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Change Order Management

NFBA NATIONAL FRAME BUILDING ASSOC.

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March 6, 2024

Introduction

Maxim Consulting Overview

Management Consulting	Lean Transformations	Peer Groups	Corporate Finance Advisory
▪ Strategic Planning ▪ Operational Excellence ▪ Technology Integration ▪ Training & Development	▪ Supply Chain Management ▪ Design Standards ▪ Enterprise Scheduling ▪ Process Standardization	▪ Electrical ▪ Mechanical ▪ Fire Protection ▪ General Contractor ▪ Heavy Civil ▪ Utility	▪ Mergers & Acquisitions Advisory ▪ Equity & Debt Financing ▪ Ownership Transition ▪ Management Succession ▪ Captive Insurance

My Goals and Expectations

Notes from My Classmates

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Recognizing a Potential Change Order

What is a Change Order?

A change order is work that is added to or deleted from the scope of work outlined in the contract.

Recognizing a Potential Change Order – Types of Changes

Owner – Initiated	GC – Initiated	Subcontractor – Initiated
Additional scope	General conditions items	Project acceleration
Design scope gap	Scope gap between trades	Overtime or out of sequence work
Use of allowance for owner desired items	Back charges	Value engineering
Schedule delay for owner furnished materials	Schedule disruption due to other trades	General conditions items – unforeseen conditions, drawing or spec conflicts

Recognizing a Potential Change Order – Rules of the Game

- Understand contract language as it relates to:
  - Types of changes and compensation allowed
  - Authorization to order changes
  - Notification requirements
  - Limits on recoverable costs, overhead, & markups
  - Differing site conditions
  - Time of completion
  - Dispute clause
  - Payment terms

Changes Clause Review Exercise

Example 1, Code Compliance

Subcontractor will furnish all labor, materials, supervision and items required for the proper and complete performance of the work in compliance with all applicable local, state and federal laws codes and ordinances.

- Questions:
    - What risks are associated with the clause/language?
    - How might you approach the change order differently because of the language?

Example 2, Trash and Debris

Subcontractor will clear its trash daily. If Subcontractor fails to do so, Contractor may clear Subcontractor's trash and charge Subcontractor the cost of same.

- Questions:
    - What risks are associated with the clause/language?
    - How might you approach the change order differently because of the language?

Example 3, Schedule Acceleration

In the event Subcontractor fails to maintain the schedule, Subcontractor shall without compensation, work such overtime as GC may direct until Subcontractor is in compliance with such schedule.

- Questions
    - What risks are associated with the clause/language?
    - How might you approach the change order differently because of the language?

Preparing for the Change Order Process

Preparing for the Change Order

- Notification-
  - In writing
  - Don't wait until all the impacts are known
- Assess current conditions and impacts
- Build a win-win relationship

Template Language

- Use of standard notification letters
  - Schedule impacts
  - Change of scope
  - Weather
  - Delays
  - Access delay
  - Differing site conditions
  - Directed acceleration
  - Etc.

Assess Impacts

- Duty to mitigate additional costs
  - (Demobilize, stabilize site conditions, etc.)
- Keep detailed daily logs including
  - Manpower
  - Equipment
  - Down time
  - Delays
  - Re-sequencing of work
- Document, document, document
  - Pictures
  - Phone logs
  - Emails

Build Win/Win Relationship with Customer

- Ask Questions
- Propose Solutions
- Establish Up Front Contract

Timing is Everything

CHANGE ORDERS

Before Starting Work

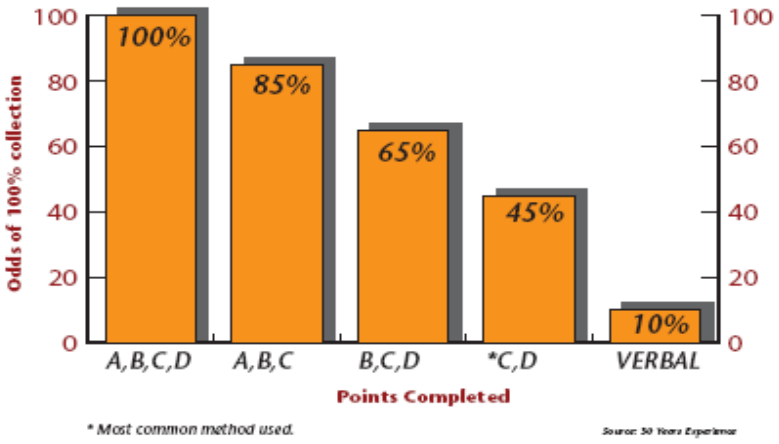
A. PRICE IT
Put a written estimate together.

