Managing Project Risk and Design Claims Avoidance:

A Roadmap for Success or Failure

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Managing Risk

Risk Recognition, Analysis and Management of Public Projects

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What You Will Learn

- The five most common causes for public projects to exceed budget and become delayed.
- How to analyze project risk and develop a plan to eliminate or mitigate the effects of project risk
- The six rules to deal with project risk

Some Case Studies

- California High Speed Rail, Fresno, California
- Anderson Bridge, Boston, Massachusetts
- Alarcon Street, Prescott, Arizona

California High Speed Rail

- Est $400 M on a $1B Contract
- Right of Way
- Utility issues and claims
- Roadway Relocation – community request

Anderson Bridge

- Est cost: $20 M, current cost: $26M
- 22 Months behind Schedule
- Permitting Issues – Historic Bridge
- Utility Issues – Permits
- Ped. Underpass added – public acceptance

Alarcon Street – Prescott, Arizona

(My home Town)

- Scheduled 5/15 revised 7/31
- Original cost $1M; rev ?
- Rain
- Underground conditions – soils, ground water

What's Common Among These Projects

- All delayed
- All over budget
- All in the newspaper
- All reflect poorly on government ability to deliver

Top Five Reasons:

1. Failure to obtain ROW
2. Utility issues
3. Permitting issues
4. Public/political acceptance
5. Underground Conditions

Not a New Issue/Not Unique To US

- Erie Canal – late and 46% over budget
- AASHTO 2007 Study:
  - 54% over budget
  - 47% delivered late
- Flyvberg study, 258 large projects in 20 European countries: 96% over budget.
- Great Britain's Major Project Leadership Academy

Why?

- Managerial issues
- Organizational shortcomings
- Project management lapses
  - Risk Management

Donald Rumsfeld on Risk Management

- *There are known "known's". These are things we know that we know.*
- *There are known "unknowns". That is to say, there are things that we know we don't know.*
- *But there are also unknown "unknowns". There are things we don't know we don't know.*

Types of Risk

- Known: You know what the risk is
  - Example: Unknown underground utilities
- Known - Unknown: You know that you don't know what the risk might be
  - Example: Public acceptance of a project
- Unknown – unknown:
  - Example: Sudden departure of the project manager

Steps in Risk Management

1. Identify the Risk (Known & Unknown)
2. Assess the impacts on CSF's (Critical Success Factors)
3. Develop means of eliminating the risk
4. Develop means of mitigating the risk

The Formal Risk Analysis and Management Meeting

- At least three formal meetings:
  - At kick off
  - At Plan in Hand review
  - Just before release for construction
- Entire team including construction and O&M personnel
- Since risk recognition is a continuous process, consider both current and new risks.
- Field review if practical (Note; Plan in Hand and release involve field review)

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Risk Management Plan

Example: Design and construction of a new water distribution system.

