

THE GOVERNMENT OF THE REPUBLIC INDONESIA  
MINISTRY OF NATIONAL EDUCATION  
DIRECTORATE GENERAL OF HIGHER EDUCATION  
HASANUDDIN UNIVERSITY

## HASANUDDIN UNIVERSITY ENGINEERING FACULTY DEVELOPMENT PROJECT

JBIC LOAN IP - 541

### CAMPUS MASTER PLAN AT GOWA

Final Report

JUNE 2008

PACIFIC CONSULTANTS INTERNATIONAL  
in association with  
INTEM CONSULTING INC  
PT.CAKRA MANGGILINGAN JAYA  
PT.DUTA HARI MURTHI CONSULTANTS

## Foreword

It has been our great privilege to have participated in Hasanuddin University Engineering Faculty Development Project.

We have now the honour of submitting to the University our Final Report of the Campus Master Plan at Gowa.

We would like to thank the University for the wealth of assistance it has afforded us during the entire period of this Campus Master Plan study. In particular we would like to thank the Project Implementation Unit (PIU) members for their great assistance and guidance.

We look forward sincerely to further opportunities and cooperation between Hasanuddin University and ourselves.

Yours very truly,

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June 2008



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Figure 1. Campus Master Plan





**Figure 2. Bird Eye View Perspective of Gowa Campus**

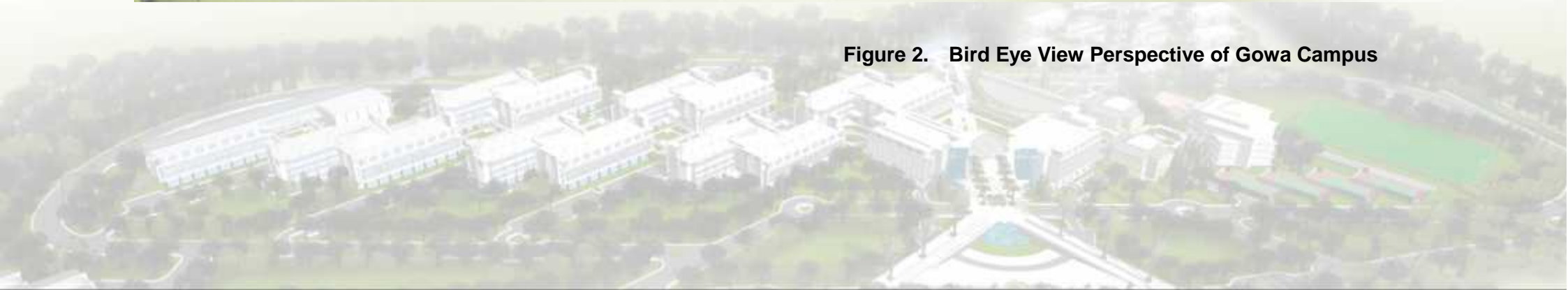




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Figure 4. Landscape Image



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## 1. Introduction

### 1.1 Background of the Project

Indonesia has achieved 7% annual economic growth rate on the average since the late 1960s until 1997, when the Asian Economic and Currency Crisis occurred. After the Crisis, various industries in Indonesia have been requesting to enhance their international competitiveness for further development of the country.

Nowadays, neighbouring countries have established their own strategy so that their industries will be more advantageously positioned in ASEAN region fully conscious of the rising position of China. So Indonesia is also required to have a strategic plan to develop its huge potential in industries such as capital-intensive industry (automobile and two-wheeler industries), labour-intensive industries (textiles), and resource utilization industries (agriculture, palm oil, food processing).

In addition, Economic Partnership Agreement (EPA) also has the role to strengthen the competitiveness of industry through improvement of investment environment such as the liberalization of trade and investment.

After the Crisis, foreign engineering industries have been shifting their products and parts made in Indonesia to export markets to cope with the sharp decrease of domestic demand and to maintain their own production bases established in Indonesia.

Under such circumstances, it is quite important for Indonesia to strengthen domestic engineering supporting industry and its competitiveness to have a high economic growth rate for the development of the country. In such context, engineering human resources are regarded as an indispensable component to sustain engineering supporting industry especially in eastern Indonesia.

Mining & quarrying, and electricity, gas and water sectors are considered to have more potential especially in eastern Indonesia. The fields of engineering human resources demanded by industrial sector are: civil engineer, mechanical engineer, electrical engineer, architect, chemical engineer, environmental engineer, industrial engineer, mining engineer, IT engineer, water supply engineer, distribution pipeline engineer, ship engineer, GIS analyst, naval engineer, port engineer, ocean engineer, marine transportation engineer, etc.

Taking those fields into consideration, the Government of Indonesia has requested the Japanese ODA Loan assistance for the project to enhance and improve the capacity of UNHAS-FE (Hasanuddin University, Faculty of Engineering) in Gowa.



## 1.2 Purposes of Master Plan

The Purpose of the Master Plan is to establish a framework to guide the physical development of UNHAS-FE Gowa campus including the future extension. The quality of education provided in a university campus is in large part affected by the quality of the facilities where pedagogical activities are conducted.

The campus master plan will ensure that the design and future development will be in compliance with UNHAS's academic strategic plan.

## 1.3 Roles of Master Plan

The Campus Master Plan contains a wide array of recommendations that are provided to fulfill the Campus planning requirements. The plan also represents the physical changes that must occur for the campus to expand and accommodate future needs. For the mission of the University to be realized, it is important to determine the key elements that will ultimately enhance the overall campus development. To achieve these roles, the following development policies are critical:

- To allow for orderly expansion of campus in future

To plan for a phased expansion of the campus, the University will need a functional plan. The Campus Master Plan will

need to be developed with the support of the administration staff, faculty, students, and the surrounding community.

- To preserve character of futuristic place image

The futuristic place image of the UNHAS-FE Gowa campus provides a major attraction for a significant number of students and faculty. This futuristic place image must be maintained throughout the planning and implementation stages of the plan.

- To provide basis for budgeted project expansion strategy

The proposed Campus Master Plan will provide a list of potential projects based upon a phased implementation strategy. The estimate of costs and phasing plane sequencing will provide the University with critical financial and budgeting data that is necessary for future planning. Throughout the life of the plan, projects can be evaluated and assigned priorities, as funds become available.

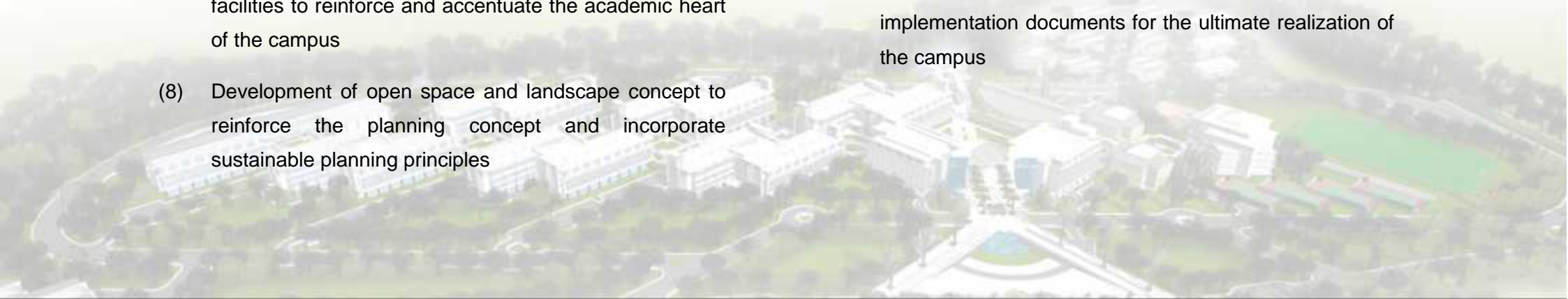
- To adapt to reflect future needs of campus

To be effective, the Campus Master Plan must adapt to the changing conditions and needs of the University. The administrators must be flexible to adjust priorities on an as-needed basis. Periodic reviews and updates of the Master Plan will keep it current and meaningful and ensure that the plan is easily implemented and realistic.

#### 1.4 Scope of Master Plan

The scope of the campus master plan includes the following;

- (1) A strategic review of the University's mission, vision, and aspirations
- (2) A review of academic programs, enrolment patterns and trends
- (3) Development of spatial allocations for and in academic facilities
- (4) A physical analysis of the site and surrounding area
- (5) In depth study of site access, traffic patterns, and circulation within and around the site
- (6) Study of planning strategies and principles used to develop the physical plan for the academic facilities, in accordance with the University's vision
- (7) Development of academic support and campus support facilities to reinforce and accentuate the academic heart of the campus
- (8) Development of open space and landscape concept to reinforce the planning concept and incorporate sustainable planning principles
- (9) An analysis of site utilities, campus energy and resource availability, distribution and use
- (10) A study of the use of responsible and applicable alternate energy sources
- (11) An analysis of security risks, concepts and features to be included in the master plan
- (12) A comprehensive signage and way-finding strategy for the campus
- (13) A study of environmentally responsible means to provide sustainable development
- (14) A cost analysis of the proposed development, including phasing plan, implementation schedule, and cash flow projections
- (15) Development of a set of principles to guide the work of consultants and designers in preparing design and implementation documents for the ultimate realization of the campus





## 2. Planning Context

### 2.1 Mamminasata Master Plan

The project site and its surroundings are going to become a higher educational zone of Metropolis Mamminasata (abbreviation for Makassar, Maros, Sungguminasa, and Takalar, four region which planned to be a development area of South Sulawesi) according to “Kawasan Pendidikan Metro Mamminasata, Tahun 2006-2010”, which is the master development plan of Gowa area by South Sulawesi Government. According to the plan, the area will become intensive in relation to:

- UNHAS Campus II (Engineering Faculty) zone
- UIN Campus II
- Crossing area between arterial road and regional railway track.

#### 2.1.1. Basic Concept of Mamminasata

Metropolis Mamminasata will have strategic functions in the Eastern Indonesian Zone (EIZ). With the infrastructure completion, it will become the centre of industrial services, trading, air transportation, sea transportation, higher education, health and economical development of EIZ.

#### 2.1.2. Physical Area Development

The higher educational zone is one of the growth center zones

in Metropolis Mamminasata. Education facility in this zone will have a primary function, supported by: housing, recreation, etc. The new development of this area will be supported by the future ring road development, which will cross the planning zone.

Active developments in the planning zone are constituted from the effect of the higher education development center:

- Hasanuddin University Engineering Faculty at ex-Paper factory of Gowa.
- UIN Alauddin (Islamic State University) at Romangpolong village.
- Other universities which will be developed their facilities in this zone.

Government regulation to arrange the education facilities into this zone will enhance and accelerate the physical urban development, especially the appropriation of farming land; the zone will become an urban area which supports daily lives of students and university staff.

The development of UNHAS-FE at Gowa ex-paper factory will impact the growth acceleration and functional changes of urban space to surrounding zone, especially with the farming in the south side of the Jeneberang river area. In anticipation of the area development acceleration in that zone, site exploitation arrangements will be necessary. Until 2015, the project site will be an educational area.

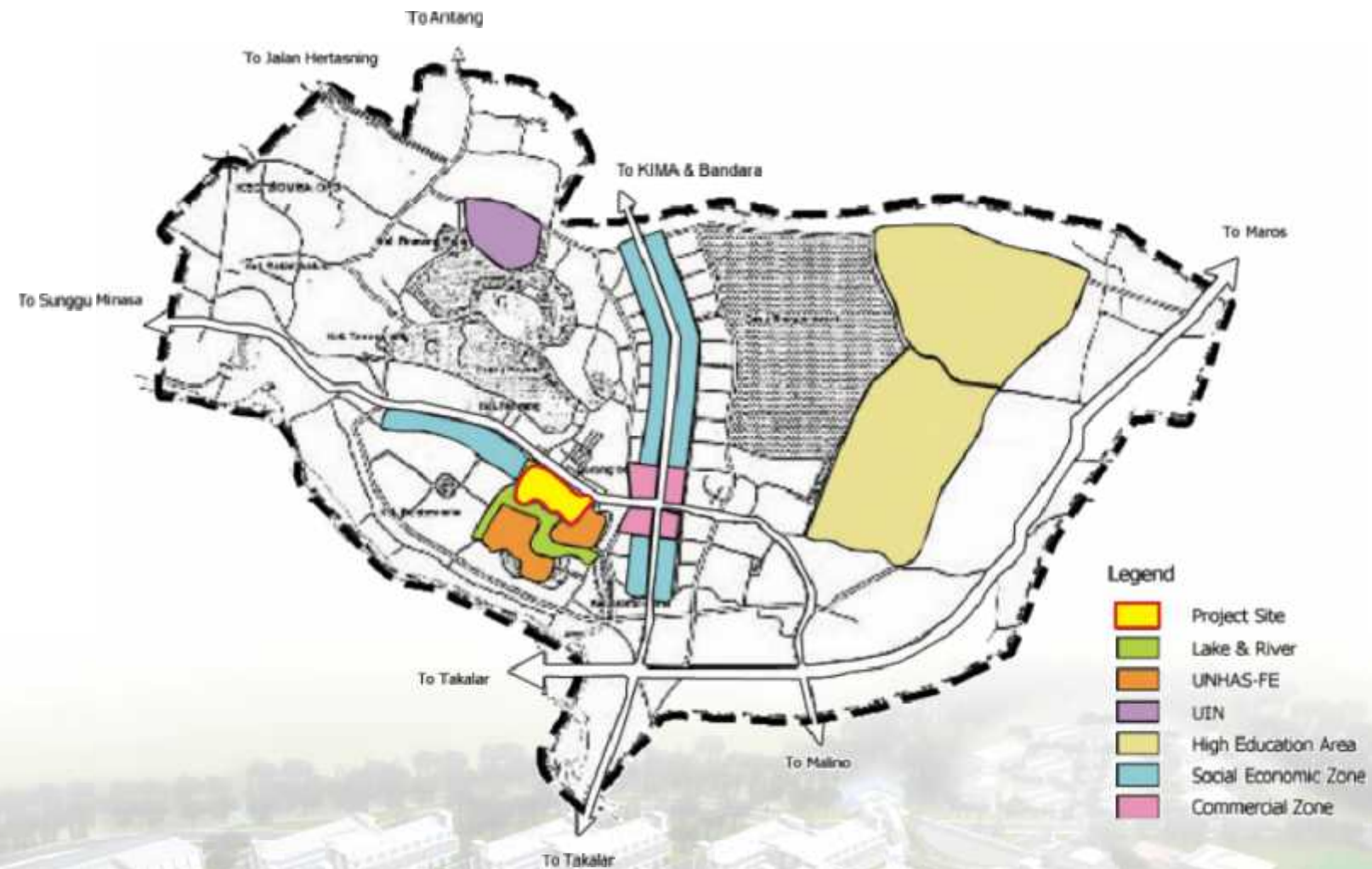


Figure 5. Mamminasata Master Plan



## 2.2 Condition of Project Site

The Project site is located at the ex-paper Factory in Gowa District. It is on the side of Makassar city access road to Malino City. UNHAS had already renovated some buildings which it uses as classrooms and for administration purposes now.

The total area of the project site is 311,740 m<sup>2</sup>, which consists of ex-paper factory of 297,094 m<sup>2</sup> and soccer field of 14,646 m<sup>2</sup>. All of the premises/buildings on the plant location are in bad condition and need to be demolished.



