




Construction Project Management 



Course 409
APPA Institute
for Facilities Management

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1

INTRODUCTION



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2


AGENDA

- Multiple Choice
- Immediate Take-Away
- Managing Expectations
- Process/Controls
- Terms & Conditions
- Start of Construction

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3

AGENDA



Construction Management


- Schedules
- Schedule of Values
- Submittals
- Payment Applications
- Requests for Information
- Change Order Requests
- Change Orders

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AGENDA

- Budget Forecasting
- Substantial Completion
- Close-out
- Managing Construction Time
- Common Issues During Construction
- Construction Claims
- Improving the Construction Process



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Credit(s) earned on completion of this course will be reported to American Institute of Architects (AIA) Continuing Education Session (CES) for AIA members.

Certificates of Completion for both AIA members and non-AIA members are available upon request.

This course is registered with AIA CES for continuing professional education. As such, it does not include content that may be deemed or construed to be an approval or endorsement by the AIA of any material of construction or any method or manner of handling, using, distributing, or dealing in any material or product.

Questions related to specific materials, methods, and services will be addressed at the conclusion of this presentation.

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COURSE DESCRIPTION

- This session is a complete review of the process of managing a construction project.
- Discuss procedures for construction inspection, change orders, communications, scheduling, payments, and dispute resolution.
- Review the insurance and bonding issues involved in construction contracting.
- Discuss the fundamental project duties and responsibilities of the owner, designer and contractor.
- Review the steps necessary to evaluate and ensure compliance with contract documents, codes and standards.

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7

LEARNING OBJECTIVES

- Review the process of managing construction projects.
- Review the steps necessary to evaluate and ensure contract document compliance with codes and standards.
- Discuss construction inspection, change orders, scheduling payments and dispute resolution.
- Review insurance and bonding issues

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8

IMMEDIATE TAKE-AWAY

“A colleague of mine is currently faced with the following challenge.....”

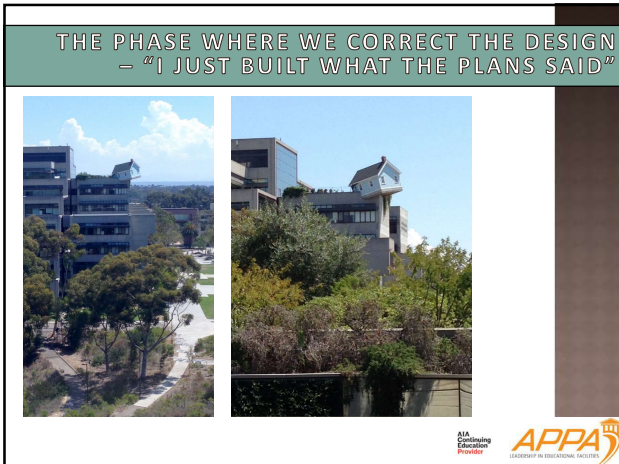


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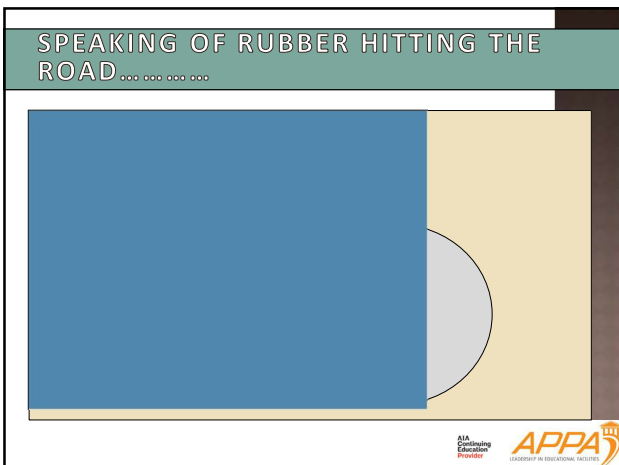
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10



11




12

MULTIPLE CHOICE - #1

Standard contracts for design services and for construction provide mutual and clear definitions of project success.

