



حرفه مدیریت ساخت (سند Capstone، از مراجع اصلی اخذ مدارک CMAA)

بخش اول: معرفی دنیای مدیریت ساخت

ارائه دهنده:

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CMAA Authorized Trainer

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What we will learn?

- ☐ Foreword
- ☐ Construction management definition
- ☐ A brief history
- ☐ Construction industry outlook
- ☐ Professional association
- ☐ Primary roles and responsibilities
- ☐ Employment opportunities
- ☐ CM certifications

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What we will learn?

☐ Owners and project types

- ❖ Understanding owners and projects
- ❖ Project delivery
- ❖ Understanding delivery methods
- ❖ The CM project delivery method
- ❖ CM's body of knowledge and their roles
- ❖ CM services

☐ بخشنامه‌های شرح خدمات همسان سال ۱۳۹۲ و ۱۴۰۱

Other concepts

❑ Other available delivery concepts include

1. Public-Private Partnership (P3),
2. Engineering-Procurement-Construction/Engineering-Procurement-Construction Management (EPC/EPCM),
3. Integrated Project Delivery (IPD), and
4. Lean Construction.

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Other concepts

❑ EPC vs. DB

- ❖ Although design-build and EPC delivery models share some important commonalities, it is their differences that are most important. Following are seven points to keep in mind when considering the differences between design-build and EPC.

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Other concepts

❑ EPC vs. DB

1. An EPC Contractor is typically a fully integrated company, which has in-house design, procurement, and construction resources. A design-build Contractor is typically, although not always, a partnership of a design professional firm and a Contractor who have created a team to execute a specific project.
2. An EPC project typically results in a turnkey facility. At closeout, the EPC Contractor hands over an operational facility. Whereas, a design-build contract typically closes out with the Owner commissioning the facility.
3. EPC Contractors are often handed little more than performance requirements (output levels, uptime levels, maintenance expense maximums, etc.), whereas most design-build contracts provide at least some design detail in the bridging documents.

Other concepts

❑ EPC vs. DB

4. Again, unless modified by the parties' contract, there is no EPC equivalent of the “design-assist” or “fast-track” design-build processes. This reflects the Owner's decreased involvement in the EPC design process.
5. Many EPC contracts transfer more risk to the EPC Contractor than do design-build contracts to a Design-Builder. Design-build contracts tend to take either a traditional design-bid-build approach to unknowns, like hidden site conditions, or share that risk between the Owner and the Design-Builder. In contrast, it's not uncommon for EPC contracts to shift these risks entirely to the EPC Contractor.

Other concepts

❑ EPC vs. DB

6. Unlike in the design-bid-build delivery system, the EPC Contractor **will not be able to rely** on the **Spearin doctrine** for any defective design plans it prepares.
7. EPC contracting is common on highly engineered facilities like power, oil and gas, and chemicals projects, which produce some “output,” whereas design-build is more common for commercial buildings, housing, and education projects.

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Other concepts

❑ EPC vs. DB

1. Binding FEED

- ❖ In this case, the EPC Contractor is required to **strictly follow** the FEED documents **provided by the Owner** (or their consultant).
- ❖ The FEED is considered **contractually binding** and forms a basis for the **detailed engineering phase**.
- ❖ If **defects exist** in the FEED, the Contractor may be able to **invoke a Spearin-like argument**, provided they had no authority or obligation to alter the design.

Other concepts

❑ EPC vs. DB

1. Non-Binding FEED

- ❖ In this scenario, the FEED documents are for **reference only**.
- ❖ The **EPC Contractor** is fully responsible for
 1. Reviewing,
 2. Validating, and
 3. Developing the design,**regardless** of the FEED content.
- ❖ **Any defects** in the design, including those **originating in the FEED**, remain the Contractor's responsibility.

Other concepts

❑ EPC/EPCM.

- ❖ Engineering-Procurement-Construction is a type of contractual agreement similar to D-B

where the **EPC contractor** is responsible for
project execution and delivery

within a **designated time** and **budget** as identified in the contract.

- ❖ With the Engineering-Procurement-Construction Management contract,
the project is **largely managed** by the owner and
the **contractor** is responsible for the design and management of the
project
on the owner's behalf

but is **not directly involved** in construction.

Other concepts

❑ Integrated Project Delivery (IPD).

- ❖ IPD is a project delivery method distinguished by a **contractual agreement** between a **minimum** of the owner, designer, and builder where risk and reward are **shared equally**.
- ❖ This practice has been used **around the world** for **many years** and is sometimes called “**Alliancing**.”
- ❖ The **IPD system** is **different** from the other delivery methods that place the **CM/contractor** in the **lead role** on a project.
 - ✓ With IPD, the **entire building team**—owner, architect, contractor, engineers, subcontractors—**works together** through the **phases of construction**.

Other concepts

❑ Integrated Project Delivery (IPD).

- ❖ **Collaboration software** is sometimes used to allow **all members** of the project team to **access files** that **might otherwise be unavailable** in **other delivery** methods.
- ❖ One of the advantages of IPD is **early involvement** of **all stakeholders** and strong project team development based on **equal incentives**.
- ❖ Disadvantages of this method may be
 - ✓ Lack of legal precedent,
 - ✓ Difficulty obtaining insurance, and
 - ✓ No single point of contact/responsible party.

Lean construction

- ❑ According to the **Lean Construction Institute**,

*“Lean Construction is a **production management-based approach** to project delivery to **maximize value** and **minimize waste**.”*

- ❑ Lean is a philosophy that **originated** from the Six Sigma approach to improving efficiency while **reducing waste**.

- ❑ The **core philosophies** are that Lean Construction can

1. **Improve** capacity, customer satisfaction, productivity, profit, quality, and responsiveness
2. while **reducing** cost, defects, inventory, lead time, space, and waste.

- ❑ **Project delivery methods** can apply

Lean Construction principles—and
technology such as BIM or virtual reality—

to **improve** project delivery and **meet** sustainability goals.

Owners and Project Types

(The CM project delivery method)

Reasons for the emergence of the CM project delivery method

- ❑ **Failure of traditional methods** to attain owners' time, cost, and quality objectives
 - ❖ **Inability** of A/E to give reliable budget estimate
 - ❖ **Absence** of construction expertise during **design**
 - ❖ **Absence** of good management by **contractor**
 - ❖ **Linear nature** of feasibility-design-letting-construction
- ❑ **Limited** liability and bonding requirements for CMs
- ❑ **Increased** project complexity and size
- ❑ Public agencies' stimulation

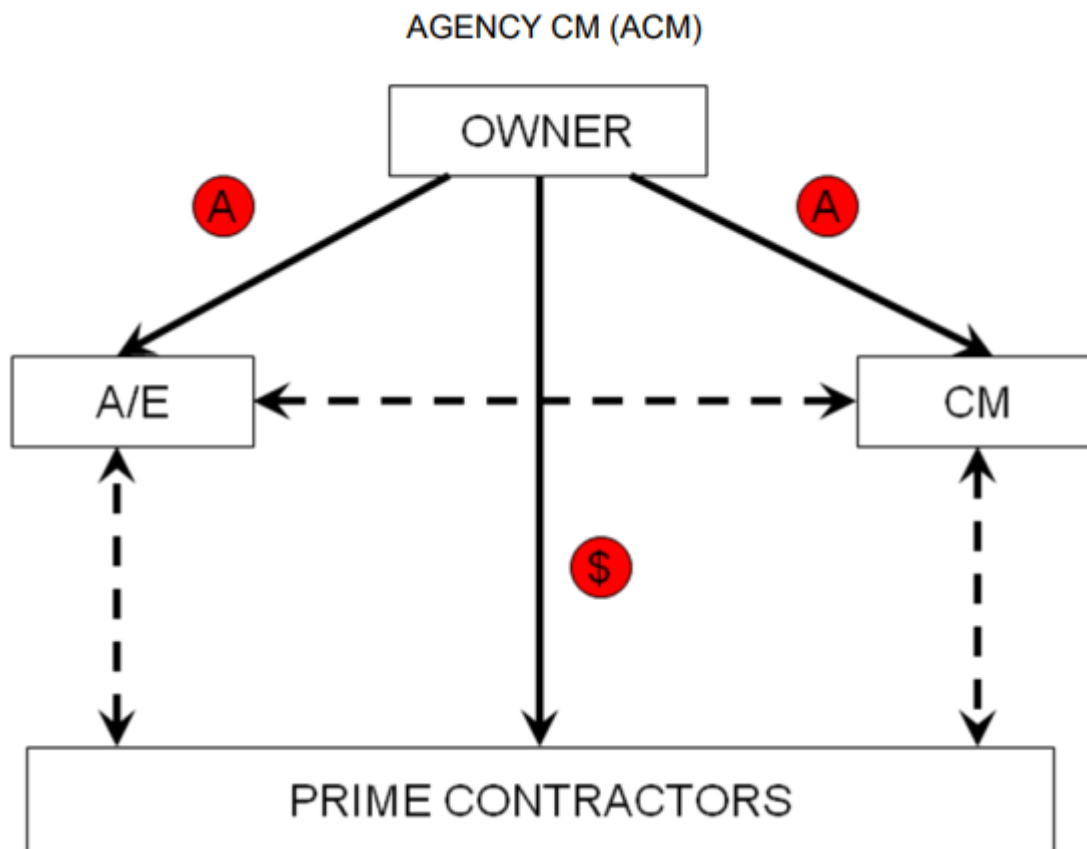
Variations of the CM project delivery method

- ☐ Agency CM (ACM)
- ☐ Extended Services CM (XCM)
- ☐ Guaranteed Maximum Price CM (GMPCM)
- ☐ Owner CM (OCM)

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Variations of the CM project delivery method

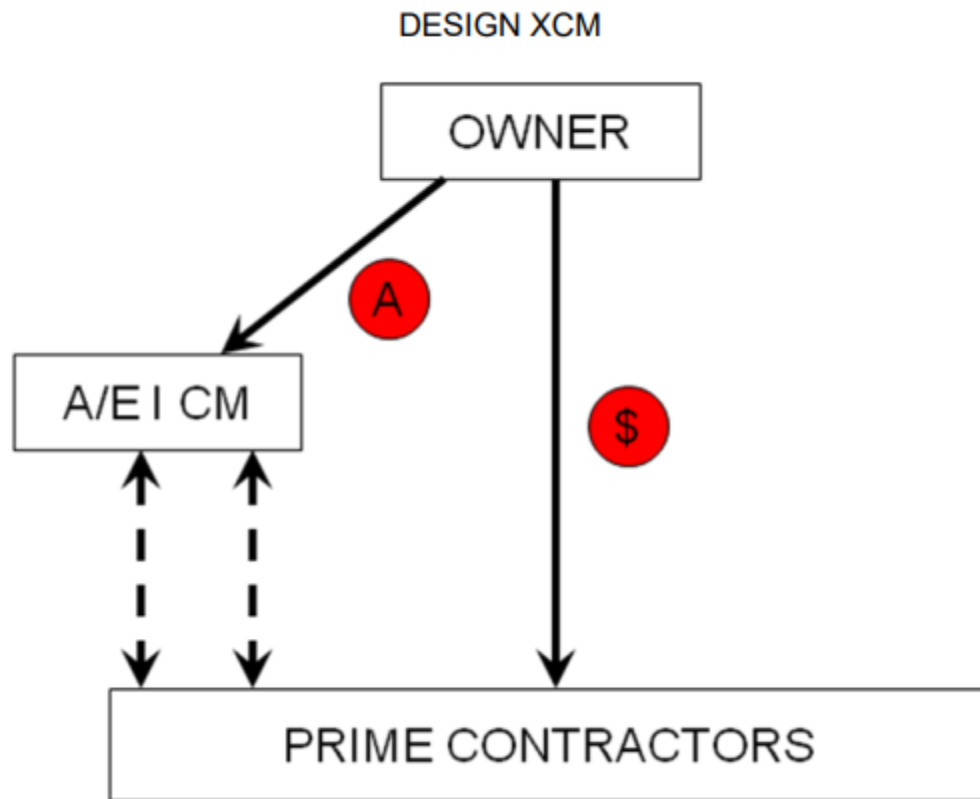
Agency CM (ACM) (CM-for-fee)



CM Project Del System

- o ACM
- o XCM
- o GMPCM
- o OCM

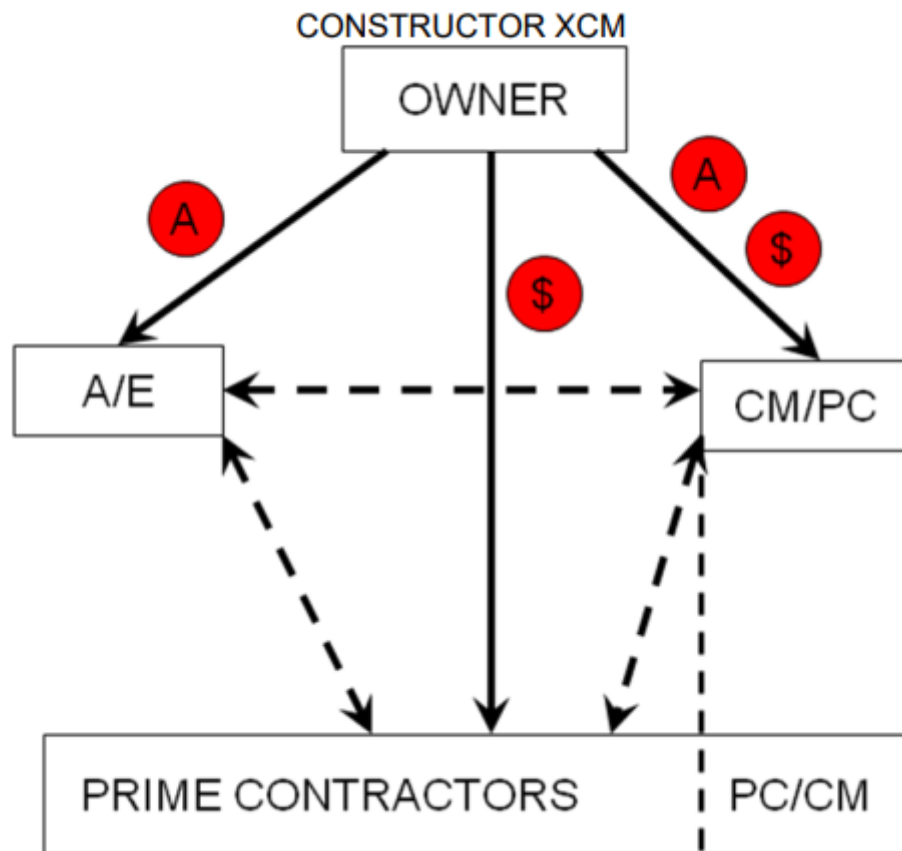
Variations of the CM project delivery method



CM Project Del System

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Variations of the CM project delivery method

