

No.

Japan International Cooperation Agency (JICA)  
Ministry of Tourism and Antiquities  
Ministry of Planning  
The Hashemite Kingdom of Jordan

# Detailed Design for Tourism Sector Development Project in the Hashemite Kingdom of Jordan

## Final Report

Main Report

**Volume 4MR**

Dead Sea Parkway Sub-project

August 2000

Pacific Consultants International  
Yamashita Sekkei Inc.

SSF
JR
00-153

**NOTE**

The following exchange rate was adopted through out this report

US\$ 1.00=JD 0.708 = Yen 106.08 (March 2000)

JD 1.00 = Yen 150

## PREFACE

In response to a request from the Government of the Hashemite Kingdom of Jordan, the Government of Japan decided to conduct the Detailed Design Study on Tourism Sector Development Projects in Jordan and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA selected and dispatched a study team headed by Mr. Takahide Fujihira of Pacific Consultants International and consist of Pacific Consultants and Yamashita Sekkei Inc. to Jordan, three times between March 1999 and July 2000.

The team held discussions with the officials concerned of the Government of Jordan and conducted field surveys at the study area. Upon returning to Japan, the team conducted further studies and prepared this final report.

I hope that this report will contribute to the implementation of the Project and to the enhancement of friendly relations between our two countries.

Finally, I wish to express my sincere appreciation to the officials concerned of the Government of Jordan for their close cooperation extended to the Study Team.

August 2000



---

Kimio Fujita

President

Japan International Cooperation Agency

August 2000

Mr. Kimio Fujita  
President  
Japan International Cooperation Agency  
Tokyo, Japan

## Letter of Transmittal

Dear Sir,

We are pleased to formally submit herewith the Final Report and tender documents of "The Detailed Design Study on Tourism Sector Development Project in the Hashemite Kingdom of Jordan." Which is composed of 7 sub-projects.

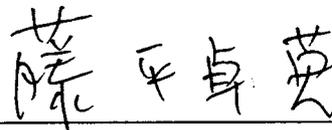
This report compiles the results of the Study including planning, design and tender documents (draft) of each sub-project.

During the study period we had been assisted by many people for the accomplishment of the Study, and we would like to express our sincere gratitude and appreciation to all those who extended their kind assistance and cooperation to the Study Team, in particular, the Ministry of Tourism and Antiquities who acted as the counterpart agency.

Also, we acknowledge the effective assistance by all the officials of your Agency and the Embassy of Japan in Jordan.

We hope that the report will be able to contribute to the implementation of Project and to the further development of Jordan through the completion of the Project.

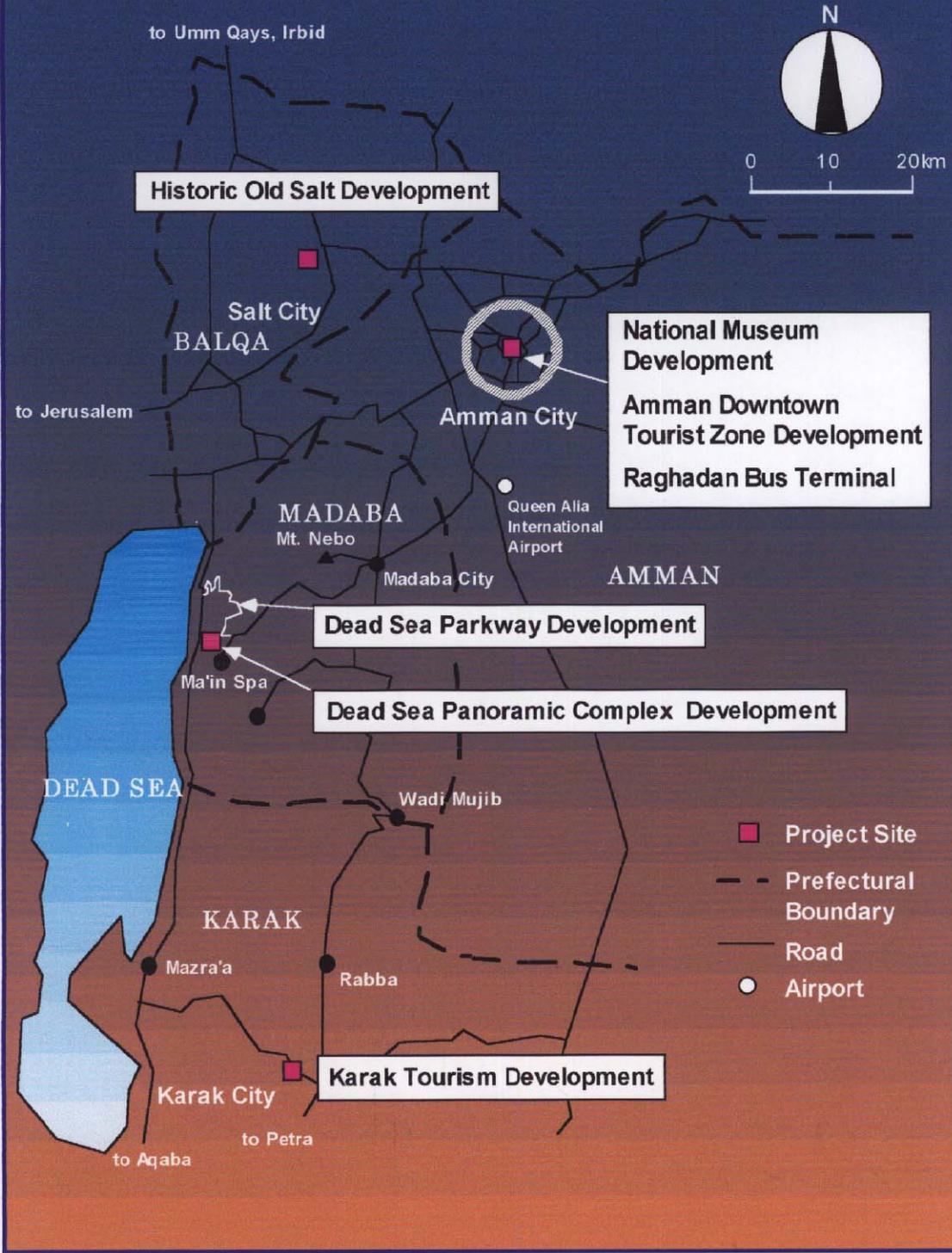
Very truly yours,



---

Takahide Fujihira  
Team Leader,  
The Study Team for  
the Detailed Design Study on  
Tourism Sector Development Project in  
the Hashemite Kingdom of Jordan