B. WRITE IT
Put it in writing/standard form.

C. SIGN IT
Get an authorized signature on estimate to proceed.

D. ON TIME
Submit to client immediately (not after job is complete).

Odds of 100% collection of change order when the above is performed:



* Most common method used.

Source: 30 Years Experience

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Pricing a Change Order

Getting it "All"

- You are pricing a change order to add 4 lay in fixtures to an existing project you have under construction. The work in the room has already been completed, ceilings closed. Ceiling height 12'. Can be added to the existing lighting circuit in the room.

Determining Costs

Direct Costs	Hidden Costs
Labor	Procurement
Material	Estimating
Equipment	Logistics
Subcontractors	As Built Drawings
Other	Engineering
	Detailing
	Design
	Warranty
	Small Tools

Telling the Story – Follow the Process

- Story must educate a non-electrical person
- Define the scope chronologically in layman's terms
- Scope first, pricing second

The scope includes all activities from the definition of a problem, through engineering a solution, procuring the materials/tools/equipment, delivering direct job items, constructing the solution, documenting the change on the drawings, then billing and collecting for the solution.

Steps in Investigating a Solution – On-Site Work

- Schedule the field investigation
- Move the furniture
- Protect the floor
- Move in a lift
- Remove/protect the ceiling tiles
- Investigate the new routing/support
- Creation of a field drawing
- Transmission of the field drawing to the PM and design team
- Replace the ceiling tiles
- Remove the lift
- Unprotect the carpet
- Move the furniture back into place

Steps in Investigating a Solution – Off-Site Work

- Design a solution
- Get field approval on the design
- Estimate the solution
- Create the proposal for the change order
- Get field approval on the proposal language
- Send the proposal in for consideration
- Meet or discuss the proposal particulars
- Gain approval for the change
- Once approved, write purchase orders
- Track purchases and receive material
- Prefab appropriate assemblies
- Kit material and installation information for shipment
- Deliver the kit to the field

Steps in Investigating a Solution – On-Site Work

- Store/secure the material kit
- Perform daily huddle to lay out the crew installing the work
- Perform a jobsite safety analysis
- Move/protect the furniture
- Protect the floor
- Move in a lift
- Move the materials to point of installation
- Remove/protect the ceiling tiles
- Intercept existing circuiting and controls, extend to new locations
- Install light fixture supports
- Install light fixtures
- Terminate and test junction box and light fixture connections
- Etc., etc., etc.

What Pricing to Use

- Labor
- Material
- Equipment
- Subcontractors
- Other

Pricing & Writing the Change Order – Pricing Auxiliary Costs using Standards

Itemized Breakdown

Description	Qty	Net Price	U	Total Mat.	Labor	U	Total Hrs.
#14 THW SOLID	5,250	158.66	M	832.97	6.00	M	31.50
Totals	**5,250**			**832.97**			**31.50**

