4.2.3 Institutional Measures

(1) Heritage Conservation

This project, to be located in one of the oldest sections of Amman at Ras al Ain, can be designed to have a substantial beneficial effect on the surrounding neighborhoods that slope into the valley. The natural setting for the museum and Civic Center is extraordinary, enclosed on all sides by sloping neighborhoods in a natural amphitheater, with the exposed escarpments of Jebel Amman's southern slopes vividly reflecting Jordan's unusual geomorphology. The urban setting is also extraordinary, reflecting a varied fabric of late Ottoman and contemporary residential and commercial structures. One or more neighborhood improvement projects could be designed to link the Civic Center with the adjacent neighborhoods through the use of pedestrian streets, improved stairways and footbridges. The neighborhood atop Jebel Amman, which already is growing in popularity with tourists, will then be well linked with the site, as well as neighborhoods to the south of it. The catalytic role of the Civic Center, to include the museum, can in this way preserve the architectural heritage of Old Amman.

(2) Community Considerations

a. Raising Awareness

To raise the awareness of the nearby neighborhoods regarding the purpose of the project and the opportunities that it will create for the local population, briefings will be held at nearby high schools at six month or yearly intervals for students and parents for several reasons. A MOTA representative and a project director can make presentations in order to achieve several goals in these meetings :

- They can inform the population about the upcoming project, and get reactions about it from the population.
- They can explain the behavior of foreign visitors wandering through their neighborhoods and into their shops, yards and mosques, and how to best deal with them in a hospitable manner.
- They can explain future work opportunities in tourism activities such as the museum, restaurants, shops, tour guidance, and the like; related vocational training requirements can also be explained.
- They can stress the usefulness of English language phrases and conduct a brief lesson, to be co-ordinated with the school's foreign language instruction.

b. Upgrading of the Urban Environment

The museum project will be undertaken with several others also included in the Civic Center. Consequently, it is not easy to isolate the effects of the museum alone on the welfare of the population in the surrounding neighborhood, since other projects will be built roughly at the same time. However, there will be a localized benefit of "recycling" old neighborhoods that have suffered decline over the past 20 years, from bustling market and business activity to semi-vacant low value market areas, now accommodating low income families, low rent workshops and stores, and foreign workers, in particular Egyptians and Iraqis. The process of the upgrading of a neighborhood and displacement of poor with richer classes is a clear objective of the municipality in central Amman. The result of the museum and other Civic Center projects will probably include the displacement of low income groups out of this sector to other areas of Amman, followed by small business investment in workshops for souvenirs and crafts, apparel, restaurants and refreshment stands, and possibly guest houses and art galleries.

The effect of these projects will be felt not only on the adjacent hillsides, but also following the valley floor eastward to the King Hussein Mosque along the twin arteries Quraysh and King Talal Streets. This is the core of Old Amman where a process of gentrification is already beginning. As catalysts of urban renovation the proposed project will accelerate this process.

c. Income & Employment Generation

The standard benefits related to international tourism will be achieved by this project in the following way. As an additional attraction in Amman, a share of foreign visitors will extend their stay to include a visit to the museum. The longer average length of stay of these tourists equates to increased expenditure, hard currency earnings, income and employment generation in Amman. This benefit will not be localized only in the museum vicinity because tourists stay in hotels spread across the Amman area, and spend their time in different parts of the city.

d. Welfare of Women

Virtually all of the permanent jobs created by the museum, both professional and support staff, will be accessible to suitably qualified women. In the world of archaeology, women are well represented in Jordan already, and it is probable that a large share of the jobs at the museum will be staffed by women.

4.2.4 Infrastructure and Environment

Relating infrastructure and environment were studied. Details are found in the Appendix 4.2.

Transportation
Traffic circulation plan is needed.

Water Supply, Sewerage and Drainage
Not critical but improvement in connected systems are desired.

Waste Management
A small scale incinerator is desirable.

Initial Environmental Examination (IEE)
IEE has been carried out, showing potential problems as regard to the sitting of the project. Sensitive issues are landscape and floods. EIA must be performed for such issues, but is of limited significance if not integrated in an EIA of the master plan for the Ras Al Ain site.

4.2.5 Economic Evaluation

(1) Project Components

The proposed Project would consist of the following four items.

(i) Planning and Design
(ii) Building Construction
(iii) Furniture, Furnishing and Equipment Procurement
(iv) Human Resources Development

(2) Project Justification

a. Benefit

The National Museum Project would make Amman more attractive, for not only domestic visitors, but also foreign visitors. This Project would induce visitors to stay longer (generation of additional tourist nights) in Jordan.

In this analysis, the extra tourist-nights generated by tourists in the country because of the National Museum were taken as the benefit.

b. Cost:

The maintenance and operating cost of this Project were assume at 10 % of the total initial project cost after the completion of this Project in 2000.

(3) Economic Analysis

It was assumed that 10 % of additional tourist-nights of Amman Tourism Area would the average net contribution to the national economy by a tourist-night would be US 100 dollars including his admission charge, accommodation and other extra expenditure.

Number of tourist-nights estimated for the Amman Tourism Area is 2,962 thousand in 1995, 3,757 thousand in 2000 and 5,562 thousand in the year 2010.

The EIRR (Economic Internal Rate of Return) was calculated at 53.32 % for the Project. The tabulation for the EIRR is shown below.

Table 4.2.2 Cost and Benefit Stream of National Museum

Year	Cost			Benefit				Ben.- Cost
	Construc-tion	Mainte-nance	Total	Additional tourist-nights	Established share (%)	Expenditure per person (US$)	Total	
1996	0.00	0.00	0.00	144,111	0.0	0	0.00	0.00
1997	0.40	0.00	0.40	295,231	0.0	0	0.00	-0.40
1998	0.50	0.00	0.50	453,701	0.0	0	0.00	-0.50
1999	4.80	0.00	4.80	619,879	0.0	0	0.00	-4.80
2000	8.80	0.00	8.80	794,140	0.0	0	0.00	-8.80
2001		2.18	2.18	944,471	10.0	100	9.44	7.27
2002		2.18	2.18	1,100,817	10.0	100	11.01	8.83
2003		2.18	2.18	1,263,419	10.0	100	12.63	10.46
2004		2.18	2.18	1,432,527	10.0	100	14.33	12.15
2005		2.18	2.18	1,608,402	10.0	100	16.08	13.91
2006		2.18	2.18	1,791,314	10.0	100	17.91	15.74
2007		2.18	2.18	1,981,545	10.0	100	19.82	17.64
2008		2.18	2.18	2,179,388	10.0	100	21.79	19.62
2009		2.18	2.18	2,385,147	10.0	100	23.85	21.68
2010		2.18	2.18	2,599,140	10.0	100	25.99	23.82

EIRR= 53.32%

Note: Currency unit is US$ million unless specified.

Source: JICA Study Team

Appendix 4.2

A. Transport

In a peak month 100 buses and 700 cars are expected each day (50 % by tourist buses and 30 % by cars) and 20% by public buses, taxis and on foot . The total of 800 vehicles is an insignificant addition to the existing flow of 60,000 daily vehicles, if access traffic is managed well. However, Ras al Ain is a nodal area of several arterial roads and is already one of the most congested areas in Amman. Therefore, development of the area needs an overall traffic management strategy.

In addition, safe, easy and comfortable pedestrian access must be provided for the 20 % (1,300 p.d) visitors approaching the site on foot.

a. Parking space

A maximum of 4,000 sqm of parking space will be required. However, this may be reduced if the use of public transport including taxis, is promoted.

Table 4.2.3 Parking Space Requirement

Vehicle	Calculation	Area required (sq.m)
Buses for visitors	65 sqm * 25 spaces	1,625
Cars for visitors	25 sqm * 88 spaces	2,200
Cars for employees	25 sqm * 4 spaces	100
Total		3,925

Source: JICA Study Team

b. Access

The vehicle entrance and exit should be separated and be connected to the main road via separate bays. Pedestrian access must be free from vehicle traffic, must link public transport stops, (which should be close to the entrance) with the museum's reception.

A feasibility study is being carried out for a new light rail system for the Ministry of Transport in 1995. The preliminary report, identified a station at the new city hall and another at the junction of Ali ibn Abi Talib Street and Prince Hasan Street. The improvement of the pedestrian environment between the national museum and these stations and the coordination and integration of the stations with the master plan of the area is essential.

B. Water Supply, Sewerage and Drainage

a. Water Supply

Based on the forecast of tourists in the year 2000, the water consumption of tourists and of local inhabitants of Greater Amman is estimated as follows (assuming a three day average tourist stay and daily water use of 200 l/c/d and 160 l/c/d for inhabitants).

Table 4.2.4 Comparison of Water Demand

Consumer	Calculation	Total
Tourists	884,000 x 200 litters x 3 days	0.53 MCM
Local inhabitants	2,151,293 x 160 litters x 365 days	125.6 MCM

Source: JICA Study Team

The water demand of tourists is 0.4% of that consumed by local inhabitants and of little significance in terms of volume. However, in order to maintain supply during the summer, when the supply is limited to two days per week, storage tanks for the museum alone or for the Civic Center as a whole will be required.

b. Sewerage

The area is served by a sewage system. During periods of heavy rainfall, heavy runoff sometimes enters this system and overflows into the city streets. To avoid this problem, the drainage system needs to be properly connected to the existing culvert to maintain the separate integrity of the drainage and sewerage systems. Oversizing of systems may be advisable to avoid re-excavation and reconstruction of systems within the mid-term.

c. Drainage

A drainage culvert has been built along the valley floor to contain the seasonal river flow eastward into the Zarqa River. The capacity of it appears to be adequate. However, to the west of the site at the major road intersection of Princess Basma Ave and Al Munim Riyad Ave, the drainage culvert is not finished and urgently needs to be completed. There is a proposal to expand capacity at Ras al Ain with a second parallel culvert on the north side, possibly under a new roadway.

C. Waste Management

a. Existing and Projected Situation

The considerable number of visitors to this museum and the diversity of its activities will generate a significant volume of waste. Waste generated by the commercial and domestic properties in the area is currently collected by the municipality by screw compression, rear end loaders from 1.1 m3 containers located on main streets through out the city. The additional waste generated is estimated to be between 200 and 500 kg per day depending on size and the range of services offered, which is equivalent to the waste generated by 250 - 625 residents. This quantity would be significantly increased with the addition of waste generated by the City Hall and other proposed components of the Civic Center. If this site is also selected as the site for the museum, it could provide a demonstration opportunity for the development of a dedicated, integrated waste management system for the entire complex.

b. Recommendations

The type of waste generated by the administrative, conference and public usage of the site would consist essentially of paper and packaging both with high calorific values suitable for combustion in a small dedicated incinerator. The heat generated during combustion could be used to heat water for use in the complex. The higher organic content of the waste from the catering facilities would probably be diluted sufficiently by the high calorific value waste to allow adequate combustion. However, the organic material could be separated at source and the recyclables sold to local traders. Organic waste and ash would be disposed of at the proposed municipal composting facility at Russyfa, and the hazardous waste at the proposed hazardous waste landfill at Qasr al Tuba.

The incinerator and recycling center would demonstrate the acceptability of small scale incineration even in sensitive urban environments and would serve to introduce a technology to Jordan which will increasingly become one of the principal planning elements for remote locations. It could also be incorporated into a museum exhibit as part of a "Caring for the Environment" display. Such a feature must be incorporated at the conceptual stage to ensure that it is fully integrated within the architectural design.

c. Human Resources

Human resource development for the waste management aspect of this project will be achieved through the training of existing government personnel and the holding

of seminars for informing those in the private sector who may, in the future, be involved in waste management. The various seminars are identified in Table 4.2.5.

These seminars will have to be repeated at regular intervals as awareness of waste management issues increases in both the public and the private sectors and to ensure that new entrants to the industry are full aware of the principles and standards now being required.

d. Operational Arrangements

The responsibility for the operation and maintenance of the museum may lie with the Museum Institute within MOTA, GAM or an independent operational company. Potential exists for contracting out the waste management service for the municipal area containing the National Museum.

D. Initial Environmental Examination (IEE)

The Civic Center area combines different functions: a road system, drainage system (culvert), a public park and open spaces, urban redevelopment, and also a protected water source in its midst. The site presents the following problems (and potentials):

- A splendid urban valley, providing an exceptional visual landscape. The site's landscape value is important because of its developmental potential but under the limitation of the following constraints :
- a protected water source, requiring strict protective measures; and
- the existing culvert infrastructure, that could be used as a large pathway and as the core of the pedestrian access.
- Noise and air pollution due to traffic, presently exacerbated by the construction of the City Hall.
- Competition between land uses (roads, the park, the water source, water control infrastructure, and several public buildings under construction or planned).
- The green park of Ras al Ain, a good example of lack of integration of the site with its surroundings due to poor pedestrian access, a location below street level, topographic and traffic constraints, poor quality of the sound environment (noisy traffic), the lack of maintenance, and presence of unhealthy conditions (litter).

The water source of Ras al Ain is a major source of drinking water for Amman. The flow fluctuates between 8 to 416 l/sec. according to season. Since the water source is superficial ground water, the area of Ras al Ain is extremely sensitive to the impact of any potentially pollution activities above ground.

The main problems of the area from the environmental point of view are summarized as follows:

- Negative Visual Effect : The museum may have to be more than 15m high in order to compensate for the limited size of the site. In such a case, it could create a negative visual effect within the landscape of the valley floor. However, the City Hall already under construction has been designed for about a 20m height, which means that the intrusive effect of the museum height will be minimized in the future land use context.

- Risk of Flooding : The site is susceptible to periods of flooding in winter for the following reasons:
- Mediterranean climate
- Location or the floor of the Wadi
- Drainage bottleneck (junction of the Abdoun watershed and of the Wadi Edh Dhira)
- Rapid runoff from urbanized watersheds

This risk of flooding will be minimized once the culvert is in full operation. However, this risk will not be completely resolved for the following reasons:

- Design Standard : Water control has been designed for a 1% occurrence (310m3/sec. once every 100 years). The key issue arises as to the acceptability of such a flooding risk for a national museum containing some objects of very high value, even irreplaceable treasures.
- Dam Effect of Culvert : The culvert should be efficient to manage watershed runoff, but it will function as a dam towards the runoff from the valley's lateral slopes, causing increased humidity and other possible effects, and frequent minor flooding. This is because the height of the culvert is 2 or 3 meters higher than the surrounding ground.

There are induced effects of the museum project together with the other projects of the Civic Center, which are increased traffic density, and increased sources of noise and air pollution. There is a risk, particularly in the absence of a master plan, of producing a road borne urban area , which means priority of motor transportation, at the expense of pedestrian networks which would effectively link the Civic Center to the surrounding neighborhoods.

There are possible additional side effects like denser construction of the valley and surrounding grounds (increasing impermeability of soil that reduces rainfall absorption), and the possible loss of the potential for a major green park in the inner

city. The area is particularly well suited for a green belt/parkland because of its location along the valley floor above superficial ground water, together with the need to protect the area of recharge. Careful study of these issues is essential before the museum (or any other major structure) is built at this location.

E. Environmental Management

Environmental protection will be ensured by the choice of measures as a result of the IEE study. There are measures which are taken into the design of the project (urbanism requirements, sanitary requirements, environmental requirements) and measures specific to the conditions of the site and the possible impacts of the project on the site (landscape protection, accesses, drainage conditions).

It is clear that the environmental impact evaluation (EIA) must be performed for the master plan of the area as a whole. It is not possible to devise solutions for the enhancement of the quality of the living environment if all elements of the site are not taken into consideration. Once the master plan has been defined, EIA could be performed in order to find out the most suitable specific location of the museum and other projects as regards to the amenities of the site (landscape, green areas, walking paths), safety requirements (traffic, runoff and drainage), pedestrian and motor access, and the general acceptance of the community.

Possible measures for environmental protection are:

- Limitation of the museum's height for optimal integration into the topography and the best protection of the landscape.
- Raising the ground level of the museum to at least at the level of the culvert, in order to ensure evacuation of water runoff. There are however alternatives like an additional lateral culvert in order to divert runoff from the nearby slopes downstream, or pumping facilities.
- Optimal sitting of the facility, to take into account the problem of water drainage as mentioned above, together with the protection and promotion of natural amenities (green, landscape, quietness) and access.
- Inclusion of large green areas around the museum and between the planned facilities of the Civic Center, in order to limit the problem of runoff and to protect the facilities in the Center as much as possible. This aspect will increase the appeal of the area for visitors, and complement the surrounding urban environment.

There are some optional features that could be integrated into the museum's design for display to the visitors, including water and energy conservation design features. The museum could be designed as an example of ecological sensitivity in construction, and serve as a pilot project of the Environmental Action Plan of

Jordan. Possible features could include storage of rainwater storage for use in sanitary flushing, water recycling, and the use of solar panels for generation of electricity needed in summer for air conditioning.

