

Guideline 2: Damage assessment for essential public assets

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Introduction

Victoria's Natural Disaster Financial Assistance (NDFA) scheme is available to local councils, Catchment Management Authorities (CMAs) and state agencies (Delivery Agencies), to relieve some of the financial burden that may be experienced following a natural disaster, in accordance with the Australian Government's Disaster Recovery Funding Arrangements (DRFA).

The DRFA is intended to support relief and recovery measures delivered by the states. In Victoria and under the DRFA, eligible reconstruction works are to be jointly funded by the Australian and Victorian governments.

Purpose

The purpose of this document is to provide guidance for the collection and assessment of evidence (particularly visual imagery) to demonstrate post-disaster and pre-disaster asset condition for compliance under the DRFA. Adherence to this guideline should assist in the compilation, review and approval process for submissions in relation to:

- emergency works for essential public assets;
- immediate reconstruction works for essential public assets; and
- essential public asset reconstruction.

A summary of the key steps in the damage assessment process is provided in the Victorian DRFA Claims Management Process Map (Appendix B of the *Victorian DRFA Guideline 1: Claims and eligibility for essential public assets*).

Post-disaster damage

Introduction

To establish a basis that the damage sustained was a direct result of an eligible disaster, the Delivery Agency submitting the claim should be able to provide evidence of the exact location, nature and extent of damage to an essential public asset through the following means:

- photographic evidence, including details of latitude, longitude and date taken.

It is recommended that this evidence is collected up to six months, but not later than twelve months following the eligible disaster. This evidence may also be supported by other imagery that may include:

- satellite or aerial imagery image that depicts extent of damage sustained.

The Delivery Agencies should engage with the Assessing Authority as soon as possible after the occurrence of an eligible disaster event, to establish the link between the damage and the eligible event, and to commence discussions on the scope, development and lodgement of claims associated with the damage.

Inspections to verify damage and restoration works by the Assessing Authority are also recommended to be undertaken on a progressive basis.

Photographic evidence

Standard of photographic evidence

The collection of visual imagery (photographic or videographic), which includes geospatial metadata of longitude, latitude and date taken, is considered the strongest form of evidence to demonstrate post-disaster damage. This visual imagery should be captured at a scope and resolution that facilitates visual assessments of the extent (width, length, depth and height – where relevant) of the post-disaster damage. The timely collection of event-related visual imagery is essential to ensure that the post-disaster damage can be identified and directly attributed to the eligible event. The prompt collection of the evidence also facilitates the development of the cost estimate for reconstruction works.

Examples of visual imagery and reporting format are provided in the following appendices:

- Appendix C: Reconstruction photo report
- Appendix D: Reconstruction works closeout photo report

When taking post-disaster photos, it is important to consider:

- Photos should be clear, in colour and must contain geospatial metadata of longitude, latitude and date taken.
- Actual post-disaster damage must be visible in the photos, photos of completed emergency works or completed reconstruction works are not suitable to establish event related damage.
- Close-up photos are encouraged. Close-up photos can be used to demonstrate the disaster damaged components to support the proposed treatment(s). Close-up photos must be supported with photos of the same damage showing the horizon and the complete asset to provide context and to establish a reference for location.
- The photos should identify the full extent of the damage. For example, where full-width reconstruction works are proposed, the post-disaster damage photos should demonstrate damage across the full width of the pavement to justify this treatment. Similarly, photos of the side view of culverts, structures and floodways' can be used to show the extent of the washout, blocked or collapsed pipe, or end structure damage.
- Take photos of the damage at every location. The photos need to show consistent damage and variances in the degree of damage. For example, for pavement that is deformed (i.e. by rutting), the degree of rutting is recommended to be identified with a 3 metre straight edge and measuring device.
- Where damage is difficult to identify, the asset should be marked to highlight damage and extent.
- Additional photos of the environmental surroundings of the asset may be required to provide evidence of the event and resulting damage (e.g. build-up of washed away pavement gravel, dislodged end wall and culvert components located in creek, scouring and washing away of rock protection seen in drain, grass debris on fence lines).

What to avoid:

- Photos that do not contain geospatial metadata of longitude, latitude and date taken as it is then difficult to ascertain the exact location of the damage.
- Photos taken from inside the car or through the windscreen.
- Any objects that obscure the view of the damage (e.g. structures, vehicles, people).
- Photos with glare or dark shadows on the ground. These can obscure the view of the damage.
- The use of star pickets, sticks, pens, posts and guideposts etc. as straight edges. It is recommended to use a 2-3 metre straight edge.