A) True
B) False



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MULTIPLE CHOICE - #2

The construction contract for a summer renovation project has been signed and awarded to a contractor. The schedule is very aggressive. Two weeks before the scheduled start of construction, the Project Manager learns that the classroom has been vacated a few days earlier than anticipated. The Project Manager wants the contractor to start work earlier.

The Project Manager should:

A) Change the Notice to Proceed
B) Plead with the Contractor to start work early
C) Review with the Contractor and issue a Change Order
D) Advise the Contractor that it is in his best interest to start

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MULTIPLE CHOICE - #3

The CFO for a major college has advised the construction contractor that he can authorize changes in the work. In addition, the architect and the construction manager are also authorized to approve changes.

Is this a good recipe for a successful project?

A) True
B) False

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MULTIPLE CHOICE - #4

As part of the construction contract, a schedule is required from the Contractor within 30 days of the NTP. The project has a very aggressive schedule and the Contractor is working along with his subcontractors. However, the Contractor has not submitted a schedule for the last 2 pay periods (months). The College is withholding payments valued in excess of \$2 million. This is within the contractual rights of the University.

Will this strategy help the project be completed on time?

A) True
B) False

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16

MULTIPLE CHOICE - #5

Construction is underway on a renovation project. The Contract duration is 12 months. As part of the submittal process, the contractor has submitted his finishes (carpet, paint, etc.) for review and approval per plans and specifications. The College has decided that they want to revise the interior standards for all campus buildings and management has directed the Project Manager “not to get back to the Contractor” on this submittal for 3-4 months.

Is this a good strategy for addressing this issue?

A) Yes
B) No

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17



MANAGING EXPECTATIONS OWNER

EXPECTATIONS

- On Time
- Within Budget
- Per Contract

18



MANAGING EXPECTATIONS THE CONTRACTOR

EXPECTATIONS

- Maximize Productivity
- Make Planned Profit
- Enhance Reputation
- Per Plans & Specifications

19



MANAGING EXPECTATIONS DESIGN PROFESSIONAL

EXPECTATIONS

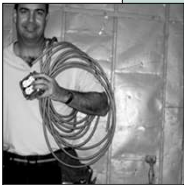

- Owner/Client Satisfaction
- Future Commissions
- Professional Recognition

20

MANAGING EXPECTATIONS

Inherent differences

- Owner
- Contractor
- Design Professional

21

POTENTIAL CONFLICT



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ALIGNMENT

- Partnering
- Common Definition of Success



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MANAGING CONFLICT

⦿ This is what not to do!




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MULTIPLE CHOICE - #1


Standard contracts for design services and for construction provide mutual and clear definitions of project success.

A) True
B) False




25

IS EVERYTHING IN PLACE?



- Notice of Intent
- Certificate of Insurance
 - Owner named as additional insured
- Risk Builder's Insurance in place
- Bonds
 - Payment Bond
 - Performance Bond
- Contract is signed



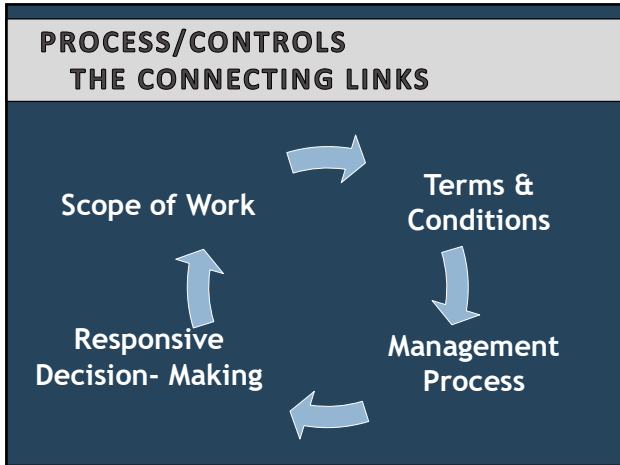
26

OTHER CONSULTANT AGREEMENTS

- Contract(s) in place
 - Materials/Special Inspections
 - Construction Manager
- Identify scheduling requirements
- Document requests for inspection
- Document cancelled inspections
- Back-charge for cancelled re-inspections (if specified)