**Photo 1. Existing Ex- Paper Factory**

The boundaries of Gowa campus are:

North: inter-municipality access road Malino

South: paddy farm and river bend of Jeneberang

West: Settlement

East: empty land



**Photo 2. West: Settlement**



**Photo 3. North: Access Road**



**Photo 4. South: Paddy farm and River bend of Jeneberang**





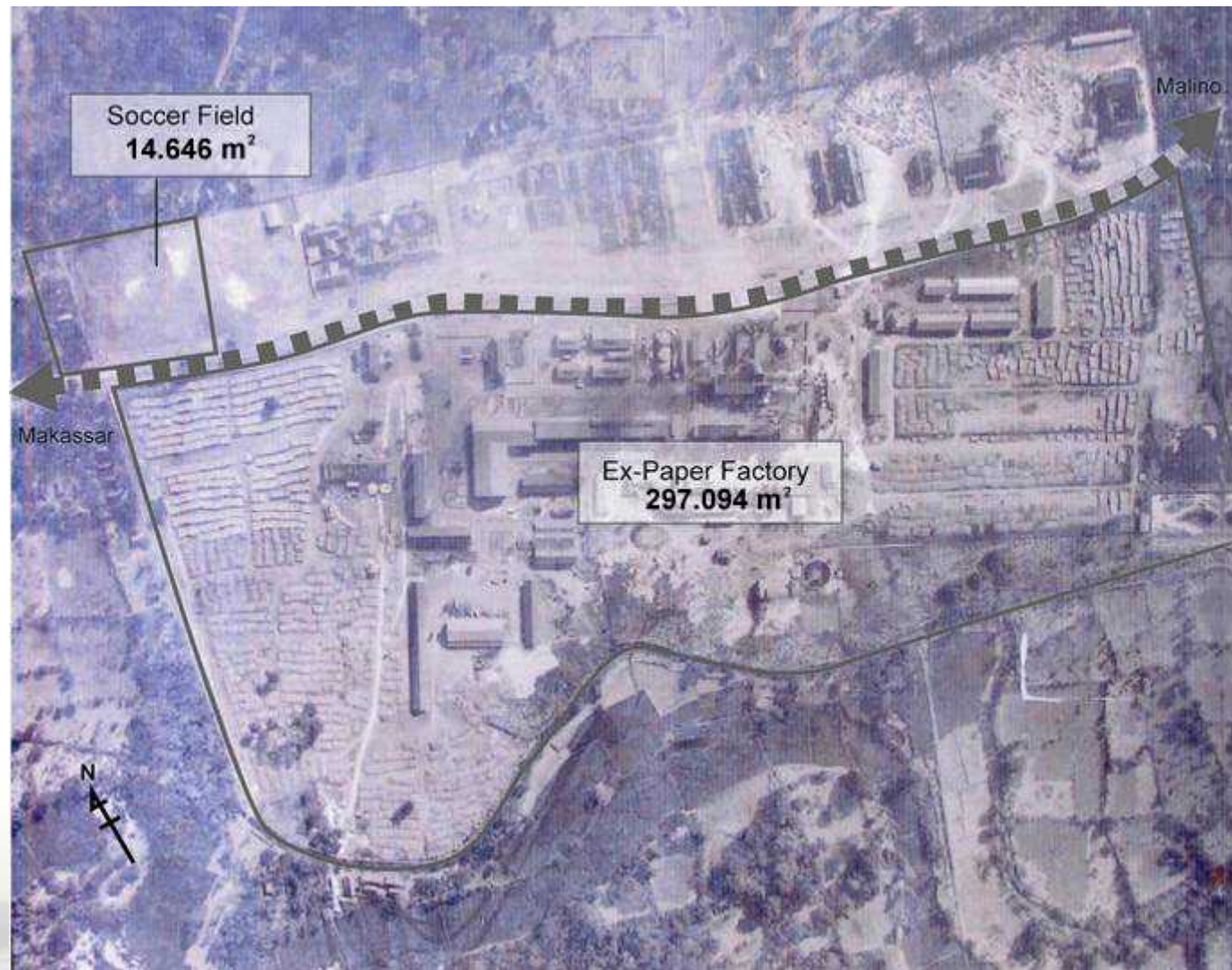


Photo 5. Existing Ex- Paper Factory Site

Source: SAPROF Final Report for UNHAS-FE Development Project, JBIC, November 2006



### 2.2.1 Land Level

Land level of the project site is lower than the front road level and slopes down from northern part (road side) to southern part (river side). However, because of the gap in land level, rainwater from heavy rain may come into the project site, and merge with the existing drainage between the road and the site. In the project site, rainwater drainage should be installed to gather and drain the rainwater to the river.



**Photo 6. Land Level Differences at Front Road and River**

### 2.2.2 Set-back Line

According to Spatial Detail Planning (RDTR) Education Area Metropolitan Mamminasata 2005 base on Regional & Spatial Planning Gowa District (Kabupaten) 2003, free borderline (set-back line) is calculated 10 meters from the road drainage line by IMB (building structure) Regulation.

### 2.2.3 Water Supply

There are two main water supply pipelines in front of the project site: one is primary pipeline with 1,000 mm diameter (debit 1,000 litres/second) and the other is secondary pipeline with 200 mm diameter (debit 300 litres/second). Intake point of water is the main pipeline of PDAM Cabang BorongloE, which runs in front of the project site.

There is no existing deep well in the project site, but there are some deep wells which have around 100 to 150 m depth (debit 5 litres/second) around the site.

### 2.2.4 Power Supply

Around the project site, there are two major power stations: namely the Tello steam generation station in northern part of Makassar City and the Bilibili hydropower station in Gowa district.

Tello power station is composed of coal-fired steam turbines (12.5 MW x 2 units), diesel engines (21.4 MW x 1 unit and 12.5 MW x 4 units) and HSD fired gas turbines (34.4 MW x 2 units). The total capacity is 197.7 MW, but only 116.5 MW or 58.9% of generating capacity was available at the end of April 2005.

Bilibili hydropower station is located about 20 km upstream of the Jeneberang river mouth. The power plants with 20 MW in generating capacity are being installed with JBIC loan.

There are many plants that will open in near future, such as Takalar coal fired power station (2007-08), Jeneponto (Punagaya) coal fired power station-1 (2008-09), Jeneponto coal fired Power station-2 (2009-11), Makea Hydropower (2012), Bonto-batu Hydropower (2012) and Poko Hydropower (2014). The transmission line expansions are also under implementation. The power supply plan for future development of South Sulawesi Province is still on-going.

The intake to the project site of Gowa campus is from PLN Sub Station (Gardu Induk BorongloE), 2 x 10 MVA capacities. There are two main distribution lines in front of the Site: one is primary distribution (medium voltage 20 kV) and other is secondary distribution line (low voltage 380/220 V).

### 2.2.5 Telephone Line

In Gowa and Makassar, subscriber lines are installed to the full exchange capacities. Both capacity utilization in Gowa and Makassar are higher than the country average of 92.3%.

Since 2003, TELKOM has been executing the optical fiber network installation project called the FORMA project (Fiber Optic Ring Makassar). In the project, 69,345 lines of optic fiber are planned to connect the whole Makassar City area.

Further telecommunication network extension depends on the subscriber needs.

### 2.2.6 Condition of Existing Building

Gowa ex-paper factory was established under Government Law (PP) No. 57/1971 dated 8 September 1971. The development of Gowa Paper Factory was financed by the national government and became one production unit of Public Corporation. Head office and factory were located at BorongloE District, Regency of Gowa, South Sulawesi. Pulp production capacity was 16.000 tons per year. Types of Products were non-coated and coated paper. The factory formerly produced 11,000 tons/year and increased it to 52,500 tons/year. Due to lack of working capital and market constraints, the factory was closed in 1992.



**Photo 7. Existing Ex-Paper Factory**



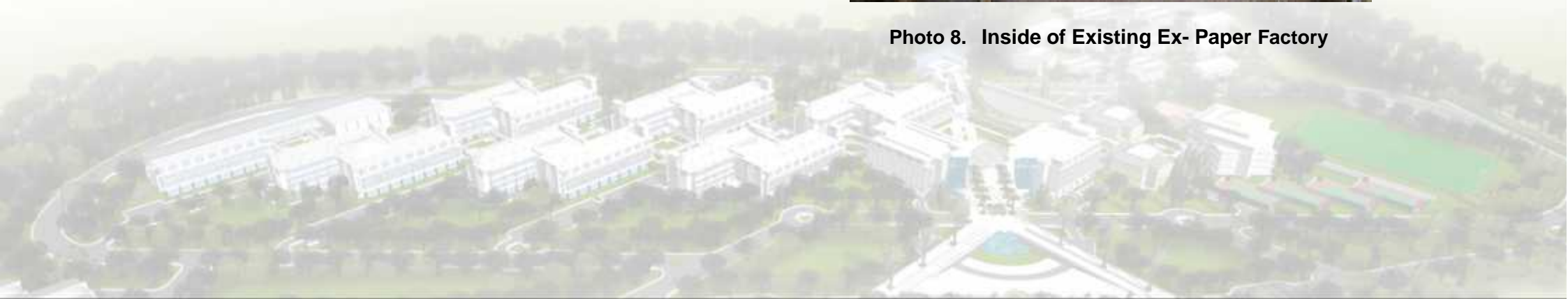
Existing Buildings in the Gowa ex-paper factory, the Project site, are shown below.

**Table 1. The Building Size of Existing Gowa Paper Factory**

| .  | Kind of Building           | Size (m) | Story | Area (m <sup>2</sup> ) |
|----|----------------------------|----------|-------|------------------------|
| 1  | Office of Director         | 30 x 12  | 2     | 720                    |
| 2  | Finishing Room             | 30 x 50  | 1     | 1,500                  |
| 3  | Packing Room               | 40 x 25  | 1     | 1,000                  |
| 4  | Coating Colour Room        | 30 x 50  | 1     | 1,500                  |
| 5  | Mechanical Paper Room      | 30 x 110 | 1     | 3,300                  |
| 6  | Stock Paper Room II, 2Lt   | 13 x 33  | 2     | 858                    |
| 7  | Stock Paper Room I, 3Lt    | 60 x 10  | 3     | 1,800                  |
| 8  | Power Station              | 30 x 20  | 1     | 600                    |
| 9  | Electrical Repair Workshop | 20 x 10  | 1     | 200                    |
| 10 | Boiler                     | 20 x 20  | 1     | 400                    |
| 11 | Water Treatment            | 10 x 10  | 1     | 100                    |
| 12 | Administration Building    | 50 x 12  | 1     | 660                    |



**Photo 8. Inside of Existing Ex- Paper Factory**



Although old paper factory facility is still stands, three of the buildings were renovated by UNHAS-FE in 2004 and are used as follows:

- Administration building (2 stories 720 m<sup>2</sup>)
- Classroom building (single story with 4 classrooms)
- Guest house (single story)



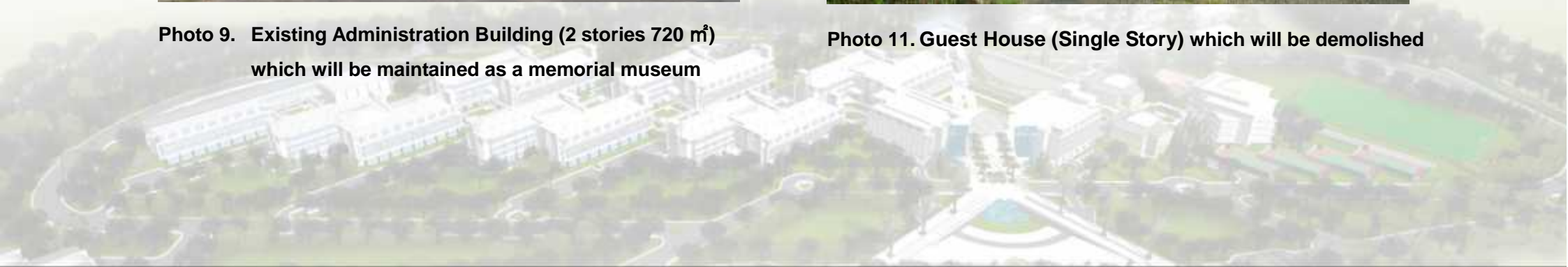
**Photo 10. Classroom Building (single story with 4 classrooms)  
which will be demolished**



**Photo 9. Existing Administration Building (2 stories 720 m<sup>2</sup>)  
which will be maintained as a memorial museum**



**Photo 11. Guest House (Single Story) which will be demolished**





## 2.3 Development Regulation

### 2.3.1 Local Regulations and the Building Codes

The Master Plan of Engineering Faculty of Hasanuddin University was developed according to the Local Regulations and the Building Codes from South Sulawesi Government as follows:

- Rencana Tata Ruang dan Wilayah Metropolitan Mamminasata Tahun 2003 – 2012 (Mamminasata Masterplan 2003 – 2012)
- Rencana Tata Ruang dan Wilayah Kabupaten Gowa Tahun 2003 – 2013 (Masterplan of Gowa 2003 – 2013)
- Peraturan Daerah Provinsi Sulawesi Selatan Nomor 3 Tahun 2005 Tentang Garis Sempadan Jalan. (Set back line regulation of Gowa District Spatial and Detail Plan)
- Lembaran Daerah Kabupaten Gowa Nomor 24 Seri E Tahun 2003, Peraturan Daerah Kabupaten Gowa Nomor 18 Tahun 2003 tentang Rencana Tata Ruang Wilayah Kabupaten Gowa tahun 2003 – 2013. (Paper of Gowa District No: 24 Seri E. 2003 and Gowa District Regulation No. 18 2003 regarding Gowa District Masterplan 2003 – 2013)

- Rencana Detail Tata Ruang Kawasan Pendidikan Metropolitan Mamminasata Kabupaten Gowa tahun 2005 by Dinas Tata Ruang dan Permukiman Provinsi Sulawesi Selatan. (Detail Plan of Educational Zone of Mamminasata Metropolis)

### 2.3.2 Social Consideration for Accessibility

The university campus should secure and maximize accessibility for all possible students and visitors including the disabled and elderly persons by including the concept of “universal design” / “barrier-free design”.

The Master Plan should comply with “Law Number 4 on People with Disabilities (1997), Government Regulation Number 43 on Generating Social Welfare for Disable People (1998)” and “Technical Standard of Accessibility of the Building and Environment (1998)” to ensure that disabled and elderly persons have safe and easy access to the buildings of the university.

Consultation should be conducted with Disabled People’s Organization (DPO) to accommodate with their special needs at each step of the project including master planning, designing, construction, execution, and evaluation.

## 2.4 Social and Natural Environment

### 2.4.1. Local Identity (Features of Local Architecture)

Hasanuddin University is named after an Indonesia national hero “Sultan Hasanuddin”, who was known as a fighter against the Dutch and the Rooster of the East, in the Kingdom of Gowa in the 17th century.

The royal palace of Gowa is a huge rectangular wooden building on stilts, looking over a small park. As seen in the royal palace of Gowa, the traditional houses of South Sulawesi were designed to protect the residents against the wild animals and/or enemies because at that time the environment surrounding it was forest; therefore the floor was raised as high as a two storey house level. Today this type of houses is rarely found in urban area but still exists in the rural area.

### 2.4.2. Memory of Ex- Paper Factory

As one of major factories in this region, many local people received benefits from this factory which was unfortunately closed in 1992. The memory of the glorious days should be kept in the architectural design. The existing administration building will be a memorial museum which exhibits the history of ex-paper factory. The existing Tugu Ayam will be preserved at the same location.



Photo 12. Royal Palace of Gowa



Photo 13. Ex- Paper Factory



### **3. Vision of New Campus**

#### **3.1 Cultivate Community Partnerships**

This campus will align itself with the surrounding community and its economic and workforce initiatives. There is an inherent bond between Mamminasata or Gowa region and the UNHAS-FE. This master plan cultivates community partnerships that benefit the University while positioning one of the community's greatest public facilities such as library, auditorium and sports facilities.

#### **3.2 Maximize a Compact Campus**

Although each zone is clearly separated by functions, almost the entire campus is within a 10 minute walk on the pedestrian deck. The center court of the campus is located at the intersection of the center mall and the campus mall. These simple and clear circulation systems maximize a compact campus.

