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The Hashemite Kingdom of Jordan

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

Summary of Cost Estimates

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Chapter 1. Premises for Cost Estimations

Beside the development of the detailed design, temporary works, construction plans and methods and the draft tender documents were prepared for the respective sub-projects, in order to estimate the construction costs based on the necessary conditions.

However, because of the confidentiality of the contents of the cost estimation data prior to the procurement process, this summary and priced bills of quantities were prepared separately from Final Reports and Draft Tender Documents exclusively official use for the limited officials concerned.

1.1 Conditions of Cost Estimations

The conditions for the cost estimates are as follows:

(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 of Jordanian Dinar against one US dollar is 0.708 JD, and the exchange rate of Japanese yen against one 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 Conditions

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

Based on the detailed design developed, project costs for the respective sub-projects were estimated according to the bills of quantities prepared for the draft tender documents.

The bills of quantities were prepared based on the classification system of Construction Specification Institute (CSI), which is commonly used in the international practices and in Jordan, under the following work 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 and Windows and Glazing
Division -9	Finishes
Division -10	Specialties
Division -11	Equipment
Division -12	Furnishing
Division -13	Special Construction
Division -14	Convey System
Division -15	Mechanical
Division -16	Electrical

1.2 Components of Construction Cost

Construction Cost is composed of direct cost and indirect cost. The following section describes the components of the direct cost and indirect cost, which are basically divided into building projects and highway project.

1.2.1 Direct Cost (except Dead Sea Parkway Sub-project)

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 a 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.

1.2.2. Direct Cost (for Dead Sea Parkway)

The unit prices used in this sub-project have already acquired approval from the Ministry of Public Works and Housing in Jordan. However, it is studied hereinafter if the unit prices are applicable for International Competitive Bidding.

As for other sub-projects, the compound costs for main construction works are set based on unit prices issued by MPWH (as of 1998) and market prices in Jordan in reference with the standard rates of Japan.

According to a study of the compound cost list, it is confirmed that the unit prices adopted upon the agreement with MPWH are appropriate.

(1) Compound Price

1) The Unit Price for Construction Materials

The unit rates issued by MPWH (as of 1998) and market prices based on the local survey are taken into consideration.

2) Working Hours

The working hours of workers in the construction field is from 8 o'clock in the morning to 5 o'clock in the afternoon including 2 hours lunch break. Therefore, duration of 7 hours is adopted as the working hours for this sub-project in the calculation of the compound cost.

Generally, the working hours is 8 hours in Jordan. However, the site of the sub-project is located in a remote area, and it is assumed this will cause difficulty in labour force supply and increase in costs such as transportation fuels and others. Therefore, the work efficiency and overhead cost are adjusted by reducing the working hours to 7 hours.

3) Efficiency of Local Labour

The efficiency of local labour is obtained by comparing work cost for each work item in Jordan and work cost calculated based on the standard of Japan. For main work items the figures are as follows:

Item	Efficiency of Local Labour
Excavation	150% work efficiency is adopted in consideration of the site location which is on undeveloped hillside, and complicated land grades.
Backfilling	Work efficiency is the same as in Japan.
Pavement work	Work efficiency is the same as in Japan.
Concrete work	Work efficiency is the same as in Japan.
Re-bar work	Work efficiency is the same as in Japan.
Guardrail work	110% of work efficiency is adopted since this is detailed work.

4) This sub-project, differently from other sub-projects, includes indirect cost in unit prices of each item. Therefore, 19.6 %, as indirect cost in other sub-projects, is added to compound price for evaluation purpose.

5) The other conditions are the same as for other sub-projects.

1.2.3. Indirect Cost (except Dead Sea Parkway Sub-project)

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, etc.

For the calculation of the cost of Temporary and Preparation Works for each Sub-Project, the ratio of 2.5% of the direct cost is adopted, except for the Dead Sea Panoramic Complex Sub-project implemented in the Dead Sea area, for which a ratio of 2.8% is adopted because the site is far from the commercial districts and availability of temporary utilities for construction is limited.

As for the Raghadan Bus Terminal Sub-project, although the site is located in Amman, the rate of 2.65% of the direct cost is adopted due to the implementation of 2 phase construction which the temporary works are expected to be slightly larger than that of one phase construction.

Site Administration

The site administration cost includes direct personnel cost, site expenses, insurance, etc. Based on the analysis of 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.

Preliminaries include the cost for Temporary and Preparation Works as well as Site Administration are determined for the respective sub-projects depend upon the location of the project site and construction method as shown below:

Sub-project	Preliminaries (rate against direct cost)
Amman Downtown Tourist Zone	14%
Raghadan Bus Terminal	14.15%
National Museum	14%
Dead Sea Panoramic Complex	14.30%
Karak Tourism Development	14%
Historic Old Salt Development	14%

(2) Profit

Based on the analysis of actual prime projects currently being 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.

1.2.4 Indirect Cost (for Dead Sea Parkway)

As aforementioned, indirect cost is included and computed in unit prices based upon discussions with MPWH as well as normal practice of road construction projects in Jordan. However, only site direct cost (cost for the Owner side and Geological survey cost for this sub-project) is incorporated in Bill No.1 of the Bill of Quantities.

The site direct cost includes Engineer's site office, its furniture and maintenance as well as transportation vehicles and drivers for staff of the Owner side and supporting staff of its site office, and accommodation facilities for the Owner's staff, these indirect costs amount approximately 4.4% of the total construction cost.

After all the above conditions are considered, it is concluded that the quantities and the unit prices confirmed with MPWH are applicable for International Competitive Bidding.

