

How CM Is Practiced in the USA

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May 10, 2006



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What I Will Talk About

- What is CM
- Origins of CM in USA
- Today's CM Market
- Standards and Practices of CM
- Licensing and Certification
- Resources Offered by CMAA
- Significant Issues Facing CM Industry
- CMAA Award-Winning Projects in 2005



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What is CM

- CM as defined by CMAA is:
 - *“The practice of professional management applied to the planning, design and construction of projects from inception to completion for the purpose of controlling time, scope, cost and quality.”*

What CM Means Today

- Leadership of the entire project team
- Focus on communication and collaboration
- Excellent project management skills
- Construction knowledge and experience
- Objective and independent of design and construction
- Rigorous control of time, cost, scope, and quality

What CM Does Not Mean

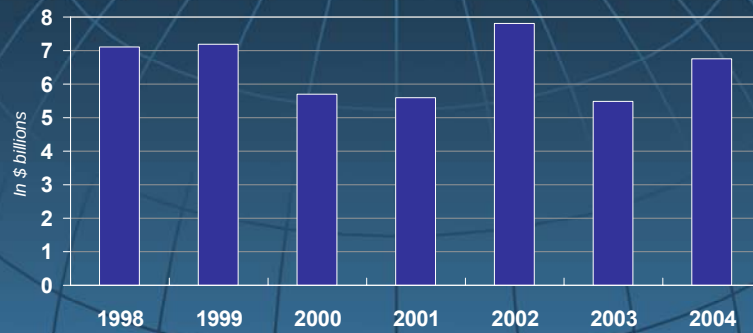
1. **CM is not a delivery system**
 - Delivery system neutral
 - Select the optimal delivery approach for the project
2. **CM is not a fixed group of services**
 - Services matched to needs of Owner and project
3. **CM is not limited to the construction phase**
 - Assist Owners with all phases of project execution

Origins of CM in USA

- Started in 1960s
- Growth driven by:
 - Increased demand for projects
 - Projects more complex and costly
 - Computer based scheduling
 - Tensions between parties, claims against Owners
- Grew in '70s and '80s as large US government agencies used CM and professional associations developed standards and contracts for CM

Today's CM Market

CM-for-Fee Revenue Jumps



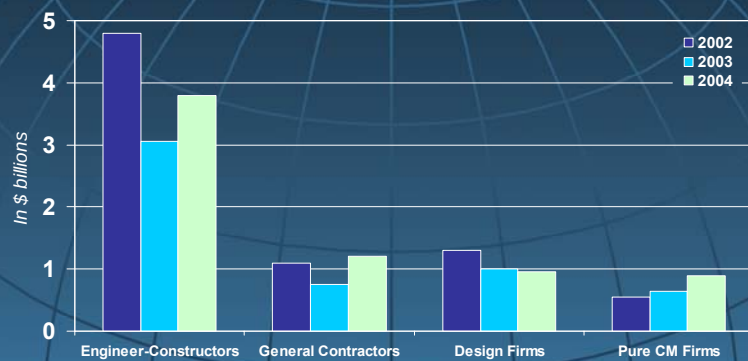
As reported by ENR Magazine, June 13, 2005



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Today's CM Market

CM Gains Among Most Types of Firms



As reported by ENR Magazine, June 13, 2005



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ENR 2005 Rankings for Construction Management (Includes Program Management Revenue)

The Top Construction Management-for-Fee Firms

RANK	FIRM	TYPE	TOTAL (\$ MIL)	INTER- NATIONAL
1	CH2M HILL COS. LTD., Denver, Colo.	EAC	699.3	29.3
2	PARSONS BRINKERHOFF, New York, N.Y.	EAC	524.2	112.1
3	THE TURNER CORP., Dallas, Texas	C	424.8	42.4
4	PARSONS, Pasadena, Calif.	EC	420.4	230.7
5	URS, San Francisco, Calif.	EAC	401.8	0.0
6	BECHTEL, San Francisco, Calif.	EC	399.0	307.0
7	JACOBS, Pasadena, Calif.	EC	389.3	97.4
8	WASHINGTON GROUP INT'L, Boise, Idaho	EC	280.0	37.5
9	BOVIS LEND LEASE, New York, N.Y.	C	260.7	15.0
10	KBR, Houston, Texas	EC	164.3	139.4

KEY: EAC=ENGINEER-ARCHITECT-CONTRACTOR; EC=ENGINEER-CONTRACTOR; C=CONTRACTOR

June 13, 2005 • ENR

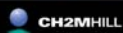


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Still, CM is Only a Modest Portion of the US Construction Market

