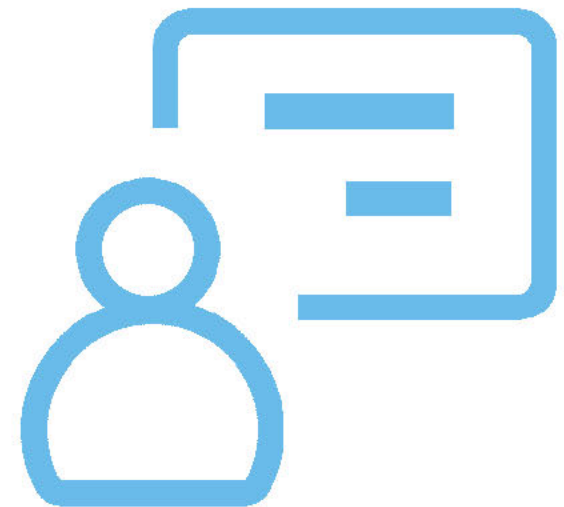




Construction project audit basics

Part 1 – Developing an audit program

- > Established in 1931
- > One of the top 15 largest accounting and advisory firms in the United States according to *Accounting Today's* 2015 list of "Top 100 Firms"
- > More than 2,500 professionals
- > Baker Tilly Virchow Krause, LLP is the largest US Baker Tilly International independent member firm
- > Baker Tilly International is the eighth largest public accounting network with representation in more than 141 countries
- > Convenient, seamless resource for worldwide needs



From **concept** and **funding** to **controls** and **compliance**, Baker Tilly has more than 300 dedicated construction and real estate industry professionals to assist with your facility development project through all stages of the development lifecycle.



Today's topics:

Why do a construction audit?

What is an audit program?

