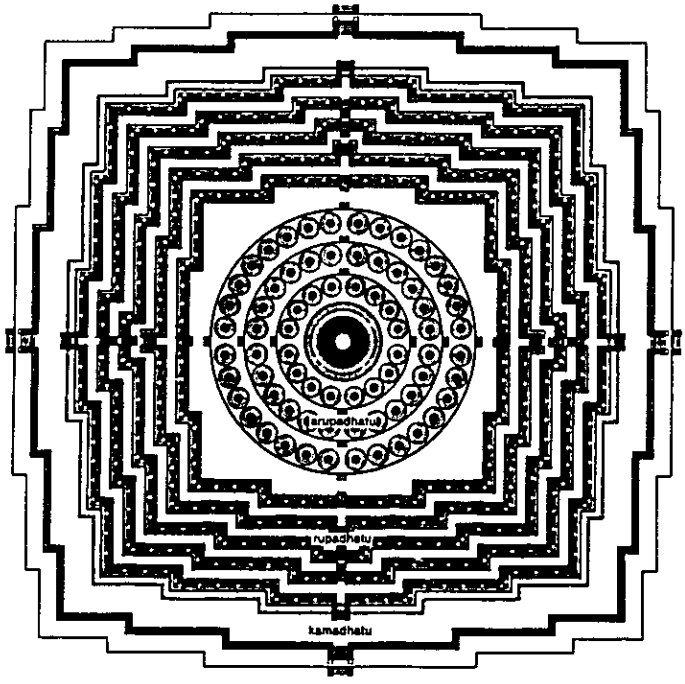
REPUBLIC OF INDONESIA

The National Archeological Parks Development Project

Borobudur & Prambanan



INTERIM REPORT

APRIL 1975

JAPAN INTERNATIONAL COOPERATION AGENCY

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CONTENTS

PREFACE

1. This interim report, which is based on the results of different stages of the various studies aimed at the preparation of development plans, comprehensive plans, basic plans and so on to serve as guidelines for national projects, considers the socioeconomic, physical and technical appropriateness of the development and improvement of the archeological remains at Borobudur and Prambanan in the Central Java Region of the Republic of Indonesia that are of such great global significance.

2. The purposes of this interim report are as follows:

   a. To identify correctly in social, cultural and economic terms the significance and role of the National Archeological Park Development and Improvement Works.

   b. To build the spatial image and concept of these archeological parks, which are unparalleled throughout the world.

   c. To carry out functional and environmental design of the archeological parks.

   d. To make proposals regarding project implementation.

3. There has been a considerable change in the external conditions of the project in comparison to last year's study. As a result of the change that has taken place in the world economy recently, the emphasis placed by the Indonesian Government on this project has shifted from the creation of an international tourism base for earning foreign exchange to the building of a core for promotion of national culture and education that will have not only an economic development effect but also the social and cultural development effect that the second 5-year plan of the Indonesian Government (Repelita II) sets forth as one of its objectives.

   Fully aware of the above background of the project, the study team has also kept in mind the connection with the study of last year in proceeding with its work.

4. The present study began in early February of this year. After spending one month in Indonesia doing local investigations, collecting pertinent data and having discussions with Indonesia government officials, the team sorted out and analyzed the results upon returning to Japan and set to work on the drafting of the plans. Basically, the work has progressed in accordance with the schedule that has already been submitted, but it has been necessary for some adjustment of the work schedule owing to delay in acquiring surveying

plans and other data. In the absence of the surveying plans, the work has proceeded on the basis of a precision base map derived by enlarging topographical charts on scales of 1:50,000 and 1:25,000. Some changes will probably have to be made once the surveying plans become available.

1 INTRODUCTION

Contents:

GENERAL (11)

1. This study represents "a study of the economic and technical appropriateness of the development and improvement of the Borobudur and Prambanan National Archeological Parks on the basis of the premise of implementation and the drafting of the plans for that purpose", all on the basis of the wide-area master plan, the initial master plans for the three archeological parks, and the various proposals that resulted from the "Tourism Development Study of Central Java and Yogyakarta Area" undertaken last year by the Japan International Cooperation Agency.

2. The work consists broadly of the following three studies:

   a. Frame planning: drafting of a Development Plan by identifying the socioeconomic significance of the project and setting the physical planning conditions.

   b. General planning: setting of the concept of the Borobudur and Prambanan National Archeological Parks and preparation of a General Plan.

   c. Master planning: drafting of an individual master plan for each of the archeological parks as well as an Action Plan.

3. The preparation of the plans for the two archeological parks will include sophisticated design work involving multilateral adjustment and coordination from many viewpoints, including the standpoint of preservation and utilization of the archeological remains, the standpoint of area designation, land use, zoning regulation, and other aspects of physical planning, the standpoint of determining the functions and facility composition of the national archeological parks, and the standpoint of redevelopment of the surrounding villages.

4. Also involved are many other study themes relating to the appropriateness and realization of the project, including analysis of the socioeconomic development effect of the development works, study of legal measures for environmental preservation and control and the making of proposals regarding the operational setup and methods of administrative organization.

STUDY PROCEDURE (12)

The work of Phase-1 (January 15-April 30) of the "National Archeological Parks Development and Improvement Feasibility Study" has been carried out according to the following schedule.

1. Preparatory work (January 15-February 8)

   Program design of work procedure, assessment of the contents of last year's plan, and preparation for the field work.
   Output: Work Implementation Plan

2. Field investigation and data collection (February 9-March 10)

   Field surveys of the Borobudur and Prambanan areas, data collection, and discussions with the Indonesian steering Committee, in which a basis consensus was reached.
   Output: Progress Report - I

3. First phase of work in Japan (March 11-March 28)

   Identification of the project conditions and design of the frame through a study of the whole project and a technical study involving the sorting, processing and analysis of the data collected.

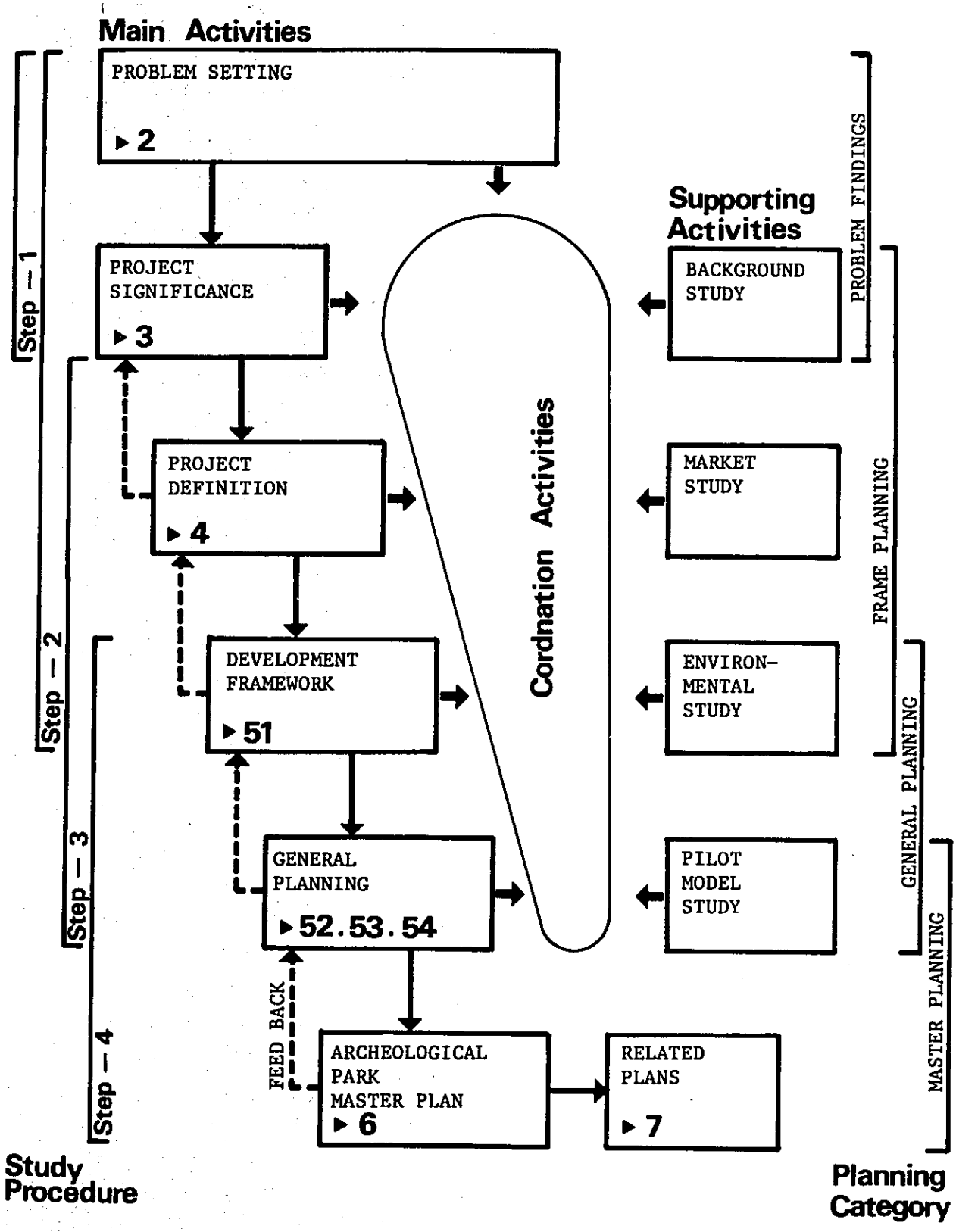
   Also, basic determination of the General Plan and Master Plan.
   Output: Progress Report-II (Draft in Japanese)

4. Second phase of work in Japan (March 29-April 30)

   Overall adjustment of the entire study, completion of remaining work, and preparation of the report and final drawings.
   Output: Interim Report (in English)

Activity Network Of The Study

Fig. 1



▶ REFERENCE OF CHAPTER

PROJECT SITES (13)

Borobudur Area

a. This area covers three kecamatan--Borobudur, Muntilan and Mungkit--belonging to Central Java Province, Kabupaten Magelang.

b. It is situated 40 km northwest of Yogyakarta City.

c. It is located in the Kedu Basin (250 m above sea level), which is surrounded by Mt. Meradi, Mt. Merbabu, Mt. Sumbing and other peaks in the 3,000 m class and the mountains of the Gandul chain and through which flows the Progo River.

d. The surrounding areas of the three temples of Borobudur, Pawon, and Mendut are divided into five desa--Borobudur, Wanurejo, Sawitan, Mendut and Progowati.

e. Desa Borobudur has a concentration of commercial functions and administrative functions on the kecamatan level.

Prambanan Area

a. This area stretches over Central Java Province and the Yogyakarta Special District (D.I.Y.).

b. It belongs to Kecamatan Prambanan in Kabupaten Klaten and Kecamatan Prambanan and Kalasan in Kabupaten Sleman.

c. It is situated 15 km east of Yogyakarta City.

d. It is located on the Kewu Plain (150 m above sea level), which forms the watershed between Central Java and Yogyakarta and through which flow the main course of the Opak River and branch of the Solo River.

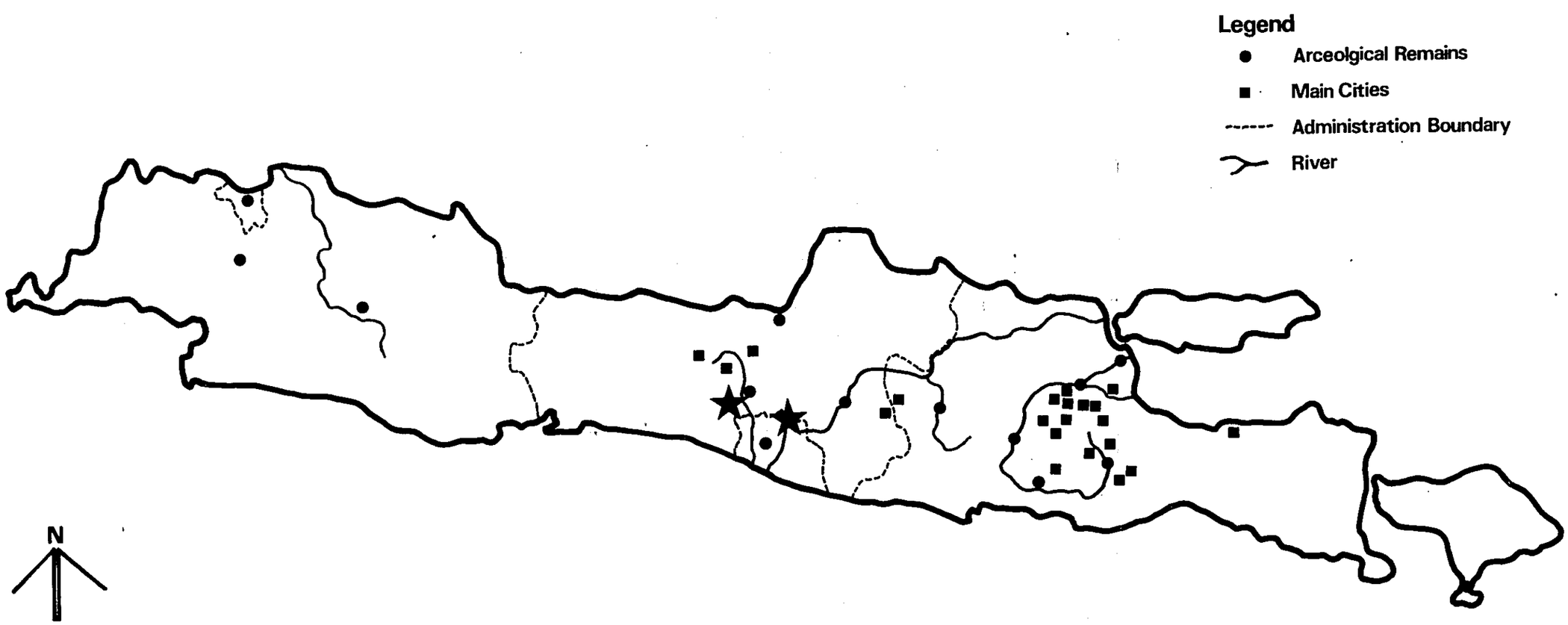
e. Across it run the national highway and railway between Yogyakarta and Surakarta, and to the south are the Pegat Hills.

f. Prambanan, Sewu, Plaosan, Sari, Kalasan and many other archeological remains are scattered there within a radius of 2.5 km.

g. Administrative and commercial functions are concentrated along the national highway in Desa Trogo and Kebondalem Kidul.

Location Map of Archeological Remains

Fig. 2



★ Borobudur

These three Buddhist temples are situated close to each other about 40 kilometres north of Yogyakarta. They were probably built during the Sailendra dynasty in the second half of the 9th century. The three temples lie in a straight line. The Waisak ceremony is held here every year to celebrate the Buddha's birth, enlightenment and final ascension into nirvana.

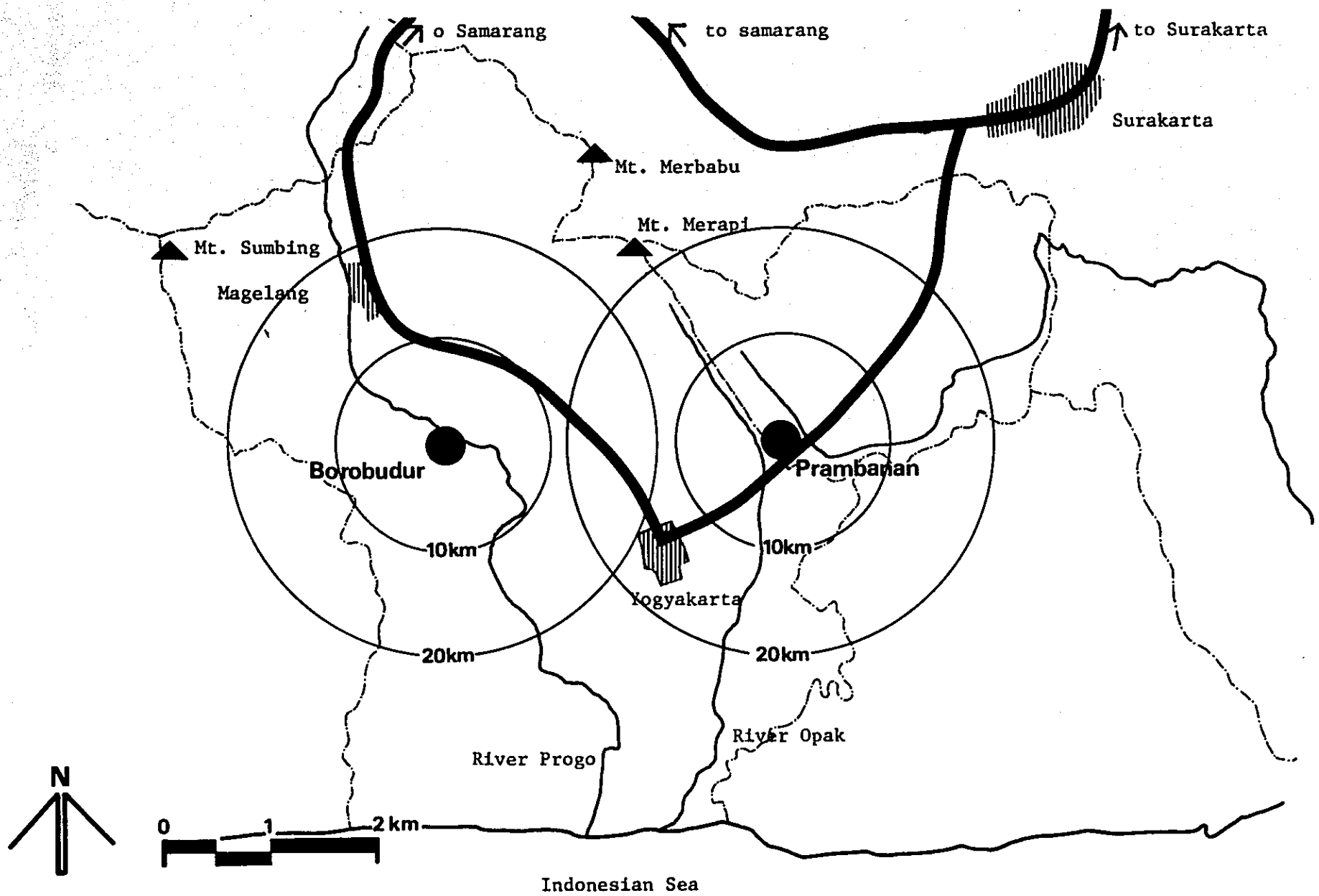
Borobudur is one of the most massive Buddhist temple complexes in South East Asia. It wraps itself like a giant's mantle round a hillock rising out of paddy fields and groves of coconut palms.

★ Prambanan

It is the most extensive Shivaite Hindu temple complex in Indonesia, standing on the Kewu Plain 17 kilometres east of Yogyakarta. The temples are built on the eastern bank of the Opak river and tower over flat fields planted with rice and cassava. Away to the north, Mt. Merapi looms menacingly, its volcanic crater wreathed in swirling vapours.

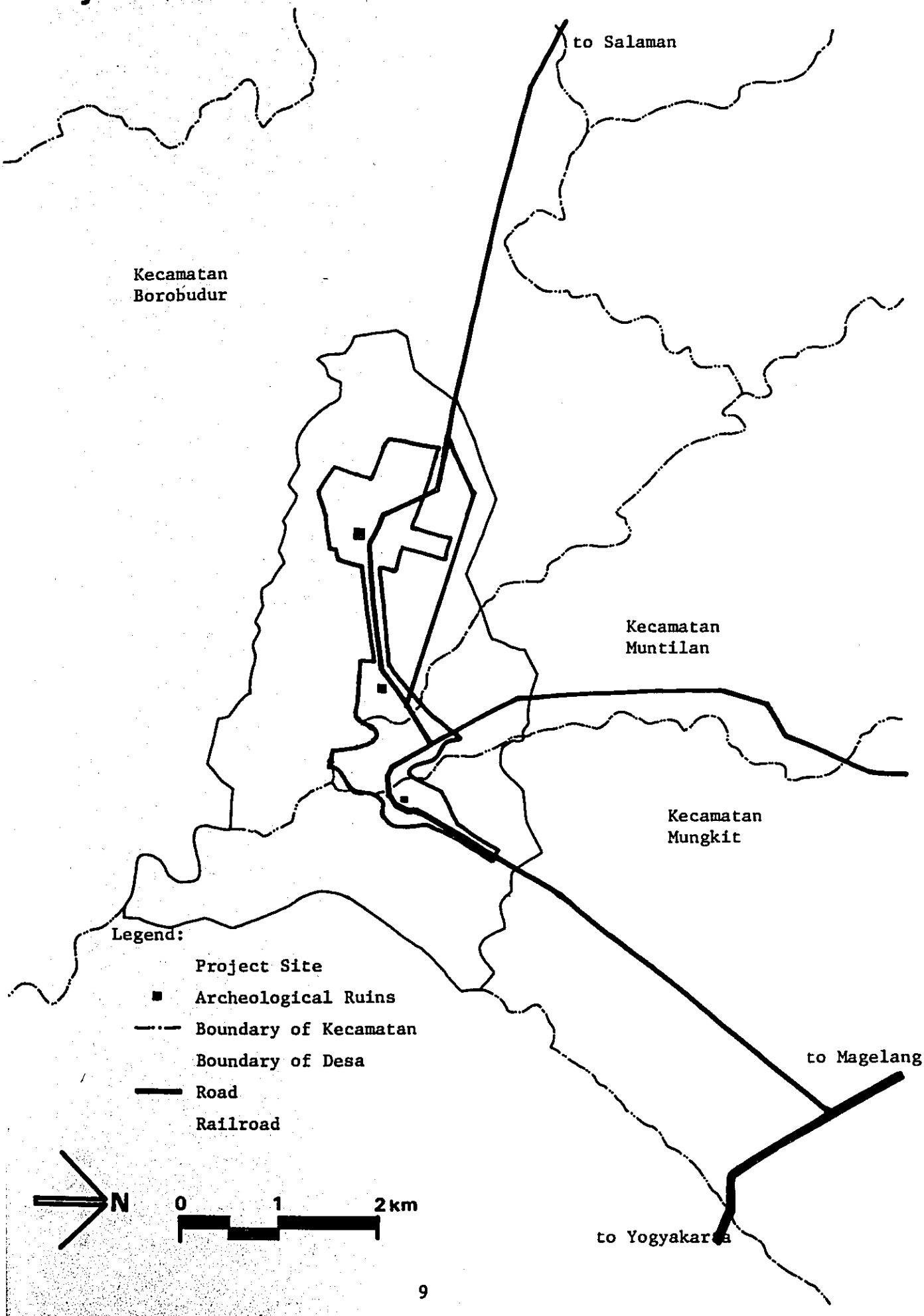
Location Map

Fig. 3



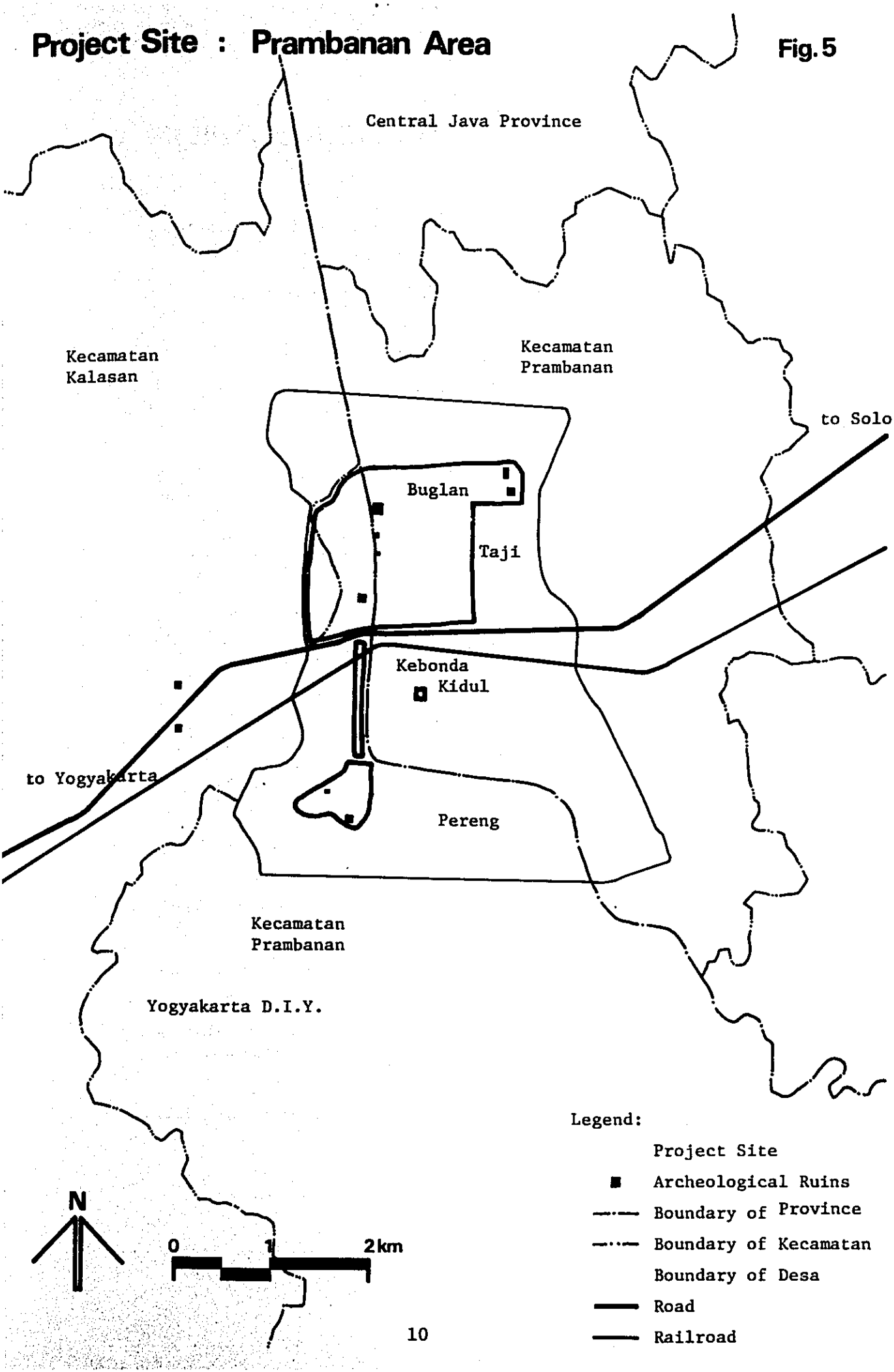
Project Site : Borobudur Area

Fig. 4



Project Site : Prambanan Area

Fig. 5



2 PROBLEMS AND FINDINGS

Contents:

PROBLEMS EXTERNAL TO THE PROJECT (21)

The following items have been both preconditions and given conditions in the design of the project frame:

1. Appropriateness and conditions for achievement as a national project.

2. Connection, compatibility and linkage with other sectors or regional development.

3. The place of this project in tourism and tourism administration policy on the national level.

4. Quantitative and qualitative definition of the tourism market.

5. Functional distribution within the Central Java tourism block.

6. Physical restrictive factors working on the project.

7. Furtherance of the legal system in terms of its relationship to this project.

8. The regional development role and the extent of development effect.

9. Relationship between preservation and utilization of the archeological assets and between regulation and development.

10. Technical solutions for park landuse in high-density areas.

PROBLEMS INTERNAL TO THE PROJECT (22)

The following items have been considered as given design conditions in preparation of the General Plan for this project:

1. Creation of the master image of the national archeological parks and qualitative definition of the environment.

2. The main and secondary functions of the national archeological parks and their facilities composition.

3. Determination of the scope of area of the national archeological parks.

4. Means of preserving the environment and natural features of the archeological assets.

5. Problems and methods of acquisition of park land.

6. Measures for the surrounding areas and local benefit from development.

7. Long-term planning flexibility.

8. Organization and methods of operation and control of development.

9. Ecological land assessment in site selection.

10. Determination of the optimum scale of the project from socioeconomic and physical standpoints.

THE BACKGROUND OF THE PROJECT (23)

The following are upper-echelon plans relating to the project and other plans relating to it. They are important in the design of the frame for development and improvement of the archeological parks.

1. Java and Madura Tourism Study

   This study, which was undertaken in 1974-1975 by Netherlands Institute of Tourism Development Consultants and Investors' and Development Consultants, Ltd., resulted in a 15-year long-term development master plan and a 5-year implementation program for 1976-81. It has governed the demand conditions (estimate of the number of domestic and international tourists) and the wide tourism area frame for this project.

2. Feasibility Study of Infrastructure for Tourism Development of Central Java and Yogyakarta

   This study in 1971-1972 was also undertaken by a TDC team.

3. Tourism Development Study of Central Java and Yogyakarta Area

   This study, which was undertaken by an OTCA (now JICA) team in 1973-1974, consisted primarily of a reassessment of study (2) above and preparation of a wide-area tourism master plan and an initial plan for three archeological parks.

4. Tourism Resources and Market Study of the Whole of Indonesia

   This is a study that is being carried out by a UNDP study group since 1973.

5. Repelita II (Second National 5-year Plan) 1974 - 1979

   This plan, which involves five central development projects in the Central Java Area and provides the guidelines for regional comprehensive development planning, has determined the basic position of this project on the basis of social development policy.

6. Village Modernization Program

   This program, which is now under consideration by PMD (Ministry

of Social Affairs) as a program for improvement of regional infrastructure nationwide, forms the background for the village improvements in this project.

7. Kali Progo Basin Study

This study, which was undertaken by Sir M. Macdonald & Partners and Hunting Technical Services, Ltd., in 1973-1974, consisted of a survey of the water system of the Progo and Opak rivers and the preparation of a comprehensive plan for improvement of the agricultural base.

8. Restoration Program by Indonesian Government and UNESCO

This 7-year program, which started in 1973, involves comprehensive survey and restoration works for the Borobudur Temple on the basis of international assistance. It is necessary that there be full compatibility between this program and the present project in view of the fact that they overlap in terms of both content and time with respect to such aspects as the scientific position of the archeological assets, investigation of the surrounding region, the yearly restoration program, and so on.

9. Community, Environmental and Spatial Planning of Borobudur

This study, which was undertaken in 1973 by the Research Center of Architecture of Gajah-Mada University, is being taken into full account in this project as a study on the same level.

10. Dieng Master Plan

This study, which was undertaken in 1972 by Nusa Consultants at the request of the Central Java provincial government, represents a large-scale natural park plan, including archeological remains. Besides being considered in the present project from the standpoint of the archeological park network, it also provides guidelines for preservation and utilization of the archeological remains.

3 SIGNIFICANCE OF THE PROJECT
SOCIO-ECONOMIC APPROACH

Contents:

TOWARD ACHIEVING UNITY OF INDONESIA AS A NATION AND AS A PEOPLE (31)

1. Polictical unity

Although opinions differ on this point, according to the oppinion of Dr. Hariri Hady it is generally recognized that political unity of Indonesia was achieved in 1965 as the fruit of over twenty years of effort by the people since the country attained independence.

2. Economic unity

The 2nd Five Year Plan lists economic unity as one of the most important goals to be attained, because strong political unity and consciousness of the nation and the people can only be substantiated and strengthened by strong economic unity. However, in view of the present circumstances in Indonesia, achievement of this goal is still far off, and many problems will have to be solved before economic unity can be attained. Cf. Dr. Hariri Hady "Problem of Promoting Inport-Substitution and Export-oriented Industries in Indonesia" Oct. 21-23, 1974 Report of the Symposium on Asian Industrial Development Institute of Developing Economies, Tokyo.

3. Projects required to close the gap between political and economic unity

The kind of project most urgently required in Indonesia today is one that consists of strong measures to advance economic unity and at the same time creates a strong spiritual backbone for advancing economic unity and strengthening political unity of the people. Even if such a project is not enough successful in attaining economic unity, it should create a common basis and lead to a strong awakening of the Indonesia people by strengthening political unity.

4. Symbol of unity of the Indonesian people

Though indigenous culture and history varies from region to region, these cultures and histories did not develop independently. They have in common cultural characteristics which have their roots in the natural features that have supported the life and history of the people of Indonesia since times when political and economic unity was still weak. The sources of these common characteristics should become all the more clear, the further history is traced back to ancient times. The most ancient historical and cultural heritage of Indonesia should be honored as a symbol of the unity of the Indonesia people, as this heritage is evidence of the common foundation of their cultural and historical existence. At the same time, this heritage should be the pride of all Indonesians.

5. The historical remains of Central Java, a glorious historical and cultural heritage

When an Indonesian is asked to name a symbol of national unity for all of Indonesia, he will most certainly select the historical remains in Central Java, of which Borobudur and Prambanan are representative. In the history of Indonesia, these remains once formed the heart of Indonesian civilization, whose influence extended to varying degrees to all regions of Indonesia as well as other parts of Asia.

From the above emerges the problem which may be considered the first feature of this project, i.e., "How can these remains be preserved and how can their value be enhanced".

6. A living symbol of Indonesian unity breathing into the people

Historical remains, however valuable they may be in a historical or cultural sense, will be no different from Inca ruins, for instance, unless they are and well known and clearly recognized by then with the people of Indonesia. They may become a project for UNESCO, but they cannot qualify as an Indonesian national project.

As the Indonesian people recognize the value and take pride in these remains as their historical and cultural heritage, and feel that it is a place that must be visited once in a lifetime, these remains are indeed the symbol of unity of the Indonesian people and the root of Indonesian culture.

From the above arises the problem which is the second feature of the project, i.e., "How can these historical remains be made known to the Indonesian people, how can this pride of Indonesian be communicated to the people of the world", in other words, "How can the value of these ruins be enhanced within the intellect and lives of the Indonesian people and the intellect of the people of the world".

7. Tourist activities as a means of attaining the objective

A symbol of unity can be created by disseminating education, publicity and knowledge about these heritages. Such amassing of knowledge as a source of tourist demands will create tourist activities which will accumulate new knowledge gaind through actual sightseeing. Knowledge further amassed through experience. Reproduction of this knowledge on an enlarged scale will strength and enhance the value of the sysmbol of unity. Creation of tourist activities will attain the objective of the project.

This means that the following is necessary.

(1) Dissemination of knowledge and, as a result, an increase of tourism.

(2) For the self-dissemination of knowledge, offering tourists attractions and services, which exceed their expectations.

(1) as a national project will include all governmental and private activities: education publication and broadcasting. What will take concrete shape in the project is (2), namely, the ability to provide services. As the generation of tourism is a demand based on non-daily experience, the whole of one trip, from departure to return, will affect the degree of satisfaction. This further depends on three factors:

a. Services offerred to reach the destination

b. Accommodations at the destination

c. Essential tourist services offerred at the destination

Directly concerning the project are b) and c). a) which refers to the improvement of transportation will have to be taken up in the framework of other activities.

The second feature of the project is at present to determine the functions (service capability) relating to b) and c). As a matter of course, facilities for these functions will have to be constructed. This forms the physical plan of the project.

ECONOMIC DEVELOPMENT OF INDONESIA AND ATTAINMENT OF ECONOMIC UNITY (32)

1. Economic unity and "personal transportation flow of tourism"

The first of the functions which have to be newly created and strengthened by this project is formation of a "personal transportation flow of tourism".

Generally, economic unity follows the three stages below.

(1) Exchange of knowledge and information. Political unification consists of removing obstacles to communication, supported by television, telephones, other mass communication media and the mvoement of people.

(2) The exchange of information leads to a flow of commodities and money.
In this stage, regional and foreign trade are liberalized and transfer of regional effective demand takes place.
This can be referred to as the stage of market unification.

(3) Movement of capital and labor between regions.
A regional production network is established, as exemplified by Japan and the EEC. This is economic unity.
Obviously, tourism promotes the stage (1) to (2), (1) prepares the ground for (2) and (3).

2. Establishment of the infrastructure and "personal transportataion flow of tourism"

The function created by tourist activities is "personal transportation flow of tourism", in other words, the creation of a network of systems covering the entire country which accommodates both foreign and domestic tourists. The 2nd Five Year Plan lists the following long-term policies for advancing economic development of Indonesia.

