Australian Government

National Emergency Management Agency

Estimating Reconstruction Costs for Essential Public Assets

This guidance note outlines the available approaches to states to develop estimated reconstruction costs (ERCs) under the Disaster Recovery Funding Arrangements 2018 (DRFA). It aims to streamline the cost estimation process and enhance understanding of how to apply Section 6 of the DRFA.

Developing estimated reconstruction costs under the DRFA

Under clause 6.4.2 of the DRFA, states must establish an ERC through:

- market response – by following applicable procurement processes of the asset owner; or
- cost estimation – by building up the component elements of cost with reference to the required scope of works, relevant assumptions and exclusions, and historical data of actual costs and/or supplier quotes.

Market response produces the most reliable data for establishing ERCs and is therefore the recommended approach where possible. However, it is acknowledged some works are delivered using internal labour and plant and equipment, and therefore market response may not be appropriate. It is also acknowledged there may be instances where a market response cannot be completed within the Allowable Time Limit for establishing an ERC. To provide additional guidance in these scenarios, this guidance note focuses on cost estimation methods available for developing ERCs.

When to establish an estimate under the DRFA

Under clause 4.3.1 b) of the DRFA, states must establish an ERC within 12 months of the end of the financial year in which the relevant eligible disaster occurred. Within this allowable time limit states should sufficiently progress investigations, design and/or specification to ensure ERCs do not require a contingency that exceeds the requirements of Guidance Note *Calculating non-construction costs within Estimated Reconstruction Costs for Essential Public Assets*. Strategic estimates and associated contingencies are not appropriate for the establishment of ERCs.

For ERCs developed through market response, the ERC should be established after the completion of the procurement activity.

Methodologies for cost estimation

There are three commonly used cost estimation methods that apply under the DRFA for developing an ERC, each suited to different project contexts and organisational factors. These include Independent Quantity Surveyor (IQS) report, benchmark rates, or internal rate buildup.

Table 1: Methodologies for cost estimation

Methodology	Description	Common use case
Independent Quantity Surveyor Report	A quantity surveyor, independent of the asset owner, is engaged to develop or review the project cost estimate, and provides a detailed report and cost build up to support the ERC developed.	- Smaller states with infrequent natural disasters and a low volume of ERCs. - IQS reports may also be used to establish ERCs when the state does not have in-house expertise due to the nature or complexity of the damage (e.g. geotechnical works).
Benchmark Rates	An example of establishing unit rates, benchmark rates apply standardised unit rates for a given treatment based on	- For larger states with frequent natural disasters and a high volume of ERCs.

Methodology	Description	Common use case
	comparable reconstruction works with reference to actual historical costs (i.e. benchmark pricing data).	• Benchmark rates support the efficient calculation of ERCs on a consistent basis across asset owners. • Often established per region to reflect different cost drivers within a state. • Requires regular review to ensure rates remain relevant and accurate.
Internal rate buildup	An example of establishing unit rates, internal rate buildup applies standardised rates based on a first principles build-up of costs. These rates are based on an organisation's estimates of effort for the use of internal labour and internal plant and equipment, and supplier quotes (where relevant).	• For smaller states with infrequent natural disasters and a low volume and value of ERCs. • Where there are lower complexity treatments that do not require specialist estimation expertise and there is lower variability in the effort to complete scope.

The choice of a cost estimation method depends on a range of factors including the stage of the project, complexity of the reconstruction works, the potential value of the project, the internal capability and capacity of the state, and the availability of reliable data. An ERC may include a mix of cost estimation and market response.

Independent Quantity Surveyor (IQS) report

Where an IQS is used to develop an ERC, the IQS must prepare a report that provides a summary of the proposed works, a detailed cost breakdown, and supporting documentation. This report must outline the methodology and sources used to develop the ERC, including:

- **Project details:** project description, disaster details, list of essential public asset/s and associated locations
- **Pre-disaster function and condition:** details regarding the pre-disaster function and condition of the essential public asset/s
- **Damage assessment:** details of the damage to the essential public asset/s resulting from the eligible disaster
- **Treatment and scope of works:** detailed treatments planned to restore the essential public asset/s to their pre-disaster function, and any additional scope which is being delivered through complementary funding outside of the ERC
- **Detailed cost estimate:** an overview of the methodology for developing the cost estimate, breakdown of costs by category and detail on how each category of cost was determined (including contingency)
- **Exclusions / limiting conditions:** list of any limitations in the scope of work and exclusions from the cost estimate
- **Summary of findings and recommendations:** Where recommendations are included, the state must include evidence regarding how these recommendations have been addressed as part of determining the ERC.
- **Supporting documentation list:** Information provided / relied upon in developing the cost estimate.

The IQS must be independent of the asset owner.

Benchmark rates

Under the DRFA, benchmarking involves developing an ERC by applying relevant assumptions and exclusions, using historical data from actual costs and/or supplier quotes, to develop realistic and defensible cost estimates.

