



NECA
PHILADELPHIA
SEPT 29-OCT 2, 2023

Project Financial Controls Processes to Drive Project Transparency




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CONVENTION EDUCATION

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- Attend 90% of this presentation
- Fill out the online evaluation for this session



Maxim Consulting Group Overview

 Management Consulting	 Lean Transformations	 Peer Groups	 Corporate Finance Advisory
<ul style="list-style-type: none"> ▪ Strategic Planning ▪ Operational Excellence ▪ Technology Integration ▪ Training & Development 	<ul style="list-style-type: none"> ▪ Supply Chain Management ▪ Design Standards ▪ Enterprise Scheduling ▪ Process Standardization 	<ul style="list-style-type: none"> ▪ Electrical ▪ Mechanical ▪ Fire Protection ▪ General Contractor ▪ Heavy Civil ▪ Utility 	<ul style="list-style-type: none"> ▪ Mergers & Acquisitions Advisory ▪ Equity & Debt Financing ▪ Ownership Transition ▪ Management Succession ▪ Captive Insurance




Challenges to Field Productivity

- _____
- _____
- _____
- _____
- _____
- _____



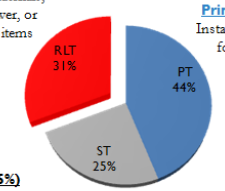
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Understanding the Opportunity

Enabling Success for Those with the Greatest Impact to the Project

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How Field Employees Spend Their Time in the Construction Industry



Recoverable Lost Time (31%)
Waiting for information, materials, equipment, tools, manpower, or other trades. Rework on items already installed.

Primary Time (44%)
Installing units of work for the first time.

Secondary Time (25%)
Planning, scheduling, material handling, lay-out, set-up, mobilization, etc.

Beginning With The End In Mind






Stephen Covey
American educator




The Scorecard

SALES	\$50,000,000	100.00%
DIRECT COSTS		
Labor	22,000,000	44%
Materials	21,000,000	42%
Subcontracts	1,000,000	2%
Equipment	250,000	1%
Other Direct Costs	100,000	0%
Total Direct Costs	\$44,350,000	89%
GROSS PROFIT	\$5,650,000	11%
Overhead	\$4,750,000	10%
NET PROFIT (BEFORE TAXES)	\$900,000	1.80%

The Effect of Labor Productivity Changes on Net Profit

% Increase/ Decrease in Labor Productivity	New Net Profit %	\$ Change in Net Profit	% Change in Net Profit
-30.00	15.00%	6,600,000	733
20.00	10.60%	4,400,000	489
10.00	6.20%	2,200,000	244
5.00	4.00%	1,100,000	122
2.00	2.68%	440,000	49
0	1.80%	0	0
-2.00	-0.92%	-440,000	-49
-5.00	-0.40%	-1,100,000	-122
-10.00	-2.60%	-2,200,000	-244
-20.00	-7.00%	-4,400,000	-489
-30.00	-11.40%	-6,600,000	-733



The Opportunity

Percent Improvement	8 Hour Day	Percent Increase in Profitability
2%	9.6 minutes	49%
5%	24 minutes	122%
10%	48 minutes	244%



