



نحوه اثبات محق بودن به ادعا و دستور تغییر ابزارهای حیاتی + نکات کلیدی (بر اساس اسنادی از ASCE و AACE)

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What we will learn?

☐ Introduction

☐ Recommended practice

❖ Elements Necessary to Demonstrate Entitlement Basis for a Change

Order Request or Claim

- ✓ Causal Event Occurrence
- ✓ Adherence to Contract Change Notice Requirements
- ✓ Contractual Entitlement to Request a Contract Change or Make a Claim
- ✓ Demonstration of Causation
- ✓ Prudent Effort to Mitigate any Impacts
- ✓ Assignment of Responsibility
- ✓ Quantification of Impacts

What we will learn?

☐ Recommended practice

❖ **Change Order Request or Claim Submission**



What we will learn?

❑ Pricing construction claims and change orders

❖ Forward pricing

- ✓ Risk in forward pricing
- ✓ Use of standard formats
- ✓ Material quantities and prices

❖ Post pricing

- ✓ Cost analysis
- ✓ Actual costs
- ✓ Reasonable costs developed from existing job data
- ✓ Reasonable cost estimation



What we will learn?

❑ Pricing construction claims and change orders

❖ The proposal – Request for equitable adjustment

- ✓ General pricing philosophy
- ✓ Unit price contract considerations
- ✓ Pricing elements and details
- ✓ Production rates

❖ Impact and inefficiency costs

- ✓ How impact costs are incurred
- ✓ Specific, identifiable extra work
- ✓ Pricing inefficiency and loss of productivity



What we will learn?

❑ Pricing construction claims and change orders

❖ Material costs

- ✓ Reasons for material claims
- ✓ Other costs associated with material claims
- ✓ Additional material quantities and cost calculation

❖ Equipment costs

- ✓ Additional equipment usage
- ✓ Cost of equipment



What we will learn?

❑ Pricing construction claims and change orders

❖ Overhead and profit

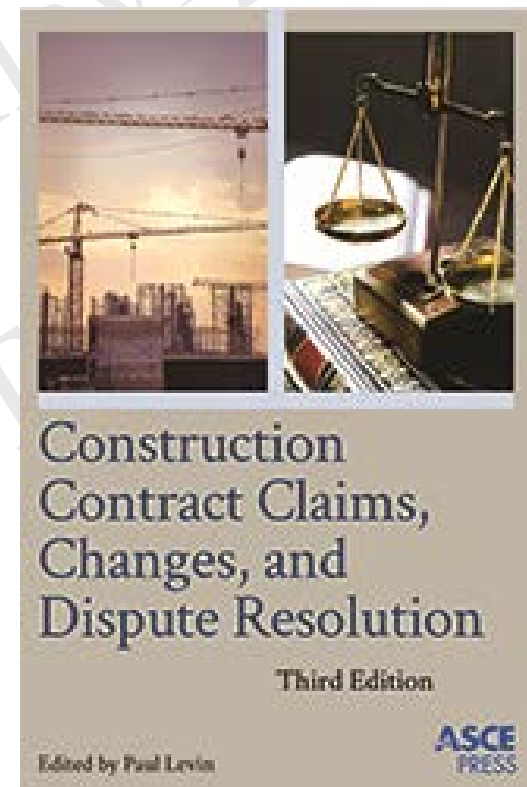
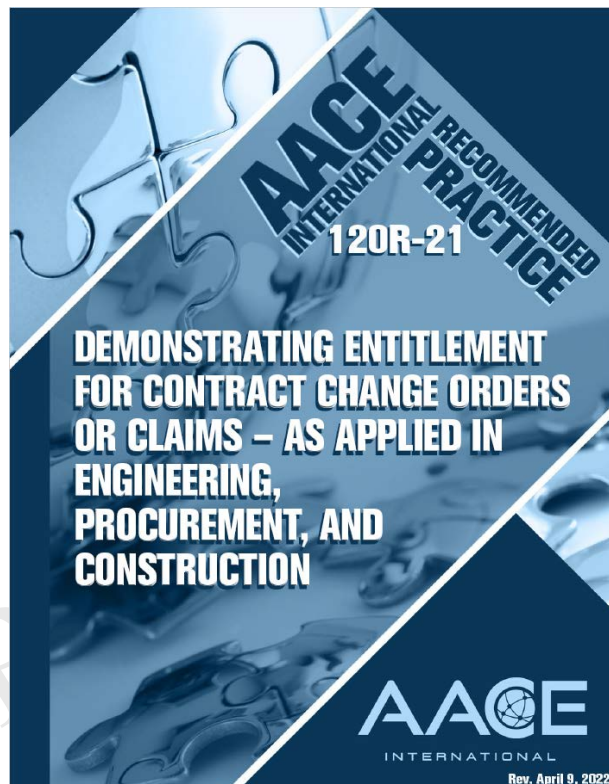
- ✓ Project overhead rates
- ✓ Overhead on large claims
- ✓ Home office overhead
- ✓ Profit

❖ Other elements of claim pricing

- ✓ Interest costs
- ✓ Insurance costs
- ✓ Bond costs
- ✓ Legal fees, change orders, and claim-preparation costs

Reference

Primary reference



Introduction

- ☐ The **foundation** of the **construction process** is the contract.
- ☐ The contract should describe in **detail**
 1. The scope of the contractor's work,
 2. The amount of work to be performed,
 3. The schedule over which it will be performed,
 4. The conditions existing at the site, and
 5. The amount and method of payment.

Are we allowed to change them?



Changed work

❑ Contractors **expect both** to

1. Perform changed or additional work and
2. Receive appropriately adjusted compensation and schedule
as a result of the changed and/or additional work through change orders
issued by the owner.

What does claim mean here?

☐ Claims **result when**

the parties are **unable to reach an agreement** on price and/or time to perform extra work,

including costs and time for delays, acceleration, and impact costs experienced on the project.

*A claim is the contractor or subcontractor's substantive **description** and **detail** that supports the change in time and extra costs incurred, or to be incurred, due to changed or added work.*

In case of dispute?

- ☐ In case of a dispute over the amount to be paid, the amount sought is often termed **“damages.”**

Prerequisite?

❑ The **party paying** for the added work, typically

1. Owner or its representative (when a contractor initiates a claim) or
2. Contractor (when a subcontractor initiates a claim),

needs **detailed** schedule and cost **analyses and discussions** to understand, negotiate, and justify extra contract time and costs.

❑ This recommended practice (RP) addresses the **necessary elements** to **determine** technical entitlement for

1. Change order request (COR) or
2. Claim

as **applied in engineering, procurement, and construction.**

❑ While any definitions **provided by contract documents** would **supersede this RP**,
in the **absence of clarity in the contract**,
this RP defines key elements of the change request process.

These elements of a COR or claim **apply to any typical** design, procurement, and
construction contracting strategy or delivery method.

- ❑ This recommended practice is **relevant to stakeholders** on a capital construction project; this includes
owner, contractor, subcontractor, construction manager, or other stakeholders.
- ❑ **Although** this recommended practice is written in the context of a contract between an **owner and contractor**,
it is equally **applicable to any parties** contracted to perform a project including owners and architect-engineers (A/E), as well as general contractors and their subcontractors.
- ❑ This RP can **also be used as an internal change management** guideline within an organization's management procedures.
 - ❖ In the context of this recommended practice, the **contractor is assumed** to be the **claimant**.
 - ✓ Of course, this is **not always the case**.
The owner/employer, A/E, and a subcontractor can also be claimants as well.

- ❑ For more discussion concerning the project change management process, refer to AACE International's **RP 100R-19, Contract Change Management** – As Applied in Engineering, Procurement, and Construction.

❑ The **approval** of a change order **may not occur** in a timely manner, which may indicate that

the **owner feels** the contractor has **not provided enough information or analyses** to justify increasing the contract compensation or granting an extension of time to the project schedule.

❖ Often, what the owner finds **missing in a COR** is

1. One or more of the required elements of a change order, or
2. That one or more are inadequately demonstrated.

These elements are further discussed in the Recommend Practice section.

What is the solution?

❑ It is recommended that

1. The **elements** that should be demonstrated in a contract **COR**, and
2. The **extent** to which they should be described,

be **agreed upon before** the contract is signed and work commences.

❑ Because the potential stakes associated with disputed changes can be significant, **many disputes** can be **avoided** with this common understanding established well before the project begins.

*A **facilitated alignment session** at the start of the project is a good way to bring such expectations into common agreement.*

Why disputes arise?



Disputes arise

❑ **Disputes** often arise due to the parties' inability or unwillingness to come to an **agreement** on pending contract changes in a **timely manner**.