Requirements by standard treatment category

Table 1: Post disaster photo considerations

Standard treatment category	Post disaster photo considerations
Unsealed pavements	<ul style="list-style-type: none">• Photos of potholes and isolated depressions or scours should be captured at every location where treatment is proposed.• Where a close-up photo is warranted to clearly identify damage, include an additional photo of the full width of pavement, with the horizon in view, to establish the context of the location.• Photos must show damage at regular intervals appropriate to the terrain. For damage of a continuous nature (e.g. rutting, scouring formation deformation) photos at a maximum spacing of 100 metres are recommended. This spacing between photos or frequency can vary depending on the geometry of the road and nature of the damage being identified. For continuous forms of damage, it is important that the photos illustrate this for the complete extent of the damaged road section.• Where full-width reconstruction works are proposed, the post-disaster damage photos should demonstrate damage across the full width to justify this treatment.• If possible, photos should capture visuals of washed out gravel, (e.g. in table drains to support proposed pavement restoration) if applicable.
Sealed pavements	<ul style="list-style-type: none">• Photos of pavement damage, potholes and isolated shoving or scours should be captured at every location where a treatment is proposed. Where a close-up photo is warranted to clearly identify damage, include an additional photo of the full width pavement, with horizon in view, to establish context of the location.• Photos must show damage at regular intervals appropriate to the terrain. For damage of a continuous nature (e.g. rutting, cracking or an edge break) photos at a maximum spacing of 50 metres are recommended. This frequency can vary depending on the geometry of the road and nature of the damage being identified.• Where full-width reconstruction works are proposed, the post-disaster damage photos should demonstrate damage across the full width to justify this treatment.
Clearing and earthworks	<ul style="list-style-type: none">• Photos must show damage to each damaged component of the asset. For clearing and earthworks-related damage, ensure photos are taken that clearly demonstrate the full extent of the damage. For example, if embankments were scoured, or debris was deposited by the event on the carriageway, provide a photo of each area of debris and scour.• If possible, use a measuring device (measuring tape, level staff, ranging pole) that clearly demonstrates the depth (if appropriate) of the damage and ensure this measurement is clearly visible with a second close-up photograph.• There may be surrounding damage that is not immediately identifiable, look for scour and debris under/around the asset and ensure this damage is captured clearly with photographic evidence. This may include build-up of washed away debris, dislodged concrete structures, scoured table drains and grass debris in fence lines.

Standard treatment category

Post disaster photo considerations

Road furniture and delineation	<ul style="list-style-type: none">• Photos must show damage to each damaged component of the asset. For road furniture and delineation ensure that a photo is taken of each individual asset that is missing/damaged. For example, if multiple road sign posts were damaged in the disaster event, provide a photo of each damaged sign post to support the proposed treatments.• If possible, show remaining part of asset (e.g. broken post, bolt holes or deformed guardrail, etc.).
Concrete	<ul style="list-style-type: none">• Photos must show damage to each damaged component of the asset. Consider taking photos at various angles and orientations to demonstrate damage and to quantify proposed treatments.• Where the asset is located adjacent to the pavement surface, include a photo of the full width pavement, with horizon in view, to establish context of the location.• There may be surrounding damage that is not immediately identifiable, look for scour and debris under or around the asset and ensure this damage is captured clearly with photographic evidence. This may include build-up of washed away gravel, dislodged end structures, lost rock protection in drains and grass debris in fence lines.
Drainage structures	<ul style="list-style-type: none">• Photos must show damage to each damaged component of the asset. Consider photos taken at various angles and orientations to demonstrate damage and to quantify proposed treatments.• Where the asset is located adjacent to the sealed surface, include a photo of the full width pavement with horizon in view to establish context of the location.• There may be surrounding damage that is not immediately identifiable, look for scour and debris underneath or around the asset and ensure this damage is captured clearly in a photo. For example, build-up of washed away gravel, dislodged end wall located in creek, lost rock protection seen in drain, grass debris in fence lines.
Other	<ul style="list-style-type: none">• Photos must show damage to each damaged component of the asset. Consider photos taken at various angles and orientations to demonstrate damage and to quantify proposed treatments.

Supplementary evidence

To establish a basis that the damage sustained was a direct result of an eligible event, the inclusion of post-disaster geospatial data, including satellite images may be used to demonstrate post-disaster damage where the extent of the damage is clearly visible and of an appropriate scale to be identified in the satellite view when compared with pre-disaster imagery.

Specific damage that can be identified and approximately quantified from a 'birds eye view' is likely to benefit from the inclusion of a comparison of post-disaster and pre-disaster satellite imagery with the claim. This may include large scale scour to bridge abutments, large scale geotechnical slips, changes to floodway extents and water courses, and significant structure damage.

Supplementary evidence such as photos obtained from newspaper stories, news websites and other sources where the location and date are able to be confirmed may also be useful to establish the pre-disaster condition and post-disaster damage to the asset.

