



فرآیند جامع آنالیز تاخیرات در پروژه

بخش یازدهم:
آنالیز مالی تاخیرات

آنالیز خسارت وارده به پیمانکار (Compensation)

ارائه دهنده:

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What we will learn?

- ☐ Delay damages to the contractors
- ☐ Types of delay damages to the contractors
 1. Extended field costs
 2. General overhead (home office overhead)
 3. Inefficiency or lost productivity costs caused by delay (Disruption Analysis)
 4. Acceleration costs
 5. Other categories of delay damages

Delay Damages To the Contractors



Introduction

❑ Most contracts deal with 3 types of delays:

1. Un-excusable
2. Excusable – Non-compensable
3. Excusable – Compensable

!!The contractor could only recover delay damages that is on the critical path!

How much this sentence is true?



Introduction

❑ Most contracts deal with 3 types of delays:

1. Un-excusable
2. Excusable – Non-compensable
3. Excusable – Compensable

Remember:

1. *Critical path delays*
2. *Non-critical path delays*



Critical path delays

ASCE Standard ANSI/ASCE/CI 67-17 (Schedule Delay Analysis)

4.7 FOR A DELAY TO BE COMPENSABLE, IT SHOULD BE THE SOLE CAUSE OF DELAY

1. For compensable delay, the delaying event should be the sole cause of **longest path delay** (no concurrent delays compensable)
 - ❖ Typically, a delay solely caused by the owner is required to qualify as **compensable**.
 - ❖ However, third party delay may be compensable depending on the **provisions of the contract**.
2. For compensable delay, the delay should **extend the scheduled completion date** of the project.
 - ❖ Activities with *float can fall on the longest path* because of schedule **constraints and multiple calendars** (e.g., weekend non-work restrictions),
 - ❖ *Critical activities can fall on paths of work that are not the longest path* (again because of constraints and multiple calendars).



Critical path delays

ASCE Standard ANSI/ASCE/CI 67-17 (Schedule Delay Analysis)

4.7 FOR A DELAY TO BE COMPENSABLE, IT SHOULD BE THE SOLE CAUSE OF DELAY

- ❑ Delay to intermediary contract milestones typically do **not result in additional delay costs**,

because the contractor would have **been on-site until completion of the project**,

and as a result, delays to **intermediary milestones** are not typically compensable to the contractor, **even if excusable**.

- ❖ However, liquidated damages attached to **intermediary milestones** by contract may be **assessed for failure** to meet each milestone and may be cumulative.



Critical path delays

ASCE Standard ANSI/ASCE/CI 67-17 (Schedule Delay Analysis)

4.7 FOR A DELAY TO BE COMPENSABLE, IT SHOULD BE THE SOLE CAUSE OF DELAY

- ❑ In some cases where **multiple subcontractors or multiple prime contractors** are **simultaneously responsible** for delay,

the **contractor or owner** may **still be able to recover** its costs **split** between the responsible parties ===== *Because this is not a concurrent delay*

as long as the **claiming party had no fault** or responsibility for delay during the **period claimed**.

NO CONCURRENT EXISTS



Non-Critical path delays

❑ Most contracts deal with 3 types of delays:

1. Un-excusable
2. Excusable – Non-compensable
3. Excusable – Compensable

If excusable delays occur on the projects

And

Even if the delays are not on the critical path

*The owner may still need to pay **financial ramifications** to the contractor
Unless the contract says otherwise!*

❑ خسارت تاخیر مجاز

- ❖ به صورت کلی و طبق قانون مدنی (ماده ۷۲۸ آئین دادرسی) عدم اجرای تعهدات طرفین، در شرایطی که **باعث ضرر (از جنس از بین رفتن مال یا فوت شدن منفعت)** به طرف دیگر گردد، باید جبران شود.
- ❖ پس تاخیری که به سبب عدم اجرای تعهدات یکی از طرفین اتفاق افتاده باشد، در صورتی که بر روی **مسیر بحرانی** بوده و باعث **تغییر زمان پروژه** گردد، هم بحث زمانی و هم مالی را به همراه دارد و باید جبران گردد.
- ❖ حتی اگر تاخیر روی مسیر بحرانی نبوده و باعث تغییر زمان پروژه نشود هم میتواند **خسارت مالی** از جنس بهره وری را به همراه داشته باشد.

صرف نظر از مبانی نشریه ۴۳۱۱، آیا قانون مدنی اجازه ادعای خسارت مالی برای تاخیراتی
مانند آب و هوا را میدهد؟

خسارت تاخیر مجاز در قانون مدنی

❑ خسارت تاخیر مجاز

- ❖ در قانون مدنی کشور، یکی از شروط جبران خسارت آنست که **خسارت ناشی از عدم انجام تعهد** در شرایطی باشد که عدم اجرای تعهد مستند به خود متعهد بوده و ناشی از علت خارجی نباشد (برای خارجی بودن باید دو شرط غیرقابل پیشبینی و غیر قابل دفع را داشته باشد).
- ❖ به همین دلیل، فورس ماژور که حادثه ای غیرقابل دفع و غیر قابل پیش بینی است در ۴۳۱۱ شامل خسارت نمیگردد.
- ❖ این موضوع در برخی قراردادهای خارجی مانند فیدیک موضوعی متفاوت بوده که در **دوره مدیریت ادعا** به تحلیل آن خواهیم پرداخت.

فرآیند جامع آنالیز تاخیرات در پروژه
آنالیز مالی تاخیرات: آنالیز خسارت وارده به پیمانکار (Compensation)
خسارت تاخیر مجاز

❑ خسارت تاخیر مجاز

❖ چنانچه تاخیرات به وجود آمده در کار به عنوان تاخیرات خارج از قصور پیمانکار باشد، پیمانکار محق به دریافت خسارت تاخیر خواهد بود.



معاونت برنامه ریزی و نظارت راهبردی رئیس جمهور

شماره: ۱۱۷۷۳۳
تاریخ نامه: ۱۳۹۳/۱۲/۰۴
پست: ندارد

بسم تعالی

موضوع: درخواست خاتمه پیمان از سوی پیمانکار

با سلام و احترام؛

بازگشت به نامه شماره E/92/AMD/6568 مورخ ۹۲/۱۰/۱۷ اعلام می‌دارد، در قراردادهای منعقد شده با شرایط عمومی پیمان موضوع پیوست بخشنامه شماره ۵۴/۸۴۲-۱۰۲/۱۰۸۸-۱۰۲ مورخ ۱۳۷۸/۰۳/۰۳ بر طبق ماده ۴۸ شرایط عمومی آن (با موضوع خاتمه پیمان) هرگاه بیش از اتمام کارهای موضوع پیمان، کارفرما بدون آنکه تقصیری متوجه پیمانکار باشد، بنا به مصلحت خود یا علل دیگر، تصمیم به خاتمه دادن پیمان بگیرد، خاتمه پیمان را با تعیین تاریخ آماده کردن کارگاه برای تحویل، که نباید بیش از ۱۵ روز باشد، به پیمانکار ابلاغ می‌کند. در حالت کلی پیمانکار مکلف به اجرای پیمان طبق اسناد و مدارک پیمان خواهد بود و با اعلام درخواست پیمانکار مبنی بر خاتمه دادن به پیمان، کارفرما ملزم به ابلاغ خاتمه پیمان نخواهد شد. اگر تاخیرات به وجود آمده در کار به عنوان تاخیرات خارج از قصور پیمانکار شناخته شوند پیمانکار محق به دریافت خسارت تاخیر خواهد بود.

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Calculation of damages

- ❑ In the **following sections** we explore the proper use of **several methods** used to compile delay damages.
- ❑ **Before** we cover some of the **specific damage components** (material, equipment, and labor costs; labor and equipment inefficiency; etc.), it is important to **better understand** the **basic principles** underlying the recovery of damages.

*The **calculation of damages** must be properly **supported** by the pertinent Contract provisions and the applicable facts supporting the claim (whether they come from the documents, cost records, testimony, etc.).*



Calculation of damages

DISCLAIMER

Although this **session pertains** to delay damages and actual costs, you should be **aware** that **other methods of recovery** may be applicable under varying circumstances.

These methods are usually specified by the **Contract**, and **legal counsel** should be used to **pursue items** such as wrongful termination, total cost claims, modified total cost claims, and jury verdict methods.

Types of delay damages to the contractors



Types of delay damages to the contractors

- Delay damages are summarized here, although not all may be recoverable.

Extended and Increased Field Costs	These damages include the additional labor, material, and equipment costs resulting from project delays. These costs are typically quantified and supported by actual measurements of increased units and/or rates.
Home Office Overhead	When a project is delayed, the Contractor may experience unabsorbed and unrecovered overhead costs. Generally, the Contractor's home office costs that support all projects are allocated to the delayed project and recovered based on a daily rate applied to compensable days of delay.
Inefficiency or Lost Productivity Costs	Depending on the nature of the delay, a contractor may also experience some measure of inefficiency. The resulting increased labor and equipment costs may be included within the damage claim.
Acceleration Costs	When the labor force is accelerated to mitigate delays, the resulting increased labor and equipment costs may also be included within the damage claim.
Other Categories of Delay Damages	A delay claim may include other related damages such as Noncritical Delays, Legal and Consulting Costs, Lost Profits, Lost Opportunity Costs/Bonding Impairment, Constructive Acceleration, Interest, and Other Impacts.



Types of delay damages to the contractors

DISCLAIMER

The **next few sections** deal separately with **various kinds of delay-related damages** that **Contractors may be entitled** to recover as the result of **an excusable, compensable** delay.

Not all categories will be addressed in every detail, as the possibilities are virtually unlimited.

Rather, an **example of the general methodology** is **presented** so you may apply the **same principles to your specific situation**.

Extended Field Costs
(Direct Costs + Project Overhead Costs)



Extended field costs

- ☐ This is also called **field office overhead (FOOH)** costs
- ☐ This type is **not difficult** to calculate if the contractor maintains reasonably good **job cost records**.
- ☐ Common types:
 - ❖ Labor costs
 - ❖ Equipment costs
 - ❖ Material costs
 - ❖ Extended Project (field) overhead costs



Labor costs

❑ Labor costs are incurred either

1. As **field overhead** to support the work (*extended filed labor costs*)
2. **More labor** is required to produce the **same amount of work** (*labor productivity loss*)
3. In the **performance** of the work (*direct labor costs*)

Labor costs – Extended field labor & labor productivity loss

- ❑ Delays generally **increase** the time of performance rather than the **amount of work**
- ❑ Delay costs related to labor are **usually in the form of**
 1. Extended field overhead labor
 - ❖ This labor is typically associated with **project management and superintendence** and general support.
 - ✓ **Extended field costs** are addressed in more detail later in this Section.
 2. Labor productivity loss
 - ❖ **More labor** is required to **produce the same amount of work**, typically defined
 - i. As a **loss of productivity** or inefficiency, or
 - ii. When **additional labor** becomes necessary to complete the work faster, which may result in additional charges for overtime, shift work, or travel costs to add labor in a limited labor environment
 - ❖ Delay costs arising from **inefficiency** addressed in disruption costs



Labor costs – Performance of the work

❑ A contractor may also incur **additional labor costs** due to a delay when **additional tasks** become necessary to **accomplish the work**,

when the **hourly cost** of the **labor increases** due to either

- ✓ Labor is forced to be idle, or
- ✓ Skill level or escalation
 1. Idle labor
 2. Escalation of labor costs



Labor costs – Idle labor

- ❑ If a Project is **delayed or suspended**, the **Contractor's workers** may be at the **Project site** **but** may be **unable to productively work**.
- ❑ For potential recovery of this type of cost, the **Project daily reports** need to **show** that
 1. **Contractor's workers** were on the site
 2. **But** were **unable to perform their work**
 - ❖ The **Owner** would appropriately question **why** the Contractor was **unable or unwilling to shift** those workers to other tasks or **other jobs or lay them off**.

Why?



Labor costs – Idle labor

*It should be noted that the Contractor has an **obligation under most contracts** to **mitigate the damages** when a delay occurs;*

*therefore, **if possible**, the Contractor needs to look at shifting its labor to other work during a delay.*

Labor costs – Idle labor

Both the Owner and the Contractor should diligently maintain documentation of labor activity on each day throughout the Project.

Why both?



Labor costs – Idle labor

If the **owner** does not retain such daily reports,

there may be **no basis for a challenge** to the **contractor's documented claim**.

Remember “time card labor” you have been learned in **Project Financial Management Course**?



Labor costs – Idle labor: Example

A contractor is installing concrete pipe for a new storm sewer. While the crew is installing the sewer piping, it comes across a buried foundation from a structure that previously occupied the site. The existence of this structure was not known by the owner or the contractor and the contract provided that the owner would take responsibility for such unknown obstructions. The contractor's installation crew immediately stopped work and asked for direction as to how to proceed. There was no other sewer piping to be installed. The owner's engineer came to the site immediately and directed the piping installation around the obstruction. Within a few hours of stopping, the owner's pipe installation crew recommenced installation. The crew had been idle for four hours.

But the delay reduced? Is there still any compensation?



Labor costs – Idle labor: Example

❑ Even if the crew had **not been idle**,

but had instead **moved to another location** on the site,

❖ **Delay** may have been **reduced or eliminated**, but the contractor may have incurred

1. Additional costs to **move** equipment and materials.
2. Additional costs might also be incurred when the **contractor returns to the original location to recommence** the work that **was stopped**.

Disruption compensation claim is still valid!



Labor costs – Idle labor: Conclusion

❑ Some construction contracts specifically address instances **when the owner** would **agree to pay** for idle labor.

❖ However, in **those instances**, recognition and payment of idle labor costs are **triggered** by

1. **Owner's issuance** of a **stop** work order or
2. **Other direction approving** the **need** for the contractor to **maintain its crew on the project site** to resume work when directed to do so.

