

# Guide for Cost Estimation of Natural Disaster Essential Public Assets Reconstruction Works

November 2023



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## Document Information

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<b>Authorised by:</b>	Joe Krsul

# 1. Introduction

The purpose of this document is to assist Transport for NSW (TfNSW) and Local Government in complying with the Natural Disaster Framework of the Australian and New South Wales Governments as it relates to estimating the cost of Reconstructing Essential Public Assets.

This document is not prescriptive and does not override or replace any of the Relevant Documents listed below.

## 2. Relevant Documents and Interpretation

**The Disaster Recovery Funding Arrangements 2018** (hereafter DRFA) set out the arrangements for disaster funding between the Commonwealth and the States and Territories. These arrangements must be complied with to enable Commonwealth contribution to eligible reconstruction works.

**The NSW Disaster Assistance Guidelines 2021** (hereafter DAG) set out how the broader DRFA applies to NSW and provides the process for the NSW Government providing financial assistance to councils that are impacted as a direct result of an eligible disaster.

**The NSW Natural Disaster Essential Public Asset Restoration Guidelines 2018** (hereafter EPARG) describes the arrangements for the restoration of local council essential public assets that have been damaged as a direct result of eligible disasters.

The documents need to be read in conjunction with each other. However, in the event there is a conflict or inconsistency the following rules apply:

- For the Commonwealth, the DRFA takes precedence over all other documents.
- For NSW, the DAG prevails over the EPARG.

## 3. Application to Estimation

From a road perspective, the overriding principle in all three (3) documents is to assist in the restoration of essential public assets to their pre-disaster function. The definitions and guiding principles defining an eligible disaster, essential public asset, pre-disaster function, etc can be found in the linked relevant documents above and will not be restated here.

Under the DRFA, the Australian Government will reimburse the states and local government via an administering agency (Transport for NSW for roads) under an estimates-based model for Essential Public Assets Reconstruction (EPAR) works following an eligible disaster.

At the highest level, the DRFA requires the estimation of the reconstruction cost of the essential public asset and identification of a total project cost. This must be

developed to include any eligible state expenditure for design, construction and project management, contingency, and cost escalation.<sup>1</sup>

The estimate can be developed based on two specific options, market response or cost estimation. These options are explored in further detail in estimate compliance requirements below.

The DRFA also provides specific requirements for the estimation of contingency and the calculation of cost escalation. These requirements must be followed to ensure a compliant estimate based on a P90 estimate approach is provided, that is, an estimate with 90% confidence level of not being exceeded for any EPAR works.

### 3.1 When is an estimate required and timeframe for work to be done?

The NSW Disaster Assistance Guidelines 2021 require that an estimated reconstruction cost to be developed in the following circumstances and work to be completed within time and cost approvals<sup>2</sup>:

1. When the restoration or replacement cannot be completed within 3 months of becoming accessible to the local council; or
2. When the damaged essential public asset will be reconstructed with some variation to its pre-disaster function (including changes to engineering standards) as determined in accordance with the NSW Natural Disaster EPAR Guidelines.
3. EPARs including the estimated reconstruction cost, must be submitted no later than 6 months after the Natural Disaster has been declared. In exceptional circumstances (where scale and size of restoration is extensive), TfNSW can extend the application timeframe to 12 months after the end of the financial year in which the disaster occurred. Australian Government approval is required beyond this.
4. When an EPAR is approved by TfNSW, the council will be offered a Total Upper Limit Grant amount (ex GST) based on the estimated reconstruction cost. Upon completion of works or part thereof, council may claim reimbursement of the actual cost (ex GST) of works up to the Total Upper Limit Grant amount.
5. The repair work must be completed within 2 years after the end of the financial year in which the disaster occurred. In exceptional circumstances, the timeframe can be extended by TfNSW to 2 years and 9 months.

### 3.2 What happens if the actual costs are greater than the Total Upper Limit Grant amount at the end of the project?

Where the actual cost of a reconstruction project is greater than the Total Upper Limit amount because of **special** circumstances, the council may be entitled to

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<sup>1</sup> See section 6.4.3 of the DRFA.