**Project Sites for Tourism Sector Development Project**



**Location Map**

**Table of Contents**

**PREFACE**

**LETTER OF TRANSMITTAL**

**LOCATION MAP**

**CHAPTER 1 INTRODUCTION..... 1-1**

1.1. BACKGROUND OF SUB-PROJECT..... 1-1

1.2. STUDY OBJECTIVES ..... 1-1

1.3. STUDY AREA ..... 1-2

1.4. SCOPE OF WORK..... 1-3

1.5. LOCATION AND DIVISION OF SUB-PROJECT ..... 1-3

1.6. RESPONSIBLE AGENCIES ..... 1-4

**CHAPTER 2. EXISTING CONDITIONS ..... 2-1**

2.1. CONDITIONS ON LOCATION ..... 2-1

2.2. TOPOLOGICAL CONDITIONS ..... 2-1

2.3. GEOLOGICAL CONDITIONS..... 2-3

2.4. HYDROLOGICAL CONDITIONS<sup>3</sup> ..... 2-5

2.5. ECOLOGICAL CONDITIONS ..... 2-10

2.6. ARCHAEOLOGY ..... 2-13

2.7. INFRASTRUCTURES ..... 2-16

**CHAPTER 3 DESIGN PREMISES ..... 3-1**

3.1. SELECTION OF AN OPTIMUM CORRIDOR..... 3-1

3.2. SCOPE OF WORK..... 3-3

3.3. DESIGN STANDARD AND DESIGN CRITERIA..... 3-5

**CHAPTER 4 DETAILED DESIGN ..... 4-1**

4.1. ROUTE OF THE PARKWAY ..... 4-1

4.2. PARKWAY ALIGNMENT DESIGN..... 4-20

4.3. PAVEMENT DESIGN ..... 4-26

4.4. CROSS-SECTION, AT-GRADE INTERSECTIONS AND OTHER ROAD FACILITIES ..... 4-27

4.5. DRAINAGE DESIGN ..... 4-35

4.6. BRIDGE DESIGN..... 4-51

4.7. DESIGN ELEMENTS WITH GEO-TECHNICAL CONSIDERATIONS..... 4-51

**CHAPTER 5. CONSTRUCTION PLANNING..... 5-1**

5.1. PROJECT SITE ..... 5-1

5.2. TEMPORARY WORKS ..... 5-1

5.3. CONSTRUCTION METHOD AND CONSTRUCTION SCHEDULE ..... 5-3

5.4. SPECIFIC ISSUES TO BE TAKEN FOR TENDER PACKAGE..... 5-5

5.5. ENVIRONMENTAL CONSIDERATION ..... 5-5

---

<b>CHAPTER 6. TENDER AND CONTRACT DOCUMENTS.....</b>	<b>6-1</b>
6.1. COMPONENTS FOR THE TENDER.....	6-1
6.2. TENDER ADMINISTRATION.....	6-1
6.3. TENDER DOCUMENTS.....	6-2
6.4. TYPE OF TENDERING.....	6-3
6.5. SPECIFIC ISSUES TO BE TAKEN FOR TENDER PACKAGE.....	6-3
<b>CHAPTER 7. COST ESTIMATES AND IMPLEMENTATION PLAN.....</b>	<b>7-1</b>
7.1. CONDITIONS OF COST ESTIMATES.....	7-1
7.2. CONFIRMATION OF PROJECT COST.....	7-1
7.3. CONSTRUCTION COST.....	7-3
7.4. PROJECT IMPLEMENTATION PLAN.....	7-3
<b>CHAPTER 8. OPERATION AND MAINTENANCE PLAN.....</b>	<b>8-1</b>
8.1. EXISTING SITUATION IN OPERATION AND MAINTENANCE PLAN.....	8-1
8.2. OPERATION, MANAGEMENT AND MAINTENANCE (OMM) PLAN FOR THE DEAD SEA PARKWAY.....	8-5
8.3. ENVIRONMENTAL CONSIDERATIONS.....	8-22
<b>CHAPTER 9. ISSUES TO BE SOLVED IN FURTHER STAGE.....</b>	<b>9-1</b>
9.1 PARTICULAR ISSUES.....	9-1

In addition to this Main Report, Final Report and Draft Tender Documents for Dead Sea Parkway Sub-project consist the following volume of reports and documents, separately.

### **GENERAL TABLE OF CONTENTS**

#### **FINAL REPORT**

- VOLUME 4MR : MAIN REPORT
- VOLUME 4SR : SUPPORTING REPORT
- Design Calculation Sheets
  - Take off Sheets for Quantity Survey
  - Other Supplemental Survey Report for Design

#### **DRAFT TENDER DOCUMENTS**

- VOLUME 4PQ : PRE-QUALIFICATION DOCUMENT
- VOLUME 4IT : TENDERING AND CONTRACTING REQUIREMENT  
(Volume )
- Invitation for tender
  - Instructions to Tenderers
- VOLUME 4SP : SPECIFICATIONS (Volume )
- VOLUME 4BQ : BILL OF QUANTITIES (Volume )
- VOLUME 4DR : DRAWINGS (Volume )
- VOLUME 4CC : CONDITIONS OF CONTRACT (Volume )
- General Conditions of Contract
  - Special Conditions of Contract