(1) An agricultural policy for Java which aims at transfoming its agriculture into one that employs capital and advanced techniques, and practices highly intensive and productive farming of high value crops. Other types of agriculture shall be moved to the outer islands.

(2) Emphasis on "import substitution industrialization" industries to Java.

(3) Emphasis of "export substitution industrialization" and export oriented industries to the outer islands.

(4) Deployment of pioneer industries to the outer islands and emigration of excess labor to these islands.

In order to carry out these policies successfully, an enormous infrastructure will have to be established, including the improvement of farm land, development of industrial land and creation of a basic transportation system. The industrial infrastructure is generally local in nature, and the government or the enterprises entering the locality will undertake the greater part of construction work.

"Personal transportation flow of tourism", on the other hand, is a network of systems covering the entire country. Neither transport communication nor accommodation are local needs. Moreover, the economic cycle of tourist activities accomplishes the construction of these systems within itself. That is to say that construction is carried out within people's tourism activities not aimed for construction of infrastructure. The infrastructure is thus formed while earning.

What is even more important than the above is that, starting with the filling of the knowledge void and shortening of the psycho-distance of the people by disseminating education and knowledge, which is a preliminary condition for inducing a "personal transportation flow of tourism", tourist services as non physical services will form a service network throughout the country, in other words, a non-physical infrastructure is established which covers the entire country.

Therefore the promotion of domestic tourist activities cannot be separated from economic expansion and industrial development plans, and on the contrary will become more important as the measure of integration among regions which will establish a high level of division of labor between various localities in the process of development.

3. The effect of tourist projects on the national economy

The effect of tourist projects involving construction on the national economy is brought about by the following two investment cycles.

(1) Investment in tourism -- Induction of tourist demands -- Investment in tourism

(2) Increase of "personal transportation flow of tourism" -- Investment in transportation -- Induction of "personal transportation flow of tourism" -- Investment in transporation -- Induction of production -- Induction of commodity flow ---

Since (2) is based on a national transportation model and requires simulation of a complete cycle analysis, it has been deleted from the present study. Limiting the discussion to direc investment only, the national income effect can be determined by multiplier analysis of investment (1). This is the direct national income effect. When (2) is included, indirect effects will be incorporated. As a result, when tourist demands are induced, induced investment is generated in the following stage.

As described above, tourist projects are a marginal addition to the national economic cycle and their effects accumulate with repetition of the cycle. The tax revenue incurred will form the foundation for government investment in preservation of historical remains and tourist activities. The income from overseas, by complex multiplier, can be termed the foreign currency effect.

Generally, a cumulative increase not only of tourist services but also of production will occur with regard to this demand effect. This is called the production effect.

On the other hand, investment as a marginal addition to the economic cycle changes the structure of transportation and production. This is called the structural effect.

hese three effects in unison bring about economic development resulting in a growth of the national income and the birth of the macro-employment effect.

4. The effect of tourist projects on the regional economy

Besides the macro-investment effects described above, the induction of regional demands by means of investment will create employment in the regions, and this in turn brings about an accelerated derivation of investment. The induction of "personal transporation flow of tourism" also has a demand effect and will invite investment. This will lead to an increase in the regional income through the regional income multiplier, and will be reflected in an increase of regional production, which in turn creates employment to match this increase. These changes will in turn effect changes in the economic structure of the region. In particular, they will influence the formation of the infrastructure described above.

These factors, as a matter of course, will bring about changes in provincial government revenuew, and this will provide the grounds for the governments of the home provinces of the tourists to join this project.

Needless to say, this project for Central Java will have a strong

effect on Java Island, where 64% of the population is concentrated.

The region which will benefit most widely will be, of course, the region where the project is located.

This is of great significance for Central Java, whose economic development lags behind other regions, so called "minus region".

5. Regional development as development policies and tourist projects

Amongh the effects on the regional economy, the influence of this project on the structure of this region will be especially strong. For the regionin which investments will be concentrated, this project will constitute a kind of regional development and renewal project, which will replace the old functions of the region by new functions.

A careful examination of the import which the difference between the old and the new functions has on regional economic development, and the import of the means of construction on the same will show that it owes more to the operation of the new functions than to construction. This is because at this stage the project is not a simple tourism project, but assumes the role of a leading porject in the framework of overall regional development planning.

The project must be evaluated as an overall regional re-development plan for Central Java.

6. Features of the economic development effect of the Central Java tourism project

In the many regions of Indonesia there are numerous places which would be suitable as tourist resorts when significance as a symbol of national unity is not made a prerequisite. The beautiful view of Toba Lake, Bali Island where classical customs still prevail -- there may be many places equal to these on the outlying islands. If the tourist resorts which each region possesses are considered local highlights, Toba Lake and Bali Island, though world famous, can still be classified as local highlights. The historical remains of Central Java, on the other hand, while being world renowned, are more a national highlight of the Indonesian people, because

(1) They are a symbol of national unity.

(2) They are situated in the most densely populated central part of Java. From the point of effectiveness in forming

an infrastructure for "personal transportation flow of tourism", the best effect can be anticipated for the island as a whole.

(3) From the point of regional development, Central Java is a strategic area for the re-development of Java Island. That is to say, by promoting the development of Central Java, the over-concentration of population in the Djakarta and Surabaja regions can be diverted. For a high density economy this is an important point.

The Borobudur and Prambanan Historical Remains Park as a national highlight is the main project for the regional development of Central Java, a strategic are for the development of all of Java. Its effectiveness as a tourist project can be further enhanced by taking the following measures.

a. Complex effect of tourism

The more numerous the tourist highlights that can be included in a daily tour, the more easily will it become a node of "personal transportation flow of tourism". If tourism is considered to be an overall service, covering the entire process from departure to return, the density of the object tourist services includedin this overall service, and the efficiency of tourist activities will be high.

b. Loop effect of tourism

When the process from departure to return of a tour is considered a single loop, the more tourist resorts are included in a loop, the larger will be the ratio of time and money spent at the resorts to time and money spent on transportation, and the objective can be obtained efficiently.

The fact that the project will be located in Central Java as a national highlight makes it easier for people coming from various areas of Indonesia to combine their tours with other local highlights and to benefit from these effects.

The project must therefore be designed so as to give full play to these effects.

PERPETUITY OF THE SYMBOL OF UNITY AND EFFECTS ON ECONOMIC DEVELOPMENT (33)

1. The value of the ruins as a historical and cultural heritage

The value of Borobudur and Prambanan as a historical and cultural heritage or symbols of unity goes beyond their physical existence. If it was possible, for instance, to transfer Borobudur to the Boston Art Museum and have UNESCO preserve it, it would only be a dead cultural treasure, a physical existence historically tied to the Indonesian people.

The value of this historical and cultural heritage is substantiated by the following three facts.

(1) They still exist to the present day where they were originally built, amid the same natural features and environment, exuding the feelings of the Indonesian people who labored to build them, inseparable from the lives of the surrounding villages that continue to exist to the present day.

(2) They are implanted in the hearts and minds of all Indonesians as a heritage of their ancestors handed on from generation to generation as actual proof of the origin of their present day culture and lives.

(3) When foreigners speak and think of Indonesia and the Indonesian people in international terms, these ruins are referred to as the symbol or synonym of Indonesia.

(1) is related to the form in which the remains will be preserved, and 2) and 3) are related to the approach used in turning them into tourist attractions.

2. Preservation and special measures to enhance the value of the historical remains

In order to make the above values more widely recognized and to enhance the value as a symbol of national unity, a number of special measures will have to be taken.

(1)

Making the management

a joint duty of the surrounding villages in exchange for certain privileges may be an efficient approach.

(2) The natural features and environment of the surroundings and historical scenes must not be destroyed. Therefore, aside from the preservation of historical, spiritual and cultural aspects of the ruins, the pastoral life aspects must also be preserved.

(3) To sustain the symbolism of the ruins, it will be necessary to convey to the people a feeling of intimacy and at the same time a sense of exaltation. For this purpose, it will be necessary to make structural plans and to nurture public ethics.

(4) It will be necessary to establish a politically and economically independent management system.

(5) In view of the significance of the ruins to the nation and the people, the construction methods to be followed by the government and the project's financial basis should be clarified.

3. Establishment of basic conditions for tourist activities

As tourist demand is induced through the accumulation of knowledge, the following activities are considered highly significant.

(1) Implanting in the minds of the people through compulsory education a consciousness and pride of being Indonesian.

(2) Introduction of a study trip system for students.

(3) Holdling national or international conventions.

(4) Sending government employees, teachers and their families to Central Java for study, and construction and management of lodging houses in Central Java provinces at the responsibility of the provincial governments.

(5) Giving special privileges to the members of such study trips, as for instance giving them tickets to festivals which are held only once every several years, thus encouraging them to visit the ruins more than once.

(6) Having local organizations issue travel coupons and organize parties. Travel savings, etc.

(7) Making travel to Central Java convenient by reducing railway fares, etc.

(8) Establishing overseas tourist centers.

4. Establishment of tourist facilities

A. 1) Establish information centers in all cities

2) Establish a network of accommodations

3) Arrange transportation within the complex

4) Promote arrangements for loop tours and issue coupons

B. 1) Historical and cultural remains which are worth preserving

2) Related facilities

3) Tourist facilities

4) Lodging facilities

5) Trnasportation facilities and establishment of transporation enterprises

5. Management of the facilities

1) Management of public facilities, toll systems

2) Control of private management activities

4 DEFINITION OF THE PROJECT

Contents:

OBJECTIVE OF THE PROJECT (41)

The significance of the project

1. Implementation of the necessary legal, scientific, technical, administrative and financial measures as well as recognition of the subject area for the recovery of the functions, activation, organization and perpetual preservation and protection of the world renowned historical ruins and cultural treasures of Borobudur and Pramabanan.

2. Heightening of national awareness and contribution to various cultural education activities by drawing upon the historical, scientific and universal artistic value of the most ancient historical remains existing in Indonesia.

3. Adoption of a policy which will contribute to raising the socio-economic level of the region and at the same time perform a starting role in the development of the region, by utilizing to a maximum the public investment in the region which will be made to organize the historical remains and their surroundings.

Themes of the project

1. Preservation of cultural heritage

   It is essential to grasp the national and international significance of the project and its universal value as seen from a broad anthropological and historical point of view. This will lead to the realization that there is a duty to pass these values on to future generations by preserving and organizing these world renowned historical remains.

2. The symbolic effect of development

   Cultural heritage should be drawn upon to play a role in the

process of awakening the nation to the common cultural and historical background, to inspire studies in the cultural education field, and encourage social exchange between the regions through tourism.

3. Effect on regional development

The development of tourist resources and the organization of a regional base can be considered the effects of this project on regional development. An efficient policy with regard to demand, production and structural effects should be adopted to ensure distribution and recycling to the region of the public investment resulting from maintenance of the archeological park.

4. Creation of a historical environment

Construction of historical features should be undertaken to convey to visitors a space experience of the national archeological park, which makes the ruins and the natural environment appear to blend into one and creates a sacred atmosphere that is well set off against the distant surroundings.

ESTABLISHING OF THE OBJECTIVES (42)

Development Policy

1. The undertaking shall be authorized as a national project for development and organization of the natural environment which encompasses the two groups of ruins of Borobudur and Prambanan - the most ancient existing cultural heritage of Central Java - to be turned into a national archeological park, and for promotion of exchange between the regions on the cultural, educational and tourist levels as a cultural symbol of the Republic of Indonesia.

2. The national archeological park shall be founded as a monument to national cultural and historical heritage in the form of a "fenceless museum" or "palace of living historical and cultural enlightenment". The park shall assume the role of a center of fomentation of national culture, perpetual preservation of material and immaterial history and culture, and national cultural exchange.

3. Various measures shall be implemented: As a policy to preserve the environment of the area designated for the archeological park, optimum social investment should be made and, while maintaining the quality of the environment, a system should be established to give full play to the effects this project will have on regional development. Further, measures will have to be taken to ensure recycling of the development profits to the region.

Building the Master Image

1. Designing of measures which will serve as a pilot model for the preservation and utilization of the many historical ruin groups that are scattered over Central and Eastern Java.

2. A unique environment shall be created to bring out historical natural features within the agricultural scenes characteristic of Java. And within this sacred confinement, space shall be allotted for various cultural, educational and recreational activities.

3. An environment featuring a perpetual space composition shall be shaped based on the position, where it is assumed the temples in the ruin groups stood at the height of the civilization which flourished there, as well as by reviving the historical features and establishing a link with the past.

4. To perpetually preserve, maintain and manage the ruins, the existng ruin groups shall be accurately restored, and an archeological sanctuary area shall be created through organizing the surroundings.

5. A place shall be created for various activities centering around appreciation of the ruins by constructing facilities and green areas required for operation of the archeological park.

MEASURES FOR ACHIEVING THE OBJECTIVES (43)

1. Increasing the significance of the project

While communicating the significance of the national archeological park project to the entire people, preparatory and public relations activities should be carried out on a national level to obtain the cooperation of international organizations, related local governments and the population.

2. Promotional activities aimed at domestic tourism

Comprehensive tourist administration should be set up to create a demand for domestic tourism, and the foundations for a mass recreation industry should be layed, while at the same time appealing and inducing national tourism.

3. Establishment of a wide range tourist sphere

Assuming the organization of a national transportation network, regional tourism should be promoted through establishment of tourist routes and massing of tourists, by planning development of profit making facilities such as trnasportation, lodging and service facilities, and organization of tourist resources, in the tourist sphere of Central Java.

4. Expansion of the physical base supporting the archeological park

Functions which cannot be included in the archeological park shall be supplemented by the surrounding areas, in particular, by cities with a tourist base character.
(Lodging facilities, transportation systems, commodity trading centers, etc. should be expanded concurrently with organization of the park.)

5. Cooperation with overall regional development

The project should be synchronized and matched with the development projects of other sectors of the Central Java region, and a high degree of cooperation between the projects should be maintained to exert the maximum effect on development.

GENERAL SOLUTIONS (44)

1. Actual implementation of pilot projects

The concept of an archeological park has not been implemented anywhere in the world.

Establishment of measures that will solve a variety of problems will therefore be required. Such problems include preservation of cultural heritage, devleopment of historical tourist resources, creation of park and green areas in a densely populated area, and re-development of villages in the wake of changes in the land use in the project area.

The significance of the planning of this project lies in the fact that it is an experimental model for historical ruins preservation projects, tourism development projects and regional re-development projects.

2. Program for preservation of historical ruins

Scientific surveys, research and restoration activities are the most important premises for this project.

Before organization of the park, an intensive survey and preservation management system will have to be set up.

The organizational plan for the park should be adequately coordinated with the historical ruins preservation program.

3. Program for tourist development

A system for utilizing the archeological park should be established.

Based on an estimate of the number of people expected to visit the park in the future, and the facilities constructed for the benefit of visitors, operating, management and entertainment plans as well as an overall utilization program and annual development plan must be drawn up.

4. Program for organization of villages

A plan must be drawn up to advance re-organization and modernization of villages within the designated area as well as administrative measures for regional contribution and development profit recycling, such as the acquisition of land for construction of the archeological park, measures to assist the surrounding villages in coping with environmental control legislation, landscaping to create historical

natural features and organization of a regional base.

5. Program for implementation of the project

The operating system of the national project should be programmed together with such varied preparatory activities required for the implementation of the project as organization of the administrative system, establishment of a development system, funding of the project, related legislative measures and systems for cooperation between regional governments and the local population.

PHYSICAL SOLUTIONS (45)

1. Establishment of an overall plan for the organization and development of the archeological park

   The area of the archeological park should be designated focussing on the historical remains and their surroundings, and an overall plan which includes preservation, development and organization, establishment of a target planned population and development programs should be established to serve as a directive for implementing the project.

2. Establishment of a landuse plan for the archeological park

   A landuse plan for the future utilization of space and resources must be established. This plan should approach the project from the angles of preservation and utilization, in order to include both the present features of land utilization and future social demands in the considerations.

3. Establishment of a zoning plan for the archeological park

   As a measure of environmental control, three area divisions and seven sub-systems will be established. This will ensure a high degree of environmental control and will assist in the perpetual preservation and maintenance of the historical remains and their surroundings.

4. Action plan

   To progressively attain the objectives of the development project, an annual program shall be established, in which project items with a high priority are funded and implemented first.

5. Operation and management plan

   A program shall be established to deal mainly with development activities such as operation, management, entertainment planning and civilian commissions related to the park, and agreement with the surrounding villages.

5 GENERAL PLAN

Contents:

SUMMARY OF THE PLAN (51)

Makeup of the Plan (511)

The Archeological Park Development and Improvement Plan is made up of the following four levels:

1. Frame Planning Level

   On this level the development project has been incorporated into the regional comprehensive development planning as a national project, the development effect of the project has been qualitatively determined, and the results have been used in the preparation of a development plan.

2. General Planning Level

   On the basis of the above frame, the development function has been converted in the context of the physical conditions of the area in question, and a general plan has been prepared, consisting of a landuse plan based on conservation planning, a zoning plan, a park utilization plan, and so on.

3. Works Planning Level (Projects Master Plan)

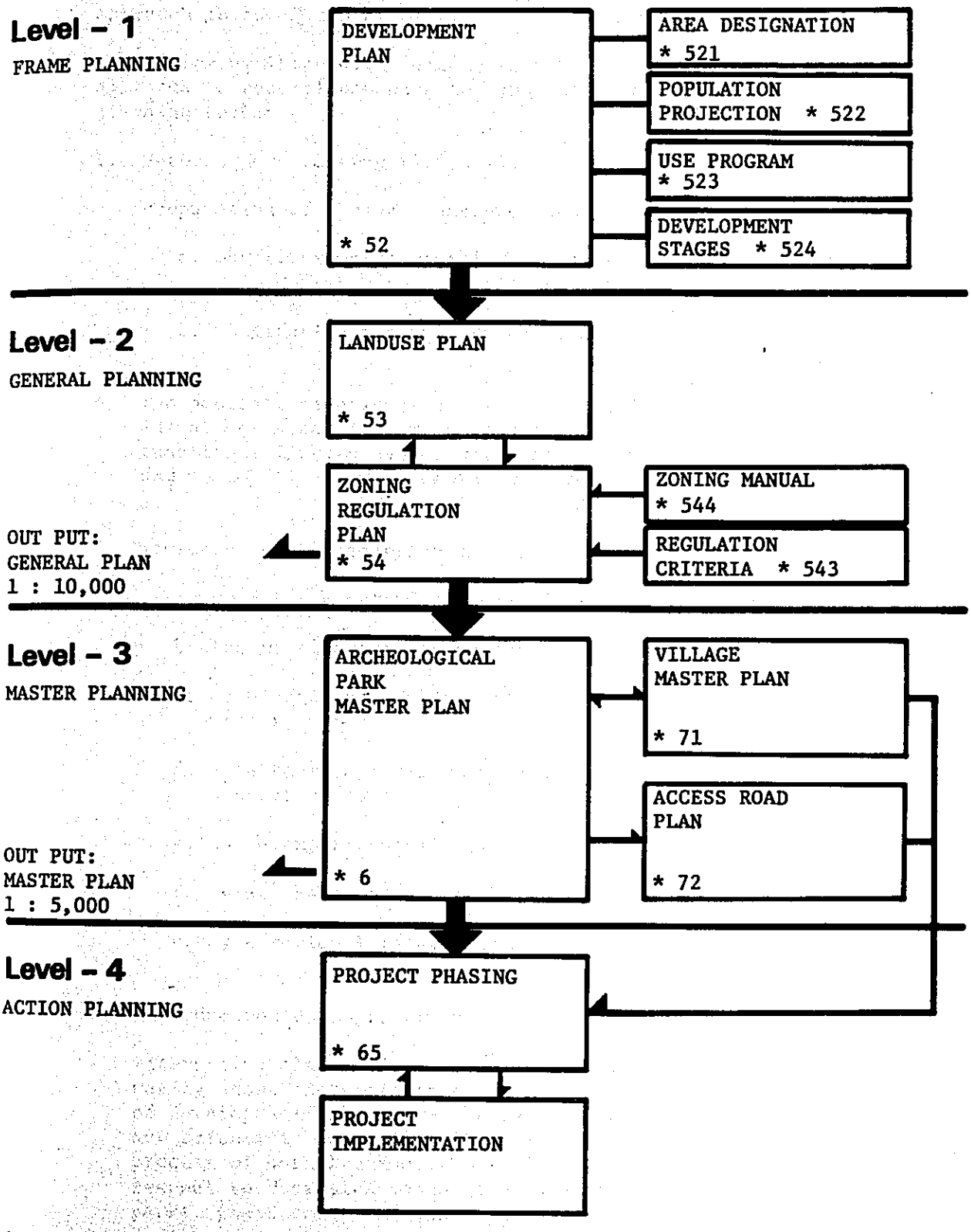
   In order to implement the above-mentioned General Plan, the works have been generally classified, and a master plan has been prepared for each classification of works: park facility development works, village works, infrastructure works and access road works.

4. Action Planning Level

   As programs for concrete development implementation, action plans covering the highest priorities have been prepared.

Planning Flowchart

Fig. 6



Approach to the Planning (512)

The following three work techniques have been set as a methodological approach to general planning to cope with long-term, border-area planning tasks:

1. Securing of planning flexibility

   Preparation of a plan capable of dealing with future unknown factors.

   a. Quantitative flexibility -- fluctuation in number of visitors (change in demand)

   b. Qualitative flexibility -- fluctuation in tourist objectives (change in social needs)

   Two possible techniques are (a) the setting aside of development adjustment areas (reserved areas) and (b) the adoption of a functional linkage system with the adaptability of being able to add at any time newly needed functions.

2. Having a general solution as a pilot plan

   a. Having the nature of a model as a national project

   b. The model nature as national archeological parks

   c. As a regional development model of the concentrated development type

   d. As a tourism development model of the type specializing in historical assets

   e. As an experimental model for village modernization

   f. As an experimental model for regional environmental control

   g. As a regional redevelopment model

3. Introduction of a procedure for extraction of the optimum solution

   Alternative plans will be studied in correspondence to each policy-making stage (determination of development policy → determinattion of development strategy → determination of development tactics), and scientific analysis will be made of decision making through a process of optimization. This will be particularly important with respect to determination of the territory of the archeological parks, their scale and their functional makeup.

Outline of Planning Techniques (513)

1. The process of determining the territory of the archeological parks

   The following scientific procedure will be followed in determining the territory of the national archeological parks for optimal area designation.

   Step-1 Site analysis and land evaluation

   a. Discovery of ecological territory and socioeconomic territory

   b. Evaluation of potential through analysis of the existing state of landuse

   c. Discovery of scenery territory and visual structure through visual analysis

   Step-2 Development of zoning system model and setting of criteria

   a. Definition of zoning concepts

   b. Classification of zoning units

   c. Designation of subsystem criteria

   d. Matrix analysis of zoning criteria

   e. Setting of planning standards

   Step-3 Zoning planning

2. The process of determining the scale of development of the archeological parks

   The optimum scale of development will be determined in the context of the correlation between the demand conditions and the site conditions.

   Step-1 Market analysis (Quantitative approach)

   a. Macro demand forecast

   b. Estimation of micro attraction power

   c. Setting of target values

   Step-2 Use analysis (Qualitative approach)

a. Setting of types of users

b. Tourist wave analysis

c. User behavior analysis

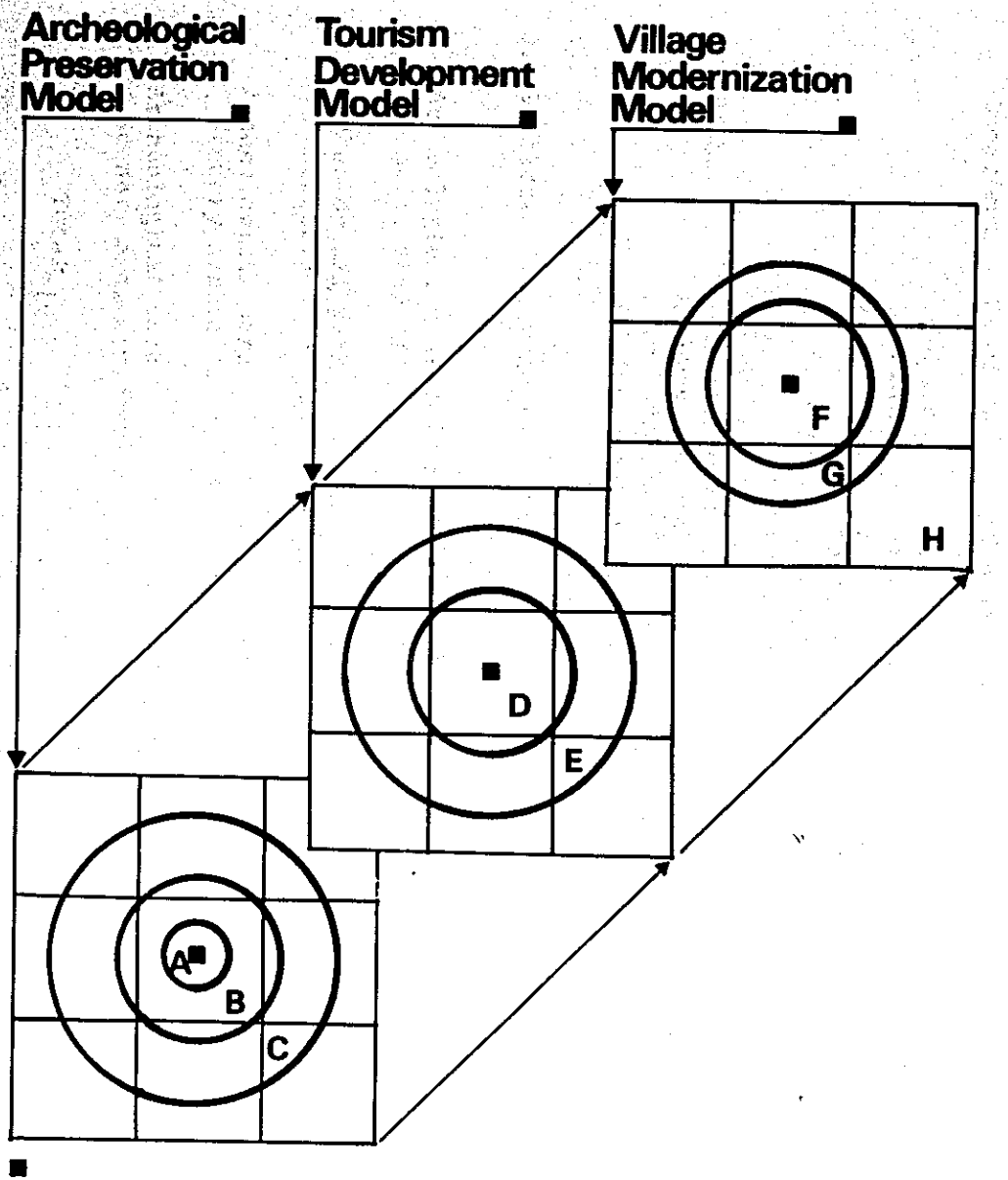
Step-3 Space needs

3. The process of determining the functional makeup of the archeological parks.

The activity, functional and facility needs of users will be derived from the development features and demand features of the archeological parks, in order to assemble an optimum functional makeup. Furthermore, the specific facilities will be identified on the basis of a functional linkage model in which primary and secondary functions have been broken down to concrete units.

Conceptual Model of The Archeological Park

Fig. 7



A Archeological preservation special area (sanctuary area)

B Archeological park protection area

C Archeological park scenic area

D Park facilities development area

E Archeological park designated area

F Area from which villages will be transferred elsewhere (Dukuh level)

DEVELOPMENT PLAN (52)

Project Location, Scope and Scale (521)

1. Borobudur Area

Location:	Provinci	Central Java
	Kabupaten	Magelang
	Kecamatan	Borobudur, Muntilan and Mungkit
	Desa	Borobudur, Wanurejo, Sawitan, Mendut and Progowati

Scope: Area covering approximately 5,400 ha within a radius of about 4.5 km of the Borobudur, Pawon and Mendut temples (including the area on both sides of the access road from the national highway)

2. Prambanan Area

Location:	Provinci	Central Java	Yogyakarta Special District
	Kabupaten	Klaten	Sleman
	Kecamatan	Prambanan	Prambanan, Kalasan
	Desa	Trogo, Bugisan, Taji, Kebondakidul, Peneng & others	Bokohar, Sambiredjo & Tamanmartani

Scope: Area straddling the Yogyakarta-Sulakarta national highway and including a portion of the Pegat hills, with a radius of approximately 4.5 km and comprising about 5,600 ha.

3. Breakdown of Development Area

	Borobudur	Prambanan
Archeological preservation Special area *i	20.5 ha	34.5 ha
Archeological park Protection area *ii	179.5 ha	165.5 ha
Archeological park Scenery special area *iii	1,220.0 ha	1,260.0 ha
Archeological park Scenery ordinary area	3,980.0 ha	4,140.0 ha
Total *iv	5,400.0 ha	5,600.0 ha

Notes:

i. Sanctuary area

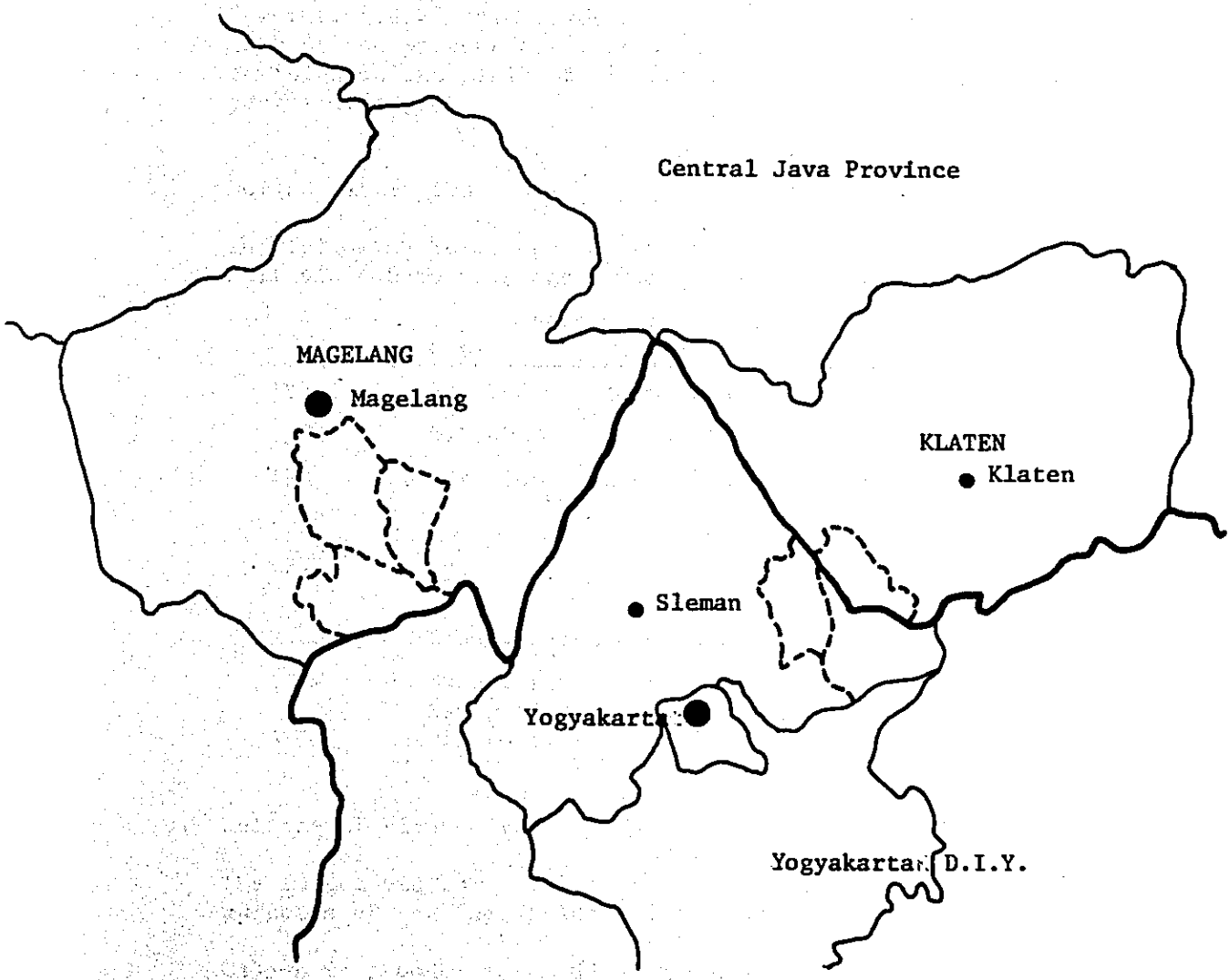
ii. Park facility area

iii. Village improvement area

iv. Overall area of designated area of National Archeological Park

Admistration Boundary

Fig. 8



Setting of Planned Population (522)

1. Forecast of Number of Park Visitors

The number of visitors to Borobudur and Prambanan in fiscal year 1974.

Borobudur	325,300
Prambanan	159,000

The target figures for tourist visitors will have to be set on the basis of overall consideration of such factors as the present trend, macro demand forecast analysis, environmental capacities, the economic justifiability of the development, and so on.

However, since these figures will be based on the long-term outlook at the present time, it will be necessary for gradual revision on the basis of the actual figures recorded in each progressive year.

2. Demand Estimation

The following is an estimation of the number of tourists that will visit Borobudur and Prambanan as based on Repelita II.

	Borobudur		Prambanan	
	Case-1	Case-2	Case-1	Case-2
1975	724,200	1,401,000	599,000	1,181,700
1980	975,000	1,819,900	762,400	1,490,300
1985	1,438,400	2,498,300	1,000,000	1,913,300
1990				
1995				

Notes: Case-1 represents a general demand estimate.

Case-2 represents a demand estimate based on the assumption that an active effort is made to attract visitors.

3. Setting of Planned Visitor Population (design capacity assumption)

The target visitor population has been set as follows for the purposes of the facilities and infractural supply planning.

Case-A is a model for achieving the target values of Case-2 of the macro demand forecast study. It assumes an active effort to

attract day visitors from the Central Java area, long-term travellers and weekend tourists on Java, Long-term travellers from throughout Indonesia, tourists from abroad, schoolchildren on organized tours and excursionists. The number of visitors a day is assumed to be 7,000.

Case-B is a model for development of a capacity capable of coping with the macro demand envisioned for 1990. It assumes investment on the basis of a long-term perspective and a daily number of visitors of 10,000.

4. Setting of Fixed Population within the Archeological Park Designated Areas

- The population figures for 1975 are as follows (estimates included).

	Borobudur	Prambanan
Archeological park protection area	2,300	4,300
Archeological park scenery special area	13,700	20,100
Archeological park scenery ordinary area	44,900	69,000
Total:	60,900	93,400

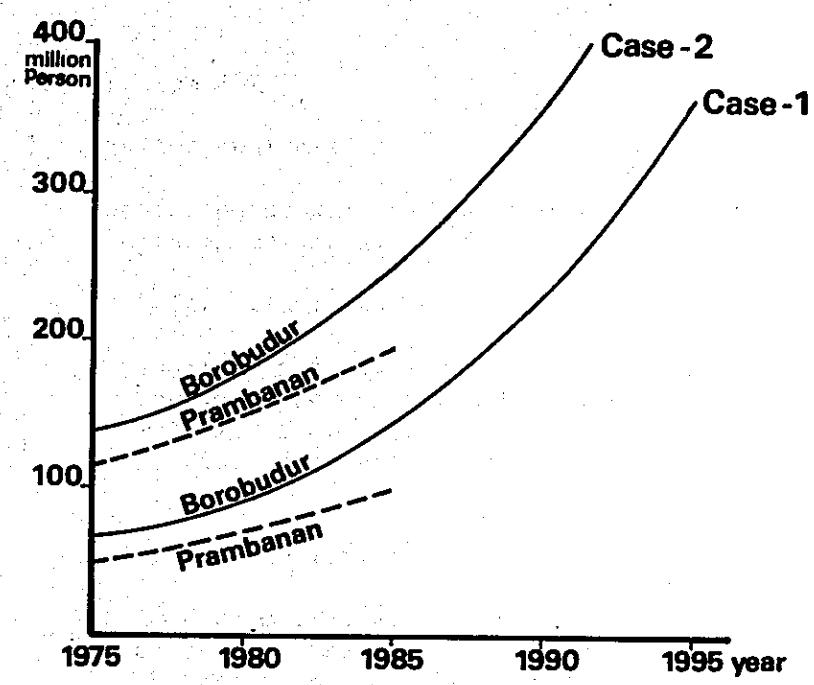
- Estimates of future fixed population figures.

