



the dr&pw

Department:
Roads and Public Works
NORTHERN CAPE PROVINCE
REPUBLIC OF SOUTH AFRICA

POLICY FOR MEASURING BRIDGES AND CULVERTS ASSET REGISTER



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1. POLICY STATEMENT

The purpose of this policy is to provide clarity on the recognition and recording of immovable assets in the financial statements and asset register of a department. The overall objective is to ensure that all identifiable properties (land and or improvements) are accurately reflected in the asset register thus providing a complete picture of bridges for decision making and accountability purposes.

2. INTRODUCTION AND BACKGROUND

The aim of this policy is to assist the Roads Technical Personnel to understand the Bridges and Culverts measurements for Bridges asset register purposes.

The Northern Cape Department of Roads and Public Works has adopted the Struman simplified approach to calculate the bridges and culverts' ASSET VALUES.

Northern Cape has bridge general and bridge cellular bridge types. The arch shaped deck bridges are bridge general.

This Policy Document is developed from the STRUMAN TERMINOLOGY GUIDE, SARF Bridges Inspection Course material and lessons learnt from Northern Cape bridges and culverts re-measurement for the implementation of simplified approach to calculate the bridges and culvert asset values.

3. APPLICABLE LEGISLATION

The policy has been developed after due consideration of the following various pieces of legislation, which amongst other, govern the acquisition, management and disposal of immovable assets:

- The Constitution of the Republic of South Africa, No. 108 of 1996;
- The Constitution of the Republic of South Africa, No. 200 of 1993;
- Land Survey Act, No. 8 of 1997;
- Government Immovable Asset Management Act, No. 19 of 2007 (GIAMA);
- Modified Cash Standard (MCS
- Accounting for Immovable Assets (Property)

4. STRUCTURE DESCRIPTION

A differentiation is made between structure type and structure classification. Structure type refers to the characteristics of the structure while the structure classification refers to the size of the structure.

Bridge: A structure consisting of separate and clearly identifiable elements such as deck slab, deck expansion joints, abutments, pier(s) and footings



Culvert: A structure (normally "buried" with road fill) consisting of "cellular" or "rectangular" units. A cellular cell unit can typically be described as an "opening" where, in general, the overall cell length is less than the cell width. Elements such as separate deck slab, abutments/piers and footings are not clearly identifiable while elements such as invert slabs, apron slab and cut-off walls are normally present.



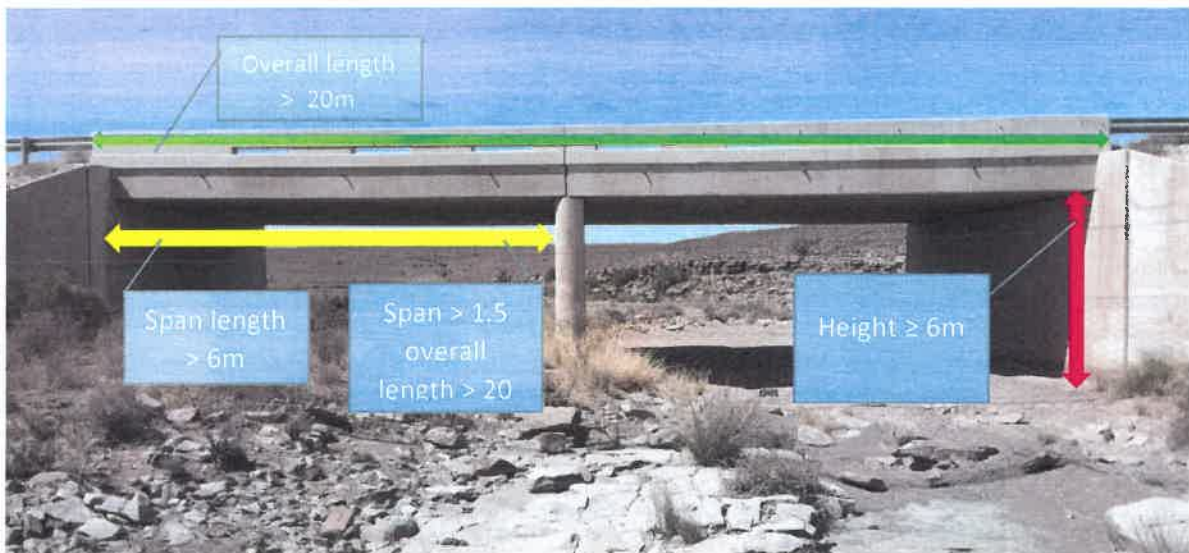
Bridge Cellular: A structure (normally "buried" with road fill) consisting of "cellular" or "rectangular" units. A cellular cell unit can typically be described as an "opening" where, in general, the overall cell length is greater than the cell width. Elements such as separate deck slab, abutments/piers and footings are not clearly identifiable while elements such as invert slabs, apron slab and cut-off walls are normally present.