---

## List of Tables

TABLE 2.1	LONG TERM AVERAGE OF CLIMATOLOGICAL PARAMETERS FOR MADABA STATION.....	2-7
TABLE 2.2 (1)	PROFILE OF WADIS.....	2-8
TABLE 2.3	CATEGORY OF ARCHAEOLOGICAL SITE.....	2-15
TABLE 3.1	COMPARISON OF SCOPE OF WORK.....	3-4
TABLE 3.2	TRAFFIC DEMAND ESTIMATION.....	3-5
TABLE 3.3	GENERAL GEOMETRIC DESIGN CRITERIA FOR PARKWAY.....	3-7
TABLE 4.1 (1)	EVALUATION OF ALTERNATIVE ROUTE OF PART-A (1).....	4-7
TABLE 4.1 (2)	EVALUATION OF ALTERNATIVE ROUTE OF PART-A (2).....	4-7
TABLE 4.2 (1)	EVALUATION OF OPTIONS OF PART-B (1).....	4-12
TABLE 4.2 (2)	EVALUATION OF OPTIONS OF PART-B (2).....	4-12
TABLE 4.3	COMPARISON OF GUARD RAIL AND ROPE SYSTEMS.....	4-33
TABLE 4.4	PEAK FLOW AND CHARACTERISTICS OF THE CATCHMENT AREAS.....	4-38
TABLE 4.5	RAINFALL INTENSITY, MADABA.....	4-39
TABLE 4.6	RAINFALL INTENSITY (MM/HR) ACCORDING TO DURATION AND RETURN PERIOD.....	4-40
TABLE 4.7	GENERALISED DESIGN CRITERIA FOR CROSS DRAINAGE STRUCTURES:.....	4-42
TABLE 4.8	DRAINAGE CROSSING STRUCTURE.....	4-44
TABLE 4.9	FLOW CHARACTERISTICS AND DIMENSIONS OF ENERGY DISSIPATERS.....	4-46
TABLE 4.10	DESIGN CALCULATIONS OF THE PROTECTION WORKS.....	4-48
TABLE 4.11	CLASSIFICATION OF METHOD OF EXCAVATION.....	4-53
TABLE 5.1	SUMMARY OF ECOLOGICAL IMPORTANCE OF THE STUDY AREA.....	5-6
TABLE 5.2	POTENTIAL IMPACTS.....	5-7
TABLE 5.3	PROPOSED MITIGATION MEASURES.....	5-8
TABLE 8.1	ROAD MAINTENANCE BUDGET FOR 1990 - 1999.....	8-4
TABLE 8.2	OBJECTIVES OF INSPECTION.....	8-11
TABLE 8.3	INSPECTION ITEMS AND RATINGS FOR ASPHALT PAVEMENT.....	8-12
TABLE 8.4	INSPECTION ITEMS AND RATINGS FOR SLOPES.....	8-13
TABLE 8.5	INSPECTION ITEMS AND RATINGS FOR CONCRETE SUPERSTRUCTURES.....	8-14
TABLE 8.6	INSPECTION ITEMS AND RATINGS FOR BRIDGES.....	8-15
TABLE 8.7	ROAD CLEANING WORK.....	8-16
TABLE 8.8	PREVENTIVE MAINTENANCE ON ROAD DEFECTS.....	8-18
TABLE 8.9	REPAIR METHODS FOR SLOPES.....	8-18
TABLE 8.10	RATING CRITERIA FOR INSPECTION WORKS.....	8-19
TABLE 8.11	POTENTIAL IMPACTS AND PROPOSED MITIGATION MEASURES.....	8-23

## List of Figures

FIGURE 1.1	ONE DAY TOURISM CIRCUIT.....	1-1
FIGURE 1.2	DEAD SEA PARKWAY SITE.....	1-2
FIGURE 1.3	DEAD SEA PARKWAY SUB-PROJECT .....	1-3
FIGURE 2.1	TOPOLOGICAL CONDITIONS.....	2-2
FIGURE 2.2	GEOLOGICAL CONDITIONS.....	2-4
FIGURE 2.3	HYDROLOGICAL CONDITIONS.....	2-6
FIGURE 2.4	MEAN MONTHLY RAINFALL (MM) FOR MADABA STATION .....	2-7
FIGURE 2.5 (1)	GROUND PROFILE OF WADI (1) .....	2-9
FIGURE 2.5 (2)	GROUND PROFILE OF WADI (2) .....	2-10
FIGURE 2.6	ECOTYPE; CORRIDOR ECOLOGY .....	2-12
FIGURE 2.7	ARCHAEOLOGICAL SITES.....	2-14
FIGURE 3.1	STUDY AREA AND ALTERNATIVE CORRIDORS PROPOSED BY SAPROF STUDY ....	3-2
FIGURE 4.1	ROUTE ALTERNATIVES BY PART AND SECTION.....	4-2
FIGURE 4.2	LONGITUDINAL SECTION OF PARKWAY .....	4-15
FIGURE 4.3	FINAL ALIGNMENT OF PART-C.....	4-17
FIGURE 4.4	FINAL RECOMMENDED AND CONFIRMED ROUTE THROUGH PARKWAY (PART-A, B AND C).....	4-19
FIGURE 4.5 (1)	SPEED DISTANCE CURVE (AASHTO).....	4-23
FIGURE 4.5 (2)	SPEED DISTANCE CURVE (AASHTO).....	4-24
FIGURE 4.5 (3)	SPEED DISTANCE CURVE (AASHTO).....	4-25
FIGURE 4.6	TYPICAL CROSS SECTIONS OF PARKWAY.....	4-28
FIGURE 4.7	DEAD SEA INTERSECTION.....	4-30
FIGURE 4.8	MA'IN INTERSECTION.....	4-32
FIGURE 4.9	LAYOUT OF PARKWAY FACILITY.....	4-34
FIGURE 4.10	INTENSITY-DURATION-FREQUENCY CURVES.....	4-39
FIGURE 4.11	DISTRIBUTION COMPARISON PLOTS ACCORDING TO DURATION FOR RAINFALL INTENSITY RECORD .....	4-40
FIGURE 4.12	I-D-F CURVES .....	4-41
FIGURE 4.13	SECTION OF APRON.....	4-45
FIGURE 4.15	SECTION OF IN-TAKE AND OUT-LET PORTIONS OF CULVERT.....	4-47
PLATE-1	SPRING WATER WITHIN PARKWAY CORRIDOR .....	4-50
PLATE-2	BASE FLOW WITHIN PARKWAY CORRIDOR.....	4-50
FIGURE 4.16	LAYOUT AND SECTION OF WADI HAMMARA BRIDGE.....	4-52
FIGURE 5.1	SUB-PROJECT AND TEMPORARY FACILITY SITE PROPOSED .....	5-2
FIGURE 5.2	CONSTRUCTION SCHEDULE.....	5-9
FIGURE 7.1	OVERALL PROJECT IMPLEMENTATION PLAN.....	7-5
FIGURE 8.1	ORGANIZATION STRUCTURE OF ROAD MAINTENANCE DEPARTMENT OF MPWH.....	8-1
FIGURE 8.2	DEFINITION AND FUNCTION OF THE DEAD SEA PARKWAY OMM SYSTEM .....	8-6
FIGURE 8.3	COMPONENTS AND TASKS OF ROAD MAINTENANCE & OPERATION .....	8-8
FIGURE 8.4	A FLOW DIAGRAM FOR SELECTING COUNTERMEASURES FOR SLOPE PROTECTION IN CUT SECTIONS.....	8-20
FIGURE 8.5	WORK FLOW CHART.....	8-21