Pre-disaster condition

Introduction

To establish a basis that the damage sustained was a direct result of an activated event, the Delivery Agency submitting the immediate reconstruction or essential public asset reconstruction works claim should be able to provide evidence of the pre-disaster condition of an essential public asset. This post-disaster damage evidence can be compared against the pre-disaster condition. The pre-disaster condition of an essential public asset can be demonstrated through one or more of the following means:

- Pre-disaster photographic evidence, including details of latitude, longitude and date taken. It is recommended that the latest available data be adopted, but no older than four years before the eligible disaster for local government assets and no older than two years before the eligible disaster for all other state assets (reference Appendices B, C and D).
- Pre-disaster asset condition assessment report – conducted or verified by a suitably qualified professional (reference Appendix E).

A suitably qualified professional may be defined as a person with undergraduate qualifications and a minimum of five years' experience, and relevant certifications in the appropriate field of work for the asset type.

This evidence can be supported by other supplementary evidence that may include:

- satellite or aerial imagery that depicts pre-disaster condition of asset prior to being damaged; and
- maintenance records.

No pre-disaster condition assessment is required when submitting an emergency works claim. However, there may be damage that existed on the essential public asset prior to the eligible event occurring and care should be taken to ensure this pre-existing damage is not included in the emergency works claim.

Photographic evidence

Standard of photographic evidence

The presentation of pre-disaster photographic imagery, which includes geospatial metadata of longitude, latitude, and date taken is considered the strongest form of evidence to demonstrate pre-disaster condition of an essential public asset. The comparison of the pre-disaster photos with the post-disaster photos is used to determine eligibility and confirm that the damage sustained is a direct result of the eligible event. For examples of photographs, see Appendices B, C and D.

When presenting pre-disaster photos, it is important to consider that:

- Photos should be clear, in colour, of the same orientation as the post-disaster damage photos (if possible) and contain evidence of geospatial metadata of longitude, latitude and date taken.
- If using Google Street View, ensure the screen capture includes the longitude, latitude in the address bar and the date taken in the header.
- Where full-width reconstruction works are proposed, the pre-disaster damage photos should show the full width of the pavement to justify this treatment.

- Where continuous post-disaster damage photos are used to demonstrate continuous damage, it is recommended a pre-disaster photo be included to compare against each corresponding post-disaster damage photo.
- Ensure that pre-disaster photos provided show the condition of each damaged component of the essential public asset. A pre-disaster photo of the carriageway (Google Street View or other) will not be sufficient evidence to establish pre-disaster condition of a culvert or structure not visible from the pavement surface.
- It is recommended that photos are provided in JPEG, TIFF or similar file format with relevant location, time and metadata information embedded in the files or imprinted on them.
- It is recommended that Delivery Agencies use systems such as Google Maps or Nearmap, or photographic or video recordings that provide a view of the assets in a chronological sequence.

What to avoid:

- Photos that do not contain geospatial metadata of longitude, latitude and date taken as it is then subjective to the exact location of the damage.
- Pre-disaster photos where the corresponding post-disaster damage area is not visible within the extents of the pre-disaster photo.
- Photos taken from inside the car or through the windscreen.
- Any objects that obscure the view of the damage e.g. structures, vehicles, people.
- Photos with glare or dark shadows on the ground.

Requirements by standard treatment category

The following table provides details of photo considerations specific to each standard treatment category. For details of each standard treatment category, please refer to the Victorian DRFA *Guideline 3 Cost Estimation*.

Table 2: Pre-disaster photo considerations

Standard treatment category	Pre-disaster photo considerations
Unsealed pavements	<ul style="list-style-type: none"> • Pre-disaster photo (Google Street View or other) of carriageway with same longitude, latitude and orientation as corresponding post-disaster photo. Ensure the area where the post-disaster damage has been identified is clearly visible in the pre-disaster photo. • Consider matching features (guideposts, structures, signs, poles, trees, creeks and rivers) present in the post-disaster damage photos with pre-disaster photo features to assist in establishing the location of the pre-disaster photos.
Sealed pavements	<ul style="list-style-type: none"> • Pre-disaster photo (Google Street View or other) of carriageway with same longitude, latitude and orientation as corresponding post-disaster photo. Ensure the area where the post-disaster damage has been identified is clearly visible in the pre-disaster photo. • Consider matching features (line marking, guideposts, structures, signs, poles, trees, creeks and rivers) present in the post-disaster damage photos with pre-disaster photo features to assist in establishing the location of the pre-disaster photos.
Clearing and earthworks	<ul style="list-style-type: none"> • Pre-disaster photo (Google Street View or other) of damaged area with same longitude, latitude as corresponding post-disaster photo. Ensure the area where the post-disaster damage has been identified is clearly visible in the pre-disaster photo. • Consider matching features (line marking, guideposts, structures, signs, poles, trees, creeks and rivers) present in the post-disaster damage photos with pre-disaster photo features to assist in establishing the location of the pre-disaster photos.