<sup>2</sup> See Section B.3 Clause 9, 41,42,43 of the NSW DAG 2021.

adjust the estimated reconstruction cost to reflect the variance. It is important to note that there are strict limitations to the variation process, and it must relate to the following circumstances:

- Geotechnical conditions that could not reasonably have been foreseen or investigated in the design period.
- Previously unidentified indigenous and cultural heritage discoveries.
- Previously unidentified heritage discoveries.
- Delays caused by subsequent eligible disasters.
- Environmental conditions that could not have reasonably been foreseen (eg threatened species discovery).
- Safety threats that could not have reasonably been foreseen (eg Asbestos discovery)
- Critical reduction in water availability that could not reasonably have been foreseen or investigated.<sup>3</sup>

Council must maintain evidence to demonstrate the **special** circumstances encountered, including why the special circumstances could not have reasonably been foreseen at time of the estimate.

Furthermore, where variation costs are **greater than 15%, and greater than \$1 million** of the established reconstruction cost estimate, any variation requires an Independent Technical Review.<sup>4</sup>

There are many other risks which may cause increases in project cost which will not entitle the council to a variation. Accordingly, the council needs to be aware that where project costs exceed an established reconstruction cost estimate, councils can be subject to substantial financial costs if Transport has not assessed and approved the variation.

### 3.3 What happens if the actual costs are less than Total Upper Limit Grant amount at the end of the project?

Where actual costs are less than the Total Upper Limit amount, they are calculated as efficiencies in accordance with the DRFA.<sup>5</sup> It is important to understand that Councils and NSW Government agencies are eligible for a share of the overall amount of disaster mitigation funding that is achieved by the NSW Government through the DRFA.

If funding from efficiencies become available under the DRFA then local councils and NSW agencies can undertake disaster mitigation activities and projects.

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<sup>3</sup> See Section 4.9.3 of the NSWEPARG 2018.

<sup>4</sup> See Section 4.9.4 of the NSWEPARG 2018.

<sup>5</sup> See page 84 of the NSW DAG 2021 for further details and sample calculation.

### 3.4 What is the TfNSW Project Manager/Assessor's role regarding the estimate?

The Natural Disaster Project Manager (including assessor role) needs to be involved throughout the lifecycle of the repair/reconstruction from initial repair works, options assessment, concept and detail design as well as the completion of any permanent works. The Project Manager/Assessor needs to be registered on RA's approved list.

The assessor needs to be able to confirm the scope of the eligible works, pre-disaster evidence and ensure a suitable, cost-effective treatment is proposed to comply with eligibility requirements.

In addition to checking the evidentiary and functional compliance elements on a council's proposal, the TfNSW assessor must check that the estimate complies with the DRFA and NSW EPARG requirements, and then establish a Total Upper Limit Grant amount for the proposed eligible reconstruction works. The Total Upper Limit Grant must be based on the estimated reconstruction cost less the council co-funding amount and any ineligible costs.

It is important that council ensures that the Total Upper Limit Grant is sufficient to cover the total project cost in accordance with the DRFA. To achieve this, councils should develop the estimate based on a **P90 basis** (meaning that there is only a 10% chance of the estimated cost being exceeded).

From an audit perspective, the estimate upon which the estimated reconstruction cost is based must comply with the requirements of the DRFA as set out below.

## 4. Estimate Compliance

### 4.1 Project phases

In accordance with DRFA guidelines, Councils will need to develop an estimated reconstruction cost in the 6 months from the disaster event and may be extended for a period of up to 12 months after the end of the financial year in which the relevant eligible disaster occurred.

The estimate and contingency amount will depend on the stage at which the project is being submitted by council to TfNSW. Councils need to provide the most accurate estimate possible within the timeframe available.

The following estimate phases are adopted by TfNSW for projects in accordance with TfNSW Project Estimating Manual (interim) ICL-EST-M-001, 16 June 2020 version 4.1:

- Strategic
- Concept
- Detailed
- Post tender / Delivery.
- Finalisation

For natural disaster projects over \$25 million, a **probabilistic P90 estimate** is required as well as an Independent Technical Review (ITR) must be conducted.

For natural disaster projects **under** \$25 million, a deterministic P90 estimate is required based on the project phase the estimate is based on.

