

Qualitative analysis: The construction site visit



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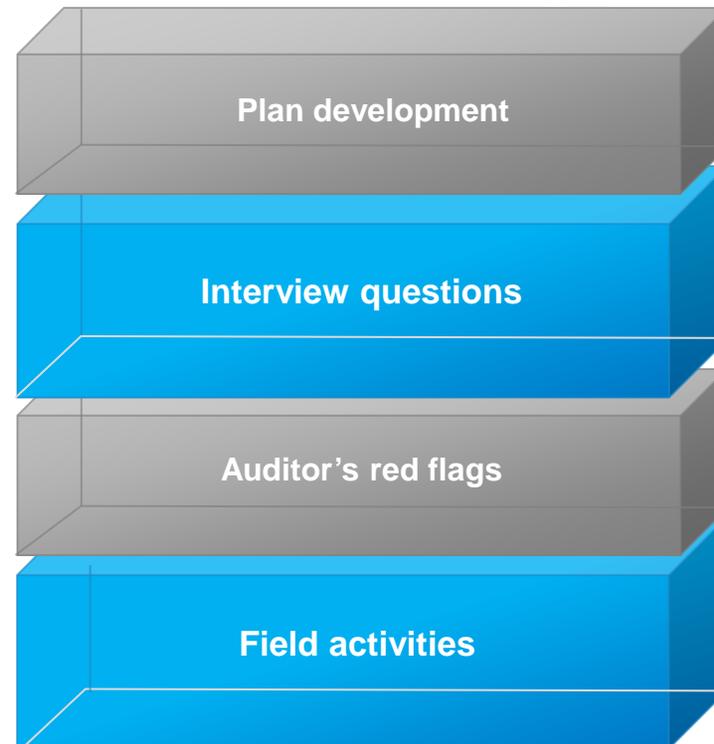




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Today's topics



Learning objectives



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- > Define the benefits of a job site tour
- > Writing the job site audit plan
- > Recognizing and mitigating job site risk
- > Job site audit red flags
- > Monitoring versus auditing

Facts

- > Interim audit procedures successfully reconciled equipment rental charges
- > Equipment rental charges are on budget
- > Hoisting (cranes) budget is GMP style billing
- > GMP contract has liquidated damages
- > Contractor hoisting plan calls for a second tower crane for peak construction months

Job site audit facts

- > Tower crane operating logs show both cranes had run time
- > Operator time sheets reconciled to the equipment logs
- > Tower cranes were visually confirmed
- > Construction schedule is 40 days behind due to weather constraints and design issues

What are the red flags?

- > Crane expenditures are ahead of progress
- > Only one crane was operating during job site tour
- > PM interview documented that the two cranes had not been used simultaneously

Audit findings

- > Only one crane operator was ever on site
- > Cranes were only being utilized 50% of the time
- > Two tower cranes were budgeted to minimize liquidated damages risk due to crane failure

Audit adjustment

- > Crane number two was rebilled using standby rates resulting in a \$390,000 credit

Tangible Benefits

- > Verify construction progress
- > Assess project controls
- > Observe the construction environment
- > Verify physical existence of resources
 - Headcount
 - Construction materials

Intangible benefits

- > Build rapport with the construction manager
- > Build credibility with the construction management team
- > Send a message to the field

Job site tour triggers



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- > Overbillings exceed 20%
- > Project documentation is frequently missing or delayed
- > Construction management team changes
- > Facility development team changes
- > Reported progress
 - 30%
 - 75%

Important project milestones

- > Substantial completion
- > Commissioning
- > Major weather event
- > Bonus triggers
- > Retainage release
- > Installation of major piece of equipment
 - MRI system
 - Steam or wind turbine
 - Process, pipe and control system
- > Because you just want to know how construction is going!