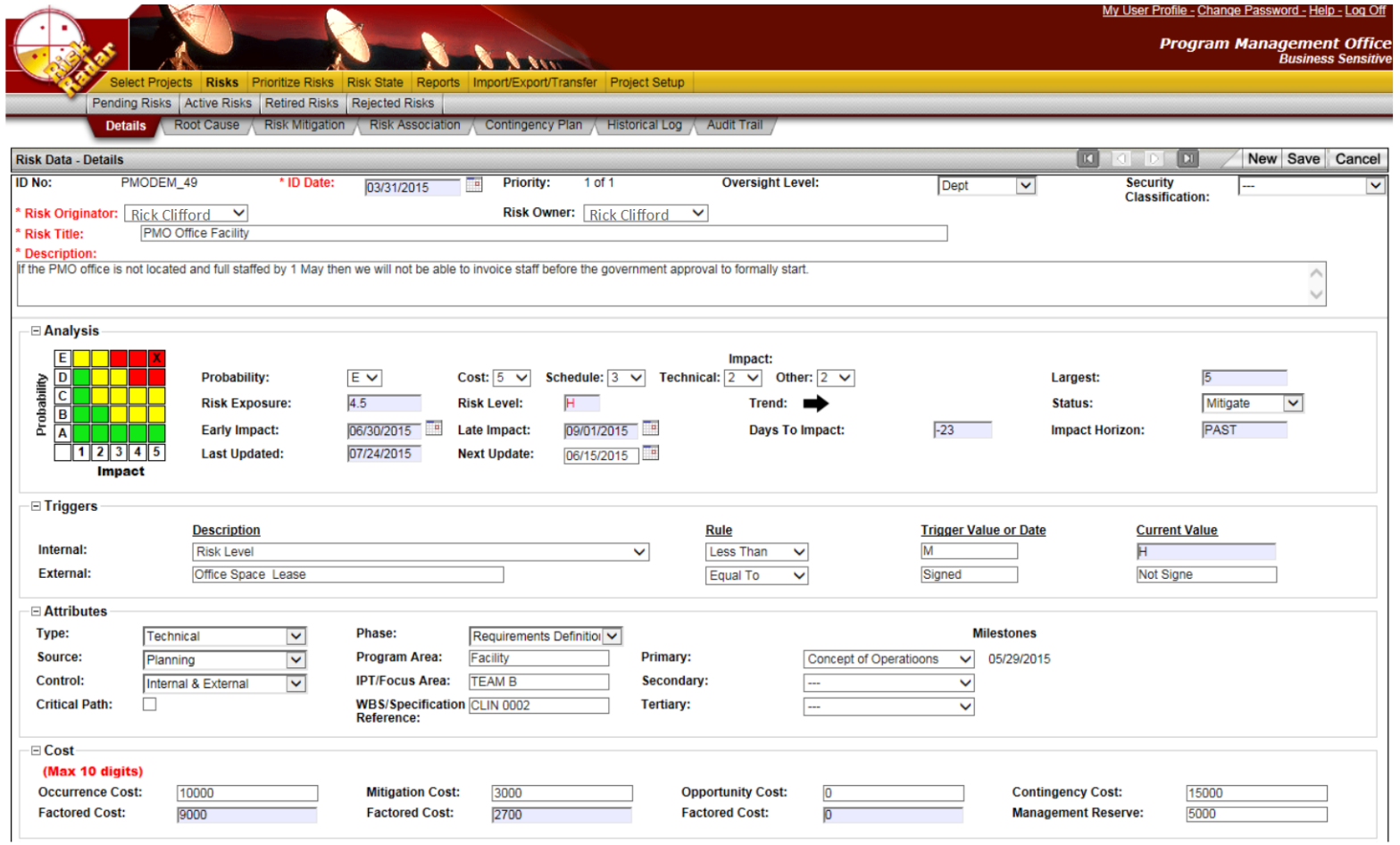
What Risks May Affect Our Critical Success Factors?	*What Are the Potential Impacts of These Risks?*	*What Can We Do to Eliminate These Risks?*	*What Can We Do to Mitigate These Risks?*
1. Delays in obtaining easements and ROWs	■ Delay completion date	■ Update approval status of each parcel every week	■ Contact owners as soon as delays are anticipated
2. Conflicts with existing utilities	■ Delay construction ■ Increase traffic disruptions ■ Increase costs	■ Pothole congested areas	■ Use unit prices in bid ■ Include allowances for utility relocation
3. Old pipelines may not withstand extra pressure	■ Unexpected "geysers" ■ Flooded basements ■ Water outages	■ Pressure test existing lines	■ Repair crews on 24-hour notice during hydro-testing

Risk Matrix

Priority = Severity x Probability

		Consequence Severity				
		Insignificant	Minor	Moderate	Major	Catastrophic
Event Probability	Rare	Low	Low	Low	Medium	Medium
	Unlikely	Low	Low	Medium	Medium	High
	Possible	Low	Medium	Medium	High	High
	Likely	Medium	Medium	High	High	Very High
	Frequent	Medium	High	High	Very High	Extreme

Risk Details Screen



What Are the Highest Priority Risks on Your Project?

