

# ASHGHAL

## Interim Advice Note No. 007

### Approval in Principle Documents for Highway Structures

#### Revision No. A1

EXW-GENL-0000-PE-KBR-IP-00007

#### Summary

This Interim Advice Note (IAN) provides the requirements for the preparation of Approval in Principle (AIP) documents for bridges and highway structures. The IAN takes immediate effect. It is applicable to bridges and highway structures.

This document supersedes IAN 007 Rev 0 dated March 2012. Third parties not working on Ashghal projects make use of this document at their own risk. Paper copies of this document are uncontrolled. Refer to Ashghal's website for the most recent version.



Rev	Date	Reason For Issue	Auth	Chk	App
A1	April 2013	Issued for All Relevant Infrastructure Projects	DL	AM	AA
0	Mar. 2012	Issued for Expressway Projects	IF	EDF	MG

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**INTERIM ADVICE FOR PWA PROJECTS ONLY**

## 1. Foreword

- 1.1 Interim Advice Notes (IAN) may be issued by Ashghal from time to time. They define specific requirements for works on Ashghal projects only, subject to any specific implementation instructions contained within each IAN.
- 1.2 Whilst IANs shall be read in conjunction with the Qatar Highway Design Manual (QHDM), the Qatar Traffic Manual (QTM) and the Qatar Construction Specifications (QCS), and may incorporate amendments or additions to these documents, they are not official updates to the QHDM, QTM, QCS or any other standards.
- 1.3 Ashghal directs which IANs shall be applied to its projects on a case by case basis. Where it is agreed that the guidance contained within a particular IAN is not to be incorporated on a particular project (e.g. physical constraints make implementation prohibitive in terms of land use, cost impact or time delay), a departure from standard shall be applied for by the relevant Consultant / Contractor.
- 1.4 IANs are generally based on international standards and industry best practice and may include modifications to such standards in order to suit Qatar conditions. Their purpose is to fill gaps in existing Qatar standards where relevant guidance is missing and/or provide higher standards in line with current, international best practice.
- 1.5 The IANs specify Ashghal's requirements in the interim until such time as the current Qatar standards (such as QHDM, QTM, etc.) are updated. These requirements may be incorporated into future updates of the QHDM, QTM or QCS, however this cannot be guaranteed. Therefore, third parties who are not engaged on Ashghal projects make use of Ashghal IANs at their own risk.
- 1.6 All IANs are owned, controlled and updated as necessary by Ashghal. All technical queries relating to IANs should be directed to Ashghal's Manager of the Design Department, Infrastructure Affairs.

Signed on behalf of Design Department:

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**Abdulla Ahin A A Mohd**

**Acting Manager of Roads & Drainage Networks Design**

Design Management (Roads Section)

Public Works Authority



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## 2. Ashghal Interim Advice Note (IAN) – Feedback Form

Ashghal IANs represent the product of consideration of international standards and best practice against what would work most appropriately for Qatar. However, it is possible that not all issues have been considered, or that there are errors or inconsistencies in an IAN.

If you identify any such issues, it would be appreciated if you could let us know so that amendments can be incorporated into the next revision. Similarly, we would be pleased to receive any general comments you may wish to make. Please use the form below for noting any items that you wish to raise.

Please complete all fields necessary to identify the relevant item			
IAN title:			
IAN number:		Appendix letter:	
Page number:		Table number:	
Paragraph number:		Figure number:	
Description comment:			
<p>Please continue on a separate sheet if required:</p> <p>Your name and contact details (optional):</p>			
Name:		Telephone:	
Organisation:		Email:	
Position:		Address:	

Please email the completed form to:

<p><b>Abdulla Ahin AA Mohd</b></p> <p>Acting Manager of Roads and Drainage Networks Design                  Design Management                  (Roads Section)                  Public Works Authority</p> <p><a href="mailto:aahin@ashghal.gov.qa">aahin@ashghal.gov.qa</a></p>
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We cannot acknowledge every response, but we thank you for contributions. Those contributions which bring new issues to our attention will ensure that the IANs will continue to assist in improving quality on Ashghal's infrastructure projects.

### **3. Introduction**

- 3.1 This Interim Advice Note (IAN), which takes immediate effect, provides requirements with regard to Approval in Principle (AIP) documents for highway structures.