Agenda

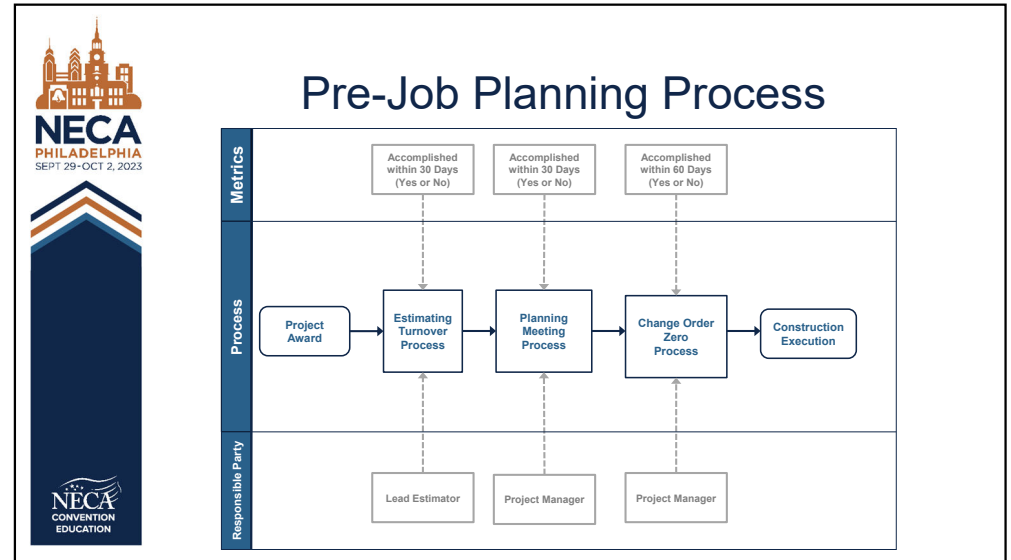
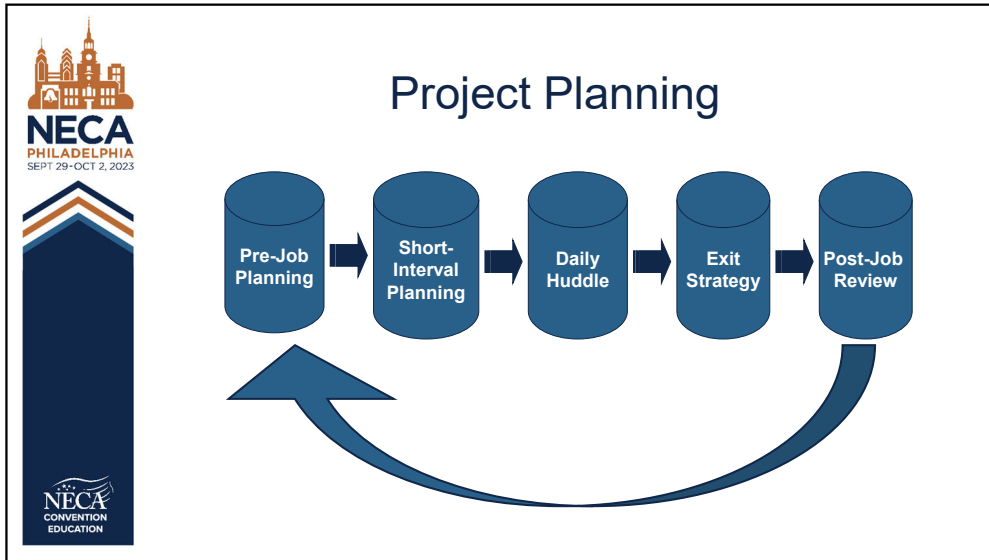
- Understand the components of an effective prejob plan
- Use a short interval plan to overcome obstacles
- Create visual batching in alignment with kitting
- Define resource loading to predict manpower issues
- Use of input worksheets as a training tool
- Understand productivity tracking



Preconstruction Planning

Field Information Needed to Start and Finish Productively

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Short Interval Planning

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Standardizing Strong Collaboration

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Reality Versus Opportunity

Status	Planned Calls to Shop >2 Working Days Notice	Unplanned Calls to Shop <2 Working Days Notice
Without Effective SIP		
With Effective SIP		

Reality Versus Opportunity

Status	Planned Calls to Shop >2 Working Days Notice	Unplanned Calls to Shop <2 Working Days Notice
Without Effective SIP	30%	70%
With Effective SIP		



Reality Versus Opportunity

Status	Planned Calls to Shop >2 Working Days Notice	Unplanned Calls to Shop <2 Working Days Notice
Without Effective SIP	30%	70%
With Effective SIP	70%	30%