Standard treatment category	Pre-disaster photo considerations
Road furniture and delineation	<ul style="list-style-type: none"> • Pre-disaster photo (Google Street View or other) of specific road furniture with same longitude, latitude as corresponding post-disaster photo. Ensure the area where the post-disaster damage has been identified is clearly visible in the pre-disaster photo. • Consider matching features (line marking, guideposts, structures, signs, poles, trees) present in the post-disaster damage photos with pre-disaster photo features to assist in establishing the location of the pre-disaster photos.
Concrete	<ul style="list-style-type: none"> • Pre-disaster photos of concrete component with same longitude, latitude as structure depicted in post-disaster photo. Pre-disaster photo (Google Street View or other) of carriageway above structure may support claim, however pre-disaster condition of each component of the concrete structure must be clearly visible. • Consider matching features (scour protection, creeks and river, guideposts, structures, signs, poles, trees) present in the post-disaster damage photos with pre-disaster photo features to assist in establishing the location of the pre-disaster photos.
Drainage structures	<ul style="list-style-type: none"> • Pre-disaster photos of structure with same longitude, latitude as structure depicted in post-disaster photo. Pre-disaster photo (Google Street View or other) of carriageway above structure may support claim, however pre-disaster condition of each component of the drainage structure must be clearly visible. • Consider matching features (scour protection, creeks and river, guideposts, structures, signs, poles, trees) present in the post-disaster damage photos with pre-disaster photo features to assist in establishing the location of the pre-disaster photos.
Other	<ul style="list-style-type: none"> • Pre-disaster photo of component of the asset with same longitude, latitude as structure depicted in post-disaster photo. • Consider matching features (line marking, guideposts, structures, signs, poles, trees, creeks and rivers) present in the post-disaster damage photos with pre-disaster photo features to assist in establishing the location of the pre-disaster photos.

Pre-disaster asset condition assessment report

Where an eligible event has caused damage to an asset and the pre-disaster condition of the asset cannot be sufficiently represented in photographs, the proof of damage can be provided through a pre-disaster asset condition assessment report. This report (undertaken at the time of the damage assessment or as soon as reasonably practicable) must be conducted or verified by a suitably qualified professional, with the appropriate level of expertise and experience. This report is to confirm that the damage was caused by the eligible disaster event.

This only applies to damage that is not clearly identified in a comparison between post-disaster and pre-disaster photos. The cause of the damage and description of the damage should be detailed to provide the Assessing Authority an understanding of how the eligible event directly caused the damage to the essential public asset.

This type of evidence may also be required when restoration works are based on an expert's advice and recommendation. Situations where this may be relevant are intelligent transport systems (ITS) infrastructure, bridge structure damage, geotechnical failures or destabilisation of slopes.

A pre-disaster condition assessment report template is available for use and has been provided in Appendix E: Pre-disaster asset condition assessment report template.

Asset condition surveys

Asset condition surveys, which provide performance information and overall condition assessment of roads are valuable to demonstrate the condition of an asset prior to an eligible disaster event. Where such a survey demonstrates a deficient aspect of the asset, and records can be provided that this was rectified, this provides a solid basis to demonstrate that the asset was adequately maintained prior the eligible disaster event.

Maintenance records

Maintenance records that can sufficiently detail the location and type of works undertaken will assist as supporting evidence that the asset has been properly maintained. It is important that such information records the date of activities and locations to be able to verify against damage that may have been sustained by an eligible disaster event.

Defect log

A defect log, that identifies defects that existed on the asset prior to the eligible disaster event, can support the condition of the asset prior to the event. Similar to maintenance records, it is important that log record the date and location of the inspection of the defects to be able to verify damage sustained by an eligible disaster event.

Satellite and aerial images

Satellite or aerial images (latest available data prior to the eligible event occurring, but no older than four years before the eligible disaster for local government assets and no older than two years before the eligible disaster for all other State assets) may be used to demonstrate the condition of the essential public asset where the extent of the damage being compared against is of an appropriate scale to be identified in the satellite/aerial view. This may include large scale scour to bridge abutments, large scale geotechnical slips, changes to floodway extents or water courses and significant structure damage.

Damage assessment by works type

Emergency works

Emergency works are the urgent activities necessary during or following an eligible disaster to temporarily repair an essential public asset to enable it to operate or be operated at an acceptable level of efficiency to support the immediate recovery of a community. There is a three month time limit to complete emergency works under the DRFA.