*Understanding the requirements and limitations in the **contract** regarding the contractor's **recovery of idle labor costs is essential.***



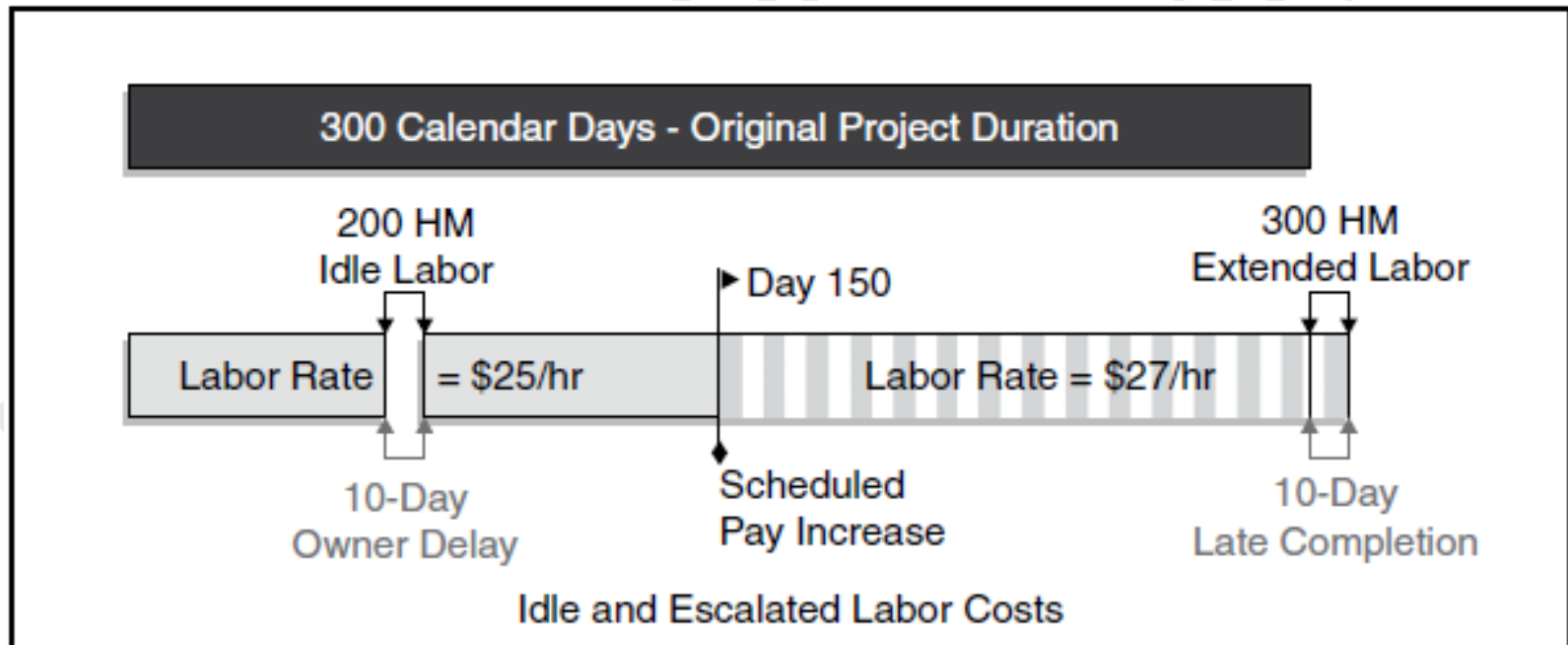
Labor costs – Escalation of labor costs

- ❑ Some delays can cause the Contractor to experience **escalation** of its labor costs.
- ❑ This may occur if the **delay shifts labor** into a **more expensive time period** than that **originally scheduled**.
 - ❖ This situation is sometimes referred to as **extended labor**, but it should **more appropriately** be considered **labor cost escalation**.

*Let's illustrates the difference between **idle** and **escalated** labor costs.*

Labor costs – Idle and Escalation of labor costs: Example

- ❑ In the **third month** of the Project, the **Owner causes a ten-day delay** to the Project.
- ❑ The **Owner accepts responsibility** for the delay, so there is no question of liability or the magnitude of the delay.
- ❑ The **Project is extended by change order an additional ten days**.

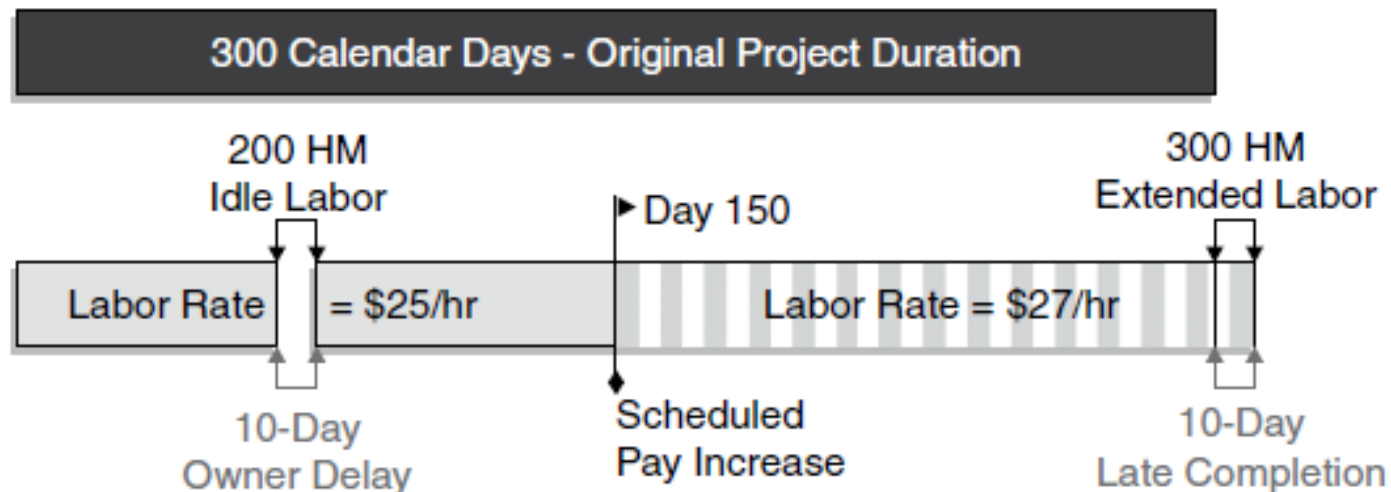


Labor costs – Idle and Escalation of labor costs: Example

- ❑ The Contractor presented a claim of 200 hrs * \$25 per hr = \$5,000 for idle labor.

The Contractor's records also show 300 labor hours for common laborers during the last ten days on the job, which occurred in a time frame later than that originally planned. The Contractor seeks compensation for the additional \$2 per hour (\$27.00 – \$25.00) for the 300 labor hours.

$$\$2/\text{hour} \times 300 \text{ labor hours} = \$600$$



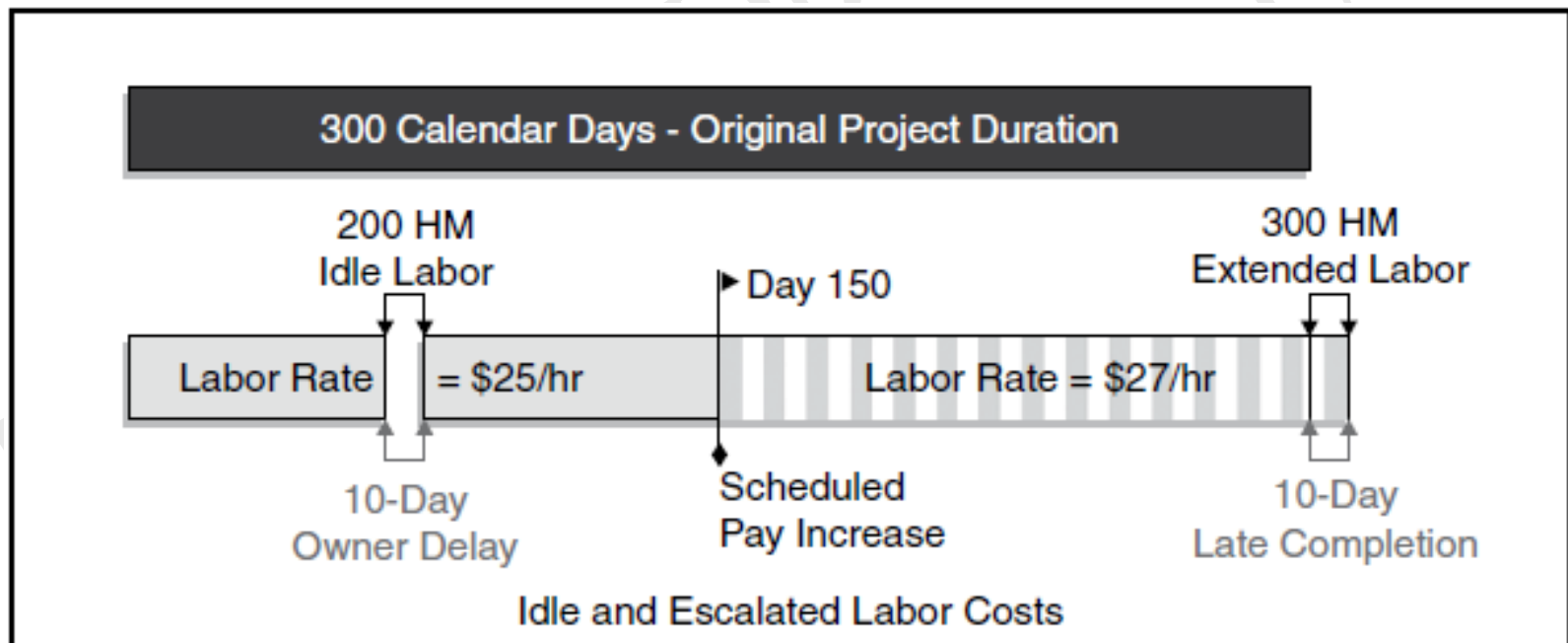
Idle and Escalated Labor Costs

Labor costs – Idle and Escalation of labor costs: Example

❑ The Contractor presented a total claim of \$5,600, with

1. \$5,000 for **idle** labor
2. \$600 for **extended** labor

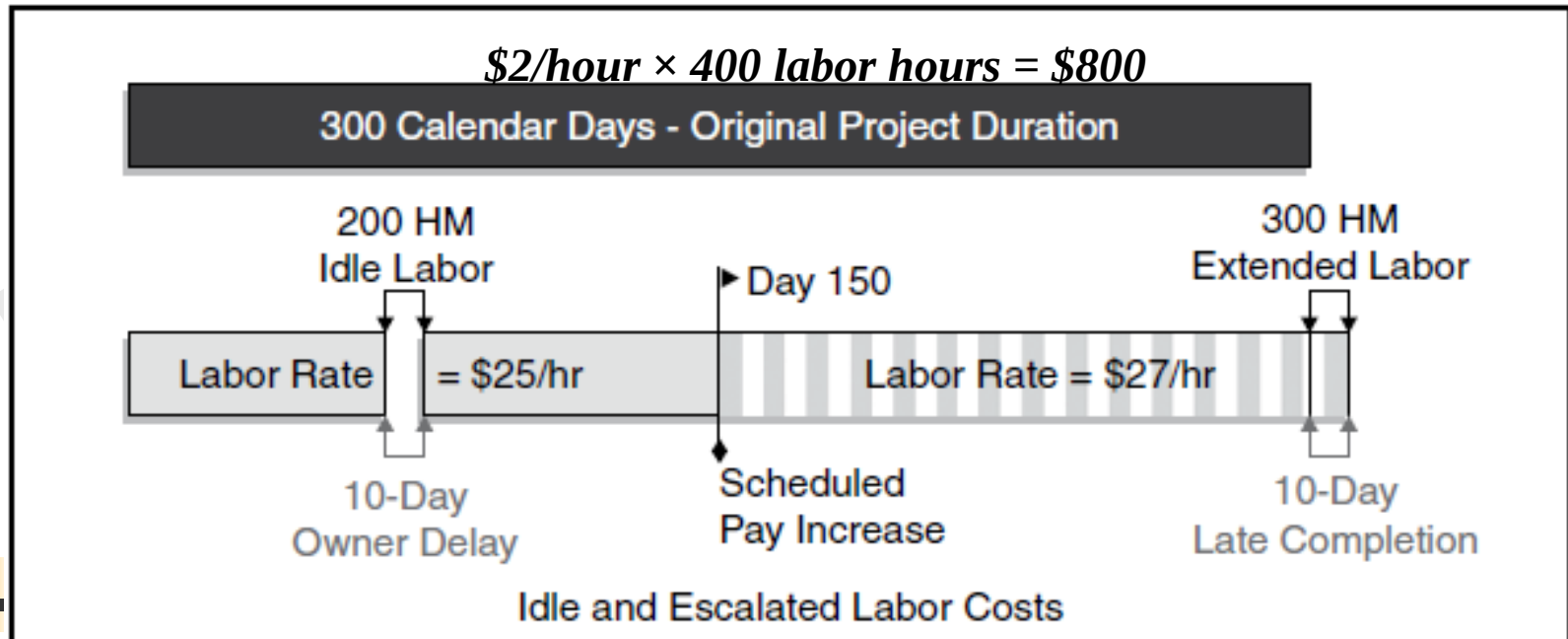
The Contractor's approach, however, is incorrect.



Labor costs – Idle and Escalation of labor costs: Example

- ❑ 300HM was planned if there had not been a delay.
- ❑ The Contractor's certified payrolls showed that **400 labor hours** were worked during the ten-day period (maybe because it was winter) immediately after the wage increase. Therefore, the Contractor would be entitled to an **additional \$800** for escalated cost of its labor due to the delay.