Short Interval Plan

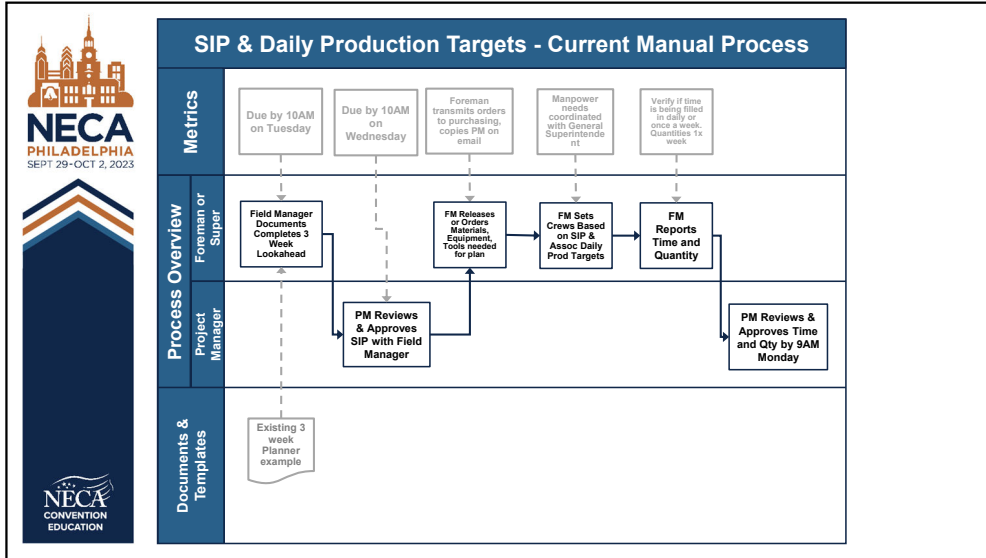


SHORT-INTERVAL PLANNING TOOL- 1 WEEK LOOK AHEAD

Objectives: Fill out by Wednesday noon and review with work crew. Fax to office by the end of the workday on Wednesday of each week.

PROJECT FOREMAN	Manpower <i>(Indicate how many people you will need on each day)</i>							Week Ending		Are materials on site?	Is this a "Request" Required?
	Mon	Tues	Wed	Thurs	Fri	Sat	Sun	Yes	No		
What work is planned and scheduled to be completed next week?											
What alternate work is planned if scheduled work happens to fall through? (i.e. PLAN B WORK)											
Total manpower needed to complete next weeks work.											
Did you receive a followup phone call from your project manager discussing last week's 1 week look-ahead? <input type="checkbox"/> YES <input type="checkbox"/> NO								Did you discuss this with your crew before sending it in? <input type="checkbox"/> YES <input type="checkbox"/> NO			
What subcontractors do you need next week?											
What issues need resolutions or answers? From whom do you need answers? When is it needed?											
What plans should we be making beyond the next week? Who should be planning? When will it be critical?											
Do you have any foremen working on your project next week? If so, please list them below and the projected durations.											





Value of the SIP

- Create understanding of needs
- Identify obstacles between the field leader and their plan
- Reinforce team centric culture
- List actionable items
- Adjust internal project schedule as needed
- Create accountability and transparency

Visual Batching of Work

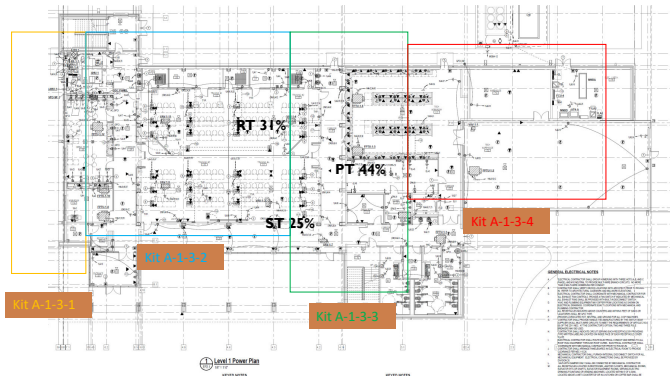
Using Visual Cues

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Visual Batching – Wall Rough In

Architectural drawing showing wall rough in with color-coded batching: RT 31%, PT 44%, ST 25%.

Visual Batching – Kit Numbers



Kit Numbers

Phase	Area	Workstep (Task)	Order of Operation
A	1	3	1
Building A	Floor 1	3 = wall rough in	First rough in area planned per schedule

What is a Kit?

- A Kit describes an assembly or mixture of items that contains the components needed in one unit to complete a section of a job or the complete job.
- They define a kit or kits as the items needed to complete a task that are not easily affected by other trades
 - Rough
 - Ceiling
 - Trim

What is Typically in a Kit?