## Abbreviations

ADTZ	:	Amman Downtown Tourist Zone
B/D	:	Basic Design
CDD	:	Civil Defence Directorate
CERM	:	Cultural Environment Resources Management
D/D	:	Detailed Design
DOA	:	Department of Antiquities (of MOTA)
DOE	:	Department of Environment (of MMRAE)
DSPC	:	Dead Sea Panoramic Complex
DSPW	:	Dead Sea Parkway
EIA	:	Environmental Impact Assessment
GAM	:	Greater Amman Municipality
GCEP	:	General Corporation for Environmental Protection
GDP	:	Gross Domestic Product
GEC	:	General Environment Corporation
GOJ	:	Government of Japan
HOSD	:	Historic Old Salt Development
ICB	:	International Competitive Bidding
IEE	:	Initial Environmental Examination
I/P	:	Implementation Program
JAM	:	Jordan Archaeological Museum
JBIC	:	Japan Bank for International Cooperation
JD	:	Jordan Dinar(s)
JICA	:	Japan International Cooperation Agency
JST	:	JICA Study Team
JVA	:	Jordan Valley Authority
JY	:	Japanese Yen
KDC	:	Karak Development Corporation
KM	:	Karak Municipality
KTD	:	Karak Tourism Development
LB	:	Local Bidding
LCB	:	Local Competitive Bidding
MMRAE	:	Ministry of Municipal, Rural Affairs and Environment
MOP	:	Ministry of Planning
MOT	:	Ministry of Transport
MOTA	:	Ministry of Tourism and Antiquities
MP	:	Master Plan
MPWH	:	Ministry of Public Works and Housing
NGO	:	Non-Governmental Organisation
NIC	:	National Information Center
NM	:	National Museum
OECF	:	Overseas Economic Cooperation Fund of Japan
PMU	:	Project Management Unit
PSC	:	Project Steering Committee
RBT	:	Raghadan Bus Terminal
RSCN	:	Royal Society for the Conservation of Nature
SAPROF	:	Special Assistance for Project Formation
SDC	:	Salt Development Corporation
SM	:	Salt Municipality
S/V	:	Supervision (of Works)
TCC	:	Telecommunications Corporation
TD	:	Tender Documents
TOR	:	Terms of Reference
T/P	:	Tender Package
UNESCO	:	United Nations Educational Scientific and Cultural Organization
USAID	:	United States Agency for International Development
WB	:	World Bank

## List of Participants

<u>Name</u>	<u>Title</u>
<b>JORDANIAN SIDE</b>	
<b>• National Museum Steering Committee</b>	
H.M. Queen Rania	Head of National Museum Steering Committee
H.E. Dr. Reema Khalaf	Former Deputy Prime Minister/Minister of Planning
H.E. Akel Biltaji	Minister of MOTA
H.E. Eng. Nidal Al-Hadid	Mayor of Greater Amman Municipality
H.E. Dr. Taleb Al-Refai	Minister of Information
Dr. Alia Hatough Bouran	Secretary General of MOTA
Dr. Abu-Ayyash	Executive Manager, PMU
Dr. Ghazi Bisheh	Former Director of DOA
Prof. Dr. Zeidan Kafafi	Dean of Research and Graduate Studies
Mr. Bilal Hammad	Architect/Private Sector
<b>• Project Steering Committee</b>	
<b><u>Higher Committee</u></b>	
H.E. Akel Biltaji	Chairman of the Committee, Minister of MOTA
H.E. Michael Marto	Minister of MOF
H.E. Husni Abu Ghaida	Minister of MOPWH
H.E. Jawad Al-Hadid	Minister of MOP
H.E. Reema Khalaf	Former Deputy Prime Minister/Minister of MOP
H.E. Abdul Rahim Okour	Minster of MoMREA
H.E. Nidal Al-Hadid	Mayor of GAM
<b><u>Executive Committee</u></b>	
Dr. Alia Hatough Bouran	Secretary General of MOTA
Eng. Abdelmajid Kabariti	Secretary General of MOPWH
Dr. Jamal Salah	Secretary General of MOP
Eng. Abdal-Rahim F. Boucai	Deputy Mayor of GAM
Mr. Mahir Abu Al-Saman	Mayor of Salt Municipality
Mr. Khalid Al-Dmour	Mayor of Karak
<b>• Project Management Unit (PMU)</b>	
Dr. A. Abu-Ayyash	Executive Manager
Mr. Khalid Laham	Financial Manager
Eng. Essam M. Jabri	Project Engineer
<b>• Relevant Authorities</b>	
<b><u>Ministry of Planning</u></b>	
Dr. Nael T. Al-Hajaj	Director of Multilateral Co-operation
Eng. Benitta Saad	Tourism Section
<b><u>Ministry of Public Works and Housing</u></b>	
Eng. Sami Jiries Halaseh	Director of Highway Studies Directorate
<b><u>Jordan Valley Authority</u></b>	
Eng. Avedis Serbekian	Secretary General of JVA
Mr. Mahannad Qudah	Former Assistant Secretary General, JVA
Mr. Jamil Itijazai	Town Planner, Executive Department, JVA

