

Reference	NR/L3/CIV/006/1B
Issue	2
Publication date	17 January 2014
Compliance date	7 June 2014

Level 3

Handbook for the examination of Structures – Part 1B: Types of Examination Regime

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Contents

1 Purpose	3
2 Scope	3
3 Roles and responsibilities	3
4 Common requirements and content of examinations	4
5 Detailed Examinations	6
6 Underwater Examinations	12
7 Visual Examinations	15
8 Additional Examinations	17

Reference	NR/L3/CIV/006/1B
Issue	2
Publication date	17 January 2014
Compliance date	7 June 2014

1 Purpose

An Examination Regime defines the means of gathering information on the condition of a Structure. Such information informs decisions on what actions are required (and the timing of such actions) to maintain, in a cost-effective manner, the safe use and performance of that Structure.

Examinations are, therefore, undertaken to:

- a) detect, quantify and monitor the extent and severity of defects;
- b) identify changes of use and examples of misuse (such as overloading);
- c) identify the need for, and the details of, further actions.

2 Scope

This Part of the *Handbook for the examination of Structures* specifies the details of the types of examination that can form part of an Examination Regime:

- a) Detailed Examinations, specified in clause 5.
- b) Underwater Examinations, specified in clause 6.
- c) Visual Examinations, specified in clause 7.
- d) Additional Examinations, specified in clause 8.

It applies to the following categories of Structure (as defined in [NR/L1/CIV/032: Managing structures](#));

- A: Bridges and Culverts
- B: Retaining Walls
- C: Tunnels
- E: Buildings and Station Structures
- F: Coastal, Estuarine and River Defences
- G: Ancillary Structures

3 Roles and responsibilities

The Route Asset Manager (Structures) [RAM(S)] is responsible for:

- a) setting the Examination Regime for Structures, and
- b) for requesting examinations to be undertaken through the Task Schedule.

The activities stated to be undertaken by a RAM(S) may be delivered by their nominated representative (referred to in this standard as the “Structure Manager”).

Reference	NR/L3/CIV/006/1B
Issue	2
Publication date	17 January 2014
Compliance date	7 June 2014

4 Common requirements and content of examinations

4.1 Requirements

A report shall be produced for each examination or each series of examinations (where, for example, reporting is done by exception).

A defect which, in the opinion of the Examiner, gives rise to immediate concern for the continuing safety of a Structure, the operational railway, people, equipment or property shall be reported to Network Rail Control immediately.

4.2 Content of examinations

The Structure Manager can instruct works to be undertaken:

- a) during an examination; and/or
- b) to enable an examination to be undertaken, and/or to improve the information that would normally be gathered from an examination.

Such works can include:

- a) removing vegetation, saplings and root balls;
- b) clearing marine growth;
- c) removing spilled ballast, dirt, detritus, and rubbish;
- d) clearing blockages in drains, down pipes, gutters, valleys, weep holes and catch pits;
- e) clearing trash screens to a Culvert;
- f) providing and fixing crack-monitoring devices;
- g) removing (and subsequently replacing) loose spoil, ballast or surfacing covering a baseplate or other buried metallic supports, to expose the part for examination;
- h) installing (and subsequently removing) temporary openings/gates, etc. to gain access to a Structure;
- i) coring timber components, and making good;
- j) providing permanent markers to indicate the location of a Culvert;
- k) repairing and/or repainting a flood marker;
- l) removing (and subsequently reinstating) Tunnel water management sheeting and its fixings;
- m) replacing defective Tunnel water management sheeting and/or its fixings;
- n) determining the thickness of Shaft linings;

Reference	NR/L3/CIV/006/1B
Issue	2
Publication date	17 January 2014
Compliance date	7 June 2014

- o) removing and reinstating Obstructions, such as cladding in Tenanted Spans;
- p) exposing hidden parts, such as metallic parts in contact with timber;
- q) using CCTV equipment to examine a Culvert or a Shaft;
- r) providing equipment to gain access to a Culvert or a Shaft;
- s) providing, fixing, reading and measuring fixed reference plumbing points or movement gauges. In addition, to (a) provide a datum set of readings, (b) provide a sketch showing the positioning and date of the plumbing, referenced to a salient feature on the Structure, and (c) use a reporting format that enables sets of successive results to be compared;
- t) removing guano;
- u) partially dismantling or exposing parts of the Structure;
- v) when Bridge identification plates or marks are missing, fitting plates in accordance with [NR/GN/CIV/202](#), *Management of the risk of Bridge Strikes* as follows:
 - 1) *track level*: 1 No. at each end of the Structure visible at track level,
 - 2) *road level*: 1 No. on each elevation of the Structure, visible from the road and at a level where they cannot be damaged easily by vandals;
- w) installing Tunnel section or tablet markers, and Shaft identification plates;
- x) the stencilling, using white paint, of the Structure number and ELR or mileage on part(s) of the Structure.

An Examination Regime can include site-specific monitoring: in most cases, data would be collected when undertaking pre-planned examinations.

Reference	NR/L3/CIV/006/1B
Issue	2
Publication date	17 January 2014
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5 Detailed Examinations

5.1 Purpose of a Detailed Examination

A Detailed Examination shall identify or determine, and record:

- a) any loss of functionality in the Structure;
- b) the nature, number, location, extent and severity of defects;
- c) any significant change in the defects recorded in the last examination;
- d) the condition of all accessible parts of the Structure, except those parts that require an Underwater Examination;
- e) any significant change in the condition of the accessible parts of the Structure since the last examination;
- f) information for use in assessing the rate of deterioration of the Structure;
- g) the uses to which the Structure is being put;
- h) other factors that could affect the safety or performance of the Structure;
- i) the scope, extent, and urgency of follow-up actions, such as further examinations or investigations, and maintenance and remedial works;
- j) changes required to Network Rail's asset management systems and other record sets.

5.2 Application of Detailed Examinations

Detailed Examinations shall be undertaken on the following types of Network Rail owned or managed Structures and Shared Structures:

- 1) Bridges;
- 2) Culverts;
- 3) Major Retaining Walls, when the information obtained from Visual Examinations is or would be insufficient to complete an Evaluation of the Structure;
- 4) Operational Tunnels (and tunnels with non-operational bores where deemed applicable by the Structures Manager);
- 5) Coastal, Estuarine and River Defences;
- 6) Operational Property Structures:
 - a) Train Sheds;
 - b) Canopies;
 - c) elevated or suspended Platforms;