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 1MR

Amman Downtown Tourist Zone Sub-project

August 2000

Pacific Consultants International
Yamashita Sekkei Inc.

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N O T E

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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.

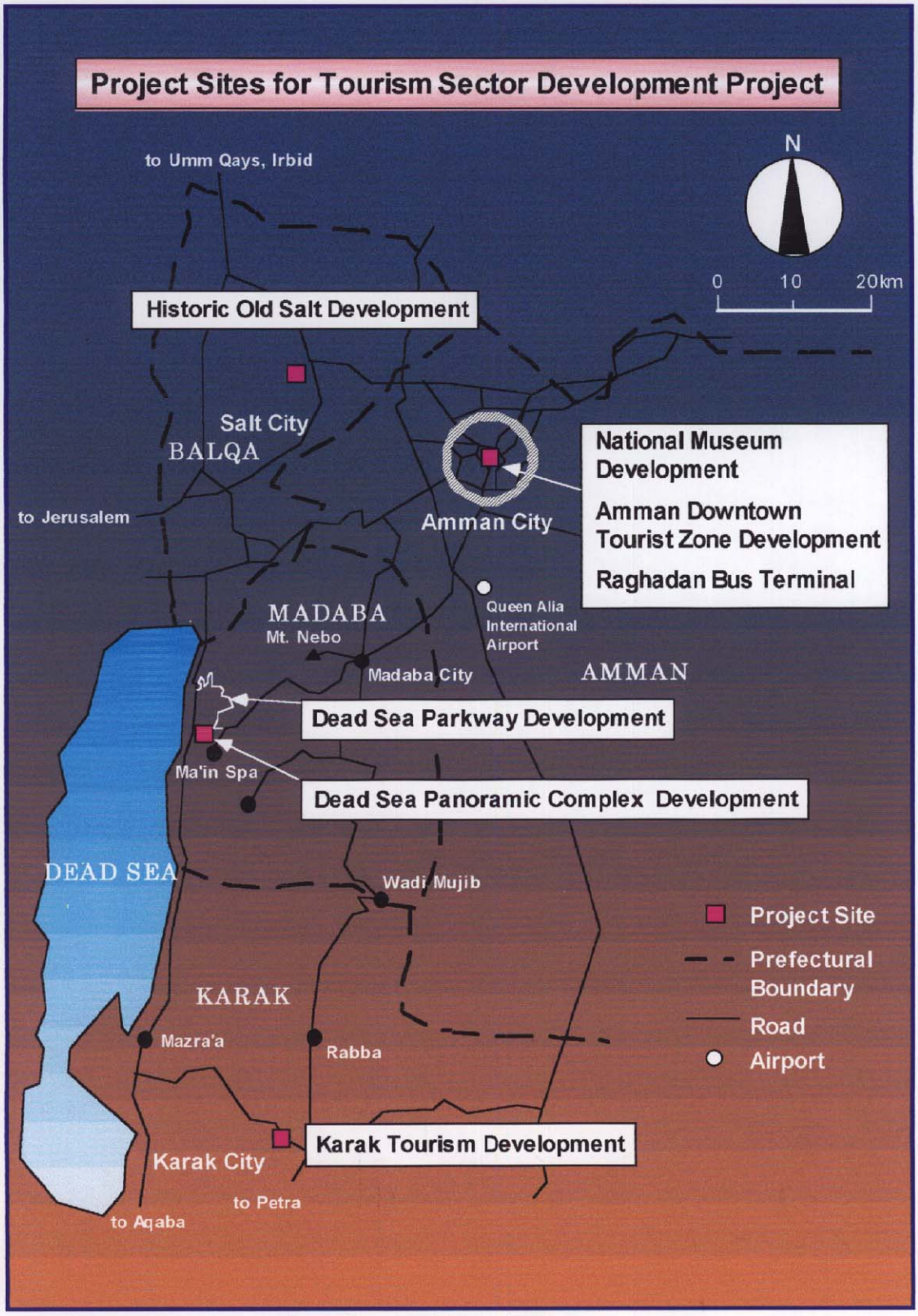
Also, we acknowledge the effective assistance by all the officials of your Agency and the Embassy of Japan in Jordan.

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,

藤平卓英

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



Location Map

Table of Contents

In addition to this Main Report, Final Report and Draft Tender Documents for Amman Downtown Tourist Zone Sub-project consist the following volume of reports and documents, separately.

GENERAL TABLE OF CONTENTS

FINAL REPORT

VOLUME 1MR : MAIN REPORT

VOLUME 1SR-(1) : SUPPORTING REPORT
- Design Calculation Sheets
- Take off Sheets for Quantity Survey
- Other Supplemental Survey Report for Design

DRAFT TENDER DOCUMENTS

VOLUME 1IT : TENDERING AND CONTRACTING REQUIREMENT (Volume Ⅰ)
- Invitation for tender
- Instructions to Tenderers

VOLUME 1SP-AS : SPECIFICATIONS (Volume Ⅱ)
- Division 1~14, Architecture & Structure

VOLUME 1SP-ME : SPECIFICATIONS (Volume Ⅱ)
- Division 15~16, Mechanical & Electrical

VOLUME 1BQ : BILL OF QUANTITIES (Volume Ⅲ)

VOLUME 1DR-AS : DRAWINGS (Volume Ⅳ)

VOLUME 1CC : CONDITIONS OF CONTRACT (Volume Ⅴ)
- General Conditions of Contract
- Special Conditions of Contract

List of Tables

List of Figures

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

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Chapter 1 Introduction

1.1. Background of Sub-project

The Project was planned to promote tourism in Amman, the capital city of Jordan. This is one of the sub-projects involved in the Project and the most directly related to Amman itself.

The City of Amman has developed on 7 hills (Jebel), but the most noteworthy sites of Amman, from the tourism development aspects, are situated within walking distance of the Downtown area, the oldest part of the City.

Although Downtown Amman has a number of prominent ancient sites, such as Roman Theatre, Hashimiya Plaza, Citadel, and various cultural facilities as shown in Figure 1.1, the downtown itself has been neglected by many tourists coming to Jordan, primarily due to inadequate promotion and lack of tourist amenities and infrastructure.

The major activities for tourists in Amman are currently catered by 5 star hotels up on the hills, and tourists are merely transferred by buses to particular spots. However, most tourists unfortunately have no chance to be tempted with Arabic-style coffee, delicious pastries such as kenafe and warbaht, or the famous mansaf (lamb, yoghurt sauce and rice) in typical downtown coffee houses and restaurants in an exotic setting.

The aim of this sub-project, Amman Downtown Tourist Zone Development, is to offer tourists a wider selection of options for their explorations on foot, and enlighten the tourists staying in Amman to enjoy the authentic Amman.

1.2. Sub-division of the Sub-project

The sub-project originally included component of the Raghadan Bus Terminal, but it was agreed to separate the Raghadan Bus Terminal from the original sub-project due to the differences of size and characteristics of works. Eventually it was determined that the remaining of Tourist Street, Tourist Trails, View Terraces and Improvement of the Visitor Centre were the components of this sub-project.

1.3. Study Objectives

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 and topographic surveys,
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 report to conclude the overall study; and
7) Pursuing technology transfer to Jordanian counterpart personnel in the course of the Study.

1.4. Study Area

In order to encourage and promote the Capital City Tourism, it is planned to improve the tourist routes (pedestrian circuits) in the Amman Downtown where many tourism assets are concentrated, such as Roman Theatre, Citadel, Archaeological museum, Al-Husseini Mosque Plaza, Hashimiya Plaza, Raghadan Bus Terminal, etc.

The existing small streets in the hillside of Citadel hill are forming tourist trails with view terraces and King Talal Street for the Tourist Street. They should give tourists more flexible travel routes, and be convenient, comfortable and enjoyable together with the tourist deck of the Raghadan Bus Terminal, which may be a hub of the pedestrian tourist flow.

Although the study area of the Tourist Street and trails has been changed from the JICA Master Plan Study and the SAPROF Study, the location of the sub-project fits well within Downtown Amman.

Each study area of the work-component in this sub-project has been clarified and confirmed with the technical committee of GAM, except the Citadel trail for which special coordination from the Department of Antiquities was also extended.

The location of the components included in this sub-project is shown in Figure 1.1.

1.5. Scope of Works

The main objectives of the sub-project aim to create and foster a new tourist attraction in Downtown Amman that will give an opportunity for the tourists to walk between/along the tourist spots such as the Roman Theatre, the new Raghadan Bus Terminal, the Citadel, Downtown Amman and the new National Museum, providing view terraces for the panoramic view along the tourist trails to the Roman Theatre and Downtown, and improvement of streets and stairs.

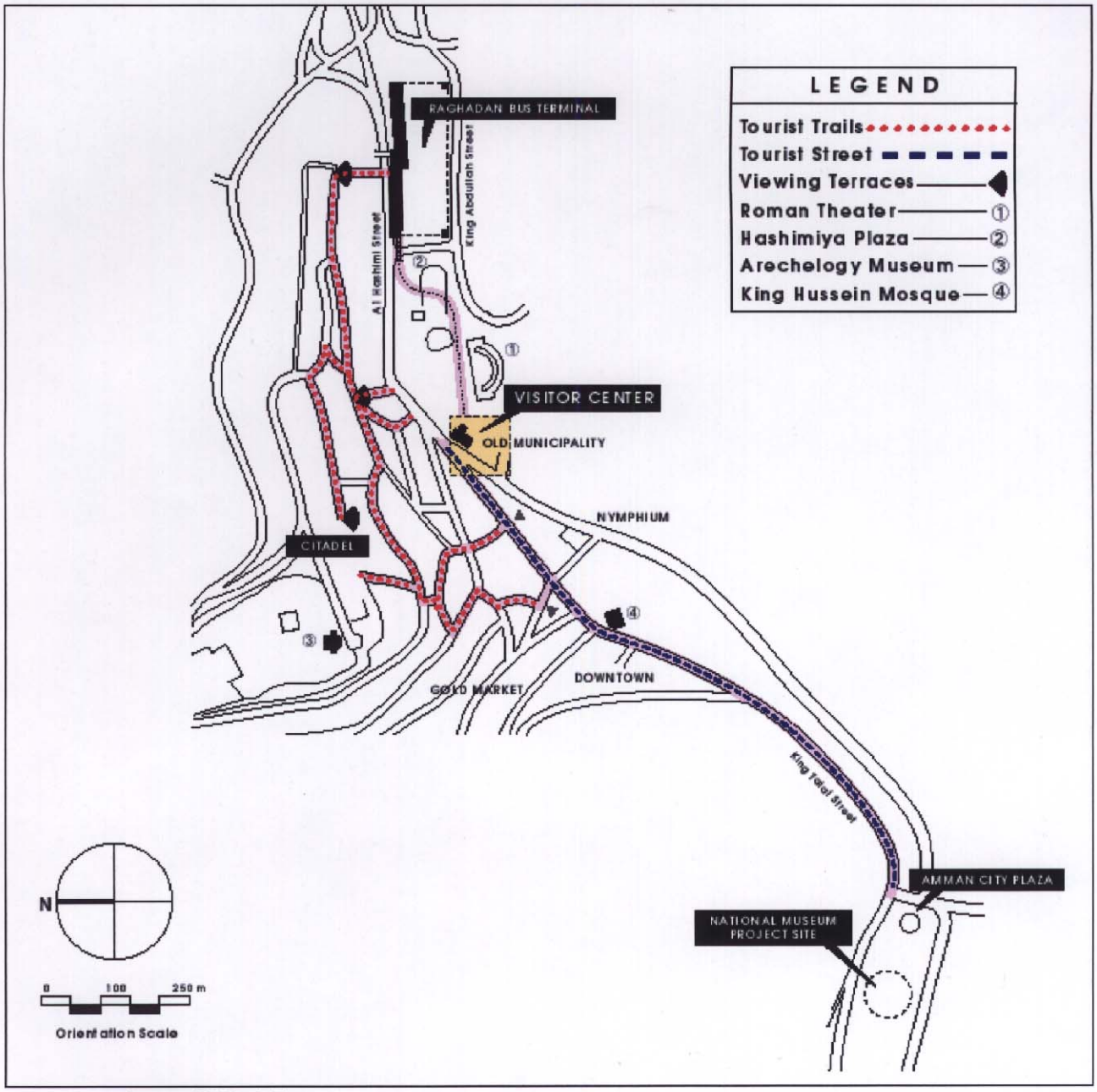
The objectives of this sub-project are summarised as below:

1) To develop tourism circulation in the Amman Downtown Tourist Zone.
2) To enforce pedestrian linkage among the tourism assets in the zone.
3) To improve tourism services along the tourism circulation as a model project.
4) To serve for:
    - providing convenience to the tourists and make them stay longer in Amman; and
    - encouraging the existing and new commercial activities in the zone.

The major components included in this sub-project are as follows:

1) Improvement of Tourist Street (King Talal Street)
2) Development of Tourist Trails and 3 View Terraces
3) Renovation of Visitor Centre

Figure 1.1 Location Map of Amman Downtown Tourist Zone



Source: JICA Study Team

1.6. Responsible Agencies

The following are the relevant agencies responsible for coordination of the Amman Downtown Tourist Zone development:

1) Responsible Agencies

   - Greater Amman Municipality (GAM) for Tourist Street, Tourist Trails and View Terraces
   - Ministry of Tourism and Antiquities (MOTA) for Visitor Centre

2) Specific Agencies relevant to the Work-components

   Department of Antiquities of MOTA for Tourist Trails relevant to archaeological sites at the Citadel

Chapter 2 Tourist Trails and Tourist Street

The major roads are located on either ridges or bottoms of the valley in Amman City, and narrow pedestrian paths stretch from these roads up and down the hills due to the unique terrain features of Amman.

As for the Downtown area of Amman, the major roads, King Talal Street and Al -Hashemi Street, form an axis in the bottom of the valley surrounded by hills (Jalal). On one of those hills the Citadel, the site of the earliest fortifications which is now subject to numerous excavations of Roman, Byzantine and Early Islamic remains, is situated parallel to this main axis. Tourist trails and view terraces are strategically situated on the southern slope of this Citadel hill (Al Qalaa) connecting with and overlooking the downtown and the Roman Theatre, the most impressive legacy of Roman Philadelphia which was built in 170 AD, cut into the slope of the other side of the hill, Jabal Al Jawfa, across Al -Hashemi Street.

2.1. Existing Conditions for Tourist Trails

The proposed Tourist Trails have been selected from those pedestrian streets and paths in order to improve the walking environment as well as to enforce linkage of tourist assets to enhance the activities within Downtown Amman.

The JICA Study Team has extensively and comprehensively studied the existing conditions of pedestrian precincts in Downtown Amman, to clarify design opportunities and constraints by field investigations. The subject locations and scope of works for the study were confirmed based on the reports prepared by the JICA M/P Study in 1996 and the SAPROF Study in 1997.

The major obstacle for the field investigations was that there was no proper map established showing accurate topographies and coordinates of the downtown area.

2.1.1. Location

The proposed Tourist Trails were selected by the JICA M/P Study / SAPROF Study from the streets and pedestrian paths on the south facing slopes: connecting the major tourist spots in Amman, the Citadel and the Roman Theatre, namely East access and Lookout access; connecting the Citadel from the tourist deck of the Raghadan Bus Terminal, namely Raghadan access; and also connecting the Citadel from Downtown Amman, namely West access.