Remember we talked about actual costs if you don't pre-agreed?





Labor costs – Idle and Escalation of labor costs: Example

This simple example illustrates that

*analyst should **not estimate damages without first clearly understanding the nature of the delays***

*A **more realistic and complex** project example might involve several trades under different collective bargaining agreements,*

***each** with **different wage increases** occurring on different dates.*

*A wage increase might **extend over a period** of more than a year for some trades.*

*The **updated labor agreements** may make new and different requirements for apprentices or supervisory labor.*



Labor costs – Idle and Escalation of labor costs: Example

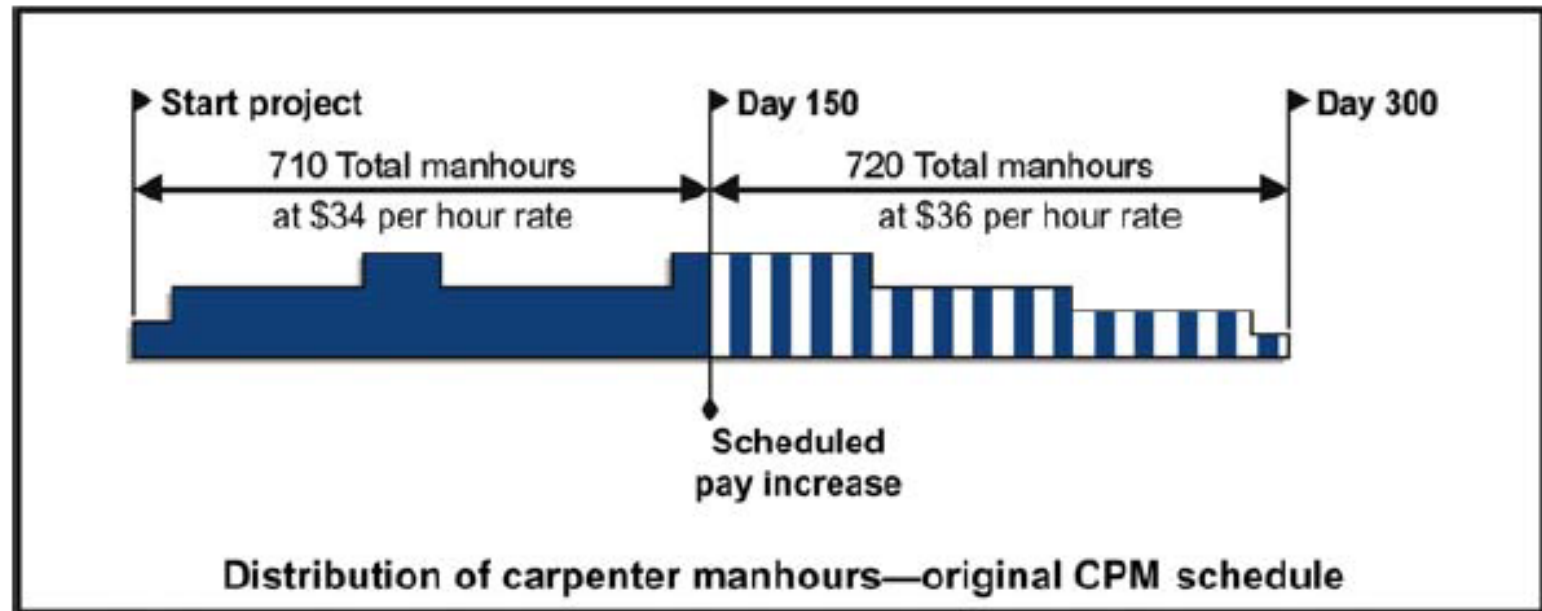
*What happens when a delay **alters** the work sequence, or when a delay **combines** with other changes to affect the **actual labor distribution** on the job?*

*In these situations, the contractor must **substantiate** the original-planned distribution of labor compared with the actual distribution.*

Let's see an example!

Labor costs – Idle and Escalation of labor costs: Example

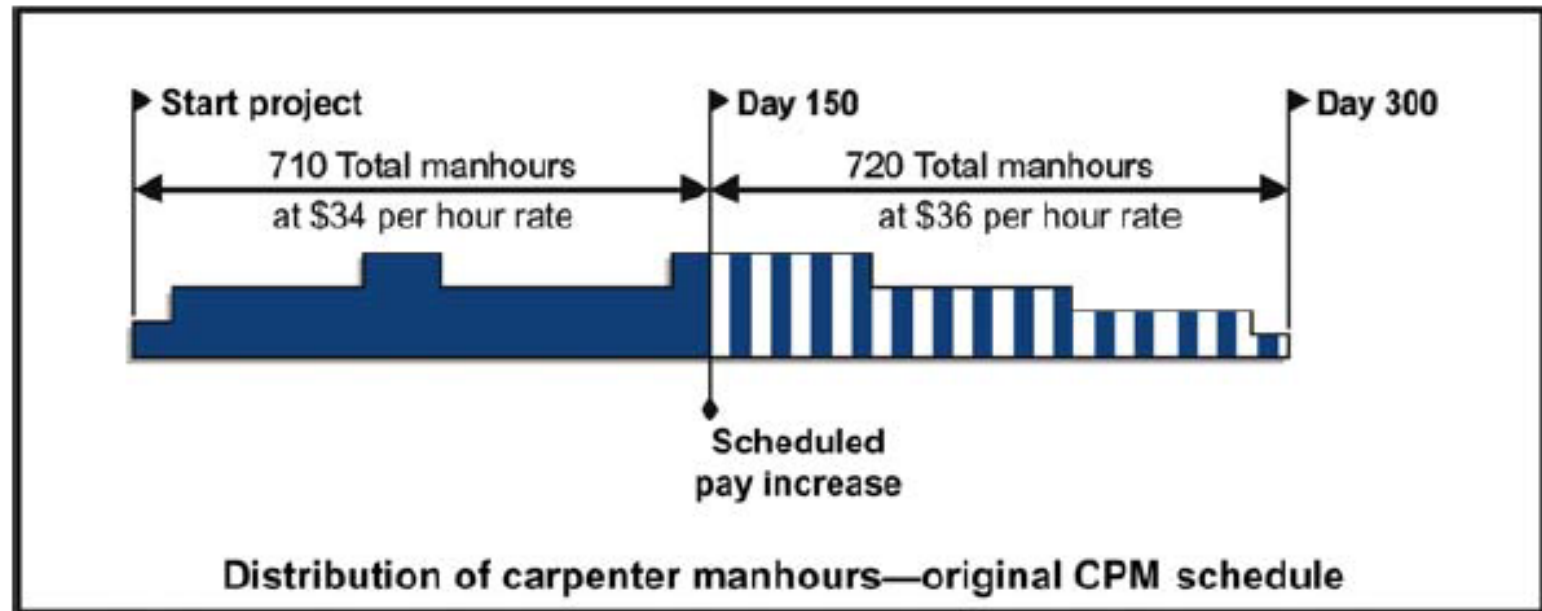
- ❑ During the Project, the Contractor maintains a **resource-loaded CPM schedule** to show the **distribution of manpower planned over time**.
- ❑ A Project is scheduled for a duration of **300 calendar days**.
- ❑ Figure shows the **distribution of planned carpenter hours** for the Project taken from the **original CPM schedule**.



Labor costs – Idle and Escalation of labor costs: Example

- ❑ This figure shows the **distribution of actual carpenter hours** on the Project, based on the **delay caused by the owner**.

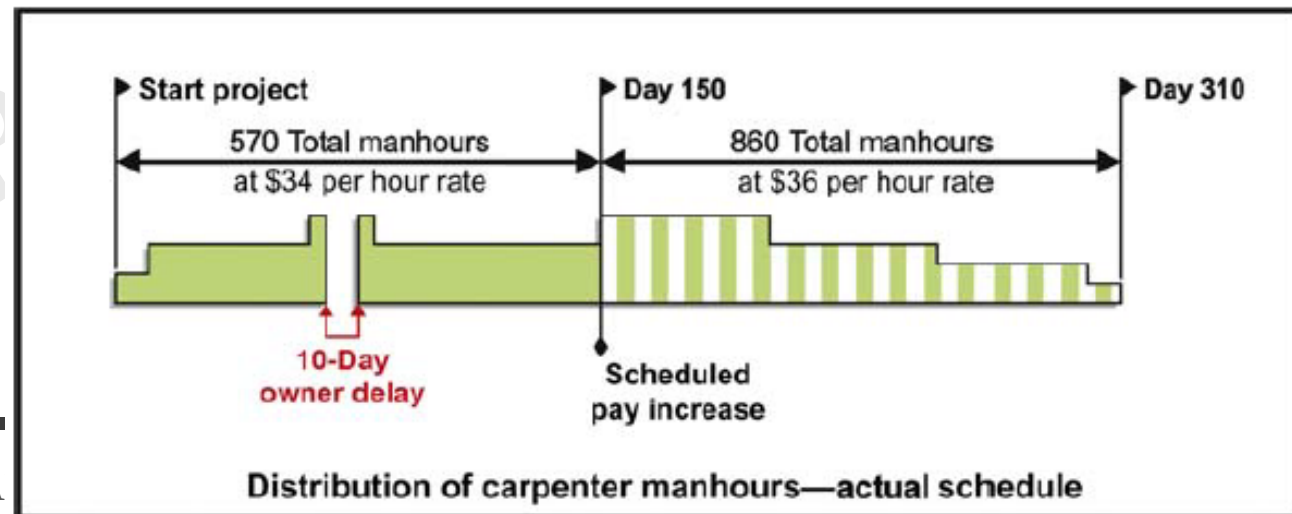
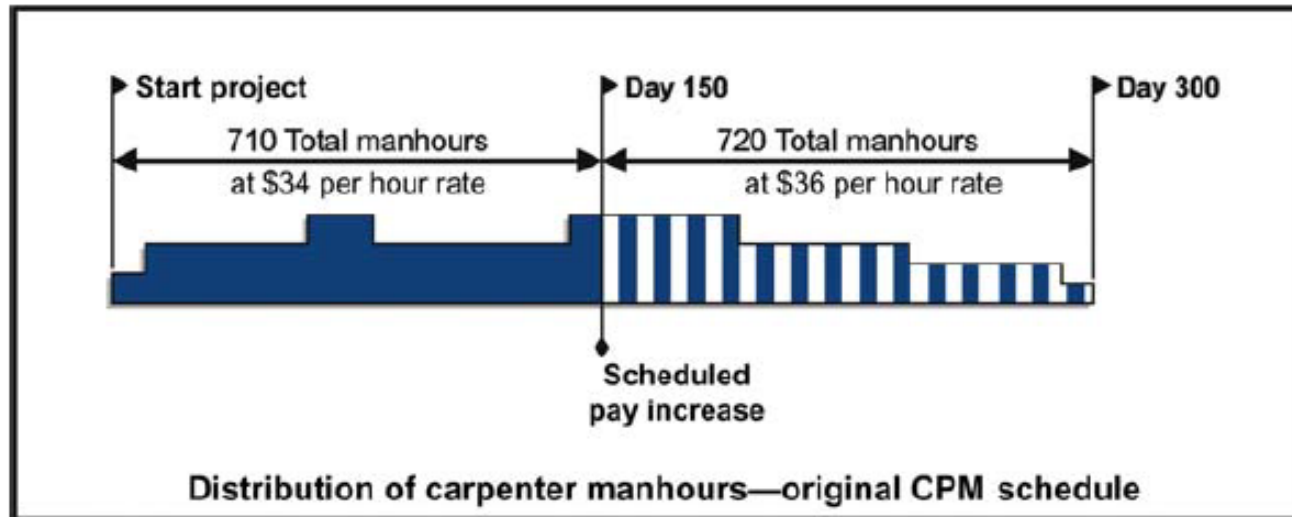
*Here it seems that there is **no idle cost** because the contractor uses the labors somewhere else.*



Labor costs – Idle and Escalation of labor costs: Example

860 actual hours – 720 planned hours = 140 labor hours

140 hours × \$2/hour wage increase = \$280.00





Labor costs – Idle and Escalation of labor costs: Example

*In this example, the **actual distribution** of carpenter labor was **caused solely** by the **Owner's delay**.*

*In a **different situation**, if the Owner can demonstrate that this **was not the case**, then the delay damages would **not include the escalated labor calculation**.*



Labor costs – Idle and Escalation of labor costs: Example

Many projects do not have a resource-loaded CPM schedule to allow a reasonably precise comparison between the **planned and the **actual** distribution of labor.**

Without the CPM schedule, the analyst can estimate the planned labor distribution from the Project bar chart.