Table 4.2.5 Waste Management Training

Seminar Contents	Personnel
Public Sector	
Technical training in the planning, environmental implications and legal framework of waste collection and disposal (4 days)	relevant contact persons within: - the Ministries of Health, Municipalities Rural Affairs and Environment, Planning, Tourism, Water and Irrigation; - Environment Corporation - Natural Resources Authority - Department of antiquities - Jordan Valley Authority (as appropriate) - Aqaba Region Authority (as appropriate) - Managers responsible for waste management within the relevant municipality
Technical training in the operational and management procedures planning, environmental implications of waste collection and disposal (4 days)	
Awareness of waste management issues and their implications for tourism (1 day)	The Governor, Members of the Municipal Council and community leaders (as appropriate),
An introduction contract procedures for contracting out and concessions (2 days)	- relevant contact person within the Ministries of Finance and Supply - Managers responsible for waste management within the relevant municipality
Private Sector	
Potential Waste Management operators Contract persons within the Ministries of Finance Industry and trade, Municipalities and Rural Affairs (1 day)	opportunities for waste management operators in Jordan, contact arrangements and regulation
Potential developers and financiers of tourism facilities (1 day)	Planning objectives and requirements, standards and regulation

Source: JICA Study Team

4.3 Historic Old Salt

4.3.1 Concept and Rationale

To prepare the inherently charming Old Salt for international tourism by a combination of small scale restoration and beautification work at selected parts of the city, as a showcase of "cultural tourism" thus far neglected in Jordan but having a large potential for future growth.

(1) Objectives

- To create a wholly new tourism product from a neglected urban resource i.e. cultural historical and folklore life;
- To broaden and diversify the product profile of Jordanian tourism from archaeology based to the culture based tourism;
- To introduce a new perspective in the tourism product development in Jordan; and
- Eventually to enhance the appeal and attractiveness of Jordan as a tourist destination in the world tourist market.

(2) Rationale

In the past Jordan's tourism appeal has been too narrowly centered around antiquities, thus neglecting a large market segment. Many tourists are interested in a much broader cultural tourism, in which visitors can experience various activities in an atmosphere different from his own. Old Salt is an excellent resource out of which such cultural tourism can be established. This project therefore can become a pioneer project which other cities and sites in Jordan may emulate.

(3) Related Projects

The Salt Development Corporation (SDC) NGO, which is supported by local citizens, has commissioned a plan to restore many of the Salt's fine old buildings. However, lack of funds has prevented its implementation. This project will realize some and go beyond some of those original plan to revitalize the city. The project will also benefit the Salt Handicraft Center project which is funded by Italy and operated by the SDC and the Queen Noor Foundation.

4.3.2 Preliminary Plan

(1) Project Components

a. Visitor Center Featuring "Historic Old Salt"

Visitor Center with "Historic Old Salt" Museum will be created inside a restored historical building located at one of the tourist nodes (see Figure 4.3.1). The building to be restored is the Abu Jaber Building, which the Salt Development Corporation and the owners of the building have both agreed should be restored and used as a public facility.

The building would contain the following facilities:

Visitor Center

- Visitor Center providing brochures and maps identifying buildings of interest and other attractions.
- Volunteer group of the local community will organize periodical walk tour on weekend or high season.
- MOTA district office would be located in the Visitor Center.

"Historic Old Salt" Museum

- Major exhibitions at the "Historic Old Salt" Museum showing the history of Salt and its architecture with photos, pictures and models.

Handicraft Shop

- A model handicraft shop will be established through SDC. It will act as an outlet of the Salt Handicraft Center.

Tourist Amenities

- Toilets and rest facilities.

Existing shops

- The ground floor of Abu Jaber Building is currently occupied by local shops of daily necessities. After the restoration, the appearance of existing shops must be compatible with the new status and purpose of the building.

b. Beatification of Public Spaces and Sign Posting

Tourist trails will provide tourist circuits of various length with attractive and informative sign boards, improved foot paths, rest facilities, restored suq, panorama view terraces, etc. Tourist trails and tourist nodes are identified in Figure 4.3.1.

Improvement of Model Tourist Trails and Tourist Nodes

- Improving pavement, drainage, water supply piping, underground wiring (in case necessary), garbage collection, car parking lots, lighting;
- Providing attractive street furniture (benches, shelters, etc.) and art works.

Providing sign boards for all Tourist Trails

- Informative boards for major buildings of interest;
- Attractive direction signs at adequate intervals (30 to 50 m);
- General town map boards at all Tourist Nodes and Transportation Nodes;
- Panorama Map boards at Panorama Spots.

Rest Facilities

- Improving toilets and rest facilities (benches, shelters, etc.) at Hill-top Park, Al Qala'a, As Sa'aha;
- Providing rest facilities (benches, shelters, etc.) at panorama spots.

c. Training of Managers and Workers

The above facilities should be operated to international standards. Training of managers and workers will therefore form an important part of the project. Areas of training will include:

- urban facility planning;
- museum management;
- tourist service management;
- tourist marketing; and
- tourist service practices.

Active cooperation should be established with Jordanian universities having courses on tourism. Training in a foreign donor country should be a part of the assistance program provided by the country for this project.

Figure 4.3.1 Historic Old Salt Project Components

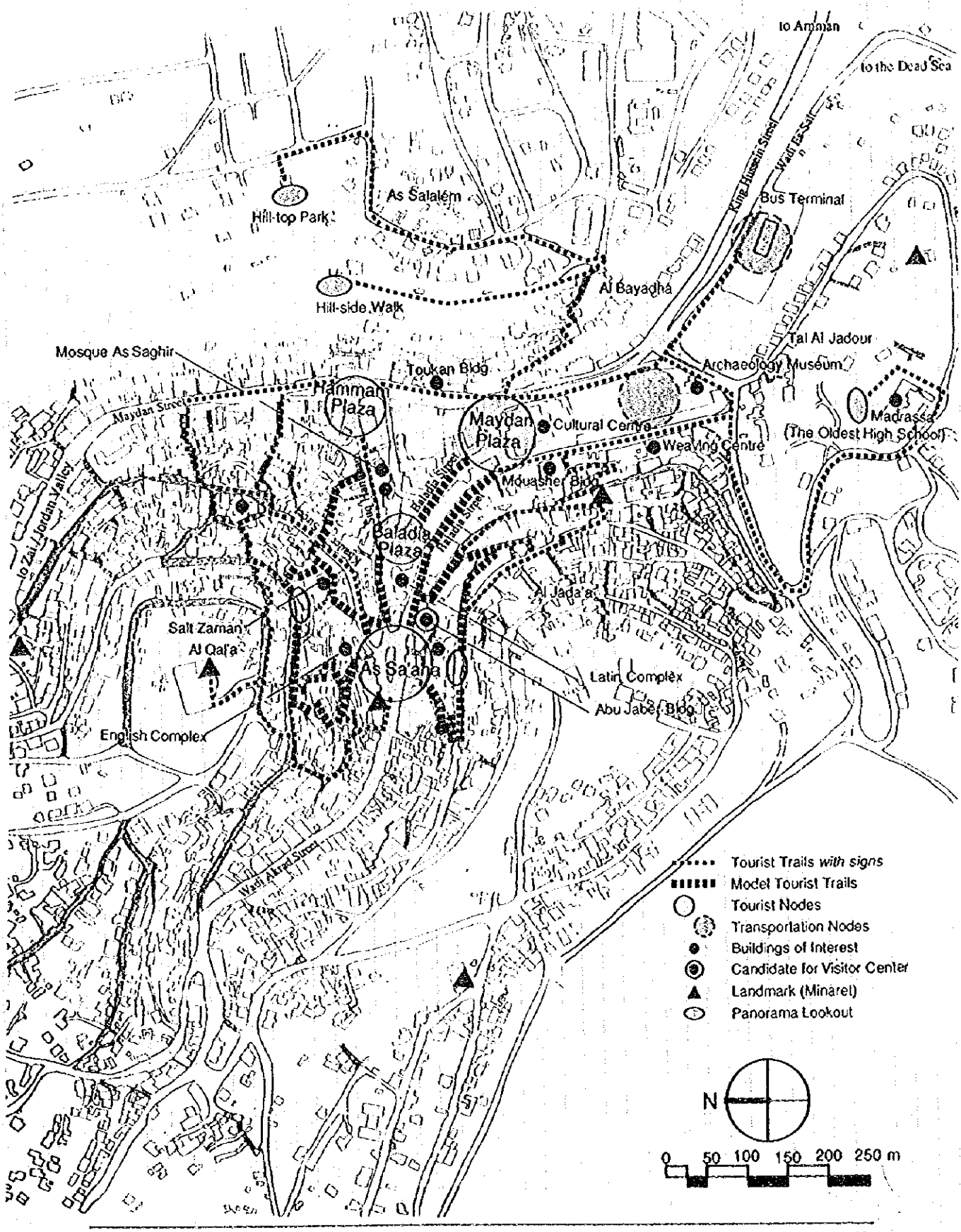
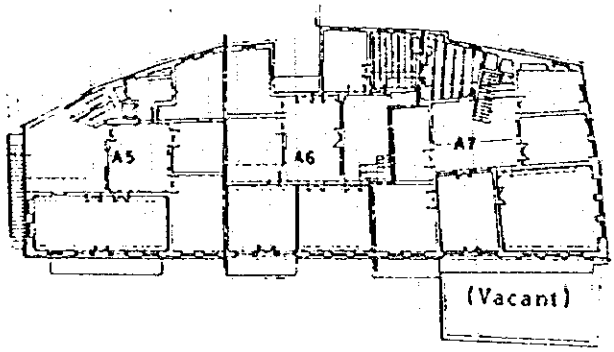
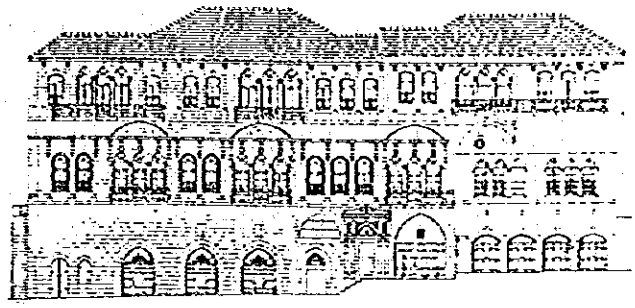


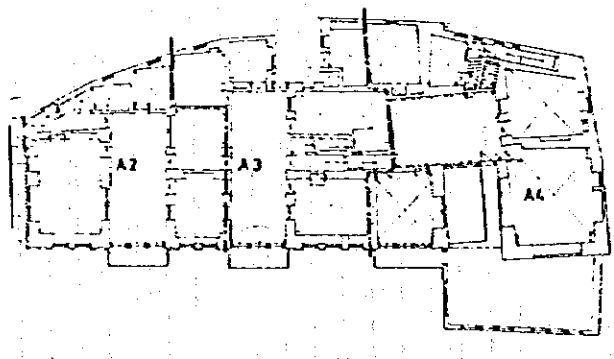
Figure 4.3.2 Candidate Building for Visitor Center



Second Floor Plan

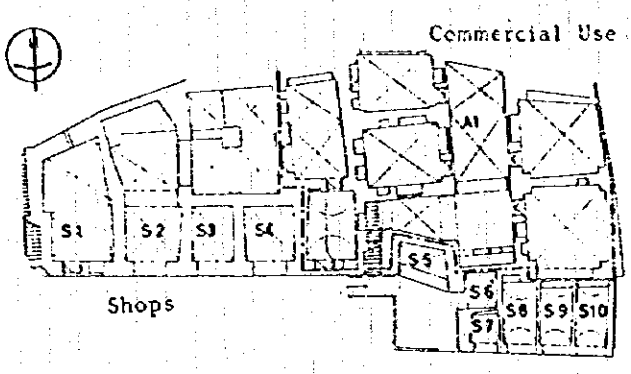


North Elevation to Baladia Street

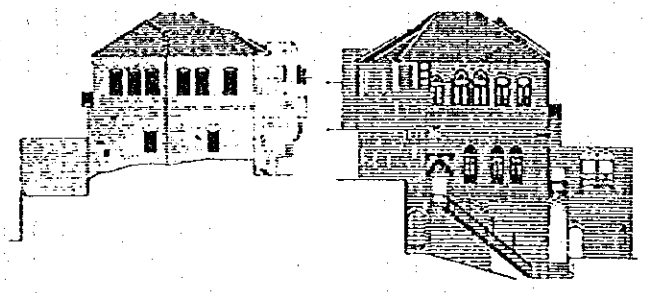


First Floor Plan

South Elevation



Ground Floor Plan



West Elevation

East Elevation

0 2 5 10 m

Source: Salt Development Corporation

Figure 4.3.3 Plan of Visitor Center with Historic Old Salt Museum

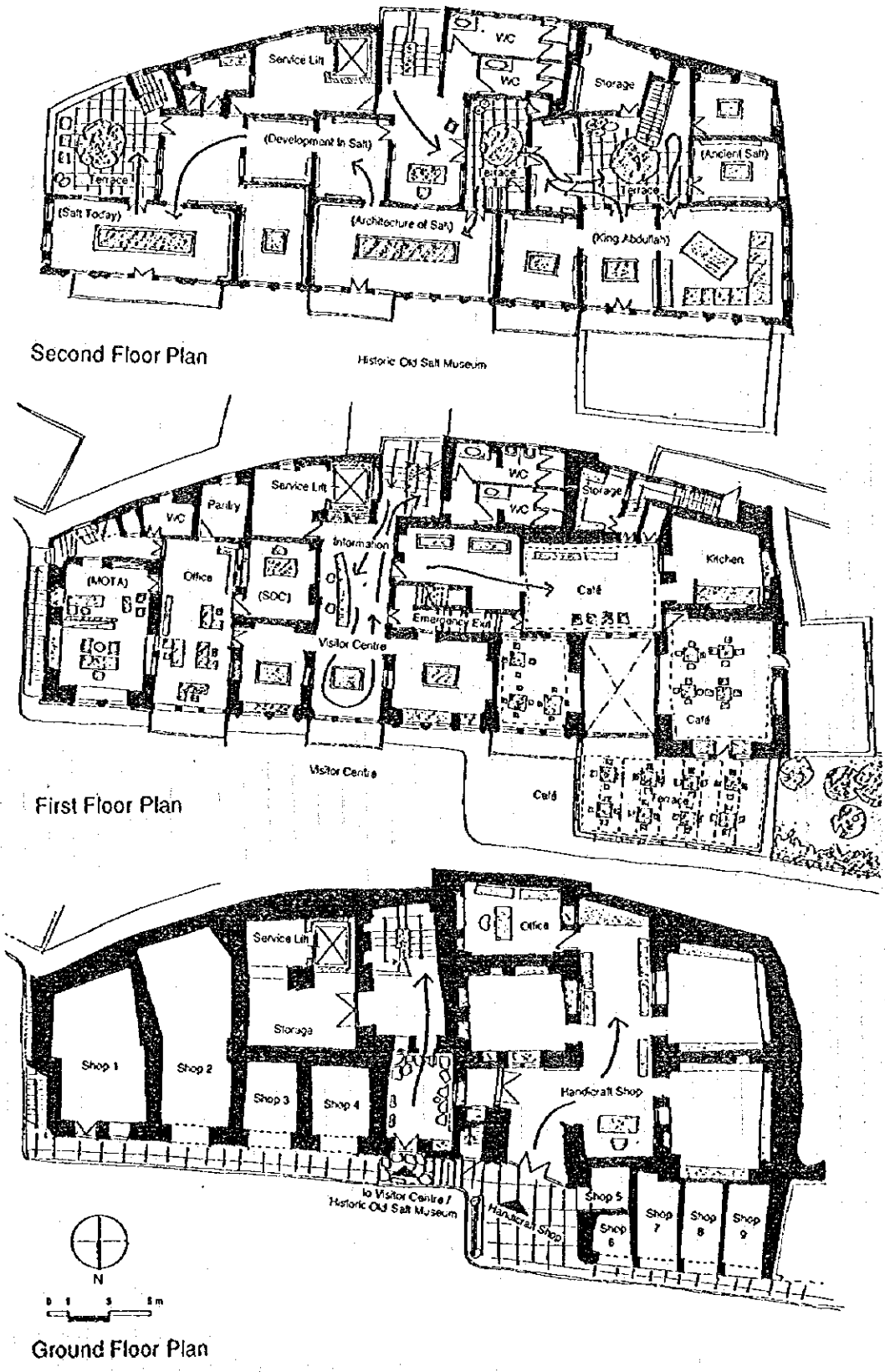
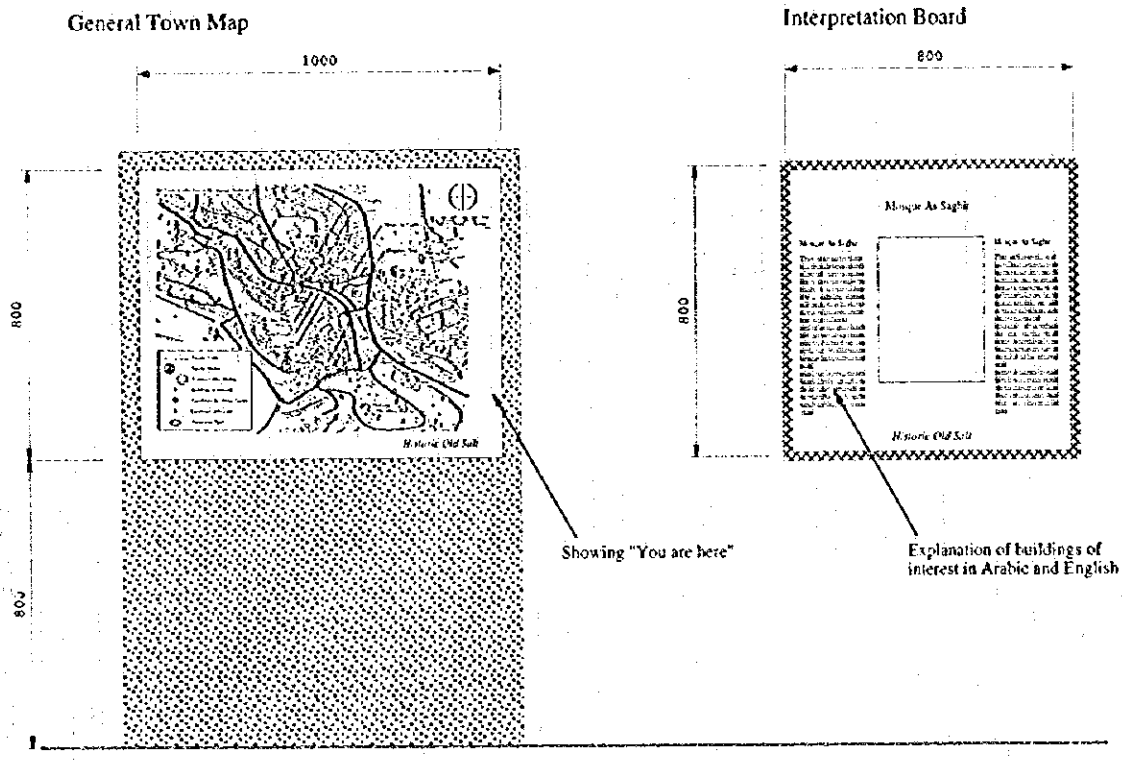
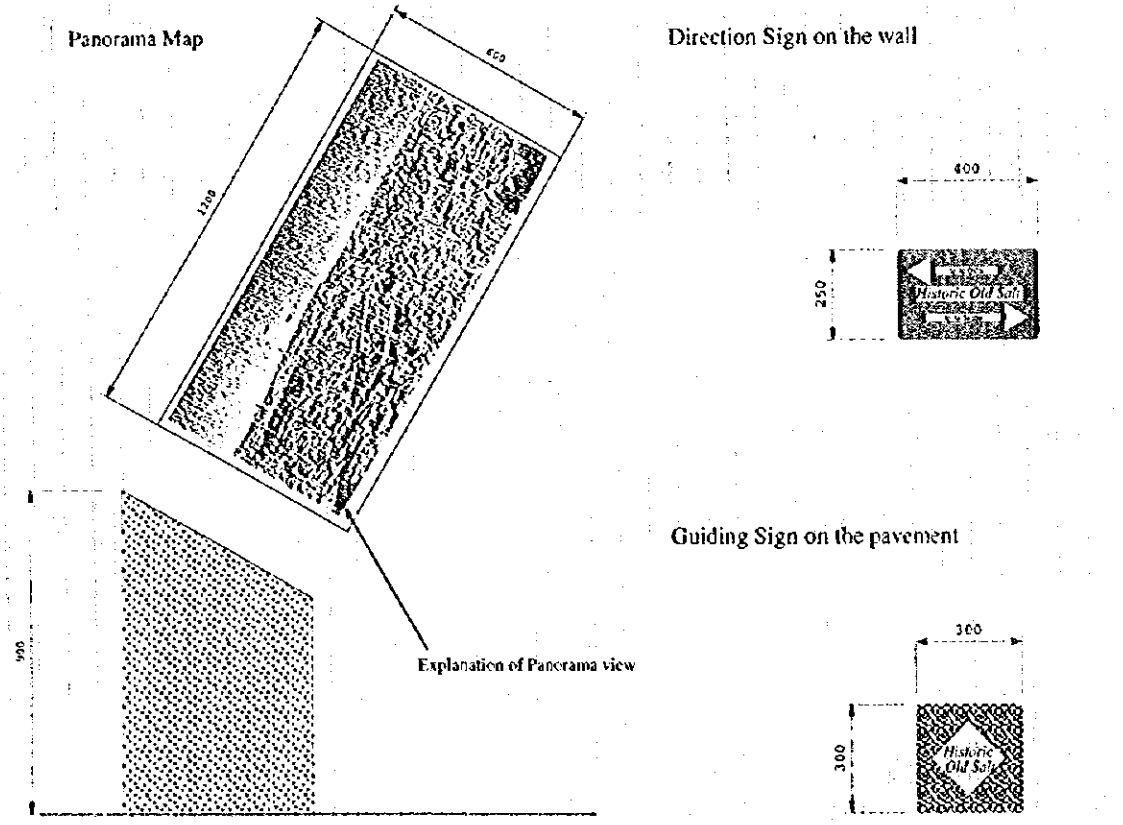


