

MASTER PLAN
Of
Zoological Park & Rescue Center, Mukundpur
(Satna)



Forest Division Satna,
Satna, Madhya Pradesh
(2012-2013 to 2022- 2023)




GOVERNMENT OF INDIA
MINISTRY OF ENVIRONMENT & FORESTS
Central Zoo Authority



THROUGH REGISTERED POST

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DATE: 11.04.2013

To

The Chief Conservator of Forests,
Rewa,
Jaianti Kunj Kendriya Vidhyala Marg,
Rewa (Madhya Pradesh).

Sub:- Master Plan of the Zoo and Rescue Centre, Mukundpur, Satna, Madhya Pradesh.

Sir,

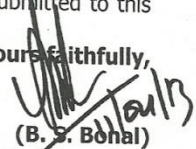
The Master Plan of the Zoo and Rescue Centre, Mukundpur, Satna was scrutinized by Expert Group on Zoo Designing of the Central Zoo Authority in its Meeting held on 1st March, 2013 and recommended for approval. Accordingly, the same was placed before 65th Meeting of the Technical Committee held on 22nd March 2013 and approved the Master Plan of the Zoo and Rescue Centre, Mukundpur, Satna subject to the condition that:-

(a) the responsibility of mobilizing the financial resources for implementation of the Master Plan will be the sole responsibility of the State Government or respective Zoo Operator, and (b) the State Government or respective Zoo Operator should quantify the resources available for the implementation of Master Plan.

In order to send you a copy of the duly signed and approved Master Plan of the Zoo and Rescue Centre, Mukundpur, Satna, you are requested to submit the binded copies of the final version of Master Plan (three copies) which should contain the signatures with stamp of the Chief Wildlife Warden, Madhya Pradesh and Director/ Officer-in-charge of the Zoo and Rescue Centre, Mukundpur, Satna and other document relevant to Master Plan & incorporating copy of this letter too.

The soft copy of the digitized and amended Master Plan in any of the format i. e. AUTOCAD/ COREL DRAW/JPEG/TIFF/PDF files on a CD/DVD may also be submitted to this office at the earliest for uploading in website.

Yours faithfully,


(B. S. Bonal)
Member Secretary

Copy for favour of information & necessary action to the Chief Wildlife Warden, Government of Madhya Pradesh, Bhopal.

1
(B. S. Bonal)
Member Secretary

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Certificate

This is to certify that the master plan of Zoological Park and Rescue Center, Mukundpur (Satna) has been prepared by me in consultation with members of CZA's expert group on zoo design for the duration of 2012 – 2013 to 2022 – 2023.

Signature



Name

Rajiv Mishra

Designation

संचालक
चिड़ियाघर सह उपचार केन्द्र
मुकुन्दपुर, वनमंडल सतना (म०प्र०)

efs



(डॉ. पी. के. शुक्ला)

प्रधान मुख्य वन संरक्षक (वन्यप्राणी) एवं
मुख्य वन्यप्राणी अधिकारी, मध्यप्रदेश

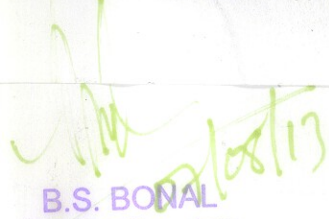
B.S. Bonal, IFS.

Member Secretary

Central Zoo Authority,

New Delhi.

Master Plan of the Zoo and Rescue Centre at Mukundpur, Satna, Madhya Pradesh is approved subject to the condition that the responsibility of mobilizing the financial resources for implementation of the Master Plan will be sole responsibility of the Forest Department, Government of Madhya Pradesh.


B.S. BONAL
Member Secretary
Central Zoo Authority
(Ministry of Environment & Forests)
Govt. of India, New Delhi

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Acknowledgement

On behalf of master plan preparation team I express my sincere and heartfelt thanks to Shri P.K. Singh, CCF Rewa and Shri Nizam Qureshi, CF Satna for their support and encouragement.

The preparation of master plan of Zoological Park and Rescue center, Mukundpur (Satna) was earnestly taken up after the visit of members of CZA's expert group on zoo design in October 2011. The expert group members visited the site and had intensive interaction with zoo and forest officials. A number of issues were discussed in the light of CZA's norms for preparations of master plan for this site. I am sincerely thankful to these experts namely Shri A.S. Dogra, PCCF (Retired), Punjab, Shri B.N. Malhotra, Chief Engineer, CCU, Ministry of Environment and forest and Dr. A.K. Malhotra, Ex-Curator (E), National Zoological park, New Delhi.

A team of Zoo officials, EPCO and Shri Mukesh Dubey of Aashraya Consultancy, Bhopal was formed who in consultation with members of expert group prepared the master plan. I am grateful to zoo officials, EPCO and Shri Mukesh Dubey of Aashraya Consultancy. Thanks are due to Shri B.B. Singh Ex-CCF & Shri Chander Shekhar Dubey, former ACF of this park for their invaluable contribution in this project.

I would also like to thank Shri B.S. Bonal, Member Secretary, CZA for his advise in the finalization of lay out plan of this park.

I also thank to all the officials and staff for their assistance and cooperation in the preparation of master plan of Zoo and Rescue center, Mukundpur.

Rajiv Mishra

Director

Zoo & Rescue Center,

Mukundpur (Satna)

Preface

Madhya Pradesh has the credit for the origin of White Tiger. The Govindgarh palace where the first White tiger, which was captured from nearby forest, kept and bred here, is 6 Km. from Zoo and Rescue center Mukundpur (Satna).

There is one state run Van Vihar zoo, Bhopal which has rescue center and enclosures to display animal for the visitors. This is about 500 Km. from Mukundpur (Satna). Travelling this distance traumatizes the sick animals which may be fatal. To check such eventuality, Government of Madhya Pradesh planed a new Zoo and Rescue center at Mukundpur (Satna). This zoo will also display the local area and national wild animal species for awareness of the visitors.

The preparation of master plan is a complex subject which involves inputs from zoo professionals, architects, veterinarians and wild lifers. A team of zoo officials, architect and civil engineer was formed which took the task of preparing this plan. The plan has been prepared for the development of this site over a period of 10 years incorporating the vision, mission, theme of display and objectives.

The layout plan and animal collection plan was prepared and submitted to central zoo authority for its approval. The expert group of zoo design of CZA recommended the approval of layout plan of this Zoo and rescue center in its 34th meeting.

The salient features of the master plan include to display the animal in an environment as natural as possible. All enclosures are open with grasses and trees, and are designed to maintain the equal level of viewer and the viewed. The physical barrier is a wet or dry moat or toughened glass. The zoo will have one way movement, clear segregation of visitors and service paths. About 70% of area will be under woodland, water bodies and lawns. The theme of display is taxonomical. Facilities like education center, butterfly park, large size water bodies, white tiger safari, reptile house and nursery of medicinal plants, besides animal enclosures have been proposed.

The whole zoo has been divided into 9 sections viz animal, veterinary, sanitation & horticulture, security, procurement (store), construction & maintenance, education, research and administration. Each section will be headed by a well qualified and

professional incumbent which is in tune with the recommendation of expert committee on zoos.

All the animal enclosures have been divided into 12 beats for proper management. It is proposed to display over 450 animals comprising of 68 species. The quality of animal care, exhibits and conversation education will be of higher level.

A well equipped veterinary hospital with diagnosing and testing facilities, supported by adequate technical man power has been proposed. The veterinarian will take a daily round of the zoo to observe the health, feeding and general hygienic condition of the animals. The rescue center will provide much needed relief to the rescued animals and the local population.

The education wing will enhance the knowledge and create awareness among visitors through signages, published material, lectures and guided tours.

About 2 lakh visitors are expected to visit this place every year. This number is likely to increase in future. Efforts have been made to provide adequate facilities like cafeteria, parking, toilets, shelters and drinking water points for the visitors for their smooth and rewarding visit.

A new residential colony has also been proposed near to the Zoo and Rescue center for the essential staff. It will have a community center, shopping complex and dispensary.

In order to meet unforeseen incidents, a detailed disaster management plan and contingency plan have been incorporated. A plan to upgrade the skill of animal keepers and other staff, a capacity building plan has also been prepared. With the development in IT sector, e-governance has also been planned. This will help to maintain the record and data of animals and related issues for easy interaction with national and international experts and institutes.

The Zoological Park and Rescue center, Mukundpur will be one of the role model in terms of facilities, infrastructures and management practices

Nizam Qureshi

Conservator of Forest, Satna (MP)

Foreword

The increasing urbanization and patterns of development have created enormous pressures on our natural resources. A number of species are thus disappearing from the earth. The Government of India took initiative to conserve the wild life by establishing a network of national park, wild life sanctuaries and zoological parks in the country.

The zoo movement in India is one of the oldest in the world. The first zoo was established in 1800 at Barrackpore, Kolkata. This was followed by a zoo in Chennai in 1855, Trivandrum 1857, Mumbai 1863, Jaipur 1876 and Udaipur 1878. In the post-independence era also the movement received an impetus and a number of important zoos were set up such as the Municipal Hill garden Zoo, Ahmedabad 1851, Delhi Zoological park 1955, Himalayan Zoological park, Darjeeling 1958, Nehru Zoological park, Hyderabad 1959, Assam state zoo, Gawhati 1960 to mention only a few.

Indian board for wild life was constituted in 1954 to advice the Govt. of India about the management of wild life in India. On the recommendation of Indian board for wild life (Now National Board for wild life), an expert committee was constituted to formulate norms and guidelines for the improvement of the management of existing zoos in 1973. This committee prepared a report – Management of zoos in India and submitted to Govt. of India which was accepted. To continue with the process of improvement of management of wild animals in captivity, a Central Zoo Authority was established to oversee the functioning of zoos and to formulate standards and norms to display the wild life in captivity in 1992 by Government of Indian, Ministry of Environment and Forest.

Madhya Pradesh is a pioneer state in the national movement for conservation of flora and fauna. Conservation oriented legal provision were made in the erstwhile Acts regulating hunting of game – birds and wild animals. In tune with the national consciousness towards conservation of flora and fauna, the State Government setup a network of in-situ and ex-situ conservation areas under the provision of the wildlife (Protection) Act, 1972.

This master plan has outlined the development of the Zoological Park and Rescue center, Mukundpur (Satna) from its start to future development in the next 10 years. I am happy to note that this plan will take care of animals, visitors and staff. This has ably been done by a team of zoo officials, EPCO and Aashraya Consultancy, Bhopal and input from the experts.

I congratulate all the team members and experts for this hard work for bringing out this master plan.

P.K. Singh, IFS
Chief Conservator of Forest,
Rewa (MP)

Part-I

Chapter -1

There are about 200 facilities keeping wild animals in captivity in the country at present. They were established at different times, beginning from the middle of the last century to the present, hence their objectives reflect the philosophy prevalent at the time of their establishment. In the absence of any accepted norms or standards for the zoos in the country, the quality and performance of management of captive animals differ widely from institute to institute.

The Central Zoo Authority was established by the Govt of India in 1992 to oversee the functioning of zoos in the country by providing technical and other assistance for their proper management and development on the scientific lines. The Zoo and Rescue center at Mukundpur (Satna) has been planned keeping in view of CZA's norms for its development, objectives and maintenance.

1.1 History: - Madhya Pradesh state has three zoos at Indore, Gwalior and Bhopal. The Van Vihar zoo, Bhopal is governed by State forest, while zoos at Indore and Gwalior are governed by local administration. The Van Vihar has the facility to house rescued animals, besides the display of other species. There is no facility to keep and display the rescued animals in Satna - Rewa region. The distance between Bhopal and Rewa is about 500 km. Traveling this long distance traumatizes the sick animals which may be fatal. To stop such victimization of the injured and sick animals, Govt of Madhya Pradesh, Forest Department, planned to establish a new Zoo and Rescue center at Mukundpur (Satna). In the light of above background, the State Govt. pursued the matter with the Honorable Supreme Court and Central Zoo authority to establish a Zoological park and Rescue center at Mukundpur (Satna). Honorable Supreme Court vide petition no 301/A no 19 in W.P.(C) no. 47 of 1998 and Central Zoo authority, Ministry of Environment and Forest vide letter no. 20-8/209-CZA (M) dated 05-07-2010 approved the proposal to establish the Zoological park and Rescue center at the aforesaid site. The copies of approval from Hon. Supreme Court and Central Zoo Authority are placed at **annexure -3** and **4** respectively.

Geographically it is one of the unique region where White Tiger was originally found. The overall habitat includes tall trees, shrubs, grasses and bushes which is an ideal site for the wild life to prosper.

The proposed area was managed by Rewa estate for shooting ground. Maharaja of Rewa managed this forest for the game for his guests and VIPs. In the year 1921 hunting law was enforced under estate law for forest in Rewa estate. No one was allowed to hunt any animal without prior permission of the State. Indian Bison and Tiger were totally prohibited for shooting in the reserve forest.

After independence, Vindhya Pradesh was created in 1948. Wild Life and forest was protected by law passed in 1949 which was regulated up to 1959. In the year 1972, Wildlife (Protection) act was enforced.

This area is well known for the origin and breeding of White Tiger. The microclimate of the area fulfills natural requirement of a zoo. The area is appropriate for the establishment of a zoo as the basic requirements like availability of water; mixed forest and availability of land for extension are available.

The proposed area is largely plain, the northern boundary of the site is bounded by perennial river, Beehad, and the western boundary is made by perennial Nala, Murjuva Nala. 50 percent area is woodland having density varying from 0.4 to 0.7. The remaining area is open. Both the banks of River Beehad and Nala Murjuva have tall trees. The wood land has teak and mixed deciduous forest. It is mosaic of various habitat types in which woodland part shall be used for housing the animals, whereas open grass land will be ideal for herbivore.

1.2 Vision:- The Zoo at Mukundpur will provide rewarding experience to the visitors not about the local wildlife but also of India. The exhibits care and awareness will be of such level to promote conservation of wildlife. The Zoological Park will endeavor to breed the endangered species in a planned manner for display, exchange and rehabilitation in the wild. This zoo will be a showcase of nature for the visitors.

1.3 Mission:- This Zoological Park intends to complement the national efforts in conservation of wildlife through planned breeding of endangered species and to develop empathy among visitors for wild animals.

1.4 Strategy:-

To conserve natural resources.

To develop expertise in animal care, wildlife education, awareness and research.

To develop infrastructure and services of high standards.

1.5 Objectives: - A professionally run zoological park will serve a great variety of roles to benefit both the animals it houses and the visiting public. Carefully planned breeding programmes can help propagate endangered species and continue gene pools for species whose habitats have been obliterated. Pure as well as applied research on animals in captivity can benefit not only the animals in the zoos but also in the wild. Educational programmes can help foster the respect that wild animals deserve and familiarize the visitors with the important role these animals play in the ecosystem. Large scale habitat destruction has resulted in the extinction of many species. Zoos may have to serve as the last bastion for threatened and endangered species.

The zoo shall work for the conservation of the rich bio-diversity of the state to the following objectives:

- (1) To create amongst the visitors empathy towards wild animals through appreciation and better understanding.
- (2) Conservation breeding of endangered species of wild animals, available within the bio-geographical range.
- (3) To provide housing and upkeep to the orphaned animals of endangered species rescued from the wild.
- (4) To collect and collate the scientific data on the biology, behavior and health care of various species of wild animals housed in the zoo and use the same in future management of the zoo.
- (5) To assist in conservation of the in-situ population of various species of endangered animals and their habitat by sensitizing the people.
- (6) To establish a small research centre for identification and cultivation of various species of medicinal plants naturally occurring in adjoining forest areas.
- (7) Recreation for the purpose of providing wholesome, healthy and educational activity to a large number of people by utilizing the outdoor natural setting without detriment to any of the preceding objectives.

1.6 Physical features

1.6.1 Topography: - The proposed site is largely plain area, the northern side is bounded by perennial river, Beehad River, the western boundary has PWD Road and the southern and eastern sides shall have artificial boundary. The north to south area is about 700mtr where as east to west is 1500 mtr.

