit financially, and if the project is not a success the entire team will share in the financial impact: "shared pain, shared gain." The Shared Pain, Shared Gain compensation model is key to team alignment and ultimately drives collaborative behaviors for project success.

THE RIGHT TEAM FOR THE JOB

Key to the successful implementation of IPD is participant selection. With IPD, the selection process is generally qualification-based. Ultimately, trust and common values among delivery participants are critical to achieve success. To evaluate behavior and learn more about the potential delivery partners, the owner will often participate in pre-selection workshops to assess teamwork capability and work approach among each of the proposers. Because team success is predicated on working in a collaborative environment, it is key to select delivery partners who are capable of open communication, team delivery and collaborative decision making. Behavioral alignment starts before selection with the evaluation of potential participants' behaviors and values. Developing a team selection strategy around these key, "softer" criteria is critical to project success.

Finally, transparency and accountability support team alignment. For teams to align, there are five factors that should be in place and approved by all participants before starting out:

- First, delivery responsibilities are assigned and understood.
- Second, non-financial "Key Performance Indicators" are developed, approved, and shared.
- Third, budgets and all costs are reviewed, approved and shared.
- Fourth, scope changes are evaluated in the context of the intended project output, reviewed by the team, revised and reconsidered in the context of overall project output as appropriate.
- Finally, risks are jointly identified, mitigated or quantified, and accepted by the entire team.

CONCLUSION

IPD is a viable option for project success and should be considered in the appropriate project context. It brings the delivery team together in ways that promote efficiency, collaboration and project delivery, and provides an alternative to consider in the construction industry. ▪

IPD - AN EFFICIENT PROCESS WITH A FOUR-PART FRAMEWORK:

1. TRUE PARTNERS. The owner and participants are integrated through a contractual agreement. They are true partners with shared success factors.

2. ALIGNED TEAM MEMBERS. IPD framework is focused on aligning participant behaviors to exceed team expectations. These factors make IPD the realistic option for projects involving many stakeholders.

3. FLEXIBLE DELIVERY. IPD provides a flexible delivery platform to accommodate changing conditions in the context of overall project output.

4. BETTER BUSINESS GOALS. While meeting schedule and budget is generally considered an appropriate target for traditional delivery, better than business as usual is the IPD expectation.

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INSURANCE

MSZ In terms of procuring insurance for the IPD project, has anything changed? For example, if the contractors are now involved in design, do they need to purchase Errors & Omissions (E&O) coverage?

PTW The insurance requirements remain the same; there is no need for the contractor to purchase E&O. The contractor is an advisor/participant in the process, bringing its expertise about means and methods to the process. They are also making a contribution to the process at an early stage by surveying the proposed construction site and identifying field conditions that may create issues during construction. This information is considered and resolved before drawings are issued. The design professional is still issuing the drawings, so there is no need for the contractor to provide insurance for E&O.

MSZ And, what about the design professionals? Because of your involvement in construction, have you procured any different types of insurance?

PTW The design professional is always part of the construction process, providing construction advisory services. The design professional does not direct the contractor's personnel to perform any work. Decisions about any directive are reached at the PLT or ELT level. There is no need to request any other type of insurance from the design professional.

Because the delivery process is conducted in a collaborative environment, the design professional's insurance carrier benefits and the E&O insurance requirements are minimized. Instead, E&O insurance is part of the responsibility of the team, who then work toward resolving any E&O within the established construction budget. The Payment and Performance Bond requirements have been waived in the contract requirements. We feel it is contrary to the collaborative nature of the process. The team is responsible for delivering the project, not the general contractor alone.

DISAGREEMENTS

MSZ If a disagreement arises at the project management level, how does that disagreement get resolved?

PTW Disagreements are resolved by discussing problems and collectively seeking solutions. If disagreements at the PLT level do not get resolved, they go up to the ELT level and that decision is binding.

FINAL THOUGHTS

MSZ Are there any final thoughts you would like to leave our readers with?

PTW If you want to deliver a project successfully, deliver it with IPD, and you will have a much better shot at success. ▪

ABOUT PALMINA TETA-WHELAN

With over 15 years of design, construction, construction management and program management experience for aviation, education, institutional and retail projects, Palmina Teta-Whelan's expertise lies in management of projects from inception to completion. This includes liaising with consultants, design teams, contractors and construction managers, and providing guidance and oversight on quality control and contract delivery. Teta-Whelan has the distinction of stewarding the first Integrated Project Delivery projects in North America for the aviation industry.

Teta-Whelan's dedication to the construction industry and the built environment is evident in her involvement with various industry associations. She currently sits on the National Board of Directors and is the International Vice Chair for the Construction Management Association of America (CMAA) International Committee as well as serving as Incoming President of the Metro NY/NJ chapter. As an ardent industry practitioner, Teta-Whelan is focused on building strong collaboration within the industry, both domestically and internationally.

Leevi Kiil
Owner
Leevi Kiil Architecture Planning & Consulting
Executive Director
Global Design Alliance

COLLABORATION AT THE CORE: LEEVI KIIL

Leevi Kiil has been in the architectural profession for 45 years, spending the better part of that time with HLW as Partner, Managing Partner and CEO. Though retired from HLW as of 2004, Kiil remains active in the architectural world, serving as AIA New York's President in 2002, running his own firm and leading the Global Design Alliance (GDA) as its Executive Director.

Teaming has always been a major part of Kiil's professional environment. He firmly believes that architects have a responsibility to work with others. "I've never felt isolated and have always preferred a team environment, working with the engineers, clients and consultants."

Throughout his career, Kiil has used collaboration with his peers as a tool to get projects done efficiently, cost effectively, on time, and at a high level of quality.

> "I have always preferred a team environment, working with the engineer, clients and consultants."

Because of this history of collaborative workmanship, Kiil understands just how important teamwork and effective tools like IPD can be. His work with the GDA speaks to his respect for these processes. For example, the GDA recently paired with Tulane University's School of Architecture in New Orleans to give its faculty and students some first-hand experience with the profession, and to learn about current initiatives underway at the school. "It was gratifying to see that their program is rich with projects that require them to collaborate, giving them the skills needed to join teams in the post-college world," says Kiil.

In addition to the initiative with Tulane, the GDA sheds light on the article in HBR 'The New Arithmetic of Collaboration', describing the process as four rungs on a ladder, with each one leading to more focused collaboration and each team member ultimately helping the others to the top. "The GDA aspires to be the fourth rung, to have an integral and transformative partnership with each company we're involved with," says Kiil.

Kiil contends that there is one basic rule that is key to the teaming experience. "Nothing is more important than a commonality of values," he says. "That additional trust allows teams to build a special relationship, to get a job done most effectively and with greater attention to detail and quality."

With leadership and a natural acumen for teamwork such as Kiil's, organizations like the GDA and project delivery tools like IPD will see design and construction of high quality projects reach completion more efficiently than ever before. ▪

ABOUT THE GLOBAL DESIGN ALLIANCE

The Global Design Alliance (GDA) was formed in 1993 as the Strategic Team of Allied Resources (STAR) alliance with nine founding member firms. The goal was a new model for practice based on common values, spirit of partnership, learning from and supporting each other and marketing together. A code of conduct and commitments were established to ensure the group was more than simply another professional networking organization.

Initiated originally as an experiment, today the GDA is an international network of 13 design, planning, construction and advisory firms who share a focus on implementing change in the construction industry through a new formula for collaboration. GDA members pursue business opportunities together, share project and process expertise and act as a source of management best practices to better serve their clients.

As a living experiment in trust-based teaming for almost 20 years, GDA members represent over 2,500 employees with over $425 million in design fees each year and over 50 offices in eight countries.

One mission of GDA is to advance best practices in every aspect of design and construction and always at a high level of collaboration. Its work is based on actual practice as GDA members purse project opportunities together. When awarded those projects, GDA members apply teaming and collaborative processes that have developed as a result of the strong relationships they have built together over the years.

GDA is unique as a professional association in that it advances relationship building, trust and human chemistry as key reasons for project success. Its mission "Better Together" may be an understatement in view of the accomplishments that GDA members have accrued as a result of their strategic relationships. With millions of dollars awarded in design fees for successful projects on which Global Design Alliance team members have collaborated, what began as an experiment, is now a proven approach for success.

For more information, visit www.globalda.com or call 917.887.3860.

James J. Terry
Partner
Zetlin & De Chiara LLP

HOW BROAD-BASED IS IPD?

James J. Terry shares his insights on the increasingly widespread success of IPD across a spectrum of business sectors.

The contributors to this newsletter have brought keen insight to our understanding of Integrated Project Delivery (IPD) and a greater appreciation of IPD's potential. While most of those contributors have been key players in the highly successful use of IPD on the American Airlines – LaGuardia projects, we also take note of the breadth of positive IPD experiences on projects of varying natures and scopes throughout the country in recent years. IPD is high-flying in more ways than one.

The AIA has undertaken several informative case studies of IPD projects. Those studies, reinforced by anecdotal evidence, underscore the growing interest in exploring IPD and the increasing comfort level that project participants are finding in working with that concept. If one were to take a cross-country flight, the landscape below would be dotted throughout by successful IPD projects.

EAST

Autodesk Inc., a creator of design software for the AEC industry, demonstrated its commitment to IPD when constructing its AEC Solutions Division Headquarters in Waltham, MA. The 2008 project was a 55,000 SF, three-story interior tenant improvement occupying an entire new office building. This $12.1 million project was Autodesk's second foray into IPD, following a successful 45,000 SF interior fit-out in San Francisco.

The Waltham project was rooted in an IPD agreement among owner, architect and builder that directly tied each party's success to the performance of the others while delineating specific roles in a "responsibility matrix." Three major subcontractors (mechanical/fire protection, electrical, and drywall) were brought into the agreement and shared in an incentive program within the fixed project budget.

The contract established an Incentive Compensation Layer (ICL) in which the architect's and builder's anticipated profit was placed at risk. The ICL was structured to adjust from minus 20% to plus 20%, depending upon whether project goals were met or exceeded. The participants jointly selected comparable local projects to serve as benchmarks by which attainment of those goals would be measured. The participants waived all claims against each other (excluding fraud, willful misconduct or gross negligence).

Three levels of collaborative teams were established: a broad-based Project Implementation Team for day-to-day matters; a Project Management Team with representatives of owner, architect and builder; and a Senior Management Team comprised of upper management of those three principal parties.

SOUTH

Among the numerous projects utilizing similar IPD principles is the $2.8 million new office construction project undertaken by SpawGlass Real Estate in 2010. As both owner and GC/CM, SpawGlass perceived a strong opportunity to experiment with IPD, when building a 15,000 SF regional office in Austin, TX.

For this project, the tri-party Consensus Docs 300 contract was employed without negotiation or customization. The collaborative terms of the contract included shared risk/reward and "Safe Harbor Decisions" providing insulation from liability; however, the parties opted to obtain traditional professional liability insurance policies. The team structure was styled as a Collaborative Project Delivery Team.

Interestingly, the major motivation for choosing IPD was not cost or schedule predictability, but rather market position. SpawGlass desired to be on the cutting edge of project innovation in the Texas market and decided that testing the IPD process on its own building presented a low-risk opportunity.

WEST

The City of Phoenix embraced IPD for the Walter Cronkite School of Journalism, a build-to-suit venture for Arizona State University. The six-story, 230,000 SF project built in 2006-08 for approximately $64 million, consists of classrooms, offices, public television studios and ground floor retail.

While the contract was a bilateral owner/design-builder agreement required by city procurement regulations, the participants collectively decided that the project's budget, schedule and programmatic requirements could be achieved only by following IPD principles. The mechanical, electrical and glazing subcontractors were early members of the team, the cohesion of which was reinforced by the use of Building Information Modeling. Although liability waivers were precluded by law, a limitation of consequential damages was contractually provided.

Project oversight was managed by an Executive Committee comprised of representatives of all stakeholders. Decisions were reached by consensus in the vast majority of instances; that collaborative and expedited decision-making process was deemed key to attaining the project's aggressive schedule. As Cronkite might have approvingly concluded, "That's the way it is."

FAR WEST

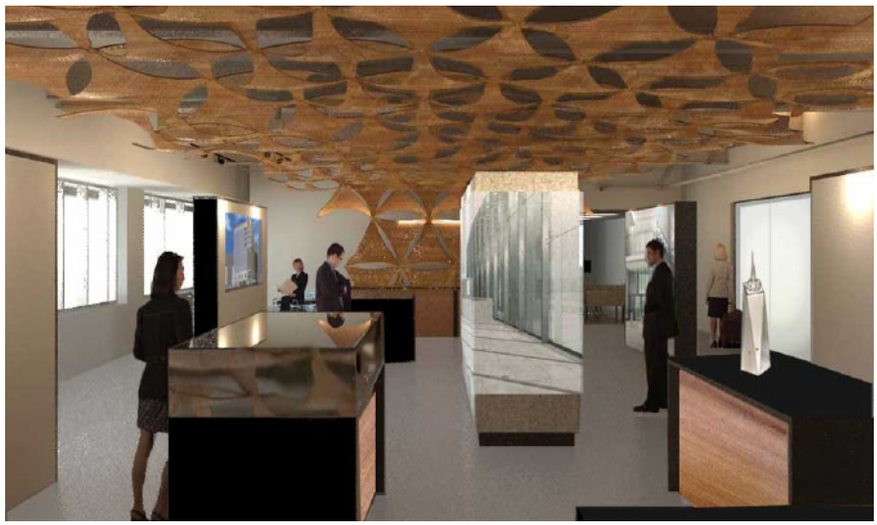
The healthcare sector is noteworthy for its utilization of IPD. A prominent example is California Pacific Medical Center's 860,000 SF, 14-level Cathedral Hill hospital project, undertaken in 2007 in San Francisco at a cost estimated around $1 billion. The owner is an affiliate of Sutter Health, an early IPD proponent, which applied the lessons learned from its 70,000 SF Fairfield, CA Medical Office Building project in 2005-07.

Cathedral Hill was governed by an Integrated Agreement for Lean Project Delivery among owner, architect and CM/GC containing collaborative commercial terms. The agreement established a risk pool whereby architect and CM/GC placed 25% of their preconstruction and construction fixed fee profits at risk. Also included in the pool were key architect's consultants (M/P, electrical, structural) and trade contractors (mechanical, electrical and concrete). Liability of the risk pool members to the owner was contractually limited, with virtually all liabilities related to the project intended to be satisfied exclusively from the at-risk pool account.

Cost predictability was reported as the owner's primary driver for using IPD, although schedule predictability and risk reduction were also identified as major motivators.

Project management emanated from a core group of stakeholders committed to lean project delivery and augmented by several interdisciplinary "Cluster Groups" established by design area. Each Cluster Group followed a Target Value Design process to ensure that the design met the value targets set by the core group. Full-time co-location of team members served to reinforce their collaborative orientation.

Based on this evidence, the nationwide breadth of IPD's influence is undeniable. It appears apt to borrow a phrase from Woody Guthrie: From the redwood forests to the Gulf Stream waters, this land was made for IPD. ▪



Autodesk AEC Solutions Group Headquarters | Waltham, MA

Walter Cronkite School of Journalism | Arizona State University | Phoenix, AZ

California Pacific Medical Center | San Francisco, CA

"Of all the process delivery methods, IPD is the n think it will become s

Ken Bower
Managing Director
Corporate Real Estate Facilities
American Airlines

American Airlines has always embraced new frontiers. As an early adopter of Integrated Project Delivery, American can speak first-hand to its efficiency, its focus on teamwork and its system of getting a job done the right way. Now, after having had a number of successful experiences with IPD, American Airlines and its IPD team are thrilled to share our positive experiences with professionals in all areas of the construction and aviation industries.

GETTING EVERYONE ON BOARD

As we struggled to complete the $1.3 billion expansion of the American Airlines JFK terminal, we knew that improving the communication and collaboration of the design and construction team was paramount to accomplishing our ambitious project delivery goals. The JFK Terminal 8 Redevelopment Project was based upon a conventional design and construction method known for delivering projects over budget and behind schedule. In search of a new delivery method, we were intrigued by the promise of IPD for several reasons.

It represented a mind shift based upon four core principles and a number of new tools. At the root of our decision, and at the foundation of what makes IPD an ideal strategic initiative, is its trust-based team, its early collaboration, its built-in sustainability and its transformational leadership. We chose IPD because it fosters an environment where all of the members of the design/build team collectively manage and appropriately share in the risk, work together, promote and support open sharing of knowledge and get a project done on time and on budget.

In previous non-IPD projects, we witnessed a lot of blame-shifting when something went wrong, a process that created delays in construction and left owners and project managers at AA challenged to resolve everything. Our experience with the IPD process has been completely different. With IPD, every member of the design/build team – from our project managers to the architect to the general contractor – was invested in the project's outcome. So, when an issue came up, everyone worked collaboratively to resolve it. We witnessed the successful application of this approach to problem-solving during our projects at LaGuardia Airport (LGA). When you're managing a project of any size, you cannot afford to waste valuable time on finger pointing when there is work to be done.

STABILITY IN AN UNCERTAIN ENVIRONMENT

While IPD worked successfully on several of our projects like the ones at LGA, it appears that the principles of IPD will hold true on any size of construction project. One of the reasons for this is its proven track record of keeping projects, both large and small, on or below budget.

AA first chose to pilot IPD while we were facing a challenging economic climate. Fuel prices were increasing, people were traveling less, and it wasn't as easy to come

Meet the American Airlines IPD team:

These construction industry professionals share their insights and experiences with IPD.

OWNER

Palmina Teta-Whelan
Senior Project Manager
American Airlines

"IPD provides a better understanding of design and architecture and how it impacts a project holistically."

ENGINEER

Porie Saikia-Eapen, AIA, FCIOB
Vice President
CH2M HILL

"IPD allows you to look at a project from the client's perspective and to focus on what is good for the project, giving the client what they want, when they want it."

CONTRACTOR

Jack Holt
CEO
Holt Construction

"After hearing and reading about IPD and how it has worked for other companies, we thought it would be a great team effort that fits with our corporate culture. IPD is the next step beyond construction management. It's a partnership. We like the fact that owner and architect are partners."

most promising. It's the wave of the future and I
standard practice at American Airlines. ”

up with funds to cover unexpected project expenses. With IPD, those unexpected costs are reduced because everyone is motivated to keep them low. This makes the budget more likely to be accurate from the beginning and the project more likely to get done on time, regardless of its size.

In our experience, a budget developed for an IPD project has proven to be categorically more definitive and accurate than those developed for a traditional design-bid-build project. The IPD budget allowed us to evaluate each line item, including projected costs for designers, architects, contractors and unseen conditions, with a more realistic and holistic viewpoint.

With our positive experiences in getting projects completed on or below budget, our department built credibility within AA's company executives and Finance Department, making the initial process of budgeting and requesting funds even easier in spite of a still challenging economic environment.

PIONEERS OF INDUSTRY

From an aviation industry perspective, IPD is still relatively new and not yet fully tested. American Airlines was an early adopter of IPD and we hope our successful experience will encourage IPD to become the universal, industry-wide project delivery system. If so, it will only result in several interesting opportunities for other designers, builders and owners to collaborate at the highest level with all airlines.

A VISION FOR THE FUTURE

Why IPD? Because it works. Now more than ever, we need to work more efficiently and collaboratively. To foster true collaborative behavior —collaboration that can take on the inevitable challenges presented by complex construction projects —requires the right people performing the right tasks within an environment that promotes trust and mutual expectations of shared project outcomes. In our experience, IPD helps prove that teamwork produces optimal results in nearly all fields of human endeavor.

The team that American Airlines was fortunate to work with included dedicated project owners, general contractors, engineers, architects, and construction attorneys. Together, our front-line experience with IPD has given us the knowledge and expertise to help others who are still learning about IPD's potential for project management. Our IPD team is happy to share its stories. ▪

CONTRACTOR

Magdy Allam
Project Executive
VRH Construction

"IPD was very exciting for us. Being involved from day one with the owner, architect and design team is a rare opportunity. We will do it again when given the opportunity. It was a very successful experience. As a company, we were looking forward to it."

ARCHITECT

Cliff W. Bollmann, AIA
Senior Associate
Gensler

"IPD is a welcome relief. Everyone is an informed partner on projects.When AA approached us, it was an easy decision. There was no question about putting our profit at risk. We are surrounded by people who are willing to collaborate and push the process. It's a natural extension of what we already do."

ARCHITECT

William Singer, AIA
LEED AP BD+C
Principal
Gruzen Samton • IBI Group

"I'd like to see IPD used in public sector projects. Risk is shared and the probability of making a project succeed increases."

ENGINEER

Brent Diemer
Vice President
CH2M HILL

"With the upfront planning of IPD, you eliminate 90% of the issues encountered with traditional construction. Get it done right from the start, and you'll set the stage for a wonderful and fun project. It's a great process for dealing with the unknowns."

COLLABORATION BY CONTRACT :

Michael S. Zetlin
Founding Partner
Zetlin & De Chiara LLP

Michael K. De Chiara
Founding Partner
Zetlin & De Chiara LLP

Timothy F. Hegarty
Partner
Zetlin & De Chiara LLP

Integrated Project Delivery (IPD) is a collaborative project management tool that allows everyone involved in a project to work together, reducing costs and increasing the likelihood of on-time project completion. Like the concept of 'teaming' introduced in the 1980s, this project delivery mechanism fosters teamwork conceptually, but IPD takes the idea a step further by adding legal contractual agreements. With all parties of the owner, design and construction team invested in a project's outcome, the project is more likely to be completed quickly, on or under budget. Because of this, the legal side of IPD is a key element in ensuring the model's effectiveness as a collaborative instrument.

One key differentiator of an IPD contract is that everyone involved in the construction process, from owner to designer to constructor, must complete a *Total Output Criteria Amendment*. This particular document establishes clearly defined, universally-acknowledged roles for all team members and includes a detailed *Integrated Scope of Services* that allocates duties and responsibilities among the parties. Through this definitive contractual tool, every key project task is defined, assigned and agreed upon, from the beginning.