Risks (Internal & External)	Severity x Probability = Priority		

Legend:
1 = lowest
5 = highest

Be Sure Everyone Understands Who Owns the Risks

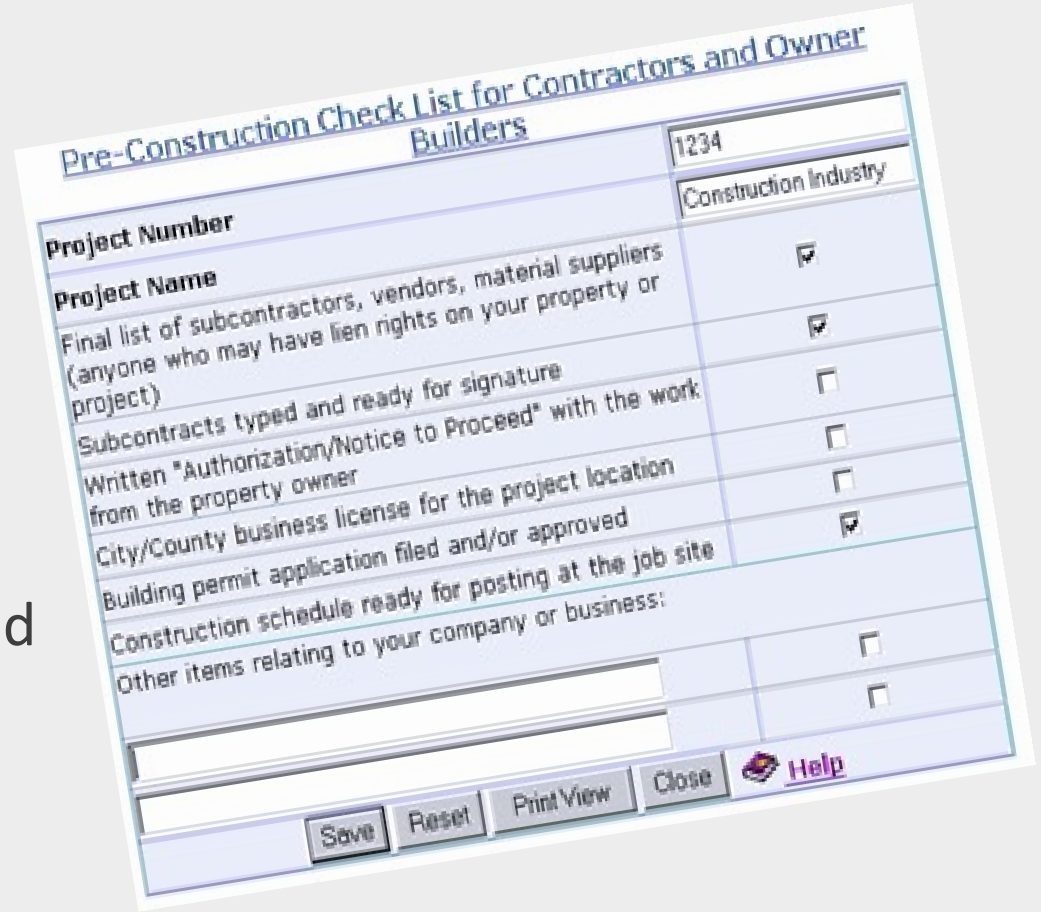
Project : Applegate Bridge			
Risk	**Risk Owner**		
	Owner	**Designer**	**Contractor**
Traffic forecasts	✓		
Accuracy of record drawings	✓		
Conforming with laws and regulations		✓	
Conforming to industry standard design practices		✓	
Unanticipated field conditions	✓		
Failure to comply with plans & specs			✓
Failure to meet industry standard construction practices			✓

Release For Construction Protocol – A Best Practice

- In what phase of the project does the highest risk occur?
  - Planning
  - Design
  - Construction

“Ready for Construction” Verification

- ✓ Based on your agency projects
- ✓ Modify as necessary for specific projects
- ✓ Use past data on “things that bite us”
- ✓ Monitor improvement and change/add as necessary
- ✓ Make this a “must use” protocol.



Release for Construction Checklist

- Plans have been checked by design team in the field within the previous thirty (30) calendar days and any resulting issues have been resolved.
- Design and construction references have been checked, are appropriate and are specifically identified by date and/or edition number.
- The spatial datum (benchmark) has been identified, properly referenced and located in the field, and adjacent existing improvements are referenced to the same datum.
- Specifications are not in conflict with the plans. In those instances where plans need to contain specifications for clarification of the design, the PM will verify that the reference is identified with the specifications.
- There is a set of check prints on file verifying that the plans have been checked
- Issues raised and errors found in the review processes (40%, 70%, etc.) are reconciled and/or corrected in the final documents.
- Pavement design has been reviewed and approved.
- The IGA, if any, has been fully executed.
- Environmental issues have been resolved.
- Utility issues have been resolved.
- Right of Way has been acquired and issues resolved.
- Possible need for updated public notice or involvement has been evaluated.

