It is planned to transfer water from the water purification plant to the IMT by two pipelines made of cast iron in parallel, each of which diameter is 600 mm. Comparing to the transportation by a single pipeline, the system seems to be adequate because of its redundancy.

Water flows in the distribution basins provided at the inlet of the IMT, after being transported from the water purification plant to the IMT and after water is distributed by pumps from the distribution basins. Water is to be distributed to the industrial zone directly by pumps because it requires a supply pressure of 4 to 5 kg/cm^2, however water is distributed to the residential and commercial area from a water distribution tower, to which water is pumped up.

8.3.2 Basic Design Data of Water Supply Facilities

(1) Total water consumption

(a) Water consumption by factories

Industrial water : 32,870 m^3/Day
Potable water etc : 2,889 m^3/Day

(b) Water consumption by residences and commercial facilities

Residences and : 4,900 m^3/Day
Commercial facilities : 2,100 m^3/Day

Total : 42,759 m^3/Day

8.4 Sewage Treatment

In this study, the concept of sewage covers not only the industrial waste water treatment and the treatment of effluents from living quarters but considers provisions for a protection system against flooding due to the inflow of storm water from the surrounding area of the IMT in the rainy season. Treatment of effluents from factories is expressed as "waste water treatment" and treatment of effluents from living quarters and storm water treatment are expressed as "sewage treatment".

"Sewage treatment" is also used as a general meaning for treatment which covers the treatment of waste water and the effluents from living quarters and storm water.

8.4.1 Waste Water Treatment Facilities for IMT

Waste water treatment capacity required for the IMT affects considerably on the public waste water treatment facilities, if it is discharged to the conduits for public service. Then, it is treated by the facilities provided for the IMT and after treating, it is discharged to the

artificial Manesar Drain, which will be provided parallel to the present Manesar Drain. The treated water is planned to irrigate the farmland. In rainy season, it flows to the Yamuna River via the Najafgarh Drain, to which the Sultanpur Link Drain is connected. The artificial Manesar Drain is connected to the Sultanpur Link Drain.

Total amount of waste water which will be treated by the water treatment plant in the IMT, is about 22,000 m^3 per day (Design capacity of the plant is 33,000 m^3 per day) and analysis of waste water estimates BOD of 330 ppm, COD of 260 ppm and SS of 200 ppm. Expected concentrations of contaminants of treated water will be BOD of 15 ppm, COD of 25 ppm and SS of 60 ppm after treating by the conventional activated sludge process.

Design philosophy of waste water treatment plant in the IMT is outlined below. Separated system is to be applied for the sewage network in the IMT and industrial waste water is classified as follows, applying the criteria which are specified in the Japanese Uniformity Standard.

8.4.2 Conceptual Design of Stormwater Drainage System

(1) Premise of stormwater drainage system design

The basic concept of drainage system design is, in principle, to maintain the same hydrographic flow in the district after development of the IMT as occurs is in the existing state.

The catchment area will not be changed by development except for minor changes in flow routes. The surface rainwater flow quantity will increase due to higher runoff but this shall be adjusted using a retention pond and the discharged flow quantity will be maintained at the existing flow. While the total flow quantity is unchanged, it is however necessary to improve (or construct) the down stream drain because the discharge from the retention pond is concentrated at one point as distinct from the overland flow or sheet flow that now occurs.. This design is based on the premise that the down stream drain will be improved.

(2) Basic concept of drainage district

The division of drainage, in principle, shall be maintained in the existing state. The area is divided into an outer site and an inner site; the runoff coefficient will increase in the latter but not in the former.

Rainfall in the outside area will be discharged by the existing flow route as far as possible. The rainfall within the site will be collected into the retention pond located on the north-west of the site where discharge flow will be controlled.

8.5 Electric Power Supply

8.5.1 Basic concept of Power Supply System for the IMT

(1) Estimate of Electric Power Demand

Power demand for the IMT is estimated by calculating the maximum power demand for each category and considering the "Demand factor" in each figures. The process of the calculation is shown in Table 8.1, total power demand for the IMT is estimated to be 110 MW.

Table 8.1 : Calculation of Electric Power Demand

Category	Maximum Power Demand		Demand Factor	Power Demand x Demand Factor (KW)
	Power Demand (KW)	Method of Estimating		
Factories	77,320	See Table 7.2.4 in the Main Report	0.9	69,588
Housing	37,400	See Table 7.3.7 in the Main Report	0.6	22,440
Social Service Facilities	28,320	See Table 7.3.7 in the Main Report	0.6	16,992
Others (Road Lighting, etc.)	2,000	-	0.6	1,200
Total	145,040	-	-	110,220 (approx 110MW)

(2) Method of Electric Power Supply

One of the main objectives of this study, as described in chapter 5, section 5.5, is supplying stable electric power to the IMT. It is an indispensable condition to improve the level of infrastructure up to an international level.

To realize this objective, the power supply system to the IMT should have a couple of power sources. In other words, one source is the IMT as own captive power generation plant and the other source is a commercial power source from the Haryana State Electricity Boards (HSEB), so that these power supply sources can mutually back each other up. These power supply sources shall have enough capacity (110MW) individually to cover the power demand of the IMT.

However, in an ordinal operation mode, the captive power generation plant will have priority as a main power source and the commercial power source will be kept as a stand-by.

In addition, the captive power plant will have its own back-up system such as stand-by unit which will be provided so that the generation of planned capacity can be continued in case of periodical inspection and/or emergency, and a back-up system for fuel supply.

Also, the electrical power distribution system will have a ring main configuration that have a couple of power receiving circuits as mutual back-ups.

8.5.2 Captive Power Generation Plant (IMT Power Plant)

(1) Selection of type of IMT Power Plant

The power generation plant should be a package-type gas turbine driven power generation plant based on the following merits:

1) Minimal time required to begin generation

2) Comparatively low noise; Counter measures can be taken easily because of the high frequency of noise.

3) Since GAIL is implementing the project to extend the gas supply trunk line to Faridabad, low cost generation using natural gas can be achieved. It is possible at some later date to provide a supply of inexpensive steam to the IMT factories by future expansion to a co-generation plant with a waste heat recovery steam generator.

4) Minimal time required for construction

5) Only small quantity of cooling water required.

(2) Selection of Numbers and capacity of Gas Turbine Generating Unit (GTG)

To minimize construction cost per KW, number of unit should be one which has a capacity of 110 to 120 MW equal to the total demand of the IMT. However, this configuration has a demerit, that failure of the unit will cause complete shut down of the power plant and when considering a stand-by unit, the capacity of the stand-by unit has to be 100% capacity of the duty unit.

Then for the power generation plant of the IMT, the configuration consisting of 4 sets of frame 6 size power unit (38 MW by ISO Base Rating) which consists of 3 duty units and 1 stand-by unit is recommended. In this case, nominal plant output will be 114 MW and rate of stand-by unit to total installed capacity will be 33%.

(3) Outline of IMT Power Plant

1) Plant Layout

Proposed plant layout is shown in Fig. 8.5. The main points which we considered when making the plan, are as follows:

(a) Gas Turbine Generator (GTG) will be Frame 6 out door package type gas turbine generating units (3 units = duty, 1 unit = stand-by).

(b) To minimize disassembling space, we provided common space for 4 GTG in a common shed which has columns and a roof without a wall, to consider maintaining of GTG in the rain.

(c) Arrangement of GTG exhaust ducts and stacks were made so that the exhaust duct can be connected to the Waste Heat Recovery Steam Generator without modification of duct, when co-generation plant and/or combined-cycle power plant is built up in the future. The height of exhaust stacks should be 45m, according to the regulations regarding the environmental act in India.

(d) The space for the following facilities is provided in the plan for future extension.

- Waste Heat Recovery Steam Generator (HRSG)
- Water Treatment Plant for HRSG
- Steam Turbine Generating Facilities for Combined-Cycle Power Plant
- Extention of Substation Bays

(e) Remote Control Building

GTG can be operated from local control cabinet combined with GTG package. In addition, our plan includes a remote control panel which can control and supervise fuel supply systems, substations, etc., from a remote position as well as GTG.

The remote control building is located in the plan to install the mentioned panel.

This building also has an operators room and switchgear room, etc. in which switchgears for station auxiliaries and distribution to the IMT will be installed.

(f) Site of IMT Main S/S is combined with the site of this power plant.