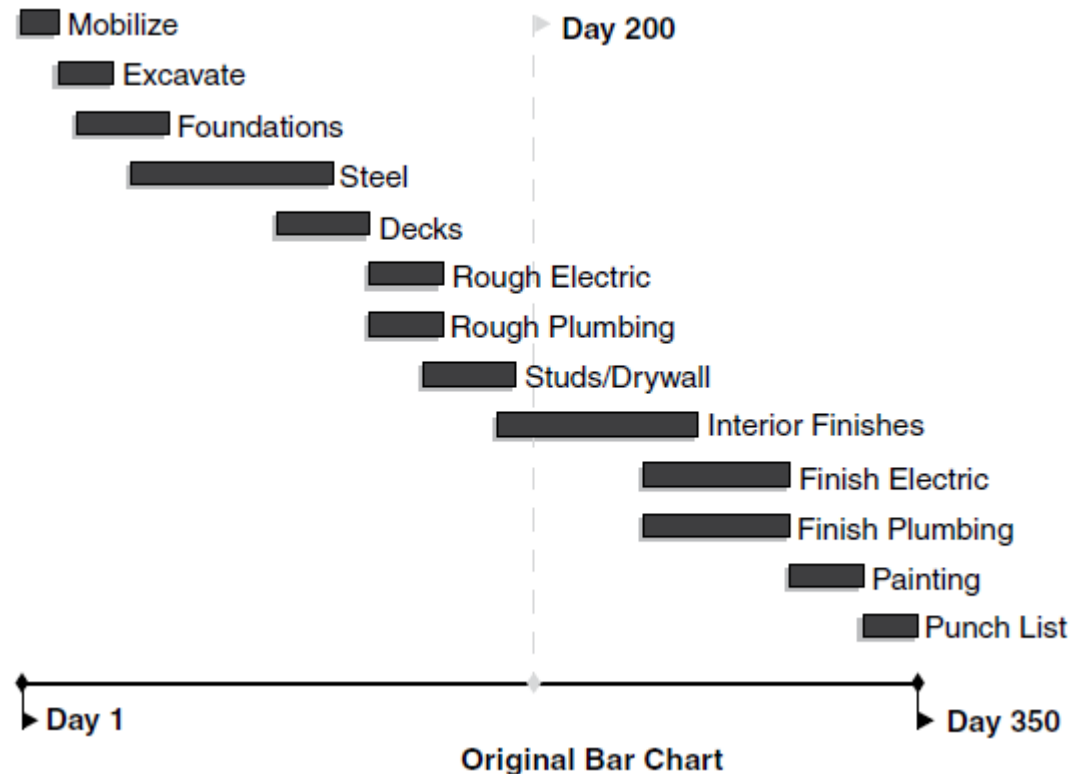
The analyst can **compare**

1. **Labor hours actually expended** on the job (taken from the **project daily reports**)
2. **Planned labor hour distribution** (taken from **bar chart**)

Let's see!

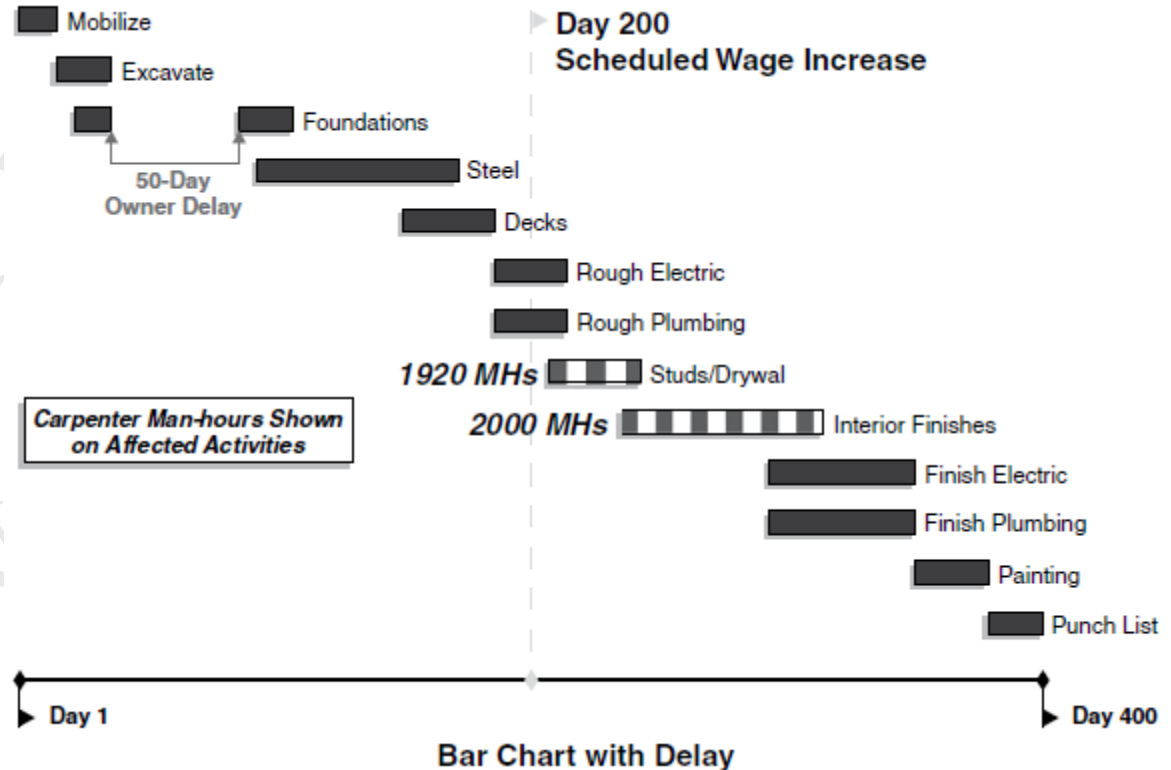
Labor costs – Idle and Escalation of labor costs: Example

- ❑ This Chart is the **Contractor's bar chart** for the work as **originally**.
- ❑ **No labor hours** are shown in the **bar chart**.
- ❑ Due to an **Owner-caused delay**, the Contractor experiences **escalated labor cost** on the Project, after a **rate increase** (from \$35 per hour to \$36 per hour) went into **effect on day 200 of the project**.



Labor costs – Idle and Escalation of labor costs: Example

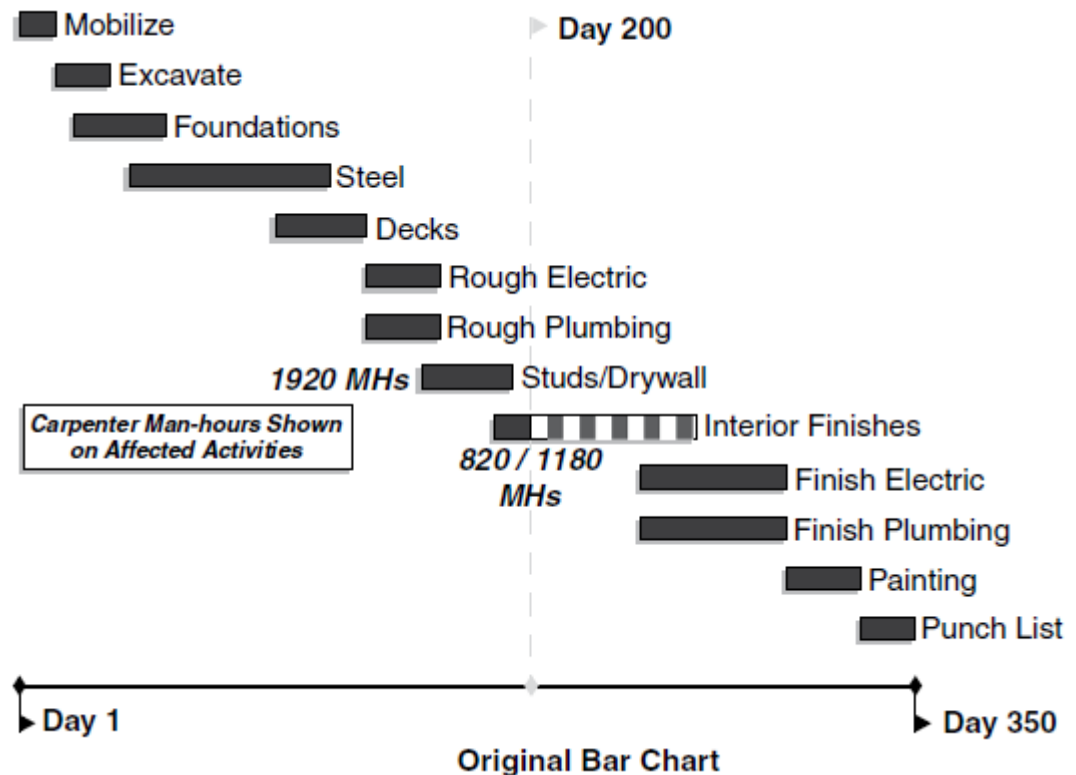
- ❑ This chart shows the actual bar chart for the project, **reflecting the delays**.
- ❑ It also shows the **actual carpenter labor hours worked** on **each shaded activity**.
- ❑ These **labor hours** were **taken** from the contemporaneously recorded Project daily



Labor costs – Idle and Escalation of labor costs: Example

$$\$1/\text{hour} \times (1,920 \text{ hours} + 820 \text{ hours}) = \$2,740$$

- ❑ It should be noted that **this conclusion assumes** the delay **only shifts the work into the more costly time period** and that **no labor inefficiency resulted**.





Equipment costs

- ❑ Delays may cause the **equipment** to be **idle**.
- ❑ The **amount of damages** that can be claimed for idle equipment **depends** on the **contract provisions**.
- ❑ In some cases, the **contract** may address **idle** or **standby equipment** and allow **only a reduced rate or no compensation at all**.
 - ❖ If the **contract** is **silent** on this issue, the **contractor would likely claim** damages at the **full rates** of the **equipment during the idle time**.

(۴۹-ج)

کارفرما و پیمانکار در مورد ماشین‌آلاتی که پیمانکار مایل است در مدت **تعطیل** از کارگاه خارج نماید، بدون پرداخت هیچ نوع هزینه‌ای، توافق می‌کنند اجاره مربوط به دوران توقف آن تعداد از ماشین‌آلات که در کارگاه باقی می‌مانند، براساس توافق طرفین به پیمانکار پرداخت می‌شود.



Equipment costs

❑ As in the case of idle labor,

the **contractor** would need to **identify specific equipment** on the project in the **daily reports** to show **exactly**

1. **When** this equipment was **idle**
2. **Duration** of the idle time.

This is exactly what we discussed in Financial Management Course!
Remember? What forms you should use for this?



Equipment costs

☐ Owner should **verify the Contractor's use of equipment**

1. **Prior to delay**
2. **During the delay**
3. **Following the period of the delay**

Why is this really important for owner?



Equipment costs

❑ If the equipment was **idle** **both before and after the delay period**, then the **Owner** may appropriately **question**

1. Whether the Contractor actually **sustained any damages** from the delay
 - ❖ Use the **equipment somewhere else**, so there would be no damage
2. Whether **idle time occurred due to another reason**
 - ❖ Concurrent delay

How about escalation costs here?



Equipment costs

- ❑ As with labor costs, a **Contractor's equipment costs** may also be subject to **escalation**.
- ❖ If a Contractor is using **rental equipment**, the delay could **shift** the Contractor's equipment into a **time period with a higher rental rate**.
 - ✓ This situation should be **documented with invoices**.

Let's see an example!



Equipment costs – Example

❑ If a **significant delay** occurs to a portion of a Project, **specialized equipment** originally **planned** for the work may **no longer be available**.

1. The Contractor's own paving machine may have been assigned to a Project for a particular period of time, but it is no longer available after the delay period. The Contractor is **forced to replace the owned equipment** with **more expensive rental equipment** in order to **meet the Project's revised schedule**.
2. In another case, the **Contractor originally planned** to perform mass excavation work **using scrapers**. Because of the delay, the Contractor now finds it **must use loaders and trucks** to excavate the material.

What do you think if in the second case the rental cost does not change?

Are you still entitled to the damages?



Equipment costs – Example

❑ It should also be noted that when the **performance of work** on the **project's critical path** is

1. **Less productive or inefficient**
2. Takes **longer than planned** to complete

the **extended duration of this work** could cause delays to the project that result in **additional delay-related costs**.

Project overhead costs + home office overhead costs (in the case of suspension)

You may be entitled to claim for:

1. **Escalation costs (rental)**
2. **Disruption costs**
3. **Project overhead costs**
4. **Home office overhead**



Equipment costs

❑ The **damages to the Contractor** would be measured by comparing the **cost** of the **originally planned** versus the **actual**.

❖ In the **case of disruption**, you may need other **supportive measurements!**

Next Example illustrates both **cost escalation** and **inefficiency** in equipment use caused by a delay.



Equipment costs – Example

- ❑ An Owner is constructing a waste water treatment plant addition. The Project site is an inactive landfill. The excavation Subcontractor is required to excavate approximately 200,000 cubic yards of material and dispose of it at a nearby active landfill. Prior to beginning excavation, the Owner is advised that the site may contain hazardous waste materials. Consequently, the Owner stops the Contractor's excavation activity in order to perform toxicity testing. The testing takes three months to complete, at which time the excavation Subcontractor is allowed to again proceed with the work as originally specified. Because of the delay, however, the Subcontractor experiences changes in its equipment cost and availability.



Equipment costs – Example

- ❑ Originally, the Subcontractor planned to excavate 170,000 cubic yards with scrapers and the remaining 30,000 cubic yards with a hydraulic excavator and a 20-ton dump truck.
- ❑ Due to the delay, the scrapers are no longer available because they have been committed to another Project.
- ❑ Consequently, the Subcontractor must now perform all of the excavation work without the use of scrapers.
- ❑ The Subcontractor experiences two problems because of the delay.
 - ❖ First, the excavators it intended to rent have increased in cost.
 - ❖ Second, the unit cost for the excavation work is higher using the dump trucks than it would have been using the scrapers.

Based on these factors, it calculates the increased costs.



Equipment costs – Example

1. Escalation of rental equipment cost:

❖ Cat hydraulic excavator rates

- ✓ Quoted rate: \$2,800/week (quote attached)
- ✓ New rate: \$2,900/week (invoice attached)
 - o Difference of \$100/week.

❖ Planned equipment time was 10 weeks (2 excavators for 5 weeks).

Extra cost: \$100/week × 10 weeks = \$1,000



Equipment costs – Example

2. Increased excavation cost (productivity loss):

❖ **Excavation with scrapers:**

- ✓ \$4.50/cubic yard (calculations attached).

❖ **Excavation with dump truck:**

- ✓ \$7.20/cubic yard (calculations attached).