#### **3.3 Clarify Circulation**

It is planned creation of safe and comfortable/pleasant campus giving priority to the pedestrians. Clear separation of vehicle and pedestrian flow is planned by providing pedestrian precinct center mall and campus mall, which are main features for pedestrians' safety, on raised pedestrian deck and by limiting

vehicle circulation on the ground level. Also, the parking area is planned nearby each building for convenience.

#### **3.4 Establish a Strong Campus Identity**

This campus will not only act as technology stimulating space for the students, but also showcase exhibits of the latest works of researchers and students for external visitors to the UNHAS-FE. The showcase will enhance interrelationships with the industry and at the same time, provide incentives to the students in research activities. To establish a strong landmark identity in the neighborhood and also act as an element constituting campus gate, distinctive lontara trees and twin towers as "showcase" will be constructed with the center of technology (COT) and the library buildings on the axis of 6 lontara trees.

#### **3.5 Create an Eco-Campus**

In the development of the design including selection of mechanical and electrical equipment, utmost consideration of the environment and energy efficiency will be made to achieve eco-friendly and economical campus, for example: orientation of buildings, passive cooling, natural lighting, building heights and façade design.



## **4. Planning Principles**

### **4.1 Beautiful Campus**

The campus will have well landscaped courtyards and gardens with substantial tree canopies which connecting to the public zone and the academic zone, center court will become the signature campus open space landscaped by amphitheater and water fountain. 6 lontana trees are symbolized on the axis of the center mall at the entrance gate.

### **4.2 Walking Campus**

The campus will be free of vehicular traffic in the public and academic zones with the elevated pedestrian walkways that will provide convenient, safe connections to all areas. Combined with hard and soft landscaping, this elevated pedestrian walkway will encourage walking and enhance the moving through the campus spaces.

### **4.3 Architecturally Distinctive Campus**

The campus identity will be enhanced by architectural and landscape gateway features at key pedestrian and vehicular campus entrances. It will be comprised of buildings which are at the latest technology and modern design. Overall, the buildings will be an ensemble reflecting a unique blend of modern and regional design elements.

### **4.4 Safe and Secure Campus**

Facilities and activities will be expanded into whole campus. In particular, proposed raised pedestrian walkway will receive special attention to ensure safety and security with a limited access control at certain points at night. It is suggested that the University prepares a “safety and security” audit of each facility as it is being designed to ensure buildings respond to the safety concerns of the campus community. In addition, it is recommended that the University cooperates with neighborhood and areas around the campus to coordinate activities to enhance the safety and security along the edges of campus.

### **4.5 Sustainable Campus Neighborhood**

Ways to encourage the use of public transportation will be one of the best solutions to improve the campus environment and reducing the number of parking space for the private cars and motor cycles. In addition, the development of dormitories and apartments in campus and the housing and commercial development to the north will promote close living conditions in which faculty, students and staff can live within walking distance of the campus, and also promote the commercial activities and supporting services. These will make a true neighborhood atmosphere as a sustainable campus.



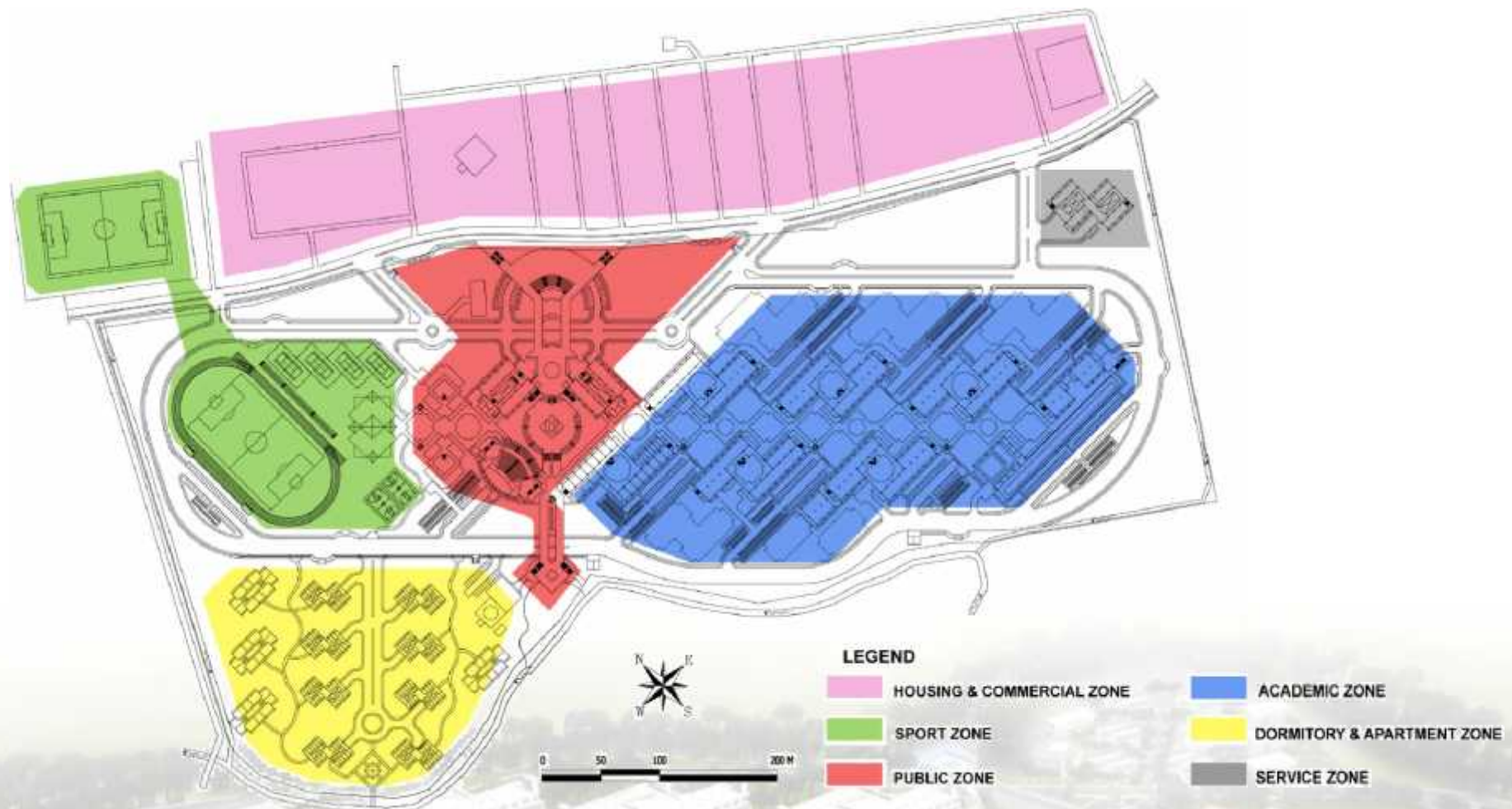


Figure 6. Site Zoning



**LEGEND**

|   |   |   |
|---|---|---|
| <span style="background-color: #FFD700; border: 1px solid black; display: inline-block; width: 20px; height: 10px;"></span> CENTRAL OF TECHNOLOGY / DEAN OFFICE | <span style="background-color: #FFD700; border: 1px solid black; display: inline-block; width: 20px; height: 10px;"></span> DEPARTMENT LABORATORY | <span style="background-color: #008000; border: 1px solid black; display: inline-block; width: 20px; height: 10px;"></span> MUSEUM    |
| <span style="background-color: #00BFFF; border: 1px solid black; display: inline-block; width: 20px; height: 10px;"></span> CLASS ROOM                          | <span style="background-color: #FF0000; border: 1px solid black; display: inline-block; width: 20px; height: 10px;"></span> COMMON USE            | <span style="background-color: #808080; border: 1px solid black; display: inline-block; width: 20px; height: 10px;"></span> WORKSHOP  |
| <span style="background-color: #FF00FF; border: 1px solid black; display: inline-block; width: 20px; height: 10px;"></span> DORMITORY & APARTMENT               | 1. LIBRARY  | <span style="background-color: #FFFF00; border: 1px solid black; display: inline-block; width: 20px; height: 10px;"></span> TUGU AYAM |
|   | 2. AUDITORIUM   |   |
|   | 3. STUDENT CENTER   |   |
|   | 4. CANTEEN  |   |
|   | 5. SPORT HALL   |   |

Figure 7. Layout of Building Function



## 5. Campus Zoning and Land Use Concept

The site area has been divided into five zones.

- 1) Public Zone
- 2) Academic Zone
- 3) Sports and Recreation Zone
- 4) Residential Zone
- 5) Housing and Commercial Zone

### 5.1 Public Zone

Since the area surrounding the main access to the campus is the face of UNHAS-FE that will attract and catering to many visitors. In addition to UNHAS-FE students, faculty and staff, this area will be zoned as “**Public Zone**” where center of technology (COT), library, auditorium, public services and student center buildings, etc will be placed.

**COT**, which is a symbolic facility for industry-university cooperation is planned nearby the entrance gate as a face of the Campus. At the same time, **Common Use Facilities** such as library, auditorium, are planned in the area surrounding the Center Court. Also, **Public Service** building including main canteen and student center building are planned in the area west of campus mall.

### Public Zone Components

| Building Name                               | Component included                |
|---|-----------------------------------|
| Center of Technology & Dean office Building | Dean Office                       |
|   | Center of Technology              |
| Library                                     | Library                           |
|   | Computer Center                   |
|   | Lecture Theater                   |
|   | Laboratory for Basic Science      |
| Auditorium                                  | Indoor Auditorium                 |
| Public Service Building                     | Public Service                    |
|   | Main Canteen                      |
| Students Center                             | Student Center                    |
|   | Student Supporting Service Center |



## 5.2 Academic Zone

East of Public Zone will be zoned as “Academic Zone” where common classroom building and 6 department laboratory buildings will be placed. Also, open spaces behind 6 department laboratory buildings are the future extension areas where future laboratory buildings will be planned.

Classroom Building is planned in the area facing to the Center Court where an entrance to Academic zone is located. The Laboratory Buildings for each department are planned in the east area of common classroom building. We proposed self-contained components which consist of building and equipment for each department of UNHAS-FE. Each department component has lecturers’ rooms, laboratories and administration as well as the required equipment and furniture.

From the viewpoint of campus management, this planning concept makes university’s activities smooth and promotes each department’s uniqueness. Individual department buildings are linked to each other by the Campus Mall.

### Academic Zone Components

| Department             | Study Program  | Facilities   |
|------------------------|--|--|
| Architecture           | Architecture<br>Regional & City Planning   | Laboratories<br>Administration<br>Lecturers Rooms<br>Drawing Studios/<br>Work Shop |
| Civil Engineering      | Civil Engineering  | Laboratories<br>Administration<br>Lecturers Rooms                                  |
| Electrical Engineering | Electrical Engineering<br>Informatics Engineering                                    | Laboratories<br>Administration<br>Lecturers Rooms                                  |
| Mechanical Engineering | Industrial Engineering<br>Mechanical Engineering                                     | Laboratories<br>Administration<br>Lecturers Rooms                                  |
| Naval Architecture     | Ship Building & Design Engineering<br>Ocean Engineering<br>Marine System Engineering | Laboratories<br>Administration<br>Lecturers Rooms                                  |
| Geology                | Geology<br>Mining Engineering  | Laboratories<br>Administration<br>Lecturers Rooms                                  |



### 5.3 Sports and Recreation Zone

The west area of Public Zone, including the land located across the main access road will be zoned as “Sports Zone”. Sports hall will be planned in the west end of campus mall. 400m track field including a soccer field, 4 tennis courts and 2 basketball courts, will be planned in the area surrounding the sports hall. Another soccer court is planned in the area across the road.

### 5.4 Residential Zone

Residential zone for dormitories and apartments are located at the south-west side of the campus along the irrigation creek. The 8 dormitory buildings consist of 640 rooms for 1,280 single students. The 3 apartment buildings consist of 210 rooms for the married students and the 1 apartment building consists of 50 rooms for the faculties.

### 5.5 Housing and Commercial Zone

The Master Plan includes the proposal to expand the campus toward the north-east. This expansion of approximately 9.3 ha is for the faculty housing behind the commercial development areas along Jl. Borongro E, Kabupaten Gowa.

## 6. Main Facility Planning

### 6.1 Raised Pedestrian Deck Walkway

The creation of a safe and comfortable pleasant campus is planned giving priority to the pedestrians. Clear separation of vehicle and pedestrian flow is planned by providing pedestrian precinct malls which are a main feature for pedestrian safety on the raised pedestrian deck walkway.

This unique idea came from the level difference between the campus site and the adjacent road. The average height of the campus site is approximately 3m lower than the adjacent road at the campus entrance area.

Taking this as an advantage, the raised pedestrian deck walkway was introduced on the vertical (north-south) axis, which is named as “Center Mall”, from the access road through the Campus Gate towards the Center Court, and the horizontal (east-west) axis, which is named “Campus Mall”, from the Sports Hall through the Center Court towards the department laboratory buildings.

The small square called “Front Garden” is planned under the campus mall pedestrian deck in order to create a pleasant surrounding environment.



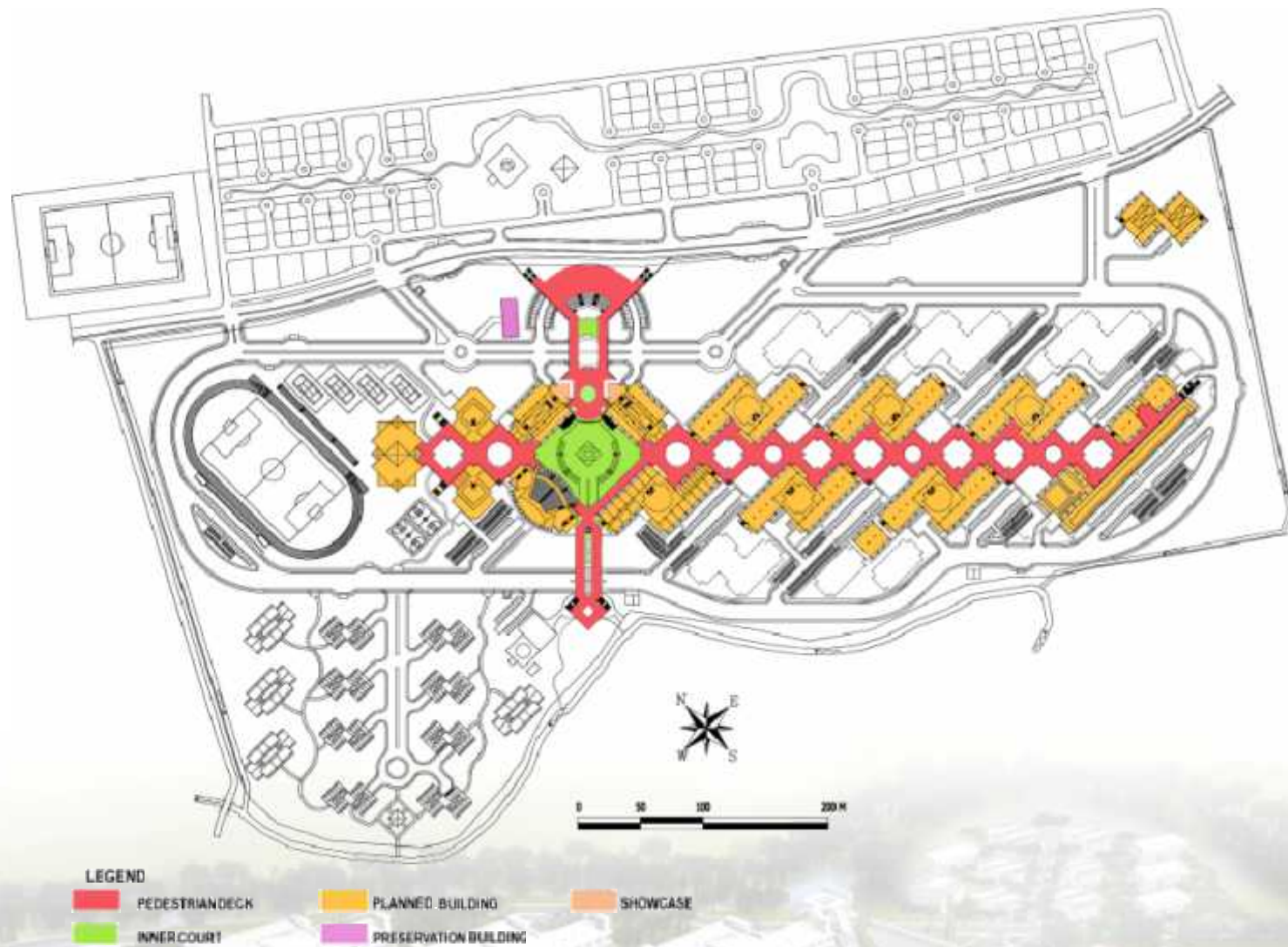


Figure 8. Pedestrian Deck Layout



## 6.2 Main Entrance Gate and Showcases

The main entrance gate is symbolized by a pond with amphitheater, 6 lontara trees and two glass towers. The functions of the monumental towers are exhibition showcases of the latest works of students and lecturers. The showcases will become message towers and promote industries business in this region.