<u>Name</u>	<u>Title</u>
<u>Department of Antiquities</u>	
Dr. Fawaz Khreshah	Director of DOA
Dr. Ghazi Besheh	Former Director of DOA
Dr. Abdel Sami Abu Dayyeh	Cultural Resources Management, Department of Antiquities
Dr. Mohammad Najjar	Excavation Section, Department of Antiquities
Ms. Tamara Bermamet	Assistant Curator, National Archaeological Museum

### **Advisory and Technical Committees for the respective sub-projects**

- **Amman Downtown Tourist Zone**
- **Raghadan Bus Terminal**
- **National Museum**

#### **Advisory Committee**

H.E. Eng. Nidal Al-Hadid	Mayor of GAM
Eng. Abdal-Rahim F. Boucai	Deputy Mayor of GAM
Eng. Falah Omoush	Under Secretary of GAM
Eng. Shehada Abu-Hdeib	Consultant for Planning, GAM

#### **Technical Committee**

Eng. Mohammad Khalifat	Director of Design Department, GAM
Eng. Ahmed Armouti	Traffic Department
Arch. Fadwa Abu Ghaida	Chief Architect of Design Department of GAM
Eng. Majid Nimri	Tech. Assistant of GAM
Eng. Bakker K. Abbadi	Landscape Engineer, Design Department of GAM
Eng. Meshal J. Halaseh	Work Department, GAM
Eng. Wasfi Mseis	Traffic Department, GAM
Eng. Mohammad Basheer	Director of Finance Department
Eng. Anwar Manasra	Planning Department of GAM
Arch. Alma Al-Fahham	Architect, Design Department of GAM
L.Arch. Raud Al-Nsour	Landscape Architect, Design Department of GAM
Dr. Nawzat Abidah	Director of DOA, MOTA
Dr. Sahar Mansour	Archaeologist, Department of Antiquities
Eng. Asma Shhaltoug	Archaeologist, Manager Amman Citadel Project

- **Dead Sea Parkway**

#### **Advisory Committee**

H.E. Husni Abu Ghaida	Minister of MOPWH
Eng. Abdelmajid Kabariti	Secretary General of MOPWH
Mr. Nasir Madadha	Director General, Government Tenders Directorate

#### **Technical Committee**

Eng. Sami Jiries Halaseh	Director of Highway Studies Directorate, MPWH
Dr. Mohammed Al-Smadi	Geotechnical Engineer, MPWH
Eng. Iman Ramahi	Head of Geometric Design Section, MPWH
Eng. Wafa J. Haddadin	Senior Highway Engineer, MPWH

<u>Name</u>	<u>Title</u>
<b>• Dead Sea Panoramic Complex</b>	
<b><u>Advisory and Technical Committee</u></b>	
Dr. Alia Hatough Bouran	Chairman of Committee
H.E. Mr. Shafiq Zawaydeh	Former Minister of MPWH
Mrs. Muna Shafiq Zawaydeh	Madaba Heritage Society
Mr. Qasem Abu Di-Haija	Mayor of Madaba
Mr. Ali Abu Rbeiha	House of Parliament
Dr. Abdel Ilah Abu-Ayyash	Executive Manager/PMU
Mr. Ahmed Eddissi	Doctor at University of Jordan
Mr. Khalid Shawabkeh	Geologist of Natural Resource Authority (NRA)
Dr. Khalid Moumani	Quaternary Geologist (NRA)
Dr. Mohammad Waheeb	Archaeologist of DOA
Dr. Abdel Sami Abu Daya	Archaeologist of DOA
<b>• Karak Tourism Development</b>	
<b><u>Advisory Committee</u></b>	
Mr. Ahmad Al-lawzy	Governor of Karak
Eng. Khalid Dmour	Mayor of Karak
Mr. Saber Aljwazneh	Director of KDC
Mr. Jamil Salman	Head of Commerce Chamber, KDC
Mr. Husain Tarawneh	Representative of KDC
Ms. Arwa Masadeh	Director of Museum
Dr. Ghazi Bisheh	Former Director of DOA
Mr. Amir Qimish	Archaeologist, DOA
Mr. Hakim Mohamid	Archaeologist, DOA Karak
<b><u>Technical Committee</u></b>	
Arch. Emad Suhimat	Architect, KDC
Eng. Yousef Al-Bustangy	Engineer, KM
Arch. Nahla Nasraween	Architect, KM
Eng. Mustafa Sakhniny	Electrical Engineer, KM
Eng. Radi Mahadeen	Communication Engineer, KM
Mr. Ghaleb Al-Jamaya	Traffic Management, KM
Mr. Jafar Shihadeh	MOTA
Eng. Nayef Al-Nawayseh	Public Works
Eng. Tawfiq Al-Habashneh	Water Authority
Arch. Luma Al-Majalieh	Architect, KM
<b>• Historic Old Salt Development</b>	
<b><u>Advisory Committee</u></b>	
Mr. Mahir Abu Al-Saman	Mayor of Salt Municipality
Prof. DR. Mohammed Al Ma'aney	Assistant Professor, Department of Architecture at University of Jordan
Eng. Ranwa Yahyaa Khatib	Building Research Centre, Royal Scientific Society
Eng. Mervat Ma'moun Habbsh	Field Liaison Officer, King Hussein Environmental Management Training Program
Eng. Mo'ayad R. Mihyar	Engineer, Private Office
Eng. Andrew de Carpentier	General Director of the Holy Land Institute for the Deaf, Salt
Ms. Maisoon S. Shaheen	General Corporation for Environment Protection (GCEP)