Industry terms

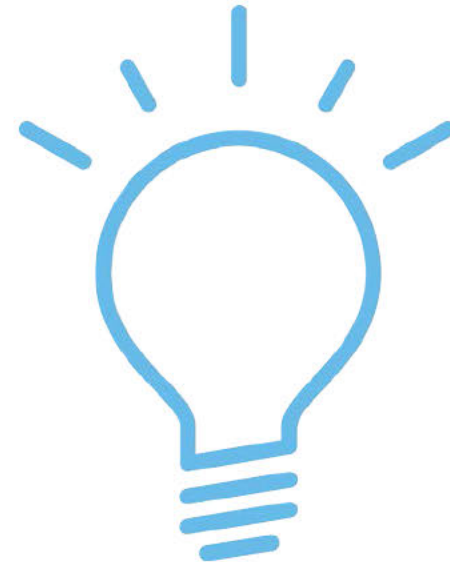
Audit program content

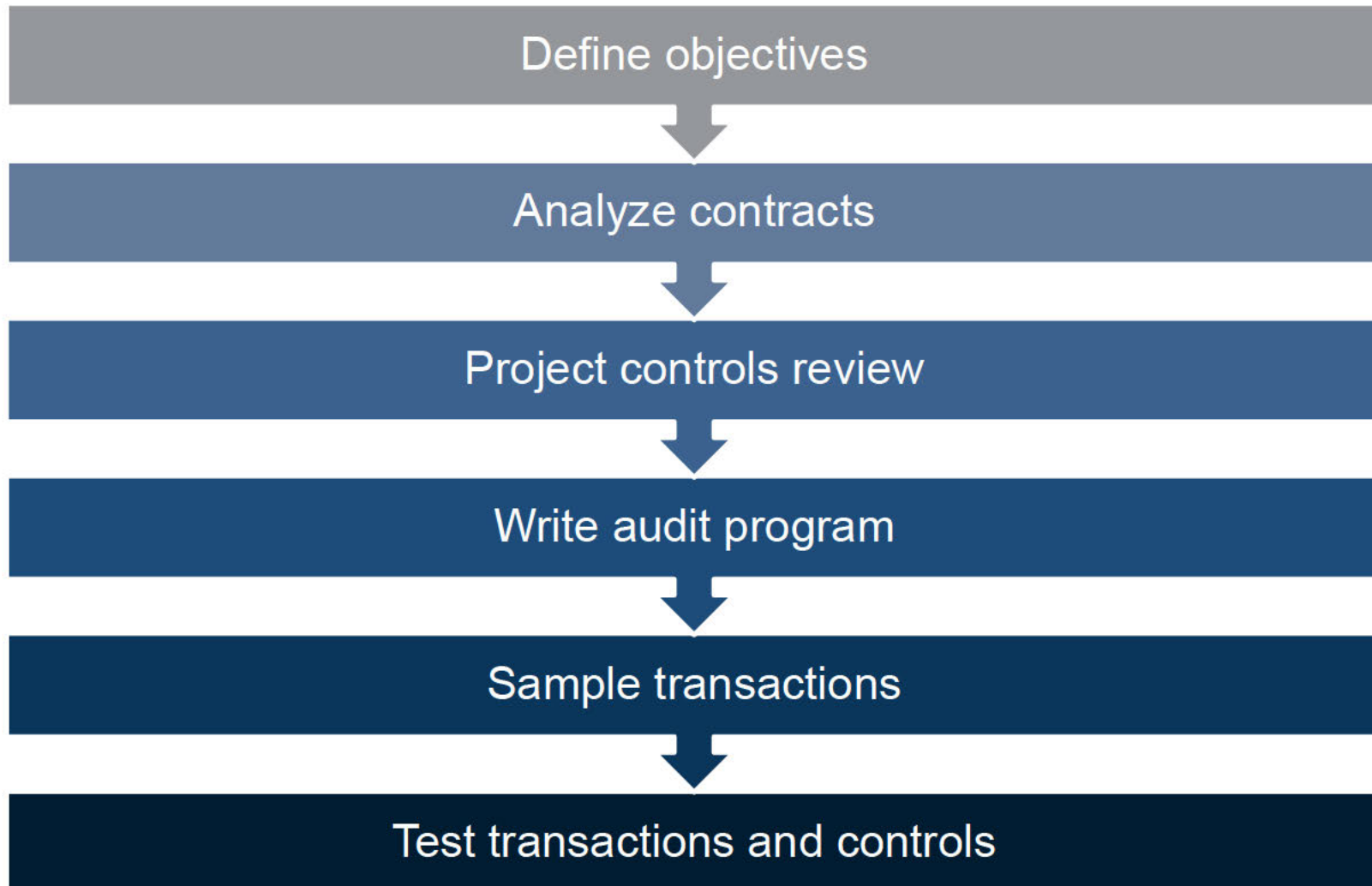
Learning objectives



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- > Evaluate construction projects for financial risk
- > Define construction project audit objectives
- > Write a construction audit program
- > Select sample sizes for testing





Defining project objectives



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Otherwise known as “Why do a construction audit?”

The most commonly stated reason is *minimize project construction costs*.

However there are more organizational benefits than just project recoveries

Defining project objectives



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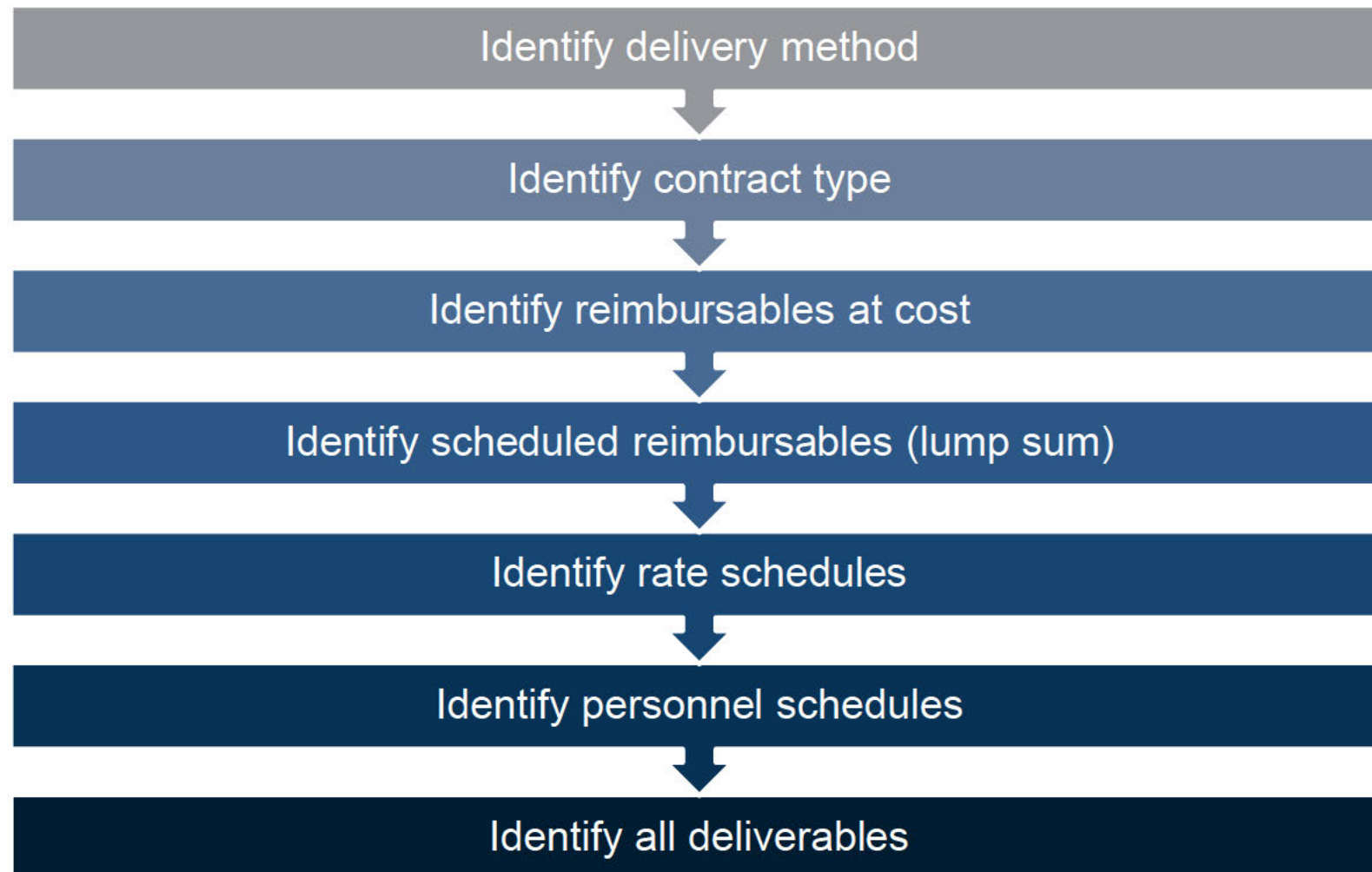
- > Identify project control improvement opportunities
- > Enhance and standardize construction contracts
- > Identify construction project financial risk
- > Prevent abusive and/or aggressive billing practices
- > Provide stakeholder assurance that project capital has been responsibly spent
- > Mitigate construction contract compliance issues
- > And identify construction cost recovery opportunities