Figure 4.3.4 Signs and Maps for Historic Old Salt





(2) Cost Estimates

Preliminary estimates are shown as follows for the purpose of indicating the size of the project.

Component		Cost US$ million
a. Visitor center with museum	Planning and Design	0.3
	Restoration and renovation	1.3
	Exhibition equipment	0.7
b. Public spaces	Planning and Design	0.7
	Improvement of model tourist trails	1.5
	Improvement of tourist nodes	1.8
	Improvement of other tourist trails	0.5
	Improvement of panorama look outs	0.5
c. Training	Overseas Training	0.2
	Domestic Training	0.1
Total		7.6

(3) Implementation Structure

a. Project Development

The project requires a clear statement of support from a high level government body such as the Higher Council for Tourism. The primary participant is the Salt Development Corporation, assisted by MOTA and Salt Municipality. The table below identifies the parties responsible for the developmental and operational phases of the undertaking. There is a strong parallel between this project and the Amman and Karak ones, which also are set in developed urban areas. Because the SDC has been spearheading the urban revitalization effort in Salt since its creation, it is the most natural entity to undertake this project. SDC and MOTA jointly share responsibility for the further study of this project, and for seeking foreign backing for it, which may be possible from a development agency. They also have a responsibility to ensure through careful monitoring of works, that restoration work of the Abu Jaber Building is done in accordance with approved designs and according to acceptable methods that are not harmful to the building.

b. Operating Arrangements

The ongoing operation of the Visitor Center and of the Abu Jaber Building can be carried out by SDC. MOTA can operate its district office and information center, and SDC can operate the Historic Old Salt Museum. A capable party such as a university or museum institute can be an advisor to the museum. Rentals paid by

building tenants may be sufficient to cover the operating costs of the building.

Table 4.3.1 Old Salt Project Implementation

Component	Development	Operation
Abu Jaber Bldg.	SDC (MOTA assistance)	SDC
Historic Old Salt Museum	SDC	SDC / MOTA
MOTA Regional Office / Information Center	SDC (MOTA assistance)	MOTA
Public Space Improvement	SDC, Municipality	Municipality or Contractor

Source: JICA Study Team

(4) Implementation Program

Historic Old Salt	96	97	98	99	2000	US$ million
a. Visitor Centre						2.3
b. Tourist Trails				Model Trails		5.0
				Nodes		
					Panorama	
c. Training				Overseas	Domestic	0.3
Cost in US$ million	0.2	0.6	4.1	2.6	0.1	7.6

B/D D/D Implementation

4.3.3 Institutional Measures

(1) Heritage Conservation

One objective of this project is to spur additional private investment in Salt in the form of renovation of old buildings, facade restoration and the like. Restoration of the prominent landmark structure, the Abu Jaber Building, will be a catalyst for investment in central Salt. To preserve the integrity of the architectural environment, and safeguard against inconsistent or unattractive features of style or restoration methods, the Salt Development Corporation will have to be vigilant in assisting the city to monitor designs and execution. Moreover, once organs such as the Jordan Architectural Heritage Society (in formation), or the Jordan National Trust (proposed) are started, they also must monitor projects as a disinterested party, for consistency and compliance with approved plans. Some poor work has already been done at Salt, and increased vigilance is essential to avoid additional mistakes.

(2) Community Considerations

a. Upgrading of the Urban Environment

The office of the Salt Development Corporation should conduct an awareness

program to inform existing land owners in Salt of any investment incentives in order that they may upgrade their properties. A parallel goal is to bring back into use some of Salt's idle or under-utilized buildings either under the current owners or to newcomers. It is certain that a significant share of investors will come from Amman and other locations. Much of the housing in central Salt has fallen into a poor state occupied by foreign workers, both single men and families. As upgrading of central Salt proceeds, the workers will move to outlying sections of town.

b. Income & Employment Generation

The standard benefits related to international tourism will be achieved by this project in the following way. The central area of Salt will derive most of the economic benefit (new businesses and jobs) since much of the incremental visitor-days and associated expenditure will be spent in this immediate area. The employment profile of central Salt can be expected to change over time in favor of retail and service activities oriented to high income consumers, and away from the low value-added distribution and services activities that presently dominate. A significant participation in business expertise will be needed from people from Amman who know the tastes of high income Jordanians and of foreigners.

c. Welfare of Women

The population of Salt is reputed to be relatively conservative as regards the behavior of womenfolk. As tourist interest in Salt rises and businesses reorient themselves to appeal to visitors, some job categories as designers, crafts workers, shopkeepers and administrative positions will attract women workers. Moreover, there is a population of foreign women from Egypt and Iraq that also may be more inclined to work than their Jordanian colleagues. One step that the project can take is to give presentations to local girls' high schools on developing work opportunities in tourism. In this way they will consider work opportunities created by tourism, and will spread the message within their families.

4.3.4 Infrastructure and Environment

Relating infrastructure and environment were studied. Details are found in the Appendix 4.3.

Transportation

No additional investment is needed but designation of parking spaces for visiting vehicles is recommended.

Water Supply, Sewerage and Drainage
No particular problems is identified.

Waste Management
Improvement desired such as concealment of containers, attractive litter bins, etc.

Initial Environmental Examination (IEE)
IEE has been carried out. No need for EIA.

4.3.5 Economic Evaluation

(1) Project Components

The proposed Project would consist of the following three items.

(i) Visitor Center
(ii) Tourist Trails
(iii) Training

(2) Project Justification

a. Benefit

The Historic Old Salt Project would contribute additional attractiveness into the Jordan tourism, for particularly foreign visitors. The Project would induce visitors to stay longer (generation of additional tourist-nights) in Jordan.

In this analysis, the extra tourist-nights generated by tourists in the country because of the Project were taken as the benefit.

b. Cost:

The maintenance cost of this Project was assumed at 5 % of the total initial project cost after the completion of this Project in 2000.

(3) Economic Analysis

It was assumed that the amount equivalent to 80 % of additional tourist-nights of the Balqa Tourism Area including the benefit generated by day trippers from Amman would be attributable to the Project after the completion of all projects (2001), and that the average net contribution to the national economy by a tourist-night would be US100 dollars including his admission charge, accommodation and

other extra expenditures.

Number of tourist-nights estimated for the Balqa Tourism Area is 25,990 in 1995, 35,000 in 2000 and 108,000 in the year 2010.

The EIRR (Economic Internal Rate of Return) was calculated at 17.07% for the Project. The tabulation for the EIRR is shown below.

Table 4.3.2 Cost and Benefit Stream of Historic Old Salt Project

Year	Cost			Benefit				Ben.-Cost
	Construc-tion	Mainte-nance	Total	Additional tourist-nights	Established share (%)	Expenditure per person (US$)	Total	
1996	0.20	0.00	0.20	1,594	0.0	0	0.00	-0.20
1997	0.60	0.02	0.62	3,286	0.0	0	0.00	-0.62
1998	4.10	0.02	4.12	5,028	0.0	0	0.00	-4.12
1999	2.60	0.35	2.95	6,987	0.0	0	0.00	-2.95
2000	0.10	0.45	0.55	9,010	80.0	100	0.72	0.17
2001		0.45	0.45	13,185	80.0	100	1.05	0.60
2002		0.45	0.45	17,857	80.0	100	1.43	0.98
2003		0.45	0.45	23,087	80.0	100	1.85	1.40
2004		0.45	0.45	28,940	80.0	100	2.32	1.87
2005		0.45	0.45	35,492	80.0	100	2.84	2.39
2006		0.45	0.45	42,825	80.0	100	3.43	2.98
2007		0.45	0.45	51,032	80.0	100	4.08	3.63
2008		0.45	0.45	60,219	80.0	100	4.82	4.37
2009		0.45	0.45	70,501	80.0	100	5.64	5.19
2010		0.45	0.45	82,010	80.0	100	6.56	6.11

EIRR= 17.07%

Note: Currency unit is US$ million unless specified.

Source: JICA Study Team

Appendix 4.3

A. Transport

a. Existing Traffic Situation in the Zone (Figure 4.3.5)

The steep topography restricts the road network and parking space. A number of roads are designated as one-way streets and Hammam Street is a pedestrian street.

A number of parking spaces are within the zone, however, because of the inadequate number most of the parking is on-street. This aggravates traffic congestion which decreases the attraction of the townscape of Old Salt.

b. Requirement for Parking and Road Traffic

It is estimated that the 100,000 tourists will visit Salt by the year 2000 and will require 50 to 60 car and bus (mostly mini-buses) parking spaces.

Parking

To alleviate the traffic congestion and to allow pedestrians including tourists to walk safely, freely and comfortably, most tourist buses and cars are expected to stop outside the historic old center but should park elsewhere.

Suitable areas for parking include the following:

- behind the Culture Center
  This location is suitable as an entrance to the zone and has a capacity of approximately 100 vehicles.

- The Bus Terminal
  The existing bus terminal has unused space and also there is additional space to the north of the terminal which may be used for tourist vehicles.

  Besides the above parking areas, the following locations are recommended as drop off / pick up points for tourist vehicles

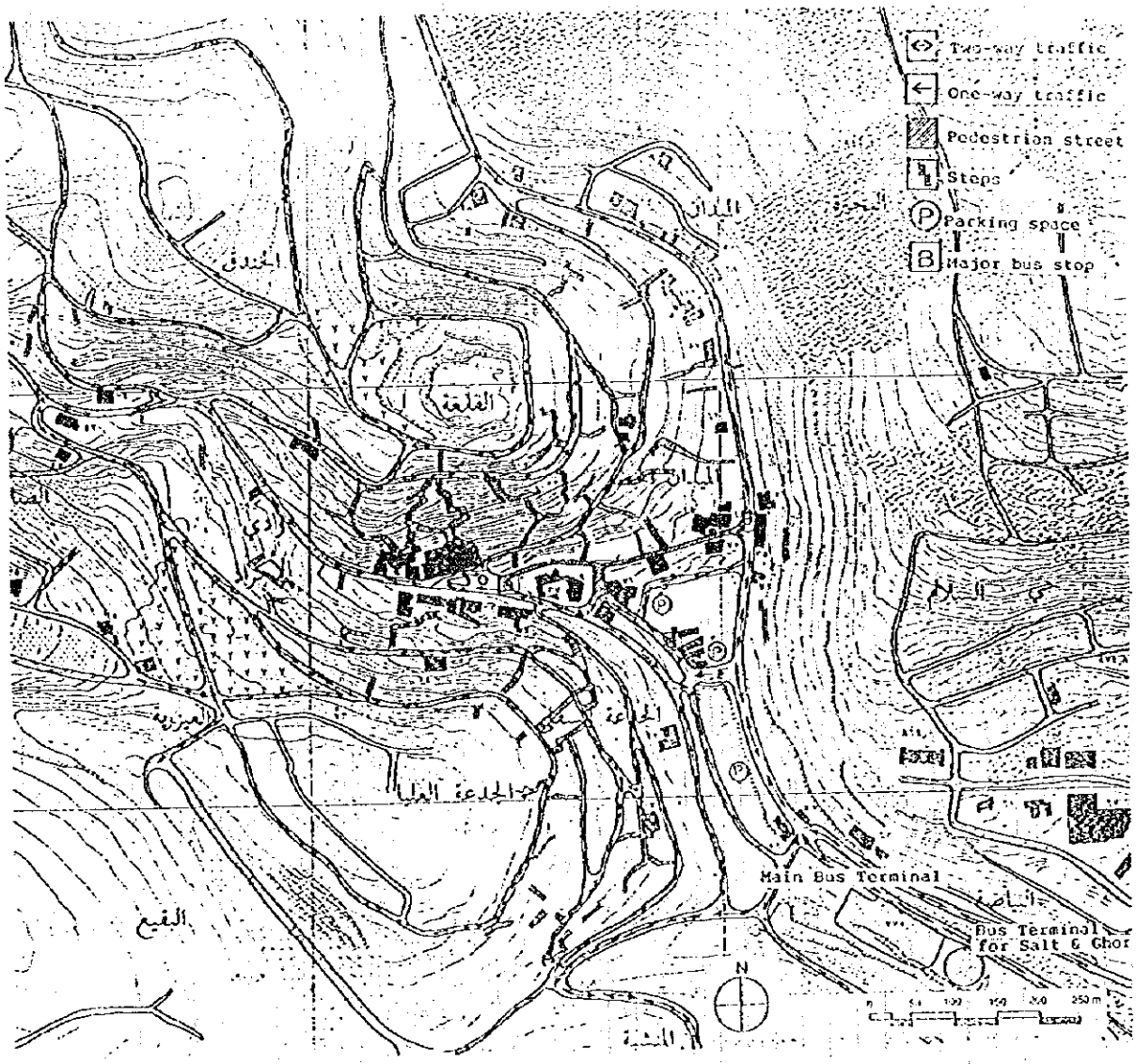
  - in front of the cultural center;
  - at the entrance of Hammam Street;
  - at the center of Hammam Street; and
  - at As Sa'aha.