Typical forms of emergency works are:

- Removal of silt and debris that pose a safety hazard or are required to be undertaken to restore the asset to an acceptable level of efficiency (for example, complete blockage of a culvert by silt, fallen trees and debris blocking the travelling public and edge scour in immediate proximity to the travelling lane of the carriageway).

- Temporary repair works to the asset that ensure it can be operated at a reasonable level of efficiency prior to reconstruction works being undertaken (for example, pothole repairs, formation grading, temporary gravel pavement repairs and temporary side tracks).
- Erection of temporary traffic management, including warning signs/barriers to ensure the asset can be safely used for its intended purpose.

For emergency works, there should be representative evidence of each of the key work types (i.e. pothole repairs, debris removal) undertaken on an essential public asset. The volume of photos for emergency works should be appropriate with the level of damage to the essential public asset. It is recommended that photographic evidence collected for all emergency works sites to ensure sufficient evidence supports the level of actual costs incurred.

To establish a basis that the damage sustained was a direct result of an eligible event, and the nature of the emergency works undertaken are eligible to be claimed under an emergency works claim, the following damage evidence should be provided:

- Emergency works photo report, representative of damaged locations, presented in a logical sequence for each asset with information specific to the post-disaster photo presented, see

- Appendix B: Emergency works photo report.
- All post-disaster photo files contained within the emergency works photo report, with metadata intact, contained within subfolders and grouped by asset (for example, road ID, culvert ID or structure ID).

When undertaking the emergency works damage assessment process, it is important to consider that:

- No pre-disaster photo comparison is required.
- Post-disaster photos to be representative of damage to each asset and of a quantity to be appropriate to the area of damage sustained and the value of works undertaken.
- Post-disaster photographic standards and considerations should be adopted as per the 'Post-disaster damage – Photographic evidence' section of this guideline.
- Post-disaster photos must show actual damage and are to be taken before emergency works are completed. A photo of an asset that is inundated (e.g. water over the road) is not considered suffice to demonstrate that damage was sustained on the asset).
- Where continuous damage is identified over the length of the asset, representative post-disaster photos should be provided over the full length of the asset (for example, where a road has sustained damage over 5km, representative post-disaster photos should be provided over the full 5km length of the road at a frequency suitable to the nature of the damage).
- No completed works photos are required for emergency works claims but can assist in the development of a reconstruction works claim if required.

Immediate reconstruction works

Immediate reconstruction works are immediate activities carried out to fully reconstruct an essential public asset and occur following a decision by the state that no essential public asset reconstruction works are required.

Immediate reconstruction works must be completed within three months from the date of the eligible disaster event or when the essential public asset becomes accessible and should only be undertaken in circumstances where there is urgent requirement to restore that asset to its pre-disaster function, and/or it does not represent value for money to undertake emergency works. Approval from the assessing agency is required before immediate reconstruction works are undertaken.

To establish a basis that the damage sustained was a direct result of an eligible event, and the nature of the immediate reconstruction works proposed are eligible to be claimed under an immediate reconstruction works claim, the following damage evidence should be provided:

- Reconstruction photo report, with pre-disaster photo comparisons, presented in a logical sequence for each asset with information specific to the post-disaster photo presented, see Appendix C: Reconstruction photo report.
- All post-disaster photo files contained within the reconstruction photo report, with metadata intact, contained within subfolders and grouped by asset (for example, road ID, culvert ID or structure ID).
- Supplementary evidence (if applicable).

When undertaking the immediate reconstruction damage assessment process, it is important to consider that:

- Pre-disaster photo comparisons (where available) are to be provided to confirm damage is a direct result of event.
- Only pre-disaster photo comparisons that show a 'step change' in the condition of the asset from the pre-disaster condition to post-disaster condition should be included in the immediate reconstruction works claim.
- Post-disaster photos for an immediate reconstruction works claim may be taken up to three months following the date the essential public asset becomes accessible to illustrate damage from the event. However, the timely collection of event related visual data is essential to ensure that the post-disaster damage can be identified and directly attributed to the eligible event.
- Post-disaster photographic standards and considerations should be adopted as per the 'Post-disaster damage – Photographic evidence' section of this guideline.

Essential public asset reconstruction works

Essential public asset reconstruction works are permanent works carried out to reconstruct an essential public asset damaged by an eligible disaster, to its pre-disaster function. Essential public asset reconstruction works must be completed within two financial years after the end of the financial year in which the disaster occurred.