1.6.2 Geology: - Soil of zoo Mukundpur is sandy loam and does not vary in the whole area. General pattern of soil profile indicates a top loose to hard soil with a different depths of a very compact nature. In most of area PH of soil is more than 8.5 and sub-soil water table is about 20mtr.

1.6.3 Rock and soil:- The area is plain without any rock. The soil is sandy loam with top loose to hard below.

1.6.4 Flora and fauna:- Flora is given in the **annexure-5** and fauna in **annexure-6**

1.6.5 Climate: - Climate is markedly periodic and is characterized by dry and increasing hot summer from March to June, warm monsoon from July to September and cold- dry winter from November to February.

1.6.6 Rainfall: - Maximum rainfall occurs between June to mid August. Wettest period of year is July. Normal annual rainfall in Rewa is 1075mm. Rainfall of higher intensity occurs mainly in July and August and occasionally in September.

1.6.7 Season: - Season is marked by hot, dry and humid summer from March to September and cold dry winter from October to February.

1.6.8 Approach: - The proposed area falls under Mukundpur range of Satna Forest Division and lies on Rewa-Amarkantak four lane highway. It is approximately 15 km in the west of Rewa. The area is well connected by road and rail. The area is situated on the tourist circuit of the Khajuraho and Bandhavgarh. Now Rewa is Also connected by air from Bhopal.

1.6.9 Demography: - The Zoo Mukundpur is situated near the Govindgarh palace, Rewa which is famous for the origin and breeding of White Tiger. The tourist spots like Khajuraho and Bandhavgarh are well connected. The whole area is surrounded by natural forest, river and nalas.

1.7 Legal status of land: - The ownership of the land of the proposed Zoo and Rescue centre belongs to forest department, Government of Madhya Pradesh. It does not have any human habitation. Necessary clearances from Hon. Supreme Court and Central Zoo authority were obtained to establish Zoo and rescue center at Mukundpur (Satna) and are placed at **annexure – 3 and 4** respectively.

1.8 Pollution: - Zoo is full of vegetation. Due to abundant greenery, air of park is pollution free. However, no data is available to substantiate this. Traffic on Rewa -Amarkantak highway does not have much effect of noise pollution due to thick vegetations. Since the zoo is a new one with abundant vegetation, so the source of pollution is negligible.

Chapter-2

2.1 Appraisal of the present arrangement and constraints: - This is a new zoo, so the question of appraisal of the existing infrastructure does not arise.

PART-II

Chapter-3

3.1 Future objectives:- There is no change in future objectives, vision and mission as given in **Part-I, Chapter –I** as this is a new zoo, however the same is reproduced as under:-

A professionally run zoological park will serve a great variety of roles to benefit both the animals it houses and the visiting public. Carefully planned breeding programmes can help propagate endangered species and continue gene pools for species whose habitats have been obliterated. Pure as well as applied research on animals in captivity can benefit not only the animals in the zoos but also in the wild. Educational programmes can help foster the respect that wild animals deserve and familiarize the visitors with the important role these animals play in the ecosystem. Large scale habitat destruction has resulted in the extinction of many species. Zoos may have to serve as the last bastion for threatened and endangered species.

The zoo shall work for the conservation of the rich bio-diversity of the state to the following objectives:

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- (5) To assist in conservation of the in-situ population of various species of endangered animals and their habitat by sensitizing the people.
- (6) To establish a small research centre for identification and cultivation of various species of medicinal plants naturally occurring in adjoining forest areas.
- (7) Recreation for the purpose of providing wholesome, healthy and educational activity to a large number of people by utilizing the outdoor natural setting without detriment to any of the preceding objectives.

3.2 Vision:- The Zoo at Mukundpur will provide rewarding experience to the visitors not about the local wildlife but also of India. The exhibits, care and awareness will be of such level to promote conservation of wildlife. The Zoological Park will endeavor to breed the endangered species in a planned manner for display, exchange and rehabilitation in the wild. This zoo will be a showcase of nature for the visitors.

3.3 Mission:- This Zoological Park intends to complement the national efforts in conservation of wildlife through planned breeding of endangered species and to develop an empathy among visitors for wild animals.

3.4 Theme:- The display of animals has been done on taxonomical system. The visitors will see the animal of a particular group in one location for better understanding of their behavior and differences. The visitors will have exciting experience of different taxonomical groups as under:-

- (1) Large carnivores
- (2) Small carnivores
- (3) White Tiger safari
- (4) Herbivores
- (5) Birds aviaries
- (6) Wetland birds
- (7) Flight less birds
- (8) Reptiles

3.5 Strategy to achieve the objectives:-

- (1) Ex-situ Conservation: - This park will display a number of endemic species like tiger, lion, panther, hyenas, wolf, different kinds of cats, grey langur, crocodile, gharial and grey jungle fowl etc. Efforts will be made to provide them adequate space for movement, health care and balance diet for their breeding and longevity. Special care will be taken to enrich the exhibits to check the boredom.
- (2) Education and awareness: - There is difference between education and interpretation. Education can be formal with a fixed schedule, where as interpretation is informal without any schedule. In order to achieve the objectives, an education wing will be created in the park with adequate man power and infrastructure like interpretation center, published material and audio-visuals.

This section will develop an education and awareness programme as under:-

- (1) To develop interactive sign ages.
 - (2) To prepare animals signages – giving basic information's & their characteristics.
 - (3) Providing of general information signages at prominent places.
 - (4) To conduct guided tour, organize lectures, talks and competitions.
 - (5) To publish guide book, brochures, guide map & leaflets about the Zoo and its inmates.
 - (6) To organize orientation programmes for the selected groups.
 - (7) To conduct various competitions on the eve of wildlife week and other specific days.
 - (8) To involve volunteers, NGO'S to take up awareness activities.
- (3) Research on wildlife:- The zoo offers ample opportunities for conducting research on wild life in captivity. For that a research section will be created with adequate staff & infrastructure. The section will be responsible to conduct research in ex-situ and in-situ conditions and also interact with other institutes for collaboration in formulation and conducting research. The probable research projects that can be taken up are as under:-
- (1) Flora of the park and adjoining area.
 - (2) Fauna of the zoo and its surrounding area.
 - (3) Breeding behavior of endangered species.
 - (4) To study the nutritional requirement of captive animals.
 - (5) To study the parasites of zoo animals.
 - (6) To identify the medicinal plants & their advantages.

Chapter-4

Future action plan

4.1 Future planning: - The future planning is aimed of providing directions for development of the Zoological Park and Rescue center, Mukundpur (Satna) in the coming 10 years i.e. 2012-2013 to 2022-2023 and will be reviewed thereafter. The proposal of development is based on the site requirements, visitors' profile, availability of water & electricity, vegetation, climatic conditions & resources available with the management. The guidelines of CZA, advice from zoo experts and wild lifers have been taken into consideration in the formulation of action plan. The development has been planned keeping in view the strategy to achieve the prescribed objectives.

4.2 Animal collection plan: - The Zoological Park aims to display animals keeping in view the local habitat, climatic conditions and the resources available. This zoo and rescue center is going to be a medium zoo. The CZA has formulated guidelines for animal collection for medium zoo as under:-

- | | |
|---------------------------------------|---------------------------------|
| (1) Species of local area / ecosystem | 40% of the total sp. displayed. |
| (2) Species of region | 40% of the total sp. displayed. |
| (3) Species of nation | 10% of the total sp. displayed. |
| (4) Exotic species | 10% of the total sp. displayed. |

The animal collection plan of the Zoo and rescue center, Mukundpur is as under:-

Sno.	Species	Existing stock				Proposed collection				Animals to be acquired				Area proposed (sqmt)
		M	F	US	Total	M	F	US	Total	M	F	US	Total	
	Mammals													
1	Tiger (Panthera tigris)	-	-	-	-	2	3	-	5	2	3	-	5	3000

2.	White Tiger (Panthera tigris)	-	-	-	-	2	3	-	5	2	3	-	5	3400
3	Lion (Panthera leo)	-	-	-	-	2	3	-	5	2	3	-	5	3300
4	Panther (Panthera pardus)	-	-	-	-	2	3	-	5	2	3	-	5	1150 (Top open) or 500 (Top closed)
5	Jaguar (Panthera onca)	-	-	-	-	2	3	-	5	2	3	-	5	1200 (Top open) or 500 (Top closed)
6	Sloth Bear (Melursus ursinus)	-	-	-	-	2	3	-	5	2	3	-	5	2000
7	Palm civet Cat (Paradoxurus hermaphrodites)	-	-	-	-	2	3	-	5	2	3	-	5	200
8	Small Indian Civet Cat (Vierricula indica)	-	-	-	-	2	3	-	5	2	3	-	5	200
9	Large Indian Civet (Viverra zibetha)	-	-	-	-	2	3	-	5	2	3	-	5	200
10	Jungle Cat (Felis chaus)	-	-	-	-	2	3	-	5	2	3	-	5	200
11	Desert Cat (Felis libyca)	-	-	-	-	2	3	-	5	2	3	-	5	200
12	Hyena (Hyena hyena)	-	-	-	-	2	3	-	5	2	3	-	5	500
13	Jackal (Canis aureus)	-	-	-	-	2	3	-	5	2	3	-	5	500
14	Wolf (Carnis lupus)	-	-	-	-	2	3	-	5	2	3	-	5	500
15	Fox (Vulpes bengalensis)	-	-	-	-	2	3	-	5	2	3	-	5	500
16	Wild Dog (Cuon alpines)	-	-	-	-	2	3	-	5	2	3	-	5	500

17	Sambar (Cervus unicolor)	-	-	-	-	2	3	-	5	2	3	-	5	4000
18	Chital(Axis axis)	-	-	-	-	2	3	-	5	2	3	-	5	4300
19	Barking Deer (Muntiacus muntijak)	-	-	-	-	2	3	-	5	2	3	-	5	4200
20	Gaur (Bos gaurus)	-	-	-	-	2	3	-	5	2	3	-	5	4100
21	Hog Deer (Axis porcinus)	-	-	-	-	2	3	-	5	2	3	-	5	4200
22	Black Buck (Antilope cervicarpa)	-	-	-	-	2	3	-	5	2	3	-	5	4200
23	Chinkara (Gazella bennetti)	-	-	-	-	2	3	-	5	2	3	-	5	4100
24	Barasingha (Cervus duvauceli)	-	-	-	-	2	3	-	5	2	3	-	5	4400
25	Wild Boar (Sus scrofa)	-	-	-	-	2	3	-	5	2	3	-	5	1200
26	Neelgai (Boselaphus tragocamelus)	-	-	-	-	2	3	-	5	2	3	-	5	4100
27	Thamin Deer (Cervus eldii)	-	-	-	-	2	3	-	5	2	3	-	5	4100
28	Porcupine (Hystrix indica)	-	-	-	-	2	3	-	5	2	3	-	5	300
29	Hedgehog (Hemiechinus auritus)	-	-	-	-	2	3	-	5	2	3	-	5	150
30	Rhesus Monkey (Macaca mulatta)	-	-	-	-	2	3	-	5	2	3	-	5	500
31	Grey Langur (Presbytis entellus)	-	-	-	-	2	3	-	5	2	3	-	5	500

32 Bonnet Monkey - - - - 2 3 - 5 2 3 - 5 500
(*Macaca radiata*)

33 Assamese Monkey - - - - 2 3 - 5 2 3 - 5 500
(*Macaca assamensis*) or
Pigtail (*Macaca nemestrina*) or
Capped Langur
(*Presbytis pileatus*)

Birds

34 Ring - necked - - - - 5 5 - 10 5 5 - 10 2100 for
Parakeet birds
(*Psittacula krameri*) aviaries

35 Alexandrine - - - - 5 5 - 10 5 5 - 10
Parakeet
(*Psittacula eupatria*)

36 Blossom headed - - - - 5 5 - 10 5 5 - 10
Parakeet
(*Psittacula cyanocephala*)

37. Grey Partridges - - - - 5 5 - 10 5 5 - 10
(*Francolinus pondicerianus*)

38. Black Partridges - - - - 5 5 - 10 5 5 - 10
(*Francolinus francolinus*)

39. Quails (*Perdicula asiatica*) - - - - 5 5 - 10 5 5 - 10

40. Ring necked - - - - 5 5 - 10 5 5 - 10
Pheasant
(*Phasianus colchicus*)

41. Red Jungle Fowl - - - - 5 5 - 10 5 5 - 10
(*Gallus gallus*)

42.	Grey Jungle Fowl (Gallus sonneratii)	-	-	-	-	5	5	-	10	5	5	-	10
43.	Ringed neck Dove (Streptopelia decaocto)	-	-	-	-	5	5	-	10	5	5	-	10
44.	Green Pigeon (Treon phoenicoptera)	-	-	-	-	5	5	-	10	5	5	-	10
45.	Munia (Estrilda amandava)	-	-	-	-	10	10	-	20	10	10	-	20
46.	Baya (Ploceus philippinus)					5	5	-	10	5	5	-	10
47.	Finches (Taeniopygia guttata)					10	10	-	20	10	10	-	20
48.	Budgerigar (Melopsittacus undulatus)					10	10	-	20	10	10	-	20
49.	Cockatiel (Nymphicus hollandicus)					10	10	-	20	10	10	-	20
50.	Macaw (Blue & Yellow) (Ara ararauna)					3	3	-	6	3	3	-	6
51.	Kakatoe(bare- eyed) (Kakatoe sanguinea)					3	3	-	6	3	3	-	6
52.	Grey heron (Ardea cinerea)	-	-	-	-	2	2	-	4	2	2	-	4
53.	Sarus Crane (Grus antigone)					2	2	-	4	2	2	-	4

54.	Painted stork (Ibis leucocephala)	3	3	-	6	3	3	-	6	
55.	Pelicans (Pelecanus philippensis)	2	2	-	4	2	2	-	4	
56.	Ducks (Different species.)	5	5	-	10	2	2	-	4	
57.	Ostrich (Struthio camelus)	2	3	-	5	2	3	-	5	525
58.	Emu (Dromiceius novaehollandiae)	2	3	-	5	2	3	-	5	500
Reptile										
59.	Marsh Crocodile (Crocodilus palustris)	2	3	-	5	2	3	-	5	1200
60.	Gharial (Gavialis gangeticus)	2	3	-	5	2	3	-	5	1050
61.	Turtle (Chelydra serpentina)	3	3	-	6	3	3	-	6	600
62.	King cobra (Ophiophagus hannah)	1	1	-	2	1	1	-	2	700 for reptile house
63.	Cobra (Naja naja)	1	1	-	2	1	1	-	2	
64.	Pit Viper (Tropidolaemus wagleri)	1	1	-	2	1	1	-	2	
65.	Russell Viper (Vipera russelli)	1	1	-	2	1	1	-	2	
66.	Krait (Bungarus fasciatus)	1	1	-	2	1	1	-	2	
67.	Water snakes (Cerberus rynchops)	10	10	-	20	10	10	-	20	

68.	Python (Python molurus)	2	2	-	4	2	2	-	4
69.	Sand Boas (Eryx johnii)	2	2	-	4	2	2	-	4

4.3 Description of the layout plan of the zoo:- The Zoological park and Rescue center Mukundpur (Satna) is a new zoo and is about 15 Km from the Rewa town on Rewa – Amarkantak highway. This zoo has been proposed to be developed on modern concept of zoo management. An area of 100 ha. presents thick wood land vegetation and a number of herbs and shrubs. The layout plan has been Prepared by Shri Mukesh Dubey of Aashraya Consultancy in consultation with the Member Secretary, CZA, CZA’s experts on zoo design and zoo officials etc.

The layout plan has been drawn on scale 1:2000 with contour interval of 0.5 mt. It includes a 2 mt. high stone masonry boundary wall having angle iron barbed wire fence over it. This also contains approach road to the zoo, parking area, entrance gate , offices, roads and paths, interpretation center, animal enclosures, water bodies, natural canals, veterinary hospital, rescue center, water works, and power station.