These figures are based on the past trend of population growth, the area subject to village improvement being the first two of the three areas mentioned above.

	Borobudur	Prambanan
1975	16,254	24,353
1980	17,270	26,612
1985	18,349	29,081
Annual rate of population increase	1.22%	1.79%
Desa involved	5 Desas	at least 8 Desas

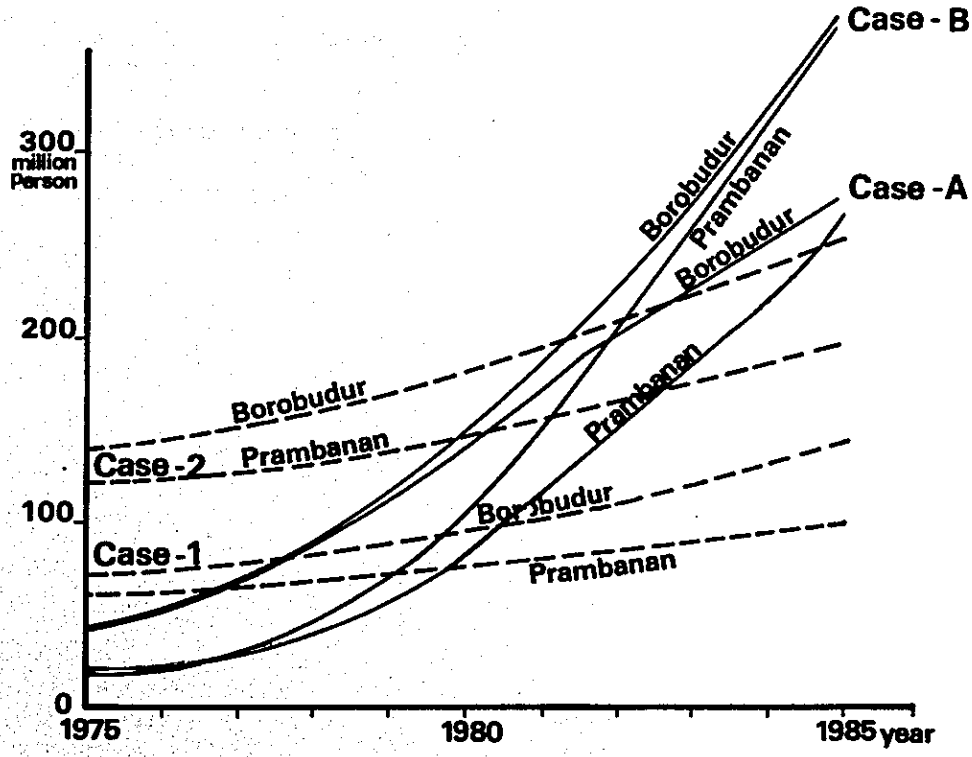
Demand Estimation of Visitor

Fig. 9



Planned Visitor Population

Fig. 10



Use Program (523)

1. Visitor designation

The following will be the characteristics of the visitors to the archeological parks.

- Origination:

  Tourists from oversee
  Tourists from throughout Indonesia
  Tourists from Java
  Tourists from the Central Java Region

- Classification:

  Long-term visitors from throughout Indonesia
  Long-term visitors and week-end visitors from Java
  Day visitors from the Central Java Region
  Excursions and school trips by school children from Java
  Foreign tourists

2. Model of macro demand by visitor type

	Case-1	Case-2
Day visitors from the Central Java Region	366,451(25%)	732,902(29%)
Long-term and weekend visitors from Java	693,449(49%)	1,386,898(56%)
Long-term visitors from	12,730(1%)	12,730(1%)
Foreign tourists	365,794(25%)	365,794(15%)

2. Visitor activity analysis

Estimate of fluctuation of number of visitors during the year (Case B)

	Borobudur	Prambanan
1980		
Daily average	4,066	2,752
Daily average during tourist season	5,286	3,578
Daily average during off-season	2,846	1,926
Peak day	14,842	10,043
1985		
Daily average	10,164	9,483
Daily average during tourist season	13,213	12,328
Daily average during off-season	7,115	8,630
Peak day	38,097	34,613

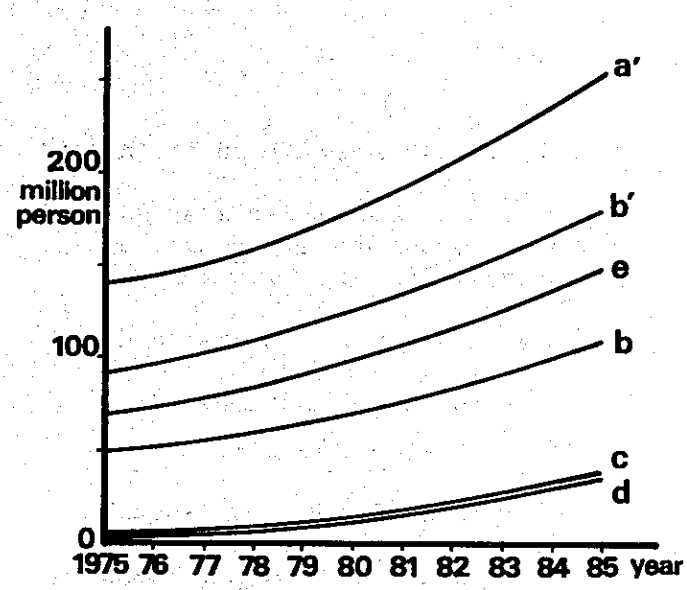
N.B. The tourist season periods are April, August, and October or November as well as the end and beginning of the year. The number of visitors on each peak day has been assumed to be one percent of the annual number of visitors.

3. Estimate of fluctuation of number of visitors during the day (Case B)

Assumption of daily average for 1985 of 10,000 visitors.
Assumption of average stay time of 4 or 6 hours.
Park operating hours -- 8:00AM to 6:00PM with evening hours of 6:00PM to 10:00PM in the case of Prambanan.

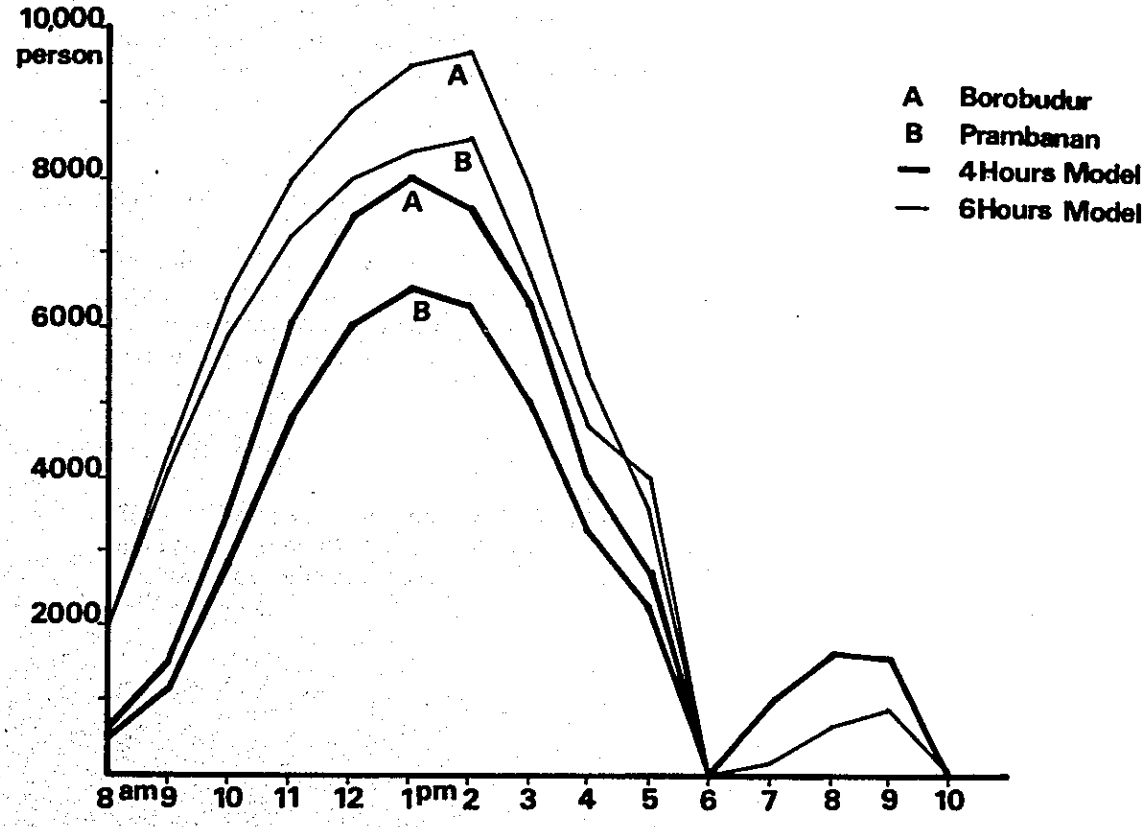
Demand Estimation by Visitor Type

Fig.11



Daily Wave of Visitor

Fig.12



Setting of Development Stages (524)

1. The national archeological park development and improvement project is being considered in terms of a 10-year plan the first year of which is 1976 (target year 1985).

   This period of ten years is divided into two 5-year phases:

   Phase-1 (1976 - 1980)

   Phase-2 (1981 - 1985)

   Phase-1 is a development period that just about coincides with the 2nd 5-year plan of the Republic of Indonesia (Repelita II). It also coincides with the period of the work for restoration of the Borobudur temple that is being carried out by Indonesian Government.

2. Phase-1 Development

   In this phase, besides diverse preparatory activity, including legislative measures, budgetary measures, the establishemnt of administrative organization, the systematization of the entities undertaking the development, completion of the detailed design and acquisition of land, such work will be undertaken as provision of infrastructure for the park facilities, investigation and restoration of the archeological assets, construction of service facilities for the number of tourists that are expected to visit the parks in the initial development period, and village resettlement.

3. Phase-2 Development

   Besides perfection of the physical environment by expansion of park facilities, large-scale provision of greenery, full-fledged improvement of surrounding villages, and so on, the aim in this phase will be the development of a diversified operational program.

4. Post Phase-2

   This will be a period of creation of new modes of use of the park environments in response to new social needs. It will also be a period for completion of any scheduled development not completed in Phase-2.

Development Component List

Items		Works
0.	Histrical Remains Restoration Work	Indonesian Restration Program
1.	Park Facilities Development Works	Sanctuary Improvements Construction of Group of Facilities on Different Themes Construction of Group of Service Facilities Provision of Park Greenery
2.	Village Improvement Works	Resettlement Redevelopment of Kecamatan Center Improvement of Desa Center Improvement of Dukuh Center
3.	Access Road Works	Borobudur Park: Repair of provincial road between Muntilan and Mungkit (4.5 km) Rerouting of the provincial road between Mungkit - Borobudur (3.5 km) Prambanan Park: Broadening of the national highway through the Park (5.5 km)

LANDUSE PLAN (53)

Landuse Planning Policy (531)

1. The plains area of Central Java has one of the densest agricultural populations in the world, with the areas around Borobudur and Prambanan being no exception.

   One of the features of this area is the distribution, at approximately even internvals, of village units of different sizes called Dukuh which are based on ties to the land.

   The farm land consists of both paddies and dry fields, representing outstanding productive green land supported by irrigational networks. There are hardly any natural forests, the only trees being those planted around villages and groves of palm trees.

2. The new development must be planned in such a way as not to give rise to any environmental destruction, taking into careful account the above point, the existing ecological system - particularly agricultural ecological system and the regional social structure - and preservation of the archeological climate.

3. Accordingly, the landuse planning has been based on the following basic policies:

   a. A high degree of use in terms of both preservation of the archeological remains and development of a tourism-oriented landuse system while at the same time maintaining the existing agricultural landuse pattern.

   b. Provision of as large an archeological environment preservation area as possible.

   c. Minimization of land for new development and land the use of which will changed.

   d. Minimization of the physical influence of new development.

   e. Very careful site selection.

   f. Utilization of the existing agricultural scenery as a background for the park area and increasing of the amount of greenery by selective landscape improvements.

   g. Paying careful attention to erosion and water control aspects and limiting the use of river banks, slopes, etc.

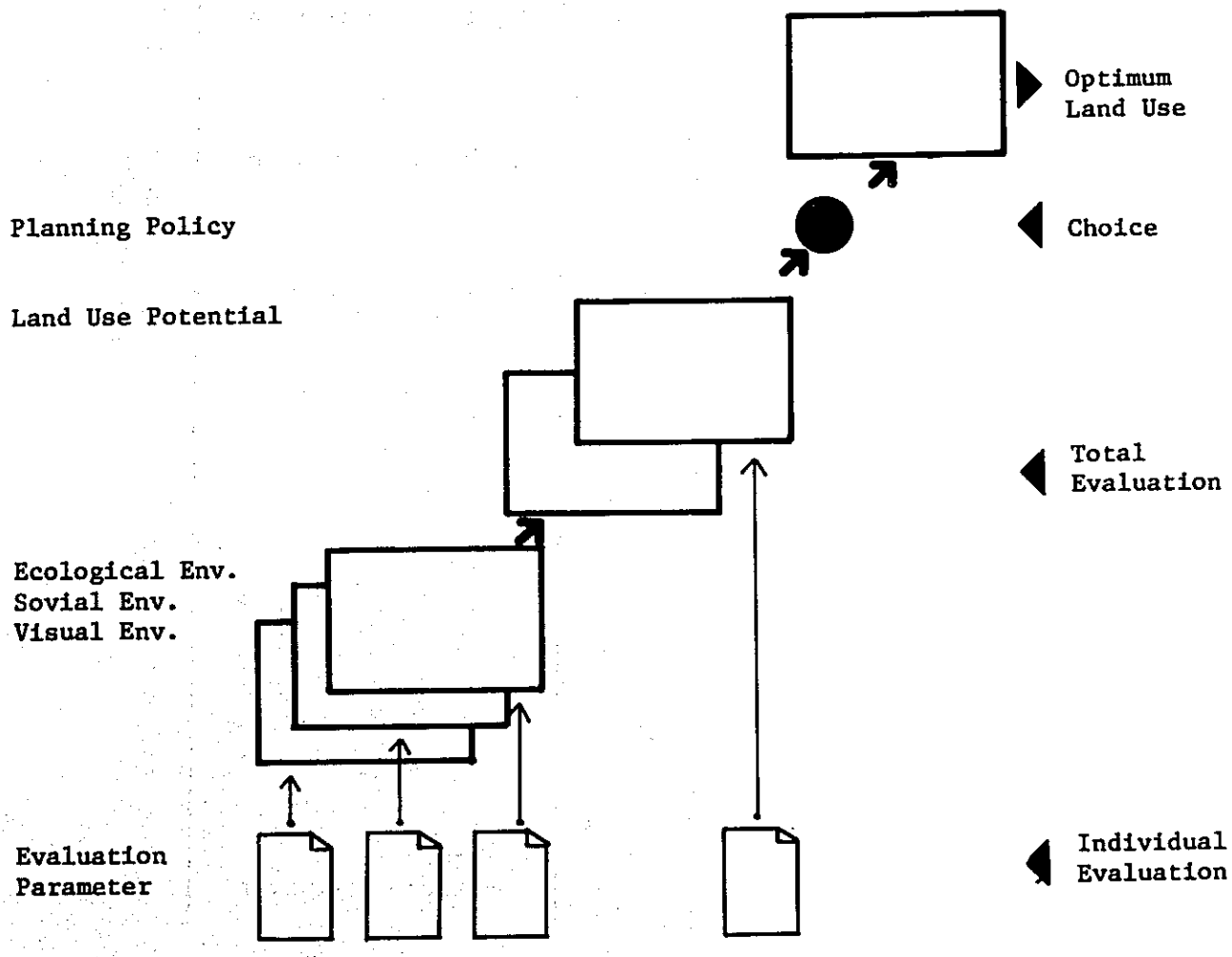
h. Taking environmental pollution risks into due account.

4. Site diagnosis by environmental evaluation martix

The features of the land in the project area, as judged from such aspects as the natural ecological system, the visual environmental system, the social environment system and use potentiality, have used as parameters for the discovery of an optimum landuse pattern. The matrix on the next page shows the assessment stage and the appropriateness or unappropriateness of site use as extracted from each item.

Environmental Evaluation Process

Fig. 13



Environmental Evaluation Matrix

Fig.14

	Evaluation Criteria	Landuse Dukuh	Elements Sawah	Crops	Archeo-logical Ruins	Riverside	Roadside	Forest	Hillyland
Natural ecological system	1. Vegetation	x	▲	▲	x	●	▲	○	○
	2. Topography	●	▲	▲	●	○	x	●	○
	3. Hydrology	▲	●	▲	x	○	x	○	▲
	4. Pollution	x	●	●	▲	●	x	○	○
	5. Flood & Drought Control	x	●	●	▲	x	●	○	○
	6. Soil Erosion	▲	●	●	●	x	●	○	○
	7. Agriculture	x	○	○	x	●	x	x	▲
Scenic system	8. Natural Landscape	x	▲	▲	●	○	x	○	○
	9. Visual Element	●	▲	▲	○	●	x	●	▲
Social environment system	10. Community Facility	○	▲	▲	●	▲	●	x	x
	11. Human Community	○	▲	x	▲	x	x	x	x
	12. Infrastructure	○	▲	x	▲	x	○	x	x
	13. Land Ownership	○	●	▲	x	x	x	▲	▲
	14. Land Value	○	○	●	x	x	●	▲	▲
Utilization potentiality	15. Accessibility	○	●	●	○	▲	○	x	x
	16. Possibilities	●	▲	▲	○	●	○	x	x
	17. Flexibility	x	x	○	x	▲	▲	x	▲
	18. Peculiarity	▲	x	x	○	▲	●	○	○

Legend: ○ Good, ● Fair, ▲ Poor, x Bad

Area Designation and Division (532)

1. Designated Area

Borobudur National Archeological Park designated area	5,400 ha.
Prambanan National Archeological Park designated area	5,600 ha.

2. Area Division

The designated area of each of the national archeological parks is divided into the following five types of area (landuse model):

1. Archeological Preservation Special Area (Sanctuary Area)
2. Archeological Park Protection Area (Park Facilities Area)
3. Archeological Park Scenic Area
   - 3.1 Special Scenin Area (Village Improvement Area)
   - 3.2 Ordinary Scenic Area
4. Access Road Area
5. Natural and Visual Protection Area

N.B.	Scope of landuse planning	1,2 & 3.1
	Environmental control areas	All areas
	Areas relating to archeological park development	1,2 & 4
	Village improvement areas	1,2, 3.1 & 4

Land Use Model

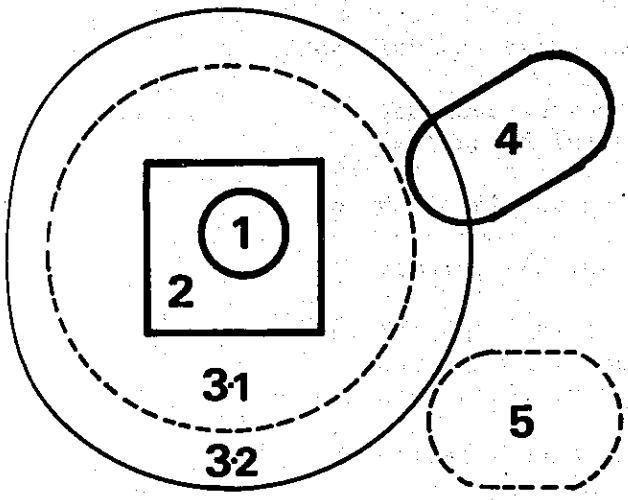


Fig 15

Zonig Model

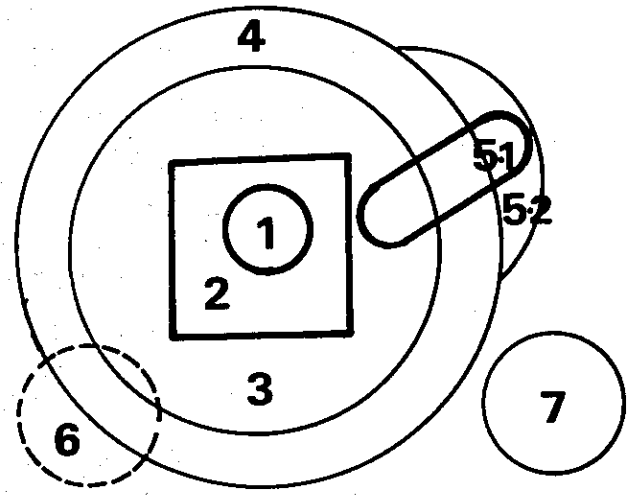


Fig.16

Land Use Block	Zoning Block
1 Sanctuary Area	1 Archeological Preservation Special Area
2 Archeological Park Facility Area	2 Archeological Park Preservation Area
3-1 Village Implementation Area	3 Archeological Park Scenic Special Area
3-2 Archeological Park Area	4 Archeological Park Scenic Ordinary Area
4 Roadside Area	5-1 Access Roadside Scenic Area
	5-2 Access Roadside Scenic Area
5 Nature & Scenery Protection Area	6 Nature Protecton Area
	7 Scenery Protection Area

Landuse Inventory (533)

1. Archeological Preservation Special Area (Sanctuary Area)

   a. The land surrounding the archeological remains will be designated in accordance with the line-drawing standards.

   b. Nationalization of the land for the sake of strict preservation and maintenance and control of the archeological remains and the designated area.

   c. For the sake of physical preservation of the archeological environment, the villages in or affecting the designated area will, in principle, be relocated.

   d. Visual expansiveness will be achieved by removing trees and other obstacles in order to be able to appreciate the archeological remains from an appropriate visual distance.

   e. The area will be utilized to ensure the activities of visitors incidental to their appreciation of the archeological remains and as an overflow area for control of the number of people who enter the archeological sites at any given time.

2. Archeological Park Protection Area (Park Facilities Area)

   a. The area for direct protection and utilization of the archeological environment.

   b. Overall site control by the development entities and improvement of the park environment and construction of facilities.

   c. Particular attention will be given to the view of the arrangement of the archeological remains surrounded by this area, with appropriate landscaping measures being taken to maximise the air of history and culture.

   d. Provision of facilities for the diversified activities of visitors centering on appreciation of the archeological remains as well a green environment.

   e. Adequate improvement of the basis of livelihood of the fixed population in terms of the villages and productive green land within the area and gradual resettlement, with the sites made vacant being used for park facilities, greenery, etc.

3. Archeological Park Scenic Area: Special Scenic Area (Village Improvement Area)

   a. Landuse planning conducive to the formation of the desired future village structure and to adjustment as surrounding area.

   b. Full environmental control by zoning.

   c. Having the local population benefit from the development while at the same time giving priority to village improvement works.

   d. Scenic regulation and active landscaping to ensure the expansiveness and quality of the archeological parks.

   e. Selection in this area of substitute sites in connection with site acquisition in the Park Facilities Area.

4. Archeological Park Scenic Area: Ordinary Scenic Area

   a. This is as far as the designated area of the national archeological parks goes.

   b. Securing of enough area in terms of natural and scenic environment for the maintenance and preservation of the archeological park environment.

   c. Regulation of activities detrimental to the preservation of the archeological climate.

   d. Inclusive of the study area determined by the Borobudur Restoration Committee.

5. Access Road Area

   a. Designation of the routes for access to the archeological parks and regulation of road scenery and use.

   b. Roadside regulation for prevention of the sprawl phenomenon that might otherwise occur in connection with park development and strict environmental control through design regulation.

6. Nature Protection Areas

   Recommendation of protection measures, regulation, etc. for rivers,

forests, mountains, slopes and so on outside of the designated area of the archeological parks but nevertheless requiring maintenance of their environments because of their relationship to the parks.

7. Scenery Protection Areas

Recommendation of protection measures and regulation for hills, forests, slopes, etc. that have an influence on the panaramic scenery from points within the archeological parks.

Landuse Area List

ZONES:		Borobudur Park		Prambanan Park	
		Subzones	Area	Subzones	Area
1.	Archeological Preservation Special Area	3 Sanctuary		9 Sanctuary	
2.	Archeological Park Preservation Areas	Borobudur Block Pawon Block Mendut Block Reserved Block Promenades		Kraton Block Prambanan Block Sewu Block Reserved Block Promenades	
3.	Archeological Park Scenic Areas	Special Areas Ordinary Areas		Special Areas Ordinary Areas	
4.	Access Roadside Preservation Areas	Viewing Areas Ordinary Areas		Viewing Areas Ordinary Areas	
5.	Nature Protection Areas	Main & Branch Streams of Progo River Southern Mountain Area		Opak & Kongkiangan Rivers Pegat Hill Area	
6.	Scenery Protection Areas	Gunungsari·Kebonsari & Gununggendol Hill Areas		Pegat Hill Area	

Ground Total

Note: Unit - Hectare

ZONING CONTROL PLAN (54)

Zoning Planning Policy (541)

1. The Significance of Environmental Control

Archeological remains do not exist independently, but rather in the context of historical, social and natural conditions, and only on the basis of an integrated awareness of these conditions can one understand their essential value.

It is therefore important that there be not only provision of facilities to help in understanding and appreciating such conditions but also measures for the maintenance and preservation of the natural environment of the remains and of the surrounding land.

Herein lies the significance of environmental control not only of the archeological remains themselves but also of the surrounding area.

2. Environmental Control Objectives

a. Active preservation; active protection and preservation of the present state into the future.

b. Maintenance of the present state; prevention of activities that will bring about change.

c. Development within the bounds set by regulation; setting of definite criteria for keeping development in check.

3. What Will Be Subject to Environmental Control

a. The natural environment; terrain, rivers, forests and other environmental elements and the existing state of landuse.

b. Artificial structures; kind, shape, color, materials, etc.

c. Activities; commercial and other activity.

4. Environmental Control Methods

a. Application of appropriate control techniques to the different areas according to their need for regulation, their features, and so on through the introduction of zoning.

b. The relation between the control objectives and the objects of control is as follows:

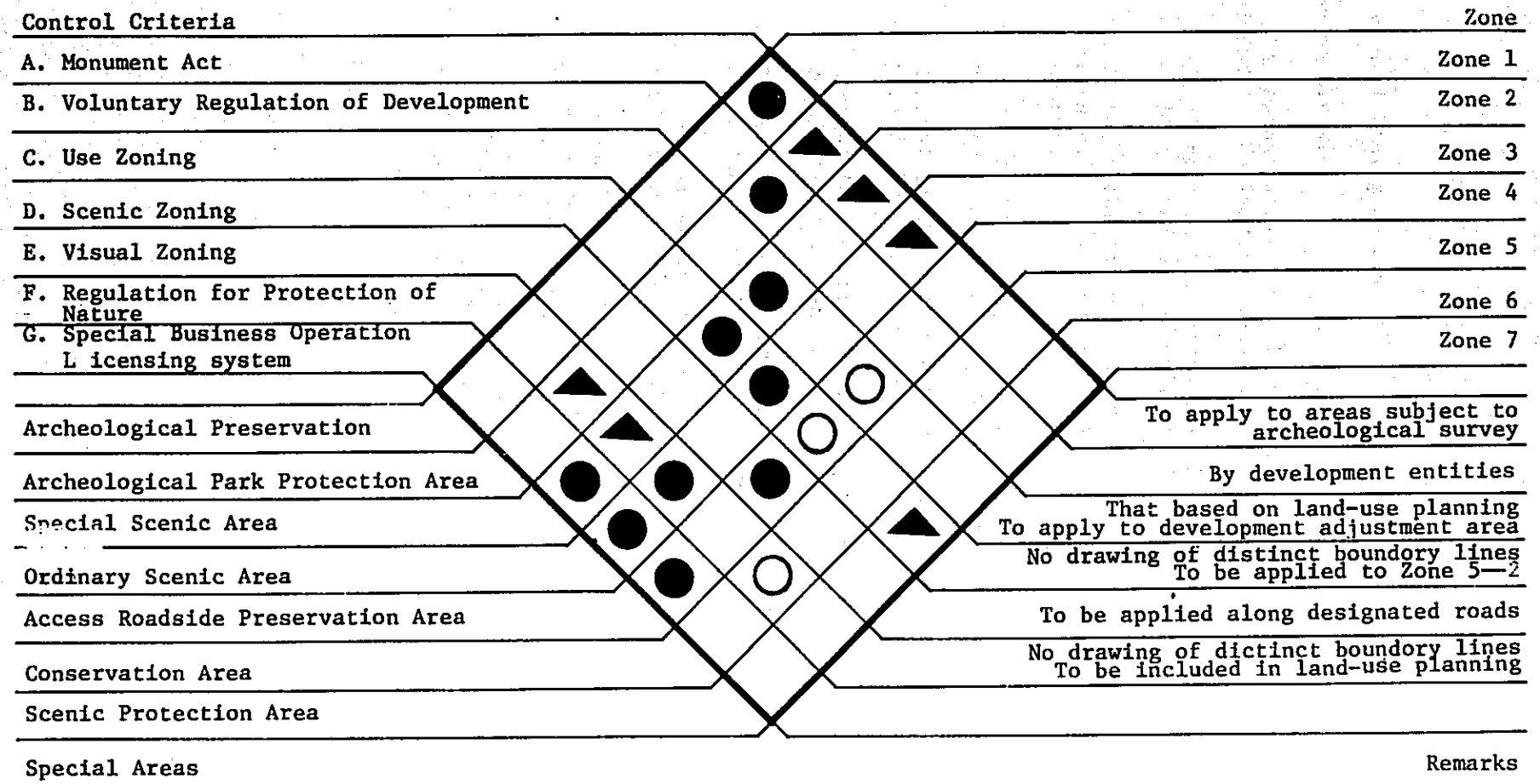
(1) Active preservation; protection of archeological remains and of nature.

(2) Maintenance of present state; use-zoning regulation and scenic regulation.

(3) Development within regulation bounds; voluntary control of development, scenic regulation, business operation licensing system.

Environmental Zoning Matrix

Fig. 17



Environmental Zoning System (542)

1. Zoning Division

The following regulation will be applied to each of the areas defined in the landuse planning.

1. Regulation in the archeological preservation special areas will be based on the Cultural Assets Protection Law.

2. In the archeological park protection areas there will be both voluntary development regulation and use zoning control.

3. In the archeological park special scenic areas there will be both use-zoning and control by scenic regulation.

4. Control in the archeological park ordinary scenic areas will be by scenic regulation.

5. Control in the access road areas will be by visual regulation (5.1) and scenic regulation.

6. Control in nature protection areas will be by nature protection regulation or recommendations.

7. Control in scenic protection areas will be by recommendations similar to scenic regulation.

N.B. Regulation of development activities by a special business operation licensing system will apply to all zones except Zones 6 and 7.

Zones 1,2,3 and 4 will be subject to regulation as survey areas on the basis of the Cultural Assets (Remains) Protection Law.

Regulation Criteria (543)

1. Cultural assets (Remains) protection regulation

   Permanent protection will be ensured through strict regulation based on the Monument Act of the Republic of Indonesia and UNESCO survey and research criteria.

2. Voluntary development control by development entities

   a. Phase control

   b. Site and building code

   c. Design code

   d. Visual code

3. Use-Zoning

   Regulation of change of use on the basis of landuse planning in accordance with criteria similar to the use-zoning criteria of the Urban Planning Act.

4. Scenic regulation

   Prohibition or licensing of the following activities in the areas subject to this kind of regulation:

   a. Construction, remodelling or expansion of buildings or other structures.

   b. Levelling of land for residential purposes, opening up of new land for cultivation, and other changes in the shape and quality of the land.

   c. Felling of trees and quarrying of soil and rocks.

   d. Other activities that might work against preservation of the historical setting.

   The will also be regulation of development that will have an adverse effect on the scenery in areas subject to scenic protection, particularly as viewed from the top of Borobudur Temple and from Klaton in Prambanan.

5. Visual regulation

The following will be prohibited or licensed in roadside scenic areas:

a. Change of the color, shape and materials of buildings and other structures in existing villages.

b. Outside display of advertisements.

c. Construction of new buildings or structures or change in the shape of the land.

6. Nature protection regulation

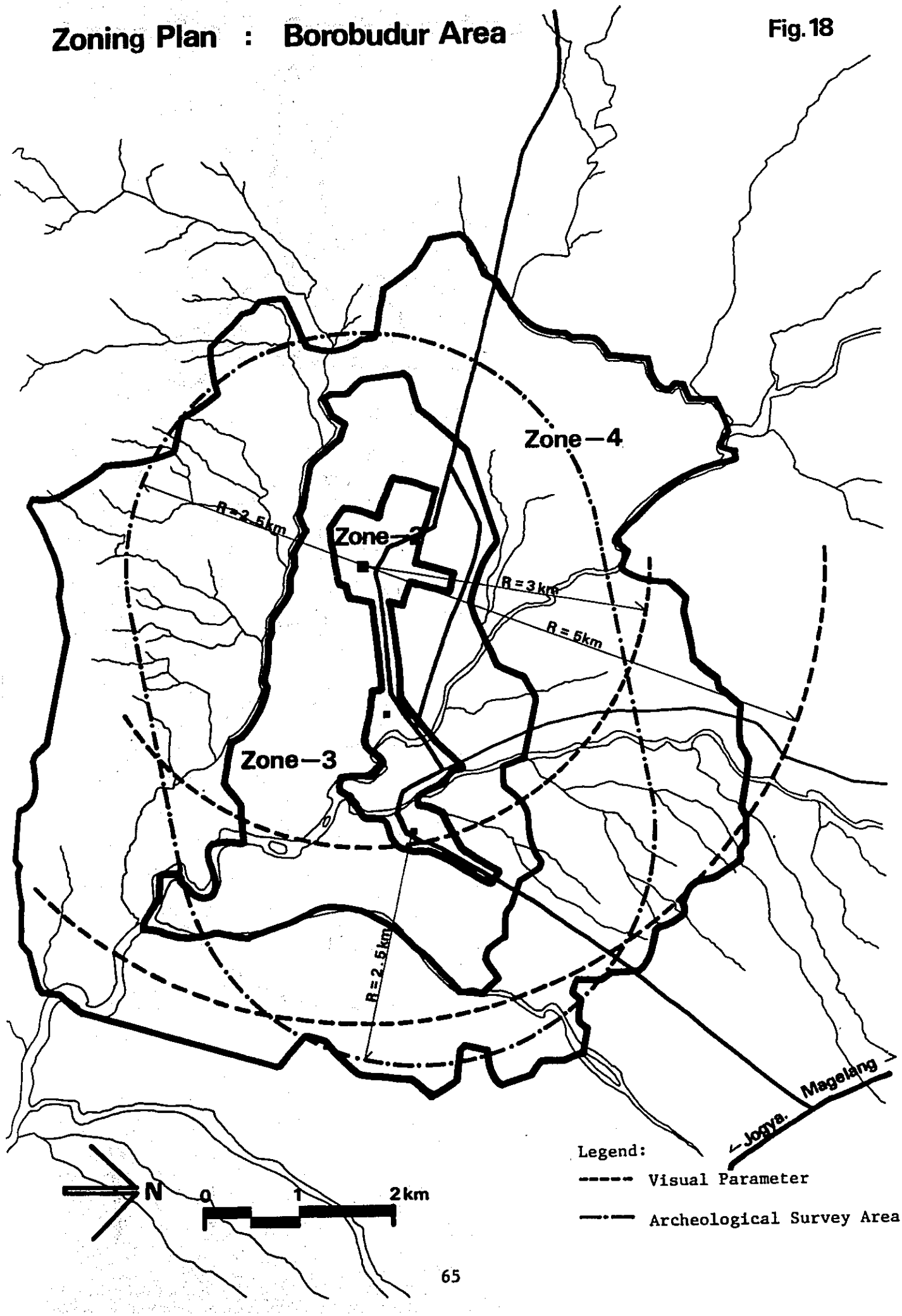
Prohibition or licensing of, or making of recommendations concerning, development activity with regard to rivers, forests, mountains or hills, slopes, and so forth.