5. CRITERIA FOR QUALIFYING THE STRUCTURE TYPE

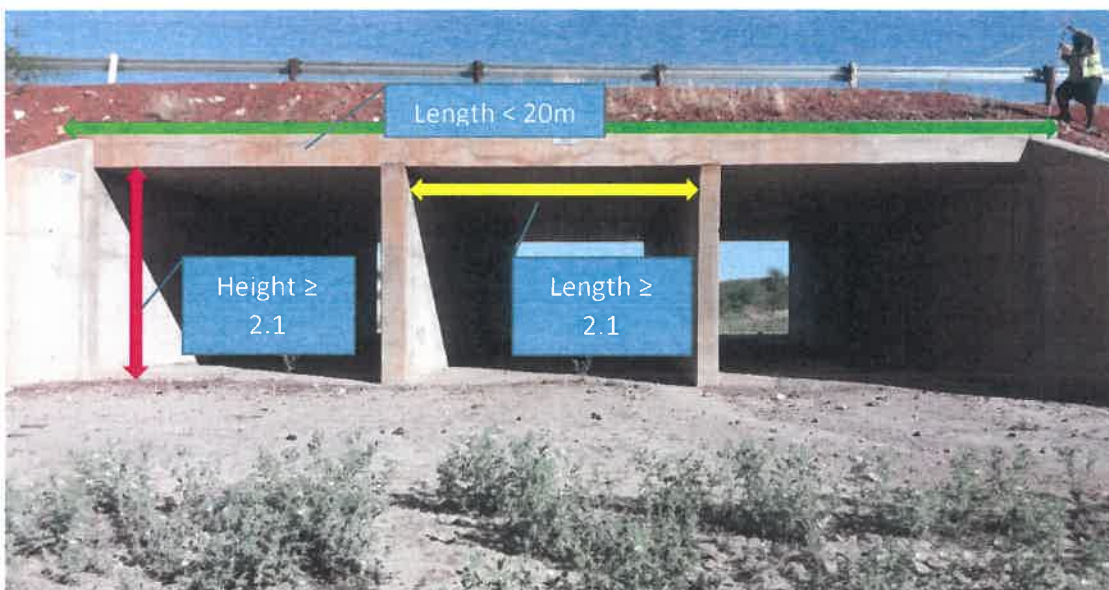
5.1 A structure is qualified as a **Bridge** if one or more of the following criteria are satisfied:

- Any single span (as measure horizontally at the soffit parallel to the road/rail centre line between the faces of its support) is equal to or greater than 6m; or
- The individual clear span (as measure horizontally at the soffit parallel to the road/rail centre line between the faces of its support) exceed 1.5m and the overall length measured between abutment faces exceed 20m; or
- The opening height, which is the maximum vertical distance measured from the top of footing to the soffit of the superstructure, is equal to or greater than 6m; or
- the total cross-sectional opening is equal to or larger than 36m², or
- Structure is a road-over-rail structure, even if the span is less than 6m.



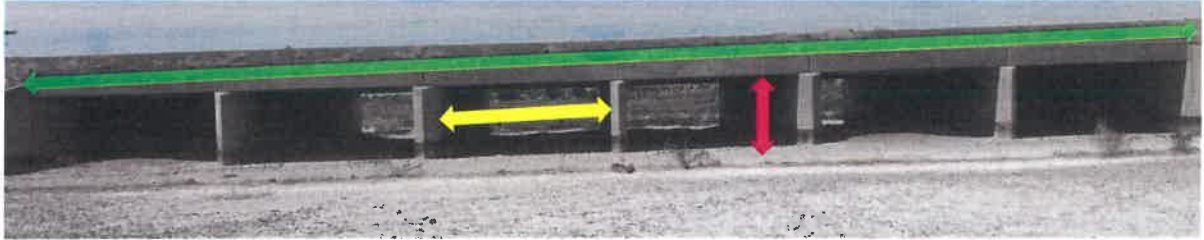
5.2 A structure is qualified as a **Major Culvert** if one or more of the following criteria are satisfied:

- A cellular structure with dimensions less than those defining a bridge; or
- A cellular structure with any clear span length (as measured horizontally at the soffit perpendicular to the faces of its supports) equal to or larger than 2.1m; or
- A culvert with a total cross-sectional opening equal to or larger than 5m².