❖ If an **agreement cannot** be achieved on **one or more CORs** during project execution,

the contractor **may choose to re-submit** the disputed CORs as **claims** at the **end of the project** to recover cost and time impacts for which it believes it is **entitled**.

Recommended Practice

- ❑ The **change management** plan should align with the specific needs of the project.

For example, **avoid using** a change management process intended for a cost reimbursable contract on a fixed price contract project.

*Experience has shown that most change management processes **focus primarily on cost elements** of a change and not enough is written that addresses proper treatment of schedule change management.*

- ❑ One **option of a change management process** can be found in AACE's Recommended Practice **100R-19**, Contract Change Management – As Applied in Engineering, Procurement, and Construction.

But important questions that should be addressed?



Introduction

1. **Prior to contract execution**, it is recommended that the parties agree to what elements should be **included in a COR** to form the bases of the change.

☐ It is also recommended that the parties agree on what types of documentation and analyses would be necessary to serve as **support to each** of the following basis elements.

**Elements Necessary to Demonstrate
Entitlement Basis for a Change Order
Request or Claim**



Introduction

- Typically, contracts place the burden of **demonstrating** the following elements on the **claimant**.

*For an owner to approve a change order requested by a designer or contractor, the following are **seven primary basis elements** of the request that should be satisfactorily demonstrated.*



Seven primary basis elements

□ They are identified as:

1. Causal event occurrence;
2. Adherence to contract change notice requirements;
3. Contractual entitlement to request a contract change or make a claim;
4. Causation;
5. Prudent effort to mitigate any impacts;
6. Assignment of responsibility; and
7. Quantification of impacts.



Seven primary basis elements

- ☐ The following is a description of each element and why it is important to be included in the change order request or claim.



Casual event occurrence

❑ **Before** a contractor can establish causation (**see item no. 4**), this element establishes **whether** an event that potentially caused an impact has actually occurred.

❖ Normally, upon **discovery** of the changed condition,
this knowledge is **shared amongst** the contractor's project team so that
the appropriate **internal steps** are taken to
initiate and support the change order request.

❑ A causal event that impacted the contractor may also have been an action that did not take place,
such as a **missed deadline** by a party it had **no control over**
but **had to rely on** to complete its work.

*This element of a substantiating that a causal event occurred **may seem to be simple to demonstrate**, but failure to do so has led to **many disputes**.*



Casual event occurrence

- ❑ A simple example could be determining whether **adverse weather** occurred such that it **impacted** the contractor's **ability to work**.
- ❖ Typically, contracts allow the contractor to submit a **change order request** if it was impacted as a **result of adverse weather**.

What is the common dispute about that?

Casual event occurrence

❑ Sometimes, there can be a dispute on

whether a rain event **occurred at all**,

especially at **locations** where rain measurement **stations are too far away to**

adequately quantify the amount of rain that fell on the project site.

*Of course, actions should be taken **prior to the project's onset** to*

account for and **quantify**

the possibility of adverse weather,

*but these measures are **not always anticipated** or are **simply not taken**.*

Who has the responsibility to demonstrate?



Casual event occurrence

- ❑ As the **claimant**, it would be the **contractor's responsibility** to demonstrate that the event **did indeed occur**.
- ❑ Therefore, the contractor would have to provide **evidence in the form of such records** including
 - ❖ Certified test results,
 - ❖ Photographs,
 - ❖ Contemporaneous weather records,
 - ❖ Minutes of meetings, and
 - ❖ Other documentationto show that the event that **caused the impacts** for which it has claimed did occur



Casual event occurrence

☐ **Without** first demonstrating or gaining acknowledgement from the owner that an **event occurred**,

it would be **impossible** to demonstrate a **causal relationship** to the alleged **resulting impacts**.



Adherence to contract change notice requirements

- ☐ It is important that **all parties** to a contract be **familiar** with the terms of the contract.
- ☐ In this case, particular focus should be on the change management process and the claims submission process,
part of which should include the **submission** of a proper and timely notice.



Adherence to contract change notice requirements

- ❑ Typically, **construction contracts** require that once the **contractor has identified** a potential changed condition,
it has a **specified number of days** to provide notice to the owner of a potential change;
the **submission of other documentation** may also be subject to time limitations.



Adherence to contract change notice requirements

- ☐ The **first step** in requesting a change order or prosecuting a change order claim is to **recognize** the potential contractual basis for an **adjustment** in time or price.
- ☐ **Early recognition** is required to ensure that **notice requirements** are met, and that costs and documentation needed to support the change order claim are maintained.

Reasons for timely notification?



Adherence to contract change notice requirements

- ❑ Among the **reasons timely notification** should be submitted to the owner are the following:
- ❖ Provides the **owner a chance** to **examine** the actual conditions on-site or **investigate** the issues under examination at the time of their occurrence;
 - ❖ Gives the owner a better chance to **mitigate** the potential adverse effects of the issues under examination (e.g., delay-causing events, adverse conditions, previously unknown site conditions, or changes to the scope);



Adherence to contract change notice requirements

- ❑ Among the **reasons timely notification** should be submitted to the owner are the following:
 - ❖ Provides the owner with an opportunity to **explore more** reasonable and/or less costly options, and possibly change its work plan by:
 - ✓ **Modifying** the design to avoid or otherwise better manage **pertinent risks**;
 - ✓ **Requesting** the **contractor** to provide a proposal or change order request to execute the changed work;
 - ✓ **Identifying** changes such as change in the **contractor's means and methods** or to **exclude** certain work elements **from the contractor's scope of work**;



Adherence to contract change notice requirements

- ❑ Among the **reasons timely notification** should be submitted to the owner are the following:
 - ❖ Provides the owner with an opportunity to adjust its budget and pursue additional funding opportunities as needed.



Adherence to contract change notice requirements

❑ **Not all** notice **requirements** in a contract are the **same**.

❖ *For example, for force majeure and differing site conditions clauses, notice timing is often shorter than for other types of change / delay.*

✓ Further, the required elements for a proper notice may change from one contract clause to another.



Adherence to contract change notice requirements

- ❑ Additionally, there may be **continuing notice obligations** to keep the **client updated** on how the contractor is “spending the client’s money”.
- ❖ *For example, with respect to notices of delay, sometimes it may **take months for a delay event** to run its **full course** and the contractor to acquire the necessary data to support its claim.*
 - ✓ In this case, contracts may require **monthly updates** be submitted to the owner that inform on the status of delay event.



Adherence to contract change notice requirements

- ☐ **Contractors** often contend that the owner had constructive notice during meetings, progress reviews, and project progress reports that a change occurred that would impact its time and cost of performance.
- ☐ A contractor should **not solely rely on this contention** as there is significant uncertainty that a **court or arbitration panel** will make an award based on constructive notice and require formal notice for the COR or claim to prevail.

Estimate of cost and time included in the notice?



Adherence to contract change notice requirements

- ❑ Often, **contracts** require that the contractor include a high-level estimate of the pricing and schedule impacts within the **initial notice** of change.
- ❑ Informing the owner as **early as possible** of a potential change and the associated change to the contractor's pricing and schedule completion date allows the owner the **opportunity** to identify and consider other options if the contractor's estimated cost and schedule **impacts** can be avoided or mitigated.



Demonstration of causation

- ❑ **Once** a causal event has been demonstrated to have occurred or is occurring, the **next test** for the contractor is to demonstrate that this event **contemporaneously impacted** its forecasted final costs and completion date.
 - ❖ Although the event is contemporaneous, its **impacts may not be felt** until far into the **future of the project**.



Demonstration of causation

☐ The contractor must demonstrate that

1. There was a **cause-and-effect** relationship between a **causal event** that was not its responsibility (or there was a shared responsibility) and
2. The **effects that event had** on its ultimate project cost or ability to finish the project by the current contract completion date.



Demonstration of causation

- ❑ Demonstrating causation is often the **most difficult aspect** of a COR for the contractor to prove, **especially if** the contractor did not **keep good project records**.
- ❑ Often the need to start capturing detailed and relevant documentation **should have been underway before** the change event occurred.
 - ❖ It is **not typically feasible** for a contractor to **keep records in anticipation** for the possibility that a **change might occur**.
 - ❖ Quite often, an event **arises and issues** such as productivity loss are **not immediately understood**;
therefore, it does **not immediately trigger** the start of detailed record keeping.

Demonstration of causation

- ☐ A **list of common causes** of changes can be found in RP 100R-19.



Demonstration of causation

- ❑ Reverting back to the rain event example, the contractor will have to **demonstrate** *that the magnitude of the adverse rain that occurred was **not only unanticipated** per the terms of the contract, but also **affected the project's ability** to move forward efficiently, or not at all, as per the schedule.*
- ❑ It must also be demonstrated that **additional costs** were incurred to **mitigate or respond** to the rain's effects.