To implement a benchmark rate method, a state must develop unit rates for standard treatments based on Australian guidance and regularly validate them to ensure they remain accurate and relevant. States should develop rates that consider variability such as the region, environmental conditions and nature of the damage to reduce the risk of inaccurate estimates. This may mean a number of different benchmark rates are developed within one state (e.g. for each region in the state).

Benchmark rates provide a consistent basis for asset owners to establish ERCs, supporting efficiency, transparency, repeatability and defensibility in the administration of the DRFA within a state.

To use benchmark rates for ERCs, states must maintain a policy and methodology document for benchmarking. This must outline a consistent basis for developing and applying benchmark rates and be endorsed by an appropriate delegate (e.g. the most senior engineer responsible for administration of the DRFA within the state). The methodology applied for establishing benchmark rates must include the following:

1. Collection of data for a statistically significant number of completed projects across the state, where this data is considered reliable and relevant to the DRFA. This data includes the project characteristics, treatments / work breakdown structure (WBS), quantities and cost / rates.
2. Analysis of this data to determine if there is variability that should result in disaggregation of the data (e.g. development of regional rates).
3. Identifying each standard treatment within the available data and breaking these standard treatments into component tasks.
4. Allocating historical costs to each of these component tasks.
5. Adjusting the data to ensure it is relevant (including DRFA eligibility), appropriate and comparable. Adjustments may include removal of indirect costs such as project management, design and overhead, in addition to removal of risk and contingency and unusual/one-off items.
6. Allocating each component of the adjusted cost data to standard treatment tasks.
7. Consolidation of costed tasks to calculate standard treatment cost and standard treatment unit rate.
8. Application of indexation for regions to ensure the final benchmark rates reflect practical geographic cost variation that is expected to occur in labour, material and transport costs.
9. Development of a complete list of treatments with the treatment type, rate, and unit of calculation (e.g. metre, m^2, m^3, each) by region (if applicable).
10. Independent review by a suitably qualified professional or quantity surveyor.
11. Endorsement by the state (generally an executive of the DRFA administration agency within the state).

Documentation must be available to evidence completion of each of the above steps.

Internal rate buildup

The internal rate buildup method uses a first principles methodology to estimate the cost of an ERC. It is particularly effective for asset owners with a mature internal works program and reliable internal unit cost records.

A state may develop a series of standard treatments (akin to benchmarking outlined above) across the state or for specific asset owners or use this methodology for the purpose of developing a single estimate.

Standard treatments

The methodology for establishing rates for an internal rate build up must include the following:

1. Identifying standard treatments for works on essential public assets and breaking these standard treatments into component tasks.
2. Undertaking a first principles build-up of costs for each treatments' component tasks. The build-up of costs must be determined through reference to reliable industry recognised data sources, which could include internal cost databases (i.e. based on contracted or established panel rates) or external publications, adjusted for any DRFA specific circumstances.
3. Adjusting the data to ensure it is relevant (including DRFA eligibility), appropriate and comparable. Adjustments may include removal of indirect costs such as project management, design and overhead, in addition to removal of risk and contingency and unusual/one-off items.
4. Application of indexation for regions to ensure the final rates reflect practical geographic cost variation that is expected to occur in labour, material and transport costs.
5. Development of a complete list of treatments with the treatment type, rate, and unit of calculation (e.g. metre, m^2, m^3, each) by region (if applicable).
6. Independent review by a suitably qualified professional or quantity surveyor.
7. Endorsement by the state (generally an executive of the DRFA administration agency within the state), where the rate will be used across the state or region

It is expected that where internal rates are used for standard treatments for developing ERCs, these are refined over time to reflect actual costs of delivered projects under the DRFA. That is, overtime a state would transition to the benchmark rate methodology.

Developing a single estimate

Where internal rate buildup is used to develop an estimate for a single project, rather than for standard treatments across many projects, this must involve:

1. Identifying the scope of works (including each treatment) required to restore the asset to its pre-disaster function
2. Undertaking a first principles build-up of costs for each treatments' component tasks. The build-up of costs must be determined through reference to reliable industry recognised data sources, which could include internal cost databases (i.e. based on contracted or established panel rates) or external publications, adjusted for any DRFA specific circumstances. This should consider the cost types outlined below (table 2).
3. Development of a complete list of treatments with the treatment type, rate, and unit of calculation (e.g. metre, m^2, m^3, each).
4. Independent review by a suitably qualified professional or quantity surveyor.

It is recommended estimates are documented in a standard template for all local council and state assets. Better practice considerations for developing this template are available in *Guidance Note 2 – Base cost estimation* (published by the Commonwealth Department of Infrastructure, Transport, Regional Development, Communications, Sport and the Art).

Cost types

The type of cost will influence the basis for the first principles build up methodology and data sources used to determine the rates. Guidance based on the type of cost is outlined below.