Because these accesses are branching from the major East-West spine of Downtown Amman, the King Talal Street (Al -Hashemi Street), the entry and exit points of these accesses are easily found by tourists, which may enhance the vitalisation of the tourist activities on foot in the Downtown Amman.

Location of the Tourist Trails is shown in Figure 1.1 in this sub-project.

2.1.2. Site conditions

(1) Characteristics of the trails and view terraces

As most trails are on slopes with steep and numerous steps in the north - south directions, tourists/pedestrians only traverse along the contours with a complement of magnificent views to the Roman Theatre and the Downtown area when they are able to walk the east-west direction.

Along the trails, there are many small alleys, open spaces and steps intersecting with the trails where some tourist attractions can be created.

Three view terraces are proposed along the Trails where tourists/pedestrians are able to rest

with the open views along the way to the Citadel or Downtown.

(2) Safety Measures

There are no traffic signals nor pedestrian crossings along the Trails. Safety measures such as handrails are not installed along the steep steps and the edge of slopes.

(3) Width of the pedestrian path

The pedestrian way is normally defined or raised from the road, and the sections of steps are only available to pedestrians. The width of those steps varies from 1.5m to 10m, and most steps are steep and straight.

(4) Pavement materials and conditions

The pavement material of the steps is concrete, however, depending upon the section of the trail, pavement material is asphalt or bare soil with debris. Some concrete pavements are badly re-paved after the repair of sub-surface utilities or left damaged, but it is basically walkable all along the Trails.

2.1.3. Physical Condition Surveys

The following physical condition surveys were conducted by the sub-contracted local consultants, together with various reconnaissance surveys by the Study Team.

(1) Topographic Survey

Topographic Surveys were conducted in the following manners:

1) Tourist trails

Plane table survey for the trails of 2.0km length to provide base plans with a scale of 1/200 for the design.

2) View Terraces

Plane table survey for 3 view terraces with an optical micrometer system to provide base plans with a scale of 1/200.

As a result of the topographic surveys, the survey areas were found to be very steep along the tourist trails and view terraces. The average grade of the subject trails is approximately 30%, thus most areas are stairways which exclude entry of vehicles, bicycles as well as wheelchairs.

(2) Soil Investigations

Soil Investigations were not conducted, since this component has no heavy structure to be constructed. However, in the areas for constructing retaining walls and small structures to be built in the view terraces, geological inspection was taken for confirmation of the amount of excavation and the size of foundation structures (footings). As a result of geological inspection, for all the areas concerned it was confirmed that boring is not necessary due to shallow talus and some outcrops are observed on site, but excavation confirmation is necessary prior to building works.

2.1.4. Major issues of Tourist Trails

The existing trails are constrained by the following issues:

- Lack of amenities and comfort to attract pedestrian tourists
- No seating or sheltered place at view terraces or along the trails
- Monotonous pedestrian walks with straight lines of concrete and stone facades
- Modern intrusion onto historical façades
- Lack of safety measures
- No clear demarcation of ways for vehicles and tourists/pedestrians
- No indication for the direction nor guidance to important tourist spots

2.2. Existing Conditions of Tourist Street

2.2.1. Location

The Tourist Street is composed of one street but it has two different names in sections, namely King Talal Street on the East and Al-Hashemi Street on the West, which are the major East-West arterial road though the downtown area of Amman.

The subject area of the street is mostly one-way road from the West to the East direction, except the area adjacent to the old municipality building.

The improvement of the Street starts from the Roman Theatre at the Public Open Space adjacent to the old municipality building through the pedestrian walks on both sides of the Street and ends at Fountain Plaza in Amman City Plaza connecting to new National Museum.

Because the Street is connecting two major tourist spots in Downtown Amman, the Roman Theatre and new National Museum of each end, the pedestrian tourists are anticipated to walk through this vital linkage. There are also many interesting shops, restaurants, cafes and gathering places of people such as Mosque and vegetable markets, which may attract tourists along the way.

The total length of the Street concerned is approximately 1,700m.

Location of the Tourist Street is shown in Figure 1.1 in this sub-project.

2.2.2. Site conditions

(1) Characteristics of the Street

The Street is very busy with plenty of pedestrians on both sides as well as heavy vehicle traffic. Many shops, café terraces and restaurants, stand bars, groceries, etc., which serve for the citizens of Amman as well as tourists, are congested side by side and create the typical hustle and bustle atmosphere of the Downtown area.

Along the Street, there are many pedestrian alleys, open plazas and steps intersecting with the Street where some tourist attractions can be created.

(2) Safety Measures

There is only one traffic signal along the Street at the intersection of Al Hussein Street, but no pedestrian signal exists on the Street. Safety measures include handrail (metal fence) along half of the Street to segregate pedestrians from vehicles, however, there are many gaps.

(3) Width of the pedestrian path (sidewalk)

The width of the pedestrian path is approximately 4m, however, because of the heavy volume of pedestrian flow in the Street, walking speeds are restricted and reduced, and many goods and illegal extension from shops are intruding into the sidewalk, which creates momentary stoppages and interruptions of the flow.

(4) Pavement materials and conditions

The pavement material of the sidewalk is coloured cement blocks in different colours and sizes depending upon the section of the Street, and limestone pavement at the mosque plaza. Some stone pavements are replaced by concrete mortar after the repair of sub-surface utilities or left damaged, but it is basically walkable all along the Street.

Curbstones are normally too high for children and ladies wearing traditional clothes primarily to avoid inundation of the sidewalk.

(5) Signage

Street signs are rarely available for overseas tourists, because most signs are limited to traffic signs in Arabic.

Storefront advertisement and signs are disordered in height, shape, colour, size and location.

2.2.3. Physical Conditions Survey

The following physical condition surveys were conducted by the sub-contracted local consultants, together with various reconnaissance surveys by the Study Team.

(1) Topographic Survey

Topographic surveys were conducted in the following manner:

1) Tourist Street

Plane table survey along 1.7km including two plazas to provide plans with a scale of 1/200.

As a result of the topographic surveys, the Tourist Street was found to be gently sloping from the West to the East direction. The alignment of the street is rather straight from the old municipality building on the North-East to Al-Husseini Mosque, then it turns into a southerly direction. This sudden change in the alignment resulted from the layout of Al-Husseini Mosque which is directed towards Mecca in the north direction.

The alignment of the street from Al-Husseini Mosque to the Amman City Plaza is nicely curving clockwise, which creates a change of views onto the façade of buildings. In particular the beautiful shape of the minarets of Al-Husseini Mosque will be the major focal point for pedestrian tourists walking from new National Museum towards the Roman Theatre by the effect of this alignment.

The built-up areas on both sides of the street are at different levels. The built-up area on the north side of the street is higher than the south side of the street, in other words, the Tourist Street is built and traversing on the contour of the south facing slope.

(2) Soil Investigations

Soil investigations were not conducted since this component has no heavy structure to be built.

2.2.4. Major issues of Tourist Street

- Lack of sophisticated shops and amenities to attract pedestrian tourists.
- Modern intrusion onto historical façade, and lack of conformity in the streetscape.
- Rainwater drainage problems due to inappropriate drainage maintenance and systems applied.
- Damaged or missing pavements especially at the entry of shops and markets
- Lack of safety measures
- Disordered car parking problems obstruct the pedestrian way, due to unavailability of parking space in appropriate spots.
- Uncomfortable to walk along the Street due to heavy vehicle traffic along the road, which creates noise and air pollution, and makes it difficult to cross the road.
- No pedestrian signals at the key intersections.
- Difficult for foreign visitors to find public toilets.
- No vegetation along the Street creates a dry urban atmosphere.
- Streetlights are not uniform.
- Uncontrolled signage and shop front design

2.3. Review of Scope of Work for Tourist Trails

Based on a series of discussions with the Technical Committee representing Greater Amman Municipality and PMU, MOTA, as well as various site investigations, review of the sub-project in the SAPROF Study was made as shown below:

2.3.1. Comparison of scope

Table 2.1 shows comparison with the major items of the scope of works between the SAPROF Study and the Final Results of the detailed design study of JICA.

Table 2.1 Comparison of Scope between SAPROF and JICA D/D Study

SAPROF Study	JICA D/D Study
Improvement of the 5 existing pedestrian trails connecting the citadel and the downtown including: Raghadan access East access Lookout access West access North access	Improvement of the existing stairways and streets connecting the citadel, the Raghadan Bus Terminal and the down town including: Al Hashmi Stairway - 9 (Raghadan Access - Lower part) Qalaa Street (Raghadan Access - Upper part) Farwah Al Jothami Stairway (East Access - The East of Lower part) Salama Bin Al Akwa' Stairway (East Access - Upper part) Al Hashmi Stairway - 3 (East Access - the West of Lower part) Hashmi Stairway - 1 (Lookout Access - Lower part) Mathar Raslan Stairway (Lookout Access - Middle part) Al Qalaa Stairway (West Access) Qalaa Trail (along the Citadel ancient wall) Salama Bin Akwa' Street (New addition)
1) For all five accesses - providing tourist signs at appropriate intervals - providing direction signs for vehicles at major junctions	1) For all streets and stairs - providing tourist signs at appropriate locations -- improvement of stairways and pavement - improvement of rainwater drainage - street furniture and planting where applicable - safety measures where needed - introduction of wooden pergolas
2) For "lookout access" and East access - improving physical structure of the trails including stairways, pavement, water supply piping, drainage, lighting, street furniture landscaping.	
3) 3 view terraces with interpretation of the panorama view	2) 3 view terraces with interpretation of the panorama view - building of arch and terrace for seating
4) 2 pedestrian overpass bridges crossing Al -Hashemi Street	3) An overpass bridge at Raghadan bus terminal across Al - Hashemi Street (this work-component is shifted to the Raghadan bus terminal work-component) and another overpass bridge at the Old Municipality Building was cancelled
5) As the enhancement measure, guidelines for the suitable façade and activities will be established	4) Improvement of particular façades and introduction of landscape solutions

Source: JICA Study Team

2.3.2. Major Changes from SAPROF Study

As shown in the above table, the major changes in the scope of the sub-project are as follows:

(1) Subject streets for tourist trails

The subject streets and stairways for tourist trails were confirmed based on the JICA M/P Report and SAPROF Report with the Technical Committee members representing GAM and MOTA.

As a result of field investigations and confirmation on site with the relevant authorities concerned, the North Access was found irrelevant to include within the subject streets due to

the duplication of a project executed by a Spanish Team, in conjunction with the restoration works of Omayyad Palace, which was built around 720AD during the rule of the Omayyad Arabs.

On the other hand, Salama Bin Akwa' Street was included for the subject streets for the substitution of the North Access, due to the important location of this street to connect all accesses in between the lower part and upper part of the slope.

The exact location and scope of establishing model tourist trails were confirmed on site with the technical committee of GAM, and the emphasis on the design was made and requested in particular with the pedestrian precinct in order to maximise the effectiveness of tourism by walking tourists.

(2) Location of View Terraces

There was only one view terrace specified by the Citadel in the JICA M/P Report, however the number of view terraces was increased to three in the SAPROF Report which does not indicate any particular locations of those three view terraces.

Consequently, the Study Team has confirmed three strategically important places for view panoramas with the coordination and discussion made with the technical committee.

(3) Exclusion of overpass bridges

Originally, two overpass bridges across Al -Hashemi Street, one at the Raghadan bus terminal and another near the old municipality building, were part of the Tourist Trails work-component. However, the nature of the design and construction of the overpass bridge across Al -Hashemi Street at the proposed Raghadan Bus Terminal is closely related to the deck structure of the Bus Terminal, the scope of the bridge was shifted into the work-component of the Raghadan Bus Terminal from the Tourist trails.

Another overpass bridge across Al -Hashemi Street near the old municipality building was cancelled due to the change of the subject street for the Tourist Street from the JICA Master Plan Study to the SAPROF Study, and an improvement of the public open space adjacent to the old municipality building was requested for this substitution by the Technical Committee.

(4) Improvement of Façade

Although the enhancement measures along the tourist trails were not included in the scope of the Study, the Jordanian side strongly requested the Study Team to introduce a model enhancement measure along the Tourist Trails, as shown in the SAPROF Report.

Originally, improvement of façades was made only as a form of guidelines in the scope. As a result of the study and discussions with the Technical Committee, however, it has found that prominent façades need to be improved in order to enhance the project. Therefore, recommendations of facades were established, provided that the subject façades are limited only to public buildings and structures.

2.3.3. Work Items

The following are the work items included in this Component according to the study results of the existing conditions and the review of the SAPROF Study as well as discussions with the responsible agency(ies).

(1) Tourist Trails

1) Improvement of stairways and streets of 2.5 km length in total with 2.0~3.0 m wide

- Pavement with stone tiles
- Retaining walls
- Planting

2) Installation of street furniture and equipment

- Wooden pergola
- Stone benches
- Plastering and painting on the some walls, platforms, etc.
- Stone elevation
- Signs

(2) View Terraces

New construction of view terraces in 3 places with 550 m2 in total.

- Construction of terrace with the provision of retaining wall, hand rail and shelter
- Pavement
- Signage
- Planting
- Watering devices for plants

2.4. Review of Scope of Works for Tourist Street

Based on a series of discussions with the Technical Committee representing Greater Amman Municipality and PMU, MOTA, as well as various site investigations, review of the sub-project in the SAPROF Study was made as shown below:

Improvement and beautification of the pedestrian walk on both sides (approximately 3.0~4.0 m wide on one side) of King Talal Street for 1.7km and improvement of Al-Husseini Mosque Plaza of 2,800sqm.

The improvement is to formulate a Tourist Street from Amman City Plaza to the junction in front of the old municipality building, which extends to the Raghadan Bus Terminal with the existing pedestrian path in front of Roman Theatre and in Hashimya Plaza.

This includes the improvement of the pavement, kerb stone, planting, signage, etc.

2.4.1. Comparison of scope

Table 2.2 shows a comparison between the SAPROF Study and the Final Results of the detailed design study of JICA.

Table 2.2 Comparison of Scope between SAPROF and JICA D/D Study

SAPROF Study	JICA D/D Study
1) Improvement of Al -Hashemi and King Talal Streets including sidewalks and vehicle lanes - Improving physical structure of the street pavement, drainage, underground electric wiring, lighting and landscaping - Providing attractive street furniture (benches, bus stops, rubbish bins, flower pots) signs and art works	1) Improving of pedestrian paths on both sides of Al - Hashemi and King Talal Streets - Stone pavement for pedestrian paths of Al - Hashemi and King Talal Streets between the Old Municipality Building and Amman City Plaza. - Street furniture including benches, signs and safety measures, planting where it is applicable - improvement of rainwater drainage - improvement of Al-Husseini Mosque plaza (2,750 m^2)
2) Encouragement measures - Establishing guidelines for suitable building façade and activities - Establishing incentives and guidance for the establishment of high standard souvenir shops, restaurants, stylish hotels	2) Enhancement measures - Particular building facades, which are at strategically important locations along the tourist street, are improved as a model for enhancement measures.

Source: JICA Study Team

2.4.2. Major changes from SAPROF Study

As shown in the above table, the major changes in the scope of the sub-project are as follows:

(1) Subject street

The subject street originally confirmed with the Jordanian side during the JICA M/P Study was a sub-road situated by the Old Municipality Building branching out from Al -Hashemi Street, total length of 400m with a width of 8m. However, because of the change in the site location for the National Museum from the Old Municipality Building site to the new site location of the National Museum in Amman City Plaza, which was determined after the JICA M/P Study, the Jordanian side requested this change be considered during the SAPROF Study. Consequently, the concerned street of 400m became no longer strategical in enhancing pedestrian tourists walking in the downtown. As a result, the Jordanian side requested to consider a connection road in between the old municipality building by the Roman Theatre and the new National Museum site to be the subject street of the Tourist Street.

