



مدیریت تغییرات قراردادی در پروژه‌های EPC

فرایند یکپارچه + نکات حیاتی
(بر اساس اسنادی از AACE و PMI و Long International)

ارائه دهنده:

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What we will learn?

- ☐ Introduction
- ☐ Change Order Definition and Other Change Order-related Considerations
 - ❖ Change Order Definition
 - ❖ Change Management Defined
 - ❖ Demonstrated Elements of a Change and Change Order
- ☐ Change Order Procedures

What we will learn?

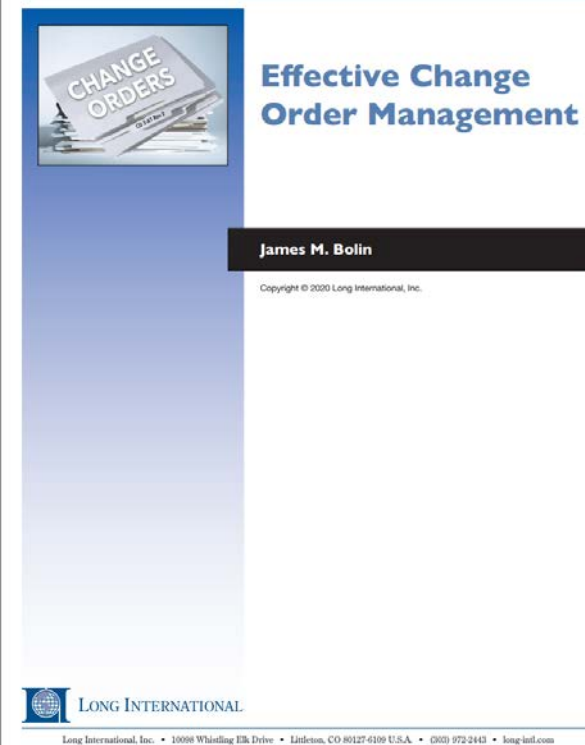
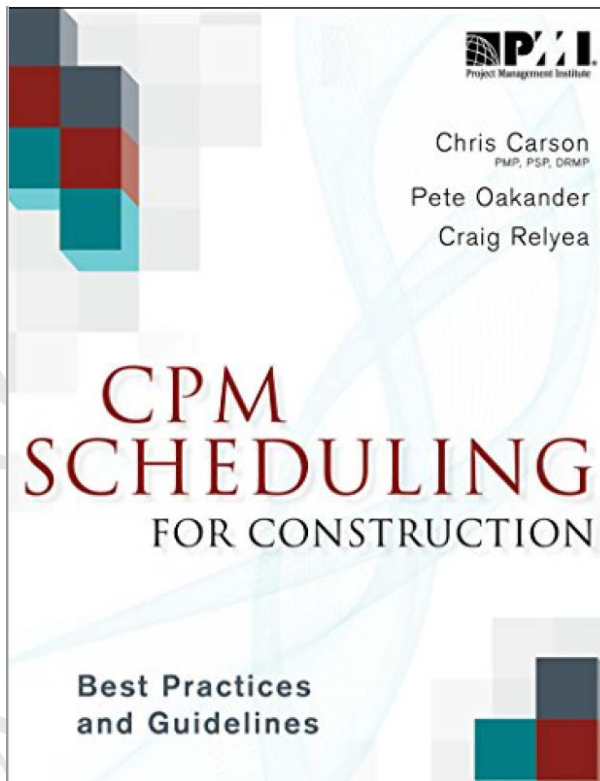
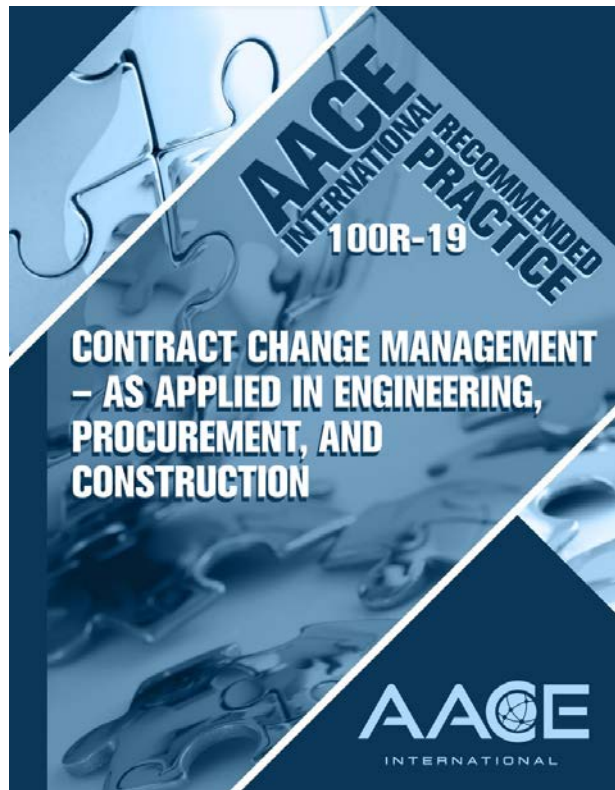
☐ Change Management Process

1. Identification of Potential Change to Contract
2. Contractor Submits Change Order Request to Owner
3. Owner Evaluates Contractor's Entitlement to Change
4. Contractor Revises or Cancels Change Order Request, or Disputes Owner's Change Order Request Rejection
5. Prepare the Proposed Change Order
6. Owner Reviews Proposed Change Order
7. Owner Decision to Approve or Request Further Discussion
8. Owner and Contractor Negotiate Change Order
9. Agreement Reached on Change Order
10. Parties' Decision to Revise, Cancel or Dispute PCO
11. Revise Proposed Change Order
12. Change Order Cancelled
13. Contractor Prepares Claim
14. Claim Submitted by Contractor to Owner
15. Finalization of Formal Change Order
16. Change Order Execution

What we will learn?

- ☐ Change Management Document Control
- ☐ Change Management Related to Scheduling
 - ❖ Guidelines
 - ❖ Scope Change – Identification and Documentation
 - ❖ Delays – Identification and Documentation
 - ✓ Prospective Time Impact Analysis
 - ✓ Claims Avoidance and Monitoring
- ☐ Appendix: Sample Change Management Template
- ☐ Final Notes:
 - ❖ Conclusion
 - ❖ Other References
 - ❖ Contributors

Reference



Introduction

- ❑ This recommended practice (RP) of AACE International addresses the **process** of change management as applied in **engineering, procurement, and construction**, given the **lack of one** in the terms of the **construction contract**.
- ❑ This process **applies across** various contracting strategies or delivery methods.

What this RP does not include?



RP intention

☐ This RP does **not** include

scope changes (allowable by contract)

associated with unit price work.

☐ **Nor does** this RP address the process concerning the **management of changes**

that are internal to a single party

that does **not affect another party** to a contract.

Is it a standard?



RP intention

- ❑ This RP is intended to provide **guidelines (i.e., not a standard)** concerning the change management process on a **capital construction project** that most practitioners would consider **good practice** for use where applicable.

Who can use?



RP intention

☐ This recommended practice is relevant to **stakeholders** on a capital construction project; for instance,

1. Owner,
2. Contractor,
3. Construction manager, or
4. Other stakeholders.

☐ **Although** this recommended practice is **written in the context** of a contract between owner and contractor,

it is **applicable to any parties** contracted to perform a project, including owners and architect-engineers (A/E), as well as general contractors and sub-contractors.

- ☐ It is recommended that change management **processes be agreed** upon before the work commences because experience has shown that one cannot go into projects **assuming a perfect world** whereby
 1. **Owner** never changes its mind,
 2. **A/E** never alters or errs with its design documents,
 3. **Contractor** never performs **poorly or mismanages** its work, and
 4. **Natural events** do **not interfere**.
- ☐ That perfect world does **not exist** in the context of capital construction projects.



❑ In 1775 **Samuel Johnson** said:

“Change is not made without inconvenience, even from worse to better.”