### **4. Withdrawn / Amended Standard**

- 4.1 Not applicable.

### **5. Implementation**

- 5.1 The IAN is to be used with immediate effect on projects as follows:
- All Ashghal projects in Design Stage
- 5.2 The only exceptions are:-
- Projects where the preparation of AIP documents has already commenced or has been completed.
- 5.4 If in doubt, Consultants / Contractors should seek guidance from the respective Ashghal Project Manager or designated Programme Management Consultant (PMC) on a scheme specific basis.

**INTERIM ADVICE FOR PWA PROJECTS ONLY**

**Appendix A – Requirements for the Preparation of Approval  
in Principle Documents**

**INTERIM ADVICE FOR PWA PROJECTS ONLY**

## 1 GENERAL

Approval in Principle (AIP) documents shall be prepared generally in accordance with BD 02 of the Design Manual for Roads and Bridges (DMRB) produced by the Highways Agency (UK) as amended and supplemented by this document.

Terms and expressions in this document shall have the same meaning as in BD 02.

Ashghal require the submission of an AIP document for all proposed bridges and also for other highway structures as defined in Clause 3.3 of BD 02. An AIP is also required for any proposed modifications to existing bridges and also for any proposed modifications to other highway structures as defined in Clause 3.3 of BD 02.

AIP shall generally be prepared for each individual bridge or structure. However, subject to prior agreement with Ashghal, a single AIP may be prepared for a group of bridges within a project which are similar in function, form and dimensions and where identical design criteria are proposed for each bridge within the group.

Where procurement of construction is by a form of contract that requires the Contractor to develop the detailed designs of structures, the Contractor's Designer shall produce AIP's for the structures in line with the requirements of this document. Any pre-tender design undertaken on behalf of Ashghal shall include preparation by the Designer of AIP's for structures. These shall broadly follow the format indicated in this document; however the content may be limited as agreed in advance with Ashghal, such that the document indicates a feasible structural solution that meets all constraints that will be imposed on the Contractor and his designers.

Functions assigned to Ashghal in this document (such as endorsements, confirmations, agreements etc.) may be carried out by a Programme Management Consultant appointed by Ashghal.

## 2 OBJECTIVES

The objective of the Approval in Principle document is to provide a clear understanding between Ashghal and the Designer of what design standards, principles, criteria and any other relevant matters will be adopted in the design prior to significant levels of design being undertaken. The AIP document shall enable Ashghal to be satisfied as to:

- (i) Suitability of the proposed structure for required function.
- (ii) Those procedures are in place to minimise the possible risks to highway users and others who may be affected.
- (iii) Compliance with Ashghal's design requirements.
- (iv) The economy of the type and form of structure proposed within the overall scheme concept.
- (v) Its suitability for the environment and sub-soil conditions.
- (vi) Its appearance, including the standards of finish to be adopted.
- (vii) The adequacy of proposals for geotechnical and other investigations.
- (viii) The loading and other design and durability criteria proposed.
- (ix) The application of selected documents and Standards, and the suitability of any methods or criteria outside existing Codes or Standards proposed for adoption in a particular structure.

- (x) The need for consultation with interested authorities and compliance with statutory requirements.
- (xi) The need for consultation with any Public Realm Consultants appointed by Ashghal.
- (xii) Constructability issues in the context of the environment, traffic management, services, utilities and timing issues of related work.
- (xiii) The provision made for the inspection and maintenance of the structure both in the context of the structure itself and the environment in which it will function.
- (xiv) In the case of temporary works, the adequacy of the proposal and design approach to enable the temporary structure to perform its intended purpose.

### **3 STRUCTURE CATEGORY AND CHECKING**

The Category of a structure with regard to checking shall be defined by Ashghal.

Structures shall be checked in accordance with the requirements defined in BD 02 for the designated Category, unless agreed otherwise in advance with Ashghal.

### **4 PREPARATION, SUBMISSION AND ENDORSEMENT**

The Approval in Principle document shall be prepared as early as practically possible in the design process, but not later than the completion of the Preliminary Design, unless agreed otherwise in advance with Ashghal.

The completed document shall first be submitted by the Designer to Ashghal for comment. The document shall then be amended as necessary following consultation with Ashghal prior to being submitted for endorsement.