- Commodities
- Sub-assemblies
- Hardware
- Tooling
- Pick lists
- Fixtures
- Detailed instructions for special items





Kits – Waiting to Ship




Resource Loading

Predicting Manpower Challenges

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Using a Schedule

PROJECT TITLE
Company Name
Project Lead

Project Start Date: 4/1/2021
Scheduling Increment: 30

Legend: On Track (blue), Low Risk (orange), Med Risk (purple), High Risk (red), Unassigned (grey)

Milestone	Descrip	Category	Assigned To	Progress	Start	No. Days	Man
Building A, Floor 1	Slab	On Track	Name	100%	4/1/2021	3	3
	Wall Rough	Med Risk		100%	5/15/2021	15	6
	Ceiling Rough	Med Risk		20%	6/10/2021	10	5
	Gear	Low Risk		0%	6/20/2021	10	4
	Wire	Low Risk		15%	6/24/2021	8	6
	Lighting	High Risk		0%	7/6/2021	15	5
	Trim and Finish	Low Risk		0%	8/1/2021	9	3


Input Worksheets

Teaching to Plan

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Teaching for Success – Enabling Learning



Inputs and Upstream Work

Job: LIBERTY HIGH	Phase: BUILDING A	Area: FLOOR 1	Task: WALL ROUGH IN		Date Field Work Starting: 5/15/21		
Labor	Material	Tools	Equipment	Subcontracts	Information	Internal Status	Obstacles/Concerns
1 FMN	KIT A-1-3-1	6' LADDER	2X ROUGH IN TOOL KIT	NONE	RFI 12 RESPONSE	KIT DELIVERED	
3 JW		12' LADDER			INSTALL DWG IN KIT	READY FOR FIELD INSTALLATION	
2 APPRENTICE		6 PAIRS GLOVES					
		4 SHARPIES					



Productivity Tracking

Using Data, Not Hope, To Succeed

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Where is the Risk?

SALES	\$50,000,000	100.00%
DIRECT COSTS		
Labor	22,000,000	44%
Materials	21,000,000	42%
Subcontracts	1,000,000	2%
Equipment	250,000	1%
Other Direct Costs	100,000	0%
Total Direct Costs	\$44,350,000	89%
GROSS PROFIT	\$5,650,000	11%
Overhead	\$4,750,000	10%
NET PROFIT (BEFORE TAXES)	\$900,000	1.80%



Why is Earned Value Important?

Estimated Labor Hours	Actual Labor Hours	Variance	Projected Labor Hours
10,000	5,000	5,000	?

How is this job performing? What is the projected labor?

This is the data we have when we ONLY report time

IMAGINE if this was your only cost code to report to?



Reporting Both Quantities and Associated Hours

Estimated Labor Hours	Actual Labor Hours	Variance	Projected Labor Hours
10,000	5,000	5,000	?

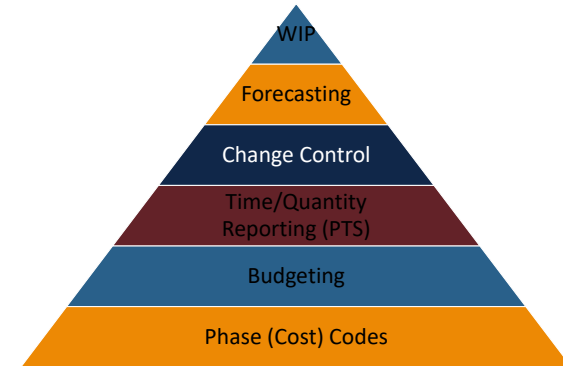
How is this job performing? What is the projected labor?

Estimated Units	Act. Installed Units	Est. Labor Hours	Act. Labor Hours	Projected Labor Hours
100	25	10,000	5,000	?

And now? Is this more accurate?