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Changes consequences

- ❑ After **more than 250 years**, this quote (citing the Dictionary of the English Language edited by Richard Hooker) still **holds meaning in the construction industry**.
- ❑ Changes on projects may create
 1. **Varying amounts** of tension and
 2. Potential **distrust**between the contract parties.

*However, in industries in which **projects are the norm**, it is now typically understood that change is endemic, brought on by an explosion in the development of technology and communications.*

How change is defined?



Change definition

❑ In the context of a project, a **change** is defined as an alteration or variation to

1. A scope of work and/or
2. The schedule

for completing the work.

❖ However, **changes** can include more than alterations or variations to scope.

Change can also include **revisions** to contract terms and other administrative revisions.

❑ **Construction contracts differ** from most legal agreements in that they consider and expect that changes will occur.

How to deal?



Change definition

❑ In order to **deal** effectively with the changes that might arise on a construction project,

the project participants should have a comprehensive and workable process for

1. Identifying and
 2. Managing
- changes.

What are the types of changes?



Types of changes in RP

- ❑ **Two commonly** occurring categories of scope changes on construction projects are either
 1. Changes **directed** by the owner, or
 2. Changes identified by the contractor as a result of an action or inaction of the owner, also known as **constructive changes**.

- ❑ An **owner-directed change** may ultimately become a constructive change if the **contractor believes** it will be impacted by the **directed change**.

How it differs with other documents?

Types of changes in other references



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Managing changes – Types of changes

1. Functional changes
2. Legal changes

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Managing changes – Types of changes: Functional changes

❑ Changes to **project scope** can be further divided into

1. Required
2. Elective

(CII 1994)



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Managing changes – Types of changes: Legal changes

❑ As project delivery relies highly on **contractual relationships**, project changes often have legal implications.

❑ **Legally**, changes can be classified into three groups:

1. Directed changes
2. Constructive changes
3. Cardinal changes

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Types of changes in other references



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Managing changes – Types of changes: Functional changes

1. Functional changes

1. Changes to project **scope** and
 - a) Required
 - b) Elective
2. Changes to project **development**

2. Legal changes

1. Directed changes
 - a) Change order directive
 - b) Change order
2. Constructive changes
3. Cardinal changes

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Does the owner have the right to issue a change?



Right to change

- ❑ It is common practice for the owner to have the **right** to make, or direct, **changes** to a **contractor's scope** of work during the design or construction phases.

Reasons for changes?



Reasons for changes

❑ Changes may come about for **many reasons**, such as:

1. Correction of errors in the drawings or specifications;
2. The owner exercising its prerogative to change the scope; or
3. The emergence of **factors or events** with magnitudes **none of the parties** could have anticipated or controlled.

Difference between intended and unintended r



Reasons for changes

❑ Change during the **construction phase** can be the result of intended or unintended consequences.

❖ Intended change would include **revisions** to the **original scope** as **directed** by the owner, also known as management changes.

❖ Unintended changes, resulting from

- ❖ Low quality work by others,
- ❖ Poor work conditions,
- ❖ External scope changes (non-contractual 3rd parties), or
- ❖ Upstream hidden changes.

Which change is the most common forms of scope changes ?



Most common changes

- ❑ Constructive changes **along** with owner-directed changes are often the **most common** forms of scope changes found on capital construction projects.
- ❑ Among these categories of changes, **constructive changes** are
“changes caused by the owner but not acknowledged by it as a change.”

How AACE defines Constructive Change?

Constructive changes

❑ A **constructive change** is defined as:

*An act or failure to act by the **owner** or the **engineer** that is not a directed change,*

*but which has the effect of requiring the contractor to accomplish work **different from** that required by the existing contract documents.*

❖ AACE International, Recommended Practice 10S-90, Cost Engineering Terminology

How it is defined in other references?



Constructive changes



Constructive change

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- ❑ A change in contract work without issuance of a formal **change order**;
1. **Insistence** on performance in a manner different from that allowed by the contract or
 2. **Refusal to accept** performance in a manner allowed by the contract.

Remember how it was defined in contract management course?
What was the impact?
What was the remedy?

So what happens then?

How AACE defines directed Change?



Directed change

❑ An **owner-directed change** may be defined as:

- ❖ A change wherein the **owner specifically directs** the contractor to make that change.
- ❖ This type of change **may or may not affect** the contract price or schedule.

How it is defined in other references?



Directed change



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Managing changes – Types of changes: Legal changes

- ☐ A **directed change** is **ordered** by the owner and **implemented** by the contractor.
- ☐ The instruction to implement the change can manifest itself either as
 1. A change order directive or
 2. A change order
- ☐ The **process** for implementing a directed change is usually described in a change order contractual clause within the contract.
- ☐ This also describes **how cost and time implications** will be taken into account in the form of corrections to the contracted cost and time.
- ☐ These types of changes need to be directed by the owner before occurring, **even if** they are initiated by the contractor through
 1. A **change order proposal** or
 2. A **request for information**

How change directive is defined?



Change directive



مدیریت ادعاء و اختلافات در طول چرخه حیات پروژه

توسعه و مدیریت برنامه در فاز طراحی (Design Phase) برای مدیریت ادعاء و جلوگیری از دعاوی و اختلافات در پروژه

Potential killer contract clauses – Change orders

☐ AIA A201-2017: General conditions for construction

§ 7.3 Construction Change Directives

§ 7.3.1 A Construction Change Directive is a written order prepared by the Architect and signed by the Owner and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions, or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

§ 7.3.2 A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

§ 7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

1. Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
2. Unit prices stated in the Contract Documents or subsequently agreed upon;
3. Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
4. As provided in Section 7.3.4.

In some contracts there is a third one!



Unilateral change

- ❑ On some projects, the **contract** allows for the owner to execute a **third type** of change, called a unilateral change, defined as:
 - ❖ A **modification to the contract** issued by the owner **without the agreement** of the contractor as to the time or price adjustment.



Unilateral change

- ❑ There is **no formal change order** process followed for unilateral changes;
rather, the **contractor is forced** to execute a change **with no adjustment** in cost or schedule.
- ❖ However, unilateral changes often end in dispute at the end of the project if the **contractor**
 1. **Feels** that it was **impacted** in cost and/or schedule and
 2. Had **contractual entitlement** to **dispute** the change.

What this RP addresses?



RP intention

- ☐ This recommended practice primarily addresses constructive changes, including owner-directed changes.

**Change Order Definition
and
Other Change Order-related
Considerations**

Change order definition

❑ In the design and construction industries, the primary change management tool used to

1. Document and
2. Authorize

changes to the contract is the change order, also
referred to as a variation or contract modification.

Let's see the definition



Change order definition by AACE

❑ A change order is defined as:

❖ A **document**

1. requesting and/or
2. authorizing

1. scope and/or

2. baseline

1. Change or
2. Correction

**Does it differ from the perspective of
owner and contractor?**



Change order definition by AACE

1. From the owner's perspective,

it is an **agreement** between the project team and higher authority
approving a **change** in the project control baseline.

2. From a contractor's perspective,

it is an **agreement** between the owner and the contractor
to **compensate** for a **change** in scope or other conditions of a
contract.

❖ It **must be approved** by both the client and the contractor
before it becomes a legal change to the contract.

**How it differs with other references'
definitions?**



Change order definition by other references

- ❑ A **Change Order** is a **document** that contractually alters an original agreement between the **signed parties**.

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Potential killer contract clauses – Change orders

- ❑ AIA A201-2017: General conditions for construction

§ 7.2 CHANGE ORDERS
§ 7.2.1 A Change Order is a written instrument prepared by the Architect and signed by the Owner, Contractor and Architect stating their agreement upon all of the following:

- 1 The change in the Work;
- 2 The amount of the adjustment, if any, in the Contract Sum; and
- 3 The extent of the adjustment, if any, in the Contract Time.



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What was field order?