<u>Name</u>	<u>Title</u>
Ms. Lamia Shareef	Regional Planning Department, Ministry of Municipalities, Rural and Environment Affairs
Mr. Hesham Al-Abbadi	Director of Belqa Tourism Office
Mr. Jawad Al-Bana	Representative of SDC

**Technical Committee**

Mr. Salah Ibrahim Salah	Director, Engineering Department, SM
Mr. Abdul Rahman Al-Hyari	Director, SM
Mr. Mohammed A. Hiasat	Architect, SM
Ms. Lina S. Abu Salym	Architect, SM

**Consulting Services-Construction Supervision**

**Tender Technical Committee**

Eng. Mahmood Murad	Government Tenders Directorate
Eng. Mohamed Al Hazaymeh	Government Tenders Directorate
Dr. A. Abu-Ayyash	PMU/MOTA
Eng. Smai J. Halaseh	MOPWH
Eng. San'a Al Nazer	MOPWH
Eng. Ismi'l Al Osta	GAM
Eng. Hana KaKish	Government Audit Bureau

<u>Name</u>	<u>Title</u>
<b>JAPANESE SIDE</b>	
<b>• Embassy of Japan</b>	
Mr. Koichi Matsumoto	Ambassador
Mr. Takashi Ashiki	Former Counsellor
Mr. Tohru Kuramata	Counsellor
Mr. Masaya Tanaka	First Secretary, Economic Section
Mr. Tadateru Nakazawa	First Secretary, Economic Section
<b>• JICA Headquarters</b>	
Mr. Takao Kaibara	Director, First Development Study Department, Social Development Study Division
Mr. Hidenori Kumagai	Deputy Director, First Development Study Department, Social Development Study Division
Mr. Tetsuro Ikeda	First Development Study Department, Social Development Study Division (Predecessor)
Mr. Kazuya Narukawa	First Development Study Department, Social Development Study Division (Successor)
<b>• JICA Jordan</b>	
Mr. Yoshio Yabe	Resident Representative
Mr. Hiroshi Kurakata	Deputy Resident Representative
Mr. Masaaki Iwai	Assistant Resident Representative
Eng. Adel O. Zureikat	Research Coordinator
Mr. Koji Oyama	Member of Japan Overseas Cooperation Volunteers
<b>• JICA Technical Appraisal Team</b>	
Mr. Toshikatsu Omachi	Advisor for Urban Facility Design
Mr. Hideo Matsuzono	Advisor for Highway Design
Mr. Hiroo Oda	Advisor for Construction Plan/Tender Documents
Mr. Miki Watanabe	Advisor for Building Design
<b>• JICA Study Team</b>	
Mr. Takahide Fujihira	Team Leader
Mr. Takanori Tanaka	Deputy Team Leader/Architect
Mr. Yasuhiro Nakajima	Deputy Team Leader/Landscape and Street Design
Mr. Sotaro Watanabe	Facility Design
Mr. Ryunosuke Okamoto	Structural Design
Mr. Kazuo Tonoshi	Mechanical/Electrical Design
Mr. Shigeyoshi Kurihara	Road Design
Mr. Fumio Arai	Construction Planning/Cost Estimation (1)
Mr. Hisao Matsumura	Civil Design/Construction and Cost Planning (2)
Mr. Hidejiro Ushizaki	Bus Terminal Design/Road Facility Planning
Mr. Akira Ogiwara	Environmental Impact Assessment
Mr. Youichi Kumakura	Exhibition Planning
Mr. Naoki Watanabe	Exhibition Facility Planning
Mr. Akio Ishikawa	Operation Planning
Mr. Yuichi Fukuoka	Maintenance/Landscape Planning
Mr. Makoto Harada	Tender Document Specialist
Mr. Shoji Kumita	Geotecnic Engineer
Mr. Hirotsugu Kato	Administration Coordinator