Once the Total Upper Limit Grant (TULG) is approved by TfNSW, the funding limit letter to council may contain Project Review Gates, which will be applied to specific projects to ensure that scope and edibility is still acceptable. These gate reviews generally apply to the strategic stage, concept design stage and at detail design stages. At these gate reviews, councils will be required to meet with TfNSW assessor to get agreement on proceeding to the next stage.

## 4.2 Estimated Reconstruction Cost

Prior to establishing the estimated reconstruction cost, the administering agency must have determined the pre-disaster function of the essential public asset in accordance with the DRFA. The estimate is then prepared with the following primary components in accordance with DRFA and EPAR Guidelines:

- Direct costs (base estimate)
  - o Construction costs
  - o Design costs
  - o Project management costs
- Contingency
- Cost escalation

The actual make up will vary significantly depending on the nature and size of the works and the method of procurement selected.

In defining a project and for estimating reconstruction costs, a project shall be considered one of the following:

- o a single essential public asset; or
- o a group of essential public assets which could be contracted jointly.

For ongoing document control and audit purposes, efforts should be made to align reconstruction estimates with the intended packaging for delivery of natural disaster works.

## 4.3 Construction costs

Given the timeframe for submitting an estimated reconstruction cost, construction costs can be established by market response or cost estimation.

A market response is where a defined scope of works is priced by the market by council for delivery by contractors. Councils can seek to engage external contractors or other local councils provided the applicable local government procurement processes are followed.



If market response approach is selected, councils must receive approval from TfNSW regarding the type of construction tender (for example, Design & Construct or construct only), scope of repairs, appropriate design, and all components of the claim in the tender before seeking a market response. If council's tender process cannot provide an agreed reconstruction estimate within the timeframe, then this estimate must be established through the cost estimation process.

Where cost estimation is the selected method, councils (opt in) may use day labour, internal plant and equipment based on established hourly unit rates, provided they are approved by the TfNSW assessor.<sup>6</sup> Direct costs need to be established using agreed unit or benchmark rates for the types of activities and treatments proposed to be undertaken. The council and the TfNSW assessor are responsible for working together to establish these unit/benchmark rates prior to finalisation of an estimate.<sup>7</sup> It is recommended that, where agreement can't be reached between council and the TfNSW assessor, an independent quantity surveyor, be engaged to advise on the appropriate rates for the item/s in dispute.

#### 4.4 Design costs

Design costs will vary widely depending on the complexity of works. Works may vary from simple restoration of road damage through to complex geotechnical projects involving slips. Council to follow Local Government Procurement policies for the procurement of any design services.

The estimated reconstruction cost is to include design costs for the strategic options, concept, and detail design phases of the repair.

The typical design costs rates quoted are derived from TfNSW document 'Guidelines for global strategic rates for project cost estimating – June 2023'.

For concept design, typical rates may vary between 1 percent and 9 percent of the construction costs depending on the value of the reconstruction costs.

For detail design, typical rates may vary between 5 percent and 10 percent of the construction costs depending on the value of the reconstruction costs.

#### 4.5 Project Management costs

Project management costs are all costs associated with managing the reconstruction works and it involves all phases of the work. This includes both TfNSW staff, consultants and council staff that are directly involved with managing the reconstruction works.

This includes services associated with investigations, design, procurement, contract administration, project and program management are eligible project management costs. Council to follow Local Government Procurement policies for the procurement of any project management services.

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<sup>6</sup> See section 3.5.2 of the NSW EPARG.

<sup>7</sup> See section 4.9.2 of the NSW EPARG.

Project management costs must be demonstrated through time spent on reconstruction projects and provide adequate supporting documents to demonstrate the nexus between the expenses incurred and the EPAR works.

For TfNSW project management staff, a two percent client and project management cost or an estimated cost figure is to be added to all EPARs on council's Form 306 as a separate line item.

Project management costs can vary subject to the complexity of the work, procurement/delivery method chosen, and the scale of the work packaged for delivery.

Accordingly, project management costs can vary from 3 percent to 20 percent of the reconstruction costs.<sup>8</sup>

For specific EPARs over \$25 million, subject to Independent Technical Review process, council to submit an estimated cost for project management staff to include all project phases and an organisational chart for managing the project.

