***INTRODUCTION***

The most basic type of qualitative risk analysis is the Risk Based Graded Approach analysis. It is a great starting point for all projects and it can be completed in very little time (it should take no more than fifteen minutes to complete, even on the most complex project).

A risk based “graded approach” analysis methodology is used to determine requirements for planning and control of the project work effort. It is a process used to define, in rough terms, the overall risk value of the project. This qualitative risk analysis will maximize project control effectiveness at the lowest cost and assist in identification and mitigation of project risks.

The Risk Based Graded Approach Worksheet is a tool which should completed by the FDOT Project Manager as part of the Project Initiation Process. The FDOT Project Manager should use this tool during the initial scoping phase of the project to grade and prioritize project risk elements, and to assess overall project risk. This will help the project manager to determine requirements for planning and control of the project work effort.

The Risk Based Graded Approach Worksheet is a management tool used to:

* Determine where to assign the appropriate project management resources
* Help define the project scope
* Help determine the makeup of the project team
* Evaluate risk elements based on probable impacts (cost or schedule)
* Get consensus from all members of the project team

Completion of the Risk Based Graded Approach Worksheet is a fast way to identify project risk early in the project timeline but it should not be used as a substitute for formal risk identification, qualification, quantification and response planning, which is performed during the Project Planning Process.

# **DEFINITIONS**

***Graded Approach****:* A flexible selection process that allows the project manager to choose a more or less rigorous application of project control elements. This flexibility permits customizing project control needs to the specific project and focuses the team efforts.

***Risk Based Graded Approach****:* A “Risk Based Graded Approach” analysis is a process that allows the project manager to evaluate overall project risk and the probability of project baseline impacts (cost / schedule baselines) during project execution.

***RISK BASED GRADED APPROACH WORKSHEET***

The Risk Based Graded Approach Worksheet is a tool used by the project manager to identify and document risk values for predetermined ***Risk Elements***. Each Risk Element is assigned a ***Risk Assessment Score*** which qualifies the possibility of baseline impacts (e.g., not meeting intended technical functions, internal or external schedule commitments, cost thresholds, et al). Each Risk Element is also assigned a ***Risk Priority Score*** to establish a relative importance and urgency. A Risk Element’s ***Total Risk Score*** (Risk Assessment Score x Risk Priority Score) indicates the probability of that risk element’s potential impacts on project deliverables cost / schedule baselines during project execution. The ***Project Risk Score*** (sum of the Risk Elements’ Total Scores) indicates the overall risk level for the project.

***RISK ELEMENT***

Numerous risk areas that may typically be encountered on an FDOT project. 20 of the more typical risk elements have been identified (based on experience from numerous projects) and are listed on the following pages. The risk elements listed are a guide and are not “cast in stone”. Risk Elements may be eliminated, or new risk elements may be added to match the characteristics of a project.

# **RISK ASSESSMENT**

The project team determines the Risk Assessment value based on the anticipated risk level for each Risk Element. Those values are documented on the graded approach worksheet. Risk Assessment values are recorded as follows:

1 – low risk

3 – medium risk

5 – high risk

(Note, although there is typically a distribution of 1’s, 3’s, and 5’s within the risk assessment column, the risk assessment scores for all risk elements may be the same (all “1”, “3” or “5”). This is dependent on the input from the team.)