7. Special business operation licensing system

Correct guidance of new commercial activity by adoption of a licensing system for prevention of development sprawl.

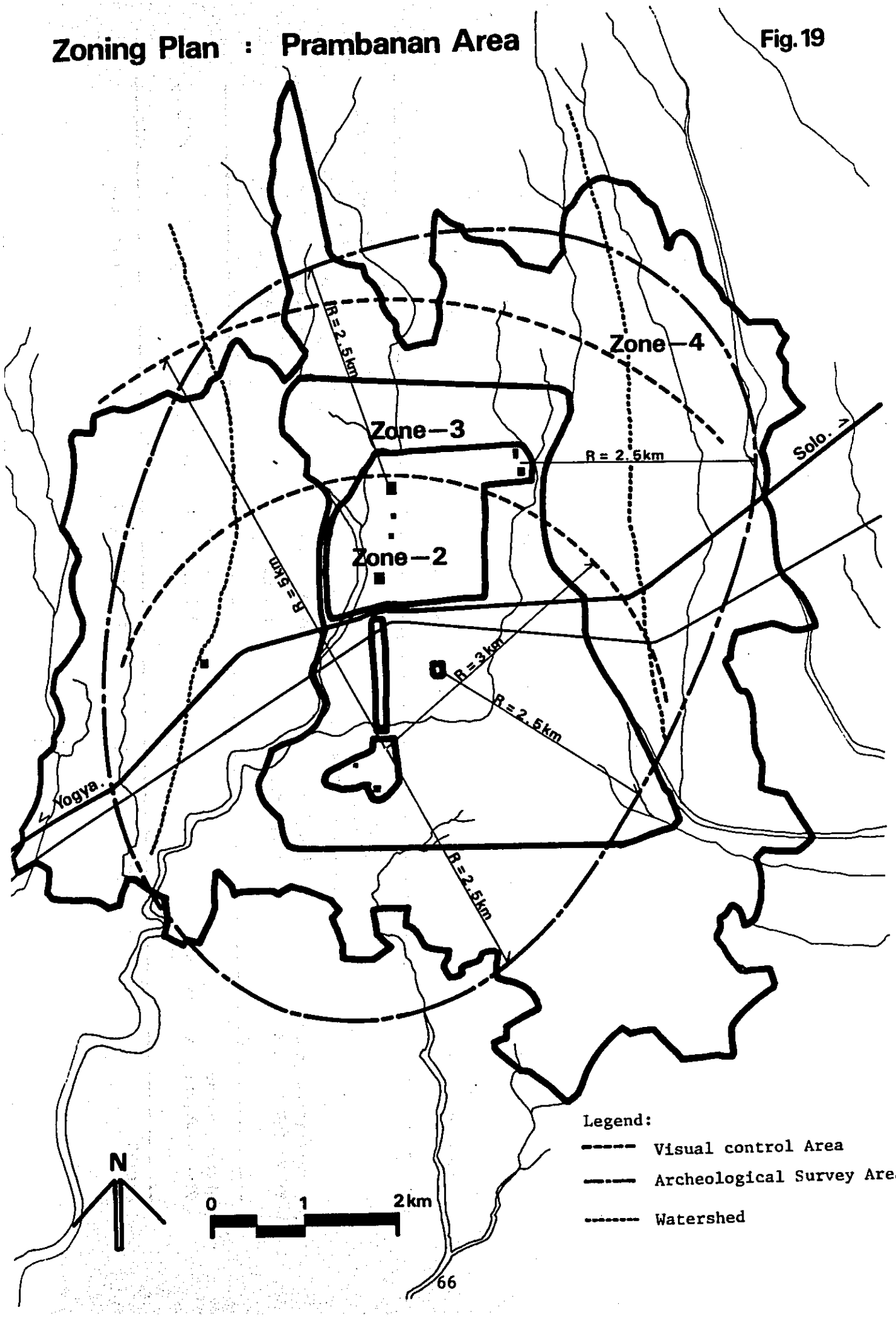
Zoning Plan : Borobudur Area

Fig. 18



Zoning Plan : Prambanan Area

Fig. 19



Zoning List

Zoning	Landuse Division	Borobudur Park		Total	Prambanan Park		Total
Archeological Preservation Special Areas		20.5 ha		20.5 ha	34.5 ha		34.5 ha
Archeological Park Preservation Areas	Facility Areas	57.5 ha			39.0 ha		
	Open Space	81.0			67.5		
	Reserved Areas	41.0			59.0		
	(Dukuh)		(13.0)			(19.0)	
	(Sawah)		(28.0)	179.5		(40.0)	165.5
Archeological Park Scenic Areas - Special Areas	Settlement Areas	385.5 ha			362.0 ha		
	(Existing)		(330.5)			(319.0)	
	(Proposed)		(55.0)			(43.0)	
	Community Facility Area	30.0			36.0		
	(Commercial Facilities)		(5.5)			(6.0)	
	(Public Facilities)		(21.0)			(25.5)	
	(Public Open Space)		(3.5)			(4.5)	
	Agliculture Area						
	Road & Railroad Area	804.5			862.0		
	River Courses			1,220.0			1,260.0
Archeological Park Scenic Areas - Ordinary Areas		3,980.0 ha		3,980.0	4,140.0 ha		4,140.0
Ground Total				5,400 ha			5,600 ha

Proposed Zoning Manual (544)

1. Zoning criteria for archeological preservation special areas (Sanctuary Areas)

   a. Visual parameters

      Separation of at least 30 m on the basis of analysis of near view. Upward viewing angle of 14-30 deg. with respect to height of archeological remains.

      A minimum visibility angle of 60 deg. with respect to the size of the foundation of the archeological remains.

      Also to be taken into consideration in determination of the visual parameters are correct approach to the archeological remains, axial relationships, arrangement of the remains, etc.

   b. Size parameters

      Ensureing a space proportional to the size and height proportions of the foundation considering the particular volume and form of the archeological remains.

   c. Area parameters

      At least 1 ha. even in the case of the smaller archeological remains.
      Generally, 7-12 times the area taken up by the foundation.

   d. Use parameters

      The space capacity inside the sanctuary areas will be a maximum of 200 persons/ha./hr.

   e. Attractiveness parameters

      The above standard (use parameter) will be raised somewhat in the case of particularly well-known archeological remains.

   f. Consideration of the surrounding environment

      Active utilization of terrain, vegetation, and other special natural features and exclusion of villages, farmland, irrigation waterways, etc.

2. Zoning criteria for archeological park protection areas (Park facilities areas)

   a. Space demand

      The area of the facilities sites will be ten times that of

the total construction floor space.

The greenery area will be ten to fifteen times that of the area of the facilities sites.

The other open space (area for movement, buffer zones, nature protection areas, etc.) will be about thirty percent of the total area.

b. Space capacity

Facility sites visitor density

High density areas	200 or more	persons/ha.
Medium density areas	100 - 50	persons/ha.
Low density areas	20 or fewer	persons/ha.

Greenery space visitor density

Medium density areas	20 - 10	persons/ha.
Low density areas	10 - 1	persons/ha.

c. Distance standards

At least 200-300 m distance from main archeological remains (medium-distance view).

d. Territory standards

(1) Discovery of micro environmental units on the basis of analysis of such natural conditions as terrain, water system, natural ecology, form of villages, and so on.

(2) Utilization of comparatively low land-evaluation areas on the basis of analysis of land development potentiality (environmental evaluation).

(3) Achievement of ideal activity territory on the basis of analysis of visitor behavior.

(4) Inclusion of sites suited for tourist facilities.

(5) Consideration also to be given to village communities and village roads.

3. Zoning criteria for archeological park special scenic areas (Village Improvement Areas)

a. At least 1 km distance from major archeological remains (consideration of landuse planning).

b. Revision of the Desa administrative boundaries on the basis of the above conditions.

c. Consideration of terrain, water system and existing landuse.

d. Socioeconomic analysis of the regional living structure to serve as a premise.

4. Zoning criteria for roadside scenic areas

100 m on each side of the designated access roads.

5. Zoning criteria for archeological park designated area

a. Within radius of 2.5 km of major archeological remains (the provisional standard adopted by UNESCO's Borobudur Restoration Committee).

b. Selection of ecospheres through natural ecological territory analysis.

c. 3-5 km (visible distance) in the case of major directions of view and 1 km in the case of other directions through analysis of the panorama from scenic points.

d. Consideration of areas easily affected by development.

6 ARCHEOLOGICAL PARK MASTER PLAN

Contents:

PLANNING/DESIGN PRINCIPLE (61)

Development Features and Themes (611)

Borobudur Park

1. The archeological remains at the Borobudur site are those of a ninth century Buddhist temple which is one of the largest Buddhist temples in Southeast Asia still in existence.

   Since 1973 large-scale survey and restoration activities have been undertaken at this site with UNESCO assistance as 6-7 year national project of the Republic of Indonesia.

2. The following functions will be comprised as development features and themes with a view to encouragement of correct understanding of and interest in this internationally valuable historical and cultural asset and spreading of information about it.

Function-1

The function of supporting survey, restoration, educational, informational and other activities aimed at scholarly study and restoration of the archeological assets and of serving as a center for international and nationwide cultural activity.

Function-2

The enlightenment function of utilizing appreciation of the archeological assets as a means of promoting understanding by broad elements of the people of Indonesia of the historical significance of such assets and of their cultural roots.

Function-3

The function of development of new tourism resources to meet diverse tourist needs, especially the ensuring of such visitor activities as will make the park an important point for route tourism and a recreational center for weekenders and day visitors.

Function-4

The function of creation of a representative tourism base in Central Java, together with Prambanan, Yogyakarta and Sulakarta, on the international tourism route that will be comparable to those of Bali and Sumatra.

Prambanan Park

1. In this area the the archeological remains represent the collocation of Buddhist temples dating from the 8th and 9th centuries and a Hindu temple dating from the 9th century.

   That was about the time when the Ramayana tales, in all of their presentday artistic forms, which are the most representative products of the Java regions cultural history, began to develop.

   Right next to the Lara Djonggrang, Prambanan's most important archeological site, in an outdoor amphitheater which presents several Ramayana dance performances a year.

   The prime purpose of this park is to preserve, on the national level, the physical historical remains of the country, including the many archeological sites dotted over the Kewu Plain, so as to be able to hand down the historical tradition of Javanese culture to future generations.

2. The following functions have been set as means of creating a place for formation of such national culture and as guidelines for the features and themes of development:

Function-1

The function of aiming, as in the case of Borobudur, at the scholarly study and preservation of the archeological remains and of supporting research, restoration, educational, informational and other activities.

Function-2

The function of the preservation and further development of intangible cultural assets in order to carry on the tradition of Javanese culture.

Function-3

The function of promoting the formation of culture on the national level and nationwide cultural interchange.

Function-4

The function of providing a base, together with Borobudur, for international and domestic tourism.

Planology: Approach to Decision-making in the Planning and Design of the Archeological Parks (612)

Methodological Approaches

The following five space concepts have been set as approaches to determining the image of the national archeological parks and their master plans.

Concept-1

Identification of the scope of the national archeological park (design of the sphere)

Concept-2

Discovery of the structure and skeleton of the national archeological park

Concept-3

Systematic analysis of the functional linkage of the national archeological park to serve as a pilot for the master plan.

Concept-4

Definition of the sanctuary area, which is the main element of the national archeological park.

Concept-5

Design of the physical, visual and psychological networks linking the archeological ruins.

Theoretical Space Simulations

On the basis of the above space concepts, the following five simulations, with their respective planning and design models have been made in deriving the master plans.

Simulation-001 (determination of macro area)
Using an archeological ecosphere model

Simulation-002 (determination of structure)
Using an archeological structure model

Simulation-003 (determination of makeup)
Using an archeological park space system model

Simulation-004 (determination of micro area)
Using a sanctuary sphere model

Simulation-005 (determination of vectors)
Using an archeological park activity network model

Borobudur Park

1. The following are the predominant factors of this archeological park:

   a. 3 groups of archeological ruins (Borobudur, Pawon and Mendut)

   b. A background of volcanos.

   c. The sea of palm trees in the Kedu Basin.

2. Since these three groups of archeological ruins are situated rectilinearly in the direction of Mt. Merapi, there will be visual awareness of this axis in the spatial composition of the park as well as unity (visual integration) of the three groups.

3. Visitors will proceed from the entrance of the park in the opposite direction along this axis first to Candi Mendut (medium size), next to Candi Pawon (small size) and finally to the climax, Candi Borobudur (large size).

4. Consideration will be given to a panoramic view from the top of Candi Borobudur as follows:

   Near view -- Borobudur Sanctuary Area

   Medium-distance view -- The park facilities area, including Pawon and Mendut.

   Far view -- The whole of the Kedu Basin surrounded by Mt. Merapi, Mt. Merbabu, Mt. Sumbing and the Gandul Mountains.

Prambanan Park

1. The following are the predominant factors of this archeological park:

   a. 10 groups of archeological ruins.

   b. Volcanic Mt. Merapi.

   c. The countryside scenery of the Kewu Plain.

2. Creation of a variety of axes symbolizing the positional relationships of the groups of archeological ruins distributed within a radius of 2.5 km of Prambanan.

3. Creation of visual integration through intensive greenification of the area that is made a strong magnetic field by the archeological ruins and through facility utilization.

4. Consideration of the panoramic view from the Kraton Ratu Boko as follows:

   Near view -- Kraton Sanctuary Area and Pegat Hills

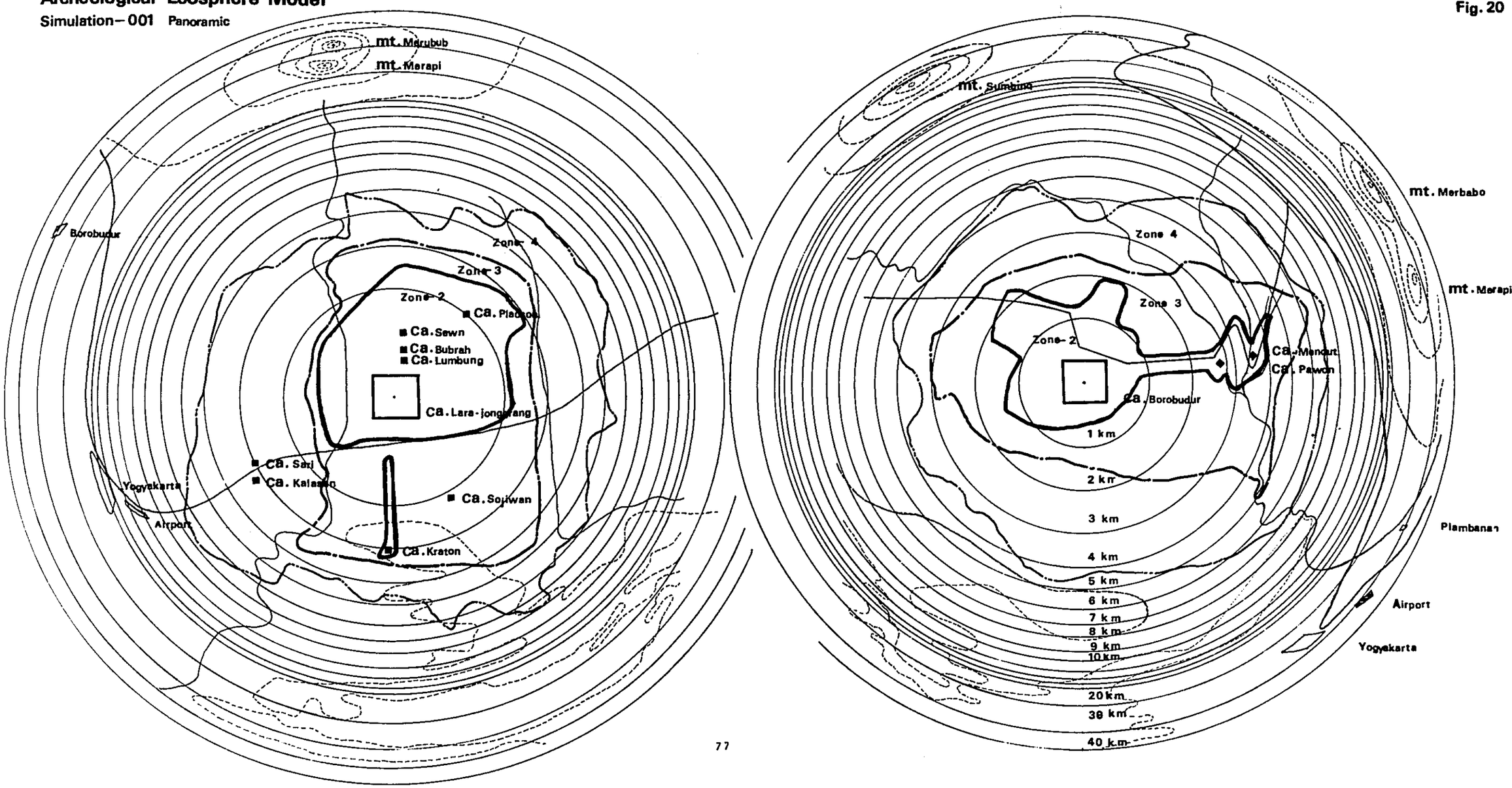
   Medium-distance view -- From the foot of the hills area to a distance of 5 km.

   Far view -- Mt. Merapi and its skirts.