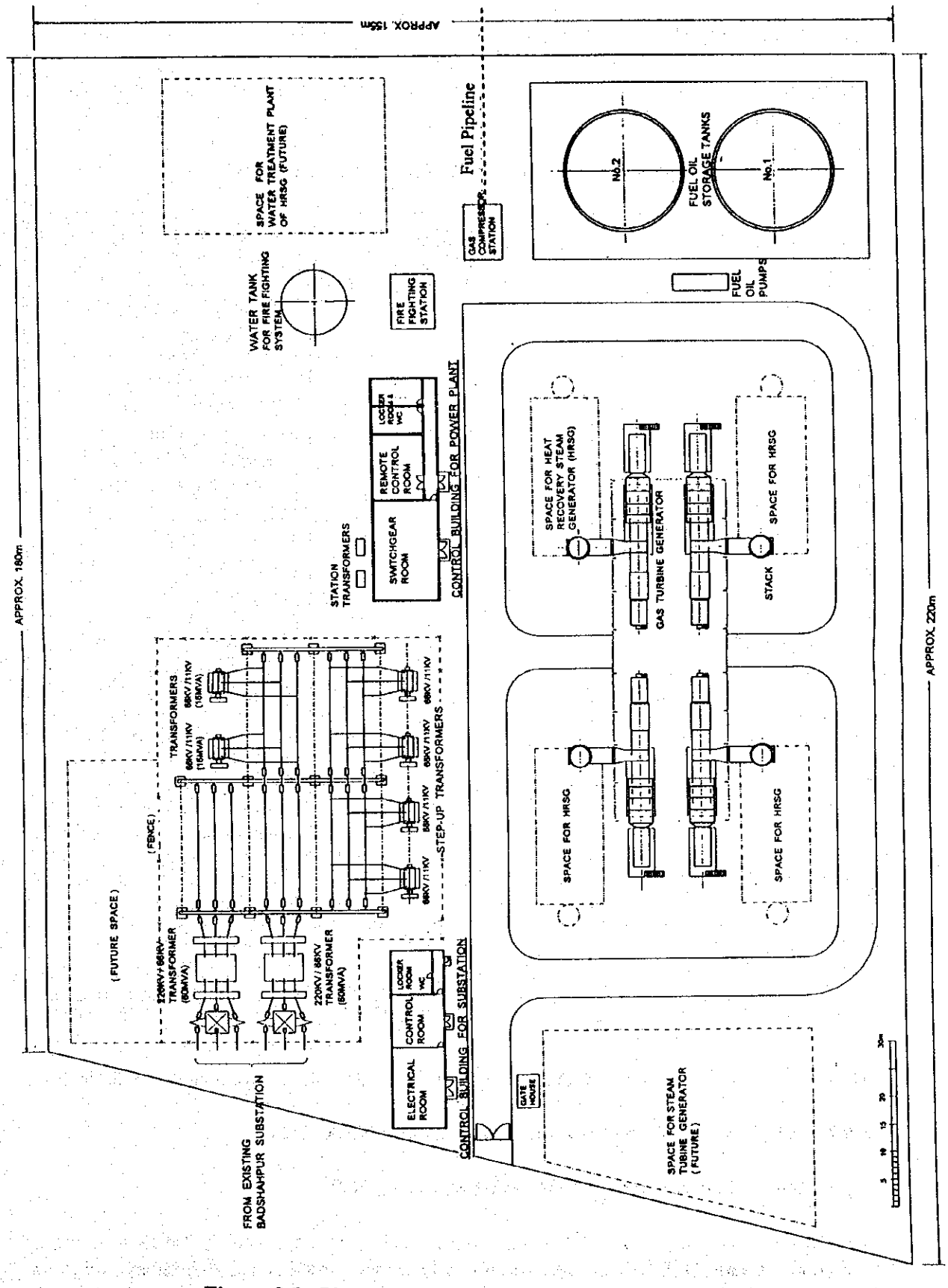


Figure 8.5 : Plot Plan of the IMT Power Plant and Main Substation

8.6 Telecommunication

8.6.1 Estimate of Telecommunication lines

Telecommunication lines for the IMT are estimated as follows, by summarizing line numbers of each category:

Table 8.2 : Estimate of Telecommunication Lines

Category	Estimated Number of Lines	Method of Estimating
Factories	496	Number of Factory: 124 Lines/Factory: 4
Urban Facilities	150	1) Town Center: 10 2) Community Center: 5 3) Shopping Center: 10 4) Restaurant Build.: 10 5) Shopping Mall: 100 6) Health Care Center: 5 7) School: 5 8) Police Stn., Fire Stn.: 5
Business Support Facilities	30	1) Promotion Center: 20 2) Training Center: 5 3) Seminar House: 5
Housing High Density	100	Number of Building: 100 Line/Building: 1
Housing Medium Density	960	Number of House: 1600 Line/House: 6/10
Housing Low Density	60	Number of Company: 20 Line/House: 3
Public Telephone	100	-
Total	**1896**	-

The estimated number of telecommunication lines for the IMT are approximately 2,000 lines.

8.6.2 Basic Concept of Telecommunication Facilities for the IMT

(1) Function of Department of Telecommunications (DOT)

The Telecommunication Business within India is exclusively managed by the Department of Telecommunications (DOT), except the city calls within New Delhi and Bombay which are

managed by Mahanagar Telephone Nigam Ltd. (MTNL). Long distance calls between New Delhi and Bombay are also in the scope of management by the DOT.

It is therefore understood way that the telecommunication facilities in the IMT are to be included in the DOT system and managed by the DOT. Then everything having to do with the telecommunication facilities for the IMT, i.e. procurement, installation, testing, commissioning, operation and maintenance should be managed by the DOT, while the IMT side provides building for Remote Exchange in the IMT and cable trenches for installing trunk line cables within the IMT.

(2) About the Policy to open to Foreign Investors and Private Sectors

According to the new economic policy adopted by the Central Government in May, 1994 (The National Telecom Policy 1994), it is now possible to participate in the telecom business in India for foreign investors and/or private sectors.

However, it is not recommendable to involve foreign investors and/or private sectors in the telecom business for the IMT, because of the following reasons:

1) When considering the scale of business which can be a commercial profit, the scale of the telecommunication system should have more than several hundred thousand subscriber lines as a minimum.
To clear this requirement, the area in which a telecom system is to be set up has to be as large as one state or at least a big district. Thus the scale of the IMT is much too small, i.e. estimated subscriber's lines are just 2,000.

2) Though the policy is to open to foreign investors and/or private sectors, there are actually some unsolved problems. For example, such individual problems are how to manage, how the number of subscribers will grow, etc.
Therefore, it is too early to involve foreign investors/private sectors in the telecom. business for the IMT.

8.6.3 Required Function of Telecommunication Facilities

(1) Line capacity has to be applicable for 2,000 of the estimated subscriber lines, and the switching equipment will have capability to extend subscriber lines without shutdown of existing lines, when more subscriber lines are required in the future.
(2) Optical fiber cable line has to be able to transmit PCM remote control signals from the computer of the Main Exchange, as well as the above mentioned capacity.
(3) The facilities should have interface matching with the following terminal devices:

- Ordinal analogue telephone set
- Digital multi-function telephone set
- Facsimile (G3, G4)
- Data terminal station (to access by 64 K bits/s interface)

8.7 Underground Utilities Duct

8.7.1 Design Condition of Underground Utilities Duct

(1) Accommodated Utilities

Following utilities shall be accommodated.

- Electric cables
- Telecommunication cables
- Water supply pipe

Pipes for stormwater drainage, sewerage and industrial waste water, which will be designed as gravity flow, will influence the depth of the underground utilities duct. Therefore, these are excluded and buried directly in the ground.

(2) Required internal dimensions

Required internal dimensions will be based on Underground Utilities Duct Design Guidance" published by the Japan Road Association.

Minimum internal height shall be at least 2.1 m considering the average height of employees with safety helmet as 1.8 m, lighting fixtures of 0.2 m and walkway concrete thickness of 0.1 m.

Minimum internal width shall be the sum of occupied width of the utilities plus a width of 0.75 m as the walkway for maintenance works.

(3) Earth cover

Earth cover of the Standard sections shall, in general, be more than 2.5 m. As at absolute minimum, earth cover shall be greater than pavement thickness.

(4) Alignment and longitudinal alignment

Alignment of underground utilities duct, in general, shall be designed on the premise that center of the duct is matching to road center.