The theme of the display of animal is taxonomical and is given as under:

- (1) Large carnivores.
- (2) Small carnivores.
- (3) White Tiger safari.
- (4) Herbivores.
- (5) Birds aviaries.
- (6) Wetland birds.
- (7) Flight less birds.

(8) Reptiles.

The animals have been displayed in spacious enclosure. Moats form the barriers between animal and visitors. All the animals have been exhibited on the main road. A secondary road has been made in front of jaguar enclosure which joins the main road in front of birds' aviary. This makes a short loop and provides the option to curtail the visit if the visitors desire. One round of the main road of the park is equal to 2.5 km. A road has been carved from the main road between the space of hog deer and black buck enclosures to join the White Tiger Safari. There are two water bodies covering an area of 2.145 ha which will have small islands with vegetation. These water bodies will remain full of water throughout the year. It is proposed to display over 450 animals comprising of 68 species

Visitors amenities like parking, toilets, drinking water points, kiosk, shelters and benches have been provided. About 2 lakh visitors are expected to visit per year.

The check dams will be built near water bodies, entry gate, white tiger safari, Murjuva Nala and Beehad river to control the water flow and erosion. Area behind white tiger safari will be used for composite pits.

The layout plan was recommended for approval by the members of expert group on zoo design in its 34th meeting, the extract of the minutes of the meeting is placed at **annexure-7**.

The approved layout plan indicating the animal's enclosures, water bodies and visitor facilities etc is placed at **annexure – 8**.

4.4 Visitor circulation:- The visitors circulation is well defined and is from left to right. The visitors enter from the Rewa-Amarkantak highway. The entry leads to the interpretation center for orientation. After visiting the interpretation center, the visitors go to the 1st enclosure of Tiger, followed by White Tiger, Lion, Panther, Jaguar and Sloth Bear on the same road. This covers the large carnivores. Then starts the small carnivores which include cats and felids. The visitors than move to left in curve on the same main road to see a number of herbivores.

A road has been made between the space of hog deer and black buck enclosures to join the White Tiger Safari. After visiting the safari, visitors will follow the same road back to join the main road to see remaining herbivores, small mammals, bird aviaries, flight less birds and monkeys. The butter fly park is also located on the main road for the visitors to see it. The reptiles house and remaining reptiles enclosures follow the butterfly park. We have avoided to create undesired loops for smooth movement. After seeing all these exhibits, the visitors follow the main road to the exit gate. It will take about 2-3 hours on foot to see the whole zoo.

4.5 Services:- The zoo proposes to provide services for its operation and maintenance in the following ways:-

- (1) Supply of feed and essential items:- For this a service gate has been proposed in front of Rewa – Amarkantak highway. Majority of the services will be under taken through this gate. A service road parallel to main loop road but behind the enclosure had been created for unobstructed movement of service vehicle for supply of feed items to animals. The service gate and the network of service roads can be seen in the layout plan.
- (2) Internal services like solid waste disposal, water management system, liquid waste disposal (sewage), drainage system and electricity system are described below.

4.5.1 Solid waste disposal:- The solid waste of the park will consist of following materials.

- (1) Leftover food.
- (2) Fecal matter.
- (3) Fallen leaves.
- (4) Grasses.

- (5) Visitors left over.
- (6) Office waste.

It has been proposed to segregate the non bio-degradable waste. This waste will be disposed off by the authorized outsourced agency at the authorized corporation site. The bio-degradable waste will be used to make manure and for vermiculture and the same will be used for horticulture purpose.

4.5.2 Water management system:- The water will be obtained from the following sources.

- (1) Beheed (River).
- (2) Bore wells.
- (3) Recycled Water from STP.

Bore wells will be made near administrative block, crocodile, white tiger safari and thamin deer enclosure. Bore wells of 150 mm dia. and an average depth of 350 m are proposed to be drilled. Suitable submersible pumps, pumping house and pipelines will be provided on these bores. Water samples of different location of the park were got tested from public health engineering department of Rewa. The report of the sample tested by public health engineering department, Rewa is placed at **annexure-9**. The health department health has advised to filter the bore wells water before its use. The water from bore wells will be collected in two reservoirs of 1 lakh litre capacity each. A water treatment plant will be installed near reservoirs for its treatment before release through over head tank of 50000 litre capacity. The drawing of potable water (drinking) distribution system is placed at **annexure – 10**.

The river water from the Beehad river will be collected behind Sambhar enclosure. There will be a pumping station for supplying water to water bodies of birds, enclosures of water loving animals and horticulture purpose through pipe lines. The distribution system of river water (non-potable) is given in **annexure—11**.

The projected requirement of water is as under:

1- Calculation Of Water Requirement-
Part -A

Sl. No.	Item/Description	Number of enclosure	Drinking		River water		Grand Total (5+7)
			Per Unit Water Requirement per day in Ltr.	Total Requirement per day in Ltr.	Per Unit Water Requirement per day in Ltr.	Total Requirement per day in Ltr.	
1	2	3	4	5	6	7	8
1.	Large Cat and bear	6	20	120	200	1200	1320
2.	Small Cat	5	10	50	50	250	300
3.	Felids	5	10	50	75	375	425
4.	Ungulate	11	75	825	200	2200	3025
5.	Reptile house	1	10	10	50	50	60
6.	Birds Aviary	1	25	25	100	100	125
7.	Ostrich/Emu	2	5	10	25	50	60
8.	Porcupine/Hedge hog	2	5	10	25	50	60
9.	Monkey	4	10	40	25	100	140
	Sub Total			1140		4375	5515
Other							
10.	Visitors	5000	5	25000	10	50000	75000
11.	Staff (All)	50	5	250	10	500	750
12.	Director Office & Administrative Building	5	5	25	10	50	75

13.	Food Store	8	5	40	10	80	120
14.	Veterinary	L.S.				500	500
15.	Incinerator	L.S.				500	500
16	Residential complex	45 units		20000		10000	30000
			Total	46455		61630	108085
				or say			
				50000			

Part-B

Sl. No.	Animal	Area in Sqm	Depth in Mtr.	Volume of River Water Required in Cum	Volume of River Water Required in Litre
1	2	3	4	5	6
1.	Crocodile	1200	2	2400	2400
2.	Gharial	1050	2	2100	2100
3.	Turtle	600	2	1200	1200
4.	Water bodies in Tiger Safari	770	2	1540	1540
5.	Water bodies for birds	2700	2	5400	5400
Total Requirement		6320		12640	12640

Part –C					
6.	Gardening				25000
7.	Fountains				5000
Total river water requirement					30000
Total River Water requirement (A+ others + B + C)					108645
Total potable water requirement (A+ others)					50000
Grand total of water requirement (say)					158645

As per calculation the water requirement for zoo and residential areas will be follows , taking into consideration of factor of safety (considering power failure etc.) :-

Potable water (drinking) requirement per day is. 50,000 LPD

River water requirement per day is (say). 1,50,000 LPD

4.5.3 Liquid waste disposal (sewage):- The liquid waste includes water from enclosures' washing, animal urine and excreta, toilets and drinking water points. However no quantity of liquid waste has been assessed at this moment. The area of the zoo is quite large, so it is not possible to make a centralized sewerage treatment plant. The whole buildings, enclosures toilets and water points will be divided into groups. The waste water of each group will be collected in a septic tank. The location of septic tanks will depend on contour so that water reaches to tank by gravity. The capacity of septic tank will be from 6000 liters to 10,000 liters. Waste water will be treated in septic tank, after primary treatment, the effluent of septic tanks will be further treated through root zone treatment system (A Biological Treatment) in a wetland. The clear water so obtained will be used to irrigate the nearby plantation. The drawing of internal sewage disposal system is placed at **annexure – 12**. The treated water of sewage will not be released in the perennial river Beehad or Murjuva Nala instead it will be used for gardening.

GROUPS FOR WASTE WATER, TREATMENT SYSTEM

Sl. No.	Name of Group Location	Building/Enclosures included for Treatment Unit	Capacity of septic tank (Liter)
1.	Administrative Block	Administrative Block, Interpretation centre, Cafeteria etc.	10,000
2.	Lion Enclosure	Tiger, White Tiger & Lion Enclosure	10,000
3.	Panther Enclosure	Panther, Jaguar, Sloth Bear,	6000
4.	Wolf Enclosure	All small cats, Hyena, Jackal & Wolf enclosure	6000
5.	Sambhar and chital Enclosure	Wild dog, Fox, Sambhar, Chital, Barking deer. Gaur, Hogdeer, Black buck, Chinkara & Barasingha	10,000
6.	Hedgehog	Neelgai, Wild bear, Thamin deer & Porcupine	6000
7.	Ostrich	Emu, Ostrich & Toilet	6000
8.	Monkey Island	Monkey Islands	6000
9.	Slaughter House	Slaughter House	6000
10.	Veterinary Complex	All Building in veterinary section	10,000
11.	Postmortem	Postmortem	6000

--	--

4.5.4 Drainage system:- During monsoon or flood, the whole park may be inundated. The excess water will be disposed off by a network of pipe lines and open drains as shown in the map placed at **annexure- 13**. This water will be released in Beehad river or Murjuva Nala.

4.5.5 Electricity supply system:- Power will be taken from 11 KVA grid through transformer of about 125 KVA. Drawing of electricity distribution system is placed at **annexure – 14**

The type of lighting on different areas / roads is given as under:

- (1) Front, parking and residential area – Conventional type.
- (2) Main and service road – 1 meter high LED based down lights.
- (3) Secondary roads – Foot lights.
- (4) Patrol roads (security) 1 meter high LED based down lights.
- (5) Offices, veterinary hospital, interpretation center – Conventional type.

The estimated power requirement will be as under:-

S No.	Item	Power requirement (KW)
1	Animal enclosures	15.0 KW
2	Main, service, secondary, and patrol roads.	5.0 KW(LED lights)
3	Residential area	25.0 KW
4	Front and parking area	5.0 KW
5	Offices,	5.0 KW
6	Veterinary hospital	4.0 KW
7	Rescue center and quarantine	3.0 KW
8	Interpretation center	4.0 KW
9	Pump house	20.0 Watts
10	Miscellaneous	14.0 KW
	Total :- Load (Electrical Power Required)	=100 KW Appx. as mentioned above.

4.6 Animal section:- Animal section is lifeline of a Zoological park. The importance of a zoo depends upon the quality of exhibits rather than the number of species it displays. This section is responsible for the upkeep of animals and their houses so that they get a hygienic and naturalistic environment in the zoo. The animals will be kept in enclosures which provide them

adequate space in quality and quantity and satisfy the biological needs of each individual species. Adequate measures will be taken to ensure the safety of animals, caretakers and visitors. Each enclosure will have proper drainage of excess water and arrangements for removal of excreta and residual waste so that a high standard of sanitation and hygiene would be maintained. The animals will be acquired from other zoos or through rescue.

Following the National Zoo Policy (1998), Zoo will not collect animals from wild except for founder animals for approved breeding program and for infusion of new blood into inbred group.

4.6.1 Duties & responsibilities of this section will be as follows:-

- (1) To ensure cleanliness and maintenance of enclosures, animal houses and surroundings.
- (2) To ensure daily optimum supply of ration and water to animals and birds and to submit regular ration requisition according to individual need.
- (3) To report and record of health, breeding and feeding conditions of animals daily.
- (4) To ensure safe capturing, crating and translocation of animals.
- (5) To keep liaison with Veterinary section for health problems and treatment of animals.
- (6) To keep liaison with construction and maintenance section for repairs of damaged enclosures, cages, doors, gates, other structures and miscellaneous works to prevent escape of animals.
- (7) To maintain records of all livestock, food distribution and inventories.
- (8) To prepare and submit report of animals section.

4.6.2 Equipment and vehicle requirement:- Following vehicles, equipments and implements will be required to run this section smoothly.

- (1) Animal crates (carnivore, herbivore, monkey, and birds) -5
- (2) Trolley for carrying animal crates – 2
- (3) Hand trolley – 20
- (4) Squeeze cage (mobile) – 1
- (5) Pressure pumps -10
- (6) Basket – 20
- (7) Daav (meat cutter) – 10
- (8) Knife – 10
- (9) Broom – 50
- (10) Turmeric powder – 10kg
- (11) Rubber pipe 500mtr
- (12) Oil and greese 5 kg

- (13) 4 wheeler – 1
- (14) 2 wheeler - 2
- (15) Bi-cycle – 2
- (16) Computer 1
- (17) Furniture as per need
- (18) Telephone
- (19) Intercom
- (20) Miscellaneous items

4.6.3 Staff requirement:- Following staff will be needed in this section:-

Proposed Staff

<i>S. No.</i>	<i>Post</i>	<i>No. of Post</i>	<i>Pay Scale</i>
<i>1</i>	Curator (Animal) or ACF	1	9300-34800 +4600GP
<i>2</i>	Asstt. Curator - or Range officer (Animal)	2	9300-34800 +3600GP
<i>3</i>	Head Zookeeper	2	5200-20200 +2100GP
<i>4</i>	Driver	1	5200-20200 +1900GP
<i>5</i>	Zoo keeper	15	5200-20200+ 1900GP
<i>6</i>	Asst. Zoo keeper	31	4400-7440+ 1300GP
<i>7</i>	Attendant	2	4400-7440+ 1300GP

4.6.4 Brief of animal enclosures to be constructed:- The guiding principle of wildlife displayed at this park is to present them in an environment as natural as possible and maintain their dignity as our fellow creatures. One will get a feeling of freedom in the free nature as he/she steps in to a different world of animals. This sets the right environment of being with wild animals in their environment. There is no place for barred cages to exhibit animals as

condemned prisoners or to push them in deep pits and dark holes. The animals will have access of bright sunshine and fresh air.

All enclosures will be open with grasses and trees, and will be designed to maintain the equal level of viewer and the viewed in majority exhibits. The physical barrier will be dry moat with its outer wall slightly higher to conceal the moat.

(1) Tiger, White tiger and Lion enclosure:-

Cell size (in mtr)			Area proposed for enclosure (sqr mtr)	Remarks
L	B	H		
2.75	1.80	3	Tiger- 3000 White Tiger- 3400 Lion – 3300	<p>The exhibits will be covered on three sides with 5cm x 5cm x 8g chain link fence, with height of 5 mtr. and 1.5mtr inverted at the top at 60 degree angle.</p> <p>V-shaped dry moat with depth of 5mtr and horizontal width at the top 8 mtr.</p> <p>To rule out any chance of its escape by developing speed and crossing the moat in a long leap, the ground slope will be kept downward.</p> <p>The fenced sides will have over grown shrubs to conceal the metallic parts.</p> <p>Enrichment:</p> <ol style="list-style-type: none"> (1) Shady trees of moderate height will be provided (2) Groove of bushes will be provided (3) Shelters / den will be made (4) Scratching logs will be provided (5) Pools / streams will be made (6) Live fish will also be released in wallowing pool.

(2) Panther and Jaguar:-

Cell size (in mtr)			Area proposed for enclosure (sqr mtr)	Remarks
L	B	H		

2	1.80	2.50	<p>Panther – 1150 (top open) or 500 (top closed)</p> <p>Jaguar -1200 (top open) or 500 (top closed)</p>	<p>The panther and jaguar will be displayed in a closed exhibits, covered on all sides with 1.5” x 1.5” chain link fence of 4mt height or in top open enclosure of 4mt high chain link fence with inverted steel plate of 1 mt width at top at 60 degree.</p> <p>The viewing will be through toughened glass fixed at 2 places for unhindered viewing.</p> <p>The fenced sides will have over grown shrubs to conceal the metallic parts.</p> <p>Enrichment:</p> <ol style="list-style-type: none"> (1) Shady trees of moderate height will be provided. (2) Scratching logs will be provided. (3) Terrace will be built to sit, hide and lie. (4) A wooden ladder will be provided to climb up to terrace.
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(3.) Sloth bear:-

Cell size (in mtr)			Area proposed for enclosure (sqr mtr)	Remarks
L	B	H		
2.50	1.80	2.50	2000	<p>The enclosure will be covered on three sides with brick wall of 4mtr in height or chain link fence of 5cm x5cm x 8g with inclined inward steel plate of one meter width on top at 60 degree. The front or viewing side will have U-shaped dry moat with a depth of 2.5 mtr and width of 5.5 mtr</p> <p>Enrichment:</p> <ol style="list-style-type: none"> (1) The arena will be provided with natural vegetation

including trees and tree logs, a pool, elevated wooden platform.

