APPA Institute for Facilities Management
Construction Project Management – Advanced Placement
Course 409A

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The goal of this session is to tackle real construction problems ranging from evaluating if all insurance and bond are properly in place, obtaining a base line schedule, approving the schedule of values, managing RFI's and change orders and a variety of other construction phase problems and issues. The session will take advantage of the collective wisdom of session participants.

The session is broken down into several sections.

Section 1) Immediate Take Away (Submittal)

Section 2) Multiple Choice

Section 3) Case Studies

Section 4) Immediate Take Away (Group Advice)

The key to the success of this session is group participation. No one has all of the answers. Each one of us though brings a perspective and a set of experiences that can help each other. So say "hi !" to your neighbor, roll up your sleeves, get comfortable and let's get rolling!

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IMMEDIATE TAKE AWAY SUBMITTAL

Name: _____

Description of the Problem/ Issue:
Note: Your problem/ issue statement could start with "I have a friend at a university that has a problem with....."

Advice Requested from the Group:

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MULTIPLE CHOICE

Question 1) _____

Question 2) _____

Question 3) _____

Question 4) _____

Question 5) _____

Question 6) _____

Question 7) _____

Question 8) _____

Question 9) _____

Question 10) _____

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CASE STUDY NUMBER 1

The Problem/ Issue

California University needed to build a new child development center. Being short on funds, they spoke with an architect that had recently completed a similar project at another university, and commissioned the architect to "site adapt" his design for their campus, resulting in a savings on design fees. The design work was completed, the project approved and constructed.

After the university moved in, problems with the mechanical system were immediately noted. There was little air movement, and spaces were always hot. Faculty, staff and students were consistently complaining to the facilities department. Monies were being withheld from the contractor pending resolution of the problem (see attached specification regarding withholding of monies) .

After several months of meetings, the contractor demanded that his retention be released indicating that he had built the project to the plans and specifications. The architect and his mechanical engineer were not able to offer any opinion as to why the mechanical system was not working, and the faculty and staff were becoming more vocal about their work conditions. To date, all efforts at resolving the problem have occurred through weekly meetings.

Develop a strategy to resolve this problem.

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CASE STUDY NUMBER 2

The Problem/ Issue

A contract for construction of a new science building was issued three months ago. On-site work is underway, and there is another 20 months of construction ahead. The university's project manager has requested that the General Contractor submit his baseline schedule in accordance with the contract specifications (attached). The contractor has indicated that he is working on it, but cannot complete it until he has executed all of his subcontracts. Requests for Information (RFI) are accumulating with the General Contractor indicating that late responses to the RFI's are causing delays.

What should the university's project manager do?

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CASE STUDY NUMBER 3

The Problem/ Issue

Construction of fire and life safety (sprinkler and fire alarm) and ADA (accessible student rooms) improvements are underway in an occupied student-housing complex filled with law students. The building is a high-rise structure, built in the 1900's. The university acquired the building approximately 20 years ago from a federal agency. The "as-built" drawings are not accurate and do not reflect all of the changes that have occurred over the past 100 years.

The General Contractor has a team of project engineers on the job generating 10-20 Requests for Information on a daily basis. There are many reasons for the RFI's including undocumented existing conditions, and document problems. The architect is not able to respond in a timely manner. The university's project manager has asked the principal of the firm to add more staff, but nothing is happening. The university's project manager can see the delay claim coming.

What advice can you give the university's project manager?

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CASE STUDY NUMBER 4

Background

California University has the need to add another campus to its system. After 25 years, the State has finally provided funds for the design and construction of a new campus.

Cal U has decided to deliver their new campus utilizing traditional, design-bid-build project delivery. They have hired an architect and a construction management firm to augment campus staff on this project. Potential general contractors were pre-qualified. On bid day, three bids were received, two bids were at $42 million, and the low-bid was at $40 million. The low-bidder was awarded a contract for construction. In addition to the architect and the construction manager, Cal U has also hired additional expertise for the materials and special inspection scope of work and a spearate Inspector-of-Record (IOR). Allof these firms have separate and direct contracts with the University.

The Dynamics

As with many public works-type projects, the relationship between the General Contracytor and the Inspector-of-Record is often strained. This project is no different, with frequent disagreements over sequencing of the work, quality control, scheduling of inspections and many other issues. The General Contraxctor has stated that they have a certain way they work, this is their comeptitive advanatge, and why they were able to save the University $2 million in their bid. The IOR believes that the General Contractor is out to take advanatge of the University and wants to make sure that the "U" gets everything that he believes they are owed according to the plans and specifications.