## 4.6 Contingency

Contingency must be calculated in accordance with section 6.5 of the DRFA. Contingency must be sufficient to allow for the reconstruction project risk profile, complexity, investment lifecycle and past performance. Councils must use an appropriate contingency estimation approach for the restoration project that is proposed.

### **Deterministic Contingency Estimation – Projects under \$25 million**

A deterministic factor-based approach will be suitable for most reconstruction projects.<sup>9</sup> Indeed, for certain reconstruction projects, a contingency allowance may be based on the type of treatment and unique characteristics of a particular region with the agreement of the TfNSW assessor. For all projects, a project specific deterministic approach is required to reflect the risk profile effectively at a P90 level.

In applying a project specific deterministic contingency approach, councils are expected to follow Guidance Note 3B published by the Department of Infrastructure, Transport, Regional Development, and the Arts.<sup>10</sup>

The deterministic contingency for projects under \$25 million to be determined based on the factor based contingency sheets in Appendix A. These factor-based sheets are based on the project phases – Strategic, Concept, Detail Design, and Post-tender/ Delivery.

The contingency is a percentage of the total direct costs (including design, construction, and project management costs).

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<sup>8</sup> TfNSW Guidelines for global strategic rates for project cost estimating.

<sup>9</sup> See section 6.5.2 of the DRFA.

<sup>10</sup> This is required by section 6.5.3 of the DRFA.

The range of P90 contingency (as % of direct cost) at the various stages from the Factor-based sheets is as follows:

- Strategic stage - 35 to 70 %
- Concept stage - 25 to 40 %
- Detail Design stage - 15 to 27 %
- Post Tender/ Delivery phase - 10 to 22 %

The P90 deterministic contingency is determined by assessing the six factors for each project. These factor-based sheets have been calibrated in line with Transport for NSW Project Estimating Manual.

A project specific deterministic contingency calculation will need to be assessed by TfNSW based on the project phase in line with the requirements of the DRFA.

Where agreement can't be reached on a contingency factor that reflects the overall project risk profile, it is recommended that an independent quantity surveyor be engaged to provide advice. With the agreement of the TfNSW assessor, the quantity surveyor can be engaged by council and claimed as an eligible expense in developing the reconstruction estimate.

#### **Probabilistic Contingency Estimation – Project over \$25 million**

Section 6.5.2 notes that a more sophisticated approach to estimating contingency may be required for complex and/or high dollar value reconstruction projects. It is expected that complex projects (particularly those greater than \$25 million in estimated value) are subject to the calculation of a probabilistic contingency estimate. Guidance Note 3A published by the Department of Infrastructure, Transport, Regional Development, and the Arts details the procedure for calculating an appropriate probabilistic contingency estimate.

It is noted that the project scope and design must be sufficiently advanced, and a detailed risk register produced, for a risk based probabilistic contingency approach to be reflective of the actual project risk. Additionally, the approach normally requires the use of suitably qualified and experienced quantity surveyor that can model the risks in accordance with Guidance Note 3A.

## **4.7 Cost Escalation**

Cost escalation allowances must be applied to estimated reconstruction cost estimates to ensure adequate capital funding is provided to compensate for any expected change in costs over the life of a project.<sup>11</sup>

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<sup>11</sup> See section 6.6.1 of the DRFA.

It is noted that the time limitations associated with eligible reconstruction projects under the DRFA would generally limit cost escalation to a maximum period of three (3) years from the end of the financial year in which the eligible disaster occurred.<sup>12</sup>

Councils are expected to utilise the escalation calculation methodology included in the NSW specific Road Construction Cost Escalation Forecasts prepared annually by the Commonwealth.

The current Commonwealth escalation rates are shown in Table 2A.5 below.