5.3 A structure is qualified as a **Cellular Bridge** if one or more of the following criteria are satisfied:

- Diameter equal to or larger than 2.1m; or
- A total cross-sectional opening equal to or larger than 5m².



6. BRIDGE CLASSIFICATION

- Small bridge: Overall structure length less than 20m;
- Medium bridge: Overall structure length equal to or more than 20m, but less than 50m;
- Large bridge: Overall structure length equal to or more than 50m, but less than 100m;
- Very large: Overall structure length equal to or more than 100m.

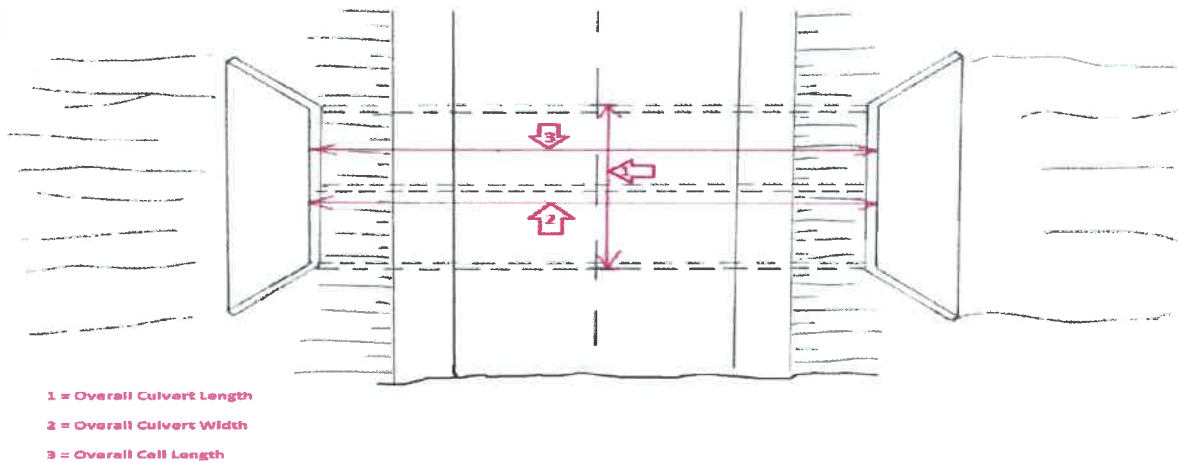


7. BRIDGES AND CULVERTS MEASURING

Bridges and culverts will be measured, for bridges asset register purposes, with a fiberglass measuring tape.

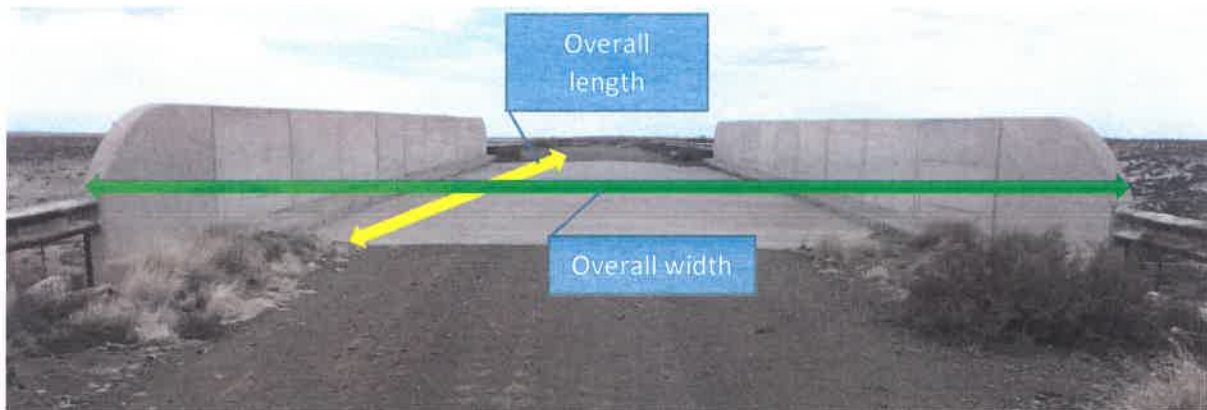
Only the following dimensions will be measured for bridges asset register purposes:

- Overall length of the deck slab;
- Overall width of the structure and
- The highest pier/abutment height.



The following measuring approaches will be followed:

- Wherever possible, the overall length and width will be measured from top of the deck.



- Wherever possible, the height of the structure will be measured from under the structure.