27



28

PROCESS/CONTROLS

- Read the contract(s)
- Know what is in it
- Document clearly
- Specified controls are part of the contract

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29

TERMS

Examples:

- Requests for Information (RFI)
- Bulletins
- Architect's Supplementary Instruction (ASI)
- Change Proposal Request (CPR)
- Change Proposal Estimate (CPE)
- Change Order Request (COR)

Which terms are the right ones?

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TERMS & CONDITIONS

Defined in the Contracts:


- Design Professional Agreement
- Construction Contract
 - Contract
 - General Conditions
 - Specifications
 - Plans
- Other Consultant Agreements



31

THE START OF THE CONSTRUCTION CONTRACT

- Issuing the Notice to Proceed
- Procedure Meeting
- Pre-construction Meeting
- Contractor's Schedule
- Schedule of Values




32



NOTICE TO PROCEED

Always use a Notice to Proceed

33



NOTICE TO PROCEED

- Specify start date of contract
- Identify date as day one of the contract

34

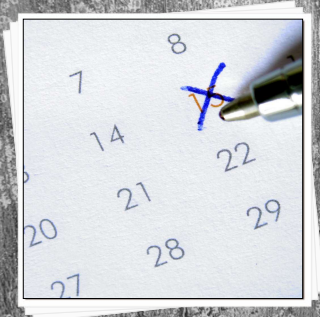


NOTICE TO PROCEED

Specify contract duration in calendar days from:

- Date of Notice to Proceed
- OR*
- Identification of Completion Date

35



NOTICE TO PROCEED

Some Basic Strategies:

- Avoid phased completion dates especially precedent activities
- Notice to Proceed date can be a future date

36

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PROCEDURE MEETING

- **Make sure that the right people attend**
- **May not be the same staff in the field**
 - Staff handling the paperwork
 - Accounting is critical in FEMA-funded projects



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PROCEDURE MEETING

- What is the regular meeting schedule?
- Who attends?
- Who takes meeting notes?
- Who is authorized to approve/direct changes?
- Who maintains logs?
- When are Payment Applications Due?
- How will retention be held?

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39

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A) True
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COMMUNICATIONS

- Protocols and procedures
- Site Visitors
- University Events
- Who is in charge?



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SITE SAFETY

- The General Contractor is solely responsible for site safety
- A Contractor's EMR Rate of 1.0 or lower is a good rate, if it is higher, you should ask questions
- Everyone is responsible for pointing out unsafe conditions if observed
- Everyone is responsible for complying with the Contractor's safety requirements

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42

SITE SAFETY

43

**SITE SAFETY –
WHAT WOULD YOU DO IF...**

The Setting

- The Chancellor announces that he would like to take a tour of active construction sites on campus.
- The Chancellor arrives at your project site that is under construction, and site work is underway.
- He has a group with him.
- One individual is dressed in jeans, and appropriate clothing, but is only wearing tennis shoes(not hard sole shoes).
- The General Contractor’s Project Manager does not say anything as the group begins walking the construction site.

44

**SITE SAFETY –
WHAT WOULD YOU DO IF...**


Part 1

- As the Project Manager for the University, do you say something to the person that is not wearing Personal Protection Equipment?
- If you do say something, what would you say?

45

**SITE SAFETY –
WHAT WOULD YOU DO IF....**



Part 2.....