Summary

General Materials		832.97
LIGHT FIXTURES		500.00
Material Tax	(@ 8.750 %)	116.63
Material Total		**1,449.60**
JW ELECTRICIAN ST WAGE:	(31.50 Hrs @ $60.00)	1,890.00
FOREMAN ST WAGE:	(5.67 Hrs @ $65.00)	368.55
GENERAL FOREMAN ST WAGE:	(2.21 Hrs @ $70.00)	154.70
MATERIAL HANDLER ST WAGE:	(1.58 Hrs @ $50.00)	79.00
RECORD DRAWINGS ST WAGE:	(0.95 Hrs @ $65.00)	61.75
PROJECT MANAGER	(1.00 Hrs @ $65.00)	65.00
SUPERINTENDENT	(1.00 Hrs @ $65.00)	65.00
PROJECT ENGINEER	(1.00 Hrs @ $60.00)	60.00
PROJECT COORDINATOR	(1.00 Hrs @ $60.00)	60.00
BIM/CAD DESIGNER	(1.00 Hrs @ $65.00)	65.00
SAFETY REPRESENTATIVE	(1.00 Hrs @ $65.00)	65.00
CONSUMABLES: EXTENSION	(832.97 @ 0.00 @ $0.05 + 0.000 % + 0.000 % + 0.000 %)	41.65
CONSUMABLES: QUOTED MATERIAL	(500.00 @ 0.00 @ $0.05 + 0.000 % + 0.000 % + 0.000 %)	25.00
DELIVERY TRUCK	(1.58 @ 0.00 @ $25.04 + 0.000 % + 0.000 % + 0.000 %)	39.56
FOREMAN TRUCK	(7.88 @ 0.00 @ $19.98 + 0.000 % + 0.000 % + 0.000 %)	157.44
MAINTENANCE ALLOWANCE	(197.00 @ 0.00 @ $0.33 + 0.000 % + 0.000 % + 0.000 %)	65.01
JOBSITE TRAILER/OFFICE SUPPLIES	(2,554.00 @ 0.00 @ $0.05 + 0.000 % + 0.000 % + 0.000 %)	127.70
SAFETY MEETINGS	(2,554.00 @ 0.00 @ $0.05 + 0.000 % + 0.000 % + 0.000 %)	127.70
SMALL TOOLS	(2,554.00 @ 0.00 @ $0.05 + 0.000 % + 0.000 % + 0.000 %)	127.70
CLEAN-UP	(2,554.00 @ 0.00 @ $0.05 + 0.000 % + 0.000 % + 0.000 %)	127.70
WARRANTY RESERVE	(2,554.00 @ 0.00 @ $0.02 + 0.000 % + 0.000 % + 0.000 %)	51.08
GRADALL - 8K	(1.00 @ 0.00 @ $2,395.00 + 0.000 %+ 0.000 % + 0.000 %)	2,395.00
Subtotal		**7,669.14**
Markup	(@ 20.000 %)	1,533.83
Subtotal		**9,202.97**
FIRE ALARM	($1,000.00 + 0.000 % + 0.000 % + 0.000 %)	1,000.00
Subtotal		**10,202.97**
BOND	(@ 1.000 %)	102.03
Final Amount		**$10,305.00**

Pricing & Writing the Change Order – Project Staff

- Resistance from GC or owner regarding:
- PM costs
- Superintendent/foreman
- Project administrator costs
- Other project team costs

Value Stream Mapping

- Value Stream Mapping allows us to boil down each work step required to perform our work, then document who performs each step.

Foreman Responsibilities

Minimum 2 to 4 hours, or ratio of foreman to field in the field, whichever is greater (i.e. 1:6 ratio of foreman to field = 16.6%). If they do not want to pay this, then let them know it would be their responsibility to perform all the duties below:

1. Identifies change request direct job costs, communicates to estimator/PM for pricing
2. Reviews scope of change request to determine accuracy and completeness
3. Reviews change request documentation update on the electronic project drawings
4. Review change request status code change and documents linked to the project drawings
5. Reviewing updated change order documentation on the project drawings once approved
6. Create material order for change order
7. Schedule the equipment needed for the change order
8. Coordinate and schedule subcontractor for change order
9. Identify work team members to perform change order work
10. Meet with work team to discuss scope of the change order
11. Receive or check in the materials for the change order, annotate the packing slips, send in for processing
12. Verify the receipt of the tools and equipment for the change order
13. Schedule the labor to perform the change order work
14. Perform daily huddle(s) with work crew for the change order work
15. Perform QA on the change order work
16. Review time and quantity reporting for change order work
17. Review as built changes for change order work
18. Notify Project Manager and Project Administrator of completion of the change order work
19. Review invoicing (if T&M) for change order work prior to submission

Project Manager Responsibilities

Minimum of 4 hours of 3% of field labor hours, whichever is greater. If they do not wish to pay this, then let them know that the below items will become their responsibility. Additionally, the hours intensity is directly contingent upon the size and scope of the change order:

1. Receives information from the field regarding a potential change order
2. Submission of notification to the owner/GC
3. Receive information on scope, materials, subs required for potential change order

4. Estimating costs for change requests
5. Definition of scope for the change request
6. Review of the change request proposal prior to sending
7. Receive the authorization to proceed for the change request and send to Project Administrator
8. Write material and equipment requisitions, send to purchasing
9. Reviews invoices for change order materials
10. Reviews billing for change order
11. Manages collection of the change order

Project Administrator Responsibilities

Should be equal to PM hours, or use a ratio if the PA supports multiple PMs.