Building Blocks of Financial Controls



Earned Value – The Industry Standard

- Practical way to provide feedback
- Single productivity metric for:
 - One Activity
 - Group of Activities
 - Job
 - Group of Jobs
 - Division
 - Total Company
- Adds objectivity to your cost to complete projections



Using Earned Value

From the Budget:

- Estimated units or quantities for key items in the budget
- Estimated man-hours for each item in the budget

From the Field:

- Installed units or quantities for key items in the budget
- Percent complete for all other items in the budget
- Actual man-hours for each item in the budget



Earned Hours – Formulas To Know

Percent Complete = $\frac{\text{Actual Units}}{\text{Budget Units}}$

Math ≠ Hope

Earned Hours = $\frac{\text{Actual Units}}{\text{Budget Units}} \times \text{Total Estimated Hours}$

Productivity Index = $\frac{\text{Earned Hours}}{\text{Actual Hours}}$

Projected Hours = $\frac{\text{Actual Hours}}{\text{Actual Units}} \times \text{Total Budgeted Units}$



Earned Value Workshop - Scenario

- You are the project manager and you are scheduled to meet with your boss to report on the status of your project
- Specifically, he wants a summary of labor productivity to date as well as projected labor hours and labor costs at completion
- You have thoroughly walked the project with the superintendent and are satisfied that the quantities (or percent complete) reported from the field are accurate



Earned Value Workshop – Assignment

- Review the summarized information from the project budget (Exhibit One)
- Review the summarized information from timecards and quantity reports (Exhibit Two)
- Complete the earned value summary report (Exhibit Three)
- Calculate the total labor cost at completion assuming a labor cost of \$50/hour (Exhibit Four)



Exhibit One: Summarized Information from the Project Budget

	Budgeted Man-Hours	Total Quantity	Unit of Measure
Activity A	8,000	100,000	SF
Activity B	6,000	50,000	LF
Activity C	4,000	1,000	EA
Activity D	1,000	1	LS
Activity E	1,000	1	LS
Total	20,000		





Exhibit Two: Summarized Information from Timecards and Quantity Reports

	Hours Reported JTD	Units or Percent Installed JTD	Unit of Measure
Activity A	4,000	40,000	SF
Activity B	2,500	25,000	LF
Activity C	2,400	600	EA
Activity D	300	30.00%	LS
Activity E	300	10.00%	LS
Total	9,500		



Exhibit Three: Earned Value Summary Report

A	B	C	D	E	F	G	H	I	J	K	(I/F)*B
BUDGETED				ACTUAL				PRODUCTIVITY		PROJECTED	
Activity	Units	UOM	Hours	Units	UOM	% Comp.	Earned Hrs.	Act. Hours	Earned/Actual	Hours	
A											
B											
C											
D											
E											
TOTAL											

Earned Value Summary Report – Start with Known Values

A	B	C	D	E	F	G	H	I	J	K	L
BUDGETED				ACTUAL				PRODUCTIVITY		PROJECTED	
Activity	Units	UOM	Hours	Units	UOM	Units Inst. or % Comp.	Earned Hrs.	Act. Hours	Earned/Actual	Hours	
A	100000	SF	8000	40000	SF		4000				
B	50000	LF	6000	25000	LF		2500				
C	1000	EA	4000	600	EA		2400				
D	1	LS	1000	30.00%	LS		300				
E	1	LS	1000	10.00%	LS		300				
TOTAL			20000				9500				

Earned Value Summary Report-Calculate % Complete

A	B	C	D	E	F	G	H	I	J	K	L
BUDGETED				ACTUAL				PRODUCTIVITY		PROJECTED	
Activity	Units	UOM	Hours	Units	UOM	Units Inst. or % Comp.	Earned Hrs.	Act. Hours	Earned/Actual	Hours	
A	100000	SF	8000	40000	SF	40.00%	4000				
B	50000	LF	6000	25000	LF	50.00%	2500				
C	1000	EA	4000	600	EA	60.00%	2400				
D	1	LS	1000	30.00%	LS	30.00%	300				
E	1	LS	1000	10.00%	LS	10.00%	300				
TOTAL			20000				9500				

Earned Value Summary Report-Calculating Earned Hours

BUDGETED				ACTUAL				PRODUCTIVITY	PROJECTED	
Activity	Units	UOM	Hours	Units	UOM	Units Inst. or % Comp.	Earned Hrs.	Act. Hours	Earned/Actual	Hours
A	100000	SF	8000	40000	SF	40.00%	3200	4000		
B	50000	LF	6000	25000	LF	50.00%	3000	2500		
C	1000	EA	4000	600	EA	60.00%	2400	2400		
D	1	LS	1000	30.00%	LS	30.00%	300	300		
E	1	LS	1000	10.00%	LS	10.00%	100	300		
TOTAL			20000				9000	9500		

