CHAPTER VI

RESULTS OF DESIGN

6.1. Design Area

6.1.1. Design specifications Area

The design theme using the theme Green Architecture with the concept of openness that has been described in the previous chapter, the concept is based on the concept of relevance to the theme, so this concept can be applied in matters relating to the theme. The concept of openness is taken also by the design objects, design objects are objects in which recreation, breeding endangered animals which seek to resemble the design of the original habitat of the animals are kept so that survival can be maintained. Based on the life of wild animals and freely chosen the concept of openness to resemble the animal habitat is open and free.

The area was designed starting from the outer side of the zoo area, which is the main entrance/gate and ticketing, circulation, parking areas, buildings and cages. Design is done not only on buildings but on the outer areas such as cages, garden and other facilities as facilities for visitors' convenience.
Figure 6.1. Site Plan of Surabaya Zoo (Source: Design result, 2011)

Figure 6.2. Lay Out of Surabaya Zoo (Source: Design result, 2011)
6.1.2. Zoning

On the zoning re-design of this zoo is divided into several zones: the private, public zones and service zones.

- **Publik**: Parking, ticketing
- **Semi public**: Office manager, general office
- **Private/service**: Animal cages, clinics, room service

However, zoning in the cages were divided according to type. Home zone is divided into three parts, namely the zone of bird, reptile zone, pisces zone, and Mammalian zone. The design is:

- **Zone Aves**: Water birds, land birds.
- **Reptile Zone**: Snakes, crocodiles, turtles, komodo
- **Pisces Zone**: Saltwater fish, freshwater fish
- **Mammalia Zone**: Herbivorous, karnifora, omnivore

Figure 6.3. Zone at KBS
(Source: hasil analisa. 2011)
The results associated with the zoning plan are:

Figure 6.4. Zone plan enclosure at KBS
(Source: hasil analisa. 2011)

Figure 6.5. Zone enclosure at KBS
(Source: Design result. 2011)

Keterangan:  
- Reptile Zone
- Aves Zone
- Mammalia Zone
- Pisces Zone
6.1.3. Pathways

On site circulation divided into several types:

1. Vehicle circulation, circulation of which is used exclusively for vehicles. Circulation on the site is geared toward the parking lot. Circulation is divided into two parts, namely the circulation kushus special visitors and circulation manager.

2. Pedestrian, for visitors who come by car could go straight into the zoo area with streets that are separated by the circulation of vehicles.

Flow circulation in Surabaya Zoo made unidirectional, so that all the exhibit can be passed. But there is such a special circulation in zones of bird and reptile has its own circulation, but is made in line with the same exit to the entrance.

![Circulation plan for the site](Source: hasil analisa. 2011)
Visitor circulation (pedestrian) purposes to all areas of the region to explore the exhibit

Visitor circulation (vehicle) parking area to the destination

Circulation manager (vehicles and pedestrians) to the destination service areas

**a. Vehicle circulation**

Vehicles used in Surabaya Zoo area is four wheel drive vehicles and motorcycles. Circulation of vehicles from the highway are directed toward the parking, reserved parking for two-wheelers, four-wheel drive. Parking is divided into two upper parking lot and parking garage. In the basement parking is only for four wheel drive vehicles, especially private cars. At a special service vehicle circulation services may enter into with a width of 10 m.
b. Pedestrian circulation

Provided for pedestrian circulation and pedestrian drop off until the gate and ticketing. From the park, visitors can walk to the ticketing is available for entry into the zoo. Upon entry into the zoo, visitors can circle the entire exhibits.

Figure 6.8. The design of the circulation in the Aves Zone (Source: Design result. 2011)

Aves special circulation zone is distinguished from the main circulation, this circulation around the entire exhibits aves with a width of 4 meters, this circulation using natural materials such as the preparation of natural stone, so that the water absorption can occur.

Figure 6.9. The design of the circulation in the Reptile Zone (Source: Design result. 2011)
6.1.4. Plants and Green Open Space Area Design

Green open space in the area of green space located on land in the area around the zoo, so it can be said Surabaya zoo is an urban forest, it is also the function and purpose of this area is where the maintenance of endangered animals. At every cage there is a vegetation forming environment habitat therein, vegetation also in park areas and resort areas such as café and hall, the arrangement of vegetation at the zoo is also visible in each lane road service area and also on the boundary of outer space and in the region. Area greening seen in every place in this region, it is also intended to adjustments to the themes and concepts used.

Figure 6.10. Vegetation
(Source: Design result. 2011)

Figure 6.11. Placement of shade and director vegetation
(Source: Design result. 2011)
Vegetation that used in this region is the shade and steering vegetation. Widely used for shade in the cages and the steering is widely used on the road circulation.

![Vegetation diagram](image)

Figure 6.12. The design of the site vegetation and green space
(Source: Design result. 2011)

### 6.2 Buildings Design

This design is more emphasis on the design of outer space as most of the design of the cages, the cages of the design adapted to the concept used is the concept of openness. With this concept is intended to make the cages according to the habitat of animals in it.