- (2) Groove of bushes will also be provided.
- (3) A cave will be provided for breeding and shelter.
- (4) A ladder to climb up to log will be made.
- (5) Concealed food will be kept at 2-3 locations.

(4.) Common palm civet cat, Small Indian civet cat, large Indian civet, Jungle cat and Desert cat:-

Cell size (in mtr)			Area proposed for enclosure (sqr mtr)	Remarks
L	B	H		
1.80	1.50	2	200 for each species	<p>The enclosures will be covered on all sides with 1.5"x1.5" chain link fence</p> <p>The viewing will be through toughened glass fixed at one place for unhindered viewing. The fenced sides will have over grown shrubs to conceal the metallic parts.</p>

Enrichment:

- (1) Small bushes will be provided.
- (2) Burrows / dens will be made.
- (3) Small logs will be fixed.
- (4) Wooden ladder will be provided.

(5) Cubicles will have darkness .

(5.) Hyena, Jackal, Wolf, Fox and Wild dog:-

Cell size (in mtr)			Area proposed for enclosure (sqr mtr)	Remarks
L	B	H		
2	1.50	2.5	500 for each species	<p>The enclosures will be covered on three sides with 5cm x 5cm x 10g chain link fence of 2.5mt high.</p> <p>The front or viewing side will have V-shaped dry moat (flat bottomed) with depth of 2.6 mtr and width of 5 mtr. The fenced sides will have over grown shrubs to conceal the metallic parts.</p> <p>A buffer of about 10 to 20 mt will be kept between enclosures of wild dog & sambhar.</p> <p>Enrichment:</p> <ol style="list-style-type: none">(1) Burrows / dens will be made.(2) Small old logs will be fixed for playing.(3) Carcass feeding will be done.(4) Groove of bushes will be provided .

(6.) Sambar, Chital, Barking dear, Gaur, Hog dear, Black buck, Chinkara,

Barasingha, Thamin deer, Neelgai and Wild boar:-

Cell size (in mtr)			Area proposed for enclosure (sqr mtr)	Remarks
L	B	H		

Deer				Sambar- 4000
				Chital - 4300
3	2	2.5		Barking deer - 4200
				Gaur - 4100
Chinkara				Hog deer - 4200
				Black buck- 4200
2.5	1.5	2.5		Chinkara- 4100
				Barasingha- 4400
				Thamin deer- 4100
				Neelgai -4100
				Wild boar- 1200

The enclosures will be covered on three sides with 7.5 cm x 7.5 cm x 10g chain link fence of 2.5 mtr high. The front or viewing side will have V-shaped dry moat with a depth of 2.5 mtr and width of 6 mtr
Enrichment:

- (1) Groove of bushes will be provided.
- (2) Adequate poles / logs to rub horns / antlers and scratching will be fixed.
- (3) Salt lick blocks will also be kept.
- (4) Food will be provided at 2-3 places.

(7.) Porcupine and hedgehog:-

Cell size (in mtr)			Area proposed for enclosure (sqr mtr)	Remarks
L	B	H		
Porcupine				The exhibits will be covered by 5 cm x 5cm x 12g chain link fence of 2.5 mtr high on all sides with top open. The foundation will be of concrete masonry 1mtr deep to check the digging of tunnels for escape. 60 percent of the arena will be kept kuccha.
2	1.5	1.5	Porcupine – 300 Hedgehog – 150	
Hedgehog				Enrichment: (1) Sandy soil will be provided for making burrows. (2) Adequate shady trees will be
2	1	1		

planted.

(8.) Primate-Rhesus, Bonnet, Pigtail Monkey and Grey Langur:-

Cell size (in mtr)			Area proposed for enclosure (sqr mtr)	Remarks
L	B	H		
2	1.5	2.5	500 for each species	<p>The enclosure will be an island type having a U or V-shaped dry moat all around with a depth of 5 mtr and width of 7 mtr for langur and depth of 4 mtr and width of 6 mtr for monkeys or install a chain link fence of 50x50x10g with 5 mt in height having inward steel plate of 1.50 mt in length at 60° all around. The viewing will be through toughened glass.</p> <p>It will have moat wall of 0.90 mtr in height and stand of barrier. If moat is kept full of water, power fence will be provided on the inner sides of moat wall.</p> <p>Enrichment:</p> <ol style="list-style-type: none">(1) Trees and logs shall be provided.(2) Small logs will be fixed in cubicles.(3) Adequate shelter will be provided.(4) Rope for swinging will be fixed.(5) Food will be provided 3- times a day.

(9.) Emu and Ostrich:-

Cell size (in mtr)			Area proposed for enclosure (sqr mtr)	Remarks
L	B	H		
3	2	2.5	Emu – 500 Ostrich - 525	<p>The enclosures will be covered on three sides with 2"x2" chain link fence of 2.5 mtr high. The front or viewing side will have V-shaped dry moat with a depth of 1.5 mtr and width of 3 mtr</p> <p>Enrichment:</p> <ol style="list-style-type: none"> (1) Australian plants / grove of bushes will be planted for emu. (2) Grass land will be created. (3) Shallow water pool with fountain will be created. (4) Marble chips will be provided at 2-3 locations. (5) Soft soil / nesting material (dry hay) will also be provided.

(10.) Bird aviaries- Parakeet ring necked, Alexandrine parakeet, Blossom headed parakeet, Grey Partridges, Black Partridges, Quails, Ring necked Pheasants, Red Jungle Fowl, Grey Jungle Fowl, Dove (Ringed neck), Green Pigeon, Munia, Baya, Finches, Budgerigar, Cockatiel, Macaw and Kakatoo:-

Cell size (in mtr)			Area proposed for enclosure (sqr mtr)	Area	Height	Remarks
L	B	H				
1	1	1.30	Parakeet ring necked	80	6	The total area of 2100 sqm is kept for the development of bird aviaries. The minimum prescribed size by CZA for the outdoor enclosures will be followed as indicated in the table. Some area will be kept as a buffer and for future development. Each aviary will be a covered exhibit with wire mesh of size of 1"x1" except munia, baya, finches and budgerigar where this size of wire mesh will be 1cm x 1 cm. The viewing will be through toughened glass of size of 3 mtr x 2 mtr.
			Alexandrine parakeet	80	6	
			Blossom headed parakeet	80	6	
			Grey Partridges	80	3	
1.10	1.10	1.30	Black Partridges	80	3	
			Quails	80	3	
			Ring necked Pheasants	80	3	
			Red Jungle Fowl	80	3	
			Grey Jungle Fowl	80	3	
.80	.80	1.30	Dove (Ringed neck)	80	6	
			Green Pigeon	80	6	
			Munia –Baya etc.	Munia	20	6
Baya	20	6				
Finches	20	6				
Budgerigar	20	6				

			Cockatiel	20	6	(2) Small size tree / bushes will be planted.
Macaw			Macaw	80	6	(3) Earthen pots or nest boxes will be kept.
2	1.5	2.5	kakatoo	80	6	(4) Nesting material will be provided.

(11.) Wetland birds: Grey heron, Sarus Crane, Painted stork, Pelicans and Ducks (different sp.):-

Cell size (in mtr)			Area proposed for enclosure	Remarks
L	B	H		
There will be no cell			1.37 ha and .775 ha	<p>Two water bodies having area of 1.37 ha and .775 ha will be developed. Small islands of different sizes (25 sqm to 100 sqm) with adequate trees and bushes will be created. The periphery of the water body will have thick row of typha plants. The depth of water body will be from 1ft to 5 ft. There will be a system of releasing the water and its exit. Pinioned birds will be released to create bird sanctuary type environment to attract free living local and migratory birds. Adequate food will be provided. Fish fry will be released to grow fish</p>

in the water body.

(12.) Crocodile, Gharial and Turtle:-

Cell size (in mtr)			Area proposed for enclosure (sqm mtr)	Remarks
L	B	H		
There will be no cell, instead a side kraal of about 20 sqm will be developed for crocodile and gharial.			Crocodile – 1200	The enclosures will be covered by 2"x2" chain link fence all around. The height of the chain link fence will be 2.50 mtr A water body of about 300 sqm with a depth of 2 mtr will be developed. The rest of the area will have sand and soft soil. There will be an inlet and out let to maintain the water level The size of water body will be 50 sqm with a depth of 2 mtr for turtle There will be a service gate towards the service road in each exhibit. Enrichment: (1) Shady trees will be provided. (2) Sand beds will be provided. (3) Flow of water will be maintained to check over
			Gharial – 1050	
			Turtle – 600	

heating in
summer.

(13) Reptiles House: King cobra, Cobra, Pit viper, Russel viper, Krait, Water snakes, Python and Sand Boas:-

Cell size (in mtr)			Area proposed for enclosure (sqr mtr)	Remarks
L	B	H		
There will be no cell.			King cobra- 40	<p>An area of 700 sqm has been kept for the development of reptiles house.</p> <p>10-15 enclosures with display area as per CZA norm will be made.</p> <p>The design of the display area will be such that half of the portion will have access to sun.</p> <p>The viewing will be through glass.</p> <p>A visit to zoo having reputed reptile house will be made and advice of experts will also be sought.</p>
			Cobra- 40	
			Pit viper- 40	
			Russel viper- 40	
			Krait- 40	
			Water snakes- 40	
			Python- 80	
			Sand Boas- 40	

(14.) White Tiger Safari:-

Cell size (in mtr)			Area proposed for enclosure (sqr mtr)	Remarks
L	B	H		
2.75	1.80	3	White Tiger – 25 ha.	<p>This will be a drive through enclosure in which entry and exit will be through a system of double gates. There will be sufficient space between the gates to allow the entry of visitors vehicle.</p> <p>The visitor vehicle will be a specially designed 20 seats bus with adequate protective measures.</p> <p>This vehicle will move on the designated road in side the safari at low speed.</p> <p>The whole area of the safari will be covered by 5cm x 5cm x 8g chain link fence of the</p>

height of 5 mtr and 1.5mtr inverted at the top at 60 degree.

The whole area will have adequate vegetation & sheds. It will have scattered water bodies following contours.

An exhibit area will be developed near the entry of safari for the orientation of the visitors. There will be a ticket window, kiosk, toilets and drinking water facility.

(15) Butterfly park:- A butterfly park has been proposed in an area of 8500 sqm. This will be an open exhibit without any net or fence with seasonal flowering plants, herbs and shrubs. Seasonal flowers like Dianthus, Cosmos, Dahlia, Sweet-pea, Nostrushm, Flask, Shoe flower, Bougainvillea, Zinnia, Verbena, Pensy, Sweet sultan, Sun flower and Guldawri etc. will be planted. These flowering plants will provide food (nectar & sap), roosting and breeding sites. Sugar (liquid) soaked flaps will be provided at different location in the whole butterfly park area as additional source of food. Adequate water supply will be made through pipes and sprinklers.

Local butterfly species like Common tiger (*Danais plexippus*), White tiger (*Danais melanippus*), Dark blue tiger (*Danais malissa*), Lepcha bush brown (*Mycalis lepcha*), Jungle glory (*Thaumantis diores*), Black rajah (*Charaxes fabious*), Jewelled nawals (*Eriboea dolon*), Blue striped palm fly (*Elymnias patna*), Common palm fly (*Elymnias hypermnestra*) and Tiger palm fly (*Elymnias nesaea*) are expected to be attracted and stay in this park.

4.6.5 Management of animal enclosures: The animal enclosures have been divided into following 12 beats for effective care of animals and daily cleaning:

- (1) Beat no. – 1 – Tiger, White Tiger and Lion enclosures.
- (2) Beat no. 2 – Sloth bear, Panther and Jaguar enclosure.
- (3) Beat no. 3 – Large Indian civet, Palm civet, Small Indian civet, Jungle cat and Desert cat enclosures.
- (4) Beat no. 4 – Hyena , Jackal, Wolf, Fox and Wild dog enclosures.
- (5) Beat no. 5 – Sambhar, Chital, Barking deer and Gaur enclosures.
- (6) Beat no. 6 – Hog deer, Black buck, Chinkara and Barasingha enclosures.

- (7) Beat no 7 – White Tiger Safari enclosure.
- (8) Beat no 8 – Neelgai, Wild boar, Thamin deer, Hedgehog and Porcupine enclosures.
- (9) Beat no. 9 – Bird aviaries, Ostrich, and Emu enclosures.
- (10) Beat no. 10 – Four monkey islands.
- (11) Beat no. 11 – Reptiles house, Gharial, Crocodile and Turtle enclosures.
- (12) Beat no. 12 – Two wetlands and butterfly park

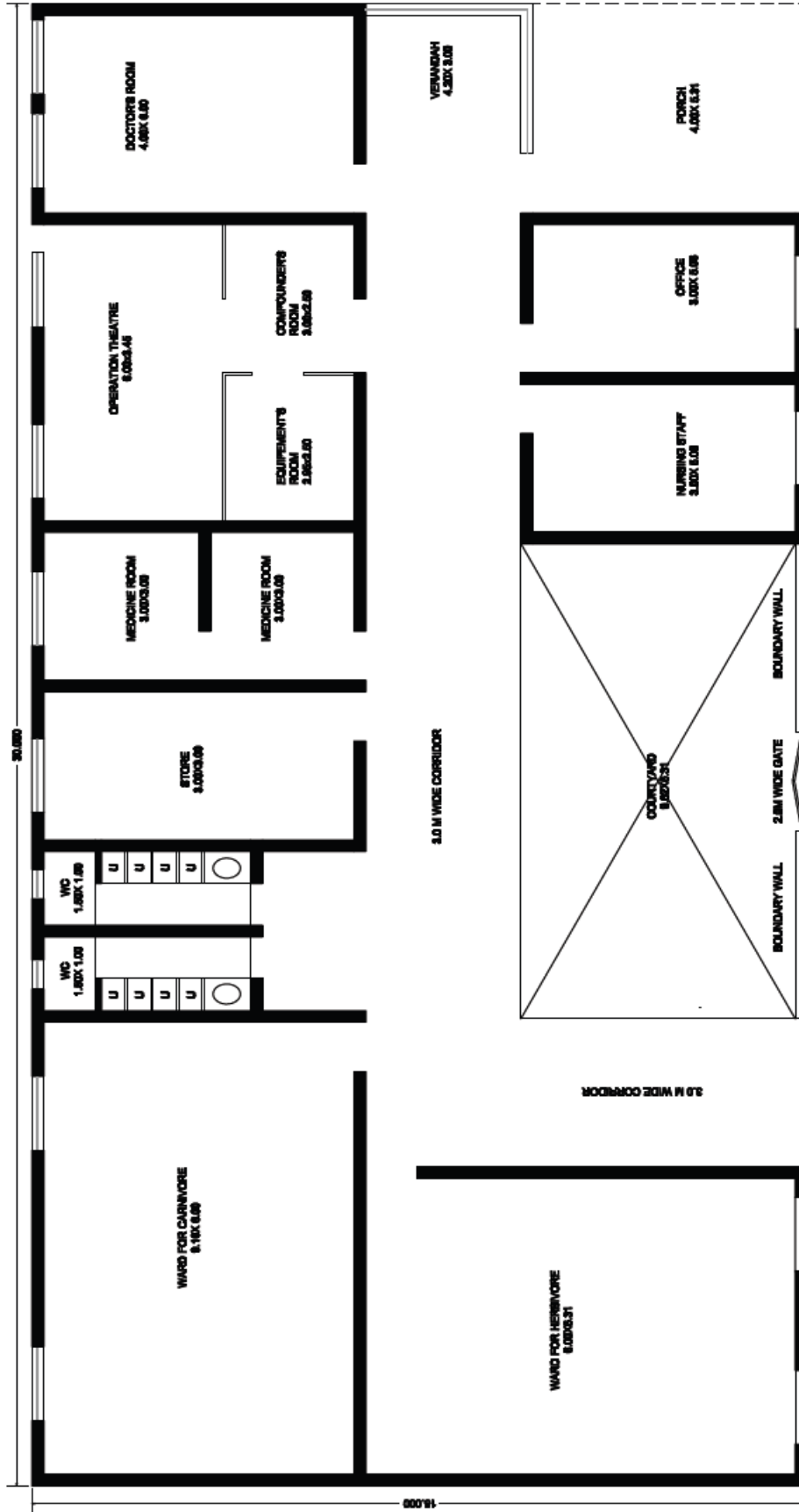
Each beat will have three persons for cleaning of enclosures and adjoining area, feeding, watering and other related works.