1. Hours should never be below 2 to 4, depending on your standard
2. Post the link for the notification of potential change order on project plans
3. Receive pricing and scope information from the PM and prepare the change request document
4. Sent out the change request document and log into change order log
5. Follow up on the change request if not received within 14 days
6. Receive the authorization to proceed from the PM, save it into the PM module
7. Revise the change order status code in the PM module to that costs can begin to be incurred
8. Open new cost codes and cost types, as applicable, to report time and to compile additional direct job costs
9. Update the link on the project documents to include the authorization to proceed
10. Send an email to the superintendent and foreman that the authorization to proceed has been received and copy the PM.
11. Receive notification of completion from the field.
12. Compile and verify direct job costing for the change order
13. Once work has been completed, deactivate cost types and cost codes specific to this change order
14. Request the contract change directive for the work completed
15. Follow up on contract change directive for the work completed until received
16. Receive contract change directive, save to project management software
17. Notify PM and foreman of contract change directive receipt
18. Obtain authorized signatures on contract change directive
19. Send signed contract change directive back to the owner or GC
20. Save the contract change directive into the project management or contract administration software
21. Receive completely executed contract change directive back from the owner or GC
22. Save the fully executed copy into the project management or contract admin software
23. Create the billing line item in the billing and include in the next billing

Know the Contract

- If you signed a contract where a project manager is non-compensable, then who does their work steps?

Quantifying Productivity Loss

Quantifying Productivity Loss

- Types of Impact Costs
  - Overtime
  - Trade Stacking
  - Escalation
  - Weather Impacts
  - Out of Sequence Work
  - Availability of Skilled Labor
  - Dilution of Supervision
  - Learning Curve
- How do you Prove it???

Quantifying Productivity Loss

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  - Learning Curve
- How do you prove it???
- Understand how Productivity can be measured

$$\text{Productivity} = \frac{\text{Output}}{\text{Input}}$$

$$\text{Productivity Factor} = \frac{\text{Actual Productivity}}{\text{Planned Productivity}}$$

$$\text{Lost Productivity} = \text{Productivity}_{(\text{Planned})} - \text{Productivity}_{(\text{Actual})}$$

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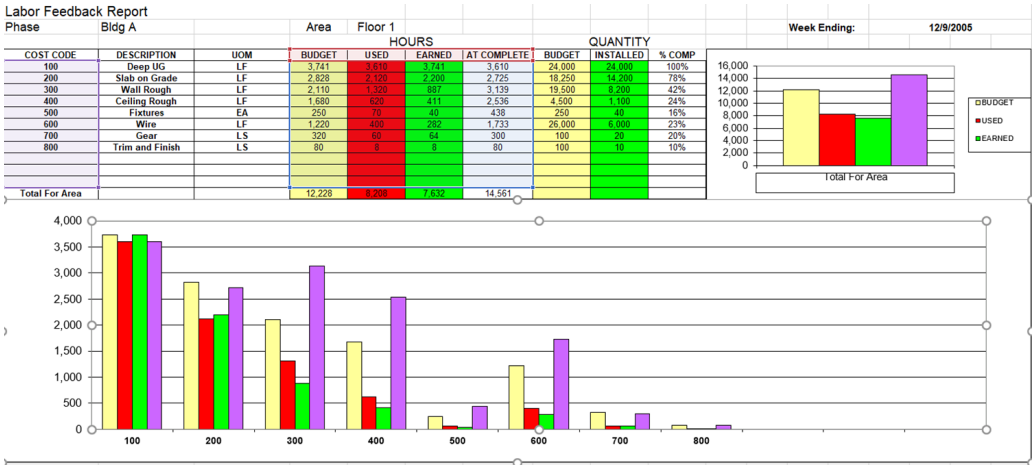
Data, Not Hope, to Win