To establish a basis that the damage sustained was a direct result of an eligible event, and the nature of the reconstruction works undertaken are eligible to be claimed under an essential public asset reconstruction works claim, the following damage evidence should be provided:

- Essential public asset reconstruction photo report, with pre-disaster photo comparisons (where available), presented in a logical sequence for each asset with information specific to the post-disaster photo presented, see Appendix C: Reconstruction photo report.
- All post-disaster photo files contained within the essential public asset reconstruction photo report in, with metadata intact, contained within subfolders and grouped by asset (for example, road ID, culvert ID or structure ID).
- Supplementary evidence (If applicable), for example photos obtained from newspaper stories, news websites where location and date can be confirmed.

When undertaking the reconstruction damage assessment process, it is important to consider that:

- Pre-disaster photo comparisons (where available) are to be provided to confirm damage is a direct result of event.
- Where pre-disaster photos are not available, a Pre-disaster asset condition assessment report is required for each asset type (i.e. road pavement, bridge, drainage).
- Pre-disaster photo comparisons that show a 'step change' in the condition of the asset from the pre-disaster condition to post-disaster condition generally demonstrate that the damage is a direct result of the event and therefore eligible.
- Post-disaster photos may be taken up to twelve months following the eligible disaster to illustrate damage from the event. However, the timely collection of event related visual data is essential to ensure that the post-disaster damage can be identified and directly attributed to the eligible event.
- Post-disaster photographic standards and considerations should be adopted as per the 'Post-disaster damage – Photographic evidence' section of this guideline.

Reconstruction works closeout

Following completion of an immediate reconstruction works or essential public asset reconstruction works project, it is necessary to provide photographic evidence of the completed works to demonstrate that the works undertaken were synonymous with the works proposed in the reconstruction claim.

To establish the nature of the reconstruction works undertaken, the following completion evidence should be provided:

- Reconstruction works closeout photo report, with pre-disaster and post disaster photo comparisons and representative post-completion photos presented in a logical sequence for each asset with information specific to the post-disaster photo presented, see Appendix D: Reconstruction works closeout photo report.
- All post-disaster and post-completion photo files contained within the Reconstruction Works Closeout Photo Report, with metadata intact, contained within subfolders and grouped by asset (for example, road ID, culvert ID or structure ID).
- The Delivery Agency is required to submit related works claims within three months after works are completed, therefore photos are to be provided as soon as works are practically complete or before the claim submission due date.

When undertaking the reconstruction damage closeout process, it is important to consider that:

- The purpose of reconstruction works closeout photo report is to provide evidence that the treatments proposed in the restoration works claim have been undertaken.
- Completion photos should be captured at a scale and orientation that reflects their corresponding post-disaster photo to enable a visual comparison between post-disaster damage and completion.
- All photos presented in the immediate reconstruction of essential public asset restoration works claim should have corresponding post-completion photos presented with the reconstruction works closeout, noting that completion photos are to:
 - Illustrate pavement treatments and widths undertaken (for example, part-width, half-width, full-width)
 - Illustrate the various reconstruction works types (e.g. drainage works, bridge works, geotechnical works).

File and folder naming conventions

- It is proposed that for all claim types, the damage evidence should be filed in a similar manner to assist in the assessment process.
- All photo files are to be assigned a unique photo ID that corresponds with the reference to the photo within the relevant claim form.
- All photo files submitted with metadata intact, presented in subfolders and grouped by asset (for example, road ID, structure ID or bridge ID).

Document information

For the list of documentation related to damage assessment, refer to Appendix A: Damage assessment standard forms and templates.

Document details

Criteria	Details
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Document title:	Victorian DRFA guideline 2: Damage assessment for essential public assets
Document owner:	Department of Treasury and Finance

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V2.0	24 10 18	Final Issue for approval	
V2.1	26.10.18	Minor updates to final issue	
V2.2	30.10.18	Working document	
V2.3	07.01.19	Updates to glossary	

Document approval

Name	Title	Organisation
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Reference material

Attached references	TRIM ID/Location
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Bibliography	Author	TRIM ID/Location
Disaster recovery funding arrangements 2018	The Australian Government	

Acronyms

Acronyms	Description
ACMS	Automated claims management system
CMA	Catchment management authority
DELWP	Department of Environment, Land, Water and Planning
DJR	Department of Justice and Regulation
DRFA	Disaster recovery funding arrangements
DTF	Department of Treasury and Finance
EPA	Essential public asset
ITR	Independent technical review
LGA	Local Government Authority
NDRRA	Natural disaster relief recovery arrangements
OH&S	Occupational health and safety
RCBC	Reinforced concrete box culvert
RCCEF	Road construction cost escalation forecasts
REPA	Reconstruction of essential public assets
VAGO	Victorian Auditor-General's Office
VMIA	Victorian managed insurance arrangements
WBS	Work breakdown structure