The guidelines in the following table can be used to assist the team members in determining the overall level of risk assessment for each risk element, as it relates to project priorities (i.e., scope, schedule, cost, and, quality).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | **RISK ASSESSMENT** | | |
|  | **RISK ELEMENT** | **1 - LOW** | **3 - MEDIUM** | **5 - HIGH** |
| 1 | ***UTILITIES*** – defines the level of utility coordination/relocation efforts | minimal | many relocations | projects requiring JPA’s |
| 2 | ***PROJECT SCHEDULE*** – defines how much time the project team has to complete the schedule. | Everyone has as much time as they want | The schedule is somewhat compressed | The schedule is very compressed or very critical |
| 3 | ***COORDINATION***– defines how many organizations are involved in project planning and/or execution. | one to three | four to seven | greater than eight |
| 4 | ***ENVIRONMENTAL*** – defines the level of environmental impacts. | minimal | medium | major |
| 5 | ***CONTAMINATION***– defines the level of contamination impacting the project. | minor or none | medium | major contamination issues |
| 6 | ***REGULATORY INVOLVEMENT*** – identifies the degree that governmental or other regulatory agencies impact your project. | none or minor involvement | somewhat involved | regular contact and/or visits |
| 7 | ***RESOURCE AVAILABILITY*** – defines the availability of internal and external resources to plan and execute the project. | Resources readily available | Resources are somewhat restricted | The project will be resource constrained impacting schedule and cost |
| 8 | ***MATERIAL AVAILABILITY***– calculation of risk due to material availability | low | medium | high |
| 9 | ***EXPERIENCE/CAPABILITY***– defines the level of experience and capability of project team members. | project loaded with highly experienced senior staff | a blend of highly experienced senior staff and inexperienced personnel | project loaded with inexperienced personnel |
| 10 | ***PROJECT FUNDING*** – defines availability and approval status of project planning and execution funds. | Single source and approved | multiple source and approved | Haven’t identified a source but go ahead and start the project |
| 11 | ***POLITICAL VISIBILITY*** – Indicates the level of exposure the project has to senior management. | None - just get it done | Somewhat visible – publish quarterly performance reports | Highly visible – scheduled visits by and monthly performance reports to top management |
| 12 | ***PUBLIC INVOLVEMENT*** – Indicates how much the public is involved in your project | None – just get it done | Somewhat involved – issue news releases as required | Very involved – representative(s) part of project scope, schedule, cost and quality decisions |
| 13 | ***SAFETY*** – defines the safety issues the project team will encounter while completing the project. | standard safety considerations | increased diligence due to location, product weight, configuration, or work type (e.g., high voltage) | very restrictive safety considerations (e.g., caustic environment, hot-taps, etc.) |
| 14 | ***RIGHT OF WAY*** - defines the level of R/W involvement | minimal, no R/W takings | corner clips and strip takes | parcel takes, relocation effort required |
| 15 | ***CONSTRUCTION/ CONSTRUCTABILITY (MOT)*** – Indicates how complex the project construction is anticipated to be | None | Somewhat complex | major complexity |
| 16 | ***MAINTENANCE*** – quantifies the long-term maintenance risk | low | medium | high |
| 17 | ***TOLLS***– defines the level of toll involvement | minimal to none | minimal impacts to toll plazas | major impacts to toll plazas |
| 18 | ***TECHNOLOGY***– defines what degree of technical complexity will be faced by the project team in executing the project. | utilize off the shelf technology | buy something off the shelf and do something else to it; an engineered solution | perform research and development (R&D) activities |
| 19 | ***FACILITIES/ARCHITECTURE*** – defines the level involvement with facilities | minimal | some impacts to buildings, gantries, etc. | major, vertical construction |
| 20 | ***OTHER***– other items affecting the project that are not included in the above listed categories | low | medium | high |

***RISK PRIORITY***

The project team identifies where they will apply priorities within the identified risk elements.

1 – low priority

3 – medium priority

5 – high priority \*(*limited by total number of elements*)

The team determines where to assign the “5’s” (i.e., highest priority) and scores the balance with either a “3” (medium priority) or “1” (low priority). **IMPORTANT: Experience/Capability and Safety should NEVER be a priority 1 because it sends a wrong message).**

\* A worksheet with up to 15 elements will have a maximum of **three** priority “5” elements. For every **three** additional risk elements over 15 elements, allow **one** additional element to be scored with a “5” for risk priority. Therefore, a worksheet with 16 to 20 elements will have a maximum of **four** priority “5” elements.

# **RISK TOTAL SCORE**

The Risk Total Score is calculated by multiplying the Risk Assessment Score by the Risk Priority Score for a Risk Total Score for each Risk Element.