46


PRECONSTRUCTION MEETING

- Project focused
- Field focused
- Mobilization
- The right attendance:
 - Contractor's field staff
 - Architect/Key Consultants
 - Owner's staff
 - Inspection forces





47

CONTRACTOR'S BASELINE SCHEDULE



- Obtain Contractor's Baseline Schedule per contract requirements
- Loaded
 - Include dates/milestones
 - Staffing/Cost
- Requires Approval
- Absolute necessity





48

CONTRACTOR'S BASELINE SCHEDULE

Remedies:



- Withhold GC's on Payment Application
- Independently prepared schedule

49

POTENTIAL REMEDIES

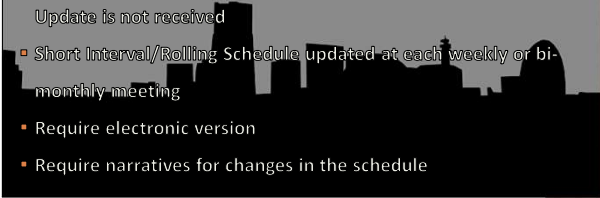

- Withholding a stipulated sum
- Holding subsequent pay applications
- 3rd Party Preparation, Costs to be deducted from Amounts Owed

50

SCHEDULE MANAGEMENT

- Baseline Schedule Updated Monthly with Payment Application
- Withhold General Conditions portion of Payment Application if Update is not received
- Short Interval/Rolling Schedule updated at each weekly or bi-monthly meeting
- Require electronic version
- Require narratives for changes in the schedule



51

MULTIPLE CHOICE - #5

Construction is underway on a renovation project. The Contract duration is 12 months. As part of the submittal process, the contractor has submitted his finishes (carpet, paint, etc.) for review and approval per plans and specifications. The College has decided that they want to revise the interior standards for all campus buildings and management has directed the Project Manager "not to get back to the Contractor" on this submittal for 3-4 months.


Is this a good strategy for addressing this issue?

- A) Yes
- B) No





61

MULTIPLE CHOICE - #6



In most cases, construction change orders can be classified into how many basic categories?

- A) 1
- B) 10
- C) 2
- D) 5






62

MULTIPLE CHOICE - #7

When changes to the base contract start to exceed the following percentage, the Project Manager should start to become concerned about the issue of Cardinal Change.

The percentage is:

- A) 5%
- B) 50%
- C) 10%
- D) 25%




63

MULTIPLE CHOICE - #8

The construction contract clearly states that the contract period is 24 months. The contractor is planning to complete the project in 20 months. Seeing that the building will be vacant for 4 months, the Project Manager is directing a change order to complete Additional work. However, the issue of extended General Conditions is in dispute.

Is the Contractor Entitled to additional costs for extended General Conditions?

- A) Yes
- B) No





64

MULTIPLE CHOICE - #9

The General Contractor is responsible for Scheduling and coordinating the work of The University's IT department and other Contractors hired by the University.

- A) True
- B) False


65

MULTIPLE CHOICE - #10

The General Contractor has been raising concerns about the length of time that it is taking the architect and engineers to respond to RFI's, Submittals and Change Order Requests. The architect's comment in response to the Contractor is that the University is not paying me enough.

The Project Manager should:



- A) Pay the architect additional fees
- B) Take over the architect's responsibilities
- C) Pay the contractor for delays
- D) Demand that the architect perform



66

MANAGING CONSTRUCTION PAYMENT APPLICATIONS

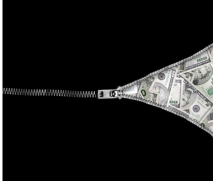

- Set regular cycle for review, once every 30 days
- Based on approved Schedule of Values
- Prepare a DRAFT in the field
- Finalize in the office
- Submitted by the Contractor
- Approved by Architect/Owner

67

MANAGING CONSTRUCTION PAYMENT APPLICATIONS

- Retention
- Typically 10% of Application
- Options
- Held by Owner
- Securities in lieu of Escrow
- As individual trades are completed, retention can be reduced by Change Order
- As project nears completion, retention can be reduced by Change Order