In addition to the cages are the main buildings and supporting the zoo, there are some buildings that became the main building, which is building a facility as a facilities and infrastructure for visitors and animals.
**Objek**

*Kebun Binatang*

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**Tema**

*Green Architecture*

Perancangan yang berusaha semaksimal mungkin tidak merusak alam dan mengembalikan manusia ke dalam kehidupan yang nyaman serta sehat.

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**Konsep Keterbukaan**

*Openness Concept*

Konsep perancangan yang didasarkan atas rancangan yaitu kebun binatang, konsep keterbukaan berusaha untuk menjadikan rancangan terlihat terbuka dan alami dan sesuai dengan tema yang digunakan.

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**Aplikasi Konsep**

- fisik bangunan: bangunan dibuat berbentuk melingkar berkesan natural dan bebas
- kandang-kandang dengan system terbuka dan dibatasi dengan air pada kandang tertentu
- system semi terbuka namun terlihat terbuka, pada kandang burung dan penggunaan kaca pada bangunan
- sistem ventilasi sebagai pemanfaatan energy alami dan memberi kesan terbuka
- penggunaan material-material ramah lingkungan
- dan lain-lain

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Figure 6.13. Chart Design
(Source: Design result. 2011)
Basically the building at the zoo is spread across the region, and almost the entire region is an animal cages.

Placement of buildings arranged and directed pace. At the main gate up and the manager put in the main entrance.

Figure 6.14. Spread building on the site
(Source: Design result. 2011)

Figure 6.15. Gate and manager plan of the building
(Source: Design result. 2011)
On this building consists of ticketing area, Hall, information centers, space management, restaurant, insect dioramas, hall, clinic.

The building is directed to building a friendly environment, the utilization of energy contained in the use of solar energy panels as sun catchers. Roof garden and palm roof put on the roof as a cooling chamber therein, thereby reducing air conditioning usage. The use of adequate ventilation for air flow and use of materials readily available and environmentally friendly like bamboo and wood.

Figure 6.16. A front gate and manager building (Source: Design result. 2011)

Figure 6.17. Rear gate and manager building (Source: Design result. 2011)
The Section shows the contents of the buildings in it. This section looks at the flow of air circulation and lighting, so the convenience can be met.

Then follow the circulation of the park found the child, the building is devoted to children as a place of learning and playing, children park is equipped with a pet zoo, was maintained by the animals that can be held by children such as rabbits, etc.
Then across the children park will be found the library, the purpose of placement of the library to be easily achieved and in accordance with the resort area. Then follow the flow of circulation will be found night kingdom, the building is devoted to the night animals that can not be exposed to direct sunlight.

Figure 6.21. Night Kingdom plan
(Source: Design result. 2011)

In the intermediate space the building will be found after the entry, then enter the next area is the cages, at the center of the exhibit there is the exhibition area or information about the animals at night. To the exit of intermediate space will be found again. At the center of the building there is space management, as a center of information and care activities in the Night Kingdom.
After the building through the Night Kingdom will find veterinary clinic, veterinary clinic position slightly because of the nature of the building into a private, specialized managers can only enter the building. These clinics specialize in the animals that are sick and need intensive care. To get to the veterinary clinic,
there are two alternative paths in the first line will pass through the exhibit, another exhibit, this path will lead to the building next door. The second alternative, the path through the service area. This path is directed through the back door of the building. This path will be used to enter the sick animals.

Veterinary clinic is designed in a circle, is free and natural, direct the entry circulation throughout the room. At the entrance of this building there are animals that are put on the back, then found the service spaces. Go deeper into the more will be found an area of treatment and care in the hall contained therein. In the middle of this area consists of several doctors living room, exam rooms, radiology, intensive care, pharmacy and medicine, administration, operating room, storage area report of animals, and aquarium.
Follow the flow of circulation will be found aquarium building. Aquarium building is located in the middle of the lake. Placement of the aquarium is because
the nature of the buildings that enclose the fish, the impression will be seen together with the lake and will facilitate irrigation system.

Aquarium plans, created the impression of a circular impression moving, dynamic, and not boring. The building consists of two different buildings, the building's first saltwater tank and a freshwater aquarium. At the main entrance will be directly found in the saltwater aquarium exhibit circular system, then enter the hall will be found through a freshwater aquarium. At the aquarium, there are room and information center managers. Freshwater aquarium diameter smaller than saltwater aquarium.
At this aquarium also use palm roof and the roof is transparent to enter into the sunlight and gives the impression of an open. On the walls are made with environmentally friendly materials such as stone, used in the hallways of the bamboo poles.
There is a mosque close to the Aquarium is located in the center of the area in order to achieve easy and quick access. The mosque is equipped with a garden that can be used for rest and play. In this area there is also a general information center is provided for visitors to easily get information about the zoo or the animals in it, along with information on each building.
In the outer space is the cages and the park as a facility for visitors.

In the open area was created in the middle area and there are games for kids. Enclosure adjacent to the road is only limited water bird cages with wire mesh nets, so that does not look massive and open. vegetation and roads laid out as a director as green space.