4.7 Veterinary section:- The Zoo Mukundpur will have a well equipped hospital. All modern facilities will be made available. A full time veterinarian along with support staff will be appointed. The hospital will have a clinic with basic facilities for treatment and dressing of animals, standard surgical instruments, diagnostic equipments and dispensary with wide range of drugs. A separate facility will be created for hand rearing baby animals. Proper drainage and ventilation will also be provided.

4.7.1 Hospital will have following facilities:-

- (1) A separate operation theatre for surgery and treatment.
- (2) A x-ray unit with dark room.
- (3) A dispensary / pharmacy with storage facility for wide range of medicines.
- (4) A nursery unit for hand rearing baby animals.
- (5) A self contained laboratory for conducting pathological tests.
- (6) Appropriate housing for in-door patients.
- (7) Quarantine / isolation ward.
- (8) Housing facilities for recuperating patients.
- (9) Offices, library, record room, toilets.
- (10) Stores and kitchen for animals feeds under treatment.

The plan of proposed veterinary hospital is given on the next page. The design of veterinary hospital, will be got approved from CZA when needed.



PLAN
VETERINARY HOSPITAL
 (Area= 450.00 Sqm.)

4.7.2 Duties and responsibilities:-

- (1) Inspection of the zoo animals, identification of sick animals and treating them.
- (2) To maintain the record of treatment of inpatient and outpatient animals.
- (3) Monitoring of pregnant animals till their successful delivery & post care.
- (4) Formulation of diet and quality control of feed issued to zoo animals.
- (5) To follow prophylactic protocol, periodical examination of fecal matter, blood, de- worming, vaccination and disinfection.
- (6) Planning breeding strategy of endangered species and their husbandry.
- (7) To take measures for preventive disease control in zoos.
- (8) Physical and chemical capture of zoo animals.
- (9) To check the quality of the food daily.
- (10) To maintain the inventory of the equipments and medicines.
- (11) To guide the rescue operation when needed.

4.7.3 Equipment and vehicle requirement:-

- (1) Treatment cages:
 - (i) 2 squeeze cages.
 - (ii) 5 cages for medicating and treating primates, carnivores and small animals.
- (2) Laboratory equipment:
 - (i) microscopes.
 - (ii) bacteriological incubator.
 - (iii) glassware.
 - (iv) chemical regents.
- (3) Sterile surgical equipment and other instrumentation for diagnosis and treatment.
- (4) Autoclave.
- (5) An X-ray unit, darkroom facilities and photographic material.
- (6) An incubator unit for baby animals.
- (7) Equipment and instrumentation for conducting post mortems.
- (8) Kitchen ware, mixer-cum-food processor, storage containers, special items like feeding bottles, nipples, cooking gas and stove.
- (9) Chain-pulley equipment for hoisting animal cages.
- (10) Room heaters, coolers etc. as per requirement.
- (11) Medicines and miscellaneous items.
- (12) Nets for capturing animals.
- (13) Ropes and poles etc.
- (14) Ambulance with equipment – 1
- (15) 4 – wheeler – 1
- (16) Hospital furniture.
- (17) Telephone and intercom.

(18) Tranquilizing equipments & drugs:-

Sl. No.	Equipment, accessories & drugs	Quantity
1	Rifle model 60	1
2	Blow pipe	1
3	4 ml. alum. Barrel for metal syringe	10
4	5ml alum. Barrel for metal syringe	10
5	Rubber plunger	10
6	Needles with collar art. 3040	10
7	Stabilizer art. 3049	10
8	Art 2006 chargers for metal syringes	20
9	Art 2013 cartridge (yellow)	20
10	Cartridge (brown)	20
11	Mini inject 3ml	5
12	Mini inject 5ml	5
13	Woolen stabilizer art 3092	5
14	Needles art 3068	10
15	Ketamine -100	50ml 1x2
16	Xylazine – 100	50ml 1x2
17	Yohimbin hydrochloride	50ml 1x2

4.7.4 Staff requirement:- Following staff will be needed in this section.

Proposed Staff

<i>S. No.</i>	<i>Post</i>	<i>No. of Post</i>	<i>Pay Scale</i>
1	Veterinary Officer	1	9300-34800 +5400GP
2	Asst. Veterinary Officer	1	9300-34800 +4600GP
3	Lab Technician	1	5200-20200 +2400GP

4	X-Ray Technician	1	5200-20200 +2400GP
5	Compounder	1	5200-20200 +2400GP
6	Computer operator	1	5200-20200 +2000GP
7	Driver	1	5200-20200 +1900GP
8	*Zoo Keeper	2	5200-20200 +1900GP
9	*Asst. Zoo Keeper	4	4400-7440 +1300GP
10	Attendant	1	4400-7440 +1300GP

*Will also look after rescue center and quarantine wards

4.7.5 Rescue center:- An area of 1200 sqm has been ear marked for rescue center which will have the following facilities.

Sno.	Type	Area for facilities (including Night house, Shelter and kraal)	No. of facilities
1.	Carnivore	200 sqm	2
2.	Herbivore	200 sqm	2
3.	Small mammal	50 sqm	2
4.	Birds	5 sqm	10
5.	Reptiles	5 sqm	2

4.7.6 Quarantine Wards:-

- (1) An area of 350 sqm has been kept for quarantine wards.
- (2) Each cell will have light and air exposure.
- (3) Each cell will have provision for medication and temperature monitoring facilities.
- (4) The breakup of the area for different wards is given as under:

<i>S.No.</i>	<i>Ward</i>	<i>Area(sq.m)</i>
1	Ward-1	100
2	Ward-2	80
3	Ward-3	60
4	Ward-4	40

4.7.7 Post mortem room:-

- (1) A 40 sqm post mortem room is proposed near incinerator.
- (2) It will have natural light, drainage, wash basin with water point and platform etc.

4.7.8 Slaughter house:-

- (1) A 100 sqm slaughter house is proposed near rescue center.
- (2) It will have a drain, water supply point, natural light and a platform.

4.8 Sanitary Section:- It is an important section for the upkeep of zoo. The sanitary section will provide clean and pollution free environment. This section will be responsible to remove leftover food, dung, cut grasses, fallen leaves, weeds and other items. All roads, foot-paths, toilets, drinking water points and rain shelters will be cleaned and maintained. Disinfection schedule will be followed round the year. Sanitary section will also operate incinerator.

We propose a separate office with a store room in the composite office building for sanitary section. This composite office will house animal and horticulture sections also.

4.8.1 Duties and responsibilities:-

- (1) Cleaning of roads, paths, toilets & urinals.
- (2) To remove and disposal of garbage, leftover food, animals waste, bones, fallen leaves, cut grasses, weeds, tobacco pouches and plastic items.
- (3) Regular cleaning of drinking water coolers & tanks.
- (4) To spray malaria oil to check mosquito breeding.
- (5) To control flies in zoo premises.
- (6) To clean and dusting of all sections office and cleaning of residential area.
- (7) To carry fogging in the residential area and animal houses.
- (8) To control rodents by using traps.
- (9) To dispose of carcasses in incinerator or in burial site with salt and lime powder along with veterinary hospital staff.
- (10) To follow the disinfection schedule for animal enclosures

4.8.2 Equipment and vehicle requirement:-

- (1) Dustbins – 100

(2) Sitting benches- 100

Operation of Sanitary sections is to be outsourced. Hence, no equipments and consumables shall be required.

Note:- Department will provide store facilities to out sourced agency to keep its equipments and other items.

4.8.3 Staff requirement:-Following staff will be needed in this section.

Proposed Staff

<i>S. No.</i>	<i>Post</i>	<i>No. of Post</i>	<i>Pay Scale</i>
1	Asstt. Curator (san) or Sanitary Inspector	1	9300-34800+3600GP

Note :- (1) Asstt. Curator (san) or Sanitary Inspector will be appointed on regular basis and work of the section will be out sourced.

(2) The sanitary section will be under the administrative control of Curator (horticulture and sanitation).

4.9 Horticulture Section:- This section will provide the naturalness in the park by maintaining natural flora. It will be responsible for all works related to plantation and maintenance of trees, gardens and lawns, etc. This section will also lay emphasis on the plantations of medicinal plants. A plant nursery will also be developed for in house consumption of seedlings and for sale.

A separate office will be made for horticulture in the composite office as stated before.

4.9.1 Duties and responsibilities:-

- (1) To maintain lawns, trees, hedges and plants.
- (2) To remove weeds from lawns and hedges etc.
- (3) To provide water to lawns, and trees.
- (4) To remove and collect all dry leaves from lawns.
- (5) To remove uprooted/dead trees when ever occasion arises.
- (6) To prepare seedlings of plants as per season.
- (7) To collect seeds and keep them for future use.

- (8) To maintain flowering and small plant earthen pots.
- (9) To develop and maintain fodder farm.
- (10) To maintain the record of manpower supplied, work under taken, and implements used by outsourcing agency.
- (11) To develop medicinal plant nursery and plant them in the park.

4.9.2 Equipment and vehicle requirement:-

- (1) A hydrant line will be provided along the ring road with provision of sub lines for sprinkling and watering the plants, trees and lawns etc.
- (2) A - 4 wheeler.
- (3) Seeds and seedlings as per seasonal requirement.
- (4) No equipment and implement is to be provided as this work is proposed to be outsourced. The agency shall provide services inclusive of consumables, equipment and implements as per acre basis.

Note:- The agency should have the following equipments.

- (1) Hedge trimmer.
- (2) Bush cutter (non electric).
- (3) Lawn mower (mechanized).
- (4) Pit hover.
- (5) Tractor with trolley.
- (6) Shrub master.
- (7) Harrow.
- (8) Cultivator.
- (9) Leveler.
- (10) Mechanized pruning machine.
- (11) Spray pump.
- (12) Pipes.
- (13) Sprinkler system.
- (14) And Garden tools.

Note:- The department will provide store facilities to the out sourced agency to keep the equipments and implements.

4.9.3 Staff requirement:- Following staff will be needed in this section.

Proposed Staff

<i>S. No.</i>	<i>Post</i>	<i>No. of Post</i>	<i>Pay Scale</i>
1	Curator (horticulture and sanitation)	1	9300-34800+4600GP
2	Asstt. Curator (Hor.) or Range officer (Hor.)	1	9300-34800+3600GP
3	Driver	1	5200-20200+1900GP

Note: - (1) Curator (horticulture and sanitation) Asstt. Curator (Hor.) or Range officer (Hor.) will be appointed on regular basis and the work of this section will be out sourced.

4.10 Security section:- This section will be responsible to safe guard zoo properties, animals and animal enclosures and to maintain law and order. It will also take care to check thefts, pick pocketing, trespassing, animal escape at night and entry of stray dogs and monkeys in the zoo premises.

A security control room will be built at the entrance with a small store, a toilet and rest room.

4.10.1 Duties and responsibilities:-

- (1) To patrol zoo area day & night.
- (2) To protect Govt. property, animals and visitors.
- (3) To check illicit cutting of trees.
- (4) To maintain law and order at entrance and inside zoo area.
- (5) To assist public in lost & found.
- (6) To interact with local police whenever needed.
- (7) To control vandalism, pick pocketing and teasing of animals.
- (8) To frisk visitors at entry point.
- (9) To man service & entry gates.

4.10.2 Equipment and vehicle requirement:-

- (1) To establish a network of CCTV for surveillance at the entrance and animal enclosures. This feed will be shared between security and animal section. Director and Asst. Director will have access to this facility in their offices.
- (2) To establish a network of public address system (PA) at entrance, panther enclosure, white tiger safari, bird aviaries, primates island and veterinary hospital.
- (3) Internal communication system and wireless (wireless tower, handsets and fix sets)
- (4) Telephone lines.
- (5) A 2 wheeler for R.O. (security).
- (6) A computer with printer.
- (7) Office furniture.
- (8) No other equipment and machinery will be procured as this work is proposed to be outsourced.

Note:- Department will provide store facilities to out sourced agency.

4.10.3 Staff requirement:- Following staff will be needed in this section.

<i>S. No.</i>	<i>Post</i>	<i>Proposed Staff</i>	
		<i>No. of Post</i>	<i>Pay Scale</i>
1	Range officer (Security)	1	9300-34800+3600GP
2	Deputy Range officer (Security)	2	5200-20200+2400GP
3	Ticket Collector	2	5200-20200+1900GP
4	Attendant	1	4400-7440 +1400GP

Note :- (1) Range officer (security) and deputy range officer (security) and ticket collectors will be appointed on regular basis and the work of this section will be out sourced.
(2) Security section will work under the administrative control of Deputy Director.

4.11 Procurement Section (Store):- A well developed store is proposed to be constructed which will have ample space to store the food as well as maintenance material. It will have a storage room, feeding troughs, storage containers, kitchen, refrigeration room or cold storage for the storage of items like meat, milk, fish, and fruit. It will have a weighing machine, and a platform for loading and unloading store items.

4.11.1 Duties and responsibilities:-

- (1) To procure, store and supply diet articles.
- (2) To get the quality of food checked by Veterinary officer or Assist. Veterinary officer daily.
- (3) To prepare daily ration as per schedule for all animals and distribute them.
- (4) To procure maintenance material as required by other sections.
- (5) To keep the record of purchase and disposal of all items.
- (6) To get the store audited every year.
- (7) To process for the write off of obsolete items.
- (8) Any other item required for running and maintenance of zoo.

4.11.2 Equipments and vehicles requirements:-

- (1) Food store container (capacity 100kg-10nos, 500kg-5nos.). - 15
- (2) Feeding trough – 10
- (3) Container for oil – as per need.
- (4) Jute bags – 50
- (5) Keema machine – 1
- (6) Fodder cutting machine – 1
- (7) Utensils for kitchen – as per need
- (8) Weighting machine – 1
- (9) Dharma kanta – 1
- (10) 500 liter per day capacity solar water heating system .
- (11) A piped gas connection / cooking gas cylinder.
- (12) Truck-1
- (13) Office furniture as per need.
- (14) Telephone.
- (15) Intercom.
- (16) A digital board for displaying of daily ration status.

4.11.3 Staff requirement:- Following staff will be needed in this section.

<i>S. No.</i>	<i>Post</i>	<i>No. of Post</i>	<i>Pay Scale</i>
1	Assistant Curator (Store) or RO (Store)	1	9300-34800+3600GP
2	Store Clerk	1	5200-20200+2100GP
3	Truck Driver	1	5200-20200+1900GP
4	Cook cum food distributor	2	4400-7440 +1400GP
5	Attendant	6	4400-7440 +1300GP

Note: - (1) Assistant Curator (Store) or RO (Store) will be appointed on regular basis and rest of the manpower will be on contract basis.

(2) The section will work under the administrative control of Deputy Director.