Demonstration of causation

❑ It is recommended that the contractor provide

1. Labor and other productivity records,
2. Photographs of work affected by the rain,
3. Correspondence,
4. Vendor records, and
5. Evidence that the project's critical path was impacted by the event.

❖ There should be a clear understanding of the work that was **contemporaneously on or near the critical path** at the time the **causal event occurred**.

❖ Additionally, the **contractor** should **demonstrate concurrent delay** if it occurred.



Prudent effort to mitigate any impacts

❑ Typically, contracts require that **both parties** have a **duty to mitigate** the impacts of a change.

❖ However, if a contractor intends to request a **change order for impacts** resulting from a change,

the owner will typically request that the **contractor demonstrate** the mitigation efforts it performed and the show the resulting effects.

✓ It is recommended that a contractor confronted with a changed condition

should make its **best efforts to mitigate** the potential impacts of the change.



Prudent effort to mitigate any impacts

- ❑ **Providing evidence** that the contractor acted to avoid or mitigate the **impacts** resulting from a change should **indicate to the owner that** the **COR** resulted **only after the contractor did its best** to reduce the cost and schedule impacts.



Assignment of responsibility

❑ **Identifying** the party that is **responsible** for a change may **seem simple** to demonstrate, and **often is**.

❖ *For example, the owner would most likely be responsible for the additional costs that arise as a result of a change in scope that it directed.*

✓ However, this is not always the case when **determining who is responsible for delay** and the **associated costs**.

○ This can sometimes be challenging, especially when other **intervening effects are simultaneously impacting** the project schedule.



Assignment of responsibility

- ❑ With respect to **delays** arising from **changes**, including owner-directed changes, the contractor will have to demonstrate that the change impacted the project schedule's critical path or other contractually-defined milestones at the time that the change occurred.

What if the contractor cannot demonstrate?



Assignment of responsibility

- ☐ If the contractor **cannot demonstrate** that the change will affect the **contemporaneous critical path** once the changed work is performed, then there are **no time impacts** to the project completion date.



Assignment of responsibility

❑ However, there may be **events** that affect the contractor's direct cost of performing the work

even though the event, change, or owner-caused action did **not affect the current critical path** of the project;

for example, acceleration or disruption costs.

An event, change, or owner-caused action may result in **delay to a subcontractor's work** that was **not on the current project critical path**, but that **subcontractor's work was extended** in time compared to its planned schedule for completion, and thus its **time related costs** were increased.



Assignment of responsibility

- ❑ Lastly, **determining responsibility** for a change and its resultant impacts can be difficult to establish **retrospectively** as a result of poor project documentation, especially when:
- a) A change was **not specifically directed** by the owner,
 - b) **Occurrence** of the causal event **cannot** be established, or
 - c) When **causation cannot** be clearly determined.

As noted previously, it is important for both parties to maintain good records contemporaneously throughout the life of the project.



Quantification of impacts

- ☐ For the contractor to be **granted an increase** to its contract price or a time extension as a result of a contract change, it must **quantify** the **associated impacts**.
- ☐ That is, the **contractor must calculate** how much additional money and time would be needed to successfully complete the project according to the terms of the contract.



Quantification of impacts

- ❑ The **contract** should define **what documentation** the contractor is to **submit** to the owner in support of its requested cost and time extension quantifications that result from a contract change.
 - ❖ However, **contracts** are often **silent or ambiguous** with respect to **what supporting** analyses and documentation the contractor is to provide.

This understanding is especially important when the **changes** are **related to quantifying** the effects of disruption and project delays.



Quantification of impacts

- ❑ It is recommended that the contractor demonstrate that the cost or schedule impacts, which **have been or will be realized** as a result of the change, are **reasonable** and **supportable**.
- ❖ Although these terms can be **subjective in interpretation**, it is important that the **claimant only include quantification** of costs or delays that it can reasonably support.



Quantification of impacts

- ❑ Concerning a **time extension request**, if not specified in the contract, a common way to **contemporaneously quantify** forecasted schedule impacts is through the use of time impact analysis,
 - using the most **recent schedule update** prior to the occurrence of the event, change, or owner-caused action or inaction.



Quantification of impacts

- ❑ The amount of information and analyses necessary to demonstrate each element should be **scalable** based on the complexity of the project and the specific issue being evaluated in the COR or claim.

Pricing construction claims and change orders?
Another section!

Change Order Request or Claim Submission



Change order request or claim submission

- ☐ It is important that the COR or claim is written in as concise and cogent manner as possible.
- ☐ **Graphics** are always helpful in communicating points that would otherwise **require multiple paragraphs** to describe.
- ☐ **Claim visuals** can play important roles in simplification and proper presentation of a claim, especially in **complex cases**,
because they are used to organize records, findings, and analyses in the most **efficient and visually attractive** ways using illustration techniques.



Change order request or claim submission

- ☐ The use of these techniques along with **other elements** of a claim such as claim narratives and other supporting documents improves readability and makes the arguments more compelling.



Change order request or claim submission

❑ Whether a COR or claim, it should be submitted using the **following guidelines**:

1. The **submission** should present a complete package, with **all necessary supporting data**, so that it be utilized...as the basis for proving the claim with little extra work.
2. The **presentation** should offer a complete, accurate, and truthful narrative about the conditions encountered on the project.
3. The **presentation** should admit and take into account problems that are the...**claimant's...own responsibility** and that had a significant effect on the project.

(The alternative to this can be a **disaster** when the...**claimant's...credibility** is shattered at a hearing or trial.)

4. Finally, the **submission** should reflect **pricing** that is not grounded in the “**twilight zone.**”





Change order request or claim submission

- ☐ The contractor's COR or claims submission should be based on **facts** and **avoid attempting** to rely on opinions or other information that is not fact-based.



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Pricing Construction Claims and Change Orders

(Introduction)



Introduction



مدیریت ادعاء و اختلافات در طول چرخه حیات پروژه
آنالیز، ارزیابی و حل دعاوی و اختلافات در فاز پس از ساخت/اجرا (Post-Construction Phase)

Stages in analysis – Damage analysis

❑ Pricing of claims falls into two categories:

1. Forward pricing

where the **price and time** are **negotiated before** the **work is done**.

2. Post pricing,

where **pricing and time adjustments** are made **during or after**
performance of the work.

❑ In applying either type, the pricing elements of the claim itself are the same and include

1. Direct cost of performing the changed work,
2. Impact and/or delayed performance costs (impacts on direct costs),
3. Project overhead costs,
4. Markups for overhead and profit.

- ❑ **Many different methodologies** have been used to successfully price claims.
- ❑ What is important is that the pricing elements are carefully **calculated** and **substantiated**.



Forward pricing

- ☐ Forward pricing establishes a **price** before the work is done.
- ☐ The owner and contractor (or contractor and subcontractor) **agree on**
 1. The **work** to be performed,
 2. The amount of **costs** to be incurred,
 3. The **time** required to perform the changed work, and
 4. The **amount** to be paid.
- ☐ This is a **practical approach** and offers **great advantages** to both parties.
- ☐ The owner or contractor can negotiate a **fair and reasonable** price and time to perform the work **before directing** the work to be performed.



Forward pricing

- ☐ The owner or contractor **also knows** the **additional cost** to be incurred because it has **been fixed** by the agreed-upon change.
- ☐ The contractor can
 1. Logically integrate the changed work into the schedule,
 2. Procure the required materials, and
 3. Perform the work.

Unfortunately, the pace of construction projects often prevents changes from being forward priced and agreement being reached prior to performing work.

- ❑ **Post pricing** is used to establish the price for changed and added work after performance of the work.
- ❑ Common post pricing methods are force account, or time and material, in which payment is based on **records of actual** work hours, materials, and equipment used.
- ❑ This method is **most commonly used** when an owner directs a contractor to make discrete changes during performance where the **changed work** can be segregated from the base contract work.

- ❑ Often, **directly capturing** the added cost is **not possible**, such as when the owner directs a *pipe size to be increased from 6 in. to 10 in. in diameter*, affecting multiple areas and trades throughout the project.
- ❑ **Directly capturing** the impact costs or labor inefficiency costs on **unchanged but affected** base contract work and the **changed work** is often difficult.
- ❑ These are the circumstances **where disputes** over the cost and time to perform changed work most often arise.
- ❑ **One benefit** to post pricing changes is that the **actual increase in cost is known** rather than estimated.

Pricing Construction Claims and Change Orders

(Forward Pricing)



Introduction

- ❑ In the Modification Impact Evaluation Guide (although withdrawn by the Corps, the statements about forward pricing remain relevant),
the U.S. Army Corps of Engineers emphasizes the **importance of agreeing on price and time terms**
before allowing the contractor to proceed with modified or changed work.