Glossary of terms

Terms	Description
Administering Authority	The Administering Authority for the DRFA in Victoria is the Department of Treasury and Finance (DTF). DTF serves as the single point of contact with the Australian Government and oversees the implementation of the DRFA across state agencies and local council.
Allowable time limits	Prescribed timeframes under the DRFA including, but not limited to, the following activities: <ul style="list-style-type: none"> • Notification of the Australian Government of a disaster event • Completion of emergency works and non-REPA reconstruction works • Provision of evidence of damage to the State for an eligible disaster event • Approval of cost estimates related to a disaster event • Period to incur REPA expenses
ASAE3150	ASAE3150 Assurance Engagements on Controls, issued by the Auditing and Assurance Standards Board
ASA 800	Auditing Standard ASA 800 Special Considerations-Audits of Financial Reports Prepared in Accordance with Special Purpose Frameworks, issued by the Auditing and Assurance Standards Board.
Assessing Authority	The Assessing Authority assesses claims for the reconstruction of essential public assets on behalf of DTF. The Assessing Authority will depend on the Delivery Agency that has undertaken the works.
Borrow pit	A borrow pit is an area where material (usually soil, gravel or sand) has been excavated for use at another location
Claim pack	The financial reporting pack provided by the Australian Government to the State each year.
Contingency	The allowance reflecting the reconstruction project risk profile, complexity, investment lifecycle, benchmarks and past performance for similar projects.
Control agency	The agency who is responsible to undertaking the control activity to mitigate the risk to ensure that the control objective(s) can be met.
Control objectives	The control objectives established within these arrangements, as required under ASAE3150
Cost estimation	The process of developing the estimated reconstruction cost for the reconstruction of essential public assets by building up the component elements including: <ul style="list-style-type: none"> • scoping and defining the works required for reconstruction of the essential public asset; • applying relevant assumptions and exclusions, and • using available historical data of actual costs (that is, benchmark pricing) and/or supplier quotes to estimate the cost of reconstruction works.
Counter disaster operations	Activities undertaken by the state in response to the occurrence of a disaster event to protect a community from the impacts of the disaster event
Day Labour	The use of a Delivery Agency's own plant, equipment or resources to reconstruct an asset. The key components of day labour are plant, labour and materials.
Disaster event activation	Under the DRFA, for an event to be activated, the following conditions must be satisfied: <ul style="list-style-type: none"> • Meets the definition of a natural disaster or terrorist event and eligible disaster; and • Has impacted an eligible undertaking.

Terms	Description
Disaster Recovery Funding Arrangements Management System	The processes and controls implemented by <i>state agency</i> and third party organisations (where applicable) in relation to an <i>estimated reconstruction cost</i> , as defined by these <i>arrangements</i> .
Delivery Agency	A State or Local Government agency responsible for delivering emergency or reconstruction works to restore an asset post-disaster.
Direct costs	Costs directly associated with the reconstruction of an eligible essential public asset, commonly referred to as construction costs.
Eligible disaster	A natural disaster or terrorist act for which: <ul style="list-style-type: none"> a coordinated multi-agency response was required, and state expenditure exceeds the small disaster criterion.
Eligible measure	A relief or recovery assistance measure specified in these arrangements, or a cost to the state under clause 8.1 of these arrangements.
Eligible undertaking	A body that: <ul style="list-style-type: none"> is one of the following: <ul style="list-style-type: none"> a department or other agency of a <i>state</i> government, or established by or under <i>state</i> legislation for public purposes (for example, a local council), and in the operation of the asset provides services free of charge or at a rate that is 50 per cent or less of the cost to provide those services.
Emergency works	Urgent activities necessary following an eligible disaster to temporarily restore an essential public asset to enable it to operate/be operated at an acceptable level of efficiency to support the immediate recovery of a community, and take place: <ul style="list-style-type: none"> prior to the state commencing essential public asset reconstruction works in accordance with these arrangements, or prior to or at the same time as immediate reconstruction works and where no essential public asset reconstruction works are required.
Escalation	The allowance for expected changes in capital costs throughout the project lifecycle.
Essential public asset	A transport or public infrastructure asset of an eligible undertaking which, the state considers, and the Australian Government agrees, is a necessary part of a state's infrastructure and is integral to the normal functioning of a community.
Essential public asset function framework	The Essential Public Asset Function Framework as defined by these arrangements (refer to clause 6.3).
Essential public asset reconstruction works	Reconstruction works on an essential public asset directly damaged by an eligible disaster for which an estimated reconstruction cost has been developed.
Estimated reconstruction costs	The estimated cost of reconstruction of an essential public asset damaged by an eligible disaster and calculated in accordance with these arrangements.
Extensions to allowable time limits	Extensions to prescribed timeframes under special/ extenuating circumstances to maintain eligibility of a claim under the DRFA
First principles estimation	The process of assigning plant, labour and material rates to a given work activity or standard treatment.
Immediate reconstruction works	Immediate reconstruction activities following an eligible disaster to fully reconstruct an essential public asset, and where no essential public asset reconstruction works are required.
Ineligible works	Works that are not eligible for claiming under the DRFA arrangements
Indirect costs	Costs indirectly related to the reconstruction of an eligible essential public asset, including overheads, project management, procurement and engineering assessment costs.