Showcases are a presentation space provided for engineering research and education activities within UNHAS-FE. Each department has an independent showcase to express its engineering result not only for researchers and students but also for the industrial sector and the public. Through showcase activities UNHAS-FE will stimulate competence and uniqueness. Thus the principal showcase is allocated to the Center of Technology & Dean Office Building which is located at the most symbolic place of the campus.



**Figure 9. Entrance Gate – Twin Showcase Tower with 6 Lontara trees**



### 6.3 Center of Technology (COT)

Center of Technology (COT) is a system to promote linkage and collaboration among UNHAS-FE, industrial sector, other universities and other academic institutions. COT has its own organization and collects information about UNHAS-FE's research activities.

COT is located with Dean Office in the tallest building at the entrance of center court, which is most important place for the public linkage.

Its facility consists of dean office, collaborating laboratories and meeting rooms as well as showcase. The function and major features of Showcases are described below. By establishing COT, the role of UNHAS-FE as key engineering institute for eastern Indonesia will be activated.



**Figure 10. Center of Technology (COT)**





#### 6.4 Identities of Department Laboratories

The UNHAS-FE Campus is projected an appropriate identity and image of "futuristic and traditional". And also the department laboratory buildings are being created so as to have a special identity of them own. The components of these design policies will create an attractive campus with an identity and a sense of unity.

Embodiment of the department identities is as follows,

##### Architecture:

Traditional style of Gowa such as Independent Column

##### Civil Engineering:

Dynamic Structure

##### Mechanical Engineering:

Machine Technology such as Transparent Elevator

##### Electrical Engineering:

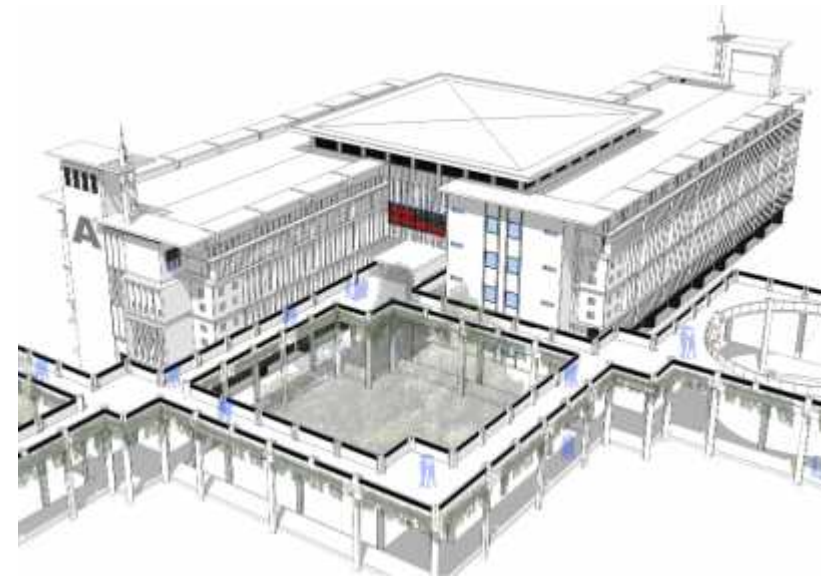
Energy Conservation Technology such as solar panel

##### Naval Architecture:

Marine Technology such as Shipbuilding

##### Geology:

Rock Strata Walls



**Figure 11. Architecture Department Laboratory**



## 6.5 General Facade Concept

Façade design is based on the following 5 concepts:

1. Research based campus
2. Originality secured by integrating futuristic design and Traditional design
3. The expression of the common identity as a UNHAS and separate identity of each Department.
4. Eco and green campus
5. Easy operation and free maintenance

### 6.5.1 Façade of Entrance Gate and Common Facilities

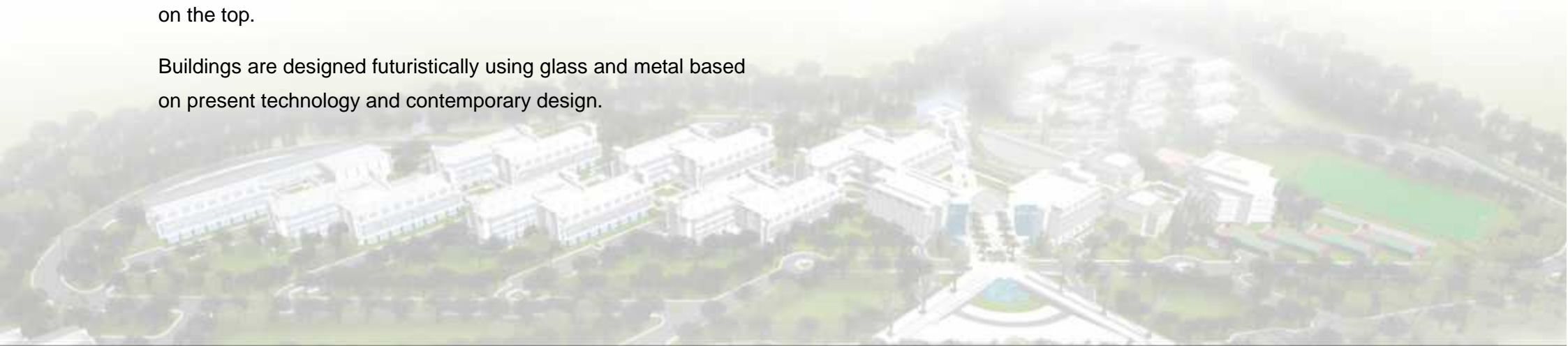
Center of Technology building (COT) and Library building are located at the main entrance of this site. Two buildings have the same façade and thus form an “Entrance Gate”.

Especially, the showcases, the front-most part of the buildings, are highest in all facilities and form “Twin Tower” with big canopy on the top.

Buildings are designed futuristically using glass and metal based on present technology and contemporary design.



**Figure 12. Façade of COT building**





### 6.5.2 Facade of Department Buildings

The connection of department buildings and pedestrian deck on first floor is particularly noteworthy. Since the vertical direction is divided by pedestrian deck, it changes the expression, similar to using marble stone on the ground floor.

The louver is not only a sunlight shade but also a main design motif. It enables a rhythmical arrangement changing the pitch occasionally. Also it establishes vertical lines in consideration of maintenance load reduction.

Moreover design will be modified partially before establishing the identity of each department, although the basic system is same.



Figure 13. Façade of Department Building



## 6.6 Existing Administration Building and Tugu Ayam

Existing administration building will be renovated and utilizing as a museum for the new campus. The history and the tradition of UNHAS-FE will be memorized in this preserved building.

The existing Tugu Ayam will be preserved at the same location and symbolized in a roundabout on the axis of access road.



Photo 14. Existing Administration building (2 stories 720 m<sup>2</sup>)



Photo 15. Existing Tugu Ayam



## 7. Eco-Campus Design Principle

In the development of the design, including selection of mechanical and electrical equipment, utmost consideration of the environmental and energy efficiency will be made to achieve eco-friendly and economical campus.

### 7.1 Orientation of the Buildings

The buildings shall be carefully oriented and designed to maximize utilization of the natural climatic benefits of the project site, and to produce innovative design that will optimize the use of natural wind, daylight and temperature swings, reducing reliance on mechanical and electrical systems, thereby saving resources and reducing emission of greenhouse gases.

The building façades shall also provide the interiors with good luminous environments that emphasize shading glaze facades while promoting uniform daylight contribution integrated with interior electric lighting and without blocking view to outdoors.

These considerations are reflected in the building layout and the most of the longitudinal building façades with windows that are oriented north-south, instead of east-west. It should also be noted that this building orientation makes the open spaces well ventilated by the pleasant ocean wind from west.

### 7.2 Passive Cooling and Atrium

Passive cooling covers design features to cool buildings naturally. In addition to the above-described tropical design principles, other possible design methods for passive cooling will be

adopted after calculations.

Double-skin wall and/or deep louver will be adopted on exposed surfaces of the buildings to reduce negative effect of solar radiation, to create shaded space and to enhance natural ventilation inside the buildings.

Traditionally, creating courtyard with pergola or trees provides a shaded and comfortable open space to allow outside activities. Introducing this courtyard concept into the building interior space, open inner courtyard the so called “atrium” can also be an effective solution for providing shaded and comfortable open space to allow inside activities. The Atrium provides excellent ventilation by chimney effect which exhausts hotter air from inside and intakes colder air from outside through outside windows facing towards the atrium. These solutions will contribute to energy saving for the buildings.

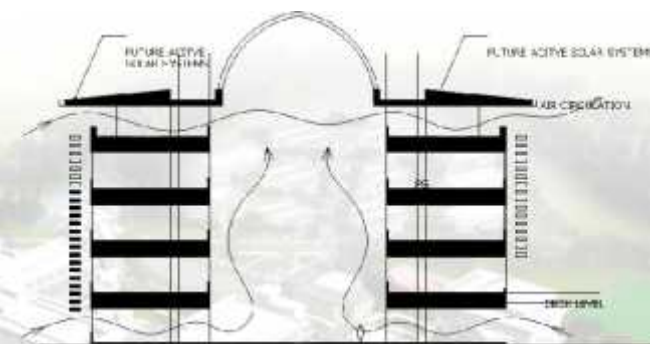


Figure 14. Conceptual Section of Department Laboratory Building

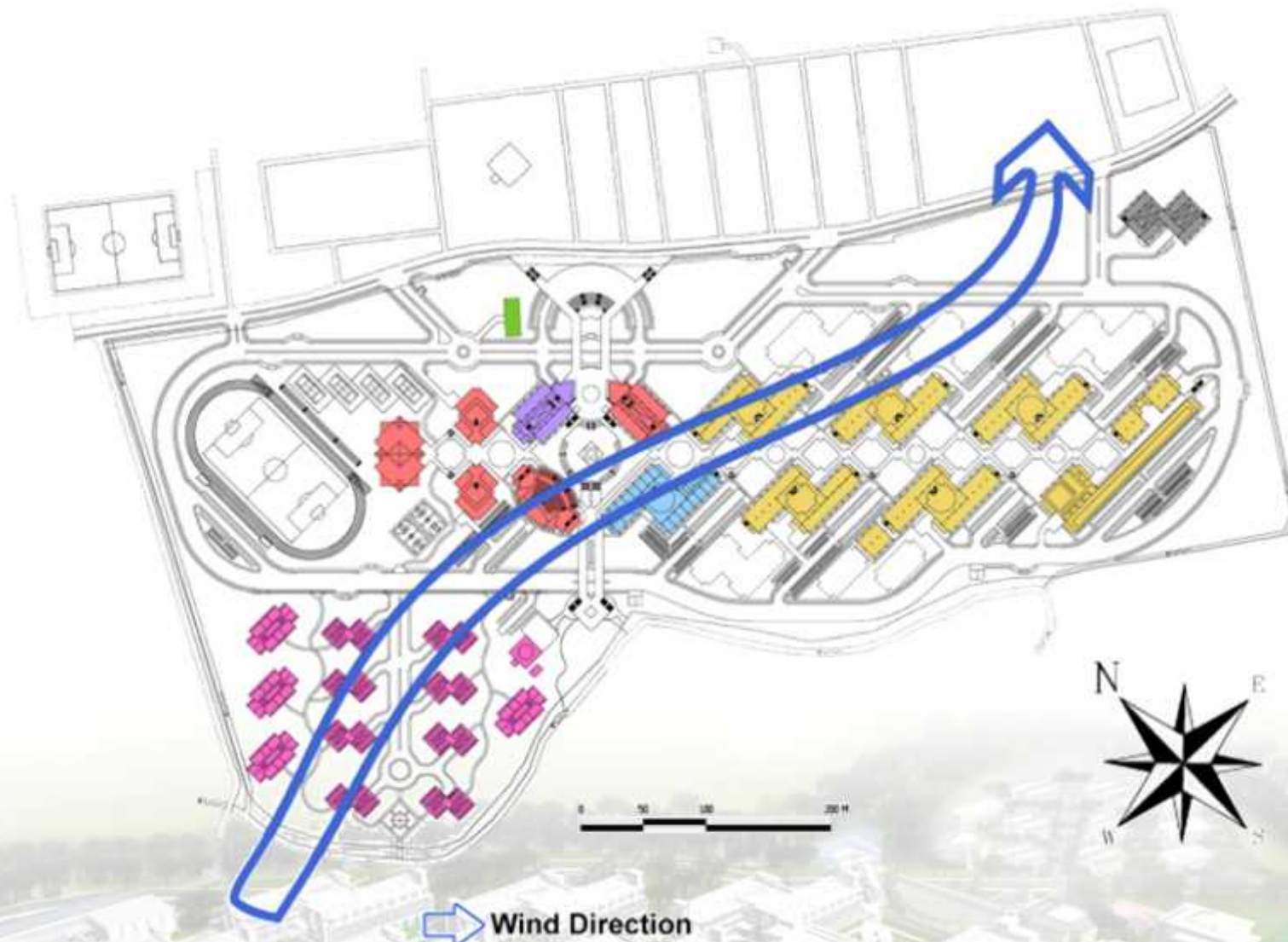


Figure 15. Orientation of the Buildings

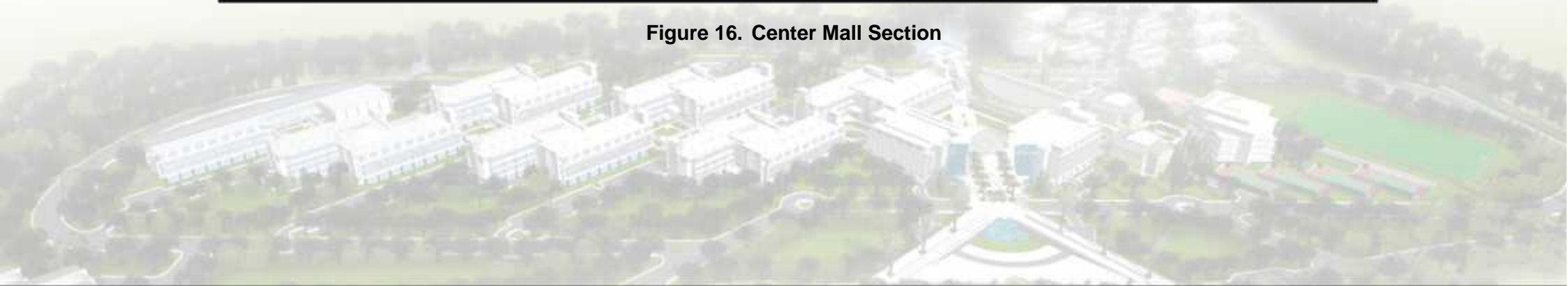


### 7.3 Building Heights

Any building without elevators should not exceed 4 levels above the entrance level. The highest buildings such as COT, library and classroom buildings have 4 levels above the entrance level on the pedestrian deck. The department laboratory buildings have 2 or 3 levels above the entrance level on the pedestrian deck.