*The guide states, “The **attitude** that the **urgency** for reaching a settlement no longer exists once the NTP [notice to proceed] has been issued is **self-defeating**.”*



Introduction

- ❑ For many reasons, it is **advantageous** to the contractor to delay final settlement of all modifications until the work is finished.”

Why the contractor believes this?

Introduction

- ❑ The guide gives the **following reasons** a **contractor would find** delaying settlement of modified work until all of the work has been completed **advantageous**:
 - ❖ The contractor can be **less cost-conscious** in doing the work.
 - ❖ **Some of the risks** contractually assigned to the contractor are **shifted to the Corps of Engineers**.
 - ❖ The contractor will have **actual cost data** with which to confront the Corps of Engineers.
 - ✓ (Actual cost data under this circumstance does **not necessarily represent reasonable cost**.)

What is the challenge here?



Challenges in forward pricing

- ❑ When a construction **change directive** is issued,
the **contractor must perform** the work;
the **cost** of that work will be determined at a **later date**.
- ❑ The **contractor assumes** that any and **all costs** it incurs will be **compensable**,
while the owner will argue that **not all costs** were necessary or reasonable
and/or some costs were excessive,
thereby resulting in a **dispute**.



Advantages of forward pricing

❑ The guide notes **advantages of forward pricing** but goes on to say that

“[a] major benefit of settling modifications before performance is that it encourages prompt revision of the progress schedule,

thus maintaining accurate knowledge of the sequencing of

1. The remaining work,

2. The final contract price, and

3. The final completion date.

❖ *The schedule then remains a **realistic tool** for determining the **impact of changes** on the contractor's operations.*

❖ *An up-to-date **CPM schedule is a prerequisite** to forecasting the presence and extent of impact.”*



Advantages of forward pricing

- ❑ An **updated current schedule** also allows for independent **analysis of future changes**.

Thus, the **impact** to the project of each change can be **determined**.



Advantages of forward pricing

- ❑ However, **although** forward pricing has certain **advantages**,
most changes are not settled in time to avoid impacts to the follow-on work.
- ❖ As a result, many **forward-pricing proposals** are withdrawn then resubmitted with **actual costs**
because **owners fail to approve** the change in time to take advantage of the risk allocation inherent in the forward-pricing method.

Does owner accept contingency?



Risk in forward pricing

- ❑ Owners **rarely** accept contingencies in price proposals.
 - ❖ Sometimes, the **owners/engineers** do **not fully inform** the contractors of **all cost implications** a change order might have on the project.
 - ✓ *For instance, an owner may change equipment furnished, but fail to inform the contractor of a **longer lead time** to **obtain the new equipment**.*
 - *Thus, the contractor is left to develop the full scope of required services to cover all unanticipated potential costs of the changed work*



Risk in forward pricing

- ❑ A change order price proposal should **include everything**, within reason, that the **change** could affect directly or indirectly.
 - ❖ This includes schedule impacts and the effect on base contract work **not directly changed** but nevertheless made more **difficult or costly to perform**.
 - ✓ The **standard changes clause** for government contracts and in many standard form contracts recognizes **claims** for impact on **“unchanged” work**.



Risk in forward pricing

- ☐ In **estimating a new job**,

ideal conditions, worst conditions, or conditions somewhere in between can be assumed when **preparing the bid**.

- ☐ In forward pricing, **more is known** about the conditions in which the work will be performed;

therefore, the **cost proposal** should include costs based on the **actual conditions** encountered or expected.

- ☐ These **conditions** should be **documented** as part of the **cost proposal**.

What to do with risks then?



Risk in forward pricing

- ❑ The **contractor's estimate** should define all probable risks and problems and **base its pricing** on those problems and risks that are more substantial and probable.
- ❑ Where **substantial risks** are identifiable, but **unlikely** and/or **difficult** to quantify, they should be **explicitly excluded** from the **change proposal**.

What if change order seems likely to affect
unchanged work ?



Risk in forward pricing

- ☐ In the event a change order seems **likely to affect unchanged work** but **cannot** be
 - (1) discerned,
 - (2) accurately estimated, or
 - (3) negotiated,the contractor should **expressly exclude** those risks from its **proposal** and **reserve the right to claim** such cost and time extensions at a **later date**.



Material quantities and prices

- ❑ **Additional work** is the **most common reason** to require additional material.
- ❑ A **detailed material takeoff** should support the quantity of additional material, and **invoice or quote backup** should support any increased costs.
- ❑ **Buying small amounts** of additional material may result in higher unit costs for the additional materials.
- ❑ **Increased costs** also result from **improperly specified materials** (or defective specifications).



Material quantities and prices

- ☐ A **contractor** would then **submit material** in compliance with the **corrected specifications**.
- ☐ The contractor should be **able to recover** the increased cost of the substituted material.



Material quantities and prices

- ❑ A contractor should **weigh** the same considerations as in the **original bid** regarding material **takeoff and pricing** when estimating material costs for change orders.
- ❑ Changes often involve **small material quantity purchases** with increased handling; as such, more attention should be paid to pricing to **ensure all applicable costs** are considered.
 - ❖ Sources for material prices include quotations, published price lists, records, handbooks, and published indices.



Material quantities and prices

❑ Factors to account for when pricing materials include

- ❖ Purchasing practice—higher prices of a reliable supplier,
- ❖ Salvage value of job material and excess purchases,
- ❖ Greater cost of odd lot sizes,
- ❖ Quantity discounts not applicable or not able to be taken,
- ❖ Cash discounts not applicable or not able to be taken,
- ❖ Transportation and handling costs (special deliveries),
- ❖ Inspection and testing costs,
- ❖ Taxes and duties,
- ❖ Escalation, and
- ❖ Storage.



More...

نحوه اثبات محق بودن به ادعا و دستور تغییر
بر اساس اسنادی از ASCE و AACE

See claim management course...

Pricing Construction Claims and Change Orders

(Post Pricing)



Cost analysis

- ☐ The contractor always has the burden of proving both the entitlement to and the amount of requested additional costs.



Cost analysis

☐ The contractor is **obligated** to provide

1. The best evidence of damages possible under the circumstances, and
2. Good, detailed presentation of damages

can frequently result in a greater recovery of the costs incurred.

❑ **Courts** have shown a **strong preference** for the actual cost method of calculating damages.

❖ *The U.S. Court of Claims stated in Bruce Construction Corp. v. United States, “As we have said above, there is a presumption that actual costs paid are reasonable. That presumption must be overcome by which every party alleges its unreasonableness.”*

✓ *In this method, the actual cost records of the contractor are used to “itemize and total the cost of each piece of equipment or material and each manhour necessitated by the [breach].”*



Actual costs

- ❑ This method is **also referred** to as the “**segregated**” or “**discrete**” cost method.
- ❑ If the **existence of the claim is known** prior to completion of the job, arranging the **contractor’s cost-accounting system** to allow for the **immediate identification** of damages may be possible.
- ❖ **Every effort** should be made to **segregate the damages** by issuing separate cost-accounting codes to **track** the labor and material for the changed work.
 - ✓ However, this is often not possible



Actual costs

- ❑ For example, when work is **both added and deleted** by a change,
no actual cost record will exist for the **deleted work**.
- ❑ When **separate cost codes** are not established,
the changed work labor and material are **comingled with the base work** labor
and material,
making the **separation** of costs **difficult** without signed time tickets,
invoices, or some methodology to identify the changed work discretely.
- ✓ If
 1. The changed work was **highly inefficient**, and
 2. **No separate cost codes** or tickets were produced,
an accurate accounting of the work hours **cannot be determined**.



Reasonable costs developed from existing job data

❑ However, **most** construction project **documentation** will include **some or all** of the following **categories of documents**:

❖ Original estimate:

- ✓ The **contractor** will generally have prepared an original estimate or budget **prior to submitting** a bid or proposal for the project.
- ✓ These **estimates** are typically broken down into **various accounts or cost codes** that reflect the work to be performed.
- ✓ Within the various accounts, **numerous subaccounts** can be included, depending on the **level of detail the contractor desires**.



Reasonable costs developed from existing job data

❑ However, **most** construction project **documentation** will include **some or all** of the following **categories of documents**:

❖ Cost reports:

- ✓ One of the most important categories of documents is the **contractor's cost reports reflecting actual costs** incurred in performing the work.
- ✓ In reviewing cost reports, there are generally two types of reports to examine.



Reasonable costs developed from existing job data

❑ However, **most** construction project **documentation** will include **some or all** of the following **categories of documents**:

❖ Cost reports:

- ✓ One is an overall project cost report, frequently called a “**job cost report**,” “**work-in-progress report**,” or “**job status report**.”
 - This report shows all incurred costs on a job, such as labor, material, and equipment, arranged by cost code or account.
- ✓ The second type of report is a labor-only report, focusing on **labor expenditures** by cost code or account.
 - Such reports frequently give work hour data, hourly cost data, and unit cost data.