<b>Table 2A.5: Annual Escalation Rates rates with zero floor policy</b>		
<b>FY</b>	<b>Average Annual Escalation Index</b>	<b>Annual Escalation Rates</b>
2017/18	103.25	2.94%
2018/19	107.83	4.44%
2019/20	109.60	1.64%
2020/21	109.60	0.00%
2021/22	114.94	4.88%
2022/23	121.86	6.01%
2023/24	125.22	2.76%
2024/25	127.08	1.48%
2025/26	128.84	1.39%
2026/27	131.31	1.91%
2027/28	134.46	2.40%
2028/29	138.64	3.11%
2029/30	142.40	2.71%
2030/31	146.27	2.71%
2031/32	150.24	2.71%
2032/33	154.31	2.71%
2033/34	158.50	2.71%

Guidance Note 4 published by the Department of Infrastructure, Transport, Regional Development, and the Arts details how escalation may be calculated on an infrastructure project.

The calculation of escalation for a project will provide the project with a total project 'outturn' cost.

The calculation of escalation requires the following information to be provided by council:

- Estimated reconstruction cost including contingency (P90 basis).
- Program schedule with includes start and finish of spending.
- Cashflow based on financial years.

<sup>12</sup> See section 6.6.2 of the DRFA.

An example is given for calculating the escalation for a \$1.25 million (P90) project below.

Outturn Estimate	Amount	Project cashflow		
		Year 1	Year 2	Year 3
		23/24	24/25	25/26
Direct costs (Base) Estimate	1,000,000	200,000	650,000	150,000
P90 estimate (incl contingency)	1,250,000	250,000	812,500	187,500
Annual Escalation Rate %		0.000	1.480	1.390
Cumulative Escalation Factor		1.0000	1.0148	1.0289
P90 estimate Escalation (\$)	17,445	0	12,025	5,420
<b>P90 Outturn Cost (\$)</b>	<b>1,267,445</b>	<b>250,000</b>	<b>824,525</b>	<b>192,920</b>

The example assumes that the estimate was done, and that expenditure commenced in 2023-24.

Note that there is no escalation provided for the first year cashflow.

A rebasing factor can be used to bring past estimates or actual costs to a current year basis using the Commonwealths Revised NSW PCB template.

## 5. Independent Technical Review

Section 4.9.4 of the NSW EPARG mandates an Independent Technical Review in the following circumstances:

1. When the estimated reconstruction cost for the project is \$25 million or more.
2. Where an alternative reconstruction project solution is preferred and there is a variance between the estimated reconstruction cost for the original project and the preferred reconstruction project solution that is:
  - a. More than 50 per cent lower than the estimated reconstruction cost of the original project; and
  - b. To a value of between \$5 million and \$25 million.
3. Where special circumstances are encountered which give rise to a variance in the estimated reconstruction cost for the project that is:
  - a. Greater than 15 per cent of the estimated reconstruction cost of the original project; and
  - b. Greater than \$1 million.
4. The Commonwealth, on receiving the estimated reconstruction cost for a project from NSW within its financial year claim, elects to have it reviewed.

Where an Independent Technical Review is required, it will be arranged by the TfNSW assessor. Where one is required, the Independent Technical Review will be the estimate review for the establishment of the Total Upper Limit Grant as it involves independent calculation and validation of the reconstruction project estimate and a review of the eligibility of the scope of works proposed.

## 6. Approach to Estimation

The approach to estimation of eligible reconstruction projects needs to balance the requirements of achieving value for money, being readily administrable, and producing a robust P90 estimate that reflects the entire project cost. The limitations on variations following establishment of the Total Upper Limit Grant mean that council should develop a good understanding of the project risks at the time of estimation and provide an appropriate amount of contingency.

The estimation approach must comply with the DRFA requirements outlined above or subsequent audits may result in significant costs being borne by the council and/or TfNSW.

A link to the DRFA mandated contingency calculation methods is provided below. It also includes useful guidance on establishing scope and developing robust base costs. An excel version of the deterministic contingency table is also available.

[Cost Estimation Guidance \(infrastructure.gov.au\)](https://infrastructure.gov.au)

# Appendix A – Deterministic Factor Based Contingency sheets.

There are attached calculated examples for P90 contingency at four project stages.

The P90 contingency percentage depends on the assessment against six factors.