Figure 16. Center Mall Section



## 8. Landscape and Aesthetic Features

### 8.1 Landscape Plan

Landscape plan will be strategically designed not only for aesthetics but also for the environment. Landscaping strategies for this purpose shall include the following:

- Selection of local plants : conservation of nature and biotic diversification, and easy maintenance
- Shading by trees : protection from direct sunlight, reduction of temperature, reduction of ecological load, and energy conservation
- Lawn on the grounds : protection from ground heat, and reduction of hot temperature
- Appropriate paving materials : avoiding increase of ground temperature
- Open space : providing a comfortable gathering and meeting space that can allow outside activities and enhance communication
- Landmarks and identity features : a way-finding system for pedestrians, bicycles and vehicle movements through campus

### 8.2 Existing Trees and Planting Concepts

The landscape concepts are to make the modern technological campus more green and shaded as well as a good environmental system by increasing the planting species and conserving rare plants and indigenous plants of Sulawesi Island.

The indigenous trees (original trees of Sulawesi island) and some rare plantation will be put in an “arboretum” as a gallery of original Sulawesi plantation. This gallery will be placed adjacent to the entrance area as added value for the campus which gives special attention in conservation of local vegetation.

Based on examination of existing project site, three kinds of actions that will be made for landscape works:

1. Maintain some special species of plantation (especially endemic plantation of Makassar or Sulawesi Island) such as Lontara trees which have a historical story of Makassar.
2. Propose some trees to be discussed with users prior to implementation.
3. Remove the trees which are not special species or cause interference by its location to the building area.



Figure 17. Existing Trees



### 8.3 Open Spaces and Aesthetic Features

#### Open Spaces and Identity

Open spaces such as well landscaped courtyards and gardens with substantial tree canopies provide comfortable gathering spaces that can allow outside activities.

The center court will become the signature of the open space campus landscaped by water fountain, amphitheater and substantial tree canopies.

The small courts under the raised pedestrian deck in the campus mall area will be the private gardens and outside exhibition spaces for 6 department laboratories. Identical features will be provided with small trees, bush, grass and bench for sitting; therefore, it will become a place of social interaction for students and staff.

These landmarks and identical features will also be a part of the way-finding system for pedestrians, bicycles and vehicle movements through the campus

#### Main Campus Entrance and Dignity

Main campus entrance has to be a spacious and dignified area which is emphasized by the Center Mall axis with 6 lontara trees on the raised pedestrian deck. It will represent the whole campus environment; therefore, this area will be

provided with planter boxes filled by small plantation to achieve transparent space.

#### Parking Lots

The parking lots should be aesthetically provided with umbrella shape of trees to make a shaded environment for vehicles. Moreover, in consideration with the heat island effect of the entire campus and global warming, the vast area of the parking lots should be paved by appropriate paving materials such as water absorbable blocks or grass combined blocks to protect from ground heat.

#### Other Open Spaces

Other open spaces along the ring road which connects all of buildings as a semi public area needs to be treated by providing plantation such as big trees, bushes and grass for ground cover, in order to achieve a shaded and comfortable environment.

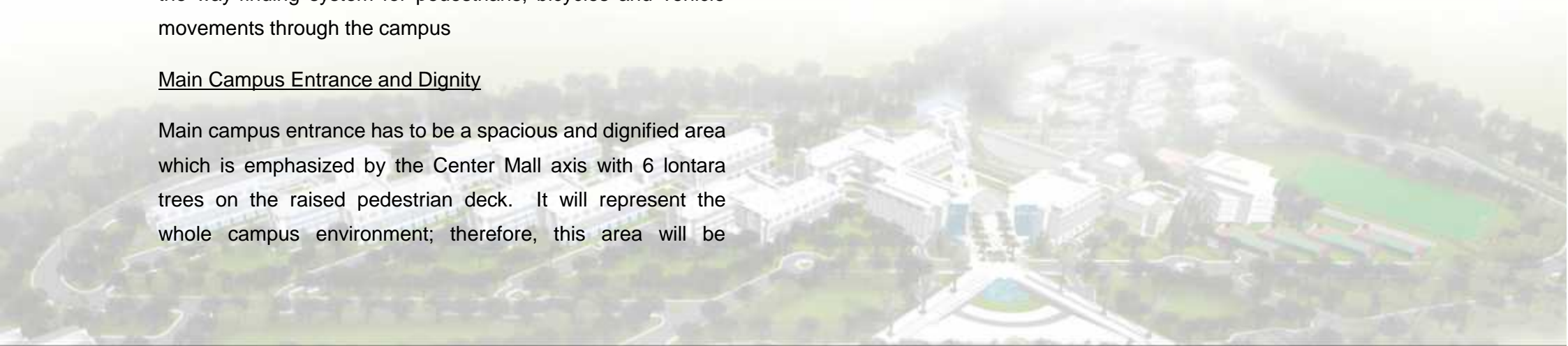




Figure 18. Green and Water Network

## 9. Circulation and Transportation Plan

The circulation and transportation plan for UNHAS-FE campus provides for pedestrian and vehicle connectivity and efficient access to all campus areas for a wide range of users such as students, teachers, researchers, and maintenance service staff as well as the public. The circulation and transportation plan is based on the following major objectives:

- A clear hierarchy of vehicular movement to ensure the smooth flow of traffic and the safety of the road user
- Optimum separation of vehicles and pedestrians
- The provision of adequate car parking facilities close to area of demand

### 9.1 Circulation Plan

#### 9.1.1 Access Gates

The main access road for UNHAS-FE campus is Inter-municipality road access to Malino.

5 access gates, including 2 main car access gates, 1 main pedestrian gate and 2 service gates, for the campus are allocated on north boundary along with the main access road.

Because of the expected high vehicle movement into the

campus, grade separated junctions are recommended. If this has political and maintenance issues of local government, traffic signals will also be considered as an alternative solution.

At the main pedestrian gate, clear separation of vehicle and pedestrian flow is planned by providing a raised pedestrian deck over the inner ring road.

#### 9.1.2 Circulation Systems

Four categories of circulation systems

##### Center Mall and Campus Mall:

Exclusive use of pedestrian only on raised pedestrian deck

##### Ground Level Pedestrian and Vehicles Network:

Ground level pedestrian walkway under raised pedestrian deck and partial use of maintenance and service vehicles

##### Inner Ring Road:

Formal vehicular access for main entrance and parking lot under raised pedestrian deck at main entrance

##### Outer Ring Road:

Vehicular access for Parking Lots along Outer Ring Road and for Maintenance and Service



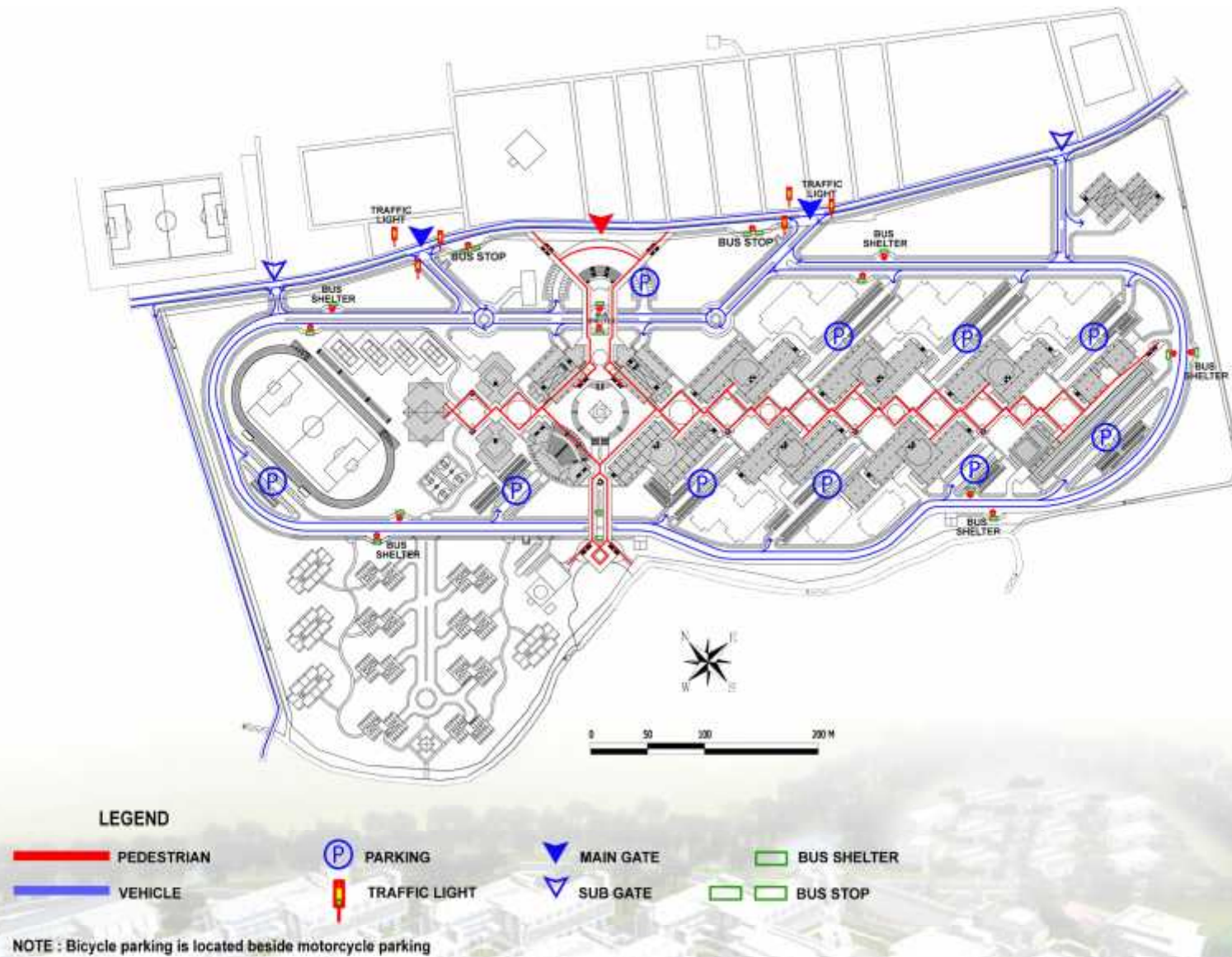


Figure 19. Access, Circulation and Parking

## 9.2 Pedestrian Network

Creation of a safe and comfortable pleasant campus is planned giving priority to pedestrians. Clear separation of vehicle and pedestrian flow is planned by providing a pedestrian precinct mall which is a main feature for pedestrian safety on the raised pedestrian deck walkway.

The major pedestrian network is developed on the center mall from the access road through the main pedestrian gate towards the center court, and also on the Campus Mall from the Sports Hall through the center court towards the department laboratory buildings.

## 9.3 Bicycle Network

Bicycle routes and bicycle parking locations are located along outer ring road which will connect each zone of the campus. To encourage the use of bicycles, rent-free-bicycle is recommended to promote the use of bicycles.

## 9.4 Car and Motorcycle Parking Requirement

The basic concept of car and motorcycle parking is to provide adequate car parking facilities close to area of demand.

| NO | BUILDING                   | CAR | MOTORCYCLE |
|----|----------------------------|-----|------------|
| 1  | COT & Library              | 78  | 112        |
| 2  | Class room                 | 36  | 192        |
| 3  | Student center, auditorium | 31  | 216        |
| 4  | Architecture Eng Dept      | 32  | 216        |
| 5  | Civil Eng Dept             | 29  | 196        |
| 6  | Electrical Eng Dept        | 34  | 112        |
| 7  | Mechanical Eng Dept        | 32  | 216        |
| 8  | Naval Arch Dept            | 86  | 185        |
| 9  | Geology Eng Dept           | 33  | 160        |
| 10 | Sport area                 | 53  | 56         |
| 11 | Work shop                  | 5   | -          |
|    | TOTAL                      | 449 | 1.661      |

## 9.5 Public Transportations

To reach the campus from the center of Makassar city, there are several kinds of public transportation such as intercity bus, mini bus (pete-pete) which provides transportation from Makasar to Malino. Local transportation inside the campus area will be served by campus bus service. The route will be the inner ring road inside the campus area. Bus shelters will be provided at points to make it easy for students and visitors to access the buildings from many directions.

The taxi stands will be located at the main pedestrian gate.

## 10. Infrastructure Planning

### 10.1 Power Supply and Distribution Systems

Codes and Standards of electrical works:

1. Persyaratan Umum Instalasi Listrik 2000 (PUIL 2000), SNI 04-0225-2000.
2. Konservasi Energi Sistem Pencahayaan pada Bangunan Gedung, SNI 03-6197-2000.
3. Tata Cara Perancangan Deteksi dan Alarm Kebakaran untuk Pencegahan Bahaya Kebakaran pada Bangunan Gedung, SNI 03-3985-2000.
4. Sistem Proteksi Petir Pada Bangunan Gedung, SNI 03-7015-2004.
5. International Electrotechnical Commission (IEC).
6. Japan Industrial Standard (JIS).
7. Verband Deutscher Elektrotechniker (VDE).
8. Other related Standards and Codes.

According to the Engineer's estimation of electrical power consumption for the entire campus required 12 MVA (peak demand power), 300MWh/month (peak load time) and 1,500MWh/month (unpeak load time).

### Power Source and Distribution Systems:

1. Power source from PLN line and relay station near project site. Under normal conditions the supply will be 20 KV and stepped down into 220/230 V by power transformer.
2. Back up Power will be supplied from Generator Set in case of PLN failure and the voltages are 220 / 230 V.
3. Distribution of medium voltage from PLN relay station to Sub Station by underground medium voltage cable (XLPE cable).
4. Distribution of Low Voltage from sub station to buildings by underground low voltage cable (NYFGBY).

### Cable installation Systems:

1. Medium voltage cable feeder from PLN Substation to Power house shall be armored XLPE and buried directly underground.
2. Low voltage cable feeder from Power house to each building shall be NYFGBY and also buried directly underground.
3. Cable installation inside building shall be NYA inserting inside uPVC high impact conduit.