Parking by local residents should be limited to a few designated locations.

Road Traffic

In the city center, adoption of traffic management policies favoring pedestrians and discouraging non-essential motor traffic is recommended.

Figure 4.3.5 Existing Traffic Situation of Olad Salt



B. Water supply, Sewerage and Drainage

a. Water supply

The water consumption of tourists and of local inhabitants of Salt in the year 2000 is estimated as follows:
(Assuming one day average tourists stay and daily water use of 400 litters/capita/day and 160 l/c/d for inhabitants).

- Tourists 100,000 x 400 x 1 = 0.04 Million Cubic Meters
- Local inhabitants 319,071 x 160 x 365 = 18.6 MCM

The water consumption of tourists amounts to 0.2% of local consumption and is of little significance when compared to the area's overall demand.

The water supply network in the urban area is almost 100% complete. However the supply of water is limited to two days a week especially in summer. Most buildings have storage tanks. In the future, PVC pipe work should be used instead of galvanized.

b. Sewerage

The sewerage network in the urban area is almost 100% complete. Waste water is conveyed using pipes to a conventional waste water treatment plant. No problems with the system were identified.

c. Drainage

Although heavy rain is a rare occurrence, some streets are flooded one or two times a year along such main roads at Baladia St. to Maydan St, Deir St. to Maydan St., and Maydan St. to King Hussein St. as shown in Figure 4.3.6. Salt Municipality plans to start a drainage improvement program for low-lying areas of the above mentioned streets.

Figure 4.3.6 Flood Area of Old Salt

C. Waste Management

a. Existing and Projected Situation

The commercial and domestic waste generated within the city is deposited in a small number of 1.1 m3 containers in poor condition and collected by screw compacting, rear end loading, refuse collection trucks. The waste from the steep valley sides is collected by the street sweepers and transported by donkey and/or open topped truck. The waste is deposited at the Salt dump some 5 km distant from the city. The main street are commendably clean; however, large quantities of waste accumulate in the lesser used passage ways, derelict buildings and/or abandoned land.

The reported volume 1 - 2 t/d has been disregarded as being too small for the population and the number of vehicles used. However, it is likely that some of the waste does not reach the collection system and that generation rates are less than those in more prosperous Amman. It is estimated that the 1000,000 visitors expected each year will generate an additional 0.1 t/d. This is less than 0.2% of that already collected and could be accommodated within the existing collection system.

b. Recommendations

A significant constraint to the development of old Salt area is the maintenance of a suitable standard of cleanliness in a steeply sloping urban areas, many parts of which are inaccessible to vehicles. In order to achieve a higher standard of cleanliness, measures similar to those for the downtown area of Amman are recommended:

Measures for General Refuse Collection and Disposal

- the replacement and supply of additional 1.1m3 containers especially in the main tourist area;
- the concealment of 1.1 m3 containers in purpose built alcoves or behind screens made of local materials;
- the more regular distribution of containers so that they are closer to major users;
- the placing of attractive, floor mounted litter bins at regular intervals along the stairways. These would be emptied by hand by the street sweepers;
- the development, where possible, of rear access to commercial premises;
- the development of an elite force of laborers by marginally increasing pay (to ensure the employment of the most conscientious of the workers) and by the supply of more distinguished protective clothing;
- the upgrading of the donkey collection system as an unusual tourist attraction; and

- the equipping of street sweepers in the central area with waste collection trolleys in place of the existing untidy wheel barrows.

Measures for Tourist Trails

- community involvement in the development of schemes effecting them;
- assignment to householders/tenants of the responsibility for the regular depositing of their waste in the containers and for maintaining the cleanliness of their frontage onto the stairways. (This would already appear possible under item 27 Public Health Law No. 21 (1977). As an incentive the waste management fee currently paid by each household with its selectivity bill could be waived.)
- the enforcement of the Public Health Law No. 21 (1977) requiring regular cleaning of abandoned or derelict property by those responsible;
- the locating of containers close to the downhill exit of the major passages and stairways;
- the encouragement of rehabilitation of the properties along the stairways by families and by businesses through the use of soft loans, demonstration projects and planning control measures.

Measures for Other Facilities.

The proposed project identifies a number of outlying areas as tourist nodes. these can be incorporated within the street sweepers regular rounds. These areas are expected to generate only small volumes of waste.

c. Human Resources

Human resource development for the waste management aspect of this project will be achieved through the training of existing government personnel and the holding of seminars for informing those in the private sector who may, in the future, be involved in waste management. The various seminars are identified in Table 4.3.2.

These seminars will have to be repeated at regular intervals as awareness of waste management issues increases in both the public and the private sectors and to ensure that new entrants to the industry are fully aware of the principles and standards now being required.

d. Operational Arrangements

The responsibility for the operation and maintenance of waste management is normally that of the municipality. All components of this project could be included into its existing waste management procedures for this part of the city, as they are not presently under strain. However, there is a possibility for contracting all or

portions An independent operating company could be appointed through competitive selection, for a contract period not to exceed say five years. (A legal framework for this would already appear to exist under the Rural Government Board Law (1955).)

Table 4.3.3 Waste Management Training

Seminar Contents	Personnel
Public Sector	
Technical training in the planning, environmental implications and legal framework of waste collection and disposal (4 days)	relevant contact persons within: - the Ministries of Health, Municipalities Rural Affairs and Environment, Planning, Tourism, Water and Irrigation; - Environment Corporation - Natural Resources Authority - Department of antiquities - Jordan Valley Authority (as appropriate) - Aqaba Region Authority (as appropriate) - Managers responsible for waste management within the relevant municipality
Technical training in the operational and management procedures planning, environmental implications of waste collection and disposal (4 days)	
Awareness of waste management issues and their implications for tourism (1 day)	The Governor, Members of the Municipal Council and community leaders (as appropriate),
An introduction contract procedures for contracting out and concessions (2 days)	- relevant contact person within the Ministries of Finance and Supply - Managers responsible for waste management within the relevant municipality
Private Sector	
Potential Waste Management operators Contract persons within the Ministries of Finance Industry and trade, Municipalities and Rural Affairs (1 day)	opportunities for waste management operators in Jordan, contact arrangements and regulation
Potential developers and financiers of tourism facilities (1 day)	Planning objectives and requirements, standards and regulation

Source: JICA Study Team

D. Initial Environmental Examination (IEE)

a. Description of the Site

The project site is the historic and commercial center of Salt. Its residential population is about 35,000 persons. The city is built on a plateau dissected by a Wadi with steep slopes.

b. Main Environmental Issues of the Site

- Annoyance and pollution generated by traffic conditions: Air pollution, water pollution by heavy rain, noise, and traffic congestion are major problems, partly due to the lack of large streets.

- Water related problems: Irregularity and shortage of water supply, flooding of streets in case of heavy rain

- Waste related problems: Accumulation of litter and insufficient collection of waste occur regularly, particularly in passageways and stairways of the poor residential area within the project site. These are sources of unhealthy conditions (children are playing outside), and disamenity (visual landscape and odors).

c. Sources of Impacts

Construction of the project cannot be considered as having a negative impact on the environment because it will help to improve the urban living environment. Because it does not change the physical conditions of the site, possible sources of negative impacts are only those induced by the operation of the project.

They are:
- Increased visitors volume
- Change in the traffic density and traffic pattern

d. Potential Impacts

Checklist and Ranking of Direct Impacts

Potential impacts of the project on the environment are summarized in Table 4.3.3. The table is a matrix of selected environmental items and project components. The global importance is assessed in the last column.

- Definitions: In this table, population means life style, habits, and traditions of local people. Settlements means housing and housing pattern, or other infrastructure like buildings and roads. Social cohesion means cohesion in standards of living, mentality, and education.
- Ranking: Ranking of the effects of the project is only indicative and is made by summing up the items having effects according to a coefficient attributed to each component of the project. The coefficient is intended to reflect the relative importance in terms of potential source of impacts. Such coefficients have

been attributed as follows:

- Coefficient 1 for items that do not effect the city and are more specifically addressed to tourists
- Coefficient 2 for items that affect the aesthetic of the city and concern also the living environment of people
- Coefficient 3 for items subject to evolution in time and that could generate pressure on the people and the quality of environment

Components coefficients are the following:

- Landscaping: 2
- Information: 1
- Urban services: 1
- Tourism: 2
- Frequentation by tourists: 3
- Tourism traffic: 3

The total ranking is classified as follows:

- Notable (I): between 3 and less or equal 6
- Significant (II): between 6 and less or equal 8
- Important (III): between 8 and less or equal 12

Results

This table shows the expected important effects, which are essentially positive. They are:

- Effects on amenities and living environment
- Effects on the economic activity

Significant negative impacts as shown in the table are limited to the following:

- Effects on local population (life style, habits, traditions)
- Effects on traffic conditions (and its induced effects on the quality of the living environment)

The range of potential issues may be summarized as follows:

- Effects on the community (cultural, social and economic gap between inhabitants and visitors, possible rise in prices of goods and land, and substitution of poor population by rich / cultivated population in the long term)
- Effects on resources consumption and management (water, electricity) and health conditions (capacity of collection and treatment of solid waste and wastewater)
- Effects on the quality of the living environment (traffic conditions, air, noise, litter)

E. Environmental Management

Significant environmental protection measures are those which relate to the involvement of communities, management of water, wastewater and solid waste, and management of traffic conditions.

Table 4.3.4 Checklist of Positive or Negative Direct Effects

	Structure Components				Operation Components		
	Lands-caping	Informa-tion	Services	Tourism	Visitors volume	Traffic Develop	Ranking of Effects
Land Use Settlements	E	-	-	-	E	-	Notable
Population	-	-	-	E	E	E	Significant
Economic Activity	E	-	E	E	E	E	Important
Traffic Conditions	-	-	-	E	E	E	Significant
Use of Resources	E	-	-	-	E	-	Notable
Solubility Sanitation	-	-	-	-	E	-	Notable
Social Cohesion	-	-	-	E	E	-	Notable
Health	-	-	-	-	-	E	Notable
Prices	E	-	-	-	-	-	Notable
Noise	-	-	-	E	-	E	Notable
Living Environment	E	-	E	E	E	E	Notable

E: effect -: no effect or not relevant

4.4 Dead Sea Panoramic Complex

4.4.1 Concept and Rationale

To create a new tourist attraction that will strengthen the appeal of the Dead Sea and environs, by providing a lookout for the panoramic view of the Dead Sea and a small museum explaining the geology, history and natural history of the area. A high class accommodation facility will also be included.

(1) Objectives

- Eventually to enhance the appeal and attractiveness of the Dead Sea area as a tourist destination;
- To create a new tourism product in the area where little is currently provided except for the natural resource;
- To broaden and diversify the product line of Jordanian tourism from the archaeology based to the culture and nature tourism based; and
- To introduce a new perspective in the tourism product development in Jordan.

(2) Rationale

The Dead Sea is well known world-wide as the lowest point on earth, and as the most buoyant sea in the world; these are two unique features providing ready international recognition of the location. The area could be developed into a first class tourist area which is the purpose of this project. The region has remained undeveloped because of national security, and has only two modest hotels and a rest house. In tandem with the development of accommodation zones by the Jordan Valley Authority, this project will become a major cultural attraction and together with the nearby Ma'in Spa. It will create a focus of tourism activity, further improving the interest level of the area for tourism.

(3) Related Projects

a. JVA Master Plan

The Master Plan of the East Coast Dead Sea Tourism Development (by Jordan Valley Authority in 1995) identifies this Model Project site as No. 10 in Zara Upper Ridge 1. An "International Antipolis" or Village containing tourist facilities including a natural history presentation, is proposed for this vicinity. The current proposal is compatible with this concept.

b. Cable Car

There is a proposal by Jordan Investment Corporation (JIC) to link Ma'in Spa with the Dead Sea by means of a cable car. This idea deserves study because if it also links the proposed Panoramic Complex, all three areas would benefit from a synergistic effect, together constituting the prime tourism location on the East Coast of the Dead Sea.

4.4.2 Preliminary Plan

(1) Site Identification

Three possible sites have been surveyed (Lookout Spots A, B and C in Figure 4.4.1). Site C has been selected because of its proximity to Madaba and Amman, its good road access, being only 1.5 km west of the Ma'in Spa road, its proximity to another tourist attraction, namely Ma'in Spa, and also its proximity to the Dead Sea coast. This location is in a designated sector in the Master Plan of East Coast Dead Sea Tourism Development (JVA).

(2) Project Components

This model project consists of a tourism complex with panoramic view that contains the following major components.

a. Panoramic Lookout and Rest house

- Lookout terrace approximately 300 square meters (approximately maximum capacity 100 persons)

Option 1 Rest house (hotel) with "Panorama Spa"

-	Capacity	40 guest rooms of Luxury size (40 to 50 sq. m)
-	Facilities	Spa (swimming pool, Jacuzzi, sauna, etc.), restaurant (200 sq. m), oasis garden, etc.
-	Total floor area	4,000 sq. m

The number of rooms is tentatively fixed considering "small but high quality" policy for the special interest resort. The rest house will serve a select clientele and provide high quality service. (A 40-room hotel is considered as the minimum number that can receive package tours).

"Panorama Spa" uses Ma'in hot spring water. This Spa will also be a luxury facility with a spectacular panorama view of the Dead Sea.

Option 2 Simple Rest house

- Facilities a restaurant (200 sq. m), shops, WC, etc.
- Total floor area 500 sq. m

b. Dead Sea Museum

- Exhibition area 600 sq. m
- Virtual reality movie theater 100 sq. m (50 p. capacity)
- Total floor area 1,200 sq. m

A virtual reality movie theater (or other high-technology design) will be provided to illustrate the birth and history of the Dead Sea. This will be a totally new and fascinating attraction for the both international and domestic tourists.

c. Cable Car access from Zara and to Ma'in Spa

- Capacity of cage 9 persons or less

d. Training of Managers and Workers

The above facilities should be operated at an international standard and services should be provided at a level that does not fail tourists' expectations. Training of managers and workers is necessary and will be incorporated in the project as an important component.