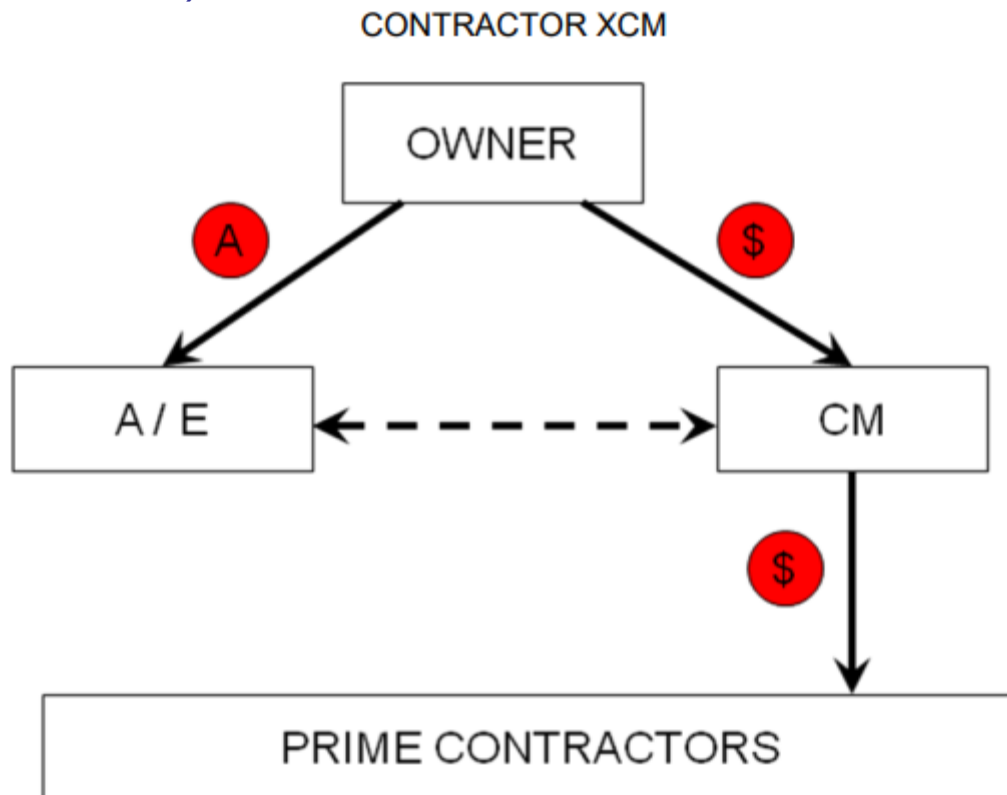


CM Project Del System

- o ACM
- o XCM
- o GMPCM
- o OCM

Variations of the CM project delivery method

Contractor XCM (CM-at-risk)

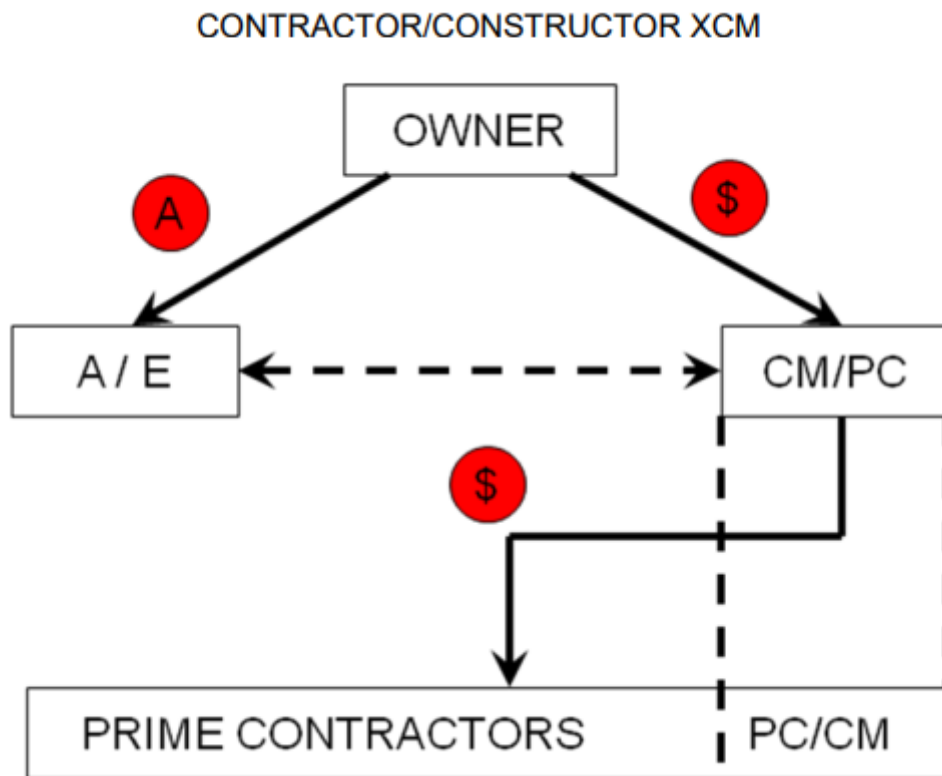


CM Project Del System

- o ACM
- o **XCM**
- o GMPCM
- o OCM

Variations of the CM project delivery method

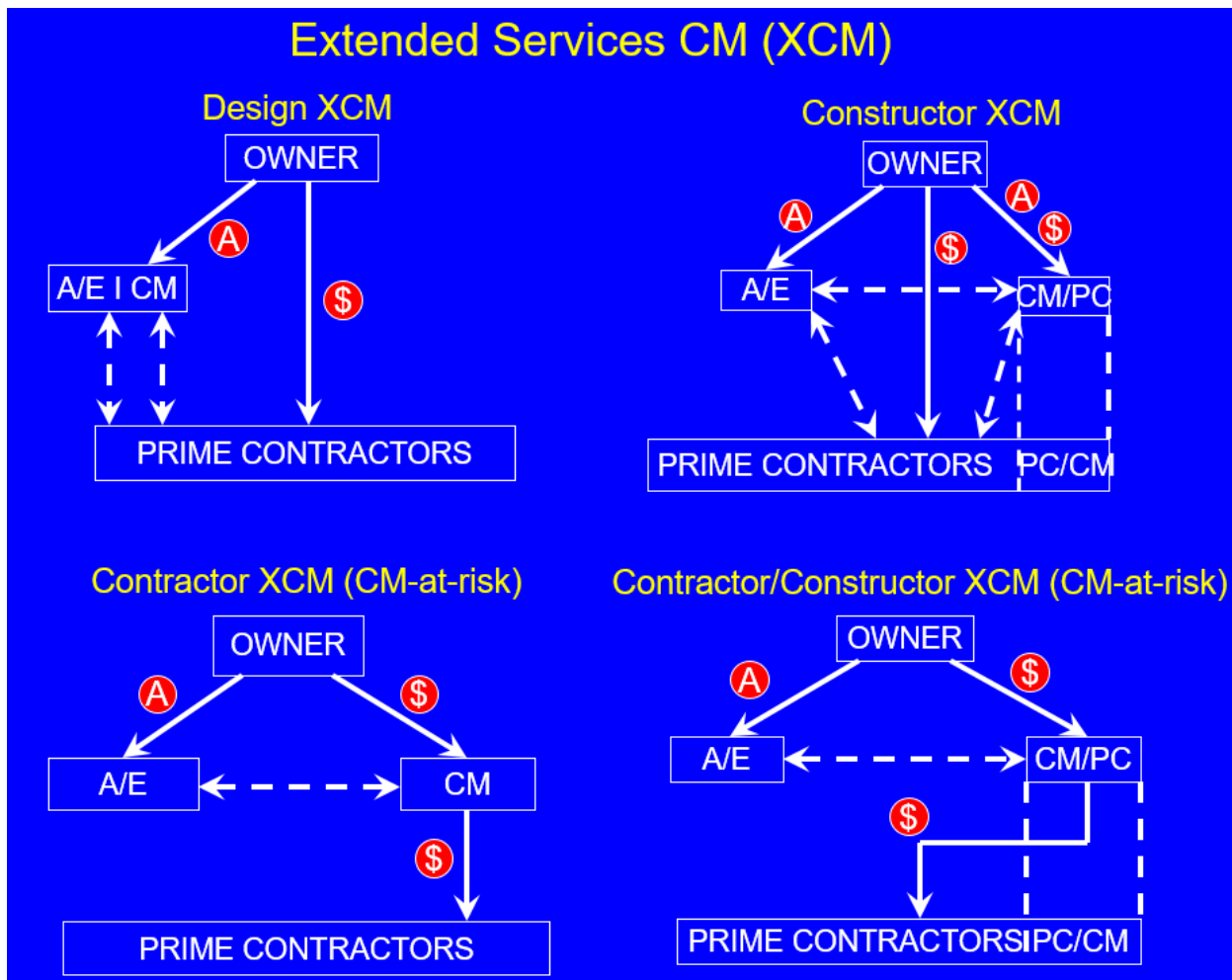
Contractor/Constructor XCM (CM-at-risk)



CM Project Del System

- o ACM
- o **XCM**
- o GMPCM
- o OCM

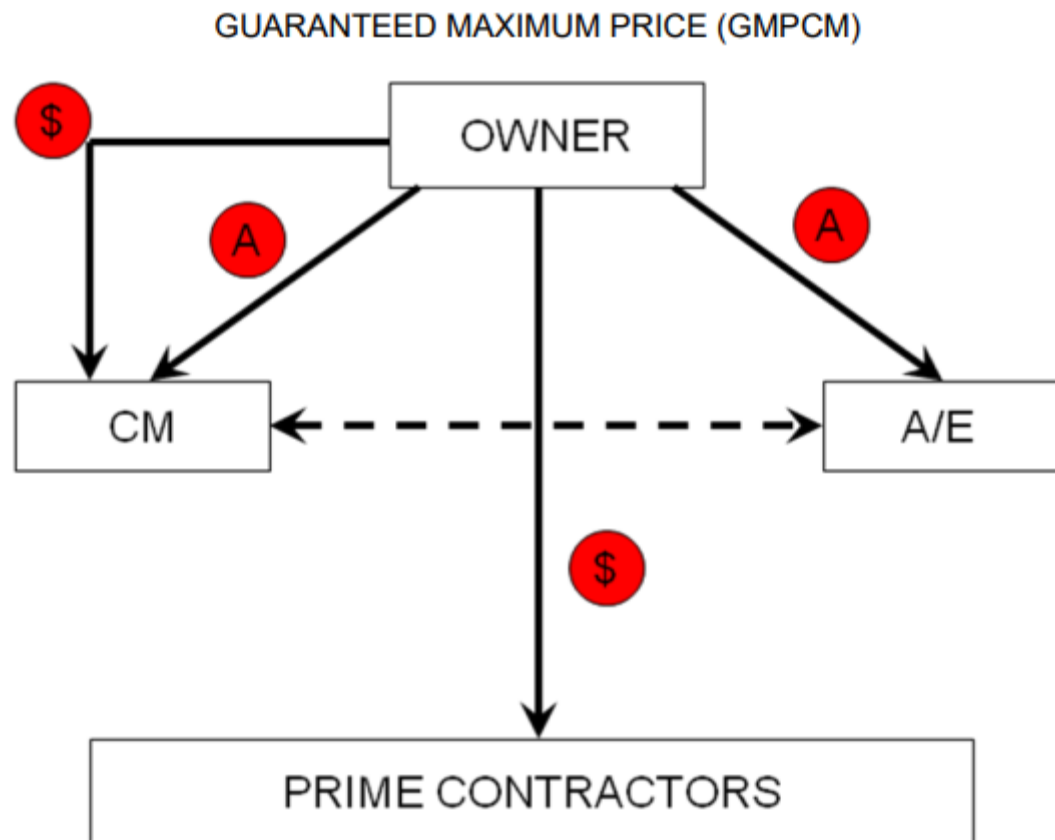
Variations of the CM project delivery method



CM Project Del System

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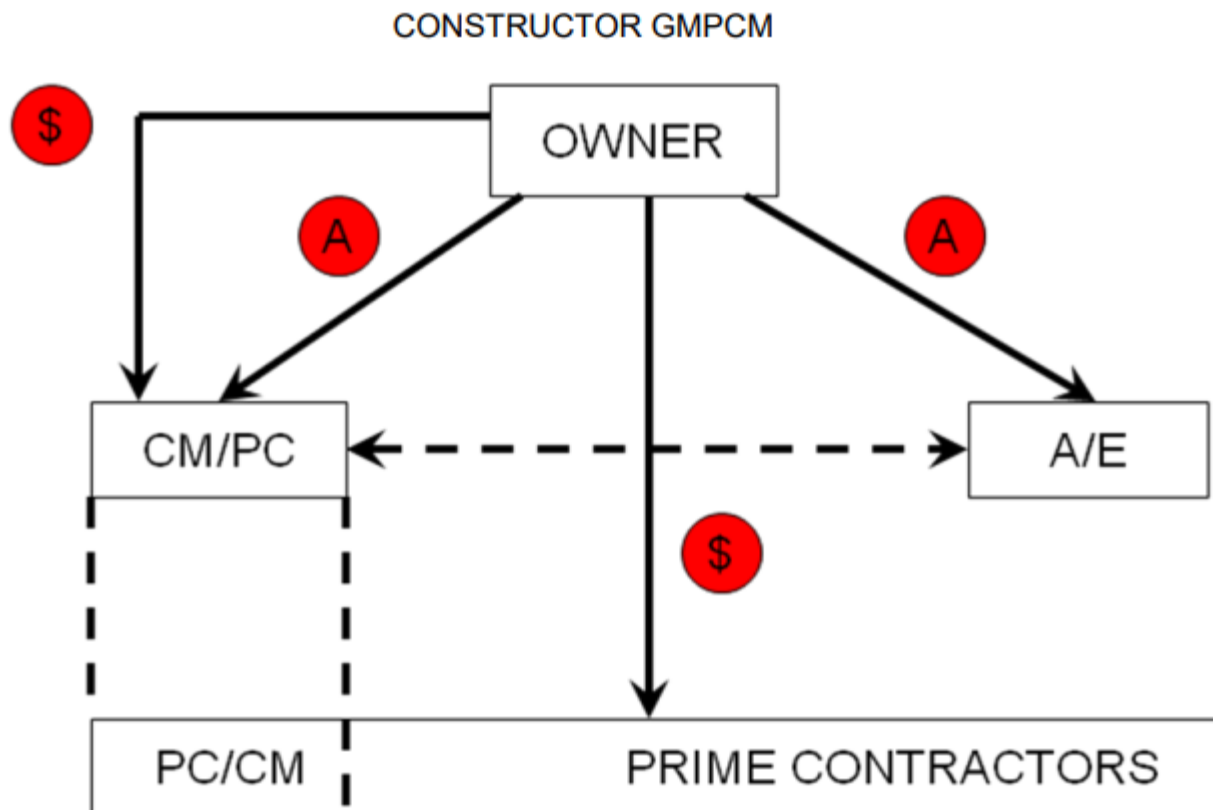
Variations of the CM project delivery method



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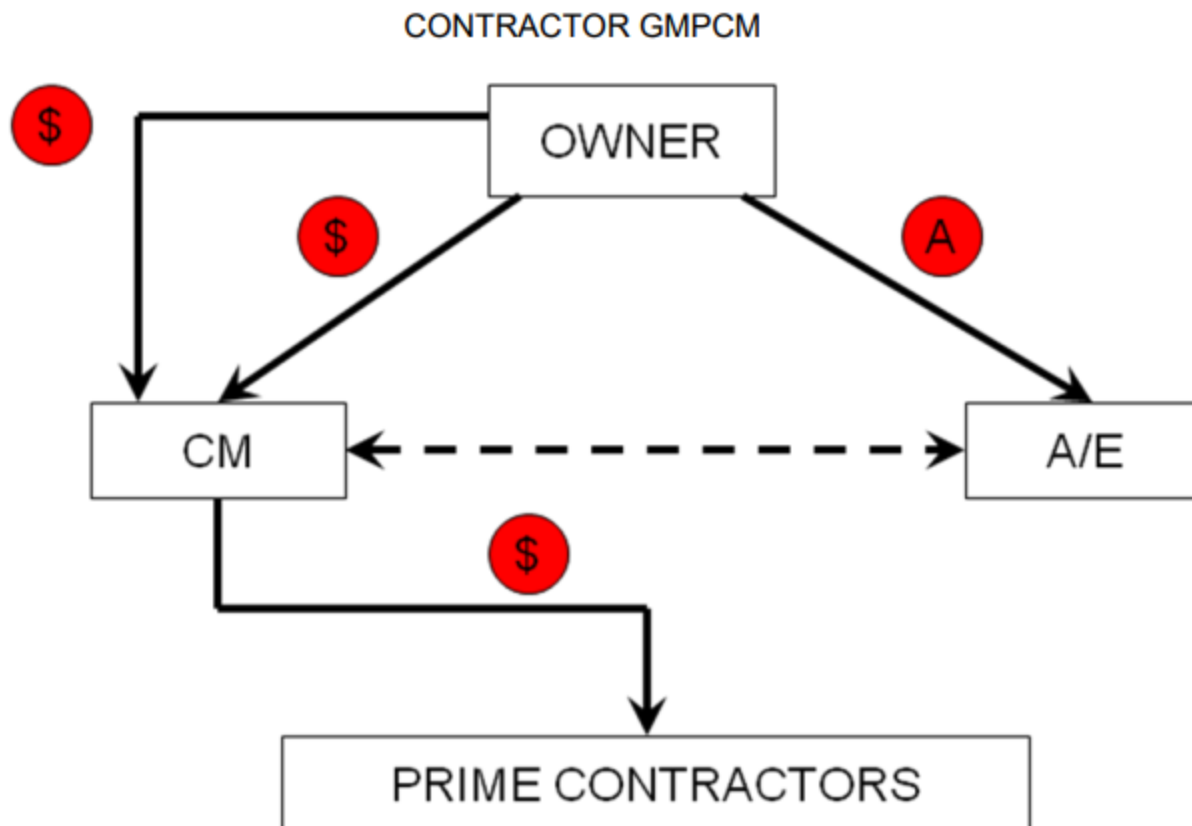
Variations of the CM project delivery method