Longitudinal slope of underground utilities duct locations shall be more than 0.2% for drainage except for special locations.

(5) Supply limit of underground utilities duct

Supply of utilities to each lot will be limited to road edge, and they will be supplied through embedded sleeves.

8.8 Industrial Solid Waste and Pollution Control

8.8.1 Solid Waste Disposal

The total amount of Industrial Solid Waste (ISW) which will be generated by the potential industries in the IMT was calculated based on the data provided by DSIDC (Delhi State Industrial Development Corporation), and the total comes to about 74 ton/D. The treatment of hazardous solid waste (HSW) included in ISW is prescribed by the Environment Act of India, and it is essential not to bring about environment pollution by the discharge of HSW. The total amount of ISW excluding all HSW & useful materials were taken off, plus municipal solid waste was calculated to be about 94 ton/D, and that is to be disposed by land filling. Installation of some facility to prevent the inflow of storm water to the land fill site and some tough interceptive sheet to prevent water leaching underground for the facility of land filling.

8.8.2 Waste Water Control

According to the analysis result of water quality around Gurgaon which was performed by HSPCB so as to grasp those current condition, hazardous heavy metals scarcely exist in the water. In case that the waste water from the industries moved into IMT exceeds the effluent standard based on the Environmental Act, it shall be discharged after being treated thoroughly to decrease the concentration up to the value less than the standard by their own disposal facility or cooperative one in IMT on their responsibility.

8.8.3 Air Pollution Control

As to process energy source for the industries moved into IMT, the supply of natural gas (NG) in which pollutants are scarcely included is actually difficult , so they cannot but apply gas oil, diesel oil & heavy oil for that, and they should be thoroughly directed not to discharge pollutant materials by those combustion.

Moreover in case that the emission of such harmful gases as CO, Halogen & Halogenated Gas, H_2S and NH_3 as well as SOx and NOx is anticipated from eg: chemical industry, the installation of the equipment to remove them off is required.

In regard to the monitoring discharge of pollutant materials in such phase of solid waste, waste water & air above mentioned, it should be fairly conducted letting them function their management organization of IMT well in cooperation with HSPCB.

In India 21 kinds of industries are defined as pollutive ones to obligate submitting EIA, but besides them some industries to be probable to discharge hazardous heavy metals must be paid attention.

Chapter 9 Operation and Management of IMT

9.1 Concept of Operation and Management Planning for the IMT

The policy for the IMT estate management which will form the basis for the industrial estate operation and management plan is as follows:

(a) As one of the objectives of construction of the IMT is the promotion of direct investment from foreign corporations etc., it is vital that management of the IMT satisfies international standards. The IMT should provide a good physical and industrial environment, such as the constant supply of electricity and the treatment of drainage, so the industries can operate smoothly. High level skills and organized management are vital for the maintenance and management of such infrastructural facilities and the overall detailed and high level management, and it is also important to establish an organization and setup that can sufficiently handle the treatment of waste from the various companies and the checking of pollution regulations.

(b) The HSIDC, the agency that operates and manages the industrial estates of Gurgaon, has gained know-how and organizational skills in operation and management through its past achievements. It is therefore necessary to consider the effective utilization of this experience of the HSIDC for he operation and management of the IMT.

(c) As the operation and management of the IMT covers many aspects and requires high level skills, it is necessary to examine the implementation of management through the consigning of possible areas to bodies that possess specialist knowledge and skills. Moreover, care shall be taken to ensure that the maintenance and management organizations is slimmed down to enable efficient and rapid handling of affairs to be done.

9.2 The Operation and Management Organization

9.2.1 Possibility of an Operation and Management Agency

As in the case of the development agency, the operation and management agency of IMT may be one of the following three organizations:

① The existing organization, HSIDC

② A new organization consisting of a joint venture between the public and the private sectors

③ A new private sector organization

This list can further be subdivided into the case in which development and operation are integrated with the development agency evolving into the operation and management agency and the case in which the organization involves itself only in operation and management.

In the event HSIDC is to assume the operation and management role, since the services required at IMT are outside the scope of HSIDC's previous experience, it will need to reinforce its organization in the fields of operation and management. It will be necessary to reinforce HSIDC's operation capability through, perhaps, employment of a consultant on an international level.

In the event third sector is to assume the operation and management role, as this implies adding the expertise of the private sector to past HSIDC experience, feasibility is high. However, the new organization will be made up of the public and private sectors, each with different objectives. Since the operation and management services provided must continue long into the future as long as companies maintain facilities in the industrial estate, the format should be carefully examined with a long term perspective in mind.

In the event the private sector is to assume the operation and management role, there is a problem as many of the facilities at IMT are not designed to produce profits and since the overall operation and management of IMT cannot be implemented without structuring these non-profit functions. There are facilities, however, that are designed to produce profits and for these, the format may work. However, here as well, accommodation with other public facilities and close cooperation with IMT's overall operation and management will have to be established.

In conclusion, operation and management by the third sector as a management body, which allows the mutual compensation of the demerits that exist in the cases of either public or private management, and which allows he merits to be obtained, is desirable.

9.2.2 Operational Planning for the IMTPC

(1) Setting up of an introduction function

When the IMT was established in the Master Plan its aim was described as the "Expansion of industrial production of manufactured goods for domestic demand," and the "Promotion of local industry by introducing advanced technology and management systems". Therefore, the IMT needs to raise India's industrial power and aim for a high standard in technology and management. From this point of view in the Master Plan the introduction of six promotional functions are intended. "7.3 Planning of Housing and Urban facilities" in the promotional F/S study indicates building the industrial Promotion Center in consideration of the functions to promote the IMT and to support business.

The five functions used in the operation and management of the IMT are as follows:

a. Investment Promotion Function
b. Business Supporting Function
c. Technology Supporting Function
d. Human Resource Education Function
e. Technology Exchange Supporting Function

(2) Outline of the facilities

The concrete facilities needed are the following five functions:

(a) Investment Promotion Function → Investment Promotion Facilities

It is necessary to have an information room (with library and data base facility) in order to provide information on an investment in India or to promote introduction of foreign capital by advertising the IMT. As for information, an independent section of one person in charge will be established because it needs reference and guidance for use.

(b) Business Supporting Function → Business Supporting Facilities

They supports the application procedure services, the management service for tenant companies, the capital raising intermediation service for tenant companies, consulting, and the introduction of subcontractors through intermediation between foreign companies and local companies. The information room (with library and data base function), conference, etc. are used as the facilities.

(c) Technology Supporting Function → Technology Supporting Facilities

The conference rooms, laboratory, the testing and analysis rooms are to guide the local companies (especially small sized) to use the test or analysis machines to meet international standard in the testing and checking of objects in the facilities. Concerning R&D facilities, as there is the existing R & D facilities in Gurgaon to intermediate their use to the companies, the facilities needed for the operation and management are conference rooms only.

(d) Human Resources Education Function → Human Resources Education Facilities

The training rooms and audio visual rooms where the tenant companies carry out small scale training are used as the facilities. Besides the training rooms in the Promotion Center, a large scale training center, are a seminar house are to be built harmonizing each facility with the service of the existing organization in Haryana state. The IMTPC will carry out desired services, making use of the facilities, intermediating to the agency of service.

(e) Technology Exchange Supporting Function → Technology Exchange Supporting Facilities

The conference rooms, the seminar rooms, the exchange rooms and the display rooms for promoting to exchange information, technology, and human resources among the companies, universities, and institutes in the IMT are used as the facilities to promote the transfer of technology.

As facilities for making operation and management of the IMT and making operation of the IMTPC, there are office floor, conference rooms, hall, etc., of every section.

9.3 Structure of Operation and Management

9.3.1 Scope of Work

The IMTPC, which shall operate and manage the IMT, shall be responsible for the smooth functioning of the industrial estates and the maintenance of equipment and buildings that will be improved through the infrastructure development. It is therefore necessary to build a system that takes this, and the fact that the IMTPC will take on affairs relating to the promotion of the estates, into consideration.

Implementation will be carried out by five departments being the Promoting Department to operate the facilities of the industrial estates, the Estates Management Department to manage the infrastructure of the industrial estates, the Housing Management Department to manage housing affairs and the facilities for the utility of the land, the Planning and Development Department to promote the use of the land and the General Affair Department to operate the organization.

The IMTPC shall of course be represented in the organization with an operation responsibility and deputy responsibility being exclusively placed within the IMT.

