2 ROADWORKS

2.1 INTRODUCTION

2.1.1 General

1 Road maintenance specifications comply mainly with Qatar Road Maintenance Manual (QRMM) published by Ashghal. It defines the standards to be adopted by Contact Centre for management by the Roads Maintenance Department, and of all customer communication streams other parties responsible for the highway maintenance through outsourced contracts, for the inspection and maintenance of the Qatar Highway Network.

2.1.2 Definitions

1 All definitions related to road maintenance should comply with QRMM

2 Related Section and Parts are as follows:

Section 5, ... Concrete
Section 6, ... Roadworks

2.1.3 References, Standards and Guidance

1 The following standards are referred to in this Part:

ISO 14001 .....Environment Management Systems and any subsequent revision

ISO 55000 .....Asset Management Standard: Introduction

ISO 55001 .....Asset Management: Management Systems - Requirements

ISO 55002 .....Asset Management: Management Systems – Guidelines for the application of ISO 55001

ISO 9001 .....Quality Management Systems and any subsequent revision

OHSAS 18001.....Occupational Health and Safety Management and any subsequent revision

OHSAS 18002:2008...Guidelines for Implementation of OHSAS 18001: 2007

The Qatar Highway Design Manual (QHDM)

The Qatar Traffic Control Manual (QTCM)

Work Zone Traffic Management Guide (WTZMG) dated July 2014

Code of Practice and Specification for Road Openings in the Highway,PWA January 1992

Any current and relevant regulation, notice or circular

The Guide for Civil Users of Explosives in Qatar prepared by the Ministry of Public Works

Well Lit Highways- Code of Practice for Highway Lighting Management

Institution of Lighting Professionals GP03-COP for Electrical Safety in Highway Electrical Operations

Institution of Lighting Professionals PLG07 High Masts for Lighting and CCTV

Intelligent Transport System (ITS) Specifications and any subsequent revisions

Worker Rights Booklet 2009 (National Human Rights Committee)

The Method of Measurement for Road and Bridgeworks published by the Ministry of Industry and Public Works, Civil Engineering Department, 1987

Safety Rules issued by the Department of Electricity Networks

Jointing Manual prepared by Electricity Networks Department

Qatar Sewage and Drainage Design Manuals

The Highways Agency's Design Manual for Roads and Bridges

2 The local documents listed above (e.g.QHDM, QTCM) are primary documents and should be taken as the lead document. Other documents referred to in the text such as any standards from the Highways Agency Design Manual for Roads and Bridges shall be taken as guidance documents and international best practice, unless otherwise stated within the text.

2.2 HEALTH AND SAFETY, ENVIRONMENT AND QUALITY MANAGEMENT

1 In all aspects of quality management, attention should be paid to the requirements of particular contracts as well as current and relevant legislation, including the Qatar Construction Specifications (QCS) with regard to the environment, health and safety and risk assessment. In every case, procedures should ensure that the appropriate health and safety regulations have been identified and fully adhered to at all times, with the aim of adopting an integrated approach between quality, environment and health and safety.

2 Risk analysis and management is an integral part of the management of the network and the provision of the routine services. Risk analysis for all activities should be regularly carried out, recorded and should include due regard for the environment, the safety of employees, the public and those nearby. The risk analysis process will involve the identification of hazards, an assessment of the likelihood of occurrence, estimation of the consequences and, ultimately, the management of the actions taken. This involves identifying, evaluating and reviewing the options for controlling the risks. These risk assessments should be reviewed when new or altered hazards are identified.

2.3 LEGISLATION RELATING TO ROADS MAINTENANCE

1 Qatar Labour Law No. 14 of 2004

2 Qatar Human Resources Law No.8 of 2009

3 The Qatar Construction Specifications (QCS) and any subsequent revision

4 Qatar Environmental Protection Law No. 30 of 2002

5 Qatar Traffic Law No. 19 of the Year 2007

6 State of Qatar Law No. 6 of 1987 and all subsequent amendments concerning Materials and Equipment from Qatar or other CCASG countries.