Change order definition

❑ Comparatively, **Field Work Orders (FWO)** are **directives** from an engineer or construction manager that either

1. Clarify or
2. Request

minor changes to the contract documents.

❑ FWOs are typically **minor revisions** that usually do not have a significant impact the contract budget or schedule.

Let's see the definition of AIA here!



Change order definition



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Potential killer contract clauses – Change orders

☐ AIA A201-2017: General conditions for construction

§ 7.4 Minor Changes in the Work

The Architect may order minor changes in the Work that are consistent with the intent of the Contract Documents and do not involve an adjustment in the Contract Sum or an extension of the Contract Time. The Architect's order for minor changes shall be in writing. If the Contractor believes that the proposed minor change in the Work will affect the Contract Sum or Contract Time, the Contractor shall notify the Architect and shall not proceed to implement the change in the Work. If the Contractor performs the Work set forth in the Architect's order for a minor change without prior notice to the Architect that such change will affect the Contract Sum or Contract Time, the Contractor waives any adjustment to the Contract Sum or extension of the Contract Time.

What if the contractor implements the "Minor Changes" without prior notice?

It needs to have TIA analysis!
Remember I emphasized in the Delay Analysis course?

How does the scope play an integral role?



Change order definition

- ❑ It is important that the **scope of the work** for the project be completely defined in the contract so that **disagreements** over scope changes can be minimized.
- ❖ However, it is **common on projects** that the parties **find disagreement** over **what scope or factors** may comprise a change order and/or its impact.
 - ✓ This **disagreement is not unusual** because the nature of each change will predictably affect each party in different ways.

How disputed issues could become further intensified ?



Change order definition

- ❑ The **resolution** of Change Orders can also become the source of disputed issues between the owner and the contractor on projects.
- ❑ The **disputed issues** become further intensified if the **change order process** is inadequately managed.
- ❑ The owner's and the **contractor's diverging and competing interests** relative to the changes on a project may also become a factor in judiciously resolving the differences.

Why having the process matters other than dispute resolution?



Change order definition

- ❑ The **owner's priorities** are focused on predicting and controlling the **costs** so that the **funding**, which is budgeted for a project, does not become **jeopardized**.
- ❑ Also, the owner usually places a **high priority** on achieving a certain completion date for the project, and often will include contractual liquidated damages to be paid by the contractor if the contractual completion date is not achieved, absent any delays for which the contractor may be **entitled to a time extension**.

Let's see the change order from the contractor's perspective!



Change order definition

- ❑ **For the contractor**, Change Orders entail several factors, which can be potentially complicated.
- ❑ First, Change Orders are often viewed as a **means of increasing** the scope of a project and offer a source of additional revenue.
 - ❖ However, this **supplemental work** can also present the contractor with the problem of having to **proceed with the completion** of change-related scope of work **prior to negotiating and finalizing** the entitlement and payment for a change.

Why and how the contract affects?



Change order definition

- ❑ The **contract** may require the **contractor to proceed** with the extra work **pending the resolution** of the valuation of a Change Order, which may also **require the contractor to finance** the cost of the alleged additional work until resolution occurs.

When the contractor accepts to do that?



Change order definition

- ☐ The **contractor** will normally proceed with scope changes
if it is **confident** that it will be fairly compensated for the alleged extra work at a later date.
- ☐ The contractor also has an **incentive to complete** the contract work in a timely manner because “time equals money,” i.e.,
the contractor’s field staff and other time-related costs **continue to rise**
if the **contract work** is delayed beyond its planned completion date.

What construction contract clauses should consider regarding the change?



Change order definition

- ❑ Construction contracts often include **conflicting clauses** regarding changed work.
 - ❖ On one hand, a **contract may state** that the contractor cannot proceed with the work for a change in the **absence of a written and approved** Change Order.
 - ❖ On the other hand, language in a contract may **also state that** the **owner has the right to order** the contractor to perform extra work without an agreement for compensation.



Change order definition

❑ These **conflicting clauses** place the contractor in a position of having to **make a choice** between

1. **Performing** the extra work at the risk of having to **later possibly accept** a reduced payment, no payment, or making the decision to refuse to proceed with completing the work.
2. The later choice, however, may place the contractor in a **position of default**, which could possibly result in the contractor being **terminated** on a project by the owner.

Remember we talked about that?



Change management defined

❑ **Change management** is a broad topic and can be found in almost all industries. In the context of capital construction projects, according to the TCM Framework, change management is defined as:

❖ ...The **process of** managing

1. Any change to scope of work and/or
2. Any deviation,
3. Performance trend, or
4. Change to an approved or baseline project control plan.

How this process related to the project control cycle?



Change management defined

❑ **Change management** is a broad topic and can be found in almost all industries. In the context of capital construction projects, according to the TCM Framework, change management is defined as:

- ❖ The change management process is used to approve or disapprove changes in the **scope** and **baseline plans**,
thereby **closing** the project control cycle loop.

What this process includes?

Change management defined

❑ **Change management** is a broad topic and can be found in almost all industries. In the context of capital construction projects, according to the TCM Framework, change management is defined as:

- ❖ The process includes
 - ❖ Identification,
 - ❖ Definition,
 - ❖ Categorization,
 - ❖ Recording,
 - ❖ Tracking,
 - ❖ Analyzing,
 - ❖ Disposition (i.e., Approval or disapproval for incorporation into approved or baseline project control plans), and
 - ❖ Reporting of deviations, trends, and changes.



Change management defined

❑ **Whether** a change in the project **affects** the scope, schedule, method of performance, cost or is administrative in nature,

change management is defined as,

“The formal process through which changes to the project plan are identified, assessed, reviewed, approved and introduced.”



Change management defined

- ❑ It is **common** on capital construction projects that the contracts between the owner, designer, and construction contractor include a **clause addressing** the formal process by which changes are addressed once they are identified.
- ❑ This same clause also typically identifies roles and responsibilities among the owner, designer, contractor, and other stakeholders **concerning each step** of the change management process.

Demonstrated elements of a change and change order

❖ It **must be approved** by both the client and the contractor
before it becomes a legal change to the contract.

❑ Typically, in order for an owner to **approve a change order requested** by a designer or contractor,

there are **three primary elements** that should be demonstrated. They are:

Demonstrated elements of a change and change order

1. Demonstration of Entitlement

1. The contractor **must demonstrate** that it has a contractual right to make the requested change and the change is not already contained in the scope of its current agreement with the owner.
2. That is, the contractor **must demonstrate** that
 1. The change was caused by the owner, or
 2. The owner was responsible for the changed condition.



Demonstrated elements of a change and change order

2. Demonstration of Causation

- ❖ The contractor **must demonstrate** the cause and effect relationship between
 1. Impact that was not its responsibility and
 2. Effects the impact will have on its ultimate **project cost** or ability to **complete** the project as originally contracted.
- ❖ The **element of causation** is often the most difficult to demonstrate of the three elements.

Demonstrated elements of a change and change order

3. Demonstration of Quantum

❖ The contractor **must demonstrate** that the cost or schedule **impacts** that

1. Have been or
2. Will be realized

as a result of the **change** are reasonable and supportable.



Demonstrated elements of a change and change order

☐ If the change was **owner-directed**,

the **contractor** is typically **not required** to demonstrate entitlement;

as the **contractor** would therefore have contractual compensation for **cost** and **schedule** impacts.

Change Order Procedures



Recommended practice

- ❑ **Changes** often have a **major impact** on the success of projects.
- ❑ The **procedures** that are defined for change management in the general conditions sections of most construction contracts **address the steps** to take following the **initiation of a Change Order**.
 - ❖ However, these guidelines do **not normally** identify the requirements for **managing the change** and its **impacts**.

Items that should be considered as part of a project's Change Order procedure include the following:



Recommended practice

❑ For the design and pre-construction phases of a project:

- ❖ Written contracts, agreements, procedures, and roles and responsibilities should be **established and accepted** during a project's early phases.
- ❖ **Difficulties** and **issues** may arise that may **affect the execution** of the work if these documents are **not in-place**.