Figure 6.37. Exterior perspective on children’s play area
(Source: Design result. 2011)

Figure 6.38. Exterior perspective on Aves zone
(Source: Design result. 2011)
Aves are also applied to zone open system there is no barrier between the animals with the visitors, only distinguish user circulation. Circulation users also made of materials that can absorb water so it does not damage the environment.

Figure 6.39. Exterior perspective on Reptile zone
(Source: Design result. 2011)

In the reptile zone are also used for green roof plants and producing oxygen as well as a shade seemed natural and natural join. Circulation also use environmentally friendly material that can absorb water. Snake cages made of transparent glass in it given the impressive open and vegetation as a natural habitat.

Figure 6.40. Exterior perspective on lakes area
(Source: Design result. 2011)
In this area demonstrated the existence of the human relationship with the environment. An open area and one with nature.

![Image](image1.png)

**Figure 6.41. Interior perspective of the Aquarium**
(Source: Design result. 2011)

Circulation that looks circular, dynamic impression by using the colors of the sea, trying to make in areas such as in the sea.

![Image](image2.png)

**Figure 6.42. Interior perspective of the hall Gate and managers**
(Source: Design result. 2011)

Inside the hall made the park as green and as a sign of welcome for visitors. In this area given a seat to rest. On the wall using natural materials and
plants were also suspended the use of wood materials in the information center.

The entrance is impressive given that the fence is open.

![Figure 6.43. Interior perspective of the veterinary clinic](Source: Design result. 2011)

Interior at the veterinary clinic are made to look clean with bright colors and also the use of wood materials as a counterweight.

6.3. Enclosure Design

Outer space at the zoo's design consists of the cages, and parks. In the design of outdoor space is still using the concept of openness, so that the cages be in accordance with the original habitat of the animals in it.

After entering the gate and ticketing, the first cages bird cages found the water. In this area is a zone aves. To make the home suitable habitat then the design is made the nets to cover the entire area of the cage, so animals can move freely aves. Use of the nets to make the cage as an unlimited and open.
In the aviary of water is seen in it the trees and the pond to create an atmosphere suitng its original habitat.
It will follow the flow of circulation in other cages found as one of them is home to camels. Camel enclosure made in accordance with the hot and arid habitats. The creation of this habitat by using a material of sand and a few trees around the cage as a counterweight.

Figure 6.47. Camel enclosure plan  
(Source: Design result. 2011)

Figure 6.48. A-A section of camel enclosure  
(Source: Design result. 2011)
Follow the flow of circulation will be found the elephant enclosure. At the elephant enclosure is made of the pool barrier. Inside the enclosure there are rocks and some vegetation and ponds to create habitat for elephants in captivity.

Figure 6.49. B-B section of camel enclosure  
(Source: Design result. 2011)

Figure 6.50. Elephant enclosure plan  
(Source: Design result. 2011)

Figure 6.51. A-A section of Elephant enclosure  
(Source: Design result. 2011)
Next to the elephant enclosure, there are a monkey cage. For the monkey cage was divided into three types of monkeys. Each cage is only limited by the water system confinement without, so it looks open and free.

Also placed in the cage of wood so it looks like a tree. Function of this wood is as a playground and climbing.
After passing through the cage the elephant and the monkey will be found savanna area. This area is an area of herbivore animals that normally live in the area savannaseperti horses, deer, antelope, giraffe. This area is made in accordance with their natural habitat by planting grasses and trees in the cage.

Then follow the flow of circulation will be found cages carnivores such as tigers, leopards, lions. At home it will be a special lane for visitors to see immediately the animal was inside the restricted glass as a barrier. Inside the enclosure is added vegetation and rocks that look like forests.

Figure 6.55. B-B section of monkey enclosure  
(Source: Design result. 2011)

Figure 6.56. Tiger, leopard, and lion enclosures plan  
(Source: Design result. 2011)
Following the circulation path will be found some of the cage as the cage rhino, wild pigs, cassowaries, etc. Visitors will be directed toward the exit to the parking area.

6.3. Drainage and Utility Area Design

6.3.1. Water Supply

PAM and deep wells, distribution system with a down feed distribution system.

Clean water for:

- Domestic Needs (activities lavatory, drinking, cooking)
- The need for fire hydrant and sprinkler protection
- Need for servicing or garden
6.3.1. Wastewater Disposal

Wastewater treatment activities include among others:

- Splicing home
- Collection and carry wastewater
- Wastewater treatment
- The End Disposal of wastewater

Ways of processing wastewater

- The individual systems of excreta disposal unit is channeled directly into the toilet pit shelters and processed/described as anaerobic.
- Communal system, household waste is channeled into the sewerage network city and end at the wastewater treatment plant, for then the water that has been qualified to dispose of the receiving water body.

For drainage of a park, wearing only a communal system, which is directly channeled into the sewerage network city and terminates on the wastewater treatment plant.

6.3.1. Electricity

Figure 6.60. Wastewater chart
(Source: Design result. 2011)

Figure 6.61. Electrical panel chart
(Source: Design result. 2011)
6.3.1. Trash

Figure 6.62. Chart of sewage treatment system
(Source: Design result, 2011)