



استراتژی مدیریت قرارداد

برای مدیران پروژه

راهنمای مدیریت قرارداد مختص مدیران پروژه (Contract Administration Guidelines)

بخش ششم: مدیریت قرارداد در فاز پس از ساخت (Post-Construction)

ارائه دهنده:

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What we will learn?

- ☐ Introduction to post-construction phase
- ☐ Post-construction checklist and schedule
- ☐ Operation and maintenance (o&m) manuals
- ☐ Operations personnel training
- ☐ Spare parts and warranties
- ☐ Final permits
- ☐ Acceptance, performance testing, and commissioning
- ☐ Beneficial occupancy
- ☐ Claim resolution
- ☐ Contractor closeout and final payment
- ☐ Contractor warranty responsibilities
- ☐ Project closeout

INTRODUCTION TO POST- CONSTRUCTION PHASE

Bridge between construction and post-construction

- ☐ This phase provides the **bridge** between construction and long-term operation of the facility.
- ☐ For **certain projects** (such as municipal water and wastewater), **some of the steps** may occur in the construction phase based on project documentation.

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CM role

☐ During this phase, the **CM**

1. Coordinates the archiving of **project documentation**,
2. Completes **administrative closeout** of the contracts, and
3. Provides for **warranty** enforcement processes.

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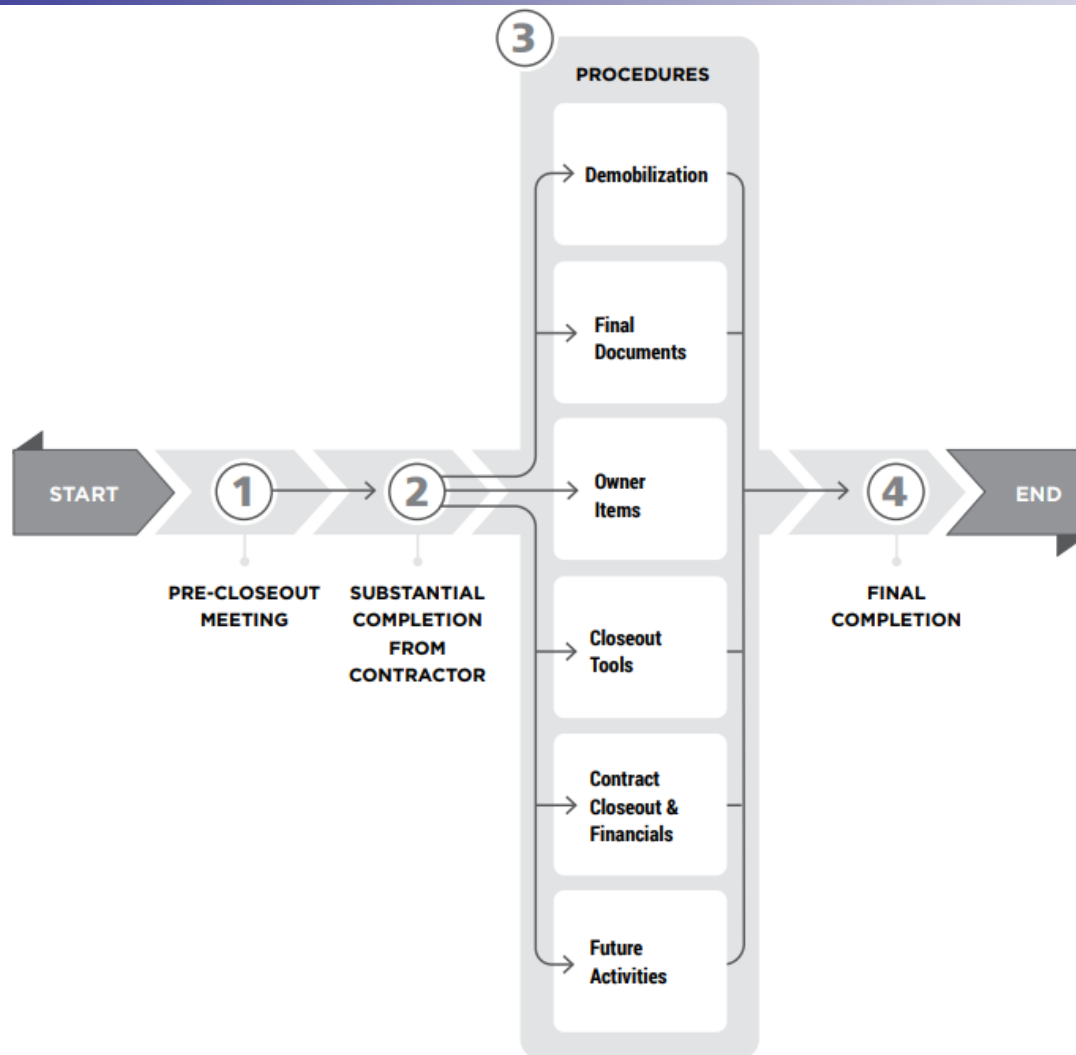
CM post-construction tasks – Appendix A