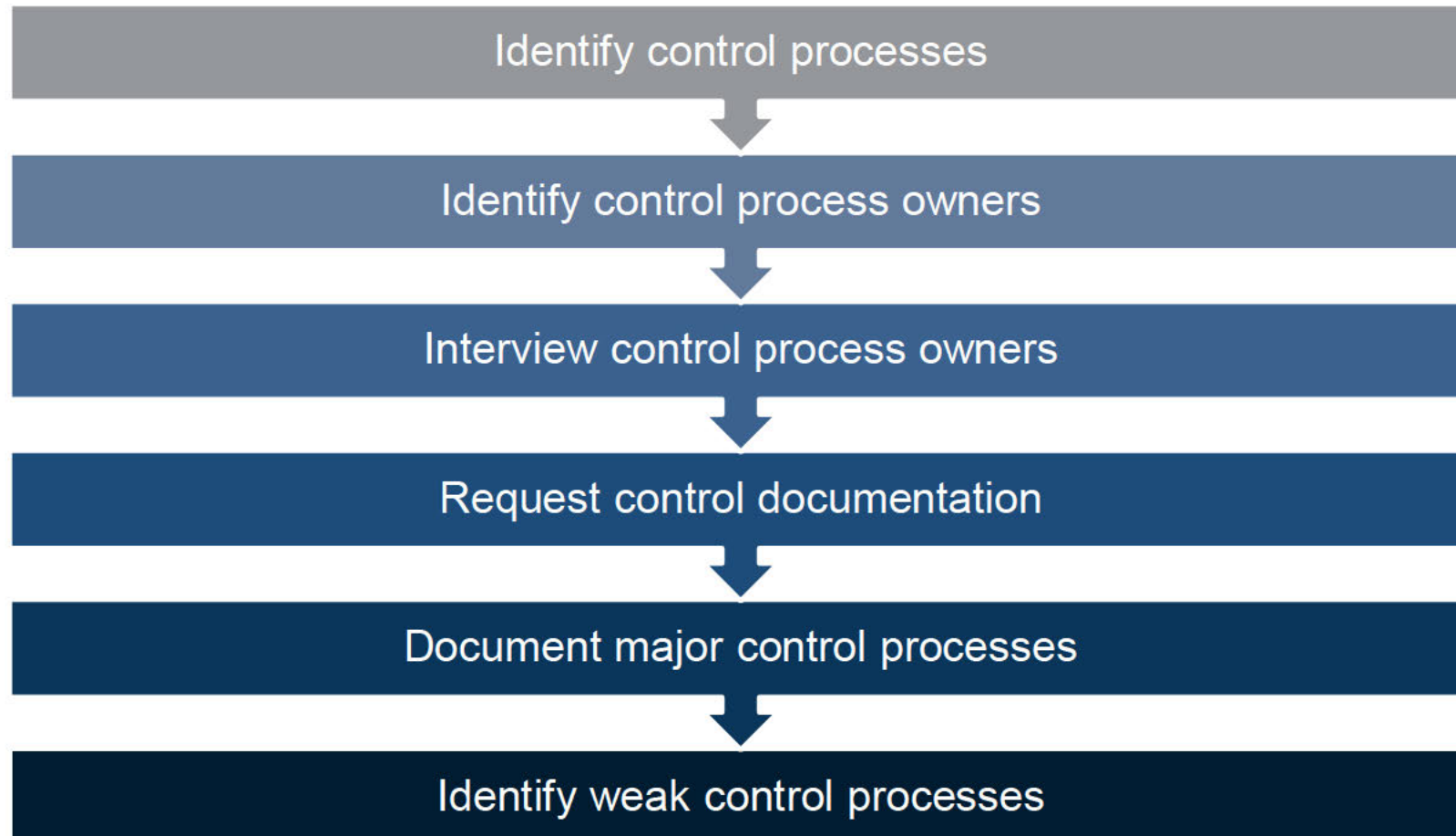
Delivery methods

- > Design – Bid – Build
- > Design – Build
- > Design assist
- > Integrated project delivery (IPD)

Contract types

- > Stipulated sum or lump sum
- > Guaranteed Maximum Price (GMP)
- > Unit Price
- > Engineer – Procure – Construct



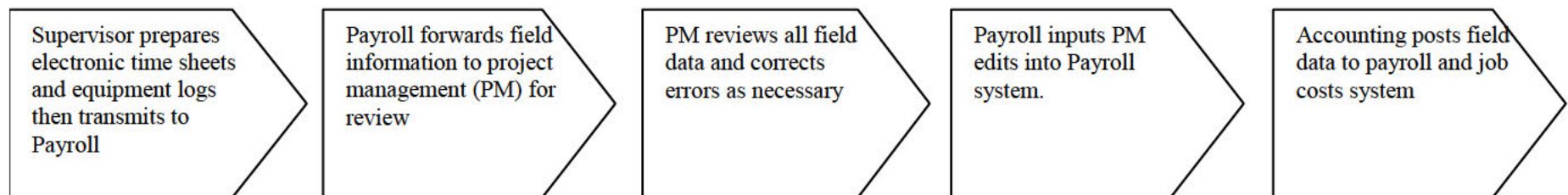


www.bakertilly.com/insights/owners-project-controls-review

High-Level Description of Process

The Payroll and Billing Department primary responsibilities are:

1. Collecting data from the field and preparing it for posting to the time and billing system
2. Verifying the accuracy of the field information
3. Researching and correcting data errors prior to posting
4. Maintaining the billing tables used to calculate customer invoices. Billing tables include but are not limited to: labor rate table, equipment rate table, and cost codes tables.
5. Producing customer invoices with supporting documentation



Potential Risks

- Invoices are being incorrectly calculated and overbilled
- Timesheets and equipment logs are not reviewed and controls are circumvented
- Labor and equipment hours are inflated resulting in overcharging

Key terms



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- > Direct costs
- > Hard costs
- > Owner direct purchases
- > Direct labor
- > Direct materials
- > Construction equipment
- > Plans and specifications
- > Material credits
- > Recycling credits
- > Project buyout
- > Aggregate
- > Self-performed
- > Prevailing wage
- > Certified payroll
- > Material substitution

Cost types

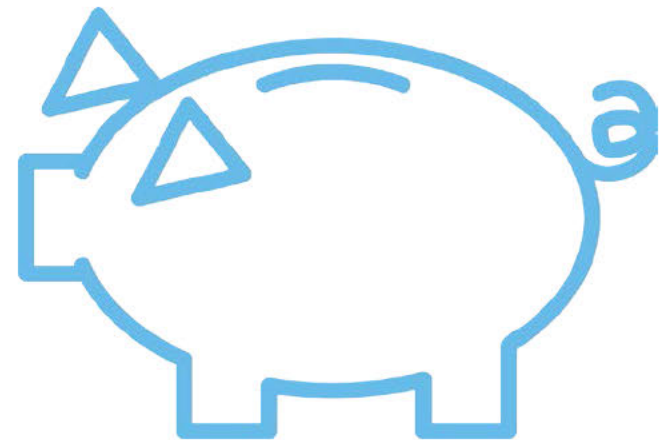
- > Soft costs are the indirect costs associated with the construction project, such as:
 - General conditions
 - Construction management fee
 - Insurance and bonding
- > Hard costs are the direct costs for constructing the facility.
CSI divisions 2-16
 - Materials, supplies and equipment
 - Subcontractor costs
 - Self-performed construction costs

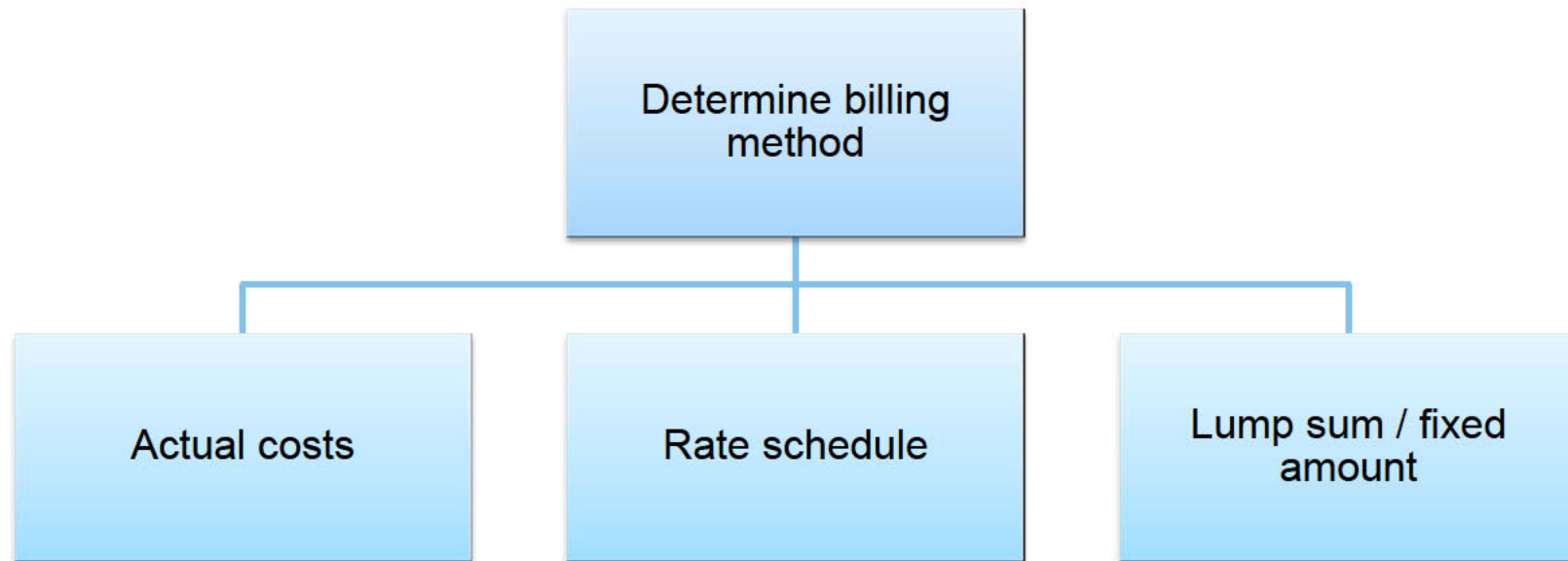
Hard cost decomposition



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- > Direct labor
- > Direct materials
- > Building equipment
- > Construction equipment





Source Documents

- > Contract
- > Original schedule of values
- > Current schedule of values
- > Pay application
- > Schedule of authorized employees
- > Employee time sheets
- > Certified payroll
- > I-9 forms
- > Safety certifications and licenses
- > Job site sign in sheets
- > Collective bargaining agreement
- > Contractor's job cost detail
- > Billing and payroll process documentation

Test Program

ID	Process Control Interview
1	Hiring and termination process
2	New employee set up
3	New employee orientation
4	Employee health and safety program
5	Time and billing entry

Findings	Concerns	Actions
Superintendents are authorized to hire day laborers	Ghost employees are hired in the field and supported with falsified time sheets	Determine materiality, if cost exceed materiality deny payment for employees not processed and approved by HR
Superintendents prepare field time sheets	None, if project managers review time and approve it for billing	
Billing processes are manual	High probability of arithmetic errors in all project reporting	Assume all source documents are unverified and footings are unreliable. Test a high percentage of calculations.