Difference of \$2.70/cubic yard

Extra cost: \$2.70/cubic yard × 170,000 cubic yard = \$459,000

Equipment costs – Example

Total cost from delay: \$460,000 = \$459,000 + \$1,000



Equipment costs – Example

Of course, the Contractor **must** always show that it **complied** with its **obligation** to mitigate damages.

In this case, the **Subcontractor** may need to demonstrate that the **premium** to rent scrapers over and above the cost of the planned scrapers was **greater** than the damages that resulted from the **change in work methods**.



Material costs

- ❑ The most common added **material cost** caused by a delay is **price escalation**.
- ❑ The calculation of escalation cost for materials can be performed in the **same manner** as that for the **escalation of labor cost**.
- ❑ A **comparison** must be made between the **price** of each material that would **have been purchased** in the **original schedule** and the **price** of each material **purchased** later **under the delayed schedule**.

Let's see the example!



Material costs – Example

- ❑ A Project was originally scheduled to take 300 calendar days.
- ❑ The Project experienced a 90-day, Owner-caused delay.
- ❑ The delay occurred at the beginning of the Project and forced the Contractor to pay more for concrete.
- ❑ The Contractor can demonstrate it had a purchase order for concrete at \$80 per cubic yard from the beginning of the Project until day 100.
- ❑ After day 100, by the terms of the purchase order, the cost of concrete increased to \$85 per cubic yard.

Due to the delay, the Contractor purchased more concrete material at \$85 per cubic yard than it originally planned.



Material costs – Example

- ❑ A review of the schedule shows that the Contractor planned to have placed concrete on six of eight floors before the price increase took effect.
- ❑ A quantity takeoff establishes this as 2,000 cubic yards of concrete.
- ❑ In the actual performance of the work, the Contractor placed only 1,200 cubic yards of concrete before the price increase took effect.
- ❑ The material cost increase is directly attributable to the excusable delay.
- ❑ Therefore, the associated damages will be at least \$4,000 (**\$5 per cubic yard × 800 cubic yards**) due to the escalated price of

2,000 cubic yards planned – 1,200 cubic yards actual = 800 cubic yards

Additional cost of \$5/yard × 800 yards = \$4,000 damages due to delay



Material cost – Storage

- ❑ **Contractor** may be **forced** to store **materials** either **on or off the site** as a **result of a delay**.
- ❑ The Contractor must **support claims** for these costs **with invoices**.
- ❑ In some cases, the **Contractor** may be able to **purchase materials** **before** they are **required for installation** and **store them**, as this may be **less expensive** than the escalated cost of the materials purchased at a later date.
 - ❖ The Contractor should **notify the Owner** in **advance** of this course of action.



Extended Project (field) overhead costs – Field labor costs

- ❑ When a Project experiences a delay, the Contractor's field staff and field equipment may be **on site longer than originally scheduled**.
- ❑ Depending on the **Project-specific circumstances**, when a Project encounters a delay, the Contractor would typically retain its supervisory team at the job site.
 - ❖ Personnel such as the Project Manager, Project engineer, superintendent, assistant superintendent, and administrative support positions:
 1. If they can be allocated to the delayed activity:
 - ✓ These personnel represent a **direct labor cost** to the contracting firm.
 2. If they cannot be allocated to the delayed activity (more than one delayed activity):
 - ✓ These personnel represent a extended field labor cost (**project overhead cost**).



Extended Project (field) overhead costs – Field labor costs

- ❑ To calculate the **delay-related direct labor cost** to maintain these people on site:

$$(Aggregate\ of\ each\ daily\ salary\ +\ burden) \times Number\ of\ days\ of\ compensable\ delay = \\ Damages\ for\ extended\ field\ labor\ (supervisory\ personnel)$$

- ❖ Make sure that if the **delay** is expressed in **calendar days** that the **costs** are also expressed in **cost per calendar day**.

While this calculation is **straightforward**, it is important to note that the **analyst** also needs to **address** the **propriety of the Contractor's claim** to recover extended field costs for **supervisory personnel**.



Extended Project (field) overhead costs – Field labor costs

- ❑ In order to address the propriety of claiming damages for extended field supervisory labor, the analyst should start with a review of the Contractor's normal accounting procedures for these costs.
- ✓ If the Contractor routinely charges the Project Manager to the activity, then claiming damages would be **appropriate** but subject to the Contract requirements.
- ✓ If the Contractor routinely charges the Project Manager for the Project overhead, then claiming damages would be **appropriate** but should be considered as a project overhead.
- ✓ If the Contractor routinely charges the Project Manager to home office overhead, then claiming this cost as a direct field cost may **not be appropriate**.

The same principle applies to the salary of any other field supervisory personnel extended on the Project because of the delay.



Extended Project (field) overhead costs – Office costs

❑ **Extended field office costs** will also consist of the **daily cost** of all of the support equipment and services that are necessary to **maintain the project site**.

1. **Equipment**: Typically include **office** and **storage trailers**, **portable sanitary facilities**, **office equipment**, and **security fencing**, etc.
2. **Services**: Typically include phone service, electrical services, drinking water supply, and security.

❖ The key to determining which costs are included in the **daily rate** is the **time-related nature** of the expenditure.



Extended Project (field) overhead costs – Other costs

❑ Delays on a construction Project may cause a number of different increased costs to the Contractor, such as the following:

- ❖ Temporary utility and facility costs
- ❖ Extended warranties
- ❖ Maintaining and protecting work during delays
- ❖ Increased bond costs

Normally, all of these items fit into one of the **general cost categories**, such as field overhead, project overhead, and so forth.

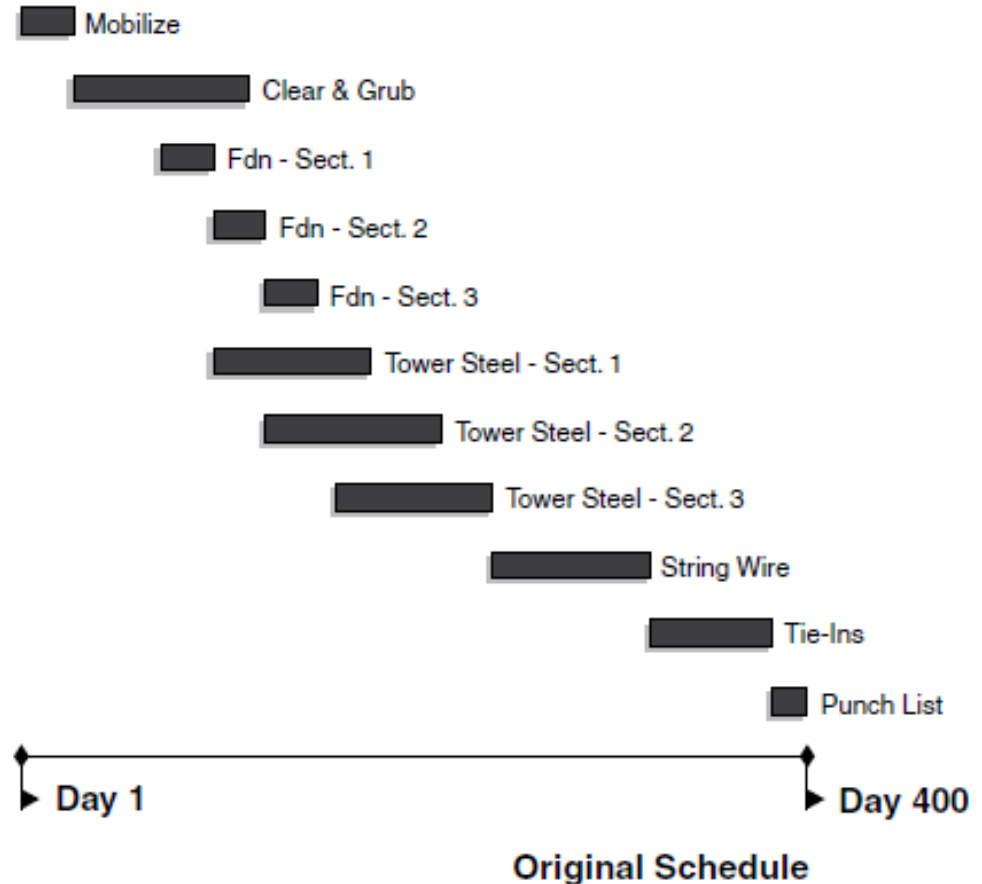
This Example shows a Contractor's damage calculations considering items mentioned in this section

It is intended to help present a clear picture of the procedures to use for calculating delay damages for an excusable delay



Example – As-planned schedule

- ❑ A Project has a Contract duration of 400 calendar days. The Contractor estimates the construction schedule to last the full 400 calendar days.



Original Schedule



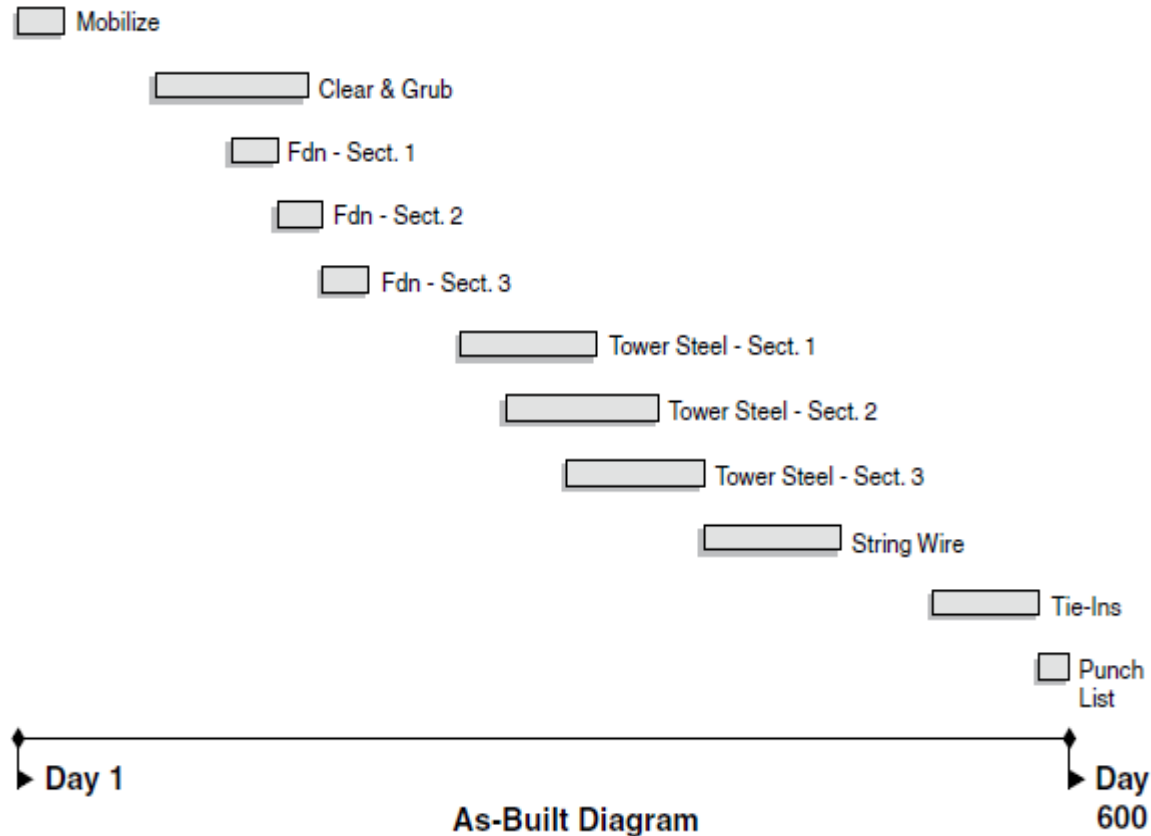
Example – As-built schedule

❑ The Project has a delay of **200 calendar days**.

❑ It was determined that the **Owner caused 150 days of delay**, and the **Contractor** was responsible for the remaining **50 days**.

❑ The Owner has issued a **two-part change order** for its delays.

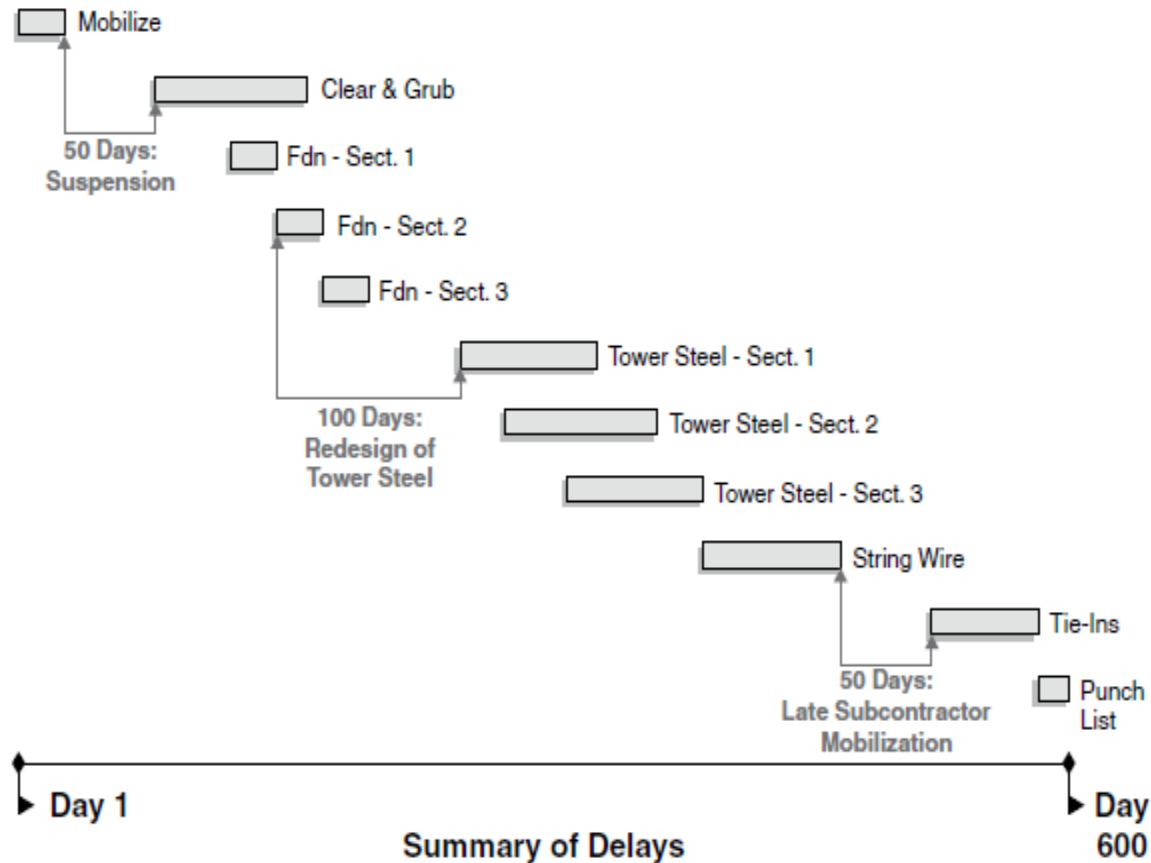
❑ The Owner is now in **negotiation** with the Contractor over the **compensation for the delay**





Example – Summary of delays

- ❑ A **summary of delays** to the schedule, shows that:
- ❑ **Owner** delayed the **start of the Project** by **suspending the work** for **50 days**.
- ❑ The next delay was also caused by the **Owner**, who, by **requesting design revisions**, delayed the Project an additional **100 days**.
- ❑ The **final delay** was **50 days**, attributable to the Contractor for **failing to mobilize a Subcontractor** to perform work.