The Designer shall receive endorsement of the AIP by Ashghal before proceeding with any further design.

Works shall not be tendered prior to endorsement of the relevant AIP's unless specific written agreement has been given by Ashghal to an alternative arrangement.

The completed design cannot be implemented until Ashghal is in receipt of certified confirmation from the Checking Organisation that the implementation documents are accurate and fully in compliance with the requirements of the AIP.

### **5 AIP CONTENTS**

The information required in the AIP will vary and is unique for each structure. The information shall address the objectives outlined in Section 2.

A Model Form of AIP is included in Section 6. This form is drawn up to particularly cover the design of new bridges; some of the information requested may not be applicable to certain structures or proposals. It should not be regarded as prescriptive nor should its contents be regarded as exhaustive. However, Designers must as a minimum have considered all the headings in the model and should demonstrate such consideration by developing the heading or



stating that it is not relevant. New headings should be introduced at the end of each section if required.

The AIP shall be as concise as possible and only contain information pertinent to the particular structure(s). Irrelevant information must not be included.

Innovative or landmark structures may require further studies, investigation and/or specialist reports in addition to the AIP and specific requirements in this regard shall be agreed with Ashghal.

The headings and numbering shown in the Model Form shall be adopted. Any heading which is not required for the structure(s) in question shall still be included and followed by the text “Not applicable”. Additional headings may be added to the ends of sections if necessary.

Text in italics are guidance notes only. All other text shall be included in the AIP.

AIP documents shall be in A4 format and portrait page layout. Drawings should be A3 size folded to A4 size and bound into the document.

Appendices shall be used to include; photographs, photomontages, drawings, extracts from factual site investigation data, structure geotechnical summary sheets / extracts from geotechnical interpretative reports, third party reports, and lists of standards to be used (TAS). The appendices should include references to any other reports, studies and working papers, which were used to develop the structure to the AIP stage.

## **6 MODEL FORM**

The Model Form for AIP documents is shown on the following pages.

## MODEL FORM: APPROVAL IN PRINCIPLE DOCUMENT

### COVER

*Include Ashghal Project Number, Project Name and bridge name(s).*

*Include and document control information/forms/sheets required by the designer's quality assurance system.*

*Document should have revision number and a record of revision history.*

### 1 HIGHWAY DETAILS

#### 1.1 Type of Highway

*Describe all roads, including both over/under at bridges e.g. freeways, expressway, arterial, collector, local, high load routes etc.*

#### 1.2 Permitted Traffic Speed

*Indicate for all roads, including over/under at bridges*

### 2 SITE DETAILS

#### 2.1 Obstacles Crossed

*List all obstacles including roads, rail lines, tracks, watercourses, major pipelines etc.*

### 3 PROPOSED STRUCTURE

#### 3.1 Description of Structure

*Basic description e.g. four span road over road bridge.*

#### 3.2 Structural Type

*Basic description to include proposed basic material and form of construction e.g. in-situ post tensioned concrete box girder.*

#### 3.3 Foundation Type

*Basic description to include proposed basic material and form of construction e.g. in-situ reinforced concrete pile cap on bored cast in situ piles*

#### 3.4 Span Arrangements and General Dimensions

*List number and dimensions of spans, deck width, skew angle etc.*

#### 3.5 Articulation Arrangements

*Describe articulation arrangements including location of any fixed, guided and free bearings.*

*Indicate type of any bearings proposed e.g. pot bearing, spherical bearing etc.*

*Indicate type of any expansion joints proposed e.g. slip strip, elastomeric etc.*

#### 3.6 Types of Road Restraint Systems

*Parapet or barrier shape, material, containment level, height etc*

#### 3.7 Maintenance and Inspection

##### 3.7.1 Traffic management

*Indicate any requirements during access for maintenance and inspection e.g. road closures, lane closures etc.*

##### 3.7.2 Access

*Access proposals for maintenance and inspection e.g. abutment galleries, access hatches, access equipment etc.*

### **3.8 Materials and Finishes**

*Include details of materials and finishes and/or refer to the appropriate contents of the Design Criteria for Highway Structures (including Revision number) produced by Ashghal.*