Furthermore, in order to carry out the regular works of the companies in the IMT more smoothly, a conference connecting each company which will be called the IMT Liaison Council, consisting of members of the located companies will be set up. The IMTPC will carry out the role of the secretariat.

9.3.2 Figure of the operation and management organization

Figure 9.1 shows the organization in the operation and management in IMTPC, relating to the contents of "9.3.1 Scope of Work"

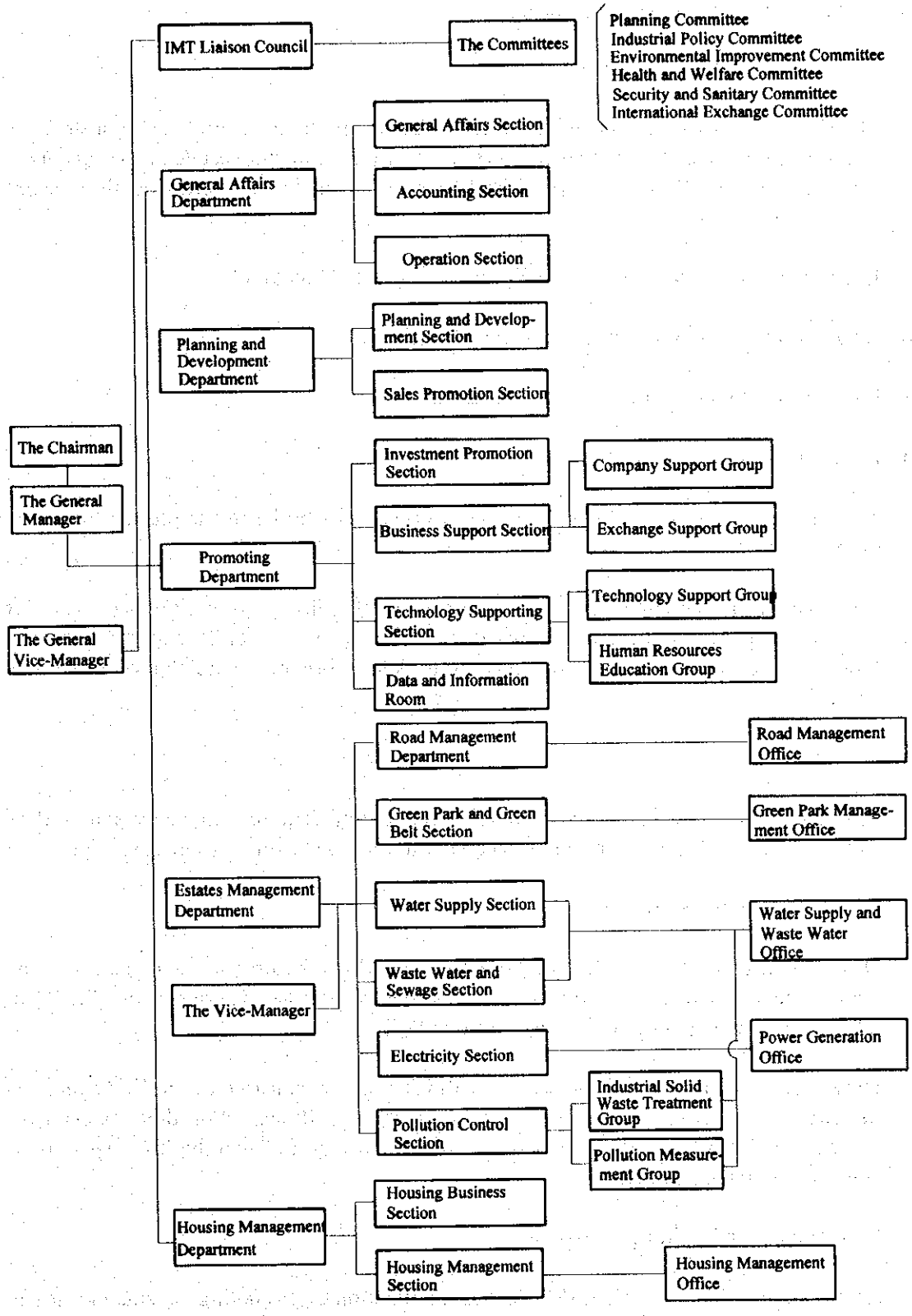


Fig. 9.1 : The Operation and Management Organization

9.3.3 The IMTPC Implementation Plan

(1) Phased formation of the organization

The IMTPC organization should be extended gradually in pace with IMT's construction of infrastructure and with the level of occupancy of the industrial estates by companies. The formation of IMTPC is envisioned to be effected in the following three steps. (refer to Figure 9.1.)

(a) Initial phase of construction (up to 2 years from ground breaking)

(b) Intermediate phase of construction (year 3 to year 5)

(c) Final phase of construction (year 6 to year 10)

(2) Phased introduction of functions

The various functions of IMTPC will be incorporated parallel to the phased formation of the organization.

The role of Investment Promotion focuses on providing information necessary for overseas corporations in deciding whether or not to locate facilities in the industrial estates, and as such must have the most up-to-date information available on the timely basis

(3) Personnel plan

In order to carry out its everyday duties, IMTPC will require a manager and staff as well as the experts in relevant fields necessary to provide business support services.

(a) Cooperation with external agencies

HSIDC will be involved except in those fields in which the private sector performs the management and operation functions. This means that the experience of HSIDC in management and operation may be utilized at IMT.

However, though housing and other facilities will be constructed at IMT, there is insufficient expertise in the management of such facilities. For this reason it is necessary to reinforce the organization by staffing from such highly experienced agencies as HUDA and HSEB.

(b) Employment and training of experts

As has been explained earlier, IMTPC has the function of promoting various industries. For this reason, personnel with the relevant expert knowledge should be recruited from the outside.
Educating IMTPC internal personnel to fill these roles may be considered in the future.

Table 9.1 : The IMTPC Implementation Plan

Item	Initial phase of construction (up to 2 years from ground breaking)	Intermediate phase of construction (year 3 to year 5)	Final phase of construction (year 6 to year 10)	After completion of construction
[The IMTPC organization]				
· General Affairs Department	●	○		
· Planning & Development Department	●	○		Δ
· Estates Management Department		●	○	
· Housing Management Department			●	○
· Planning & Development Department			●	○
[Industry Promotion functions]				
· Investment Promotion function	●	○		Δ
· Business Support function		●	○	
· Technical Support function			●	○
· Human Resources Development function			●	○
· Technology Exchange Support function			●	○

(Note) ●: establish department or function;
○: reinforce organization/expand scope of function;
Δ: decrease scope of function

Chapter 10 Cost Estimation and Implementation Schedule

The development cost of the Industrial Model Town is estimated based on the conceptual design mentioned in Chapter 8, and the unit construction costs collected during the field survey. Following that, the implementation schedule is described.

10.1 Cost Estimate

(1) Major Premises for Cost Estimate

The following conditions and assumptions are applied to the cost estimate.

(a) Scope of the Cost Estimate

In this study, the components of the IMT are divided into the following 9 groups : Land Acquisition, Basic Infrastructure, Flyover (modification of National Highway No. 8), Power Supply, Telecommunication, Water Supply, Drainage and Waste Water Treatment, Solid Waste Management and Buildings (Housing, Town and Commercial Facilities) and the cost estimate of each group is separately accomplished.

(b) Price Base

Costs are estimated in 1994/95 constant prices, and inflation is not included. The unit costs applied to the cost estimate are basically market rates in India. The cost of consulting services including design works are estimated based on the assumption that consultants of a developed country are hired in order to develop the model town to an international standard.

(c) Currency and Exchange Rates

The estimates are carried out in local currency (Indian Rupee), and any costs estimated in foreign currencies are converted to local currency by using the following exchange rates.

Rs 1 = 3.3 Japanese Yen = US$ 0.033

(2) Results of Cost Estimate

Table 10.1 shows the summary of cost estimate based on the above premises.