Archeological Ecosphere Model

Simulation–001 Panoramic

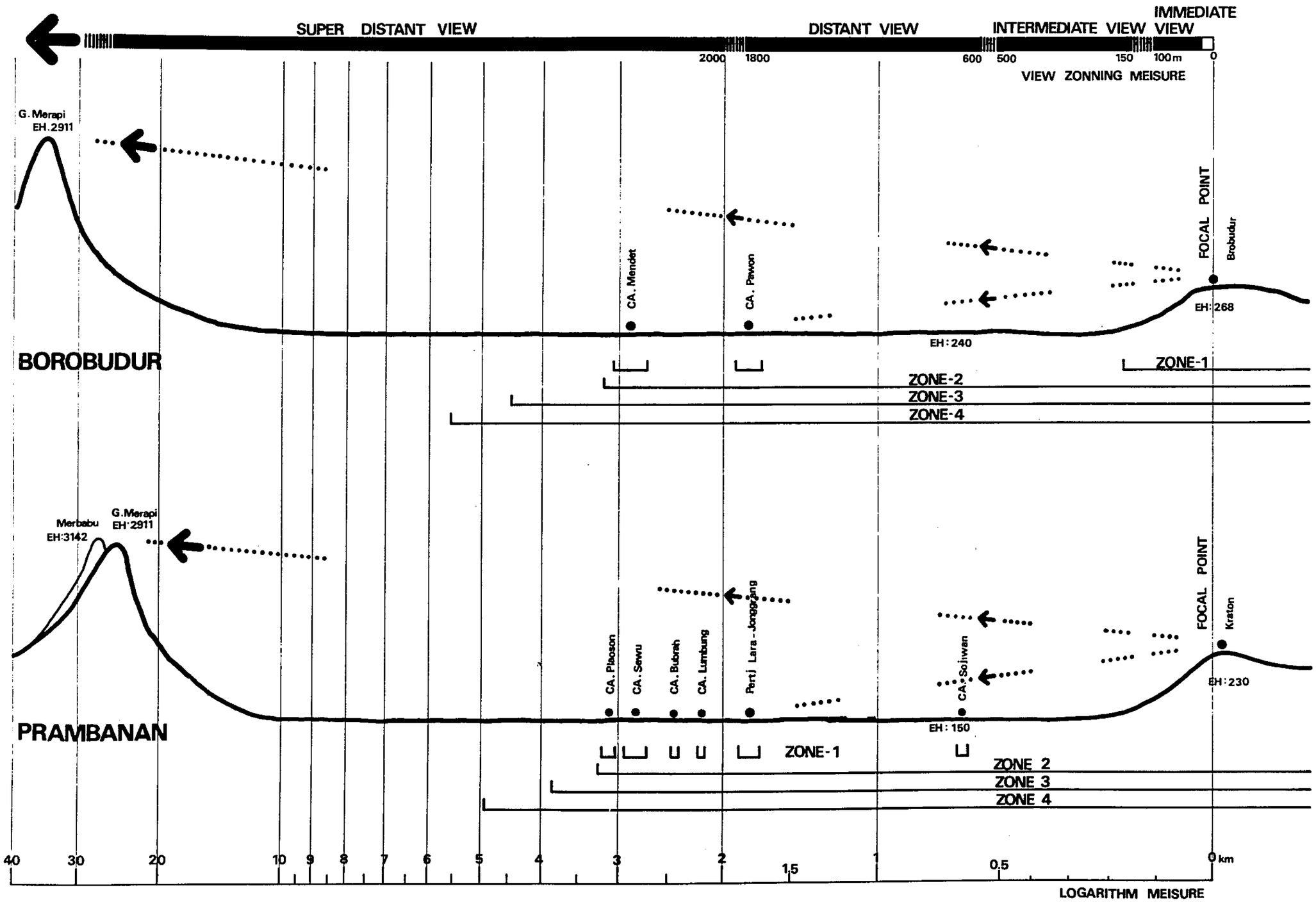
Fig. 20



Archeological Ecosphere Model

Simulation — 001 Sectional

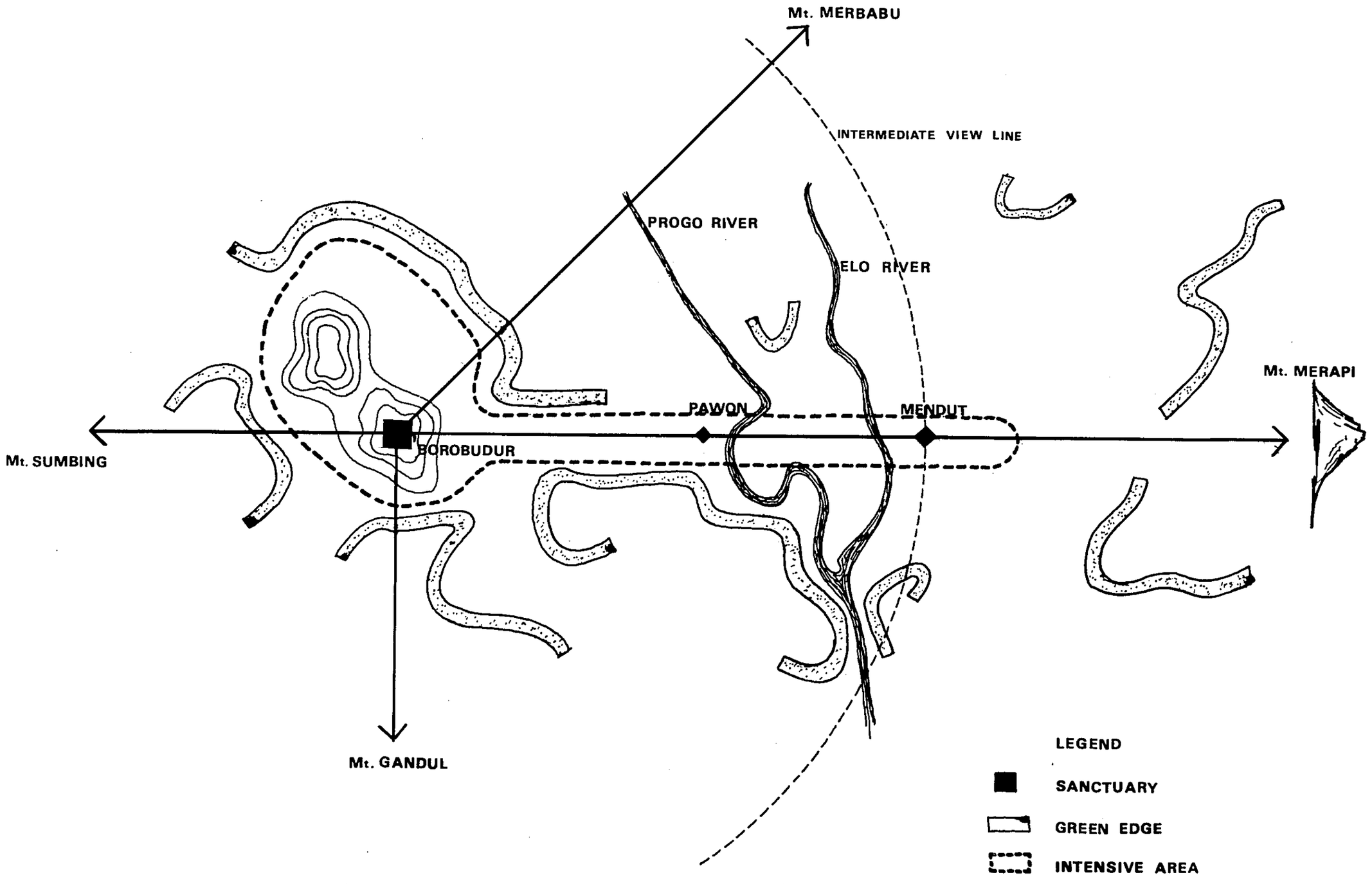
Fig.21



Structure Model : Borobudur

Simulation — 002b

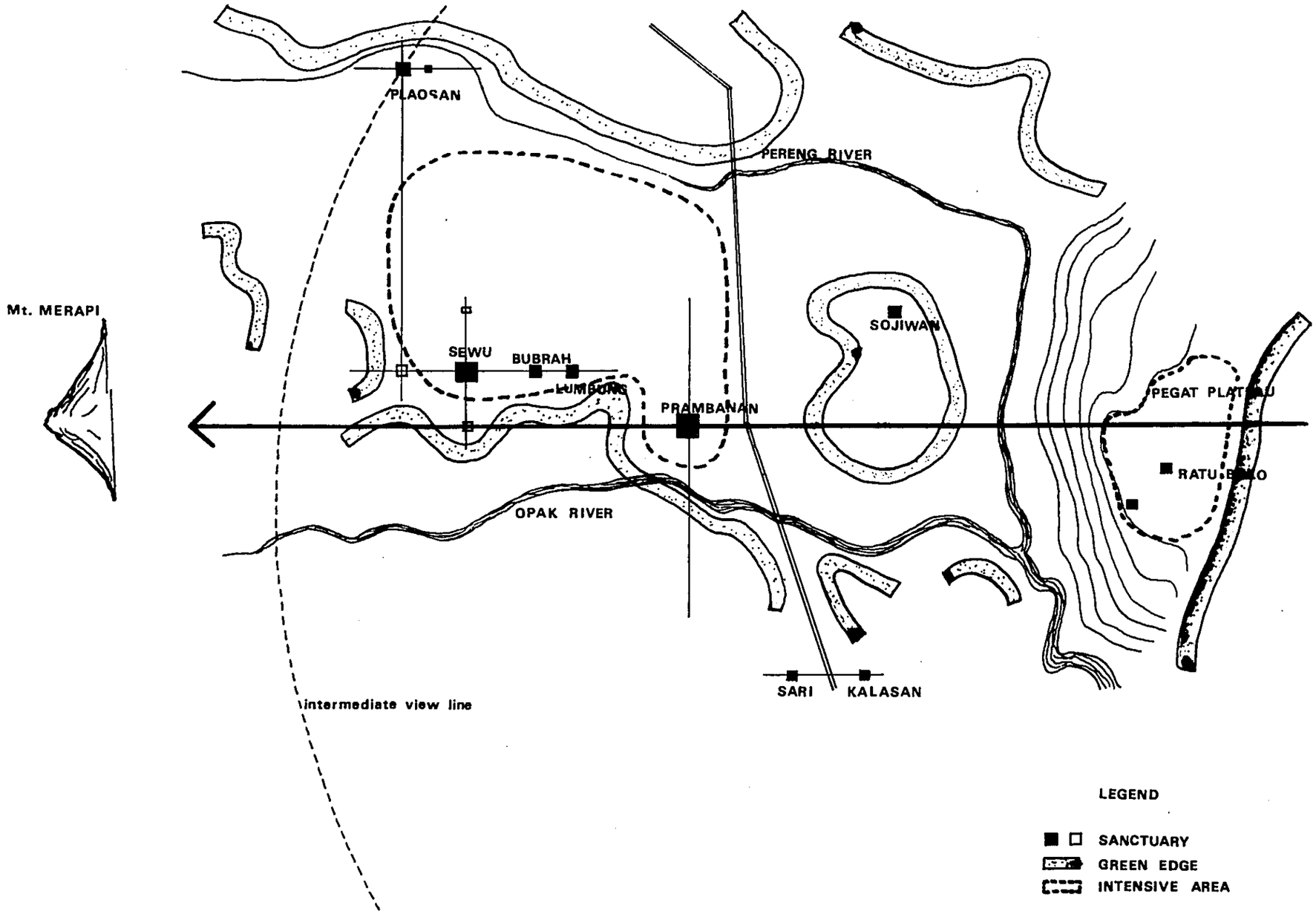
Fig 23



Structure Model : Prambanan

Simulation— 002p

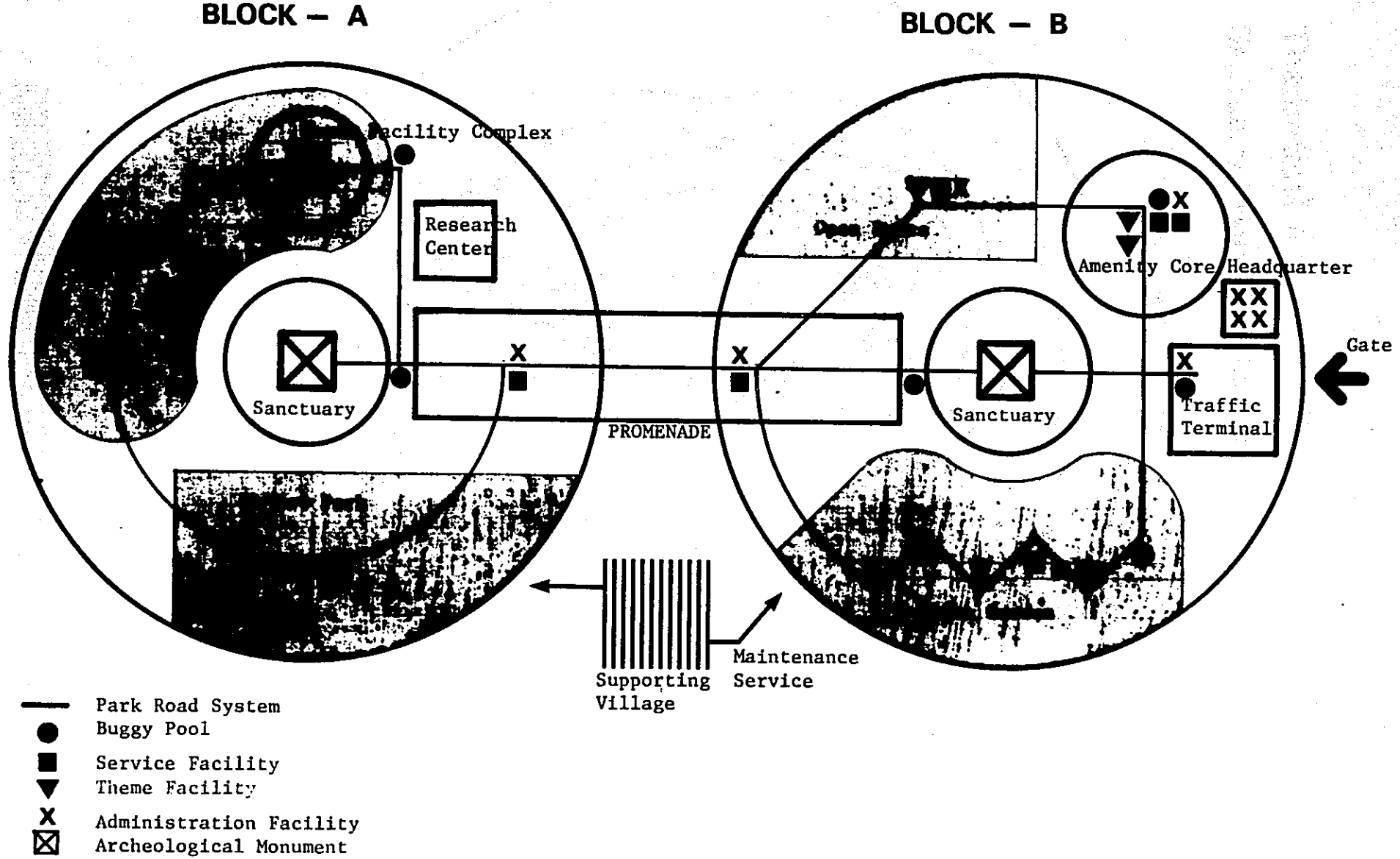
Fig22



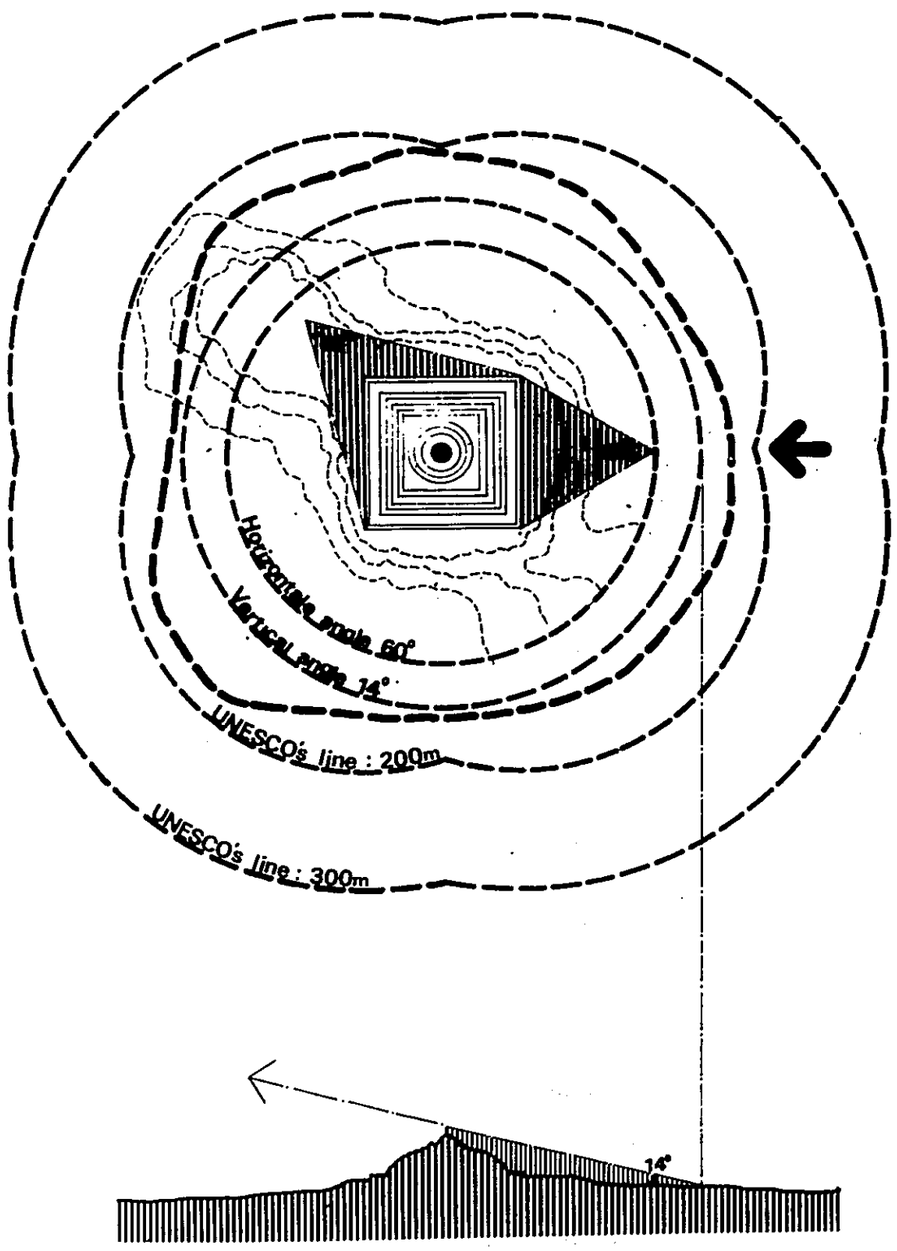
Space System Model

Fig.24

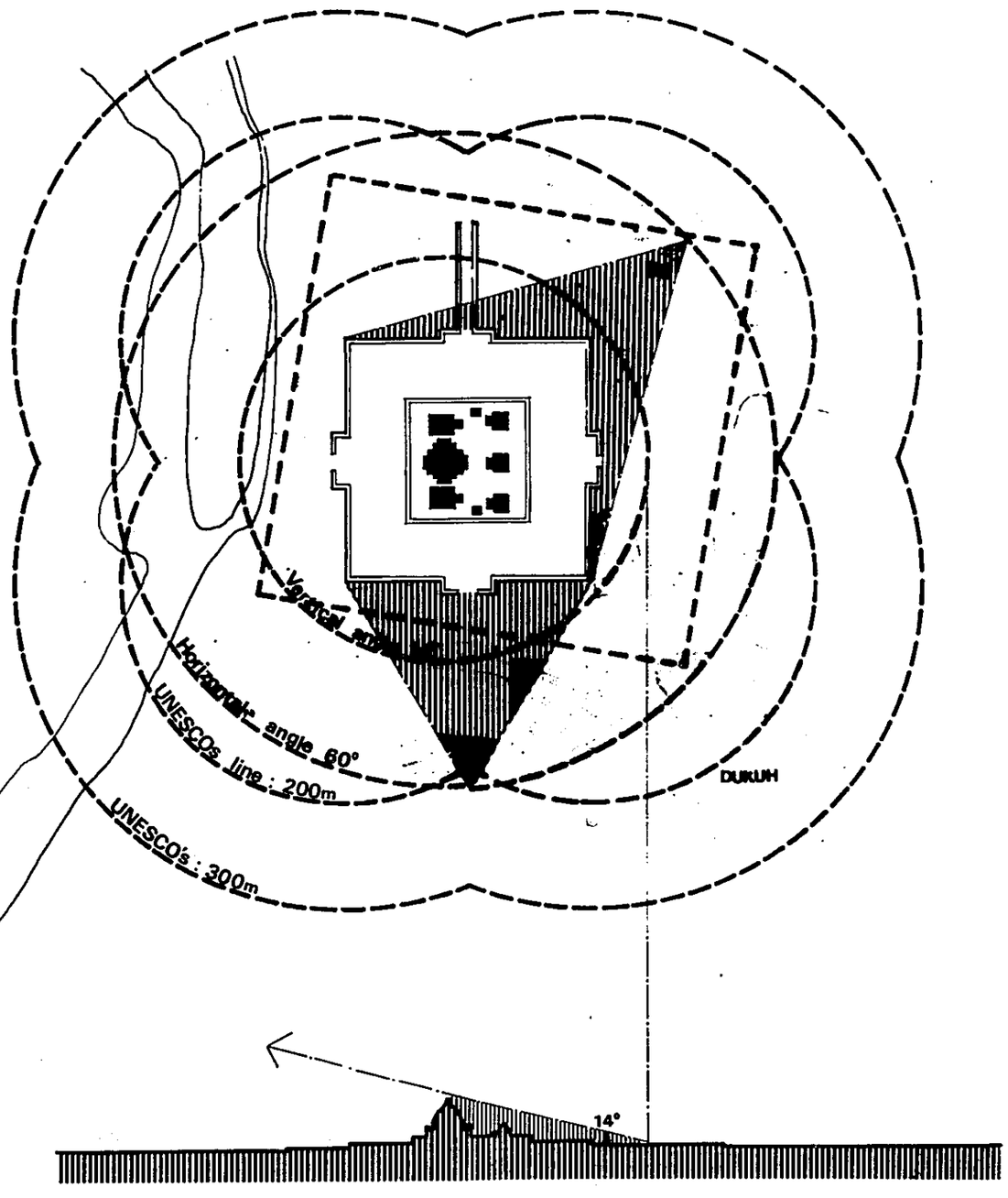
Simulation—003



Sanctuary Principles : Candi Borobudor



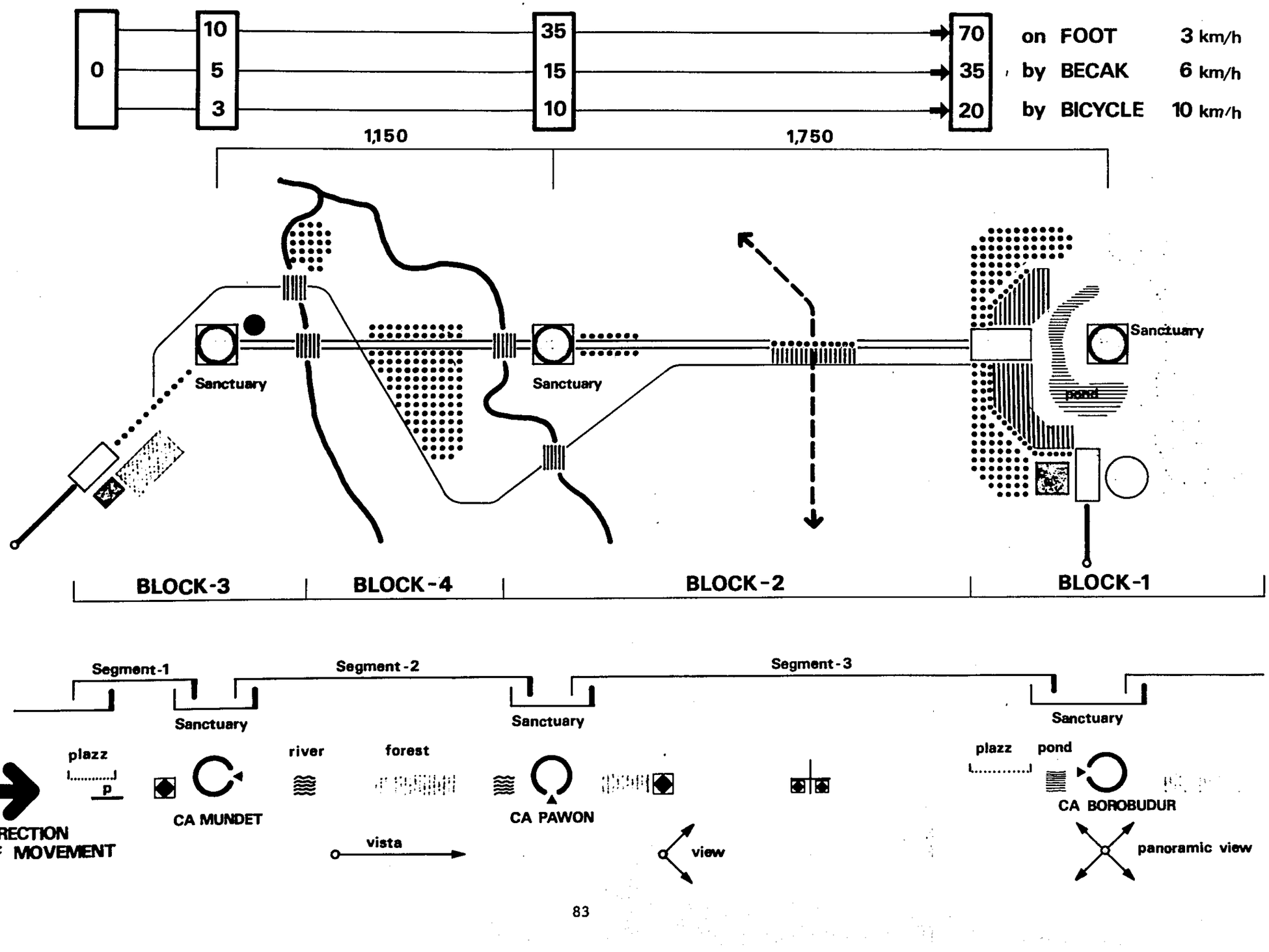
Sanctuary Principles : Candi Prambanan



Activity Network Model

Simulation — 005b

Fig. 26



Planned Functions (613)

1. Functions required by visitors

    a. Viewing and appreciation of the archeological remains--need for sanctuary area.

    b. Utilization of theme facilities (visiting, appreciation, research)--need for attractive resources

    c. Outdoor recreational activities--need for greenery

    d. Utilization of service facilities--need for service facilities

2. Functions required by management entity

    a. Overall control of visitors

    b. Maintenance and control of environment

    c. Control of transportation facilities, service facilities and other activities operated by private entities

    d. Planning of events, programming, and information services and public relations.

    e. Overall office work.

3. Archeological ruins research activities

    a. Scholarly research of archeological ruins (surveying and scientific research)

    b. Preservation of archeological ruins (repairs, restoration, control and maintenance)

    c. Educational and informational activities relating to the fruits of research (training of specialists and technicians, courses, symposiums)

    d. Activities in conjunction with domestic and international organizations (joint research, distribution of materials, mutual assistance)

4. Indonesian cultural research activities

    a. Collection, control and passing on of intangible cultural assets

b. Promulgation and educational activities as an extension of these activities

c. Public exhibitions, performances and contests relating to intangible cultural assets

d. Promotion of folk crafts and local industry

5. Community relations

a. Preferential employment of local people in park maintenance management.

b. Village reorganization and redevelopment and other active assistance to improvement of the living and production infrastructures

c. Requesting cooperation in the acquisition and renting of land for park use

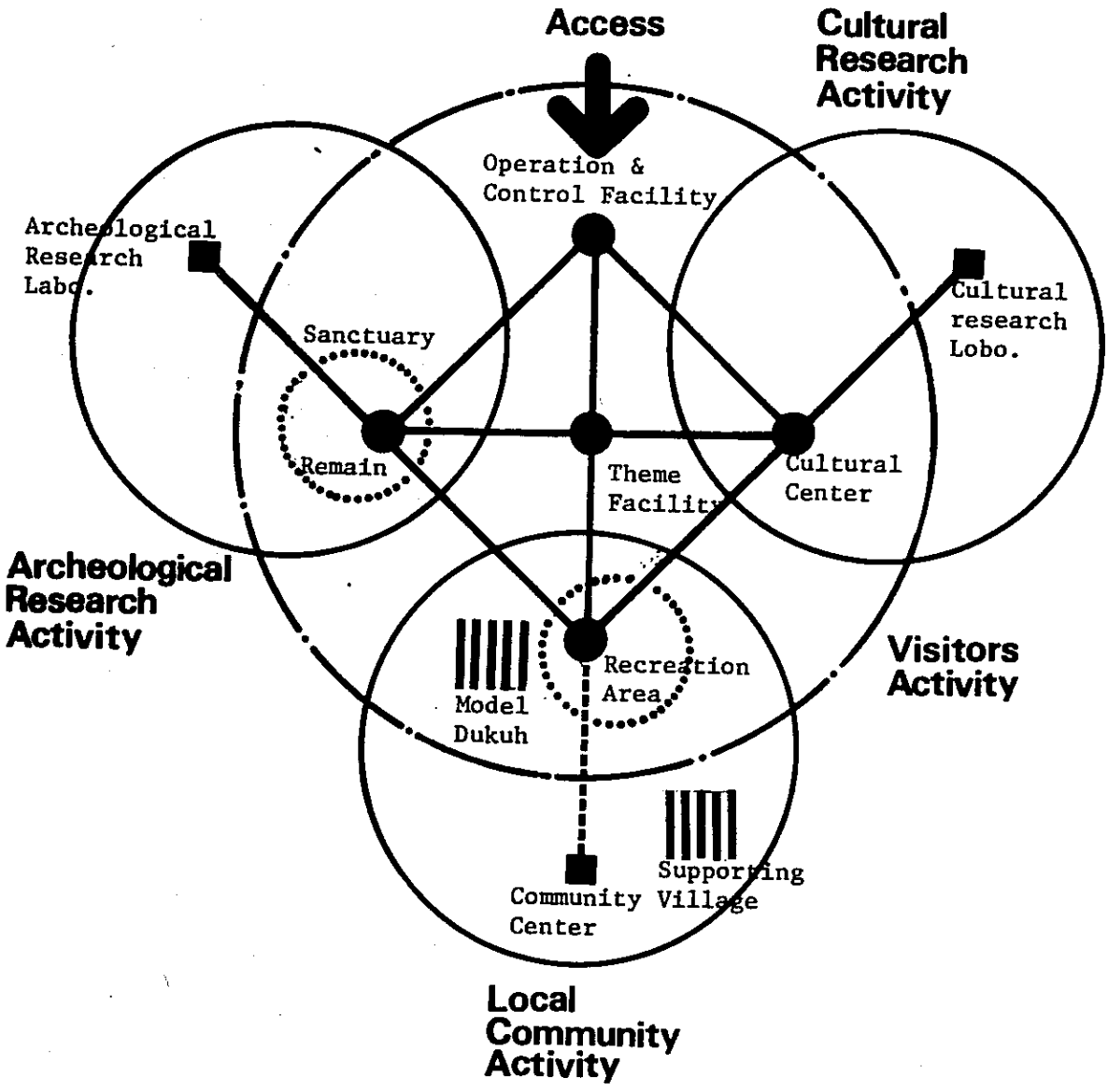
d. Agreements regarding hostel facilities and encouragement of tourism-related service industries

e. Introduction of private capital and utilization of petty private capital (seedling nurseries, etc.)

6. The following function network model for the archeological parks shows the correlation between these functions.

Function Network System

Fig. 27



7. Proposed program of performances

Borobudur Park

- Revival of regular annual religious events
- Holding of scholarly conferences, archeological conferences and seminars in a variety of fields
- System of school trips
- Designation of sister cities and exchange of visits
- Regular holding of sessions of international agencies (UNESCO, ICOMOS, ICOM, etc.)
- Training of persons in the area of history education
- Attraction of international archeological research organizations

Prambanan Park

- Regular holding of cultural festivals
- Permanent performances of Ramayana dancing
- Holding of cultural events on the level of the general public
- Revival of regular annual religious events
- Holding of art exhibitions
- Holding of various kinds of domestic and international cultural conferences
- Community cultural contests and craft exhibitions

SPACE COMPOSITION (62)

Borobudur Park (621)

1. General

This area consists of 4 blocks:

Block-1: An area of 100 ha., centering on Candi Borobudur, which forms the climax environment of this archeological park.

Block-2: An area of 17 ha. centering on Candi Pawon.

Block-3: An area of 32 ha. centering on Candi Mendut.

Block-4: A reserved area of 50 ha. enclosed by the Progo and Elo rivers which will be developed in accordance with future planning and demand.

There are three park roads connecting the blocks:

Promenade-1: A 1.75 km promenade between Borobudur and Pawon.

Promenade-2: A 1.15 km promenade between Pawon and Mendut.

Promenade-3: A 2.0 km existing promenade between Pawon and Mendut.

2. Borobudur Block

An area that represents the climax of the Borobudur Archeological Park.

It is made up of such elements as the Candi Borobudur hills (sanctuary), the Bukit Pagi hills (animal sanctuary), the crescent lake that embraces Candi Borobudur, the forest park around the archeological remains and Borobudur Gate (traffic terminal).

The facilities include an archeological museum, an international conference hall, a festival plaza and such amenity facilities as restaurants and cafeterias.

From the top of the Borobudur foundation one can see the axis from Pawon and Mendut to Mt. Merapi and well as get a grandiose view of the Kedu Basin surrounded by the mountains of Merbabu, Sumbing and Gandul.

The quiet forest and gently undulating lawns of the Bukit Pagi

hills will serve as the location of an outdoor gallery (Sculpture Forest) for display of archeological artifacts discovered in the surrounding areas and as a rest site for visitors with such animal hosts as deer, squirrels, birds and other small animals.

3. Pawon Block

Situated at the middle of a 3km-long promenade, it serves as a milepost for excursionists.

A quiet sanctuary surrounded by forest along the Progo River.

4. Mendut Block

Located at the main gate of the Borobudur Archeological Park.

Serves as the nucleus of the archeological park, with a Visitor Center, the Passar Pariwisata, operation and control facilities and other facilities being distributed around the periphery of the Mendut Sanctuary.

5. Reserved Block

This area, which is closed in by two rivers and the access road, will be designated as a reserve area for future site requirements. It will be utilized in significant planning for the future development of the archeological park. One possible use might be for a condominium complex (seminar houses, sports facilities and other community facilities centering on accommodation facilities) to be developed jointly by the 26 provinces of the Republic of Indonesia.

6. Borobudur Promenade

This will be a magnificent 3 km park road in the restoration of which historical facts will be taken into account.

After enjoying Mendut, visitors to Borobudur Park can make their way to Candi Borobudur by ox cart, andong, becak, bicycle, or on foot, being able to fully appreciate the atmosphere of the park as they pass Candi Pawon and other milestones along the way.

In order to maximize the sequence experience of visitors, the design will include active efforts to incorporate scenic elements along the way and scenery techniques for creating an approach to a sacred area.

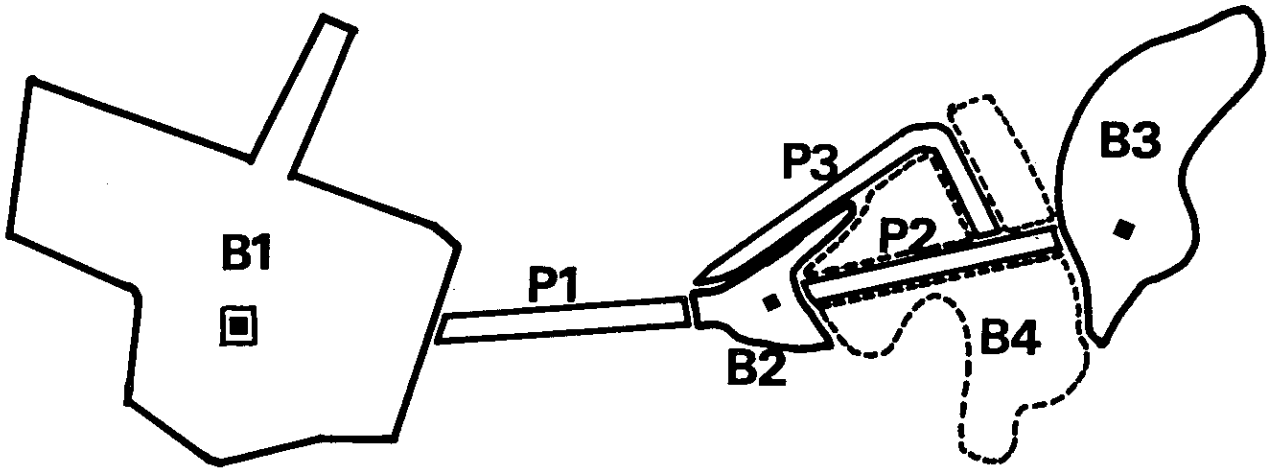
This area will be reserved for future use, one possibility being a cultural pavilion to be planned jointly by the 26 provinces of the republic as a center of national cultural activities.

7. Exclave Sanctuaries

Strict maintenance management on the basis of archeological special preservation area designation and provision of service facilities for visitors.

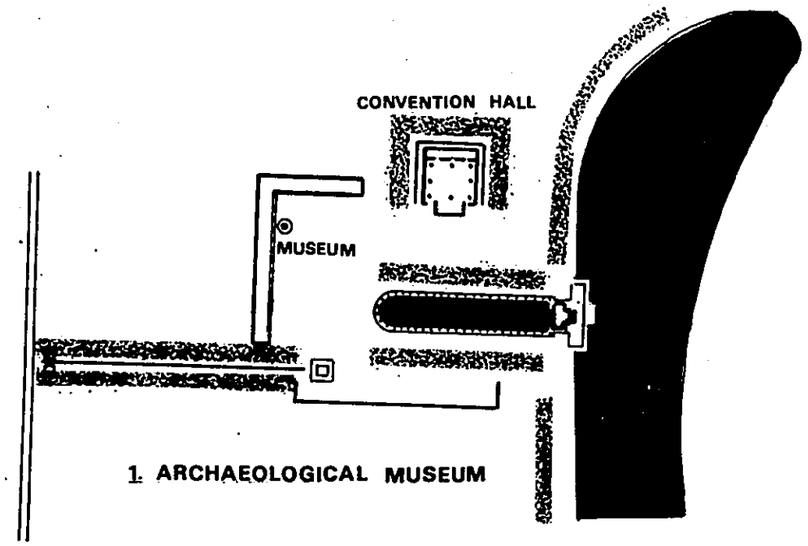
Block Division Diagram :
Borobudur Park

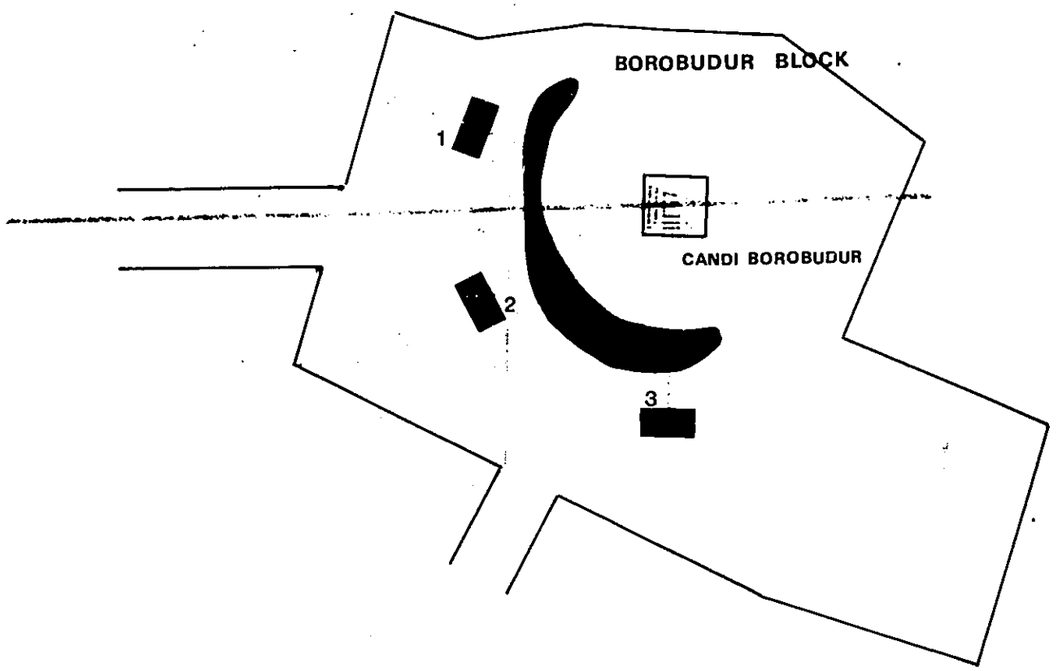
Fig. 28

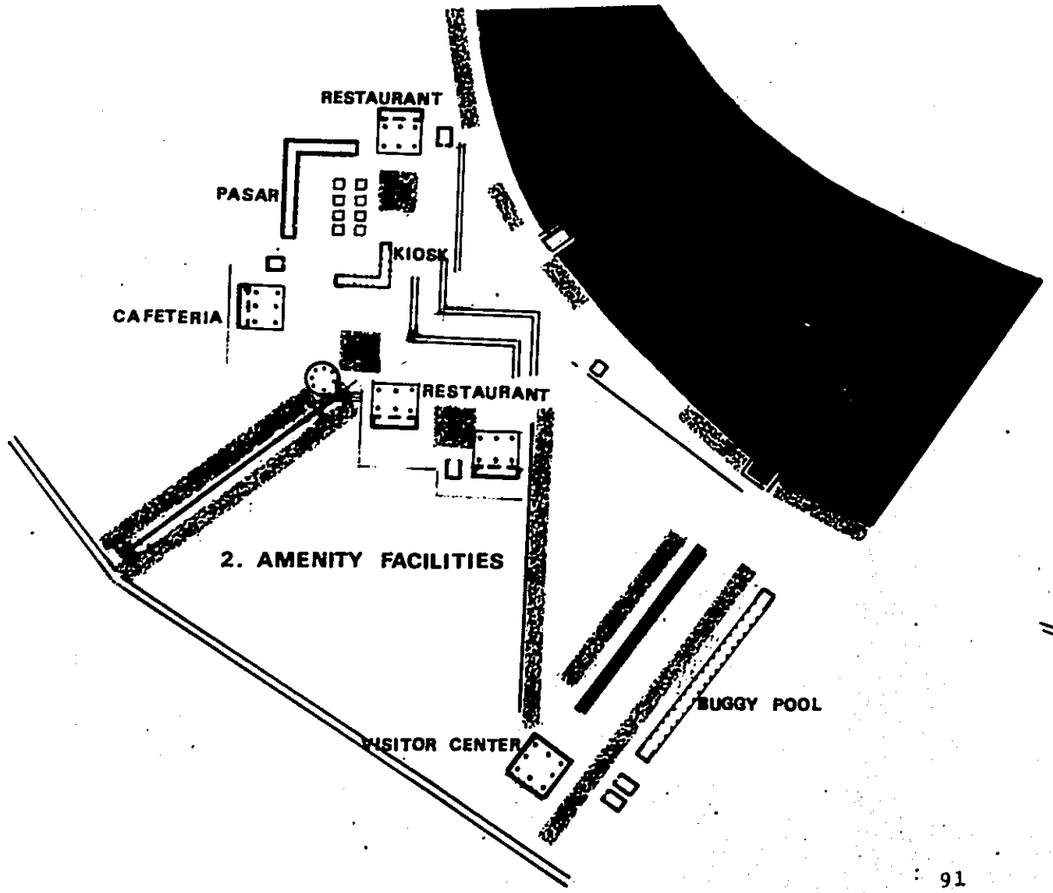


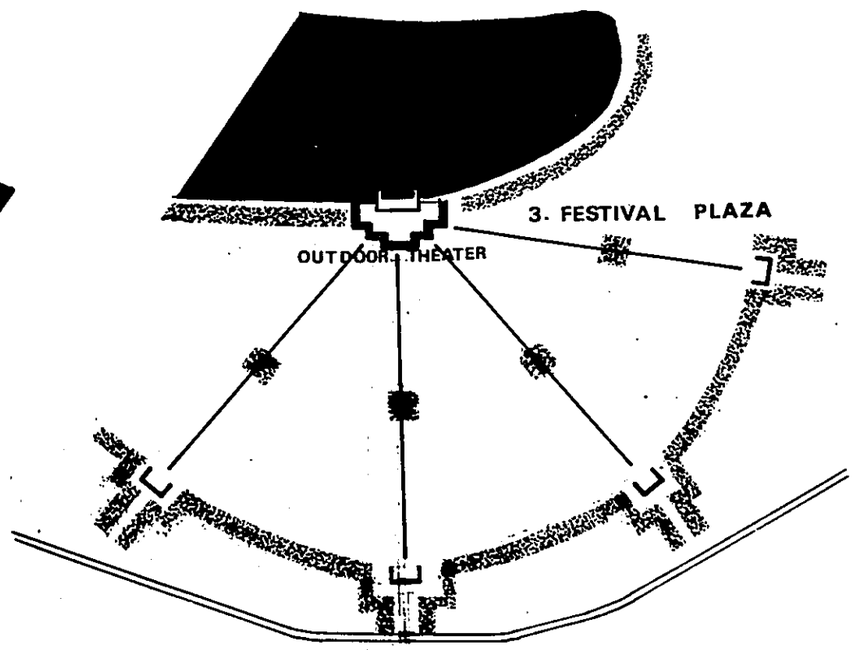
Architectural Concept: Borobudur Block

Fig.29









Prambanan Park (622)

1. General

This area consists of 4 blocks and several sanctuary area exclaves:

Block-1: An area of 30 ha.,centering on Ktaton on the Pegat Hills tableland.

Block-2: An area of 90 ha., centering on Lara Djonggrang, which forms the nucleus of this archeological park.

Block-3: An area of 50 ha. that includes Sewu, Bubrah and Lumbung.

Block-4: A reserved area of 90 ha., surrounded by Block-2, Block-3 and the Plaosan exclave, which will be developed in accordance with future plans and demand.

Sanctuary areas: The exclaves of Plaosan, Sojiwa, Sari and Kalasan.

The three following routes are park roads joining these blocks:

Promenade-1: A road running 1.2 km. in a north-south direction between Kraton and Lara Djonggrang.

Promenade-2: A road running 1.8 km. between Kraton and Lara Djonggrang along the Opak River.

Promenade-3: A road running 2.2 km. from Lara Djonggrant to Plaosan via many archeological remains of medium and small scale.

Promenade-4: A 500 m water promenade in the Prambanan block.

The strong axial nature of the 150m-wide promenade will be expressed by the tall trees that line it and the buffer greens, and here and there will be alcove space with rest space and service and other facilities. Moreover, waterways, flower beds, and so on will serve as guidelines leading people to the sacred area.

Here and there in the direct linear communication space linking the three temples of Borobudur, Pawon and Mendut will echo the dialogue and friendship of the people of Indonesia.

2. Kraton Block

From Kraton Ratu Boku at the northern extreme of the Pegat hills, one can see below a large number of archeological remains centering on Lara Djonggrang as well as enjoy a magnificent panorama of the Merapi Volcano.

Any visitor standing on this plateau can easily imagine what civilization here was like in the 10th century.

A terrace-shaped observation square, festival plaza and other facilities will located on this tableland on an extension of the Merapi-Lara Djonggrang axis, with nighttime illumination of the archeological remains and other illumination being attractive features.

In conjunction with the Ramayana theater below, warrior dances and ceremonies will take place here against a background of magnificent scenery.

A Pathway will be provided along the Pegat hills cliff.

3. Prambanan Block

Here is the heart of the Prambanan Archeological Park, where all of the facilities are concentrated.

On the north-south and east-west axial lines centering on Lara Djonggrang will be located facilities on different themes:

East core: Art Gallery
South core: Ramayana Theater
West core: Academy of Arts
North core: Cultural Museum

At the Main Gate there will be a concentration of such amenity facilities as a visitor center, restaurants, Passar Pariwisata, park operational facilities, and so on.

A water corridor will lead to Lara Djonggrang.

The spatial composition of this area, like the arrangement of the buildings of a Buddhist temple, consists of a straight-line grid of buildings, paths, plazas, trees, ponds, and so forth.

4. Composition of the Prambanan Sanctuary Area

Prambanan Temple used to have three boundaries:

That of the Inner Square (110m x 100m), which includes 16 temples centering on Lara Djongrang.
That of the Second Compound (222m x 222m), consisting of 224 Candi Perwara.
That of the Third Compound (390m x 390m), which provided rest and temporary accommodation space for monks and pilgrims.

If the Third Compound, which has gone entirely out of existence, is restored as a sanctuary, the former majestic air can be revived.

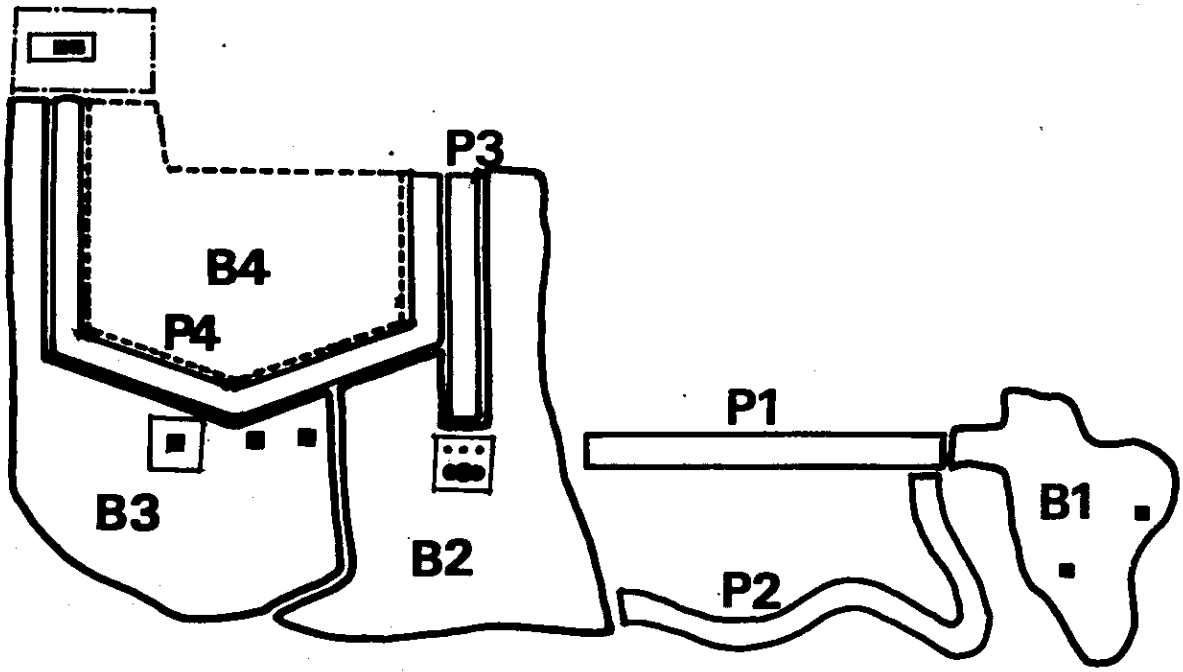
5. Sewu Block

In this area visitors can follow the promenade from Lumbung to Bubrah to Sewu, fully enjoying the archeological climate amidst countryside scenery.

6. Reserved Block

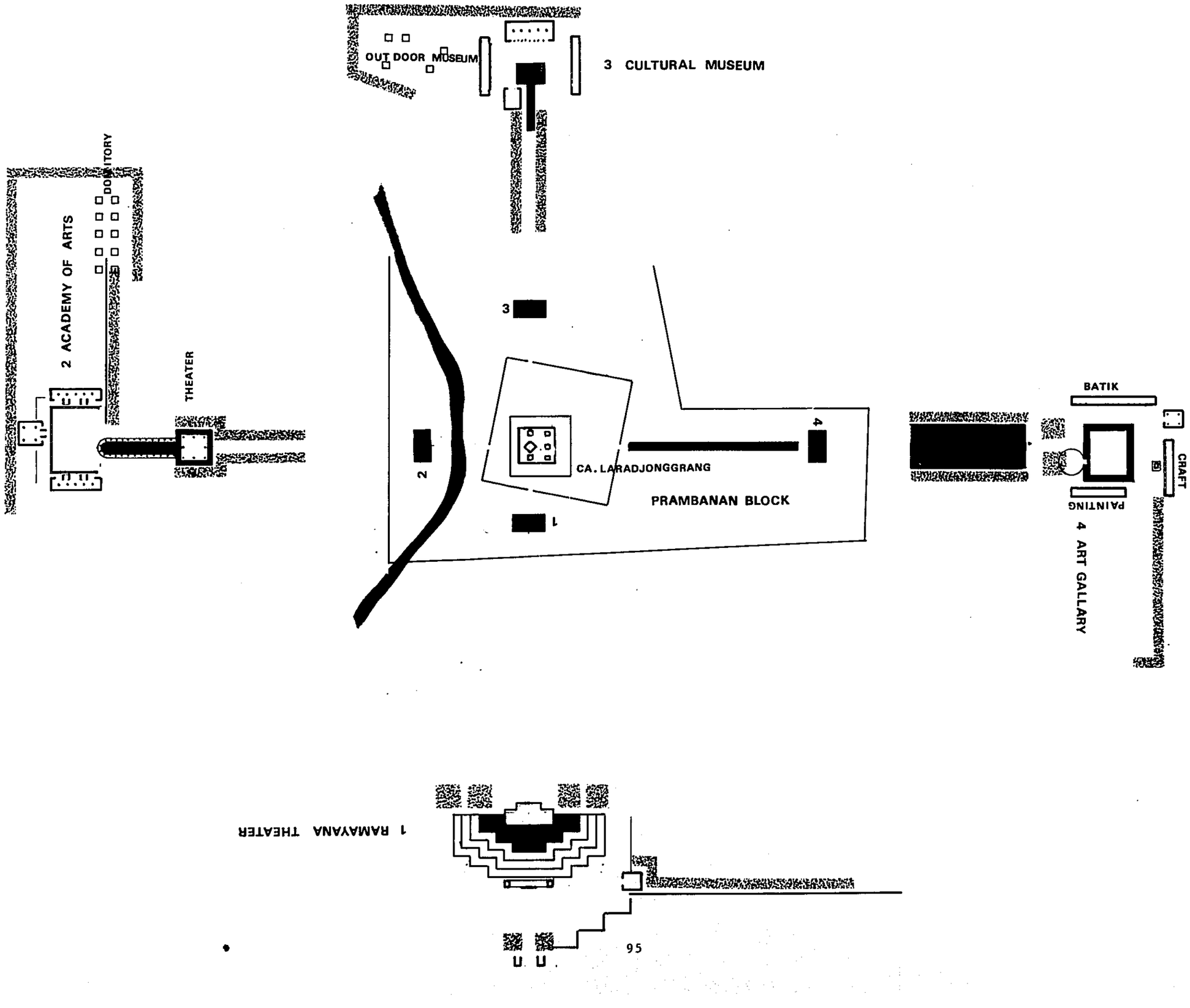
This is a lofty space surrounded by five archeological remains, a sacred area in which one can experience the cultural past while viewing Mt. Merapi and the Pegat hills in the distance and sensing the presence of the Lara Djonggrang tower.