Example – Contractor's additional compensation presentation

Request for Equitable Adjustment

Ace Construction Company hereby requests the following compensation for the 150 days of delay caused by factors beyond our control. In Part 1 of Change Order No. 7, the owner has granted a time extension of 150 calendar days. Because of this 150-day delay, Ace Construction accrued the following extra costs.



Extended Field Overhead

Labor

Project Manager	150 days @ \$600/day for 25% of time	=	\$22,500
Superintendent	150 days @ \$520/day	=	\$78,000
Clerk	150 days @ \$200/day	=	\$30,000
Master Mechanic	150 days @ \$480/day	=	<u>\$72,000</u>
Subtotal Labor			\$202,500

*Note: Certified payrolls attached.
Project Manager is a direct job charge.*

Equipment

Superintendent's truck	150 days @ \$25/day	=	\$3,750
Portable toilet	5 mos. @ \$150/month	=	\$750
Project trailer	5 mos. @ \$160/month	=	\$800
Tool trailer	5 mos. @ \$120/month	=	<u>\$600</u>
Subtotal Equipment			\$5,900

*Note: Invoices for equipment attached.
Superintendent's truck costed by
normal company accounting practices.*

General Conditions

Utilities	Electricity: 5 mos. @ \$150/month	=	\$750
	Water/Sewer: 5 mos. @ \$100/month	=	\$500
Dumpsters	2 dumpsters: 5 mos. @ \$150 ea/month	=	\$1,500
Copy machine	5 mos. @ \$120/month	=	\$600
Office supplies	5 mos. @ \$80/month	=	\$400
Scheduling updates	5 mos. @ \$1,000/month	=	<u>\$5,000</u>
Subtotal General Conditions			\$8,750

Total Extended Field Overhead

\$217,150

Example – Contractor's additional compensation presentation**Construction Equipment Costs:****Extended Equipment:**

100-ton crane:	3 extra mos. @ \$6,000/month	=	\$18,000
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Note: Applicable
timesheets and certified
payrolls attached.

Escalation of Equipment:

D-7 dozer:	2 mos. @ increased rental rate of \$400/month	=	\$800
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Union agreement and
calculation of rates to
include burden and
overhead attached.

Idle Equipment:

Scrapers:	327 hours @ \$70/hour	=	\$22,890
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D-7 dozer:	240 hours @ \$75/hour	=	\$18,000
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Total Construction Equipment Costs		:	\$59,690
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Example – Contractor's additional compensation presentation

Idle Labor:

Carpenters:	725 hours @ \$37/hour	=	\$26,825
Laborers:	816 hours @ \$25.50/hour	=	\$20,808
Ironworkers:	420 hours @ \$37/hour	=	\$15,540
Subtotal Idle Labor:			\$63,173

Escalation of Labor:

Carpenters	Escalation: 700 hours @ \$1.60/hour	=	\$1,120
Laborers:	Escalation: 250 hours @ \$1.50/hour	=	\$375
Ironworkers	(1st increase) escalation: 320 hours @ \$1.20/hour	=	\$384
	(2nd increase) escalation: 650 hours @ \$1.50/hour	=	\$975

Note: Applicable timesheets and certified payrolls attached.

Union agreement and calculation of rates to include burden and overhead attached.

Subtotal Labor Escalation:			\$2,854
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Total Labor Costs:			\$66,027
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Example – Contractor's additional compensation presentation

Material Costs:

Escalation of Concrete: 1200 yards @ \$3.00/yard = \$3,600

Storage of rebar: Supplier Charge = \$650

Total Material Costs: \$4,250

Grand Total: \$347,117

GENERAL OVERHEAD

(Home office overhead)

(HOOH)



Introduction

- ❑ Since the contractor adds a **percentage for markup** to the **direct cost bid amount** to **recover** home office costs,
 - ❖ If this **Project** were to then **experience a delay**, **Project revenues** may be **earned** over a **longer period of time**,
 - disrupting the basis** under which the Contractor **originally allocated** its home office overhead costs.
 - ❖ Usually, the **Contractor** calculates the **final bid price** by adding a **percentage for markup** to the **direct cost bid amount** to **recover** home office costs, but unable to recover those costs.

This is called **home office overhead (HOOH)** costs

Home office overhead (HOOH)

What included in HOOH?

There is a debate here!

Remember Financial Management Course?

Item	Annual Cash Flow From Operations												Total
	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	
Revenues	768,000	712,000	785,000	769,000	560,000	545,000	500,000	391,000	342,000	460,000	492,000	516,000	6,840,000
Overhead:													
Advertising	7,680	7,120	7,850	7,690	5,600	5,450	5,000	3,910	3,420	4,600	4,920	5,160	68,400
Promotion	—	—	—	—	—	—	8,000	—	—	—	—	15,000	23,000
Car and Truck Expenses	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	13,200
Computer and Office Furniture	—	—	—	—	—	—	18,000	—	—	—	—	—	18,000
Employee Wages and Salaries	22,618	22,618	22,618	22,618	22,618	22,618	22,618	22,618	22,618	22,618	22,618	22,618	271,416
Employee Benefits	750	750	750	750	750	750	750	750	750	750	750	750	9,000
Employee Retirement	679	679	679	679	679	679	679	679	679	679	679	679	8,142
Employee Taxes	2,300	2,238	2,046	1,994	1,924	1,878	1,809	1,809	1,809	1,801	1,565	1,144	22,317
Insurance	4,366	4,086	4,451	4,371	3,326	3,251	3,026	2,481	2,236	2,826	2,986	3,106	40,514
Taxes & Licenses	100	—	—	—	—	—	—	—	—	—	—	—	100
Office Supplies	500	500	500	500	500	500	500	500	500	500	500	500	6,000
Office Rent	500	500	500	500	500	500	500	500	500	500	500	500	6,000
Office Utilities	350	350	250	250	250	350	350	350	250	250	350	350	3,700
Postage and Delivery	100	100	100	100	100	100	100	100	100	100	100	100	1,200
Janitorial and Cleaning	433	433	433	433	433	433	433	433	433	433	433	433	5,200
Telephone	440	440	440	440	440	440	440	440	440	440	440	440	5,280
Charitable Contributions	—	—	—	—	—	—	—	—	—	—	—	3,000	3,000
Dues and Memberships	—	—	—	1,500	—	—	—	—	—	—	—	—	1,500
Legal and Professional Services	1,000	—	—	3,000	—	—	1,000	—	—	1,000	—	—	6,000
Meals and Entertainment	867	867	867	867	867	867	867	867	867	867	867	867	10,400
Bank Fees	50	50	50	50	50	50	50	50	50	50	50	50	600
Miscellaneous	100	100	100	100	100	100	100	100	100	100	100	100	1,200
Total Overhead	43,933	41,931	42,734	46,942	39,237	39,066	65,321	36,686	35,851	38,614	37,958	55,897	524,170

General Overhead Budget

Could owner restrict this?



Home office overhead (HOOH)

❑ The **auditing or accounting standards** employed by the owner can **further restrict the definition of home office overhead**.

❖ For example, under contracts governed by **Federal Acquisition Regulation (FAR)** cost principles,

certain costs, such as those **expended for marketing and entertainment** may **not be recoverable** as home office overhead costs.

*As a result, on Federal projects, or on projects that rely on the FAR for the purposes of cost accounting, these marketing and entertainment costs **end up being covered** by whatever amounts the contractor is able to mark up its costs for profit, if at all.*

How delays could affect on HOOH?



Effects of delays on general (home office) overhead costs

❑ There is a distinction between:

1. *Extended home office overhead*: Project was **formally suspended**

❖ **Additional expenses** incurred **over time** due to a delay that **prevents** a contractor from **taking on additional work in a same project**.

2. *Unabsorbed home office overhead*: Project was **partially or informally suspended**

❖ The **portion of home office overhead costs** that are **not** contributed to a **project** as a result of **delay, suspension, or other reason**.

❑ The **calculation** of damages for **each may differ**, but **in practice**, most courts and boards have **not always maintained** this clear **distinction** in terms.

Regardless of the nature of the delay, the analyst should establish the damages the

Contractor actually experiences.

Let's look at "unabsorbed home office overhead!"



Effects of delays on general (home office) overhead costs

☐ **Generally, there are two situations:**

1. One project at a time
2. Multiple projects

Unabsorbed home office overhead – One project at a time - Example

- ❑ Relatively **straightforward**
- ❑ The **difference** between delays caused by a **suspension** and those that result from **extra work** are explained later.

A contractor has home office costs of \$48,000 per year and has a one-year contract for \$1,000,000. The project experiences a one-month delay, during which time home office costs of \$4,000 accrue. If the delay were the result of a compensable suspension of work, the contract amount of \$1,000,000 would remain the same, but the contractor would now have to cover a total home office cost of \$52,000 over the term of the contract, an increase of \$4,000.

Contract amount: \$1,000,000

Yearly home office costs: \$48,000

New home office expense, including extending the project
one month: \$52,000

Increase in home office costs to be covered by this project:

$\$52,000 - \$48,000 = \$4,000$

Therefore, the contractor may be entitled to receive \$4,000 in damages to cover home office costs for the delay.

Unabsorbed home office overhead – Multiple projects - Example

- ❑ Clearly, as the number of projects increases, the calculations become more difficult.

This contractor has home office overhead costs of \$1,000,000 per year. The contractor normally has four projects in progress at any one time, for a total yearly volume of \$20,000,000. The contractor allocates home office costs by adding a 5 percent markup to each bid. Each of the four projects is valued at \$5,000,000. What would happen if one project were to experience a delay?

Originally, each project absorbed \$250,000 of home office costs, or about \$21,000 per month. If one project experiences a one-month delay, then the contractor would receive no additional revenue to cover home office costs from that project and would therefore suffer a net loss in recovered home office overhead costs of \$21,000. If the delay were attributable to extra work, the contractor might receive compensation from the markup on a change order. However, in the absence of extra work, the project experiencing the delay would underabsorb its share of the home office costs, leaving the other projects to overabsorb these costs.

Is there any debate on this?



Unabsorbed home office overhead – Debates

❑ In principle, **home office overheads are recoverable**, however difficult to ascertain in **practice**.

❖ Despite being a commonly sought element of delay damages, **home office overhead** remains a **contentious issue**.

Why?



Unabsorbed home office overhead – Debates

- ❑ There is **no standard method** of calculating HOOH!
 - ❖ Most contractors want to use formulas
 - ❖ Most owners want to see “Real damage”
 - Some **disagree with the formulas** that are **often used to calculate** home office overhead costs.
- ❑ Some **do not agree** that there is a home office overhead cost incurred by the contractor as a **result of a delay** or that any cost incurred is **the contractor’s risk and not the owner’s responsibility.**
- ❑ Some believe that the **home office costs associated** with a delay are **fully compensated by the markup** for overhead provided on the **cost of the change** that caused the delay or on the other delay costs being sought.

We will see whether the **courts** agree or not **later!**
 What is the **least requirements** to recover these costs?



Unabsorbed home office overhead – Least requirements

- ❑ **Before** it can **recover** **unabsorbed overheads**, the **contractor** must be able to **demonstrate** that it has:
- Failed** to **recover** the overheads it could reasonably have expected during the **period of prolongation**
 - Been unable** to **recover** such overheads **because** its **resources were tied up** by delay

In order to succeed in such a claim, the Contractor must demonstrate that there was other revenue and profit earning work available which, in the absence of the Employer Delay, would have been secured by the Contractor.

What do you need?



Unabsorbed home office overhead – Least requirements

4. Cost records

- ☐ If the **contractor** wants to use a **formula** for the **assessment** of **lost profits** and **general overheads (unabsorbed overheads)**, it will need to **produce evidence** that the **delay caused by owner** **avoid** **contractor** to take a **new project**.
- ☐ To **prove**, you need the following:
 1. **Business plans** prior to delay **caused by employer**
 2. Contractor's **bidding history**
 3. Records of **acceptance** or **rejection of bidding**
 4. Records that **support** the **inputs into the formula** used, in particular **contractor's company accounts** for:
 - a) **Periods** immediately **preceding** and **succeeding** the **employer delay**
 - b) **Period** when the **employer delay** occurred



Unabsorbed home office overhead – Calculation

The remainder of this section presents some methods for calculating delay damages associated with unabsorbed home office overhead costs.