*Both types of reports are normally available in **summary and detail** formats.*



Reasonable costs developed from existing job data

❑ However, **most** construction project **documentation** will include **some or all** of the following **categories of documents**:

❖ Labor records:

- ✓ Labor cost is **often the largest** variable cost a contractor incurs and is a frequent **source of damage claims**.
- ✓ Labor records include documentation such as timesheets, overtime reports, and cost records.



Reasonable costs developed from existing job data

❑ However, **most** construction project **documentation** will include **some or all** of the following **categories of documents**:

❖ Quantities:

- ✓ The **anticipated quantities** of work to be performed are usually included in the **initial estimate**.
- ✓ Most estimates include a **quantity takeoff**, which is the count or measure of the quantity of material required along with the labor required to install those materials.
- ✓ These **quantities** should be compared with the actual quantities of work performed to determine whether **cost overruns or underruns** are related to quantity differences.



Reasonable costs developed from existing job data

❑ However, **most** construction project **documentation** will include **some or all** of the following **categories of documents**:

❖ Schedules:

- ✓ The **original schedule** is typically updated on a regular basis, generally **monthly**.
- ✓ The **updated schedules** are important to any delay or acceleration claim, as **critical path impacts** on a monthly basis can be identified.



Reasonable costs developed from existing job data

❑ However, **most** construction project **documentation** will include **some or all** of the following **categories of documents**:

❖ Pay applications:

✓ Pay applications can be a **source of information** on the **quantity of work performed**,

allowing for an **analysis** of the **amount of work performed** by period and type,

particularly for **unit price contracts**.

✓ Pay applications can be used to **identify** an earned cost as **compared** with an actual cost per pay period.



Reasonable costs developed from existing job data

❑ However, **most** construction project **documentation** will include **some or all** of the following **categories of documents**:

❖ Changes estimates:

- ✓ When the **owner directs** a change in work, the contractor is generally **requested to submit an estimate** of the increased or decreased costs and time resulting from the change.
- ✓ In **performing a claim analysis**, **revisions** to the budget in the cost report should be **reconciled** with approved change orders.
- ✓ *As an example, if an additional 500 work hours are added, the budgeted work hours should reflect an increase of 500 work hours as compared with the actual work hours expended for the same work item.*



Reasonable costs developed from existing job data

❑ However, **most** construction project **documentation** will include **some or all** of the following **categories of documents**:

❖ Daily logs and reports:

- ✓ The **daily logs or daily reports** of the prime contractor and subcontractor provide a contemporaneous view of what work was being performed and any problems encountered.
- ✓ The architect, engineer, and the owner's representatives may also maintain periodic reports.



Reasonable costs developed from existing job data

❑ However, **most** construction project **documentation** will include **some or all** of the following **categories of documents**:

❖ Daily logs and reports:

- ✓ Daily logs and periodic reports can provide insight into
 1. **What actually occurred** on the project on a day-to-day basis, and in some occasions
 2. **Why** specific events occurred, or
 3. **When** and **how much** added equipment was used in a specific time period.
- ✓ Often, the daily logs and/or reports are the best source of **contemporaneous project information** to confirm extra costs claimed.



Reasonable costs developed from existing job data

❑ However, **most** construction project **documentation** will include **some or all** of the following **categories of documents**:

❖ Productivity reports:

- ✓ For self-performed work, a **daily or weekly record** is kept, showing installed units and work hours for **each labor cost code**, as compared with the estimated productivity rate for the same work item.
- ✓ These reports reflect when **productivity problems** occurred and, if properly developed, document the **causes of poor productivity**.



Reasonable costs developed from existing job data

❑ However, **most** construction project **documentation** will include **some or all** of the following **categories of documents**:

❖ Photographs:

- ✓ **Date-stamped photographs or videos** are excellent ways to record actual conditions or components of the changed work.



Reasonable costs developed from existing job data

❑ However, **most** construction project **documentation** will include **some or all** of the following **categories of documents**:

❖ Unit cost reports:

- ✓ Unit costs **pulled from a computer** report alone **cannot be expected to prove** factual evidence of cost.
- ✓ Unit costs vary widely, depending on
 1. Quantities recorded,
 2. Material purchases made (and recorded),
 3. Size of crews used, and
 4. Types of equipment deployed for a particular period.



Reasonable costs developed from existing job data

- ☐ When **detailed cost records exist**,
whether they are segregated for the claim or not,
a **line-by-line analysis** of the cost records must be performed.
- ☐ During the **first review** of the records,
every item with a **significant variance**,
either overrun or underrun,
should be **identified** and the **causes** of these variances
determined.



Reasonable costs developed from existing job data

❑ Focusing **only on the overruns** can be a mistake;

sometimes **underruns** are equally informative.

❖ Examining the **reasons for underruns**

can **avoid making unjustified claims** for large labor
overruns

that **actually resulted** from the **contractor's
performance** in lieu of subcontracting certain
items.



Reasonable costs developed from existing job data

❑ **Costs** should be explored to determine whether certain **correlations exist**.

❖ As an example, if an **excavation contractor** has significant labor overruns, **corresponding overruns** in equipment costs should be present.

✓ If those overruns do **not exist**,

closer scrutiny is required

because the **equipment and labor costs** should move in parallel.



Reasonable costs developed from existing job data

- ❑ The **coding** of the actual work must also follow the **same process** as the original estimate.
 - ❖ For instance, if the estimate and budget segregates **drywall installation** between walls and ceilings,
but the **contemporaneous tracking** or coding **does not**,
this can lead to the appearance of **overruns or underruns**.



Reasonable costs developed from existing job data

- ❑ The project documentation and cost records must be kept so as to **sufficiently support** the claimed amounts.
 - ❖ Ideally, the project documentation and cost records will **supplement each other**.
 - ✓ In some claims, **law or contract mandates** the use of actual costs.
 - *For example, in **termination for convenience** cases, many contracts require that the contractor be **compensated based on actual costs expended**.*



Reasonable costs estimation

- ☐ **One approach** often used in construction claims is to estimate the amount of damages.
- ☐ Contractors are often able to estimate damages with **some degree of accuracy**.
- ☐ Determining damages by estimating is **not unreasonable**, because contractors survive economically by accurately estimating the cost of projects prior to construction.
- ☐ If **enough discrete items** are known, then reasonable **assumptions can be made** and **reasonably accurate estimates** of damage costs can be calculated.



Reasonable costs estimation

- ☐ When using this method,
being cognizant of **other projects performed** by the contractor with similar problems or similar design or use
is necessary so that **comparisons** between the projects can be made.
- ☐ **Many contractors** maintain histories of their projects that allow such cost comparisons.
- ☐ **Historical information** on prior projects must be examined so that the **validity of the contractor's estimate** can be analyzed accordingly.

See claim management course...

Pricing Construction Claims and Change Orders

(Post Pricing)



Unit price contract considerations

- ❑ Unit price contracts are based in **whole**, or in large part, on **unit prices**, frequently with estimated quantities of each unit.
- ❑ Contracts for heavy and civil construction, particularly highway and utility work, are often put out for bid and priced using a schedule of unit prices and estimated quantities.
- ❑ **Even lump-sum contracts** may contain **some items** that are based on unit prices.
- ❑ Issues often arise when the estimated quantities in the contract **vary significantly** from the actual quantities performed.



Unit price contract considerations

- ❑ The **determination of how units** are to be **calculated** for the purpose of payment is extremely important in **unit-price contracts**.
- ❑ **Disagreements** over the **measurement** of units are **not uncommon**.
- ❑ The contractor will likely be held to the prescribed unit price
unless the contract specifically sets forth **different unit prices** for
different quantities of work or materials.
 - ❖ **Absent a contract provision** allowing the unit prices to be renegotiated for quantity changes,
the **general rule** is that a contractor or an owner
cannot require a unit price to be renegotiated
simply because of a **quantity change**.



Unit price contract considerations

- ❑ If the **contract specifically provides** that a **change in quantity** will **not result** in a change of unit price,
neither the owner nor the contractor is entitled to an adjustment in the **unit price** when the **quantity increases or decreases**.
 - ❖ Many form contracts contain provisions governing change in quantity.



Unit price contract considerations

❑ For example, **AIA-A201, Standard General Conditions**, contains the following provision:

❖ 7.3.4. *If unit prices are stated in the Contract Documents or subsequently **agreed upon**, and*

❖ *if **quantities originally contemplated** are so changed in a proposed Change Order or Construction Change Directive*

*that application of such unit prices to quantities of Work proposed will **cause substantial inequity** to the Owner or Contractor,*

*the **applicable unit prices** shall be **equitably adjusted**.*

What is the problem here?