68

MANAGING CONSTRUCTION PAYMENT APPLICATIONS

ADDITIONAL REQUIREMENTS

- Updated construction schedule
- Status of As-built drawings/documentation
- Lien releases and Conditional/Unconditional lien releases






69

SAMPLE PAYMENT APPLICATION

Application is made for payment under the Contract as shown below and in Schedule I attached hereto:

1. ORIGINAL CONTRACT SUM.....	\$5,698,712.00
2. NET CHANGE BY CHANGE ORDERS.....	\$600,183.00
3. CONTRACT SUM TO DATE (Line 1 Line 2).....	\$6,298,875.00
4. TOTAL AMOUNT COMPLETED TO DATE (Column E on Schedule 1).....	\$4,835,312.00
5. RETENTION: 10% of Completed Work (Column H on Schedule 1).....	\$0.00
a. Current Value of Securities Deposited in Escrow	\$0.00
b. Current Value of Retention Deposited in Escrow	\$0.00
c. Retention Held by University.....	\$0.00
Current Retention Value (a + b + c).....	\$0.00
6. TOTAL EARNED LESS RETENTION (Line 4 less Line 5).....	\$4,835,312.00
7. TOTAL AMOUNT PREVIOUSLY PAID.....	\$4,220,502.00
8. CURRENT PAYMENT DUE (Line 6 less Line 7).....	\$614,810.00
9. BALANCE TO FINISH, PLUS RETENTION (Line 3 less Line 6).....	\$1,463,563.00



70

IS THE PROJECT GOING TO BE FINISHED ON TIME?

- Look at Monthly Payment History
- Evaluate how much work can be put in place on a monthly basis
- Look at how many months are remaining on the base contract

Example

- 18-month duration, \$40 million contract value
- 10-months have passed with avg. monthly pay
- Application of \$1.5 million

71

MANAGING CONSTRUCTION REQUESTS FOR INFORMATION



- Typically initiated by the Contractor
- Intended for clarification
- Answered by Design Team
- Always should be in writing
- Responses should be timely
- Cautions
 - Excessive RFI's
 - Changes caused by Responses
- Maintain Log
 - Review weekly





72

CAUSES OF CHANGE ORDERS

Typical Causes of Change Orders:

- Unforeseen/Differing Site Conditions
- Document Problems
- Approval Agency/Inspections
- Owner Scope Changes
- Poor Management



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79

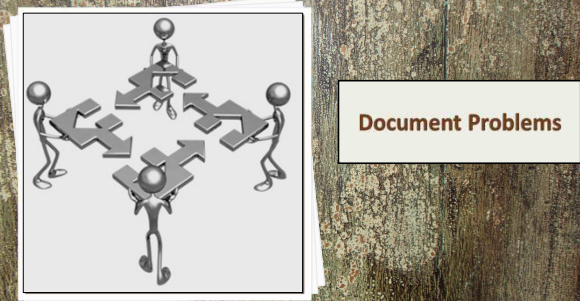
DIFFERING SITE CONDITIONS



▪ Different site conditions *are not* the contractor's responsibility

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80

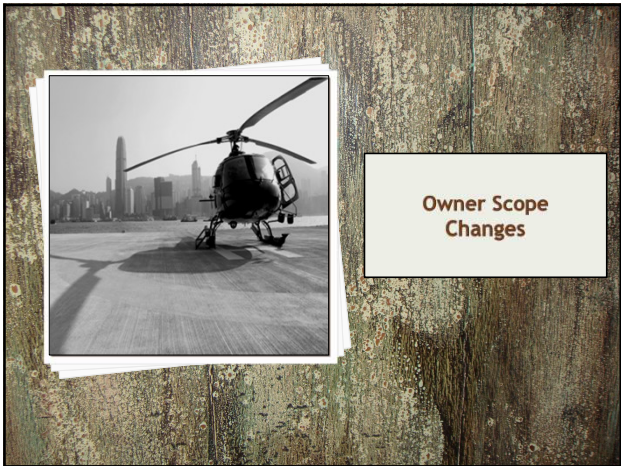


Document Problems

81



82



83

SITE CONDITIONS

Site Condition Video

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The slide features a teal header with the text "SITE CONDITIONS". Below it, the text "Site Condition Video" is displayed. A video frame shows a person in a blue dress standing near a store named "EPANNEUP". The store sign also includes the text "COURTESY OF EMERIE AVENUE" and "HEALTH". In the bottom right corner, there is a logo for "AIA Continuing Education Provider" and "APPA 100 Years of Excellence in Education".