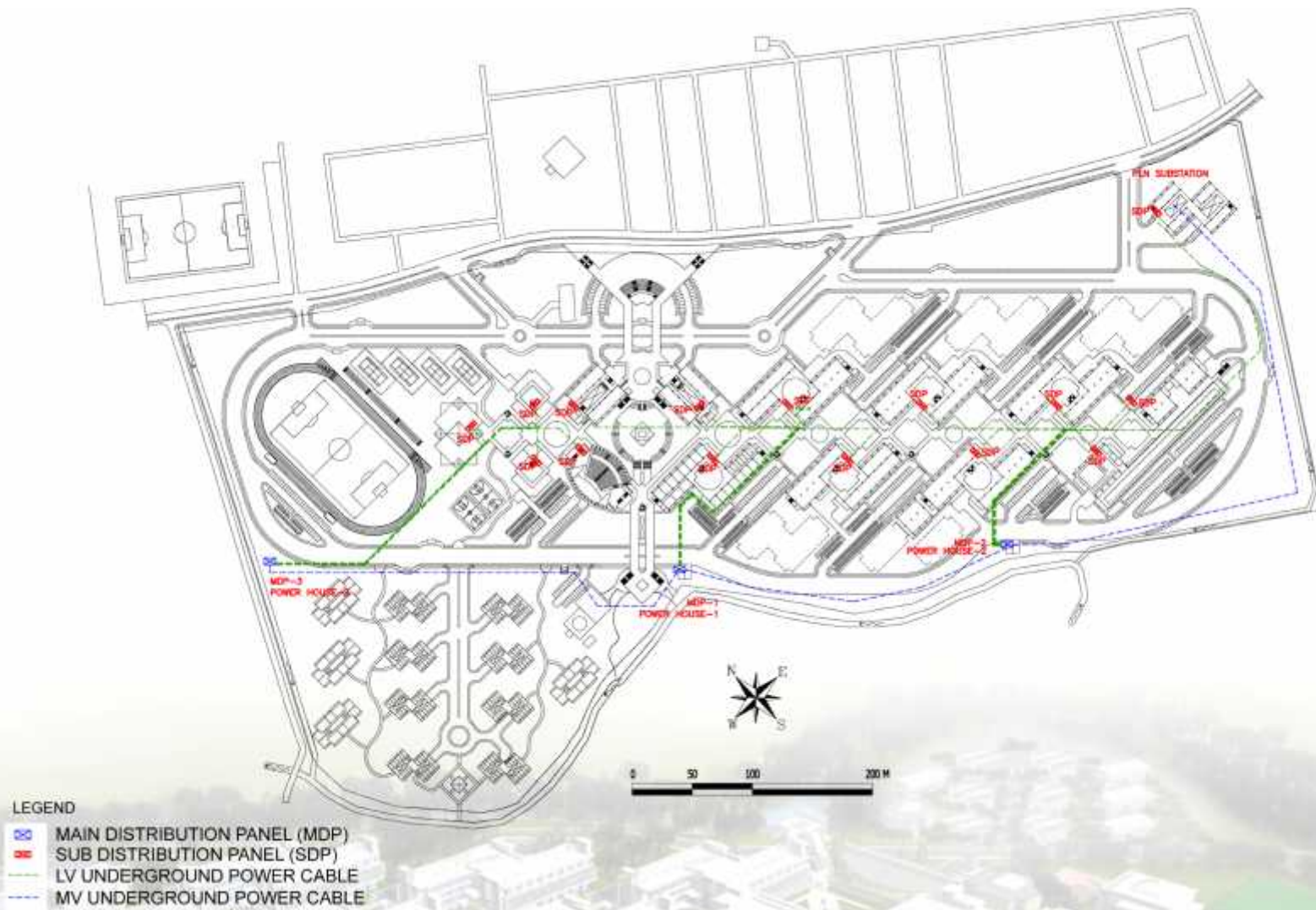


Figure 20. Power Distribution System

## 10.2 Water Supply Systems

Design of clear water system for this buildings/campus will use central system where the clear water which comes from the City water system (PDAM) that is located close to the Campus area.

Clear water from city water system (PDAM) will be accumulated first in the Central Water Reservoir/Water Tank.

The clear water that had been accumulated in Central Water Reservoir/Water Tank afterwards will be distributed to each building by using distribution pumps.

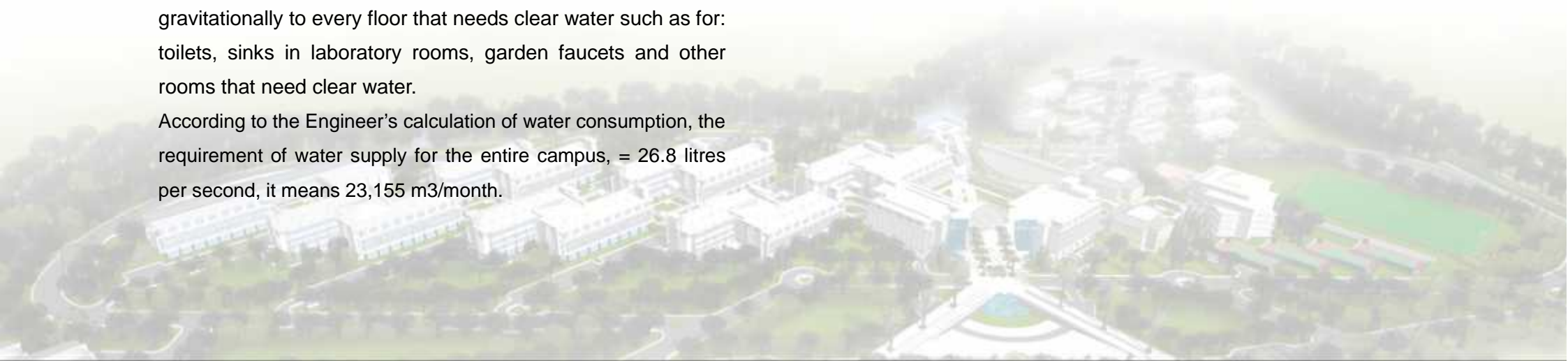
Each building will be provided with a water reservoir that will be located underground and also provided with roof tank that will be located on the roof floor of building. The clear water from central water reservoir/water tank will accumulate first to each water reservoir in each building. Then clear water will be lifted or transferred to roof tank by the Lifting Pump. Afterwards clear water from roof tank will be distributed gravitationally to every floor that needs clear water such as for: toilets, sinks in laboratory rooms, garden faucets and other rooms that need clear water.

According to the Engineer's calculation of water consumption, the requirement of water supply for the entire campus, = 26.8 litres per second, it means 23,155 m<sup>3</sup>/month.

## 10.3 Drainage and Sewage Treatment Systems

Waste water & soil water from every building such as: waste water from toilets, lavatories, floor drains, sinks, urinals, closets, etc. will be treated first in a sewage treatment plant. The effluent water from sewage treatment plant that already complies with the standard of expediency can be wasted to the ditch of campus drainage system.

Especially waste water from some laboratory that contains chemicals will be treated first in a neutralization plant. The effluent water from neutralization plant that already complies with standard can be wasted to ditch of campus drainage system. Both of pipes waste & soil water shall be provided with vent piping system.





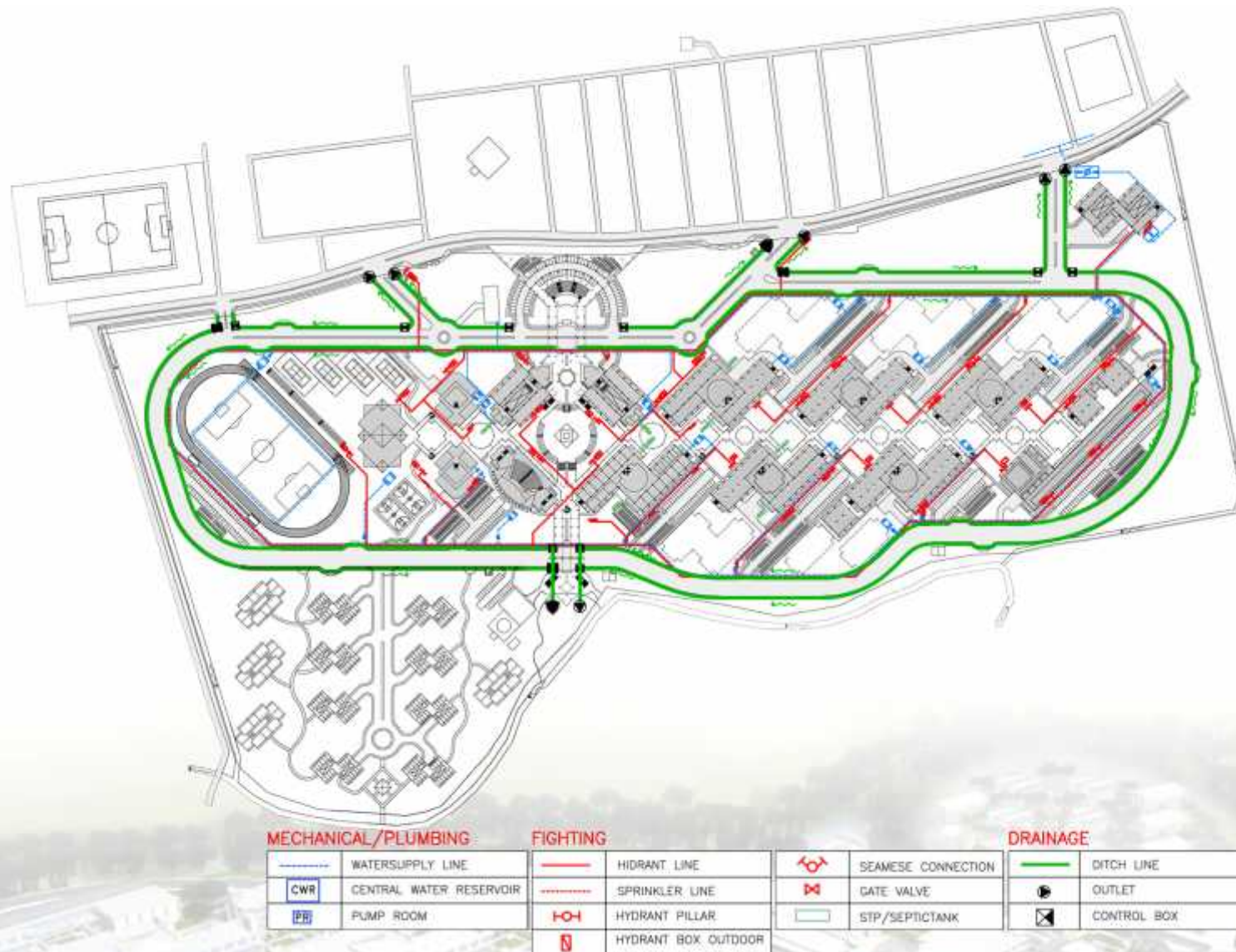


Figure 21. Water Supply, Waste Water and Fire Fighting Systems



#### **10.4 Communication Systems**

Telephone system will be integrated with LAN system (VOIP).

Each building will be provided with PABX and Data Switch and will be connected to the Main PABX.

Public address system shall be provided in Common area and class room.

Inside class room and corridor / hall will be equipped with speaker to be used for paging the student and staff.



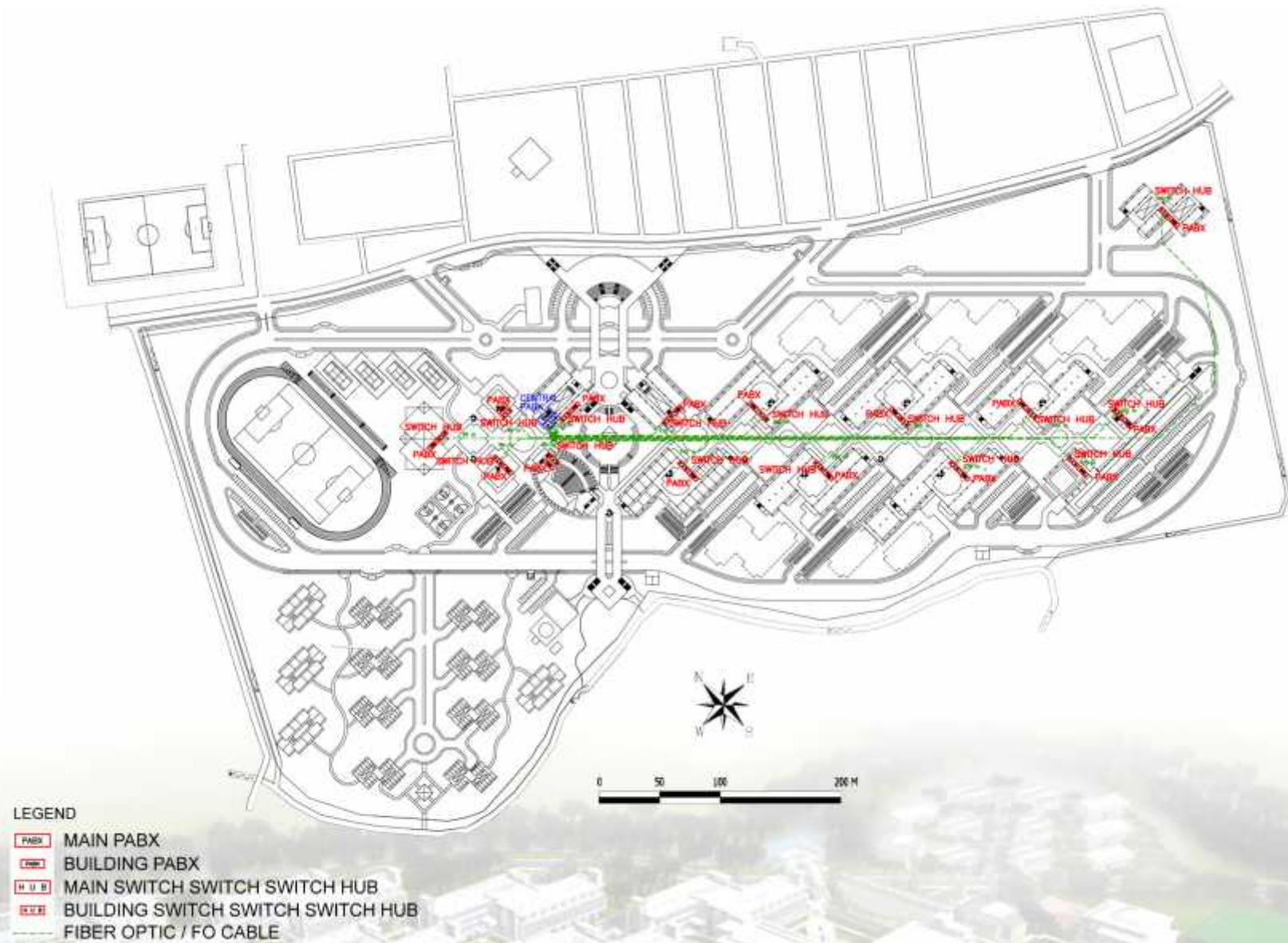


Figure 22. Telephone Line Distribution Systems

## 10.5 Fire Fighting Systems

For protecting buildings & occupants, the building shall be provided with system of fire fighting systems.

Design system of fire fighting consists of:

- System hydrant & sprinkler
- System fire extinguisher

### 10.5.1 System Hydrant & Sprinkler

System of hydrant consists of indoor hydrant and outdoor hydrant. Indoor hydrant is provided with hydrant box indoor and outdoor hydrant is provided with hydrant pillar and siamese connection.

For a building with floor height more than 14 meters, it must be provided with installation of sprinkler system and installation of sprinkler system must be designed from the ground floor until the top floor.

The piping of hydrant and sprinkler will be designed with separately riser. Sprinkler system is provided with alarm check valve and alarm gong.

For saving cost and efficiency, the system of fire fighting shall be designed with centralized system where the fire pump will be used for all buildings. The fire pump consists of 1 set fire pump for hydrant system and 1 set fire pump for sprinkler system. Both set of pumps will be placed in campus area (workshop building).

### 10.5.2 System Fire Extinguisher

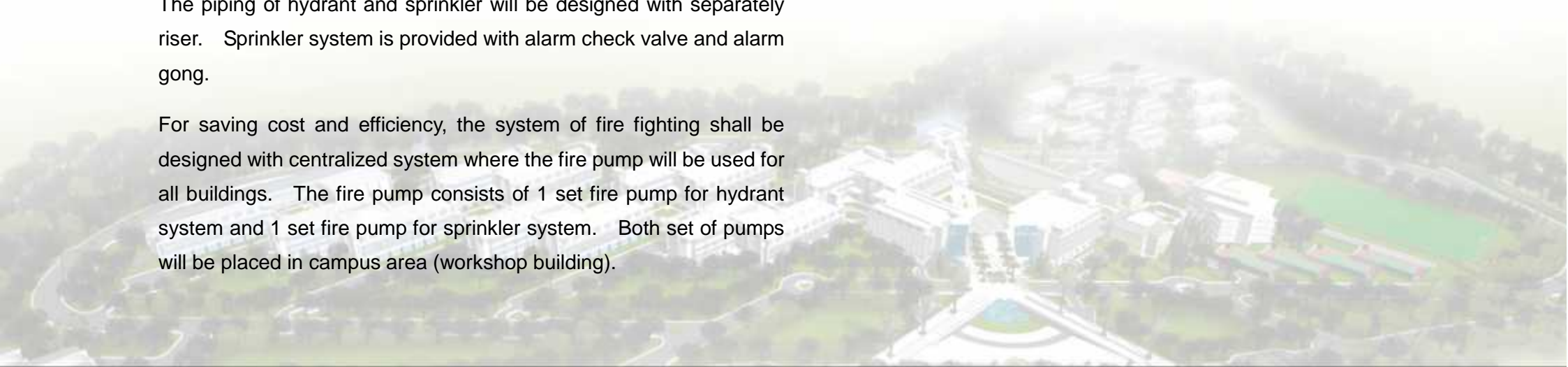
System fire extinguisher consists of portable fire extinguisher.