10.2 Implementation Schedule

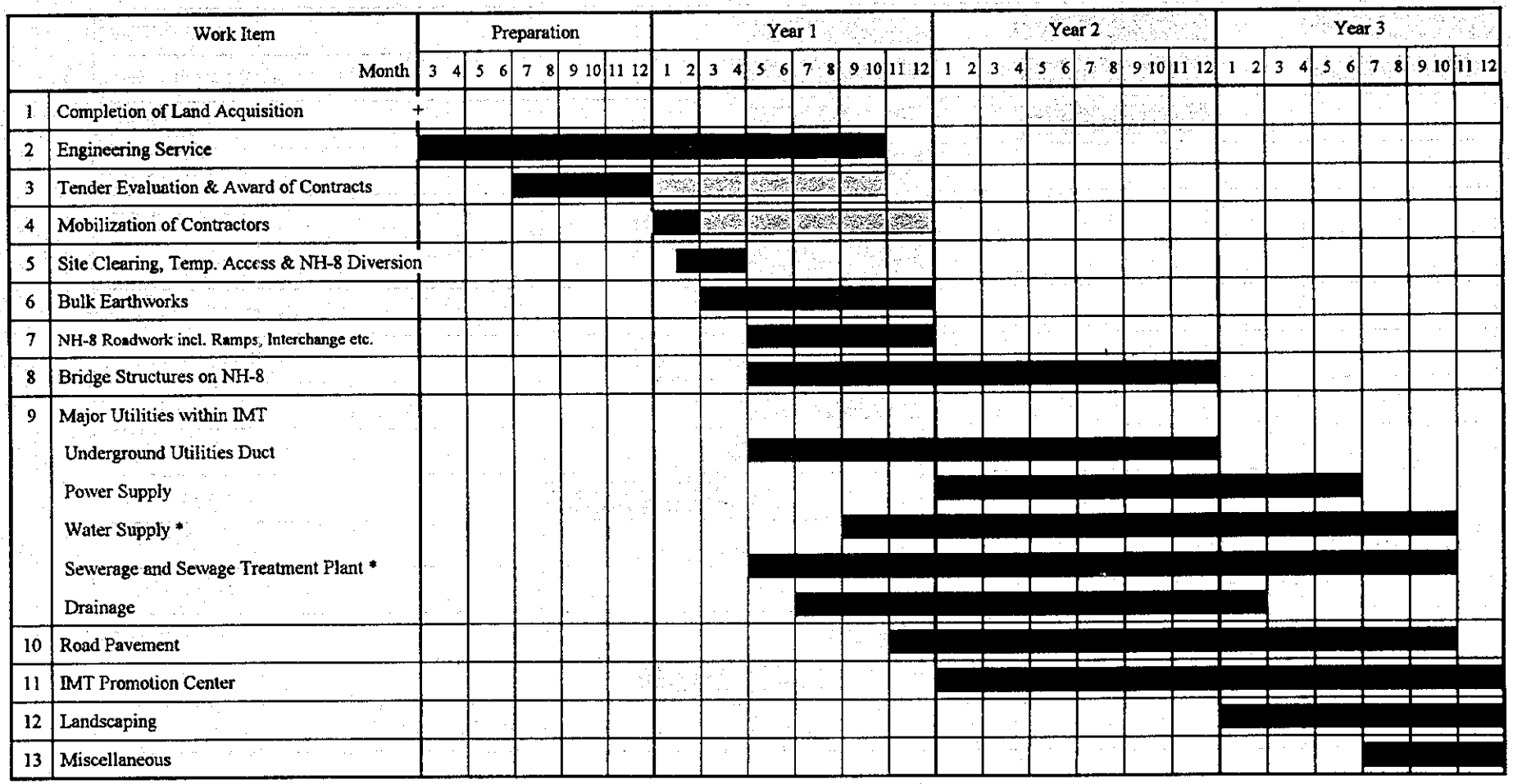
Figures 10.1 and 10.2 show the implementation schedule after the completion of land acquisition work.

Table 10.1 : Summary of Cost Estimate

(Unit: Rs Million)

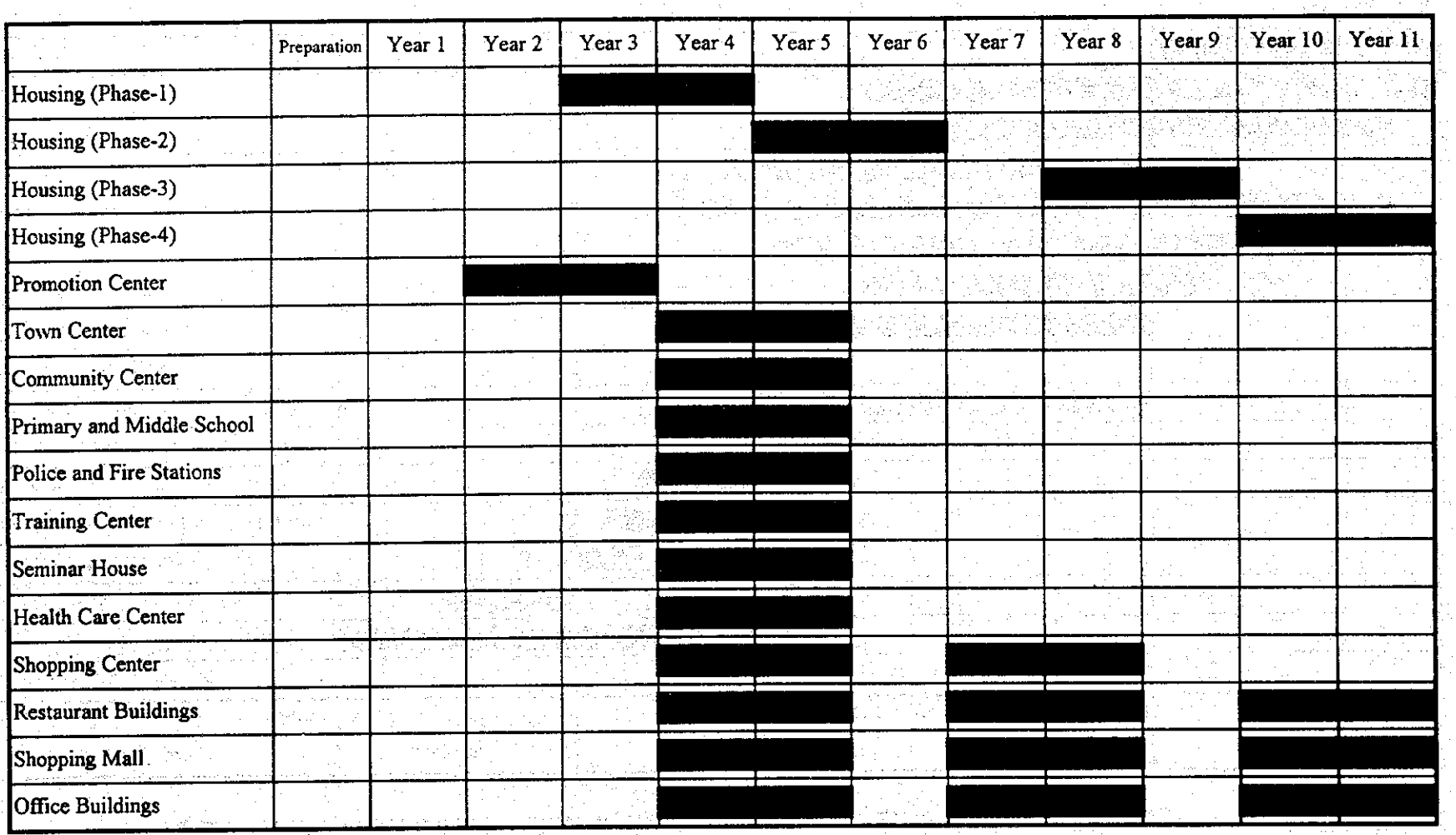
Item	Direct Cost			Engineering Service	Contingency	Total Cost
	Foreign	Local	Total			
(1) Land Acquisition						***1,500.0***
(2) Basic Infrastructure of IMT						
Land Preparation	0.0	189.6	189.6	19.0	9.5	218.0
Road	0.0	385.4	385.4	38.5	19.3	443.2
Landscaping(Green Belt, Park, Boundary, etc.)	0.0	49.1	49.1	4.9	2.5	56.4
Street Lighting	0.0	40.0	40.0	4.0	2.0	46.0
Underground Utility Duct	0.0	306.3	306.3	30.6	15.3	352.2
Power Distribution Line	116.2	32.0	148.2	14.8	7.4	170.4
Water Supply Piping Network	0.0	78.0	78.0	7.8	3.9	89.7
Sewage Collection System	0.0	42.8	42.8	4.3	2.1	49.2
Storm Water Drainage Facility	0.0	359.3	359.3	35.9	18.0	413.2
Settling Basin for Storm Water	0.0	25.3	25.3	2.5	1.3	29.1
Sub-total	116.2	1,507.6	1,623.8	162.4	81.2	***1,867.4***
(3) National Highway No.8(Flyover)	0.0	233.8	233.8	23.4	11.7	***268.8***
(4) Power Supply						
Land Acquisition						
Rearrangement of Manesar Sub-station (3 ha)						7.5
Transmission Line to Badshapur (27 ha)						54.0
Gas Pipeline (45km)	349.1	85.5	434.6	34.8	21.7	491.1
Gas Turbine Power Plant	1,957.6	192.0	2,149.6	172.0	107.5	2,429.0
Sub-station & Transmission Line to Badshapur	571.2	247.5	818.7	65.5	40.9	925.1
Rearrangement of Manesar Sub-station	37.1	145.0	182.0	14.6	9.1	205.7
Sub-total	2,915.0	670.0	3,584.9	286.8	179.2	***4,112.5***
(5) Telecommunication						
Machinery	90.9	0.0	90.9	7.3	4.5	102.7
Subscriber Line	90.9	0.0	90.9	7.3	4.5	102.7
Optical Fiber Cable	13.6	0.0	13.6	1.1	0.7	15.4
Sub-total	195.5	0.0	195.5	15.6	9.8	***220.9***
(6) Water Supply						
Land Acquisition (25 ha)						25.0
Water Purification Plant	0.0	92.9	92.9	7.4	4.6	105.0
Water Reservoirs	0.0	300.0	300.0	24.0	15.0	339.0
Water Pipeline to IMT	0.0	131.5	131.5	10.5	6.6	148.6
Pumping Station	0.0	114.5	114.5	9.2	5.7	129.4
Sub-total	0.0	638.9	638.9	51.1	31.9	***747.0***
(7) Sewage Treatment and Drainage						
Waste Water Treatment Plant	0.0	264.6	264.6	21.2	13.2	298.9
Sludge Treatment Facility	0.0	209.7	209.7	16.8	10.5	236.9
Improvements to Manesar Nala Drain (7km)	0.0	8.1	8.1	0.6	0.4	9.1
Land Acquisition for Outlet Channel (17.5 ha)						35.0
Improvement of Culvert under Railway Line	0.0	4.6	4.6	0.4	0.2	5.2
Sub-total	0.0	486.9	486.9	38.9	24.3	***585.2***
(8) Solid Waste Management						
Trucks	0.0	45.0	45.0	0.0	2.3	47.3
Land Acquisition (dumping for 3 year)						10.3
Others	0.0	5.5	5.5	0.0	0.3	5.8
Sub-total	0.0	50.5	50.5	0.0	2.5	***63.3***
Total Cost excl. Buildings	3,226.6	3,587.6	6,814.2	578.2	340.7	***9,365.0***
Total Cost excl. Buildings(Million Yen)	10,647.8	11,839.2	22,487.0	1,908.2	1,124.3	***30,904.4***
(9) Residential Facility						
High Density Housing(4F)	0.0	550.0	550.0	38.5	44.0	632.5
High Density Housing(10F)	0.0	4,200.0	4,200.0	294.0	336.0	4,830.0
Middle Density Housing (3F)	0.0	1,312.5	1,312.5	91.9	105.0	1,509.4
Housing for EWS(4F)	0.0	136.8	136.8	9.6	10.9	157.3
Sub-total	0.0	6,199.3	6,199.3	434.0	495.9	***7,129.2***
(10) Town and Commercial Facility						
Promotion Center	0.0	380.0	380.0	38.0	30.4	448.4
Town Center for Public Service	0.0	160.0	160.0	16.0	12.8	188.8
Community Center for Residents	0.0	35.2	35.2	3.5	2.8	41.5
Primary and Middle School	0.0	144.0	144.0	14.4	11.5	169.9
Police Station	0.0	8.0	8.0	0.8	0.6	9.4
Fire Station	0.0	4.0	4.0	0.4	0.3	4.7
Training Center	0.0	72.0	72.0	7.2	5.8	85.0
Seminar House	0.0	60.0	60.0	6.0	4.8	70.8
Health Care Center	0.0	64.8	64.8	6.5	5.2	76.5
Shopping Center	0.0	224.0	224.0	22.4	17.9	264.3
Restaurant Building	0.0	72.0	72.0	7.2	5.8	85.0
Shopping Mall	0.0	384.0	384.0	38.4	30.7	453.1
Office Building	0.0	1,156.0	1,156.0	115.6	92.5	1,364.1
Sub-total	0.0	2,764.0	2,764.0	276.4	221.1	***3,261.5***
Grand Total	3,226.6	12,550.9	15,777.5	1,288.6	1,057.8	***19,755.7***
Grand Total(Million Yen)	10,647.8	41,418.1	52,065.8	4,252.4	3,490.7	***65,193.8***