Terms	Description
Independent Technical Review	A review of estimated reconstruction costs in accordance with the DRFA
Market response	The process of developing estimated reconstruction cost for reconstruction of essential public assets by tender or competitive bidding.
Monitoring agency	The agency who is responsible for monitoring that the control activity has been undertaken to successfully meet the control objective(s).
Natural disasters	According to the DRFA, a natural disaster is one, or a combination of the following rapid onset events: Bushfire, earthquake, flood, storm, cyclone, storm surge, landslide, tsunami, meteorite strike or tornado.
Pre-disaster condition	Condition of an eligible asset prior to the occurrence of the disaster event
Post-disaster condition	Condition of an eligible asset in the aftermath of a disaster event occurring
Pre-disaster asset function	Under the DRFA, the Australian Government will provide funding equivalent to reconstruct an essential public asset to its pre-disaster function. Therefore, the pre-disaster function must be determined to establish the proposed treatment and subsequent estimated reconstruction cost. It is important to note that pre-disaster condition of the asset is still an important factor, and evidence of the assets condition prior to the disaster event is required as part of the funding claims process.
Project	For the purpose of defining a project, a project shall be considered one of the following: <ul style="list-style-type: none"> • a single asset • up to 10 individual assets with estimated costs of ≤\$50,000 each (totalling no more than \$500,000).
Public infrastructure	An asset that is an integral part of a state's infrastructure and is associated with health, education, justice or welfare.
Reconstruction	The restoration or replacement of an essential public asset.
Re-damaged essential public asset	An essential public asset is re-damaged if it suffers additional damage from a subsequent eligible disaster which occurs after the development of an estimated reconstruction cost for the preceding eligible disaster.
Reasonable assurance engagement	An assurance engagement in which the assurance practitioner reduces engagement risk to an acceptably low level in the circumstances of the engagement as the basis for the assurance practitioner's conclusion. The assurance practitioner's conclusion is expressed in a form that conveys the assurance practitioner's opinion on the outcome of the measurement or evaluation of the underlying subject matter against criteria
Responsible agency	The agency who is responsible for undertaking the activity as prescribed under the DRFA.
Small disaster criterion	For the purposes of these arrangements, the amount of \$240 000 or an amount as published by the department.
Special Circumstances	Where the estimated reconstruction cost is lower than the actual cost of a project as a result of special circumstances, and the variance does not meet the criteria for an Independent Technical Review, delivery agencies can adjust the estimated reconstruction cost to reflect the variance. The Delivery Agency must provide evidence to the Assessing Authority to demonstrate the special circumstances encountered, including why the special circumstances could not reasonably have been foreseen.
Standard treatment(s)	Common or typical reconstruction/ repair procedures undertaken in response to damage sustained from natural disasters

Terms	Description
The System (Disaster Recovery Funding Arrangements Management System)	The processes and controls implemented by a <i>state agency</i> and third party organisations (i.e. delivery agencies where applicable) in relation to an estimated reconstruction cost, as defined by the DRFA.
Terrorist act	<p>An action or a series of actions committed in Australia which the Minister has determined is a terrorist act for the purposes of an eligible disaster under these arrangements.</p> <p>Without limiting the matters to which the Minister may have regard in determining whether the action or series of actions is a terrorist act, the Minister may have regard to:</p> <ul style="list-style-type: none"> the definition of a terrorist act under section 100.1 of the Criminal Code Act 1995, and if available, the advice of other Commonwealth agencies. <p>In the event of one or more acts, the Minister may determine two or more related acts to be a single terrorist act.</p>

Appendix A: Damage assessment standard forms and templates

Item	Description	Form/Doc ID
1	Victorian DRFA Guideline 2 - Damage assessment for essential public assets	GL-2
2	Victorian DRFA Fact Sheet 2 - Damage assessment for essential public assets	FS-2
3	Emergency works photo report	GL-2 App B
4	Reconstruction photo report	GL-2 App C
5	Reconstruction works closeout photo report	GL-2 App D
6	Pre-disaster asset condition assessment report template	GL-2 App E

Appendix B: Emergency works photo report

Appendix C: Reconstruction photo report

Appendix D: Reconstruction works closeout photo report

Appendix E: Pre-disaster asset condition assessment report template