Recommended practice

❑ For the design and pre-construction phases of a project:

❖ **Define** and **establish** a detailed change management process for the project that is part of the design plan and procedures for the project.



Recommended practice

❑ For the design and pre-construction phases of a project:

❖ **Anticipate** that changes will **inevitably occur** on a project and **plan** for it accordingly.

✓ If the necessary steps for managing changes are **not taken**, the Change Order process will **not be managed well** and the project will suffer.



Recommended practice

❑ For the design and pre-construction phases of a project:

❖ Attentively **monitor** the trending of the project's **design progress**.

❖ At the **completion of the work** related to the design,

it is important that the **owner initiate and communicate** a “freeze” of the design.

❖ **Any revisions** to the established scope of work will be measured against this **baseline for the design**.



Recommended practice

❑ For the design and pre-construction phases of a project:

- ❖ During the **design and pre-construction** phases of the project,
identify areas of uncertainty and areas lacking fully defined scope.
- ❖ **Evaluate** the **risks** that may be associated with these areas.



Recommended practice

❑ For the design and pre-construction phases of a project:

❖ **Conduct** constructability reviews and **institute** a value engineering program to **assess the feasibility** of the project's design and defined work scope.



Recommended practice

❑ For the design and pre-construction phases of a project:

- ❖ **Introduce** changes as **early as possible** during a project in order to help minimize the impact of the change.
- ❖ **Comparatively**, it is **more cost effective** to include changes early in a project **than to wait until** the later stages of the project.



Recommended practice

❑ For the design and pre-construction phases of a project:

- ❖ **Fully define** the work scope for **each change** in terms that are understood by all parties.
- ❖ This **clear and concise definition** helps to reduce confusion or the **misinterpretation** of the requirements of a change by the parties.



Recommended practice

❑ For the design and pre-construction phases of a project:

❖ **Avoid** delaying the approval of changes that **will ultimately be approved**.

- ✓ **This tactic** results in the changes being **pushed to later** in the project where they become **more costly** to implement.
- ✓ It is a **misconception** to believe that the **issues** related to Change Orders **resolve themselves**.



Recommended practice

❑ For the design and pre-construction phases of a project:

- ❖ **Authorization** for a change should be mandatory before implementation,
regardless of the **type of agreement or contract**.
- ❖ **Authorization** should be timely and decisive.



Recommended practice

❑ For the design and pre-construction phases of a project:

❖ In **advance of releasing** the project design and bid package documents for tender and construction,

ensure that the **documents** are complete and fully definitive.

Recommended practice

❑ For the construction phase of a project:

❖ **Evaluate** the contractor's bid proposal to ensure that

- ✓ **Documents** are complete and
- ✓ **Cost and schedule** reasonably represent the scope objectives and timelines required for the project.



Recommended practice

❑ For the construction phase of a project:

❖ **Review** the **contractor's construction** procedures, methods, and resources to confirm the contractor's capabilities and flexibility to handle

1. Types,
2. Magnitudes, and
3. Quantities of

change orders that are expected for the project.

Recommended practice

❑ For the construction phase of a project:

❖ Establish a **comprehensive system** for budget and schedule baseline control.



Recommended practice

❑ For the construction phase of a project:

❖ Process, approve, and execute Change Orders

in a **timely manner** to avoid **disputes and claims** that may affect the progress and completion of the project.

Recommended practice

❑ For the construction phase of a project:

❖ Do **not proceed** with the **work** for Change Orders without authorization and avoid verbal authorization.



Recommended practice

❑ For the construction phase of a project:

- ❖ To **avoid confusion** and **misinterpretations** of the work scope and requirements that are defined for Change Orders,
work to ensure that the packages for each change are **complete**.
- ❖ **Actively follow up** with the parties involved and **solicit any questions** or requests for clarification.



Recommended practice

☐ For the construction phase of a project:

❖ **Conditions** that are determined to be the general cause or the **reoccurring factor** for change orders on a project should be **corrected**.

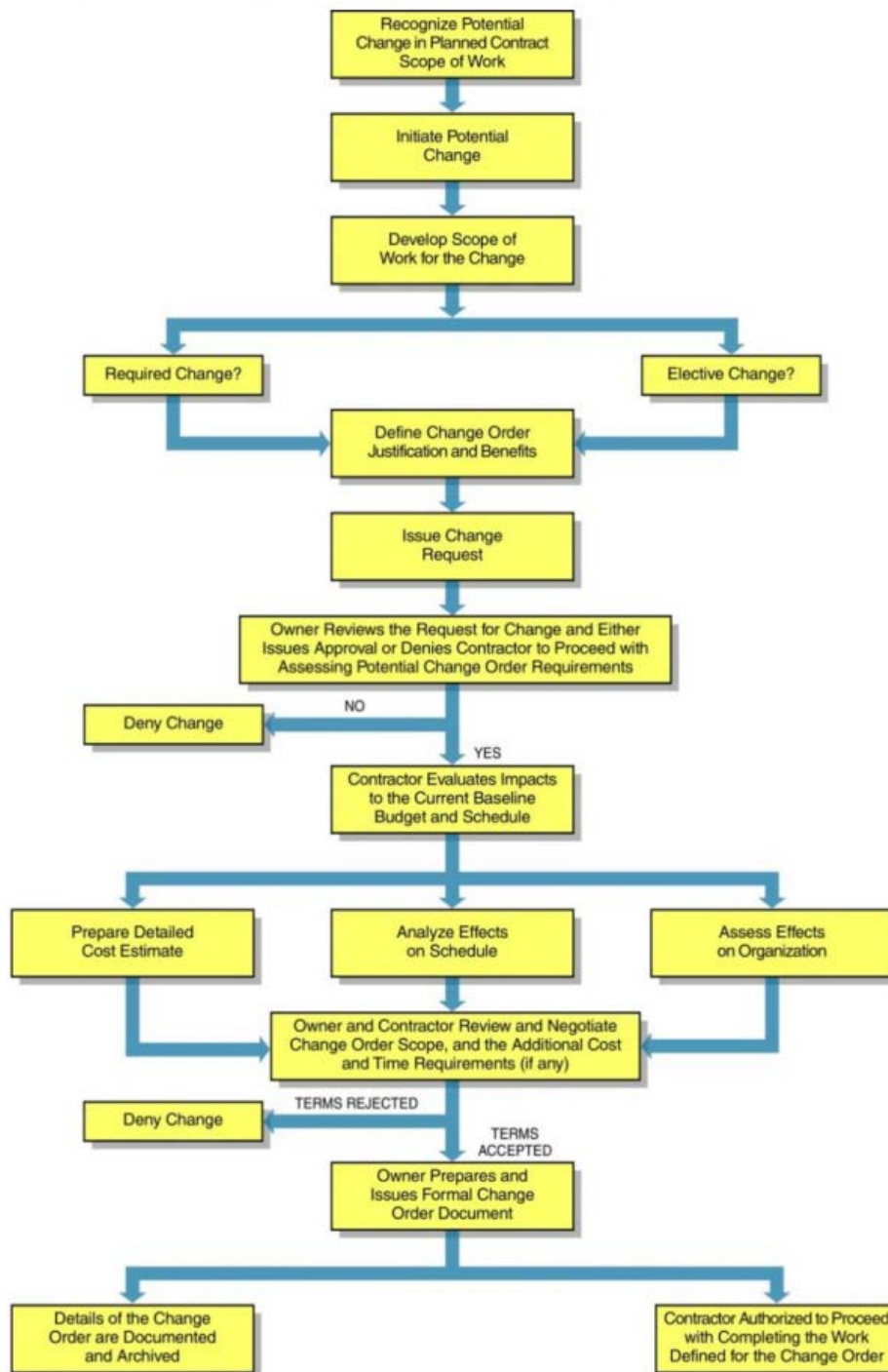


Recommended practice

❑ For the construction phase of a project:

❖ **Detailed information** from the changes should be collected and documented so that the data may be used to provide a **historical reference** on the current and future projects.