2.4 NETWORK HIERARCHY

1 A network hierarchy is the foundation of a coherent, consistent and auditable maintenance strategy. It is also crucial to asset management in establishing levels of service. It is important that the hierarchy adopted reflects the needs, priorities and actual use of each road in the network.

2 These may be determined by importance- a route leading to a major hospital, for example. They may be determined by environment- rural, urban, busy shopping street, residential street etc. They may be determined by non-- vehicular traffic factors such as pedestrian usage.

3 At present, and for the purposes of this document, a footway hierarchy has not been determined; however the footway classification shall be determined to be the same as the adjacent carriageway. As such it shall be subject to the same inspection and maintenance frequencies as the adjacent carriageway. Collectively, these issues may be referred to as the functionality' of the section of highway in question.

2.5 CARRIAGEWAY HIERARCHY

1 Historically, the roads in Qatar have been classified as Expressway, Primary (includes Expressways), Secondary, Tertiary and Local.

2 During 2013, the Ministry of Municipality and Environment (MME) undertook a review of the current functional road network hierarchy and have developed a revised hierarchy based on the future needs of Qatar Table 1 in QHMM details the hierarchy name and road type descriptions that relates to the road network classification encountered in Qatar. It also includes a column showing the maintenance hierarchy description.

2.6 ROAD TYPES

1 On any road network there are two environments through which a road will pass- Urban and Rural. They have different characteristics in terms of the density of roads, the extent of their adjacent development and the nature of their travel patterns.

2 Urban and Rural road types can be defined as follows:

(a) **Urban roads**- lie adjacent to areas which contain, or are zoned for built land use development

(b) **Rural roads**- lie adjacent to areas which are predominantly natural, with little or minor adjacent built land use development

3 MME have allocated a classification to each of the road types (urban and rural). The Urban Road network is classified as follows:

(a) Expressways

(b) Arterials

(c) Boulevards

(d) Collectors

(e) Collector Distributors

(f) Major

(g) Minor

(h) Local

(i) Service Roads

(j) Local Roads

4 However, for road maintenance purposes and in the context of this document the hierarchies will remain as:

(a) Expressways

(b) Primary

(c) Secondary

(d) Tertiary

(e) Local

5 These terms are well established and understood in Ashghal and Qatar road industry; they are simple, uncomplicated and easy to apply the inspection and defect repair regime that is further described in this document. The Network has been classified using the Primary, Secondary, Tertiary and Local Road classification and the inspection and maintenance regimes described in this document are based on that classification.

2.7 NETWORK INSPECTION

1 The establishment of an effective inspection regime incorporating inspection frequencies, items to be recorded and nature of response is an integral component of an effective highway maintenance strategy. An approved robust inspection regime, incorporating network safety and serviceability, also forms part of Ashghal's defense against third party liability claims. An inspection, testing and monitoring regime should minimise risks to public safety, provide sufficient data for management and make effective use of resources. The mix of techniques used in the regime, and frequencies at which they are applied, should be determined by considering appropriate criteria in an objective manner, e.g. Through a formal risk assessment. The criteria should include, but not be restricted to, public safety, the characteristics of the assets, the consequence of failure, the environment the assets operate in, the services provided, typical rates of deterioration and susceptibility to damage.

2 The inspection, testing and monitoring techniques should be sufficient to:

(a) identify condition, defects and signs of deterioration that are significant to safety and management

(b) identify any significant changes in condition, loading or environment that have occurred since the last observation

(c) assess or provide information for the assessment of stability and serviceability

(d) determine or assist the determination of the cause, extent and rate of deterioration

(e) provide information that can be used to support highway management, i.e. the identification of needs and associated maintenance works.

3 The inspection regime should provide the basic information for addressing the key objectives of highway maintenance strategy, these are:

(a) Network safety

(b) Network serviceability

(c) Network sustainability.

4 It will also provide the basic condition data for the development of programmes for maintenance as part of the Asset Management Plan (AMP). All elements of the inspection and assessment regime should be applied systematically and consistently, in accordance with the principles of Quality Assurance.