Post-Construction Phase Tasks	
✓ Checklist and schedule ✓ O&M manuals ✓ Operations personnel training ✓ Spare parts and warranties ✓ Final permits ✓ Sustainable project documentation ✓ Acceptance, performance testing, and commissioning	✓ Beneficial occupancy ✓ Claims resolution ✓ Contractor closeout and final payment ✓ Closeout report ✓ Contractor warranty responsibilities ✓ Post-occupancy review ✓ Project closeout

CM post-construction tasks – Appendix F

E. Acceptance and closeout				
1	Provide acceptance and closeout phase support and coordination and the following areas: substantial completion, final completion, close out procedures, equipment manuals, as built, training, warranties, final acceptance, final project report	A	R	
F. Commissioning phase				
1	Provide commissioning phase support and coordination and the following areas: systems startup, occupancy plan / schedule, occupancy permit, move in coordination, claims and evaluations, warranty administration, post occupancy evaluations and reports, commissioning phase reporting	A	R	
G. Other duties and responsibilities				
1	Attend meetings as requested by owner. Meetings may be conducted during or after regular business hours. Examples of the types of meetings which the program manager may be requested to attend include:			
	a) Community meetings	A	C,R	
	b) Project review meetings	I	C,R	
	c) Owner building committee meetings	A	C,R	
	d) Coordination/communication meetings with owner employees	I	C,R	
	e) Local government agencies	A	C,R	

Process



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POST-CONSTRUCTION CHECKLIST AND SCHEDULE

Post-construction checklist

- ☐ The **post-construction checklist** is a useful tool in managing the post-construction process.
- ☐ The **CM** should **develop** a post-construction checklist.

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Post-construction checklist

- ☐ The **post-construction checklist** should address **all aspects of the project** which require submission to the owner for record purposes.

- » O&M manuals.
- » Training logs and attendance sheets.
- » CM project correspondence files.
- » Shop drawing logs and related drawings.
- » Project photos and videos.
- » Job cost records.
- » Schedule development, revisions, and monitoring data.
- » Certification of any required minority participation.
- » Project diaries and quantity books.
- » Record field set of drawings.
- » Comprehensive list of job participants, including design representatives, CM team members, utility company representatives, owner representatives, etc., include team members' names, organization, and specific role in the project.
- » Disposition of any outstanding items.

Pre-construction schedule

- ☐ The **CM** should use **milestone scheduling** to ensure the timely execution of the post-construction operations.
- ☐ A detailed plan and schedule are important
as the **post-construction/pre-occupancy** period often **gets compressed** and
the **operating** characteristics of the building **can suffer greatly**
leading to owner discomfort and dissatisfaction and
ultimately cause an extension of the closeout period for
the project.

OPERATION AND MAINTENANCE (O&M) MANUALS

CM role for O & M

☐ The CM

1. **Tracks** maintenance manuals and operating procedures

developed by the contractor through the submittal portion of the document control system and

2. **Verifies** the **turnover** of the documentation to the owner.

☐ The CM should also **coordinate** the training of the owner's staff in the operation of **contractor-installed equipment**.

Training program

❑ The **training programs** are conducted by

1. Systems installers or
2. Specialty contractors

to **ensure** that the owner's personnel can:

- » Start, operate, and shut down the systems efficiently and safely.
- » Identify parts and service supplies.
- » Efficiently maintain and, if appropriate, repair the systems.
- » Understand warranty terms and conditions.

OPERATIONS PERSONNEL TRAINING

Training plan for approval

- ❑ After completion and **approval** of the maintenance and operation manuals, the **contractor** should **submit** a complete training plan for approval.
- ❑ Once the plan is **approved**, it must be implemented and documented.
- ❑ **Operational training** is critical for the owner to **take over** the building maintenance.
- ❑ The **earlier** this can occur in the project, the **sooner** the owner's maintenance personnel can take over those functions.