The Study Team confirmed and studied this new subject street, King Talal and Al -Hashemi Streets, with the technical committee of GAM on site, and found the subject street is relevant for enhancing tourism in the downtown area of Amman.

(2) Subject area on the Street

Originally, the subject area on the Street was the whole street included with the roadway. However, the Technical Committee has addressed the importance of improvement in the existing pedestrian paths (sidewalks) on both sides of the Street in order to encourage tourists to walk and experience Downtown Amman, and the improvement of the roadway is not considered under this project due to the limited budget allocation in order to minimize the investment cost.

Therefore, the scope was limited to the pedestrian paths on both sides of the Street, provided that the necessary improvement of part of the roadway should be included in conjunction with the improvement of the stone pavement of the pedestrian paths.

(3) Improvement of public open spaces

Originally, the improvement and location of public open spaces was not specified in particular. As a result of the study and discussions with the Technical Committee, however, it was found that prominent public open spaces along the Tourist Street need to be improved in order to enhance this sub-project. Therefore, the improvement of public open spaces was determined to be added to the scope by the technical committee.

In this regard, the improvement of the public open spaces at Al-Husseini Mosque and the public plaza beside the Old Municipality Building were requested by the technical committee.

The public plaza besides the old municipality building is, however, included with the work-component of the visitor centre, due to their strong relationship and their strategic locations.

(4) Enhancement measures

Although the enhancement measures along the Tourist Street were not included in the scope of the Study, the Jordanian side strongly requested the Study Team to introduce a model enhancement measure along the Tourist Street in order for GAM to develop in the future. As a result of the study and discussions and investigations with the Technical Committee on site, a particular building façade, which situated in a strategic location along the Tourist Street, is to be improved in order to enhance the effectiveness of the sub-project.

2.4.3. Work Items

The following are the work items included in this Component according to the study results on the existing conditions and the review of SAPROF Study as well as discussions with the responsible agencies concerned:

(1) Improvement of sidewalks along Al -Hashemi Street and King Talal Street as Tourist Streets (1.7 km long in total with 3.0-4.0m width on both sides, approximately 13,600m^2), in order to improve and provide;

- Pavement with concrete tiles
- Erection of stone elevation
- Signage
- Street lighting

- Balustrades
- Planting

(2) Open plazas of Al-Husseini Mosque plaza (2,800 m^2)

- Pavement
- Street furniture and planting
- Outdoor lighting
- Planting
- Watering devices for plants

2.5. Design Premises

The following standards and criteria were adopted for designing the work-components.

2.5.1. Design Standard

For the design of the work-components in this sub-project, priority was given to Jordanian codes and standards and also to general and specific requirements identified by local authorities concerned.

When those are not sufficient for the design, however, international codes and standards were also applied. The following codes and regulations were adopted for the planning and design.

(1) Retaining wall and structural design

For the reinforced concrete structure and retaining wall, priority is given to Jordan's codes and standards and also to general and specific requirements identified by local authorities concerned. When those are not sufficient for the structural design, international codes and standards can also be applied. The following codes and regulations are adopted in the structural design of Amman Downtown Tourist Zone.

- British Standard for the structural use of concrete (BS 8110) is employed for reinforced concrete structural analysis and design.
- British Standard for the Structural use of Steelwork in Building (BS 449 and BS 5950) is employed for structural steel analysis and design.
- Jordan Code for Loads and Forces is employed for the definition of Dead, Live, Wind, and Seismic Loading.
- The British Standard for Foundations (BS 8004) is employed for the design of Foundations and Substructures.
- The British Standard Specification for bending dimensions and scheduling of reinforcement for concrete (BS4466) is employed for reinforcement details.

(2) Pavement Design

The following standards are applied for designing the pavement of the Tourist Street and trails:

- ASTM for materials and quality of works
- BS for concrete and stone pavement works
- AASHTO for grade and alignment of street

(3) Mechanical

The design of the mechanical works is in accordance with the following standards, codes, and regulations where applicable:

- General and specific requirements of the local water and drainage authority (Amman Water Authority), local public health officer, and the regulations of the Civil Defence Department.

(4) Electrical

The design of the electrical works is in accordance with the following standards:

- National Electrical Code (NEC).
- International Electrical and Electronics Engineers Association Regulations (IEEE).
- The requirements of Civil Defence Department.
- The Jordan telecommunication corporation requirements.
- Any other standards, regulations and/or code of practice and norms issued by institutes and or authorities of other countries such as Japan and Europe, provided they are found applicable and acceptable to perform the job.

2.5.2. Design Aspects

For achieving convenience of people an important aspect is the relative ease of moving from one destination to another without confusion or obstructions. Density and grade of pavement for tourists/pedestrians in the tourist street and tourist trails plays an important role to maintain the convenience of people.

In order to achieve comfort and convenience of tourists/pedestrians, while maintaining the variation of spatial sequential experiences of tourists, the following functions and aspects were carefully studied to integrate the result into the Design:

(1) Spatial Design Aspect

Spatial modulation of the tourist street and trails was considered both horizontally and vertically, thus, the following dimensions have been studied in conjunction with the purpose of the trail and the existing or expected intensity of use:

1) Width and constructing gauge

A function of expected pedestrian volume, acceptable density, desirable rate of movement, and requirement of physical obstructions (i.e. platform of residences or shops, rubbish bins, light fixtures, benches, etc.) were studied in conjunction with the width and construction gauge (height) of the streets, stairs and trails.

2) Longitudinal gradient

User abilities, design objectives, safety, and aesthetic context of views were studied in conjunction with the longitudinal gradient of the streets, stairs and trails.

(2) Pavement Design Aspect

Several factors influence the selection of pavement material. However, the most dominant factor is that the Tourist Street and trails are not newly constructed, but the existing streets or pedestrian paths are improved and maintained by GAM. In this regard, the following design aspects were studied:

1) Aesthetic harmonisation

Pavement pattern, colour, and visual texture of the existing pavement and stairs were studied in relation with the function and visual aspects of the surrounding buildings along the streets, stairs and trails.

2) Durability

Temperature, precipitation, and quality of skilled labour, intensity and volume of traffic, availability of materials were studied in particular with the maintenance ability of GAM for the pavement condition.

3) Safety

Weather conditions, required traction ratings, surface texture and slopes were carefully studied in view of pedestrian tourists.

4) Costs

Long-term and short-term basis, installation cost, repairability, maintenance and cleaning aspects were studied in order to adopt and apply an optimum solution in the Design.

(3) Visual Aspect

Hierarchical ordering of the public spaces and view terraces within the context of human activities and the direction of views are reflected into the Design. The following considerations were taken for the Design:

1) Eye level

Standing and seating position, adults and children, direction of focal point, signage location were studied at the respective location of public spaces and view terraces to maximise location specific advantages.

2) Cone of vision

Framed view, vertical and horizontal degrees, signage location were studied in order to achieve better visual effects by the design application in the view terraces.

3) Perception

Vertical and horizontal enclosure of a space, settings of outdoor furniture and plantings, scale and form of a space, flow of tourists/pedestrians were studied in conjunction with the sequential experience of tourists/pedestrians along the streets, stairs and trails.

2.5.3. Planning and Design Criteria

Although the improvement and development of the Tourist Street and trails are applied basically onto the existing premises, the following planning and design criteria were, once again, considered and confirmed.

(1) Pavement

1) Type of Pavement

Three types of pavement materials are applied, namely stone, concrete tiles and gravel. The following table shows the type of pavement material in conjunction with the areas applied.

Type of Pavement	Areas to be applied
Stone pavement - Limestone - Basalt	 Areas where only pedestrians are expected Areas for pedestrians crossing the road
Concrete tiles	Sidewalks along the road
Gravel pavement	Areas located adjacent to the archaeological site

2) Basic Structure

The basic structure of the pavement consists of the following strata:

Stone pavement	Basalt, or Limestone
- Lime stone	Mortar
- Basalt	Gravel (Compacted)
	Ground
Concrete tiles	Concrete tiles
	Mortar
	Gravel (Compacted)
	Ground
Gravel pavement	Gravel
	Gravel (Compacted
	Ground

3) Strength of Pavement

Careful consideration should be given to pedestrian crossing that will also serve as passages for vehicles. Such pedestrian crossing should be designed to accommodate wheel loads of up to 2,500 kg in the tourist trails and up to 4,000 kg in the Tourist Street.

4) Width of Pavement

The walking speed of tourists is assumed, slower than that of local people, around 100 – 130 steps/minutes in flat areas and around 40 – 60 steps/minutes in steep areas and stairs. Therefore, the computation in width of the pedestrian pavement should have a wider allowance to create comfortable space for walking.

Based on this premise, the occupancy width of a person is 0.80m including 0.60m for net width of human figure and 0.10m for an allowance of the movement on both sides. If two tourists are passing each other, a minimum of 1.50m is required.

5) Longitudinal Gradient

If the maximum longitudinal gradient of the pedestrian pavement is more than 18%, steps should be adopted for safety. Thus, if the existing longitudinal gradient of the subject trails is more than 18%, the trail should be re-graded to less than 18% or steps should be adopted.

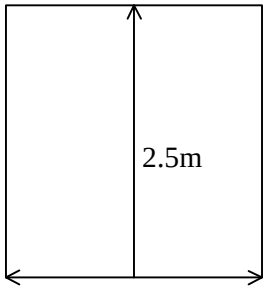
The longitudinal gradient should be smooth to avoid sudden changes and be consistent with the topography as much as possible for safety and economical aspects.

6) Horizontal Gradient

The horizontal gradient of the pedestrian pavement should be 1.5 – 2.5% in order to discharge surface water. The direction of the slope where the pedestrian path is situated on the side of the road should be towards the centre of the road. The direction of the slope in the pedestrian-only trail should be toward the centre of the trail to avoid gully erosion of the building structures along the trail.

7) Construction Gauge

In general, the minimum height of building free area should be 2.5m for bicycle riders and to avoid a sense of oppression. However, to create an exotic atmosphere, enclosed and opened feeling should be created by the spatial changes along the trail.



Width of walking path

(2) Steps and Stairs

1) Longitudinal gradient

Maximum slope of the stairs should be limited to 60% for safety. If the existing gradient of stairs is more than 60%, the stairs should be re-graded to less than 60%. If the length of steep steps becomes more than 3m, landing area should be established.

2) Size of steps

Minimum width for stairways should be 1.5m.

The height of the riser should be designed more than 10cm in order for pedestrians to easily identify the existence of the step, but maximum height should be less than 16cm in order for children to walk safely. The width of the tread should be designed from more than 26cm to 40cm. For ease of ascent or decent, and for safety reasons, tread of riser ratios are always held constant within set of stairways.

3) Detail

Nosing of the step is easily chipped off, so that the edge should be rounded. The surface of the steps should be graded towards the front of the step in order to discharge surface water.

(3) Seating

1) Size of seating

The height of the seating should be designed as 35 – 40cm for both adult and child users. The width of the seat should be designed between 38 – 43cm. The length of the seating should be more than 1.20m for 2 persons. The leaning angle of the backboard should be designed between 100 - 110°, if applicable.

(4) Structure

Load

1) Dead Loads

- Weight of reinforced concrete = 24.0kN/m^3
- Weight of water = 10.0k/Nm^3
- Weight of Heavy Partition in plan = 2.5kN/m^2

2) Live Loads

- Roof = 3.0 kN/m^2

- Others = 3.0kN/m^2

3) Earthquake Loads

- Zone B according to the Jordan Loads and Forces Code.

Materials and strengths

1) Concrete

- 25Mpa for reinforced concrete members
- 20Mpa for Plain concrete
- 15Mpa for Concrete blinding

2) Reinforcement

- All reinforcing bars of a diameter larger than 8 millimetres shall be deformed high strength steel bars of Characteristic Strength equal to:

  fy=420Mpa

- Bars of 6 and 8 millimetres diameter shall be mild steel of Characteristic Strength equal to:

  fy=280Mpa

3) Aggregates

- Maximum aggregate size is 20mm for all concrete.

4) Concrete Cover

Clear concrete cover for reinforcement shall be:

- 50mm for concrete surfaces in contact with ground
- 25mm for interior concrete surfaces above grade.
- 30mm for exposed fair faced concrete surfaces.

(5) Mechanical

Water supply should be taken from the nearest city network point with the combination of raised reservoir water tank. All work items should install separate water meter.

(6) Electrical

Criteria for illumination level of street lighting is listed below:

1) Street and asphalt-coated trails (Illumination level 30-100lx)

- Minimum distance between lighting poles: 25 meters.

2) Paved Stairs and View Terraces (Illumination level 50-150lx)

- Number of lighting fixture: 1 pole/ 20 m^2

3) The stone paved areas (Illumination level 30-100lx)

- Distance between lighting fixture: 10-20m

2.5.4. Remarks to be taken in Design

(1) Tourist Trails and View Terrace by the Citadel ancient wall

For design of the trails and view terraces beside the Citadel ancient wall, a particular

consideration should be taken in conjunction with the consolidation works being executed by DOA, MOTA.

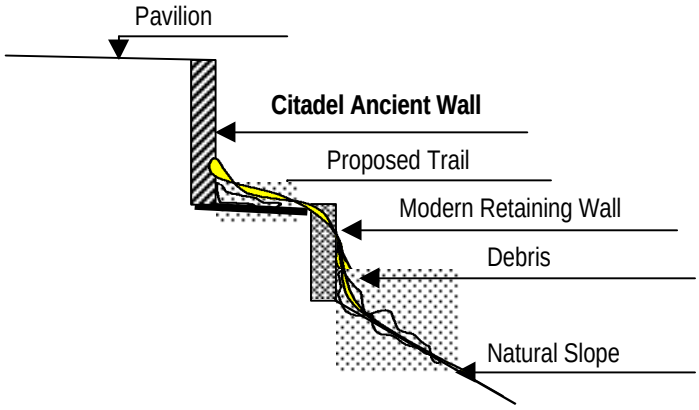
According to DOA, the consolidation works have already started from the east side corner since 19th June 1999, and approximately 200m of restoration on the Citadel Wall will be completed by the end of June 2000.

The consolidation works done by DOA include excavation and sounding for the investigation of any artefacts and archaeological interests remaining under the debris, removing of debris and the consolidation of existing deteriorated Citadel ancient wall. The following special remarks to be taken for designing the trails and view terraces on this location:

- Design of the Trail can be integrated with the characteristics of the buttress wall of the Citadel in order to enhance the original features and character of the wall.
- Design of the benches along the proposed Trail should use a similar stone to the Ancient Wall.
- Pavement of the trails and view terraces should be as natural as possible so as not to intrude or stand out from the ruins of the wall.

The existing and proposed situation of the Citadel ancient wall is shown below:

Figure 2.1 Section of Tourist Trail along the Citadel Wall



Source: JICA Study Team

2.6. Detailed Design

Attractions for tourists/pedestrians are defined into two major aspects, namely natural and cultural aspects. Although natural attractions are created by the introduction of planting materials and open spaces onto the existing landscape, cultural attractions including the attraction of human activities are already existing, but further enhancement by physical design is necessary. In order to achieve the objectives of the sub-project, social interaction, both passive and active, is extremely important and the cultural attractions are the primary determinant regarding enjoyment of a place by tourists. Therefore, aesthetic aspects of tourist/pedestrian circulation enhance, in particular, the sensory and intellectual experiences enjoyed by tourists when moving through various locations in the Downtown Amman.