1.3. Issues on Measurement and Cost Estimates

Because of unknown factors are envisaged in some construction works, the following quantities may have variations depending upon the actual site conditions:

Tender Packages	Quantities of work-components which may be subjected by variations	Necessary works to be applied or matters to be confirmed
Amman Downtown Tourist Zone	Retaining walls of Viewing Terrace	Need confirmation excavation
Raghadan Bus Terminal	Temporary works	Construction phase and temporary site
	Earth works	Need confirmation boring and excavation
National Museum	Earth works	Need confirmation boring and excavation
Dead Sea Parkway	Earth works and retaining walls	Need confirmation boring and seismic prospecting investigation
Dead Sea Panoramic Complex	Temporary works	Common use of temporary works with Dead Sea Parkway sub-project
Karak Tourism Development	Retaining walls of upper observation point	Need confirmation excavation
	Site works of Karak Castle Presentation	Removal of debris under the DOA supervision
Historic Old Salt Development	Retaining walls of Panorama Lookouts and behind Abu Jaber Building	Need confirmation excavation

Source: JICA Study Team

Chapter 2. Project Costs

The Construction Costs are summarized as shown in Table 1.

The Table shows the estimated costs required for the implementation of the Project in comparison with the allocated amounts for “Construction and Equipment” shown in the SAPROF Report prepared by OECF (called the “OECF Budget” hereinafter) in 1997.

The costs of the sub-projects, as shown in the right column, are estimated by the JICA Study Team based on the accepted detailed design. It is appeared that some tender packages are higher and others are lower than the OECF Budget.

The aggregated amount of estimated costs is less amount of approximately [40 million JD](#) from the total amount of the OECF budget as shown in the left column in Table 1.

2.1 Construction Costs for the respective Tender Packages

The detailed breakdown of the estimated construction costs for the respective Tender Packages are shown in the priced bills of quantities under the following volume of documents:

Tender Packages	Volume No.
Amman Downtown Tourist Zone	Volume 1PBQ
Raghadan Bus Terminal	Volume 2PBQ
National Museum	Volume 3PBQ
Dead Sea Parkway	Volume 4PBQ
Dead Sea Panoramic Complex	Volume 5PBQ
Karak Tourism Development	Volume 6PBQ
Historic Old Salt Development	Volume 7PBQ

Source: JICA Study Team

Table 1 Summary of Construction Costs of the respective Sub-projects (Tendering Package)

Exchange Rate : 1JD = US\$ 0.708, 1US\$ = JP¥106.2-

Rate : 1JD = JP¥150.00-

SUB-PROJECTS	*1) OECF Budget	*2) D/D (FR)		(%)
	Amount (JD)	Amount (JD)	Amount JP Yen	
(I) INTERNATIONAL COMPETITIVE TENDER PACKAGE (More than 900 Million Yen)				
1 Raghadan Bus Terminal	5,600,000	8,348,000	1,252,200,000	149.1
2 National Museum				
a Building/Landscape	6,743,750	8,808,756	1,321,313,400	130.6
b Exhibition/Furniture	2,850,000	3,752,244	562,836,600	131.7
Sub-total	9,593,750	12,562,000	1,884,300,000	130.9
3 Dead Sea Parkway	8,257,400	8,757,155	1,313,573,250	106.1
Sub-total	8,257,400	8,757,155	1,313,573,250	106.1
ICB Package Total	23,451,150	29,667,155	4,450,073,250	126.5
(II) LOCAL COMPETITIVE TENDER PACKAGE (400 M. Yen - 900 M. Yen)				
1 Dead Sea Panoramic Complex				
a Building/Landscape	2,285,600	2,884,000	432,600,000	126.2
b Exhibition	600,400	456,000	68,400,000	75.9
Sub-total	2,886,000	3,340,000	501,000,000	115.7
2 Historic Old Salt Development				
a Restoration of Building (Museum)	640,000	922,000	138,300,000	144.1
b Exhibition	744,000	416,000	62,400,000	55.9
a Tourist Trails	1,401,000	835,000	125,250,000	59.6
b Lookout	125,000	426,000	63,900,000	340.8
c Public Space	1,820,000	413,000	61,950,000	22.7
Sub-total	4,730,000	3,012,000	451,800,000	63.7
LCB Package Total	7,616,000	6,356,000	953,400,000	83.5
(III) LOCAL TENDER PACKAGE (Less than 400 Million Yen)				
1 Amman Downtown Tourist Zone				
a Tourist Street	3,440,000	1,170,000	175,500,000	34.0
b Tourist Trails (View Terrace)	1,345,200	368,000	55,200,000	27.4
c Downtown Visitor Centre	605,000	188,000	28,200,000	31.1
Sub-total	5,390,200	1,726,000	258,900,000	32.0
2 Karak Tourism Development				
a Karak Castle Pathway	441,000	217,000	32,550,000	49.2
b Karak Castle Museum	450,000	411,000	61,650,000	91.3
c Visitor Centre	615,000	68,000	10,200,000	11.1
d Tourist Street	1,656,000	494,000	74,100,000	29.8
e Castle Observation Points	251,800	536,000	80,400,000	212.9
Sub-total	3,413,800	1,726,000	258,900,000	50.6
LB Package Total	8,804,000	3,452,000	517,800,000	39.2
GRAND TOTAL	39,871,150	39,475,155	5,921,273,250	99.0

Note : 1) OECF budget based on the SAPROF report in March 1997

2) Costs estimated based on the first draft of the Tender Documents in March 2000

Source: JICA Study Team