Change Management Process



Recommended practice

- ☐ The **change management process** is most often a stepped, sequential process.
- ☐ The steps that take place are listed as follows:

1. Change Identification and Initiation

- a. Identification
- b. Notifications
- c. Reviews

Recommended practice

- ☐ The **change management process** is most often a stepped, sequential process.
- ☐ The steps that take place are listed as follows:

2. Preliminary Submittals

- a. Preliminary Change Request
- b. Reviews and Responses

Recommended practice

- ☐ The **change management process** is most often a stepped, sequential process.
- ☐ The steps that take place are listed as follows:

3. Change Order Submittal

- a. Potential Change Order Document
- b. Review and Responses



Recommended practice

- ☐ The **change management process** is most often a stepped, sequential process.
- ☐ The steps that take place are listed as follows:

4. Approvals, Rejections and Recourse

Recommended practice

- ☐ The **change management process** is most often a stepped, sequential process.
- ☐ The steps that take place are listed as follows:

5. Change Order Execution

Recommended practice

- ☐ The **change management process** is most often a stepped, sequential process.
- ☐ The steps that take place are listed as follows:

6. Claims



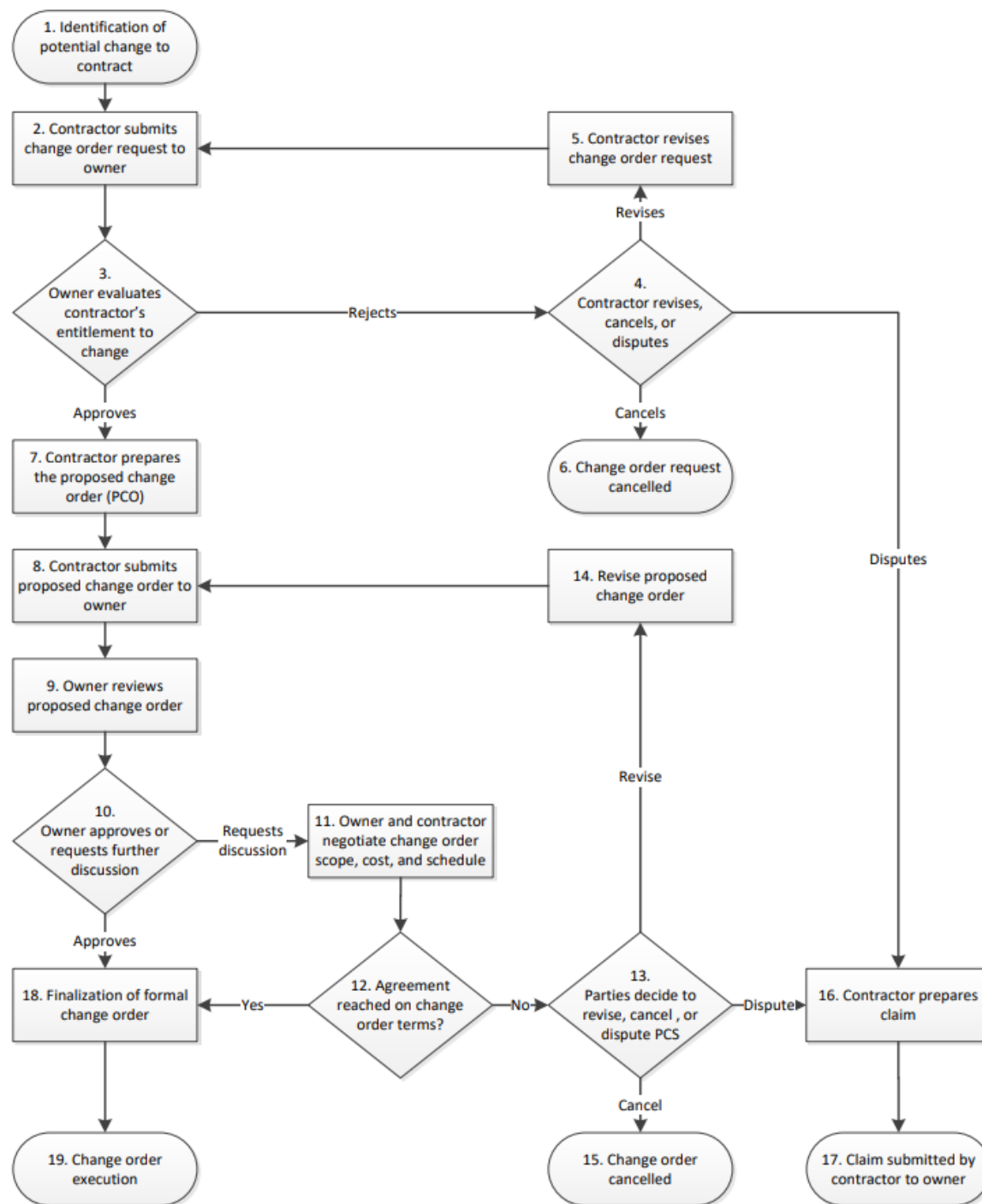
Recommended practice

- ❑ Typically, **every** construction project's change management process includes **some form of each** of these categories.
- ❑ The **nomenclature** may be different, and there may be **interim steps** included, but the **above categories** are **common** throughout the construction industry



Recommended practice

- ❑ **Figure 1** summarizes in more detail the change management process for a **typical capital construction project**.
- ❑ **This process flow chart** is a more detailed version of the one found in **Section 10.3** of AACE's Total Cost Management Framework.





Recommended practice

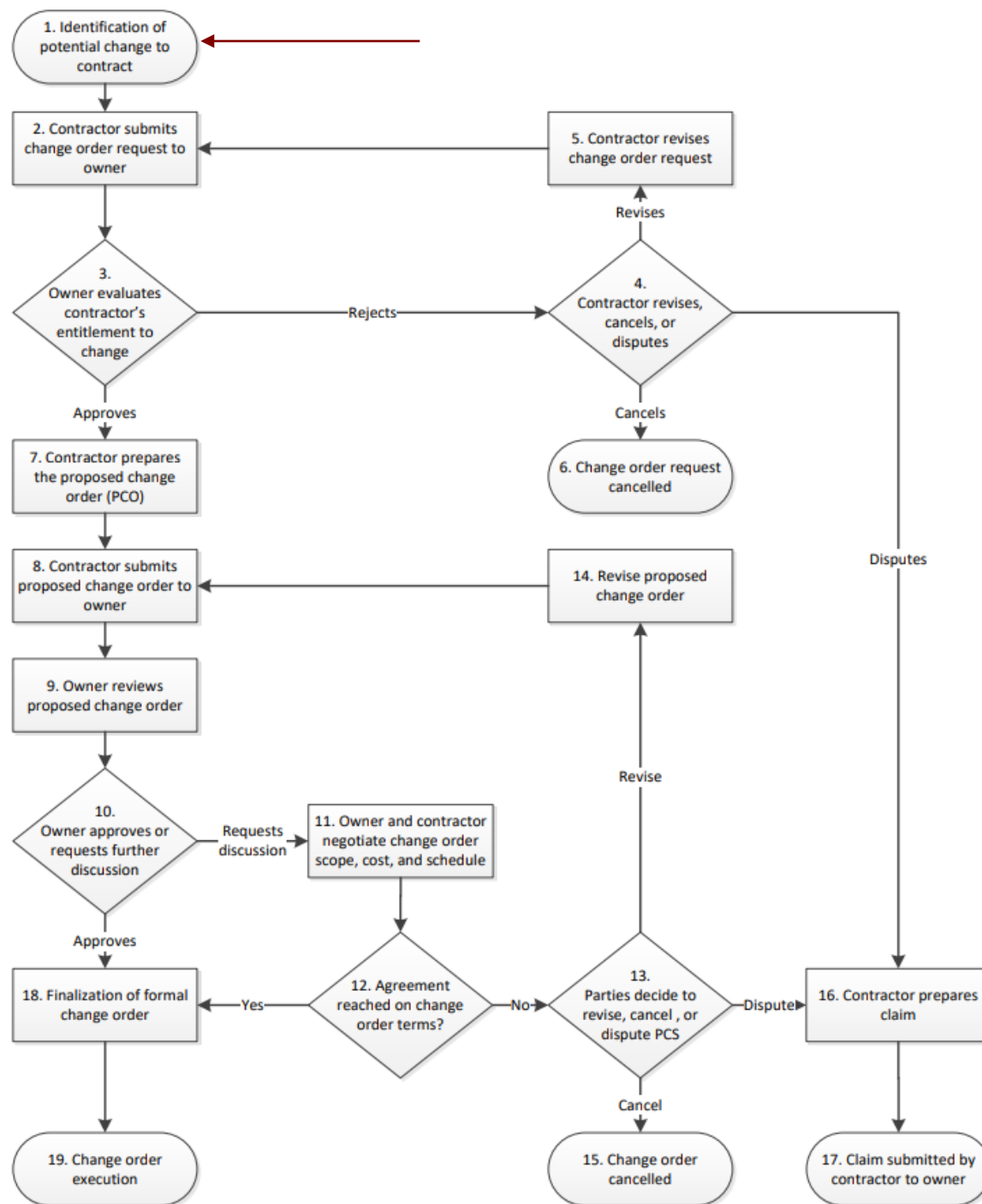
- ☐ This process flow chart **works equally** well for a **singular** designer, construction contractor, or design/build (EPC) contractor.
- ☐ It is **recommended** that the owner and contractor **assign members** from their respective teams to be **responsible** for
 1. Executing,
 2. Reviewing, or
 3. Supportingeach aspect of the change management process identified in Figure 1.