Unit price contract considerations

- ❑ However, what constitutes a **substantial inequity** is not strictly defined, which can lead to **further disagreements** between the owner and contractor.

What is the solution here?



Unit price contract considerations

- ❑ Some contracts contain **clauses that specify** that an **adjustment in unit price** will be **permitted**

if the actual quantities **vary by more than a certain percentage** of the estimates quantities.

- ❖ These provisions are known as variation in estimated quantities (VEQ) clauses and are common in **government road-construction contracts**.
 - ✓ The existence of a VEQ clause generally **reduces the number of disputes** that arise concerning variations in quantity.



Unit price contract considerations

❑ However, **even with a VEQ clause**,

recovery may be denied if the increased cost of performing the additional units was **not caused by the variation** in quantity.

❖ Some courts have held that if a quantity variation does **not come within the purview of a VEQ clause**,

an appropriate adjustment can be made **under the differing site conditions or changed conditions** clause of the contract.

✓ The **differing site condition clause** may apply **rather than the VEQ clause**

in cases where the **cost of additional units** varies greatly from the contract price,

no matter the reason for the increase.



Stages in analysis – Damage analysis: Proposal for pricing the claims

Pricing elements and details

□ The **basic elements** of the change order/claim proposal include:

• **Summary**

- Entitlement
- Amount of request
- Time extension
- Parties involved in the claim
- Reference to contract clauses and/or contract disputes act

• **Narrative**

- Growth in cost amount
- Growth in time
- Facts
- Entitlement

• **Schedule analysis, if applicable**

- Time impact analysis, as-planned vs. as-built, windows analysis, etc.

Pricing elements and details



Pricing elements and details



مدیریت ادعاء و اختلافات در طول چرخه حیات پروژه
(Post-Construction Phase) آنالیز، ارزیابی و حل دعاوی و اختلافات در فاز پس از ساخت/اجرا

Stages in analysis – Damage analysis: Proposal for pricing the claims

Pricing elements and details

❑ The basic elements of the change order/claim proposal include:

• Pricing

○ Direct costs

- Labor (including all burdens)
- Supervision directly related to work
- Owned and rented equipment
- Permanent materials
- Job materials

○ Mark-up

- Jobsite overhead
- Home office overhead
- Profit
- Bond
- Insurance



Pricing elements and details



مدیریت ادعاء و اختلافات در طول چرخه حیات پروژه
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Stages in analysis – Damage analysis: Proposal for pricing the claims

Pricing elements and details

- ☐ The **basic elements** of the **change order/claim proposal** include:

• **Pricing**

○ **Impact costs**

- Impact on other activities
- Delay costs (standby time, escalation)
- Acceleration costs (overtime and premium hours, disruption)
- Lost profit
- Lost productivity costs (disruption)
- Lost overhead



Unit price contract considerations

- ❑ In **forward pricing**, the most convenient and acceptable method of pricing is to
 1. **Estimate** production rates for the changed work,
 2. **Show** crew compositions and expected crew hours required to perform the changed work, and
 3. **Determine** the type of equipment and equipment hours needed to support the crews.
 - ❖ **Material costs** should be listed separately and substantiated with quotes, invoices, or price lists.



Unit price contract considerations

- ❑ For **post pricing**, names and dates of **laborers** and **equipment** should be listed, summarized, and submitted along with the rate and hours expended.
- ❖ **Copies** of time cards are **usually not required**, so long as they are available for verification.
- ❖ On **force-account change orders**, the work is commonly documented and verified **daily** by **both** the owner and the contractor.
- ❖ On large projects, a **contractor may claim** it had to perform force-account work
but **no owner's agent** could be **located to substantiate** the need or costs incurred for the **alleged work**.



Unit price contract considerations

- ☐ A **contractor** should be **cautious** in performing additional work that is not approved.
- ☐ Where possible, pre-agreed
equipment rates, unit costs, and/or crew rates
should be established early in the project.
- ☐ In **many cases**, equipment rates and labor rates are **stipulated** in the **contract documents**.
 - ❖ This will **expedite the negotiation** and processing of individual changes.

Production rates

- ❑ **Change orders** often affect the productivity rate at which the **changed work** can be performed and the productivity rate of the **unchanged work**.
- ❑ In computing production rates for **prospective changes** and to establish a **reasonable cost**,
considering all factors that could increase or decrease the computed production rate is important.
- ❑ The size of the crews and the production rates are the two most important items **affecting the value of work** to be performed.

Pricing Construction Claims and Change Orders

(Impact and Inefficiency Costs)



How impact costs are incurred

❑ Under the changes clause of the contract, the cost of performing **unchanged work** can be **included** in the equitable adjustment

only if the performance of the **change affects such cost**.

❖ “If so, those **increased costs** of performing the **unchanged work** which are **directly attributable** to and which **flow from the change** are **properly compensable** under the change order.”



Specific, identifiable extra work

❑ **To calculate** the effect of changes on unchanged work,

1. Showing specifically what increased costs were incurred or
2. Showing what the actual cost was compared with what the work would have cost without the change order is necessary.

With **smaller change orders**, showing the added cost of an item of work is **much easier**.



Specific, identifiable extra work

- ❑ *For example, the cost increase is somewhat easy to show*
 - ❖ *if an item took three shifts to complete where it normally would have taken two shifts or*
 - ❖ *if a larger crane was needed to perform the change order work and the same larger and more expensive crane was used to also perform the contract work.*
 - ✓ In such cases, it is simply a matter of computing the additional hours of equipment and labor used or planned for and the additional materials that were required.
 - ✓ With larger delay, disruption, or acceleration claims, the pricing of impact becomes more complex.



Pricing inefficiency and loss of productivity

- ❑ Unfortunately, **most impact costs** are not as easily identified and quantified.

You learned this in Delay Analysis Course!



Pricing inefficiency and loss of productivity

- ❑ **Productivity analysis** is a three-step process consisting of
- (1) **Quantifying** the overruns and underruns that occurred;
 - (2) **Determining** the cause(s) of the overruns and underruns; and
 - (3) **Calculating** the actual productivity loss (if any), using the difference in productivity rates.



Pricing inefficiency and loss of productivity

- ❑ The general calculation for **quantifying the cost of lost productivity** is

$$\text{Unproductive work hours per unit} = \frac{\text{Work hours in affected area or time frame}}{\text{Units}} - \frac{\text{Work hours in unaffected area or time frame}}{\text{Units}}$$

$$\text{OR} = \text{Actual} \left(\frac{\text{Work hours}}{\text{Units}} \right) - \text{Planned} \left(\frac{\text{Work hours}}{\text{Units}} \right)$$

$$\text{Total unproductive work hours} = \left(\frac{\text{Unproductive work hours}}{\text{per unit}} \right) \times (\text{Units})$$

$$\text{Cost of lost labor productivity} = \left(\frac{\text{Total unproductive work hours}}{\text{work hours}} \right) \times (\text{Hourly labor cost})$$



Pricing inefficiency and loss of productivity – Acceleration

- ❑ **Acceleration** occurs when the contractor is required to complete some or all of the work within a **shorter duration of time** than reasonably planned.
- ❑ Acceleration often results from delays early in a project or to complete more work resulting from **change directives** of the same duration as originally contemplated in the original contract.
- ❑ Acceleration on a project generally leads to
 - ❖ Overcrowding and trade stacking,
 - ❖ Increased crew sizes,
 - ❖ Increased shift lengths, and
 - ❖ Working more days per week,

all of which can result in inefficiencies and lost productivity, leading to **increased costs**.



Pricing inefficiency and loss of productivity – Overcrowding and trade stacking

- ❑ **Overcrowding** is the simultaneous operation of several trades in the same area.
- ❑ Lowered productivity can result from **having more workers than can function efficiently** in a limited working space.

Pricing inefficiency and loss of productivity – Shift and/or Days and Hours Worked per Week

- ❑ Working more than eight hours per day or more than five days per week introduces **premium pay rates** for workers and results in **efficiency losses**.
- ❖ The efficiency losses result from a slower pace maintained by workers and fatigue from **longer hours**.
 - ✓ Working sustained overtime of 50 hours per week for six weeks will result in a productivity loss of approximately 15%, and
 - ✓ working 60 hours per week for six weeks will result in a productivity loss of approximately 28%.



Pricing inefficiency and loss of productivity – Shift and/or Days and Hours Worked per Week

❑ As noted in The **Business Roundtable**,

- ❖ “After five to six weeks of operations, there is a further drop in productivity, which levels out at a low point after nine to 12 weeks of sustained overtime operation.”
- ❖ Industry studies indicate that
the productivity of laborers who work 50 hours per week for a period of 10 weeks can decrease by as much as 35% and that 60-hour work weeks over the same length of time can result in a decrease of labor productivity up to 45%.

