WOKINGHAM
BOROUGH COUNCIL

HIGHWAY MAINTENANCE

MANAGEMENT PLAN

VOLUME 6

HIGHWAY STRUCTURES

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HIGHWAY MAINTENANCE MANAGEMENT PLAN

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I. Introduction

The structures service contract set out to deliver the eleven core duties including the earthworks and VRS assets to support the council's services.

II. Service Inspections

2.1 Bridges and Other Highway Structures

Purpose: To ensure management of bridges and other highway structures in accordance with the objectives of the Management of Highway Structures: Code of Practice, September 2005 and any subsequent updates. This Code should be used as a companion to the following Codes of Practice:

- Well-Maintained Highways Infrastructure: Code of Practice for Highway Management (Revised Oct 2016), Part C - Structures
- DMRB CS 450 Inspection of Highway Structures

The Council has responsibility for the management and maintenance of 246 highway structures, comprising: road bridges, footbridges, culverts under the highway with a span greater than 900mm; subways through which the public have a right of way; structural elements of high mast lighting; CCTV masts; cantilever traffic signals; and retaining walls more than 1.5m high. In addition there are 87 private structures which carry a public highway. The aim is to maintain the bridges and highway structures to such a standard that structural inadequacy does not affect the use of the highway network, the safety of all users of the highway is reasonably assured and the condition of the structure does not compromise the amenity of the area in which it is located.

The service delivery includes the inspection of the highway structures/non-highway structures as detailed below;

(a) Inspections of bridges, culverts and other structures to be generally in accordance with the Design Manual for Roads and Bridges Advice note CS 450 issued by the Department of Transport.

(b) The purpose of a General Inspection is to provide information on the physical condition of all visible elements on a highway structure. The inspection can be carried out without the need for special access equipment, or extensive traffic management arrangements

(c) General inspections of all elemental parts of the structure to be carried out at intervals not exceeding three years.

(d) The purpose of a Principal Inspection is to provide information on the physical condition of all inspectable parts of a highway structure. A Principal Inspection is more comprehensive and provides more detailed information than a General Inspection.

(e) Principal Inspection intervals determined through risk assessment shall not exceed twelve years.

(f) The purpose of a Special Inspection is to provide detailed information on a particular part, area or defect that is causing concern, or inspection of which is beyond the requirements of the General/Principal Inspection regime.

(g) Further examples of when Special Inspections are recommended are given in the Inspection Manual for Highway Structures.

(h) BA 35 provides guidance on limited site testing that may be undertaken as part of a Special Inspection for concrete structures, i.e. half-cell potential, chloride level, cover meter and depth of carbonation. Additionally the wall thickness of steel hollow sections can diminish through internal corrosion and may go unnoticed. The non- destructive measurement of wall thickness of sections at critical areas, eg. Base of parapet posts, rails near ends or joints, is recommended for elements which exceed or are approaching the end of their design life, or where poor detailing for durability is evident, or where there are visible signs of distress or deterioration.

(i) An Underwater Inspection is a specific type of Special Inspection concerned with parts of highway structures that are below water level.

Special Inspections are recommended for in the following circumstances:

(a) Cast iron structures, at intervals not exceeding six months.

(b) Structures strengthened by the use of bonded plates, at intervals of six months for the first two years and thereafter in accordance with the intervals prescribed in the maintenance records.

(c) Structures that have to carry an abnormal heavy load. The structure should be inspected before, during and after the passage of the load if either:

- an assessment has indicated that the margin of safety is below that which would be provided for a design to current Standards; or
- similar loads are not known to have been carried.

(d) To investigate possible structural damage after major accidents, Chemical spillage or fires adjacent to structures.

(e) When necessary to investigate a specific problem or if a particular problem has been identified on other similar structures.

(f) Management of post-tensioned concrete bridges, as described in CS 465

(g) Probing of river bridge foundations after flooding. Where probing indicates the possibility of scour, further Underwater Inspection should be carried out

(h) If unexpected settlement is observed.

(i) Where flooding is reported to have occurred, bridge foundations will be checked during the following summer months.

2.2 Vehicle Restraint Systems (BARRIERS)

The council has responsibility for the management and maintenance of the Vehicle Restraint Systems (Barriers), safety fences and pedestrian guard-rails. The Council is in the process of setting up the asset inventory. Currently the inspections are carried out in accordance with the following:

(i) Steel Vehicle Restraint Systems (VRS), safety fences and pedestrian guard-rails will be inspected every five years in respect of mounting height, surface protective treatment and structural condition.

(ii) Boundary fences for which the Council are responsible will be inspected in respect of integrity and, if appropriate, stock-proof qualities during the periodic safety inspections or, in the case of the A329M/0 and A33 Swallowfield Bypass, during one of the programmed twice-yearly maintenance programmes (ie annually).

(iii) Additionally, a visual inspection of all barriers and safety fences will be undertaken during routine highway safety inspections.

2.3 Embankments and Cuttings

Significant embankments and cuttings are listed and will be subject to a visual inspection at least every two years. A more detailed specialist geotechnical survey will be arranged if necessary. The highway geotechnical assets are being managed in accordance with the guidance of CS 641 Managing the maintenance of highway geotechnical assets

In 2018, WSP were commissioned by WBC to undertake a geotechnical asset identification survey of the WBC owned highway network. This involved a cycling survey to identify major and minor geotechnical assets within WBC jurisdiction and recording of preliminary data including type, location, geometry and vegetation cover. a total inspected length of 27.73 km for which feature graded data is available.

Geotechnical asset types:

The geotechnical asset shall be divided into the following asset types:

I. Minor earthworks; being cuttings, embankments and at-grade sections whose maximum vertical height within the longitudinal extent of the asset is less than 2.5m; and,

II. Major earthworks; being cuttings, embankments and bunds whose maximum vertical height within the longitudinal extent of the asset is greater than or equal to 2.5m.

A risk-based approach was used to determine the assets with the highest perceived risk in terms of failure and ultimately risk to the highway network. The identification survey and subsequent findings from the data analysis were summarised in a GeoAMP, issued in May 2020. The GeoAMP recommended a progressive programme for inspections and maintenance to help shift WBC to a proactive approach of geotechnical asset management. Inspection types shall comprise the following:

- Principal Inspections (PIs), the main type of inspection, providing inventory data and assessing the condition of the asset through identification and risk rating of features observed.
- Brief inspections, consisting of a brief look at the asset to recognise any obvious defects which are related to geotechnical characteristics of the asset or changes in the geotechnical conditions.
- Monitoring inspections, on known assets on which PIs were undertaken in November 2017.
- Ongoing survey inspections, monitoring slope movements at several locations (primarily large embankment slopes).