Best Practices for Mitigating Risk on Construction Projects

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Chief Administrative Officer Crossland Construction Company
To Earn CEUs for this Session

Participants must:
1. Check in with attendance proctor at the door.
2. Attend at least 95% of the session.
3. Complete the post-program evaluation.
4. Complete a brief assessment with a score of 75% or greater.

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Learning Objectives

By attending this session participants will be able to:

1. Compare their experience of risk against industry benchmarks established in the Dodge Data & Analytics study.
2. Identify the most important risks based on both frequency and cost impact, by project sector and size of firm, so that they can determine more targeted and effective risk management strategies before problems arise.
3. Advocate driving change in their organization by learning about the most important triggers and obstacles to increased investment in risk planning and mitigation.
4. Examine how approaches like Lean Construction and Integrated Project Delivery can help manage risk effectively in projects.
Agenda

• Data: Risk and Owner Performance Studies

• Panel Discussion About Risk and Best Practices

• Audience Questions
Two Studies

Risk
- Over 500 participants: Owners, GCs, Trade Contractors
- Study conducted online
- Summer 2016

LCI Owner Satisfaction and Project Performance
- 81 Owners providing information on two of their projects: best and typical
  - Establish the difference in performance
  - Look at what they are doing differently on each
- Conducted online in 1st and 2nd quarters of 2016
RISK: Experienced a Dispute or Claim in Last 5 Years

Owners: 77%
GCs: 83%
Trades: 60%

Source: Managing Risk in the Construction Industry SmartMarket Report, Dodge Data & Analytics, 2017
**RISK:** Most Frequent and Most Costly Disputes

- **Ranked First for Highest Number of Disputes/Claims**
  - 31% Claims Arising From Construction Defects
  - 26% Warranty Issues
  - 38% Subcontractor Default, Termination or Failure
  - 44% NA

- **Ranked First for Most Costly Disputes/Claims**
  - 36% Claims Arising From Construction Defects
  - 27% Warranty Issues
  - 26% Subcontractor Default, Termination or Failure
  - 41% NA
**RISK:** High Risk Factors: Strategic

- **Brand/Reputation Risks:**
  - Owners: 14%
  - GCs: 6%
  - Trade Contractors: 1%

- **Contractual Specification of Risk:**
  - Owners: 13%
  - GCs: 27%
  - Trade Contractors: 27%

Source: Managing Risk in the Construction Industry SmartMarket Report, Dodge Data & Analytics, 2017
**RISK:** High Risk Factors: Operational

Source: Managing Risk in the Construction Industry SmartMarket Report, Dodge Data & Analytics, 2017
**RISK:** High Risk Factors: Financial

- **Contractual Risks (Owners of Project Specs, Warranty Guarantees, etc.)**
  - Owners: 13%
  - GCs: 22%
  - Trade Contractors: 25%

- **Delays in Payment, Claims**
  - Owners: 5%
  - GCs: 19%
  - Trade Contractors: 25%

- **Project Financing and Pay-Terms Risks**
  - Owners: 4%
  - GCs: 9%
  - Trade Contractors: 11%

*Source: Managing Risk in the Construction Industry SmartMarket Report, Dodge Data & Analytics, 2017*
**RISK:** High Risk Factors: Hazards

- **Insufficient Quality Risks:**
  - Owners: 10%
  - GCs: 6%
  - Trade Contractors: 1%

- **Unsafe Workforce Behavior:**
  - Owners: 8%
  - GCs: 16%
  - Trade Contractors: 11%

- **Negligence Risks:**
  - Owners: 8%
  - GCs: 12%
  - Trade Contractors: 10%

Source: Managing Risk in the Construction Industry SmartMarket Report, Dodge Data & Analytics, 2017
**RISK:** Top Three High Risk Factors by Player

**Owners**
1. Planning/Scope Changes
2. Schedule Changes
3. Cost Escalation

**GCs**
1. Labor Procurement/Subcontract Management
2. Contractual Specification of Risk
3. Schedule Changes

**Trades**
1. Schedule Changes
2. Contractual Specification of Risk
3. Delays in Payment/Claims

Source: Managing Risk in the Construction Industry SmartMarket Report, Dodge Data & Analytics, 2017
**RISK:** Risk Evaluation Strategies

- **Formal Brainstorming With Team:** 71%
- **Checklists/Forms/Risk Registers:** 71%
- **Expert Input From Internal Resources:** 66%
- **Expert Input From External Resources:** 50%

Source: Managing Risk in the Construction Industry SmartMarket Report, Dodge Data & Analytics, 2017
**RISK:** Risk Evaluation Strategies

- **Formal Brainstorming With Team:** 71%
  - 54% used
  - 54% ranked first for effectiveness

- **Checklists/Forms/Risk Registers:** 71%
  - 24% used
  - 24% ranked first for effectiveness

- **Expert Input From Internal Resources:** 66%
  - 32% used
  - 32% ranked first for effectiveness