- US construction market is \$1.1 trillion*
- If we assume CM fees average 5% of constructed value, then:
 - \$7 billion fees = \$140 billion constructed value
 - \$140 billion = 13% overall construction market
- CM stronger in public works

* As reported by US Bureau of Economic Analysis and FMI



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Standards and Practices of CM

- **Role of the Construction Manager is to:**
 - Act as the Owner's agent, to manage all or part of the project delivery process
 - Act in best interests of the Owner and project
 - Construction Manager does not have liability for the cost or schedule of the project

- CM draws from a large pool of services and tools, covering the entire delivery process, to match the needs of the Owner and project
- See example next slide:

Representative Construction Management Services

Planning/Design Phase

Project Team Chartering
Project Delivery Analysis
Contract/Bid Packaging
Master Scheduling
Independent Cost Estimates
Constructibility Reviews
Value Engineering
Risk Analysis
Project Budgeting
Coordinate Permitting
Contractor
Bid/Evaluation/Selection
Public Interest Programs

Construction Phase

Contractor Coordination
Cost and Schedule
Control
Quality Assurance and
Inspection
Document Management
Contract Administration
Change Management
Manage Submittals, RFIs
Claims Avoidance
Safety Oversight
Conflict Resolution
Payment Request Review
Project Web Site

Startup

Owner Startup
O&M Training
Bond and Lien Releases
Coordinate Punch List
Building Commissioning
Close-out Permitting
Close-out Reports, Records
Claims Resolution
Lessons Learned Program

CMAA's Standards of Practice Define What, Who, When

PRACTICE AREAS

1. Project Management
2. Cost Management
3. Time Management
4. Quality Management
5. Contract Administration
6. Safety Management
7. Program Management

PROJECT PHASES

- Pre-Design
- Design
- Procurement
- Construction
- Post Construction

Licensing and Certification

- **Licensing**
 - Only 1 state (Idaho) licenses CMs, for public works projects; uses CMAA's certification process
 - In many states, CM included in General Contracting, Architectural, or Engineering regulations
 - CMAA compiling comprehensive database of all state licensing and regulations for CM, and will seek a more consistent national approach to regulating CM as a separate profession

- **Certification**
 - CMAA has certification program (CCM)
 - CMAA's program is ANSI and ISO accredited – only professional certification that is accredited
 - Currently there are 678 CCMs
 - CCM gaining increasing Owner recognition:
 - 1 agency now requires a CCM for CM projects
 - US GSA gives preferences to firms with CCMs
 - Many Owners promote CCM to their staff

Qualifications Matrix

PHASE:	Pre-design	Design	Procurement	Construction	Post-construction
FUNCTION/ROLE:					
Project Management	[X]	[X]	—	[X]	—
Cost Management	—	[X]	[X]	[X]	—
Time Management	—	[X]	—	[X]	—
Quality Management	—	[X]	—	[X]	[X]
Contract Administration	—	—	[X]	[X]	[X]
Safety Management	—	—	—	[X]	—

X - represents minimum qualifying experience to apply; total experience of all must equal or exceed 48 months as Responsible in Charge.

Responsible in Charge - Did the decisions that the candidate was empowered to make directly impact the successful completion of the project and was the candidate directly responsible in charge of construction management services and for protecting the interests of the project and the owner?

Resources Offered by CMAA

The screenshot displays the CMAA website interface within a Microsoft Internet Explorer browser window. The browser's address bar shows the URL 'http://cmaanet.org/'. The website features a navigation menu on the left with links to 'Home', 'Membership', 'Conferences', 'CMAA Bookstore', 'CMAA University', and 'CM Certification'. The main content area includes a 'Welcome to CMAA!' message, a 'CMAA News' section with several articles, and a 'Grassroots Advocacy' section. The website also features a search bar and a 'Links' section.