Labor Feedback Report

Phase: Bldg A | Area: Floor 1 | Week Ending: 12/9/2005

			HOURS				QUANTITY		
COST CODE	DESCRIPTION	UOM	BUDGET	USED	EARNED	AT COMPLETE	BUDGET	INSTALLED	% COMP
100	Deep UG	LF	3,741	3,610	3,741	3,610	24,000	24,000	100%
200	Slab on Grade	LF	2,828	2,120	2,200	2,725	18,250	14,200	78%
300	Wall Rough	LF	2,110	1,320	887	3,139	19,500	8,200	42%
400	Ceiling Rough	LF	1,680	620	411	2,536	4,500	1,100	24%
500	Fixtures	EA	250	70	40	438	250	40	16%
600	Wire	LF	1,220	400	282	1,733	26,000	6,000	23%
700	Gear	LS	320	60	64	300	100	20	20%
800	Trim and Finish	LS	80	8	8	80	100	10	10%
Total For Area			12,228	8,208	7,632	14,561			

Proving Entitlement to Compensation

- Met notice requirements
- Events occurred during the work which were unforeseeable
- Events were beyond control of contractor seeking compensation
- Events were caused by the owner or owners rep (GG, CM, engineer)
- Recovery is not barred by contract clause
- Events caused a loss in productivity

Methods of Estimating Lost Productivity

- Project Specific Measure
  - Measured Mile
  - Earned Value
- Project Comparison
- Specialty Industry Study
  - Cumulative Impact of Change Orders
  - Acceleration Studies
  - Weather Impact Studies
- General Industry Studies
  - NECA Manual of Labor Units
  - Mechanical Contractors Association of America Labor Estimating Manual
  - US Army Corps of Engineers, Modification Impact Evaluation Guide
- Total Cost Method
  - Actual cost – planned cost

Class Exercise

You are an electrical contractor. Your crew has been asked to work an accelerated schedule requiring substantial overtime. Determine the direct labor costs (overtime premium) and impact costs (loss of productivity) associated with this request using the NECA Overtime Impact Tables.

You have a 10-man crew working 40 hours a week. The owner has requested acceleration to finish the project on time. He is requesting 60-hour work weeks for the next 5 weeks to complete the project. Straight time wages are $50 per hour. Overtime wages are $75 per hour.

He has GRACIOUSLY offered to pay the overtime differential.

20 OT hours per week x 5 weeks x 10 men = 1000 hrs.

1000 hrs. x $25/hour = $25,000

Are you going to settle for that?

NECA Overtime and Productivity Study

Week of Extended OT	50 hrs/wk	54-56 hrs/wk	60 hrs/wk	63 hrs/wk	70-72 hrs/wk	84 hrs/wk
1	0.95	0.94	0.91	0.89	0.86	0.75
2	0.93	0.90	0.88	0.84	0.80	0.70
3	0.92	0.86	0.85	0.78	0.73	0.65
4	0.91	0.83	0.81	0.73	0.68	0.60
5	0.85	0.79	0.76	0.67	0.63	0.55
6	0.86	0.75	0.72	0.62	0.58	0.50
7	0.76	0.72	0.67	0.58	0.54	0.47
8	0.77	0.70	0.64	0.55	0.51	0.44
9	0.74	0.68	0.62	0.54	0.50	0.43
10	0.72	0.66	0.61	0.52	0.49	0.42
11	0.72	0.65	0.60	0.51	0.48	0.41
12	0.71	0.64	0.59	0.50	0.47	0.40
13	0.69	0.63	0.56	0.49	0.46	0.39
14	0.68	0.62	0.55	0.48	0.45	0.38
15	0.67	0.61	0.54	0.47	0.44	0.37
16	0.66	0.60	0.53	0.46	0.43	0.36

NECA Overtime and Productivity in Electrical Construction, 1989

Class Exercise

Week 1:

- 91% efficient
- 9% loss of productivity
- 9% of 60 hours = 5.4 additional hours needed to stay close to productive
- 5.4 added hours x 10 men x $75/hour = $4,050
- 20 OT hours/man x 10 men x $25/hour = $5,000
- Week 1 total impact = $9,050

Week 2:

- 88% efficient
- 12% loss of productivity
- 12% of 60 hours = 7.2 additional hours needed to stay close to productive
- 7.2 added hours x 10 men x $75/hour = $5,400
- 20 OT hours/man x 10 men x $25/hour = $5,000
- Week 2 total impact = $10,400