Recommended practice

- ❑ In the following paragraphs, **each numbered stage (box)** found in Figure 1, the Summary Change Management Process flow chart, is **further described**.

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1. Identification of Potential Change to Contract (Box 1)

- ☐ It is important that the **parties** to a design and/or construction contract understand and act in **good faith** in accordance with the terms of the contract.
- ☐ A **change** to the contract can **only occur** if the parties **recognize** that a change has occurred.
- ☐ Changes can be identified **by any party** to a project contract and can be **associated** with **myriad causes**.

Most changes can be classified as having one or more of the following causes:



1. Identification of Potential Change to Contract (Box 1)

☐ Design Modifications

- ❖ These involve revisions to the contract drawings and specifications on a project, and they are **usually initiated** by the owner, the owner's representative or the owner's engineer.
- ❖ It should be noted that if the owner **initiates** a revision to any aspect of the design before it has been completed, the designer may be entitled to additional costs and/or a time extension.



1. Identification of Potential Change to Contract (Box 1)

❑ Design Modifications

❖ This point is especially important on a project that is delivered using the design/build methodology, also known as EPC,

because in addition to the impacts that may affect the **designer's ability** to

1. Complete on time and
2. Under budget,

the design modifications **may also affect**

1. Procurement,
2. Construction costs and schedule

depending on **what point in time** of the project the change occurred.



1. Identification of Potential Change to Contract (Box 1)

❑ Errors and Omissions

- ❖ These **address the items** that are determined to be defective or missing in the contract set of **drawings and specifications**.
- ❖ Several studies reveal that on construction projects that use the traditional design-bid-build delivery process,
design errors and omissions generally account for the **primary cause of change orders**.



1. Identification of Potential Change to Contract (Box 1)

☐ Changes to Means and Methods

- ❖ These occur when the **owner or outside agencies** impact the contractor's planned means and/or methods for executing the work.



1. Identification of Potential Change to Contract (Box 1)

☐ Changed Conditions

❖ These reflect **actual physical conditions** encountered

but were unforeseen and materially differed from the conditions

that were identified in the contract documents or were conditions not normally found in the area of the project site.



1. Identification of Potential Change to Contract (Box 1)

☐ Additional / Reduced Work Scope

❖ At the **owner's discretion**,

the **contract scope of work**

1. May be **expanded** as a result of enhancements to the design or
2. May be **reduced** because of budget considerations and value engineering.



1. Identification of Potential Change to Contract (Box 1)

☐ Owner-Directed Schedule Acceleration or Slowdown

- ❖ Based on the **owner's directive** to modify the contractor's planned performance on a project,

the contractor may incur **additional costs** and **expenses** when the scheduled project performance is accelerated or delayed.

- ❖ In addition, if the contractor does **not receive** justifiable time extensions for excusable delays,

it may require that the **contractor accelerate** the work to compensate for the delays in order to meet the **contractual milestone dates**.



1. Identification of Potential Change to Contract (Box 1)

☐ Work Sequencing

- ❖ This change is a result of the **owner's requirement** to **revise** the contract's planned sequence for completing the work tasks on a project.
- ❖ The **owner's directive** may impact
 - ✓ Contractor's scheduled and
 - ✓ Available labor, material, and equipment,
 - ✓ As well as the contract time for completing a project.



1. Identification of Potential Change to Contract (Box 1)

❑ Adjustments to the Unit Pricing

- ❖ This change is based on **cost overruns** that result from revisions to the **contract unit prices**.
- ❖ **Increases** in a contract item budgeted quantity or material item budgeted quantity are the **most common** reasons for an adjustment to a **unit price**.



1. Identification of Potential Change to Contract (Box 1)

☐ Force Majeure Delays

- ❖ These generally include **extensions** to the project schedule based on events for **which neither** the owner nor the contractor is **accountable** or have the ability to control, such as:

acts of God, strikes and labor disputes, and unusual weather-related delays.



1. Identification of Potential Change to Contract (Box 1)

☐ Added Cost Incentives

❖ These are **implemented by the owner** to

❖ **Encourage** the contractor's participation in **value engineering** on a project

or

❖ **Entice** the contractor to **accelerate** the completion of a project.



1. Identification of Potential Change to Contract (Box 1)

☐ Delayed, Denied, or Restricted Access to a Project Site

❖ This occurs when a **contractor** is unable to **fully access a project site** due to

- ✓ Owner's inability to grant access or
- ✓ Obtain the necessary permits.



1. Identification of Potential Change to Contract (Box 1)

☐ Inappropriate Rejection of the Contractor's Work

- ❖ This is based on the **owner's incorrect rejection** of work elements that **were completed** by the contractor.
- ❖ A change order may be **appropriate if** **subsequent investigation** indicates that the work completed was acceptable and in accordance with the terms and conditions of the contract.



1. Identification of Potential Change to Contract (Box 1)

☐ Delays to Owner-Supplied Services and Materials

❖ These are **impacts to a project schedule** resulting from the owner's inability to provide

services, permanent materials, and/or equipment

within a timeframe that is consistent with the requirements defined in the contract.