Preparation is the key to a successful visit

Job site visit planning



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- > Job site audit plan development
- > Scheduling
- > On site activities
- > Follow up activities
- > Interpreting and acting on your observations

Identify risk areas

- > Progress reporting
- > Equipment utilization
- > Materials management
- > Safety management
- > Job trailer management
- > Records management
- > Site security
- > Project controls

Progress reporting

Auditor's objective

- > Ensure actual progress and reported progress are reasonably close

Auditor's interview questions

- > Is this a lean construction project?
- > Is the project on time and on budget?
- > What challenges have you had with staying on schedule?
- > Has the job required overtime to stay on schedule?
- > What is the nature of change orders and RFI's to date?
- > Have there been any labor shortages?
- > Have there been any construction material delivery delays?
- > Has the architect provided drawing and information on a timely basis?

Progress reporting

Auditor's red flags and field activities

- > Construction schedule does not reconcile to reported progress
- > Count the number of floors and compare the total with the planned total.
- > Take photos of the site to document your observations
- > Completed divisions for work still have contractors on site

Facts

- > Project kicked off on time
- > CM had a lump sum general conditions budget
- > Design issues delayed bid packages by 10 months
- > CM billed 35% of general conditions budget while reporting only 10% complete
- > CM issued a general conditions change order for an additional 10 months of fees

Site visit observations

- > Job trailer did not have the full compliment of staff
- > Computers and office equipment had not been installed
- > Only one of two trailers had been mobilized

Outcome

Change order was adjusted down to compensate the CM for costs incurred to date

Equipment utilization and management

Auditor's objective

- > Ensure equipment rental costs are minimized

Auditor's interview questions

- > Where is equipment parked when not in use?
- > Have there been any delays caused by equipment breakdowns?
- > What do you do to recover lost production days due to equipment breakdowns?
- > How do you differentiate repair bills from maintenance bills. And which of these are the responsibility of the rental agency?

Equipment utilization and management

Auditor's red flags and field activities

- > Physically inventory “big” pieces of equipment
 - Cranes, trailers, earthmoving equipment
 - If it looks expensive, ask about it
 - » What is it
 - » How is it used
 - » It is used often
 - » Who owns it
- > Does it look like it has been recently used?
 - Indicators of unused equipment are: dried mud on tracks and parked well away from the job site

Equipment utilization

Back at the office

- > Request equipment operating logs
- > Request equipment operator time sheets
- > Reconcile physical inventory to equipment rental billings and document variances
- > Reconcile logs and time sheets to equipment rental billings and document variances

Materials management

Auditor's objectives

- > Evaluate material receiving and fulfillment controls
- > Observe materials received

Auditor's interview questions

- > How are received materials verified for specification and quantity?
- > If a shipment is incorrect how is the mistake fixed?
- > What purchasing, receiving and shipping records are maintained?
- > How are materials issued and tracked?
- > How are excess materials returned and credited?
- > Have there been any problems with theft?
- > Will attic stock be purchased for this job?

Materials management

Auditor's red flags and field activities

- > Tour the layout yard. This should be a secure area for receiving, storing, and fulfilling construction materials at the job site
- > Look for organization, a sloppy laydown yard may result in lost materials and inefficient fulfillment
- > Observe quantities on hand and installed. Do they look right for the purchase orders processed?
- > Look for dedicated waste bin/dumpsters for recycled materials
- > Pay special attention to the handling of portable commodities:
 - Light fixtures
 - Plumbing fixtures
 - Bulk copper: wire or tubing

Materials management

Special circumstances

- > Major facility equipment
 - Chillers
 - Elevators
- > Prefabricated equipment and components
- > Long lead time items
- > Engineer to order items

Facts

- > Materials are purchased and paid for directly by the owner
- > Documentation is incomplete
 - Invoices missing
 - No receiving tickets
- > Materials are being drop shipped subcontractors bypassing the job site
- > There is little room on the job site to store materials

Site tour observations

- > CM has no procedures or documentation verifying receipt of drop shipped materials
- > There is unused flooring materials the subcontractor's job trailer
 - The material is in sound condition still in the package
 - The subcontractor says this will shipped back to their shop and used on another job

Outcomes

- > CM implemented procedures verifying installation of all materials stored off site
- > Subs are required to submit photos of materials stored off site
- > Subcontractors document off site materials receipt and delivery
 - Packing slips and bill of lading for materials received at the shop
 - Delivery logs for materials shipped from the shop to the jobsite
- > CM works with subcontractors to coordinate returns on any excess materials for vendor credit to the owner

Safety management

Auditor's objective

- > Confirm there is a safety program
- > Obtain reasonable assurance that it is functioning as intended

Auditor's interview questions

- > Is there a site safety program?
- > How is the program communicated to field personnel?
- > What kinds of activities help ensure a safe job site?