The Situation

In spite of the dynamics on the project, construction is proceeding and making good progress. Then one day a situation arises. During a safety walk with several subcontractors, Joe (who works for the GC) is discussing fall protection with the trade superintendents. Tom, the IOR happens to be walking by at the time, and remarks, "I wonder what kind of protection Joe is using when he is with Sue" (Sue is the hoist operator for the project and works for the GC). Joe confronts Tom about his comemnts and Tom's glasses are broken. The GC offers to pay for the repairs.

Instead of repairing the glasses, Tom obtains a new set and asks the GC to be reimbursed for the cost. The GC declines, indicating that he agreed to pay for the repairs only. Tom then goes to the police department and files a police report on the scuffle with Joe and obtains a Temporary Restraining Order against Joe. Sue learns about the comments made by Tom through the workers on the job and decides not to come to work the next day, citing a "hostile work environment".

She contacts the General Contractor (her employer) and the business agent for her union. The GC places her on administrative leave pending an investigation into her complaint.

The General Contractor completes their investigation and finds sufficient evidence supporting Sue's concerns. The General Contractor then sends a letter to Cal University demanding disciplinary action against the IOR.

Is there a Problem?

Does Cal Univesity have a problem? If so, what kind of problem? What course of action would you reccmend to the University?

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CASE STUDY NUMBER 5

The University is building a unique new campus. Located on a downtown site, there are no parking lots or fields. The campus will be a 5-story, steel structure with existing buildings around all three sides of the building.

In preparation for construction, the University made sure that all of the Owner's contracts were in place, including that of the special materials and testing laboratory. The testing lab was selected through a formal Request for Qualifications advertisement, evaluation of statements of interest, and an interview. A $500,000 fee was negotiated with the successful firm and a contract was executed. It should be noted that the firm selection and the award of the contract has occurred prior to the bidding of the construction.

As the contractor mobilized on site and prepared his construction schedule, an opportunity developed where the delivery of the structural steel could be accelerated by having two separate steel mills working on the project. The time saved amounted to approximately three months off of the schedule. The mills are located in different states. The University reviewed the opportunity and agreed to accelerate the fabrication and delivery of structural steel. Inspection of welding, etc. was coordinated with the special inspection laboratory.

Halfway through the erection of the structural steel, the testing lab called the university to inform the project manager that they will be using up their fee prior to the completion of the erection of steel and they needed an additional $150,000 to finish the job. If they did not receive an increase to their fee, they may need to pull off of the job.

What advice can you give the University's Project Manager to help him resolve this situation?

What are the lessons learned and how can the University avoid this problem on future projects?

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CASE STUDY NUMBER 6

The Situation

The University is building a new campus. In preparation for construction, the University made sure that they coordinated with the local utility company for electrical and gas service. An application for service was filed with the utility company over a year before the project was put out to bid.

Through regular monitoring with the utility company, intermediate reports were that everything was fine and that there was no problem. After the award of the construction contract and another regular phone call to the utility company, the application was suddenly found to be "missing" and a new application required. Worse yet, engineering had not begun by the utility company and there was no assurance that temporary power (for the tower crane) would be available and no schedule for the installation of permanenent power for the project.

With construction underway, this news was too late. To keep the project moving, the general contractor rented a diesel generator to provide temporary power for the tower crane. Located on a downtown site, the building needs to come up form out of the ground and there were no engineering plans as to where the utility company wanted their vaults. The contractor has had to resequence his work several times, and try to work around the Team's best guess as to where and how utilities will enter the new building.

With a temporary genreator, construction has been able to proceed. As the elevators are being assembled, the elevator subcontractor has scheduled to "bump the motors" to make sure that are in working order and are assembled in the right direction. Further, the elevator sub has raised a concern about the use of temporary power. Given the fluctations caused by a diesel generator, any spike in the variation of power could burn out a control board. There are four elvators with 4 circuit boards each, with a cost of $2,500 to $8,000/ circuit board.

The GC has advised the University of this situation and has advised them that while the risk may be real, the cost of a circuit board is minor, especially when compared to the costs involved in delaying the project. The elvator sub has scheduled to "bump the motors" on Friday. The Owner calls the local power company to see if they have scheduled permanent power for the new campus yet.