*The contractor should make **all reasonable efforts** to demonstrate through records the home office overheads that it **has failed to recover**.*

*If **not feasible** then the **following formulae** may be used with caution.*

آیا میتوان عرف و عادت خارجی را به داخل تعمیم و تسری داد؟

□ ماده ۶ شرایط عمومی پیمان قراردادهای مهندسی، تامین کالا و تجهیزات، ساختمان و نصب به صورت توام
برای کارهای صنعتی (EPC – نشریه ۵۴۹۰) اشاره کرده:

"در موارد مسکوت در پیمان از آخرین نگارش استانداردها و مدهای معتبر خارجی هماهنگ با دیگر
استانداردهای پیش بینی شده در پیمان با تایید مشاور کارفرما استفاده میشود."

البته تعمیم و تسری مورد بحث، با ملحوظ نمودن محدودیتهای حقوق موضوعه بایستی صورت گیرد.

آیا میتوان عرف و عادت خارجی را به داخل تعمیم و تسری داد؟

ادعای پیمانکار در بندهای ۱ و ۲ و ۳ و ۴ و ۵ و ۷ در این بخش از قرارداد اول، جملگی ذیل بند ۷-ق. ۱. می باشد؛ فلذا با امعان نظر به ماهیت این ادعا و با تجویز رجوع به عرف در «ماده ۲۲۰» قانون مدنی، و قابلیت بهره‌مندی از روش‌های رایج در مدیریت ادعا، ادعای پیمانکار در بندهای یک تا پنج این بخش از قرارداد اول، صفر، منظور شده و با اعمال ضابطه ایجلی اصلاح شده یک به جهت تناسب حاکمیتی با ماهیت پروژه - به تجویز عرف موضوعی «ذیل ماده ۲۲۵» قانون مدنی - و تخصیص آن به ردیف هفت، به میزان ۱۰،۲۳۴،۵۴۹،۱۷۲ ریال، وارد است.



Eichleay formula

- ❑ In 1960 the ASBCA (دادگاه استیناف قراردادهای نیروهای مسلح آمریکا) heard the appeal of the Eichleay Corporation from a **Corps of Engineers** determination concerning home office expense allocable as a result of delays encountered during the construction of a Nike Missile Base in Pennsylvania.
- ❑ ASBCA recognized that when a contractor encounters government caused delays of an unknown duration, the contractor's HOOH continues to accrue but is **no longer supported** by revenue from the delayed project.
- ❑ ASBCA acknowledged previous Court findings that there is **no exact way** to calculate unabsorbed HOOH in order to determine the compensation owed the contractor.
- ❑ The **appellant** in this case, the Eichleay Corporation, **offered a formula** to proportionately allocate their HOOH from the corporate level.
- ❑ The **ASBCA** in their decision **adopted** the appellant's proposed method of computing unabsorbed HOOH delay costs – and thus the **Eichleay Formula was born!**



Eichleay formula

- ❑ The Eichleay Formula, brought about initially by decisions issued by the U.S. Court of Claims, is a method to equitably **determine** the allocation of unabsorbed overhead to allow **fair compensation** to a contractor for a government caused delay.
- ❑ It is **not necessary to prove a specific amount** of home office expenses, but **only to determine a fair allocation** for the purpose of compensating a contractor for delay by the government.

The Eichleay Formula is **not an accounting** formula, it is an **estimating** formula!



Eichleay formula

تمامی فرمولهای فارسی از سایت حقوق احداث برداشته شده است.

<https://clc1int.com/>



Classic Eichleay formula

❑ The Eichleay Formula is a simple **three-step formula**.

❖ STEP 1

$$\text{Allocable Contract Overhead} = \frac{\text{Total overhead cost incurred during the contract period}}{\text{Total billings during the contract}} \times \frac{\text{Billings from the delayed contract}}{\text{Total billings during the contract}}$$

- ✓ Contract period is the time of the contract including **excusable and non-excusable delays**.
- ✓ Total billings during the contract are the total billings for **all projects**.

$$\frac{\text{مبلغ نهایی (تجمعی) قرارداد (صورت وضعیت قطعی)}}{\text{کل درآمد شرکت (تمامی صورت وضعیت ها) در زمان اجرا}} \times \frac{\text{تمام بالاسری دفتر مرکزی در بازه زمانی اجرا}}{\text{تخصیص به قرارداد}} = \text{بالاسری قابل}$$

The question is that what categories of overheads should be included?



Classic Eichleay formula

❑ The Eichleay Formula is a simple **three-step formula**.

❖ STEP 2

$$\frac{\text{Allocable overhead}}{\text{Number of days of contract performance (including delay)}} = \text{Daily allocable overhead rate}$$

What does that mean?

$$\frac{\text{بالاسری قابل تخصیص به قرارداد}}{\text{روزهای واقعی اجرای قرارداد (مدت اولیه + تاخیرات مجاز و غیرمجاز)}} = \frac{\text{نرخ روزانه بالاسری قابل تخصیص به قرارداد}}{\text{قرارداد}}$$



Classic Eichleay formula

❑ The Eichleay Formula is a simple **three-step formula**.

❖ STEP 3

Daily allocable overhead rate	×	Number of days of compensable delay	=	Home office overhead damages
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What does that mean?

میزان بالاسری جذب نشده مورد = تعداد روزهای تأخیر ناشی از قصور کارفرما × نرخ روزانه بالاسری
(تأخیرات مجاز) (ادعا برای قرارداد چار تأخیر)



Classic Eichleay formula – Example

- ❑ Company has total billings of \$50,000,000 during the Contract period. The Contract billings total \$5,000,000. Total home office overhead is \$1,000,000 during the Contract period. The Project duration totals 200 days, and compensable delays total 30 days.

$\frac{(\text{Contract billings})}{\text{Total contract billings}} \times (\text{Home office overhead}) = (\text{Allocable overhead})$
$\frac{\$5,000,000}{\$50,000,000} \times \$1,000,000 = \$100,000$

$\frac{(\text{Allocable overhead})}{\text{No. of days of contract performance}} = \text{Daily allocable overhead rate}$
$\frac{\$100,000}{200 \text{ days}} = \$500/\text{day}$

$\text{Daily allocable overhead} \times \text{Number of days} = \text{Home office overhead damages}$
$\$500/\text{day} \times 30 \text{ days} = \$15,000$



Classic Eichleay formula – Problems

- ❑ While the **Eichleay Formula** is simple to apply, one might reasonably **question its accuracy**.
- ❑ The Eichleay Formula is an **estimated allocation** and may, therefore, be somewhat **inaccurate**, yielding results that are **either too high or too low**.
- ❑ **Despite this limitation**, the **federal courts** and **boards** have, for the most part, **accepted** the formula as a **reasonable approximation** of the damages sustained.
- ❑ **With less case law** to draw upon, **state courts** have been **less receptive** to outright acceptance of the formula.

Debate over the use of the formula has therefore led to refinements regarding its application.

Let's see!



Classic Eichleay formula – Problems: Example

- ❑ The most common argument against the use of the **Eichleay** Formula is that the **Contractor receives compensation** of home office overhead by virtue of the markup on a change.
- ❑ Excavation-Construction, Inc., ENG BCA 3851 (1984), the Engineering Board of Contract Appeals (ENG BCA) recognized the use of the Eichleay Formula to determine the cost not only of a suspension of work but also of a delay caused by extra work.

“The Board believes in general that an Eichleay-type approach is the preferred way to determine home office overhead in a suspension situation and that a markup of direct costs is the preferred way to determine home office overhead for a change. However, no automatic approach can be applied in avoidance of a careful scrutiny of the facts. In this appeal, the changed work on the retaining walls is only part of the reason for extension of the contract period. Much of the delay and disruption occurred because the change was not timely made. The parties have agreed that the net effect was to extend the period necessary for performance by 99 days. Measurement of the effect on home office overhead by the costs alone is likely in these circumstances to understate the amount to which E-C is entitled. Therefore, the Board considers this appeal to be a proper one for application of the Eichleay Formula.”



Classic Eichleay formula – Problems: Example

- ❖ The **board** did, however, **subtract** from the Eichleay calculation the amount of **overhead** that was already **being paid** by virtue of the markup on the change order.



Classic Eichleay formula – Problems: Example

- ❑ Another common argument is that HOOH costs are **fixed costs** that would have been incurred **even if there had been no delay**.
 - ❖ **So, Eichleay formula should not be used.**
- ❑ Armed Services Board of Contract Appeals' response in George E. Jensen Contractor, Inc., ASBCA no. 29772 (1984).

"Finally, the Government argues that the home office or extended overhead costs are fixed costs that would have been incurred even if there had been no delay. Its argument continues that to allow relief by utilizing the Eichleay Formula would permit recovery of overhead costs much greater than the direct costs incurred during the periods of delay. This argument misses the point. Home office expenses are indirect costs usually allocated to all of a contractor's contracts based on each contractor's incurred direct costs. When a government-initiated delay causes a contractor's direct costs to decline greatly, that contract does not receive its fair share of the fixed home office expenses. The Eichleay Formula is one method approved by boards and courts over a long period of time that corrects this distortion in the allocation of these indirect expenses."



Classic Eichleay formula – Problems: Example

- ❑ Another argument is that the **markup clearly contains** an allocation for **home office overhead**, so Eichleay should not be used
 - ❖ This argument is not valid as well.
- ❖ This case shows how the ASBCA addressed the point in Shirley Contracting Corporation, ASBCA No. 29848 (1984).

“We find no support for this position. The Corps’ Area Engineer testified that he did not know the composition of the 15 percent allowed but nonetheless approved it as a matter of course. He also admitted that the 15 percent overhead was allowed even ‘on modifications that involved no delay at all.’ ”



Classic Eichleay formula – Problems

☐ Accountants & Auditors

- ❖ Consider it an accounting formula

☐ Owners

- ❖ HOOH not real cost & Eichleay pays too much

☐ Contractors

- ❖ Too many restrictions of collecting HOOH



Classic Eichleay formula – Problems: Accountants & Auditors

❑ Eichleay assumes proportional relationship between contract billings & fixed indirect costs

❖ **Contract billings** rarely used as base for distribution of indirect costs

✓ **Break-even contribution margin ratio**

❖ Thus, there may **not be a proportionate relationship** between billings and indirect costs

Eichleay does not adjust for this



Classic Eichleay formula – Problems: Accountants & Auditors

❑ Eichleay assumes contractor performs no substituted work during delay period

- ❖ If contractor **remobilized** to **another part** of project and **kept working**, HOOH being paid for.
- ❖ If contractor **took on new work** HOOH being offset
- ❖ **Substituted work mitigates damages**

Eichleay does not adjust for this

Classic Eichleay formula – Problems: Accountants & Auditors

- ❑ Eichleay assumes effect of delay always the same, regardless of when delay occurs
 - ❖ If delay occurs in **winter period** when contractor **less productive**, has **fewer resources**, delay has **less impact** than if arose **during summer** when have **more resources**.

Eichleay does not adjust for this



Classic Eichleay formula – Problems: Accountants & Auditors

❑ Eichleay assumes actual contract duration acceptable base period for calculating fixed indirect costs

❖ This may be **accurate under normal, stable business conditions**

✓ But, in **times of economic turbulence**, indirect costs may **vary widely**

○ But, **Eichleay** assumes **indirect costs not variable**

Eichleay does not adjust for this



Classic Eichleay formula – Problems: Accountants & Auditors

- ❑ HOOH recovered through mark-ups on added or changed work is not accounted for in the context of the Eichleay formula.

Eichleay does not adjust for this



Classic Eichleay formula – Problems: Accountants & Auditors

- ❑ Eichleay does not take into consideration that project delay simply defers HOOH recovery from one period to another
 - ❖ There may be no true economic loss and the time value of money is not considered.

Eichleay does not adjust for this



Classic Eichleay formula – Problems: Owner

- ❑ Eichleay may cause **overpayment of damages**
 - ❖ Contractor using Eichleay may be **double dipping**
 - ✓ **Unless** portion of **change order markup paid** for HOOH previously **removed** from delay damages
- ❑ For those owners who want to **settle delay as it occurs**, Eichleay is an **end of project calculation**
 - ❖ Cannot be applied mid-project-time & costs employed are **all end of project numbers**



Classic Eichleay formula – Problems: Contractors

- ❑ Many states do not accept Eichleay
 - ❖ Some have substantial restrictions on when Eichleay could be applied
- ❑ Some states even **disallow** Eichleay
- ❑ Federal courts **restrict** when Eichleay can be used & some state courts have followed suit
 - ❖ Will be talked later
- ❑ Eichleay is an **end of job formula**
 - ❖ Actual duration of work, total project revenue, total company HOOH during project period
 - ✓ **Cannot** be used to price delay claims in **middle of project**
 - ✓ Does **not help resolving** delay issues **as they arise**



Eichleay formula – When to apply?

The application of the Eichleay Formula is automatic.

1. Like all claims for delay damages, to recover **home office overhead costs**, the Contractor must first establish that the **delay was indeed compensable**.
 - ❖ This typically entails establishing that the delay was the Owner's fault or responsibility and could **not have been** reasonably anticipated or otherwise mitigated by the **Contractor**.
2. Contractor must also **demonstrate** that there was **other revenue available** which, in the absence of the employer delay, would have been **secured by the contractor**.

In addition, many courts that have accepted the Eichleay Formula have attached other prerequisites to its application.

What prerequisite?



Eichleay formula – When to apply?