Safety management

Auditor's red flags and field activities

- > Are you given a safety briefing before walking the job site
- > Are you given a hardhat and safety glasses to wear
- > Are field crews
 - Wearing hardhats
 - Wearing safety vests
 - Using safety lanyards
- > Do you see tools haphazardly left where they were last used?
- > Has the site been charged with any safety violations?

Facts

- > CM had a substantial budget for site clean up
 - Equivalent of three FTE during the project
- > Bid packages required the subcontractors to clean and maintain the site
- > Project was a planned gold LEED designation

Site tour observations

- > Job site was generally unorganized
- > Debris was piled throughout the site
- > Dumpsters were overloaded
- > Subcontractors with lump sum contracts were being charged back for clean up services
- > No designated recycling dumpsters
- > Break areas, parking lots and job trailers were littered with cigarette butts

Outcomes

- > Subcontractor chargebacks were recovered as owner credits
- > Clean up budget was converted from general requirements to an owner controlled allowance.
- > Owner established a Friday afternoon clean up period and held the CM accountable for enforcing the subcontract terms
- > A mandatory safety meeting was held to communicate the non-smoking policy of the institution

Job site cleanliness

Auditor's objective

- > Verify who is performing the clean up activities
- > Confirm site conditions
- > Confirm recycled materials management
- > Ensure that clean up services are not double billed
- > Confirm site clean up is performed as required in the contract

Auditor's interview questions

- > How frequently is the site cleaned and organized?
- > What activities are leveraged to subcontractors?
- > Are dedicated clean up staff hired?

Job site cleanliness

Auditor's red flags and field activities

- > Overflowing dumpsters and piles of debris scattered throughout the job site
- > Finished areas are soiled with mud, plaster, paint or other dirt easily cleaned
- > Clean up questions are answered with
 - It's pointless to do that right now, it will only get dirty again
 - We have clean up later in the schedule
 - It's the subs responsibility, we need to get after them for that
- > Flat surfaces do not appear to have been swept recently

Site security

Auditor's objective

- > Verify construction site is reasonably secure and safe from theft and damage
- > Ensure that unauthorized personnel are not on the site

Auditor's interview questions

- > Has the site had any unauthorized visitors and how were they dealt with?
- > What steps have been taken to secure the job site?
- > What is the site work hours and after hours policy?
- > Are personnel required to sign in when they enter the job site?

Site security

Auditor's red flags and field activities

- > Is the site fenced with controlled access points?
- > Are security guards posted at the site?
- > Do storage areas and sheds have locks and chains to secure access?

Job trailer management

Auditor's objectives

- > Confirm on site personnel
- > Confirm on site office equipment

Auditor's interview questions

- > Who has access to the job trailer?
- > Is the job trailer shared with the architect?
- > Are all project records maintained at the trailer or back at the office?
- > Who has assigned desks and offices in the trailer?

Job trailer management

Auditor's red flags and field activities

- > Administrative personnel are not at their desks
- > Too few file cabinets for the job site records
- > Too few desks for assigned personnel
- > Construction schedule is not posted
- > No obvious staff tracking tool. Look for an "In/Out whiteboard"
- > Staff tracking tool has fewer personnel than pay application documentation
- > Office equipment doesn't match general conditions billing
- > Office services do not match general conditions billing
 - Phones, fax, internet, bottled water
 - No utility meter on the job trailer

Records management

Auditor's objectives

- > Ensure good record keeping
- > Verify record accessibility

Auditor's interview questions

- > How often is the schedule updated?
- > Are the subcontractors pay applications submitted timely
- > Are the subcontractors being paid timely, and are any subcontractor payments being withheld?
- > Any supplier payments being withheld?
- > What divisions of work are complete?