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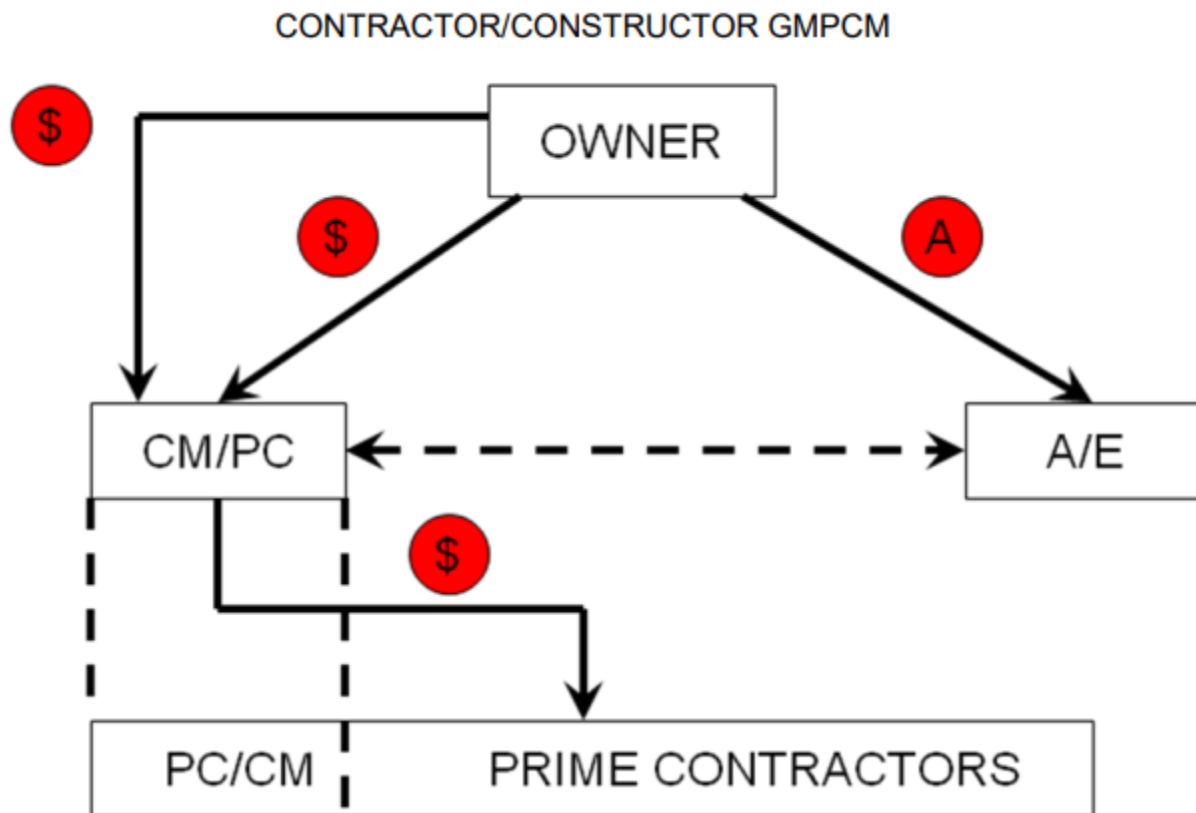
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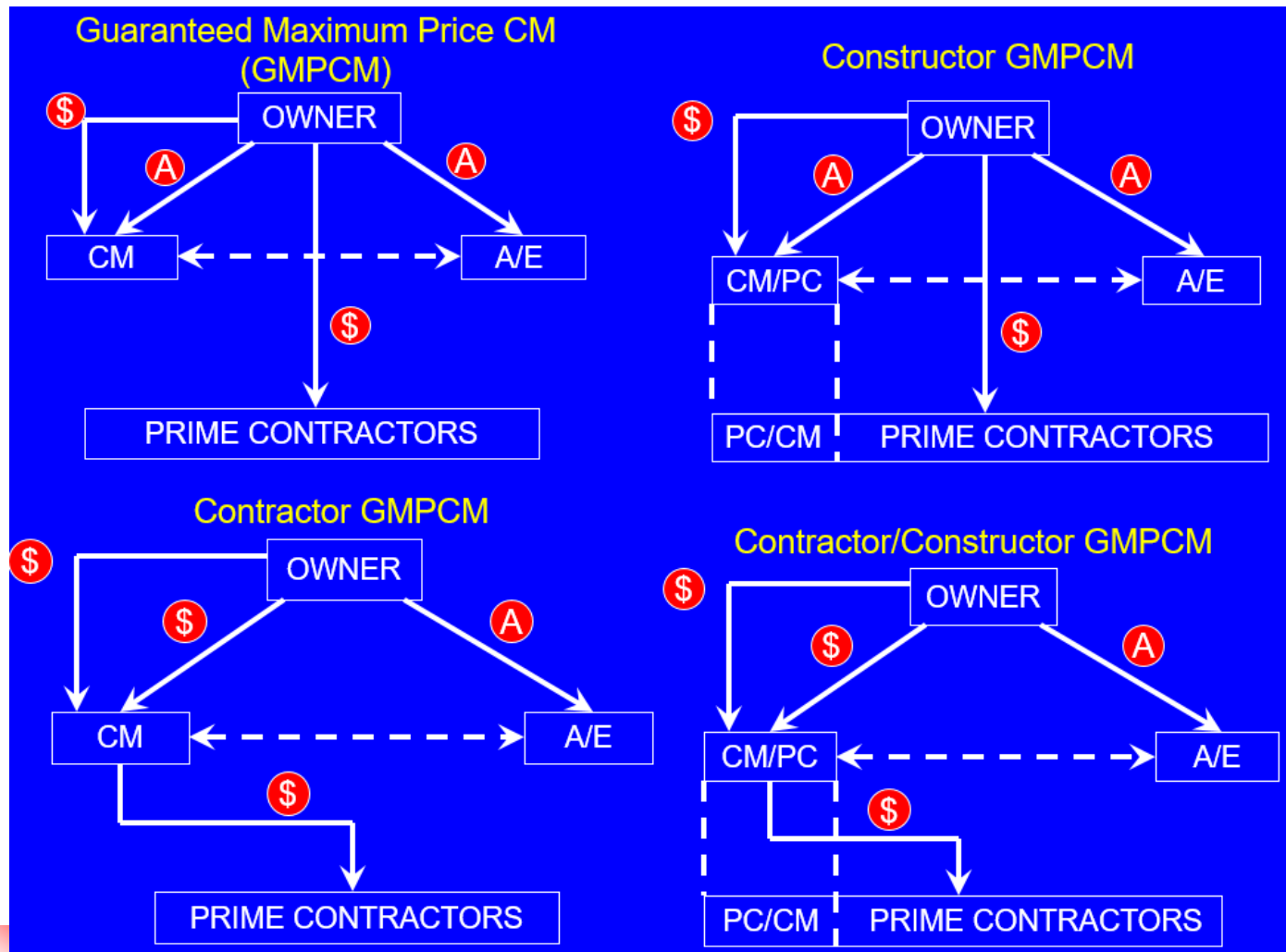
Variations of the CM project delivery method



CM Project Del System

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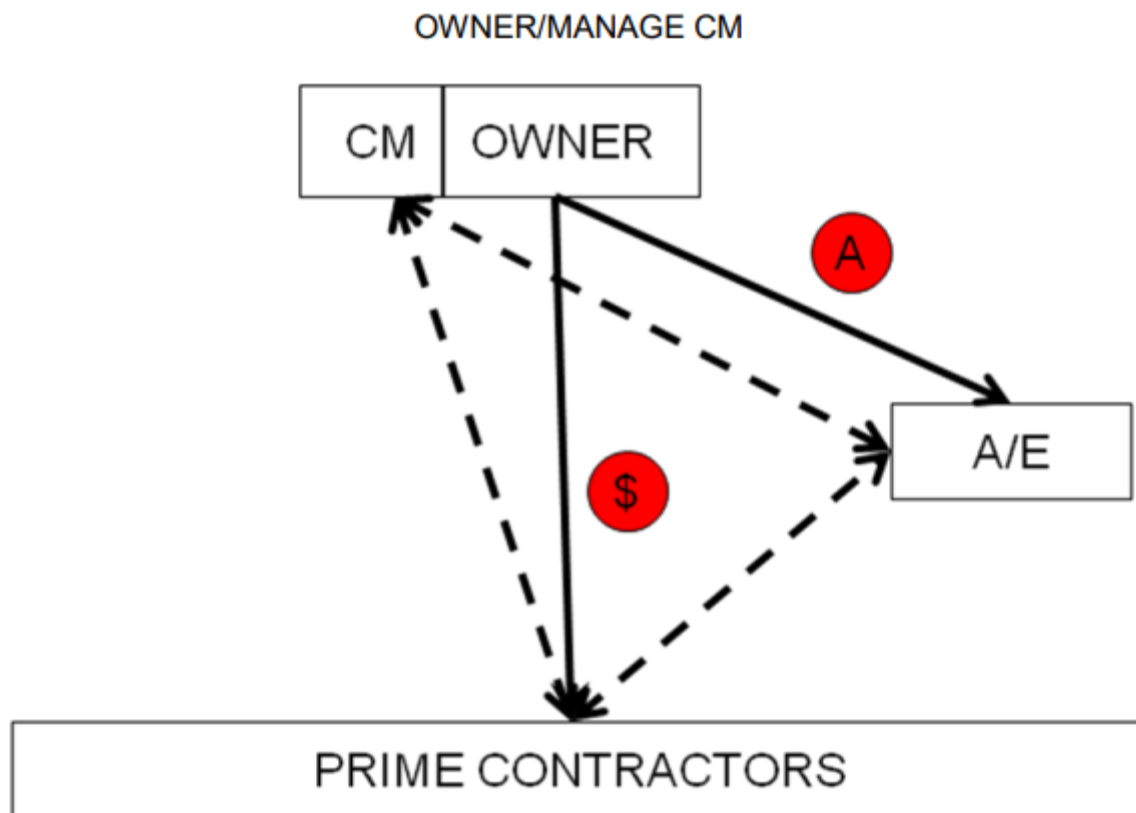
Variations of the CM project delivery method



CM Project Del System

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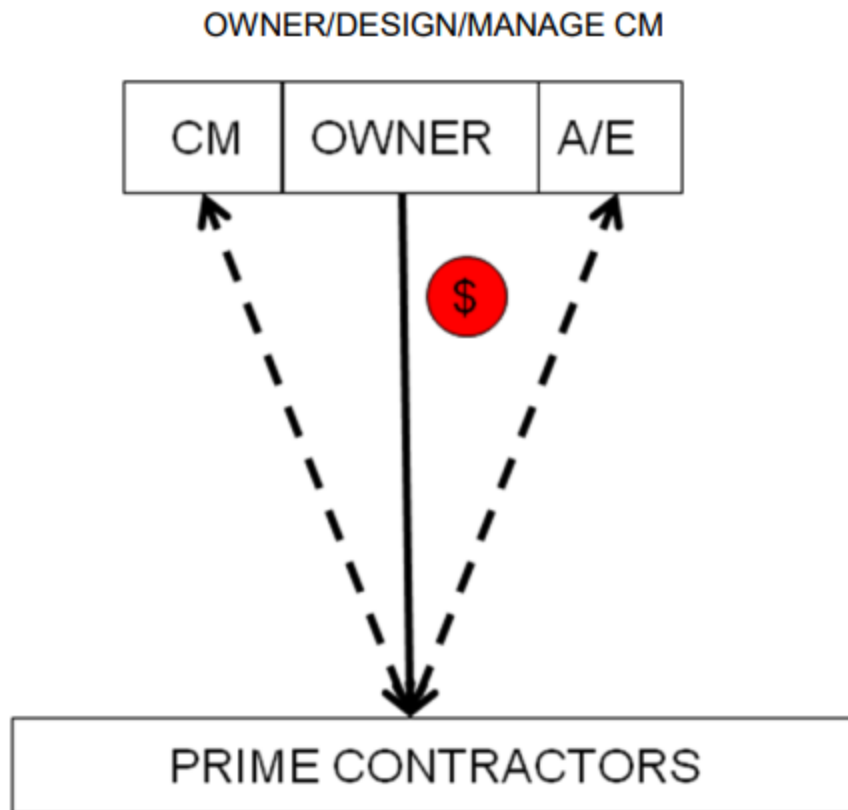
Variations of the CM project delivery method



CM Project Del System

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- o XCM
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- o OCM

Variations of the CM project delivery method



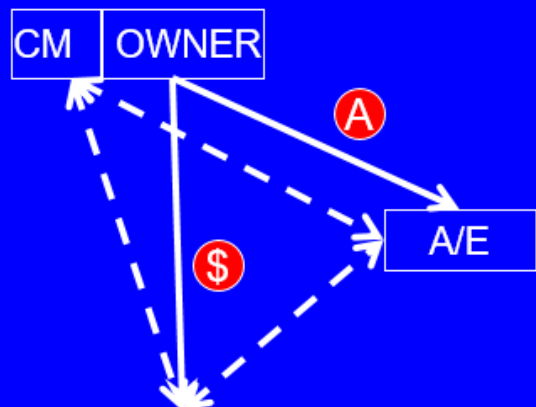
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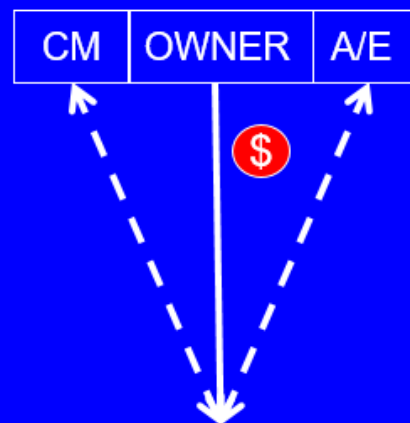
Variations of the CM project delivery method