Each room of building shall be provided with portable fire extinguisher. Type of portable fire extinguisher depends on conditions and character of room that will be protected.

## 10.6 Lightning Rod Systems

Lightning protection system should be provided to prevent serious damage of the building structures and electrical facilities.

The system will be electrostatic type, with the lightning rod to be installed 5 m above from the highest building.





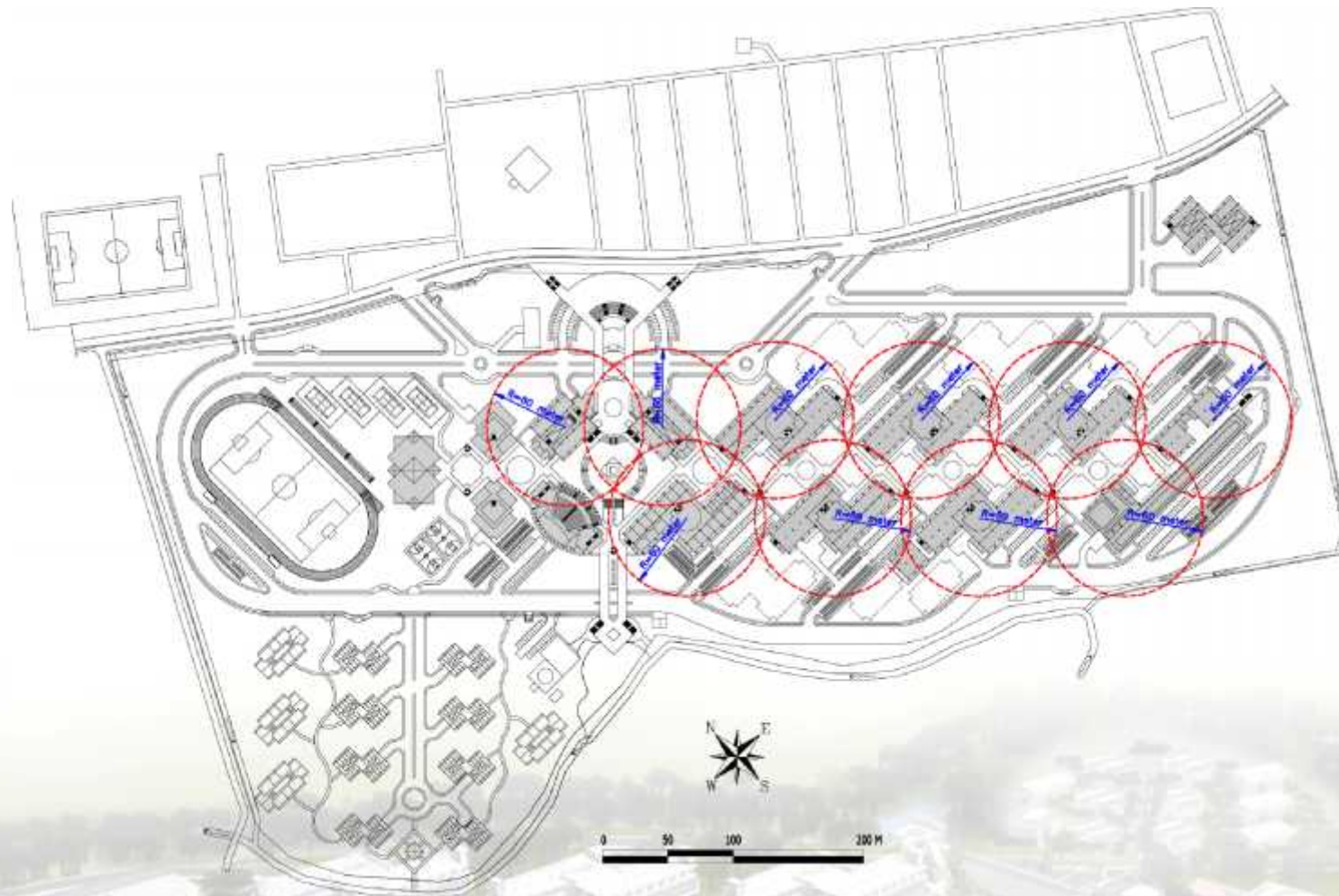


Figure 23. Lightning Protection Plan

## 11. Area Calculation

### Average Building Coverage Ratio (BCR)

| NO | BUILDING             | Building Area |
|----|----------------------|---------------|
| 1  | Architecture Dept    | 2,577 M2      |
| 2  | Civil Eng Dept       | 2,577 M2      |
| 3  | Electrical Eng Dept  | 2,966 M2      |
| 4  | Mechanical Eng Dept  | 2,577 M2      |
| 5  | Geology Dept         | 2,577 M2      |
| 6  | Naval Arch Dept      | 4,230 M2      |
| 7  | Class room building  | 2,577 M2      |
| 8  | Library              | 1,556 M2      |
| 9  | Center of technology | 1,556 M2      |
| 10 | Canteen              | 1,062 M2      |
| 11 | Sport hall           | 1,735 M2      |
| 12 | Auditorium           | 2,088 M2      |
| 13 | Student center       | 1,062 M2      |
| 14 | Work shop            | 1,607 M2      |
| 15 | Dormitory            | 5,336 M2      |
| 16 | Apartment            | 3,232 M2      |
| 17 | Pedestrian deck      | 10,643 M2     |
|    | TOTAL                | 49,958 M2     |

Total site area = 297,094 m2, therefore BCR =  $49,958 / 297,094 = 0.1681$  (16.81%)

### Average Floor Area Ratio (FAR)

| NO | BUILDING             | Floor AREA |
|----|----------------------|------------|
| 1  | Architecture Dept    | 9,244 M2   |
| 2  | Civil Eng Dept       | 8,248 M2   |
| 3  | Electrical Eng Dept  | 10,239 M2  |
| 4  | Mechanical Eng Dept  | 8,470 M2   |
| 5  | Geology Dept         | 6,458 M2   |
| 6  | Naval Arch Dept      | 7,795 M2   |
| 7  | Class room building  | 11,701 M2  |
| 8  | Library              | 6,829 M2   |
| 9  | Center of technology | 6,925 M2   |
| 10 | Canteen              | 1,916 M2   |
| 11 | Sport hall           | 2,223 M2   |
| 12 | Auditorium           | 3,021 M2   |
| 13 | Student center       | 1,916 M2   |
| 14 | Work shop            | 2,876 M2   |
| 15 | Dormitory            | 21,344 M2  |
| 16 | Apartment            | 12,928 M2  |
| 17 | Pedestrian deck      | 10,643 M2  |
|    | TOTAL AREA           | 132,776 M2 |

Total floor area including Dormitory and Flat = 132,776 M2,  
total land area = 297,094 M2, FAR =  $0.447$  (44.7%)

## 12. Phasing Program and Construction Package Plan

The actual rate and magnitude of facilities growth will be a function of needs, resources and external factors that grow less predictable as one move further into the future. The Phasing Program has been organized into two time frames. The first is made up of projects currently in planning that would likely be implemented in the short-term period (Phase-1) of up to ten years. The second time frame consists of future projects that have been identified as long-term (Phase-2 and Phase-3) needs or goals over the next 10 to 20 years and beyond. The short-term (Phase-1) projects reflect various stages of tangible programming, planning and demonstrated need, while the long-term program (Phase-2 and Phase-3) encompasses developments that are subject to further programming and evaluation to establish firmer dimensions, feasibility and sequencing.

The details of the program will surely change over time for both the short-term and long-term elements, due to internal and external considerations that cannot be foreseen. However, the program is a sound conceptual resource upon which to develop the framework elements of the master plan, such as land use, density, spatial organization and circulation patterns.

### Phase-1

The first phase of the Campus Master Plan implementation is comprised of JBIC Loan project, made up of four Package, for which funding has already been secured. Phase-1 also includes projects that improve the quality of the student life experience at Gowa campus. Constructing the Auditorium, Student Center, Canteen, Sport Hall, Inner road and Landscape, etc. are funded by Local governments. Phase-1 is projected to run until 2016.

### Phase-2

The second phase of the Campus Master Plan implementation focuses on expansion of student dormitory and apartments on campus. It will allow the university to accommodate approximately 25% of full time undergraduate student. Phase-2 also includes projects that improve the quality of the research at Gowa campus such as extending department laboratories. Phase-2 projects are anticipated to run until 2026.

### Phase-3

The third phase of the Campus Master Plan implementation primarily focuses on community projects that will continue the improvements in the quality of the student and community life experience at Gowa campus. These include constructing the Community Center, Shopping Center, and making other site improvements.