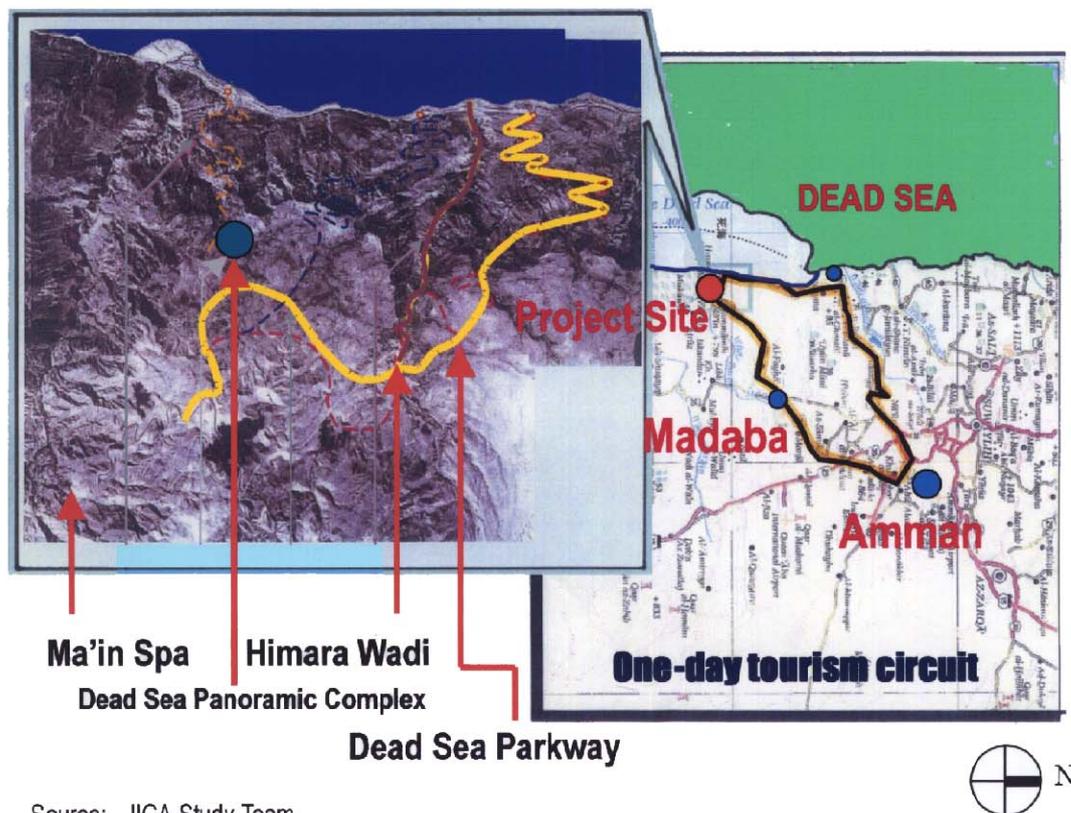
## Chapter 1 Introduction

### 1.1. Background of Sub-project

This Dead Sea Parkway Development is selected as one of the highest priority sub-projects in the “Study of the Tourism Development Plan in the Hashemite Kingdom of Jordan (hereinafter called the “JICA Master Plan Study)” from December 1994 to February 1996.

The Dead Sea is well known world-wide as the lowest point on earth (about 395m below sea level), and is considered the most buoyant sea in the world. The potential of the Dead Sea should be utilized for the tourism promotion of Amman Tourism Centre. The Parkway development will formulate a “one day tourism circuit” from the Amman Tourism Centre through Madaba, Ma’in Spa, Zara Cliff, Dead Sea Coast and Amman as shown in Figure 1.1. The formulation of the one-day circuit is expected to contribute to the tourism development and promotion of Amman Tourism Centre.

Figure 1.1 One day Tourism Circuit



Source: JICA Study Team

### 1.2. Objectives

Study The study objectives are summarised as follows:

- 1) Review and reassessment of previous studies of the Project such as JICA Master Plan Report (February 1996) and SAPROF Report (March 1997);
- 2) Conduct supplemental site investigations, topographic surveys, and soil investigations;
- 3) Establishment of the definitive plan including preliminary design and provisional cost estimates in consideration of the amount of construction cost allocated in JBIC loan agreed with HKJ;

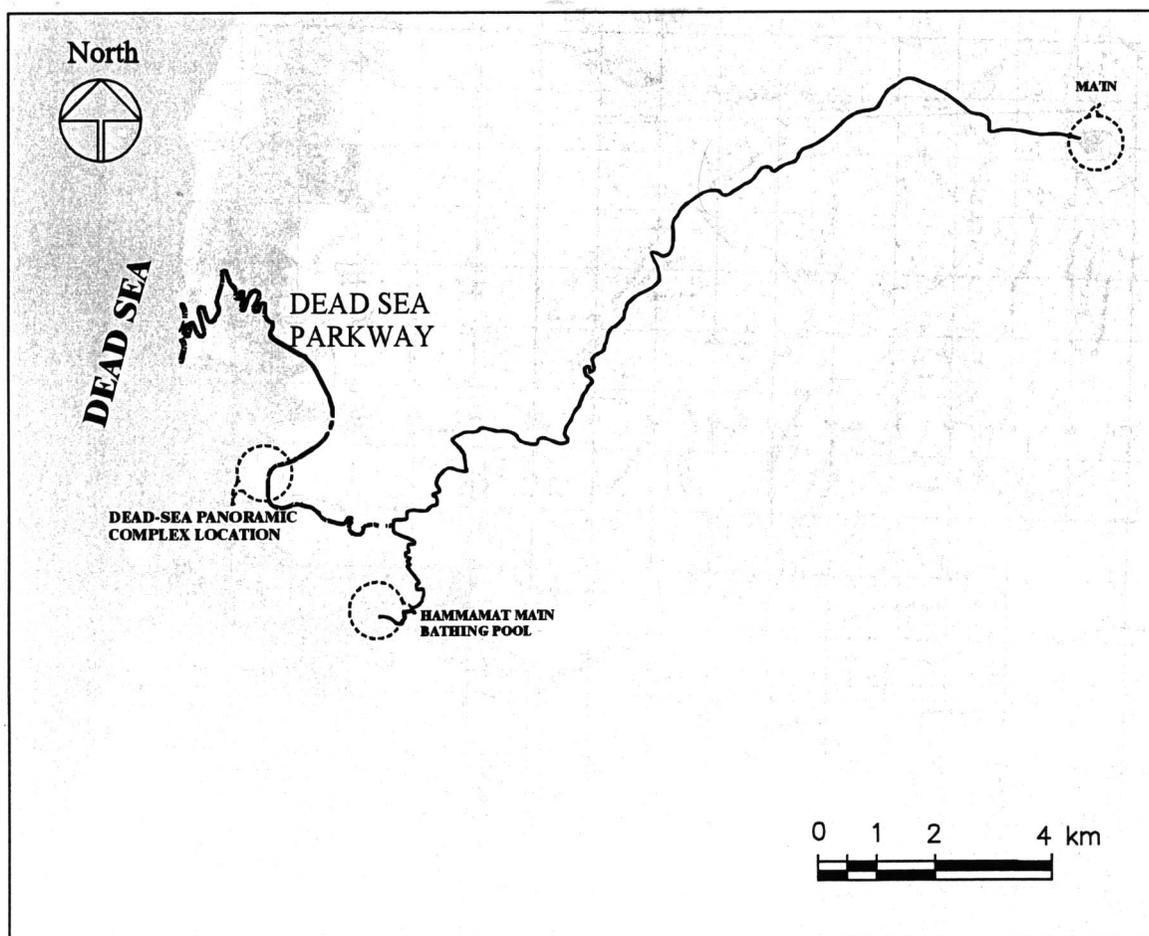
- 4) Preparation of the detailed design of the facilities to be constructed under the Project including construction plan and cost estimates in consideration of the amount of construction cost allocated in JBIC loan agreed with HKJ;
- 5) Preparation of the tender documents of the Tourism Sector Development Project;
- 6) Preparation of the study reports, and
- 7) Pursuing technology transfer to Jordanian counterpart personnel in the course of the Study.