4.12 Construction and maintenance Section:- The section will undertake construction of buildings, animal enclosures, roads, path, laying of service lines, over head tank, bore wells, power supply system and maintenance thereof. This section will also take care to protect animals against summer and winter season.

There will be separate office and work shop with adequate space for keeping construction and maintenance material. The work shop will have all equipments required for the upkeep of building and animal enclosures. It will also have enough space for parking of vehicles and keeping of transport cages under shed.

4.12.1 Duties and responsibilities:-

- (1) Construction of buildings, animal enclosures, roads, path, and service lines.
- (2) Maintenance of all buildings, animal enclosures, service lines etc.
- (3) Repair and strengthening of steel sections, doors, partitions, up slides etc. by welding.
- (4) Lubrication of sliding/partition/gates/doors/pulleys/pressure pumps etc. to ensure their proper functioning.
- (5) Dewatering of moats/ponds/wallow pools/water bodies, as and when required.
- (6) Repair pressure pumps/heaters/coolers and other miscellaneous equipments and to maintain them functional.
- (7) Replacement of damaged steel wire ropes of up-slide partitions/gates of animal enclosures.

4.12.2 Equipments and vehicle requirement:-

(1)	Tools for carpenter	as per requirement
(2)	Tools for welder	as per requirement
(3)	Tools for mason	as per requirement
(4)	Tools for plumber	as per requirement
(5)	Generator 40 KVA	1
(6)	Chain saw	1
(7)	Gas machine	1
(8)	Portable welding machine	1
(9)	Drill machine	1
(10)	Rotary Hammer	1
(11)	Pressure pump	1
(12)	Tong Tester	1
(13)	Spray gum	1
(14)	Air compressor (1000psi)	1
(15)	9-1" 1 machine for Carpenter	1
(16)	Computer with printer	1
(17)	Vehicle	4 wheeler (one)
(18)	Rickshaw	1
(19)	Office furniture – as per need	
(20)	Telephone	
(21)	Intercom	

4.12.3 Staff requirement:- Following staff will be needed in this section.

<i>Proposed Staff</i>			
<i>S. No.</i>	<i>Post</i>	<i>No. of Post</i>	<i>Pay Scale</i>
1	Curator (Engg.) or Asst. Engineer	1	9300-34800+4600GP
2	Asstt. Curator or JE (Elec. & Civil)	2	9300-34800+3600GP
3	Draft man	1	5200-20200+2800GP
4.	LDC	1	5200-20200+1900GP
5	Driver	1	5200-20200+1900GP
6	Electrician	2	5200-20200+1900GP
7	Black Smith/Welder	1	5200-20200+1900GP
8	Plumber	1	5200-20200+1900GP
9	Mason	1	5200-20200+1900GP
10	Carpenter	1	5200-20200+1900GP
11	Painter	1	5200-20200+1900GP
12	Pump Driver	1	4400+7440 +1400GP
13	Attendant	10	4400+7440 +1300GP

Note :- (1) Curator (Engg.) or Asst. Engineer, Asstt. Curator or JE (Elec. & Civil, Draft man will be on deputation and rest of manpower will be on contract basis. If the incumbents are not available on deputation, then these posts will be filled on contract basis.

(2) All the major construction works will be undertaken by inviting tenders as per state govt. rules.

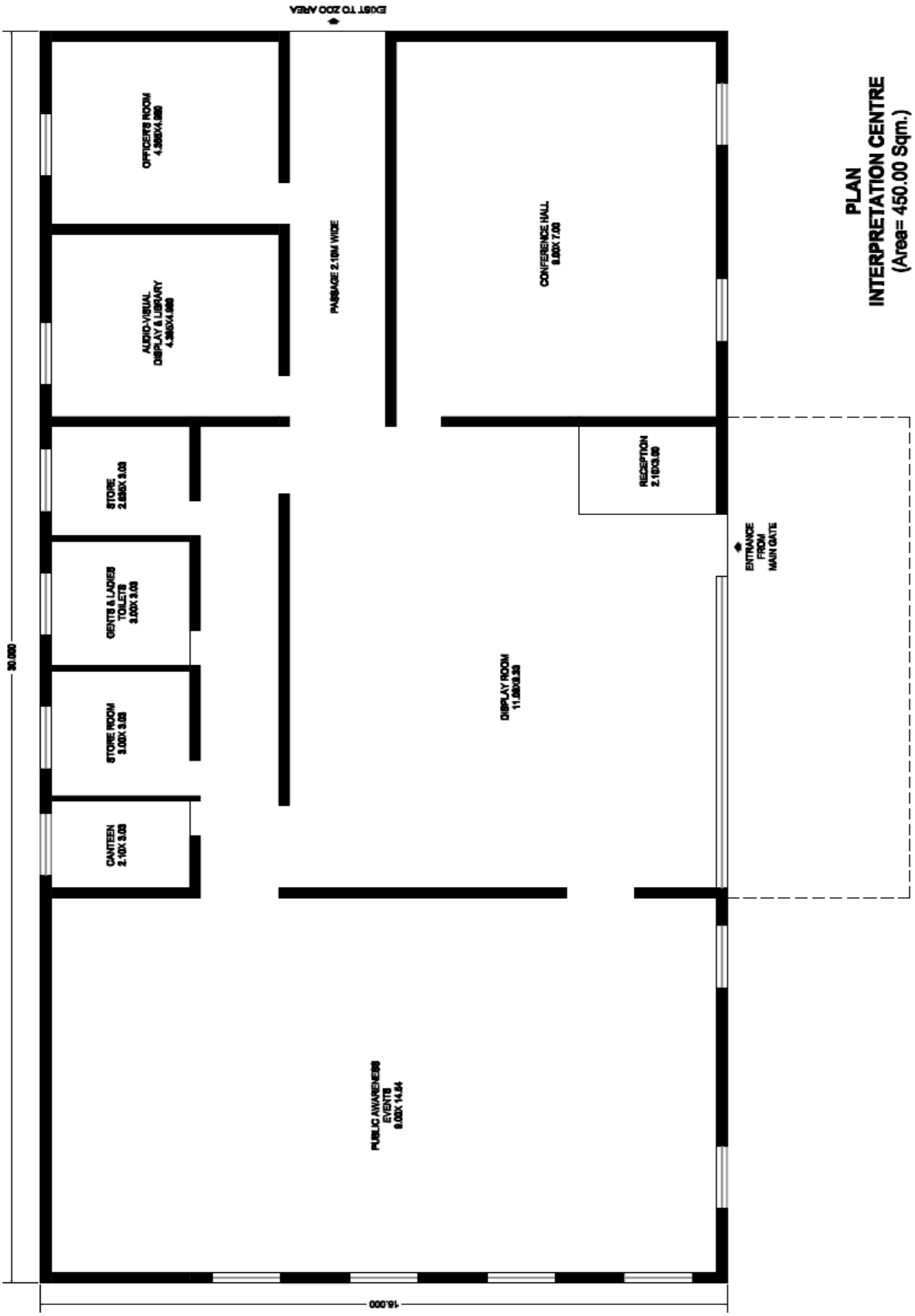
4.13 Education section:- Zoo is a living educational Institute. It imparts firsthand knowledge and experience of nature to visitors. Zoo is also a place from where the visitors can get lot of information on wildlife and environment.

As per CZA's norms on zoo education, zoo should inspire empathy for wild life, understanding and awareness about need of conservation of natural re-sources besides maintaining ecological balance.

A separate education office with an interpretation center will be created near the entrance. The interpretation center will have an exhibit area, small auditorium with projector room and a class room. The office will have a office for education officer and its staff, store, library, toilets and drinking water facilities. The plan of proposed interpretation is given on the next page. The Design of interpretation center will be got approved from CZA when ne

4.13.1 Duties & responsibilities:

- (1) To formulate and execute the educational programs of the zoo.
- (2) To conduct guided tour particularly for students from time to time.
- (3) To publish educational material like guide books, guide maps, brochure and leaf lets.
- (4) To prepare material for animal, directional and utility signages.
- (5) To produce interactive exhibits and signages.
- (6) To organize various awareness and orientation programs from time to time.
- (7) To provide information about wild animals to individual visitor and institutions.
- (8) To conduct training work shop for zoo keepers, trolleys operators and volunteers.
- (9) To help, in preparation of audio visuals on wild animals.
- (10) To help and guide students in preparations of their projects.
- (11) To conduct lectures and presentation for organized groups.
- (12) To look after the Zoo Library.
- (13) To look after public relation work.
- (14) To prepare monthly awareness / educational activities programmes and to execute.
- (15) To prepare the annual report of the park.



4.13.2 Equipment and vehicle requirement:-

- (1) Audiovisual equipments and films of wild life.
- (2) Power point projector with computer.
- (3) A photo copier.
- (4) Computer with internet facilities and printer.
- (5) PA system.
- (6) Published material.
- (7) Panels with stands.
- (8) Books, news papers, periodical, and journal for library.
- (9) Office furniture.
- (10) Telephone.
- (11) Intercom.

4.13.3 Staff requirement: Following staff will be needed in this section.

<i>S. No.</i>	<i>Post</i>	<i>Proposed Staff No. of Post</i>	<i>Pay Scale</i>
1	Curator(Ed) or Edu- Officer	1	9300-34800+4600GP
2	Asstt. Curator (Ed) or RO (Edu)	1	9300-34800+3600GP
3	Library Asstt	1	5200-20200+2400GP
4	Audio- Visual operator	1	5200-20200+2100GP
5	Computer operator	1	5200-20200+2100GP
6	Attendant	4	4400-7440+1300GP

Note :- (1) Curator(Ed) or Edu- Officer , Asstt. Curator (Ed) or RO (Edu) will be on regular basis and rest of the staff will be on contract.

4.14 Research section:- Research on wild life in captive is one of the objective. So a full-fledged research section is proposed to be established. It will have a office with a small laboratory facilities with toilets and drinking water point. It will interact with other institutes in formulation of research projects and their studies. It will collect data on behavior, breeding biology, growth, hand rearing and population dynamics. This section will be located adjoining to education section near the interpretation center.

4.14.1 Duties & responsibilities:-

- (1) To collect the data on behavior, breeding, growth and analysis it.
- (2) To maintain the animal history card as per CZA format.
- (3) To maintain the stud book of endangered species.
- (4) To formulate research project and execute them.
- (5) To keep liaison with research institutes.
- (6) To study the utility of medicinal plants of the park.

- (7) To conduct work shop on research in the zoo.
- (8) To prepare replies to queries of visitor and institutes.
- (9) To publish research papers in the journals.
- (10) To maintain the record of all equipments.

4.14.2 Equipment and vehicle requirement:-

- (1) Computer with printer and internet facilities -1
- (2) Photostat machine -1
- (3) Microscope -1
- (4) Binocular -2
- (5) Digital camera -1
- (6) Digital weighing machine -1
- (7) Laboratory reagents – as per need.
- (8) Office furniture.
- (9) Telephone.
- (10) Intercom.

4.14.3 Staff requirement:- Following staff will be needed in this section.

<i>S. No.</i>	<i>Post</i>	<i>Proposed Staff No. of Post</i>	<i>Pay Scale</i>
1	Curator (Res.) or Research Officer or Biologist	1	9300-34800+4600GP
2	Asstt. Curator or RO (Research)	1	9300-34800+3600GP
3	Field Asstt	2	4400-7440+1300GP

Note :- (1) Curator (Res.) or Research Officer, Asstt. Curator or RO (Research) will be on regular basis and rest of the staff will be on contract.

4.15 Administrative section:- A new administrative section has been proposed which will include the office of Director, Deputy Director, administrative and account staff. A separate room will be created for each officer. The administrative and account sections will be in a hall. This building will have small conference room, store, parking, toilet and drinking water facilities.

Director will be a whole time officer and over all in charge of the zoo operation. He will be responsible to the Govt. and management committee. He will be assisted by the Deputy Director, Veterinary officer, Curators and other support staff for the smooth running of the zoo.

This section will have following two sub sections:-

- (1) Establishment.
- (2) Account section.

4.15.1 Duties and responsibilities of establishment section:-

- (1) To process recruitment of staff when required.
- (2) To maintain service book and ACRs of employees.
- (3) To maintain diary and dispatch of letters.
- (4) To invite tender for supply of diet and maintenance articles.
- (5) To invite tender for leasing out parking site, cafeteria, kiosk battery operated trolley and white tiger safari ride.
- (6) To process for out sourcing the various works and to engage man power on contract.
- (7) To coordinate various meetings.
- (8) To undertake correspondence with state ministries, CZA and other department.
- (9) To process pension cases in time.
- (10) To deal cases of ACP, promotion, disciplinary action and enquiries.
- (11) To process returns well in time.
- (12) To procure furniture, stationary liveries for employees etc.
- (13) To attend representations of SC, ST, OBC etc.

4.15.2 Duties and responsibilities of account section:-

- (1) To prepare plan & non plan budget and revise estimates.
- (2) To process cases of GPF withdrawal and retirement benefits.
- (3) To prepare regular Pay, Arrear, DA and Bonus, LTC, TA, Medical, Gratuity, Leave encashment bills.
- (4) To issue salary slip, GPF statement and form 16 of Income Tax.
- (5) To process cases of loans for Scooter, Cycle and House building.
- (6) To maintain record of visitor data & revenue collected.
- (7) To submit monthly statement of expenditure to department.
- (8) To process telephone, water and electricity bills.
- (9) To prepare duty roaster for booking counters.
- (10) To maintain cash book, contingency register, cheque and challan register.
- (11) To deposit cash collected from gate.
- (12) To keep record of entry tickets.
- (13) To pass the bills of outsourced agencies.

4.15.3 Equipment requirement for establishment and account section:

- (1) Office furniture as per requirement.
- (2) Computer with printer – 8
- (3) Photostat machine – 1
- (4) Almirah – 8
- (5) Telephone – 2
- (6) Intercom – 2
- (7) Stationary as per requirement.
- (8) Cooler – 2
- (9) Heaters – 4

4.15.4 Staff requirement for establishment section:-

<i>S. No.</i>	<i>Post</i>	<i>Proposed Staff</i>		<i>Pay Scale</i>
		<i>No. of Post</i>		
1.	Office suptt. Or Head clerk	1		9300-34800+3200GP
2.	UDC	2		5200-20200+2800GP
3.	LDC	2		5200-20200+1900GP
4.	Peon	1		4400-7440+1300GP

4.15.5 Staff requirement for account section:-

<i>S. No.</i>	<i>Post</i>	<i>Proposed Staff</i>		<i>Pay Scale</i>
		<i>No. of Post</i>		
1.	Accountant	1		9300-34800+3200GP
2.	UDC	1		5200-20200+2800GP
3.	LDC (booking clerk)	2		5200-20200+1900GP
4.	LDC (office)	1		5200-20200+1900GP
5.	Cashier (LDC)	1		5200-20200+1900GP
6.	Peon	1		4400-7440+1300GP

4.15.6 Equipments and vehicles requirement for office of Director and Deputy Director:-

- (1) 4 wheeler- 2
- (2) Computer with printer and internet facility – 4
- (3) Office furniture – as per need.
- (4) Refrigerator – 2
- (5) Air conditioner – 2
- (6) Telephone – 2
- (7) Intercom- 2
- (8) Photostat machine - 1

4.15.7 Staff requirement for office of Deputy Director:-

<i>S. No.</i>	<i>Post</i>	<i>Proposed Staff</i>		<i>Pay Scale</i>
		<i>No. of Post</i>		
1.	Deputy Director	1		15600-39100+5400GP
2.	Personnel Assistant Gr-II	1		9300-34800+2800GP
3.	Driver	1		5200-20200+1900GP
6.	Peon	1		4400-7440 +1300GP

Note :- (1) Deputy Director and PA will be on regular basis and rest of the staff will be on contract.