Block Division Diagram: **Fig. 29**
Prambanan Park



Architectural Concept: Prambanan Block

Fig.30



PHYSICAL SOLUTIONS (63)

Planning Framework (631)

1. The master plan of the park area (Zone-2) consists of the following elements:

   (1) Special landuse plan -- plan of the special landuse divisions within the park

   (2) Trnasportation plan -- plan of the special transportation system within the park

   (3) Landscape plan -- plan of the landscaping and gardening within the park

   (4) Architecture plan -- plan of the location and construction of the park facilities

   (5) Utility plan -- plan of the facilities for supply of utilities and services within the park and in some surrounding villages

2. Project scale

   The following planning conditions were set in the preparation of the master plans for the park areas (Zone-2).

   (1) Development area and landuse breakdown thereof

   Development area (Park facilities area)

	Borobudur	Prambanan
Sanctuary area	20.5	34.5
Facility area	57.5	39.0
Open space & others	81.0	67.5
Promnade area	42.0	21.0
Reserved area	41.0	90.0
Total	242.0 ha	281.0 ha

(2) Planned number of visitors

	Borobudur	Prambanan
Number of visitors in 1980	4,000 persons/day	2,800 persons/day
Number of visitors in 1985	10,000 "	10,000 "
Number of hours a day park will be open	10 hours	10 hours + 4 hours
Average length of stay per visitor	4 hours	4 hours + 1.5 hours
Peak percentage of total daily number of visitors in the park at any given time	80%	65%

3. Description of visitors

(1) Breakdown of visitors by type

Type	Mode of tourism	Length of stay	Percentage of total
From throughout Indonesia	Route	Short	1
From Java	Route	Short	37
From Java	Weekend	Medium	19
From Central Java	Weekend	Medium	10
From Central Java	Day	Long	18
From abroad	Route	Short	15

(2) Activities for different lengths of stay

Length of Stay	Hours	Activities
Short	2 hrs.	(a) making the rounds of the main archeological ruins. (b) making the rounds of the theme facilities. (c) light meals or snacks and shopping.
Medium	4 hrs.	Besides (a), (b) and (c) above, resting in the open space.
Long	6 hrs.	Spending the whole day seeing and using all of the facilities.
Prambanan Night show	1.5 hrs.	some of day visitors, particularly those from afar, will also attend the night show.

4. Density criteria

Setting of desirable environmental values for the evelopment of the park area (Zone-2) and planning of density allocation, which will also serve as an operation and control standard.

The following are the five zone density classifications:

(1) High-density zones (200 persons/ha.)

Areas where an active effort will be made to raise the visitor density in order to have amenities provided there. Use as sites for service facilities, etc.

(2) Medium-density zones (50-100 persons/ha.)

Creation of a comparatively relaxed environment through combination of facilities and park land. Use as theme facility sites, sanctuary areas, etc.

(3) Low-density zones (under 20 persons/ha.)

Use as forest park and other open space.

(4) Other zones

Areas such as greenery areas along rivers, buffer greenery areas, etc. off-limits to visitors.

(5) Reserved areas

A gross density of no more than medium density (50-100 persons/ha.) for future development.

Special Landuse Plan (632)

1. Development will progress within the context of strict voluntary regulation and on the basis of landuse planning in accordance with the special use objectives of the park area (Zone-2). The following are the special landuse items:

   (1) Sanctuary areas (Archeological Preservation Special Areas -- Zone-1)

   (2) Facility areas: sites for theme facilities, service facilities, operation and control facilities and so on.

   (3) Open space: gardens, plazas, forest parks, etc.

   (4) Transportation facilities area: traffic terminal, park roads, etc.

   (5) Reserved area

   This area has been set aside to ensure the flexibility of the Master Plan. It is necessary for the following reasons.

   - New functions will be required of the national archeological parks in the future.

   - There may be new plans by the development entities or the national or local governments.

   - It will be necessary to cope with a greater number of visitors in the future.

   - It is necessary that the national archeological park have an appropriate size.

   The present village and agricultural activities in the reserved area will be allowed to continue until there is demand for development in the future.

   (6) River courses, buffer green, etc.

2. Physical solution measured for park operation system

   The following physical solution measures will be taken in connection with problems that arise from fluctuation of the number of visitors to the archeological parks, qualitative change with respect to them, and long-term development:

   a. Provision of environmental flexibility so that green and

other areas can serve as overflow areas if the need arises in the course of fluctuation of the number of visitors during the year.

b. Prevention, by an information control system, of overcrowding of visitors at the archeological ruins, theme facilities, service facilities and other places where they can be expected to do so.

c. Raising of the rate of operation and capacity of service facilities by erecting temporary extensions on peak days and during peak hours.

d. One-way traffic and other traffic regulation on approach route when visitors are arriving in large numbers.

e. Coping with quantitative and qualitative visitor fluctuation with multi-use space created by temporary erection of environmental devices on facility green areas.

f. Provision of a facility extension system with a long-term construction program.

g. Setting aside of a reserved area to meet future needs.

Special Landuse Area List

Borobudur Park

Items	Block-1	Block-2	Block-3	Block-4	Others
Sanctuary area	8.40	1.00	1.00	-	-
Facility area	22.70	0.64	4.66		-
Open space & Others	68.89	15.36	26.34	50.00	42.00
Total	100.00ha	17.00ha	32.00ha	50.00ha	42.00ha

Grand Total 241.00ha

Pranbanan Park

Items	Block-1	Block-2	Block-3	Block-4	Others
Sanctuary area	1.00	7.10	4.50	-	-
Facility area	1.88	16.03	2.13		
Open space & Others	27.12	66.87	43.37	90.00	210.000
Total	30.00ha	90.00ha	50.00ha	90.00ha	210.000ha

Grand Total 281.00ha

Sanctuary Area List

Sanctuary	Width	Depth	Height	Sanctuary Area	Regional Origin	Construc-tion	Remarks
(Borobudur Park)							(Original) (Height)
1. Candi Borobudur	120M	120M	32M	8.4ha	Buddhist	9th	42 M
2. Candi Pawon	7	9	15	1.0	Buddhist	9th	
3. Candi Mendut	24	28	20	1.0	Buddhist	9th	27
(Prambanan Park)							
1. Candi Praosan Northern Ruin	49	39	21	6.0	Buddhist	9th	2 Ruins
Southern Ruin	70	90		4.7	Buddhist	9th	
2. Candi Sewu	63	63	15	2.3			
3. Candi Bubrah	38		15	1.0			
4. Candi Lumbung	45		15	1.2			
5. Prambanan (Lara Djonggrang)	110	110	47	7.1	Shivaite Hindu	9th	
6. Candi Sojiwan	40			1.0			
7. Kraton Ratu Boko	20		5	1.0	Buddhist	9th	
8. Candi Sari	17	10	15	1.0	Buddhist	late 8th	
9. Candi Kalasan	14	14	15	1.0	Buddhist	late 8th	

Approximatery

Transportation Plan (633)

1. Park road system

There will be four road classification within the park area:

(1) Entrance road: connecting the access road and the traffic terminal.

(2) Promenades: main roads joining the different blocks in the park.

(3) Parkways (vehicle and pedestrian): the main roads within the individual blocks, also serving as service roads.

(4) Walkpaths (pedestrians only)

Road design criteria

	R.O.W.(m)	A.D.T. Buggy	Pedestrian
Borobudur Promenade	150	2,000	10,000
Plambanan Promenade	90	2,000	8,000
Parkway	9.5	500	2,000
Walkpath: main	4	-	1,000
Walkpath: minor	2	-	200

2. Traffic terminal

In principle, visitors will not be allowed to come into the park area in motor vehicles. From the traffic terminal at the entrance to the park they are to change to secondary means of transportation or walk.

In the case of the Borobudur Park, there will be traffic terminals at the Main Gate and at the Borobudur Gate, and in the case of the Prambanan Park, there will be a traffic terminal at the Main Gate and another supplementary one at the Kraton Gate.

Borobudur: Parking space capacity

Name	Location	Area (M^2)	Bus	Car	Buggy
Main gate	Block-3	10,400	50	90	170
Borobudur Gate	Block-1	4,800	30	44	95
Total		15,200	80	134	265

Prambanan: Parking space capacity

Name	Location	Area (M^2)	Bus	Car	Buggy
Main Gate	Block-2	10,700	65	110	179
Kraton Gate	Block-1	1,200	5	8	50
Total		11,900	70	118	229

3. Buggy pools

Buggy pools will be located no farther than 200m from each of the major facilities for the convenience of visitors.

Buggy pools allocation

	Borobudur	Prambanan
Block-1	95	50
Block-2	95	179
Block-3	170	88
Total	370	317

4. Design basis

(1) Means of transportation to be used by visitors to the parks and the numerical and percentage breakdowns

Tourist buses	100 (40 passengers each)	40%
Route buses	100 (40 passengers each)	40%
Passenger cars	170 (3 passengers each)	5%
Other means	-	15%

(2) Parking space demand

Peak percentage of total daily number of vehicles that will be parked at any given time

Borobudur	80%
Prambanan	65%

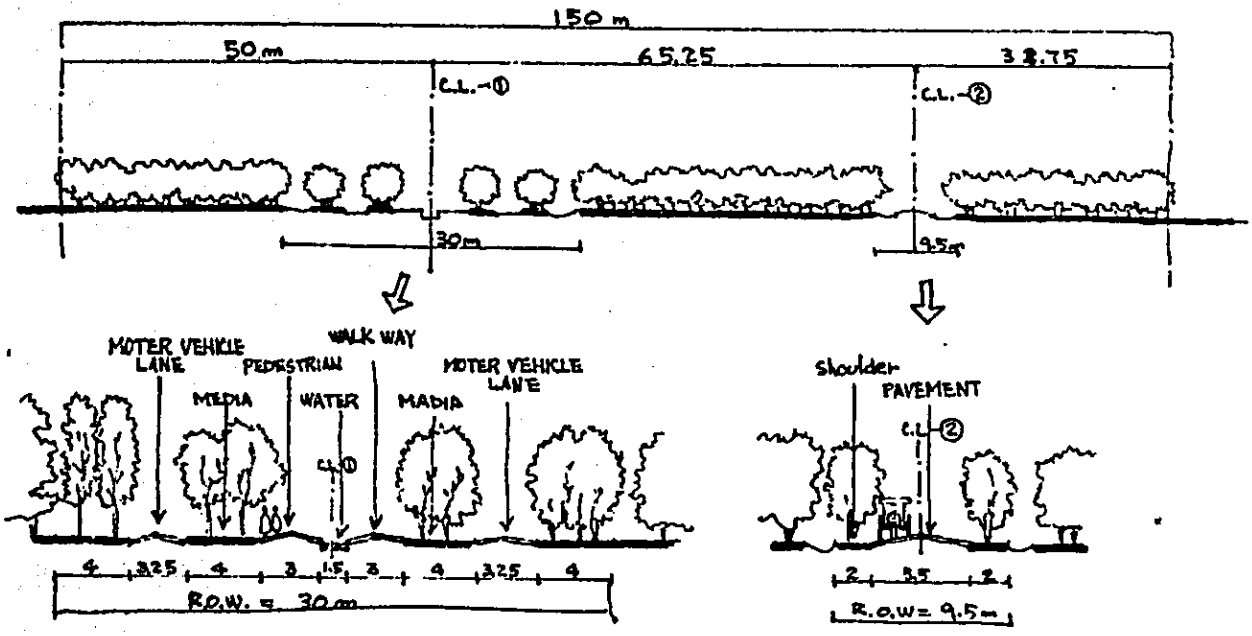
Amount of parking space taken up by each vehicle

Buses	100 sq.m.
Passenger cars	30 sq.m.
Buggies	8 sq.m.

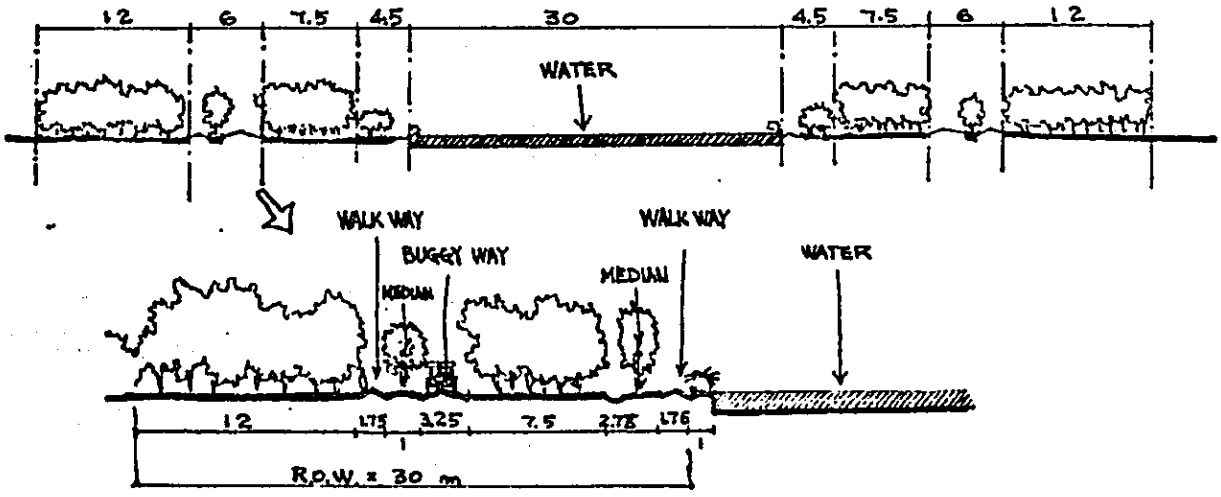
Typical Section of Park Road

Fig. 30

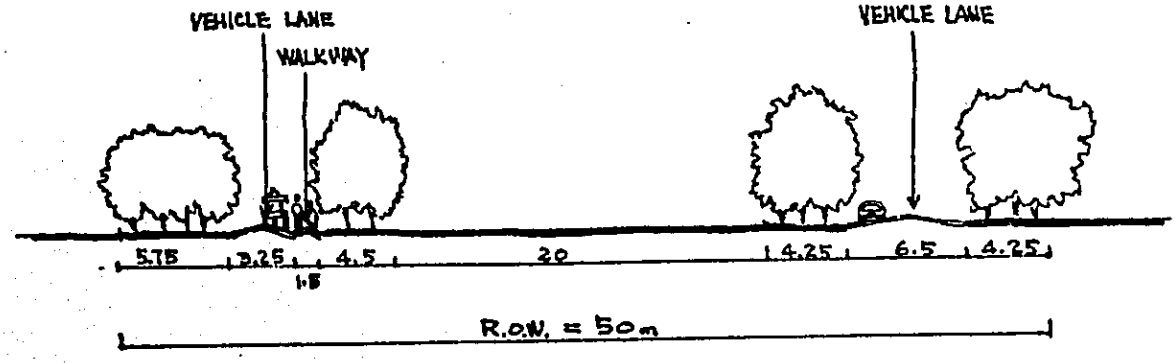
Borobudur:
Promenade



Prambanan:
Promenade I



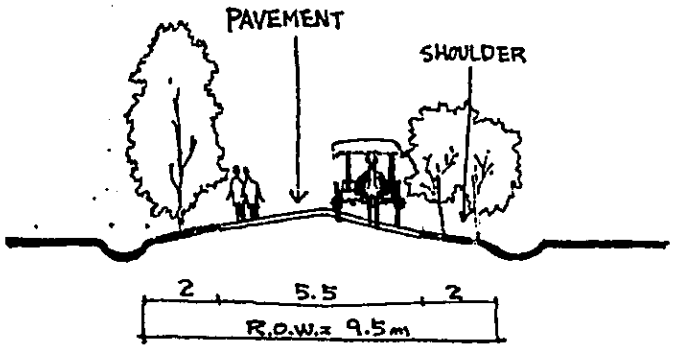
Promenade II



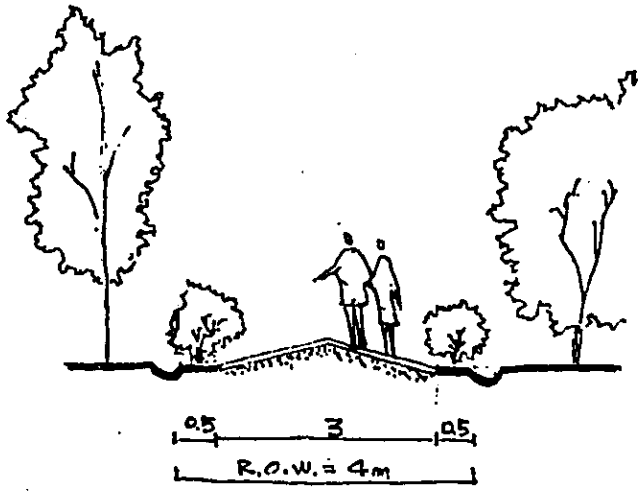
Typical Section of Parkway & Walkpath

Fig. 31

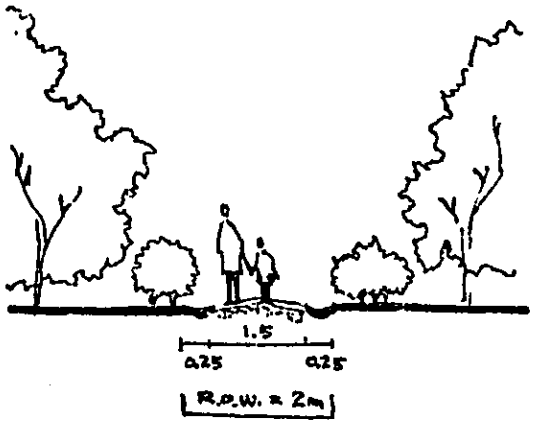
Parkway



Walkpath (1)



Walkpath (2)



Landscape Plan (634)

1. Landscape zones

The park area can be divided into the following zones from the standpoint of landscape planning:

(1) Sanctuary Landscape Zones

Areas where the landscape design will attempt to create the atmosphere of a sanctuary.

(2) Entrance landscape zones

Areas where sophisticated landscaping techniques will be employed to impart to visitors a sense of arrival at a new and different spatial environment.

(3) Promenade landscape zones

Areas where sequential design techniques will be employed in designing the promenades linking the archeological remains rectilinearly.

(4) Forest Landscape Zones

Areas from which dukuhs have been resettled which will be used as forest parks with park facilities.

(5) Buffer green zones

2. Design policy

- Introduction of the water element
- Tropical gardening
- Recovery of greenery with a commemorative tree planting system
- Nightitme illumination of the archeological remains
- Active utilization of panorama views from focal points
- Giving the park area identity by emphasizing visual axialness
- Creation of an excursion route through sequence design
- Creation of spatial integration through sign and symbol distribution

3. Landscape works

(1) Nurseries

Nurseries will be operated within the park areas and in the surrounding villages in order to supply trees and flowers for the park.

(2) Maintenance

The skills of the people in the surrounding villages will be put to good use in park maintenance and management.

(3) Earthwork

Conversion of paddies and fields to park landscape.

(4) Planting

Active program to increase the amount of greenery, including commemorative plantings by visitors to the parks.

(5) Gardening work

- Outdoor lighting and furniture

- Pavement and grading

- Symbols and signs

Architecture Plan (635)

1. Outline of facilities

The facilities of the park area (Zone-2) can be divided into the following three categories:

(1) Theme facilities

(2) Service facilities

(3) Operation and control facilities

2. Theme facilities

These are main facilities reflecting the development features of each area. The kraton (palace) architectural style, with large courtyards, makes for an atmosphere of grandeur.

The following is a rundown on the individual theme facilities of the Borobudur park.

- Archeological Museum

  It consists of a conventional museum the purpose of which is to explain the various archeological remains centering on the Candi Borobudur and to exhibit historical and cultural materials relating to them; a research center the purpose of which is scholarly research on the archeological remains and theri restoration and preservation; and an "Archeological Forest", or outdoor archeological museum.

- Convention Hall

  This facility will be used not only for international conferences on archeology and, more particularly, on the theme of restoration and preservation of archeological remains, but also for conferences of a wide variety of scholarly fields and organizations.

- Festival Plaza

  This plaza is for religious ceremonies and festivals but will also provide, with its outdoor theater and spacious lawns, a place where people can relax and enjoy outdoor performances of music and dancing.

Next, a rundown on the individual theme facilities of the Prambanan park.

- Ramayana Theater

  The Ramayana dancing that is presently being performed in the theater in front of Candi Lara Djonggrang is one of the most unique traditional ceremonies of the Java area. Our plans call for relocating and expanding this theater to a capacity of 3,000 - 5,000 persons.

- Cultural Museum

  This will consist of a museum for display of material regarding the Prambanan archeological remains and other historical materials and things connected with Indonesian culture as well as a research center with the same functions as those of the research center of teh Borobudur Archeological Museum.

- Art Gallery

  In this facility will be displayed batik, paintings, sculpture and other Indonesian art and industrial art forms, the purpose being the continuation and enhancement of Indonesian artistic traditions.

- Academy of Arts

  This is a collage facility, complete with dormitories, for the training of personnel in artistic fields, and particularly in performing art fields. Its indoor theater will be open to visitors.

- Ramayana Terrace

  This facility, which forms a pair with the Ramayana Theater, is an observation terrace on the hill where the Kraton Ratu Boku is located. Nighttime festivals and cermonies will be performed here in the light of bonfires.

3. Service facilities

These facilities are for the support of visitor activities. Included in this category are restaurants, cafeterias, kiosks, passars (Souvenir and gift shops), and so on. Most of them will be located in a concentrated fashion, and they will consist of small architectural units to facilitate the extension that rapid change in the number of visitors will necessitate.

- Restaurants

  These restaurants will be for relatively high-class visitors and will therefore provide omcplete service.

- Cafeterias

  These will be self-service type restaurants offering not only the foods of various regions of Indonesia but also the cuisine of different Southeast Asian countries.

4. Operation and control facilities

Included in this category will be the visitor centers, the park offices, workshops, and so on.

- Visitor Center

  This facility will function as the operation and control center of the park and will provide information and other services for visitors. Included in it will be meeting rooms, a medical clinic, a security personnel office, and so on.

5. Scale of facilities

The calculation of the scale of each of the facilities has been based on the following three assumptions:

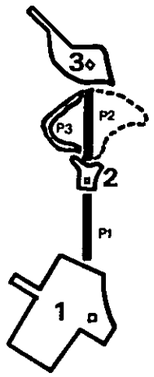
Average daily number of visitors -- 10,000

Average length of stay per visitor -- 4 hours

Number of visitors during peak hour -- 7,000

This scale of the theme facilities has been calculated on the basis of the additional assumptions of use by 15-20% of the total number of visitors and a length of stay of 30 min. That of the service facilities has been calculated on the basis of the additional assumptions of the percentage of total number of visitors that will use each facility (15% in the case of the restaurants, 35% in the case of the cafeterias, 50% in the case of the kiosks) and the turnover speed of each facility (3 turnovers/4hr. in the case of the restaurants, 5 turnovers/4hr. in the case of the cafeterias, and 10 turnovers/4hr. in the case of the kiosks).

BOROBUDUR PARK FACILITY LIST



CATEGORY	FACILITY	1. BOROBUDUR BLOCK BUILDING AREA M²	SITE AREA M²	CAPACITY AND NUMBER		FEATURE	2. PAWON BLOCK BUILDING AREA M²	SITE AREA M²	CAPACITY AND NUMBER		FEATURE	3. MENDUT BLOCK BUILDING AREA M²	SITE AREA M²	CAPACITY AND NUMBER		FEATURE	TOTAL BUILDING AREA M²	TOTAL SITE AREA M²
THEME FACILITY	ARCHEOLOGICAL MUSEUM	1,600	10,700	V-182 S-26	1	□ I											1,600	10,700
	RESEARCH CENTER	400	2,700	40	1	△ * I											400	2,700
	OUTDOOR MUSEUM		5,000		1	II												5,000
	CONVENTION HALL	2,000	14,000	V-500 S-6	1	□ * II											2,000	14,000
	FESTIVAL PLAZA		65,000		1	I												
	OUTDOOR THEATER		4,000		1	I												
SERVICE FACILITY	RESTAURANT	1,525	10,150	273	3	□ I II						508	3,400	91	2	□ I II	2,033	13,550
	CAFETERIA	534	3,560	127	5	○ I II						1,600	10,700	381	10	○ I II	2,134	14,260
	KIOSK	623	4,150			○ I II	208	1,400			○ I II	778	5,200			○ I II	1,609	10,750
	PASAR	150	1,000			△ I						750	5,000			△ I	900	6,000
	SUMMER HOUSE	400	2,700		16	○ I II	100	670			○ I II	200	1,400			○ I II	700	4,770
	PUBLIC TOILET	105	700	35	7	△ I II	36	240	12	2	△ I II	70	470	23	4	△ I II	211	1,410
OPERATION AND CONTROL FACILITY	VISITOR CENTER	350	2,300	S-15	1	□ * I						588	3,920	S-20	1		938	6,220
	GATE HOUSE	20	134	S-4	2	○ I						30	200	S-6	2	○ I	50	334
	EMPLOYERS HOUSE	1,050	7,000	15	1	△ I II											1,050	7,000
	WORK SHOP	1,600	10,700		1	○ I II											1,600	10,700
ENVIRON-MENTAL FACILITY AND OTHERS	CAR PARKING		3,660	C-40 BS-30	1	I							7,800	C-100 BS-60	1	I		11,460
	BUGGY POOL - 1		1,140	BG-95	1	I II		100	BG-10	1	I II		2,040	BG-170	1	I II		3,280
	BUGGY POOL - 2		300	BG-25	1	I II							516	BG-43	1	I II		816
	POND		78,250					4,000					6,000					88,250
	GREEN AND OTHERS		688.856					153.590					263,354					1,105,800
TOTAL		10,357	916,000				344	160,000 M²				4,524	310,000 M²				15,225	1,386,000

PROMNADE P1 - 262,500 (L-1750 MXW - 150M)
P2 - 57,500 (L-1150 MXW - 50M)
P3 - 100,000 (L-2000 MXW - 50M)

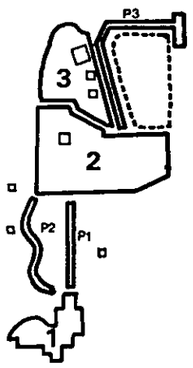
TOTAL 420,000 M²

GRAND TOTAL 1,806,000 M²

LEGEND

- V. VISITOR NUMBER
- S. STAFF NUMBER
- C. CAR NUMBER
- BS. BUS NUMBER
- BG. BUGGY NUMBER
- □ REIGN FORCED CONCRETE STRUCTURE
- △ CONCRETE BRICK STRUCTURE
- ○ WOODEN STRUCTURE
- * AIR CONDITIONING
- I or II PHASING

PRAMBANAN PARK FACILITY LIST



CATEGORY	FACILITY	1. KRATON BLOCK BUILDING AREA M²	SITE AREA M²	CAPACITY AND NUMBER		FEATURE	2. PRAMBANAN BLOCK BUILDING AREA M²	SITE AREA M²	CAPACITY AND NUMBER		FEATURE	3. SEWU BLOCK BUILDING AREA M²	SITE AREA M²	CAPACITY AND NUMBER		FEATURE	TOTAL BUILDING AREA M²	TOTAL SITE AREA M²
THEME FACILITY	KRATON TERRACE		10,000		1	II												10,000
	ART GALLARY						2,000	13,400	V-200 S-30	1	□ I						2,000	13,400
	ARCHEOLOGICAL MUSEUM						1,500	10,000	V-175 S-26	1	□ I						1,500	10,000
	RESEARCH CENTER						400	2,700	40	1	△ ✻ I II						400	2,700
	RAMAYANA THEATER							10,000	5,000	1	□ II							10,000
	ACADEMY of ARTS						1,850	12,500	200	1	○ II						1,850	12,500
	DOMITORY						600	4,000	60	1	□ II						600	4,000
SERVICE FACILITY	RESTAURANT						1,960	13,050	350	4	□ I II						1,960	13,050
	CAFETERIA	412	2,750	100	2	○ I II	1,440	9,600	350	12	○ I II	206	1,380	49	2	○ I II	2,058	13,730
	KIOSK	59	400			○ I II	1,167	7,780			○ I II	468	3,120			○ I II	1,694	11,300
	PASAR						1,500	10,000			△ I						1,500	10,000
	SUMMER HOUSE	250	1,750		10	○ I II	400	2,700		16	○ I II	400	2,700		16	○ I II	1,050	7,150
	PUBLIC TOILET	30	200	10	2	△ I II	120	800	40	8	△ I II	250	1,700		10	△ I II	400	2,700
OPERATION AND CONTROL FACILITY	VISITOR CENTER						700	4,700	S-20	1	□ ✻ I						700	4,700
	GATE HOUSE						60	400	S-6	2	○ I						60	400
	EMPLOYERS HOUSE						1,050	7,000	15	1	△ I II						1,050	7,000
	WORK SHOP						900	6,000		1	○ I II						900	6,000
ENVIRON-MENTAL FACILITY AND OTHERS	CAR PARKING		640	C-B BS-5	1	I		8,500	C-110 BS-65	1	I							9,140
	BUGGY POOL - 1		588	BG-49	1	I		2,148	BG-179	1	I		360	30	1	I		3,096
	BUGGY POOL - 2							540	BG-45	1	I							540
	POND		2,500			I		34,500			I		12,000			I		49,000
	GREEN AND OTHERS		271,172					668,682					433,740					1,373,594
TOTAL		751	290,000 M²				15,647	829,000 M²				1,324	455,000 M²				17,722	1,574,000M²

PROMNADE
P1 - 60,000 (L-1200 x W-50)
P2 - 90,000 (L-1800 x W-50)
P3 - 66,000 (L-2200 x W-30)

TOTAL 210,000

GRAND TOTAL 1,897,400 M²

LEGEND

- V. VISITOR NUMBER
- S. STUFF NUMBER
- C. CAR NUMBER
- BS. BUS NUMBER
- BG. BUGGY NUMBER
- □ REIGN FORCED CONCRETE STRUCTURE
- △ CONCRETE BRICK STRUCTURE
- ○ WOODEN STRUCTURE
- ✻ AIR CONDITIONING
- I or II PHASING

UTILITY PLAN (64)

General (641)

1. Here we shall explain our study of the following infrastructural elements as they relate to the various activities of visitors to the national archeological parks and to the living environment of the residents within the park areas:

   a. Water supply plan

   b. Sewerage system plan

   c. Stormwater drainage facilities plan

   d. Irrigation facilities plan

   e. Power supply facilities plan

   f. Communications facilities plan

   g. Refuse disposal facilities plan

2. The Present Situation

   As things now stand, none of these infrastructural elements except irrigation have been provided for at all in the case of either of the park areas. Nor is provision of such in present plans for the future adequate for the purposes of this project.

3. Utility Provision Zones

   The following two zones have been set for each park area in connection with the infrastructural plans:

   (1) Park Utility Provision Zone-1

   This zone corresponds to the archeological park protection zone (Zone-2) designated in 532. "Regional Designation and Division". It is where there will be a concentration of park facilities and where the visitor density will be the highest.

   Here high standards will be followed in the provision of utility facilities.

   (2) Park Utility Provision Zone-2

   This zone corresponds to the archeological park special scenic zone (Zone-3) designated in 532. "Regional Designation and Division". It is where the development impact

is high and where utility facilities will be provided as a part of the village improvement plan.

Here ordinary standards will be followed in the provision of utility facilities.

4. Park Utility Improvement System

As a result of having studied the present state of provision of utility in the region and future plans therefor, we have concluded, judging from the standards, performance stability, operational problems, and so on, that it would be better to have a separate infrastructural improvement system for the archeological parks than to wait for such improvements in the context of regional planning.

The following are two possible types of utility improvement systems in this case:

(1) Single System

What is meant here is a single system covering both of the above-mentioned utility provision zones in each archeological park.

The following are features of such a system:

- High degree of effective use of facilities.
- Comparatively easy control because of concentration.
- Small initial investment.
- Need for adjustment of rights across boundaries of administrative units.
- Difficulty of separation of standards between utility provision zones.

(2) Multiples System

What is meant here is a separate system for each of the utility provision zones.

The following are features of such a system:

- Low degree of effective use of facilities.
- Decentralization of control.

- High initial investment.

- Utility improvement according to administrative unit (desa) is possible.

- Clear division of standards between utility provision zones.

The single system has been selected in view of investment balance and other considerations. The system, however, will have to be capable of integration into regional utility planning once the level, performance and supply stability of utility infrastructure in the surrounding area improves.

5. Utility Improvement Works (1976 - 1985)

In this period utility improvements will be made in utility provision zone-2 with respect to facilities relocated in the Kecamatan center and new facilities provided in the Kecamatan center as well as new dukuh.

Although utility improvements should be made with respect to all dukuh from the standpoint of environmental preservation and the living environment, we have limited them to the above out of consideration of investment balance within the framework of the archeological park project.

The reason why it has been decided to undertake adequate utility improvements with respect to the new dukuh is that such improvements will play a leading role in attaining the objective of improvement of the standard of living in rural communities set forth in the new 5-year plan as well as an incentive role with respect to the other dukun.

The individual utility improvement plans will be discussed in outline in the following. Some adjustments will have to be made, however, after receipt of topography maps from the Indonesian Government.

Water Supply (642)

1. Plan standards

In determining the amount of water to be supplied, the local situation, as represented by the findings of our field investigations in the project area, has been taken into account.

For the park facility areas and the Kecamatan centers, the water supply has been calculated on the basis of the peak number of visitors using the facilities.

The average stay per visitor in the park facilities area has been assumed to be 4 hours.

The maximum accommodation of the facilities has been used as the population of the Kecamatan center.

2. Planned amount of water supply

Borobudur

	PHASE-1			PHASE-2		
	Planned pop.	Max. daily supply	Supply/ person /day	Planned pop.	Max. daily supply	Supply/ person /day
Park facilities area	14,842	787	53	38,097	1,370	36
Kecamatan center	3,500	165	47	7,000	330	47
New dukuh	1,285	257	200	3,420	684	200
Total	19,627	1,209	62	48,517	2,384	49

Prambanan

Park facilities area	10,043	562	56	34,613	1,350	39
Kecamatan center	2,650	125	49	5,100	250	49
New dukuh	1,870	380	200	3,700	750	200
Total	14,563	1,067	73	43,413	2,350	54

3. Water supply system

Both areas have a plentiful amount of underground water which can be raised from deep wells by pumps and be purified by simple means and clorinated before being supplied.

The water supply facilities will be provided in four phases over a ten-year period. Pumps and other equipment will have to be uniform in order to facilitate maintenance.