Owner CM

Owner/Manage CM



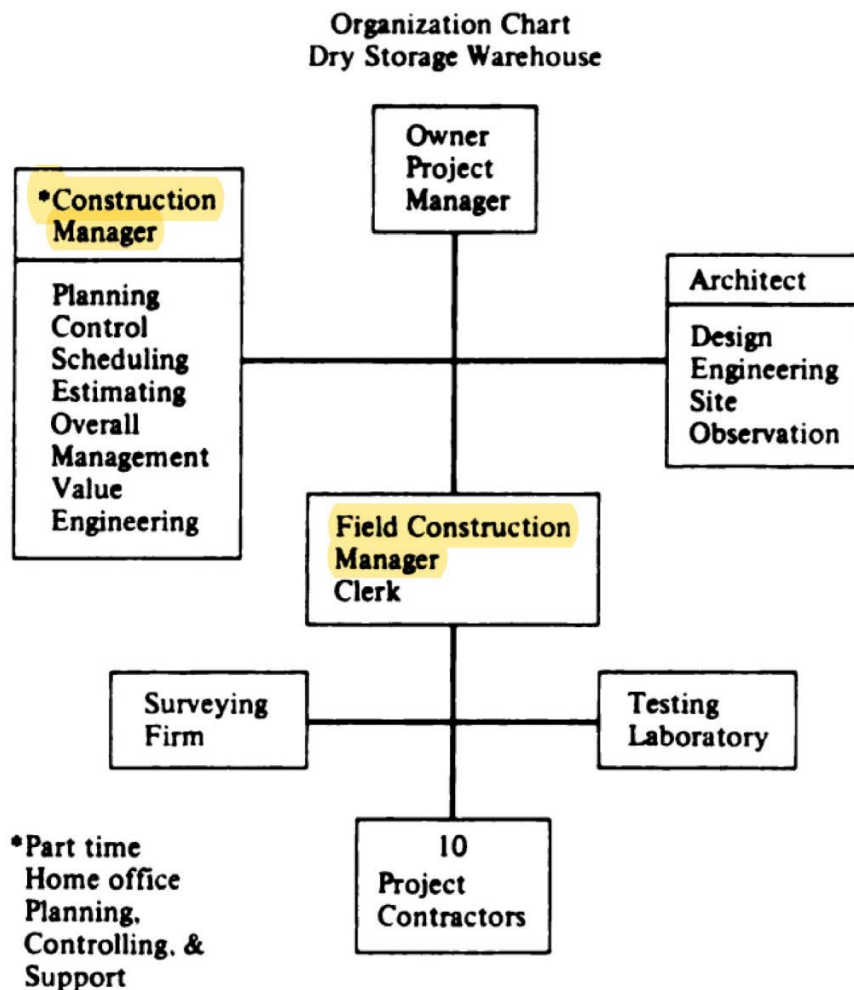
Owner/Design/Manage CM



CM Project Del System

- o ACM
- o XCM
- o GMPCM
- o OCM

Variations of the CM project delivery method



CM Project Del System

- o ACM
- o XCM
- o GMPCM
- o OCM

Advantages of the CM delivery method

❑ Minimizing schedule problems (77%)

- ❖ Mitigation of delay
- ❖ Phasing of design, bid/award, construction

❑ Minimizing budget problems (77%)

- ❖ Reduction of contractor overhead
- ❖ Reduction of A/E fees
- ❖ Cost estimating input into design

❑ Leadership for the whole project team (76%)

- ❖ Systems approach to problems
- ❖ Single source of management
- ❖ Reduction in owner's involvement
- ❖ Elimination of adverse relationships
- ❖ Construction input into design
- ❖ Possibility of owner-purchased materials

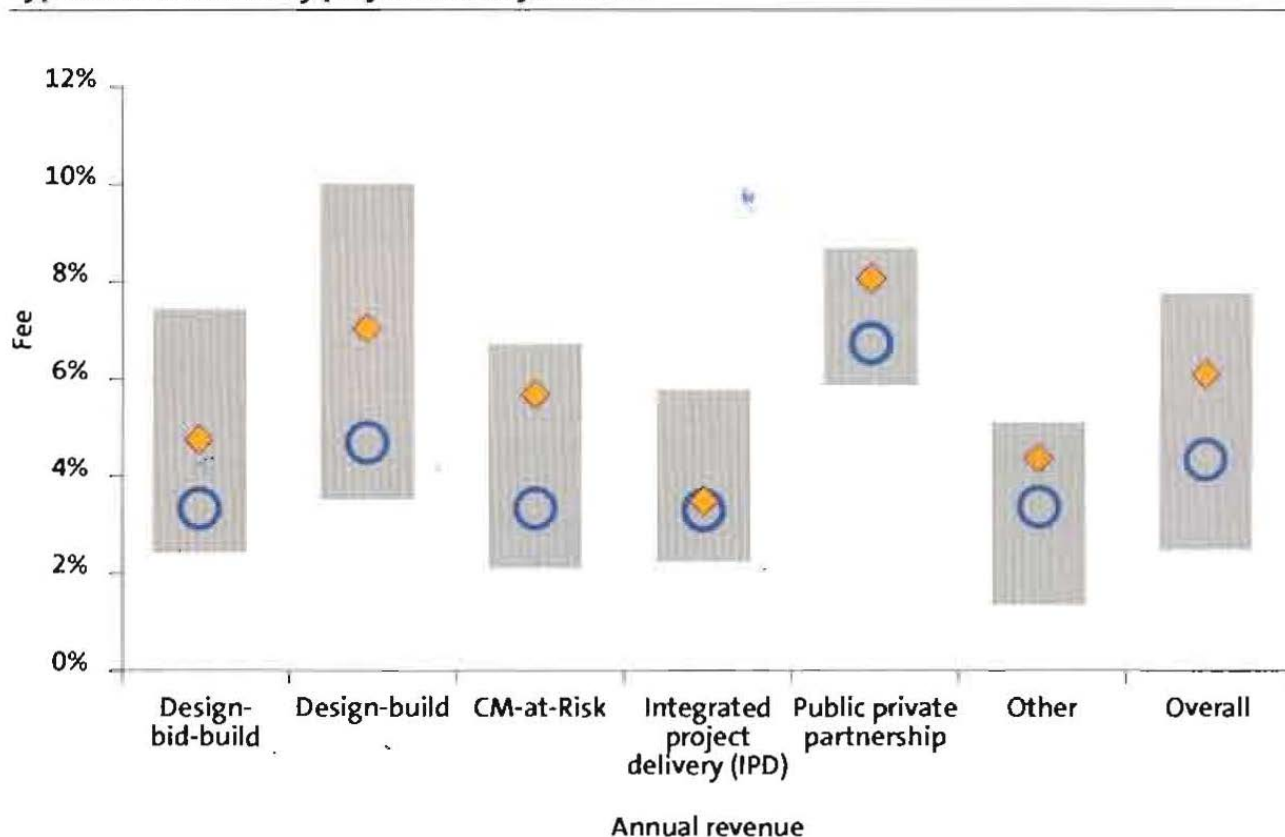
Disadvantages of the CM delivery method

- ☐ Fees to be paid to the CM (average 5.6% in 2014, ranging between 0.6% to 18%)
 - ❖ Fixed fee
 - ❖ Fixed fee + reimbursable items
 - ❖ Percent of project cost
- ☐ Unknown total cost at start
- ☐ Responsibility without authority
- ☐ No cost guarantee given by CM
- ☐ Bonding of individual contractors
- ☐ Problems with phased construction



Disadvantages of the CM delivery method

Typical CM/PM fees by project delivery method



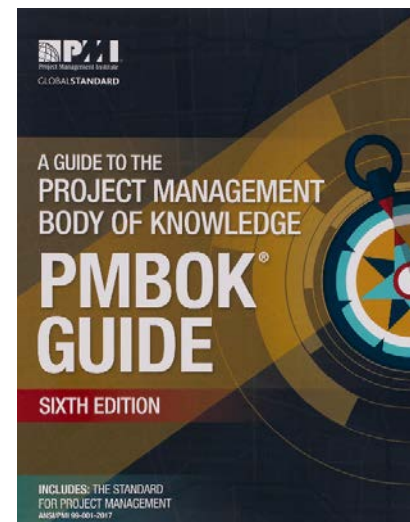
The grey-shaded bars represent the span from the 25th percentile to the 75th. The blue circles represent the median values and the orange diamonds represent the averages.

Owners and Project Types

(CMs body of knowledge and their roles)

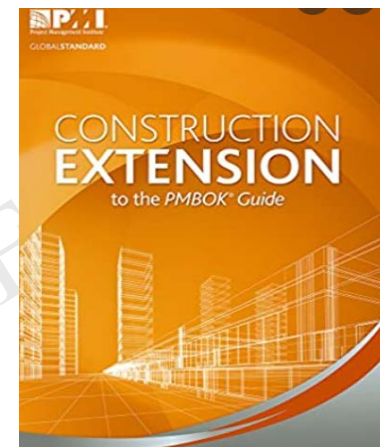
General PM body of knowledge

- ☐ Project integration management
- ☐ Project scope management
- ☐ Project schedule management
- ☐ Project cost management
- ☐ Project quality management
- ☐ Project resource management
- ☐ Project communication management
- ☐ Project risk management
- ☐ Project procurement management
- ☐ Project stakeholder management



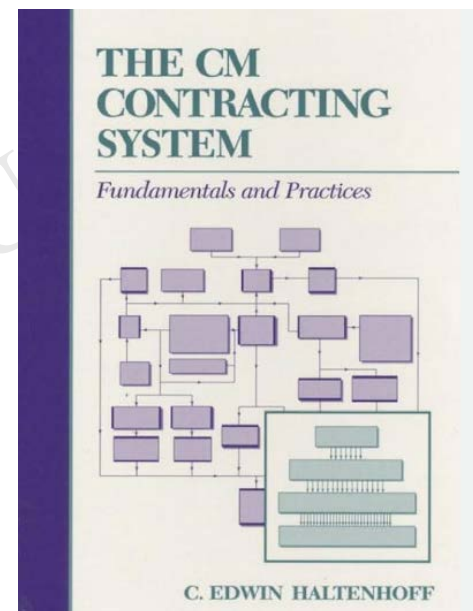
Construction PM body of knowledge

- ☐ Project integration management
- ☐ Project scope management
- ☐ Project schedule management
- ☐ Project cost management
- ☐ Project quality management
- ☐ Project resource management
- ☐ Project communications management
- ☐ Project risk management
- ☐ Project procurement management
- ☐ Project stakeholder management
- ☐ Project health, safety, security, and environment (HSSE) management
- ☐ Project financial management
- ☐ ANNEX A1 (Managing claims in construction)



CM body of knowledge

1. Budget management
2. Contract management
3. Decision management
4. Information management
5. Materials/Eqt management
6. Project management
7. Quality management
8. Resource management
9. Risk management
10. Safety management
11. Schedule management
12. Value management





CM body of knowledge

حرفه مدیریت ساخت (بر اساس سند مهمی از CMAA)
بخش اول: معرفی دنیای مدیریت ساخت



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Construction and Program
Management Worldwide

CM Core Competencies

CMAA's Standards of Practice include construction management core competencies and accompanying body of knowledge that must be learned and successfully mastered before becoming a professional construction manager/project manager. CMAA's publications include competencies around the following subject areas:

CONSTRUCTION MANAGEMENT CORE COMPETENCIES

A Guide to the Construction Management Core Competencies and their Body of Knowledge

CM PROFESSIONAL PRACTICE	1
CM PROJECT MANAGEMENT	4
COST MANAGEMENT	7
TIME MANAGEMENT	9
QUALITY MANAGEMENT	10
CONTRACT ADMINISTRATION	12
SAFETY MANAGEMENT	15

Trends in Expectations about Duties and Responsibilities of Construction Managers

David Arditi, M.ASCE¹; S. M. Reza Alavipour, Ph.D.²; and
The Committee on Management Practices in Construction (ASCE Construction Institute)

<https://dralavipour.com/blog/view/CM-roles>

❑ As a leader, manager, and influencer, the CM must focus on specific areas of the project:

1. Contract Administration
2. Cost Management
3. Information Management
4. Project Management
5. Quality Management
6. Risk Management
7. Sustainability Management
8. Time Management



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CAPSTONE

An Introduction to
the Construction
Management Profession

2020

Code of professional conduct

Professional construction management

Project management

Cost management

Time management

Quality management

Contract administration

Safety management

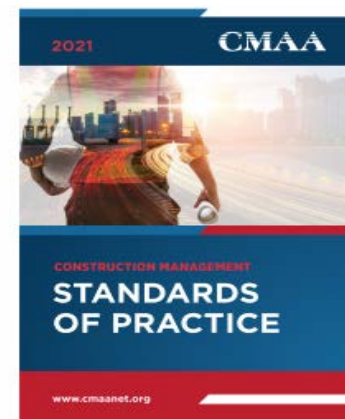
Sustainability

Technology management

Risk management

Program management

✓ Stakeholder, PGMO, MIS, Scope, Procurement





Understanding Your Role

CM/PM Responsibilities
by Project Delivery Method

Acknowledgments

Like all professional associations, the Construction Management Association of America (CMAA) relies on its members' efforts for success. We gratefully acknowledge the following team members who made this manual possible.

2025 Edition Contributors

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Owners and Project Types

(CM services)

- ❑ **CM services** may be requested to provide management techniques and expertise that is **tailored** to **owner's specific project needs**.
- ❖ Typically, **this service** is not included in the **project contract documents** and is **not part** of a project delivery method.
- ❑ As part of **CM services**,
the CM works in an agency capacity by applying and integrating
comprehensive project controls to manage the critical issues of
time, cost, scope, safety, and quality.

❑ Construction management services may include:

- | | |
|--|--|
| » Alternative Project Delivery Solutions | » Program Management |
| » Asset & Facilities | » Project Controls |
| » Building Information Modeling (BIM) | » Project Management |
| » Claims & Contract Solutions | » Project Monitoring |
| » Commissioning Services | » Quality Management |
| » Construction Management | » Regulatory Compliance |
| » Cost Management | » Risk Management |
| » Energy & Sustainability Solutions | » Safety & Environmental Health Mgmt. |
| » Inspection Services | » Schedule Management |
| » Operations & Maintenance | » Virtual Design & Construction Services |

☐ A **separate contract agreement** will

1. Establish the scope of services and
2. Define the relationship between the parties.

☐ It is possible that **certain tasks** and **responsibilities** place the CM in a legal agent relationship with the owner;

however, the CM

1. has **no** vested **financial interest** in the project—in either its design or construction—and
2. **maintains** a responsibility to
 - I. act on the **owner's behalf** and
 - II. provide **impartial advice** concerning the construction project.

- ❑ **Regardless of the project delivery method used,**
a professional CM should **improve the owner's confidence** in the success of the project.

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❑ This **enhanced confidence grows out** of the ability of a professional CM to make **expert recommendations** regarding:

- ❖ Most effective use of available funds.
- ❖ Enhanced control of the scope of the work.
- ❖ Optimal project/program scheduling options.
- ❖ Best use of individual project team members' expertise.
- ❖ Maximum avoidance of delays, changes, and claims.
- ❖ Enhanced design and construction quality.
- ❖ Optimum flexibility in contracting/procurement options.
- ❖ Recommendations of emerging technology tools.

CM services

❑ **Construction management services** involves the **application** and **integration** of comprehensive project controls to the design and construction process and **generally includes** the following.

- ❖ **Development** of a written scope of work (statement of needs) which is understood by all participants.
- ❖ **Development** of thorough design criteria for issuance to the designer.
- ❖ **Communication** and **management** of risk throughout the project, including the **owner's tolerance** for risk.
- ❖ **Design** quality assurance throughout the **design** process.
- ❖ **Consideration** of material, systems, and process alternatives.
- ❖ **Constructability** reviews.

❑ **Construction management services** involves the **application** and **integration** of comprehensive project controls to the design and construction process and generally includes the following.

- ❖ Code compliance **review**.
- ❖ **Milestone** cost estimating—to ensure the design **complies** with the **budget**.
- ❖ **Matching** construction spending to funds availability.
- ❖ Construction contract administration and compliance.
- ❖ **Continuous schedule analysis**.

❑ The **owner** has the **option** of **tailoring** its use of construction management services to **its needs** in order to provide the **best combination** of project control and cost.