Test Program

ID	Employee and Hours Testing
1	Verify employees
2	Prepare employee time sheet schedule
3	Reconcile time sheets with I-9 forms
4	Reconcile employee time sheets with certified payroll
5	Reconcile job trailer sign in sheet with employee time sheets
6	Reconcile safety training log with employee time sheets
7	Reconcile authorized employee schedule with employee time sheets
8	Verify labor hours
9	Overtime hours
10	Verify all employees charging over 40 hours per week are non-exempt
11	Verify no single employee has been given overtime preference
12	Verify overtime wasn't incurred to meet financial milestones
13	Verify overtime incurred wasn't due to poor labor management
14	Premium time hours
15	Reconcile premium occurrence dates with field journals and reports
16	Straight time hours
17	Reconcile total certified payroll hours with total time sheet hours

Direct labor – actual costs



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Direct Labor Control Schedule

Date	Work order	Name	Class	Unit	Worked hrs.	ST hrs.	OT hrs.	DT hrs.	ST rate	OT rate	DT rate	ST labor	OT labor	DT labor	Total
2/27/2011	66662	Aaron	0	2150	33.5	0	31.5	2	\$79.05	110.878	142.702	-	\$3,492.66	\$285.40	\$3,778.06
3/13/2011	66662	Aaron	160J0	2150	34	20	14	-	\$79.05	110.878	142.702	\$1,581.08	\$1,552.29	-	\$3,133.37
4/3/2011	6662	Aaron	106J0	2150	12	10	20	-	\$79.05	110.878	142.702	\$790.54	\$221.76	-	\$1,012.30

Findings	Concerns	Actions
Day laborers are paid out of petty cash	Ghost employees may be in the DL cost	Deny payment as an unsupported cost
Exempt employees charged in excess of 40 hours per week	No cost incurred over 40, owner has been overcharged	Request credit for excess DL charge
Overtime is charged by the same few people and always just a few hours per week	OT is unnecessary and collusion has occurred	Request cost justification for OT. Was OT owner approved
OT spikes every month end or project milestones	Project is mismanaged and is using OT to catch up before progress reporting to owner	Implement owner approved use of OT. Review project schedule to determine days ahead or behind to justify OT.
Certified payroll has fewer hours than DL cost	Owner is charged for DL not paid to employee	Request credit for overcharge. Fraud indicator requiring executive oversight

Test Program

ID	Labor Rate Testing
1	Verify labor rates
2	Prepare a schedule of labor rates by employee classification
3	Sample test gross certified payroll calculation
4	Reconcile schedule of labor rates with certified payroll
5	Verify labor burden rates
6	Verify direct labor charges
7	Sum raw labor costs
8	Sum labor burden costs
9	Sum benefit hours
10	Reconcile calculated labor costs with actual labor charges
11	Reconcile benefit hours charges with benefit hours labor burden
12	Report all variances
13	Billing rate analysis
14	Decompose labor rate into raw labor and burden
15	Measure burden against known metrics
16	Report any embedded billing rate profit margin

Union Rate Schedule

ATTACHMENT 'N' (STRAIGHT TIME)