Figure 10.1 : Implementation Schedule for Land Preparation and Infrastructure Development



Note: * Time to start construction work depends on demand and the policy of developer.

Figure 10.2 : Implementation Schedule for Construction of Buildings



Chapter 11 Financial and Economic Evaluation

11.1 Financial Evaluation

(1) Basic Objectives for the Financial Analysis

In this study, the profitability of the five assumed items and facilities, i.e. development and sales of land, power supply, water supply, sewage treatment, and housing are individually investigated. The overall profitability of the project is also studied. For the profitability study of each item, the minimum salable price to recover the investment costs is derived, and the adequacy of the price is discussed.

(2) Major Conditions and Assumptions for the Financial Analysis

In the financial analysis, all prices are 1994 basis, and inflation is not considered. Calculations are made on local currency (Indian Rupees: Rs), and below exchange rates are applied for necessary conversion. For the development and sales of land, the effects of inflation and change of exchange rates on profitability are studied in sensitivity analysis.

Rs 1 = 3.3 Yen = US$ 0.033

Based on the current taxation system, the corporate income tax of 46 % (Base Tax: 40% + Surtax: 6%) is applied. For power supply, the tax is exempted for 5 years after the start-up of operation. The amount of depreciation in each year is calculated by declining balance method based on the Taxation system in India. The cost incurred on the land acquisition and the development of basic infrastructure is recovered in proportion to the sold area in tax calculation instead of the normal depreciation.

Regarding sales forecast of land, two cases are considered. For the industrial area, sales completion in 10 years (Case-A) and 5 years (Case-B) are applied. For the residential and commercial facilities, phased development based on the assumed sales of industrial area is considered.

(3) Development and Sales of Land

The feasibility of the development and sales of land is investigated assuming that the costs of Acquisition of 600 hectares land area, Development of basic infrastructure, Construction of flyover, Construction of promotion center building, and Improvement and land acquisition for outside drain is covered by selling land.

The feasibility is evaluated assuming that the entire costs for land acquisition is covered by the own equity because the debt for land acquisition makes the salable land price expensive and makes the project financially infeasible. As for the financing for the development cost, the following three cases are

studied. The repayment term of the debt is assumed to start from the second year of land sales until completion (9 years for Case-A and 4 years for Case-B). In the three cases of financing plan, Case-1 is one of the typical example of financing plan for J/V formation, and Case-3 is less likely. Case-2 is the financing plan unable to be financed by foreign financial institutions, and the project will be highly indebted.

- Case-1 : Loan of foreign commercial financing institutions (interest rate of 6.5% p.a., equity 20%)
- Case-2 : Loan of local financing institutions (interest rare of 16% p.a., equity 15%)
- Case-3 : Loan and equity participation of foreign governmental financing institutions (interest rate of 5% p.a., equity 47%)

The calculated salable price of land under the assumed conditions are shown in the following Table.

Table 11.1 Minimum Selling Prices of Land (without debt financing for land acquisition)

	Case-A1*	Case-A2*	Case-A3*	Case-B1*	Case-B2*	Case-B3*
Salable Price						
(Rs/m^2)	1,221	1,563	1,113	1,136	1,337	1,070
(US$/$m^2$)	40.3	51.6	36.7	37.5	44.1	35.3

Note: Entire cost for land acquisition is covered by equity in all cases.

From the above analysis, the borrowing from foreign lenders with lower interest rate are regarded as favorable. In case that the entire land acquisition cost is covered by equity and the finance by foreign commercial financing institutions is applied to the development (Case-A1* and Case-B1*), an appropriate profit can be realized. From the results of sensitivity analysis, the borrowings from foreign lenders are more preferable than local loan despite devaluation of Rs to US$ or Japanese Yen by 5 % p.a. The salable price approaches US$ 50/m^2 for Case-A1*, the base case, under the 10 % p.a. inflated costs of development.