Figure 4.4.1 Dead Sea Panoramic Complex Site Location Map

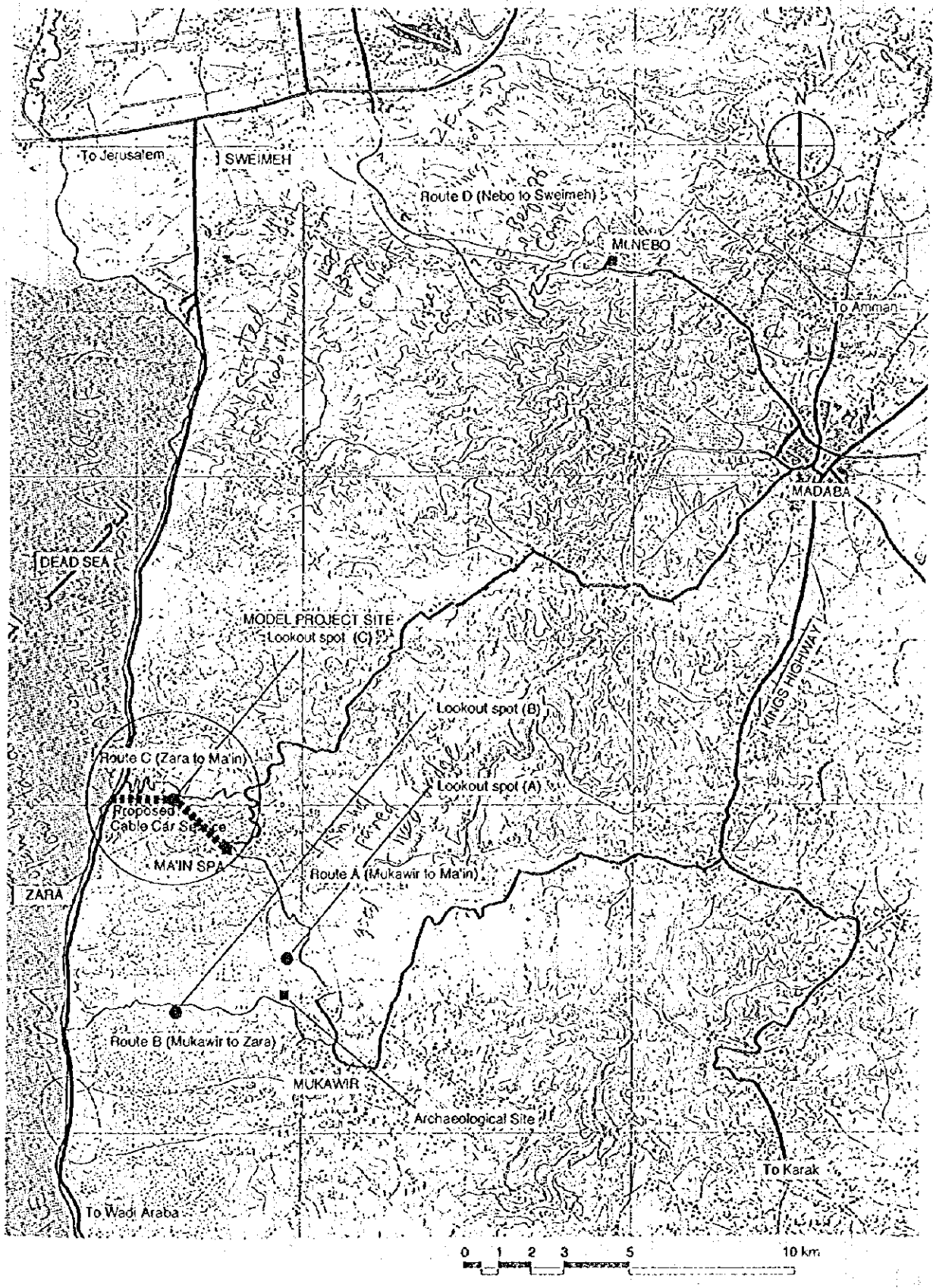


Figure 4.4.2 Dead Sea Panoramic Complex Block Plan

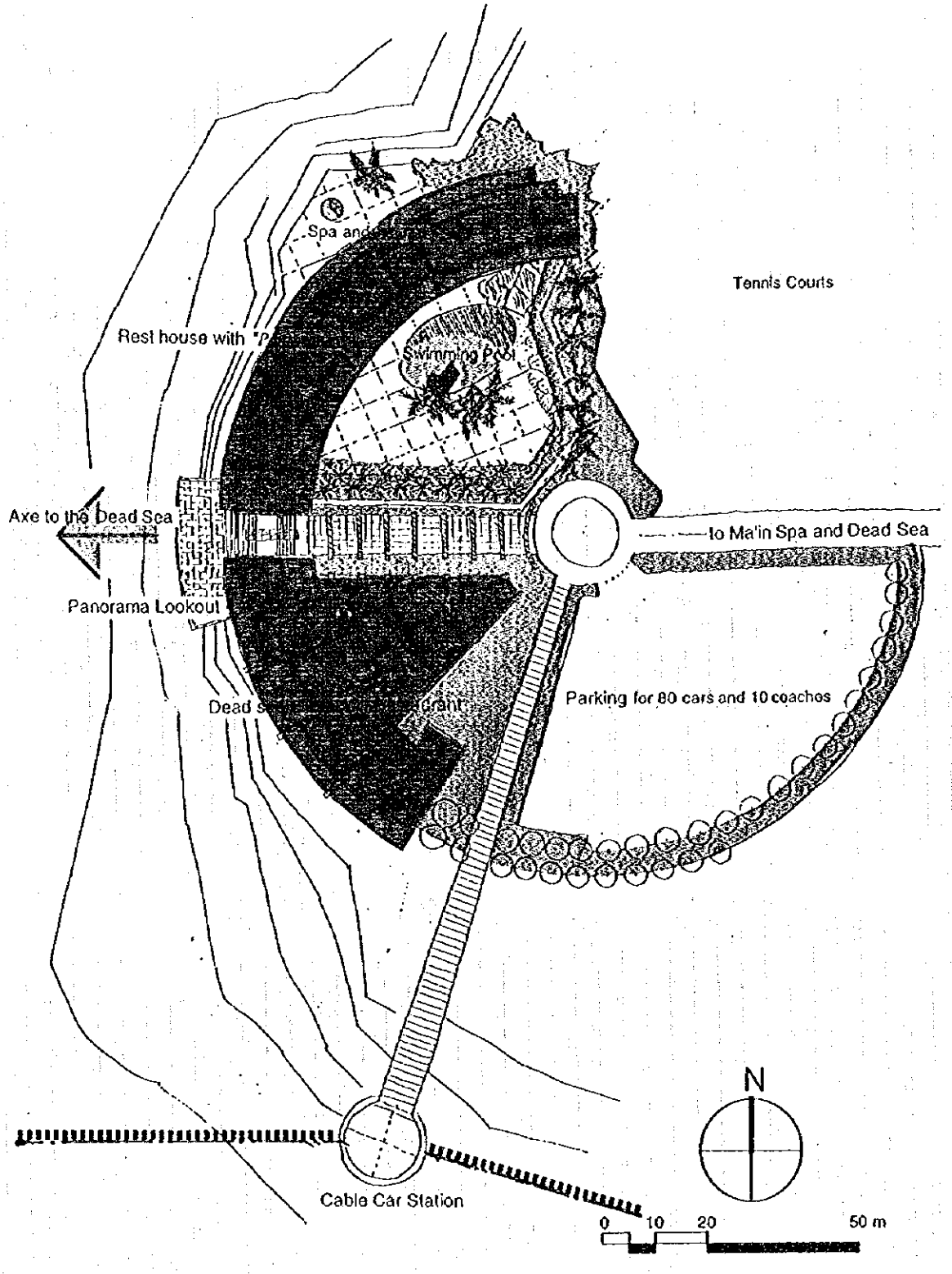


Figure 4.4.2 Dead Sea Panoramic Complex Block Plan

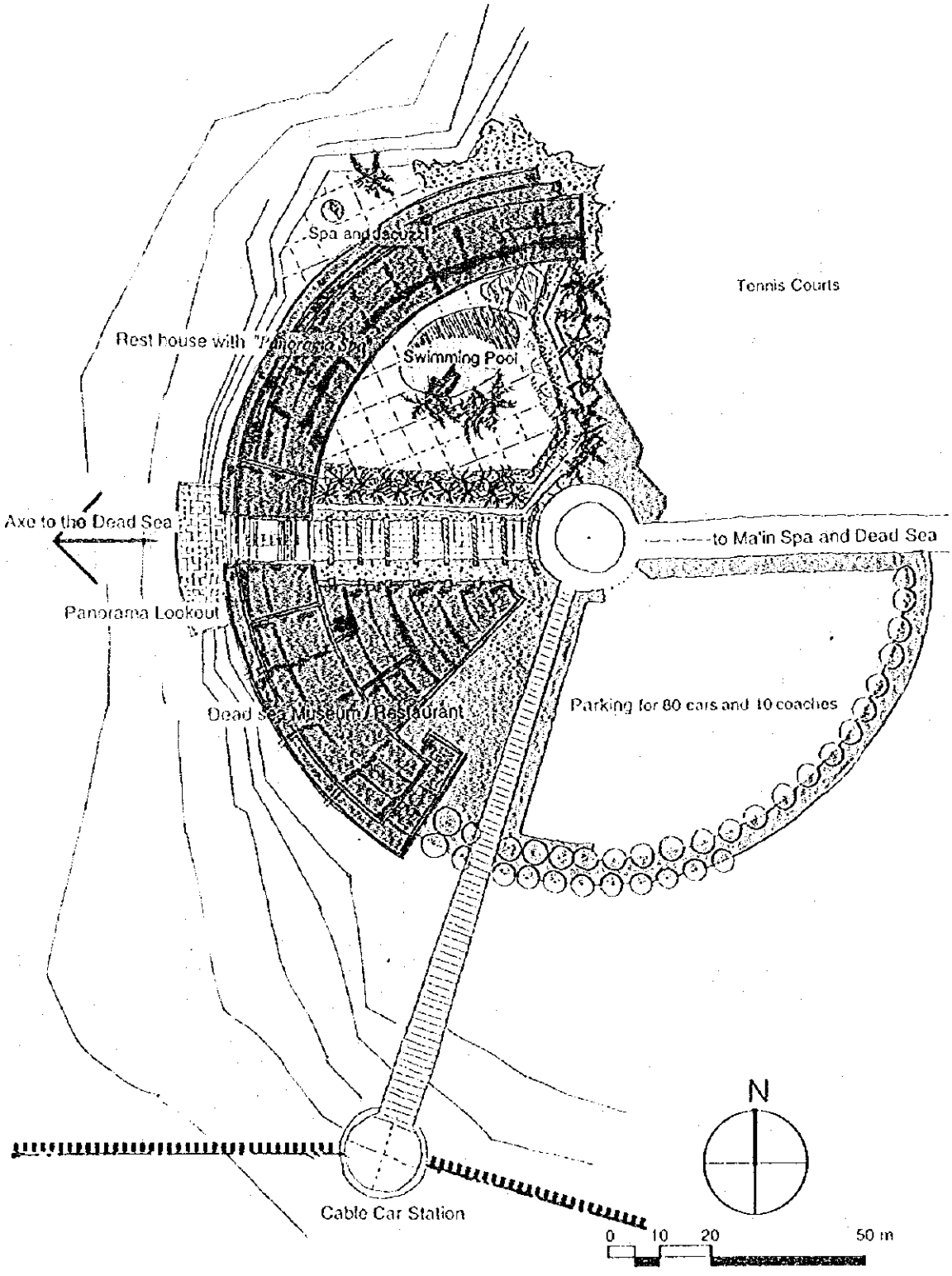


Figure 4.4.3 Dead Sea Panoramic Complex Elevation

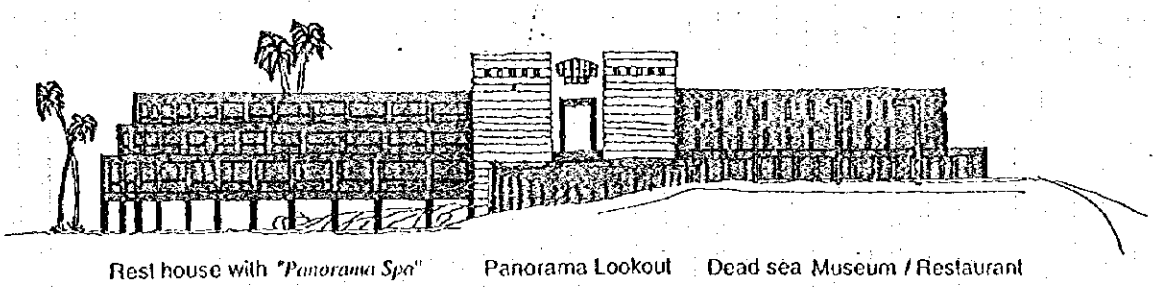
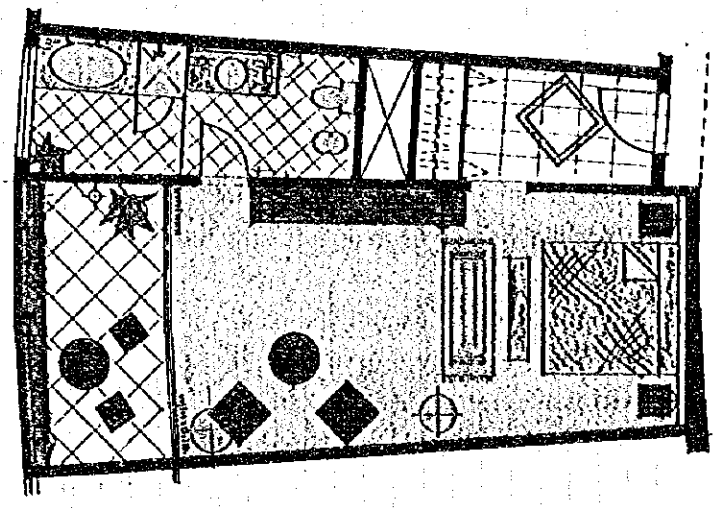


Figure 4.4.4 Dead Sea Panoramic Complex Typical Guest Room



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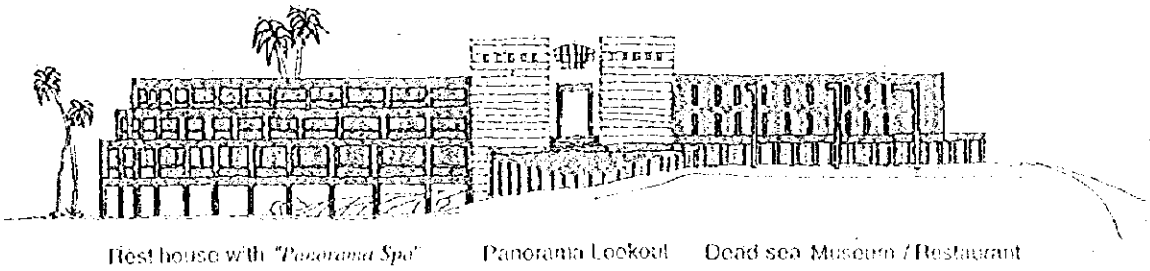
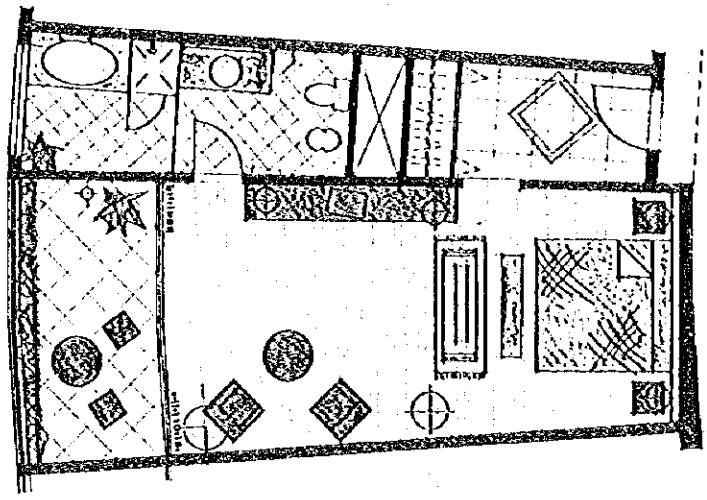


Figure 4.4.4 Dead Sea Panoramic Complex Typical Guest Room



(3) Cost Estimates

Preliminary estimates are shown below for the purpose of indicating the size of the project.

Component		Cost US$ million
a.Resthouse with "Panorama Spa"	Planning and Design	1.2
	Construction	7.4
	Furniture, Furbishing and Equipment	1.0
Simple Resthouse	Planning and Design	(0.2)
	Construction	(1.0)
	Furniture, Furbishing and Equipment	(0.1)
b.Dead Sea Museum	Planning and Design	0.3
	Construction	1.2
	Furniture and Exhibition Equipment	0.6
c.	Cable car	6.0
d. Infrastructure (Water Supply and Waste Water Treatment)		1.7
Total		19.4 (11.1)

(4) Implementation Structure

a. Project Development

MOTA would have a primary responsibility in defining, planning and managing the project because such a main international tourist facility can be developed only by a responsible body who knows about the characteristics, future perspective and policy direction of the tourism in Jordan. JVA would have a secondary responsibility because the site is located in the territory controlled by JVA and such a project require JVA collaboration such as infrastructure development.

The project is a combination of a museum and panoramic lookout with a rest house to include a restaurant and possibly a luxury hotel. Normally, a museum is not a profit-making activity while restaurants and hotels are. Moreover, the museum and hotel components will require highly specialized designs if they are to be operated according to international standards. This project may best be split into two coordinated ones, the museum component and the rest house (hotel with spa). MOTA can define clear design guidelines for these components and invite competing bids for the design work.

b. Operating Arrangements

The MOTA appears to be the most likely agency to retain ownership of this project.

The project's profit-making activities could be competitively awarded to private operators under fixed term concession contracts, relieving government agency of the managerial responsibilities.

The museum could be operated by the MOTA, the Natural Resources Agency or the RSCN. Alternatively, it could be operated under concession to the private sector or an NGO, again according to a concession agreement.

As indicated in the later section on Infrastructure, this study proposes the appointment of a private contractor to provide utilities and other common services for the entire Panorama Complex. In the event that this territory is designated as park land or given some other protected status, responsibility for managing the contract could easily be passed to the Royal Park Authority.

(5) Implementation Program

Dead Sea Panoramic Complex	96	97	98	99	2000	US$ million
a. Rest House (with Panorama Spa)						9.6
b. Dead Sea Museum						2.1
c. Cable Car						6.0
d. Infrastructure						1.7
Cost in US$ million	0.5	0.7	6.7	11.5		19.4

B/D D/D Implementation

4.4.3 Institutional Measures

(1) Heritage Conservation

Information on this location suggests that there are few if any sites with antiquities in the vicinity of the proposed project. If there are any facilities, the EIA must identify them. If they are of some interest to the public, then the Department of Antiquities can authorize excavation.

As regards the contents of the museum, a possible component could take the form of multi-media presentation facility offering a selection of full color spectacular films no longer than 20 minutes in length. Such visual presentations can be extremely entertaining as well as educational and some have proven popular in some countries. At the Dead Sea, this facility could treat such themes as :

a) Birth of the Great Rift Valley	geology focus
b) The Lowest Sea on Earth	ecology of the Dead Sea
c) The Dead Sea in Islam	religious history
d) The Dead Sea in the Bible	religious history

c) The Healthiest Spot under the Sun climate & health

(2) Community Considerations

The proposed site is desolate and unpolluted, and likely to remain so even after completion of this project. The town of Ma'in is 15 km to the Northeast, and Madaba 20 km away. Because of this significant distance, the provision of limited bachelor quarters for single staff members may be optimal. Upon approval of the project by the Jordanian Government, a MOTA representative must explain the project to citizens at special meetings at Ma'in and possibly at Madaba, to fully inform them of the plan, and to make them aware of upcoming job opportunities. Meetings at high schools in the vicinity are also recommended for the same reasons. Because tourism is already developing at the town of Madaba and at Hammamat Ma'in, social effects of this new project are not deemed to be significant. The project will create jobs for both women and for men, and will probably draw workers primarily from the labor pool on the Madaba plain. Some initial employee training, including English language training, could be arranged at a school in Ma'in or in Madaba.