CMAA Provides Services to Industry

- “Find a CM”
- Assists Owners to Organize their Programs
- Professional Development and Training
- National Conferences
- Standards of Practice and Procedures Manuals
- Standard Contract Forms
- Research on Value of CM
- Publications
- Federal and State Government Advocacy

Significant Issue Facing US CM Industry

1. Quantifying the Value of CM
2. Applying CM to programs of multiple projects to achieve efficiencies, cost reductions, innovation, faster delivery
3. Global cost escalation and unpredictability
4. Potential shortages of skilled engineering and labor
5. Design quality issues and cost pressures
6. Managing increasingly complex project risks
7. Using technology to innovate, add value, and improve communication and collaboration

CMAA Award-Winning Projects in 2005



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Excellence in Program Management with Constructed Value Greater than \$100 Million - Completed Program

Alexandria Sanitation Authority Advanced Wastewater Treatment Facility Upgrade, Alexandria, VA, construction management by CH2M HILL

More than 20 structures on this 22-acre site were involved in this rehab and modernization project designed to enhance the quality of treated water discharged into the Potomac River.

The project presented a number of complexities, beginning with the site itself. All excavated soil was contaminated with total petroleum hydrocarbons and intermixed with solid waste, so it had to be handled specially. More than 8,600 100-ton and 50-ton steel H-piles had to be driven -- and without damaging existing 72-inch interceptor and underground tunnels.

CH2M HILL's services contributed to seamless construction from the design and award phase through completion. Scheduling was under additional pressure due to the owner's need to meet state-mandated deadlines for components of the project.

Despite its great complexity, the project was completed 40 calendar days early.



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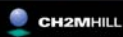
Excellence in Program Management with Constructed Value Greater than \$100 Million – Ongoing Program

Los Angeles Unified School District for its New School Construction and Modernization and Repair program, construction management by LAUSD Facilities Services Division

This is the largest public school construction and repair program in America's history. Spending more than \$15 billion on 16,500 repair projects, 160 brand new schools, and 80 school additions, LAUSD is transforming the city's schools and adding nearly 200,000 new classroom seats.

The impact of this initiative on the city's future cannot be calculated.

Among the innovations driving this project, the district created a special Small Business program and achieved an agreement with all of its building trade unions to ensure the quantity and quality of labor available to contractors. The district even created a program providing local residents with an opportunity to enroll in comprehensive 10-week pre-apprenticeship training programs leading to possible jobs on the schools project.



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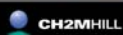
Excellence in Program Management with Constructed Value Between \$20-100 Million

First Baptist Church of Woodstock, Georgia, construction management by Gleeds

At 405,000 square feet and rising 185 feet, this imposing structure includes a 7,000-seat sanctuary with additional seating for choir and orchestra, along with a 52,000-square-foot preschool and a dramatic three-story lobby.

Gleeds' involvement in pre-construction planning, estimating and value engineering enabled the Church to optimize the value it received for its budget, and careful schedule management meant that despite an unusually rainy season the project finished two weeks ahead of schedule.

Mid-project the lender reduced its commitment, and Gleeds had to guide a series of decisions to reduce its scope while still meeting the church's overall ministry needs.



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Public Project with Constructed Value Greater than \$100 Million

Outbound Baggage Handling System and Security Enhancements at Tampa International Airport, construction management by Skanska USA Building, Inc.

This project was undertaken to meet enhanced aviation security requirements established by the Transportation Security Administration. It involved integrating an explosive detective system into an automated baggage handling system.

This had never been done before: a fully automated baggage handling system that features inline explosion detection screening of all passenger bags. And the project had to be executed within an existing, operating airport.

Skanska was involved in the project from the very beginning. Because the owner wanted to move the baggage screening operation out of the ticketing lobby as quickly as possible, Skanska used a fast-track approach, with design and construction going on simultaneously at many times.



Public Project with Constructed Value Less than \$100 Million

Mansfield Senior High School in Mansfield, OH, construction management by Gilbane

This is the largest single building project funded by the Ohio School Facilities Commission: a 354,000-square-foot comprehensive educational campus that includes a 2,500-seat gym, a 900-seat auditorium, and extensive other facilities.

To accommodate the harsh mid-Ohio winter, the project team worked in phases, enclosing large parts of the project before each winter so that interior work could proceed during the cold months.

This aggressive scheduling strategy enabled Gilbane to meet a spring occupancy date, giving the school district ample time to commission the new building before it went into operation in the fall.



Private Project with Constructed Value Less than \$100 Million

Providence St. Joseph Hospital, Burbank, CA, construction management by The JCM Group

The Northridge, California earthquake of 1994 severely damaged the hospital, and The JCM Group has been centrally involved in helping to rebuild this important community resource.

JCM helped the hospital re-engineer its entire rebuilding effort to bring the project within budget and deliver a new facility that did not merely restore but actually improved what had been there before.

During construction, the owner decided to implement significant changes to the design to incorporate improved technology and other improvements.