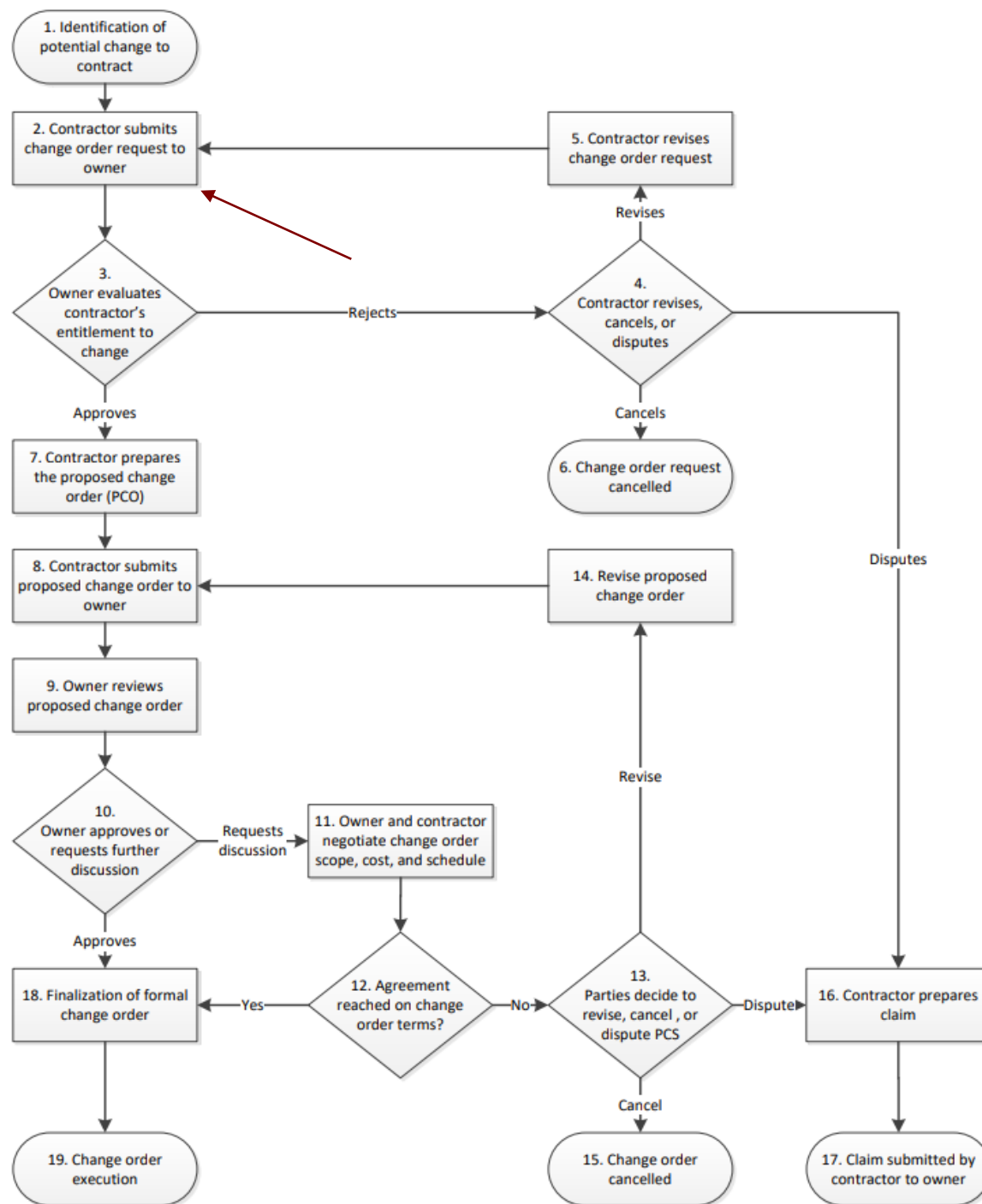
1. Identification of Potential Change to Contract (Box 1)

☐ Owner Interference

❖ This results from the **owner directing**

subcontractors, sub-consultants or vendors

without direct contractual authority (bypassing the prime contractor).





2. Contractor Submits Change Order Request to Owner (Box 2)

☐ Procedures for initiating a change order

❖ The **procedures** for initiating a Change Order have a tendency to **differ between projects**,

as **owners** and **construction managers** each have their **own established** requirements and preferences.

Although there may be some variances, the following items address the practices that are normally expected on a project.



2. Contractor Submits Change Order Request to Owner (Box 2)

- ☐ Once the designer or contractor **determines** that a **potential change** has occurred, timely written notice should be provided to the **owner** communicating that a **potential change** to the project has been identified.

What is the name of this notice?

2. Contractor Submits Change Order Request to Owner (Box 2)

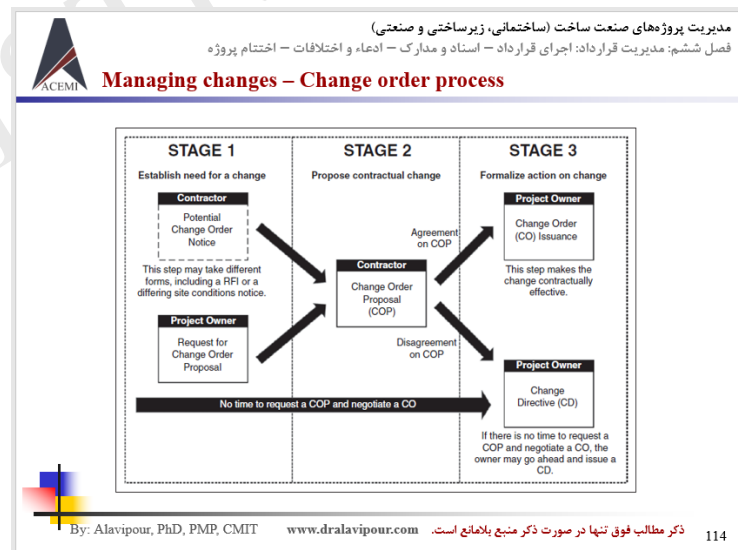
❑ The notice, **often referred** to as

- ❖ Change order request (COR) or
- ❖ Potential change notice (PCN),

is typically **conveyed**

1. **Formally** through letter and/or template form, or
2. **Informally** as an email or other manner allowed by the contract.

Is it acceptable to verbally notify?





2. Contractor Submits Change Order Request to Owner (Box 2)

☐ Although an **attorney should be consulted**,

unless otherwise **specified** in the contract,

verbally informing of a potential change during a meeting between the parties is **not usually an acceptable** means of providing notice

unless it is **followed up in writing** via

1. Meeting minutes or
2. Correspondence.

**What criteria this notice of change
should include?**



2. Contractor Submits Change Order Request to Owner (Box 2)

☐ Notice of a change should include the following **four criteria**:

1. Notice should be in an acceptable written form;
2. The **content** of the notice should **describe** the event or occurrence causing
 - ❖ Change,
 - ❖ Effect on the contractor's work, and
 - ❖ Expected cost and schedule impact;
3. The notice should be **submitted to the owner** in a timely manner, which is often specified in the contract; and
4. The notice must be given to the proper recipient.

Why timely notice is important for owner?



2. Contractor Submits Change Order Request to Owner (Box 2)

- ☐ The **primary reason** for providing a COR is that it **allows the owner** **timely opportunity** to mitigate the effects of the change with the **least amount of impact** to the project's cost or schedule.



2. Contractor Submits Change Order Request to Owner (Box 2)

- ☐ Once a changed condition has been **identified**,
construction contracts often have a **notice clause** that specifies
the **number of days** by which a contractor has to formally
communicate to the owner
that a potential request for change to the contract is being
evaluated and may be submitted.
- ☐ Change order requests are typically a **one to three-page form letter**.

What COR should include?

2. Contractor Submits Change Order Request to Owner (Box 2)

❑ The COR should include:

- ❖ A **short (one to two paragraphs) description** of the reason for and nature of the changed condition.
- ❖ **Detailed description** of the **affected scope**, e.g. unit, geographic location, level, etc.
- ❖ The **date** on which the changed condition was **identified**.
- ❖ A **rough order estimate** of the potential cost and schedule impacts, **if quantifiable**.
- ❖ The proposed reimbursement terms; e.g. unit price, lump sum, reimbursable, etc.
- ❖ Any **other details** that will aid the owner relative to the change and **development of mitigation strategies** regarding the potential cost or schedule impacts.
- ❖ **How the change** will affect the performance measurement baseline (PMB).



2. Contractor Submits Change Order Request to Owner (Box 2)

- ☐ It is also important that the **date the notice was submitted** is **identified** on the change order request.
- ☐ If the request is submitted as a **formal letter or form**, the **owner's document control staff** may **stamp** the letter with the date it was received.
- ☐ The **submittal date** is important as the contract terms may **specify the number of days** after a change has been identified by which the **COR must be submitted**.