Table 1 - Strategic Phase

Table 2 - Concept

Table 3 - Detail

Table 4 - Post tender/ Delivery

**Table 1 – STRATEGIC Phase Factor based contingency estimates.**

<b>For an estimate with 90% confidence level of not being exceeded on a road project</b>					
<b>Factor influencing the Estimate</b>	<b>Available information on which the Scoping Estimate is based</b>	<b>Confidence and Reliability level</b>			<b>Adopted Contingency (example only)</b>
		<b>Highly Confident &amp; Reliable</b>	<b>Reasonably Confident &amp; Reliable</b>	<b>Not Confident &amp; Not Reliable</b>	
<b>Project Scope</b>	A set of defined project objectives and related performance criteria A report with potential options (with all underlying assumptions and exclusions noted) A set of strategic drawings (covering all the physical scope and staging)	8%	11%	15%	11%
<b>Risk Identification</b>	Identified significant risks (political, community, technical, financial) A risk analysis for major risks A project delivery method	8%	12%	15%	12%
<b>Constructability</b>	A constructability and staging review A construction timetable (with durations and broad activities)	5%	7%	10%	5%
<b>Key Dates</b>	A set of project dates (to enable outturn cost to be assessed) Timing of the construction phase (for escalation assessment)	3%	4%	5%	4%
<b>Site Specific Information</b>	Sufficient and documented investigation for strategic design (geotechnical, heritage, environmental, technical, hydraulic, utilities, property acquisition) Enabling works (adequately identified & allowed in the estimate)	8%	11%	15%	15%
<b>Project interfaces</b>	External interfaces (identified and defined in terms of scope, access and risk) Project assessment (extended or short site and greenfield/brownfield)	3%	6%	10%	3%
<b>Total contingency percentage to be adopted for an estimate with a 90% confidence level of not being exceeded:</b>					<b>50%</b>
<b>Total contingency percentage to be adopted for an estimate with a 50% confidence level of not being exceeded: (assessed to be 40% of the contingency percentage for a 90% confidence level of not being exceeded)</b>					<b>20%</b>



**Table 2 – CONCEPT Phase Factor based contingency estimates.**

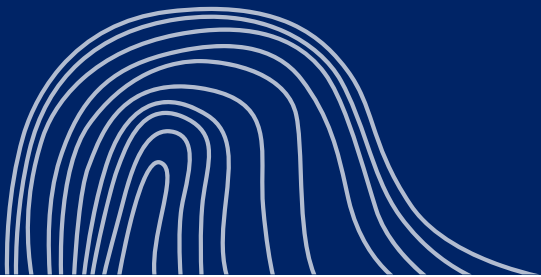
<b>For an estimate with 90% confidence level of not being exceeded on a road project</b>					
<b>Factor influencing the Estimate</b>	<b>Available information on which the Scoping Estimate is based</b>	<b>Confidence and Reliability level</b>			<b>Adopted Contingency (example only)</b>
		<b>Highly Confident &amp; Reliable</b>	<b>Reasonably Confident &amp; Reliable</b>	<b>Not Confident &amp; Not Reliable</b>	
<b>Project Scope</b>	A set of well-defined project objectives and related performance criteria A design report (with all underlying assumptions and exclusions noted) A set of concept drawings (covering all the physical scope and staging)	6%	7%	9%	7%
<b>Risk Identification</b>	Identified significant risks (political, community, technical, financial) A detailed risk analysis A project delivery method	7%	8%	9%	9%
<b>Constructability</b>	A constructability, staging and construction access review A construction timetable (with appropriate start up and handover periods)	3%	4%	5%	4%
<b>Key Dates</b>	A set of project dates (to enable outturn cost to be assessed) Timing of the construction phase (for escalation assessment)	1%	2%	3%	2%
<b>Site Specific Information</b>	Sufficient and documented investigation for concept design (geotechnical, heritage, environmental, technical, hydraulic, utilities, property acquisition) Enabling works (adequately identified & allowed in the estimate)	5%	6%	9%	9%
<b>Project interfaces</b>	External interfaces (identified and defined in terms of scope, access and risk) Project assessment (extended or short site and greenfield/brownfield)	3%	4%	5%	4%
<b>Total contingency percentage to be adopted for an estimate with a 90% confidence level of not being exceeded:</b>					<b>35%</b>
<b>Total contingency percentage to be adopted for an estimate with a 50% confidence level of not being exceeded: (assessed to be 40% of the contingency percentage for a 90% confidence level of not being exceeded)</b>					<b>14%</b>