- **Expert Input From External Resources:** 50%
  - 19% used
  - 19% ranked first for effectiveness

Source: Managing Risk in the Construction Industry SmartMarket Report, Dodge Data & Analytics, 2017
**RISK:** Timing of Risk Evaluation Strategies:

**Formal Brainstorming With Team**

- Owners
- GCs
- Trade Contractors

**Expert Input From External Resources**

- Owners
- GCs
- Trade Contractors

Source: Managing Risk in the Construction Industry SmartMarket Report, Dodge Data & Analytics, 2017
**RISK:** Top GC Benefits of Formal Brainstorming:

- Increased Reliability in Overall Project Performance: 57%
- Improved Project Safety: 35%
- Improved Project Schedule: 28%
- Increased Client Satisfaction: 33%
- Reduced Cost of Construction: 30%
- Increased Ability to Innovate: 26%

Source: Managing Risk in the Construction Industry SmartMarket Report, Dodge Data & Analytics, 2017
**RISK**: Risk Mitigation Strategies

- **Regular Team Meetings on Risk**: 66%
- **Develop Risk Management Plan**: 62%
- **Contingency Planning**: 52%
- **Risk Prioritization**: 32%
- **Tracking Risk Metrics Across Projects**: 32%
- **Special Teams to Monitor and Mitigate Risk**: 23%

Source: Managing Risk in the Construction Industry SmartMarket Report, Dodge Data & Analytics, 2017
**RISK: Risk Mitigation Strategies**

- **Regular Team Meetings on Risk:** 66%
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Source: Managing Risk in the Construction Industry SmartMarket Report, Dodge Data & Analytics, 2017
RISK: Top GC Benefits of Team Risk Meetings:

- Increased Reliability in Overall Project Performance: 49% (Owners), 47% (GCs), 40% (Trade Contractors)
- Improved Project Safety: 22% (Owners), 38% (GCs), 37% (Trade Contractors)
- Improved Project Schedule: 28% (Owners), 35% (GCs), 25% (Trade Contractors)
- Increased Client Satisfaction: NA
- Maintain Original Intent for Level of Project Quality: 42% (Owners), 26% (GCs), 22% (Trade Contractors)
- Reduced Rework: 27% (Owners), 20% (GCs), 22% (Trade Contractors)

Source: Managing Risk in the Construction Industry SmartMarket Report, Dodge Data & Analytics, 2017
**RISK:** Top 4 Obstacles to Risk Management:

1. **Lack of Knowledge About Risk Mitigation Strategies**
   - Owners: 47%
   - GCs: 30%
   - Trade Contractors: 27%

2. **Lack of Awareness of Cost of Risk**
   - Owners: 39%
   - GCs: 29%
   - Trade Contractors: 23%

3. **Lack of Industry Standards for Evaluating and Managing Risk**
   - Owners: 36%
   - GCs: 20%
   - Trade Contractors: 24%

4. **Lack of Cooperation/Information Flow Between Design and Construction Team**
   - Owners: 32%
   - GCs: 32%
   - Trade Contractors: 38%

Source: Managing Risk in the Construction Industry SmartMarket Report, Dodge Data & Analytics, 2017
### Top 7 Causes of Uncertainty

<table>
<thead>
<tr>
<th>Cause</th>
<th>Owner</th>
<th>Architect</th>
<th>Contractor</th>
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<tbody>
<tr>
<td>Unforeseen Site or Construction Issues</td>
<td>1</td>
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<tr>
<td>Accelerated Schedule</td>
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### Ranking of Importance

**Source:** Managing Risk in the Construction Industry SmartMarket Report, Dodge Data & Analytics, 2017
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Source: Managing Risk in the Construction Industry SmartMarket Report, Dodge Data & Analytics, 2017
### RELATED FINDING:

#### Top 7 Causes of Uncertainty

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Source: Managing Risk in the Construction Industry SmartMarket Report, Dodge Data & Analytics, 2017
GOAL: Increasing Reliability in Project Performance

- Formal Brainstorming With Team: 57%
- Regular Meetings of Full Project Team Focused on Risk: 49%
- Expert Input From Internal Resources: 45%
- Developing a Plan to Manage Risk: 45%
- Regular Meetings of Full Project Team Focused on Risk: 44%
- Expert Input From Internal Resources: 37%

(% who rank it in their top 3 most effective)

Source: Managing Risk in the Construction Industry SmartMarket Report, Dodge Data & Analytics, 2017
GOAL: Reducing the Cost of Construction

- Expert Input From Internal Resources: 24% (30%)
- Formal Brainstorming With Team: 30%
- Expert Input From External Resources: 31%
- Developing a Plan to Manage Risk: 24% (25%)
- Regular Meetings of Full Project Team Focused on Risk: 25%
- Formal Brainstorming With Team: 36%

(% who rank it in their top 3 most effective)