Earned Value Summary Report-Calculating Productivity

BUDGETED				ACTUAL				PRODUCTIVITY	PROJECTED	
Activity	Units	UOM	Hours	Units	UOM	Units Inst. or % Comp.	Earned Hrs.	Act. Hours	Earned/Actual	Hours
A	100000	SF	8000	40000	SF	40.00%	3200	4000	0.80	
B	50000	LF	6000	25000	LF	50.00%	3000	2500	1.20	
C	1000	EA	4000	600	EA	60.00%	2400	2400	1.00	
D	1	LS	1000	30.00%	LS	30.00%	300	300	1.00	
E	1	LS	1000	10.00%	LS	10.00%	100	300	0.33	
TOTAL			20000				9000	9500	0.95	

Earned Value Summary Report-Calculating Projected Hours

BUDGETED				ACTUAL				PRODUCTIVITY	PROJECTED	
Activity	Units	UOM	Hours	Units	UOM	Units Inst. or % Comp.	Earned Hrs.	Act. Hours	Earned/Actual	Hours
A	100000	SF	8000	40000	SF	40.00%	3200	4000	0.80	10000
B	50000	LF	6000	25000	LF	50.00%	3000	2500	1.20	5000
C	1000	EA	4000	600	EA	60.00%	2400	2400	1.00	4000
D	1	LS	1000	30.00%	LS	30.00%	300	300	1.00	1000
E	1	LS	1000	10.00%	LS	10.00%	100	300	0.33	3000
TOTAL			20000				9000	9500	0.95	23000

Putting It All Together – Adding Conditional Formatting

BUDGETED				ACTUAL				PRODUCTIVITY	PROJECTED	
Activity	Units	UOM	Hours	Units	UOM	Units Inst. or % Comp.	Earned Hrs.	Act. Hours	Earned/Actual	Hours
A	100000	SF	8000	40000	SF	40.00%	3200	4000	0.80	10000
B	50000	LF	6000	25000	LF	50.00%	3000	2500	1.20	5000
C	1000	EA	4000	600	EA	60.00%	2400	2400	1.00	4000
D	1	LS	1000	30.00%	LS	30.00%	300	300	1.00	1000
E	1	LS	1000	10.00%	LS	10.00%	100	300	0.33	3000
TOTAL			20000				9000	9500	0.95	23000

Exhibit Four: Labor Cost Summary



Labor cost to date =

$$\underline{\hspace{2cm}} \text{ Hours} \times \$50 = \$ \underline{\hspace{2cm}}$$

Projected labor cost-to-complete remaining work =

$$\underline{\hspace{2cm}} \text{ Hours} \times \$50 = \$ \underline{\hspace{2cm}}$$

Projected labor cost at completion =

$$\underline{\hspace{2cm}} \text{ Hours} \times \$50 = \$ \underline{\hspace{2cm}}$$



Exhibit Four: Labor Cost Summary



Labor cost to date =

$$9500 \text{ Hours} \times \$50 = \$475,000$$

Projected labor cost-to-complete remaining work =

$$\underline{\hspace{2cm}} \text{ Hours} \times \$50 = \$ \underline{\hspace{2cm}}$$

Projected labor cost at completion =

$$\underline{\hspace{2cm}} \text{ Hours} \times \$50 = \$ \underline{\hspace{2cm}}$$



Exhibit Four: Labor Cost Summary



Labor cost to date =

$$9500 \text{ Hours} \times \$50 = \$475,000$$

Projected labor cost-to-complete remaining work =

$$13,500 \text{ Hours} \times \$50 = \$675,000$$

Projected labor cost at completion =

$$\underline{\hspace{2cm}} \text{ Hours} \times \$50 = \$ \underline{\hspace{2cm}}$$