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MULTIPLE CHOICE - #6

In most cases, construction change orders can be classified into how many basic categories?

- A) 1
- B) 10
- C) 2
- D) 5

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85

MANAGING CONSTRUCTION CHANGE ORDERS

Formal change to the contract should include:

- Description of scope
- Actual cost of the work
- Any time extension
- Any extended overhead

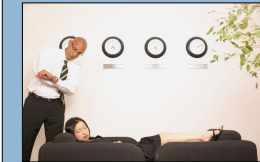
Reservation of Rights should be an exception – not the norm



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MANAGING CONSTRUCTION CHANGE ORDERS




Owner has the right to expect that once the change order is signed, contractor **WILL NOT** come back and request additional time or money.

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87

CHANGE ORDER REQUEST- WHAT WOULD YOU DO IF....

- Construction is underway
- The construction market is very robust
- Construction labor is short and competition for staff is highly competitive
- National policy imposes tariffs on a variety of construction materials specified in plans and specifications
- The Contractor is claiming that subcontractors are facing unknown material costs and product delivery
- What would you do?



88



CARDINAL CHANGE





89

MULTIPLE CHOICE - #7

When changes to the base contract start to exceed the following percentage, the Project Manager should start to become concerned about the issue of Cardinal Change.

The percentage is:

- A) 5%
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- C) 10%
- D) 25%



90

BUDGET FORECASTING


- Critical key to successful project management
- Accounting reports tell what you have and where you have been
- Accounting reports do not tell you where you are going
- Needs to be combined with forecasts of time and money



91

WAG'S


- It is better to anticipate than to be unpleasantly surprised
- Take the number of RFI's, COR's, etc. that have Cost impacts and have been approved to date
- Divide the numbers to obtain an average
- Apply the average to the number of RFI's, COR's, etc. that are open
- Budget for these potential cost impacts



92

SUBSTANTIAL COMPLETION

- Owner's use of the project for its intended purpose, but not all requirements of the contract are complete
- Similar to Beneficial Occupancy
- Document:
 - Specify parts of the project occupied
 - Specify parts of building systems that are taken over
 - Starts warranty period on occupied spaces
 - Responsible for utility costs and maintenance



93

CLOSE OUT


- Commissioning
 - Systems check
 - Start-up
 - Testing and Balancing
- Pre-Punch
- Punch-list
- Contract Requirements
 - As-Builts
 - Warranties
 - Operation and Maintenance Manuals



94

COMMISSIONING


- Commissioning begins during the design phase
- Identify participants
 - Architect/Engineer
 - General Contractor/Subcontractors
 - Commissioning Agent
- Quality Assurance/Quality Control Plan
- Commissioning Plan



95

PUNCH LIST

- Pre-punch Lists
 - Punch list as construction proceeds
- Punch List
 - Specify procedures and participants
 - Architect/engineers
 - Building engineer
 - Facilities staff

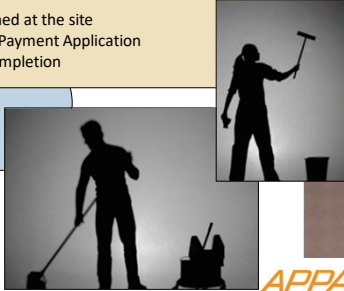



96

AS-BUILTS

Separate line item on Schedule of Values

- **As-builts**
- Continuously maintained at the site
- Reviewed monthly w/Payment Application
- Final documents at completion