### **3.9 Risks and Hazards**

*Document Risk Assessment undertaken and any unusual or exceptional risks identified.*

### **3.10 Estimated Cost and Alternatives Considered**

*Estimated cost of proposed structure together with other structural forms considered. Note - details of other forms considered is not required if this has been documented in an earlier submission to Ashghal.*

### **3.11 Proposed Arrangements for Construction**

*Describe construction method and requirements.*

#### **3.11.1 Traffic management**

*If traffic management is required to construct the structure, a brief description should be provided.*

#### **3.11.2 Utility diversions**

*Note any major utilities diversion required specifically to construct the structure, which have significant cost or programme implications.*

#### **3.11.3 Interface with existing structures**

*If applicable.*

## **4 DESIGN CRITERIA**

### **4.0 General Design Criteria**

*Sample text:*

*The structure shall be designed in accordance with the “Design Criteria for Highway Structures Revision XX” produced by Ashghal and appended in Annex X.*

*Refer to and append the current revision of the document.*

### **4.1 Live Loading and Headroom**

#### **4.1.1 HA Loading**

*Sample text:*

*HA loading shall be applied in accordance with the “Design Criteria for Highway Structures Revision XX” produced by Ashghal and appended in Annex X. This includes traffic live loading to the full width of the structure between parapet faces and not to the width between kerbs as required by BD 37.*

#### **4.1.2 HB Loading**

*Sample text:*

*45 units of HB loading shall be applied in accordance with the “Design Criteria for Highway Structures Revision XX” produced by Ashghal and appended in Annex X. This includes traffic live loading to the full width of the structure between parapet faces and not to the width between kerbs as required by BD 37.*

#### **4.1.3 Footway or footbridge live loading**

*If required.*

#### **4.1.4 Loading Relating to Exceptional Loads**

*Document any exceptional loads to be designed for including location of vehicle track on deck cross section.*

#### **4.1.5 Any special loading not covered above**

*As required.*

4.1.6 Heavy or high load route

*Heavy or high load route requirements and arrangements being made to preserve the route, including any provision for future heavier loads or future widening.*

4.1.7 Minimum headroom provided

*State the minimum headroom provided to each obstacle crossed. The clearance envelopes must also be shown on the drawings.*

4.1.8 Authorities consulted and any special conditions required

*List authorities and any conditions imposed.*

**4.2 List of Relevant Documents from the TAS**

*List all relevant documents that are being proposed for use in the design. This should be included as an Appendix to the AIP. The format and guidance given in BD 2 shall be adopted.*

4.2.1 Additional relevant standards

*List all relevant documents that are being proposed for use in the design that are not included in the TAS. The list should be included as an Appendix to the AIP.*

**4.3 Proposed Departures**

*Details of any proposed departures from standards given in 4.2 and 4.2.1 and/or from the Design Criteria for Highway Structures issued by Ashghal. Include details of any proposed departures together with reasons and justification, including benefits to Ashghal. Note – endorsement of an AIP by Ashghal is not an approval of proposed departures listed in that AIP. A separate approval procedure exists for departures.*

**4.2 Proposed Methods for Dealing with Aspects not Covered by Standards in 4.2 and 4.2.1**

*As required.*

**5 STRUCTURAL ANALYSIS**

**5.1 Methods of Analysis Proposed for Superstructure, Substructure and Foundations**

**5.2 Description and Diagram of Idealised Structure to be used for Analysis**

**5.3 Assumptions Intended for Calculation of Structural Element Stiffness**

**5.4 Earth Pressure Coefficients**

*Proposed earth pressure coefficients ( $K_a$ ,  $K_0$ , or  $K_p$ ) to be used in the design of earth retaining elements.*

**6 GEOTECHNICAL CONDITIONS**

**6.1 Acceptance of the Geotechnical Report**

*Acceptance of recommendations of the Geotechnical Report to be used in the design and reasons for any proposed changes.*

*If the Geotechnical Report is not yet available, state when the results are expected and list the sources of information used to justify the preliminary choice of foundations. When the results of the ground investigation become available, an addendum to the AIP, covering section 6, shall be submitted to Ashghal. The addendum shall have its own sections 8, 9 and 10 to provide a list of drawings, documents and signatures*