4.15.8 Staff requirement for office of Director:-

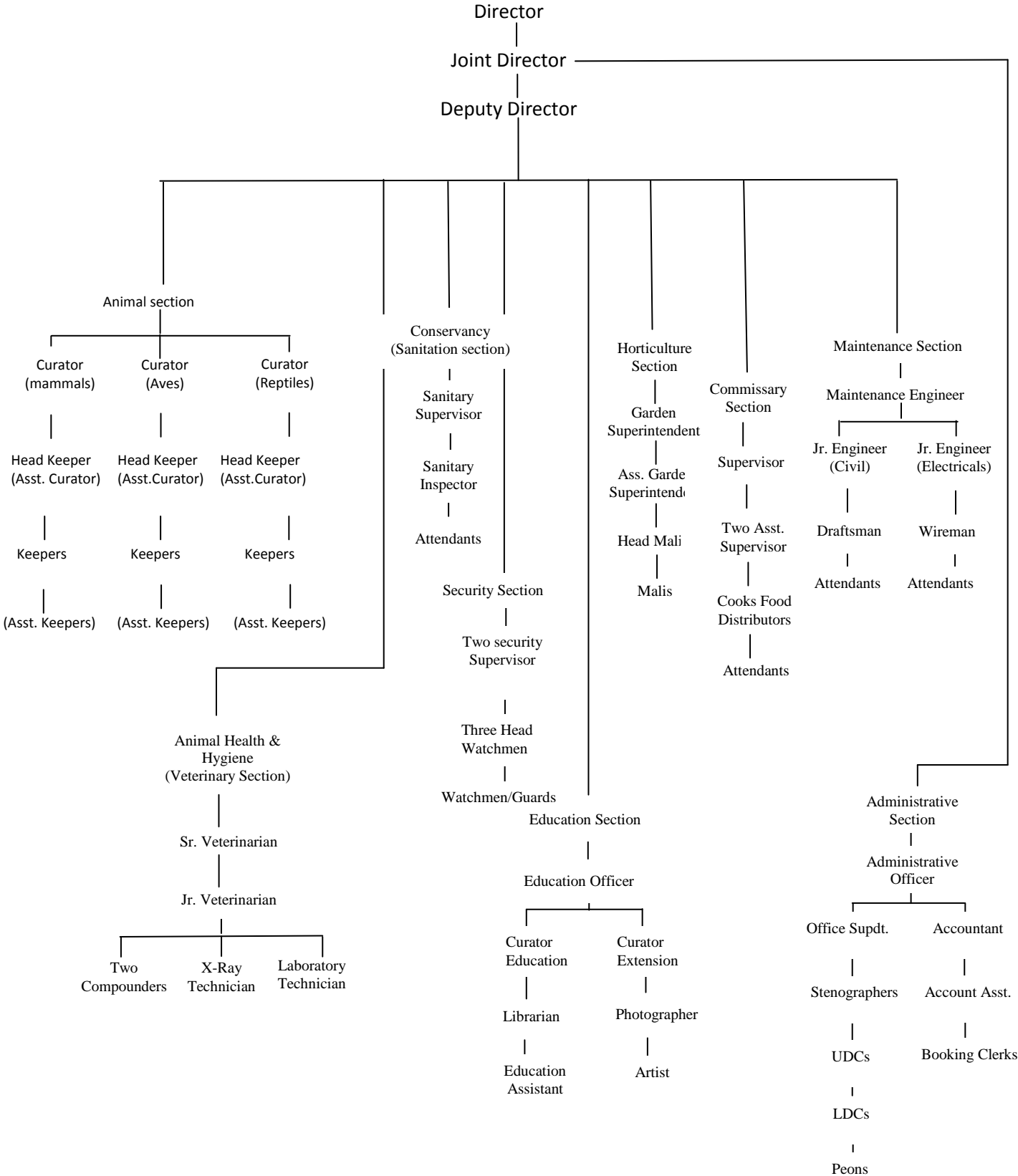
<i>Proposed Staff</i>			
<i>S. No.</i>	<i>Post</i>	<i>No. of Post</i>	<i>Pay Scale</i>
1.	Director	1	15600-39100+7600GP
2.	Personnel Assistant Gr-I	1	9300-34800+3600GP
3.	Driver	1	5200-20200+1900GP
6.	Peon	2	4400-7440 +1300GP

Note :- (1) Director and PA will be on regular basis and rest of the staff will be on contract.

4.15.9 Justification for the staff and hierarchy:- On the recommendation of Indian board for wildlife in 1973, Govt. of India constituted an expert committee on zoos to suggest administrative pattern for various categories of zoos. This committee suggested that Director should be a whole time officer and should be overall in charge of the zoo operation at site. He is responsible to the governing body which may be the government or a departmental head or a management committee. He will have adequate administrative and financial power. There must be a second officer to assist the Director and to function as in- charge in his absence. In a zoo, the various branches should be headed by qualified and trained Curators, Veterinarian and Engineers. Separate staff is necessary for construction, maintenance of the buildings and gardens.

According to Wildlife Institute of India, Dehradun, the management of a zoo is a multidisciplinary team work which requires inputs from various disciplines such as personnel management, planning, finance, biology, veterinary science, horticulture, sanitation, security, public relations, education, research, engineering etc. The organizational set up of a zoo should, therefore be suitably structured so as to provide for professional inputs from these disciplines. A model administrative set up for a zoo with more than 100 hectares in area is given on the next page.

MODEL ADMINISTRATIVE SET UP FOR A MODERN ZOO WITH AN AREA OF MORE THAN 100 HECTARES

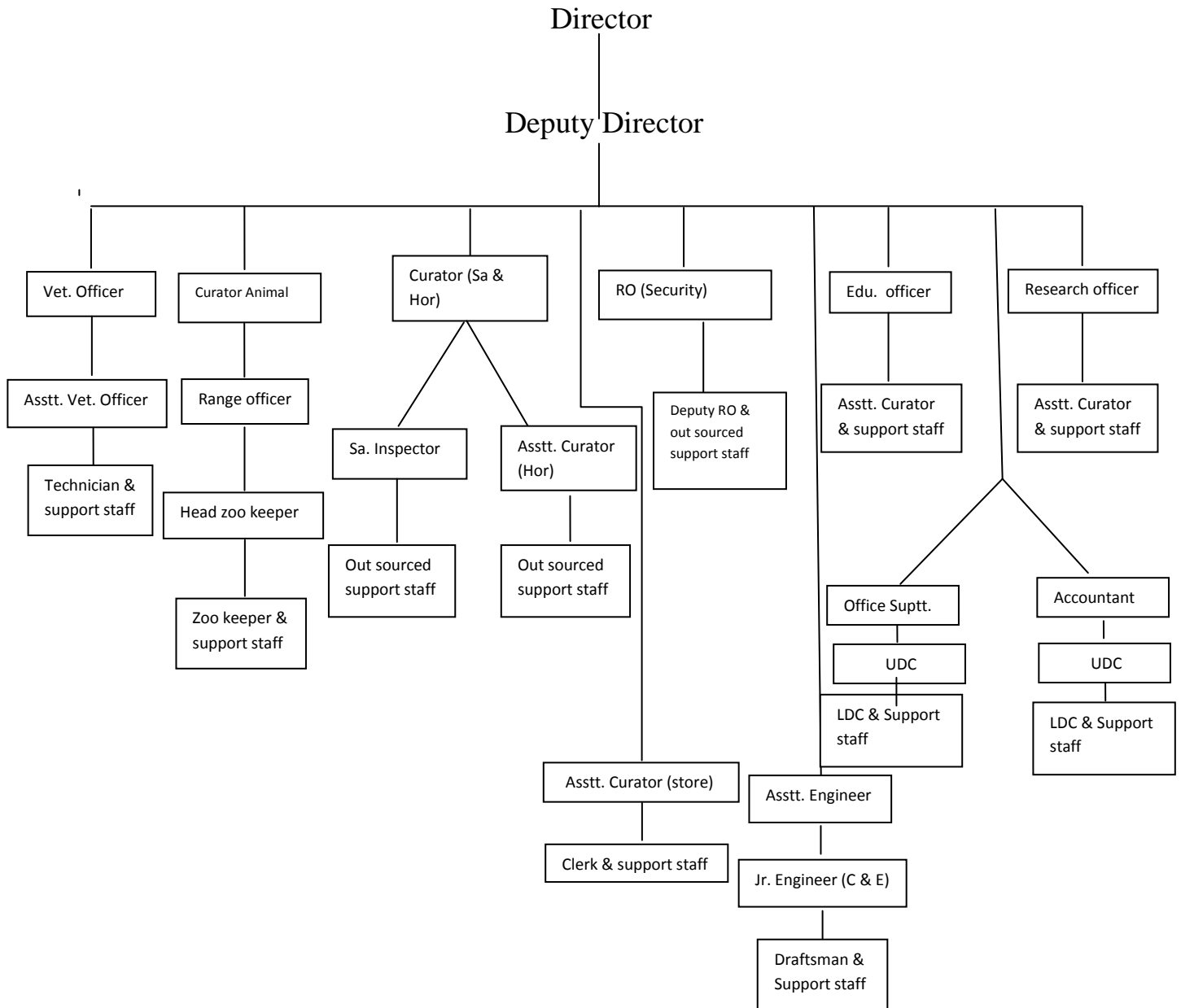


Under the zoo recognition rules, CZA has prescribed the requirement of scientific & technical staff to support the officer in-charge of the zoo in carrying out the responsibility of housing, upkeep and healthcare of zoo animals, research and visitors education as specified in the table below:

Category of staff	Large Zoo	Medium Zoo	Small Zoo	Mini Zoo
Curator	1	1	1	Mini zoo shall
Veterinarian	2	1	1	avail the
Education officer	1	1	1	assistance of
Biologist	1	1	1	appropriately qualified individual available locally.

The Zoological Park and Rescue center, Mukundpur has an area of 100 ha. It will display about 450 animals comprising of 68 species. This organization will require inputs from administrator, veterinarian, engineer and curators to run it smoothly to achieve its objectives. We have, therefore, proposed the staff requirement and pattern in the tune of recommendations of Expert Committee on Zoos, CZA's rules for zoo recognition and WII Dehradun report – Standards / Guidelines for Indian Zoos requirements. The staffing pattern for this zoo is proposed on the next page.

4.15.10 Staffing pattern of Zoological Park and Rescue Center, Mukundpur (Satna)



4.15.11 Calculation of strength of animal keepers :-

We have calculated the requirement of Zoo keepers, Asstt. Zoo keeper taking into the consideration of parameter adopted by the Delhi Zoological park, New Delhi. We have divided animal enclosures of this zoo and rescue center into 12 beats. Each beat will have 3 persons (1 Zoo keeper and 2 Asstt. Zookeeper) for day to day cleaning, feeding and care. Mathematically, the strength of Zoo keepers and Asstt. Zookeeper is calculated as under:-

No. of beats – 12

No. of Zookeeper required – 12

No. of Assistant zoo keeper required – 24

Requirement for Weekly off of Zoo keeper and Asstt. Zookeeper - 10%

Requirement for CL and EL for Zoo keeper and Asstt. Zookeeper – 10%

Therefore net requirement of Zookeeper – 15

Therefore net requirement of Asstt. Zoo keeper – 29

The justification of other administrative and technical post will be given at time of creation of posts, however the responsibility and duties of each section has been described in the previous pages.

4.15.12 Promotion opportunities:- Most of the posts in the zoo shall be manned by forest officials who have already in built promotion prospects. The post of Education officer, Research officer, and Curators will be taken as feeder cadre post for the promotion to the post of Deputy Director. Similarly the post of Asstt. Curators can be taken as a feeder cadre post for the promotion to the post of curators. Further the recruitment rules may be made in such a way that each cadre should get at least three promotions in his service time. All the employees should be given pay scale as recommended by Vth pay commission. The benefit of ACP (assured carrier promotion) should also be granted as per pay commission recommendation.

4.16 Visitor amenities:- The Zoo, Mukundpur is likely to cater about 2 lakh visitors annually. This will include adult, children, students, scientists, foresters, wild lifers, old, disabled and foreigners. It will be opened on all the days except Friday for the visitors. The following amenities will be developed:

4.16.1 Parking:- An area of about 8500 sqm will be developed for parking of bus, truck, cars, two wheelers and cycles. The parking will be leased out.

4.16.2 Entry gate:- An entry gate will be developed at the entrance near the parking. It will have following facilities:-

- (1) Ticket booking window -2 (with a provision to increase to 4) with visitors entrance.
- (2) Cloak room-1
- (3) Entry and exit gate for vehicle.
- (4) Security office.
- (5) Public address system.
- (6) A ramp

4.16.3 Entry fee and other charges:-

S. No.	Item / particulars	Rate in Rs.
Entry in to the zoo		
1.	Adult	20.00 per head.
2.	Child (up to 12 years)	10.00 per head.
3.	School / college / institute groups with staff / faculty	5.00 per head.
4.	Disabled	Free.
5.	Car / jeep	500.00 per car (For initial period or till battery operated trolley is made available. There after private vehicles will be banned).
Video camera		
6.	Amateur	20.00 per day.
7.	Professional	100.00 per day.
8.	Still Camera	Free.
9.	Film shooting	5000.00 per day.
10.	Trolley ride	50.00 per head.
Safari Ride		
11.	Adult	20.00 per head.
12.	Child	10.00 per head.

4.16.4 Zoo Timing:-

- (1.) April to October 9:00 am to 5:00 pm (last ticket to be issued at 4:30 pm)
- (2.) November to March 9:30 am to 4:30 pm (last ticket to be issued at 4:00pm)

4.16.5 Toilets and drinking water points:- These facilities are proposed to be provided near the following locations:-

- (1) Parking site.
- (2) Trolley ride station.
- (3) Panther / jaguar.
- (4) Near small carnivore.
- (5) Near white tiger safari entrance.
- (6) Near thamin dear.
- (7) Near primates.
- (8) Reptiles house.

4.16.6 Cafeteria, kiosk and souvenir shop:- The visitor will have to walk about 2.5 km to see the whole zoo. They are likely to be tired. These facilities are proposed for their relaxing. The location of these amenities is as under:

- (1) Cafeteria – In the parking area
 - (2) Souvenir shop- Near the entrance
 - (3) Kiosk – Near White tiger safari entrance
- These will be leased out.

4.16.7 Trolley ride:- A battery operated trolley will be available near the interpretation center. The operation and maintenance of the trolley will be on contract basis. The ride charges per head is given in the above table and will be revised as per the circumstances at that moment.

4.16.8 Safari ride:- The visitor will be taken in a well protected bus in the safari. This ride will also be run on contract basis. The ride charges per head is given in the above table and will be revised as per the circumstances at that moment.

4.16.9 Wheel Chairs:- Two wheel chairs will be available at the entrance for the disabled visitors free of charges.

4.16.10 Sitting benches and shelters:- About 50 sitting benches and shelters will be provided at different locations for visitors.

4.16.11 First-aid kit:- It will be available at the entrance with the security office, office, field office, safari entrance, reptiles house and zoo veterinary hospital.

4.16.12 Dustbins:- About 100 dustbins will be placed at different locations to collect waste and left out.

4.17 Staff amenities:-

4.17.1 Staff Quarters:- The site of Mukundpur zoo is 15 km away from Rewa town. For ease of staff and to meet emergency situation in the zoo and rescue center, it is proposed to have a residential complex in an area of 3 ha. in front of the zoo for the staff. For this purpose following residences and other amenities are planned in this proposal:-

Table – 1

Sl. No.	Name of Facilities	Area (Sq. ft.)	No.	Remarks
1	Director Building House	4BHK 2500	1	
2	Officer House –I	3BHK 2000	2	
3	Officers House – II	2BHK 1800	5	
4	Officers	2BHK 1500	8	

	House – III			
5	Staff	1BHK	1000	24
6	Dormitory	Capacity of 10	1000	1
7	Community / recreation / Club House	For Staff	5000	1
8	Dispensary	For Staff	1000	1
9	Shopping Complex	For staff	2500	1
10	Park	For staff	10000	1

Detail of Amenities:-

(1) The population of the residential complex is each expected around 200 plus floating population. To serve the population following amenities are provided:-

- (1) Community centre
- (2) Casual Shops/Commercial complex.
- (3) Park.
- (4) Dispensary.
- (5) Club House.