(4) Power Supply

The feasibility of power supply is evaluated assuming that the costs for Land acquisition (for re-arrangement of Manesar sub-station, and for 220 kV transmission line to be used for the power interchange), Construction of gas turbine power plant, Construction of sub-station and transmission line, and Re-arrangement of Manesar sub-station and transmission line is recovered by selling electricity. The annual generation is set at 75 % of installed capacity of 1,331.52 Gwh or 998.64 Gwh (average of 114 MW x 8,760 hours) assuming that the excess electricity is sold to the HSEB. The losses of transmission and distribution is estimated at 3 % of generated electricity. For the operation cost, fuel

cost (unit price of Rs 3.5/m^3) and other cost (5 % of gas turbine generator) are included.

In evaluating the power supply sector, it is assumed that land acquisition cost and 15 % of construction cost is covered by the own equity and the balance is covered by loan. The below listed two cases of financing conditions are studied. The interest rate of Case-1 is assumed that the State Government borrows from foreign governmental financing institutions but in local currency through the Central Government of India. Case-2 is based on borrows from the local financing institutions of India.

Table 11.2 Borrowing Terms for the Power Supply

	Interest	Repayment	Grace Period
Case-1	12.0 % p.a.	20 years	10 years from the first drawdown
Case-2	16.0 % p.a.	10 years	2 years from the first drawdown

The salable price of electricity derived under the assumed conditions are Rs 1.84/kWh in Case-1 and Rs 1.93/kWh in Case-2. The price in Case-1 is lower than the current price of HSEB (Rs 1.84/kWh for small users of 70 kW or less, Rs 2.07/kWh for more than 70 kW). Thus, operation of power supply facilities is feasible with appropriate margin on the above price. Operation in Case-2 can also be regarded as feasible without subsidy.

(5) Water Supply

It is planned that HUDA constructs water treatment plant with a capacity of 90,000 m^3/day and supplies required water (42,759 m^3/day in maximum) to the IMT. In this study, two cases of water demand is assumed based on the land sale forecast, and the feasibility of water supply is investigated. As for the financing plan, the same conditions as that of power supply are applied. The calculated water charge, Rs 5.26 to 8.13/m^3, is higher than current price at Rs 2.5/m^3, and financial support will be necessary.

(6) Sewage treatment

The sewage charge is estimated under the assumption that the volume of sewage is equal to water supply. The financing plan of the sewage treatment is set at the same conditions as those of water supply. The calculated sewage charge of Rs 8.78 to 13.16/m^3 is quite expensive and financial support will be necessary.

(7) Residential Facility

The rent to recover the initial investment is estimated assuming that the real estate developers purchase the required land at Rs 1,515/m^2 (US$ 50/m^2). The results of estimation under the same financing

conditions as those of water supply and sewage treatment are shown in the following Table.

Table 11.3 Rent of Housing

(Unit; Rs/room/month)

	High Density (4F)	High Density (10F)	Middle Density	Housing for EWS
Case-A1	1,643	9,389	13,672	2,130
Case-A2	1,918	11,584	15,603	2,435
Case-B1	1,606	9,305	13,233	1,990
Case-B2	1,866	11,403	15,113	2,360

The above listed rent for 4-stored apartments for single employees is significantly lower than the average monthly wage of workers (about Rs 8,000). Housing for EWS (Economically Weaker Section) is to solve the problems of slum and is not intended to receive rent payments. If the expenses from the EWS housings are to be covered by rent collected from the single residents and that there are 5,000 rooms for single residents and 1,000 rooms for the EWS, the monthly rent will range from Rs 2,000 to 2,400. Construction and operation of housing for EWS by housing rent from single residents is well feasible, assuming the room is shared by two residents. The rent of 10-stored high-density housing (80 m^2/household) and middle-density housing (100 m^2/household) with wide floor area will be expensive and can not be leased to workers of the IMT. There is no need for the State Government to take the role in the development of 10-stored apartment and middle density housing which will be sold instead of leased.

(8) Profitability of the Total Project

The profitability of the total project including development of land, infrastructure such as electricity, water supply and sewage, and social infrastructure is studied under the reasonable prices. As for the financing plan, the realistic and financially favorable plan (Case-1, Case-1* for the development of land) is applied to each item. The following Table shows the calculated IRRs. In Cashflow analysis, cash shortage is not observed. In other words, the income from sales of land, electricity and housing rent covers shortage from operation of water supply, sewage treatment and town facility. If the investment costs increase by 10%, this project is unable to recover the initial investment at the prices applied in this study. Design modifications to lower the investment Costs are hence recommended. Negotiations with the central government for financial support for the construction of flyover are also important.

Table 11.4 Profitability of Total Project

(Unit; %)

	ROI (b/tax)	ROI (a/tax)	ROE (b/tax)	ROE (a/tax)
Case-A	10.7	8.1	8.4	4.7
Case-B	12.1	8.7	12.4	9.2

(9) Overall Evaluation

This project is financially feasible under the following conditions.

- The acquisition costs of land are covered by equity.
- The development costs is financed by foreign commercial financial institutions.
- The construction costs for power supply, water supply, sewage treatment, residential and town facilities are financed by foreign public institutions.
- The sales of land is to be completed within 10 years.

11.2 Economic Evaluation

(1) Basic Objectives

Since the major economic benefit of this project is an increase in value added from increased industrial production, the economic evaluation is conducted based on the increase in value-added .

(2) Quantitative Analysis

112 firms representing 24 fields are observed to invest in the IMT. In this study, total value-added is estimated to be Rs 28,364 million by multiplying the output of each field with the rate of value-added obtained from the input-output transaction tables of India. The estimation of output in each field is referred to information on past data of Japanese firms in the ASEAN countries, China, Korea, and India. The economic costs consists of (a) Cost of land, (b) Development cost of the IMT, (c) Construction costs of the factories, and (d) Administration expenses of the IMT. The construction costs of factories are estimated at US$ 675 million or Rs 21,060 million by referring to information on past investments by Japanese firms in the ASEAN countries, China, Korea, India and other countries and from the field of industry and the plot area mentioned in Chapter 7. The EIRR (Economic Internal Rate of Return) based on the above economic benefit and economic costs is 29.6 % which shows this project is economically feasible.

(3) Other Economic Benefits

In addition to the increase in value-added by increased industrial production, this project has many economic benefits. The major benefits are as follows:

- Growth in Domestic Industries
- Improvement of Trade Balance
- Increase in Employment Opportunities
- Increase in Income by Taxation
- Effect on the Regional Economy
- Effect on the Output (expansion of production in various fields / Induced production)

Chapter 12 Social Environment Assessment

This study has been made in compliance with the instruction given in the Final Report of the Master Plan Study, to supplement or to up-date some part of the Master Plan Study that could not be completed at the time.

The components covered by this Study are: Land Acquisition, Water Rights, Employment Related Problems, Commuting, Slums and Environmental Protection.

12.1 Land Acquisition

Smooth land acquisition of the entire proposed site is a prerequisite for this project, and it is understood by all concerned that the project implementation starts from the point where the land acquisition is completed.

A land acquisition for public purposes in India is authorized only for governments to execute, either by the Central or local governments. Haryana State Government will carry out the land acquisition for this project.

It is anticipated that the land acquisition will be carried out by the legal procedures according to the Land Acquisition Act. The State government has issued the second notification on November 15, 1994 and the land acquisition is expected to be completed by May 1995.

12.2 Water Rights

Water rights for Manesar Drain does not exist. The purpose of this drain is basically to control floods. Although some farmers freely use the drain water, water rights are not involved.

Gurgaon Canal that is used for farming runs throughout the Gurgaon District and water rights are given by the Irrigation Offices in the district depending on cultivated crops. These canals however do not reach the IMT area.

12.3 Employment Related Problems

Because the proposed site is adjoining to the metropolitan area as well as Gurgaon city, there will be no difficulties in finding labour forces. Nevertheless, the expansion of training facilities and institutes for technicians and experts may be necessary.

12.4 Commuting

A major means of transportation in Haryana State is public bus services, but bus service to transport workers may not be sufficient. The bus corporation is ready to increase their bus service according to necessities.