Additionally, all involved parties agree to establish a *Total Output Cost* (TOC) for the project and will amend the contract to reflect this cost. If the final TOC is less than the TOC set forth in the contract, all parties will share in the savings. *Key Performance Indicators* (KPIs) must also be set in the contract and all parties shall be compensated for achieving those KPIs.

If all KPIs are met, and there is an underrun on the TOC, the design professional and the contractor will each receive a proportionate share of the underrun, plus an additional payment equal to the owner's share of the underrun (known as the Owner's KPI Contribution).

Examples of KPIs that must be achieved in order to receive additional compensation, might include:

- early completion of project schedule, weighted at XX%;
- successful implementation of IPD concepts, weighted at XX% and including participation of all parties during all phases of delivery and teamwork and commitment to IPD;
- customer experience, weighted at XX%;
- health and safety, weighted at XX%; and
- limited claims, zero litigation and zero owner-led changes to the initial contract TOC, weighted at XX%.

DEFINING THE PLT

The Project Leadership Team (PLT) consists of one representative from each party who will use his/her knowledge, skill and expertise to benefit the project.

> ...the legal side of IPD is a key element in ensuring the model's effectiveness as a collaborative instrument.

The PLT is primarily responsible for the execution of decisions and directives issued by the Executive Leadership Team (ELT). The PLT also manages the day-to-day administration of the project, including the coordination of all activities required to complete the project in a collaborative and integrated manner.

All decisions made by the PLT should be unanimous and subject to a subsequent review by the ELT and, if necessary, the Dispute Resolution Committee (DRC). All parties agree to be bound by the PLT's decisions. If, however, the PLT is unable to come to a unanimous decision, they may request a resolution from the ELT.

DEFINING THE ELT

The Executive Leadership Team (ELT) consists of one representative from each party. Its responsibilities include, but are not limited to, making decisions, as well as planning and managing the project in such a way that allows all parties to achieve the KPIs and successfully complete the project as planned.

Decisions made by the ELT must be unanimous. If the team cannot reach a unanimous decision, it may submit the matter to the Dispute Resolution Committee.

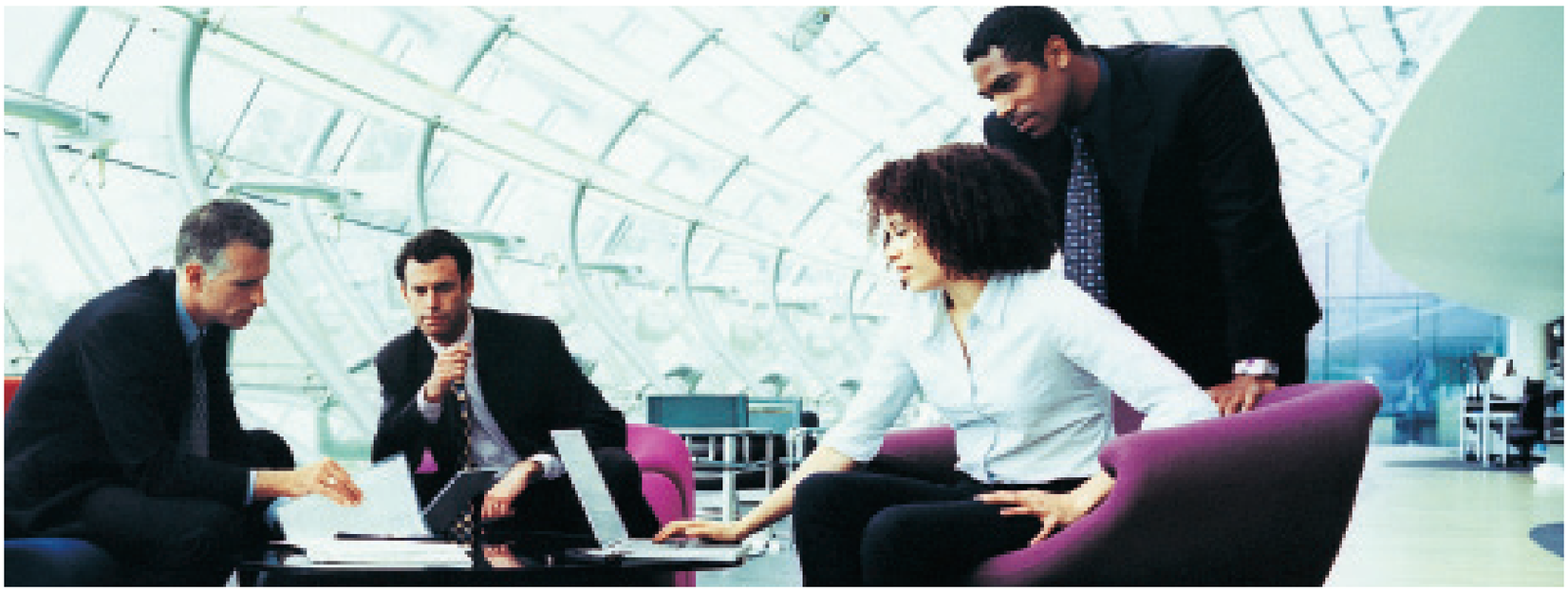
DEFINING THE DRC

The Dispute Resolution Committee is formed to aid both the PLT and the ELT, and will consist of party representatives in senior management positions with broad organizational responsibilities and a Project Neutral. All disputes that the PLT and/or ELT cannot resolve are referred to the DRC.

FINAL PIECE

The Risk Sharing: General Waivers of Claims and Liability is a key piece to the overall process. This concept of waiver is critical to enhancing collaboration by minimizing the finger-pointing and defensiveness that can arise among parties in a traditional construction project.

While Integrated Project Delivery in its current form has been utilized since the mid-aughts, the term IPD has been used to describe everything from an early collaboration among project participants to financial risk for all parties along with a focused goal and structure put in place for formal dispute avoidance. At its core, IPD recognizes and takes the best of many advancements in the construction industry and business management, from BIM and other technological advancements to lean construction to collaborative business practices. The use of IPD as a project delivery method is growing and, because of its fluidity, the prospect for its future is very bright.▪



FIRM NEWS

- Michael S. Zetlin and Patricia Harris discussed E-Discovery Disaster Prevention with ENR's Erin Joyce in the article, "How to Avoid e-Discovery Disasters."
- Michael S. Zetlin recently moderated a panel featuring Steve Ross, Robert Yaro and Seth Pinsky at Columbia University's The Center for Urban Real Estate (CURE.) Megaprojects Conference.
- Michael K. De Chiara moderated a special session at The Steven L. Newman Real Estate Institute's conference, "Battery Park City: Coming of Age."
- Carol Patterson, Michael S. Zetlin and Michael K. De Chiara were named leading construction lawyers by **Chambers USA** (2012).
- Michael S. Zetlin and Michael K. De Chiara were again recognized in the **Legal 500** (2012).
- Michael Vardaro, Lina Telese and Timothy Hegarty presented Ethics for Architects and Engineers to design professionals across the United States.
- The first episode of **Inside Building with ZD Law** has been released and is currently available at **www.zdlaw.com.**

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Office of the Inspector General

Commonwealth of Massachusetts

Gregory W. Sullivan
Inspector General

Experience of Massachusetts Public Agencies with Construction Management at Risk Under M.G.L. c. 149A

October 2009

The Commonwealth of Massachusetts
Office of the Inspector General

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October 1, 2009

The Honorable Brian A. Joyce, Senate Chair
Joint Committee on State Administration and Regulatory Oversight
State House, Room 413A
Boston, MA 02133

The Honorable Steven M. Walsh, House Chair
Joint Committee on State Administration and Regulatory Oversight
State House, Room 22
Boston, MA 02133

Dear Chairman Joyce and Chairman Walsh:

Pursuant to Chapter 193 of the Acts of 2004, "An Act Further Regulating Public Construction in the Commonwealth," the Office of the Inspector General is submitting a review of the construction management at risk (CM at risk) alternative delivery method. This alternative construction method was introduced as an innovation in public construction that was based upon a construction delivery method successfully utilized in the private sector and advanced by Commissioner David B. Perini of the Division of Capital Asset Management (DCAM), as a member of the Special Commission on Public Construction Reform. The final version of the statute, M.G.L. c.149A, §§1-13, included the ideas of many other Special Commission members. Section 13 of the legislation incorporated a review to analyze and assess the delivery method after a five-year period.

The office analyzed the experiences of local and state entities that have employed the alternative delivery method on their projects. Since 2005, there has been over $1 billion of local CM at risk projects authorized. In addition, Massport and DCAM have both used CM at risk for a number of projects; for example, DCAM is using the methodology to construct the New Psychiatric Hospital in Worcester, which is estimated to cost $302 million.

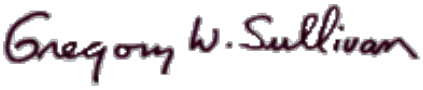
Overall, CM at risk as a delivery method is becoming more popular at both the state and local level. Since the data and information collected as the basis for this report, the office has approved seven more projects and has received three more requests. DCAM also reports that its construction management procurement process continues to gain strength within the industry. In 2009, DCAM has issued requests for proposals on eight CM at risk projects with an average contract value of approximately $40 million. DCAM received an average of 14 CM at

risk firm's responses per project. The CM at risk firms proposing include a mix of large national and regional firms, as well as smaller CM at risk firms who concentrate on the local market, indicating significant interest in projects using the CM at risk delivery method.

Based on the experiences of those that have used CM at risk as presented in this review, most entities appear satisfied with the current process and expressed few disadvantages. The office thanks the participants in this study for providing other public owners with an interest in using M.G.L. c. 149A with valuable data, procedural information, lessons learned, and practical advice. Nevertheless, the office has identified some changes to the law that would correct unclear or problematic provisions and strengthen the public protections contained in the law.

I am available to discuss the findings and recommendations contained in the report. The review will also be made available on the office website.

Sincerely,



Gregory W. Sullivan
Inspector General

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Introduction

Chapter 193 of the Acts of 2004, known as the public construction reform law, created a new statute, M.G.L. c. 149A, containing provisions authorizing and governing the use of two optional alternative delivery methods for public construction projects in Massachusetts: construction management at risk (CM at risk) for building projects estimated to cost $5 million or more and design-build for public works projects estimated to cost $5 million or more. The provisions of M.G.L. c. 149A took effect on January 1, 2005.

Prior to the enactment of the public construction reform law, most public owners in Massachusetts were required to use the design-bid-build project delivery method required by M.G.L. c. 149, §§44A-M for major public building projects with limited exceptions: Massachusetts law has long authorized the use of alternative delivery methods for modular buildings, which are subject to the competitive requirements of M.G.L. c. 149, §44E, and energy management contracts, which are subject to the competitive requirements of M.G.L. c. 25A. In addition, the Massachusetts General Court has enacted special legislation authorizing specific alternative delivery methods for certain public building projects: for example, the General Court authorized the use of CM at risk for the construction of the Worcester Courthouse project undertaken by the Division of Capital Asset Management (DCAM) and certain dormitory construction projects undertaken by the Massachusetts State College Building Authority (MSCBA).

M.G.L. c. 149A, §13 requires the Office of the Inspector General (OIG) to review public agencies' experiences with the use of CM at risk:

> Not later than 5 years after the effective date of this chapter, the inspector general shall undertake and complete a review for the purpose of describing the experience of public agencies that utilized construction manager at risk services. The review shall serve as the basis for a report to be submitted by the inspector general to the joint committee on state administration, the clerk of the house of representatives, and to the clerk of the senate not later than October 1, 2009. The report shall also include legislative recommendations, if any.

Study Objectives

The OIG contracted with a consultant, Clarus Group, to assist with performing this study. The specific objectives of the study were as follows:

1. Describe the experiences of public agencies that used the CM at risk project delivery method;

2. Analyze the CM at risk project delivery method compared to the traditional building project delivery method required by Massachusetts law; and

3. If appropriate, recommend changes to the legal requirements contained in M.G.L. c. 149A for using the CM at risk project delivery method.

Methodology

This section identifies the principal sources of data used in the development of this study: project identification, public owner surveys, a focus group interview, and interviews with representatives of public owners.

CM at Risk Project Identification

Under M.G.L. c. 149A, public agencies seeking to use CM at risk are required to submit an application to the OIG for authorization to proceed on a specific project. Five agencies are exempt from this requirement; these exempt agencies are required to submit and obtain OIG approval of procedures that may be used on multiple CM at risk projects.[1] The information in the applications served as a starting point to identify projects for inclusion in this study. In addition, OIG staff contacted the exempt agencies that had submitted and obtained OIG approval of their procedures to identify CM at risk projects that they had undertaken using the M.G.L. c. 149A process.[2]

Public Owner Surveys

Three instruments were developed to survey public agencies, referred to in this report as "public owners," about their experience with CM at risk under M.G.L. c. 149A. The first instrument consisted of an online survey that collected information about each CM at risk project undertaken, including:

- information on the project and its current status;
- competition for the CM at risk contracts;
- CM at risk contract amounts, including detail on fees and general conditions;
- ordering of long lead time items;

[1] The exempt agencies are the Division of Capital Asset Management (DCAM), Massachusetts Port Authority (Massport), Massachusetts Water Resources Authority (MWRA), Massachusetts State College Building Authority (MSCBA), and University of Massachusetts Building Authority (UMBA).

[2] Although the MSCBA is an exempt agency, the MSCBA has not used the M.G.L. c. 149A process to date. Chapter 193 of the Acts of 2004 amended Chapter 703 of the Acts of 1963 to include nine sections authorizing the MSCBA to select the CM at risk project designer and the CM at risk firm using a "single selection method," which is a process by which a designer and a CM at risk firm respond jointly as a team to an RFQ and an RFP for CM at risk services and are evaluated by the MSCBA as a team. Because the CM at risk projects undertaken by the MSCBA have been procured pursuant to the single selection procedures prescribed in the above legislation, and not pursuant to the selection procedures required by M.G.L. c. 149A, the surveys and interviews conducted for this review excluded the CM at risk projects undertaken by the MSCBA.

- trade contractor bidding and performance of trade and nontrade subcontract work by CM at risk firms;
- early construction work undertaken prior to execution of a guaranteed maximum price (GMP) amendment;
- the GMP amendment, the GMP contingency, and subsequent changes to the GMP;
- owner's project manager (OPM) and design contract amounts and payments;
- scheduled and, if applicable, actual substantial and final completion dates; and
- legal disputes, including claims, direct payment claims, bid protests, and litigation.

A copy of the online survey instrument is provided in Appendix B of this report.

The second survey instrument was a trade contract spreadsheet. For each trade contract on the project, the spreadsheet solicited information about the trade contractor RFQ (when issued, number of responses, and number of prequalified firms), bids (number of bids and whether the contract was awarded to the low bidder), CM at risk firm participation (whether or not the CM at risk firm submitted a bid and won the contract), and price (original and current trade contract price).

The third survey instrument collected information about the implementation of minority business enterprise (MBE) and women business enterprise (WBE) participation goals in the design and CM at risk contracts awarded by a select group of nine public owners that were interviewed during the course of the study.

All three survey instruments were submitted to DCAM officials for comment, and the first two surveys were pretested by representatives of the City of Worcester, which had completed the Union Station Parking Garage for the Worcester Redevelopment Authority (WRA) using the M.G.L. c. 149A CM at risk process. Following the pretest, some questions were added and some changes were made for clarity. In addition, representatives of the Public Construction Reform Task Force were given a copy of the first two survey instruments in advance of the focus group interview with Task Force representatives, discussed below.

The first and second survey instruments were distributed by the OIG in September 2008 to the public owners that had undertaken M.G.L. c. 149A projects. The OIG also requested that the public owners submit copies of their contracts with OPMs, designers, and CM at risk firms. In some instances, it was necessary to contact public owners to follow up on the status of responses and to obtain corrections and clarifications. Most responses were received in September 2008; one public owner provided the requested information in May 2009. The third survey instrument was distributed by the OIG in June 2009.

Focus Group Interview

On August 21, 2008, the OIG convened a meeting of representatives of agencies, organizations, and associations that had participated in the Public Construction Reform Task Force as well

representatives of the Office of the Attorney General. The agencies, organizations, and associations represented at the meeting were as follows:

- Senator Bruce Tarr
- A representative from Representative Barry Finegold's office
- Office of the Inspector General
- Office of the Attorney General
- DCAM
- Associated General Contractors
- Associated Subcontractors of Massachusetts
- Massachusetts Building Trades
- Boston Society of Architects
- American Council of Engineering Companies

Public Owner Interviews

Detailed project interviews were conducted with representatives of nine public owners: six municipalities, a Commonwealth charter school, DCAM, and Massport. These nine owners were selected for detailed, in-person interviews based upon the status of their projects as reported in the public owners' survey responses. City of Worcester officials were interviewed regarding the WRA's Union Station Parking Garage project in August 2008. Six other project interviews were conducted during the period of December 2008 and January 2009. Representatives of Massport, which submitted a completed survey for one project, were interviewed in January 2009. Representatives of DCAM, which submitted completed surveys for 12 CM at risk projects, were interviewed in August 2008 and in June 2009. Table 1, below, lists the public owners for which representatives were interviewed for this study. In some cases, the owners elected to have the project OPMs conduct the interviews or participate in the interviews. In this report, references to "representatives" of public owners interviewed for this study include all individuals, including OPMs, who participated in the interviews on behalf of the owners.

Table 1. Public Owner Representatives Interviewed	
Public Owner	**Project(s)**
Abby Kelley Foster Charter Public School	High school
Nantucket Memorial Airport Commission	Airport terminal
City of Newton	Newton North High School
City of Quincy	New Quincy High School
City of Salem	Salem High School
City of Taunton	High School/Middle School
Worcester Redevelopment Authority	Union Station parking garage
Massport	Pump station
DCAM	12 projects

Acknowledgments

The OIG would like to express its appreciation for the cooperation and assistance provided by the many individuals representing public and private organizations throughout Massachusetts who participated in this study.

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Comparison of Design-Bid-Build and CM at Risk

Design-bid-build is a well established project delivery method that requires the design and construction stages of a construction project to proceed sequentially. Under the design-bid-build delivery method, the owner completes the project design, solicits competitive bids from general contractors on the completed design, and selects the qualified general contractor submitting the lowest bid to complete the construction work. The general contractor's bid includes the cost of all work performed by project subcontractors and the general contractor is responsible for the performance of all subcontractors. The owner executes a lump-sum contract with the selected general contractor; change orders resulting from scope changes and unanticipated site conditions encountered during construction may increase the final contract cost.

Under the CM at risk method, the owner typically selects the CM at risk firm, which will later serve as the project general contractor, at the outset of or early in the design stage. Because the CM at risk firm assumes a dual role of construction manager and general contractor, the CM at risk delivery method is sometimes referred to as "CM/GC." After conducting a selection process that focuses on qualifications and fees, the owner executes an initial CM at risk contract with the selected CM at risk firm. As the design progresses, the CM at risk firm provides construction management services, such as constructability reviews of the design, construction scheduling, and project cost estimates, to the owner. At some point during the design stage, the owner and the CM at risk firm negotiate a guaranteed maximum price (GMP) for the project. When the contract is amended to include the GMP, the CM at risk contract becomes a cost-plus contract with a GMP, and the CM at risk firm assumes responsibility for the performance of the work, including the work performed by project subcontractors. The owner pays the CM at risk firm the actual cost of the work plus the agreed-upon CM at risk fee up to the GMP; change orders resulting from scope changes and unanticipated site conditions encountered during construction may increase the final contract cost.

M.G.L. c. 149 and M.G.L. c. 149A: Major Differences

This remainder of this section provides an overview of the major differences between the design-bid-build contracting procedures required by M.G.L. c. 149 and the CM at risk contracting procedures required by M.G.L. c. 149A. More detail on the requirements of each statute is provided in the Inspector General's manual on Designing and Constructing Public Facilities, available at http://www.mass.gov/ig/publ/dcmanual.pdf.

Dollar Thresholds

Building construction contracts subject to M.G.L. c. 149 are subject to differing competitive procurement requirements depending upon the estimated cost of the contract. Contracts estimated to cost less than $10,000 must be procured by soliciting three written quotations, contract estimated to cost at least $10,000 but not more than $25,000 must be procured through a public notification process, contracts estimated to cost not less than $25,000 but not

more than $100,000 must be procured in accordance with the competitive sealed bidding procedures of M.G.L. c. 30, §39M, and contracts estimated to cost more than $100,000 must be procured through a competitive sealed bidding process that requires subcontractors to file sub-bids for certain subtrades. The following discussion of M.G.L. c. 149 requirements in this section applies to contracts estimated to cost more than $100,000.

The CM at risk contracting procedures contained in M.G.L. c. 149A may be used by public agencies in Massachusetts only for building construction contracts estimated to cost $5 million or more.

OIG Approval

All public agencies in Massachusetts with the exception of the Massachusetts Bay Transportation Authority are subject to the competitive provisions of M.G.L. c. 149 when procuring contracts of all dollar amounts for the construction, reconstruction, installation, demolition, maintenance or repair of any building. No approval is required to use the procedures of M.G.L. c. 149.

Before undertaking a CM at risk building project, M.G.L. c. 149A requires public agencies to submit a detailed application to proceed to the OIG; M.G.L. c. 149A sets forth criteria for the OIG's authorization to use CM at risk in the form of a notice to proceed. This requirement was incorporated into M.G.L. c. 149A at the recommendation of members of the Construction Reform Task Force. Because the CM at risk method is markedly different from the traditional design-bid-build method required by M.G.L. c. 149, these members recommended that the OIG be assigned responsibility for assessing whether public agencies seeking to use the CM at risk method possess the requisite knowledge and capacity to undertake a CM at risk project. As previously noted, DCAM, Massport, MWRA, MSCBA, and UMBA are exempt from the requirement to apply to the OIG for authorization to use CM at risk on a building project. However, each exempt agency must submit its procedures for the procurement and use of CM at risk services to the OIG annually for review and approval. The OIG must approve the procedures if the OIG determines that they comply with the requirements of M.G.L. c. 149A.[3]

Project Design

Both M.G.L. c. 149 and M.G.L. c. 149A require the preparation by a registered designer of fully detailed plans, drawn to minimum scale, and specifications. Massachusetts jurisdictions are required to comply with the competitive selection procedures of the designer selection law, M.G.L. c. 7, §§38A½-O, when selecting project designers for building projects. For cities and towns, the designer selection law applies when the construction project is estimated to cost more than $100,000 and the design fee is estimated to be $10,000 or more;[4] for state agencies, independent state authorities, and Commonwealth charter schools, the designer selection law

[3] M.G.L. c. 149A, §4.