❑ The prerequisite could include the contractor establishing:

- 1) An **owner-imposed suspension** of critical work
 - ❖ Owner must be sole cause of delay (no concurrent delays)
- 2) An **owner requirement** that the contractor stand-by during the associated delay
- 3) Proof that **while standing-by**, the contractor was unable to take on additional work
- 4) Of unknown duration (if there is an uncertainty about the suspension duration)
- 5) Suspending most, if not all, work (work force need not be 100% idle)
 - ❖ Contractor required to remain on “hot standby”
 - ❖ Contractor unable to perform replacement work
- 6) Must experience compensable delay
- 7) Resulting in **substantial decrease** in project revenue



Eichleay formula – When to apply?

- ❑ Arguments against the broad application of Eichleay are provided in P.J. Dick Inc., Appellant, v. Anthony J. Principi, Secretary of Veterans Affairs, Appellee. Nos. 02-290, 02-401, April 07, 2003. The United States Court of Appeals decided in part, as follows:

In short, a court evaluating a contractor's claim for Eichleay damages should ask the following questions: (1) was there a government-caused delay that was not concurrent with another delay caused by some other source; (2) did the contractor demonstrate that it incurred additional overhead (i.e., was the original time frame for completion extended or did the contractor satisfy the Interstate three-part test); (3) did the government CO issue a suspension or other order expressly putting the contractor on standby; (4) if not, can the contractor prove there was a delay of indefinite duration during which it could not bill substantial amounts of work on the contract and at the end of which it was required to be able to return to work on the contract at full speed and immediately; (5) can the government satisfy its burden of production showing that it was not impractical for the contractor to take on replacement work (i.e., a new contract) and thereby mitigate its damages; and (6) if the government meets its burden of production, can the contractor satisfy its burden of persuasion that it was impractical for it to obtain sufficient replacement work. Only where the above exacting requirements can be satisfied will a contractor be entitled to Eichleay damages.



Eichleay formula – When to apply?

On the subject of suspension, the Court wrote:

Our case law clearly requires that the contractor must show a suspension, whether formal or functional, of all or most of the work on the contract.

Explaining this statement further, the Court added:

As to PJD's factual arguments, those too must fail. The Board found that "[t]he evidence before us shows conclusively that PJD was able to progress other parts of the work during the time periods it alleges it was suspended." Although PJD argues the evidence shows its direct billings were greatly diminished during the delays, substantial evidence supports the Board's finding. The evidence, at worst, shows that in one of these delay periods PJD billed 53% less than it had the month before. There is, however, no evidence whatsoever that PJD's direct billings were less than they would have been absent the suspensions—that is the controlling test. A comparison of pre- and intradelay billings or intra- and post-delay billings is not the test. Regardless, PJD's direct billings during the delay periods can hardly be characterized as "minor." See Altmayer, 79 F.3d at 1134. At worst, PJD's direct billings during one of the periods of suspension were 47% of what they were in prior months; thus, PJD continued to perform substantial amounts of work on the contract during the suspension periods. On these facts, which are supported by substantial evidence, we must affirm the Board's conclusion that PJD was not on standby.



Eichleay formula – When to apply?

- ❑ Eichleay Formula is a calculation **applied** at the end of the Project after **all the work and delays are completed**.
- ❑ **If** the parties attempt to **resolve the question** of home office overhead **during the Project**, some form of a **modified Eichleay Formula** may be appropriate.
 - ❖ One approach is to **apply the Eichleay Formula** from the **beginning of the Project** up to the **point of negotiations**.
 - ✓ Thus, the total Contract billings, the total company billings, and the total number of days from the **start of the Project up to the approximate date of the calculation** are used.



Eichleay formula – When to apply?

- ❑ When using the Eichleay Formula in **federal government** cases, **some costs** (such as advertising, entertainment, interest, etc.) that are normally considered home office overhead are **not allowable**.
 - ❖ The government will normally **disallow** these costs during **its audit procedures**.
 - ❖ In its Contract, the federal government **has the right to audit a Contractor's records**.
- ❑ For delay claims **in excess of \$100,000**, the government normally will **perform an audit**.
- ❑ The **various federal agencies** have **different internal guidelines** mandating the dollar **level** at which an **audit is required**.



Eichleay formula – Potential remedies

Let's examine some potential remedies

☐ **Must be included in contract documents**

AND

☐ **Must seeking competent legal advice**

“Compensation sought by the contractor for unabsorbed home office overhead can be one of the more contentious issues faced on ... projects.”¹⁰ However, if the project owner is an agency of the U.S. Government, or if a contractor has a contract directly with the U.S. Government and is seeking recovery of HOOH, then they are required to use the classic Eichleay Formula to estimate the cost of the unabsorbed HOOH.¹¹

Practical Problems with Pricing Delay Using Eichleay,
Navigant Consulting Inc.



Eichleay formula – Potential remedies

❑ Change rules on HOOH recovery

❖ *Audit/Access to records clause*

- ❖ **Enables** owner to look at **certain issues**
- ❖ **Insert** clause in **every contract**
- ❖ If not have one, use **Federal Acquisition Regulation** (**FAR 52.214-26 or 52.215-2**)

❖ *Adopt Mortensen Rule by Contract*

- ❖ **Contractor** has **option at outset** of contract to choose between
 - ✓ Percentage markup on each change
 - ✓ Select daily rate on changes causing time extension
 - Choice applies to all change orders
 - Use also the same method for suspension



Eichleay formula – Potential remedies

❑ Change rules on HOOH recovery

❖ *Adopt Absorption Rate Formula in contract*

Absorption rate formulas calculate under absorption by **comparing** a **potential or reasonable overhead absorption rate** against the **actual absorption rate**

❖ *Alleghany formula*

$$\frac{\text{Actual Overhead Rate During Delay Period}}{\text{Actual Overhead Rate During Entire Project Performance Period}} = \text{Excess Overhead Rate}$$

$$\text{Excess Overhead Rate} \times \text{Contract Base Cost} = \text{Home Office Overhead Rate Owed}$$

This is not correct!

اله گینی

نرخ اضافی بالاسری = نرخ بالاسری برنامه ریزی شده - نرخ بالاسری در زمان واقعی اجرا

بالاسری جذب نشده = هزینه های مبنای کار × نرخ اضافی بالاسری



Eichleay formula – Potential remedies

❑ Change rules on HOOH recovery

❖ *Adopt Absorption Rate Formula in contract*

Absorption rate formulas calculate under absorption by **comparing a potential or reasonable overhead absorption rate** against the **actual absorption rate**

❖ *Alleghany formula*

It is cost based, not time based.

Thus, it does not derive a daily overhead rate but calculates overhead from the rate differential times the base bid cost.

*Again, if **no rate differential** can be demonstrated, then **no HOOH** is owed even if **owner-caused delay is present**.*



Eichleay formula – Potential remedies

❑ Change rules on HOOH recovery

❖ *Adopt Absorption Rate Formula in contract*

Absorption rate formulas calculate under absorption by **comparing** a **potential or reasonable overhead absorption rate** against the **actual absorption rate**

❖ **Carteret formula**

$$\frac{\text{Actual Overhead Rate During Delay Period}}{\text{Normal Overhead Rate}} = \text{Excess Overhead Rate}$$

$$\text{Excess Overhead Rate} \times \frac{\text{Total Cost of Work During Delay Period}}{\text{Home Office Overhead Owed}}$$

کارترت

$$\text{افزایش ضریب بالاسری} = \text{ضریب بالاسری معمولی} - \text{ضریب بالاسری واقعی در بازه‌ی تأخیر}$$

$$\text{بدهی بابت بالاسری دفتر مرکزی} = \text{صورت وضعیت (های) کارهای انجام شده در بازه‌ی تأخیر} \times \text{افزایش ضریب بالاسری}$$



Eichleay formula – Potential remedies

❑ Change rules on HOOH recovery

❖ *Adopt Absorption Rate Formula in contract*

Absorption rate formulas calculate under absorption by **comparing a potential or reasonable overhead absorption rate** against the **actual absorption rate**

❖ **Carteret formula**

*Carteret is a formula that comes out of the **manufacturing sector** but some have **attempted** to apply the formula to construction delay cases.*

Since this is a cost based formula, it does not derive a daily rate.

*The **problem** with this approach is that if **no rate differential** can be shown, then **no HOOH is owed**.*



Eichleay formula – Potential remedies

❑ Change rules on HOOH recovery

❖ *Adopt Absorption Rate Formula in contract*

Absorption rate formulas calculate under absorption by **comparing** a **potential or reasonable overhead absorption rate** against the **actual absorption rate**

*It should be noted that while a number of accountants/auditors have **recommended** this approach, courts understand that these formulas are **more suitable for manufacturing operations** than construction projects since they do **not propose a time-related costs**.*

Practical Problems with Pricing Delay Using Eichleay,
Navigant Consulting Inc.



Eichleay formula – Potential remedies

❑ Change rules on HOOH recovery

❖ *Extended vs. Unabsorbed HOOH rates*

- ✓ **Prevent** recovery of **unabsorbed HOOH** with contract language similar to **AIA A201-1997 ¶8.3.3**
- ✓ But, **allow** recovery of **extended HOOH costs** based on **actual value of additional administrative services** incurred due to delay



Eichleay formula – Potential remedies

☐ Change rules on HOOH recovery

❖ *Use other alternative formulas*

- ✓ Will be talked later



Eichleay formula – Potential remedies

☐ Change rules on HOOH recovery

❖ *Incorporate Federal rules in contract*

- ✓ Delay must be owner caused
- ✓ Of indefinite (unknown) duration
- ✓ Suspending most (%included) of project work
- ✓ Resulting in substantial decrease in monthly project revenue
- ✓ Contractor required to remain on “hot standby”
- ✓ Unable to work around or secure new work



Eichleay formula – Potential remedies

❑ Change rules on HOOH recovery

❖ *Incorporate Federal Acquisition Regulation (FAR) unallowable cost provisions by contract language*

- Some owners do **not object** to the Eichleay Formula but want to **insure** that certain of the contractor's HOOH costs are **disallowed** when calculating their HOOH costs.

- ✓ **Disallows** some specific HOOH costs

- **Require contractor** to produce **audit document** to demonstrate removal of such costs

- ✓ Use **Audit/Access to records clause** to check on compliance



Eichleay formula – Potential remedies

❑ Create Mid-Contract HOOH recovery rule in contract

❖ *Limited Reservation of rights clause*

➤ **Many owners** understand the **value of settling delay claims** as such situations arise.

✓ For owners who want to **settle delay claims** as they occur

1. Include **clause providing** for payment of direct delay costs (i.e., extended equipment and storage, extended FOOH, etc.)
2. Include **reservation of rights language** preserving **contractor's right** to recover **HOOH at end of project**



Eichleay formula – Potential remedies

❑ Create Mid-Contract HOOH recovery rule in contract

❖ *Create a Mid-project formula*

✓ For owners who want to **settle delay claims** as they occur

1. Adopt **one of previous formulas** to use to craft **mid-course delay claims** settlements
2. Reserve **owner's rights** to apply **Eichleay at end of project** and recover **overcompensation paid**, depending upon the **outcome of the final calculation**



Eichleay formula – Potential remedies

☐ Bid your delay

❖ *Time related overhead approach*

- ✓ **One line item in the bid** requires the contractor to fill in their **daily time related cost**.
- ✓ The contractor is **paid monthly** as the project progresses.
- ✓ If **delays arise** during the performance, the delay can be **priced**.
- ✓ If delay **exceeds 149% of the original number of work days** in the contract, the **unit price** can be changed.



Eichleay formula – Potential remedies

☐ Bid your delay

❖ *Include line item in bid for 60 days of owner caused delay*

✓ Bid documents **stipulate** this **total delay cost** (FOOH, HOOH, etc.)

✓ Contractor **fills in daily cost** and **multiplies** by **60**

✓ Still has to be **low bidder** to **receive contract award**

✓ This is **not subject** to **quantity variation clause**

✓ At the end of job:

1. If delay is **less than 60 days**, owner **takes remaining cost back**

2. If **more than 60 days**, owner **pays at bid rate**

The U.S. General Services Administration (GSA) has successfully used the Bid Your Delay Approach to contractually define delay damages, including HOOH damages, to which a contractor is entitled.



Alternative formulas – Modified Eichleay formula – Variation 1

$$\frac{\text{Contract Billings}}{\text{Total Billings for Original Contract Period}} \times \frac{\text{Total Company Overhead During Original Contract Period}}{\text{Period}} = \text{Overhead Allocable to Contract}$$

$$\frac{\text{Allocable Overhead}}{\text{Original Days of Contract Performance}} = \text{Overhead Allocable to Contract/Day}$$

$$\text{Daily Overhead} \times \text{Days of Owner-Caused Delay} = \text{Home Office Overhead Owed}$$

$$\frac{\text{مبلغ نهایی (تجمعی) قرارداد (صورت وضعیت قطعی)}}{\text{کل درآمد شرکت (تمامی صورت وضعیت ها) در مدت اولیه قرارداد}} \times \frac{\text{تمام بالاسری دفتر مرکزی در مدت اولیه قرارداد}}{\text{تخصیص به قرارداد}} = \text{بالاسری قابل}$$

$$\frac{\text{بالاسری قابل تخصیص به قرارداد}}{\text{مدت اولیه اجرای قرارداد}} = \text{نرخ روزانه بالاسری قابل تخصیص به قرارداد}$$

$$\text{میزان بالاسری جذب نشده مورد ادعا} = \text{تعداد روزهای تأخیر ناشی از قصور کارفرما (تأخیرات مجاز)} \times \text{نرخ روزانه بالاسری برای قرارداد چار تأخیر}$$

موسسه مهندسی و مدیریت ساخت علوی پور (ACEMI)

دفتر آموزش



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