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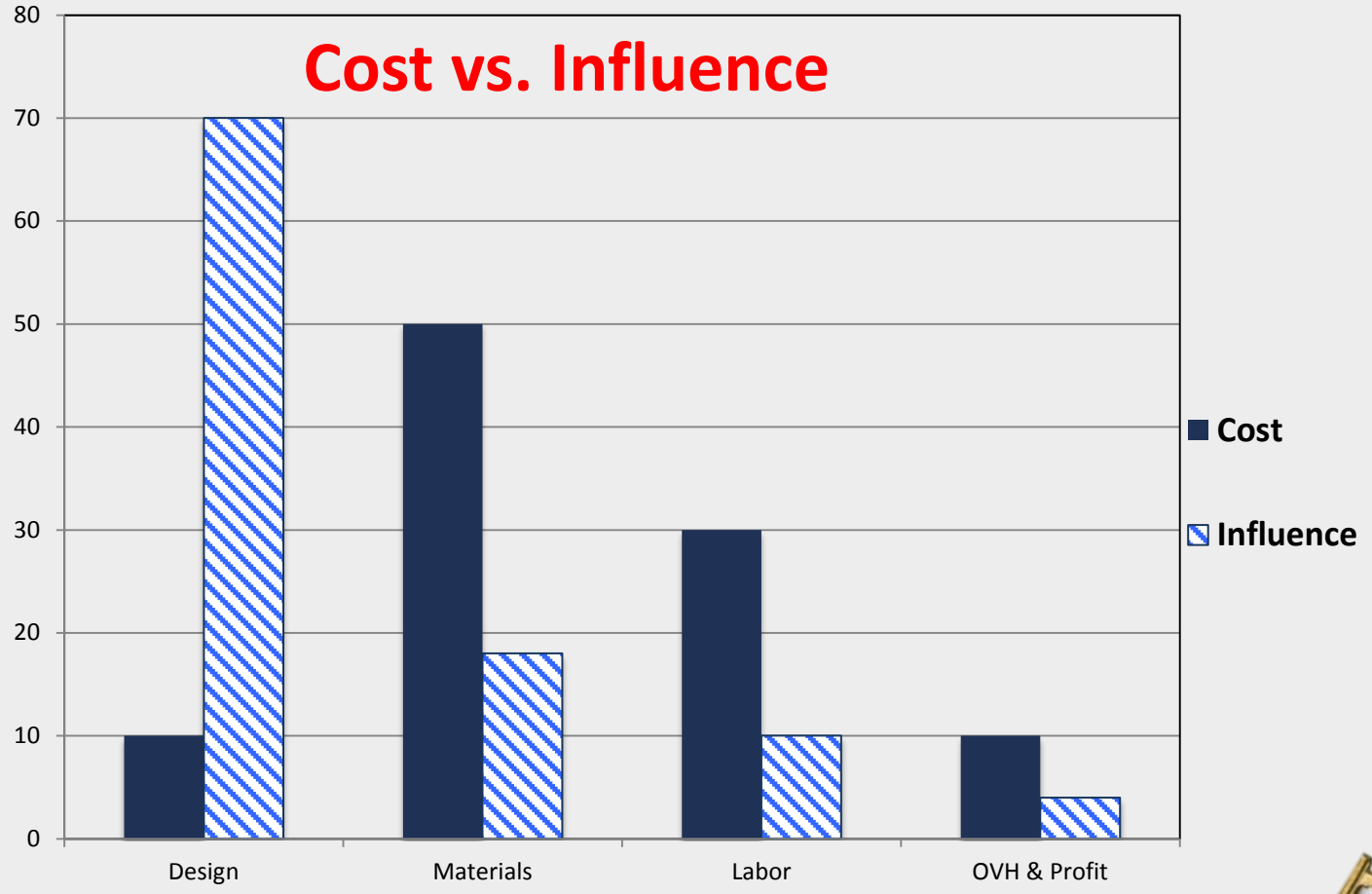
Six Risk Management Rules

1. Risk Recognition and Management are part of your PMP
2. Identify risks early and often – what are the “known unknowns?”
3. Identify risk elimination and mitigation strategies
4. Identify who “owns” the risk
5. Prioritize
6. Track the risks

Take Away

- Risk Management is a fundamental function of the Project Manager
- Risk Analysis must be part of your PM protocol
- Consider risk potential, impact and means of elimination and mitigation
- Some risk must be accepted
- REMEMBER: DELAY IS THE LEADING CAUSE OF CONSTRUCTION CLAIMS

What Really Controls Project Costs?



Courtesy: Resolution Management Consultants

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Resources

- **PSMJ Resources**: Project Management Training, Surveys, Publications and Manuals on business of A/E/C firms and agencies. www.psmj.com. or Mellegood@psmj.com
- **Pro-Concepts:** Risk management application -Risk Radar Enterprise www.proconceptsllc.com or Laurie.McCabe@proconceptsllc.com

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