[4] The design fee threshold is cited in "Designer Selection Board Guidelines for City and Town Building Projects," issued by the Designer Selection Board in December 2008.

applies when the construction project is estimated to cost $100,000 or more and the design fee is $10,000 or more.

On a M.G.L. c. 149 project, the general contractor is not selected until the project design has been completed. The public owner solicits bids on the detailed project plans and specifications and awards the construction contract to the responsible and eligible general contractor submitting the lowest bid. Thus, the general contractor has no role during the design stage.

On a M.G.L. c. 149A project, the CM at risk firm – which will serve as the project general contractor during the construction stage – is selected during the design stage of the project and provides a range of construction management services to the public owner as the design is being developed. According to M.G.L. c. 149A, these services may include cost estimation and consultation regarding the design of the building project, preparation and coordination of bid packages, scheduling, cost control, and value engineering. Thus, the final design may reflect or incorporate substantial input from the CM at risk firm. As previously noted, the general contractor's involvement in the project design is regarded as a major benefit of the CM at risk method in comparison with design-bid-build.

General Contractor Selection

Under M.G.L. c. 149, the public owner conducts a publicly advertised invitation for bids (IFB) process to select the general contractor. Only general contractors that have been certified by DCAM in the category or categories of work specified by the public owner may bid on a M.G.L. c. 149 contract. The DCAM certification process screens general contractors on the basis of qualifications, past performance on public and private projects, financial condition, bonding capacity, and other factors. The public owner must award the contract to the responsible and eligible bidder submitting the lowest bid on the detailed plans and specifications. A responsible bidder demonstrably possesses the skill, ability, and integrity necessary to faithfully perform the work called for by a particular contract; an eligible bidder meets all M.G.L. c. 149 requirements for bidders.

With the exception of the exempt agencies,[5] public owners are required to use the detailed prequalification procedures found in M.G.L. c. 149, §44D½ to prequalify general contractors to bid on each building project estimated to cost $10 million or more. All public owners may elect to prequalify general contractors using these prequalification procedures for building projects estimated to cost $100,000 or more. Only prequalified general contractors may bid on M.G.L. c. 149 projects for which general contractors have been prequalified under M.G.L. c. 149, §44D½. The prequalification process thus enables public owners to restrict the M.G.L. c. 149 competitive bidding process to general contractors that the public owner has prequalified.

Under M.G.L. c. 149A, the public owner conducts a two-phase competition to select the CM at risk firm. The first phase of the competition is a prequalification process based on CM at risk firms' responses to a publicly advertised request for qualifications (RFQ) issued by the public

[5] DCAM, Massport, MWRA, MSCBA, and UMBA are exempt from this mandatory general contractor prequalification requirement.

owner. The public owner must prequalify at least three CM at risk firms in order to proceed to the second phase, which consists of a selection process based on the proposals submitted by prequalified CM at risk firms in response to a request for proposals (RFP) issued by the public owner. The proposals are required to contain detailed technical information as well as the CM at risk firms' fees for preconstruction and construction services and the CM firms' estimated general conditions cost;[6] the proposals do not include construction pricing. Thus, under M.G.L. c. 149A the public owner selects the CM at risk firm that will later serve as the project general contractor on the basis of qualifications and proposed fees; the public owner has the discretion to decide on the relative weights to be accorded to these criteria in the selection of the CM at risk firm. The initial contract with the CM at risk firm does not contain construction pricing; as will be discussed, the public owner negotiates the maximum construction price with the selected CM at risk firm at a later point in the project.

Subcontractor Selection

M.G.L. c. 149 requires a filed sub-bidding process for subcontracts in the 17 sub-trade categories specified in M.G.L. c. 149, §44F when the subcontract work is estimated to cost more than $20,000. Sub-bidders submit sub-bids for the work in each filed sub-bid category directly to the public owner in response to the publicly advertised IFB. Only subcontractors that have been certified by DCAM in the subtrade for which filed sub-bids are solicited may bid on a M.G.L. c. 149 subcontract. The DCAM certification process screens subcontractors on the basis of qualifications, past performance on public and private projects, financial condition, and other factors. After screening the sub-bidders, the public owner provides a list of eligible sub-bidders and their sub-bid prices to all interested contractors. Each general contractor submitting a bid on the M.G.L. c. 149 contract must select, in each subtrade category, the filed sub-bidder that the general contractor wishes to use and list the selected filed sub-bidders, and their sub-bid prices, in the statutory bid form submitted to the public owner. General contractors are not required to take the lowest sub-bid in each subtrade category.[7]

With the exception of the exempt agencies,[8] public owners are required to use the detailed prequalification procedures found in M.G.L. c. 149, §44D¾ to prequalify subcontractors to submit sub-bids on each building project estimated to cost $10 million or more, when the estimated cost of the subcontract work exceeds $20,000. All public owners may elect to prequalify filed sub-bidders using these prequalification procedures for building projects estimated to cost $100,000 or more. Only prequalified subcontractors may bid on M.G.L. c. 149 projects for which subcontractors have been prequalified under M.G.L. c. 149, §44D¾. The

[6] The general conditions cost covers the CM at risk firm's direct project overhead expenses. M.G.L. c. 149A, §6(a)(10) requires the owner to include in the CM at risk RFP "a fully developed schedule of cost items listing the public agency's determination of what will be considered fee, cost of the work, and general condition[s] items."

[7] M.G.L. c. 149 contains detailed filed sub-bidding rules that are not covered in this brief summary. For example, filed sub-bidders are allowed to restrict their sub-bids to or from any general contractor, and general contractors are allowed to submit filed sub-bids if they meet certain M.G.L. c. 149 requirements.

[8] DCAM, Massport, MWRA, MSCBA, and UMBA are exempt from this mandatory subcontractor prequalification requirement.

prequalification process thus enables public owners to restrict the M.G.L. c. 149 filed sub-bid process to subcontractors that the public owner has prequalified. Project subcontractors other than those discussed above are selected by the general contractor. Under M.G.L. c. 149, the general contractor contracts with and is responsible for the work of all subcontractors on the project, including those selected through the filed sub-bid process conducted by the public owner.

M.G.L. c. 149A requires prequalification and bidding of all project subcontracts with an estimated cost that exceeds $20,000. Subcontractors performing subtrade work that would be subject to filed sub-bidding on a M.G.L. c. 149 project are called "trade contractors" on a M.G.L. c. 149A project. M.G.L. c. 149A requires the public owner to conduct a two-phase trade contractor selection process. Trade contractors must first be prequalified through a publicly advertised RFQ process by a trade contractor prequalification committee on which a representative of the CM at risk firm participates; the public owner then solicits competitive bids from prequalified trade contractors and awards each trade contract to the prequalified bidder submitting the lowest bid. The prequalification process undertaken by the trade contractor prequalification committee closely resembles the subcontractor prequalification process required by M.G.L. c. 149, §44D3/4 except that the project CM at risk contractor participates in prequalifying trade contractors on a M.G.L. c. 149A project.

Under M.G.L. c. 149A, the CM at risk firm is responsible for prequalifying and obtaining bids from subcontractors for subcontracts that are not trade contracts – that is, contracts that do not fall into any of the 17 filed sub-bid categories identified in M.G.L. c. 149, §44F – and are estimated to cost more than $20,000. The CM at risk firm is first required to draw up a list of the required qualifications for each subcontract and to select three subcontractors that meet the qualifications; after the public owner has approved the required qualifications and the list of three subcontractors, the CM at risk firm invites bids from approved subcontractors, based on detailed bidding information developed by the CM at risk firm. The CM at risk firm then selects a subcontractor and presents the bids and the selection decision to the public owner, along with a written explanation of the reason for the subcontract award. M.G.L. c. 149A requires the public owner to approve the subcontractor selection method used by the CM at risk firm for subcontracts estimated to cost $20,000 or less. As under M.G.L. c. 149, the CM at risk firm on a M.G.L. c. 149A project is responsible for the work of all subcontractors on the project, including those selected through the trade contractor prequalification and bidding process conducted by the public owner.

Early Construction Packages and Long Lead Time Items

On a M.G.L. c. 149 project, the public owner typically solicits bids on the completed design and awards a single construction contract to a general contractor. However, it is possible to "fast-track" a M.G.L. c. 149 project by soliciting bids on early construction packages for site work, foundation work, or other project components for which the design is complete. Because M.G.L. c. 149 requires that the lowest responsible and eligible bidder be selected for each contract, the general contractor selected to perform an early construction package may not be the same as the general contractor selected to perform the remaining construction work. Thus,

the decision to issue early construction packages on a M.G.L. c. 149 project is likely to require the public owner to manage multiple general contractors on the project. Under M.G.L. c. 149, long lead time items typically are not ordered until the construction stage begins, although the public owner has the capacity to order long lead time items prior to construction.

Under M.G.L. c. 149A, the public owner selects and contracts with the CM at risk firm on the basis of qualifications and fees before the design is completed. The CM at risk firm is the general contractor for all construction work; thus, early construction packages can be undertaken as soon as the design for each package is complete. Rather than soliciting bids from general contractors on each early construction package, the public owner amends the existing contract with the CM at risk firm to include the cost of the early construction work, the general conditions cost, and any additional CM at risk fee. Early construction packages are subject to the M.G.L. c. 149A trade contractor prequalification and bidding process discussed in the previous section. The CM at risk firm's early involvement in the project also facilitates the ordering of long lead time items by the CM at risk firm.

Construction Price

On a M.G.L. c. 149 project, the public owner pays the general contractor a lump-sum price comprised of the general contractor's bid price plus the cost of approved change orders. The initial construction price is established through the competitive IFB process, which requires the public owner to award the construction contract to the responsible and eligible bidder submitting the lowest bid. Change orders approved by the public owner during the construction stage amend the construction contract and may increase the contract price. For example, the public owner is required to make an equitable adjustment in the contract price when site conditions differ substantially or materially from the conditions indicated in the construction plans or contract documents.[9] Owner-generated design changes and incomplete or flawed plans and specifications may also warrant change orders that increase the contract price.

On a M.G.L. c. 149A project, the construction price paid by the public owner consists of the actual cost of the construction work, a general conditions amount negotiated with the CM at risk firm, and the CM at risk firm's fee for preconstruction and construction services; the price paid by the public owner cannot exceed the GMP negotiated with the CM at risk firm. The initial GMP, which becomes an amendment to the public owner's contract with the CM at risk firm, is negotiated when the project design reaches the level of completion specified in the public owner's RFP for CM at risk services; M.G.L. c. 149A provides that the design documents must be at least 60 percent complete when the GMP amendment is executed. The GMP includes the actual cost of any early construction packages, the CM at risk firm's general conditions and fees, the CM at risk firm's contingency, a detailed line-item cost breakdown by

[9] M.G.L. c. 30, §39N requires owners to make equitable adjustments to the contract price if, during the progress of the work, the contractor or the awarding authority discovers that the actual subsurface or latent physical conditions encountered at the site differ substantially or materially from those shown on the plans or indicated in the contract documents.

trade, and any allowances. The GMP amendment also includes other information, such as a list of all drawings, specifications, assumptions, and clarifications on which the GMP is based and the substantial and final completion dates on which the GMP is based.

As on a M.G.L. c. 149 contract, approved change orders may increase the construction price to the public owner of a M.G.L. c. 149A contract. For example, the public owner is required to make an equitable adjustment in the contract price when site conditions differ substantially or materially from the conditions indicated in the construction plans or contract documents.[10] Owner-generated design changes and incomplete or flawed plans and specifications may also lead to change orders that increase the GMP for the construction work on a CM at risk project. When the public owner approves a change order increasing the construction price, the price of the change order is usually added to the negotiated GMP. Thus, the initial GMP negotiated with the CM at risk firm may increase during the course of the project.

As previously discussed, the GMP is not a lump-sum construction price; it is a maximum price for an agreed-upon scope of work. The public owner's actual payments to the CM at risk firm consist of reimbursements for the actual cost of the work performed by trade contractors and other subcontractors; the negotiated general conditions amount; and the CM at risk firm's fee. If the sum of these amounts equals or exceeds the GMP, the public owner will pay the CM at risk firm the full amount of the GMP. If the sum of these amounts is lower than the GMP, the public owner will pay only the amounts owed; the CM at risk firm is not entitled to any portion of the "savings" between the actual amount owed and the GMP unless the contract includes an incentive provision allowing the CM at risk firm to share in these savings. M.G.L. c. 149A restricts any contract incentives to no more than one percent of the estimated construction cost.

Allowances

Allowances in construction contracts are dollar amounts, established by the owner, intended to cover unpredictable or unknown cost items. The owner, rather than the general contractor, bears the risk of the cost of items designated as allowances: if the actual cost of an allowance item is less than the amount included in the contract, the owner pays only the actual cost; if the actual cost exceeds the dollar amount included in the contract for that item, the owner is responsible for paying the additional cost.

M.G.L. c. 149 prohibits the use of allowances, defined as "a sum of money covering one or more items of labor or labor and materials which is designated in bid documents and which general bidders are required to use in computing their bids,"[11] in the award of any contract subject to the provisions of M.G.L. c. 149, §44A. M.G.L. c. 149 further states:

> Whenever the designer is unable to supply specifications for any item prior to the solicitation of bids, such item shall not be included in any contract subject to

[10] M.G.L. c. 149A contracts are subject to the requirements of M.G.L. c. 30, §39N.

[11] M.G.L. c. 149, §44G(a).

> the provisions of section forty-four A. The awarding authority shall solicit bids for every such item separately pursuant to the provisions of section forty-four A after specifications for that item are prepared.[12]

By contrast, M.G.L. c. 149A explicitly permits the use of allowances: the GMP amendment must include "a list of allowances and statement of their basis."[13]

Bonding Requirements

M.G.L. c. 149 requires the selected general contractor (on contracts estimated to cost more than $100,000) to furnish performance and payment bonds, each in the amount of 100 percent of the contract price, after receiving the contract from the public owner. On M.G.L. c. 149 contracts requiring contractor and subcontractor prequalification, filed sub-bidders are required to furnish the general contractor with performance and payment bonds, each in the amount of 100 percent of the subcontract price, after receiving the subcontracts from the general contractor.

M.G.L. c. 149A requires the CM at risk firm to furnish performance and payment bonds, each in the amount of 100 percent of the GMP, after executing the GMP amendment to the contract with the public owner; trade contractors are required to furnish performance and payment bonds, each in the amount of 100 percent of the trade contract price, after receiving the trade contractor agreement from the CM at risk firm. In addition, CM at risk projects undertaken pursuant to M.G.L. c. 149A are subject to M.G.L. c. 149, §29, which requires the construction contractor to provide the public owner with a payment bond in the amount of at least 50 percent of the contract price.

Contract Negotiation and Financial Oversight by the Public Owner

On a M.G.L. c. 149 contract, the public owner's contract negotiations with the general contractor are typically limited to negotiation of change orders during the construction stage. By contrast, M.G.L. c. 149A requires the public owner to negotiate the non-fee terms of the CM at risk contract, including the general conditions payment to the CM at risk firm; the GMP; and any changes to the GMP requested by the CM at risk firm as a consequence of changes to the design as it progresses, differing site conditions encountered during construction, or other circumstances for which the public owner bears the risk. In addition, unlike the lump-sum form of contract required by M.G.L. c. 149, the cost-plus not to exceed GMP form of contract is a cost reimbursement contract that requires the public owner to monitor and audit all project costs throughout the project through an "open book process." Thus, a M.G.L. c. 149A contract typically requires more ongoing owner involvement and financial oversight than does a M.G.L. c. 149 contract.

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[12] M.G.L. c. 149, §44G(a).

[13] M.G.L. c. 149A, §7(b)(4).

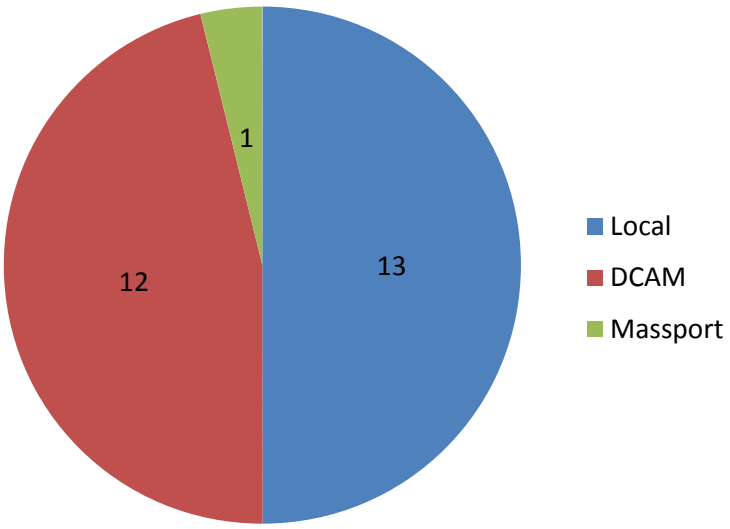
Findings

Public Owner Use of CM at Risk under M.G.L. c. 149A

1. **From January 1, 2005 through August 2008, 14 public owners had undertaken 26 construction projects using the M.G.L. c. 149A CM at risk process. The projects were at various stages of execution, and four had reached substantial or final completion. Ten projects reported GMPs that ranged from $7.7 million to $162.8 million and altogether totaled over half a billion dollars.**

This study examines the use of CM at risk in Massachusetts under M.G.L. c. 149A. In the period covering January 1, 2005, when M.G.L. c. 149A took effect, through August 2008, when the projects for this study were identified, a total of 26 CM at risk projects had been undertaken under the M.G.L. c. 149A process.[14] As shown in Figure 1, below, one-half of the 26 projects were under the control of local owners (including municipalities, a municipal redevelopment authority, and a Commonwealth charter school); 12 others were state projects under the control of the DCAM; and one project was under the control of Massport, a state authority.

Figure 1: Public Owners Undertaking CM at Risk Projects
January 2005 – August 2008

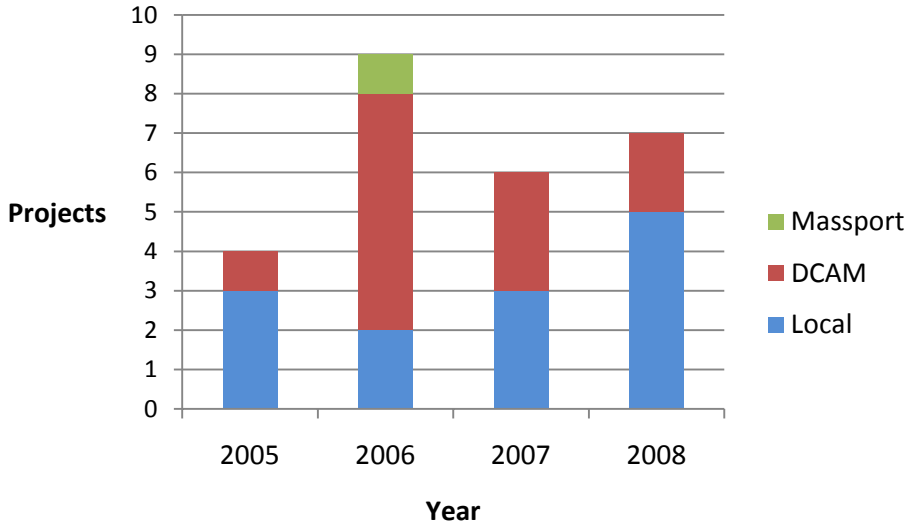


According to the survey data reported by public owners in September 2008 with respect to the date on which the owners issued RFQs for CM at risk services, four of the CM at risk projects were undertaken in 2005, nine in 2006, six in 2007, and seven in 2008 through August, as

[14] As noted in the methodology section of this report, the projects included in this study were identified using the list of projects approved by the OIG as well as project data reported by DCAM and Massport in response to the study survey.

shown in Figure 2, below. No additional projects had received approval from the OIG to use CM at risk as of August 2008.

Figure 2: CM at Risk Projects Undertaken January 2005 – August 2008



As shown in Table 2, below, 13 projects were undertaken by local owners, 12 projects were undertaken by DCAM, and one project was undertaken by Massport.[15] City of Worcester employees served as OPM on two projects: a Worcester high school project and a parking garage project undertaken on behalf of the Worcester Redevelopment Authority. The 26 projects included new construction and renovation of a variety of facilities, including schools, airports, courthouses, higher education facilities, a hospital, and other facilities.

Table 2 indicates the status of each project. At the time of the survey, four projects had issued RFPs for CM at risk services but had not completed the selection process. CM at risk firms were under contract for all of the remaining 22 projects, GMP amendments had been executed for 11 of the 22 projects, and four of the 22 projects had reached substantial or final completion.

[15] Massport provided survey data on one project, a pump station replacement project that was under construction at the time that Massport representatives were interviewed for this study. Massport representatives interviewed for this study also commented on two additional projects, each of which was in the preconstruction stage: one project involved Terminal E, and the other project involved the Terminal B parking garage. This study focused principally on the pump station project for which survey data were provided.