IBEW LOCAL 2150 - WISCONSIN
RATES EFFECTIVE 6/1/2009 thru 5/31/2010

		GENERAL FOREMAN	CREW FOREMAN	JOURNEYMAN LINEMAN	HEAVY EQUIPMENT OPERA	EQUIPMENT OPERATOR / M	OPERATOR TRAINEE II	OPERATOR TRAINEE I	HEAVY GROUNDMAN DRIVE	LIGHT GROUNDMAN DRIVE	GROUNDMAN	7TH STEP APPRENTICE	6TH STEP APPRENTICE	5TH STEP APPRENTICE	4TH STEP APPRENTICE	3RD STEP APPRENTICE	2ND STEP APPRENTICE	1ST STEP APPRENTICE
BASE WAGE ST		40.55	37.90	35.26	31.73	28.21	26.45	24.68	24.68	22.92	19.39	31.73	29.97	28.21	26.45	24.68	24.68	24.68
HOLIDAY ALLOWANCE		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SUBTOTAL		40.55	37.90	35.26	31.73	28.21	26.45	24.68	24.68	22.92	19.39	31.73	29.97	28.21	26.45	24.68	24.68	24.68
INS (WC+GL)	16.87%	6.84	6.39	5.95	5.35	4.76	4.46	4.16	4.16	3.87	3.27	5.35	5.06	4.76	4.46	4.16	4.16	4.16
RISK MGMNT	0.00%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PAYROLL TAXES	8.90%	3.61	3.37	3.14	2.82	2.51	2.35	2.20	2.20	2.04	1.73	2.82	2.67	2.51	2.35	2.20	2.20	2.20
FRINGES	\$ 5.01	5.01	5.01	5.01	5.01	5.01	5.01	5.01	5.01	5.01	5.01	5.01	5.01	5.01	5.01	5.01	5.01	5.01
+ % OF GROSS	30.95%	12.55	11.73	10.91	9.82	8.73	8.19	7.64	7.64	7.09	6.00	9.82	9.28	8.73	8.19	7.64	7.64	7.64
DIRECT LABOR / FRINGES		68.56	64.40	60.27	54.73	49.22	46.46	43.69	43.69	40.93	35.40	54.73	51.99	49.22	46.46	43.69	43.69	43.69
OVERHEADS / G&A	20.91%	14.34	13.47	12.60	11.44	10.29	9.71	9.14	9.14	8.56	7.40	11.44	10.87	10.29	9.71	9.14	9.14	9.14
SMALL TOOLS	2.00%	0.81	0.76	0.71	0.63	0.56	0.53	0.49	0.49	0.46	0.39	0.63	0.60	0.56	0.53	0.49	0.49	0.49
CONSUMABLES	0.75%	0.30	0.28	0.26	0.24	0.21	0.20	0.19	0.19	0.17	0.15	0.24	0.22	0.21	0.20	0.19	0.19	0.19
SUBTOTAL		84.01	78.91	73.84	67.04	60.28	56.90	53.51	53.51	50.12	43.34	67.04	63.68	60.28	56.90	53.51	53.51	53.51
PROFIT **	6.00%	5.04	4.73	4.43	4.02	3.62	3.41	3.21	3.21	3.01	2.60	4.02	3.82	3.62	3.41	3.21	3.21	3.21
TOTAL STRAIGHT TIME RATE		89.05	83.64	78.27	71.06	63.90	60.31	56.72	56.72	53.13	45.94	71.06	67.50	63.90	60.31	56.72	56.72	56.72

* Overhead % is figured upon fully burdened cost.
** Profit is a % of fully burdened cost plus Overheads
1.299

Labor burden build up



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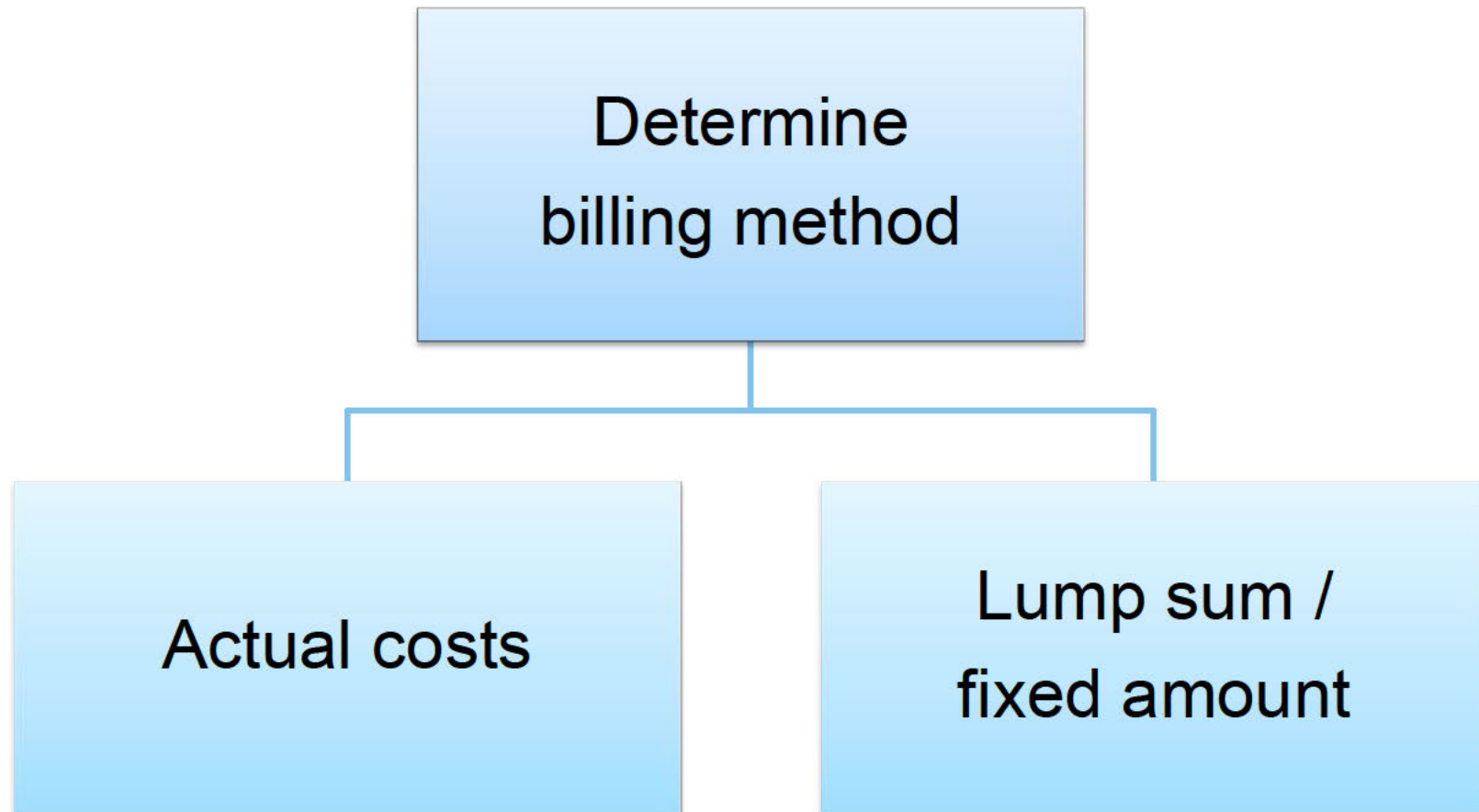
Contractor Labor Rate Calculation			
Contractor Name:		Occupation: Superintendent	
Rate Applicability Period:		Straight Time	Reported
Base Wage (\$ Per Hour)		\$ 42.37	\$ 42.37
Taxable Benefits (Vacation -As applicable)			
Subtotal Taxable Wages & Benefits		\$ 42.37	\$ 42.37
Benefits			
401K assume 2% of wages		\$ 0.77	
Health & Welfare assume \$1000 per month		\$ 5.77	
Safety		\$ 0.03	
Substance Testing		\$ 0.04	
Skills Training		\$ 1.00	
Reported 35%			\$ 14.83
Total Benefits		\$ 7.61	\$ 14.83
Subtotal Base Rate + Fringes		\$ 49.98	\$ 57.20
Insurance			
Workers Compensation (2%)		\$ 0.85	
Liability Insurance (1.5%)		\$ 0.64	
Payroll Taxes:			
State Unemployment (3.9% of \$12,300)		\$ 0.23	
Fed Unemployment (6.2% of \$7,000)		\$ 0.21	
Medicare (1.45%)		\$ 0.61	
F.I.C.A. (7.65%)		\$ 3.24	
Reported 50%			\$ 28.60
Total Tax & Insurance		\$ 5.78	\$ 28.60
Cost Per Hour		\$ 55.76	\$ 85.80
Contract Hourly Rate		\$ 85.80	
Premium (Discount)		\$ 30.04	