The Customer Service representative at the local utilitiy company has assured the Owner that permanenent power is scheduled for next Thursday, one week later.

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The architect and the construction manager have each reviewed the situation on thier own. The architect has discussed the situation with his elevator consultant. The construction manager has talked to other elevator subcontractors, his cost estimators and construction superintendents. A memo has been sent to the Owner indicating that the University should take the risk of "bumping" the motors utilizing temporary power. The cost and time consequences of delays will far exceed the cost to replace a circuit board.

Your Decision

As the University's Owner, it is your decision on how to proceed.

If you approve "bumping" the motors on temporary power, you may take on the risk of replacing a circuit board or controller.

If you do not approve "bumping" the motors on temporary power and direct the GC to wait for permanenent power, you may be delaying the project.

What is your decision? What do you tell the Board of Trustees in either case?

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CASE STUDY NUMBER 7

The Problem/ Issue

California University has been renovating one of its major academic classroom bulding's for over a year. It is now August 1, and classes are scheduled to begin within 30 days. The new, roof mounted air handling units are scheduled to arrive within 5 days and to be installed by the mechanical sub-contractor. If all goes well, the installation of the new mechanical units, commissioning, testing and balancing should be completed in time for classes.

The Project Manager for this project has just received a phone call from the General Contractor. The Mechanical Subcontractor has just indicated that he would like all outstanding Change Order Requests (COR) approved, including those that were rejected by the University a year ago. If they are not approved and processed, he will not work and will not install the mechanical units. The total amount of outstanding COR's for the mechanical Subcontractor is $20,000, and the amount of previously rejected COR's is approximately $250,000. The total value of the construction contract is $10 million.

Classes are starting shortly and the President and the Dean's are expecting to move in and set up for classes. Students are expecting to show up for classes in the newly renovated building. The consequences of not moving in are substantial, and have a domino-affect on the campus. The move must occur and classes must start.

Develop a plan for the Project Manager to move forward with, including the completion of the mechanical system for the newly renovated classroom building.

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CASE STUDY NUMBER 8

The Problem/ Issue

To meet the needs of its geographically dispersed service area, California University is building a satellite campus, many miles away from the main campus. Located in the high desert region of the state, the students being served are spread across a sparsely populated area, and the nearest city has a population of 23,000.

To meet the needs of the campus and to develop a community asset for the area, the University has received funding to build a new Performing Arts Center (PAC). This 500-seat theatre, with dance studios, scene and costume shops, rehearsal rooms and more, will truly be a community venue serving the region.

The estimated construction cost is approximately $16 million. The project is state-funded, and due to the remote geographic area, the project is bid using the standard, public sector procurement of lump sum, low bid.In terms of project size, this is a sizeable project for the region, with very few local contractors capable of bonding and bidding this size of project, and costly for a larger contractor to bid, due to the location, approximately 200 miles from the nearest "larger" city.

The low-bidder is a local general contractor that has performed a considerable amount of public work projects in the region. In addiition. they self-perform a wide array of work.

The University awards the contract for construction and issues a Notice to Proceed.

The pace of construction goes very slowly. On average, only about $200,000 a month of contract value is being put in place. In addition the University's Project Manager is hearing from the major subcontractor's that they are not being paid, however, the subcontractors are not filing any Stop Notices for fear that they would not be able to bid future projects with the General Contractor.

The University's Project Manager brings up that he has heard that subcontractors are not being paid at the weekly Owner-Architect-Contractor (OAC) meetings, and the Contractor shrugs off the comments as just disgruntled subs.

After months of slow progress, and on-going rumors of subcontractors not being paid, but no Stop Notices being filed, the electrical subcontractor finally files a Stop Notice valued in excess of $1 million.

Shortly thereafter, the mechanical subcontractor files a Stop Notice and several other subcontractors .
Within two weeks, Stop Notices in excess of $2.5 million are received by the University from subcontractors.

In accordance with State Law, 125% of the Stop Notice value is to be held until the Stop Notice has been resolved. Based on the Stop Notices received by the University, payments totaling $3.25 million are being withheld. The amount being withheld is such that, the University is not able to make any monthly payments to the Contractor.

The University has contacted the Bonding Company and the Bonding Company has elected not to bond around the Stop Notices. They have asked the University to issue two-party checks, which the University has said no.

Finally, the bonding company has set up a special escrow account in which the University is to deposit monthly payments (based on the progress of the work) into, and a consultant hired by the bonding company will ensure that payments are made to the subcontractors.