Records management

Auditor's red flags and field activities

- > Lack of a filing system
- > Payments in arrears to supplier and subcontractors
- > No file cabinets for records
- > Appearance of records chaos
- > Inability to produce receiving logs, security logs or safety logs
- > Request copies of
 - site sign in sheets
 - Safety training logs
 - Superintendents diary
 - Plan of the week meeting minutes, agenda or other meeting documentation

Who should you meet with?

- > Project manager
- > Assistant project manager
- > Superintendent
- > Project accountant

Documents to review prior to your visit

- > Pay applications
- > Invoices for any materials purchased directly by the owner
- > Change orders
- > Project status updates

Pay applications

- > Project completion percentage
- > Tasks that are 100% complete
- > Divisions lagging behind construction progress

Owner direct purchases

- > Large items such as air handlers
- > Commodity items like copper and sheet metal

Change orders

- > Change or unforeseen site conditions
- > Owner changes
- > Architectural changes

Project status updates

- > Review project progress through photo library
- > Review contractor's monthly status report to owner
- > Milestones completed
- > Upcoming milestones

Set the stage with a kickoff meeting

- > Planned at or near the completion of bid documents
- > Set the expectation that job site tours will occur regularly
- > Explain the objectives of the site visit
- > Ask what days during the week are better than others and why

First job site tour of the project

- > Ask to sit in the plan of the week meeting.
- > Schedule job site tour the day after the plan of the week meeting

Second and subsequent job site tours

- > Pick a day when materials are schedule to be delivered
- > As a courtesy avoid Mondays. These are the busiest day at the job site and while often informative the project manager will not have time to adequately answer questions.
- > Remember to build rapport with the project manager. Work with them to schedule site tours in hopes of maximizing contractor cooperation.

If you have resources, plan to attend monthly dashboard meetings and draw meetings.

- > Visibility is a powerful monitoring tool
- > Knowing how the monthly invoice is compiled may offer insights into problems with suppliers and subcontractors
- > These meetings offer firsthand knowledge to the schedule and actual progress.

Control interviews should be conducted with

Construction manager and their personnel

Mechanical subcontractor(s)

Design assist professionals

- > Architects
- > Mechanical contractor
- > Electrical contractor
- > Plumbing contractor
- > Other significant specialty contractors

Topics to be covered during the interviews

- > Materials directly billed to the owner but delivered to the subcontractor
- > Cost tracking of fabricated and engineer to order components
- > Tracking and reconciling saved and stored inventory
- > Open communication with architect and design professionals

Subcontractor interview

In addition to the above topics

- > Timely payment by prime contractor
- > Timely processing of change orders

Facts

- > GMP project
- > Lump sum subcontractor bids
- > Schedule has slipped 45 days
- > CM is inexperienced with this type of facility

Interview observations

- > CM is 90 days behind paying subcontractors
- > CM has short paid subcontractor on change orders
- > CM has been paid less retainage every 40 days
- > Subcontractor is at risk to walk off the job
- > Subcontractor is threatening claims against the owner and CM
- > CM claims that the subcontractor is underperforming

Outcome

- > Auditor initiates an immediate A/P audit of the CM
- > The CM is in arrears with multiple suppliers and subcontractors.
- > Owner initiates meetings with CM and each major subcontractor and supplier
- > Payment terms are negotiated
- > Owner is now monitoring CM's A/P payments monthly
- > Loss of subcontractor and potential schedule delays are mitigated

Supplier interviews

- > Purchase orders delivered with adequate delivery lead time
- > What are the charges for expedited materials?
- > What is the policy for returning unused stock
 - Restocking charges
 - Issuing credits
- > Does the supplier have a volume or incentive program for its contractors?

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