4.4.4 Infrastructure and Environment

Relating infrastructure and environment were studied. Details are found in the Appendix 4.4.

Transportation
Good access to the Dead Sea and Madaba Parkway.

Water Supply, Sewerage and Drainage
Water is to be conveyed from the Zarqa Ma'in River. A closed sewerage system is proposed.

Waste Management
A closed self-contained disposal system is proposed.

Initial Environmental Examination (IEE)
IEE has been prepared, showing potential problems as regard to the scenery resource of Wadi Zarqa Ma'in. Suitable sitting of the cable car is one major issue. Good integration of picnickers is also essential. EIA is required.

4.4.5 Economic Evaluation

(1) Project Components

The proposed Project would consist of the following four items.

(i) Rest House
(ii) Dead Sea Museum
(iii) Cable Car
(iv) Infrastructure

(2) Project Justification

a. Benefit

The Dead Sea Panoramic Complex would create additional attractiveness into the Jordan tourism, for not only domestic visitors, but also foreign visitors. The Project would induce visitors to stay longer (generation of additional tourist-nights) in Jordan.

In this analysis, the extra tourist-nights generated by tourists in the country because of the Project were taken as the benefit.

b. Cost:

The maintenance and operating cost of this Project was assumed at 10 % of the total initial project cost after the completion of this Project in 2000.

(3) Economic Analysis

It was assumed that the amount equivalent to 80% of additional tourist-nights of Madaba/Dead Sea Tourism Area including the benefit generated by day trippers from Amman would be attributable to the Project after the completion of all projects (2000), and that including his admission charge, accommodation and other extra expenditures.

Number of tourist-nights estimated for the Madaba Tourism Area is 103,960 in1995, 348,000 in 2000, and 972,000 in the year 2010.

The EIRR (Economic Internal Rate of Return) was calculated at 22.79% for this project. The tabulation for the EIRR is shown below.

Table 4.4.1 Cost and Benefit Stream of Dead Sea Panoramic Complex

Year	Cost			Benefit				Ben.- Cost
	Construc-tion	Mainte-nance	Total	Additional tourist-nights	Established share (%)	Expenditure per person (US$)	Total	
1996	0.50	0.00	0.50	28,416	0.0	0	0.00	-0.50
1997	0.70	0.00	0.70	64,599	0.0	0	0.00	-0.70
1998	6.70	0.00	6.70	110,672	0.0	0	0.00	-6.70
1999	11.50	0.00	11.50	169,338	10.0	0	0.00	-11.50
2000		1.90	1.90	244,040	10.0	100	2.44	0.54
2001		1.90	1.90	281,685	20.0	100	9.44	3.73
2002		1.90	1.90	323,403	20.0	100	11.01	4.57
2003		1.90	1.90	369,633	20.0	100	12.63	5.49
2004		1.90	1.90	420,864	20.0	100	14.33	6.52
2005		1.90	1.90	477,638	20.0	100	16.08	7.65
2006		1.90	1.90	540,553	20.0	100	17.91	8.91
2007		1.90	1.90	610,273	20.0	100	19.82	10.31
2008		1.90	1.90	687,536	20.0	100	21.79	11.85
2009		1.90	1.90	773,157	20.0	100	23.85	13.56
2010		1.90	1.90	868,040	20.0	100	25.99	15.46

EIRR= 22.79%

Note: Currency unit is US$ million unless specified.

Source: JICA Study Team

Appendix 4.4

A. Transport

a. Existing Situation and Outlook

The proposed site is approached from the Main Spa Road (a 2 lane paved road) along a paved section which crosses to the proposed site at the cliff edge and an unpaved section which descends the escarpment west of the site, and is not suitable for most vehicles. The limited traffic (100 vehicles per day) already uses the flat section of the road. The proposed Main-Dead Sea Road would pass near this location.

b. Requirement of Transport Facilities and Systems

Parking space
A total of 2,500 sq. m of parking space is required as shown below.

Table 4.4.2 Parking Space Requirement

	Buses	Cars	Total
Visitors	400 (5)	1,625 (65)	2,025
Employees	250 (5)	22 (9)	475
Total	625 (10)	1,850 (74)	2,500

Source: JICA Study Team

These would be accessed from Ma'in-Dead Sea Road.

Cable cars
Space for the cable car station may be allocated next to the facility. The site is very spacious and could easily contain a cable car terminal.

B. Water supply, Sewerage and Drainage

a. Water supply

The water consumption of tourists and of local inhabitants of Madaba Governorate and Dead Sea area in the year 2000 has been estimated as follows (Assuming one day average tourists stay and daily water use of 400 litters/capita/day and 160 l/c/d for inhabitants):

- Tourists 150,000 x 400x 1 = 0.06 MCM

- Local inhabitants 125,313 x 160x365 = 7.3 MCM

The water consumption of tourists amounts to 0.8% of local consumption and is therefore of little significance when compared to the governorate's overall needs.

Three qualifies of water are required to serve the complex
- potable water;
- lower quality water for toilet flushing; and
- Spa water.

These may be acquired from either:
- Zarqa Main River as currently supplied to the Ashtar Hotel Ma'in; or
- ground water close to the Panorama Complex.

The availability and cost of locating and pumping ground water is not known but would avoid the significant pumping cost of raising water form Main Spa to the Panorama Complex. Water demand could be reduced by using recycled potable water for toilet flushing and sludge and treated sewage for irrigation of any landscaping.

b. Sewerage

No sewerage or waste water treatment facilities are installed at or near this site. Tourist facilities transport sewerage to a treatment plant 35 km away. A dedicated closed system is recommended as shown in Figure 4.4.6, with estimated installation costs shown in Table 4.4.3.

The purification capability of such a system is sufficient to enable the effluent to be used for irrigation (Biochemical Oxygen Demand below 20 ppm) (Table 4.4.4).

c. Drainage

No problems of drainage have been detected at this site.

Figure 4.4.5 Water sampling Location

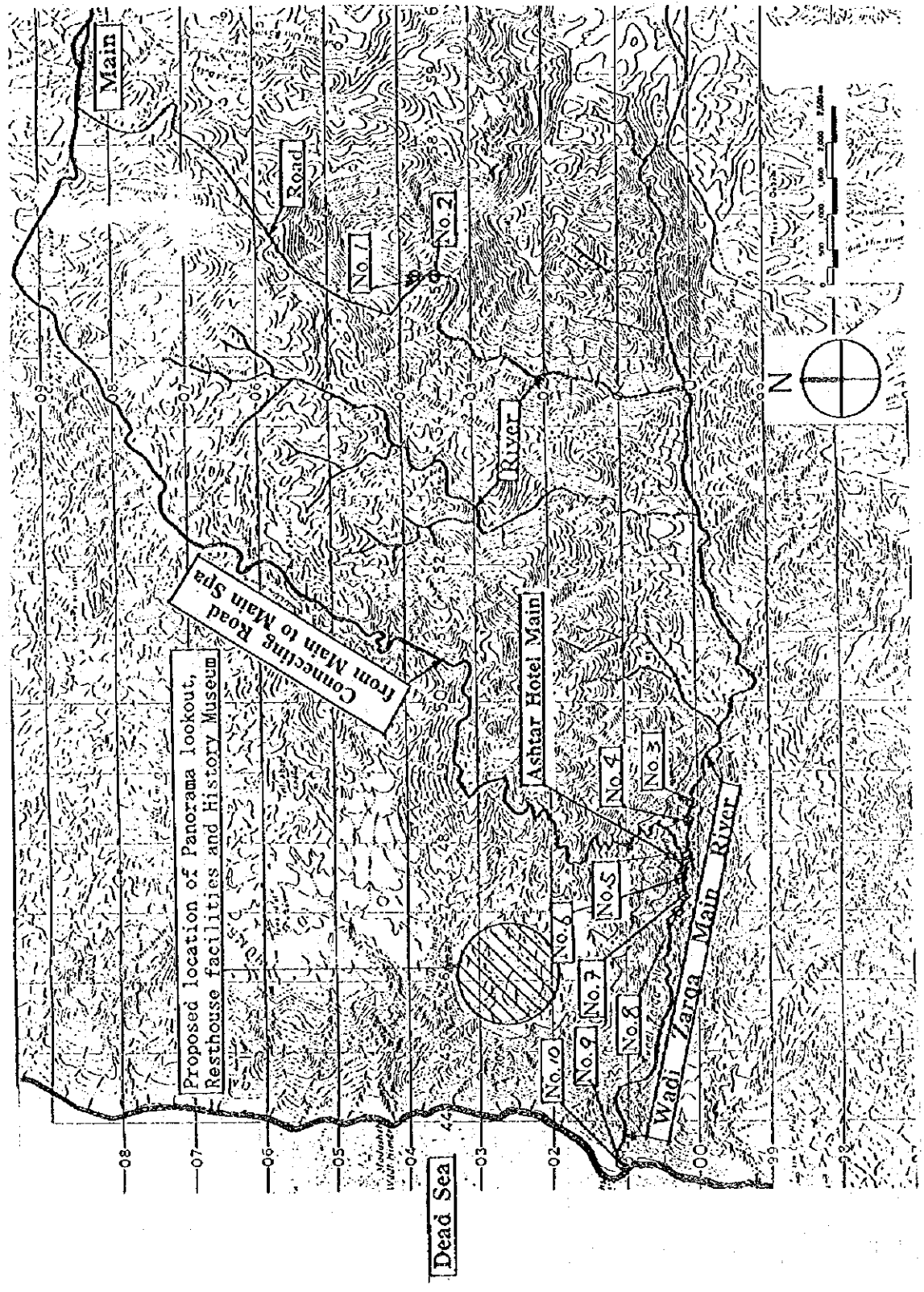


Figure 4.4.6 Compact Enclosed Dedicated Treatment System

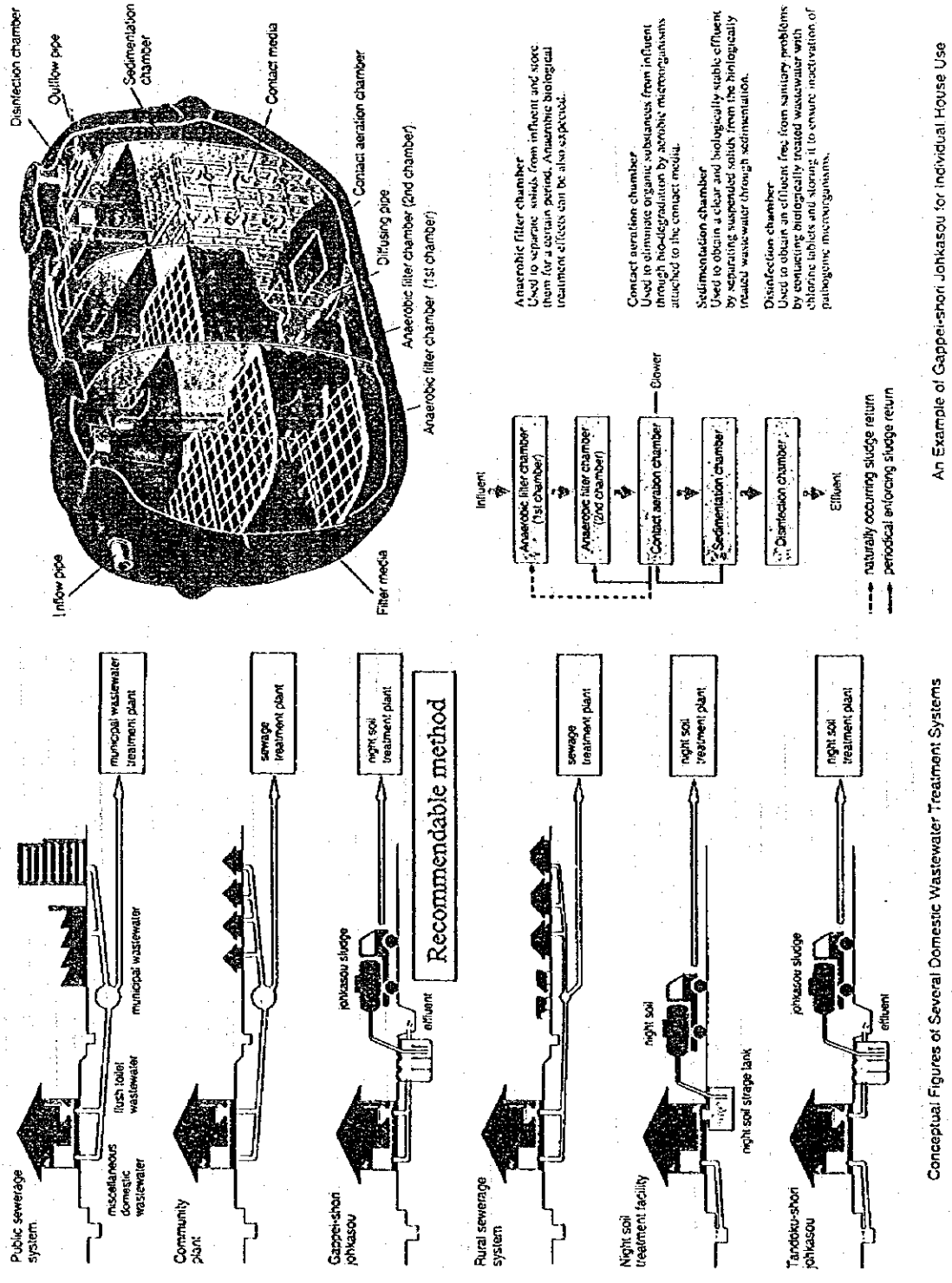


Table 4.4.3 Compact Enclosed Dedicated Treatment System

Capacity of Users	Width (mm)	Height (mm)	Length (mm)	Power Consumption for Blower (w)	Cost (JD)		
					Equipment (2)	Civil Works (3)	Total
5	1,650	1,860	3,700	107	3,261	1,703	4,964
6	1,800	2,000	3,780	150	5,326	1,884	7,210
7	1,800	2,000	4,140	200	5,507	2,101	7,608
8	1,800	2,000	4,640	200	5,689	2,283	7,972
9	1,700	2,000	5,200	250	6,232	2,464	8,696
10	1,700	2,000	5,700	250	6,522	2,609	9,131
20	3,000	2,300	6,440	300	16,305	9,783	26,088
50	3,200	2,300	11,300	800	36,232	21,014	57,246
100	6,500	2,500	12,000	1,000	65,218	27,174	92,392
200	6,500	2,700	16,000	2,000	79,710	36,232	115,942
500	6,500	3,000	21,000	4,000	108,696	50,725	159,421

Remarks :
(1) C.E.D.T. (JOHKASOU) System means Compact Enclosed Dedicated Treatment System.
(2) The cost of Equipment is figured at 50% of the Japanese cost to reflect cheaper sources (other countries or local production).
(3) Civil Works are applied to be local costs.
(4) Running cost, and sludge conveyance and maintenance cost (4 month interval) are excluded.

Table 4.4.4 Treated Water Quality by CEDT System

Commencement Date of Operation	Treatment Capacity of Users (prs.)	Kinds of Facility	BOD of Influent	BOD of Effluent	Purpose for Recycling	Location of Installation
Feb. 1979	10	House	_	1	Toilet Flushing, Sprinkle for Garden	Kurume City, Fukuoka Pre.
Jul. 1984	25	Office	_	1.1	_ do _	Nichinan City, Miyazaki Pre.
Dec. 1984	400	School	_	1	Toilet Flushing, River	Hisayama cho, Fukuoka Pre.
Mar. 1986	200	Apartment	_	0.9	River	Oita City, Oita Pre.
Dec. 1988	7	House	_	1	Toilet Flushing, Sprinkle for Garden	Yanagawa City, Fukuoka Pre.
May. 1990	120	Restaurant	_	4	River	Nabari City, Mie Pre.
Jul. 1990	110	Hospital	_	0.5	River	Ohita City, Ohita Pre.
Oct. 1990	25	Temple	_	2	Toilet Flushing, Sprinkle for Garden	Ryukoku Temple, Fukuoka Pre.
Jan. 1991	25	Kinder Garden	_	3.1	River	Oguchi City, Kagoshima Pre.
Feb. 1991	120	Dormitory	_	2	River	Oguchi City, Kagoshima pre.
Nov. 1991	208	Dormitory	_	1.4	River	Uji City, Kyoto Pre.
Apr. 1991	80	Health Home for Aged People	_	1.5	River	Omura City, Nagasaki Pre.
Jun. 1992	500	Resort Area	_	2.4	River	Taku City, Fukuoka Pre.
Aug. 1992	300	Dormitory	_	2.4	River	Saga City, Saga Pre.
Nov. 1992	300	City Hall	_	2.6	River	Yamauchicho, Saga Pre.
Feb. 1993	N.A	Works of Food Production	1,700	5.1	Irrigation, River	Ogawamachi, Saitama Pre.
Mar. 1993	86	Health Home for Aged People	_	2.5	River	Aritamachi, Saga Pre.
Mar. 1993	77	Restaurant	260	4.2	Tree Flower plantation, River	Oizumimura, Yamanashi Pre.
Sep. 1993	Milch Cow, 60 head	Livestock Breeding Research	3,600	8	Irrigation, River	Takizawamura, Iwate Pre.
Mar. 1995	503	School	180	10	River	Kanbaramachi Shizuoka Pre.