Although 250 mm. diameter piping will not be necessary until the second phase, 200 mm. being adequate in the first phase, 250 mm. piping will be laid from the outstart in view of the fact that there is not much difference in the cost.

4. Facilities list (Phase-2)

Deep wells: 60-100m in depth, pumping capacity of 1 cu. m./min. x 2

Water supply pumps with pressure tanks

2.4 cu.m./min. 2 sets of 2 (Prambanan)

2.7 cu.m./min. 2 sets of 2 (Borobudur)

Simple purification tank: 1,700 cu.m.

Chlorinator

Building: 100 sq.m.

Same for both Borobudur and Prambanan except where otherwise indicated.

5. Related facilities

Borobudur

(1) Landscape waterways

Landscape waterways will be provided on both sides of the promenade planned for the Borobudur area. They will each be 1.00 m wide, and the method of water resupply will be of the circulation type.

The water will be resupplied at a rate of 10% of the amount of outflow, for a total daily resupply of 200 cu.m.

As in the case of the Prambanan ponds, the resupply water

will come from wells but by a separate system from that of the regular water supply.

The facilities will be as follows:

Waterway-A	1,200 m in length
Waterway-B	500 m in length
Waterway-C	1,200 m in length

Wells, pumps and piping.

Prambanan

(1) Fountains and ponds

Fountains will be provided in the several ponds planned for the Prambanan area. The fountain system will be of the pond water circulation type.

The water for the ponds will also come from wells but by a separate system from that for the regular water supply.

The pond water will be resupplied at the rate of 5% of the amount coming out of the fountain nozzles, for a total daily resupply of 400 cu. m.

The facilities will be as follows:

Type-A	One main fountain (700 liters/min.) and ten small fountains (50 liters/min. each) at five locations.
Type-B	One main fountain (1,800 liters/min.) and fifteen small fountains (50 liters/min. each) at one location.

Wells, pumps, and piping.

Sewage (643)

1. Plan Standards

Discharge standards -- The only regulations are those regarding industrial use that are now under consideration. In this project we have set a B.O.D. maximum of 90 ppm in view of the fact that the water temperature is high in the local rivers and disintegration of organic substances is rapid.

Calculation of the amount of sewage has been based on sewage coefficients of 0.35 for the park facilities area, 0.7 for the Kecamatan center and 0.5 for the new dukuh.

2. Amount of Sewage Discharge

Borobudur	PHASE-1			PHASE-2		
	Water supply cu.m/ day	Sewage co-efficient	Amount of sewage cu.m/ day	Water supply cu.m/ day	Sewage co-efficient	Amount of sewage cu.m/ day
Park facilities area	787	0.35	275	1,370	0.35	479
Kecamatan center	165	0.7	115	330	0.7	230
New dukuh	257	0.5	130	684	0.5	340
Total	1,209	-	520	2,384	-	1,049
Prambanan						
Park facilities area	562	0.35	197	1,350	0.35	472
Kecamatan center	125	0.7	88	250	0.7	175
New dukuh	380	0.5	195	750	0.5	375
Total	1,067	-	475	2,150	-	1,022

3. Sewage Treatment System

We have considered the two following sewage systems on the basis of the above planning conditions:

Mixed type (soil water and waste water together)

Separate type (only soil water)

The following chart gives a comparison of the characteristics of the two.

	Mixed type	Separate type
Standard	60 ppm	90 ppm
Method of treatment	Activated sludge, trickling filtration	Septic tank with aeration tank or trickling filtration tank
Piping	Conflux possible within building	Sewage piping to septic tank necessary
Maintenance	Person responsible maintenance needed	Only periodical checks
Construction cost	Cost per person 5-10 times that of separate type	Cost per person only 1/5-1/10 of that of mixed type
Future requirements	Extension of system to meet future increase	Can be changed to mixed type in future

After comparing the characteristics of the two systems, we have selected the separate type with septic tank and aeration tank.

The sewage treatment facilities will be distributed in each facility area in the average proportion of one tank per 1,000 persons.

The soil water from the septic tanks, together with waste water, will be discharged into rivers or irrigation ditches via sewage piping mains.

Since there is not much difference in between the first and second phases in the cost of laying the sewage mains, second-phase capacity will be provided from the outstart.

In the case of Prambanan, one collection piping system will be adequate for the park facilities area. In the case of Borobudur, however, three will be required because of the topography.

Stormwater Drainage (644)

Neither the Borobudur nor the Prambanan area has an effective rainwater drainage system at the present time. As the annual rainfall is in excess of 4,000 mm in the vicinity of Mt. Merapi and the erosion of river dikes is considerable, comprehensive, full-fledged river control works would appear to be necessary.

Although this project, too, will have to rely on such future basic river control works, in the meantime it will be necessary for repairs within the project areas where the erosion is particularly severe.

In the project areas the existing irrigation network will be used to a maximum extent, with change of the course of flow being avoided as far as possible.

In principle, all of the collection and drainage will be by open ditches leading to irrigation waterways or rivers. The junctions with irrigation waterways will be provided with sand sedimentation pools and distributor arrangements for control of the inflow of rainwater. A gravel fill will be provided at junctions with rivers to prevent erosion and alleviate pollution.

In building facility areas, drainage structures such as under-drains and culverts will be provided as necessary, with connection with main open ditches.

It will be necessary to device means to prevent muddy rainwater from flowing into the landscape pond in the Borobudur park.

Irrigation (645)

As the irrigation systems are quite good in both the Borobudur and Prambanan areas, we have planned for maintenance and reinforcement of the existing networks. Particular attention will be given to effective utilization of the pond water in the Borobudur area raised by pumping.

The irrigation systems of the Borobudur and Prambanan areas will both be of the stream type.

Consideration will be given to some use of pond water and water from the regular water supply in the vicinity of the archeological remains.

An effort will be made to prevent erosion where the discharged water runs into rivers.

Electricity (646)

1. Plan Standards

The electricity demand for the park facilities areas and the Kecamatan centers has been calculated with respect to indoor and outdoor lighting and power consumption on the basis of the areas of the various facilities.

It has been assumed that each unit in the new dukuhs will have one 100-watt light.

2. Necessary Amount of Electricity

Brobudur

	Sighting	Power	Total
Park facilities area	298.0	173.0	471.0
Kecamatan center	77.0	57.0	134.0
New dukuh	71.6	20.0	91.6
Total	446.6	250.0	696.6

Prambanan

Park facilities area	356.0	172.0	528.0
Kecamatan center	82.0	57.0	139.0
New dukuh	78.5	20.0	98.5
Total	516.5	249.0	765.5

3. Electricity Supply System

The electricity will be supplied by diesel generators, with the three following cases being possible:

Case-1 Supply only to the park -- two 300 KW generators, one of which being stand-by

Case-2 Supply to the park and also to villages as an extension of the park -- two 500 KW generators, one of which being stand-by.

Case-3 Supply to the park and the villages by separate systems -- two 300 KW generators for the park and two 150 KW generators for the villages, one of which in each case being stand-by.

We have adopted Case-2, which allows for supply of electricity to the park facilities areas, the kecamatan center and the new dukuh by the same system.

A loop system will be used for the distribution lines, with 6 KV for high-voltage supply and 200V/400V for low-voltage supply.

The supply lines will be underground cables in the case of the park facilities area for considerations of the view and overhead lines in the case of other areas.

Pad-mounted transformers will be located nearby each of the facilities, with secondary supply lines leading from them to the buildings and outdoor lighting facilities.

In the category of special outdoor lighting in the case of Prambanan will be the underwater lighting for the fountains and the illumination of the archeological remains.

Control of the outdoor lighting will be by photo electric relay.

4. Facilities List

Power plant facilities:	generators, automatic voltage regulator, the plant building (200 sq.m.) and engine cooling tower
Power distribution facilities:	transformers, power line poles
Outdoor lighting fixtures:	street lighting fixtures, area lighting fixtures, archeological remains illumination fixtures, and underwater lighting fixtures

Telephone (647)

Although it will be possible to link up each of the park areas with the Yogyakarta Exchange, at the present time there would seem to be some difficulties involved in the execution of the work.

An appropriate system would be radio communication between the parks and with Yogyakarta.

Each park area will be provided with a radio transceiver and a general exchange, with a telephone line system of underground cables within the park area and overhead lines within the villages.

The required number of telephone circuits will be as follows:

	Park facilities area	Kecamatan center	New dukuh	Total
Borobudur	4	1	-	5
Prambanan	3	1	-	4
Total	7	2	-	9

Refuse Disposal (648)

1. Plan Standards

Standards of refuse:	Park facilities area	0.4 kg./person
	Kecamatan center	0.3 kg./person
	New dukuh	0.6 kg./person

2. Amount of refuse on peak days:

	Borobudur		Prambanan	
	Number of persons	Amount of refuse	Number of persons	Amount of refuse
Park facilities area	38,097	15.2	34,613	13.8
Kecamatan center	7,000	2.1	5,100	1.5
New dukuh	3,420	2.1	3,700	2.2
Total	48,517	19.4	43,413	17.5

3. Refuse Disposal System

Collection: two 4-ton trucks

Disposal: diesel incinerator

PROPOSED PROJECT PHASING (65)

Key A. Archeological ruins restoration works

B. Environmental improvement works

C. Facilities provision works

D. Utility works

E. Village relocation works

F. Access road works

BOROBUDUR PARK

Phase-1 (1976 - 1980)

A. Making sanctuaries of the Borobudur, Pawon and Mendut ruins.

B. Active improvement of Block-1 and Block-3
Construction of Borobudur Promenade (1.75 km)
Construction of nurseries

C. Priority construction of main theme facilities, service facilities, operation and control facilities, and other facilities.

D. Laying of main lines for water service, sewage, electricity, etc.
Construction of supply and treatment facilities adequate for meeting the demand of 4,000 visitors a day.
Supply of utilities to the new dukuh and relocated community facilities.

E. Priority-1 Resettlement of 770 persons in 159 households involving an area of 18.5 ha.

Priority-2 Resettlement of 110 persons in 23 households involving an area of 2.6 ha.

F. Widening and landscaping of the main access road (4.5 km)
Rerouting of the road in the park area (3.5 km)

Phase-2 (1981 - 1985)

A. Improvement of the three sanctuaries

B. Improvement of Block-2 and the reserved block
Construction of the Borobudur Promenade (1.15 km)

C. Expansion of facilities in keeping with increase in tourist demand
Construction of additional facilities for greater variety

D. Expansion of facilities to cope with the demand of 10,000 visitors a day in Phase-2

E. Priority-3 Resettlement of 160 persons in 33 households involving an area of 3.8 ha.

Priority-4 Resettlement of 720 persons in 148 households involving an area of 17.3 ha.

Priority-5 Resettlement of 530 persons in 110 households involving an area of 12.8 ha.

F. Improvement of minor access road (7.5 km)

Prambanan Park

Phase-1 (1976 - 1980)

A. Making sanctuaries of Lara Djonggrang, Sewu, Plaosan and other major archeological ruins

B. Active improvement of Block-2
Construction of water promenade and Sewu-Plaosan promenade
Construction of nurseries

C. Same as in case of Borobudur Park

D. Same as in case of Borobudur Park, except for the demand of 2,800 visitors a day

E. Priority-1 Resettlement of 1,200 persons in 247 households involving an area of 18.2 ha.

Priority-2 Resettlement of 370 persons in 76 households involving an area of 5.5 ha.

F. Widening and landscaping of 5.5 km of national highway

Phase-2 (1981 - 1985)

A. Making sanctuaries of the other archeological ruins

B. Gradual improvement of Block-1, Block-3 and the reserved block
Construction of Kraton promenade and Riverside promenade

C. Same as in the case of the Borobudur Park

D. Same as in the case of the Borobudur Park
Adequate supply of utilities to redevelopment area

E. Priority-3 Resettlement of 240 persons in 49 households involving an area of 3.7 ha.

Priority-4 Resettlement of 470 persons in 97 households involving an area of 7.2 ha.

Priority-5 Resettlement of 1,990 persons in 410 familiers involving an area of 30.4 ha.

F. Construction of bypass

7 RELATED PROJECTS

Contents:

VILLAGE MASTER PLAN (71)

General (711)

The local community element ranks with the elements of protection of the environment of the archeological and utilization of the park after providing the necessary facilities as one of the three important related elements of the project. In other words, without the active participation, cooperation and assistance of the local community in the creation of the desired environment of the park and archeological ruins, the other two elements will function inadequately, and the success of the archeological park will be jeopardized.

However, local community improvements, as part of the regional economic development called for in Repelita II, which ranks above this project in the planning hierarchy, should be positioned within a comprehensive village modernization program and should go beyond mere physical improvements, requiring as well a long-term, wide-area physical vision as a framework.

Accordingly, in connection with the village improvement plan, we have set the goal of solving the direct problems inseparably related to the park improvement works, i.e., the relocation plans and other related plans, and have proposed a physical village structure from a comprehensive approach as a necessary framework for such solution.

Outline of the Plan (712)

The following are given conditions to the village improvement plan that will arise as a result of implementation of the archeological park project:

(1) Considerable change of the existing pattern of land use and relocation of facilities.

(2) Change in village exonomic activity as a result of the investment in the park works.

(3) The various kinds of regulation that will come into effect for the purpose of maintaining the park environment.

The study items with respect to village improvement have been set as follows under these given conditions:

- Systematic selection of substitute land within the same area for housing that is to be relocated.

- The relocated housing should serve as a future model for the area.

- The public facilities, as basic facilities of regional life, should be of planned content and scale and should be located appropriately within the overall village structure.

- Since conversion of farmland to other uses will deprive the villages of production capacity, it will be necessary to raise the productivity of other farmland, help the transition to other industry, and make an active effort to provide opportunities for employment in park operations and control activities.

- It will also be necessary to consider measures for the promotion of commercial activity, service activities and other local industrial activities.

- As for change in the landuse pattern, it will be necessary to consider appropriate landuse and village-structure proposals of adequate flexibility in terms of both time and space sequences as well as measures for guiding such landuse and village structure in order to prevent unregulated sprawl and environmental deterioration caused by it.

- It will be necessary for consideratyion of concrete work unplementation measures corresponding to the following kinds of village regulation:

  - Landuse regulation

- Scenic regulation
- Regulation of the view along roads
- Nature protection regulation
- Regulation for protection of the scenery

1. Areas involved

Villages in the vicinity of the archeological parks that receive a direct influence and impact from the park improvement works and also serve as important points in the scheme of long-term village development (Zone-3).

Borobudur area	The 5 desa of Borobudur, Wanurejo, Sawitan, Mendut, and Progowati, representing an area of 1,420 ha. running 5 km in the east-west direction and 3 km in the north-south didrection.
Prambanan area	The 5 desa of Tlogo, Bugisan, Taji, Kebondakidul and Pereng and part of 7 other desa, including Tamanmartani, Bokohar, and Sambireyo, representing a total area of 1,460 ha. running 5 km in the north-south direction and 3 km in the east-west direction.

2. Population

Assuming natural growth rates of 1.22% and 1.79%, respectively, for the Borobudur and Prambanan areas, the following population figures have been estimated for 1975, 1980 and 1985:

	1975	1980	1985
Borobudur area (Persons)	16,254	17,270	18,349
Prambanan area (Persons)	24,353	26,612	29,081

3. Landuse

Besides preserving to a maximum extent the existing landuse pattern as surrounding area for protection of the archeological parks and as high productivity farmland, the basic structure of landuse, including community facilities, which are a basic element of the living environment, main village roads, and village utilities, will be determined, especially on the substitute land for the relocated facilities, at the same time as the construction stage of the park improvement works.

	Residential Area	Commercial Facilities Area	Agricultual Farmland etc.	Total
Borobudur area (HA)	385.5	30.0	804.5	1,220
Prambanan area (HA)	362.0	36.0	862.0	1,260

4. Housing areas

The dukuh (300-400 person units) scattered here and there in the area will be preserved and improved as agricultural village housing environment units. Particular emphasis will be placed on promotion of construction of dukuh centers as well as roads and sanitary facilities and power supply facilities within the dukuh. There will be two types of new dukuh to serve as models for modernization of housing facilities:

Type-A Dukuh serving as a model for new farming communities and new farming community housing. This type is particularly suited to the Borobudur area.

Type-B Dukuh serving as a model for high-density housing with urban elements. This type is particularly suited to the Prambanan area.

5. Community facilities

It is necessary that the community facilities in the villages correspond to the related administrative units and at the level of each unit be suited to the needs of the background population.

Furthermore, the sanitary facilities, power facilities, roads and other infrastructural facilities must be located where it will be easy for supply to these community facilities in particular.

Community centers will be located at three levels the Kecamatan level, the desa level, and the dukuh level -- as follows:

	Kecamatan Center	Desa Center	Dukuh Center
Borobudur area (Sites)	1	5	40 - 50
Prambanan area (Sites)	1	3 - 5	60 - 70
Background population (persons)	40,000 - 50,000	2,000 - 3,000	300 - 400

6. Development phases

Phase-1 (1976 - 1980)

In this phase, along with the park improvement works, there will be a minimum of relocation of housing, stores, and other facilities as well as works related to this relocation such as road works, provision of utilities, and landscape and farmland improvements.

Phase-2 (1981 - 1985)

The relocation works will be continued from Phase-1 with the target of completion in this phase. At the same time, there will be promotion of the construction wroks for the Kecamatan center and other community and infrastructural facilities.

Post Phase (1986 -)

Besides improvement of the living environment on the level of the dukuh, there will be construction of desa centers and promotion of construction works relating to improvement of the village infrastructure.

Furthermore, a comprehensive village development plan will be established in coordination with Repelita II, irrigation waterway development plans, and other related upper-echelon plans, and the works called for in it will be implemented.

7. Service Industries

The investment in the park improvement works must not only provide employment opportunities during the construction and help to

promote related industry in the area but also make possible the following economic merits subsequent to the opening of the parks:

a. Establishment of contract agricultural operations with respect to such products as sugar cane, tobacco, vegetables, livestock, etc., which can be used to meet the food demand of visitors.

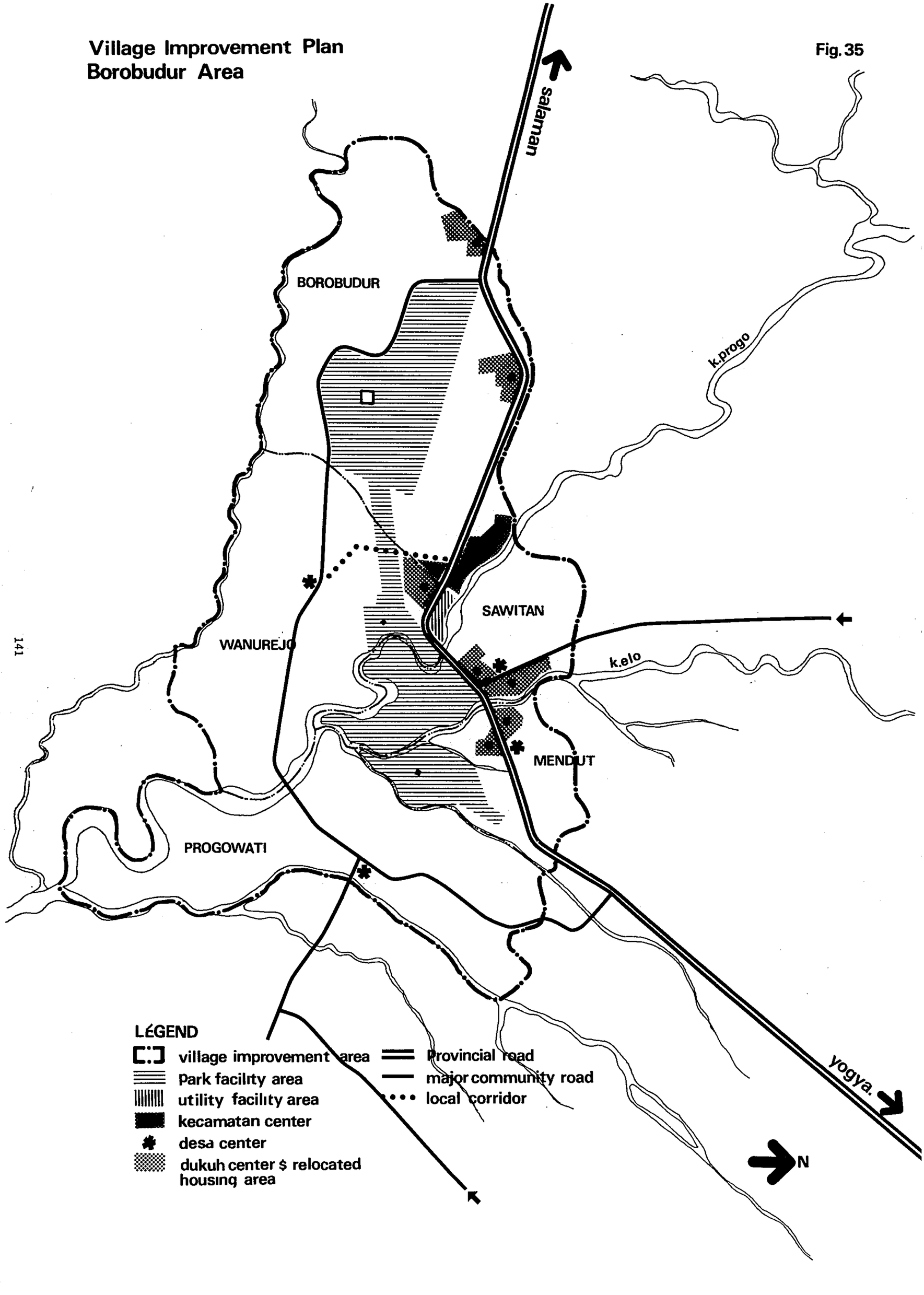
b. Employment opportunities in the maintenance and control of nurseries, fields and other activities contributing to the preservation of the park environment as well as in other service and maintenance activities.

c. Measures for giving priority to local commercial activities inside and outside of the parks.

d. Active participation in the runningof simple visitor accommodations such as hostels and rest houses and other tourist-related businesses and capital participation in the development and operation of the parks.

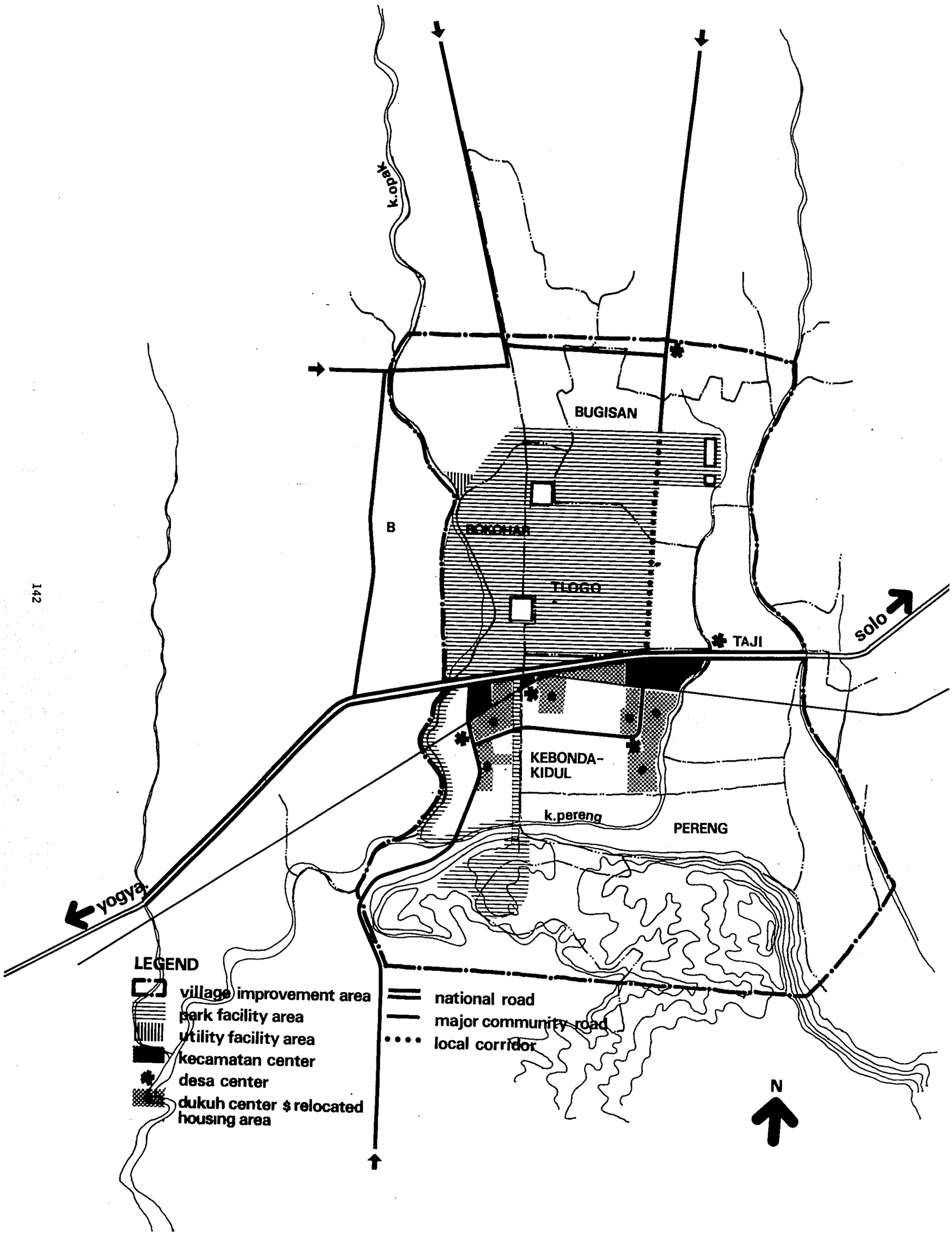
Village Improvement Plan
Borobudur Area

Fig. 35



Village Improvement Plan
Prambanan Area

Fig. 36



Proposed Village Structure (713)

Here we will make special mention of the following 3 elements of the basic landuse structure with respect to the village improvement plan:

(1) The plan for the community traffic network that will serve as the arteries for village activity, and particularly the main community roads.

(2) The plan for provision of community centers that will serve as the centers of village life.

(3) The plan for provision of utilities.

1. Provision of main community roads

The regional trunk roads (national highways and provincial highways) and main community roads will be determined from the three following standpoints:

- The necessity for major regional roads which will correspond to future traffic demand and future utility demand that will arise from the park improvement works and future economic development.

- The need for basic separation of the traffic flow of park visitors and the traffic flow of regional activity.

- The possibility of use of making a network of the existing roads with partial repairs and improvement.

Borobudur Area

The provincial highway will be partially rerouted for separation of roads within the park and village roads.

Furthermore, for control of access to the park, a frontage road (main community road) will be provided to the south.

A short cut will be provided between the Kecamatan center and Desa Wanurejo as a local corridor.

Prambanan Area

The existing main roads (roads A and B in the diagram) will be improved, particularly in the area around the new Kecamatan center, to serve as a basic traffic network.

Furthermore, as in the case of the Borobudur area, the portion of

road A within the park area will be designated as a local corridor.

The Kinds of Community Roads (See Fig. 42)

Major community roads	---	Interdesa network
Minor community roads	---	Interdukuh network
Local corridors	---	Networks through the park
Distributors	---	Intradukuh networks

2. Provision of community facilities

We have identified the following community facilities as being necessary for life in regional society on the basis of consideration of the present situation in Central Java, regional development policy in Indonesia and the standards for rural communities in various other countries (see community module).

Kecamatan center:	High school, middle school, hospital, local government office, post office, fire station, police substantion, passar, street of shops and stores, public park and plyaing grounds, etc.
Desa center :	Elementary school, clinic, local government branch office, agricultural cooperative, mosque, kindergarten store, neighborhood park, etc.
Dukuh center:	Village common facilities (public baths, toilet, warang, water taps, playground, etc.)

* See Fig. 41 for the scale of the facilities.

3. Provision of utility facilities

The supply of utilities in the villages will be determined from the following standpoints:

- Improvement of health and sanitation, particularly improvement of the living environment by raising the level of the water supply and the standards of sewage treatment.
- Mechanization and labor-saving in agricultural work through supply of electricity.

- Greater convenience in everyday life with electrical lighting and telephones.

Types of utility facilities to be provided:

(a) Water supply facilities

(b) Sewage facilities

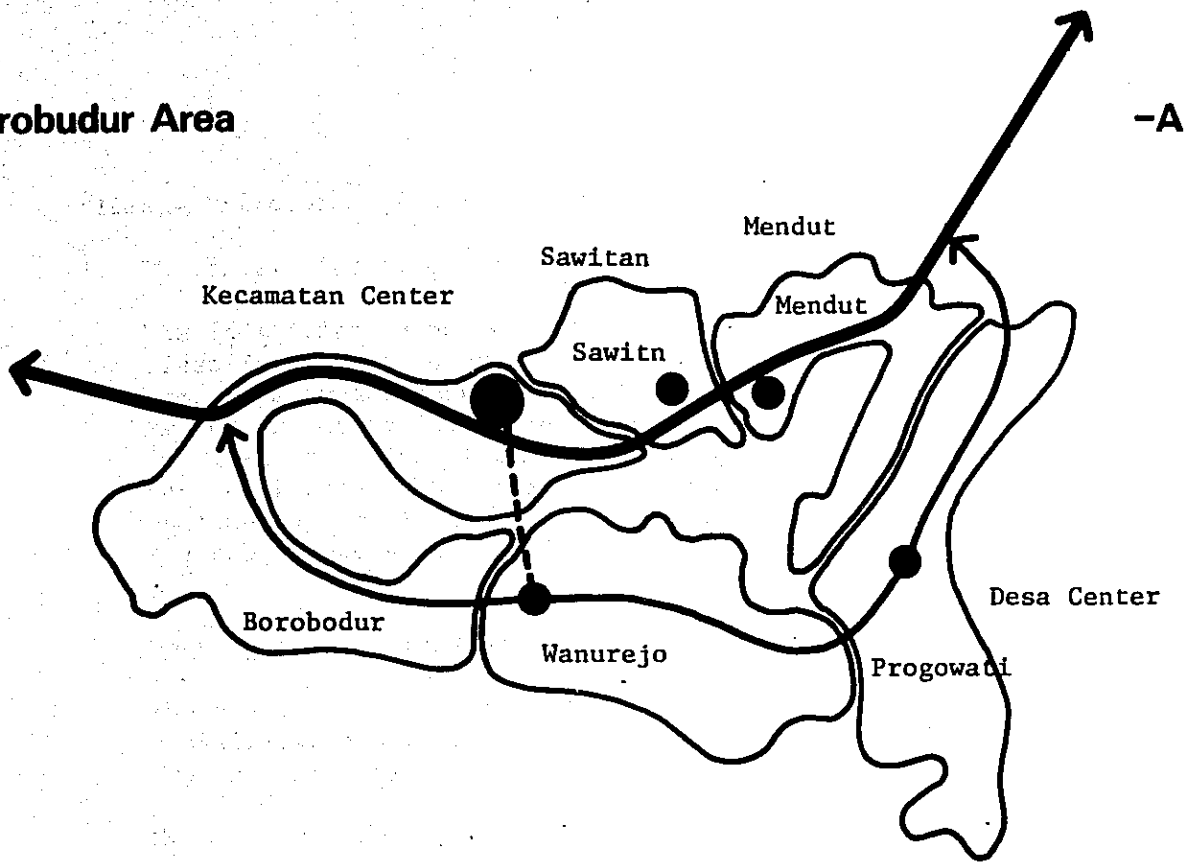
(c) Electricity and telephone facilities

Although the eventual goal is provision of these facilities to villages in the area, initially they will be provided only to the new dukuh, which will serve as models, and to the Kecamatan centers in order, as stated in 64. Utility Plan, to avoid overinvestment at the outstart and consequent regional imbalance.

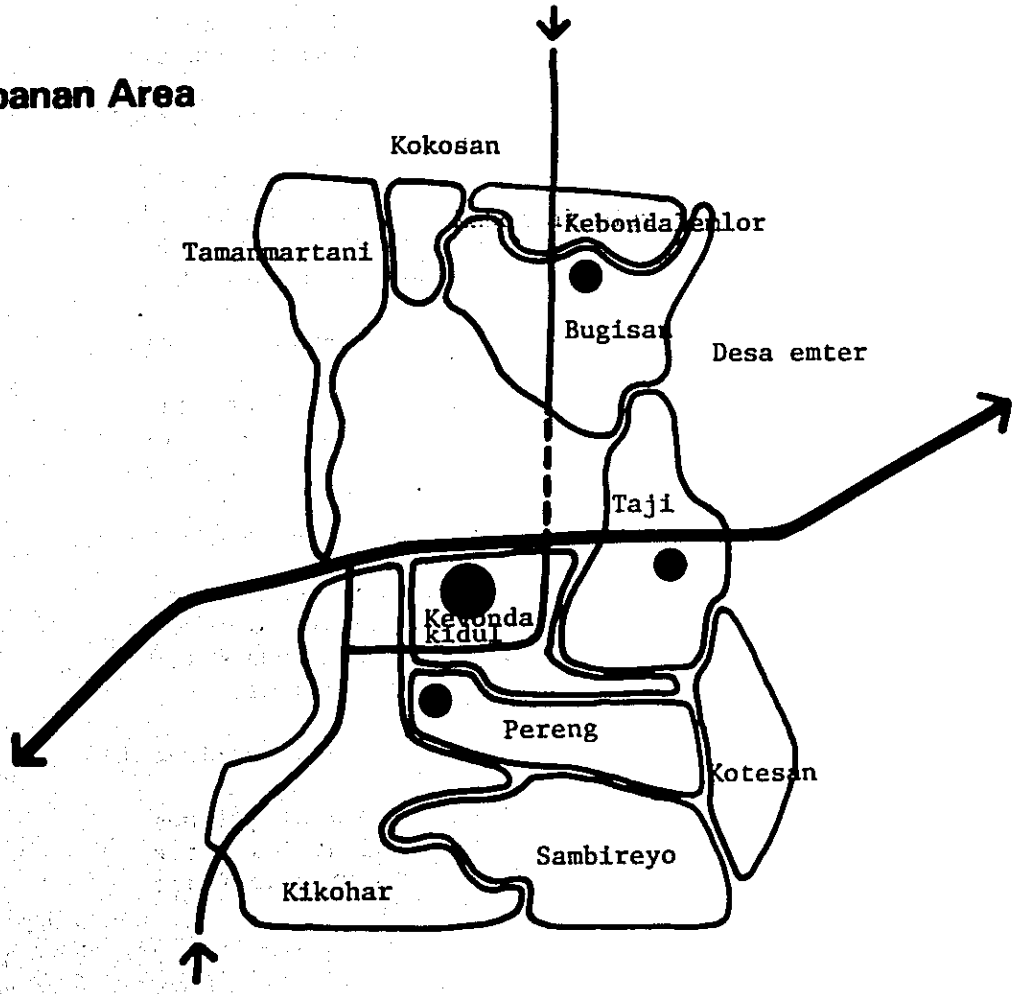
Village Structure

Fig. 37

Borobudur Area -A



Prambanan Area -B



Village Relocation Plan (714)

1. The facilities to be relocated

The facilities to be relocated can be divided into two main classifications: housing and community facilities such as stores, schools, hospitals, etc. Here we will deal with housing. As for the other facilities scheduled for relocation as described in 713-2 Provision of Community Facilities, only those that have been confirmed in our field reconnaissance will be discussed in outline in Fig. 41 and in terms of basic policy regarding substitute sites and distribution.

2. Housing to be relocated

The housing to be relocated has been divided into the following classifications in order to keep it to a minimum and to allow for gradual relocation.

Classification-1

The housing to be relocated in Phase-1 the relocation of which is urgent in terms of the park improvement works.

Classification-2

The housing the relocation of which should begin in Phase-1 but which is not so urgent as to have to be immediate, provided that the necessary adjustments can be made with the park operation system.

Classification-3

The housing to be relocated in Phase-2 the relocation of which will be urgent at that time in terms of the park improvement works.