### 1.3. Study Area

The location of the sub-project is the west-facing slope in the eastern coastal area of the Dead Sea. The closest town is the Ma'in City, around 15 km far from the site and there is a facility complex of Ma'in Hotel (Spa) around 4 km far from the site at the south-east direction.

In response to the early recommendation made by the JICA Master Plan Study, MOTA intends to encourage the development of the area that is located near the site and along the cliff area on the eastern side of the Dead Sea as a tourist area. A plan was prepared by MOTA to include the development of a hotel facility to be located at the northern part of the Dead Sea Panoramic Complex.

Figure 1.2 Dead Sea Parkway Site



Source: JICA Study Team

### 1.4. Scope of Work

The main objectives of the project aim at to create and foster a new tourist circuit that will give an opportunity for the tourist travelling from Ma'in Spa or the Dead Sea Coast providing a tourist facility with a panoramic view of the Dead Sea.

### 1.5. Location and Division of Sub-project

The proposed DEAD SEA PARKWAY starts from the Dead Sea Highway (Route 65) some 7 km to the south of the Hotels Development Area at the Dead Sea and to the north of Wadi Al - Mujib.

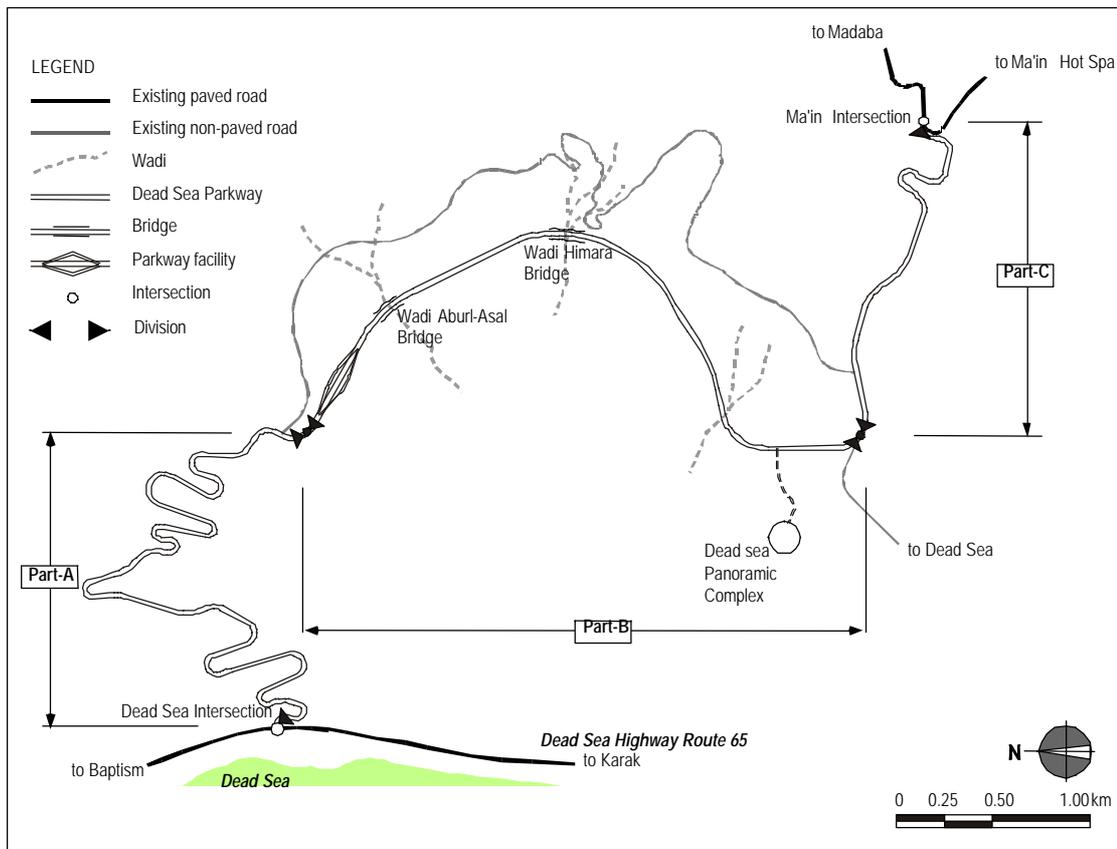
The proposed route generally runs east and south east, climbing the mountainous and difficult first part of the corridor that is almost 5.5 km in length. It crosses some main and minor wadis until reaching the coordinate line of E 206 000 (which is the end of the difficult part).

The proposed route continues running east and south east crossing two main wadis where two bridges are proposed (namely, Wadi Abu El-Asal & Wadi Himara) until it intersects with the Ma'in Main Road that connects Madaba and Ma'in with the Hot Spa.

The proposed road passes adjacent to the proposed site for the Dead Sea Panoramic Complex.

The Parkway is divided into 3 sections for the study according to its topographic characteristics, as shown in Figure 1.3.

Figure 1.3 Dead Sea Parkway Sub-project



Source: JICA Study Team

- 
- Part-A: The topography of the first part of the corridor is mountainous and the difference in elevation is almost 470 m within a straight distance of almost 1.4 km. This gives an average natural ground slope of more than 30%.
- Part-B: The topography of the second part is generally considered hilly with some sections of flat terrain. The only difficult section in this part is where the proposed route intersects Madash Himara Wadi and its branches at Sta. 7 + 300 approximately.
- Part-C: This section is the improvement of the existing one-lane road. The existing road is not suitable for large tourist buses since it is highly damaged with steep slopes and small radius curves. Therefore, it was requested by MOTA and MPWH to be implemented together with the original Parkway and agreed by JICA, although this was originally out of the scope of the Parkway sub-project.

## **1.6. Responsible Agencies**

(1) Development of the Parkway

The Ministry of Public Works and Housing (MPWH) is the responsible agency for the development of the Parkway under the provision of the land by Jordan Valley Authority (JVA)

(2) Operation and maintenance

MPWH is the agency responsible for maintenance of this Parkway.