Should the contractor start preparing a draft change order at this stage?



2. Contractor Submits Change Order Request to Owner (Box 2)

- ☐ **Prior to allowing** the contractor to proceed with preparing a draft change order,
owners typically want to determine **whether they agree** to the contractor's entitlement to the potential change.
- ☐ **Approval** typically means that the owner concurs that, according to the terms of the contract,
the **conditions do exist** in which the contractor is entitled to a change to the contract.

What if the owner directed a change?



2. Contractor Submits Change Order Request to Owner (Box 2)

☐ If the **owner directed the change**,

then by default,

the contractor would be **entitled to request relief** from potential cost and schedule impacts.

What is the responsibility of the contractor here?

2. Contractor Submits Change Order Request to Owner (Box 2)

☐ On these occasions when the owner has **directed the change**,

the **contractor's responsibility** is to **submit**

1. Cost estimate and
2. Resulting schedule impacts

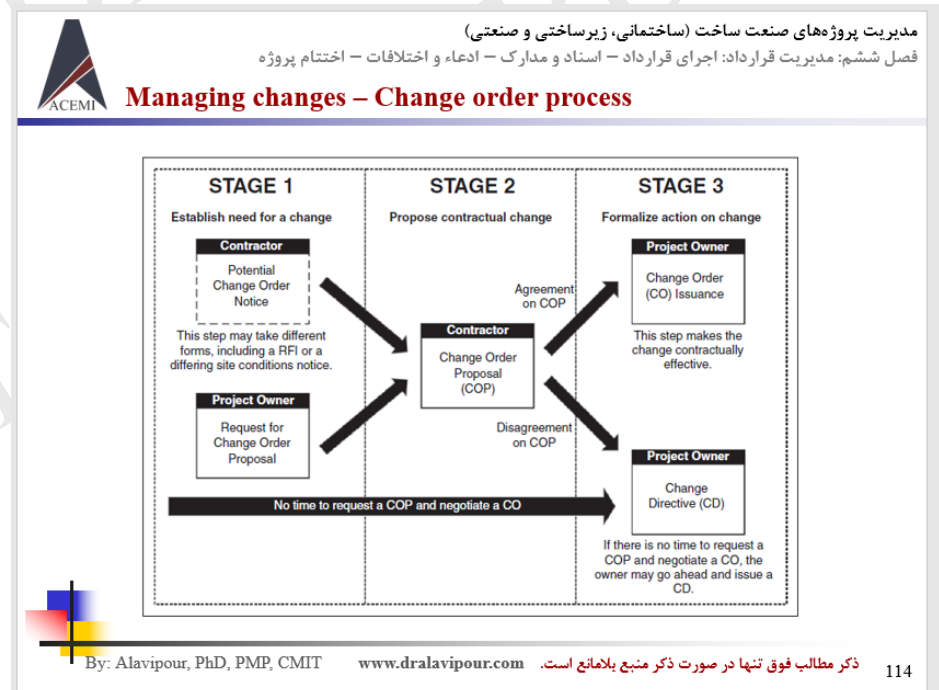
to the owner.



2. Contractor Submits Change Order Request to Owner (Box 2)

- It is recommended that **both parties** to a COR keep complete and organized records as the **issue transforms** from a COR to a proposed change order and then to a change order.

What should these records include?



2. Contractor Submits Change Order Request to Owner (Box 2)

☐ These records **should include**

- ❖ Correspondence,
- ❖ Drafts,
- ❖ Analyses, and
- ❖ Any other information relevant to the potential change.

2. Contractor Submits Change Order Request to Owner (Box 2)

❑ DEVIATION REQUEST [FORM 013]

- ❖ The **contractor** completes and submits a “**Deviation Request**” form to the owner or its representative on a project.
- ❖ The purpose of this form is to **document the deviations** that have been determined from the **original contract documents**.
- ❖ This form serves as a **notification by the contractor** of any changed conditions, omissions, or discrepancies that may result in extra work.
- ❖ The owner can either **approve** or **disapprove** the request, dependent on the **validity or justification** of the change.

Deviation request: Sample form 01

DEVIATION REQUEST

No. _____

Owner _____

Contractor _____

Project _____

Project No. _____

Date _____

Subject _____

Drawing Nos. _____

Specification Nos. _____

Original Contract Requirements _____

Reason for Deviation Request _____

Proposed Deviation _____

Any Change to Contract Cost? ☐ Yes ☐ No If Yes, Describe _____

Any Change to Contract Time? ☐ Yes ☐ No If Yes, Describe _____

☐ APPROVED ☐ DISAPPROVED

CONTRACTOR _____ DATE _____ OWNER / OWNER'S REPRESENTATIVE _____ DATE _____

2. Contractor Submits Change Order Request to Owner (Box 2)

❑ INITIATOR CHANGE ORDER REQUEST [FORM 02]

- ❖ This form can be **initiated** by the owner, the owner's representative, a project engineer, or the contractor.
- ❖ The preparation and submittal of this form are **intended** to define the scope of work
that is involved in completing a potential change and to demonstrate the **justification for the change**.
- ❖ The owner's signed endorsement indicates its **authorization to proceed** with the issuance of a Change Order.
- ❖ The Change Order Request offers **notification** on a project that
the **possibility exists** for an **adjustment** to the contract price and schedule
as a result of a potential Change Order.

Initiation change order request: Sample form 02

INITIATOR CHANGE ORDER REQUEST

No. _____

Project _____

Project No. _____ Contract No. _____ Contract Date _____

Contractor _____

Proposed / Submitted By ☐ Owner ☐ Owner's Rep ☐ Engineer ☐ Contractor

Name _____ Date _____

Change Order Justification _____

Description of Work to Be Performed _____

Contractor is authorized to proceed with this Change ☐ Yes ☐ No On _____ DATE

Approved _____ OWNER _____ DATE



2. Contractor Submits Change Order Request to Owner (Box 2)

☐ CHANGE ORDER TECHNICAL JUSTIFICATION [FORM 03]

- ❖ This form is usually **prepared** by the owner's representative or a project engineer.
- ❖ The **intent** of this form is to **provide the owner** with documented credibility and justification
relative to **completing** the work scope for a **potential Change Order**.

Change order technical justification: Sample form 03

CHANGE ORDER TECHNICAL JUSTIFICATION

Potential Change Order No. _____
Contract Change Order No. _____
Contractor _____
Contract No. _____
Prepared / Submitted By ☐ Owner's Representative ☐ Engineer
Name _____ Date _____

Description of Change _____

Reason for Change _____

Alternatives Considered _____

Impact of Non-Incorporation _____

Approved _____
OWNER DATE

[illegible]



2. Contractor Submits Change Order Request to Owner (Box 2)

- ☐ An **important step** in the initiation process is
 1. For the **originator** to classify whether the change is **required or elective**, and
 2. For the **owner** to confirm and approve this **designation**.

- ☐ The **determination** of whether a change is **required or elective** will influence
 1. **Justification** for the change and
 2. **How** the change will be **evaluated**.

The differences between the two classifications include the following:



2. Contractor Submits Change Order Request to Owner (Box 2)

☐ Required changes must be implemented, and typically include those changes that are necessary to meet:

- ❖ Basic, defined venture/business objectives;
- ❖ Regulatory or legal requirements; and/or
- ❖ Defined safety and engineering standards.

2. Contractor Submits Change Order Request to Owner (Box 2)

- ☐ Elective changes are those that are proposed to **enhance the project**, but are **not required to meet** the original project objectives.
- ❖ Therefore, elective changes **may or may not be implemented**.
- ❖ This type of change is **not mandated**.



2. Contractor Submits Change Order Request to Owner (Box 2)

☐ Change order backlog

- ❖ It is **advantageous to both** the owner and the contractor that potential Change Orders on a project are processed in a fair, equitable, and timely manner.
- ❖ The failure to do so most often results in an **increased probability** of extended disputes and claims between the owner and the contractor.

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