Table 2. Public Owner Survey Results Profile of CM at Risk Projects						
Public Owner	Project	Project Status				Guaranteed Maximum Price
		CM RFQ	CM Contract	GMP	Complete	
Abby Kelley Foster Charter Public School	High school	■	■			
Barnstable Municipal Airport Commission	Airport terminal, roadways, and parking	■				
City of Malden	Malden High School	■	■			
Geriatric Authority of Milford	Building modernization	■	■	■	■	$ 7,777,171
Nantucket Memorial Airport Commission	Airport terminal	■	■	■		$ 22,674,708
City of Newton	Newton North High School	■	■	■		$ 162,764,808
City of Northampton	Police facility	■	■			
City of Quincy	New Quincy High School	■	■	■		$ 99,083,414
City of Salem	Salem High School	■	■	■	■	$ 54,582,078
City of Springfield	Vocational Technical High School	■	■			
City of Taunton	High School/Middle School	■	■	■		$ 88,467,267
City of Worcester	North High School	■				
Worcester	Union Station parking garage	■	■	■	■	$ 17,458,142
Massport	Pump station replacement	■	■			
DCAM	Phase II Expansion Fire Academy	■	■	■		$ 34,225,677
	New Psychiatric Hospital	■	■			
	Worcester State College Administration Building Renovations	■	■			
	New Taunton Trial Court	■	■			
	State House Roof Replacement and Exterior Repairs	■				
	Marshall Conant Science Building Modernization and Expansion	■				
	New Fall River Courthouse	■	■			
	Health and Wellness Center Bunker Hill Community College	■	■	■		*
	J. Michael Ruane Judicial Center	■	■			
	Wall Experiment Station Renovations	■	■			
	Cronin Skating Rink	■	■	■	■	$ 13,180,017
	Ely Library/Campus Center Accessibility Upgrades	■	■	■		$ 9,490,000
					Total	$ 509,703,282
* GMP information was not provided for this project.						

The survey responses for ten of the 11 projects for which a GMP amendment had been executed reported the original GMP and, if the GMP had changed as the project progressed, the current GMP as of the date of the survey responses. The current GMPs for the ten projects totaled $509.7 million – over half a billion dollars. The average project GMP for the ten projects was approximately $51 million; the project GMPs ranged from $7.8 million for the Milford geriatric facility to $162.8 million for Newton North High School. Of course, the final GMPs for these projects may have changed since the survey responses were prepared and, for those not yet completed, are subject to change in the future.

Table 3, below, provides selected project costs for the ten projects for which GMP amendments had been executed. For each project, the costs shown in the table, as of the date that the survey response was submitted, include the current GMP, the owner contingency, the OPM contract amount, and the design contract amount. The table provides some information about the magnitude of the CM at risk projects listed, but the information should be interpreted with caution for two reasons. First, the information represents contract costs and contingencies at the time of the survey responses, and the amounts may have been adjusted since the survey responses were prepared. Second, the costs do not represent total project costs: for example, they do not include staff costs (including the costs incurred by the City of Worcester and DCAM for project OPM services provided by in-house staff), legal costs, and other consulting costs and fees that were paid as direct project expenses.

Table 3. Public Owner Survey Results
Project Costs of CM at Risk Projects

Project	Guaranteed Maximum Price	Owner Contingency	OPM Contract Cost	Design Contract Cost	Project Total
Milford Geriatric Authority Building modernization	$ 7,777,171	$ 192,000	$ 100,000	$ 280,000	$ 8,349,171
Nantucket Airport terminal	$ 22,674,708	$ 1,000,000	$ 683,314	$ 2,972,000	$ 27,330,022
Newton North High School	$ 162,764,808	$ 5,000,000	$ 4,019,429	$ 15,373,000	$ 187,157,237
New Quincy High School	$ 99,083,414	$ 6,116,799	$ 3,653,361	$ 8,875,575	$ 117,729,149
Salem High School	$ 54,582,078	$ 568,887	$ 2,472,971	$ 4,111,067	$ 61,735,003
Taunton High School /Middle School	$ 88,467,267	$ 3,000,000	$ 2,564,317	$ 9,506,400	$103,537,984
Worcester Union Station parking garage	$ 17,458,142	$ 300,000	*	$ 454,600	$ 18,212,742
Phase II Expansion Fire Academy	$ 34,225,677	$ 1,860,732	*	$ 2,000,000	$ 38,086,409
Cronin Skating Rink	$ 13,180,017	$ 1,031,773	*	$ 650,000	$ 14,861,790
Ely Library/Campus Center Accessibility Upgrades	$ 9,490,000	$ 796,885	*	$ 640,000	$ 10,926,885

*Worcester and DCAM employed staff OPMs on these projects.

OPM and Designer Selection and Contracting Practices

M.G.L. 149A requires that each public owner procure or otherwise employ the services of an OPM[16] before procuring the services of a designer on a CM at risk project. Public owners that are required to obtain authorization from the OIG to use the CM at risk method for their projects must acquire the services of both the OPM and the designer before submitting an application to the OIG.[17]

OPM Selection and Contracting Practices

2. The majority of public owners interviewed for this study contracted with private firms with CM at risk experience to provide OPM services. Half of the OPM contracts contained detailed scope requirements pertaining to the use of CM at risk, and half did not.

The documents provided by the nine public owners interviewed for this study showed that six owners contracted with private firms to provide OPM services in connection with their CM at risk projects. Three owners, including DCAM and Massport, assigned in-house staff to serve as the project OPMs.

All six owners that contracted for OPM services reported that they had selected OPM firms with CM at risk experience. Of these, three executed contracts with the selected firms containing detailed scope requirements reflecting the CM at risk-related tasks to be performed by the OPM. The other three owners had contracted with the OPM firms well before deciding to apply to the OIG for authorization to use the CM at risk method for the projects; the selected OPMs had advocated successfully for the use of CM at risk to deliver the projects. The contracts with the OPMs executed by these three owners referenced the CM at risk method but did not contain detailed scope requirements reflecting the tasks relating to CM at risk to be performed by the OPM.

Designer Selection and Contracting Practices

3. All public owners interviewed for this study contracted with private firms to provide design services; the majority reported that the selected designers had CM at risk experience. Two-thirds of the design contracts contained detailed scope requirements pertaining to the use of CM at risk, and one-third did not.

The documents provided by and interviews conducted with the nine public owners showed that all contracted with private designers to provide design services in connection with their CM at risk projects. The majority contracted with their designers after deciding to use the CM at risk method, selected designers with previous CM at risk experience, and incorporated explicit

[16] M.G.L. c. 149, §44A½ identifies the required qualifications of the OPM as well as the OPM's duties. The OPM must be independent of the designer, the general contractor, or any subcontractor involved in the project.

[17] M.G.L. c. 149A, §3.

provisions into their contracts with the selected designers enumerating the designer's responsibilities in assisting the owner with specific project tasks required by M.G.L. c. 149A. However, representatives of most of these owners indicated in interviews that their plans to use CM at risk did not significantly influence their designer selection decisions.

Three owners contracted with their designers well before deciding to use the CM at risk method and did not amend the design contracts to include explicit CM at risk-related provisions. In two of these cases, the designer did not have previous CM at risk experience.

CM at Risk Projects and Procedures Approved by the OIG

As previously discussed, M.G.L. c. 149A requires most public agencies to apply to the OIG for a notice to proceed to use CM at risk for a specific project. M.G.L. c. 149A requires that the public agency procure or otherwise employ the services of an OPM and procure the services of a designer for the CM at risk project before submitting a CM at risk application to the OIG. The OIG's application, entitled *Procedures Relative to Receiving a Notice to Proceed to Use Construction Management at Risk Services*, requires applicants to submit detailed information regarding the project for which CM at risk authorization is requested and the applicant's capacity to procure and manage the CM at risk services required by the project. Five agencies – DCAM, Massport, MWRA, MSCBA, and UMBA – are exempt from the requirement for project-by-project approval but must obtain from the OIG annual approval of their CM at risk procedures.

4. **As of August 2008, OIG had issued notices to proceed for 13 CM at risk projects and had approved CM at risk procedures submitted by three exempt agencies. The approved projects had a combined estimated construction cost of approximately $608 million. The applications submitted to the OIG cited a variety of reasons for using CM at risk. Public owners are generally satisfied with the OIG application process.**

As of August 2008, the OIG had approved 13 applications for CM at risk projects. The OIG had also approved CM at risk procedures for implementing M.G.L. c. 149A submitted by DCAM, Massport, and UMBA.

Table 4, below, lists all public owners that submitted applications, the CM at risk projects for which they sought notices to proceed, and the status of the applications as of August 2008. The OIG had received a total of 16 applications.[18] The total estimated construction cost for all of the projects, as reported by the owners, was approximately $735 million. As of August 2008, one application had been withdrawn by the owner, and two applications were pending. The total estimated construction cost for the 13 approved projects was approximately $608 million.

[18] One applicant, the Nantucket Memorial Airport Commission, actually submitted two applications for the same project. The second application was submitted because of scope changes in the project plan; the estimated construction cost remained the same and the Commission had already contracted with a CM at risk firm. OIG decided that the Commission could continue under the first notice to proceed, so the two applications are counted in this report as one.

Table 4. Applications to OIG For Notice to Proceed With a CM at Risk Project			
Public Owner	Project	Application Status August 2008	Estimated Construction Cost
Abby Kelley Foster Charter Public School	High school	Approved May 2008	$ 10,000,000
Ashburnham	Public Safety Facility	Withdrawn August 2005	$ 5,300,000
Barnstable Municipal Airport Commission	Airport terminal, roadways, and parking	Approved May 2007	$ 25,400,000
City of Malden	Malden High School	Approved January 2008	$ 56,318,769
Geriatric Authority of Milford	Building modernization	Approved October 2005	$ 5,400,000
Nantucket Memorial Airport Commission	Airport terminal	Approved November 2005	$ 22,500,000
Town of Nantucket	Public safety building	Pending	$ 27,500,000
City of Newton	Newton North High School	Approved July 2006	$ 115,261,000
City of Northampton	Police facility	Approved February 2008	$ 11,600,000
Town of Norwood	Norwood High School	Pending	$ 72,000,000
City of Quincy	New Quincy High School	Approved December 2006	$ 108,466,367
City of Salem	Salem High School	Approved April 2005	$ 35,381,223
City of Springfield	Vocational Technical High School	Approved April 2008	$ 95,000,000
City of Taunton	High School/Middle School	Approved November 2007	$ 83,000,000
City of Worcester	North High School	Approved November 2007	$ 51,420,000
Worcester Redevelopment Authority	Union Station parking garage	Approved March 2006	$ 10,652,316
		Total	$735,199,675
		Total Approved	$607,899,675

Records maintained by the OIG indicate that the OIG worked with prospective applicants to help them understand potential issues and application requirements, and worked with owners that had submitted applications to clarify information in the applications or to obtain additional

information. In most instances the OIG sought and obtained greater detail on the qualifications, roles, and responsibilities of OPMs and designers listed in the applications.

Owner Perspectives on the OIG Application Review

All owner representatives interviewed for this study who were familiar with the OIG application process for their CM at risk projects[19] expressed satisfaction with the application process. Some owner representatives characterized the process as straightforward, user-friendly, and reasonable; one owner representative noted that the OIG had provided helpful comments on the owner's preliminary application. None of those interviewed recommended changes to the application process.

Reasons for Use of CM at Risk Cited in Owner Applications

Consistent with the requirements of M.G.L. c. 149A, the OIG's application for authorization to use the construction management at risk method requires applicants to submit a written determination that the use of CM at risk services is appropriate for the building project as well as the reasons for the determination. The 13 CM at risk applications submitted to and approved by the OIG as of August 2008 indicated that the owners had selected the CM at risk method for their projects for a variety of reasons. The most frequently cited reasons, which overlap in some respects, were as follows.

> **Anticipated schedule benefits.** The majority of owners indicated that they anticipated that use of the CM at risk method would result in time savings resulting from the ability to order long lead time items early in the project, the ability to undertake phased construction, the constructability reviews by the CM at risk firm, and reduced change orders and associated delays.
>
> **Ability to select the contractor based on qualifications as well as fee.** The increased focus on contractor qualifications in the selection process required by M.G.L. c. 149A was the second most frequently cited reason for using the CM at risk method; owners noted that their projects required highly skilled contractors and that some desirable contractors were unlikely to bid on the projects if procured using M.G.L. c. 149.
>
> **Contractor input into the design.** Owners cited the beneficial effect on the project quality of the value engineering and constructability advice provided by the CM at risk firm during the design stage. One owner embarking on a renovation project noted that the CM at risk process, unlike the M.G.L. c. 149 bid process, would give the contractor an understanding of the design documents.

[19] The representatives of one owner interviewed were not on staff or under contract at the time that the owner applied to the OIG and were unable to comment on the application process.

Anticipated logistical benefits. The need to manage complex phasing and operational issues on projects with aggressive schedules was another reason cited by multiple owners for using the CM at risk method.

Contractor input into the selection of trade contractors. Several owners indicated that they expected the CM at risk firm's advice regarding the prequalification of trade contractors to benefit their projects by improving the project quality and reducing the number of change orders.

Coordination and collaboration among participants. Several owners expected the CM at risk firm's participation in the design reviews and selection of trade contractors to foster a team approach to the project and a team dialogue among the project participants: in particular, among the owner, the designer, and the contractor.

Ability to negotiate the GMP. Several owners regarded the ability to negotiate a GMP for the project as an important benefit that would reduce the cost uncertainty associated with bidding and ensure that the owner paid only the actual cost of the work plus the agreed-upon fee.

Anticipated cost savings. While most owners did not cite cost savings as an anticipated benefit of using the CM at risk method, two owners indicated that they did expect cost savings to result from the schedule savings afforded by CM at risk and from the coordination and management provided by the CM at risk firm.

Approved Agency Procedures for M.G.L. c. 149A Projects

DCAM's OIG-approved procedures as of August 2008 contained detailed procedural requirements beyond those contained in M.G.L. c. 149A for procuring project services. These requirements included the following:

- A CM at risk proposal submission requirement of a bid security in the amount of five percent of the estimated construction cost of the project as determined by DCAM and provided in the RFP.
- Submission by CM at risk firms of separate sealed fee/cost and technical proposals.
- A procedure for rating the technical CM at risk proposals, consideration of the CM at risk fee/cost proposals, and ranking of the proposals in view of both the technical ratings and the fee/cost proposals.
- A requirement that the selected CM at risk firm provide performance and payment bonds, each in the amount of 100 percent of the estimated construction cost of the project, with provisions to increase the sum of each bond by the amount of any construction work performed prior to the execution of the GMP amendment. When

GMP amendment is executed, performance and payment bonds, each in the amount of 100 percent of the GMP, are substituted for the initial bonds.

- A procedure for returning the bid security to each proposer after the CM at risk contract is executed.
- A procedure to be followed if fewer than three trade contractors for a particular trade are prequalified.[20]

Massport's OIG-approved procedures as of August 2008 included the following procedural requirements beyond those contained in M.G.L. c. 149A:

- A requirement contained in the CM at risk RFQ that respondents provide a bid bond in the amount of five percent of the construction estimate, if it is deemed necessary.
- A requirement that the CM at risk RFQ remind firms that notarizing a document does not take the place of signing under the pains and penalties of perjury.[21]
- Inclusion in the RFP of a schedule of cost items, including Massport's estimate of the fee, the cost of the work, and the cost of general conditions.
- Procedures for the return of bid bonds of CM at risk firms that were not prequalified after the prequalification process is completed and of prequalified CM at risk firms after the CM at risk contract is executed or the CM at risk process is cancelled.

UMBA's OIG-approved procedures as of August 2008 included the following procedural requirements beyond those contained in M.G.L. c. 149A:

- Requirements that the CM at risk RFQ and the trade contractor RFQ inform applicants that notarizing a document is not the same as signing a document under the pains and penalties of perjury and that notarizing the statement of qualifications does not satisfy the mandatory requirement that the statement of qualifications be signed under the pains and penalties of perjury.
- A provision allowing the UMBA to establish maximum CM at risk fees for project preconstruction and construction services.
- A requirement that, if the CM at risk firm submits a bid to self-perform non-trade subcontract work, all bids shall be transmitted to the UMBA's project manager.

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[20] Although M.G.L. c. 149A does not require prequalification of at least three trade contractors for each trade contract, M.G.L. c. 149 does contain such a requirement as well as procedures to be followed if fewer than three trade contractors are prequalified. The procedures contained in DCAM's approved procedures are similar to those found in M.G.L. c. 149.

[21] M.G.L. c. 149A, §5 requires CM at risk firms responding to the RFQ to sign their statements of qualifications under the pains and penalties of perjury.

CM at Risk Firm Selection Process

M.G.L. c. 149A requires public owners to undertake a two-phase process for selecting the CM at risk firm. The first phase consists of an advertised RFQ process administered by a prequalification committee, the membership of which is prescribed by M.G.L. c. 149A. M.G.L. c. 149A contains detailed requirements governing the content of the RFQ issued by the public owner as well as the information that must be provided by CM at risk firms responding to the RFQ. The prequalification committee must select at least three qualified CM at risk firms to receive the RFP for CM at risk services. The second phase consists of the RFP process, which is administered by a selection committee, the membership requirements for which are the same as those for the prequalification committee. M.G.L. c. 149A contains detailed requirements governing the content of the RFP and the technical and price information that must be provided in the proposals submitted by prequalified CM at risk firms in the second phase of the selection process; however, owners are free to devise their own evaluation criteria and procedures. The price component of each proposal is required to include the fee for preconstruction services, with appropriate detail; the fee for construction services, with explanation of the basis; and the estimated cost of general conditions, with appropriate detail.

The selection committee is required to evaluate all proposals in accordance with the RFP criteria, to enter into non-fee negotiations with the highest-ranked firm, and to award the contract with the highest-ranked firm with which the selection committee is able to negotiate an acceptable contract. The fees proposed by competing firms are not negotiable.

5. **Public owners interviewed expressed positive views of the M.G.L. c. 149A CM at risk firm selection process. DCAM representatives estimated that the process typically takes 16 weeks.**

Public owners interviewed for this study praised the two-phase process required by M.G.L. c. 149A for prequalifying and selecting the CM at risk firm. One owner representative expressed the view that the M.G.L. c. 149A process is superior to that required by M.G.L. c. 149 because it enables the owner to make an informed selection considering fees, general conditions, and interview information. Another stated that the value of the M.G.L. c. 149A process was that the owner was able to choose the general contractor rather than being saddled with the low bidder under M.G.L. c. 149. A third stated that the process had worked well for this owner but noted that most municipalities lack the necessary expertise and resources to make the process work well.

DCAM representatives interviewed estimated that the process of selecting a CM at risk firm takes 16 weeks; they noted that the reference checking requirements of M.G.L. c. 149A are extensive. However, they also stated that DCAM has adopted a policy to the effect that if a CM at risk firm has been prequalified within the last six months, DCAM does not call the same references again when prequalifying the firm for a new project; instead, DCAM relies on the references kept on file.

Competitive Environment

6. **Survey data and interviews with public owners indicate that competition from CM at risk firms for M.G.L. c. 149A projects has been mixed, although there are indications that competition has recently increased. Approximately half of the public owners interviewed, including DCAM and Massport, have been satisfied with the competition for their CM at risk contracts. Public owners are generally satisfied with the caliber of the CM at risk firms that have competed for their contracts.**

The competitive environment for CM at risk contracts has varied on the M.G.L. c. 149A projects for which survey data were analyzed. Table 5, below, shows the median number of responses to each RFQ, the median number of CM at risk firms prequalified for each project, and the median number of prequalified firms submitting proposals for each CM at risk contract, as reported by survey respondents. As the table shows, CM at risk firms had been prequalified through the RFQ process on 26 projects. On these projects, the median number of RFQ responses to each RFQ was six, and the median number of CM at risk firms prequalified for each project was four; the number of responses to each RFQ ranged from three to 11, and the number of firms prequalified for each project ranged from three to eight. On seven projects (27 percent of the total number of projects) public owners prequalified all CM at risk firms that submitted responses.

The table also shows that the RFP process had been completed on 23 projects. The median number of proposals received for each project was three; the number of proposals ranged from two (on four DCAM projects and two local projects) to seven (on one DCAM project and one local project). All CM at risk firms that had been prequalified submitted proposals on nine projects (39 percent of the total number of projects).

Table 5. Public Owner Survey Results
Competition for CM at Risk Contracts
Prequalification and Proposals

	RFQ Responses (n=26)	Prequalified Firms (n=26)	Proposals (n=23)
Median*	6 responses	4 prequalified	3 proposals
Range	3-11 responses	3-8 prequalified	2-7 proposals

*The averages corresponding to each category were 5.88, 4.62, and 3.50, respectively.

The survey data show that 31 firms[22] had been prequalified for one or more M.G.L. c. 149A projects, indicating a sizable potential market of CM at risk firms. Although the majority of firms (18) were prequalified for just one project, many had been prequalified for multiple projects and two firms had been prequalified for 10 or more of the projects.

[22] This number includes four joint ventures.

Of the 31 prequalified firms identified in the survey data, 11 (approximately one-third) were selected for CM at risk contracts. Six of the firms held one contract, two firms held two contracts, two firms held three contracts, and one firm held six contracts. A list of the CM at risk firms working on each project reported in the survey is contained in Appendix A of this report.

Representatives of approximately half of the public owners interviewed for this study, including DCAM and Massport, stated that they were satisfied with the competition from CM at risk firms for their contracts, while representatives of the remaining four owners indicated that they had expected or hoped that more CM at risk firms would compete for their contracts. (The representatives of one owner participating in the interview had not been involved with the CM at risk firm selection process and could not comment on this issue.)

The owners who were not satisfied with the competition for their CM at risk contracts cited varying reasons for the lower-than-expected participation of CM at risk firms in the selection process: one owner representative stated that one or two CM at risk firms had not competed for the contract because they regarded some provisions of the CM at risk contract developed by the awarding authority, such as those concerning the project timing, schedule, and penalties, as too onerous; the selected CM at risk firm subsequently insisted that some of these provisions be changed. Another owner representative, discussing one of the first CM at risk projects undertaken under the provisions of M.G.L. c. 149A, stated that he had encouraged several major CM at risk firms to compete for the contract but that they had all indicated that they were waiting for the M.G.L. c. 149A CM at risk process to "work out the bugs." A third owner representative noted that the timing of the owner's project was wrong for two CM at risk firms that the owner had hoped would compete for the contract. A fourth owner representative indicated that the project RFQ had been issued twice because the first RFQ had not generated sufficient competition.