12.5 Slums

Haryana State Government has indicated that they would control the appearance of slums by establishing a law preventing the construction of buildings along the neighbouring roads. However, it may be difficult to prevent the formation of slums only by rules and laws. Construction of inexpensive housing, and markets and stores of certain standards to provide daily necessities including foods for low-income groups would be necessary.

12.6 Environmental Protection

The protection of surrounding environment of the site is an important agenda. Particular attention should be given for the Sultanpur Bird Sanctuary and Aravalli Natural Preservation that are located within the radius of 20 kilometers of the site.

12.6.1 Aravalli Natural Preservation

Aravalli Natural Preservation is adjoining to the IMT site, and it extends to the south and southeast of the site. For these reasons, there is a possibility of impact from the air from the IMT and road traffic that will be increased by the construction of the IMT. Accordingly, careful studies and countermeasures may be required.

12.6.2 Sultanpur Bird Sanctuary

Sultanpur Bird Sanctuary is located at about 13 kilometers away from the site and situated towards the northeast of the site. Therefore, it is considered that the impact of the winds, even if air were polluted, is small.

12.6.3 Environmental Impact Assessment

Implementation of an Environmental Impact Assessment is required for this project in view of the Environmental (Protection) Act of India and Environmental Consideration Guidelines of JICA due to the fact that this is an Industrial Model Town project.

Further, because the southern part of Haryana State is designated for the industrial development area by the State, giant-size development projects are undergoing in the vicinity of the IMT site. Therefore it is expected that the area is exposed to a dramatic change in its social and natural environments within a few years.

For the above reasons, it is recommended that studies will be made again upon the determination of the number and types of industries participating in the IMT, or at the time when the development have progressed to a certain degree. And based on the results of the studies necessary countermeasures be taken.

Chapter 13 Conclusion and Recommendations

13.1 Conclusion

(1) Judging from the results of the economic analysis, the economic viability of the Project is high.

(2) The feasibility of the Industrial Town in Gurgaon of Haryana State based on the IMT development concept has been confirmed subject to the realization of several requirements as described below. Effective and timely achievement of these requirements is necessary for implementation of the IMT project.

13.2 Recommendations

There are many important matters to be resolved for successful implementation of the IMT. These matters should be studied and then implementation should be planned and executed in a timely manner. Matters to be resolved during the project preparation stage and those required for project commencement are discussed as follows:

13.2.1 Requirements during Project Preparation Stage

(1) Financial arrangement for land acquisition

Complicated legal procedures are required for land acquisition, which is the first step for the implementation of the IMT. It is anticipated that the land acquisition will be carried out by the legal procedures according to the Land Acquisition Act. The State government has issued the second notification on November 15, 1994 and the land acquisition is expected to be completed by May 1995.

In case the State or Central government is not able to allocate the necessary budget for land acquisition, it might be necessary to borrow money from domestic financial institutions.

(2) Setting of implementation agencies

The following implementation agencies have been selected as a result of Chapter 7 (Development Methodology of the IMT) and Chapter 11 (Financial and Economic Evaluation).

Regarding land preparation and infrastructure development, it was decided to adopt third sector development based on the results of the examination of the relative priorities on the development and demand sides.

Regarding power, it was decided to adopt development by the state government as a result of the financial and economic analysis. Regarding housing, it was decided to adopt joint development by the state government and the private sector, again as a result of the financial and economic analysis. Concerning water supply and sewage works, development led by the state government is desirable, because revenue from service charges cannot cover the works

costs.

The expected development system shall therefore be a slight modification of Case 2 from Chapter 7.

IMT facilities		Implementing Agency		
		State Government	Third Sector	Private Sector
Land Acquisition		O		
Infrastructure and public utility facilities outside of the IMT		O		
Land development and infrastructure preparation			O	
Power		O		
Housing	High density housing (4 floors), and EWS housing	O		
	High density housing (10 floors) and medium density housing			O
Commercial facilities (Shopping centers)				O

Generally speaking, the third sector system involves the establishment of an organization that it is hoped will allow the joint effects of the public and private sectors. Providing the divided duties function according to plan, the benefits will be sustained.

However, difficult leadership is often required due to joint operation by organizations that possess different characters. It is important that the parties concerned have good mutual understanding and also obtain the cooperation of specialists etc., who possess experience in and knowledge of industrial estate development and operation, in order to ensure smooth management and operation.

(3) Supply of gas

In order to maintain an international level of infrastructure, a captive power generation plant for the IMT is to be installed.

Natural gas is the fuel for the power plant. Demand for gas is high in the vicinity of Delhi and adjustment of the gas supply plan for other projects may be necessary. If the gas supply is not reliable, the planned power plant cannot be realized.

Priority should be given to gas supply for the IMT from the point of view of this project being ranked as a national project.

(4) Study of phased construction method

The Indian side strongly intends to realize this project as soon as possible, taking into

consideration the present favourable conditions for foreign direct investment in India. Early implementation is also desirable since there is a risk that other industrial estates will be developed in the meantime, affecting demand for the IMT.

However, project cost would be substantial, therefore phased construction is desirable for implementation, especially from the cash flow point of view. The project realization is very sensitive to both the world economy and investor's interest. For this reason, the implementing agency is required to study phased construction taking into consideration the result of the investment demand survey in this study.

(5) Additional survey and mapping

It is pointed out that topographical maps used for this study are old and are not sufficient in detail. The present conditions are not reflected. An accurate field survey of the topography and the boundaries of acquired land is required for checking before implementation.

Some modification of the land use plan and design changes may be required due to the results of the topographical survey. In this case, quick action should be taken to avoid any delay in project implementation.

(6) Relocation of crematory

A crematory along NH-8 for common use of nearby villages was found during the second field survey. According to Indian regulations, removal or relocation of this type of religious facility is not permitted.

The State Government, however, intends to proceed with relocation of the crematory in due course by negotiation with the surrounding inhabitants. It is preferable to confirm this principle of relocating the crematory to another place for proper development of the IMT.

13.2.2 Requirements for Project Commencement

(1) Improvement of National Highway (NH - 8)

According to information given by the Ministry of Surface Transport (MOST), expansion of NH - 8 from two lanes to four lanes will start with funding from the ADB in early 1996.

Expansion works of NH - 8 would effectively solve the problem of increasing traffic volume in the short-term at least and implementation at the soonest possible date is highly desirable from the viewpoint that a well established infrastructure would appeal to potential investors.

(2) Active action for investment promotion

Introduction of foreign companies to the IMT should be actively made using for example investment promotion seminars to attract potential foreign investors. This action should be immediately taken after the establishment of an implementation organization. Details of investment promotion activities should be prepared by the implementation organization. If required, foreign experts in investment should be recommended as an effective measure for

promotion.

(3) Implementation of environment impact assessment

The Aravali Natural Reserve Area and the Sultanpur bird sanctuary are near the IMT site.

Large development projects, larger than the IMT, are to be implemented and further expanded in the future near the IMT site. The impact that these large scale developments will have on the reserved lands requires implementation of an environment impact assessment, which should be prepared after drafting of the comprehensive development plans for Gurgaon.

(4) Preventive measures against formation of slums

There is concern about the formation of unplanned and unauthorized slums, shops and market places around the IMT site during and after the construction of the IMT. In order to prevent the emergence of such slums, the implementing agency for the IMT should provide low cost housing and shops and restaurants (canteens) of reasonable standard to the workers engaged during the construction stage of the IMT. Government controls on unauthorized developments should be enforced during implementation of the IMT.

(5) Enforcement of single window services

No special incentives except those for the existing industrial estates in Haryana, are given for the IMT. The Indian side including other states emphasize the ability to provide services for foreign investors through a single window service. However, improvement and enhancement of the provided services are required as foreign enterprises do not fully appreciate the existing services.

The single window should supply sufficient services to companies requiring an investment permit, and should also support establishment and production activity in the initial stages.

(6) Expansion and reinforcement of training institute

According to interviews with Japanese manufacturers located around Gurgaon, each company employs skilled workers who are graduates from the Industrial Training Institute (ITI) at Gurgaon.

There are many applicants for the existing ITI, however, the existing facility has limited capacity and educational materials are very old. From these existing conditions, it is judged that technical training should be provided in the IMT.

Furthermore, provision of training for inhabitants who will be displaced from acquired agricultural land is important from the viewpoint of social welfare and employment creation.

The provision of adequate numbers of trained people will be a significant advantage to companies establishing in the IMT as it will avoid steep increases in salary due to manpower shortages.