Week 3:

- 85% efficient
- 15% loss of productivity
- 15% of 60 hours = 9 additional hours needed to stay close to productive
- 9 added hours x 10 men x $75/hour = $6,750
- 20 OT hours/man x 10 men x $25/hour = $5,000
- Week 3 total impact = $11,750

Week 4:

- 81% efficient
- 19% loss of productivity
- 19% of 60 hours = 11.4 additional hours needed to stay close to productive
- 11.4 added hours x 10 men x $75/hour = $8,550
- 20 OT hours/man x 10 men x $25/hour = $5,000
- Week 4 total impact = $13,550

Week 5:

- 76% efficient
- 24% loss of productivity
- 24% of 60 hours = 14.4 additional hours needed to stay close to productive
- 14.4 added hours x 10 men x $75/hour = $10,800
- 20 OT hours/man x 10 men x $25/hour = $ 5,000
- Week 5 total impact = $15,800

Totals:

- 1000 hours OT x $25/hour = $25,000
- 474 additional hours required x $75/hour = $35,550
- Change order requested $60,550
- AND DOUBLE TIME WAS NOT EVEN CONSIDERED IN THESE CALCULATIONS!

Negotiating the Change Order

Presenting/Negotiating the Change Order

- Do you like to negotiate?

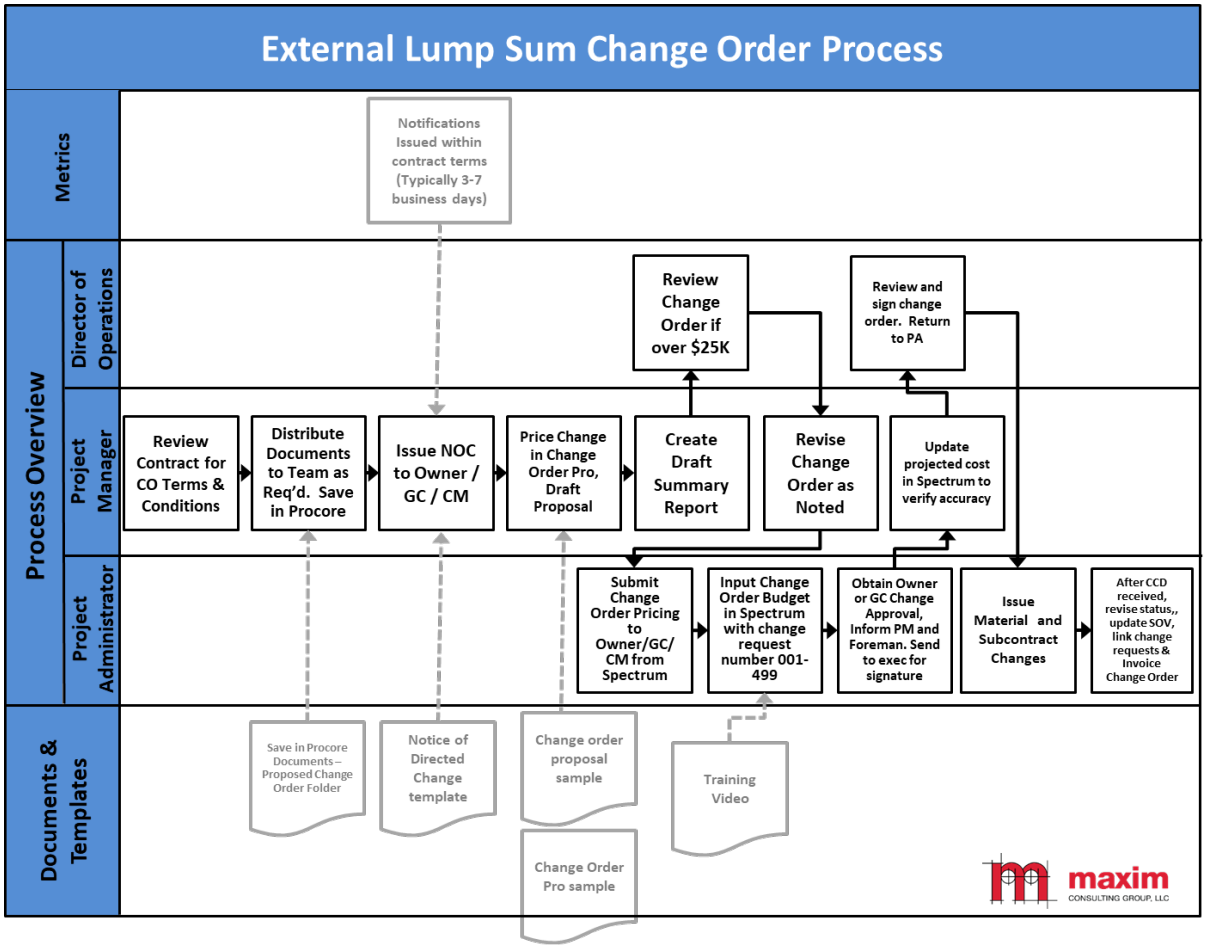
10 Tips for Successful Negotiating

1. Listen