There are indications that competition for CM at risk contracts has increased over time. Although the survey data are limited and cannot provide definitive information regarding competitive trends, the data do indicate an increase in the average number of proposals received by the owners responding to the survey: in 2005, 2006, and 2007, owners received an average of three CM at risk proposals per project, whereas in the first six months of 2008, owners received an average of five CM at risk proposals per project.[23] DCAM officials interviewed in the spring of 2009 noted that more than 20 CM at risk firms had applied for prequalification on a recent CM at risk project, in contrast to the lower numbers of firms competing for some of the CM at risk contracts for which survey data were collected in 2008.

All eight public owners (excluding the owner cited above whose representatives interviewed for this study were not involved with the CM at risk selection process) expressed satisfaction with the caliber of the CM at risk firms that had competed for their contracts. DCAM and Massport representatives noted that some high-quality CM at risk firms competing for their CM at risk

[23] The number of projects on which these averages are based are as follows: one project in 2005, eight projects in 2006, eight projects in 2007, and six projects in the first six months of 2008.

contracts had not previously worked on their agencies' projects or, in some cases, competed for public projects under M.G.L. c. 149.

Selection Decisions

7. Public owners have based their CM at risk firm selection decisions principally on qualifications; most owners also considered the proposed fees in their selection decisions.

The representatives of all public owners interviewed for this review reported that their selection decisions had focused primarily on the CM at risk firms' experience and capacity to complete their projects, although most indicated that fees were also an important consideration. Owner representatives cited the following reasons for their decisions:

- The selected firm demonstrated the best understanding of the project; the firm had mapped out a strategy that appeared reasonable. The firm's fee was in the midrange of the fees proposed, indicating that the firm understood the project.
- The selection decision was based on the firm's qualifications; price did not play a major role. With respect to the fee, the public owner requested the firm to provide a sense of the percentage of construction costs sought by the firm.
- The selected firm had stellar experience and made a thoughtful presentation to the selection committee on the firm's plan for operating on a tight site. The firm's fee was slightly higher than the fee charged by the other proposer.
- The selected firm made an effective presentation indicating that the firm understood the complex challenges posed by the project. The firm had done CM at risk work for DCAM, had a good safety record, and had strong references. An evaluation matrix that rated firms on a series of criteria was used; fee accounted for 25 percent of the overall rating each firm received.
- The selected firm had no CM at risk experience but did have extensive experience constructing renovations and additions to occupied buildings. The selection committee used a point system that considered a variety of factors; the point system allocated 80 percent of the points to qualifications and 20 percent to price.
- The selected firm was chosen based on its qualifications; the fee proposals from competing firms were close.
- DCAM's selection decisions focus on the firms' experience with projects of similar size and complexity. DCAM has adopted a requirement that the CM at risk firm must have completed a project of at least 75 percent of the value of the project for which the firm is competing. DCAM always considers fee: where two CM at risk firms offer strong experience, the firm with the lower fee is chosen.

- Massport considers the qualifications of CM at risk firms during the RFQ stage; in the RFP stage, Massport evaluates the extent to which proposers have considered potential challenges posed by the project and value engineering strategies. During interviews, Massport assesses the proposed team's interactions and capacity to answer questions. When there is a major disparity in the fees proposed by prequalified firms, Massport accords significant weight to the fee in the selection decision. Massport also requires competing firms to provide cost estimates by trade in their proposals, based on 25 percent design documents provided by Massport. These estimates, according to Massport representatives, enable Massport to evaluate the extent to which the CM at risk firms have studied the plans and specifications and understand the project.

Contract Negotiations

8. Some owners reported negotiating the terms of the CM at risk contracts with their selected firms, while others reported that they did not conduct significant contract negotiations before executing the CM at risk contracts.

Public owners responding to the survey provided the following examples of contract issues negotiated with their CM at risk firms: delay provisions, reduction of duplicative preconstruction general conditions, personnel time, and conversion of some items to allowances. The extent to which owners negotiated the terms of the contracts with the selected CM at risk firms ranged from no negotiated changes to extensive negotiations of contract terms related to risk allocation and change orders, according to owner representatives interviewed for this study. Representatives of four owners, including DCAM, reported negotiating the general conditions amounts and allowances (discussed later in this report) during the CM at risk contract negotiations, while representatives of two other owners reported that the general conditions proposed by the firms did not change in the executed contract. According to DCAM representatives, DCAM negotiates the general conditions and sometimes the composition of the CM at risk team, but DCAM does not negotiate the terms and conditions of DCAM's CM at risk contract; although competing firms propose exceptions, DCAM does not accept them. Massport representatives reported that Massport provides a copy of Massport's preconstruction contract to competing firms and advises them that no exceptions will be permitted. Any substitutions of staff for those promised in the proposal require Massport's approval.

The CM at Risk Contract

As noted earlier in this report, M.G.L. c. 149A requires that the price components of the proposals submitted by CM at risk firms competing for the contract contain proposed fees for preconstruction and construction services as well as "the estimated cost of general conditions with appropriate detail."[24] The proposed fees are not subject to negotiation; the general conditions amount may be negotiated.

[24] M.G.L. c. 149A, §6(c)(2).

M.G.L. c. 149A provides that the public agency may include an incentive clause in the CM at risk contract for various performance objectives, provided that the incentive clause does not include an incentive exceeding one percent of the estimated construction cost. M.G.L. c. 149A restricts the use of shared savings provisions allowing the CM at risk firm to share in any savings between the final GMP and the final cost of the work, including the CM at risk fee, to the one percent incentive limit.[25]

Fees

9. The survey data show that the fees for preconstruction services paid by public owners to CM at risk firms ranged from zero percent to .88 percent of the GMP. This variation may be attributable to owners' differing cost allocation practices.

As discussed earlier in this report, M.G.L. c. 149A requires public owners to pay CM at risk firms two types of fees, both of which are included in the GMP: a fee for preconstruction services and a fee for construction services. Public owners surveyed for this study reported preconstruction fees on ten projects (seven local projects and three DCAM projects) for which the GMPs had been negotiated. The fees for preconstruction services reported in the survey data ranged from zero to .88 percent of the GMP amount. The median percentage of the GMP represented by the fee for preconstruction services was .19 percent.

As previously discussed, M.G.L. c. 149A requires the owner to include in the CM at risk RFP a fully developed schedule of cost items listing the owner's determination of what will be considered fee, cost of the work, and general conditions items. Thus, the variation in the size of the fees for preconstruction services relative to the GMP amounts reported by owners is likely to be explained, at least in part, by owners' differing cost allocation practices with respect to the cost items that are included in the fee, cost of the work, and general conditions.

10. The survey data show that the fees for construction services paid by public owners to CM at risk firms ranged from approximately 1.5 percent to nearly 10 percent of the GMP. This variation may be attributable to owners' differing cost allocation practices.

Public owners surveyed for this study reported fees for construction services on ten projects (seven local projects and three DCAM projects) for which the GMPs had been negotiated. The fees for construction services reported in the survey data ranged from 1.51 percent to 9.91 percent of the GMP. The median percentage of the GMP represented by the fee for construction services was 2.47 percent. As in the case of the fees for preconstruction services paid by owners, the variation in the size of the fees for construction services relative to the GMP amounts reported by owners is likely to be explained, at least in part, by owners' differing cost allocation practices with respect to the cost items that are included in the fee, cost of the work, and general conditions.

[25] M.G.L. c. 149A, §7(a).

General Conditions Costs

11. The survey data show that the general conditions costs paid by public owners ranged from less than two percent of the GMP to more than 14 percent of the GMP. Public owners have adopted varying approaches to negotiating and paying the CM at risk firm for general conditions costs on their projects.

As noted above, the cost items that are considered general conditions costs vary from project to project, depending upon the owner's cost allocation practices. Public owners surveyed reported general conditions costs on ten projects (seven local projects and three DCAM projects) for which the GMPs had been negotiated. The general conditions amounts reported in the survey data averaged 8.64 percent of the GMP (a percentage that was virtually identical to the median percentage) and ranged from 1.68 percent to 14.62 percent of the GMP.

Representatives of the public owners interviewed for this study reported varying methods of negotiating and paying CM at risk firms for general conditions costs.[26] The approaches to negotiating and paying for general conditions reported by public owner representatives[27] included the following:

- Negotiation of preconstruction and construction phase general conditions amounts, paid based on a schedule of values.
- Negotiation of an up-front mobilization payment and a lump-sum construction phase general conditions amount, paid monthly.
- Negotiation of a lump-sum construction phase general conditions amount, paid based on a schedule of values.
- Payment of actual construction phase general conditions costs based on invoices submitted by the CM at risk firm.

Incentive Provisions

12. The CM at risk contracts executed by one-third of the public owners interviewed included incentive provisions for early project completion and, in one case, for the final project cost.

The contract documents provided by the nine public owners interviewed for this study indicated that three owners had included incentive provisions in their CM at risk contracts. All

[26] Some CM at risk contracts used the term "general requirements" for cost items classified as "general conditions" in other CM at contracts. For simplicity, the above discussion uses the term "general conditions" to refer to all such cost items.

[27] Representatives of two owners interviewed for this study were unfamiliar with the details of the general conditions cost negotiations conducted by their predecessors on staff or by the owner's general counsel.

three contracts included incentives for early completion, and one of the three also included a shared savings incentive as permitted by M.G.L. c. 149A.[28]

Negotiation of the GMP Amendment

Under M.G.L. c. 149A, the GMP must be based on design documents that are at least 60 percent complete and must be incorporated by amendment into the public owner's contract with the CM at risk firm. The GMP amendment must include the following information:

- a line-item cost breakdown by trade, including the cost of early construction work and dollar amounts for the CM at risk firm's contingency, the general conditions, and the fees paid to the CM at risk firm for preconstruction and construction services;
- a list of all drawings, specifications, and other information on which the GMP is based;
- a list of allowances and statement of their basis;
- a list of any assumptions or clarifications in which the GMP is based;
- the dates for substantial and final completion on which the GMP is based; and
- a schedule of applicable alternates and unit prices.[29]

Contingencies are intended to cover risk. A CM at risk project entails two budgeted contingency amounts. The contingency that is included within the GMP is an amount that the owner negotiates with the CM at risk firm; this "CM contingency" is used for project costs that are not associated with scope changes or latent conditions encountered during the construction phase, such as labor or materials costs in excess of the amounts budgeted in the GMP for those items. The "owner's contingency" is a separate fund established and controlled by the owner to cover costs associated with changes in the project scope and with unforeseen latent or subsurface conditions encountered during the construction phase. Expenditures funded by the owner's contingency are typically added to the GMP amount. Thus, the GMP increases with each approved change order.

13. Survey data and interviews with public owners show that owners negotiated the GMP amendments when the designs were complete or nearly complete and, in most cases, after construction work on the projects had begun.

Public owners responding to the survey reported that they had negotiated GMPs for ten CM at risk projects. Table 9, below, shows the reported stages of design completion of the projects at the time that the GMP was negotiated. In most instances, the design was complete or nearly complete when the GMP was negotiated: the designs for eight of the ten projects were 100 percent complete, and the designs for two projects were 90 percent complete. On eight of the

[28] The contract documents also showed that eight of the nine public owners, including DCAM and Massport, had included liquidated damages provisions in their CM at risk contracts.

[29] M.G.L. c. 149A, §7(4).

ten projects, the GMP was negotiated after at least some portion of the construction was completed. As shown in Table 9, construction of one project was nearly complete when the GMP was negotiated, construction of another project was 50 percent complete, construction of two projects was almost 25 percent complete, and construction of four projects was 13 percent complete or less. Construction work on the remaining two projects had not begun at the time that the GMP was negotiated.

Table 9. Public Owner Survey Results Work Completed Prior to GMP Amendment (n=10)	
	Projects
Design Status	
100 percent complete	8
90 percent complete	2
Construction Status	
97 percent complete	1
50 percent complete	1
23-24 percent complete	2
12-13 percent complete	2
1-2 percent complete	2
0 percent complete	2

Representatives of eight of the nine public owners interviewed for this study reported that their project designs were 100 percent complete and some construction work (including early construction work) had been completed, when the GMPs for their projects were negotiated. One owner reported that the design was 90 percent complete and construction work had begun when the GMP was negotiated.[30] The majority of owners, including DCAM and Massport, reported that most or all trade contracts had been bid at the time that the GMP was negotiated.

14. The majority of public owners interviewed reported that their OPMs had handled the GMP negotiation process; other owners reported having involved other project participants in the GMP negotiations.

Representatives of five public owners interviewed, three of which assigned in-house staff to serve as OPMs, reported that the GMP negotiations were handled by their OPMs and then approved by other public officials in the agency or jurisdiction. In the other four cases, the OPM participated in the negotiations along with public officials from the jurisdiction and, in two cases, the designer. Two owner representatives indicated that their counsel participated in the GMP negotiations as well.

[30] According to the representatives of this owner, the CM at risk firm on this project bid the trade contracts when the bid packages were 90 percent complete; the trade contract prices subsequently increased when the design work for each trade contract reached 100 percent completion.

15. All public owners interviewed for this study reported incorporating allowances into the GMP amendments for their projects. Most allowances were included in the general conditions costs of the projects to cover unknown or unpredictable cost items.

As previously discussed, M.G.L. c. 149A explicitly permits and anticipates the inclusion of allowances in the GMP amendment to the CM at risk contract. The four GMP amendments available for this study indicated that the percentages of the GMPs accounted for by allowances ranged from 2.5 percent to 8.5 percent. These allowances were not restricted to general condition items, although most allowances were included in the general conditions costs.

All nine public owners interviewed for this study reported that the general conditions costs paid on their CM at risk projects included allowances: i.e., cost items, paid by the public owner, that were not capped by the negotiated general conditions amount or the GMP. On one project, which entailed extensive school renovations, the general conditions allowance items included cost items such as fire alarm systems, negative air testing, and hygienist services. Other examples of general conditions items cited by owners and listed in documents provided by public owners as allowances included fuel; electricity; temporary heat; police details; temporary barriers for pedestrian control; an auditorium sound system; and permits, inspection, and testing.

The owners cited various reasons for incorporating allowances into the general conditions for their projects. One owner representative noted, with regard to a school construction project, that allowances were necessary in connection with the removal of asbestos because the CM at risk firm would not assume the risk for this work; other allowances in the CM at risk contract covered other unknown and unpredictable items. Another owner representative characterized the items for which allowances were used as "unquantifiable": for example, fuel and electricity costs. A DCAM representative stated that because allowances enable DCAM to assume the risk of unpredictable cost items, the CM at risk firms have no incentive to negotiate large contingencies in the general conditions amounts to cover these unpredictable costs or to attempt to assign general conditions items to subcontracts. (He also noted that DCAM requires excess costs for allowance items to be funded from the CM at risk firm's contingency in the GMP.)

All of those interviewed agreed that allowances were necessary and beneficial to their projects. However, one owner representative cautioned that incorporating a large number of allowances into the general conditions of the contract had proved difficult to manage and recommended that public owners limit the number of allowances for this reason.

16. The survey data show that CM contingency amounts were low in proportion to the original GMP, reflecting the late negotiation of the GMP on the projects for which contingency amounts were reported. Owner contingency amounts were higher in proportion to the original GMP, reflecting the higher risk assumed by the public owners. The public owners interviewed reported varying procedures for use of the CM contingency: two-thirds required the owner's approval for any expenditure, while the remaining one-third permitted their CM at risk firms to make expenditures without owner approval within defined dollar thresholds.

The survey data regarding the ten projects for which GMPs had been negotiated show that the CM contingency amounts on these projects were low relative to the owner contingency amounts on these projects, reflecting the fact that the designs were complete or nearly complete in all cases and that the trade contracts had been bid in many cases. As shown in Table 10, below, the median contingency amount for CM at risk firms was 2.23 percent of the original GMP; the CM contingency amounts ranged from 1.29 percent to 5.76 percent of the original GMP. The owner contingency amounts were higher, reflecting the higher risk assumed by the owners. The median owner contingency amount was 4.07 percent of the original GMP; the owner contingency amounts ranged from 2.71 percent to 9.93 percent of the original GMP.

Table 10. Public Owner Survey Results
CM at Risk Contingencies as Percent of Original GMP
(n=10)

	CM Contingency	Owner Contingency
Median*	2.23%	4.07%
Low	1.29%	2.71%
High	5.76%	9.93%

* Average percentages of the original GMP were 2.58 percent and 5.17 percent, respectively.

Six of the nine public owners interviewed for this study, including DCAM, required their CM at risk firms to obtain approval from the owners for all expenditures, regardless of amount, charged to the CM contingency. The representative of one of the six owners noted that it is important to guard against abuse of the CM contingency. For example, when the work is complete, the CM at risk firm could try to assign its own staff to the project in order to use up the CM contingency while protecting its staff from layoffs.

The representatives of the other three owners reported varying rules for use of the CM contingency. On one completed project, the CM at risk firm was permitted to charge smaller expenditures to the CM contingency but required to obtain the owner's approval of any contingency charges exceeding $5,000 or $10,000, according to the project OPM. On another project, the owner representatives reported that the CM at risk firm is permitted to use the CM contingency for expenditures up to $25,000; above that threshold, the owner approves expenditures from the CM contingency. On the final project, the CM at risk firm is permitted to charge expenditures to the CM contingency and informs the owner regarding each expenditure; no owner approval of these charges is required.

Additional Owner Comments and Advice

17. **The public owners interviewed cautioned other public owners regarding the importance of understanding the pricing components of the GMP, the contingency, the assumptions and qualifications on which the GMP is based, the risks borne by each party, and the impact of the timing of the GMP on the project budget.**

The owner representatives interviewed for this study offered the following additional comments and advice to other public owners regarding negotiation of the GMP:

- Owners need to pay close attention to the GMP. Negotiating the overall cost proved a major issue; with the addition of incentives and allowances, the total negotiated GMP was lowered by $1.6 million.
- Owners should proceed slowly and review everything.
- Owners should understand how construction project pricing is put together and decide which costs will be included and excluded from specific categories. It is helpful to have an OPM with major general contractor experience to assist in negotiating the line items within the GMP.
- Owners should not negotiate the GMP too early; doing so would require an enormous contingency in the GMP. The later in the process the GMP is negotiated, the lower the amount of the contingency required. Owners should not include too many allowances in the GMP.
- Owners should make sure that their architects and OPMs go through the line-item estimates carefully and that they understand the schedule and the contingency. The most important component of the GMP amendment is the document containing the clarifications and qualifications, which must be written clearly.
- Owners should make clear which cost items are in the GMP and which are not. Owners must focus on the risks borne by each party, be familiar with the documents, and spend time reviewing the assumptions and qualifications submitted by the CM at risk firm.
- Because the GMP is negotiated so late in the project, after all the subcontract prices are in place and construction has begun, most pricing components are hard numbers. The GMP negotiations focus on the size of the CM contingency.

CM at Risk Project Execution

Participant Roles

18. Public owners reported in interviews that their CM at risk firms had performed value engineering reviews, provided cost estimates, and recommended design changes to reduce the estimated project costs during the design stage. Some owners reported that their designers were required to produce more detailed documents than were customary and that the owners had paid for additional design review services. Most owners obtained cost estimates from their CM at risk firms and their designers; some also obtained cost estimates from their OPMs. During the construction stage, two owners required their designers to maintain a full-time presence at the construction site.

Most owner representatives interviewed for this study reported that their CM at risk firms had performed value engineering reviews of the designs and recommended changes that would reduce the estimated project costs. The CM at risk firm's provision of project cost estimates, detailed constructability and value engineering reviews of the project designs, and recommended design changes to meet the project budgets is regarded by most owner representatives interviewed for this study as highly beneficial. One owner representative reported that the scoping conducted by the CM at risk firm resulted in certain decisions to shift the traditional scopes of work: for example, the decision was made to move the brick demolition work and waterproofing work to the masonry package. In the case of one CM at risk project undertaken by DCAM, the CM at risk firm recommended changes to the building design that would enable standardized equipment and materials to be used for construction; as a result, the project cost estimate was reduced to conform to the project budget. By contrast, another owner contracted with a CM at risk firm with no prior experience with CM at risk late in the design process; on this project, constructability reviews were provided not by the CM at risk firm but by the OPM, a firm that also provides CM at risk services to other jurisdictions.

Representatives of some public owners interviewed for this study reported that their designers were required to prepare more detailed designs than they were accustomed to preparing; they also prepared design revisions in response to the CM at risk firms' value engineering recommendations. On two projects, the owners paid for additional design review services. One owner contracted with an outside consultant to check the construction documents prepared by the designer after receiving a wide range of bid prices on a trade contract; the outside consultant identified areas that required clarification. The other owner paid the CM at risk firm, which had already prepared detailed sequencing documents to accompany the construction documents prepared by the designer, an additional fee to conduct a full, in-depth review of the construction documents.

Representatives of all nine owners interviewed for this study reported that their CM at risk firms had provided cost estimates during the design stage or, in the case of projects for which the designs were complete or nearly complete when the CM at risk firm was brought into the project, at the end of the design stage. In some cases, the cost estimates prepared by the CM at risk firms significantly exceeded the cost estimates prepared by the project designers.

Interviews with owner representatives indicated that the specific services provided by the OPMs differed: for example, some OPMs provided cost estimates during the design stage, while others did not. As previously noted, the OPM on one project prepared cost estimates, conducted constructability reviews of the design, and delivered other services typically provided by a CM at risk firm. Another owner did not originally plan to obtain project cost estimates from the OPM, according to the owner representatives interviewed for this study. However, as the project cost escalated, this decision was subsequently reversed, and the jurisdiction amended the OPM's contract to require cost estimates at 50 percent and 80 percent design. This owner determined that preparation of cost estimates by the OPM was an important requirement because, unlike the designer and the CM at risk firm, the OPM is required to represent the owner's interests.

DCAM representatives stated that the designer and the CM at risk firm usually prepare cost estimates and that the CM at risk firm's cost estimate is usually higher, reflecting the CM at risk firm's incentive to protect its interests in ensuring that the project budget is sufficient. DCAM obtains a third, independent estimate if the two estimates by the designer and the CM at risk firm are not reconcilable. Massport representatives indicated that Massport's OPMs do not develop separate cost estimates for CM at risk projects; these are prepared by the designers and the CM at risk firms.