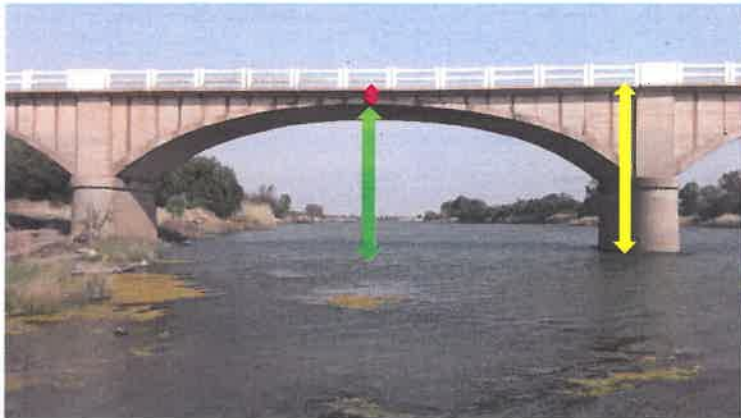
- In the case where access is not possible to get to under the structure, the height will be measured from the top of the structure using the tape or the survey ranging rods.



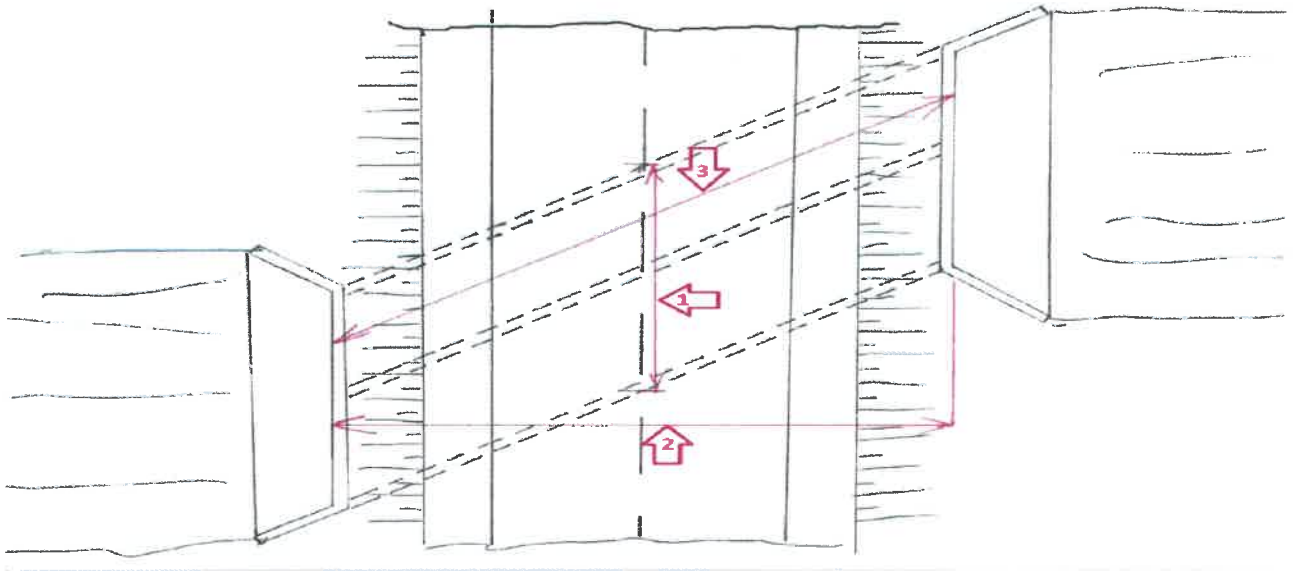
- In the case where measuring overall length and width from the top of the deck will compromise the accuracy of the measurement, the head walls will be projected vertically.



- In the case of the arch shaped deck the height will be measured from the footing to the peak of the soffit.



- In the case of the skew structure where the perpendicular measurement head wall to head wall is impossible, the imaginary head wall will be projected horizontally.



8. MEASUREMENT OF THE ELEMENTS OF THE DEPARTMENTAL FINANCIAL STATEMENTS

Measurement of properties should be done in line with the Modified Cash Standard (MCS). Assets captured in the Asset Register should comply with paragraphs .69 to .73 of the MCS Chapter on Capital assets, which dictates that measurement should be at cost and where not reliably determinable, at fair value.

“Measurement is the process of determining the monetary amounts at which the elements of the financial statements are to be recognised and carried in the Statement of Financial Position and Statement of Financial Performance, or recorded for disclosure as secondary financial information. This involves the selection of the particular basis of measurement. The individual chapters of this Standard will specify the appropriate measurement basis to use for a specific element.