Pricing Construction Claims and Change Orders

(Material Costs)



Introduction

❑ **Material cost claims** can be divided into two categories:

1. Claims for additional material and
2. Claims for the escalated cost of material.
 - ❖ For various reasons **attributable to the owner**, contractors may be **forced to purchase** materials that were unanticipated at the time of bidding.
 - ❖ Also, **contractors** may be **required** to purchase materials at prices higher than anticipated.

It is well recognized that contractors can recover the costs of additional material and escalated cost of materials.

The **cost of supplies** incurred as a result of **additional material requirements** is also recoverable as an element of construction claims.

- ❑ Escalated material and labor costs can easily be **incurred when a project is delayed**, pushing the time of performance into later time periods than anticipated.
 - ❖ *For example, if concrete was anticipated to be placed in a given year but was delayed to a following year, the material could easily increase in cost.*
 - ❖ *Similarly, delaying labor into later time periods than anticipated could push the labor into new labor agreement periods with higher labor rates.*



Reasons for material claims

☐ The **three most common reasons** for material claims are

1. Owner-caused delay,
2. Defective specifications, and
3. Owner-directed changes.

☐ In cases of owner-caused delay,

contractors seek primarily to recover the **escalated cost of the material**.



Reasons for material claims

- ❑ Defective specifications require **correction**, and **compliance** with corrected specifications may result in the contractor **substituting another material**.
- ❖ However, substituting materials at no additional cost is **often impossible**.
 - ✓ Contractors may be **able to recover** the increased cost of **material substitutions** in certain situations.
 - Contractors **may recover** the increased cost of performing in accordance with an owner's defective plans and specifications.



Reasons for material claims

❑ If a **specification** calls for a general material and contains **no other specific representation**,

the **contractor typically** bears the risk of the material's unavailability and is **not entitled** to an equitable adjustment.

❖ However, material that is unavailable due to **abnormal circumstances** may result in cost or time **adjustments to the contract**.

✓ *Examples of this are a concrete shortage due to the cement plant being unable to produce cement and drywall being unavailable because it was diverted to a different geographic area to address storm-related repairs.*



Reasons for material claims

- ❑ The **contractor also assumes risk** even when an owner specifies a subcontractor or sole-source supplier.
 - ❖ If the contract requires a specific subcontractor, the **risk of nonperformance** remains with the contractor.



Reasons for material claims

- ❑ Similarly, when a **sole source** is designated, the owner implicitly warrants **only that the specified source** will be capable of supplying the required material.
- ❑ Also, when a **unique material is specified**, an implied warranty exists that the **material will be available** to accommodate the construction schedule.
 - ❖ The **contractor may be responsible** to schedule its work to accommodate the **material availability**.



Reasons for material claims

- ❑ Contractors should **not limit claims** solely to the increased cost of the material.
- ❖ Contractors should be aware that, along with the **additional costs** of the substituted items, they may also be able to recover for **delay costs associated** with complying with the **defective specifications**.



Reasons for material claims

- ❑ Moreover, a **change order** may render previously purchased material unsuitable or unusable.
- ❖ Such material costs are **recoverable elements** of construction claims.



Other costs associated with material claims

- ❑ The **Federal Acquisition Regulation (FAR)** permits recovery of additional material costs for items **not actually used** on the project.
 - ❖ *Specifically, it states, “[i]n computing material costs, the contractor shall consider reasonable overruns, spoilage, or defective work (unless otherwise provided in any contract provision of the contract relating to inspecting and correcting of defective work).”*

Additional material quantities and cost calculation

- ❑ Calculating additional material quantities is a **fairly simple process** because material quantities are **easily identifiable**.
- ❑ Maintaining accurate records facilitates establishing the quantity of additional material used on a project.
- ❑ In the absence of records or other supporting data, contractors may establish and calculate the quantity of additional materials by reference to the **project's drawings**.
- ❑ The difference between
 1. The quantity of materials required by the original drawings and
 2. The quantities actually used on the projectis the amount of additional materials that were required.

Pricing Construction Claims and Change Orders

(Equipment Costs)



Introduction

- ❑ **After labor**, the greatest variable cost item on most construction projects is **equipment**.
- ❑ On projects involving heavy civil work,
equipment costs are **closely related** to labor costs.
 - ❖ If additional labor is required, **additional equipment** is usually required because the work is **not completed with bare hands alone**.
 - ✓ Moreover, **equipment costs always increase** when a project is extended,
even in the **absence of labor increases**,
because **equipment costs are still incurred**
whether or not the equipment is **operating**.



Introduction

- ❑ Equipment is distinguished from small tools primarily on the basis of cost.
 - ❖ Frequently, **small tools** are defined as those items falling under a set value limit, **typically \$1,000**.
 - ✓ Equipment, as a capital item, is considered to be charged to the project only for the time it is on the project.
 - ✓ Small tools, however, are typically considered to be consumed on the project.
- ❑ The distinction between equipment and small tools is important in claims analysis for purposes of **calculating increased costs**.

- ❑ Increased equipment costs often are incurred due to one of the following events:
1. An extended performance period requiring the same amount of equipment to be on the project for a **longer time period**;
 2. Additional work on the project requiring either
 1. The same equipment on the project for a longer time or
 2. New or additional equipment to perform the new work; and
 3. Decreased productivity requiring **more labor** and, hence, **more equipment**.

In many construction claims, a **combination of all three factors** applies.



Introduction

- ❑ The cost of **mobilizing or demobilizing equipment** on an equipment intensive project can be **significant**.
- ❑ The **additional cost** of an unanticipated demobilization **followed by a remobilization** can be a compensable cost of a delay or suspension of work.



Additional Equipment Usage

- ❑ When **usage of additional equipment** has occurred on a project, the calculation of the **additional time period** for the equipment is somewhat simple.
 - ❖ If the equipment was **rented** from an outside vendor, the cost of that equipment is the rental cost plus the operating costs of that equipment.
 - ❖ Most contractors should have a **consistent method for accounting** for owned equipment.
 - ✓ However, if the contractor or an affiliate of the contractor **owned the equipment**,
the **appropriate rate** for the equipment can be the source of **significant disagreement**.



Additional Equipment Usage

- ☐ **Ideally**, the contractor will have cost-accounting records showing the equipment costs for each unit of work.
- ☐ The cost of equipment per unit of work is multiplied by the **additional work units** to obtain the **added equipment costs**.



Additional Equipment Usage

- ☐ **When** additional equipment costs are required because of extended job duration,
1. Determining not only that the equipment was **on site longer**
 2. But also whether it was **less productive** or whether it sat **idle part of the time** because of the **extension** of the schedule is necessary.



Additional Equipment Usage

❑ Another consideration is **whether** the **contractor made reasonable efforts** to reassign the equipment to **avoid leaving it idle**.

❖ Of course,

1. The uniqueness of the equipment,
2. Whether it was specifically designed and purchased for one project, and
3. The location of the site

are factors to consider in determining whether the equipment could be reassigned reasonably.

❖ **Proving exactly** when equipment was **assigned to a contract** and then **reassigned** can be **difficult**.



Additional Equipment Usage

- ❑ When the equipment is **rented or leased** from an outside third party, the **cost of placing equipment** on **standby** when a **delay or suspension** of work has occurred is **simple**.
- ❖ The costs of the suspension or delay can be determined from the **actual invoices** from the rental companies or lessors.
 - ✓ However, disputes frequently arise in valuing **contractor-owned equipment**.
 - One method to **minimize the disputes** over the cost of contractor-owned equipment is to **set forth the rate** for **each specific piece or type** of equipment in the contract.



Additional Equipment Usage

- ❑ Recovery for idle equipment is limited to the equipment that is **actually idle**.
- ❑ In Pennsylvania Department of Transportation v. Herbert R. Imbt, Inc., the **contractor was denied** recovery for standby equipment costs because the **equipment was available to perform other work**.
 - ❖ The **owner had ordered** the contractor to demobilize the equipment, but the **contractor decided to leave the equipment on site** rather than divert it to another project.



Additional Equipment Usage

❑ Because **large equipment** has to be moved from location to location by **truck at substantial cost**,

contractors sometimes **elect to leave the equipment on site** until they have a use for it at a **specific location**.

❖ While this method of “**storing**” equipment is **not uncommon**, the contractor is **not entitled to recover the cost** of the “stored” equipment as idle equipment.