During the construction phase, two owners contracted with the project designers to provide a full-time presence at the construction site. The owner representative for one of these projects explained that the design contract was amended to require the designer to provide an on-site contract administrator who attended trade contractor meetings, in contrast to the more typical weekly inspection conducted by designers on many design-bid-build construction projects. Representatives of both owners indicated that the designers' full-time presence was a major benefit to the projects.

Participant Collaboration

19. Public owners generally report high and productive levels of collaboration among the participants on their CM at risk projects.

Most public owners interviewed for this study reported that the collaboration among the designer, the CM at risk firm, the OPM, and the owner during the design stage of the project was high and productive, although several reported that there were some tensions among the participants on their projects. An owner representative pointed out that on a design-bid-build M.G.L. c. 149 project, the designer is given authority to make many design decisions, whereas on a CM at risk project, the designer is required to collaborate with the OPM and the CM at risk firm. This representative, who described the relationships among the participants on his project as harmonious, stated that after the GMP was negotiated, a mediator was hired to guide a meeting of the OPM, the designer, and the CM at risk firm to discuss lessons learned. Representatives of another owner, whose project was subject to tensions among the participants, noted that surfacing conflicts during the design stage is preferable to deferring them to the construction stage, where such tensions tend to emerge on a M.G.L. c. 149 project.

MBE and WBE Participation

20. The survey data show that, in most cases, owners incorporated affirmative marketing goals into their design and CM at risk procurements and contracts. However, owners reported mixed success in achieving the goals for MBE and WBE participation on CM at risk projects.

In 2004, revisions were made to M.G.L. c. 23A, §44 and M.G.L. c. 7, §40N, to include a new municipal affirmative marketing program for state-assisted construction projects, including CM at risk projects. Projects that receive funding provided by the Commonwealth, in whole or in part, including MSBA funding, funding in any legislative appropriation, grant awards, reimbursements, municipal commitments to use state funds and the like, must incorporate the

MBE and WBE participation goals into design and construction contracts. State projects required such goals prior to 2004. DCAM, in consultation with the State Office of Minority and Women Business Assistance (SOMWBA), develops the participation goals. Since 2004, the participation goals for state-assisted design contracts have been 8 percent for MBEs and 4 percent for WBEs; the participation goals for state-assisted construction contracts have been 7.4 percent for MBEs and 4 percent for WBEs. The goals require use of MBEs and WBEs that have been certified by SOMWBA.

DCAM's survey responses for 12 CM at risk projects showed that DCAM projects either had met or were on track to meet the MBE and WBE goals on the design and CM at risk contracts in all but two instances: one involving the design contract goals, and the other involving CM at risk goals. In the latter case, a DCAM representative reported that DCAM was still trying to achieve the participation goals since the project was not yet completed.

Other public owners' responses showed that some projects were not on track to meet the goals and other projects were not yet at the stage of implementing the goals. The single exception was a local project that reported having achieved 9.5 percent MBE participation in the CM at risk contract. In some cases, the designers had been hired prior to 2004, when the participation goals were not required. In other cases, owners reported that they were not subject to the participation goal requirement because their projects did not receive state funding; some of these owners reported other local or federal goals were in place for those projects. One owner representative reported that the CM at risk delivery method complicates achieving success under the affirmative marketing program for construction contracts. The owner noted that the requirement to bid trade contracts does not provide the CM at risk firm with the flexibility to select an MBE or WBE trade contractor, as general contractors are able to do on M.G.L. c. 149 projects through the filed sub-bidding process. Thus, the pool of available dollars for MBE or WBE firms is narrowed to subcontractor contracts. One owner reported that due to tight budgets, awards were made to low bidders that were not MBEs or WBEs, and the goals would not be achieved. On the other hand, in interviews, two owners reported that under CM at risk, the ability to review subcontractor bids and the open book accounting process provided them with important information relative to MBE and WBE participation. Owners also emphasized the importance of careful monitoring of each CM at risk project's affirmative marketing program.

Contract Administration

21. Most public owners report that the "open book process" worked well on their CM at risk projects. A slight majority indicated that the contract administration workload on their CM at risk projects did not exceed that required by M.G.L. c. 149 projects; the other owners indicated that their CM at risk projects required significantly more contract administration resources than would be required for M.G.L. c. 149 projects.

Under M.G.L. c. 149A, the public owner's contract with the CM at risk firm is required to "utilize a cost-plus not to exceed guaranteed maximum price form of contract in which the public

agency shall be entitled to monitor and audit all project costs."[31] The process of monitoring and auditing project costs on a CM at risk contract is typically referred to as an "open book process." Because the owner pays for all project costs charged to the GMP as well as the cost of change orders not covered by the GMP, all costs must be documented and open to inspection.

Most public owner representatives interviewed for this study stated that the open book process had worked well to date. DCAM representatives stated that the open book process promotes partnering and productive project meetings, and Massport representatives indicated that they prefer the open book process to the contract payment procedures required by M.G.L. c. 149.

Although the M.G.L. c. 149A contract administration process reportedly worked well for the public owners, their representatives expressed disparate views on the contract administration workload borne by the owner on a CM at risk project undertaken under M.G.L. c. 149A in comparison with the contract administration workload required by a design-bid-build building construction project undertaken under M.G.L. c. 149. Representatives of four owners stated in interviews that the owner's contract administration duties on a CM at risk project are no more extensive than those on a M.G.L. c. 149, although several noted that the contract administration duties required by the two delivery methods differ. One such difference, according to one owner representative, is that the owner audits the project costs as the project proceeds rather than when it is completed. Another owner representative expressed the view that the requirements for monitoring payments on a CM at risk project are higher but that CM at risk projects entail fewer claims than a design-bid-build building project; thus, the public owner's overall workload is no higher on a CM at risk project.

By contrast, representatives of four other owners, including DCAM and Massport, expressed the view that CM at risk projects undertaken under M.G.L. c. 149A entail more contract administration work for the public owner than do building projects undertaken under M.G.L. c. 149. One owner representative noted that the open book process is cumbersome but open, fair, and necessary in order to manage a CM at risk project. As discussed earlier in this report, two owners paid their designers to provide a full-time contract administration presence at the construction sites.

DCAM representatives stated that DCAM assigns substantially more contract administration resources to M.G.L. c. 149A projects than to M.G.L. c. 149 projects: a single DCAM project manager may be given responsibility for five M.G.L. c. 149 projects, whereas DCAM assigns only one M.G.L. c. 149A project to a project manager. DCAM representatives attributed the additional workload to the contract administration requirements associated with early construction packages, which often entail change orders, and to the need to review the increased documentation that a CM at risk project entails. They noted that CM at risk projects require a capable OPM with CM at risk expertise and that the owner must stay involved with the project to monitor project expenditures. Massport representatives expressed a similar

[31] M.G.L. c. 149A, §7(a).

view: they stated that CM at risk projects entail more work in the early stages of the project than design-bid-build projects and that CM at risk projects require a more sophisticated owner, or a very capable OPM, relative to design-bid-build projects.

Trade Contractor Selection Process

Under M.G.L. c. 149A, the public owner is required to prequalify and solicit bids from trade contractors when the work in any of the 17 categories in M.G.L. c. 149, §44F, the filed sub-bid statute, is estimated to cost more than $20,000. The prequalification process requires the owner to appoint a trade contractor prequalification committee consisting of two representatives of the owner, one representative of the designer, and one representative of the CM at risk firm. M.G.L. c. 149 specifies a detailed set of procedures for soliciting qualifications information from trade contractors through an advertised process, evaluating each trade contractor's qualifications using evaluation criteria based on the specific evaluation categories and subcategories stated in M.G.L. c. 149A, assigning point ratings to each trade contractor in accordance with the point rating scheme detailed in M.G.L. c. 149A, and prequalifying all trade contractors receiving a point score of 70 or higher.[32]

The public owner is then required to prepare and provide to each prequalified trade contractor a Request for Bids containing specific information detailed in M.G.L. c. 149A requirements. Each trade contract is awarded to the lowest prequalified bidder submitting a responsive bid. If fewer than three responsive bids are received for a trade contract, and the lowest bid exceeds the estimated cost of the trade contract work, the CM at risk firm is required to attempt to negotiate an acceptable price with the lowest bidder and, if those negotiations do not succeed, with the second lowest bidder. If those negotiations also fail, then the CM at risk firm solicits additional bids through the procedure required by M.G.L. c. 149A for selection of nontrade contractors (discussed later in this section). Each selected trade contractor executes a trade contractor agreement, the form of which is prescribed by M.G.L. c. 149A, with the CM at risk firm. Thus, the trade contractors are subcontractors analogous to filed sub-bidders on M.G.L. c. 149 projects.

22. While some public owners report that the M.G.L. c. 149A trade contractor selection process worked well on their projects, others cited difficulties with the process, such as problems relating to the resources required to prequalify trade contractors and the requirement to contract with the lowest bidder on each trade contract. Several owners recommended eliminating or changing the trade contractor prequalification and bidding requirements of M.G.L. c. 149A.

Public owner representatives' comments on the trade contractor prequalification and bidding procedures included the following:

[32] The evaluation categories and subcategories as well as the point rating scheme closely resemble those required by M.G.L. c. 149, §44D¾ for prequalifying filed sub-bidders on building contracts estimated to cost $10 million or more when the work in a filed sub-bid category is estimated to cost more than $20,000.

- The prequalification process is very time-consuming: the OPM must check five credit references for each trade contractor and faxes numerous requests for credit references, while receiving only two or three out of five. The prequalification process consumes approximately six weeks of the time of 1.5 FTE OPM staff.

- DCAM addresses the time-consuming nature of the prequalification process by maintaining files of references that have been checked for prequalified trade contractors; if a trade contractor has been prequalified within the last six months, DCAM consults the references in the file rather than recontacting the same references. DCAM prequalifies most trade contractors: of 100 trade contractors, approximately four are disqualified.

- The CM at risk firm narrowed down the list of prequalified trade contractors to those with which they had worked in the past; because the CM at risk firm is a union shop, union status may have factored into the prequalification decisions. The CM at risk firm then bid the trade contracts without full packages, a practice that led to subsequent increases in the prices of some trade contracts. For example, one trade contract was bid when the bid documents were 90 percent complete, and the contract price increased by $700,000 when the design was final. However, the higher trade contract prices were within the CM at risk firm's estimate, and the CM at risk firm did not request contingency funding for these increases.

- The prequalification scoring process was difficult, and there were several challenges from trade contractors that were not prequalified. The owner would have preferred to use a process similar to that required for prequalifying the CM at risk firm, as the latter process does not require the assignment of scores. M.G.L. c. 149A provides inadequate guidance on the owner's ability to reject trade contract bids.

- The low, $20,000 threshold for prequalification and bidding of trade contractors is a problem, given the time-consuming nature of the prequalification process. Two members of the trade contractor prequalification committee had full-time jobs and were unable to commit the necessary time to the process.

- A major benefit of the trade contracting process required by M.G.L. c. 149A is that the trade contractors know who the general contractor will be on the project; another is that the CM at risk firm can advise against prequalifying certain trade contractors. However, having to accept the lowest bid from a prequalified trade contractor is a problem: if the lowest bidder did not understand the specifications, there is no opportunity for the bidder to correct the bid. Two trade contractors were persuaded to withdraw their low bids on the project because of problems with their bids.

- The requirement to select the lowest prequalified bidder for each trade contract potentially undercuts the collaborative nature of the CM at risk project: if the difference in price between two bidders is small, it may be preferable to select the higher-priced bid if submitted by a stronger firm than the firm submitting the lowest bid. In addition, the low bid requirement prevents the consideration of minority or

women-owned business enterprise (M/WBE) status in selecting trade contractors. Because Massport requires all trade contractors to meet the specific M/WBE participation goals of the project, the trade contractor prequalification and bidding process is complicated.

The owner representatives interviewed for this study offered several recommendations regarding the M.G.L. c. 149A trade contractor prequalification and bidding requirements contained in M.G.L. c. 149A.[33] Representatives of three owners recommended that the trade contractor prequalification and bidding requirements be eliminated from M.G.L. c. 149A; their rationales for this proposed change included the time savings that would result if the requirements were eliminated,[34] the improved cost estimates that would result if the CM at risk firm were allowed to obtain trade contractor input during the design stage, and the benefit to the project of allowing the CM at risk firm to bring its own team to do the work. One owner representative suggested that M.G.L. c. 149A require the same selection process for trade contractors as the process that M.G.L. c. 149A requires for nontrade subcontractors. A second owner representative suggested that, if the prequalification and bidding requirements cannot be eliminated, the threshold for trade contracts requiring prequalification and bidding be increased from $20,000 to at least $50,000 because of the time-consuming nature of the prequalification requirements.

DCAM representatives expressed the view that the CM at risk firms' preconstruction work would be improved if the firms were allowed to consult and work with trade contractors during the design process. They indicated that their early participation would not interfere with the subsequent trade contractor prequalification and bidding process required by M.G.L. c. 149A.

Competitive Environment

23. The survey data and interviews with public owners indicate that M.G.L. c. 149A projects have generated substantial competition from trade contractors. Survey responses show that, on average, public owners have received three or more bids for most trade contracts; however, elevator contracts have generated little competition. Public owners are generally satisfied with the competition for trade contracts on their CM at risk projects, with the exception of elevator trade contracts, and with the caliber of the firms competing for trade contracts.

The survey data show that M.G.L. c. 149A projects have generated multiple responses and bids from interested trade contractors. Table 11, below, lists the average, lowest, and highest

[33] The process of readvertising trade contracts if fewer than three trade contractors are prequalified was cited as a problem by representatives of two public owners; however, although M.G.L. c. 149, §44D¾ requires readvertising if fewer than three filed sub-bidders are prequalified, M.G.L. c. 149A does not. DCAM, one of the two public owners, has adopted procedures, approved by the OIG, setting forth procedural requirements in the event that fewer than three trade contractors are prequalified for a trade contract.

[34] As will be discussed, the survey data show that the average number of trade contractors requiring detailed evaluation and reference checking on the M.G.L. c. 149A projects surveyed exceeded 50; this number reached 92 on one project.

numbers of responses to each trade contract RFQ, trade contractors prequalified for each trade contract, and bids received for each trade contract. As the table shows, on the 17 CM at risk projects for which trade contractors had been prequalified and selected at the time that the survey responses were prepared, the survey respondents had, on average, prequalified trade contractors for 12 trade categories on each CM at risk project; the number of categories for which trade contractors were prequalified ranged from four categories to 15 categories. The number of trade contractor responses to the RFQs averaged 66 and ranged from 16 and as many as 101. Of the trade contractors applying for prequalification, 59 trade contractors, on average, were prequalified to bid on each project; the number of prequalified trade contractors ranged from 14 to 92.

The table also shows that, on the 14 projects for which trade contract bids had been received at the time that the survey responses were prepared, the number of trade contract categories for which bids were received averaged 12 categories and ranged from four categories to 15 categories. The number of bids received for each project averaged 42 and ranged from 11 to 66. The bid yield (the percentage of prequalified bidders that actually submitted bids) averaged 71 percent and ranged from 58 percent to 100 percent. Stated another way, an average of 29 percent of prequalified trade contractors did not submit bids on the trade contracts for which they had been prequalified.

Table 11. Public Owner Survey Results
Trade Contractor Competition in CM at Risk Projects

	Average	Low	High
Prequalification (n=17 projects)			
Number of categories per project	12	4	15
Number of responses per project	66	16	101
Number prequalified per project	59	14	92
Bidding (n=14 projects)			
Number of categories per project	12	4	15
Number prequalified per project	60	14	92
Number of bids per project	42	11	66
Bid yield	71%	58%	100%

Notes:
1. Averages and bid yields are rounded.
2. Bid yield is calculated as the number of bids for each project divided by the number prequalified for each project.

Table 12, below, shows the extent of competition for trade contracts in 16 different trade categories. In 12 of the 16 categories, the trade contracts generated, on average, three to five bids. Less competition was generated, on average, for glass and glazing contracts, which averaged 2.6 bids per contract; for lathing and plastering contracts (bid in only two projects), which averaged two bids per contract; and for resilient floor contracts, which also averaged two

bids per contract. As the table shows, elevator trade contracts were not competitive in most cases: on average, they generated only one bid per contract.

Table 12. Public Owner Survey Results Trade Contractor Competition in CM at Risk Projects By Trade Contract Category		
Trade Contract Category	Number of Contracts	Average Bids per Contract
Elevators	9	1.1
Lathing and plastering	2	2
Resilient floors	12	2
Glass and glazing	11	2.6
Acoustical tile	12	3
Miscellaneous and ornamental iron	14	3
Painting	14	3
Tile	12	3
Waterproofing, damp-proofing, and caulking	14	3
HVAC	14	4
Metal windows	9	4
Plumbing	15	4
Terrazzo	1	4
Masonry work	13	4.2
Electrical work	15	5
Roofing and flashing	14	5
Note: The above list excludes Marble, since no trade contracts in this category were reported, and trade contracts labeled in the survey responses as "Other."		

The average number of bids for elevator contracts listed in Table 12 overstates the extent of competition among elevator contracts in the M.G.L. c.149A process, for the following reasons:

- Three of the nine owners whose survey responses indicated that they had bid elevator trade contracts reported having received no bids for the contracts.
- Three other owners reported receiving bids from elevator contractors (two bids in two projects and three bids in one project) despite having prequalified no elevator contractors. One survey respondent explained that the elevator trade contract RFQ had been advertised twice but received only one response; subsequently, the owner assigned the contract to the CM at risk firm, which obtained three bids.
- The other three owners each received one bid for their elevator contracts.

The survey responses showed that the owners surveyed awarded the trade contracts to the lowest bidder in most cases: on 172 trade contracts, the lowest bidder was selected in all but nine cases.

Seven of the nine public owners interviewed for this study stated that they were satisfied with the amount of competition they received for most of the trade contracts, with the exception of elevator contracts cited by five of the seven owners as a problem category. Of the other two owners who were not satisfied with the trade contract competition on their projects, one attributed the inadequate competition to the fact that the project was a phased school renovation project that required contractors to undergo CORI checks and that the trade contracts were bid at a time when the market for trade contractors was strong. The other owner attributed the inadequate competition to the manner in which it had advertised the trade contracts.

The owner representatives expressed general satisfaction with the caliber of the trade contractors competing for their projects. DCAM representatives expressed the view that the quality of the trade contractors competing for CM at risk projects has been higher than the quality of the filed sub-bidders competing for M.G.L. c. 149 projects. They attributed the increased participation of high-quality trade contractors in part to the fact that the trade contractors know the identity of the CM at risk firm, which is the general contractor, when they compete for a M.G.L. c. 149A contract and, thus, confront lower risks than filed sub-bidders on a M.G.L. c. 149 project.

Selection Process for Nontrade Subcontractors

The process prescribed by M.G.L. c. 149A for selecting subcontractors for nontrade contracts estimated to cost more than $20,000 is as follows: the CM at risk firm draws up a list of the required qualifications for the subcontract and selects three firms that meet these qualifications. The public owner is responsible for approving the qualifications and may add or eliminate firms from the list, provided that the new firms are acceptable to the CM at risk firm. The CM at risk firm then invites bids, based on detailed bidding information, from the approved firms, makes a selection, and presents the bids and the selection decision to the owner, accompanied by a written explanation of the reason for each selection. Subcontractors for nontrade contracts estimated to cost $20,000 or less may be selected by the CM at risk firm using any method selected by the CM at risk firm, with the approval of the owner.

24. Public owners identified no issues or concerns regarding the M.G.L. c. 149A requirements for selecting nontrade subcontractors.

None of the public owner representatives interviewed identified problems with the M.G.L. c. 149A requirements for selecting nontrade contractors. Some owner representatives, including those from DCAM and Massport indicated that they typically required their CM at risk firms to obtain three bids for all nontrade contracts, including those estimated to cost $20,000 or less; others indicated that most or all nontrade contracts were estimated to cost more than $20,000.

One owner representative noted that the CM at risk firm, a union contractor, encouraged bids from other union contractors, especially on nontrade work.

Performance of Subcontract Work by CM at Risk Firms

M.G.L. c. 149A provides that the CM at risk firm may submit its qualifications to bid on trade contract work or subcontract work in accordance with the selection procedures contained in M.G.L. c. 149A, provided that the CM at risk firm customarily performs the work for which it submits qualifications, that the CM at risk firm performs the work with employees on its own payroll, and that the CM at risk firm meets all requirements of the selection process.[35] As discussed above, the CM at risk firm serves on the prequalification committee and selection committee for each trade contract and is responsible for managing the prequalification and selection of nontrade subcontractors. M.G.L. c. 149A contains no instructions or guidance to owners for avoiding conflicts of interest when the CM at risk firm competes for trade contract or nontrade subcontract work.

25. The survey data and owner interviews indicate that self-performance of trade contract work by CM at risk firms is infrequent, while self-performance of nontrade subcontract work by CM at risk firms is more common.

The survey data show that on three of the 21 CM at risk projects that had prequalified trade contractors, the three CM at risk firms had been prequalified to bid on trade contracts. However, the survey responses indicated that none of the owners had awarded a trade contract to the CM at risk firm on the project. The survey data also show that CM at risk firms were awarded nontrade subcontracts on six CM at risk projects.

Of the nine owners interviewed for this study, only one reported having awarded a contract to a trade contractor after the survey responses were submitted: the representatives of this owner reported that the CM at risk firm had a masonry company that had been awarded a trade contract after the low bidder failed to execute the contract because of a mathematical error in its bid. The owner representatives stated that the CM at risk firm had participated on the prequalification committee for the trade contract but that the OPM had handled the bid opening. This same CM at risk firm performed nontrade subcontract work on the project; these contract awards were handled by the OPM, according to the owner representatives. Two other owners, including DCAM, also reported awarding some nontrade subcontract work to the CM at risk firm. DCAM representatives also reported that when DCAM receives no bids for a trade contract, DCAM assigns the trade contract work to the CM at risk firm.[36] In the case of an elevator trade contract, the CM at risk firm obtained bids on the work.

[35] M.G.L. c. 149A, §8.