5 The inspection regime described shall be the standard to which all roads owned and maintained by Ashghal are maintained. It is also recommended that other third party road owners and maintainers e.g. Qatar Energy should use this standard as industry best practice by which they maintain their roads. Inspections should be carried out by trained, qualified or experienced personnel. To promote inspection consistency and quality, authorities are recommended to carry out regular in-house inspection meetings to assess the competence of inspectors including those provided by external contractors.

2.8 THE WATCHMAN ROLE

1 The Watchman Role is central to a network management approach and will encompass wide-ranging and varied functions. It dictates the way an organisation responds to the changing needs of itself, stakeholders and customers, encouraging value and innovation and a constantly improving level of service.

2 An important element of the Watchman Role is the requirement to improve quality, efficiency and effectiveness of operations, thus improving outcomes for customers and overall asset value and involves:

(a) monitoring customers' perceptions and addressing their complaints

(b) monitoring the operation, and influences on the network

(c) monitoring network trends

(d) identifying needs and risks

(e) maintaining and improving asset value

(f) aligning with the corporate strategies and objectives

(g) proposing solutions or enhancements to operations or network asset.

3 Network Stewardship is a major element of the Watchman Role. Stewardship is the fostering of ownership of the network, providing a thorough understanding and awareness of the state of the network.This involves working with all Ashghal departments, stakeholders, contractors and the supply chain towards common goals and objectives for the delivery of integrated services for the operation of a safe, reliable and efficient road network that delivers corporate objectives, whilst focusing on the needs and views of the customer.

4 Through Stewardship, staff will foster network ownership, providing a thorough understanding and awareness of its state. Regular and extensive liaison with stakeholders on or adjacent to the network will enable us to anticipate the impact of any external influences.

5 The tasks to be performed under the network stewardship element of the Watchman Role are as follows:

(a) monitoring and identifying network issues

(b) completing a Watchman Form

(c) recording and tracking reports on Watchman Register

(d) reviewing and progression of Watchman issues

(e) consultation with others who may influence the network

(f) performance monitoring.

6 The Watchman Role involves everyone within the business. It promotes a culture of network stewardship throughout every member of staff within Ashghal by encouraging everyone to become the “eyes and ears” of the network.

7 Categories of Inspection

(a) Safety patrols

(b) Safety Inspections

(c) Details Inspections

(d) Hazard Metigation

8 Defect Definition

(a) Emergency

(b) Urgent (category 1)

(c) Non Urgent (category 2)

9 Pavement condition survey

(a) General

(b) Carriageway Deflection/structural capacity

(c) Pavement Roughness

(d) Skid Resistance Survey

(e) Pavement Distress

(f) GPR

10 Routine Maintenance of Highways

(a) Pavements

(i) Modes of Deterioration

(ii) Environmental factors

(iii) Wear and Tear

(iv) Inspection Requirements

(b) Footways and Cycle Tracks

(i) General

(ii) Inspection requirements

(c) Covers, Grating, Frames and Boxes (Ironwork)

(i) General

(ii) Inspection requirements

(d) Kerbs, Edgings and Pre-formed channels

(i) General

(ii) Inspection requirements

2.9 MISCELLANEOUS

1 Specifications for Maintenance of the following shall be as per QRMM :

(a) Highway Drainage

(b) Piped Drainage systems

(c) Gallies, Catchpits, Soakaways, Interceptors, and Catch Basins

(d) Ditches and Swales

(e) Culverts

(f) Balancing Bands

(g) Ancillary items

(h) Flooding

(i) Geotechnical Assets

(j) Soft Estate

(k) Sweeping, Cleaning and Animal Carcasses

(l) Vehicle Restraint System and Barriers

(m) Fences ,walls, Screens and Environmental Barriers

(n) Road Studs

(o) Road Markings

(p) Road Traffic Signs

(q) Road Lighting

2.10 ROUTINE INSPECTION AND MAINTENANCE OF STRUCTURES

END OF PART