

# Generic Risk Mapping | Civil Engineering Projects

| External 3d Parties   | Site  | Project Management  | Engineering, Technology, Cost  | Organization, Top Management  | Market, Vendors   | Commissioning, Handover, O&M  |
|---|---|---|--|---|---|---|
| <b>Statutory, Permits</b><br>urban/regional plan, complex permitting processes, Building Permit requirements  | <b>Soil and Sub Soil, underwater</b><br>geology, soil types, irregular findings, earthquakes, hydrology, underwater   | <b>Manpower, Resources</b><br>Lack of experience/capabilities/competencies, team stability  | <b>Engineering</b><br>not clear requirements/SOW, engineering assumptions, lack of VE, lack of experience/knowledge, software gaps, changes in design, lack of SMEs, design not completed/not accurate | <b>Priority</b><br>dependency in other projects, in interfaces, decision makers, allocation of budget   | <b>Contractors and Sub Contractors</b> lack of, not experienced/qualified/certified, lack of manpower, financial robustness, overloads, payment terms, availability | <b>Start up, Commissioning, Handover</b> Long processes, many interfaces, PTO procedures, authorities permits |
| <b>Environmental impacts</b><br>MOE requirements, EIA, green parties, noise, vibrations, dust, mud, flora & fauna, damages, hazardous materials, blast, contamination, recycling and conservation, green building | <b>Infrastructure and roads</b><br>access impact on adjacent facilities & infrastructure, relocation, unknown infrastructures, access roads to site, traffic arrangements | <b>Culture Gap</b><br>remote control, language gaps, managerial gaps, communication, different working hours, project's objectives terminology, religions, costumes, managerial methodology | <b>Technology</b><br>lack of technology/unknown/not available/not proven/no regulation, complexity in implementation   | <b>Organizational Culture</b><br>complex processes, organizational interfaces, matrix orgchart, decision making length, procedures, risk appetite, union  | <b>Raw Materials, Supplies, Goods</b> lack of, special materials/items, LLIs, imported, raw materials, resources of   | <b>Operation</b> Complex procedure, impacts of project over operation aspects (cost, SLA, performance)        |
| <b>Authorities</b><br>requirements, interfaces, drainage, MOD, IDF, IAI, traffic, local and regional authorities  | <b>Archeology and Conservation</b><br>findings, antiquities, conservation, graves, old buildings, restoration   | <b>Payments</b><br>payments ethics & moral, extreme terms of payments, delay in payments  | <b>Equipment</b><br>lack of, availability, complexity in operation, knowledge, LLIs  | <b>Organizational resources</b> lack of resources, unexperienced resources, capabilities  | <b>Suppliers</b> lack of, single vendor, payment terms, LoCs, down payments needed  | <b>Maintenance</b> complex maintenance, special spare parts and its availability, fast wear, high costs       |
| <b>Emergency Forces</b><br>police, Red Cross, MDA, fire brigade, HFC  | <b>Properties, Expropriation</b><br>availability of land, landlords, disruption, compensation   | <b>Schedule</b><br>aggressive, not realistic, critical milestones, hidden critical paths, limited working hours, wrong assumptions regarding durations                                      | <b>Surveys, Data, Mapping</b><br>lack of accuracy, data, availability, validity, mapping   | <b>Procurement and Contracting</b><br>priorities, complex/long processes, contracts structure, global procurement, LLIs, single vendor, suppliers' certification, insurance requirements, bonds requirements, RFT | <b>Designers and Consultants</b><br>lack of, not experienced/qualified/certified, away from site, global  |   |
| <b>Interfaces and Stake Holders</b><br>adjacent projects, infrastructure owners, energy, stake holders, PR, media   | <b>Facilities Connections</b><br>water, sewage, power, gas, communication, fuel   | <b>Monitor and Control</b><br>too many activities, complex control, software, document control, lack of PMO resources, archive, coding, too much data                                       | <b>Costing</b><br>lack of information/data, wrong data, change in prices, wrong BoQs, unstable estimations, overheads, escalation, inflation   |   | <b>Financial impacts</b> extreme changes in economics (macro/micro), taxation, resources availability, market changes, currencies, hedging                          |   |
| <b>Regulation, Government</b><br>law/regulation/standard changes, political bias, air/sea ports, banks, transportation, customs   | <b>Safety</b><br>hazards, contaminate soil, work in heights, closed spaces, collapse, hazardous materials   | <b>Construction</b><br>complexity, dependencies, resources timing and availability, span of control, mobilization sites, deposit sites, design changes, site engineering                    |  |   |   |   |
| <b>Terror and War</b><br>actions, events, situations  | <b>Security</b><br>access control, cyber, corruption, classified materials/data, vandalism  | <b>Logistics &amp; Site Engineering</b><br>mobilization sites, deposit sites, design changes, site engineering  |  |   |   |   |
| <b>Extreme Weather Conditions</b><br>floods, snow, earthquakes, storms, extreme temperatures  |   |   |  |   |   |   |
| <b>Pandemic</b><br>viruses, diseases  |   |   |  |   |   |   |