Findings	Concerns	Actions
Incorrect billing rates were used in calculating DL cost	Owner has been overcharged	Request a credit for billing difference
Billed labor burden exceeds estimated burden	Owner has been overcharged	Reconcile labor burden with contractor and request credit for unsupported variances
Contractor cannot produce a certified payroll	Owner is being overcharged for DL cost	Request and reconcile payroll records with DL costs
Owner is charged prevailing wages and employees are paid less than prevailing wages	Payroll fraud is a high risk if this occurs	Escalate to legal counsel for guidance

Audit program differences from actual cost testing:

- > No labor rate or burden analysis
- > All other procedures to verify employees, hours and overtime should be applied





Source Documents

- > Contract
- > Original schedule of values
- > Current schedule of values
- > Pay application
- > Purchase order
- > Material specification
- > Materials take off
- > MSDS
- > Receiving tickets
- > A/P ledger
- > Check register
- > Trucking tickets
- > Scale tickets
- > Contractor's job cost detail

Test Program

ID	Direct materials testing
1	Prepare control schedules
2	Owner direct payments for materials
3	Purchase orders, receiving tickets and vendor payments
4	Trucking and scale tickets
5	Purchase order testing
6	Compare competitive supplier bids with P.O.
7	Reconcile purchase orders with material take off
8	Reconcile purchase orders with field receipts
9	Vendor credits and discount testing
10	Confirm with supplier discount and incentive programs
11	Verify early payment discounts are pass through to owner

Test Program

ID	Direct materials testing
12	Material usage testing
13	Verify destination of delivered materials
14	Reconcile receiving tickets with P.O.
15	Reconcile P.O. with material take off
16	Compare as built to P.O.
17	Compare inspection reports to P.O.
18	Sales tax testing
19	Verify proper sales tax treatment
20	Direct owner purchases testing
21	Verify no DOP are in the contractor's job cost ledger
22	Research why any material purchases are in the contractor's job cost ledger

Direct materials – actual costs



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Findings	Concerns	Actions
Weak receiving controls at the job site	No ability to track materials that may lead to additional material costs	Inform facility development of deficiency and suggest improvements
Suppliers report material returns, however no credits appear on pay app	Owner is overpaying for materials	Request owner's credit in the amount of unused materials
Suppliers report volume discount and incentive program with contractor	Owner is overpaying for materials	Verify discounts result in material credits.
20% of the trucking tickets are missing from project file	Owner is overpaying for gravel, dirt and aggregate	Request trucking tickets from trucking company or deny payment for unsupported costs
Several trucking tickets show time and mileage significantly different than the others	Some of the truck loads have been delivered somewhere other than the jobsite	Deny payment for charges until discrepancies are resolved

Direct materials – actual costs



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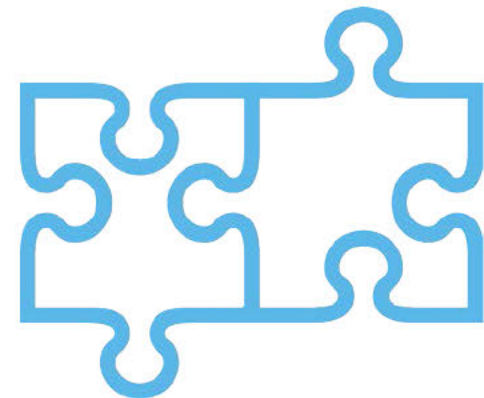
Findings	Concerns	Actions
DOP vouchers do not utilize vendor payment discounts	Owner's A/P department is forfeiting discounts due to slow pay	Escalate to A/P to request priority voucher processing
Project plan requires 5% less concrete than was purchased	Owner over purchased concrete quantities	Negotiate a return to supplier for credit
Door styles are substituted with a less expensive door type	Owner is over paying for materials	Negotiate credit for material substitution
Revised plans used 20% fewer windows	No c/o was found authorizing change, material cost reduction, or labor adjustment	Negotiate credit change order
Local preference was ignored	Project financing required local supplier and contractor preference	Escalate to corporate counsel for direction