The two common measurement bases are historical cost and fair value:

For assets, historical cost is the amount of cash or cash equivalents paid or the fair value of the consideration given to acquire the asset at the time of its acquisition. For liabilities, historical cost is the amount of proceeds of cash or cash equivalents received or the fair value of non-cash assets received in exchange for the obligation at the time the obligation is incurred, or in some circumstances the amounts of cash or cash equivalents expected to be paid to settle the liability in the normal course of business.

Fair value is the amount for which an asset could be exchanged, or a liability settled, between knowledgeable, willing parties in an arm’s length transaction.”

8.1 Valuation Methods

Three methods to be considered in determining the fair values of immovable assets:

- Municipal valuation rolls (and supplementary rolls) can be utilised as the default method to determine a fair value as deemed cost. Municipal valuations must comply with the Municipal Property Rates Act, 2004 which, requires a market related value to be determined. The municipal rolls where rates are paid in accordance with the rolls are considered to be third party documents (independent from the department) and the audit outcome of the municipality thus irrelevant. Where the Municipal value is disputed an alternative fair value should be determined.
- Market based value (Sales Comparison method): – This method takes into account comparable properties that have been sold recently in the same area and adjustments for rights, location, time, size, shape and layout. It can be used in the absence of Municipal values or where MVR

values were deemed to be out-dated /unreliable (with reasons documented). This method can be used for vacant land, farms & some residential properties.

- Depreciated replacement cost – value calculated by using the acquisition cost of a similar asset and then adjusted by taking into account condition (depreciation/impairment) or functionality of the asset, this method can also be used in the absence of reliable Municipal values for certain specialised properties, e.g. hospitals, airports, weighbridges, etc.

8.2 Subsequent measurement

After initial recording, a capital asset shall be carried at its cost.

Currently all capital assets remain in the asset register at their original cost (or deemed cost). Capital assets are not depreciated nor subject to impairment testing or valuation adjustments for appreciation or devaluation. Cost may only be adjusted to correct an error or on a change of accounting policy.

Subsequent costs

Any subsequent expenditure incurred on an existing capital asset that is of a capital nature is added to the cost of that asset. Where the subsequent expenditure relates to a project that spans over more than one financial year, the project costs are carried in work in progress as incurred and added to the cost of the capital asset when ready for use. Any cost incurred subsequent to that must be added to the cost of the asset until the total project cost has been accounted for at the end of the project.

9. FORMULA FOR CALCULATING THE ASSET VALUE/FAIR VALUE

Asset Value(AV)= Replacement Cost(Rcb) X Depreciation(d)

Replacement cost is cost to replace the structure with a similar structure at current rate

$(RCb) = (Ld) \times (Wd) \times (Fpt) \times (Ft) \times Kb$

Where:

RCb = Replacement Cost
 Ld = Length
 Wd = Width
 Fpt = Factors for maximum pier height
 Ft = Factors for the type of bridge
 Kb = Unit cost for bridges (R/m²)

The default year for structures with unknown years of construction is 1975.

The equations for the calculation of the depreciation factors are as follows:

Bridges with age <= 50 years: $d = -0.01 \times \text{Age} + 1$
 Bridges with age > 50 years: $d = -0.004 \times \text{Age} + 0.7$
 Major culverts <= 80 years: $d = -0.025 \times \text{Age} + 1$

The unit rate for bridges are around the following values (from TMH22, published in March 2013):

March 2013: R 20 800/m²
 March 2014: R 21 940/m²
 March 2015: R 22 950/m²
 March 2016: R 24 390/m²
 March 2017: R 25 890/m²

The values for March 2014 to March 2017 were based on the R 20 800/m² of March 2013 and were escalated using the CPI.

NB: The depreciation is based on a functional lifespan of a bridge, accepted as 100 years.

If the construction year is not known, a default year of 1975 will be accepted.

Kb is accepted as R24390 used by Struman on April 2016 (Kb will be updated to the latest released, whenever it is released)

The pier factors are accepted as follows:

- Pier height factor is 1 if pier height is $\leq 8\text{m}$
- Pier height factor is 1.5 if pier height is $> 8\text{m}$ and $\leq 20\text{m}$
- Pier height factor is 2 if pier height is $> 20\text{m}$

If the difference between dimensions in asset register (base dimension) and another dimension measured after base dimension is equal or less than 10%, the base dimension will be accepted.

Dimension shall be measured by fiberglass measuring tape.

All measurements shall be taken to two decimal places.

10. POLICY REVIEW

This policy will become effective and applicable after the approval by the Head of Department and is subject to review on an annual basis. In the event that the policy is amended, the amended policy or provisions thereof will supersede the previous one.

APPROVAL

Approved/ ~~Not Approved~~

Comments:

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HEAD OF DEPARTMENT

27.08.2018

DATE