Table 2: Internal rate buildup by direct cost type

Direct cost type	Description	Basis for calculation
Internal plant and equipment	Use of internal machinery, tools and other equipment to undertake the work	For internal plant and equipment, eligibility and calculation guidance is available in Guidance Note: *Internal plant and equipment costs*
Internal labour	Workforce delivering the project	For internal labour, eligibility and calculation guidance is available in Guidance Note: *Labour costs.*
Construction materials	On-site materials used in reconstruction	Recent actual costs, external quotes or typical supply arrangements including standing offer arrangements. In case of borrow pits or other internal material resources, eligibility and calculation guidance is available in Guidance Note: *Internal plant and equipment costs* to determine the internal supply rate.
Contractor /subcontractor services	Specialist services engaged to complete specific components of the project, which can include plant and equipment and labour.	Recent actual costs, external quotes or existing agreements / arrangements. This includes contractor plant and equipment and labour rates.
Other external costs	Includes external fees such as Indigenous fees and biodiversity expenses.	Recent actual costs or external quotes.

For detailed methodologies and better practice for establishing unit rates, refer to *Guidance Note 2 – Base cost estimation* (published by the Commonwealth Department of Infrastructure, Transport, Regional Development, Communications, Sport and the Art).

Design, project management, contingency and cost escalation must be developed in accordance with Guidance note: *non-construction costs*.

Maintaining benchmark rates and internal rates

To ensure rates remain current and accurate for standard treatments, an internal validation and review process must be implemented as follows:

- **Annual review** to reflect changes in market rates and actual project costs (i.e. annual indexation), and any significant deviations noted throughout the year (e.g. a change in rates in a particular region due to a thin market or material shortages); and
- **Comprehensive review every three years** to reassess assumptions, data sources and rate validity against actual costs for delivered projects.

For both reviews, the rates must be re-endorsed by the state (generally an executive of the DRFA administration agency within the state).

How to develop an estimate using benchmark or internal rates

Once benchmark rates or internal rates (if used as the standard method for developing ERCs) are established, these rates must be applied on a methodical and consistent basis across each ERC. Below outlines the steps that must be undertaken when applying these rates.

Steps to establish an estimate using unit rates:

1. **Confirm eligibility**
   - Confirm the asset is an eligible Essential Public Asset (EPA) under the DRFA
   - Confirm the pre-disaster function and condition of the EPA(s)
   - Assess the nature and extent of damage caused by the disaster

2. **Select the appropriate standard treatment**
   - Choose a treatment which restores the EPA to its pre-disaster function (e.g. "gravel resheeting" for unsealed roads), referring to the state's Standard Treatment Guide or equivalent guidance

3. **Measure the scope**
   - Quantify the affected area or volume, to determine (where applicable): length (km), area (m²), volume (m³)

4. **Apply rates**
   - Identify the relevant unit rates for the treatment or cost component

5. **Calculate cost**
   - Multiply the quantity by the rate for each component of the treatment/task

6. **Document the estimate**
   - Document the estimate using the state's template, ensuring it covers off the EPA details and:
     - Treatment type and scope
     - Quantity and rate calculations

7. **Incorporate non-construction costs**
   - Calculate non-construction costs (e.g. design, project management, contingency, cost escalation) in accordance with the *Non-construction Costs* Guidance Note

8. **Submit for validation**
   - Submit the ERC for review in accordance with state processes (including DRFA Management System).

Appendix A: Developing direct costs using benchmark rates

Table 4: Example cost estimation using benchmark rates. The example project involves gravel resheeting of a 1 km section of unsealed rural road, incorporating a 100 mm compacted gravel layer.

Item	Unit	Quantity	Benchmark Rate ($)	Total Cost ($)	Notes
Gravel supply & delivery	m³	150	45	6,750	Based on 100 mm layer over 1 km × 4 m width
Grading	km	1	1,200	1,200	Includes mobilisation and shaping
Compaction (Roller)	hr	4	140	560	Wet hire of roller equipment
Traffic management	job	1	1,000	1,000	Lump sum for signage and control
			Total cost	**$9,510**	

Appendix B: Developing direct costs using internal rate buildup.

Table 5: Example cost estimation using internal rate buildup. The example project involves gravel resheeting of a 1 km section of unsealed rural road, incorporating a 100 mm compacted gravel layer.

Delivery item	Sub item	Unit	Quantity	Internal Rate ($)	Total Cost ($)	Notes
Internal plant and equipment	Grader	hr	10	120	1,200	Council-owned grader and staff
	Roller	hr	6	110	660	Internal roller and operator
Internal labour	Field crew	hr	40	65	2,600	2 staff, 20 hours each
	Project management	hr	15	85	1,275	Internal engineering staff
Construction materials	Gravel supply (council quarry)	m³	150	38	5,700	Based on internal quarry rate
Other costs	Traffic management	hr	1	950	950	Internal traffic control team
				Total cost	**$12,385.00**	