In this regard, the design integrated the many cultural factors that contribute to the enjoyment of outdoor spaces, provide a richness of experience and a depth of meaning to all whom potentially may enjoy participation in the tourist street, tourist trails, view terraces and public spaces.

2.6.1. Planning and Design Policy for Tourist Trails

All the tourist trails eventually lead the way up to the Citadel from King Talal and Al - Hashemi Streets, part of the subject tourist street. In spite of the currently existing dry character, the design aims to realise the different potential identity of each trail.

A major design effort is tackling the beginning of each trail, to declare its importance and establish an attractive visual link with the city's streets and trails. A certain theme for each stair is envisaged by integrating the pavement, lighting and special landscape features (planters, pergolas, seating, etc.) in harmony as a whole.

The design of the view terraces is dealt with in a way to enhance each location's unique character such as the top of a stair, the meeting of two stairs and beside the ancient Citadel wall. Each view terrace is treated as an integral part of its surroundings.

The careful analysis of the present form of the Tourist Trails and their own characteristics opens the way to create unique design solutions.

The following are the planning policies for each trail and view terrace:

(1) Upper part of the East Access (Salama Bin Al Akwa' Stairway)

The stair at the higher part of the east access is already interesting with its changing geometry and the interception of the shade of the "berry tree".

The enhancement and beautification of the beginning of this trail was found to be very important. Special treatment of the corner building, namely by adding a wooden canopy to the upper windows, to make a new visual point of interest, and to install a "Sabeel" -public drinking fountain- at the foot of the stair which will be of interest and benefit to tourists and locals alike, are introduced.

(2) Lower part of the East Access (Farwah Al Jothami Stairway)

The stair at the lower part of the east access looks somewhat dry, though in good shape. Here, in order to enrich the experience of the urban space as a whole, the design suggests adding a small coffee shop; a terrace covered by a wooden pergola, allowing more interaction between local citizens and tourists, and giving this trail a strong sense of identity from Al -Hashemi Street.

(3) View Terraces in front of the Roman Theatre (Central View Terrace)

Lower part of the East Access gradually turns to the right untill it meets another trail at a wide landing space, which is facing to the centre of the Roman Theatre. The design proposes to make this platform one of the View Terraces. A Stone Arcade is provided on this important landing spot to highlight and greatly enhance this event.

The roof of this arcade is designed at the same level of the upper street (tourist trails). This will allow tourists to use it as an upper view terrace. A wooden pergola gives shade and some colour to the ambience.

(4) Lower Part of the East Access (Al Hashmi Stairway-3)

It is characterised by the white entry platforms attached to the two façades of the buildings along the stairs. The idea is to add wooden pergolas with hanging green vines (grapes) to each landing. This, in addition to varied pavement patterns, will soften the atmosphere and give the required interest and identity.

(5) Raghadan Access (Al -Hashemi Stairway-9)

Raghadan Access is strategically selected for leading tourists from Raghadan Bus Terminal to the Citadel though a view terrace situated along the way.

At the upper end of this stairs, the design proposes to locate a View Terrace. Since the stairs are very steep and lack enough landings for rest, the design proposes to stretch the length of the stairs to ease the slope by extending the trail to the right side, and make it pass through different level of terraces with coloured plantings and benches, which will offer tourists and locals a pleasant resting space as well as an interesting viewing spot.

2.6.2. Planning and Design Policy for Tourist Street

From the planning point of view, the strategic locations of the major focal and nodal points (features) along King Talal Street such as Al – Husseinni Mosque Plaza and the Old Municipality Plaza are highlighted and enhanced. Also traditional stone buildings with an important architectural value border a certain portion of the street, and these hidden stone façades are enhanced and highlighted by the change of pavement patterns and introduction of street furniture, so that tourists may pause along the way.

The design suggests architectural treatment of some chosen focal points of visual interest along the tourist street, treatment of lighting and patterns of pavement will contribute to the general atmosphere in accentuating the theme of a series of events and discoveries along the way.

There are also several alleys and stairs that connect with King Talal Street. The design solution is to introduce certain treatments of some of those connection points through introduction of landscape features and special tiling patterns on the pavement.

The aim of this component is to establish a strong axis of tourist flows though the middle of Downtown Amman between the Roman Theatre adjacent to the old municipality building and the new National Museum in the Amman City Plaza.

The design aims at maintaining the vitality of the King Talal Street and makes it more attractive and appealing to the pedestrian tourist. The Street is a major link between:

- The National Museum and Circular Court Plaza of Ras Al - Ein zone.
- Al-Husseini Mosque zone
- The Roman Theatre and the Old Municipality Plaza.

By realising and enhancing the urban character of this Tourist Street as a model for urban continuity in Downtown Amman, the tourism sector of Jordan will be developed accordingly.

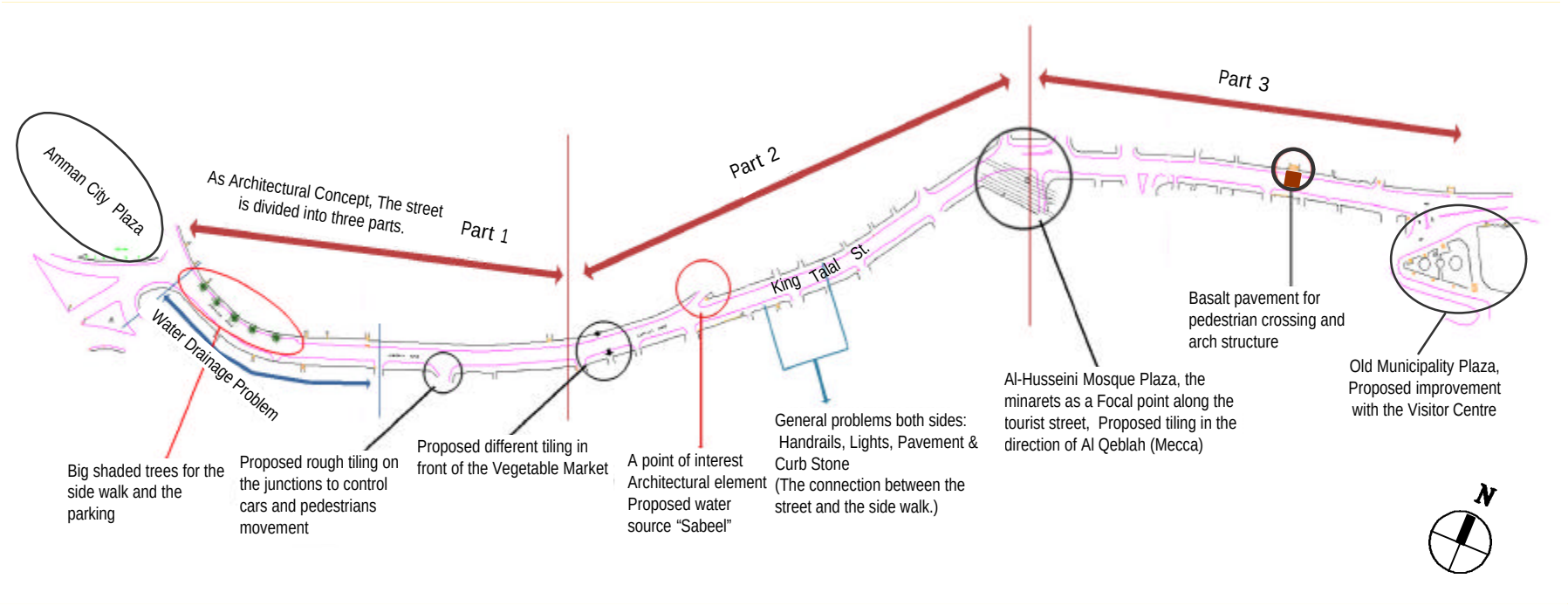
(1) Layout of King Talal Street

Based on the analysis of the form and features of King Talal Street, the Street is composed of three (3) main sectors. The first: starting at the new Municipality Circular Plaza (adjacent to the new National Museum) reaching to the vegetable market zone. The second; continues to the Al-Husseini Mosque Plaza. The third: stretches to reach the Old Municipality Plaza.

These (3) sectors connect a series of architectural and urban events and spaces. The main urban spaces are the Al-Husseini Mosque Plaza and the Old Municipality Plaza. Other features include some stone buildings and entry points to neighbouring specialised markets such as the vegetable market, and public stairs. The basic concept is to design stone archways to enhance the urban atmosphere and interest of King Talal Street.

The layout map of King Talal Street is shown in Figure 2.1.

Figure 2.1 Layout Map of Tourist Street (King Talal Street)



Source : JICA Study Team

(2) Al-Husseini Mosque Plaza

The Al-Husseini Mosque Plaza is a major gathering space for local people in Downtown Amman, which is in addition to it's very important symbolic significance to the citizens of Amman. It constitutes the intersection point of several main streets such as King Talal, Faisal (Al – Saa'da), Basman and -Hashemi Streets. The rich stone façade of the Mosque is unique in Jordan with its pedestrian plaza in the front containing a small attractive structure called "Sabeel" or public drinking fountain (a typical water feature of traditional arab-islamic cities for refreshment and purification).

It is noticed that during special religious occasions, prayer rows of worshipers extend out of the mosque in to the plaza and even along the neighbouring streets. In order to enrich and highlight this experience, the design solution is to pave the front plaza and immediate neighbouring streets with a special pavement pattern of lines that are parallel to the direction of Mecca. This will enhance the diversity of sequential experiences in the Tourist Street, and give more character to this important urban space.

In addition, a big shady tree and a special tiling pattern on the pavement around this little cube (Sabeel) are provided. Also a special pattern is suggested in front of the main gateway to the mosque, in order to add a sense of courtyard space.

Two groups of trees near the corners of the mosque, below the two minarets, will beautify the space and add to the sense of enclosure.

(3) Old Municipality Plaza

The site is a very important connecting zone between King Talal Street and the Roman Theatre area; an important station for tourists on their trip in Downtown Amman. Further details are described in Chapter 3.

(4) Safety Measures

Some parts of the Tourist Street are currently provided with handrails. Although the existing handrails are not visually appealing to the tourist, the handrails are needed in order to avoid any dangerous crossing cut of the road by pedestrians.

Some introduction of planter boxes to substitute the handrails was considered during the conceptual stage. However, because the section of the street is heavily populated by pedestrians, spaces to introduce any planting materials or planter boxes, benches or drinking fountains are not available except in public plazas or extended pedestrian strips.

Depending upon the future traffic volume on this street, widening of the pedestrian strips or excluding vehicles from this street for pedestrians should be seriously discussed and studied in order to secure the healthy flow of pedestrians and to achieve the final goal of the tourist street.

Some street curbs are too high for pedestrians, in particular children and elderly people, and need some adjustment and improvement.

2.7. Design Concept

The spatial requirements differ within the location in various trails and view terraces as a function of usual densities of people, heritage, social and environmental values. However, most areas concerned are surrounded by buildings, walls or slopes, and it is difficult to alter the spatial arrangements based on design criteria shown in Section 2.5.3.

Thus, the differences between the transitional space and nodal space are enhanced within the sequential experience in the pedestrian and tourist movement. In this regard, the modulation

of transitional spaces represented by steps, landing areas and courtyards, and the accentuation with the hierarchical ordering of nodal spaces represented by view terraces along the tourist trails and public open spaces along the Tourist Street have become design principles.

2.7.1. Pavement Design

(1) Visual appearance

Pavement pattern, colour and visual texture are designed in harmony with the surrounding structures by using similar types of materials commonly used for the buildings along the tourist trails (i.e. limestone pavements). While pedestrian crossings on the road use basalt stone pavements which harmonise with asphalt pavement in colour, the surface texture of the pavement is quite rough by using small cubes (10x10x15) in order to visually standout from the road surface so that the drivers can easily identify the difference.

(2) Durability

The durability of the pavement is an important aspect in design. Temperature, precipitation, dryness, intensity and volume of pedestrians, and quality of skilled labour are taken into consideration in the pavement design. In this regard, local limestone is a durable material for the pavement with 30mm thickness of the stone tile.

(3) Costs

In order to achieve low installation and maintenance costs, the availability and reparability of the pavement material are considered. The stone pavement selected is a type of limestone which is readily available in Jordan. As for the tourist street, concrete tiles are selected to cover a large area in order to decrease the material cost.

2.7.2. Signage Design

The functional aspect of a pedestrian network is of prime importance for both tourists and local people on the tourist street and tourist trails. In particular, visual cues determine the degree of orientation and direction to a given destination point from an origin. However, an excessive introduction of direction signs will spoil not only the pristine landscape of Amman, but also the quality of uncertainty and excitement of an exotic area for tourist.

In this regard, the aspects of visual cues are enhanced, by highlighting landmarks, historical building facades and established trees as focal points within a visual sequential experience of tourist.

Four types of signs are designed with two kinds of functions as shown below:

(1) Site interpretation signs

Site interpretation in historic areas is part of the overall management of a certain historic and cultural resource. Site interpretation could address resources of various spatial modules (singular houses, complexes, streets and steps, plazas, whole areas, and neighbourhoods). Interpretation could even address a conservation spatial module as large as a whole historic city core.

Signage provides interpretation boards that would address direction, interpretive remarks, historic contexts and identity of the place (how it was the centre of religious, civic, political, or social life in Amman). Drawings of certain historic resources; in addition, it includes interpretive drawings and text illustrating key features on Panoramic Views.

- The interpretation signs of the wall/floor-mounted type are placed in the view terraces and

plazas.

- The interpretation signs of the wall-mounted type are placed on the existing walls along the tourist trails and street.

(2) Common signs

The notice of accessibility, warnings and common direction signs with sequential manner are facilitated. However, the design of signage should be readily observable by all people and harmonised with the existing landscape without confusion with other graphics.

- The direction and notice of accessibility signs on the pole-mounted with lighting fixture type are placed at the entry location of the tourist trails and stairways as well as the view terraces and plazas, in order to illuminate the sign during the night.
- The direction signs on the pole-mounted type are placed at key intersections along the tourist trails and street.

2.7.3. Outdoor furniture design

Conflict at intersections, confusion at existing or potential gathering spots should be solved with design solutions. In this regard, outdoor furniture, planting, sign/symbol, lighting, etc. are integrated in an overall planning scheme to suggest purposes and expected behaviours to the tourists/pedestrians using the facilities.

(1) Seating

Seating places are provided in the places where panoramic views to the lower part of the downtown area, the Roman Theatre, Hashimiya Plaza, Mosques and Raghadan Bus Terminal are available. Placement of the seating in areas where they obstruct the pedestrians and are exposed to vehicles is avoided for safety reasons. There are basically two types of seating available in the tourist street and trails, one of wood and another of stone.

(2) Pergolas

Pergolas are also provided on the entry platforms along the tourist trails and view terraces to soften the atmosphere of the places where the seating spots are provided with shade, by combining with planting of vines and climbers.

Two types of wooden pergolas are designed, one for wall supported type along the tourist trails and another is the free-standing type for view terraces.

(3) Drinking fountain (Sabeel)

A drinking fountain is provided in the middle part of the East Access for refreshment of passers-by as well as a visual interest for tourists.