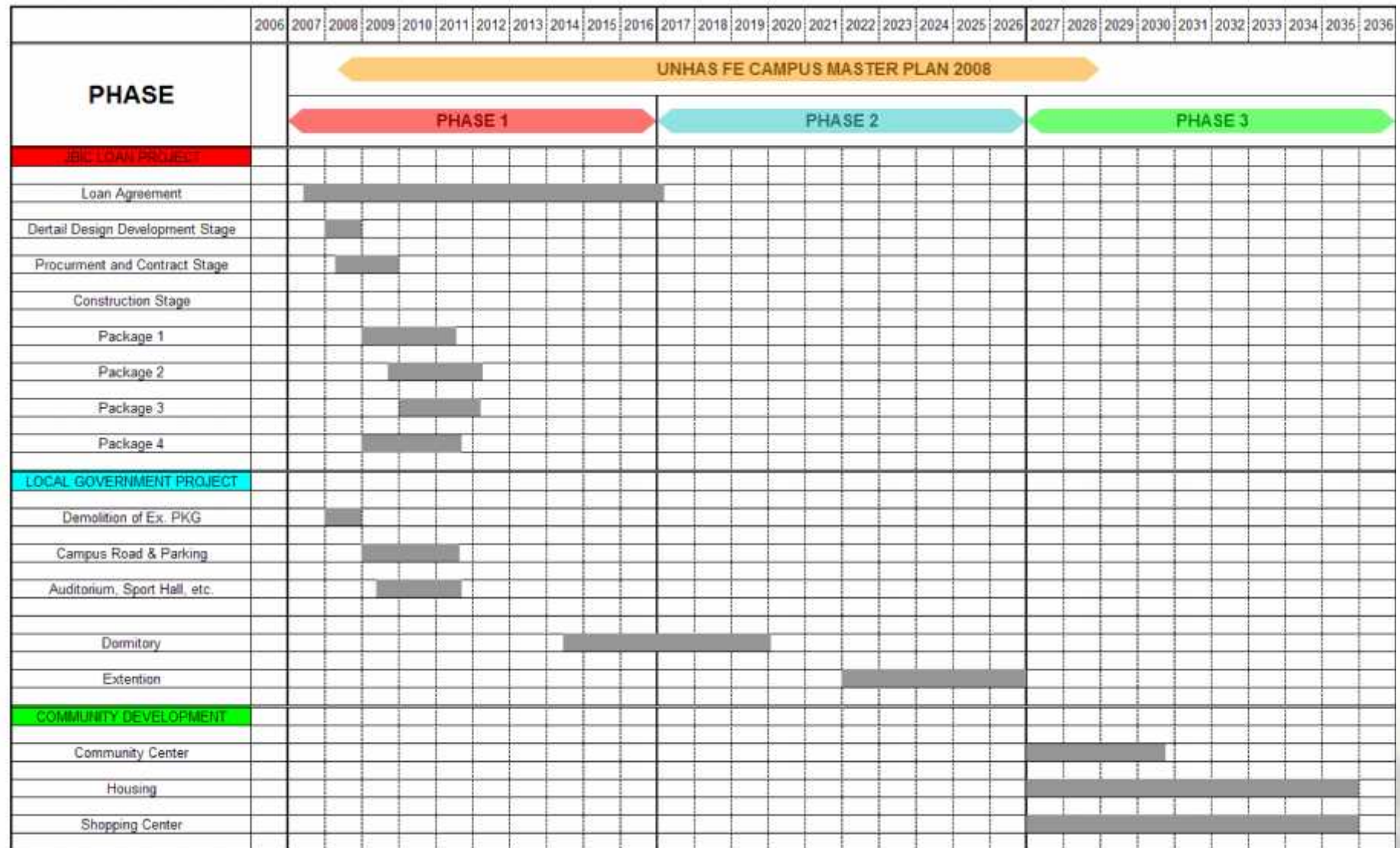


Figure 24. Development Phasing Schedule

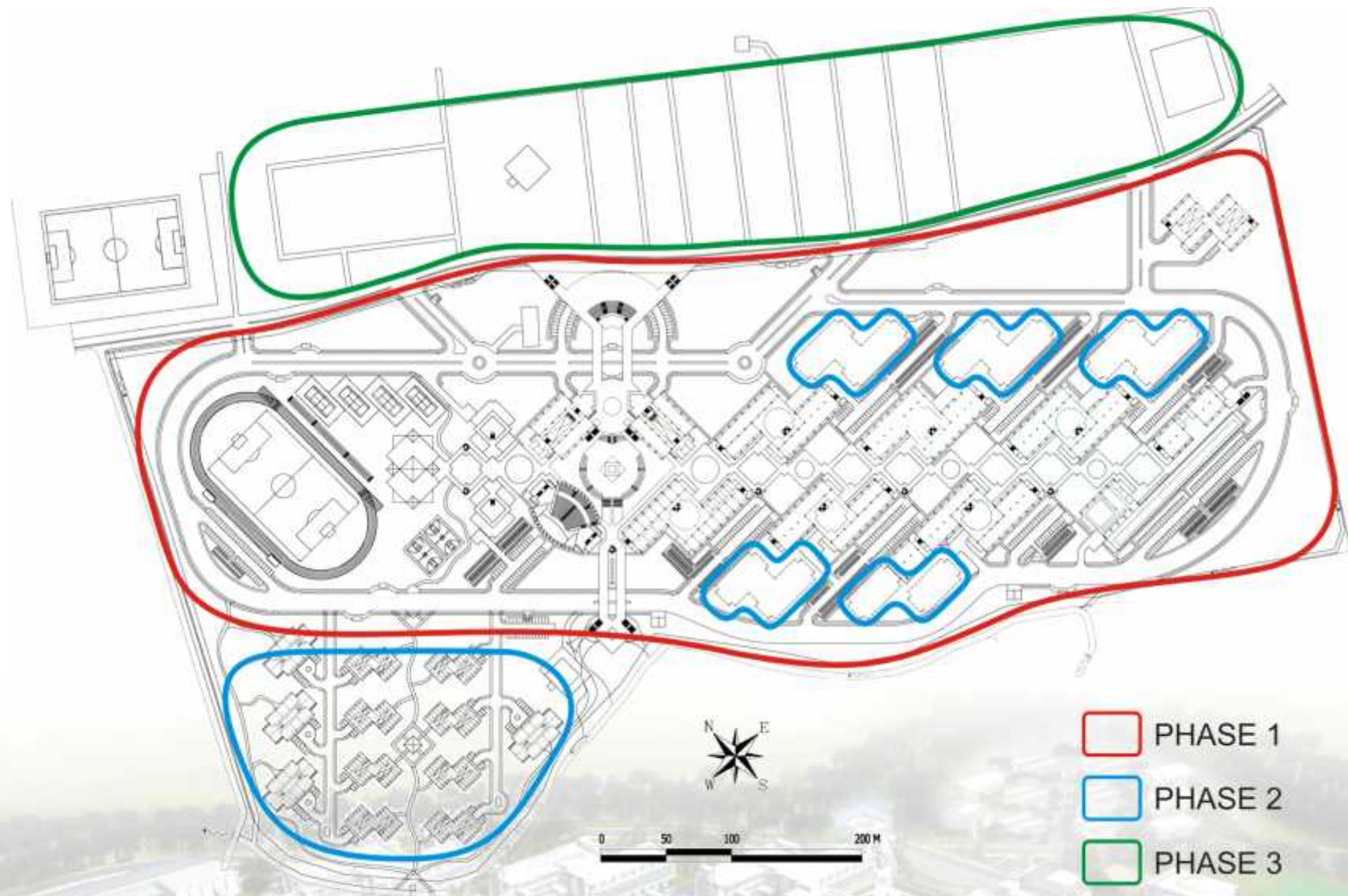


Figure 25. Phasing Plan



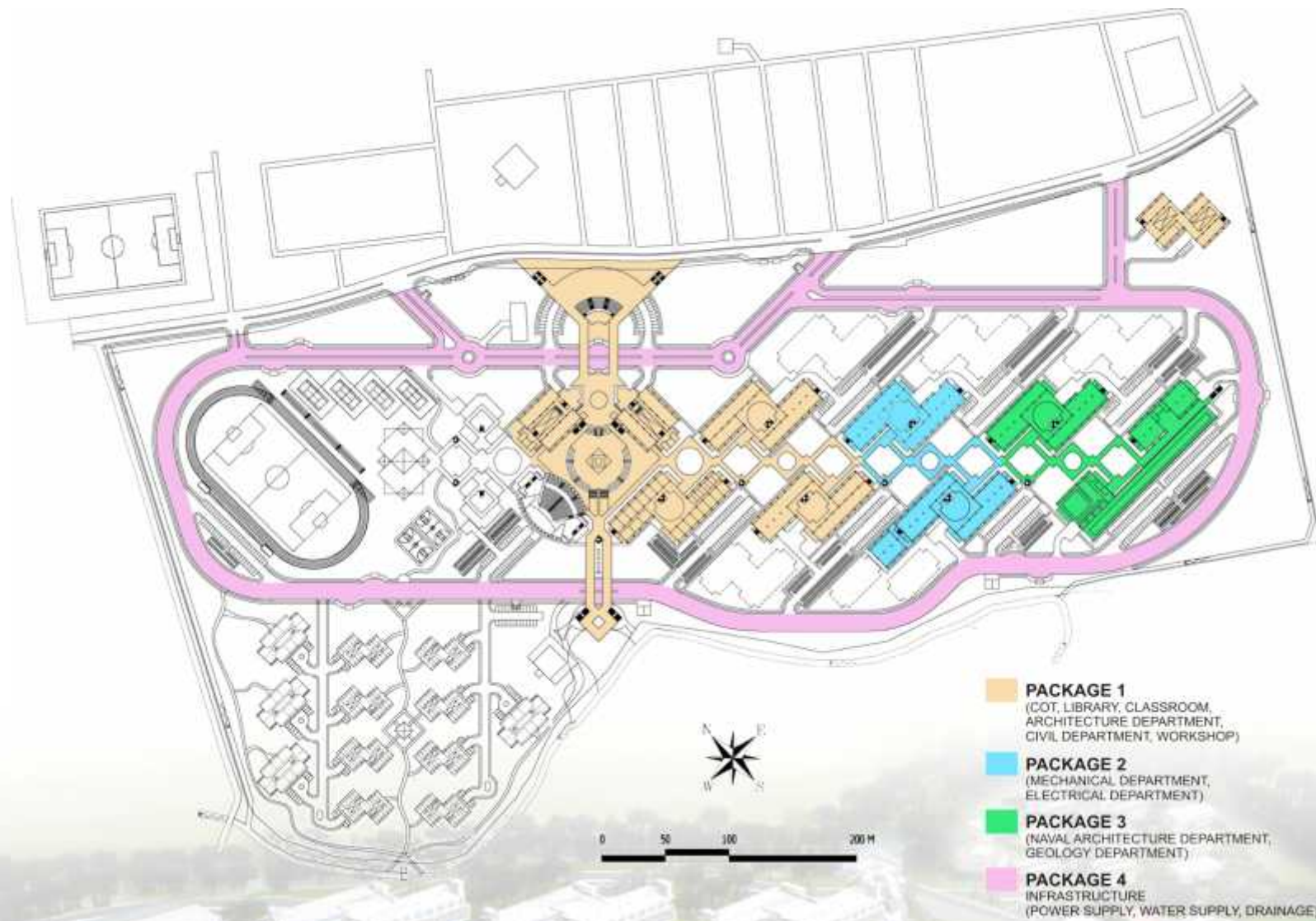


Figure 26. Construction Package Plan



### 13. Operations and Maintenance

#### 13.1 Operations and Maintenance of Facilities

Operations and Maintenance of Facilities (OMF) is committed to meeting the needs of the university by effectively managing the operations and maintenance of the facilities under its jurisdiction to the extent resources allow. OMF strives to effectively operate the facilities to provide a safe, clean, comfortable and functional environment to enhance discovery, learning, living and working throughout the campus community. OMF endeavors to satisfy these needs by pursuing the following:

Basic maintenance services include:

- Addressing plumbing problems
- Replacing light bulbs
- Maintenance of doors/windows/walls/ceilings/floors
- Routine cleaning needs
- Air-conditioning needs
- Repairs to classroom/lobby furniture or fixtures
- Addressing electrical problems

#### 13.2 Security Concepts

Campus security solutions should be a balance of architectural, electronic and operational measures. Passive solutions should be integrated with current technology to derive the most effective security solution and operational requirements. Two major concepts of the security solutions are:

#### Crime Prevention Through Environmental Design (CPTED)

CPTED is a concept that attempts to utilize planning solutions such as architectural barriers, landscaping, and lighting in conjunction with traditional security elements to reduce weaknesses.

#### Concentric Circles of Protection (CCP)

CCP is a concept that is based on the requirement for varying levels of protection starting at the site perimeter, working through the building perimeter and interior specialty controlled areas, becoming increasingly tighter as one proceeds through each level to reach the most sensitive areas.

#### 13.3 Disaster Preventing Operation

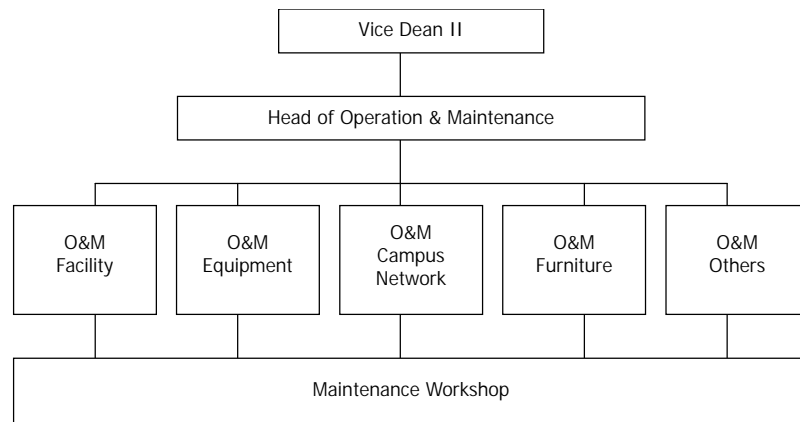
Disaster preventing solutions in this campus should also be a balance of architectural, electronic and operational measures. The typical planning solutions are physical barriers such as setback distances, clear zones, emergency power and water systems. Operational solutions include signage and intercom systems.

#### 13.4 Future Management Recommendation

For the future management, it is recommended that a new "Operation & Maintenance Section" be in charge. This Section should consist of Vice Dean-II and representatives from six departments.

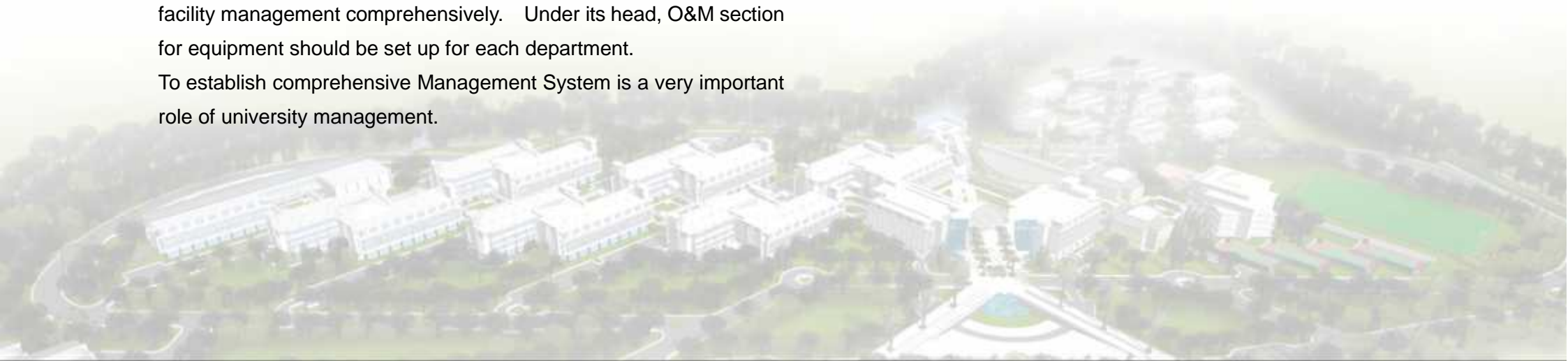
The proposed organization structure for the operation and maintenance of UNHAS-FE is shown as follow.

**Figure 27. Organization Chart of Operation & Maintenance Section**



It is required to establish an independent Section for facilities, equipment, campus network, furniture and others in order to treat facility management comprehensively. Under its head, O&M section for equipment should be set up for each department.

To establish comprehensive Management System is a very important role of university management.



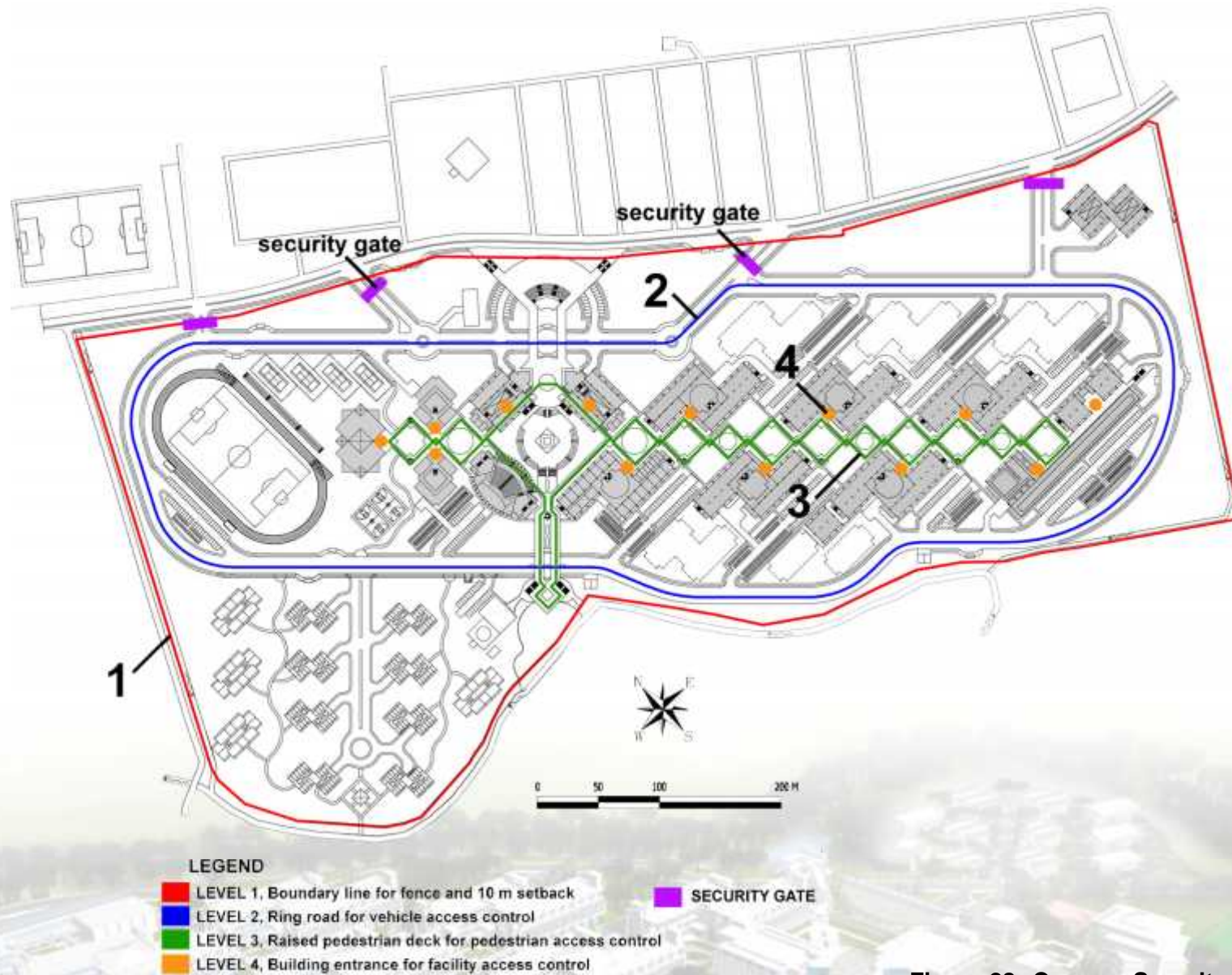


Figure 28. Campus Security Level



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- Photo 9 Existing Administration Building (2 stories 720 m<sup>2</sup>) which will be maintained as a memorial museum
- Photo 10 Classroom Building (single story with 4 classrooms) which will be demolished
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- Photo 14 Existing Administration building (2 stories 720 m<sup>2</sup>)
- Photo 15 Existing Tugu Ayam



## Appendix

### History of Campus Master Plan in Chronological Order

#### Conceptual Sketch in September 2007

Many conceptual sketches for this Campus Master Plan were drawn in the preparation period of the proposal.



Conceptual Sketch 1



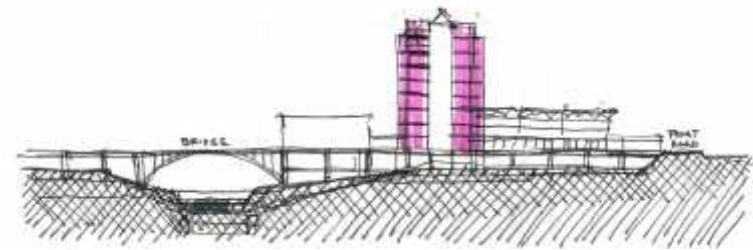
Conceptual Sketch 2



Conceptual Sketch 3



Conceptual Sketch 4



Cross Section for Conceptual Sketch 3

#### Proposal Stage in October 2007

Final concept plan was selected and developed for the proposal.



Proposal of Campus Master Plan





**Overall View Image**



**Entrance Gate Image**



**Laboratories Image**

### Campus Master Plan in February 2008

The conceptual plan for proposal stage was refined as a pure concept for the 1<sup>st</sup> presentation of Campus Master Plan to discuss with clients.



Initial Plan

Future Extension Plan



Model Photo in February 2008

### Campus Master Plan in March 2008

According to the discussions with clients, the pure concept was modified and transformed as a realistic and practical concept plan.



Initial Plan

Future Extension Plan



Model Photo in March 2008



### Final Campus Master Plan in June 2008

The final Campus Master Plan was developed and integrated with architectural and engineering concepts.



**Figure 29. Entrance Gate – Twin Showcase Tower with 6 Lontara trees**



**Figure 30. Campus Mater Plan**







Figure 31. Bird Eye View Perspective of Gowa Campus