Source: Managing Risk in the Construction Industry SmartMarket Report, Dodge Data & Analytics, 2017
GOAL: Improving Project Schedule

- Checklists Forms Risk Registers: 24%
- Expert Input From Internal Resources: 30%
- Contingency Planning: 31%
- Formal Brainstorming With Team: 24%
- Regular Meetings of Full Project Team Focused on Risk: 25%
- Contingency Planning: 36%

(% who rank it in their top 3 most effective)

Source: Managing Risk in the Construction Industry SmartMarket Report, Dodge Data & Analytics, 2017
KEY TREND: Increased Collaboration Reduces Risk

Agree That Increased Collaboration With Other Members of the Project Team Reduces Risk

Source: Managing Risk in the Construction Industry SmartMarket Report, Dodge Data & Analytics, 2017
KEY TREND: Positive Impact of BIM on Risk

Owners: 66% Agree That BIM Reduces Risk
Contractors: 56% Agree That BIM Reduces Risk

Source: Managing Risk in the Construction Industry SmartMarket Report, Dodge Data & Analytics, 2017
KEY TREND: Positive Impact of Lean Construction on Risk

Agree That Lean Design and Construction Reduces Risk

39%

Source: Managing Risk in the Construction Industry SmartMarket Report, Dodge Data & Analytics, 2017
RELATED FINDINGS: Performance from Approval of Capital Project
(% of Best/ Typical Projects)

Completed Ahead of Schedule
- Best Project: 24% (21%)
- Typical Project: 6% (-61%)
- Completed Behind Schedule
- Best Project: -21%
- Typical Project: -46%

Completed Under Budget
- Best Project: 46% (49%)
- Typical Project: 10% (-49%)

Completed Behind Schedule
- Best Project: -17%
- Typical Project: -49%

Total (n=81)
RELATED FINDINGS: Timing of Key Stakeholder Engagement

**Best Projects:**
76% engage key stakeholders before or during conceptualization

**Typical Projects:**
42% don’t engage key stakeholders until design development or later

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<th>Stages</th>
<th>Typical</th>
<th>Best Performing</th>
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<tr>
<td>Pre-business case</td>
<td>9%</td>
<td>3%</td>
</tr>
<tr>
<td>Business case validation (pre-design)</td>
<td>9%</td>
<td>25%</td>
</tr>
<tr>
<td>During conceptualization (0-15% design)</td>
<td>22%</td>
<td>42%</td>
</tr>
<tr>
<td>During schematic design (15-30%)</td>
<td>15%</td>
<td>7%</td>
</tr>
<tr>
<td>During design development (30-60%)</td>
<td>17%</td>
<td>11%</td>
</tr>
<tr>
<td>During construction documents (60-90%)</td>
<td>16%</td>
<td>3%</td>
</tr>
<tr>
<td>End of construction documents or later (100% CD)</td>
<td>9%</td>
<td>4%</td>
</tr>
</tbody>
</table>
**RELATED FINDINGS:** Project Management Methods

**Methods with Most Degree of Difference Between Usage**

- **Co-location Big Room**: 6% Typical, 44% Best Performing Projects
- **Target Value Design**: 6% Typical, 40% Best Performing Projects
- **Prefab/Modularization**: 17% Typical, 49% Best Performing Projects
- **Conceptual/Continuous Estimating**: 22% Typical, 48% Best Performing Projects
- **Full-team On-boarding**: 17% Typical, 41% Best Performing Projects
- **BIM Design authoring**: 17% Typical, 41% Best Performing Projects
- **A3 Thinking**: 5% Typical, 27% Best Performing Projects
- **Last Planner System®**: 19% Typical, 40% Best Performing Projects
RELATED FINDINGS: Top 5 Team-Related Methods

- Co-location Big Room
  - Typical: 6%
  - Best Performing Projects: 44%

- Visual Management
  - Typical: 5%
  - Best Performing Projects: 22%

- Full-team On-boarding
  - Typical: 17%
  - Best Performing Projects: 41%

- Root cause analysis
  - Typical: 11%
  - Best Performing Projects: 25%

- A3 Thinking
  - Typical: 5%
  - Best Performing Projects: 27%
Correlation of lean intensity to outcomes on best projects (% likelihood)

- Completed Ahead of Schedule:
  - Low Lean Intensity
  - High Lean Intensity

- Completed Under Budget:
  - Low Lean Intensity
  - High Lean Intensity

- Lean Intensity vs Schedule & Budget:
  - 3X
  - 2X
Panelist Insights

Bevan Mace, PhD
Vice President of National Operations & Lean
Balfour Beatty

David Allison, CPA, CCIFP
Chief Administrative Officer
Crossland Construction Company
SUMMARY

• Strong correlation to risk reduction:
  • Evaluation: Formal Brainstorming with Team
  • Mitigation: Regular Risk-focused Meetings

• Seek external input prior to start of construction
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