2.7.4. Safety Measures

Some of the steps along the Tourist Trails are too steep and have no handrails to protect tourists/pedestrians falling from the trail. These areas are re-graded and handrails are installed.

2.7.5. Structural Design

Structural system of reinforced concrete consists of the followings:

- Foundation : Shallow foundation consists of single and strip cast insitu footings.

- Columns : Cast insitu rectangular columns
- Slabs : Flat slab or one way ribbed slabs
- Beams : Cast insitu reinforced concrete beams
- Basement walls and retaining walls : Cast insitu concrete walls

Special attention has been given to seismic design for the view terraces.

The lateral stability of the buildings and their resistance to seismic force is provided primarily by reinforced concrete walls. The beam/column framing also contributes to seismic force resistance.

2.7.6. Mechanical Design

(1) Piping network

Potable water shall be supplied for horse bib for watering vegetation, public toilets and fountains. Water supply is taken from the nearest city network point and all work items have separate water meter. All pipe work will be galvanised steel. Sewerage lines are also connected with the nearest city sewerage network. The pipe work used for drainage will be UPVC pipes.

2.7.7. Electrical Design

(1) Cable network

Each trail is served by one control panel. Control panel will be connected and mounted an existing electrical poles owned by JEPCO.

(2) Street lighting fixtures

1) Tourist Street and Trails

By using decorative type lighting poles and decorative lanterns.

The street and asphalt-coated trails are served by utilising 5-meter decorative poles of either aluminium or powder coated stove enamelled steel headed by 2 or 3 number oriental lanterns of 70 watt high- pressure sodium lamps and 100 watt tungsten lamps.

The proposed distance between poles is 25 meters. The sections of street and trails are treated separately whether one or more control panel serves each. Feeder cable from the electrical authority and fused cut outs for each pole are provided.

2) Paved Stairs and View Terraces

By lighting poles and oriental decorative lanterns. The view terraces are served by utilising 5m high poles each loaded by 4 no. lanterns as those for asphalt trails. It is proposed 1 pole/ 20 m^2. One control panel is considered for each.

3) The stone paved areas are served by either

- Wall mounted bracket lanterns.
- 3 meter poles with one lantern at the top.
- 1-meter poles.
- Ground lights where found necessary.

The proposed distance between poles and/or lanterns varies between 10-20 meters. Each trail is served by one control panel or more. Feeder cables to the control panels are taken into consideration, and cables and related civil works are considered. Fuse cut out boxes for poles are considered.

2.8. General Drawings

The following general drawings are attached at the end of this Report for reference:

1) Master Plan for Amman Proposed (1:2400)

2.8.1. Design Drawings for Tourist Trails and View Terraces

1) Al Hashmi Stairway – 9 Plan & Detail (VAR)
2) Farwah Al Jothami Stairway Plans (1:100)
3) Central View Terrace Plans (VAR)
4) Central View Terrace Sections, Elevations & Details (1:100)

2.8.2. Design Drawings for Tourist Street

1) General Site Plan – Zone 1 Plan (1:500)
2) General Site Plan – Zone 2 Plan (1:500)
3) General Site Plan – Zone 3 Plan (1:500)
4) General Site Plan – Zone 4 Plan (1:500)
5) Hussieni Mosque Plaza Plan (1:200)

Chapter 3 Visitor Centre

3.1. Existing Conditions

3.1.1. Location

The location of the existing visitor centre (presently called visitor centre) is in the Old Municipality Building situated in the middle of the Downtown Amman, adjacent to the Roman Theatre.

The visitor centre is facing to an open space where local people and tourists alike are sitting and standing for their comfort.

The place is also intersected by the ways to the Roman Theatre and the major market place in the Downtown area.

Location of the Tourist Trails is shown in Figure 1.1 in this sub-project.

3.1.2. Existing Situation

The existing tourist visitor centre is managed by MOTA, which is located in the old municipality building, owned by the Greater Amman Municipality (GAM), adjacent to the Roman Theatre. The building is maintained by GAM, however, operational costs are allocated in MOTA's budget. The work-component is to improve the visitor centre to function as a visitor centre for international tourists.

The existing conditions of the visitor centre are as follows:

(1) Size of Space:

- Width: 3.00 m,
- Length: 15.50 m,
- Total Floor Area: 46.50 m^2

(2) Numbers of visitors:

- 25,000 persons/year in 1998

(3) Number of staff employed

- Staff from MOTA: 2 persons
- Volunteer citizens: 4 persons

(4) Functions

Currently, the visitor centre is providing information and orientation of the major tourist spots in Jordan with simple pamphlets for visitors.

The parking space is not specially allocated for the centre, however, visitors with vehicles are parking on the street nearby for short periods of time.

3.1.3. Major Issues of the existing Visitor Centre

The existing tourist visitor centre was founded on 27th July 1997 at a corridor of the old municipality building in Amman Downtown.

The following are the major issues constraining the activities of the centre:

- Existing floor area is very narrow (3m x 15.5m)
- The centre has no utility facilities such as toilet and kitchen.
- Floor is very dirty caused by natural sand and dust, which is brought in by visitors, and very hard to clean due to finishing material of lime-stone. These conditions are inconvenient for tourists and staff.
- There is no video screen or media computer screen system and culture display facilities to introduce visitors to tourist spots.
  In short, there is a lack of amenities to draw the attention of tourists.
- Although the existing visitor centre is situated in the old municipality building, the entrance and sign of the visitor centre located beside the building and is difficult to notice by the tourists walking on the King Talal Street, which has major pedestrian flow in Downtown Amman.

Therefore, on these conditions, the proposed new visitor centre should be improved to a more attractive centre for tourists.

3.2. Review of Scope of Work

Based on a series of discussions with the Technical Committee representing GAM, PMU and MOTA, as well as various site investigations, review of the sub-project in the SAPROF Study was made as shown below.

3.2.1. Comparison in Scope

Table 3.1 shows a comparison between the SAPROF Study and the Final Results of the detailed design study of JICA.

Table 3.1 Comparison of Scope between SAPROF and JICA D/D Study

SAPROF Study	JICA D/D Study
1) Renovation of the interior of the Visitor Centre	1) Renovation of the interior of the Visitor Centre - provision of tourist promotion equipment in the visitor centre - Improvement of floor finish - Provision of counter desk
	2) Improvement of the Old Municipality Plaza and planting garden (Additional) - improvement of pavement of the plaza - provision of outdoor furniture
	3) Provision of kiosks in the plaza (Additional) - 10 numbers of general kiosks - 1 number of information kiosk

Source: JICA Study Team

3.2.2. Major Changes from SAPROF Study

As shown in the above table, the major changes in the scope of the work-component are as follows:

(1) Improvement of the old municipality plaza garden

The original scope was the renovation of the interior of the existing tourist visitor centre with floor area of 46.5sqm, which is located in the old municipality building and access point to the

Roman Theatre from King Talal Street. However, the location of the visitor centre is not well considered for tourists, therefore the technical committee requested this component to be improved in conjunction with the improvement of the old municipality plaza with 11 numbers of kiosk including one tourist information kiosk at the west corner of the plaza, in order for tourists to easily identify the visitor centre.

The improvement of the old municipality plaza garden was originally requested by the technical committee of GAM for the substitution to the pedestrian overpass bridge which had been cancelled due to the change of the site location of the National Museum and the Tourist Street. As a result of the site investigation and discussion with the relevant authorities concerned, the plaza garden is found to be situated in the prime spot along the tourist street for the enhancement of downtown tourism (the area is approximately 2,500m^2).

Another important aspect is that the plaza garden is situated at an entry part to the Roman Theatre, which is acting as a foyer of the Theatre where many elderly locals are gathering under the shade of trees in the garden, drinking tea and coffee.

Because the location of the plaza garden is at a focal and nodal spot for pedestrians walking from King Talal and Al-Hashemi Streets, the improvement of the existing visitor centre in the old municipality building, where accessibility of tourists is constrained, was determined to be studied in parallel with the plaza garden.

(2) Toilet in the visitor centre

The provision of a toilet in the visitor centre was planned during the preliminary stage based on the request from the staff working in the existing visitor centre. However, because the area is very narrow and limited in space, the suitable location of the toilet is limited to the south end or north end of the space. According to the staff, the south end has a window and open view to the Roman Theatre and pedestrians outside, and it is important for the visitor centre to keep this opening free. On the other hand, the north end has no opening but a wall, and is considered to be the location for the toilet.

As a result of further investigations and discussions with the technical committee of both GAM and MOTA, the Committee determined to exclude the toilet from the scope of works based on the following reasons:

- The existing toilet in the other part of the old municipality building can be used as at present.
- It is not worth deteriorating the ornamental interior decoration and arch on the north wall, which represents the history of this heritage building.
- Concern with irritable noise and odour created by the toilet in the enclosed space for tourists.

3.2.3. Work Items

The following are the work items included in this Component according to the study results on the existing conditions and the review of SAPROF Study as well as discussions with the responsible agency(ies).

(1) Renovation of the existing Visitor Centre (46.5 m^2)

- Improvement of furniture
- Improvement of floor finish

(2) Old Municipality Plaza (2,500 m^2)

- Pavement
- Street furniture and planting
- Outdoor lighting
- Planting
- Watering devices for plants
- General Kiosks: 10 nos.
- Tourist Information Kiosk: 1 no.
- Mechanical and Electrical

3.3. Design Premises

3.3.1. Design Standard

(1) General

- Jordanian codes and standards
- BSS/BSI: British Standards and code of practice

(2) Mechanical

The design of the mechanical work is generally in accordance with the following standards, codes, and regulations where applicable:

- General and specific requirements of the local water and drainage authority, local public health officer, and the regulations of the local Civil Defence Department.

(3) Electrical

Design is mainly based on the following standards and should be carried out accordingly:

- National Electrical Code (NEC).
- The requirements of Jordan Civil Defence Department.

Any other standards, regulations and/or codes of practice and norms issued by institutes and or authorities of other countries such as Japan and Europe, provided they are found applicable and acceptable to perform the job.

3.3.2. Planning and Design Criteria

(1) Pavement

As described Item (1) of Section 2.5.3.

(2) Structure

As described Item (4) of Section 2.5.3.

(3) Mechanical

Water supply should be taken from the nearest city network point.

(4) Electrical

Power source should be taken from the old municipality building.

(5) Remarks to be taken in Design

Because the old municipality building is an historically important building, any alteration in finishing and structure of the building is restricted.

3.4. Detailed Design

3.4.1. Planning and Design Policy

Because of limited space of the existing Visitor Centre in a historical building, the application of design is very limited, and the improvement of accessibility of the centre is impossible by itself. In this regard, the planning and design policy aims at improving the atmosphere of interior and working environment and function for the staff.

3.4.2. Site Plan

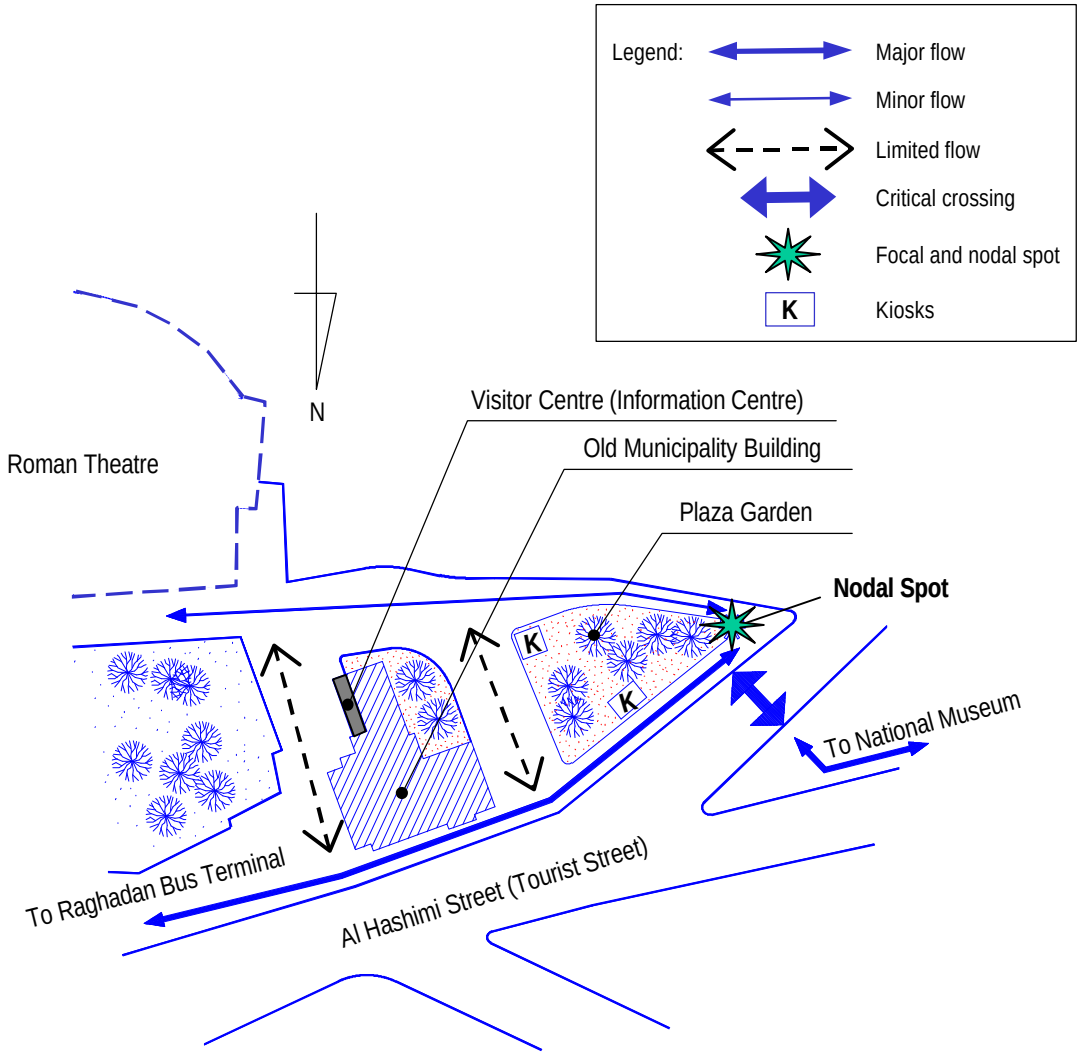
The most critical issue of the existing visitor centre is its lack of visibility. Number of visitors to the centre is very limited (25,000 persons/annum) as show in Section 3.1.2, because of this location away from the major flow of tourists. In order to overcome this issue, a tourist information kiosk was proposed by the technical committee of GAM to be located at a strategic location for tourists. Thus, the improvement of the existing visitor centre to improve its visibility, together with the improvement of the old municipality plaza where tourists are attracted for refreshments and rest under the shade, and walking axis through to the Roman Theatre, were combined.

The new tourist information kiosk is placed at the focal and nodal spot in the corner of the plaza, which is very visible to tourists coming from the tourist street crossing the road to the Roman Theatre.

The existing kiosks are relocated in between the old municipality building and plaza garden where plenty of space is available under the shade.

Figure 3.1 shows the existing situation of the visitor centre in relation with the old municipality building and plaza garden.