JCM still brought the project in ahead of schedule and on budget, providing substantial savings and helping the hospital generate revenue by receiving patients earlier than expected.



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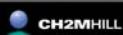
Public Project with Constructed Value Between \$10-29 Million

Clipper Magazine Stadium, Lancaster, PA, construction management by the joint venture of Warfel Construction and Barton Malow Construction Services

This 6,200-seat minor league baseball stadium was constructed on an extraordinarily fast schedule to meet an inflexible deadline.

At every preconstruction stage, estimates were higher than the budget, and significant value engineering efforts were required. In addition, Barton Malow's experience with similar sports facilities enabled the construction managers to identify potential problem areas early in the process.

The site itself presented a variety of challenges. The site was an abandoned railroad yard, with several underground fuel storage tanks, contaminated soil, and structurally unsuitable soil. The combination of a difficult site, a tight budget and a compressed schedule called for maximum creativity from the construction management team.



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Public Project with Constructed Value Between \$30-50 Million

Hudson Valley Transportation Management Center, Hawthorne, NY, construction management by Jacobs Facilities

Among Jacobs' first contributions to the project was the determination that the initial design documents were only about one-quarter complete and left many issues unresolved. Jacobs then spearheaded a new design effort and helped the owners re-establish the focus of the project.

More than \$14 million in scope changes were ordered after construction had begun. The magnitude of these changes compelled the team to work together even more efficiently.

Jacobs followed a fast-track approach that enabled the project to keep moving even while this major addition was being planned.

Despite 522 RFIs, 1,148 submittals, and 83 change orders, the project closed within the revised schedule and budget.



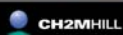
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Private Project with Constructed Value Less than \$50 Million

Country Inn and Suites, New Orleans, LA, construction management by Hanscomb, Faithful & Gould

This 155-room hotel was constructed from seven historic buildings. Design and construction had to follow strict guidelines. New doors and windows had to be fabricated to match the originals. New wood structures were used to support rotted materials, arches were cut in existing walls, and entirely new electrical, mechanical and conveying systems replaced the existing systems. The project team also had to deal with different floor elevations in four of the seven old buildings, as well as an original exterior wall that was 18 inches out of vertical.

The result is a remarkable blend of old and new, a modern building highly sensitive to its historic roots.



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Public Project with Construction Value Less than \$10 Million

Brooklyn Academy of Music, Brooklyn, NY, construction management by Greyhawk North America

The Academy of Music was completed in 1907 and designated a landmark in 1978. Renovation of the exterior included reproduction of missing elements and refurbishment of marble columns, stained glass transoms, parapets, windows, brickwork, and the roof.

The facility remained operational throughout the project, and Greyhawk designed a special scrim to camouflage the scaffolding. This scrim included a ginger bread cake design mounted to a nylon mesh screen. It turned out to be both a structural and aesthetic success.

Among the technical challenges overcome during this project was reproduction of terra cotta elements with lighter but stronger modern materials, careful reproduction of authentic details, and some very inclement weather.



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Private Project with Constructed Value Less than \$10 Million

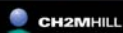
Michael Tyler Fisher Center for Education, USS Intrepid Sea, Air and Space Museum, New York, NY, construction management by Hudson Meridian Construction Group

The USS Intrepid is a de-commissioned World War II era aircraft carrier now moored in the Hudson River as an exciting Sea, Air and Space Museum.

The new Education Center is a three-level state-of-the-art conference center and children's educational facility totaling approximately 18,000 square feet.

Client commitments required that the entire job be accomplished in just six months. The key design feature, a glass curtain wall spanning the width of the ship, required demolition of the shipbuilder's steel and construction of new structural steel. Hudson Meridian's expertise in marine construction enabled them to monitor and adjust to the almost continuous motion of the ship.

The entire project was fast-tracked, relying on web-based project management and a variety of technical innovations.



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International Project of the Year

Palm Jumeirah, Dubai, construction management by Hill International

This massive project essentially involved building three new islands.

Each of these enormous islands required more than 100 million cubic meters of soil, most of which was dredged from two nearby ports, then specially prepared and installed so as to resist erosion and provide a secure surface for construction. More than 60 seagoing vessels worked on this project.

Hill went to particular lengths to assure environmental integrity, using natural seabed material and creating a natural topography.

The result is one of the world's largest man-made structures, which will include 2,400 homes, 20 to 30 hotels, themed entertainment and other tourist attractions.