Remarks : (*1) C.E.D.T. (JOHKASOU) System means Compact Enclosed Dedicated Treatment System.
(*2) Number of Users is avairable at once for 1,000 persons more.

C. Waste Management

a. Existing and Projected Situation

No waste is currently generated in the area of the proposed complex. The nearest generators of waste are Ma'in, Ma'in Spa, Mukawir, and Al Mashnaqa. Domestic and commercial waste generated in Ma'in (population 3500) is deposited in recycled 55 gallon oil drums for collection by the Ma'in Municipality in an open topped truck for disposal at the at the dump 8 km west of Madaba. Approximately 1 tone / day is disposed of in this way. Domestic waste from the Ma'in Spa complex is burnt in a small incinerator with no heat recovery.

It is estimated that the expected 150,000 annual visitors to the project will generate less than 0.2 t/d of waste, which is less than that collected by the other locations individually.

b. Recommendations

The development of this site would provide the opportunity for the implementation of a self contained, dedicated solid and waste water system serving the entire complex. Its implementation would be made a condition of development permission and it would be operated and maintained by the principal operator of the facility thus freeing a potential burden on the resources to the municipality.

The type of waste generated by the administrative and public usage of the site would consist essentially of paper and packaging of high calorific value suitable for combustion in a small dedicated incinerator. The heat generated during combustion could be used to heat water for use in the complex. The higher organic content of the waste from the catering facilities would probably be diluted sufficiently by the high calorific value waste to allow adequate combustion. Alternatively, this material could be separated at source and the recovered materials recycled through local traders. The organic waste could be macerated and composted for use in landscaping of the complex. Any remaining waste, together with the small volume of ash from the incinerator, would be disposed of at the landfill at Madaba.

Such an approach would demonstrate the acceptability of small scale incineration, even in a sensitive rural environment, and the effectiveness of transferring responsibility for waste collection and disposal to a developer.

c. Human Resources

Human resources development for the waste management aspect of this project will

be achieved through the training of existing government personnel and the holding of seminars for informing those in the private sector who may, in the future, be involved in waste management. The various seminars are identified in Table 4.4.5.

These seminars will have to be repeated at regular intervals as awareness of waste management issues increases in both the public and the private sectors and to ensure that new entrants to the industry are full aware of the principles and standards now being required.

d. Operational Arrangements

The responsibility for the operation and maintenance of the required public utilities could be handled in a number of ways. Because of the remoteness of the site and lack of established networks, the management of these utilities is most appropriately managed by a single body for components of the complex i.e. the museum, visitor center, restaurant and rest house.

The critical advantage of centralization is the provision of services to all parts of the complex, at a high standard consistent with the demands and expectations of a large foreign clientele. Management of some or all of the above mentioned services could be consolidated in this way.

The options for a single management body are as follows:

Option 1: A consortium of service users
These users of services could create a consortium to operate the complex or even join with other nearby users such as the cable car operator, the hotel at Main Spa, to share costs more widely. A successful consortium would require some sophistication and dedication on the part of members for it to function well in the long run.

Option 2: Private Sector concession
A simpler option is to award a private contractor a concession to provide these services on a profit-making basis. Several advantages may be possible with this arrangement.

- Specific performance standards can be included in the contract, and the contractor changed in the event of failure to comply;
- A private company can raise capital more easily than a government body;
- A private company will be more motivated than a government body to provide consistently good service;
- A private company can more flexibly negotiate labor contracts and supplier

contracts than a government agency; and
- A private contractor can extend his service area to include other customers/users as the area develops, achieving efficiencies;

Table 4.4.5 Waste Management Training

Seminar Contents	Personnel
Public Sector	
Technical training in the planning, environmental implications and legal framework of waste collection and disposal (4 days)	relevant contact persons within: - the Ministries of Health, Municipalities Rural Affairs and Environment, Planning, Tourism, Water and Irrigation; - Environment Corporation - Natural Resources Authority - Department of antiquities - Jordan Valley Authority (as appropriate) - Aqaba Region Authority (as appropriate) - Managers responsible for waste management within the relevant municipality
Technical training in the operational and management procedures planning, environmental implications of waste collection and disposal (4 days)	
Awareness of waste management issues and their implications for tourism (1 day)	The Governor, Members of the Municipal Council and community leaders (as appropriate),
An introduction contract procedures for contracting out and concessions (2 days)	- relevant contact person within the Ministries of Finance and Supply - Managers responsible for waste management within the relevant municipality
Private Sector	
Potential Waste Management operators Contract persons within the Ministries of Finance Industry and trade, Municipalities and Rural Affairs (1 day)	opportunities for waste management operators in Jordan, contact arrangements and regulation
Potential developers and financiers of tourism facilities (1 day)	Planning objectives and requirements, standards and regulation

Source: JICA Study Team

D. Initial Environmental Examination (IEE)

a. Study Area

The study area is composed of the rift escarpment, which is dissected into several deep talwegs and steep slopes, a major valley, a minor area of sea shore, and the upper plateau (Figure 4.4.7). It extends from the Dead Sea shore (Zara) on the west to Hammamat Ma'in on the east. The area includes the Zarqa Ma'in valley (Wadi

Zarqa Ma'in) and the area lying between this valley and the Wadi Himara on the north. Zara generally designates the area lying at the mouth of Wadi Zarqa Ma'in on the Dead Sea shore. The site for the Panoramic Complex project is on the plateau area at about 100m height.

The project site just lies between the Wadi Mujib nature reserve on south and the Ma'in range reserve on north (Figure 4.4.8). The site itself is classified as a grazing land, which means a government owned land opened to free grazing activity. However, the grazing potential seems almost negligible.

b. Conditions of the Initial Site

Physical Conditions

- Climate: Yearly rainfall amount is less than 50 mm at sea level, and remains under 200 mm on the plateau, within the study area. Temperature is more than 30°C and increases to 40°C from May to August. Humidity is low (20 to 40%), and atmospheric pressure is high.

- Geomorphology: The area is basically made of sedimentary strata, recent basaltic intrusions, and tectonic elements (faults, rift). The Lithology is of successive layers of limestone, marl, sandstone, and fluviatile deposits. Extremely unstable sediments of quaternary period are generally lying in the Wadi and on the Dead Sea shore (slopes, deltaic formations).

- Drainage: Wadi Zarqa Ma'in is remarkable because of the permanence of the superficial water, which strongly contrasts with the ambient arid climatic conditions. The river sources are maintained by the discharge of deep ground water (200m depth from the plateau area), in the form of hot springs.

There are 63 accessible springs in Zarqa Ma'in valley, all of them at about 100m below sea level. The 2 most important sources have a debit of more than 50 litters/second, but the debit is generally between 2 and 5 litters/second. The total debit of the river has not been measured. Hydrological fluctuation of the river is determined by the amount of rainfall during heavy rains.

Environmental Quality

- Water quality: See Section B of Appendix 4.5.

- Air quality: The air is naturally rich in oxygen (10% more than world average at sea level). The unique sources of air pollution are quarries and traffic along the Dead Sea shore. Traffic of heavy trucks is not permitted, and total traffic density is still very low.

- Soil quality: Probably due to overgrazing together with climatic conditions, vegetative cover is very scarce, and soil has been almost eroded. Remaining soils are those along the Dead Sea shore, particularly in Zara, and on the plateau around Wadi Himara. These soils are not thick (80 cm), poor in organic matter, low in water retention capacity, and subject to erosion. There is no soil around the project site.

- Landslide occurrence: Unconsolidated slopes, climatic conditions, and seismic conditions are all together serious factors of landslides. The Zarqa Ma'in valley and the steep slopes of the rift escarpment are exposed to such risk. Hammamat Ma'in is within such area. Surface as well as gully erosion is also strong in this area.

- Habitats and wildlife: All the wildlife in the area is conditioned by the system of wadis because of the presence of water. Wadi Zarqa Ma'in is essential because of its extension and permanent superficial water. There are several small wadis with seasonal or permanent aquifers. Vegetation, migratory birds, fishes (2 endemic species), and mammals (of which species like ibex, wolf, and hyena) and strongly dependent on the presence of wadis.

- Landscape: The Panoramic Complex project and its area provides an exceptional panoramic view of the Dead Sea together with the Wadi Zarqa Ma'in. Such landscape conditions are not common along the Jordanian Dead Sea shore, and they are here of very high value. However, several pressures are potential causes of loss of the landscape value along the Dead Sea: Construction of roads, opening of quarries, electrical lines, cable car, and various tourism facilities.

Social Environment

- Use of water: The hot water of the river is used for drinking purpose (upstream) and for bathing purpose (upstream and downstream). Downstream, litter and human feeies deposited by the picnickers are directly discharged into the Dead Sea. These generate repulsive odors all along the river. There are no toilets available in the area.

- Use of land: The landscape is an arid land without permanent settlement. The Bedouin population is using the grazing land in the north several kilometers from the project site. The Dead Sea shore is occupied by the new coastal road.

- Historical remains: There are no known historical remains within the limits of the study area. The department of Antiquities is conducting a survey in the

region, but is unlikely to look at the site of the Panoramic Complex.

c. Main Sources of Impacts and Sensitive Issues

Potential Sources of Impacts

The facilities have been described above. It is worthwhile to note that project option 1 rest house includes a pool and an oasis garden. Other facilities to be considered for the IEE of the site are the cable car and road projects. The total number of visitors is forecasted to be 150,000 persons / year.

The main direct source of impact is the cable car project. It is proposed that the cable car project should be divided into 3 possible alternatives (Figure 4.4.9):

- The "Wadi alternative", from Dead Sea / Zara to Ma'in Spa all along the valley as proposed by the Jordan Investment Corporation
- The "Panoramic Concept" alternative, from Dead Sea to Ma'in Spa with a direct connection to the planned Panoramic Complex.
- The "plateau alternative", from Dead Sea (mouth of the Wadi Himara) to Ma'in receiving two sections connected by a road bus.

Another major source of impacts is the increased visitor volume which will be induced by the above mentioned projects together with the proposed road project.

Sensitive Issues

Main receptors of impacts are water for drinking, bathing, aquatic life, and potential additional uses. Wildlife, landscape, and tourist population are also critically sensitive to impacts of the project. The sensitive issues are reviewed according to geographical units.

- Zarqa Ma'in valley: The valley is already subject to tourism pressure upstream and downstream. Zara generates a concentration of visitors because of the availability of Dead Sea bathing water together with the sweet water of the Wadi. Sensitive elements are water, aquatic wildlife, terrestrial wildlife, landscape, wild nature atmosphere, salubrity and health.

- Dead Sea escarpment and plateau: This area is not sensitive to effects of the project at the exception of the scenery resource (Figure 4.4.10).

- Dead Sea shore line: The Dead Sea shore line is already degraded by the following:
  - Main road and change in the pattern of sweet water leakage
  - Artificial decrease of the Dead Sea water level
  - Unsalubrity conditions (litter, human fecies)

- Loss of vegetative cover
- Risk of traffic accident

Within the study area, the Dead Sea shore is not important from the ecological point of view. The probable future rise of the water level of the Dead Sea to its original level after completion of the Dead Sea - Red Sea canal project is an additional factor of ecological uncertainty.

d. Potential Negative Impacts

Impacts according to project categories are summarized in Table 4.4.6. Critical issues are mentioned below.

- Change in the landscape and remote atmosphere of wild nature, with possible loss as a tourism resource, mainly in relationship with the sitting of the cable car, and secondarily with electrical lines. The impact of the cable car on landscape is critical according to the "Wadi alternative", important according to the "panorama layout alternative", and almost in existent according to the "plateau alternative.

- Pressure on water resource availability: Implementation of the option 1 will induce a serious pressure on water resources in order to supply guests, pool, and the oasis garden. Water intake for supplying guests only could be about 82m3/day. However, maintenance of the facilities including the oasis garden, and operation of the pool will induce a larger consumption of water. Water intake upstream could reach a significant rate of the available flow.

- Degradation of the water quality: As a consequence of reduced natural flow of water together with other factors, the ecology of the river could be seriously modified. These factors include the increased quantity of treated waste water upstream, the increased use of water for bathing, and the increased quantity of litter and human feeies in the river,

- Increased exposure to the risk of natural disaster (landslide, erosion): Hammamat Ma'in hotel is already considered as being located in an area with landslide risk in winter season and / or with earthquake occurrence. Increasing its activity or capacity would also intensify the exposure to risk. As well, the "Wadi alternative" for cable car would increase exposure.

Ranking of effects : Acceptable, Unacceptable, Uncertain, X for no effect or negligible effect

	Direct effects of elements and alternatives of the project				Induced effects (together with parkway project)		Global effects and ranking of effects	
	Primary effects CABLE CAR "wadi alternative"	Primary effects CABLE CAR "panorama layout alternative"	Primary effects CABLE CAR "plateau alternative"	Primary effects FACILITIES (museum, hotel, panorama)	Visitors volume	Traffic development	**Without environmental protection measures**	**With environmental protection measures**
Sound / visual Landscape;	*Unacceptable*	*Unacceptable*	*Acceptable*	*Uncertain*	*Acceptable*	*Uncertain*	**Unacceptable**	**Acceptable**
Water resource; water use	X	X	X	*Acceptable*	*Acceptable*	X	**Uncertain**	**Acceptable**
Water quality	X	X	X	*Unacceptable*	*Unacceptable*	*Uncertain*	**Unacceptable**	**Acceptable**
Wildlife	*Uncertain*	X	X	X	*Uncertain*	*Uncertain*	**Uncertain**	**Acceptable**
Exposure to landslide risk	*Unacceptable*	*Unacceptable*	*Uncertain*	X	*Uncertain*	*Uncertain*	**Unacceptable**	**Uncertain**
Salubrity conditions	X	X	X	X	*Unacceptable*	X	**Unacceptable**	**Acceptable**
Noise Air quality	X	X	X	X	X	*Acceptable*	**Acceptable**	**Acceptable**
Conflicts	X	X	X	X	*Unacceptable*	X	**Unacceptable**	**Acceptable**