Exhibit Four: Labor Cost Summary



Labor cost to date =

$$9500 \text{ Hours} \times \$50 = \$475,000$$

Projected labor cost-to-complete remaining work =

$$13,500 \text{ Hours} \times \$50 = \$675,000$$

Projected labor cost at completion =

$$23,000 \text{ Hours} \times \$50 = \$1,150,000$$



Exhibit Four: Labor Cost Summary

Original Labor Budget =

20,000 Hours X \$50 = \$1,000,000

Projected labor cost at completion =

23,000 Hours X \$50 = \$1,150,000

Labor Cost Overrun = \$150,000 or 15%



THE NEED FOR ACCURATE FIELD REPORTING – Correct Reporting Example

BUDGETED				ACTUAL				PRODUCTIVITY	PROJECTED	
Activity	Units	UOM	Hours	Units	UOM	Units Inst. or % Comp.	Earned Hrs.	Act. Hours	Earned/Actual	Hours
A	100000	SF	8000	40000	SF	40.00%	3200	4000	0.8	10000
B	50000	LF	6000	25000	LF	50.00%	3000	2500	1.2	5000
TOTAL			14000				6200	6500	0.95	15000

All data is complete in this example. Shows us over in labor by 1,000 hours.



THE NEED FOR ACCURATE FIELD REPORTING – Optimistic Reporting Example

BUDGETED				ACTUAL				PRODUCTIVITY	PROJECTED	
Activity	Units	UOM	Hours	Units	UOM	Units Inst. or % Comp.	Earned Hrs.	Act. Hours	Earned/Actual	Hours
A	100000	SF	8000	50000	SF	50.00%	4000	4000	1.00	8000
B	50000	LF	6000	30000	LF	60.00%	3600	2500	1.44	4167
TOTAL			14000				7600	6500	1.17	12167

% Complete data is reporting incorrectly. Should be 40% and 50%, respectively. This now shows us saving 1,833 hours.



THE NEED FOR ACCURATE FIELD REPORTING – Pessimistic Reporting Example

BUDGETED				ACTUAL				PRODUCTIVITY	PROJECTED	
Activity	Units	UOM	Hours	Units	UOM	Units Inst. or % Comp.	Earned Hrs.	Act. Hours	Earned/Actual	Hours
A	100000	SF	8000	35000	SF	35.00%	2800	4000	0.70	11429
B	50000	LF	6000	20000	LF	40.00%	2400	2500	0.96	6250
TOTAL			14000				5200	6500	0.80	17679

% Complete data is reporting incorrectly. Should be 40% and 50%, respectively. This now shows us running over in labor by 3,679 hours.

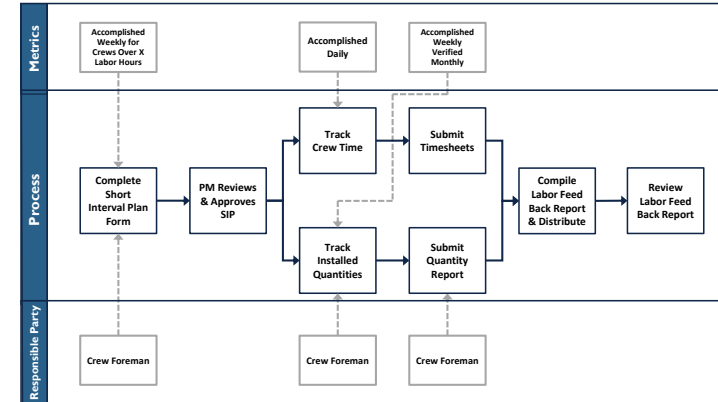


The Moral of the Story

	Activity A Projected Hours	Activity B Projected Hours	Projected Total Hours	Projected Labor \$ at \$75/Hr.	Labor Over/(Under) Inaccuracy
Accurate	10000	5000	15000	\$1,125,000	\$0
Optimistic	8000	4167	12167	\$912,525	(\$212,475)
Pessimistic	11429	6250	17679	\$1,325,925	\$200,925



Production Tracking Process



Summary & Closing Points

- Processes to drive planning are necessary to allow for trainability, transparency, and accountability
- Tools defined to enable collaboration allow teams to seamlessly transfer information
- Measuring productivity allows a view on the areas of the project that need focus with the timing that allows for a far more proactive impact



Thank You!

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Complete the Online Evaluation