❖ For example,

- ✓ many owners have a **large contingent** of **inspection personnel** but may **lack** enough **management experience** to enact effective project cost controls.
- ✓ Or, an owner may wish to have **more construction knowledge** built into the **design process** by engaging a **CM** to perform a value engineering or constructability review.
- ✓ The owner may also desire **enhanced scheduling expertise** in coordinating its **various designers** and **contractors** for a multiple-phase effort.

❑ Other owners may be very **comfortable** with their **design team**

but may need **assistance** in finding qualified contractors to perform the work.

- ❖ Many owners use a CM's construction **closeout services** to resolve **intractable problems** on projects that degenerate due to **disputes** with the contractor over schedule and delay issues.
- ❖ The CM may also provide beneficial services in coordinating the **turnover of the project**

as the **owner begins** to operate and maintain the facility.

- ✓ This is especially **critical** in some phased construction approaches,

where portions of the project may reach **substantial occupancy** as other portions are still in a **design or construction phase**.

Key services offered by a CM at preconstruction stage

- ☐ Owner needs identification
- ☐ Project feasibility study
- ☐ Tax analysis
- ☐ Market research
- ☐ Assistance in financing
- ☐ Obtaining permits
- ☐ Budgeting
- ☐ Value engineering
- ☐ Parameter estimating
- ☐ Scheduling of design
- ☐ Identification of long lead items
- ☐ Bid packaging
- ☐ Awarding contracts
- ☐ Setting out operating procedures
- ☐ Processing paperwork

Key services offered by a CM at construction stage

- ☐ Detailed scheduling
- ☐ Phase estimating
- ☐ Setting out operating procedures
- ☐ Supervision of time and cost
- ☐ Inspection of quality
- ☐ Testing materials
- ☐ Handling paperwork
- ☐ Organizing site safety
- ☐ Regulating labor relations
- ☐ Handling change orders
- ☐ Controlling time and cost
- ☐ Processing contractors' payments
- ☐ Testing completed project
- ☐ Marketing completed project
- ☐ Property management

بخشنامه
شرح خدمات همسان مدیریت طرح

شماره ۹۲/۲۴۱۳۹
تاریخ ۱۳۹۲/۰۳/۲۵

بخشنامه شرح خدمات همسان مدیریت طرح سال ۱۳۹۲



بسمه تعالی

سازمان برنامه ریزی و محاسبات راهبردی، پژوهش و تحقیقات

شماره:	۹۲/۳۴۱۳۹
تاریخ:	۱۳۹۲/۰۳/۲۵

موضوع: شرح خدمات همسان مدیریت طرح

به استناد ماده (۲۳) قانون برنامه و بودجه و ماده (۶) آیین نامه استانداردهای اجرایی طرحهای عمرانی - مصوب سال ۱۳۵۲ و در چارچوب نظام فنی و اجرایی کشور (موضوع تصویب نامه شماره ۴۲۳۳۹/ت/۳۳۴۹۷-هـ مورخ ۱۳۸۵/۴/۲۰ هیأت محترم وزیران)، همچنین جزء (۳) بند «ت» ماده (۳) آیین نامه خرید خدمات مشاوره (موضوع تصویب نامه شماره ۱۹۳۵۴۲/ت/۴۲۹۸۶-ک مورخ ۱۳۸۸/۱۰/۱ کمیسیون اصل ۱۳۸ قانون اساسی) موضوع بند «ه» ماده (۲۹) قانون برگزاری مناقصات، به پیوست «شرح خدمات همسان مدیریت طرح» از نوع گروه سوم ابلاغ می شود.

دستگاههای اجرایی می توانند با استفاده از این دستورالعمل، شرح تفصیلی خدمات را تهیه یا در ابتدا به عنوان یک امتیاز فنی از مشاوران (واحدهای خدمات مدیریت طرح) درخواست نموده و سپس شرح تفصیلی خدمات تلقی شده خود را به همراه سایر اسناد درخواست پیشنهاد (RFP) به منظور اعلام قیمت از مشاوران (واحدهای خدمات مدیریت طرح)، به آنها ابلاغ کنند.

دستورالعمل ۱۰۱/۱۹۴۸۵۹ مورخ ۱۳۸۲/۱۰/۲۱، موضوع دستورالعمل انتخاب و ارجاع کار به واحدهای خدمات مدیریت طرح، کماکان به قوت خود باقی است.

این دستورالعمل جایگزین بخشنامه شماره ۵۴/۲۹۸۳-۵۵-۸۰-۱۰۵ مورخ ۱۳۸۰/۶/۱۳، موضوع شرح عمومی خدمات مدیریت طرح برای تهیه و اجرای طرحهای غیر صنعتی، می شود.

بهرز مرادی

بخشنامه
ضوابط ارائه خدمات مدیریت طرح

شماره ۱۴۰۱/۵۴۱۳۷۱

تاریخ ۱۴۰۱/۱۰/۰۵

ضوابط ارایه خدمات مدیریت طرح سال ۱۴۰۱

 سازمان برنامه و بودجه کشور رئیس سازمان	
بخشنامه به دستگاه های اجرایی، مهندسان مشاور و پیمانکاران	شماره: ۱۴۰۱/۵۴۱۳۷۱ تاریخ: ۱۴۰۱/۱۰/۰۵
موضوع: ضوابط ارایه خدمات مدیریت طرح	
۱۳۸۲/۴/۲۳ و اصلاحیه های بعدی آن در تخصص مربوط به منظور ارایه خدمات مدیریت طرح در خصوص قراردادهایی که امکان تفکیک عملیات میسر نباشد (به تشخیص دستگاه اجرایی) الزامی نیست. ۶- شرح خدمات عمومی خدمات مدیریت طرح برای اجرای طرح های غیر صنعتی، به شرح پیوست این دستورالعمل خواهد بود. دستگاه های اجرایی می توانند با استفاده از این پیوست، شرح تفصیلی خدمات را تهیه یا در ابتدا به عنوان یک امتیاز فنی از مشاوران (واحدهای خدمات مدیریت طرح) درخواست نموده و سپس شرح تفصیلی خدمات تلفیق شده خود را به همراه سایر اسناد درخواست پیشنهاد (RFP)، به منظور استعلام قیمت از مشاوران (واحدهای خدمات مدیریت طرح)، به آنها ابلاغ کنند. این دستورالعمل جایگزین بخشنامه شماره ۹۵/۸۶۰۳۹۶ مورخ ۹۵/۹/۲ موضوع «شرح عمومی خدمات مدیریت طرح در صنعت احداث (برای اجرای طرح های غیر صنعتی)» و دستورالعمل شماره ۱۰۱/۱۹۴۸۵۹ مورخ ۱۳۸۳/۱۰/۲۱ موضوع «انتخاب و ارجاع کار به واحدهای خدمات مدیریت طرح» خواهد بود.	
 سید مسعود میرزاظمی	

شماره ۴۷۶۱۱۱۵

صفحه ۱ از ۱

 سازمان برنامه و بودجه کشور رئیس سازمان	
بخشنامه به دستگاه های اجرایی، مهندسان مشاور و پیمانکاران	شماره: ۱۴۰۱/۵۴۱۳۷۱ تاریخ: ۱۴۰۱/۱۰/۰۵
موضوع: ضوابط ارایه خدمات مدیریت طرح	
در چارچوب ماده (۳۴) قانون احکام دائمی برنامه های توسعه کشور، موضوع نظام فنی و اجرایی یکپارچه، ماده (۲۳) قانون برنامه و بودجه و همچنین جزء (۳) بند «ت» ماده (۳) آئین نامه خرید خدمات مشاوره (تصویب نامه شماره ۱۹۳۵۴۲/ت/۴۲۹۸۶/ک مورخ ۱۳۸۸/۱۰/۱ هیات محترم وزیران)، ضوابط مربوط به ارائه خدمات مدیریت طرح به شرح زیر ابلاغ می شود تا پس از سه ماه از تاریخ ابلاغ به مورد اجرا گذاشته شود: ۱- موافقتنامه و شرایط عمومی همسان قراردادهای خدمات مدیریت طرح، بر اساس دستورالعمل شماره ۱۰۵-۷۳۵-۵۴/۲۰۱ مورخ ۱۳۸۰/۱/۲۸ تنظیم می شود. ۲- شرکتهای دارای گواهینامه مشاوره یا احراز صلاحیت فنی شده در پایه های (۱) یا (۲) در یکی از تخصصهای مندرج در آیین نامه تشخیص صلاحیت مشاوران مصوب هیات محترم وزیران به شماره ۲۸۴۳۷/ت/۲۰۶۳۷ مورخ ۱۳۸۲/۴/۲۳ و اصلاحیه های بعدی، در صورتیکه متقاضی ارایه خدمات مدیریت طرح در تخصص متناظر باشند، لازم است درخواست مکتوب خود را به امور نظام فنی اجرایی، مشاورین و پیمانکاران اعلام نمایند تا امکان ارایه خدمات مدیریت طرح در تخصص مورد تقاضا در گواهینامه مشاوره آنان صادر و همچنین در سامانه اطلاعات عوامل نظام فنی و اجرایی کشور (ساجار) اعلام گردد. ۳- گواهینامه های خدمات مدیریت طرح که قبل از تاریخ این بخشنامه صادر گردیده، به شرط دارا بودن پایه (۱) یا (۲) تخصص مرتبط، به منزله امکان ارایه خدمات مدیریت طرح بوده و شامل بند (۳) این بخشنامه نمی شوند. ۴- به ظرفیت کاری شرکتهای دارای گواهینامه مشاوره که امکان ارایه خدمات مدیریت طرح دارند یک ظرفیت کاری در تخصص مرتبط اضافه می شود. استفاده از ظرفیت کاری اضافه شده، برای ارایه خدمات مشاوره امکان پذیر نبوده لیکن استفاده از تمام تعداد ظرفیت مشاوره در تخصص مرتبط به منظور ارایه خدمات مدیریت طرح مجاز می باشد. ۵- شرکتهای مشاور که امکان ارایه خدمات مدیریت طرح دارند می توانند تا سقف حداکثر حق الزحمه مناسب آن تخصص در پایه یک نسبت به انعقاد قرارداد اقدام نمایند لیکن رعایت مبلغ حداکثر حق الزحمه مناسب در پایه یک (موضوع جدول شماره (۹) آیین نامه تشخیص صلاحیت مشاوران مصوب هیات محترم وزیران به شماره ۲۸۴۳۷/ت/۲۰۶۳۷ مورخ ۱۳۸۲/۴/۲۳)	

شماره ۴۷۶۱۱۱۵

صفحه ۱ از ۱



حرفه مدیریت ساخت

(سند Capstone، از مراجع اصلی اخذ مدارک CMAA)

بخش دوم: قراردادهای و موافقتنامه‌های مدیریت ساخت

ارائه دهنده:

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(PhD, PMP, CMIT)

CMAA Authorized Trainer

دانشگاه Illinois Tech آمریکا

What we will learn?

☐ Section Objectives

☐ Contracts

☐ Formats

☐ Types of Contracts

☐ CM Contract Documents

☐ Modifying Contracts

☐ موافقتنامه و شرایط عمومی همسان قراردادهای خدمات مدیریت طرح

☐ موافقتنامه و شرایط عمومی همسان قراردادهای خدمات مشاوره

☐ موافقتنامه و شرایط عمومی همسان قراردادهای خدمات مدیریت طرح در صنعت نفت

Section Objectives

Introduction

- ❑ Learn about the **two basic contracting formats** and how they are acquired.
- ❑ Understand the **differences** among the types of contracts, the important parts of a contract, and the applicable delivery methods.
- ❑ Learn **how an owner may opt** to use standard forms of agreements, a customized project-specific set of contracts, or a combination of the two.
- ❑ **Review** the **four basic types** of standard form contracts available.
- ❑ **Learn about AIA contract documents** and their uses.
 - ❖ Understand the difference between CMAA and AIA contracts for agency and at-risk CMs.
- ❑ Understand the **basic process** for **modifying** a contract.

Contracts

- ❑ A **contract** is an arrangement for the **distribution** of construction project risk—
most frequently **cost** or **performance** risk—
between the **parties**.

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❑ Cost risk is the risk of **not** being able to **complete** a **defined scope** within a given budget or of changes to the scope **exceeding** the original budget agreement.

❖ This risk distribution is **accomplished** through methods of arriving at or limiting, the **amount** of money to be **paid**.

❑ Performance risk is the risk of **not** being able to **complete** the project

1. On time and
2. At the level of quality and
3. Cost as agreed.

This is **distributed** through the **technical terms** of the contract, either by

1. Describing requirements for the **finished product only** or
2. Describing specific **methods** by which a **task** is to be **performed**.

- ❑ When **contract administration** is the **CM's** responsibility,
 1. It's important to not only **read** the **contracts**,
 2. But to also make **sure** they **clearly define everything**, including owner/contractor **contingencies**.
 - ❖ The CM may want to **engage** the **advice** of a professional for **interpreting contracts**.

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Formats

❑ Many **contracting formats** have evolved because of the desire of owners or contractors to either

1. shift or share the **risk** (usually cost) of a project through **contractual provisions** or
2. increase the **speed of delivery** of the construction.

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- ❑ Public and often private works are usually procured through a **sealed bid**, **fixed price** contract.
 - ❖ In these contract arrangements, **most** of the **cost risk** is intended to shift to the **contractor**.
 - ❖ In order to provide a reasonable and enforceable **scope definition** to the contractor so that **bids** can be developed, **fixed-price contracts** are almost always based on a **completed design**.

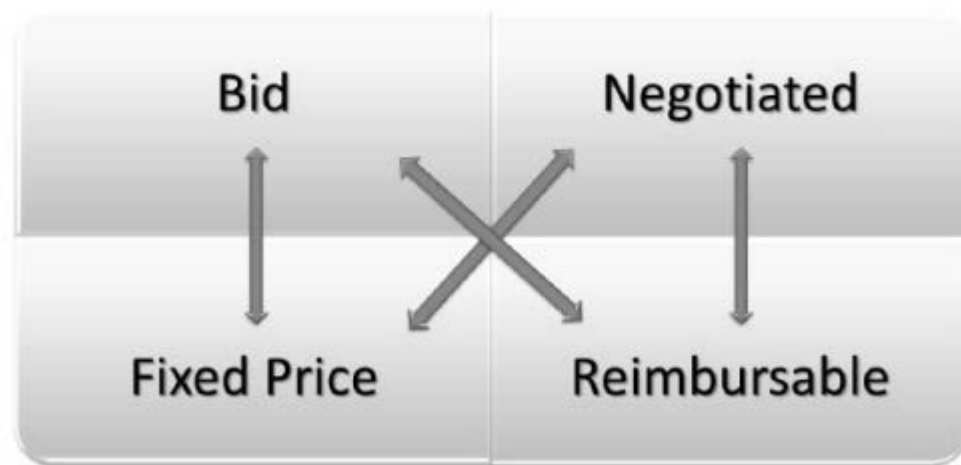
☐ The **need** to have a **completed design** in hand prior to the commencement of construction requires

1. **Longer lead time** for the construction process and
2. A **linear approach** to project delivery
that **reduces** flexibility.

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□ All construction phase contracts are a **variation** of two basic forms—

1. Cost reimbursement
 2. Fixed price
- ❖ Most involve pricing that is either
- i. negotiated or
 - ii. procured by **competitive bid**.



❑ **Contract formats** are usually as follows:

1. Price competitively bid contract
2. Negotiated price contract
3. GC reimbursement methods
 - i. Lump sum,
 - ii. GMP,
 - iii. Unit price,
 - iv. Cost plus fixed fee,
 - v. Time & materials

GC Reimbursement Methods	Fixed vs. Reimbursable
» Lump Sum » GMP » Unit Price » Cost Plus Fixed Fee » T&M	When is a reimbursable contract the best choice? » Unknown quantities of work » Risky work Work that is impossible to define

☐ Seeking **more flexible alternatives**,

the private sector developed a host of **risk-shifting** and **risk-sharing** contract variations, including

- ❖ negotiated fixed price,
- ❖ GMP,
- ❖ cost plus fixed or variable fee,
- ❖ time and material, and
- ❖ unit price.