2. Start with a small add or deduct
3. Do your homework – understand the contract
4. Do your homework – understand your estimate
5. Make sure the other party has the authority to finalize agreement
6. Explain the changed scope in detail and gain agreement on scope first
7. Discuss price only after scope is agreed to
8. Review direct costs and be prepared to justify pricing (refute the Home Depot argument)
9. Don't take it personally
10. Be prepared to walk away – know your BATNA

Managing Change Order Risk

Keys to Managing Change Risk

1. Standardize your change order process
2. Track change orders by status
3. Implement a change escalation policy



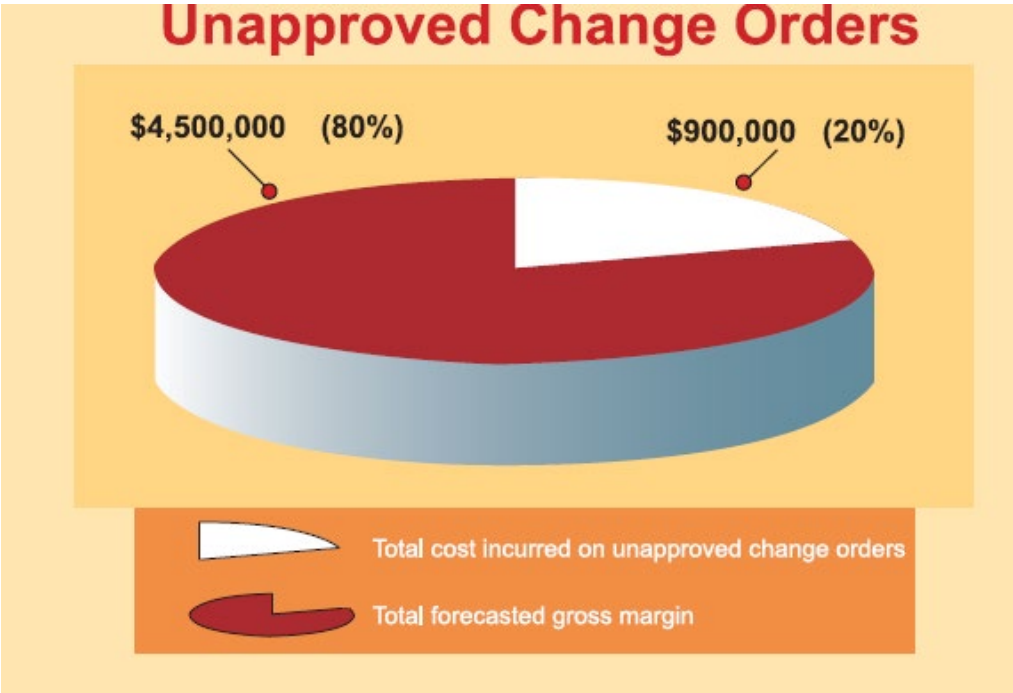
Change Order Status Codes

1. Received
2. No Cost
3. Submitted (no cost incurred)
4. Proceed Pending (costs incurred but no executed change)
5. Approved (change order received for signature)
6. Executed (fully executed change order received)
7. Cancelled or Void
8. Claim

Why so Many Status Codes?

In a word, **RISK**

Change Escalation Policy



No more than 5% of total contract value may be incurred on unapproved change orders without executive level approval.