97

WARRANTIES

- Procedures
- Call list
- Follow-up




98

OPERATIONS & MAINTENANCE


- Training
- Extra Stock
- Preventive Maintenance
- Operations and Maintenance Manuals




99

FINAL COMPLETION

- File Notice of Completion (NOC) only when:
all aspects of the contract are completed
- Starts statutory time limits on liens
- Absent a filing on NOC, lien limits become longer



100





Managing Construction Time

101

MANAGING CONSTRUCTION TIME

- The meter is running once the Notice to Proceed is issued
- Time is money:
 - During design, time will erode the buying power of your budget
 - During construction, extended general conditions can be substantial

102



TIME EXTENSIONS DUE TO CHANGES

Do not give a time extension unless the affected activity(ies) is on the critical path

Contractor ***MUST*** demonstrate it is entitled to extensions.

Settle time extensions at the time the change order is agreed upon

Contractor ***MUST*** demonstrate it is entitled to extensions.






103

EARLY COMPLETION

WHO OWNS THE FLOAT?


- Contract specifies completion of project on JUNE 30
- The contractor's schedules shows a completion date of JUNE 1
- The owner ***ADDS ONE CHANGE ORDER*** to the contract which delays the contractor one month



104

EARLY COMPLETION

- The contractor completes the project on JUNE 30



- Had it not been for the ***CHANGE ORDER***, the contractor would have completed on JUNE 1

105

EARLY COMPLETION

- A contractor is entitled to the RIGHT OF EARLY COMPLETION provided the following are met:
 - The contractor's intent was to complete early from the beginning
 - The contractor formally advised owner about the early completion
 - Early completion date is reasonable

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MULTIPLE CHOICE - #8

The construction contract clearly states that the contract period is 24 months. The contractor is planning to complete the project in 20 months. Seeing that the building will be vacant for 4 months, the Project Manager is directing in a change order to complete Additional work. However, the issue of extended General Conditions is in dispute.

Is the Contractor Entitled to an add for extended general conditions?

A) Yes
B) No

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SPECIFIC TO A UNIVERSITY

- Missed Expectations
- Coordination of Campus Service Providers
- Conflicts with the Academic Calendar
- Conflicts with University Events
- Conflicts with University Housing Contracts
- Contractor Workforce Parking
- Restoration of Landscape Areas

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SEPARATE CONTRACTORS

The General Contractor is not responsible for coordination of separate contractors



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MULTIPLE CHOICE - #9

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A) True
B) False

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ADMINISTRATION

Owner has obligation to provide sufficient resources to process submittals, drawings, vendor data, samples, and change orders in a timely manner. Failure to do so may result in constructive change.

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112

MANAGING CONSTRUCTION

- Before Starting
 - Board/Trustee/State approvals are obtained
 - All of your paperwork is signed
 - All contracts are in place
 - Procedure Meeting
 - Preconstruction Meeting
- Issue the Notice to Proceed

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MANAGING CONSTRUCTION

- Determine the construction meeting schedule
- Determine who will have the "Power of the Pen"

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MANAGING CONSTRUCTION

- As part of meeting, review:
 - Submittal Log
 - RFI Log
 - COR Log
 - Three-week Rolling Schedule
 - Monthly Schedule Update
 - Monthly Payment Application

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MANAGING CONSTRUCTION

- Some days, managing construction is like being a referee!




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CONSTRUCTION CLAIMS

- Claims are a common part of the construction process.




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GENERAL COUNSEL'S VIEW

- What does the contract say?
- Is the claim time barred?
- What was the approved schedule?
- What did the Owner do to affect the critical path?
- What was the Change Order rate on the project?
- How has the Owner been damaged?
- Who else can we get involved?



121

WHAT HAPPENS IF THERE IS A CLAIM?