Figure 4.4.7 Morphological Units

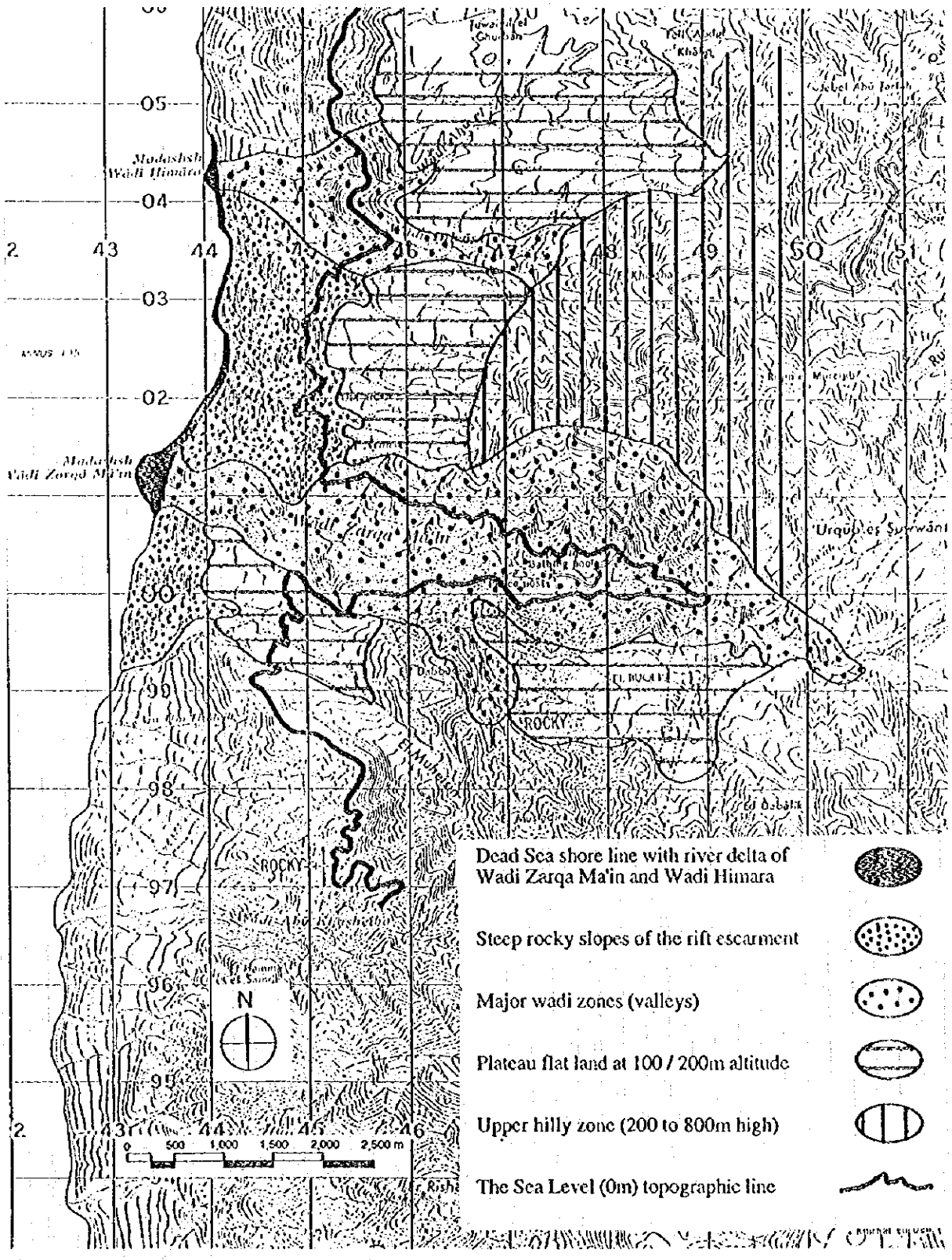


Figure 4.4.8 Project Sites according to the Dead Sea Master Plan

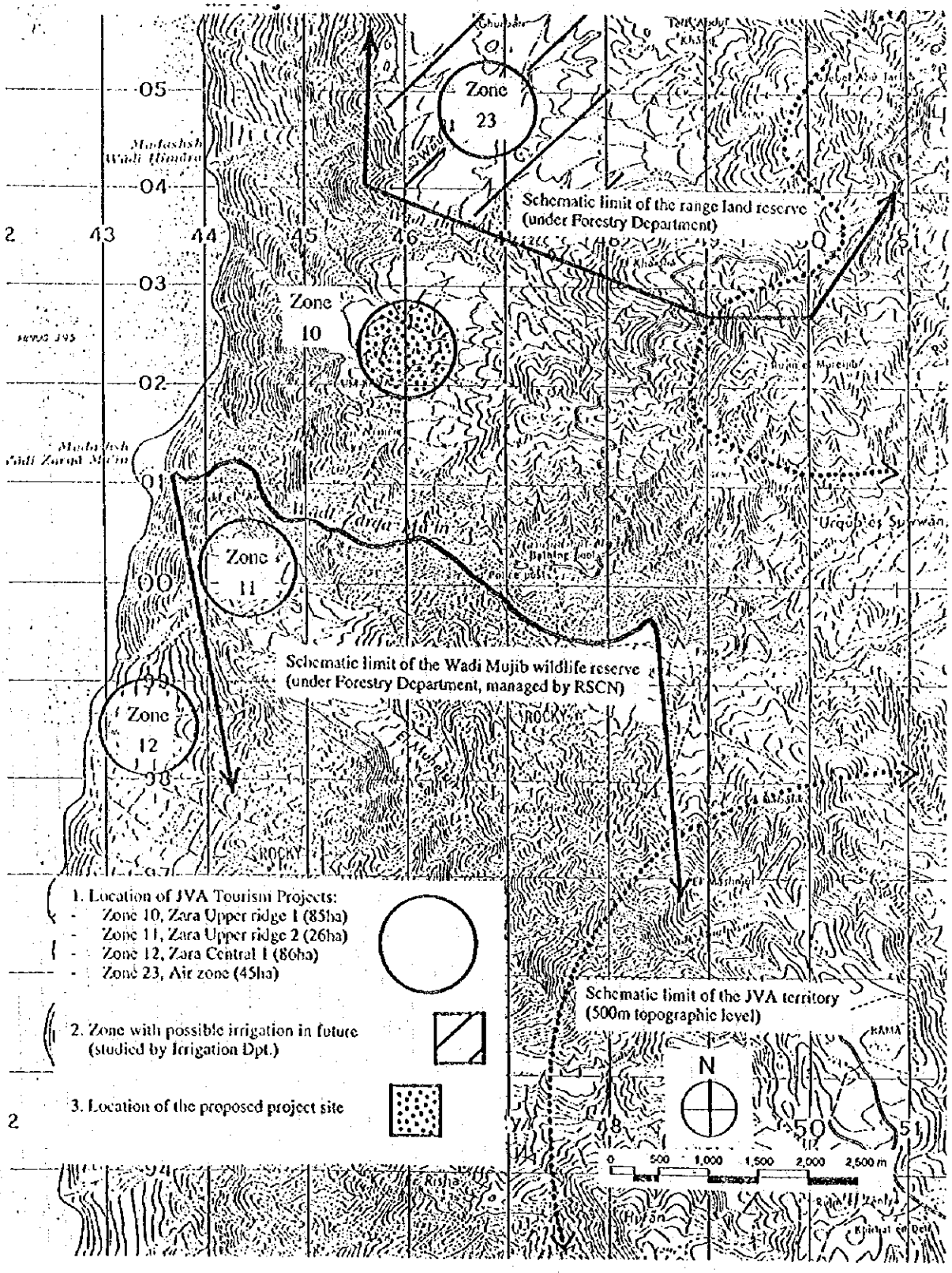


Figure 4.4.9 Cable Car Alternative for the IEE Study

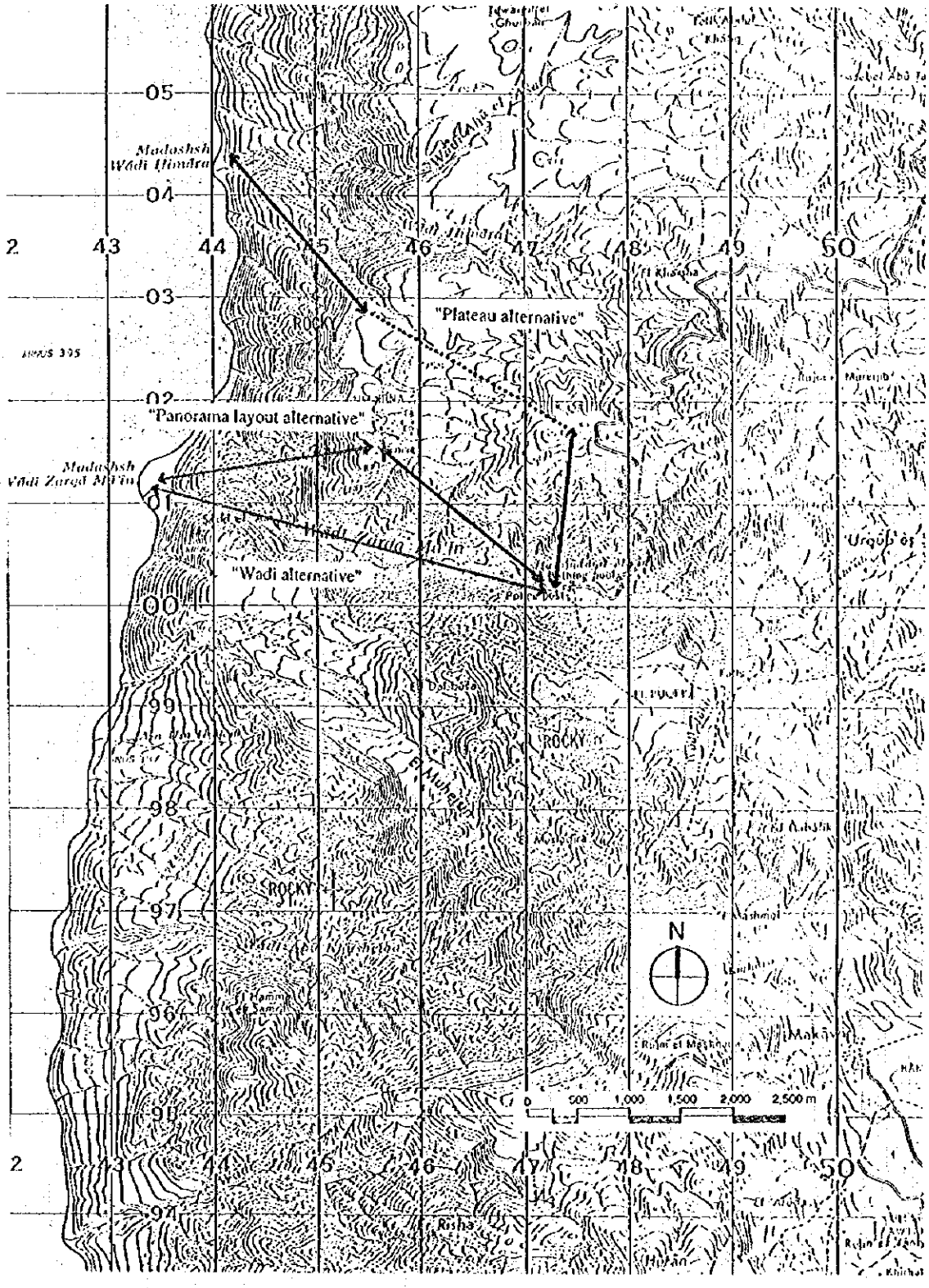
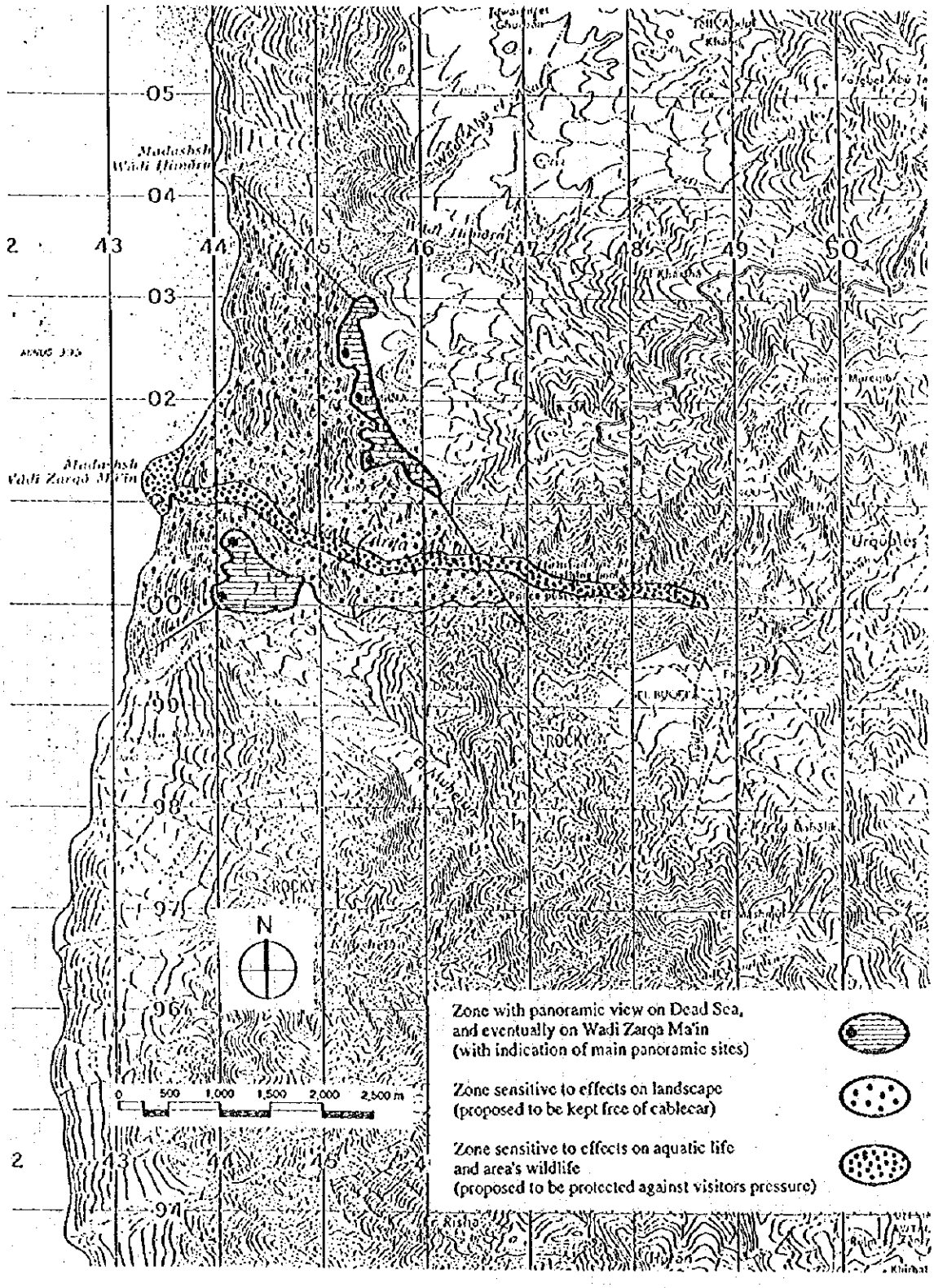


Figure 4.4.10 Sensitive Zones around the Project Site



E. Environmental Management

a. Main Objectives

- Conservation of the scenic value
- Protection of the panoramic sites and good integration of facilities in the site
- Conservation of nature and wildlife
- Integration of the picnickers population in the project development
- Ecological management of resources and environmental quality

b. Recommended Measures

- Assessment and management of the risk of exposure to landslide: Exposure of Hammamat Ma'in to landslide risk cannot be avoided now, but assessment and control of the area are needed. Exposure of the cable car facility to such risk can be controlled by sitting in a safe area.

- Environmentally suitable location of the cable car project and other facilities: The choice of the "plateau alternative" for sitting of the cable car provides a good alternative from the environmental point of view. The advantages are:
- Protection of the scenic value
- Protection against landslide because of the construction on a moderate interfluve slope, and because of the possible enforcement of soil conditions together with the construction of the access road project.
- Dispersion of visitors on the plateau according to their objectives, which avoids excessive pressure on the ridge.

- EIA study focusing on the major issues and objectives mentioned above: Such a study could include a survey of landslide risk in the valley, an inventory of wildlife in the area (in coordination with RSCN which has already started inventory in Wadi Mujib), an inventory of possible archaeological sites, a study of the feasibility of an oasis garden (availability of water and soil), and others.

- Establishment of basic facilities for environmental quality maintenance: This concerns each site subject to tourism pressure, namely Zara, panoramic concept, and Hammamat Ma'in. Basic facilities means toilets, treatment of wastewater, collection of garbage, picnic tables with minimum comfort, parking area, and leisure parks for children. The purpose is double:
  - to ensure healthy and safe conditions,
  - to minimize social conflicts between downstream picnickers and upstream international tourism visitors, and

- to minimize possible future conflicts for the use of water, provided that a tourism project that would not be also at the benefit of picnickers would receive low attention from other potential water users like projects of the Irrigation Department.

- Management of the capacity of the site: The geographical dispersion of visitors is essential for the sustainability of quality conditions of the site. Here, the establishment of a trails and pathways system is considered to be the best measure.

- Conservation of water, and the use of renewable sources of energy: This issue is essential because of the scarcity of water, which will be expected to become increasingly critical in Jordan. The best way to satisfy the needs without excessive conflicts is a multi-faced approach including rain water storage for specific uses, economical water consumption, and the recycling of used water. Use of electricity should be considered with the same care.

- Restoration of natural conditions in Zara.

- There are more long term measures to be considered at institutional level like development of an EIA and environmental approval system for the Dead Sea in particular, preparation of protected areas plan, designation of strict reserves for wildlife, and limited reserves for landscape and nature, and strengthening of management capacity. Directly involved agencies are MOTA, RSCN, General Environment Corporation, JVA, and others. The JVA master plan for tourism development has already proposed to limit development of the east shore of the Dead Sea and to study the possibility of establishing a regional natural park. This alternative should be considered together with conservation priorities and tourism development potential.

c. Impacts with Adoption of Environmental Protection Measures

The comparison of effects with and without environmental protection measures is given in Table 4.4.6. In this table, the so-called acceptability of effects refers to the common environmental quality standards, the recognition of the value of wildlife (international conventions), the spirit of the environmental strategy and law, and the need of sustainable tourism resources (landscape).

The project is quite acceptable and positive only if the proposed measures are taken. The landslide risk will however remain for Hammamat Ma'in but could be managed in order to limit it.

4.5 Madaba - Dead Sea Parkway

4.5.1 Concept and Rationale

(1) Concept

The basic concept is to provide a road that will substantially improve access between Amman and various points along the Dead Sea, and also between the future hotel zone at Suwayma and the tourist attractions to the south including the Panoramic Complex, Ma'in Spa, and all the other points accessible via the Kings' Highway (Mukawir, Wadi Mujib, etc.). Because it will descend the Rift Valley escarpment some 700 meters, it will offer some beautiful panoramic views of the surrounding escarpment, the Dead Sea, and opposite shore of the West Bank. By this road, circulation through Amman, Dead Sea, Ma'in, Madaba and back to Amman and the other way round will be realized.

(2) Rationale

Tourism requires easy road access between the dispersed locations with attractions and the gateway points and key cities, for flexibility in creating appealing circuits for bus tours. Amman is the core for tourism in the country, and in the future, major hotel zones will be developed at Suwayma and Zara. At present the regions south of Amman have north-south corridors that are not well connected by east-west links. This situation restricts the creation of good tour circuits. The Madaba-Dead Sea area is an example of a zone suffering from limited access.

A link is needed between the established Kings' Highway corridor, serving points such as Madaba, Mt. Nebo, Ma'in Spa and Mukawir, and the emerging Dead Sea corridor along which the two hotel zones will be located. The two east-west connecting roads, Route 40 connecting Amman and Kafrain to the north of the project site, and Route 50 connecting Karak and Mazar to the south of the project area, are over 60 km apart from one another. From the standpoint of tourism development of the region, these corridors need an additional link in this area. The road connecting Mt. Nebo and the Kafrein Junction is to be completed by the end of 1995, but the alignment is too northerly to make possible an easy tour circuit linking the Madaba area and the Dead Sea.

The various attractions on the Madaba plain and at the Dead Sea will all benefit from this new link. Moreover, the Ma'in Spa and proposed Panoramic Complex will benefit since at present the location of Ma'in Spa is isolated, having no direct access to the Dead Sea area.