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Recovery of Past Due Receivables

Days Past Due	Percent Recovered
30 Days	97%
90 Days	90%
120 Days	80%
180 Days	67%
1 Years	45%
2 Years	23%
3 Years	12%

Remember: Old receivables get older!!!

Massachusetts Prompt Pay Act

1. Prime, subcontractors, and suppliers are entitled to file a mechanic's lien where the prime contract is $3M or more
    a. Does not apply to residential projects of 4 or fewer units
2. How it works
    a. Payment applications
        i. "Reasonable time" period for submission of an application may not exceed 30 days
        ii. Payments based on progress, though milestones may still be a basis for payment, but pay requests cannot exceed 30 days between requests
        iii. Reasonable time for approval or rejection cannot exceed 15 days, though an additional 7 days granted to prime contractors for review and processing
        iv. Grounds for rejection are not prescribed by the law and subject to the parties' contract
3. How it works continued
    a. Payment applications
        i. Reasonable time for payment cannot exceed 45 days after approval
    b. Change orders
        i. Time period for approval or rejection cannot exceed 30 days after submission of the request or commencement of the changed work, whatever is greater
        ii. An additional 7 days is granted for the prime and each lower tier for a request from the tier below
        iii. If a change order request is neither approved nor rejected within the specified time, it's likewise deemed approved unless properly rejected
            1. Once approved, whether expressly or deemed, the change order request for payment may be submitted with the next payment application
4. Disputes
    a. Prompt pay act directs that the rejection of a payment application or a change order request is subject to the applicable dispute resolution procedure
    b. Any provision that requires a party to delay use of that procedure for more than 60 days is void and unenforceable
5. Pay if Paid
    a. Void and unenforceable with only 2 exceptions
        i. First exception is non payment due to failure in performance by the party seeking payment

6. Suspension of work
    a. npaid contractors and subs may not longer be forced to continue to work with 2 exceptions:
        i. Non payment is due to a dispute over the quality or quantity of work, typically involving defects
        ii. Non payment is due to a default occurring after approval of the payment, typically where the party seeking payment has defaulted in some other way
7. Unenforceable provisions
    a. Prompt pay is the law
    b. Provides that any contract provision which purports to waive or limit the terms of the law is void and unenforceable

Summary Wrap Up – Today We Covered

- Recognizing a Potential Change Order
- Preparing for the Change Order Process
- Pricing the Change Order
- Pricing Impact Costs
- Negotiating the Change Order
- Managing Change Order Risk
- Massachusetts Prompt Pay Act

Select One Change Order Habit to Change

1. Old habit:

_____

2. New habit:

_____

3. Initial steps to implement:

_____

_____

_____

4. Who will help:

_____

5. How will they help:

_____

_____

6. Identify a checkpoint for yourself to see how you are doing with this new habit:

_____

Speaker Bio

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Career History

- Maxim Consulting Group
  Director
  (2011-current)
- Turnupseed Electric
  Division Manager
  (2010-2011)
- A-C Electric Company, Inc.
  Division Manager
  (1998-2010)
- Gates Electric Company
  (1985-1998)

Background

Stephane McShane is a Director at Maxim Consulting Group responsible for the evaluation and implementation processes with our clients. Stephane works with construction related firms of all sizes to evaluate business practices and assist with management challenges. With a large depth of experience working in the construction industry, Stephane is keenly aware of the business and, most specifically, operational challenges that firms face. Her areas of expertise include: Leadership development, executive coaching, organizational assessments, strategic planning, project execution, business development, productivity improvement, and training programs. Mrs. McShane is an internationally recognized speaker, mentor, author, and teacher. Her ability to motivate, inspire, and create confidence among your work groups is extremely rare and very effective.

Professional and Industry Experience

Stephane possesses the rare combination of talent from being in the field as an apprentice, electrician, foreman, then working her way through each operational chair within a successful electrical construction firm. Her ability and drive defined her to be "best in class" at each position held. This talent is what makes her tremendously effective at operational and organizational assessments today. She has successfully conquered every operational position from being an estimating trainee through executive management. She has built, trained, and led her teams to become the undisputed leaders in their markets. She is able to quickly identify organizational positives and negatives and assess appropriate action steps and throughputs.