Source Documents

- > Contract
- > Original schedule of values
- > Current schedule of values
- > Pay application
- > Contractor's job cost detail
- > Equipment operator time sheets
- > Equipment logs
- > Repair invoices
- > Equipment rental invoices
- > Billing rate schedule
- > Equipment rental agreements

Construction equipment used on the project may be charged to the project several ways:

- > Pre-established rate schedule
- > Rental invoice from third party equipment dealer
- > Purchased by the project and transferring ownership



Test Program

ID	Equipment testing
1	Prepare control schedules
2	Equipment usage logs
3	Rental invoices
4	Repair invoices
5	Equipment usage testing
6	Reconcile usage logs with operator logs
7	Reconcile usage logs with contractor's job cost ledger
8	Equipment cost testing
9	Reconcile rental invoices with pay application
10	Reconcile repair invoices with pay application
11	Verify equipment rental costs do not exceed 100% of equipment purchase price
12	Verify rental agreements are not lease or lease to buy agreements

Test Program

ID	Equipment testing
13	Fuel, repairs and consumable testing
14	Verify fuel is charged only on operating days
15	Verify maintenance and repairs are not duplicated
16	Equipment rate testing
17	Verify billing rates comply with rate schedules
18	Verify billing rates are competitive with published equipment rental rates

Owned and rented equipment analysis



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Equipment Rate Decomposition

Equipment	Terms	Hourly	Daily	Weekly	Monthly	Standby	Operator
Pick up truck							
Daily rental rate		\$ 8.99	\$ 64.00	\$ 303.80	\$ 1,099.90	n/a	n/a
Fuel	Included						
Consumable surcharge	Included						
Maintenance surcharge	Included						
Transportation surcharge	N/A						
Insurance	Included						
Equipment	Terms	Hourly	Daily	Weekly	Monthly	Standby	Operator
Cat D6							
Daily rental rate		\$ 66.60	\$ 479.52	\$ 2,157	\$ 9,170	\$ 4,585	n/a
Fuel		\$ 3	\$ 24	\$ 120	\$ 480	\$ 240	
Consumable surcharge	5%	\$ 3.33	\$ 23.98	\$ 107.85	\$ 458.50	\$ 229.25	
Maintenance surcharge	Actual						
Transportation surcharge	50%	\$ 33.30					
Insurance	Included						

Owned and rented equipment analysis



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Findings	Concerns	Actions
Equipment hours significantly exceed operator hours	Equipment is parked at the job site to generate rental revenue	Questions the charges and request a credit for underutilized equipment
Repair costs include charges for oil and minor adjustments	Owner is double charged for maintenance costs	Request credit for maintenance charges
Fuel charges are billed on holidays	Owner is charged for fuel when equipment is idle	Request adjustment to fuel cost charge
Rental agreement looks like a finance purchase agreement	Owner is overpaying to rent equipment	Request rental rate adjustment to reflect commercial rental rates
Owner is paying for 105% of equipment FMV	Owner has effectively purchased the equipment	Negotiate equipment buy back arrangement

Construction auditor's toolbox



Candor. Insight. Results.

- > Work paper index
- > Work program
- > Analysis templates
- > Contract resources
- > Analytical tools
- > Estimating and pricing tools



Work paper index	Section Reference
I. Contract review and analysis	
A. Construction contracts	I.A
B. Contract risk analysis	I.B
C. Contract revisions, exhibits and schedules	I.C
II. Testing & Analysis	
A. Direct labor testing	II.A
1. Source documents	
a. Time sheets	II.A.1.a
b. Labor rate schedule	II.A.1.b
c. Contractor 's job cost ledger	II.A.1.c
2. Analysis	
a. Labor burden analysis	II.A.2. a
b. Time sheet reconciliation	II.A.2. b
3. Findings	II.A.3
B. Pay application testing	
1. Source documents	
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b. Lien waivers	II.B.1.b
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a. Pay application roll up	II.B.2.a
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III. Reporting	
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IV. Communication	
A. Information requests	IV.A
B. Email and memo to file	IV.B
C. Supplier confirmations	IV.C

1.0	Preparation of Control Schedules
2.0	Reconciliation of Project Expenditures
3.0	Direct Labor Analysis
4.0	Direct Materials Analysis
5.0	General Conditions Analysis
6.0	General Requirements Analysis
7.0	Equipment Rental Analysis
8.0	Change Order Analysis
9.0	Change Order Pricing Analysis
10.0	Subcontract Analysis

- > Pay application control schedule
- > Source document control schedules
- > Labor burden and billing rate analysis
- > Equipment rate decomposition
- > Change order pricing
- > Change order control schedule
- > Cost responsibility matrix
- > Contract risk matrix

- > American Institute of Architects (AIA documents)
- > Consensus documents
- > Association of General Contractors (AGC)
- > Construction Owner's Association of America (COAA)
- > Construction Users Roundtable (CURT)
- > Legal counsel

Analytical tools



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- > ACL
- > Idea
- > Primavera P6 (schedule management)
- > Meridian (earned value analysis)

Pricing and estimating tools



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- > RS Means
- > National Electrical Contractor's Association (NECA) Handbook
- > U.S. Department of Labor
- > Local Department of Revenue
- > Local Department of Labor
- > National Electrical Code (NEC) cost book
- > BNI cost book

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