# **PROJECT RISK SCORE**

The Risk Total Scores are then summed to determine a “Project Risk Score”. The Project Risk Score will help determine the Project Risk Level for the project.

|  |  |  |
| --- | --- | --- |
| **Project Risk Level Ranges for 15 Risk Elements** | **Project Risk Level** | **Project Risk Level Ranges for 20 Risk Elements** |
| 0 - 90 | Low Risk | 0 - 120 |
| 91 - 150 | Medium Risk | 121 - 200 |
| > 150 | High Risk | > 200 |

The Project Risk Level ranges are determined as follows:

**High Risk:**

Project Risk Score **>** (# Risk Elements x 10)

**Medium Risk:**

(60% x (# Risk Elements x 10)) **<** Project Risk Score **≤** (# Risk Elements x 10)

**Low Risk:**

Project Risk Score **≤** (60% x (# Risk Elements x 10))

Note: If the number of Risk Elements is reduced or is increased, the maximum Medium Risk score and the maximum Low Risk score should be adjusted accordingly.

*SAMPLE RISK BASED GRADED APPROACH WORKSHEET:*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ITEM | RISK ELEMENT | RISK ASSESSMENT | RISK PRIORITY | RISK TOTAL |
|  |  |  |  |  |
| 1 | UTILITIES | 3 | **5** | 15 |
|  |  |  |  |  |
| 2 | PROJECT SCHEDULE | 5 | **5** | 25 |
|  |  |  |  |  |
| 3 | COORDINATION | 3 | 1 | 3 |
|  |  |  |  |  |
| 4 | ENVIRONMENTAL | 3 | 3 | 9 |
|  |  |  |  |  |
| 5 | CONTAMINATION | 3 | 3 | 9 |
|  |  |  |  |  |
| 6 | REGULATORY INVOLVEMENT | 3 | 1 | 3 |
|  |  |  |  |  |
| 7 | RESOURCE AVAILABILITY | 1 | 1 | 1 |
|  |  |  |  |  |
| 8 | MATERIAL AVAILABILITY | 3 | 3 | 9 |
|  |  |  |  |  |
| 9 | EXPERIENCE/CAPABILITY | 5 | 3 | 15 |
|  |  |  |  |  |
| 10 | PROJECT FUNDING | 1 | 1 | 1 |
|  |  |  |  |  |
| 11 | POLITICAL VISIBILITY | 3 | 3 | 9 |
|  |  |  |  |  |
| 12 | PUBLIC INVOLVEMENT | 3 | 3 | 9 |
|  |  |  |  |  |
| 13 | SAFETY | 3 | 3 | 9 |
|  |  |  |  |  |
| 14 | RIGHT OF WAY | 1 | 1 | 1 |
|  |  |  |  |  |
| 15 | CONSTRUCTION / CONSTRUCTABILITY (MOT) | 3 | **5** | 15 |
|  |  |  |  |  |
| 16 | MAINTENANCE | 3 | 3 | 9 |
|  |  |  |  |  |
| 17 | TOLLS | 1 | 1 | 1 |
|  |  |  |  |  |
| 18 | TECHNOLOGY | 5 | **5** | 25 |
|  |  |  |  |  |
| 19 | FACILITIES/ARCHITECTURE | 3 | 3 | 9 |
|  |  |  |  |  |
| 20 | OTHER | 3 | 3 | 9 |
|  |  |  |  |  |
|  |  |  | **PROJECT  RISK SCORE** | **186** |
|  |  |  |  |  |
|  | Project Risk Score = 0 - 120 | Low Risk |  |  |
|  | Project Risk Score = 121 - 200 | Medium Risk |  |  |
|  | Project Risk Score = > 200 | High Risk |  |  |
|  |  |  |  |  |

**INTREPRETING THE RISK BASED GRADED APPROACH WORKSHEET**

Two values that should be examined closely are the Project Risk Score and the risk elements rated as “5-5”.

1. The project’s total Risk Score – This indicates where the project fits into specified ranges for low, medium, or high risk. For this example, the Project Risk Score is 174 and is considered a **Medium Risk** project.
2. The “5 X 5” Risk Elements -– A “5 X 5” Risk Element (5 in both the risk assessment and risk priority columns) signifies a risk element that should be focused on by the team and used to determine the makeup of team members. For this example, a “5 X 5” in **Project Schedule** would suggest need for a schedule focused leader, whereas a “5 X 5” in **Technology** would suggest need for more of an engineering focused leader. (The project team should also review moderate risk elements receiving scores of “3-5” or “5-3” to determine actions that can be taken to reduce, mitigate or plan for the risk.)