Figure 3.1 Site Analysis Map



Source: JICA Study Team

The following planning policies are applied to the planning and design study of the visitor centre:

- To improve accessibility and visibility of the visitor centre by adding a tourist information kiosk at a strategic location
- To enhance existing pedestrian flows and gathering
- To create an oasis for pedestrian tourists and local people for refreshment and resting spot

3.4.3. Architectural Design

(1) Exterior design of the old municipality building

Because any alterations of the existing façade of this historical building are prohibited, the improvement of the exterior of the visitor centre is basically focussed onto the signage design in consideration with the following aspects:

- Legible from distance, but the appearance of sign board is inconspicuous from the façade of the building to maintain the historical/architectural feature of the building

- Rehabilitate the existing wooden pergola to create shade and green

3.4.4. Outdoor Works (Old Municipality Plaza)

(1) Site Layout

The space is designed as a sunken garden for resting for tourists and locals alike, surrounded by trees and coloured planting with benches and sitting (stone) steps.

The placement of a Tourist Information Kiosk at the round corner with a round shaded platform is an addition to this place. This kiosk will make it very visible being an important focal point, and also enhances the theme of "a sequence of interesting visual urban events". The new layout proposes to group all the existing kiosks in a row (Souq) between the plaza and the Old Municipality's western façade to vitalise that area and enhance the role of the plaza as a connection zone with the Roman Theatre, the Hashimiya Plaza and the tourist deck of the Raghadan Bus Terminal.

(2) Pavement Design

The pavement is designed to enhance the direction and existence of pedestrian flow, in particular with the flow axis to the Roman Theatre coming from the tourist street.

Because the south side of the tourist street ends at the old municipality plaza, the road crossing at the corner of the plaza is a critical location for tourists visiting the Roman Theatre. However, this crossing is currently not well-maintained and protected from vehicles due to invisible markers on the road and no mitigation measures for speed control. In order to overcome these issues, the pavement patterns and materials are intentionally differentiated from the asphalt road by introducing basalt cubes for the pavement with a ground concrete beam to support the load of the vehicles passing the place. The pavement of the crossing is also differentiated from the pedestrian pavement in order for pedestrians to notice that the crossing is different from the pedestrian walk for their safety.

(3) Signage Design

Pole-mounted direction signs with lighting fixture are allocated at each corner of the plaza garden.

3.4.5. Utility design

Mechanical

1) Water Supply services

Water supply for watering devices and kiosks is taken from existing main line. All pipe work is with galvanised steel.

3.5. Design Drawings

3.5.1. General Drawings

The following general drawings are attached at the end of this Report for reference:

(1) Old Municipality Plaza

- Old Municipality Plaza Plan (1:150)
- Old Municipality Plaza Plans & Sections (1:50)

(2) Visitor Centre

- Visitor's Centre — Plan & Detail (1:10,20,50)
- Visitor's Centre — Elevation (1:50)

Chapter 4 Construction Planning

4.1. Project Site

The project sites of this sub-project are dispersed throughout the downtown area and are currently used by local people every day. Therefore, prior to the commencement of the construction, a notification to the local residents is mandatory.

The project site should be handed over to the contractor for the construction period in which the contractor shall have all responsibility of the site, however the accessibility of the trails, stairs and street should be maintained for local use.

4.2. Temporary Work

All temporary works are the responsibility of the contractor. Program and plan of all temporary works should be submitted to and approved by GAM and/or relevant agencies prior to the commencement of actual implementation of the temporary works on site.

4.2.1. Temporary Facilities

(1) Construction access road:

King Talal Street itself can be utilised for the construction access for the tourist street work component and the existing trails can be used for the implementation of tourist trails and view terraces work - components.

(2) Contractor's office, workshop, material storage, parking, etc.

Though it has been agreed with GAM, the area in front of the Mosque in the Amman City Plaza could be utilised as the necessary temporary facility site. The contractor may be able to select a space(s) in the construction site for the facilities during the construction if the implementing agency allows.

(3) Testing room and equipment

In Amman there are public and private laboratories where the tests can be conducted. The contractor can select a laboratory(ies). The brochure of the laboratory(ies) selected and items tested by the laboratory(ies) should be submitted to GAM for their acceptance prior to conduct of the tests.

(4) Utility Services for the construction works

1) Water supply

It is confirmed by GAM that the contractor can obtain water supply from the existing main pipe which runs along the nearest road to the site, but subject to permission from Amman Water Authority.

2) Electrical supply

It is also confirmed by GAM that the contractor can obtain electrical supply from the existing transmission line running along the nearest road to the construction site, but under coordination with Jordan Electrical Power Company.

3) Telecommunications

As for the telephone line, it may be practical to utilise mobile telephones. However, cable lines are required for the facsimile line and also internet/e-mail lines. It is

confirmed that the lines can be obtained from the main telephone line along the nearest road to the site, under the coordination with Jordan Telecommunication Company (JTC).

As for the sub-projects of the Dead Sea Parkway and Dead Sea Panoramic Complex, there are no proper water supply pipes and electrical cables to the sites. Consideration of the utility lines are shown in each Section of the sub-project.

4) Sewerage

There is no sewerage facility available to the contractor. However, if the contractor wants to provide toilets near the site, the contractor should provide a new septic tank(s) to purify soiled water to meet the Jordanian standards and regulations. The discharge point of the treated water should be coordinated with the Execution Department and Coordination Department, GAM. The total sewerage system should be approved by GAM prior to the construction on site.

5) Normal solid waste disposal from the contractor's office

GAM will collect the normal solid waste and dispose of it according to their own system. If not, the contractor should apply an appropriate system and measures under his own responsibility.

6) Disposal of excess soil and debris

The excess soil and debris should be disposed to an area(s) which should be designated under coordination with the Execution Department and Coordination Department, GAM. The necessary measures to mitigate environmental impacts should be taken by the contractor.

The final solutions of the utility services accepted by the relevant agencies should be submitted to GAM in written form prior to the construction on site.

4.2.2. Traffic Control Measures

In general, the contractor should not hinder the existing traffic flows, both vehicles and pedestrians, by the construction activities without introducing any alternative flow lines. Plans of alternative traffic flow lines should be submitted and coordinated with the Traffic Department of GAM.

(1) General traffic control measures to be taken

- Entry and exit of construction vehicles
- Activities to connect utility lines (both temporary and permanent) to the existing main/transmission lines along the site boundary

(2) Pedestrian flows

For the pedestrian flows in the tourist trails and street, the contractor shall take measures under co-ordination with the Transporting Department, GAM, maintaining traffic directly related to the daily life of the residents and shops along the street.

4.2.3. Safety and Security Measures

In general, the contractor should be responsible for safety of the people living in the adjacent areas and of passing vehicles and pedestrians surrounding the site throughout the construction period.

(1) Safety measures

1) Access point

The contractor should determine an access point(s) for the construction vehicles to the construction site and submit to GAM for their acceptance. At the access point, the contractor should provide safety measures for the vehicles and pedestrians passing the existing road(s) on which the access point will be located.

2) Working space and warning

The distance between the road and the edge of the construction should be created at least 30cm of working space with the safety fence or cones to clearly indicate the construction site for drivers.

(2) Security measures

Provision of a temporary fence or similar surrounding the construction site, in particular with the view terraces, is recommended in order to avoid unnecessary entry of people as well as to protect construction materials and equipment from theft.

4.2.4. Environmental consideration

The project composes improvement of the tourist street, tourist trails with development of view terraces, and renovation of the existing visitor centre. The project basically helps to improve amenity of the urban area of Amman City. Also it will enhance economic activities of the town due to an increase of tourists. The project sites are located in residential areas or along the streets, and environmental impacts caused by the project are restricted to the human environment and socio-economic activities.

Based upon the on-site survey, it is confirmed that the residents and shops near the project sites may receive indirect or direct impacts at the stages of both construction and operation.

Table 4.1 summarises the key adverse impacts and the proposed mitigation measures at both stages of construction and operation. The proposed mitigation measures are different according to their nature, the identified information is classified into that which should be described in the tender documents and others. The detail is described in the Supporting Report (Volume S1-3).

Table 4.1 Potential Impacts and Proposed Mitigation Measures

	Actions	Impacts	Mitigation measures
mitigation measures should be clarified in the tender document	- renovation works of the visitor centre and tourist street and trails	**Air Pollution:** - cause nuisance to the neighbouring residents by dust	- provide sheets for dust control - watering for dust control
	- renovation works of the tourist street and trails	**Noise & Vibration Pollution:** - nuisance and disturbance of the neighbouring residents	- use low noise and vibration equipment - restrict working hours - shorten construction period
	- earthworks of the tourist street and view terraces	**Waste Pollution:** - construction debris clog drain pipe - generate large volume of construction wastes	- secure disposal sites - enhance recycling of the wastes
	- renovation works of the visitor centre and tourist street and trails	**Existing Infrastructure:** - affect the existing signage, sewage and electric lines etc.	- alleviate effects on the existing infrastructures by clarifying the existing conditions and scope of works
	- construction works of tourist street and trails	**Traffic &Safety:** - increase conflict between vehicles and visitors	- conduct traffic control - secure detour (if necessary) - avoid rush hours

Source : JICA Study Team

4.3. Construction Method and Construction Schedule

The contractor should plan the most appropriate construction method and construction schedule. They should be submitted to GAM for approval prior to the commencement of the work on site.

4.3.1. Construction Method

The construction method should include utilisation plan of construction machines as well as labour force.

The following are the items to be taken into consideration in the construction method:

(1) Construction Procedure

1) Tourist Trails and View Terraces

The construction of view terraces should be executed by combining with the relevant tourist trails divided into four zones such as:

Zone 1: Hashmi Stairway-9 with Raghadan View Terrace

Zone 2: Hashmi Stairway-3, Farwah Al Jothani Stairway and Salama Bin Al Akwa Stairway with Central View Terrace

Zone 3: Mathar Raslan Stairway, Hashmi Stairway-1 and Al Qalaa Stairway

Zone 4: Qalaa trail with Al Adlar View Terrace

2) Tourist Street

The construction of the Tourist Street should be separated into three zones such as:

Zone 1: Starting from in front of the old municipality building to Al-Husseini Mosque

Plaza

Zone 2: Starting from Al-Husseini Mosque Plaza to the vegetable market

Zone 3: Starting from the vegetable market to the Amman City Plaza

The technical committee recommended to commence the construction from Zone 1 toward Zone 3.

(2) Care against damaging the existing road

The improvement of pavement along the asphalt road should be executed with care for the surface and structure of the existing road, in particular with the interface between the stone pavement and asphalt pavement. If the curb stones need to be replaced, mending of asphalt surface after the operation should be properly done.

4.3.2. Construction Schedule

A construction schedule indicating the major work items, recommended by the Study Team, is shown in Figure 4.2. The total construction period is estimated as 18 months (1.5 years) with the defect liability (guarantee) period of one year.

The actual construction schedule should be prepared in CPM by the contractor taking into consideration their work program including: temporary works and construction methods as well as other conditions of the site, material and labour supply plan, etc. The construction schedule should be submitted to GAM for their review and approval prior to the commencement of the work.

The rainy season (from December to February) should be taken into consideration for the preparation of the construction schedule.

4.3.3. Remarks on Construction Plan

(1) Construction of the Tourist Trails and View Terraces by the Citadel ancient wall

A particular consideration should be taken in conjunction with the consolidation works being executed by DOA, MOTA.

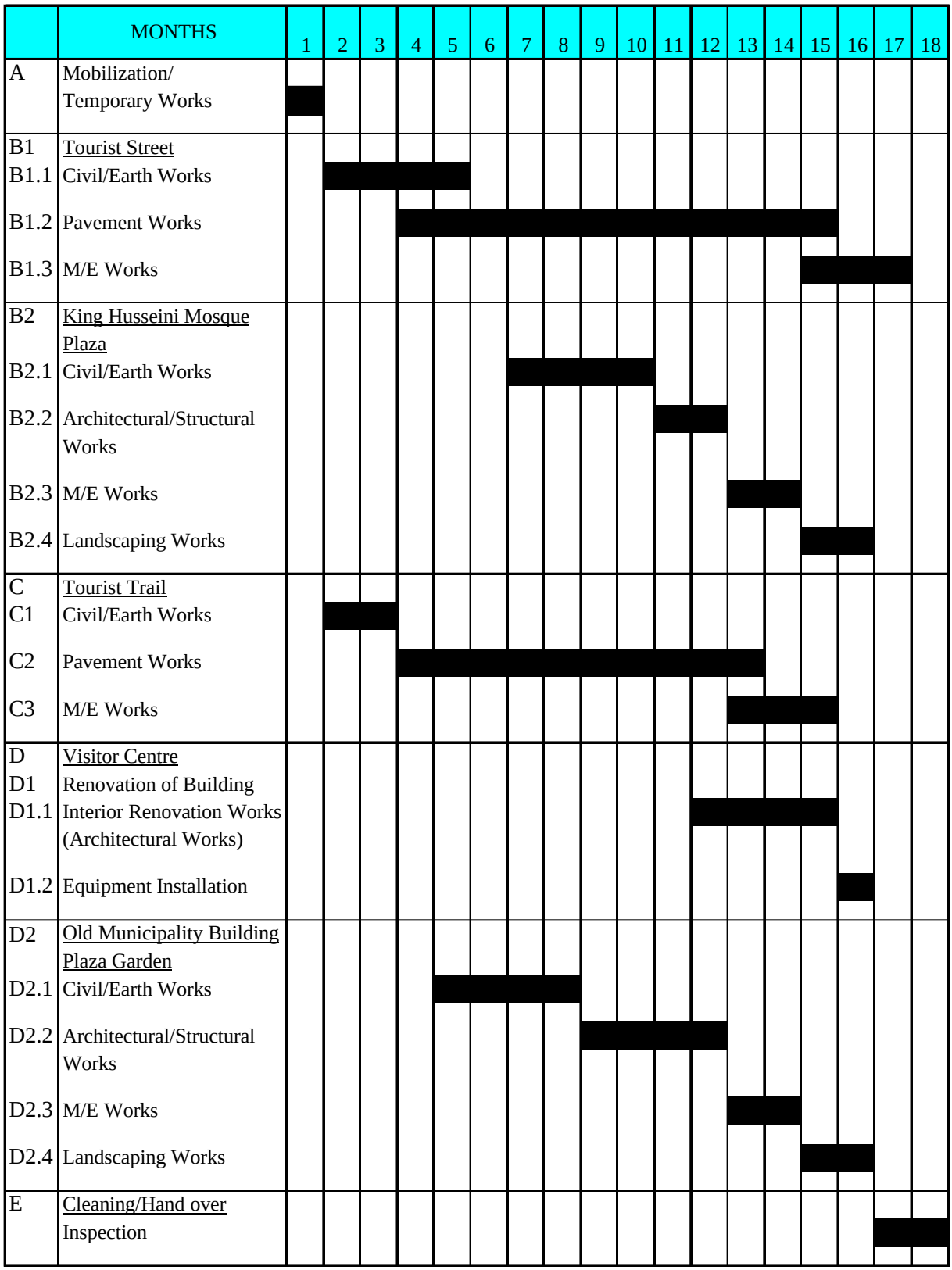
According to DOA, the consolidation works have already started from the East Side corner since 19th June 1999, and approximately 200m of restoration on the Citadel Wall will be completed by the end of June 2000.

The consolidation works done by DOA include excavation and sounding for the investigation of any artefacts of archaeological interest remaining under the debris, removal of debris and the consolidation of the existing deteriorated Citadel ancient wall.

In this regard, the construction work of the proposed Tourist Trails and View Terraces beside Citadel Ancient Wall shall not be started before the completion of the consolidation works by DOA.

It is also very important that the contractor should execute their works with the coordination of DOA.