❑ These contracts run the **spectrum** from the lump sum, where all the cost and schedule risks are placed on the **contractor**, to

cost-reimbursable situations, where the owner agrees to **pay all costs**.

❖ Most of these methods are now also being implemented, to some extent, by **public sector owners**.

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Types of Contracts

Types of contracts

- ❑ The **actual usage** of a **particular contract** for the construction phase depends on
1. Delivery method being used,
 2. Type of project being implemented,
 3. Completion status of the plans and specifications at the time of contracting, and
 4. Consideration of any performance requirements.

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Types of contracts

☐ Other factors include

1. Type and level of sophistication of the owner,
2. Role of the designer(s),
3. Method of financing,
4. Scheduling requirements, and
5. In the public sector, compliance with applicable laws and statutes.

Some of the **more commonly used** construction contracting **forms** and the **corresponding project delivery methods** that they are **most often associated** with are shown in the **table**.

Types of contracts

TYPE OF CONTRACT (CONSTRUCTION PHASE)	BASIC DELIVERY METHOD			
	Design-Bid-Build (Traditional)	Multiple Prime	CM At-Risk (CMAR)	Design- Build
Fixed Price/Lump Sum	X	X	X	X
Cost Plus Fixed Fee		X	X	X
Guaranteed Maximum Price			X	X
Time and Material	X			
Unit Price	X			

Fixed price/lump sum

❑ **Fixed-price contracts**, also known as **lump sum contracts**, are used in the private and public sectors,

primarily with the **traditional project delivery system** for contracting with single and Multiple Prime Contractors.

❖ This form of contract is also used for contracting **trade** or **specialty** contractors as part of the CM at-risk and D-B delivery methods.

TYPE OF CONTRACT (CONSTRUCTION PHASE)	BASIC DELIVERY METHOD			
	Design-Bid-Build (Traditional)	Multiple Prime	CM At-Risk (CMAR)	Design- Build
Fixed Price/Lump Sum	X	X	X	X
Cost Plus Fixed Fee		X	X	X
Guaranteed Maximum Price			X	X
Time and Material	X			
Unit Price	X			

Fixed price/lump sum

- ❑ In the **private sector**, contractors are usually **pre-qualified** with the objective of
 1. Improving quality and
 2. Meeting established safety standards.
- ❖ In the **public sector**, pre-qualification is usually subject to restrictions established by **laws** and **statutes**.
- ❑ Contractors are usually asked to **bid work** based on a complete set of drawings and specifications,
but, on **rare occasions**, may be asked to bid on a **partially complete design**, known as a scope bid.

Fixed price/lump sum

☐ Once **bids** are received and evaluated,

a fixed price contract is usually awarded to **lowest bid** from the person or entity that makes a **submission** that

conforms to the requirements identified in the **RFP**,

also known as a “**responsive bidder**.”

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Fixed price/lump sum

- ❑ The **fixed price** includes **all costs** to the contractor,
who **agrees** to provide
 1. What is clearly stated or
 2. Reasonably impliedby the construction documents used for bidding.
- ❑ With this contracting method, the **contractor** usually **assumes all** the **risks** associated with cost and performance.
 - ❖ Therefore, it is important that the **contractor price such risks** and **include** them in the bid.

Fixed price/lump sum

❑ In negotiated fixed-price contracts,

generally used in the **private sector**,

contractors may be brought on before the design is complete to provide

1. Preliminary pricing and even

2. Pre-construction services.

❖ These **preliminary prices** form a **basis to negotiate**
the **fixed price agreed** to under contract.

Fixed price/lump sum

- ❑ The **primary advantage** to the owner of the fixed price or lump sum contract is that
 - ❖ The construction **costs are known prior** to the actual work starting.
 - ❖ In addition, a **fixed commitment** is obtained by the owner from the contractor.
 - ✓ **Best results** are achieved when
 1. The contract **documents are 100%** complete and
 2. There are a reasonable number of **experienced contractors willing** to bid.

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Fixed price/lump sum

❑ A **disadvantage** of the fixed-price contract is the potential for an **adversarial position** between the owner and the contractor.

❖ In addition, **poorly drafted** construction documents can result in need for **changes**, thus

- ✓ Increasing contract costs,
- ✓ Possibly delaying completion, and
- ✓ Resulting in claims.

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Cost plus fixed fee

- ❑ The **cost-plus-fixed-fee** contract is a cost-reimbursement type of contract that provides for a **fixed fee established** at the **time of contract award**.
- ❖ The **fee** does not vary with the **actual costs expended**
unless the **scope** of work is **changed**.
- ❑ **Depending** on the terms and conditions of the contract,
the **fee** may also be **increased** when
the **contract** is **delayed** for reasons **beyond** the control of the
contractor involved.

TYPE OF CONTRACT (CONSTRUCTION PHASE)	BASIC DELIVERY METHOD			
	Design-Bid-Build (Traditional)	Multiple Prime	CM At-Risk (CMAR)	Design- Build
Fixed Price/Lump Sum	X	X	X	X
Cost Plus Fixed Fee		X	X	X
Guaranteed Maximum Price			X	X
Time and Material	X			
Unit Price	X			

Cost plus fixed fee

- ❑ The use of a **fixed fee** allows the **owner** to **limit** the potential incentive for the contractor to increase profit **through increasing contract costs**.
- ❖ The owner should **adjust** the **fixed fee only** when unusual circumstances or difficulties arise.
- ❖ **Factors** having a bearing on the **amount of fixed fee** include
 - ✓ Size,
 - ✓ Complexity,
 - ✓ Location,
 - ✓ Duration,
 - ✓ The scope of work, and
 - ✓ The terms and conditions agreed to by the parties for direct reimbursement costs.

Cost plus fixed fee

❑ The **fixed fee** usually includes **profit**, plus

1. The cost of officers,
2. Principals, and
3. Home office support staff not directly assigned to the construction site;
4. All costs not directly related to site operations, and
5. Cost not identified as reimbursable under the terms and conditions of the contract.

*Examples of costs that are **not normally** a part of the **reimbursable expenses** include*

1. *home office overhead,*
2. *recruitment costs for the job site, and*
3. *home office personnel.*

Cost plus fixed fee

❑ Reimbursable expenses generally include

- ❖ The costs of all job site supervisory personnel,
- ❖ Staff relocation costs,
- ❖ Travel and living expenses,
- ❖ Subsistence to key field employees;
- ❖ The cost of all job site labor, material, equipment,
- ❖ All subcontractor costs,
- ❖ Communications, vehicles, project-related fees paid, reproduction, postage, computers, and
any **other field office-related expenses.**

Cost plus fixed fee

❑ Other reimbursable expenses may include

use of **home office personnel** who may be involved in purchasing, expediting, scheduling, and estimating, and any other specific functions or tasks that are usually part-time and project or field support service related.

❑ Further, the cost of general condition items and any field labor associated with the performance of **general conditions** would be considered **reimbursable** expenses.

Cost plus fixed fee

- ❑ **This type** of cost-reimbursement contract allows construction to **start without** the **plans and specifications** being 100% complete.
- ❖ When **time restraints** are a concern,
this method of contracting becomes a **means** of meeting the **earliest possible time** objectives.
- ❖ In addition, this method allows phasing and sequencing of **key decision points** that may be necessary for **determining the feasibility** of unique or state of the art projects with unpredictable pricing by **tracking sequential progress** vs. available budget as **construction is underway**.

Cost plus fixed fee

- ❑ While this method is open-ended and potentially costly, there are **situations** such as unique or remote projects where some **costs cannot** be **foreseen**.
 - ❖ If a **fixed price** contract were **used**, the contracts would have to include **large contingencies** for **such risks**.

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Cost plus fixed fee

❑ A **variation** to the cost-plus-fixed-fee approach is the **percentage fee plus cost**.

In this case, the **fee** is based on a percentage of the **total cost** of the work and the services provided.

❖ The **primary disadvantage** of this option to the owner is the **possible disincentive** for the contractor involved to control time and costs.

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Time and material

❑ This type of contract provides for the contractor to be **reimbursed** for

all **its time** at fixed hourly rates for

1. Equipment and material, plus
2. All subcontractor costs for construction.

❖ The contractor also receives a **reasonable allowance** for overhead and profit.

❖ Essentially the **entire risk** is borne by the **owner** and the **potential** for **gain** is **limited** for the contractor.

TYPE OF CONTRACT (CONSTRUCTION PHASE)	BASIC DELIVERY METHOD			
	Design-Bid-Build (Traditional)	Multiple Prime	CM At-Risk (CMAR)	Design- Build
Fixed Price/Lump Sum	X	X	X	X
Cost Plus Fixed Fee		X	X	X
Guaranteed Maximum Price			X	X
Time and Material	X			
Unit Price	X			

Time and material

- ❑ The owner may **retain control** over
contractor's methods, procedures, and performance requirements.
- ❑ This type of contract is **occasionally used** with the traditional delivery system
but is **most common** in situations where the **scope of work cannot** be clearly defined, such as
repair work, maintenance, or emergency repair situations.
 - ❖ The **owner** has **no control** over the ultimate cost, and
the **contractor** has **little incentive** to
work efficiently or
control project costs.

- ☐ This type of contract is used as one of the options associated with the **traditional delivery system**, when the **exact quantities** may be unknown.
- ☐ This format is **most closely associated** with sealed bid contracts and is primarily used for civil works and horizontal-type construction projects.
- ☐ The **total cost** to the owner will vary with the actual quantities of units put in place and the **owner** assumes the risk of cost and the amount of work required.

TYPE OF CONTRACT (CONSTRUCTION PHASE)	BASIC DELIVERY METHOD			
	Design-Bid-Build (Traditional)	Multiple Prime	CM At-Risk (CMAR)	Design- Build
Fixed Price/Lump Sum	X	X	X	X
Cost Plus Fixed Fee		X	X	X
Guaranteed Maximum Price			X	X
Time and Material	X			
Unit Price	X			

Unit price

☐ While **this type** of contract allows work to **proceed without the full scope** being known,

it requires **accurate methods** of measuring quantities and reimbursement terms be established **before the contract is awarded**.

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Unit price

- ☐ The **unit price contract** requires that the work be **divided** into various quantities and that a pricing structure is established for specified units of work.
- ☐ When **competitive bids** are to be considered, it is necessary that
 1. **All units** of work be described, and
 2. Bidders be asked to provide a price for each unit of work.
- ☐ With the unit price contract,

the owner pays a **fixed amount** for **each work unit completed** by the contractor, which, depending on the **contract stipulations**,
will typically include a percentage included by the contractor for its **overhead and profit**.

Unit price

- ❑ The **total cost** of the contract will vary with the actual quantities of units of work put into place.
- ❖ **Quantities** are usually subject to variations and adjustments within **reasonable limits**.
 - ✓ Therefore, in the public sector, **provisions** for an equitable price adjustment are normally included for
increases or decreases of **set percentages** from the estimated quantities.

Unit price

☐ Unit price contracting can be **beneficial**

1. When there are a **limited number** of **work units** and
2. Where the **estimated volume** is **substantial**.

☐ There is **inherent fairness** implied in the method,

in that it provides for the contractor to be **compensated** for **exactly the amount** of work it **completes**.

❖ A **disadvantage** is that the **final cost to the owner** is dependent on

1. The **accuracy** of the **estimated quantities** and
2. That the contractor's individual **unit prices** reasonably reflect the **actual cost** of performing the associated work.

Guaranteed Maximum Price (GMP)

- ❑ This contracting format is commonly used in the private sector and increasingly in the public sector,
often in **conjunction** with the fast-track process (the overlapping of the design and construction activities).
- ❑ It is often **associated** with a CM at-risk delivery method.
- ❑ Under the GMP concept, a **guaranteed maximum price** is established **before** construction starts.
- ❑ The **contractor** agrees to perform within a cap or ceiling that is commonly based on the **completion** and **approval** of the preliminary design-stage drawings and specifications.

Guaranteed Maximum Price (GMP)

❑ The contractor is usually selected and a GMP is established with an **understanding** by the parties that the **actual cost** of the work could be less.

❖ The GMP may include either the estimated or bid cost of

- ✓ Certain trade contracts,
- ✓ Purchases from suppliers and vendors,
- ✓ General condition items,
- ✓ The contractor's fee,
- ✓ Reimbursable expenses, and
- ✓ Sometimes a contingency to protect the contractor from unforeseen costs at the time the GMP is prepared.

TYPE OF CONTRACT (CONSTRUCTION PHASE)	BASIC DELIVERY METHOD			
	Design-Bid-Build (Traditional)	Multiple Prime	CM At-Risk (CMAR)	Design- Build
Fixed Price/Lump Sum	X	X	X	X
Cost Plus Fixed Fee		X	X	X
Guaranteed Maximum Price			X	X
Time and Material	X			
Unit Price	X			

Guaranteed Maximum Price (GMP)

❑ One of the **primary benefits** of this contracting format is the **flexibility** it gives the **owner**,

due to the **ability to retain** the contractor **before** the **construction documents** are 100%.

❖ This presents an opportunity to **enhance**
the **schedule** as well as the **cost** of the project.

❑ Possible **disadvantages** include the complexity associated with

1. The **scheduling** and **coordination** involved and
2. The potential impact resulting from **scope changes** or **differences** over the interpretation of the **original scope**.

Guaranteed Maximum Price (GMP)

- ❑ It is important the **phrase guaranteed maximum price** be clearly defined in the contract as to
what it includes and specifically excludes.
- ❑ **Terminology** such as construction costs or project costs must be **clearly defined**.
 - ❖ The definition of construction costs is usually stated as the **cost of all work** required to **complete the construction** as defined in the construction contract documents.
 - ✓ Normally, it does **not include** such items as land costs, professional service costs, or the cost of movable equipment, furniture, etc.
 - ❖ In addition, **definitions** should be provided for reimbursable and non-reimbursable costs.

Guaranteed Maximum Price (GMP)

- ❑ Once a **GMP** for **construction cost** is established, the **contractor takes on the risk** of completing the project.
- ❖ **Trade** and **specialty** contracts can be bid or negotiated and are usually **held by the contractor**.
 - ✓ It is the **responsibility** of the **contractor** to **stay within**
 1. Its estimated costs and
 2. Contingency allowances.

Guaranteed Maximum Price (GMP)

- ☐ On some GMP projects, the **owner may reserve the right** to
 1. Approve all trade and
 2. Purchase contracts.
- ☐ Under such conditions, the contract should be clear as to **which party pays** the **difference** between
 - ❖ the estimated trade contract cost and
 - ❖ the actual trade contract award valuewhen the **award value approved** by the owner is **greater than** the estimated cost element included in the **GMP**.

Guaranteed Maximum Price (GMP)

☐ Since many GMP contracts are **negotiated**

before the project is completely specified,

a **contingency** is often included in the **GMP**,

to be **drawn against** as the exact scope of the work becomes better defined.

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Guaranteed Maximum Price (GMP)

☐ Items that are

1. Difficult to estimate or
2. Dependent upon the owner's later decision

are sometimes **priced** as **allowances**,

whereby an **agreed-upon allowance** is established to cover the eventual cost.

- ❖ Frequently, **finish items** such as carpets or draperies are priced in this manner, with the **understanding** that the owner will make the **final selection** of these **items later** and will **compensate the contractor** for the **actual amount expended** on them.

Guaranteed Maximum Price (GMP)

❑ Since the **terminology** of a **guaranteed maximum price** implies that the **actual price** could be lower,

it is **reasonable** for an **owner to expect** that it might realize **savings** by paying the contractor the actual cost of completing the project.