**6.2 Geotechnical Summary**

*Provide a brief description of the ground conditions and any relevant soil or rock properties assumed in the design.*

**6.3 Differential Settlement**

*Clarify differential settlement to be allowed for in the design of the structure.*

**7 CHECKING**

**7.1 Proposed Category**

Category 3

**7.2 Name of Proposed Independent Checker**

**7.3 Erection Proposals or Temporary Works**

*Erection proposals or temporary works for which an independent check will be required, listing parts of the structure affected with reasons for recommending an independent check.*

**8 DRAWINGS AND DOCUMENTS**

**8.1 Drawings and Documents**

*List of documents and drawings (including numbers) appended to the AIP.*

**INTERIM ADVICE FOR PWA PROJECTS ONLY**

**9 THE ABOVE IS SUBMITTED FOR ACCEPTANCE BY**

Signed \_\_\_\_\_

Name \_\_\_\_\_

Position Held \_\_\_\_\_

Engineering Qualifications \_\_\_\_\_

On behalf of (Organisation) \_\_\_\_\_

Date \_\_\_\_\_

Organisation's Stamp



**INTERIM ADVICE FOR PWA PROJECTS ONLY**

**10 THE ABOVE IS ACCEPTED BY THE ASHGHAL PROJECT MANAGER / PROGRAMME MANAGEMENT CONSULTANTS (SUBJECT TO THE AMENDMENTS AND CONDITIONS SHOWN BELOW)**

\_\_\_\_\_ confirms that this Approval in Principle is compliant with Ashghal's current Design Criteria for Highway Structures.

Signed \_\_\_\_\_

Name \_\_\_\_\_

Position Held \_\_\_\_\_

Engineering Qualifications \_\_\_\_\_

Acceptance \_\_\_\_\_

Date \_\_\_\_\_

Organisation's Stamp

AMENDMENTS AND CONDITIONS

This acceptance in no way modifies:

1. The contractual and statutory responsibility of any party for the work carried out.
2. The legal responsibility of professional engineers and / or the consultant.

This acceptance does not relieve the designer/checker or the category 3 checker of the responsibility for:

1. The validity and arithmetic correctness of the calculation and their translations into the design details & drawings, specification clauses, etc.
2. The applicability and accuracy of all computer programs.
3. Ensuring the validity to the programs for each application

## DOCUMENTS TO BE APPENDED TO THE AIP DOCUMENT

Include, without limitation:

- (a) Copy of the proposed Ashghal Design Criteria for Highway Structures being adopted for the design.
- (b) Technical Approval Schedule (TAS).
- (c) Site Location Plan at 1:50,000 or other agreed scale.
- (d) General Arrangement Drawing(s). These shall be drawn to scale with border and shall include the following details as appropriate;

### **Plan**

*North arrow*

*Right of Way*

*Chainage*

*Earthworks profile*

*Plan dimension on carriageway(s) / watercourse / railway*

*Skew angle*

*Service ducts / chambers*

*Lighting*

*Interface with existing or proposed structures*

*Direction of flow for watercourses*

*Articulation arrangement*

### **Elevation**

*Existing ground profile*

*Rock profile / competent strata*

*Intermediate and end support details*

*Foundations (hidden detail)*

*Access arrangements*

*Paving details*

*Slope protection*

*Lighting*

*Safety barriers*

*Interfaces with existing or proposed structures*

*Clearance envelope*

*Overall length*

*Span dimensions*

*Water levels (flood level assumed)*

*Road / rail under – camber, dimensions*

*Watercourse cross-section dimensions*

*Parapets / pedestrian guardrail*

*Earthworks profile*



**Cross Section**

*Bridge cross section dimensions*

*Camber*

*Superstructure cross section*

*Interface with existing structures*

*Interface with intermediate supports*

*Raised verge / footway details*

*Services*

*Parapet / pedestrian guardrail*

*Surfacing and waterproofing*

**Miscellaneous**

*Wingwalls*

*Approach arrangements*

*Finishes*

*Waterproofing details*

*Indicative location of construction joints*

(e) *Relevant extracts from the Geotechnical Report*

(f) *Departures from Standards*

(g) *Methods of dealing with aspects not covered by Standards*

**INTERIM ADVICE FOR PWA PROJECTS ONLY**