**Table 3 – DETAIL Phase Factor based contingency estimates.**

<b>For an estimate with 90% confidence level of not being exceeded on a road project</b>					
<b>Factor influencing the Estimate</b>	<b>Available information on which the Scoping Estimate is based</b>	<b>Confidence and Reliability level</b>			<b>Adopted Contingency (example only)</b>
		<b>Highly Confident &amp; Reliable</b>	<b>Reasonably Confident &amp; Reliable</b>	<b>Not Confident &amp; Not Reliable</b>	
<b>Project Scope</b>	A set of well-defined project objectives and related performance criteria A design report (with all underlying assumptions and exclusions noted) A set of detailed drawings (covering all the physical scope and staging)	4%	5%	6%	5%
<b>Risk Identification</b>	Identified significant risks (political, community, technical, financial) A detailed risk analysis A project delivery method	4%	5%	6%	5%
<b>Constructability</b>	A constructability, staging and construction access review A construction timetable (with appropriate start up and handover periods)	2%	3%	4%	3%
<b>Key Dates</b>	A set of project dates (to enable outturn cost to be assessed) Timing of the construction phase (for escalation assessment)	1%	2%	3%	1%
<b>Site Specific Information</b>	Sufficient and documented investigation for detail design (geotechnical, heritage, environmental, technical, hydraulic, utilities, property acquisition) Enabling works (adequately identified & allowed in the estimate)	3%	4%	5%	4%
<b>Project interfaces</b>	External interfaces (identified and defined in terms of scope, access and risk) Project assessment (extended or short site and greenfield/brownfield)	1%	2%	3%	2%
<b>Total contingency percentage to be adopted for an estimate with a 90% confidence level of not being exceeded:</b>					<b>20%</b>
<b>Total contingency percentage to be adopted for an estimate with a 50% confidence level of not being exceeded: (assessed to be 40% of the contingency percentage for a 90% confidence level of not being exceeded)</b>					<b>8%</b>

**Table 4 – POST TENDER/ DELIVERY Phase Factor based contingency estimates.**

<b>For an estimate with 90% confidence level of not being exceeded on a road project</b>					
<b>Factor influencing the Estimate</b>	<b>Available information on which the Scoping Estimate is based</b>	<b>Confidence and Reliability level</b>			<b>Adopted Contingency (example only)</b>
		<b>Highly Confident &amp; Reliable</b>	<b>Reasonably Confident &amp; Reliable</b>	<b>Not Confident &amp; Not Reliable</b>	
<b>Project Scope</b>	A set of well-defined project objectives and related performance criteria A design report (with all underlying assumptions and exclusions noted) A set of detail drawings IFC (covering all the physical scope and staging)	2%	3%	4%	3%
<b>Risk Identification</b>	Identified significant risks (political, community, technical, financial) A detailed risk analysis A project delivery method	2%	3%	4%	4%
<b>Constructability</b>	A constructability, staging and construction access review A construction timetable (with appropriate start up and handover periods)	1%	2%	3%	2%
<b>Key Dates</b>	A set of project dates (to enable outturn cost to be assessed) Timing of the construction phase (for escalation assessment)	1%	2%	3%	2%
<b>Site Specific Information</b>	Sufficient and documented investigation for IFC detail design drawings (geotechnical, heritage, environmental, technical, hydraulic) Enabling works (adequately identified & allowed in the estimate)	2%	3%	4%	4%
<b>Project interfaces</b>	External interfaces (identified and defined in terms of scope, access and risk) Project assessment (extended or short site and greenfield/brownfield)	2%	3%	4%	3%
<b>Total contingency percentage to be adopted for an estimate with a 90% confidence level of not being exceeded:</b>					<b>18%</b>
<b>Total contingency percentage to be adopted for an estimate with a 50% confidence level of not being exceeded: (assessed to be 40% of the contingency percentage for a 90% confidence level of not being exceeded)</b>					<b>7%</b>



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