❖ The owner can **encourage** the contractor to deliver such savings by **offering an incentive to**

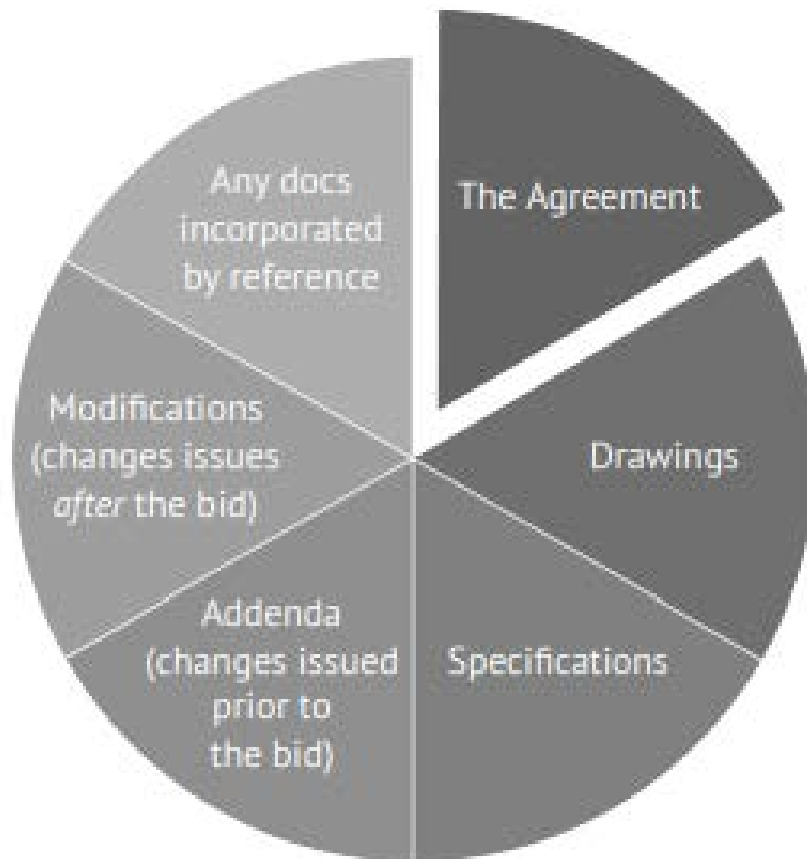
share the savings below the GMP with the contractor and by either

1. **Reviewing** all subcontracts prior to award or
2. **Retaining** the right to audit the project at its completion.

Guaranteed Maximum Price (GMP)

- ❑ As in most contracts, the owner has the **right to make changes**.
 - ❖ Accordingly, the contract should be clear as to **how** the **GMP** will be **equitably adjusted** for both added and deleted work.
 - ❖ If the project is **extended beyond** the scheduled completion date for reasons **beyond the control** of the contractor,
 1. A time extension, and
 2. An increase in the contractor's compensation may be required.

What does a contract document typically include?



CM Contract Documents

CMAA contract documents for CM

- ❑ Currently, there are **four basic standard forms** of agreement issued by CMAA for use when an owner retains a **CM as an agent** of the owner to represent it in the project management process. These documents are as follows:
- ❖ CMAA Document A-1, Standard Form of Agreement Between Owner and Construction Manager (CM as Owner's Agent)
 - ❖ CMAA Document A-2, Standard Form of Contract Between Owner and Contractor
 - ❖ CMAA Document A-3, General Conditions of the Construction Contract; Owner-Contractor Contract
 - ❖ CMAA Document A-4, Standard Form of Agreement Between Owner and Designer.

CMAA contract documents for CM

- ❑ The **four CMAA Standard Forms** of Agreement for **CM at-Risk (CMAR)** where the CM has responsibility for construction performance are as follows:
- ❖ CMAA Document CMAR-1, Standard Form of Agreement Between Owner and Construction Manager
 - ❖ CMAA Document CMAR-2, Standard Form of Agreement Between Construction Manager and Contractor
 - ❖ CMAA Document CMAR-3, General Conditions of the Construction Contract Between Construction Manager and Contractor
 - ❖ CMAA Document CMAR-4, Standard Form of Agreement Between Owner and Designer

CMAA contract documents for CM

❑ The CMAA documents were drafted to

1. Provide contractually specified duties and
2. Avoid concurrent or undefined responsibility to

minimize conflicts between the CM, designer, and contractor.

Standard Form Contracts

- Advantages
 - Increase the predictability of project outcomes
 - Increase the consistency of pricing
 - Simplify management
 - Regularly updated
- Most Common
 - AIA - American Institute of Architects
 - CMAA - Construction Management Association of America
 - ConsensusDocs
 - DBIA - Design Build Institute of America
 - Owner-specific

AIA contract documents for CM

History

- Standard form documents **since 1888** (131 years)
- Evolved to reflect practices in the construction industry
- Substantial volume of interpretive case law (AIA Legal Citator)
- Now, nearly 200 agreements and forms

First AIA Contract Document 1888

AIA Contract Documents

AIA contract documents for CM

- ☐ Construction Manager as Adviser (CMa)
- ☐ Construction Manager as Constructor (CMc)

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AIA contract documents for CM

❑ AIA standard forms of agreement that are comparable to the **CMAA Agency Series**

consist of:

- ❖ AIA Document A132-2009 (formerly A101CMa-1992) Standard Form of Agreement Between Owner and Contractor, Construction Manager as Advisor Edition.
- ❖ AIA Document A232-2009 (formerly A201CMa-1992) General Conditions of the Contract for Construction, Construction Manager as an Advisor Edition.
- ❖ AIA Document B132-2009 (formerly B141CMa-1992) Standard Form of Agreement Between Owner and Architect, Construction Manager as Advisor Edition.
- ❖ AIA Document C132-2009 (formerly B801CMa-1992) Standard Form of Agreement Between Owner and Construction Manager as Advisor Edition.

AIA contract documents for CM

- ❑ The AIA also has a set of documents that can be used when the **CM is at-risk** and provides a GMP option,

although the **concept of the AIA** series is **substantially different** from that of the **comparable CMAA series**.

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AIA contract documents for CM

- ❑ AIA Document A132-2009 (formerly A101CMa-1992), Standard Form of Agreement Between Owner and Construction Manager as Advisor
where the basis of payment is the Cost of the Work Plus a Fee
with or without a GMP.
- ❑ This document is coordinated for use with **AIA Documents**
 - ❖ **A232™-2009**, General Conditions of the Contract for Construction, Construction Manager as Advisor Edition,
 - ❖ **B132™-2009**, Standard Form of Agreement Between Owner and Architect, Construction Manager as Advisor Edition, and
 - ❖ **C132™-2009**, Standard Form of Agreement Between Owner and Construction Manager as Advisor Edition.

AIA contract documents for CM

☐ This integrated set of documents is **appropriate for use on projects**

where the **CM only serves** in the capacity of an **Advisor** to the owner

rather than as **constructor**

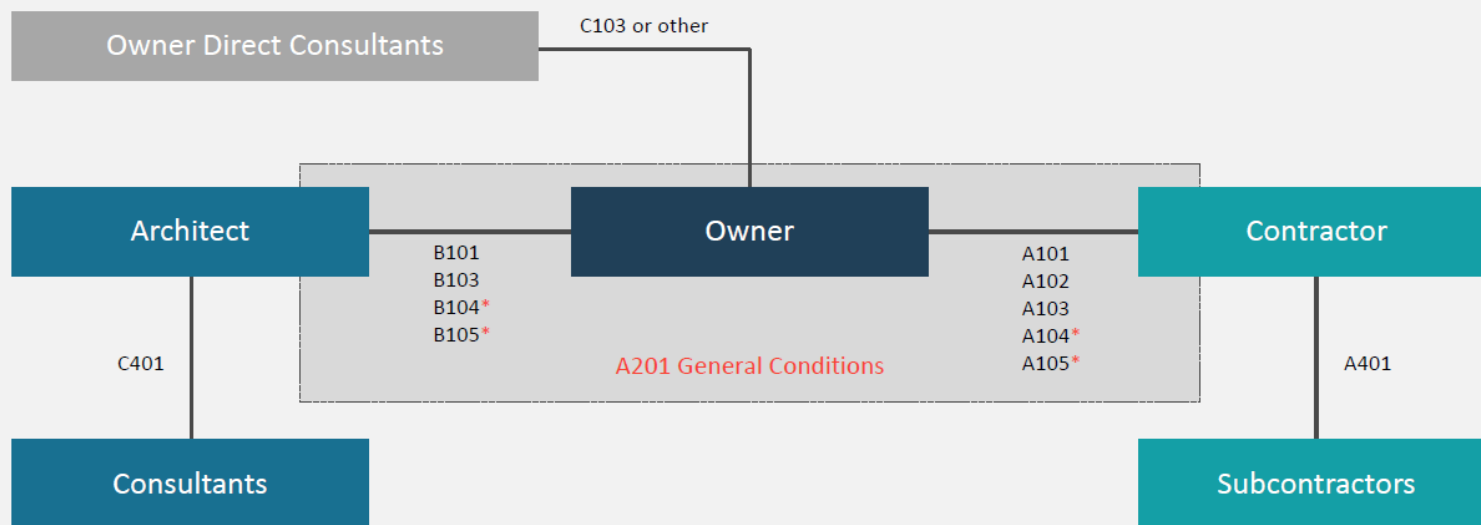
(the latter relationship being represented in AIA Documents A133™-2009 and A134™-2009).

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AIA contract documents for CM

A201

Conventional Design-Bid-Build



AIA Documents: A101®, Owner/Contractor Agreement—Stipulated Sum; A102™, O/C Agreement—Cost of the Work Plus a Fee, with GMP; A103™, O/C Agreement—Cost of the Work Plus a Fee, No GMP; A104™, Abbreviated O/C Agreement; A201®, General Conditions of the Contract for Construction; A310™, Bid Bond; A312™, Performance Bond/ Payment Bond; A401™, Contractor/Subcontractor Agreement; A105™, Standard Short Form of Agreement Between Owner and Contractor; B101™, Owner/Architect Agreement; B103™, O/A Agreement—Complex Project; B104™, Abbreviated O/A Agreement; B105™, Standard Short Form of Agreement Between Owner and Architect; C103™, Owner/Consultant Agreement; and C401™, Architect/Consultant Agreement.

*A104/A105 and B104/B105 are intended to be used for smaller projects or projects of limited scope. A104 and A105 combine the Owner-Contractor agreement with abbreviated General Conditions.

AIA Contract Documents

AIA contract documents for CM

A201 Conventional

Key Attributes:

- For use when the Owner's project is divided into separate phases of, and with separate contracts for, design (Architect) and construction (Contractor).
- Suitable for conventional project delivery (design-bid-build/stipulated sum).
- Owner retains Architect.
- Architect and his/her Consultants prepare drawings and specifications.
- Architect assists Owner in obtaining bids/cost proposals, and then Owner awards contract for construction.
- Contractor and Surety obligated to Owner for bid and, if required, performance and payment bonds.
- Contractor and subcontractors provide the Work.

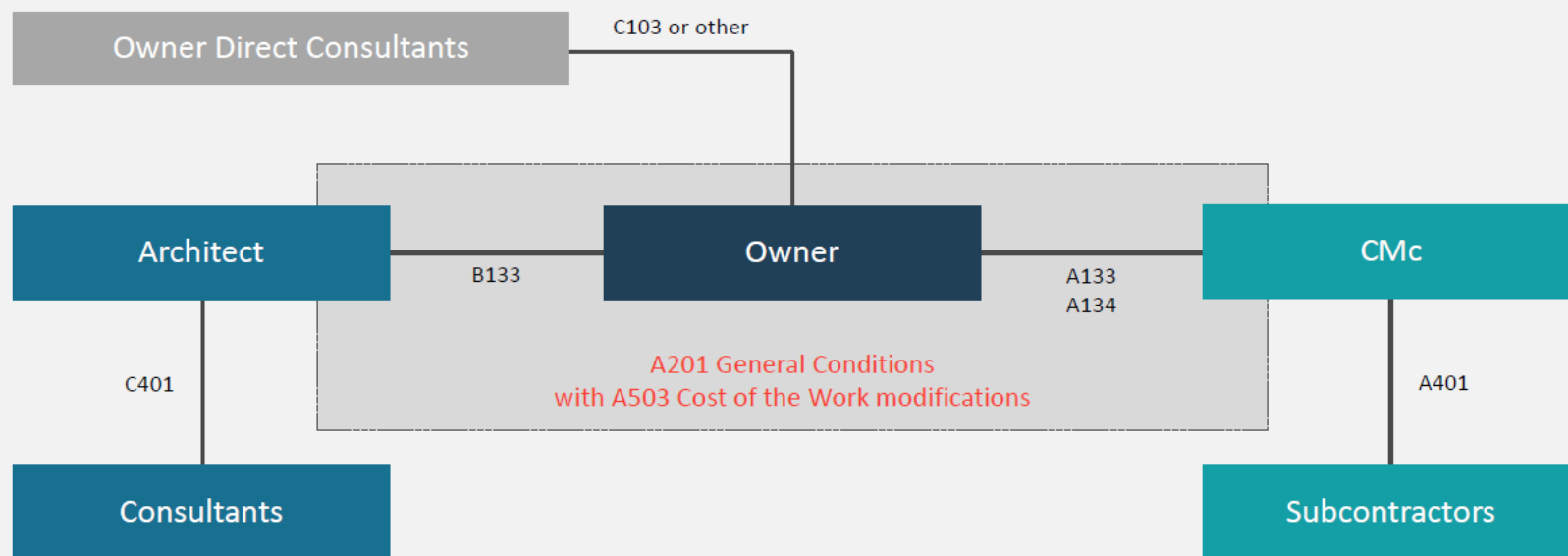


AIA Contract Documents

AIA contract documents for CM

CMc

Construction Manager as Constructor



AIA Documents: A133™, Owner/Construction Manager as Constructor Agreement, where the basis of payment is the Cost of the Work Plus a Fee with a Guaranteed Maximum Price; A134™, Owner/Construction Manager as Constructor Agreement, where the basis of payment is the Cost of the Work Plus a Fee without a Guaranteed Maximum Price; A201®, General Conditions of the Contract for Construction; A401™, Contractor/Subcontractor Agreement; B133™, Owner/Architect Agreement, Construction Manager as Constructor Edition; and C401™, Architect/Consultant Agreement.

AIA Contract Documents

AIA contract documents for CM

CMc

Key Attributes:

- Single party (CMc) provides construction management advice in preconstruction phase and then completes construction. CMc has responsibility and control over construction work via direct contract(s) with Subcontractor(s).
- Construction phase services are paid on the basis of Cost of Work plus a fee either with (A133) or without (A134) a Guaranteed Maximum Price. Both are based upon the Cost of the Work ("*...costs necessarily incurred by the Construction Manager in the proper performance of the Work.*") as defined in Article 7, Compensation.



AIA Contract Documents

AIA contract documents for CM

CMc

2019 Documents

- A133–2019 O/CMc, Cost of the Work Plus a Fee with a Guaranteed Maximum Price
- A134–2019, O/CMc, Cost of the Work Plus a Fee without a Guaranteed Maximum Price
- B133-2019, O/A Agreement for CMc
- E234-2019, Sustainable Projects Exhibit for CMc
- A503-2017/2019, Guide for Supplementary Conditions ...