Figure 4.2 Construction Schedule of Amman Downtown Tourist Zone



Note: The following three (3) parties for the construction are considered; 1st party for B1 and B2, 2nd party for C and 3rd party for D1 and D2.

Chapter 5 Tender and Contract Documents

5.1. Tender Package

This tender is conducted in one package including the following components:

1) Improvement of Tourist Street
2) Development of Tourist Trails and View Terraces
3) Renovation of Visitor Centre

The same elements of the original sub-project are included in this tender package, except that of the Raghadan Bus Terminal work-component which is separated from the Amman Downtown Tourist Zone primarily due to its scale and the difference in characteristic of construction works.

5.2. Tender Administration

In order to manage the tender process, the following aspects are considered.

5.2.1. Procurement Method

According to the Procurement Guidelines of JBIC, this sub-project should adopt Local Bidding (LB), since the construction cost is estimated at less than 400,000,000 Japanese Yen (approximately 2.7 million JD). In the case of LB, pre-qualification procedure is not necessary before the tender procedure.

Regarding the procedures of LB, specific requirements are as follows:

1) Unless the award of contract is to be made to the lowest tenderer among all the tenders received, review and concurrence are required by JBIC on the "Analysis of the Tenders and Proposal for Award" with a Summary Sheet as per the Form stipulated, before such award is made.
2) After executing a contract, review and concurrence are required by JBIC on the "Contract" with a duly certified copy of the contract.

5.2.2. Responsible Agency of this Tender

This LB for the Amman Downtown Tourist Zone will be conducted under the responsibility of the Greater Amman Municipality (GAM). The Tendering Department of GAM will organise a Tender Committee composed of staff of the department, staff of GAM, etc. The various works related to the tender will be assisted by a Project Management Consultant (PMC) assigned for the implementation of the sub-project.

The signer (the Employer) of the contract with the Contractor will be the Mayor of GAM.

5.3. Tender Documents

The tender documents are prepared by the JICA Study Team under the contract with JICA as a technical assistance scheme of the Japanese Government. The documents will be granted to the Jordanian Government after the completion of appraisal by JICA, and the Jordanian Government should legalize and formalize the documents for use in the implementation of the Project.

5.3.1. Composition of the Documents

The tender documents are composed of the following volumes and parts:

(1) Invitation to Tenderers

(2) Volume -I: Instructions to Tenderers

Form of Tender

1) Appendices

Appendix A:	Schedule of Time, Rates and Conditions
Appendix B:	Form of Agreement
Appendix C:	Form of Tender Security
Appendix D:	Form of Performance Security
Appendix E:	Form of Advance Payment Security
Appendix F:	Drawing List
Appendix G:	General Construction Schedule
Appendix H:	Temporary Site Location
Appendix I:	Query Form
Appendix J:	Tender Acknowledgement
Appendix K:	List of Eligible Countries

2) Enclosures

Enclosure No.1:	Power of Attorney
Enclosure No.2:	Certification of Submission of Tender Guarantee
Enclosure No.3:	Joint Operation Agreement
Enclosure No.4:	Letter of Association
Enclosure No.5:	Affidavit of Site Inspection
Enclosure No.6:	Basic Program of the Work
Enclosure No.7:	Contractor's Organisation Chart
Enclosure No.8:	Outline Construction Plan and Proposed Layout Plan for Temporary Works
Enclosure No.9:	List of Contractor's Equipment to be used on the Works
Enclosure No.10:	List of Major Materials and Plant for the Works
Enclosure No.11:	List of Sub-Contractors/ Suppliers
Enclosure No.12:	List of Intended Import Materials and Plant
Enclosure No.13:	Detailed Monthly Cash Flow of Anticipated Contract Payments
Enclosure No.14:	Breakdown of Major Rates

(3) Volume -II: Specifications

PART-1: General Requirements
PART-2: Technical Specifications

(4) Volume -III: Bill of Quantities

(5) Volume -IV: Drawings

(6) Volume -V: Conditions of Contract

PART-1: General Conditions of Contract
PART-2: Special Conditions of Contract

5.3.2. Order of Contract Documents

The priority among the documents is as follows:

1) Contract Agreement

2) Letter of Acceptance

3) Tender and Notice to Tenderer/Appendix
4) Conditions of Contract Part (II)-Special Conditions
5) Conditions of Contract Part (I)-General Conditions
6) Specifications
7) Drawings
8) Priced Bill of Quantities

5.4. Type of Tendering

In principle, a type of "Unit Price Base Contract" tender shall be adopted for the contract of this sub-project with the arrangement of a provisional sum for limited work items.

(1) Provisional Sum

The Provisional Sum means a sum included in the Contract and so designated in the Bill of Quantities for the execution of any part of the construction works or for the supply of goods, materials, plant or services, or for contingencies which sum may be used, in whole or in part, or not at all on the instructions of the Engineer represented by the implementing agency of this sub-project.

The Contractor shall be entitled to only such amounts in respect of the work, supply or contingencies to which such Provisional Sums relate as the Engineer shall determine in accordance with the contract.

Chapter 6 Cost Estimates and Implementation Plan

6.1. Conditions of Cost Estimates

(1) Estimation Time

The unit prices for the construction works are adopted for the sub-project at the time of the cost estimation in March 2000.

(2) Base Cost for Estimation

The prices for construction materials, rental fees for construction equipment and labour unit rates obtained from the Ministry of Public Works and Housing (Issued in 1998) are adopted as the base cost for the sub-project.

(3) Jordanian Dinar (JD) is used for the cost estimation currency, since the basis of the construction budget for the Project has been referred from the SAPROF Report, prepared in March 1997 by OECF (currently called JBIC).

(4) Exchange Rate

The exchange rate between Jordanian Dinar and US dollar is 0.708 JD, and the exchange rate between Japanese yen and US dollar is 106.08 at the time of March 2000. The following exchange rates are applied:

- US$1 = 0.708 JD
- 1 JD = ¥150

(5) Price Increase

According to the information on construction costs from the Ministry of Public Works and Housing, the Government of Jordan, the unit prices for construction costs in Jordan have not changed for the last three years, since the construction sector is not active and new construction projects are decreasing, thus competitiveness of contractors is increasing. Therefore, the price increase for the Project is not considered for this cost estimation.

(6) Cost items to be excluded

Land acquisition costs and relocation costs for existing residents and shop owners are not included in accordance with the SAPROF budget. Contingency costs are also not added to the estimation in this study.

(7) Tax Condition

Custom duties and service tax are excluded for some specific materials and equipment, which are expected to be imported. Custom duties and service tax are included in the unit price for construction materials and equipment.

(8) Measurement System

The Bills of Quantities are prepared in accordance with the standard prepared by the American Institute of Architects (AIA), which is commonly used in Jordan.

The construction work items are divided into the following divisions:

Divisions	Work Items
Division –1	General Requirement
Division –2	Site Work
Division –3	Concrete Work
Division –4	Masonry Work
Division –5	Metal Work
Division –6	Wood and Plastic
Division –7	Thermal and Moisture Protection
Division –8	Doors, Windows and Glazing
Division –9	Finishes
Division –10	Specialities
Division –11	Equipment
Division –12	Furnishing
Division –13	Special Construction
Division –14	Convey System
Division –15	Mechanical
Division –16	Electrical

6.2. Project Cost

6.2.1. Direct Cost

An official standard for quantity surveying for buildings is not available in Jordan. At the time of estimation, JST prepared compound costs for main construction works with reference to the information obtained from the Ministry of Public Works and Housing, other large projects currently being executed and the standard rates of Japan.

(1) Compound Cost

1) Working Hours

The working hours of people in the construction field is assumed from 8 o'clock in the morning to 6 o'clock in the afternoon including 2 hours for lunchtime. Therefore, for the calculation of the compound cost, 8 hours is adopted as the working hours for the sub-project.

2) Efficiency of Local Labour

The work efficiency for the project, as a coefficient, has been computed by utilising the information collected in Jordan with the comparison of the standard efficiency of Japan.

3) Machine Rental Price

The rental prices for construction machines obtained from the Ministry of Public Works and Housing is adopted for the calculation.

6.2.2. Indirect Cost

Rate of indirect costs (Preliminaries and Profit) are analysed and referenced based on the actual sample of prime projects currently being executed in Jordan.

(1) Preliminaries

Temporary and Preparation Works

Temporary and Preparation Works include temporary access roads, working yard, temporary buildings, working facilities, safety expenses, power and water, cleaning, laboratory testing, transportation, etc.

For the calculation of the cost of Preliminaries for each Sub-Project, the ratio of 2.5% of the direct cost is adopted.

Site Administration

The site administration cost includes direct personnel cost, site expenses, insurance, etc. Based on the analysis of the actual prime projects currently executed in Jordan with the comparison of rates applied in Japan, the rate of the site administration is assumed to be 11.5% of the direct cost.

For the sub-project, appropriate a sum of 14.00% of the direct construction cost as they Preliminaries include the cost of Temporary and Preparation Works as well as Site Administration..

(2) Profit

Based on the analysis of the actual prime projects currently executed in Jordan with the comparison of rates applied in Japan, the rate of the profit is assumed to be 10.0% of the direct cost.

For the sub-project, appropriate a sum of 10.0% of the direct construction cost as the profit.

6.2.3. Construction Costs

The construction cost of this sub-project is not specified in this report primarily due to the public availability of this report and the confidentiality of the construction cost prior to the tender. The detailed information on the construction cost, however, has been described in a separate edition, which has been supplied only to the Agencies and Ministries concerned.

6.3. Project Implementation Plan

6.3.1. Execution of the Sub-project

Items to be fulfilled for the overall implementation period of this sub-project, which is categorised as a LB type of procurement method, are as shown below:

(1) Completion of the JICA Study

JICA plans to complete the Final Report and Tender Documents by the end of August and they may be transferred to the Jordanian Government as soon as possible after finalising the internal procedures of the Government of Japan.

(2) Procurement of Project Management Consultant (PMC)

A Project Management Consultant (PMC) should be procured before the tender documents are transferred to the Jordanian side by JICA in order to maintain a smooth transition to the implementation stage under the JBIC Loan from the JICA D/D Stage.

(3) Review and confirmation of the tender documents

The tender documents should be reviewed and updated if any changes are made by the Jordanian side to the tender packaging, scope of works, employer address and so on.

(4) Tender period

This is categorised in the sub-projects for which the procurement method is LB. The procurement procedures for LB sub-projects are stipulated in the JBIC Guidelines as follows:

1) Announcement of Tender
2) Pre-tendering conference and distribution of Tender Documents
3) Preparation of tenders by the tenderers
4) Tender opening
5) Evaluation of Tenders
6) Unless the award of contract is to be made to the lowest tenderer among all the tenders received, review and concurrence are required by JBIC on the "Analysis of the Tenders and Proposal for Award" with a Summary Sheet as per the Form stipulated, before such award is made
7) Sending the notice of award to the successful tenderer
8) Negotiation
9) Signing the contract
10) After executing a contract, review and concurrence are required by JBIC on the "Contract" with a duly certified copy of the contract.

(5) Construction and As-built drawings

As shown in Figure 6.1, the construction period for this sub-project is estimated at 18 months. The contractor should prepare and submit a set of as-built drawings to GAM within one month after the completion of the construction works (issuance of the completion certificate).

(6) Defect liability (Guarantee) period

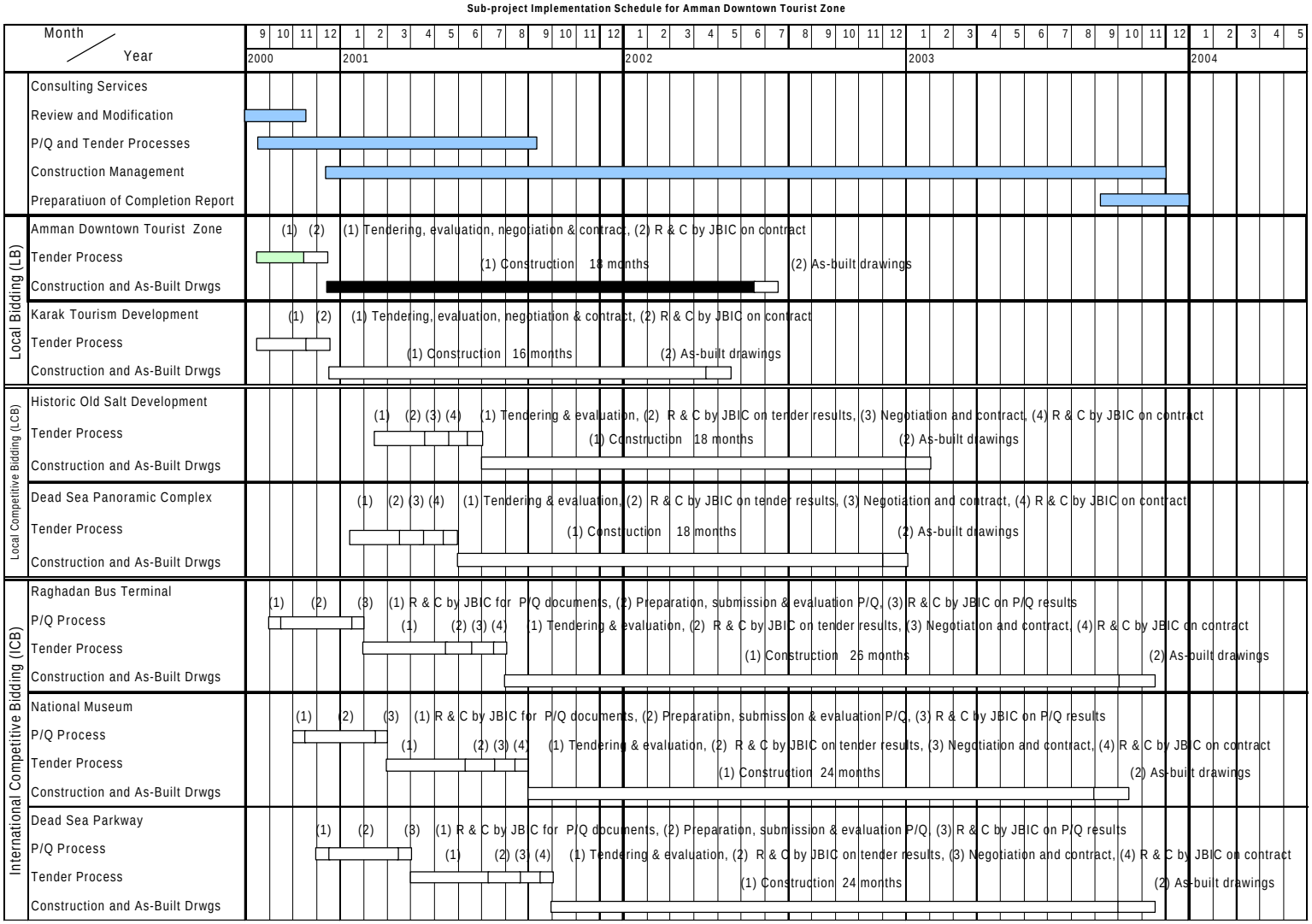
The period for defect liability is 365 days (one year).

(7) Completion Report

Within 3 months after the completion of the construction works a completion report should be prepared and submitted by the Consultant to GAM.

An overall project implementation schedule prepared by JST is shown in Figure 6.1.

