

RiskTopics

Hazard identification and risk register for construction

Zurich Resilience Solutions - Risk Engineering

Contractors need the right controls in place to prevent incidents, serious injuries or property damage arising from the hazards and associated risks encountered during all phases of a project. Assessing and managing project risk is a complex task, and the right tools and guidelines are needed to help owners, design professionals and contractors assess the diverse set of political, geographic, economic, environmental, regulatory, security, and cultural risks a project faces.

Introduction

Hazard identification is an important part of any risk management plan for construction projects. A risk register can be used to help identify, track, and mitigate risk exposures.

Discussion

The Risks should be identified, defined, and evaluated based on their possible causes, potential outcomes, and associated risks. Each risk should be rated based on their priority, severity, potential impact, and probability. Each risk should have an associated control measure. Each risk should be assigned to an individual for responsibility. Risks should be discussed among the entire project team as each member may have seen risks arising from unexpected causes on other projects.

All the phases of construction should all be reviewed. In each phase, identify and categorize construction risks.

The Simplified Project Phases of Construction



Risk Registers should be tailored to the project type and size. Risk registers can define basic risks on lower risk projects or can be complex for projects with major hazards and operations. Below is an example of what might be included in a Hazard Identification/Risk Register:

Risk Register Example:

Project Risk Register														
Company Name														
Project Name						Project Manager			Project Number		Update Date			
Contractor Project Risks by Phase														
Risk ID#	Entry ID	Risk (description) By Project Phase	Date raised	Impact	Probability	Project Severity	Mitigation Measures	Ownership	Adjusted Impact	Adjusted Probability	Adjusted Severity	Status	Last Review Date	Date Closed
1.00	PM	Conceptual Design												
1.10														
1.20														
2.00	PM	Finance and Business Plan												
2.10														
2.20														
3.00	PM	Design and Engineering												
3.10														
3.20														
4.00	PM	Procurement and Mobilization												
4.10														
4.20														
5.00	PM	Engineering and Construction												
5.10														
5.20														
6.00	PM	Testing and Punch Out												
6.10														
6.10														
7.00	PM	Operations and Maintenance												
7.10														
7.20														

Risk Register Example by Zurich Risk Engineering

Guidance

Create a risk register before the project begins. It should be monitored at least weekly and updated regularly as a function of the project management protocol and should include input from critical subcontractors and suppliers / vendors who may have valuable insights. It is also important to note that identification of certain risks may be developed from historical experience and loss data. Periodic reviews of warranty and call-back service may reveal construction elements and operations that should be considered for the risk register. Similarly, internet searches for legal action or claims in the industry may also contribute to risk identification and mitigation efforts.

- Define potential risks. Some examples are:
 - Labor Considerations– Skilled trade availability in busy markets or remote areas
 - Equipment and Material Procurement/ Schedule impacts / Long lead items
 - Staffing– Adequate and qualified PM's and supporting administration personnel
 - Lifting and Rigging operations
 - Fire and explosion potentials for gas/electrical/steam services
 - Collapse– pre-cast erection / false work / shoring / scaffolding / excavations / Support of excavation (SOE)
 - Public Safety– Barriers / advisory signage
 - Traffic congestion/collision potential - deliveries
 - Theft/Security/on and off-site material storage
 - Site Access – controlled access points
 - Night Operations and supervision
 - Noise – monitoring and mitigation
 - Building envelope - Water infiltration / Internal and external wet systems
 - Vibration/damage to adjacent structures
 - Emergency Procedures – accidents, emergency services access, emergency exit plans
 - Confined Spaces – proper training and emergency response
 - Natural Disaster Potentials: Flooding, Earthquake, Windstorms, Tornados

- Elevated Work Platforms, ladders, scaffolding
- Flammable Materials – construction projects/ignition sources
- High Pressure Hazards
- High Voltage Hazards
- Job Specific Hazards – including new or un-tested methods, materials or technologies
- Possible Impacts
 - Injury or death
 - Environmental impact
 - Property Damage
 - Large Financial Loss
 - Disruption in schedule
 - Damage to Reputation
 - Unacceptable Public Safety or Worker Safety Risk
- Probability
 - Probability can be defined as the likelihood the risk will occur with noticeable impact on the project.
 - Can range from unlikely to very likely or very low to very high and impact can range from very low to very high

Probability/Risk Rating
Very High /Very Likely
High/Likely
Moderate/ Possible
Low/Rare
Very Low /Unlikley

- Project Severity
 - Can be simply defined as low to very high severity
 - Depending on type and size of project, can be narrowly defined by categories ranging from very low to catastrophic.

Severity
Very High /Very Likely/Catastrophic
High/Likely
Moderate/ Possible
Low/Rare
Very Low /Unlikley

- Mitigation Measures
 - Identify and plan risk mitigations or control measures. Mitigation plans and control measures should reduce the overall unmitigated risk rating to an acceptable level for the project stakeholders. Some examples of types of risk mitigation plans are:
 - Hurricane Action Plan
 - Hot Work Program
 - Site Security Plan
 - Crane Safety Plan/Critical Lift Plans
 - Crisis Management Plan
 - Contingency Plan that document strategies to allow for a timely resumption of construction activities, after a loss, to minimize the effect of unanticipated disturbances. The strategies should be specific to the project.

- Ownership - Each risk should be assigned to an individual for monitoring and follow up. Performance and effectiveness reviews should be team-based and documented.
- Each risk should be re-evaluated based on mitigation measures and real time performance. The impact, probability and severity should be categorized based on this re-evaluation.

Conclusion

Reviewing potential hazards and risks is a proactive approach to evaluating risk on any construction project. Risks should be evaluated prior to the start of any project, reviewed, and updated regularly along with mitigation plans, control measures and assigned responsibilities.

A risk register should be concise and followed by all jobsite personnel with program monitoring by senior project management

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Other related Zurich RiskTopics

- Job hazard analysis (JHA) for construction
- Activity hazard analysis (AHA) for construction
- Daily hazard analysis (DHA) for construction

July 2023

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