[36] M.G.L. c. 149A contains no provisions governing the circumstance in which the owner receives no bids on a trade contract.

GMP and Schedule Changes

26. Of the four CM at risk projects that had achieved substantial or final completion, three increases in the original GMPs ranging from 2.69 percent to 13.66 percent and schedule changes ranging from a decrease of 131 days to an increase of 31 days.

As previously noted, CM at risk projects can experience changes in the GMP and schedule for substantial and final completion contained in the GMP amendment. Table 13, below, shows the information reported by public owners about project status, original GMP, increase in GMP as both a dollar amount and a percentage of the original GMP, and changes in the final completion schedule date for the 10 projects that reported an original GMP amount. Of the four projects that had reached substantial or final completion, three reported changes in their GMPs and schedules. Those projects reported GMP increases that ranged from 2.69 percent to 13.66 percent of the original GMP. The schedule changes included one major schedule decrease of just over four months (131 days) and two smaller schedule increases (11 days and 31 days). Only one of the six other projects listed in the table reported an increase in the project GMP: this increase amounted to less than one percent of the GMP. However, it is possible that the GMPs and schedules for all projects have changed since the survey responses were prepared.

Table 13. Public Owner Survey Results
GMP and Schedule Changes

Project	Project Status	Original GMP	GMP Increase	Final Completion Schedule Change
Milford Geriatric Authority Building modernization	Final Completion	$ 7,368,200	$ 408,971 (5.55%)	+11 days
Nantucket Airport terminal	GMP Amendment	$ 22,674,708	-	-
Newton North High School	GMP Amendment	$ 162,764,808	-	-
Quincy High School	GMP Amendment	$ 98,993,615	$ 89,799 (0.9%)	-
Salem High School	Substantial Completion	$ 48,022,002	$ 6,560,076 (13.66%)	+ 31 days
Taunton High School /Middle School	GMP Amendment	$ 88,467,267	-	-
Worcester Union Station parking garage	Final Completion	$ 17,000,000	$ 458,142 (2.69%)	- 131 days
Phase II Expansion Fire Academy	GMP Amendment	$ 34,225,677	-	-
Cronin Skating Rink	Substantial Completion	$ 13,180,017	-	-
Ely Library/Campus Center Accessibility Upgrades	GMP Amendment	$ 9,490,000	-	-

Legal Disputes

27. Few legal disputes on CM at risk projects were reported by public owners in surveys and interviews. The Office of the Attorney General issued three bid protest decisions related to CM at risk projects undertaken pursuant to M.G.L. c. 149A.

The survey asked public owners to report the number and value of claims against the owner made by the CM at risk firms, direct payment claims filed against the CM at risk firms, bid protests to the Office of the Attorney General (OAG), and litigation filed. Public owners reported few disputes. Three owners reported that trade contractors or other subcontractors had filed a total of six bid protests with the OAG regarding contract awards, and one of the three owners reported that project-related litigation had been filed by citizens. Owners surveyed reported no instances of claims against an owner made by a CM at risk firm and no direct payment claims filed against the CM at risk firms.

The Business and Labor Bureau of the OAG issued three bid protest decisions related to CM at risk projects undertaken pursuant to M.G.L. c. 149A between January 1, 2005, the effective date of M.G.L. c. 149A, and May 2009. These three decisions are summarized below.

Newton North High School plumbing trade contract. The OAG allowed a protest from Plumbers and Gasfitters Local 12 Boston regarding the City of Newton's award of the trade contract for plumbing work to Sagamore Plumbing & Heating, Inc. The City's bid specification stated that each bidder was required to submit an Update Statement as part of its bid; Sagamore, the low bidder on the contract, did not submit an Update Statement with its bid. After the bids were opened, the City asked Sagamore to submit an Update Statement; Sagamore did so the day after the bid opening. The protestor argued that the City was required by regulations promulgated by DCAM, which require trade contract bidders to submit completed Update Statements with their bids, and by the City's bid requirements to reject Sagamore's bid. The OAG found that "[t]he City and the bidders had the obligation to adhere to the DCAM regulation, which has the force of law." (City of Newton v. Plumbers and Gasfitters Local 12 Boston, Attorney General Bid Protest Decision, August 18, 2008)

Newton North High School electrical trade contract. The OAG denied a protest from LeVangie Electric Co., Inc., regarding the City of Newton's award of the trade contract for electrical work to Griffin Electric, Inc., the low bidder on the contract. The City's specification established unit prices to be paid by the City for additional work or quantifies of certain classes of work and solicited other unit prices from bidders for informational purposes. The protestor argued that Griffin's bid did not conform to the specifications with respect to the unit prices provided in the bid. Noting that "[a]n awarding authority retains substantial discretion to either accept or reject a bid that contains only minor or trivial deviations from the statutory requirements," the OAG found that the unit pricing contained in Griffin's bid did not violate a statutory requirement of substance and, thus, it was within the City's discretion to independently reject Griffin's proposed unit prices while accepting its bid for electrical work. (*City of*

Newton v. LeVangie Electric Co., Inc., Attorney General Bid Protest Decision, October 15, 2008)

Malden High School electrical trade contract. The OAG denied a protest from LeVangie Electric Co., Inc., regarding the City of Malden's award of the trade contract for electrical work to Sullivan & McLaughlin Companies, Inc., the low bidder on the contract. The original list of prequalified bidders issued by the City had not listed Sullivan & McLaughlin; however, the City had subsequently issued an addendum that included Sullivan & McLaughlin's name. The protestor argued that the City's failure to include Sullivan & McLaughlin in the original list of prequalified bidders precluded consideration of the firm's trade contract bid. The protestor also argued that another addendum was issued in an untimely fashion and, therefore, provided the protestor with inadequate time to properly calculate its bid. The OAG found that, by issuing the addendum containing the corrected list of prequalified bidders 18 days before the bid opening, the City had complied with the requirement of M.G.L. c. 149A that a list of prequalified trade contractors be included with the Request for Bids for the trade contract. The OAG also found that the other addendum cited by the protestor was available four days before bids were due and that the process used by the City did not violate the bid laws. (*City of Malden v. LeVangie Electric Co.*, Attorney General Bid Protest Decision, May 18, 2009)

Satisfaction With M.G.L. c. 149A

Public Owner Perspectives on CM at Risk Under M.G.L. c. 149A

28. Public owner satisfaction with the CM at risk process is high: most owners reported that CM at risk had yielded multiple benefits for their projects. The benefits most often cited by owners included the owner's ability to factor experience and capacity into the CM at risk selection decision, the preconstruction services provided by the CM at risk firm, the collaborative and productive working relationships among the participants on a CM at risk project, and the schedule savings from early construction work.

Based on their experiences implementing the requirements of M.G.L. c. 149A, most public owners interviewed for this study expressed positive views of the CM at risk method, and most reported that they had achieved the benefits that they had anticipated from the CM at risk method; some others said it was too early in their projects to reach a conclusion. Owners' ability to factor experience and capacity to provide such services into the competitive selection process for CM at risk services is a feature of M.G.L. c. 149A that all owners regarded as beneficial; DCAM and Massport representatives noted that some high-quality CM at risk firms competing for their CM at risk contracts had not previously worked on their agencies' projects or, in some cases, competed for public projects under M.G.L. c. 149. The majority regarded the CM at risk firm's services during the design stage as a major benefit of CM at risk: owner representatives reported that their CM at risk firms had conducted detailed scope reviews of

the construction documents for trade and nontrade contractors, had identified numerous issues that were resolved before the work was bid, and had improved the constructability of the designs. For projects with aggressive schedules, the preconstruction services provided by the CM at risk firms also included planning, coordinating, and managing complex phasing approaches to undertaking these projects; owners reported high levels of satisfaction with the performance of their CM at risk firms in these areas.

The early selection and participation of the CM at risk firm in the project also facilitated cooperation between the designer and the CM at risk firm; several owner representatives reported that these project relationships were less adversarial and more collaborative and productive than the relationships between designers and contractors on M.G.L. c. 149 projects. Also, as previously noted, DCAM representatives observed that high-quality trade contractors that were not willing to submit filed sub-bids on M.G.L. c. 149 contracts were competing for CM at risk contracts, a phenomenon attributed to the fact that the trade contractors knew the identity of the general contractor on the project before submitting their bids.

The schedule advantages of CM at risk constituted another major benefit cited by owners. Because of the hybrid role of the CM at risk firm, the CM at risk firm can provide the services described above while also serving as the general contractor for early construction work. As discussed in an earlier section of this report, owners reported schedule savings from early construction work and early ordering of long lead time items ranging from two months (on an 11-month project) to one year. In addition, representatives of one owner stated that the "whole team" approach of the CM at risk process, in contrast to the adversarial approach required by M.G.L. c. 149, meant that the project was two months ahead of the schedule that would have been possible under M.G.L. c. 149.

29. Public owners report that the quality of their completed projects was high. While some cited higher costs associated with CM at risk, public owners are generally satisfied with the cost of their projects.

Representatives of public owners interviewed for this study reported that the quality of their completed CM at risk projects was high; those whose projects were incomplete anticipated that the quality of their completed CM at risk projects would be high. Owner representatives attributed the high quality of CM at risk projects to a variety of factors, including the higher caliber of the firms competing for CM at risk projects in comparison with that of firms competing for M.G.L. c. 149 projects, the qualifications-focused CM at risk selection process, the improved constructability of the project designs, the team approach to resolving problems, and the open book process.

The majority of owners interviewed for this study were satisfied with the costs of their CM at risk projects, although none reported cost savings attributable to the CM at risk method. Although the owner representatives for one project noted that the project cost exceeded the anticipated budget, the owner representatives stated that they regarded the cost as reasonable in comparison to the cost of similar school projects. Another owner representative stated that although CM at risk is a more expensive delivery method than M.G.L. c. 149, the project was completed on schedule, to the owner's satisfaction, with no lawsuits, thereby justifying the

higher price. Massport representatives noted that although the owner initially pays more for a CM at risk project than for a M.G.L. c. 149 contract, the owner is more likely to avoid unforeseen costs later in the project; thus, the total project cost will be the same, although the quality of the CM at risk project will be higher.

30. The lack of a firm construction price until late in the project, the lack of risk to the CM at risk firm, and the difficulty of explaining project cost increases to the public are regarded by public owners as disadvantages of CM at risk.

The disadvantages of the CM at risk method reported by representatives of public owners interviewed for this study included the lack of a firm construction price until late in the project, the lack of risk borne by the CM at risk firm when the GMP is negotiated late in the project, and the difficulty of countering public perceptions that the project cost to the owner cannot increase on a CM at risk project. As discussed earlier in this report, owners did not negotiate GMPs for their projects until the designs were complete and, in most cases, early construction work had begun. The lack of risk borne by the CM at risk firm when the GMP is negotiated late in the project was cited by several owner representatives as a disadvantage to the owner. Representatives of two owners also cited as a disadvantage of CM at risk the difficulty of explaining to the public project cost increases despite the fact that they had a "guaranteed maximum price."

31. Public owners view the CM at risk method as most appropriate for complex projects involving phasing, challenging logistics, and aggressive schedules; they view the M.G.L. c. 149 process as most appropriate for new construction projects on open, clean sites that do not involve aggressive schedules.

Representatives of all public owners interviewed for this study expressed the view that the CM at risk method is appropriate for some, but not all, building projects. When asked for which types of projects they would be likely to use the CM at risk method in the future, owner representatives responded that they would be inclined to use CM at risk on complex projects involving some combination of phasing, challenging logistics, and/or tight schedules. Conversely, owner representatives indicated that they would be more likely to use the M.G.L. c. 149 process for projects entailing new construction on open or "clean" sites, for which the design is complete and the schedule is not aggressive.

32. Public owners emphasize the need for owners using CM at risk to protect the public interest by obtaining the services of an experienced, skilled OPM and by remaining involved with the project.

Below is a summary listing of additional owner perspectives regarding the CM at risk process under M.G.L. c. 149A. Each paragraph summarizes the comments provided by the representative or representatives of one public owner interviewed for this study.

- The CM at risk process encourages cooperation by changing the incentives, thereby helping a project avoid change orders and problems with cost and schedule. The cost of a CM at risk project is comparable to the cost of a M.G.L. c. 149 project, and the CM at

risk process results in a quality product. The process also demonstrated that the CM at risk firm bears little or no risk when the GMP is established late in the project, a fact that was not understood by the owner at the outset of the project.

- On a M.G.L. c. 149 project, the owner goes out to bid and hopes to get a good general contractor; the owner receives no preconstruction services from the general contractor. The greatest benefit of CM at risk is the CM at risk firm's provision of preconstruction services. However, owners should realize that the CM at risk firm is the general contractor. According to this owner representative, the CM at risk label is misleading: the CM at risk firm is not at risk; the owner is at risk.

- The public got very nervous about spending money on a school before obtaining a price from the contractor, but the owner wanted to get the CM at risk firm involved early on. There was a collective sense of collegiality during the development of design. The OIG should issue regulations providing guidance regarding M.G.L. c. 149A, and the Massachusetts School Building Authority should develop sample contracts for CM at risk services and OPM services on a CM at risk project.

- It is unclear why an owner would select CM at risk over M.G.L. c. 149, although there may be a benefit to having the designer and the general contractor work together before construction begins. Owners should be aware that there will be changes in a CM at risk contract; it has been difficult to explain this to the public.

- Public owners need the assistance of an OPM who understands the CM at risk process and should be prepared to pay for a higher level of service from the OPM as well as from the designer and the CM at risk firm, in comparison to the services provided by the OPM, the designer, and the contractor on a M.G.L. c. 149 project.

- Under CM at risk, there is more personal investment of project team members in working to meet the schedule. Owners should make sure the OPM has the skilled people and time to review the payment invoices. There are fewer claims and less defensiveness on a CM at risk project than on a M.G.L. c. 149 project, but the owner has to monitor the project and payments. The owner has to watch for "fee enhancement."

- CM at risk requires a more sophisticated owner, or a very good OPM, in comparison to M.G.L. c. 149. A traditional project that overruns the budget must be redesigned; with CM at risk, the budget is updated.

- Owners should hire a good OPM that has worked on CM at risk projects before. However, the owner must stay involved with the project; CM at risk requires the owner to manage a high degree of uncertainty. The project cannot be left to the CM at risk firm, who is working with the owner's money and may have an incentive to resolve problems with the trade contractors by "giving your money away."

Other Perspectives on M.G.L. c. 149A

33. Representatives of the Public Construction Reform Task Force participated in a focus group to discuss implementation of M.G.L. c. 149A. Issues raised by participants included the low number of municipalities expressing interest in using CM at risk, misconceptions regarding the owner's risk in a CM at risk project, the need for more public education regarding CM at risk, the disadvantages of the trade contractor prequalification and bidding procedures contained in M.G.L. c. 149A, and the provision of M.G.L. c. 149A allowing CM at risk firms to self-perform trade and nontrade subcontract work.

As stated in the methodology section of this report, the OIG solicited the views of a focus group consisting of representatives of agencies, organizations, and associations that had participated in the Public Construction Reform Task Force, which was responsible for drafting the provisions of M.G.L. c. 149A as well as the other provisions contained in Chapter 193 of the Acts of 2004. (The list of agencies and organizations represented at the focus group meeting convened by the OIG in August 2008 to discuss M.G.L. c. 149A is provided in the methodology section of this report.) The focus group participants did not report any major problems in the implementation of M.G.L. c. 149A. However, some raised issues and concerns, which are summarized below.

Low municipal interest in CM at risk. The reluctance of many municipalities to use the CM at risk process to deliver their building projects was a central theme of the discussion. One participant noted that the practice recommended by DCAM of negotiating the GMP when the design is complete and early construction has begun does not work well for municipalities that must obtain Town Meeting approval for override votes to fund the construction work. Several participants pointed to the fact that municipalities are accustomed to the design-bid-build process required by M.G.L. c. 149 and prefer the hard bid system. A participant observed that some CM at risk firms have indicated that they prefer to undertake CM at risk projects for state agencies rather than for municipalities, whose inexperienced building committees may not understand CM at risk. The participant noted that some OPMs that lack experience with CM at risk may discourage their municipal clients from using CM at risk; other OPMs, however, have recommended CM at risk to their municipal clients.

Need for further CM at risk education and training. The lack of Massachusetts School Building Authority guidelines for using CM at risk and lack of education were cited by several participants as other possible reasons for the relatively small number of municipal CM at risk projects; one participant suggested that an organization such as the Massachusetts Municipal Association should provide training to municipalities on the advantages of CM at risk.

Misunderstandings about CM at risk. The participants discussed the widespread misconception that CM at risk entails no risk to the public owner and eliminates change orders on construction projects. They observed that change orders are inevitable on any construction project, including a CM at risk project, and that the term "guaranteed

maximum price" may be confusing to the public. A participant expressed concern that municipalities may lack the capacity to provide the intensive management required by a CM at risk project.

Schedule pressure on architects. A participant cited the architect's compressed schedule for document review and coordination on a CM at risk contract as an issue of potential concern: when early construction packages are issued, it is important to allot enough time to the construction documents when early construction packages are issued. Another participant cited an example of a state project for which the building had been constructed before the design was 100 percent complete.

Advantages of Massachusetts State College Building Authority's single selection process. One participant reported that some general contractors would support the widespread adoption of the single selection CM at risk selection process (discussed in the methodology section of this report) used by the MSCBA.

Trade contractor prequalification procedures. Several participants reported industry concerns regarding the time required to implement the trade contractor prequalification process required by M.G.L. c. 149A and the extent to which owners conduct the due diligence required by the process. One participant expressed concern that the subcontractor prequalification and bidding requirements prevent CM at risk firms from obtaining advice and input from subcontractors early in the design stage. Another participant observed that the principal value of the prequalification process may be its deterrent effect in discouraging unqualified contractors from applying for prequalification.

Self-performance of the work by CM at risk firms. The provision of M.G.L. c. 149A permitting CM at risk firms to compete for trade and nontrade contracts was a topic of discussion on which the participants' views differed. Two participants noted that some experts do not recommend the practice of allowing CM at risk firms to self-perform work and that some owners discourage CM at risk firms from self-performing trade or nontrade subcontract work. However, another participant objected to the suggestion that this provision of M.G.L. c. 149A should be changed, pointing out that this provision of M.G.L. c. 149A was negotiated as part of the overall agreement reached by the members of the Special Commission on Public Construction Reform.

Changes to M.G.L. c. 149A suggested by individual focus group participants included the following:

- The changes to M.G.L. c. 149A contained in the technical corrections bill[37] should be enacted. M.G.L. c. 149A should make clear that the trade contractors carry their bonds and the CM at risk firm carries its bonds.
- The provision in M.G.L. c. 149A giving the CM at risk firm the right to self-perform trade contract work and nontrade subcontract work should be eliminated so that each public owner can decide whether or not to allow this practice on a CM at risk project.

[37] House No. 4185 of 2009 would make technical corrections to the public construction reform law, including corrections to M.G.L. c. 149A. One such technical correction would require each trade contractor to pay the premiums on the trade contract bonds required by M.G.L. c. 149A and include the premiums in the trade contract bid price.

Conclusion

This report has presented survey data and interview information regarding the experience of public owners that have used the M.G.L. c. 149A CM at risk process to deliver their building projects since January 1, 2005, when M.G.L. c. 149A took effect. Because most of the CM at risk projects were not yet complete at the time that the data and information were collected, the final costs, schedule, and quality of these projects are as yet unknown. Moreover, baseline data enabling a comparison of M.G.L. c. 149A CM at risk projects with traditional M.G.L. c. 149 design-bid-build projects are not available. Nevertheless, the preliminary evidence of owners' attitudes toward and experience with CM at risk under M.G.L. c. 149A presented in this report is clear and consistent.

Overall, this study shows that public owners are satisfied with CM at risk. Most owner representatives interviewed for this study reported that the quality of their project designs and project budget estimates had been improved by the preconstruction services, such as value engineering, constructability reviews, and phasing reviews, provided by their CM at risk firms; that their project schedules had been shortened by the early construction work and ordering of long lead time items enabled by the CM at risk process; and that their projects had benefited from collaborative and productive working relationships among the designer, the CM at risk firm, the OPM, and the owner as a result of the CM at risk process. The ability to select their CM at risk firms through a process that emphasizes experience and expertise is important to owners, and many expressed positive views of the expertise and performance of the CM at risk firms they had selected. DCAM and Massport, the largest and most experienced owners included in this study, reported that high-quality CM at risk firms that had not previously competed for their M.G.L. c. 149 contracts had competed for their CM at risk contracts, indicating that M.G.L. c. 149A has expanded the pool of qualified contractors competing for public building contracts.

As this report has documented, owners have implemented the provisions of M.G.L. c. 149A using a variety of approaches to some issues, such as the incorporation of CM at risk-related tasks into the OPM and design contracts, the allocation of cost items to and payment of fees and general conditions, and the procedures for approving expenditures from the CM contingency in the GMP. However, a consistent finding of this study is that public owners choose to negotiate the GMP at or very near the end of the design stage, notwithstanding the fact that M.G.L. c. 149A permits the GMP amendment to be executed as early as the 60 percent completion stage. All ten owners surveyed that had executed GMP amendments had done so when their designs were 100 percent complete or, in two cases, 90 percent complete. The majority of these owners, including DCAM and Massport, had completed the bidding process for some or all trade contracts when the GMP amendment was executed.

The explanation for this finding lies in the CM at risk process for developing and amending the GMP. As this report explains, the GMP includes a CM contingency to cover the risk that actual costs will exceed the costs listed in the GMP for items such as labor or materials. (The owner has a separate contingency, not included in the GMP, to cover the costs of changes in scope

and of unforeseen latent or subsurface conditions encountered during the construction phase.) When the GMP is negotiated on the basis of an incomplete design, the risk that the actual costs will exceed those listed in the GMP is high, requiring a high CM contingency amount to cover this risk. As the size of the CM contingency in the GMP increases, the funds available for the cost of the work, general conditions, and fees are correspondingly reduced. Because the GMP amount represents the owner's construction budget, the project scope is dependent upon the size of the CM contingency. Public owners thus seek to maximize the impact of their project budgets by investing in project scope rather than in the CM contingency. By completing the design and bidding the trade contracts and nontrade subcontracts before negotiating the GMP amendment, owners are able to reduce the size of the CM contingency to which the CM at risk firm will agree. A DCAM representative noted in an interview that the CM contingencies negotiated by DCAM are very low because the GMPs are comprised of hard numbers: trade contract and nontrade subcontract bid amounts, general conditions, and fees.