SPARE PARTS AND WARRANTIES

Coordination and progress

☐ The **CM coordinates**

1. Transfer or
2. Delivery

of the **specified spare parts**, also called attic stock, and

3. Warranties by the contractor to the owner.

☐ A **comprehensive checklist** should be developed for **all constructed items** having a warranty or spare part requirement.

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Coordination and progress

- ☐ The warranty provisions summarize the **contractor's responsibility** for quality and for conforming to the **requirements of the contract documents**.
- ☐ The **warranty** covers general workmanship and product performance from manufacturers and should **not be confused** with, **nor limited** to, the warranty period for *correcting defective work at no cost to the owner.*

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Warranty period

- ❑ **Every construction** contract includes warranties, intended to **protect** clients against deficiencies.
- ❑ **Warranties** for the project typically start at
 1. Substantial performance of the work, or
 2. Date of occupancy or
 3. A phased or partial occupancy
 - ❖ *If a **deficiency** is **discovered** during the comprehensive warranty period, the **owner or client** should be contracting the CM or design professional, **who will contact the contractor.***
 - ❖ *The **contractor** will then contact the appropriate **subcontractor** to have the **problem fixed.***

Is it possible to extend this period?

Warranty period

- ☐ Should the owner require a correction period longer than one year after substantial completion, the owner may require, via the contract, that the **performance and payment bonds** remain in effect for their **entire penal sums** throughout the longer correction period.
- ☐ Under this approach, the **cost of the bonds** will be higher; for extraordinarily long correction periods, bonding may be unavailable.

Is it there any alternatives?

Warranty period

- ❑ Alternatively, for bonding beyond the first year of the correction period, the **owner** may elect to require the contractor furnish a warranty bond (also known as a maintenance bond),

which is often in the **amount of 10 to 20 percent** of the final contract sum.

- ❑ **When a warranty bond** is furnished, it should not overlap the period that the performance bond is in effect.

- ❖ Requiring a performance bond plus a separate warranty bond or maintenance bond for a typical, one-year correction period is **likely unnecessarily “double-bonding”** the **first year of the correction period**.

- ✓ Overlapping performance and warranty (maintenance) bonds typically provide **no useful benefit for the owner** (the bond’s obligee) but will likely have a **greater cost than only the performance bond**.

Warranty vs. guarantee

- ❑ In **construction**, the term “**guaranty**” is not used to distinguish this **requirement**, and the **term that is used instead is “warranty”** which often leads to the confusion of these two terms.

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Warranty vs. guarantee

Warranty Provisions

With a warranty provision, the contractor “warrants” (or represents) that their work will be conducted in accordance with the set standards that were issued in the contract, and otherwise be free of construction defects and stay in line with the design documents. As **Bradenton construction lawyers**, we know how important it is for contractors to understand warranty provisions, and how to avoid violating them. If a contractor breaches a warranty clause, they will be found liable. If there is a breach of the warranty, the solution is to recover any financial damages that were sustained by the other party (i.e., the project owner or general contractor).

An example of this would be defected materials that need to be replaced by the owner. If there was a breach of warranty, the owner is eligible to receive the cost of repairs or a replacement from the owner.

Guaranty Provisions

In a construction contract, a guaranty (or guarantee) provision goes into effect after the contractor finishes the work, and needs to replace defective materials or equipment, or needs to fix improper workmanship, both of which is done at their own expense. With guaranty provisions, the contract that contains this requirement typically comes with an expiration period informing when the guaranty is no longer enforceable.

Coordination and progress

❑ Progress is **monitored** through the submittal portion of the document control system.

❑ A **system** for

1. Transfer,
2. Cataloging, and
3. Storage

of spare parts should be developed **in conjunction** with the owner's staff.

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FINAL PERMITS



Permits

- ☐ The **CM oversees** the acquisition of all **required operating permits** and **compliance** with regulatory requirements.
- ☐ The **CM coordinates** any required agency inspections and the **securing** of occupancy permits.
- ☐ The **status** of **all permits** should be tracked using the **submittal portion** of the document control system.

ACCEPTANCE, PERFORMANCE TESTING, AND COMMISSIONING

CM and GC

- ☐ The **CM** is often required to **monitor** acceptance and performance testing of specified systems to
verify performance in accordance with contract requirements.
- ☐ The **general contractor** must provide **access** for **observance** of these tests by the CM,
as well as **filing** all appropriate test reports.