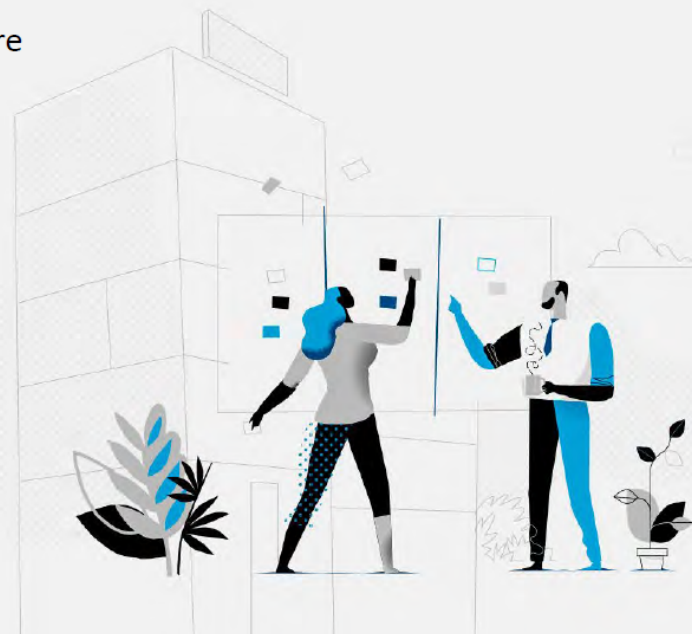
AIA Contract Documents

AIA contract documents for CM

CMc

Preconstruction Phase

- Owner retains Architect
 - Architect and its consultants develop design and prepare drawings and specifications
- Owner retains CMc
 - CMc advises and provides cost estimating and other preconstruction services, including scheduling, constructability review, and selection of subcontractors and suppliers



AIA Contract Documents

AIA contract documents for CM

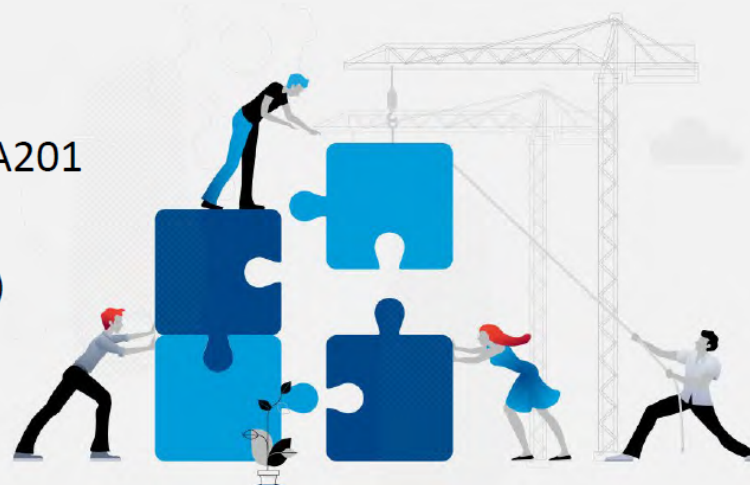
CMc

Construction Phase

- CMc awards the work to subcontractors and suppliers
- CMc enters into contracts with subcontractors
- CMc issues purchase orders to suppliers
- CMc assumes role of Contractor under A201

Cost of the work plus fee with GMP (A133)

Cost of the work plus fee without GMP (A134)



AIA Contract Documents

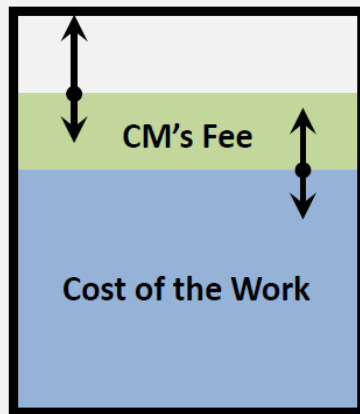
AIA contract documents for CM

CMc

A133 vs. A134

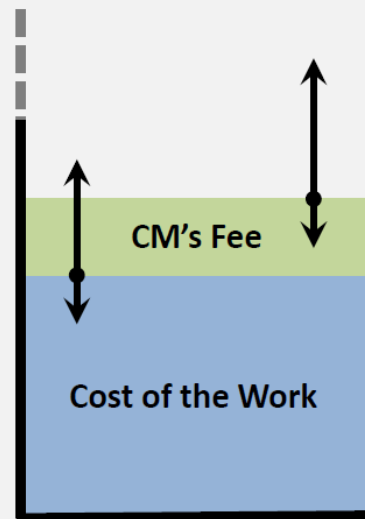
Guaranteed Maximum Price

Contract Sum



A133-2019

Contract Sum = Cost of the Work + CM's Fee
subject to the Guaranteed Maximum Price



A134-2019

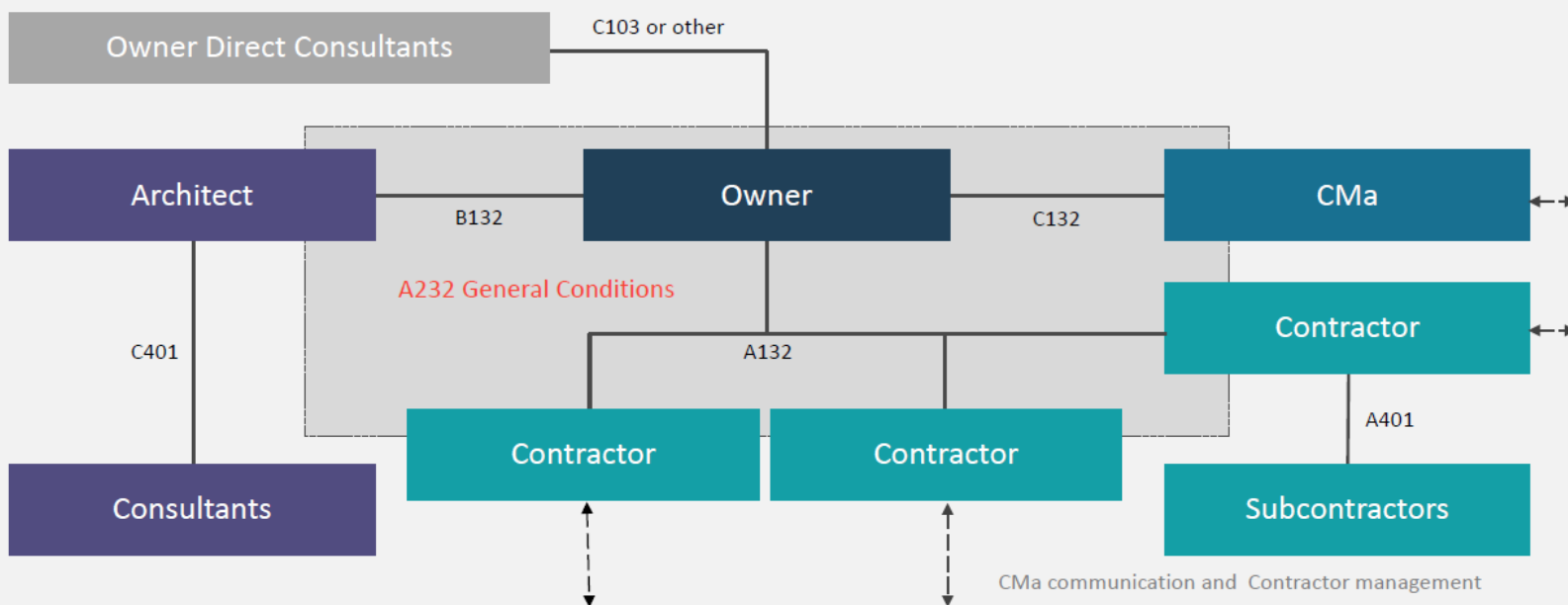
Contract Sum = Cost of the Work + CM's Fee

AIA Contract Documents

AIA contract documents for CM

CMa

Construction Manager as Adviser



AIA Documents: A132™, Owner/Contractor Agreement, CMa Edition; A232™, General Conditions of the Contract for Construction, CMa Edition; A401™, Contractor/Subcontractor Agreement; B132™, Owner/Architect Agreement, CMa Edition; C132™, Owner/Construction Manager as Advisor Agreement; and C401™, Architect/Consultant Agreement. While less likely, agreements with Contractors also could be GMP, pure cost of the work, limited design/build, or any other delivery option.

AIA Contract Documents

AIA contract documents for CM

CMa

Key Attributes:

- CMa provides the same coordination, management, and information flow between multiple direct-to-Owner contractors that the general contractor normally provides between the subcontractors in traditional delivery and CMc.
- Owner retains an Architect and a CMa who acts as an adviser to the Owner during the pre-construction phase and Construction Manager of the Contractors during the construction phase.
- Contractor(s) and Subcontractors are responsible for construction.
- CMa gives Owner construction management advice throughout the preconstruction and construction phases, providing expertise in planning, managing, and coordinating the project from start to finish.



AIA Contract Documents

AIA contract documents for CM

CMa

Documents Family

- A132-2019, O/C Agreement
- A232-2019, General Conditions
- A533-2019, Supplementary Conditions
- B132-2019, O/A Agreement
- C132-2019, O/CMa Agreement
- G731-2019, Change Order (was G701 CMa)
- G732-2019, Application and Certificate for Payment
- G733-2019, Construction Change Directive (was G714 CMa)
- G734-2019, Cert. of Substantial Completion (was G704 CMa)
- G736-2009, Project Application and Project Certificate for Payment
- G737-2009, Summary of Contractors' Applications for Payment

AIA Contract Documents

AIA contract documents for CM

CMa

Preconstruction Phase

- Owner retains Architect
 - Architect and its consultants develop design and prepare drawings and specifications
- Owner retains Construction Manager as its adviser
 - CMa provides cost estimating, scheduling, and constructability review, and prepares bid packages



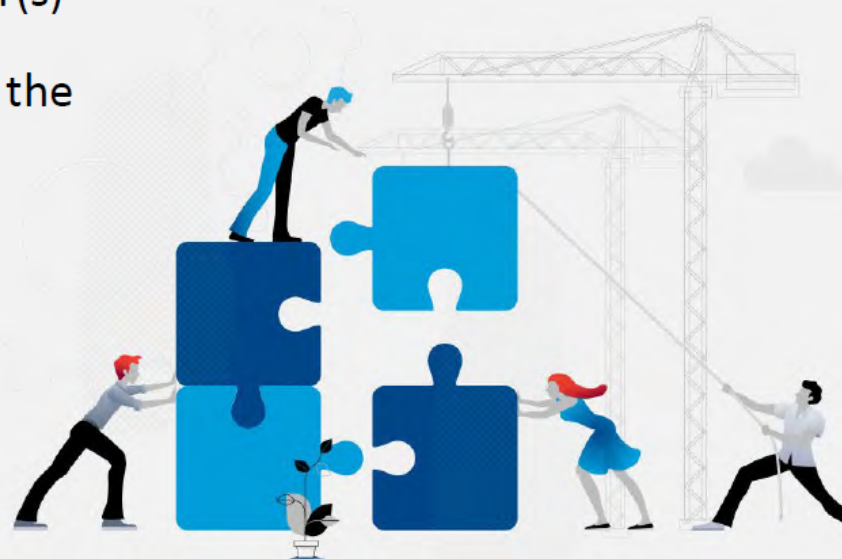
AIA Contract Documents

AIA contract documents for CM

CMa

Construction Phase

- CMa assists the Owner in pricing the drawings and specifications
- Owner enters into contracts with Contractor(s)
- CMa administers contracts and coordinates the Contractor(s) on behalf of the Owner
- Contractor(s) and subcontractors perform construction



AIA Contract Documents

AIA contract documents for CM

A232 – Article 4

Architect / CMa Shared Construction Phase Services

AIA Contract Documents



AIA contract documents for CM

Architect/CMa

Shared Administration

Construction Manager	Architect and CMa	Architect
	Owner's representatives	
Receive and review submittals	Approve submittal schedule	Approve submittals
	Object to subcontractors or superintendent	
Maintain project documents on site		
Collect and deliver final documents to Owner		
Make recommendations regarding RFI		Interpret construction documents

AIA Contract Documents

AIA contract documents for CM

Architect/CMA

Shared Administration

Construction Manager	Architect and CMA	Architect
Prepare Change Orders and CCDs	Approve Change Orders and CCDs	Authorize minor changes in the work
	Notify Owner of defects	
	Reject work with notice to each other	
	Order testing with notice to Owner	
	Request uncovering of work	
Certify Contractor applications for payment	Certify Project application for payment	Make final decision on disputed application for payment

AIA Contract Documents

AIA contract documents for CM

Architect/CMA

Shared Administration

Construction Manager	Architect and CMA	Architect
Prepare punch list with Contractor	Conduct substantial completion inspection	
	Issue certificate of substantial completion	
	Conduct final completion inspection	
	Issue final certificate for payment	

AIA Contract Documents

AIA contract documents for CM

CM

Other terminology

CM_c – Construction Manager as Constructor

- CM at Risk - also CM@R or CMAR or CMR
- CM/GC – Construction Manager/General Contractor
- GC/CM – General Contractor/Construction Manager

CM_a – Construction Manager as Adviser

- CM Agent
- Agency CM

AIA Contract Documents

- ☐ The relationships established by **CMAA Documents A-1 through A-4** are essentially the **same as those** set forth in **AIA Construction Manager as Advisor (CMa)** family of contract documents to the extent that
1. There are **one or more contracts** for construction between owner and contractors and
 2. **Separate agreements** between
 - ❖ The **owner** and **designer** and
 - ❖ The **owner** and **CM**.

❑ The **project management system** implemented by the CMAA documents is, however, **significantly different** from that of the AIA.

❖ Under the CMAA documents,

- ✓ The **CM** is the **owner's principal agent** instead of the **designer**, and
- ✓ The **CM** is responsible for **contract administration**;

the designer's role is **limited to matters of design**.

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CMAA A1-A4 Contracts	AIA A101, B132 Contracts
1 or more construction contracts	1 or more construction contracts
CM is the owner's principal agent	The designer is the owner's principal agent
The CM handles the contract administration	The designer handles the contract administration
The designer handles the design	The designer handles the design

CMAA vs. AIA

- ❑ The principal differences between the AIA and CMAA **CM at-risk documents** are:
 - ❖ In the **AIA** system, the **CM** is essentially a **GC** who provides **limited services** during the **pre-construction phase**.
 - ✓ In the **CMAA** system, the CM provides **extensive professional services** regarding the cost, schedule, and quality of the work during **both pre-construction and construction phases**.
 - ❖ In the **AIA** system, the **CM** may **perform part** of the construction work.
 - ✓ In the **CMAA** system, the **CM** may **do so only if the CM submits a bid** for a **specific portion** of the work and such **bid** is the accepted bid.
 - ✓ Further, such **work** is done under a **separate contract** between the owner and CM.

CMAA vs. AIA

- ❑ The principal differences between the AIA and CMAA **CM at-risk documents** are:
 - ❖ In the **CMAA** system, the **owner** has the **right to not accept** a proposed GMP and **direct the work** to continue with the CM and designer acting as the owner's agents (essentially the Agency Series system).
 - ✓ This option does **not exist** in the **AIA** system.
 - ❖ If the **owner accepts** the **CM's GMP bid** under the **CMAA system**, the **CM still retains** certain project and quality management responsibilities on behalf of the owner.
 - ✓ In the **AIA** system, the **CM** is clearly **acting only** in the traditional role of a **GC** once the **GMP is accepted**.
 - ❖ The **CM** makes **all payments** to the **contractors** in the **AIA** system.
 - ✓ In the **CMAA** system, **either** the **owner or CM** may do so depending upon **project-specific considerations**.

CMAA CM-AT-RISK	AIA A133, B133
CM's extensive professional services during design	CM's limited professional services during design
Self-perform work only if low bid, owner approves, and a separate GMP contract is signed	CM may self-perform work at their own discretion without submitting bids
Owner may reject GMP; CM may continue as agent	No option for owner to reject GMP and continue CM's services
Owner may require additional services after GMP is signed	No option for owner to require additional services after GMP is signed

EJCDC contract documents for CM



Construction
Manager as
Advisor (22)



Construction
Manager at Risk
(CMAR) (28)

موسسه مهندسی و مدیریت ساخت علوی پور (ACEMI)

دفتر آموزش



تهران، بلوار فردوس شرق، مجتمع آبگینه، طبقه سوم اداری، واحد C42



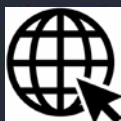
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