Thus, this study indicates that under the CM at risk model implemented by public owners to date, owners generally assume the risks for the cost of the project during the design stage and for early construction work performed prior to the execution of the GMP amendment; as discussed in this report, the CM at risk contract is a cost reimbursement contract until the GMP amendment is executed. If the owners negotiated the GMPs for their projects earlier in the design stage, they would shift the risks for the cost of the project to their CM at risk firms earlier; in return, however, the owners would confront higher CM contingencies and reduced funds in their GMPs for the project work. In making this tradeoff, owners have opted to assume more financial risk during the course of the project in return for GMPs with relatively low contingencies. After the GMP is executed, the owner bears the risk for the costs of allowance items[38]; the owner is also responsible for the cost of change orders, which increase the original GMP.

Several public owner representatives interviewed for this study, who were otherwise pleased with the CM at risk process, cited as disadvantages of CM at risk the lack of a firm construction price until late in the project and the lack of financial risk borne by the CM at risk firms. On the other hand, this risk allocation model appears to be a contributing factor to the harmonious working relationships that most owners have enjoyed with their CM at risk firms. As discussed in this report, owner representatives interviewed for this study reported that the interactions among project participants have been collaborative and productive, with few disputes over project costs, in contrast to the adversarial interactions some owners have experienced on M.G.L. c. 149 projects.

This study also shows that the "open book process" of monitoring project costs during the course of the CM at risk project has proved manageable for public owners. Some owner representatives reported that their M.G.L. c. 149A projects required no more contract

[38] As discussed in this report, the GMPs for the projects reviewed for this study included allowances, which are dollar amounts, established by the owner, intended to cover the cost of unpredictable or unknown cost items. The owner, rather than the general contractor, bears the risk of the cost of items designated as allowances in the event that the actual cost of an item exceeds the allowance amount.

administration resources than would have been required if the projects had been bid under M.G.L. c. 149 or stated that they expected the additional resources required to procure and administer their CM at risk contracts to be offset by resource reductions associated with fewer change orders; others, including DCAM, reported significantly higher investments of contract administration resources in their M.G.L. c. 149A contracts.

Notwithstanding these reports of divergent contract administration practices, the importance of assigning an experienced and qualified OPM to protect the owner's interests on a CM at risk project is a central theme emerging from the interviews conducted for this study. Unlike the CM at risk firm, the OPM serves as the owner's agent throughout the project. Several owner representatives pointed to the risks of allowing the CM at risk firm to spend the owner's funds without ongoing scrutiny and oversight by the OPM. Owner representatives also emphasized the need for the owner to remain involved in the project and to review project payments. Overall, public owners were unanimous in the view that the CM at risk process under M.G.L. c. 149A is a valuable option for public owners and that this option is not appropriate for every owner or every building project.

This study provides a snapshot of the experience of the relatively small number of public owners that have used the CM at risk process prescribed by M.G.L. c. 149A during the early years of the law's implementation. Their participation in this study has provided other public owners with an interest in using M.G.L. c. 149A with valuable data, procedural information, lessons learned, and practical advice. As more experience is gained with M.G.L. c. 149A, public owners would benefit from continued sharing of experience and best practices. CM at risk under M.G.L. c. 149A, like all other construction project delivery methods, offers potential benefits to public owners while also posing potential risks. To the extent that public owners are able to capture these benefits while also minimizing those risks that can be controlled, the public interest will be well served.

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Recommended Changes to M.G.L. c. 149A

The following recommended changes to M.G.L. c. 149A are intended to correct unclear or problematic provisions and to strengthen the public protections contained in the law.

1. The amendments to M.G.L. c. 149A contained in House No. 4185 of 2009, the technical corrections bill, should be enacted. In addition to correcting typographical and drafting errors, these amendments would accomplish the following:

    - Require the OPM assigned to the CM at risk project to have the required number of years of "relevant" experience.

    - Require the OIG to render decisions regarding applications for approval to use the CM at risk method in not more than 60 days from the date the application is submitted to the OIG.

    - Require the public agency to designate the representatives of the public agency serving on the CM at risk prequalification and selection committees.[39]

    - Require trade contractors to pay the costs for the performance and payment bonds required by M.G.L. c. 149A and include these costs in their bid prices.

    - Require trade contractors seeking prequalification for a particular CM at risk project to submit to the awarding authority a copy of the Certificate of Eligibility issued by DCAM along with a completed Update Statement.

    - Clarify that all trade contractors must return an executed trade contract as well as the required bonds and insurance certificates to the CM at risk firm within 10 business days of receiving the trade contract from the CM at risk firm.[40]

2. The definition of "Designer" in M.G.L. c. 149A, §2 should be corrected to state that the term shall have the same meaning as found in M.G.L. c. 7, §38A½, not M.G.L. c. 7, §38A.

3. The definition of "Guaranteed maximum price" in M.G.L. c. 149A, §2 should be revised by replacing the words "agreed total" with the word "maximum." The current language defines "Guaranteed maximum price" as "the agreed total dollar amount for the construction management at risk services, including the cost of the work, the general conditions and the fees charged by the construction management at risk firm." This

[39] Section 36 of House No. 4185 of 2009 should be amended to make clear that the amendment applies to line 6 of M.G.L. c. 149A, §5(b) and not line 5 of M.G.L. c. 149A, §5, as currently indicated in Section 36.

[40] Section 43 of House No. 4185 of 2009 should be amended to make clear that the trade contractor agreement in subsection (k) is the trade contract for all trade contractors, not only those selected by the CM at risk firm.

definition incorrectly suggests that the GMP is a lump-sum amount owed to the CM at risk firm by the owner. Rather, as stated elsewhere in the same section, the GMP is "the maximum amount to be paid by the public agency for the building project, including the cost of the work, the general conditions, and the fee payable to the construction management at risk firm."

4. M.G.L. c. 149A, §5(c) should be revised to reduce the extensive list of information that public agencies are required to include in the RFQ advertisement. The current provision requires the public notice to include all of the mandatory information required in the RFQ, including preliminary concept designs and key factors important to the final section, the evaluation criteria and procedures to be used in selecting the CM at risk firm, a specific description of the scope of services expected of the CM at risk firm, and other specific information that is appropriate for the RFQ but that is costly and impractical to include in an advertisement.

5. M.G.L. c. 149A, §5(c)(3), which requires the RFQ and the public notice to include "the evaluation procedure and criteria pursuant to subsection (f), including any rating system," should be revised to delete the following phrase: "pursuant to subsection (f)." Subsection (f) does not prescribe an evaluation procedure or criteria.

6. M.G.L. c. 149A, §5(f) should be revised to delete the following sentence: "Only construction management at risk firms achieving an acceptable rating as defined pursuant to clause (3) of subsection (c) will be selected to proceed to phase 2 of the 2-phase selection process and receive a request for proposals issued pursuant to section 6." Clause (3) of subsection (c) does not prescribe a specific rating system, nor does it define "acceptable rating."

7. M.G.L. c. 149A, §6(d) should be revised by inserting a requirement that proposals be opened in the presence of one or more witnesses and that a register of proposals be prepared for public inspection. The current language simply provides that upon receipt of the proposals, the selection committee shall evaluate all proposals; there are no requirements governing the opening or documentation of proposals at the time that proposals are received.

8. M.G.L. c. 149A, §7(3) should be revised to include a requirement that, prior to undertaking early construction work before the execution of the GMP amendment to the CM at risk contract, the CM at risk firm furnish the owner with performance and payment bonds, each in the amount of 100 percent of the agreed-upon sum for the scope of work, including the cost of the work, the general conditions, and any additional fee. Section 7 currently contains no performance bond requirement for early construction work.[41]

[41] However, M.G.L. c. 149, §29, which requires the contractor to furnish a payment bond in the amount of at least 50 percent of the contract price, applies to M.G.L. c. 149A projects.

9. M.G.L. c. 149A, §8(g) should be revised by deleting subsection (7), which requires all prequalified trade contractors to submit, with their bids, "an affidavit that all sub-trade contractors named on the bid form have been prequalified by the trade contractor using criteria similar to the criteria for prequalification of trade contractors." The trade contractor prequalification process entails numerous requirements that are not relevant to or necessary for the trade contractor's selection of sub-trade contractors, including submission of a Certificate of Eligibility and Update Statement (required by DCAM regulations), a mandatory commitment letter from a surety for payment and performance bonds, and a minimum of five credit references. The affidavit requirement is not logical or reasonable and could expose trade contractors to legal challenges.

10. M.G.L. c. 149A, §8 should be amended to include specific procedures to be followed in the event that the public agency receives no responses to the RFQ for a trade contract, prequalifies no trade contractors for a trade contract, or receives no responsive bids for a trade contract. (Although M.G.L. c. 149A, §8(h) sets forth a procedure to be followed if the public agency receives fewer than three responsive bids on any trade contract and the lowest bid exceeds the estimated cost of the work for which bids are requested, these conditions do not cover the scenario in which the public agency receives no responsive bids.)

11. M.G.L. c. 149A, §8(a) should be amended to state that if the CM at risk firm submits its qualifications to bid on trade contract or nontrade subcontract work, the public agency will assume the CM at risk firm's responsibilities for that contract with respect to bidder prequalification and selection and that the CM at risk firm will not serve on the prequalification committee for that trade contract or participate in any way in the prequalification or selection process for the trade contract or nontrade subcontract.

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Appendix A: CM at Risk Firms

The table below identifies the CM at risk firms selected for public projects under M.G.L. c. 149A, according to the survey responses from public owners.

CM at Risk Firms Selected for M.G.L. c. 149A Projects		
Public Owner	**Project**	**CM at Risk Firm**
Abby Kelley Foster Charter Public School	High school	Consigli Construction Company
City of Malden	Malden High School	Gilbane Building Company
Geriatric Authority of Milford	Building modernization	Consigli Construction Company
Nantucket Memorial Airport Commission	Airport terminal	Skanska USA Building, Inc.
City of Newton	Newton North High School	Dimeo Construction Company
City of Northampton	Police facility	Barr & Barr
City of Quincy	New Quincy High School	Gilbane Building Company
City of Salem	Salem High School	Gilbane Building Company
City of Taunton	High School/Middle School	Bacon/Agostini JV
City of Worcester	North High School	Gilbane Building Company
Worcester Redevelopment Authority	Union Station parking garage	Gilbane Building Company
Massport	Pump station replacement	O'Connor Constructors
DCAM	Phase II Expansion Fire Academy	Consigli Construction Company
	New Psychiatric Hospital	Gilbane Building Company
	Administration Building Renovations Worcester State College	W. T. Rich Company
	New Taunton Trial Court	Daniel O'Connell's Sons
	New Fall River Courthouse	Dimeo Construction Company
	Health and Wellness Center Bunker Hill Community College	Daniel O'Connell's Sons

CM at Risk Firms Selected for M.G.L. c. 149A Projects (continued)		
DCAM (continued)	J. Michael Ruane Judicial Center	Daniel O'Connell's Sons
	Wall Experiment Station Renovations	O'Connor Constructors
	Cronin Skating Rink	JK Scanlan
	Ely Library/Campus Center Accessibility Upgrades	D.A. Sullivan & Sons

Appendix B: Online Owner Survey

CM at Risk in Massachusetts - Owner Survey

1. Introduction

The Office of the Inspector General is required by M.G.L. c. 149A, §13, to undertake and complete a review describing the experience of public agencies that used construction management at risk (CM at risk) services pursuant to the provisions of M.G.L. c. 149A. The Office has contracted with Clarus Group, an independent consulting firm, to perform this review.

Pursuant to M.G.L. c. 12A, §9, the Office requests your jurisdiction's cooperation and assistance in completing this survey questionnaire for each CM at risk project undertaken by your jurisdiction pursuant to the provisions of M.G.L. c. 149A. Each survey questionnaire should be completed by a knowledgeable representative of your jurisdiction or by the designated owner's project manager (OPM) for the CM at risk project. The individual completing the survey will attest, under the pains and penalties of perjury, that the answers are accurate and complete to the best of his or her knowledge. The information solicited by this survey questionnaire will provide background information on the CM at risk projects undertaken by your jurisdiction; additional data collection activities and interviews will be conducted over the coming months.

Please note that it is best to complete the survey in one sitting. However, you may leave the survey and return to it at any time before you click the "Done" button at the end of the survey if you use the same computer and the cookies have not been cleared from your browser.

If you have any questions about this survey questionnaire, please contact Clarus Group by phone at 781-878-6000 or by email at info@theclarusgroup.com. Thank you for your assistance.

* 1. Jurisdiction (awarding authority)

* 2. Project name

3. Current project status (check all that apply)

- CM at risk request for qualifications issued
- CM at risk request for proposals issued
- CM at risk contract executed
- One or more trade contractor requests for qualifications issued
- Trade contractors prequalified
- GMP amendment executed
- Long lead time items ordered
- One or more amendments to CM at risk contract to begin construction prior to GMP amendment
- Substantial completion achieved
- Final completion achieved

4. If construction has started on the CM at risk project, please provide the construction start date.

	MM	DD	YYYY
Start date	/	/	

2. CM at Risk Request for Qualifications

1. Have you issued a request for qualifications for CM at risk services?

- Yes
- No (If no, click "Next" at the bottom of this page and you will automatically skip to section 12)

2. Request for qualifications.

	MM	DD	YYYY
Date issued	/	/	
Date due	/	/	

3. Number of responses received.

Number

4. Number of CM at risk firms prequalified.

Number

3. CM at Risk Request for Proposals

1. Have you issued a request for proposals to prequalified CM at risk firms?

- Yes
- No (If no, click "Next" at the bottom of this page and you will automatically skip to section 12)

2. Request for proposals.

	MM	DD	YYYY
Date issued	/	/	
Date due	/	/	

3. Number of proposals received.

Number

4. Names of prequalified CM at risk firms that submitted proposals.

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

4. CM at Risk Contract

1. Have you executed a contract with a CM at risk firm?

- Yes
- No (If no, click "Next" at the bottom of this page and you will automatically skip to section 12)

2. Name of CM at risk firm.

3. Date contract executed.

	MM	DD	YYYY
Date	/	/	

4. Were there any negotiated changes to the non-fee proposal? If so, please briefly list the negotiated changes.

5. Original contract fees and general conditions (include no dollar sign or commas).

Preconstruction fee	
Construction fee	
Total general conditions amount	
Preconstruction general conditions amount (if separate)	
Construction general conditions amount (if separate)	

6. If there have been any contract changes to the original fee amounts, please indicate the current contract fees below (no dollar signs or commas).

Current preconstruction fee

Current construction fee

Current total general conditions amount

Current preconstruction general conditions amount (if separate)

Current construction general conditions amount (if separate)

7. Does the contract allow the CM at risk firm to perform subcontract work?

- Yes - explicitly allowed by contract
- No - explicitly prohibited by contract
- Not explicitly allowed or prohibited by contract

5. Long Lead Time Items

1. Have you ordered or do you plan to order any long lead time items for this project?

- Yes
- No (If no, skip question 2 below)

2. Please list items and indicate whether or not they have been ordered (yes or no).

6. Trade Contractor Request for Qualifications and Bidding

CM at Risk in Massachusetts - Owner Survey

1. Have you issued a request for qualifications for any trade contract?

- Yes
- No (If no, click "Next" at the bottom of this page)

Note: If you answered "Yes" above, indicating that you have issued a request for qualifications for trade contracts, please complete the separate spreadsheet that is available at www.theclarusgroup.com/media/tradecontracts.xls.

2. Has your CM at risk firm been prequalified for any trade contract?

- Yes
- No (If no, click "Next" at the bottom of this page)

3. Has your CM at risk firm submitted a bid for any trade contract?

- Yes
- No (If no, click "Next" at the bottom of this page)

4. Has your CM at risk firm been selected for any trade contract?

- Yes
- No

7. Nontrade Subcontract Work by CM at Risk Firm

1. Has your CM at risk firm performed any non-trade subcontract work on the project?

- Yes
- No

2. If yes, briefly identify type and dollar value of work performed.

8. Construction Prior to GMP Amendment

CM at Risk in Massachusetts - Owner Survey

1. Have you executed any amendments to the CM at risk contract to begin construction prior to execution of a guaranteed maximum price (GMP) amendment?

- Yes
- No (If no, click "Next" at the bottom of this page)

2. Please provide the following information for amendments to the CM at risk contract to begin construction prior to the execution of the GMP amendment.

Total number of amendments

Total value of amendments (no dollar sign or commas)

3. Did the amendment(s) contain a lump-sum price or a GMP? (If you had different amendments with different payment methods, check "Both".)

- Lump-sum price
- GMP
- Both - Different payment method for different contracts

4. Did you require a performance bond from the CM at risk firm? (If you had different contracts with different performance bond requirements, check "Both".)

- Yes
- No
- Both - different requirement for different contracts

5. Did you require a payment bond from the CM at risk firm? (If you had different contracts with different payment bond requirements, check "Both".)

- Yes
- No
- Both - different requirement for different contracts

9. Original GMP Amendment

This section concerns the original GMP amendment to the CM at risk contract. Changes, if any, to the

original GMP amendment are addressed in the next section.

1. Have you executed a GMP contract amendment with the CM at risk firm?

- Yes
- No (If no, click "Next" at the bottom of this page)

2. Date original GMP amendment executed.

	MM	DD	YYYY
Date	/	/	

3. Percent of design completed when GMP amendment executed.

Percent (enter a number with no decimal point or percentage sign)

4. Percent of construction completed when GMP amendment executed.

Percent (enter a number with no decimal point or percentage sign)

5. GMP amount.

Dollar amount (no dollar sign or commas)

6. Substantial completion date in GMP amendment.

	MM	DD	YYYY
Date	/	/	

7. Final completion date in GMP amendment.

	MM	DD	YYYY
Date	/	/	

8. Amount of CM at risk firm contingency in GMP amendment.

Dollar amount (no dollar sign or commas)

10. Changes to Original GMP Amendment

This section concerns the changes, if any, to the original GMP amendment to the contract.

CM at Risk in Massachusetts - Owner Survey

1. Have there been any amendments to the original GMP amendment?

- Yes
- No (If no, click "Next" at the bottom of this page)

2. Current GMP amount.

Dollar amount (no dollar sign or commas)

3. Current substantial completion date in GMP amendment.

	MM	DD	YYYY
Date	/	/	

4. Current final completion date in GMP amendment.

	MM	DD	YYYY
Date	/	/	

5. Current amount of CM at risk firm contingency in GMP amendment.

Dollar amount (no dollar sign or commas)

11. Owner's Contingency

1. Indicate the dollar amount of the owner's contingency.

Original owner's contingency amount (no dollar sign or commas)

Current owner's contingency amount (no dollar sign or commas)

Amount used to date, if any (no dollar sign or commas)

2. Did the original GMP amendment include the owner's contingency amount?

- Yes
- No

12. Contract Amounts and Payments

CM at Risk in Massachusetts - Owner Survey

1. Please provide the following dollar amounts (no dollar signs or commas).

OPM contract amount	
OPM fee paid to date	
Design contract amount	
Design fee paid to date	
CM at risk firm preconstruction fee paid to date	
CM at risk firm construction fee paid to date	
Total general conditions amount paid to date	
Preconstruction general conditions amount paid to date (if separate)	
Construction general conditions amount paid to date (if separate)	
Cost of work paid to date	
Cost of work paid to date for work performed by CMR firm	

13. Schedule

1. Enter the actual substantial and final completion dates, if applicable.

	MM	DD	YYYY
Actual substantial completion date	/	/	
Actual final completion date	/	/	

14. Disputes - CM at Risk Firm Claims

1. Has the CM at risk firm submitted any claims?

- Yes
- No (If no, click "Next" at the bottom of this page)

2. Number of claims.

Number of claims submitted to date

Number of claims settled to date

Number of claims pending

3. Total dollar value and schedule days claimed to date.

Dollar value (no dollar sign or commas)

Days

4. Total dollar value and schedule days awarded in claims settled to date.

Dollar value (no dollar sign or commas)

Days

5. Total dollar value and schedule days in pending claims.

Dollar value (no dollar sign or commas)

Days

15. Disputes - Direct Payment Claims

1. Have any direct payment claims been submitted?

- Yes
- No (If no, click "Next" at the bottom of this page)

2. Direct payment claims submitted to date.

Number

Dollar value (no dollar sign or commas)

3. Direct payment claims paid to date.

Number

Dollar value (no dollar sign or commas)

4. Direct payment claims currently pending resolution.

Number

Dollar value (no dollar sign or commas)

16. Disputes - Protests

CM at Risk in Massachusetts - Owner Survey

1. Has anyone filed a protest with the Office of the Attorney General regarding the award of any contract related to this CM at risk project?

- Yes
- No (If no, click "Next" at the bottom of this page)

2. How many protests have been filed to date?

Number

3. Who filed a protest?

- CM at risk firm
- Trade contractor
- Other subcontractor
- Supplier

Other (please specify)

17. Disputes - Litigation

1. Has anyone filed litigation related to this CM at risk project?

- Yes
- No (If no, click "Next" at the bottom of this page)

2. Who has filed litigation related to this CM at risk project?

- Owner
- Designer
- OPM
- CM at risk firm
- Trade contractor
- Other subcontractor
- Supplier
- Citizen or citizen group

Other (please specify)

18. Comments

1. If you would like to make any comments or provide any additional information, please do so in the space below or send an email to info@theclarusgroup.com.

19. Attestation

CM at Risk in Massachusetts - Owner Survey

* 1. Respondent information

Name:

Title:

Organization:

Address:

City/Town:

State:

ZIP:

Email address:

Phone number:

* 2. By submitting this survey, you attest under the pains and penalties of perjury that all information provided is accurate and complete to the best of your knowledge.

Agree.