In spite of all of this, progress of the work is even slower than before, and subcontractors are reluctant to work on this project.

What should the Project Manager and the University do to get this project back on track?

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CASE STUDY NUMBER 9

The Problem/ Issue

California University is building a new satellite campus. The preferred project delivery strategy is Construction Manager At-Risk (CMAR) due to the University's ability to bring the builder on-board during the design phase. During the design phase, the CMAR is responsible for participating in Owner scoping meetings, surveying the construction market in terms of availabilty of materials and equipment, and performing constructability reviews and cost estimates throughout the design and construction document phases.

Upon completion of construction documents, and the issuance of the building permit, the University authorized the CMAR to proceed with procurement. The CMAR was required to develop a number of bid packages, and to bid each package to a minimum of three bidders. The low bids for each bid package were tabulated, and the CMAR's fee and general conditions bids (in terms of percentages) were added to the total, along with a contingency of 8%.

The entire contract amount - the sum of all bid packages, general conditions, fee and contingency - were submitted to the Board of Trustees for approval. At their regualrly scheduled Board meeting, the contract was approved, and a Notice to Proceed was issued shortly thereafter.

During construction, small issues began to arise with regards to the completeness of the construction drawings. Some of the issues invovled unknown field conditions, and drawing coordination between disciplines. Othe rissues developed regarding lack of adherance to University standards, missing program elements that were discovered by the faculty, as well as missed coordination between the building and FF&E (fixtures, furnitiure and equipment). Soon, the 8% contingency was passed, and additional funding was required from the Trustees.

During the Board meeting a number of questions were raised by individual Trustees about responsibility and accountability for the Change Orders. During this disucussion, the Vice Chancellor procalimed that "the only responsible party is the Construcoitn Manager At-Risk (CMAR). They were on board during the design and construction documents phase, so they should have known if the drawings were incomplete. In addtion, that is what the 8% contingency is for. The architect and the engineers are not responsible."

Several of the Trustees began nodding their heads in agreement with the Vice Chancellor and directed him to began preparing a lawsuit to seek recovery of damages when the project is completed.

Discussion

Do you agree with the Vice Chanclellor's statement that with this project delivery stategy (CMAR) o nly the CMAR is responsbile?

Are the architect and the engineers relieved of their responsibility for their construction documents?

Is the Univeristy relieved of their financial responsibility?

What should the University's Project Manager be doing to address the situation and to prepare for litigation?

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CASE STUDY NUMBER 10

The Problem/ Issue

California University is building a new campus using design-build project delivery. This is thier first design-build project and they want to make sure that they obtain the best value for their capital improvement investment and assembled bridging documents to clearly state what the expecations are for the project.

Several Teams were prequalified to compete for the assignment. Through a points evaluation process, three teams were identified to compete for this contract. These three Teams competed in earnest, and ultimately, one firm was slected based on a combination of points, price, and other criteria such as community outreach.

The successful firm's proposal was taken to the Board of Trsutees for approval. Board approval was obtained, and a Notice to Proceed was issued.

During design confirmation, the Design-Build Team's strucutral engineer recommended a specific strucutral system that could be permitted more quickly, involved fewer tons of steel and would expdite the proect schedule. From the Owner's perspective, as long as the structural system met all code requirments and a permmit could be obtained, the final decision rested on the shoudlers of the D esign-Build Team. Seeing no objections from the Owner, the Design-Build Team approved their structural engineer's reccomendation and proceeded.

Unfortunately, the strucutral engineer's claim did not materialize. Insetad of an expdited permit review, the actual review time took twice as long - six months instead of three. The steel fabricator was challenged in producing the required shapes and sizes in the drawings and the erector had difficulty in scheduling his crew due to the delay. In additn, all of the other trades started to fall be hind as the building shell was delayed.

The steel fabricator and erector submitted a request for addtional services in the amount of $1 million. Other subcontractors were also being affected financially. However, it is clear that the responsibility is that of the Design-Build Team. Due to the magnitude of the financial impacts, subcontactors are rumored to not being paid, some are not dispatching workers to the jobsite, and hints are being made that Stop Notices may be filed soon.

The new campus is in an underserved community, and there is tremondous political pressure to make sure that this project is completed on time.

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Discussion

Given the dynamics of ths project, what should the Univiersity's Project Manager be doing to make sure that the project is completed on time?

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