Pricing Construction Claims and Change Orders

(Overhead and Profit)



Introduction

- ❑ In addition to the direct costs of performing extra work, a contractor is normally entitled to a **reasonable allowance** for overhead and profit, typically in the form of fixed percentage markups on the direct cost of the work.
- ❑ These markups are either specified in the original contract or agreed to in writing by the parties after the contract has been signed.
- ❑ Combined rates for overhead and profit may be specified, such as **15% for overhead and profit**, or separate markups on **cascading direct costs** as are sometimes used in **U.S. Department of Veterans Affairs contracts**.
 - ❖ *Separate percentage markups are used, including two overhead elements—jobsite (or field) overhead and home office overhead.*

Introduction

- ❑ When **separate percentage markups** are used for overhead and profit, care should be given to identify **what each percentage is applied to**.
 - ❖ *Applying 10% overhead to the direct cost of the work and 10% profit to the direct cost of the work results in substantially different amounts than applying 10% overhead to the direct cost and then 10% profit to the sum of the direct cost plus the overhead.*
 - ✓ The total markup becomes 21% under the latter scenario.
- ❑ **Contractually agreed-upon labor rates** should be **analyzed to determine whether** those rates include markups,
 - which would be in addition to the separately identified markups.
 - ❖ Inclusion of both in a claim could lead to the contractor obtaining a windfall.



Project overhead rates

❑ Overhead costs include two elements: **(1) fixed costs** and **(2) variable costs**.

1. Fixed costs remain essentially unchanged over time or volume of work, for example, the monthly **rental cost** of an office trailer.

❖ The monthly cost of the office trailer will be the same every month, regardless of any changes or occurrences on the project.

2. Variable costs fluctuate based on the volume of work, changes to the scope or schedule, and many other factors.

❖ An example of variable costs is **fuel**.

❖ Equipment may be used much more heavily during some periods of the project than others; therefore, fuel costs will be much greater during those high-use periods.



Project overhead rates

- ☐ If an item usually included in **field overhead** can be clearly segregated,
a court or board may list it as a **distinct item of damage**.
- ☐ In many cases, the contract sets forth a fixed percentage for field overhead markup on change orders.
- ☐ Because **many overhead costs** appear to be **fixed**,
owners are very reluctant to pay **additional overhead costs** without
convincing documentation.
- ☐ The burden of **proving that additional overhead** was **not only incurred**
but necessary **solely as the result of the changed work** falls on the contractor.



Project overhead rates

- ☐ On contracts without fixed-percentage markups,
negotiating a supplemental agreement to the contract to permit fixed markups for minor changes is usually advantageous.
- ☐ This **saves both the owner and contractor** the time-consuming tasks of computing and analyzing overhead costs for **each and every change order**.



Overhead on large claims

- ❑ **Major claims** have **several means of computing field overhead costs**, and the one offering the most reasonable results should be selected.
 - ❖ The **first method** is similar to that discussed previously—
applying percentages based on cost experience,
the original bid percentage, or
the contract stipulated percentages to the **direct costs claimed**.



Overhead on large claims

❑ **Major claims** have **several means of computing field overhead costs**, and the one offering the most reasonable results should be selected.

❖ The **second method** is the total cost approach,
where the **bid overhead** (plus any overhead received on other change orders) is

deducted from the **total actual overhead incurred** during the **period**
in question.

✓ Use of this method typically requires the **contractor to prove** that
its **original bid overhead** was reasonable and all-inclusive;
otherwise, the contractor would **end up getting**
compensated for its own bid errors.



Overhead on large claims

❑ **Major claims** have **several means of computing field overhead costs**, and the one offering the most reasonable results should be selected.

❖ A **third method**, which amounts to a modified total cost approach, is to take the **total actual overhead** and **deduct** the **reasonable overhead**.

✓ This method can be used over the entire project or for the affected time period only.

○ Reasonable overhead can be computed several ways.

The simplest method is to **apply a percentage** to the **direct costs** that would have been incurred had no change or delay taken place.



Overhead on large claims

- ❑ **Major claims** have **several means of computing field overhead costs**, and the one offering the most reasonable results should be selected.
- ❖ For **use in claims** where a delay or suspension of work has occurred, a fourth method can be used—the **average daily rate**.
- ❖ An **average daily rate** for project overhead is calculated using the actual costs incurred and the actual days of performance.

This rate is then **multiplied** by the number of days of delay or suspension experienced to arrive at the overhead cost for the affected period.

Overhead on large claims

❑ **Major claims** have **several means of computing field overhead costs**, and the one offering the most reasonable results should be selected.

❖ Lastly, a fifth method is to identify, isolate, and include as **direct cost items** that were added for the **purpose of administration** of the specific claim or change order.

✓ *For example, an additional supervisor, bookkeeper, or engineer required strictly because of the change would not be fairly compensated in the normal percentage markup.*

With this last method, the basic overhead for the change is computed on a **percentage basis**

with an **additional charge** for the additional direct cost items.



Overhead on large claims

- ☐ Using one or more of the methods for complex changes, such as those that add both significant work and additional time, may be appropriate.



Home office overhead

- ❑ In addition to **field overhead**, contractors incur home office overhead costs.
- ❑ These are expenses that serve all projects, such as home office rent, telephones, salaries, taxes, payroll, insurance, and bookkeeping expenses.
- ❑ These are the costs incurred by a contractor to conduct business but are **not specific to any project**.
- ❑ As such, these overhead expenses are an **indirect expense** that benefits all projects and must be allocated to all projects on a shared basis.
- ❑ For the purpose of **routine change orders**,
a fixed-percentage markup is often negotiated,
as described previously, that is added to **direct costs**
along with project overhead and profit.

- ❑ Profit is usually a fixed percentage amount to be added to the **direct cost** of the changed work.
- ❑ Some contracts restrict the **general contractor's markup** for **tiered subcontractor's work** to a much smaller amount than allowed for direct work.
- ❑ Often, the **amount of profit** that can be **applied to changed work** is defined in the contract documents.
- ❑ In many cases, **separate profit markups** are used for **different types of work**.
 - ❖ The markups on a **contractor's direct costs** may be greater than that allowed on subcontractor costs or material costs.

Pricing Construction Claims and Change Orders

(Other Elements of Claim Pricing)



Interest costs

- ☐ A **contractor** is responsible for **providing the capital required** to perform a **construction contract**.
- ☐ If the project owner **expands the scope of work** and **increases the contract price**, however, the contractor may be able to **recover the cost of borrowing funds** necessary to perform the additional work.
- ☐ This assumes the **contract does not contain** a clause that specifically disallows interest charges or other capital costs.



Interest costs

- ❑ If the **contractor does not borrow** funds to perform change-order work,
but **uses its available equity capital**,
there **may be no recovery** from imputed interest, or the “cost” of this capital.
- ❖ Contractors, however, **routinely argue** that although they did **not actually borrow** additional funds,
they **lost the use of the funds they provided**, and that the
lost use of those funds has a corresponding cost.



Interest costs

❑ These **four factors** must be met for **interest costs to be allowed**:

1. The owner must have directed the work;
2. The funds must have actually been borrowed;
3. The borrowed funds must be segregated in a separate account; and
4. The borrowed funds must have been used only for the changed work.



Insurance costs

- ☐ Insurance is a significant and growing cost element of construction contracts and on certain contracts can be **1% or more** of the total price of the contract.
- ☐ An **owner's action or inaction** may cause the contractor to incur **increased insurance costs** that are a recoverable element of construction claims.



Insurance costs

- ☐ **Insurance costs** can increase due to owner-directed changes and owner-caused delays.
- ☐ **Insurance premiums** are generally based on the total dollar amount of the contract.
- ☐ When **owner-directed changes** increase the amount of the insurance premium, the contractor is **entitled to recover the difference** between the original premium price and the increased premium price.



Insurance costs

- ❑ Similarly, owner-caused delays may require the **existing insurance policies** to be **renewed for the extended duration** of the contract.
 - ❖ When the **contractor incurs increased insurance costs** due to owner-caused delay,
the **entire cost** of the extended duration or new policy is **often recoverable**.

- ❑ Similar to insurance costs, **contractors incur additional bond costs** primarily when owner-directed changes or owner-caused delays occur.
- ❑ Like insurance, **bond premiums** are calculated on a percentage basis of the total contract value, and
any **increase in the value of the contract** will increase the amount of the **bond premium**.
- ❑ Owner-caused delays may require the contractor to **obtain additional bonding** and incur increased bonding costs.
- ❑ In either situation, the **cost of additional bond premiums** is recoverable and should be considered and included in all claims and change orders.



Legal fees, change orders, and claim-preparation costs

- ❑ The **costs of preparing** routine change orders are typically considered incidental to contract performance and included as part of the **overhead markup** added to the price of the change order.
- ❑ One situation where **discrete change-order-preparation costs** may be **allowed is when** the owner **requests** a price for a change order but never actually issues the change order.

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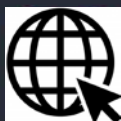
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