Classification-4

The housing the relocation of which should begin in Phase-2 but which is not so urgent as to have to be immediate, provided that the necessary adjustments can be made with the park operation system.

Classification-5

Housing in the reserved areas which will be relocated only after relocation becomes necessary at some future date in terms of park utilization.

These classifications involve the following areas and populations:

	Borobudur Area	Prambanan Area
Class-1	18.5 (770, 159)	18.2 (1,200, 247)
Class-2	2.6 (110, 23)	5.5 (370, 76)
Class-3	3.8 (160, 33)	3.7 (240, 49)
Class-4	17.3 (720, 148)	7.2 (470, 97)
Class-5	12.8 (530, 110)	30.4 (1,990, 410)
Total	55.0 ha(2,290 heads 473 units)	65.0 ha (4,270 heads 879 units)

3. Substitute land

It will be necessary that appropriate substitute land be selected within the overall landuse framework in accordance with the schedule described in (2) above and that the land selected be prepared for use and substitute facilities be provided.

(1) Selectionof appropriate land for the new dukuh

- Land within the same desa or as near to it as possible.
- Either public land or land managed by the desa.
- Land of low productivity or low in price.
- Land the accessibility of which from main regional roads is high.
- Land the use of which will not be detrimental to the existing farming landscape.
- Land on the perimeter of the park so that the trees around the houses can afford a visual boundary for the park.

Borobudur area

The distribution shown in Fig. 38 has been chosen for the Borobudur area in view of the fact that the regional trunk road (provincial highway) passes by all of the desas, there is adequate substitute land within the same desa, and the trees around the houses can serve as a green edge for the park.

Prambanan area

Since the rerouting of the national highway will entail reorganization of a parcel of land along it and the entire desa of Tlogo will have to be relocated outside the park, the best solution is to relocate it, along with the housing and facilities in other desa that will have to be relocated outside the park, on that parcel of land with the intensive distribution shown in Fig. 39.

(2) Area of the substitute housing land

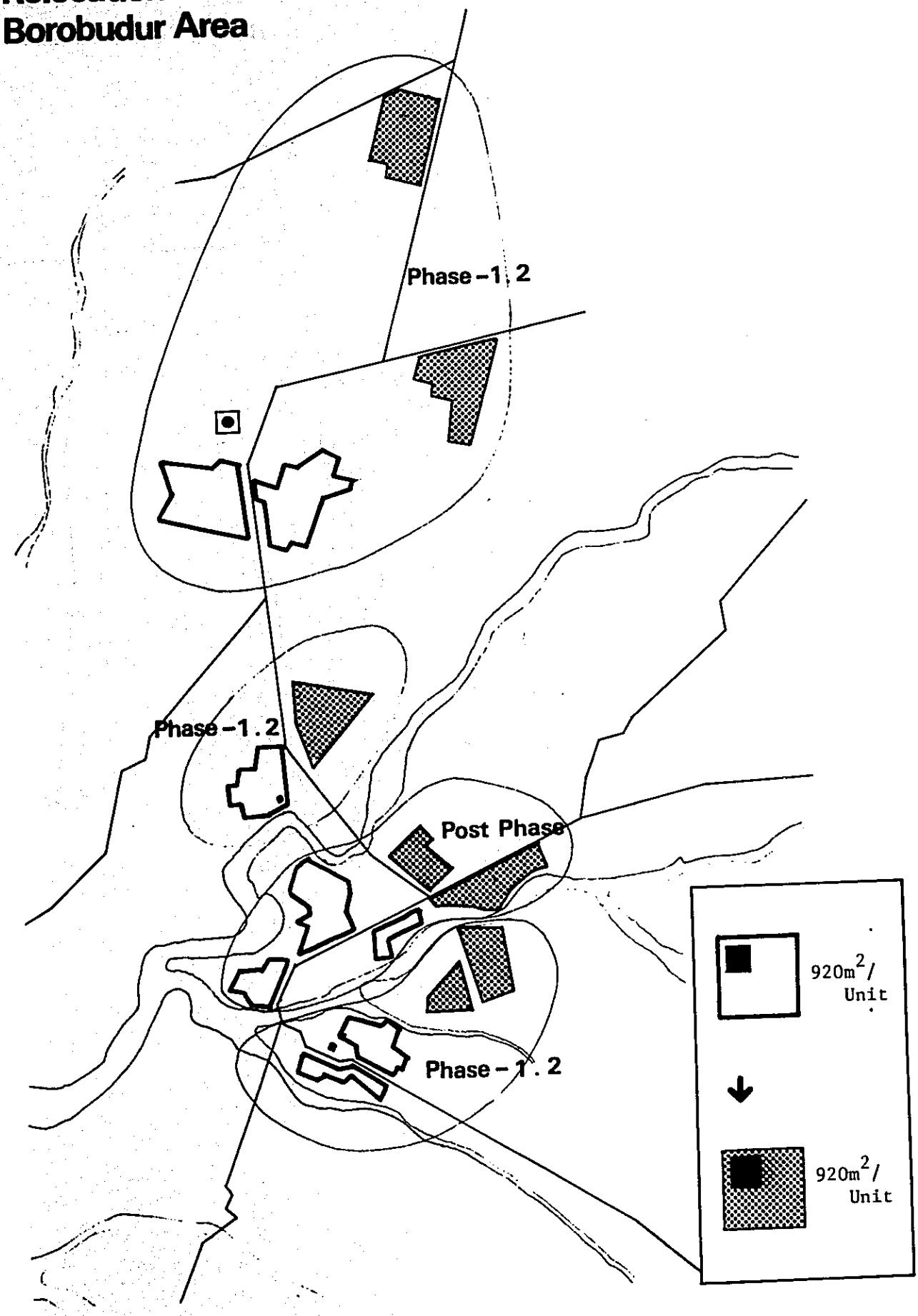
At the present time the housing lots average about 900 sq.m. each at Borobudur and 600 sq.m. each at Prambanan, which is more than enough for a housing lot. The lots are so spacious because of the fact that a large portion of them is used for self-sufficient production (fruit, vegetables, livestock, etc.).

The following areas have been set for the substitute housing lots in each case:

Borobudur area	The same area as that of the original housing lots.
Prambanan area	1/1 - 1/25 of the area of the original housing lots.

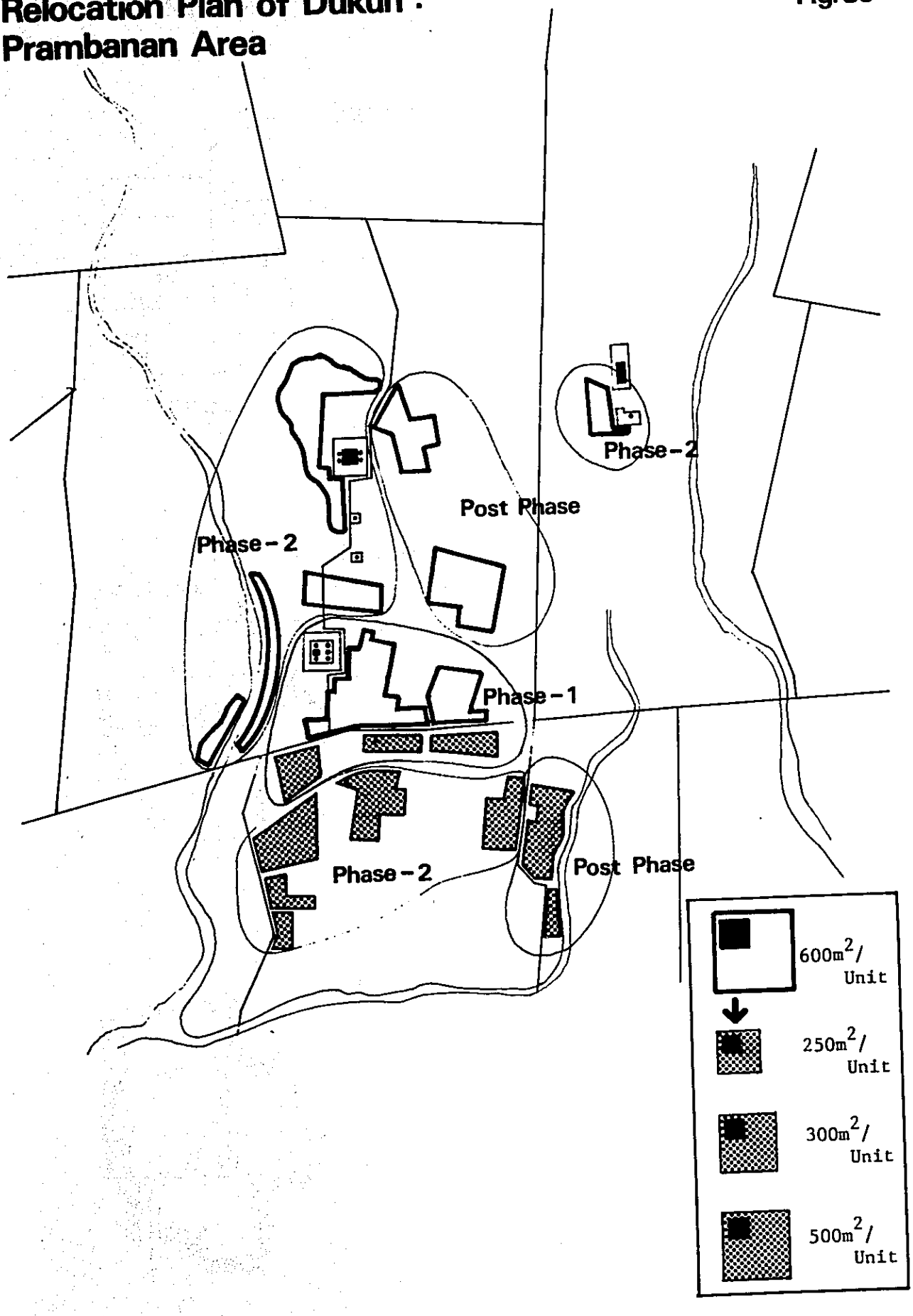
Relocation Plan of Dukuh : Borobudur Area

Fig. 38



Relocation Plan of Dukuh : Prambanan Area

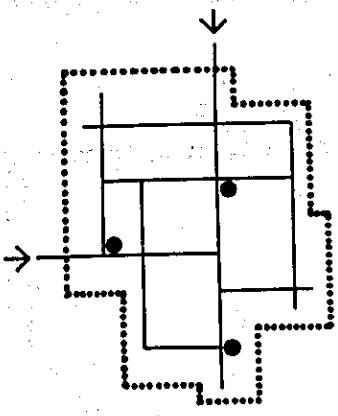
Fig. 39



DUKUH Model

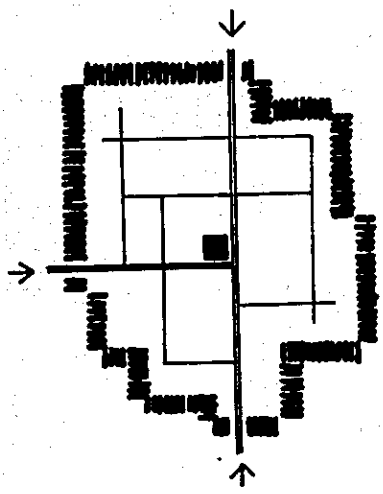
Fig.40

Existing DUKUH



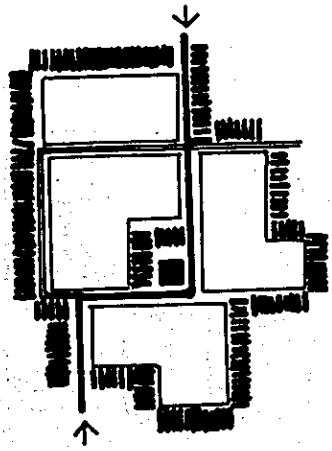
POPULATION	250 - 300 Persons
AREA	6.0 - 7.5 Ha.
HOUSE HOLD	60 - 70 Units
DENSITY	41.59 Persons/Ha.
HOUSING LOT	650 - 1,600 m^2/Units
COMMUNITY FACILITIES	Primary Schools, Kantor Mosques, Warangs etc. (Area Scattering)
ROAD	2 - 4 m with Grid Pattern Unpaved, No Ditch

Future DUKUH



POPULATION	300 - 350 Persons
AREA	6.0 - 7.5 Ha.
HOUSE HOLD	60 - 80 Units
DENSITY	50 - 55 Persons/Ha.
HOUSING LOT	600 - 1,000 m^2/Units
PROJECTS	- Kukuh Center - Minor Community Roads - Utility Supply - Nursing the Buffer Zones of Trees Around the Existing Dukuh

New DUKUH

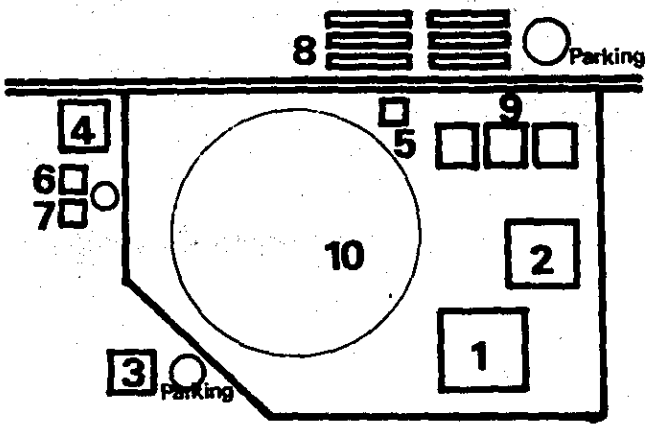


POPULATION	300 - 400 Perons
AREA	5.5 - 8.0 Ha.
HOUSE HOLD	60 - 70 Units
DENSITY	50 - 55 Perons/Unit
HOUSING LOT	Average 1,000 m^2/Unit
PROJECTS	- Site Preparation - Housing - Dukuh Center - Minor Community Roads & Correctors - Utility Supply - Landscaping

Communinty Center Model

Fig.41

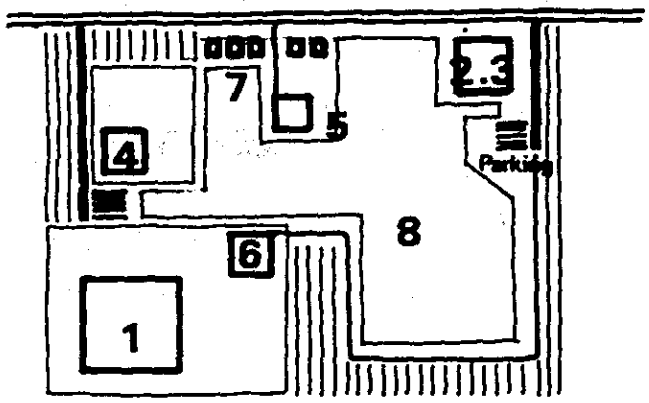
KECAMATAN Center



Location	Center of Kecamatan
No of Center	1 Center/Kecamatan
Project Population	2,000-3,000 Persons

1. Senior High School
2. Junior High School
3. Hospital
4. Kantor Kecamatan
5. Post Office
6. Police Station
7. Fire Station
8. Market
9. Super
10. Play Ground

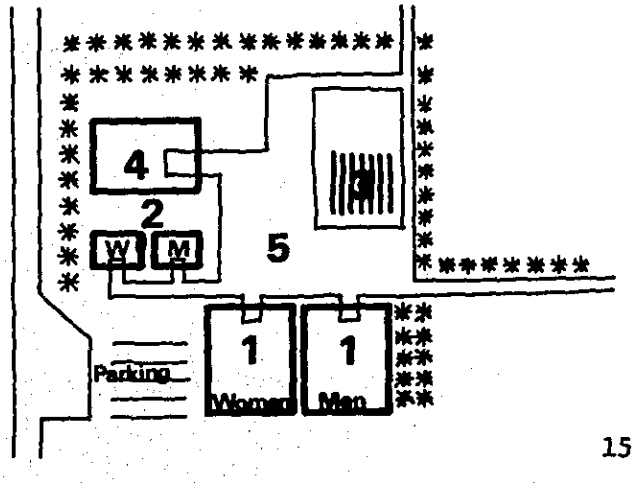
DESA Center



Location	Center of Desa
No of Center	1 Center/Desa
Project Population	2,000-3,000 Persons

1. Primary School
2. Clinic
3. Kantor Desa
4. Agricorporation
5. Mosque
6. Kindergarten
7. Shops Area
8. Desa Park

DUKUH Center



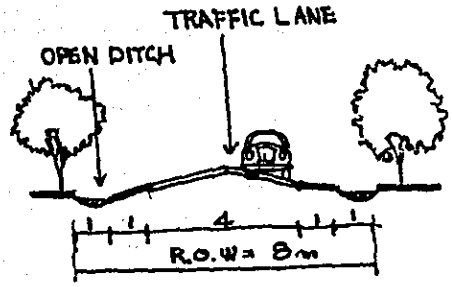
Location	Center of Dukuh
No of Center	1 Center/Dukuh
Project Population	300-400 Perons

1. Bath Rm.
2. Toilet
3. Shops Area
4. Water Stand
5. Play Lot

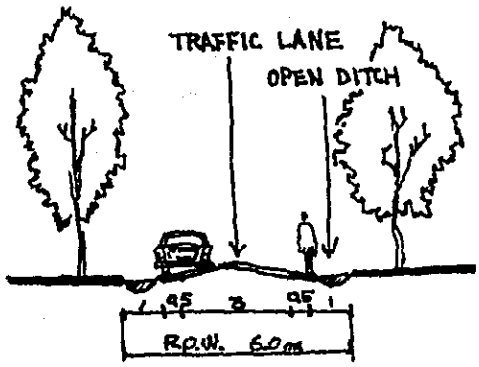
Typical Section of Village Road

Fig. 42

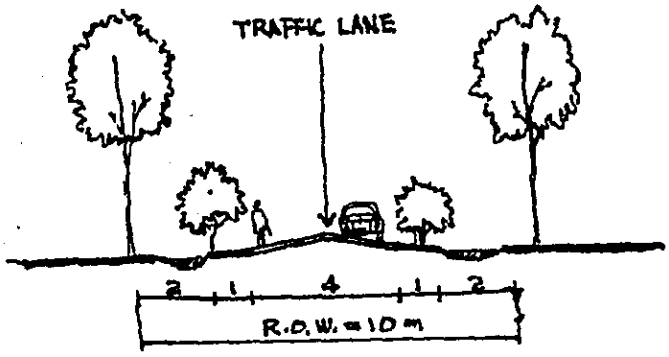
Major Community Road



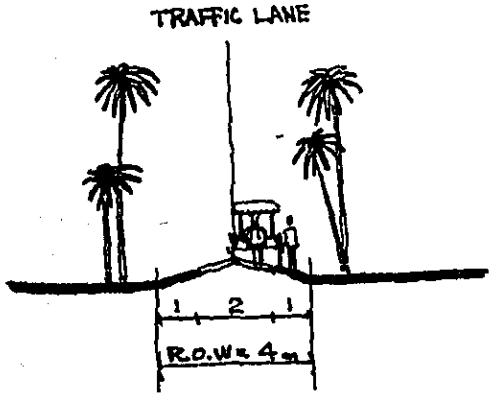
Minor Community Road



Local Corridor

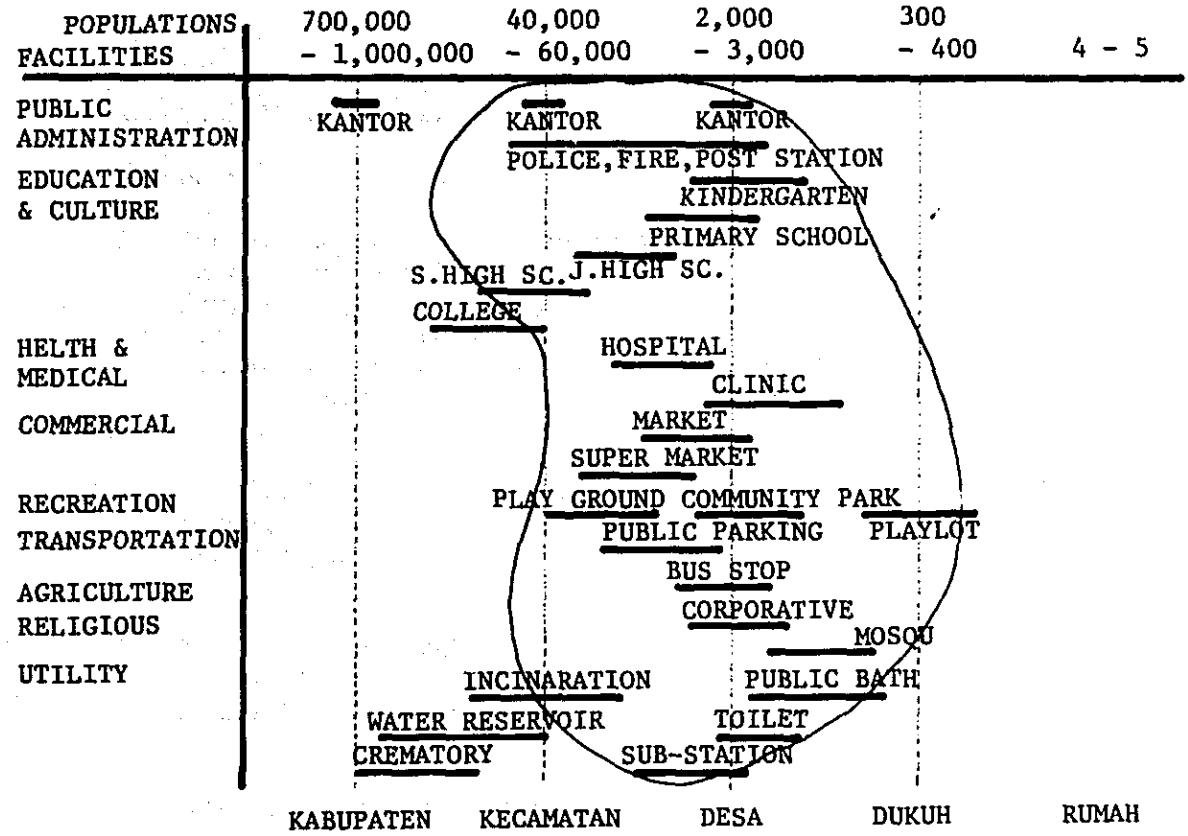


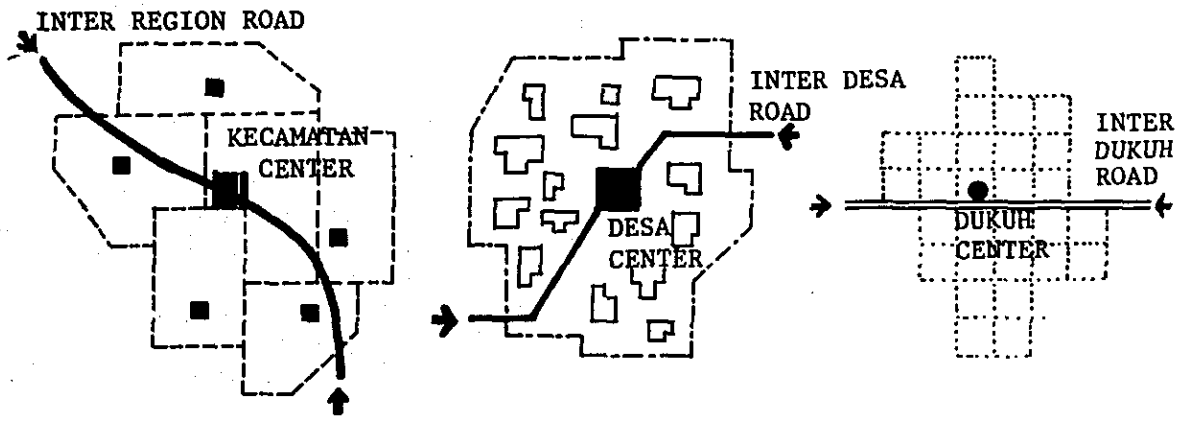
Corrector



Community Module

Fig. 43





KECAMATAN
(Unit of Desas)

Borobudur
Muntilan
Mungkit

Borobudur
Prambanan

Prambanan
Kalasan
Prambanan
(Sleman)

DESA
(Unit of Dukuhs)

Borobudur
Wanurejo
Sawitan
Mendut
Progowati

Tlogo
Taji
Kebondakidul
Bugisan
Pereng
and Other 7 Desas

DUKUH
(Unit of Rumahs)

60 - 70 Rumahs
300 - 350 Persons

70 - 80 Rumahs
350 - 400 Persons

ACCESS ROAD PLAN (72)

Borobudur Access Road

1. The 4.5 km stretch of provincial highway from Muntilan to Mendut that branches off from the 2nd-class national highway between Yogyakarta and Magelang will be designated as the route for access to the vicinity of the archeological park. It will be widened to include a low-speed lane for local traffic to avoid congestion.

2. The 7.5 km stretch of road from Mungkit to Mendut will be used during peak hours as an auxiliary access and departure route with one-way traffic.

3. The 3.5 km stretch of road between Mendut and Borobudur will be rerouted to the north to put distance between it and the archeological ruins.

4. Adequate landscape improvements will be made along the main access road.

5. The view will be preserved along the road by roadside regulation.

Prambanan Aceess Road

1. The Yogya-Solo Second-class national hgihway will be the access road to this archeological park. In the near future this road is scheduled to be widened in accordance with Bina Marga standards. Since it not only will be used as an approach to the park but also passes through it, special roadside landscape work and a special lane arrangement will be necessary. The road work on the 5.5 km stretch inside the designated park area will commence in Phase-1.

2. It will also be necessary in the future to build a bypass to the north to handle through traffic since this road serves as a wide-area trunk industrial road.

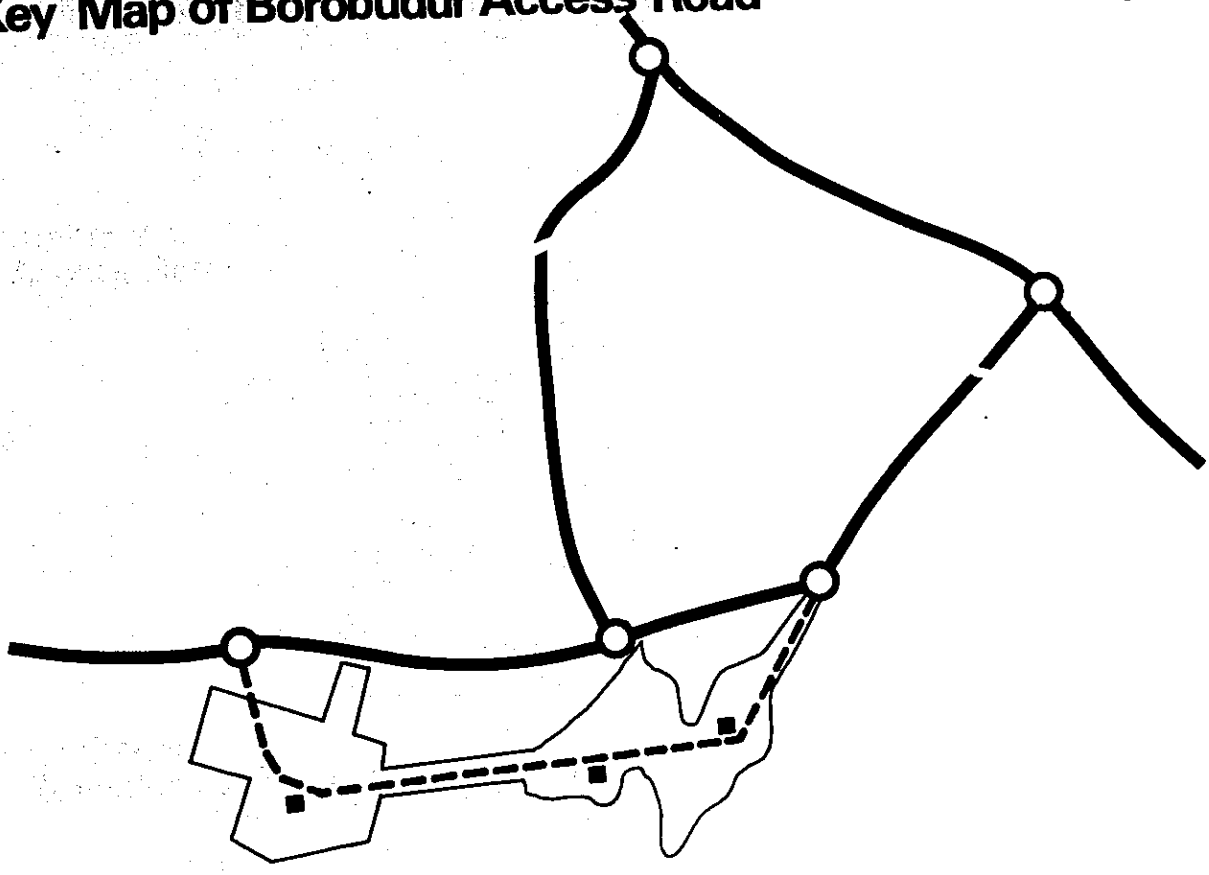
3. The view will be preserved along the road by roadside regulation.

Road Design Criteria for Regional Road

Design Controls & Elements	Unit	Borobudur Access Road	Prambanan National Road	Prambanan Bypass	Remarks
1. TERRAIN		FLAT	FLAT	FLAT	
2. PLANNED AVERAGE DAILY TRAFFIC	veh/day	4,000	15,000	4,000	
3. DESIGN SPEED	km/h.	60	60	60	
4. RESERVE (R.O.W.)	meter	28	58	18	
5. PAVEMENT WIDTH (Through Traffic Lanes)	meter	2 x 3.5	2 x 4	2 x 3.5	
6. SHOULDER	meter	2 x 3.0	2 x 6.0	2 x 3.5	
7. BORDER	meter	2 x 2.0	2 x 10.5	2 x 2.0	
8. MEDIAN	meter	6.0	2 x 3.5	-	
9. SLOW SPEED VEHICLE LANE	meter	5.0	2 x 5.0	-	
10. MINIMUM RADIUS	meter	150	150	150	
11. MAXIMUM GRADES	%	5	5	5	
12. STOPPING SIGN DISTANCE	meter	75	75	75	
13. VERTICAL CURVE RADIUS	CREST (SAG) meter	1,400 (1,000)	1,400 (1,000)	1,400 (1,000)	

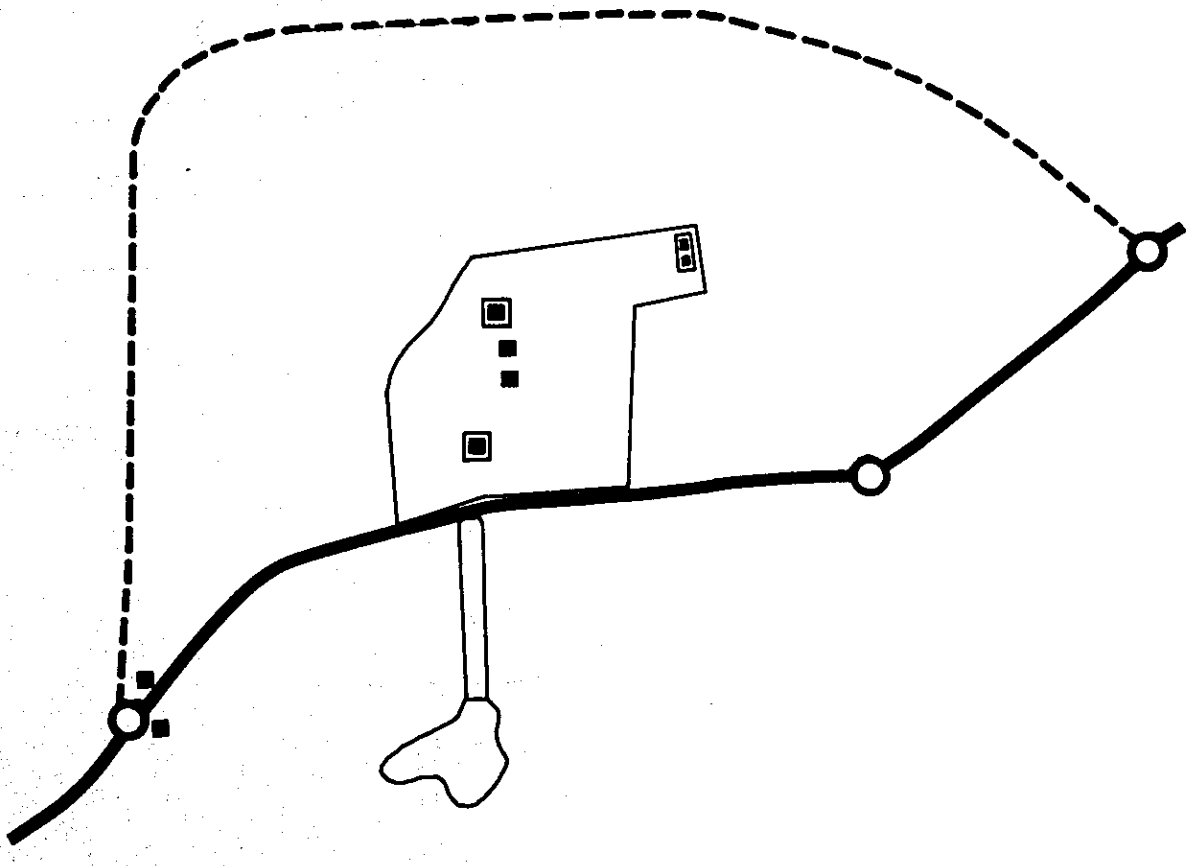
Key Map of Borobudur Access Road

Fig.44



Key Map of Prambanan Access Road

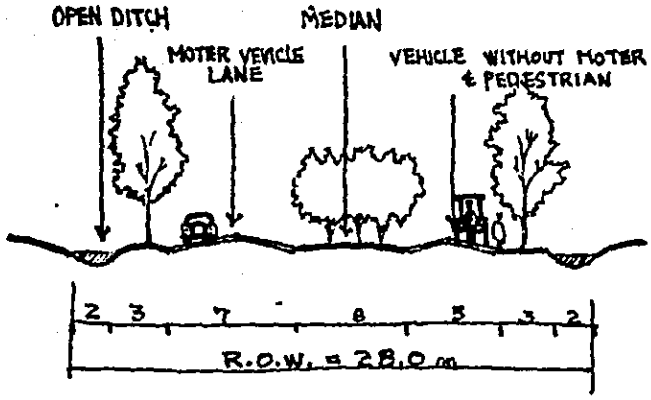
Fig.45



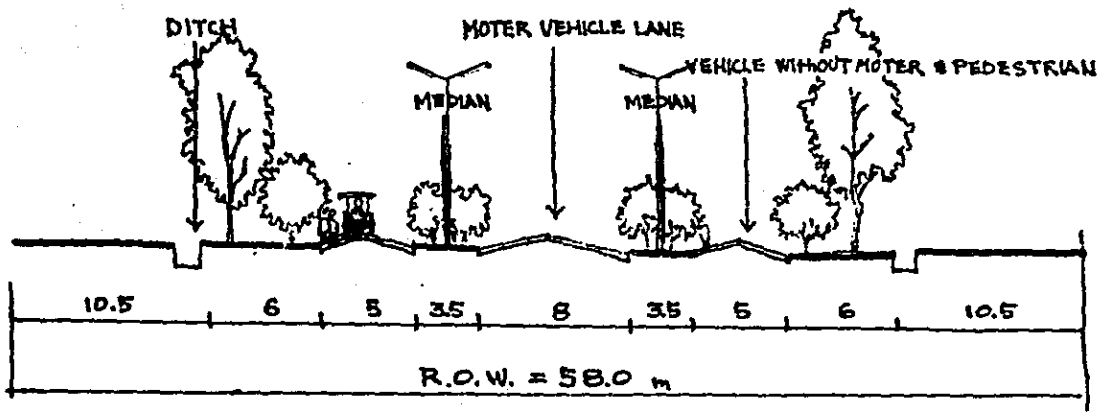
Typical Section of Access Road

Fig. 46

Borobudur :
Access Road



Prambanan :
National High Way (Through the park)



Bypass