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Commissioning plan

- ❑ The commissioning plan should
 1. **Detail** the commissioning process,
 2. **Identify** commissioning team members, and
 3. **Specify** their responsibilities in each phase, including post-occupancy.

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Post-construction phase commissioning activities

Post-construction phase commissioning activities include the following activities:

- | | |
|--|---|
| <ul style="list-style-type: none">✓ Complete seasonal and/or deferred functional testing✓ Verified completion of as-built documents✓ Complete outstanding O&M documents✓ Complete commissioning documentation | <ul style="list-style-type: none">✓ Verify completion of outstanding O&M personnel training✓ Provide for formal owner acceptance of the systems✓ Update & complete commissioning report |
|--|---|

BENEFICIAL OCCUPANCY

Date of BC

- ☐ Beneficial occupancy is the stage of construction of a **building** or **facility** **before final completion**,
at which its owner can occupy it for the purpose it was constructed.
- ☐ The **date of beneficial occupancy** will normally establish the beginning of the specified period on the **warranties**.
- ☐ **After** the date of beneficial occupancy,
the **owner must assume responsibility** for the maintenance and operation of the facility.

Move-in

- ☐ The **CM** often **coordinates** the owner's move-in to the completed project and the **startup** of project systems.
- ☐ The **CM** should **assist** the owner in developing an occupancy plan for the **completed project** that best suits its schedule and operational needs.
- ☐ Phased occupancy requirements must be well-planned and communicated to ensure a smooth execution.

CLAIM RESOLUTION

CM in claim resolution

- ☐ The **CM** should **continue** to assist the owner in **resolving** any outstanding claims brought by the **designer or the contractor**.
- ☐ When possible, it is recommended that litigation be avoided by **taking advantage** of various alternative disputes resolution (ADR) processes to resolve disputes.

Lengthy arbitration and litigation should be used **only as a last resort** in resolution of construction-related issues.

CONTRACTOR CLOSEOUT AND FINAL PAYMENT

Final assessment

- ☐ The **CM conducts** a final assessment of the project,
in conjunction with the owner and the designer,
to verify that **all work is complete**.
- ☐ This involves **implementing** the project **closeout procedures** contained in the PPM
and the PMP/CMP.

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Final assessment

☐ The **CMP** will establish

1. The **parameters** for conducting the final inspection, which includes
a **means** of determining whether the **project is ready** for the final inspection and
2. The **acceptance criteria** that will **permit** final payment.

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Formal review

❑ As part of the **project closeout procedure**, a formal review of **key submittals** should be submitted including

1. A certificate of substantial completion,
2. Certificate of punchlist completion,
3. Final lien waivers,
4. Warranties, and
5. Final applications.

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Final process

- ☐ Once **all parties** are **satisfied** that the contractor has met all its required contractual obligations,
the **CM** should **process** the contractor's final payment application.
- ☐ In cases where the project has maintained **buyout savings** through unused allowances or has not consumed all contingency,
a **final deductive change order** may be required.