- Do not get overly excited
- Notify the administration
- Gather resources
 - Administration
 - Legal Counsel
 - 3rd Party Experts
- Pay close attention to timelines



122


MANAGING CONSTRUCTION

- Determine if there is a entitlement
 - Typically this first starts with the designer of record
 - Make them decide yes or no
- Look for the root cause
- Evaluate time and money components
- Document agreement through a Change Order



123

IMPROVING THE CONSTRUCTION PROCESS




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GENERAL CONTRACT RECOMMENDATIONS

IMPROVE OWNER-CONTRACTOR RELATIONSHIP BY:

Avoiding use of onerous contract conditions



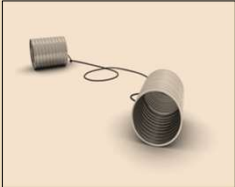
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GENERAL CONTRACT RECOMMENDATIONS

IMPROVE OWNER-CONTRACTOR RELATIONSHIP BY:

Establishing GOOD communication channels.




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GENERAL CONTRACT RECOMMENDATIONS

IMPROVE OWNER-CONTRACTOR RELATIONSHIP BY:

Giving authority to On-Site Managers




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GENERAL CONTRACT RECOMMENDATIONS

IMPROVE CONTRACT EXECUTION BY:

More owner investment in preconstruction studies



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GENERAL CONTRACT RECOMMENDATIONS

IMPROVE CONTRACT EXECUTION BY:

Better defining risk




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GENERAL CONTRACT RECOMMENDATIONS

IMPROVE CONTRACT EXECUTION BY:

- Developing procedures for handling risks
- Independent cost estimates
- Constructability review
- Peer review



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DETERMINANTS OF PROJECT SUCCESS

Project Manager

- Experience
- Total construction experience
- Ability to communicate with all parties
- Some suited to design phase, others to construction phase



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DETERMINANTS OF PROJECT SUCCESS

Project Team

- Team turnover/ players remaining
- Commitment to project




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DETERMINANTS OF PROJECT SUCCESS

Control Systems

- Usable & understandable systems
- Ability to get budget/accounting updates often




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DETERMINANTS OF PROJECT SUCCESS

Planning

- Overall approach to control of project



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WAS THE PROJECT SUCCESSFUL?

Planning

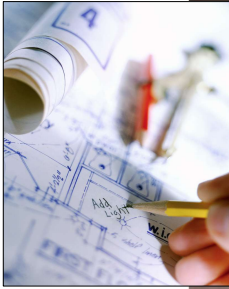
- On time?
- On budget?
- Did all participants agree that the achieved performance outcome was better than expected?

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CASE STUDIES

- **Case Study 1:** The problem with the mechanical system
- **Case Study 2:** Obtaining the schedule
- **Case Study 3:** Responding to the RFI's
- **Case Study 4:** On-Site Teamwork?
- **Case Study 5:** The Run-away Materials Testing Lab Fees
- **Case Study 6:** The Uncooperative Local Utility Company and the Potential for Delays

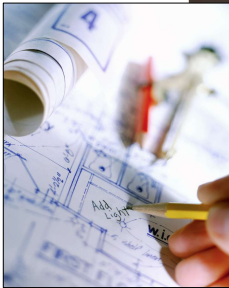


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CASE STUDIES

- **Case Study 7:** Project completion being held up by a subcontractor
- **Case Study 8:** Subcontractors not being paid
- **Case Study 9:** Is the CMAR at risk for everyone?
- **Case Study 10:** What happens when a Design-Build Team makes a bad decision



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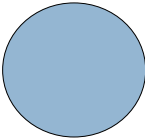
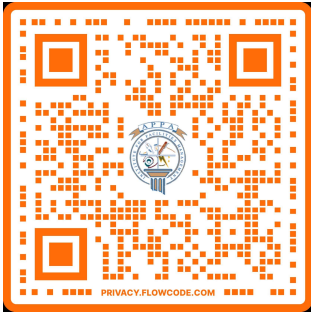
ALMOST FINISHED... ..



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138

FEEDBACK AND REVIEW


139

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140
