CHAPTER 13. MAINTENANCE OF STRUCTURES

13.1 INTRODUCTION

The effective maintenance of bridges, culverts, retaining walls and gantry sign supports is important for preventing the deterioration or failure of these structures.

This section provides guidance on inspections of structures as well as other matters pertaining to routine maintenance for structures, including the treatment of graffiti.

13.2 INVENTORY OF STRUCTURES

At the start of a routine maintenance contract, the Route Manager must identify all bridges and culverts on the road sections to be maintained and ensure that the information contained in the road logs is correct. This also provides the opportunity to assess the condition of the drainage systems and note any apparent problems.

A standard form for recording the locations of structures is provided in Appendix H.

13.3 ROUTINE MAINTENANCE INSPECTIONS

The standard procedures of SANRAL include detailed inspection of structures to be carried out by experts in this field at approximately five-year intervals. These inspections have specific reporting procedures that will alert SANRAL to actions required to keep the structures in good order.

It is accepted that the Site Management Team on routine road maintenance contracts might not have the necessary skills to report on all aspects of assessing the condition of structures. Nevertheless, the Team must inspect all structures on an annual basis (see the section on management duties and inspections in this Manual) and after flood events, and report on the condition of basic elements.

A checklist reflecting items to be inspected and reported on as part of the road routine maintenance duties is provided in Appendix H. In brief, the various elements that require inspection include:
Watercourses
- Waterway clear of obstructions (vegetative growth, silt, rubble, flood debris);
- Signs of erosion, scour, watercourse rerouting.

Foundations
- Condition of footings for the piers, abutments, wingwalls;
- Signs of subsidence, cracking.

Substructure
- Signs of cracking (horizontal or vertical displacement);
- Condition of bearing pads, seatings as far as can be determined;
- Weepholes working.

Superstructure
- Damage to balustrades, handrails, guardrails;
- Scuppers cleaned;
- Joint material in place and cleaned out, cracking at joint edges/noses;
- Signs of cracking and distress of bridge deck;
- Road approach signage and traffic aids appropriate and in place.

Inspections should not be limited to the annual inspections or after flood events. If on normal road maintenance inspections any significant problems are noticed these should be reported to SANRAL immediately.

13.4 RETAINING STRUCTURES

Retaining structures include gabion walls, reinforced or mass concrete walls, concrete block retaining (CBR) walls (Terraforce, Loffelstein, etc), Reinforced Earth and similar structures.

These all need to be inspected in detail on an annual basis and as part of the more regular routine road maintenance duties. Most important elements to be inspected include:

Drainage
- Catchwater drains above, water spilling behind structures and eroding or undermining the structure stability;
- Wet areas evidenced by plant growth or seepage water.

Structures
- Displacement, movement or cracking of the structures;
- Insufficient lengths of structure evidenced by erosion or spillage around the structure and slope instability at extremes.
13.5 GANTRIES

Gantries are required to support overhead signs and other traffic management equipment. Most gantries are made of steel and these structures require regular inspection to identify early warnings of deterioration. Areas to be inspected include:

Footings
- Evidence of bolts rusting, damage by vehicles or other collisions. In locations which are wet or regularly inundated, inspections should be frequent;

Supports
- Evidence of rusting and paint spalling. (Tap on support to detect unsound areas);

Overhead support for signs
- Cranes or hoists are required to inspect the sign supports closely. Whenever a sign is to be repaired or replaced, the sign supports should be inspected for evidence of deterioration.

13.6 GRAFFITI

Graffiti is often painted on roadsigns, structures, or walls. Overseas and local experience has confirmed that one of the most effective ways of handling graffiti is to remove this as soon as possible.

More common treatments for the removal or obliteration of graffiti are as follows:

On roadsigns:
- Use a commercial brand remover like Graffitigo which is obtainable at some hardware stores. Other commercial products are also available. A trial should be made on a small section of sign to check whether the reflecting of the sign is adversely affected by the treatment.

On concrete surfaces like bridge abutments, retaining walls and Vibracrete fences:
- A cement wash is often effective. Paint the wash on a neat rectangular area or paint a section of the wall.

On painted surfaces:
- Try to match the paint colour, before overpainting the graffiti.

On exposed aggregate surfaces:
- This is difficult. Sandblasting may have to be resorted to.