Figure 6.1 Overall Project Implementation Plan



Source: JICA Study Team

Chapter 7 Facility Operation and Maintenance Plan

7.1. General

The goal of the total management system is to achieve the objectives of the Amman Downtown Tourist Zone sub-project described as follows:

1) To develop tourism circulation in the Amman Downtown Tourist Zone.
2) To enforce pedestrian linkage among the tourism assets in the zone.
3) To improve tourism services along the tourism circulation as a model project.
4) To serve for:
   - providing convenience to the tourists to make them stay longer in Amman; and
   - encouraging the existing and new commercial activities in the zone.

In order to maintain and achieve the above objectives, an appropriate operation and maintenance system should be established as an overall system, because the sub-project contains various components in different sites and functions shown in Table 7.1.

Table 7.1 Component and Agency Responsible for Operation and Maintenance

Functional group	Component	Responsible agency
Tourist flow	Tourist Street	GAM
	Trails and stairways	GAM
Tourist spot	Plazas along Tourist Street	GAM
	View terraces	GAM
Tourist information service	Visitor centre	MOTA
	Information kiosk	MOTA

Source: JICA Study Team

7.2. Components of Tourist Flow and Tourist Spot Improvement

7.2.1. The existing structure of GAM for maintenance of roads and public spaces

The components are the responsibility of the Execution Department and Transporting Department for its maintenance, cleaning and pavement, and road marking respectively.

The each department has staff of 35-40 numbers in total as shown in Table 7.2.

Table 7.2 Number of Staff in the Existing Maintenance Organisations of GAM

Staff	Number of Staff	
	Executing Department	Transporting Department
Director	1	1
Maintenance division manager	1	1
Engineers	4	4
Technicians	5-6	5-6
Workers	25-30	25-30
Total	Approx. 35-40	Approx. 35-40

Source: GAM

7.2.2. Current maintenance procedures of GAM

(1) Annual periodical maintenance and repair

The municipal area of GAM has 20 districts and the procedures for the annual maintenance and repair are as follows:

1) Annual inspection report is prepared by each district and submitted to the Special Committee of GAM for the maintenance.
2) Review and inspection by the Special Committee according to the report by the district.
3) Prioritisation of the reported items by the Committee and application of budget to the GAM council.

(2) Cleaning and pavement

The cleaning by manpower is depending on the priority of roads in the municipal area and the interval is once a week or once a month.

7.2.3. Proposed maintenance system

It is proposed that the current system should be basically applied for Tourist Street and Public Plazas, Tourist Trails and View Terraces. However, considering the objectives of the Project to promote the tourism in Amman as well as in Jordan, the maintenance of Tourist Street, Tourist Trails, View Terraces should be taken with more care and frequency as shown below, although Al Talal Street (tourist street) is ranked as one of the highest priority road in Amman.

(1) Inspection System

Inspections are performed so that repairs can be made and pavements maintained and no hindrance to pedestrians will occur.

Pavement inspections are one of the most important maintenance activities in this sub-project to determine the convenience of the tourists as well as local people's walking conditions.

The types of inspections to be conducted are divided into three categories as routine inspection and cleaning, periodic inspection and special inspection.

1) Routine Inspection and Cleaning: inspecting any deteriorations and damages while cleaning streets, trails, stairs and facilities according to the criteria of the current program of GAM.
2) Periodic Inspection: the investigation of structures such as stone and concrete tile pavements, drainages, vegetations and slopes.
3) Special Inspection: the supplementary inspection conducted in addition to the routine and periodic inspection described above when necessary due to possible damages caused by storms, heavy rain, earthquake, or other unusual conditions.

The frequencies of cleaning and inspection mentioned above are as follows:

- Routine Inspection and Cleaning Once a week/Once a month
- Periodic Inspection Once a year
- Special Inspection As necessary

The proposed contents of inspections are shown in Table 7.3.

Table 7.3 Contents of Inspection

Functional Category	Classification of Structure
Pavement Surface	Pavement (Lime stone, Basalt, Concrete tile)
	Curb
	Mortar Joint
Slope	Vegetation Slope
	Slope Protection Works
	Masonry
	Retaining Wall
Drainage Facilities	Street Surface
	Slope
	Catchment
Building Structure (Arch, Pergola, View Terraces)	Concrete Structure
	Concrete Sub-structure
	Steel Fastening
	Painting
	Wooden Structure
Culvert	Reinforced Concrete Box
	Reinforced Concrete Pipe
	Other
Traffic Safety Facilities	Traffic Barrier (Hand Rail, Boland)
Traffic Control Facilities	Signs (Direction sign, traffic sign)
	Markings
	Delineators (Guard Posts)

Source: JICA Study Team

(2) Pavement Cleaning

Pavement cleaning involves removing dirt and trash from the street, trails, plazas and adjacent facilities to eliminate walking obstructions.

(3) Vegetation Management

Vegetation management consists of planting new growth, pruning and maintaining established vegetation, and removing old vegetation, so that grass, shrubs and trees can grow without any obstruction and provide a pleasing respite for pedestrians, and help to conserve and enhance the environment.

(4) Repairs

Repairs include repairing the pavement surface and slope, and repainting traffic control facilities, stairs, structures, etc.

- Basalt pavement

  Basalt pavement repairs are required because of loosening cracking and rutting caused by heavy traffic, sudden stopping and tire chains. An evaluation method shall be established for the repairs required, based on a survey and analysis of the existing pavement roughness, cracking ratio and depth of rutting.

- Minor Repair
  - Replacement of broken pavement, crack sealing and patching of local damage and adjustment of pavement surface differences.
  - Traffic safety and control facilities, guard-rails, signs and road markings.
  - Slopes, embankment control, drainage and removal of fallen rock and debris.
  - Minor repair and leakage of water pipes.
- Maintenance of Street Fixtures, Fittings and Equipment

  This item includes the daily inspection, maintenance and repair of water devices and lighting fixtures as well as electrical facilities.

(5) Restoration of Traffic Accident Damage

Typical damage caused by traffic accidents are the damage to signages, curbs, trees, light poles, curbs and pavements, and building walls, etc.

(6) Restoration Work for Damage Caused by Unforeseen Natural Disasters

Slope failures and retaining wall damage are caused by heavy rainfall and/or earthquakes. Slope failures are normally related to heavy rainfall and providing inadequate drainage of surface and seepage water.

7.3. Visitor Centre and Information Kiosks

7.3.1. Maintenance System

The maintenance of the existing visitor centre in the old municipality office building and the information kiosks which are installed in Public Plaza adjacent to the old municipality office building would be covered by the maintenance section of the Tourism Development Department, MOTA.

7.3.2. Operation System

(1) Current operation system

The existing visitor centre in the old municipality building is operated by MOTA with 2 numbers of staff. The centre is serving tourists to supply tourism information of Amman as well as Jordan with literature or in verbal.

(2) Proposed system

Basically, it is proposed to apply the current system to operate the visitor centre continuously even after the renovation, but 1-2 numbers of staff would be increased by MOTA for the operation of the information kiosks which will be placed in the visible spot in the Public Plaza.

7.4. Environmental Considerations at Operation Stage

The project composes improvement of tourist street and tourist trails and renovation of the existing visitor centre. The project basically helps to improve insufficient amenity of the urban area of Amman City. Also it will bring enhancement of economic activities of the town due to increase of tourists. The project sites are located in the residential areas or along the streets, and environmental impacts caused by the project are restricted to the human environment and socio-economic activities.

Based upon the on-site survey, it is confirmed that the residents and shops near the project sites may receive indirect or direct impacts at the stage of operation.

Table 7.4 summarises the key adverse impacts and the proposed mitigation measures at the operation stage.

Table 7.4 List of Environmental Impact and Mitigation Measures proposed

Actions	Impacts	Mitigation measures
- increase of tourists	**Waste Pollution:** - generate huge volume of construction waste	- place litter boxes for collecting general waste - improve the existing waste collection system
- increase of tourists and vehicles	**Traffic &Safety:** - increase conflict between vehicles and visitors	- raise awareness by environmental education - improve the functions of parking areas - plan/ implement new traffic system to reduce the number of cars in city centre and to secure good traffic circulation with long-term perspectives

Source: JICA Study Team

7.5. Facility Operation and Maintenance Plan for Observation Points

7.5.1. Facility Operation and Maintenance System

Although the facilities are designed with the utmost emphasis on ease of operation and maintenance, it is advisable to establish a system for efficient maintenance of the facilities taking into consideration following.

1) Technical staff responsible for operation and maintenance of facilities in each field would be arranged by the Municipality in the current system.

2) Building Contractor shall give on-the-job training for the operation, maintenance and inspection of facilities to the above technical staff and at the same time provide instruction manuals on maintenance and operation, if any.

3) Weekly reports on maintenance and inspection of facilities shall be prepared by the technical staff to make it easy to have a clear grasp of the status of the facilities.

7.5.2. Operation and Maintenance Plan

The activities for operating and maintaining the facilities are as shown below.

O& M	Daily O& M	- cleaning, operation, daily inspection
	Periodical O& M	- periodical inspection/adjustment, minor repair
	Emergency O& M	- emergency inspection, repair, renovation

To establish an overall plan for operation and maintenance, especially for the periodical inspection/adjustment among the above activities, is essential to keep facilities operated in order as planned and to prolong the facilities life.

The inspection and maintenance system of the facility are shown in Section 7.5.3 below. In addition to them, special emphasis shall be placed on the following issues.

(1) Roof

- Highly durable materials are selected for waterproofing of the roof. Periodical inspections and cleaning, however, are necessary to avoid water leaks.
- Gutters and drainpipes, especially, shall be cleared twice a year since they are likely to be filled with dust.

(2) Finishing Materials

- When exterior materials have rusted, rust shall be removed and the metal shall be painted to prevent it’s spread.
- Rooms shall be kept well ventilated and the finished surfaces of rooms shall be kept clean to prevent them from getting rusty and dirty.
- Since floors finished with stone or terrazzo tiles are difficult to repair once scratched, particular care shall be taken when moving heavy objects on such a floor.
- Ceiling finish materials shall be handled very carefully since they are affected by shocks,

(3) Building Machines

- Building machines shall be operated and inspected by engineers with professional knowledge of electricity or machinery in accordance with the instructions listed in instruction manuals.
- When troubles are found in a piece of machine, operation of it shall immediately be stopped to find out the cause and remedial measures shall be taken to prevent the trouble form affecting other pieces of machines.

7.5.3. Inspection and Maintenance System

The main points of facility inspection and maintenance to be inspected and adjusted, and their suitable periods are shown in Table 7.5 for the building and Table 7.6 for the electrical and mechanical.

Table 7.5 Building Inspection and Maintenance System

Part of Building		Inspection Points	Inspection Period
Structure	Footing	1. Crack, deform, damage and settlement. 2. Submergence and floating of the building from the ground level.	3 years
	Column, Girder, Wall, Floor, Roof, Balcony, Stair	1. Crack, deformation, damage, rust, erosion, deterioration of painting, and loosening of connection.	
Finish	Floor	1. Crack, damage, fragmentation of surface, rust, erosion, abrasion, deterioration of paint, condensation in finishing materials. 2. Performance of waterproofing membrane. 3. Drainage of water exposed area.	1 year
	Stairs	1. Crack, damage, fragmentation of surface, rust, erosion, condensation, deterioration of paint, and rain leaking in finishing materials. 2. Deformation, damage or deterioration, and installation condition of non-slip.	1 year
	Wall	1. Crack, deformation, damage, fragmentation of surface, rust, erosion, condensation, deterioration of paint and rain leaking in finishing materials. 2. Crack, damage, and deterioration of sealant. 3. Deformation, rust, erosion or deterioration of paint and installation condition of metallic material.	Interior 3 years Exterior 1 year
	Door & Window	1. Deformation, damage, abrasion, rust, erosion or deterioration of paint, and condition of working & installation. 2. Crack, deformation, damage, abrasion and deterioration of sealant & airtight material.	1 year
	Ceiling	1. Crack, deformation, damage, and fragmentation of surface, rust, erosion, condensation, deterioration of paint, rain leaking and installation condition of finish. 2. Deformation, damage, rust, erosion or deterioration of paint and installation condition of curtain box & ceiling maintenance hatch.	Interior 3 years Exterior 1 year
	Roof	1. Crack, damage, deterioration and surface fragmentation of finish & expansion joint 2. Crack, damage or fragmentation of surface, rust and installation condition of parapet & top rail. 3. Performance of waterproofing membrane.	3 years

Table 7.6 Mechanical and Electrical Inspection and Maintenance System

Mechanical Equipment

Building utilities		Maintenance Item	Maintenance Period
Water supply, drainage system	Water supply and drainage	1. Check damages, rust, corrosion, noise and abnormal vibration.	1 year
		2. Check lubrication of bearings.	-ditto-
		3. Check operation of devices.	-ditto-
	Pipes and valves	1. Check damages, rust and corrosion.	1 year
		2. Check operation of valves.	-ditto-

Electrical Equipment

Building utilities		Maintenance Item	Maintenance Period
Lighting and motor control system	Lighting and motor control devices	1. Check damage inside of distribution board, rust, temp rising, noise and connection of cables.	1 year
		2. Operation test	-ditto-
		3. Operation test of protective devices.	-ditto-
		4. Check damages, connection of cables, rust, and temp rising of outdoor lighting fixtures.	-ditto-
	Feeder	1. Check damages, rust and temp rising.	1 year
		2. Check condition of installation and damages or rust on supporting materials.	-ditto-
Wiring system for outdoor		1. Check crack, damage, corrosion, condition and connection of cables.	
		2. Check damage, corrosion of pipes and supporting materials.	6 months
		3. Check crack, damage, level of lid of hand hall and man hall.	-ditto-
		4. Check deformation, damage and condition of hand hall and man hall.	1 year -ditto-
		5. Operation test.	-ditto-

Source: JICA Study Team

7.6. Particular Attentions to be taken for Operation and Maintenance

(1) Maintaining Consistency of Pavements for Tourist Street, Tourist Trails and Stairs

Because of no respectation in current pavement designs, re-pavement works are mostly done improperly (i.e. removal of stone pavements and covering with concrete mortar) after the sub-surface repair or maintenance works.

In order to sustain the consistency of the pavement design, GAM should issue strict regulations concerning on the method of installing new pipes or repairing sub-surface utilities not to replace by irrelevant pavement materials along the street, trails and stairs concerned.

(2) Maintaining Panorama Views of View Terraces

In order to avoid any obstructions to sustain the existing magnificent views at View Terraces, height and landscape controls in front of View Terraces should be implemented as a form of regulations or restrictions. If the Municipality owns the land, pruning of shrubs and trees into a certain height is necessary to maintain the views.

(3) Maintaining of Safety and Convenience of Pedestrians

Because some parts of pedestrian paths are occupied by commercial goods, signs and symbols, pedestrians feel inconvenience especially at busy hours of the day.

Maintaining smooth flow of pedestrians is also to sustain the safety of people walking on the street. In this regard, GAM should restrict the commercial activities on the street to control in certain limited areas where people have enough space to pass each other.

Chapter 8 Issues to be solved in further stage

There are still many issues to be solved by the Jordanian side to proceed further in the implementation stage.

8.1. Particular Issues

(1) Review of Procurement Schedule

The procurement schedule should be confirmed prior to the commencement of the procurement procedures. The procurement procedure should be updated according to the actual situations of issues of each component.

(2) Confirmation of acceptance to stop operation of shops for Tourist Street and Trails

The construction of the Tourist Street and Trails can not conduct without co-operation of the residents and shop owners for disturbance of their daily activities such as entry/exits, stopping the operation, etc.