CONTRACTOR WARRANTY RESPONSIBILITIES

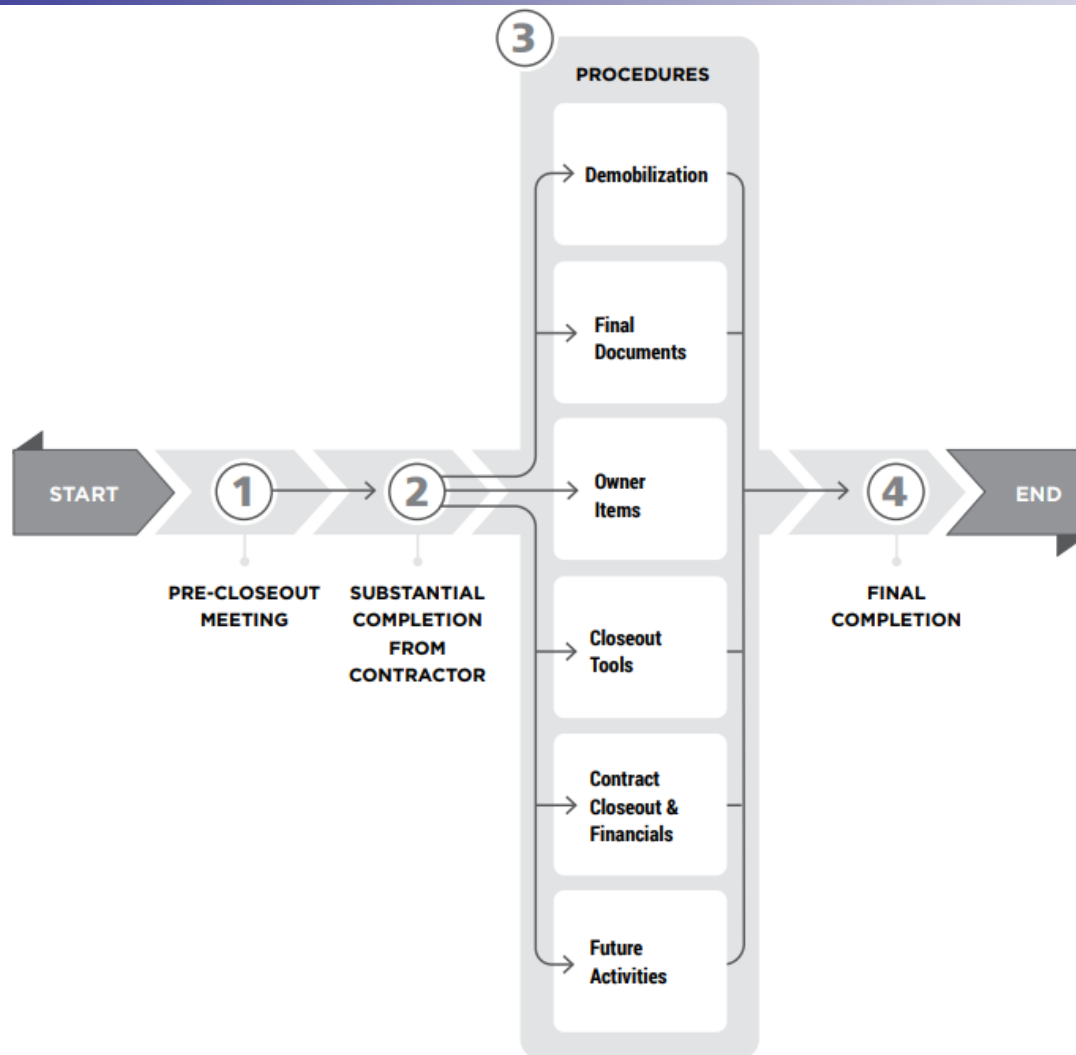
CM coordination

- ☐ The **CM** may **continue** to coordinate contractor responses to **warranty items** as identified by the owner's operations and maintenance staff, but that is **not always cost effective**.
- ☐ At a **minimum**, the **CM** should **provide** the owner with a list of key contacts for warranty or maintenance work.

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PROJECT CLOSEOUT

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Pre-closeout meeting

- ☐ The **CM chairs** the pre-closeout meeting to kick off the final phase of the project.
- ☐ The **meeting** should occur well before the end of the project.
- ☐ The **attendees** should include the contractor and the owner who will operate the completed project.

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Substantial completion

- ❑ Next, the **contractor** will **notify** the CM once substantial completion has been reached.
- ❑ The **CM** should **review** that the **necessary tasks** have been completed **satisfactorily**.
- ❑ Once **substantial completion** is confirmed, the final closeout procedures can begin.
- ❑ **Substantial completion** is sometimes accompanied by, and dependent on, the **final code inspection** by the building official.
 - ❖ This also begins the process of **closing out** the remaining open permits.

Closeout procedures

- ☐ These **closeout procedures** are used to **ensure** that construction tasks have been completed in conformance with contract documents.
- ☐ That goes **beyond** just handing off the project to the owner.
- ☐ It includes
 1. Checking necessary punchlists,
 2. Reviewing and submitting completed paperwork, and
 3. Double-checking all specified obligations.

Final milestone completion

- ❑ When this **milestone** is reached, the **contractor** has **completed construction** as required in the contract documents.
 - ❖ This is often when the **owner** provides **final payment** to the contractor.
 - ❖ The **closeout punchlist** has been completed and **all the closeout procedures** have been successfully performed.
 - ❖ **All required tasks** have been completed, and the **CM** has **reviewed** that **all documentation** has been **provided to the owner**.
 - ❖ The Certificate of Occupancy has been **issued** and **all inspections** are complete.

The facility is ready for occupancy.



Final milestone completion

- ❑ For more, see CMAA Project Closeout Guidelines.

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موسسه مهندسی و مدیریت ساخت علوی پور (ACEMI)

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