(2) Services:-

The residents will have the facilities of water supply, sewage, drainage, internal & external electrification and LED street light for better traffic control at 9:00 AM and 7:00 PM. Wide road will be provided. These services will be maintained by the construction and maintenance section of the zoo. A bus service will also be provided for the staff and children to go to city and schools.

4.17.2 Fuel allowance:- We propose to provide fuel allowance on per month lump sum basis for all officers and supervisory staff of all sections which use their own vehicles, which is as under:

<i>Category</i>	<i>Fuel charges</i>	
	<i>Four wheelers</i>	<i>Two wheelers</i>
A and B	2000 pm or as per State Govt. rules	1200pm or as per State Govt. rules
C	N.A	1200pm or as per State Govt. rules

Fuel charges may be reviewed after every six months.

4.18 Zoo development unit:- This is a new zoo to be developed on forest land. The creation and filling of above mentioned posts will take time. So initially following staff should be recruited to start the planning and construction work.

- (1) Director – Whole time with administrative and financial powers.
- (2) Zoo professional- On contract basis as consultant.
- (3) Architect - On contract basis as consultant.
- (4) Civil and electrical engineer- On contract basis as consultant.
- (5) Administrative staff – OS, 2 clerks.
- (6) Account staff – Accountant and 2 Clerks
- (7) Stenographer - 1
- (8) Support staff – Driver, Attendant -3.
- (9) Logistic support.

A site office would be constructed at the site to start the development works.

The above team will be responsible for the following works:-

- (1) Designing and construction of animal enclosures.
- (2) Construction of road, paths and visitor facilities.
- (3) Development of civic facilities.
- (4) Landscaping.
- (5) Designing and construction of health care facilities.
- (6) Designing and construction of interpretation centre, admin block and other support infrastructures.
- (7) Procurement and transportation of zoo animals.
- (8) This unit will take care to keep buffer between sambhar and wild dog enclosures and also the plinth level of structures to mitigate flood during monsoon.
- (9) The unit will also take care to check soil erosion, water conservation and rain water harvesting aspect while designing the structures and execution.

CHAPTER – 5

Personnel planning

The Zoological park, Mukundpur (Satna) has an area of 100 ha. and is likely to display over 450 animals as per animal collection plan. This zoo expects about 2 lakh visitors of different walks of life per year. Development and expansion has been envisaged in the master plan for the years 2012-13 to 2022-23. A hierarchy of category of medium zoo has been proposed. This includes animal, veterinary, sanitary & horticulture, education, research, store, construction and maintenance sections. Besides animal enclosures, white tiger safari and butterfly park has been proposed. In order to maintain the park and to achieve its objectives, new posts in all sections have been proposed to be created with adequate support staff. A few sections will be out sourced for their operation. The norms of CZA to include technical staff in the personnel management has also been taken care of.

The proposed staffing pattern for this zoo is at page –55

There is no existing staff as this zoo is to be developed afresh, however proposed staff requirement of different sections is given below:-

(1) Proposed staff requirement for animal section:-

Proposed Staff

<i>S. No.</i>	<i>Post</i>	<i>No. of Post</i>	<i>Pay Scale</i>
<i>1</i>	Curator (Animal) or ACF	1	9300-34800 +4600GP
<i>2</i>	Asstt. Curator - or Range officer (Animal)	2	9300-34800 +3600GP
<i>3</i>	Head Zookeeper	2	5200-20200 +2100GP
<i>4</i>	Driver	1	5200-20200 +1900GP
<i>5</i>	Zoo keeper	15	5200-20200+ 1900GP
<i>6</i>	Asst. Zoo keeper	31	4400-7440+ 1300GP
<i>7</i>	Attendant	2	4400-7440+ 1300GP

(2) Veterinary section:-

Proposed Staff

<i>S. No.</i>	<i>Post</i>	<i>No. of Post</i>	<i>Pay Scale</i>
1	Veterinary Officer	1	9300-34800 +5400GP
2	Asst. Veterinary Officer	1	9300-34800 +4600GP
3	Lab Technician	1	5200-20200 +2400GP
4	X-Ray Technician	1	5200-20200 +2400GP
5	Compounder	1	5200-20200 +2400GP
6	Computer operator	1	5200-20200 +2000GP
7	Driver	1	5200-20200 +1900GP
8	*Zoo Keeper	2	5200-20200 +1900GP
9	*Asst. Zoo Keeper	4	4400-7440 +1300GP
10	Attendant *Will also look after rescue center and quarantine wards	1	4400-7440 +1300GP

(3) Sanitary section:-

Proposed Staff

<i>S. No.</i>	<i>Post</i>	<i>No. of Post</i>	<i>Pay Scale</i>
1	Asstt. Curator (san) or Sanitary Inspector	1	9300-34800+3600GP

Note :- (1) Asstt. Curator (san) or Sanitary Inspector will be appointed on regular basis and work of the section will be out sourced.

(2) The sanitary section will be under the administrative control of Curator (horticulture and sanitation).

(4.) Horticulture section :-

Proposed Staff

<i>S. No.</i>	<i>Post</i>	<i>No. of Post</i>	<i>Pay Scale</i>
1	Curator (horticulture and sanitation)	1	9300-34800+4600GP
2	Asstt. Curator (Hor.) or Range officer (Hor.)	1	9300-34800+3600GP
3	Driver	1	5200-20200+1900GP
4	Attendant	1	4400-7440+1300 GP

Note: - (1) Curator (horticulture and sanitation)Asstt. Curator (Hor.) or Range officer (Hor.) will be appointed on regular basis and the work of this section will be out sourced.

(5) Security section:-

<i>S. No.</i>	<i>Post</i>	<i>Proposed Staff</i>	
		<i>No. of Post</i>	<i>Pay Scale</i>
1	Range officer (Security)	1	9300-34800+3600GP
2	Deputy Range officer (Security)	2	5200-20200+2400GP
3	Ticket Collector	2	4400-7440 +1400GP
4	Attendant	1	4400-7440 +1400GP

Note :- (1) Range officer (security) and deputy range officer (security) and ticket collectors will be appointed on regular basis and the work of this section will be out sourced.

(2) Security section will work under the administrative control of Deputy Director

(6) Procurement / Store section:-

<i>S. No.</i>	<i>Post</i>	<i>Proposed Staff</i>	
		<i>No. of Post</i>	<i>Pay Scale</i>
1	Assistant Curator (Store) or RO (Store)	1	9300-34800+3600GP
2	Store Clerk	1	5200-20200+2100GP
3	Truck Driver	1	5200-20200+1900GP
4	Cook cum food distributor	2	4400-7440 +1400GP
5	Attendant	6	4400-7440 +1300GP

Note: - (1) Assistant Curator (Store) or RO (Store) will be appointed on regular basis and rest of the manpower will be on contract basis.

(2) The section will work under the administrative control of Deputy Director.

(7) Construction and maintenance section:-

<i>S. No.</i>	<i>Proposed Staff</i>		<i>Pay Scale</i>
	<i>Post</i>	<i>No. of Post</i>	
1	Curator (Engg.) or Asst. Engineer	1	9300-34800+4600GP
2	Asstt. Curator or JE (Elec. & Civil)	2	9300-34800+3600GP
3	Draft man	1	5200-20200+2800GP
4.	LDC	1	5200-20200+1900GP
5	Driver	1	5200-20200+1900GP
6	Electrician	2	5200-20200+1900GP
7	Black Smith/Welder	1	5200-20200+1900GP
8	Plumber	1	5200-20200+1900GP
9	Mason	1	5200-20200+1900GP
10	Carpenter	1	5200-20200+1900GP
11	Painter	1	5200-20200+1900GP
12	Pump Driver	1	4400+7440 +1400GP
13	Attendant	10	4400+7440 +1300GP

Note :- (1) Curator (Engg.) or Asst. Engineer, Asstt. Curator or JE (Elec. & Civil, Draft man will be on deputation and rest of manpower will be on contract basis.

(2) All the major construction works will be undertaken by inviting tenders as per state govt. rules.

(8) Education section:-

<i>S. No.</i>	<i>Proposed Staff</i>		<i>Pay Scale</i>
	<i>Post</i>	<i>No. of Post</i>	
1	Curator(Ed) or Edu- Officer	1	9300-34800+4600GP
2	Asstt. Curator (Ed) or RO (Edu)	1	9300-34800+3600GP
3	Library Asstt	1	5200-20200+2400GP
4	Audio- Visual operator	1	5200-20200+2100GP
5	Computer operator	1	5200-20200+2100GP
6	Attendant	4	4400-7440+1300GP

Note :- (1) Curator(Ed) or Edu- Officer , Asstt. Curator (Ed) or RO (Edu) will be on regular basis and rest of the staff will be on contract.

(9) Research section:-

Proposed Staff			
S. No.	Post	No. of Post	Pay Scale
1	Curator (Res.) or Research Officer or Biologist	1	9300-34800+4600GP
2	Asstt. Curator or RO (Research)	1	9300-34800+3600GP
3	Field Asstt	2	4400-7440+1300GP

Note :- (1) Curator (Res.) or Research Officer, Asstt. Curator or RO (Research) will be on regular basis and rest of the staff will be on contract.

(10) Administration section:-

(i) Establishment section:-

Proposed Staff			
S. No.	Post	No. of Post	Pay Scale
1.	Office suptt. Or Head clerk	1	9300-34800+3200GP
2.	UDC	2	5200-20200+2800GP
3.	LDC	2	5200-20200+1900GP
4.	Peon	1	4400-7440+1300GP

(ii) Account section:-

Proposed Staff			
S. No.	Post	No. of Post	Pay Scale
1.	Accountant	1	9300-34800+3200GP
2.	UDC	1	5200-20200+2800GP
3.	LDC (booking clerk)	2	5200-20200+1900GP
4.	LDC (office)	1	5200-20200+1900GP
5.	Cashier (LDC)	1	5200-20200+1900GP
6.	Peon	1	4400-7440+1300GP

(iii) Office of Deputy Director:-

Proposed Staff			
S. No.	Post	No. of Post	Pay Scale
1.	Deputy Director	1	15600-39100+5400GP
2.	Personnel Assistant Gr-II	1	9300-34800+2800GP
3.	Driver	1	5200-20200+1900GP
6.	Peon	1	4400-7440 +1300GP

Note :- (1) Deputy Director and PA will be on regular basis and rest of the staff will be on contract.

(iv) Office of Director:-

Proposed Staff			
S. No.	Post	No. of Post	Pay Scale

1.	Director	1	15600-39100+7600GP
2.	Personnel Assistant Gr-I	1	9300-34800+3600GP
3.	Driver	1	5200-20200+1900GP
6.	Peon	2	4400-7440 +1300GP

Note :- (1) Director and PA will be on regular basis and rest of the staff will be on contract.

5.1 Outsourcing:-

The following services will be outsourced:-

- (1) Sanitation: (Cleaning and sweeping of roads path office buildings, cleaning of toilets and water points, collection of garbage, leftover, dry leaves, grasses and their disposal, cleaning benches, shelter and signages, mosquito, rodent and fly control and any other sanitation works).
- (2) Horticulture: (Development and maintenance of lawns, landscaping, plantation and nursery, pruning and cleaning of hedges, trees, preparation and maintenance of earthen pots, watering, sprinkling and manuring of lawns, hedges, trees and seedlings, collection of seeds, preparation of manure and other horticulture works).
- (3) Security: (Patrolling of zoo area, maintenance of law and order, frisking, control of entry of stray animals, duty at office and gates and other security related works).
- (4) Cafeteria, kiosk and souvenir shop – on lease.
- (5) Battery operated trolley - on lease.
- (6) Operation of Safari ride (White tiger) – on lease.
- (7) Parking – on lease.
- (8) Cloak room – on lease.

5.2 Manpower on contract:- (Lab. technician, x-ray technician, compounder, computer operators, store clerk, cook cum food distributors, Truck driver, electrician, black smith / welder, plumber, mason, carpenter, painter, pump driver, library assistant, audio visual operator, UDCs, LDCs except cashier and booking clerk, drivers, peons, attendants and field assistants).

5.3 Manpower on deputation:- (Veterinary Officer, Assistant Vet. Officer, Asstt. Engineer, JE. (Civil and Electrical) and Draftsman. If manpower does not available on deputation than engagement on contract will be made).

5.4 Brief resume of personnel required for operation of the zoo:-

No.	Name of post	Required number	Pay scale	Basic qualification
1	Director	1	15600-39100+7600GP	IFS or State cadre forest officer with Diploma in wildlife Management.
2	Deputy Director	1	15600-39100+5400 GP	IFS or State Cadre forest officer with Diploma in wildlife Management.
3	Veterinary Officer	1	9300-34800+5400 GP	M. Vsc in Medicine with 3 years working experience in the field.
4	Asstt. Vet. Officer	1	9300-34800+4600 GP	B Vsc with 2 years working experience in the field or M. Vsc.
5	Curator (Animal)	1	9300-34800+4600 GP	M. Sc. In Zoology or Wildlife, or B.sc. (Bio) with 5 year of managing wild animals in captivity.
6	Curator (San & Hor.)	1	9300-34800+4600 GP	M. Sc. In Horticulture or Botany or B.Sc. in Horticulture or Botany with 5 year experience in the field.
7	Curator (Eng) or Asstt. Eng	1	9300-34800+4600 GP	BE (Civil) or Diploma in Civil Engineering with 5 years working experience in the field.
8	Curator (Ed) Edu. Officer	1	9300-34800+4600 GP	M. Sc. In Zoology or Wildlife or B. Sc. (Bio) B. Ed with 5 years of teaching experience.
9	Curator (Re.) or Research officer or Biologist	1	9300-34800+4600 GP	M. Sc. In Zoology or Wildlife, preferably Ph.D in Zoology or wildlife.

10	Asstt. Curator (Animal) or RO (Animal)	2	9300-34800+3600 GP	M. Sc in Zoology or Wildlife or B. Sc. With (Bio) with 5 years working experience in the field.
11	Asstt. Curator (Sa.) or Sanitary Inspector	1	9300-34800+3600 GP	12 th pass with Diploma in Sanitary inspector or equivalent.
12	Asstt. Curator (Horticulture) or RO (Hor.)		9300-34800+3600 GP	B. Sc with biology or horticulture.
13	Asstt. Curator (security) or RO Security	1	9300-34800+3600 GP	Graduate from recognized university or ex-servicemen at least of the rank of Lt.
14	Asstt. Curator (store) RO Store	1	9300-34800+3600 GP	Graduate from recognized university with knowledge of procurement of store items and their disposals & knowledge of computer.
15	Asstt. Curators (Civil & Ele) or JE (Civil & Ele)	2	9300-34800+3600 GP	1. Diploma in civil engineering with experience of construction work 2. Diploma in electrical engineering with experience of electrical work.
16	Asstt. Curator (Edu.) or RO(Edu)	1	9300-34800+3600GP	M.Sc. in Zoology or Wildlife or B. Sc. (Bio) B. Ed.
17	Asstt. Curator (Research) or RO (RE)	1	9300-34800+3600 GP	M. Sc. In Zoology or Wildlife.

18	Officer Suptt.	1	9300-34800+3600 GP	Graduate from recognized university with 5 years working experience in the cadre & knowledge of computer.
19	Accountant	1	9300-34800+3600 GP	B. Com from recognized university with 5 years working experience in the cadre & knowledge of computer.
20	Draftsman	1	5200-20200+2800GP	12 th passed with trade certificate from ITI.
21	Personnel Assistant Gr.I	1	9300-34800+2800 GP	Graduate with English shorthand speed of 80 words / minute and English typing speed 40 wpm and 1 year working experience.
22	Personnel Assistant Gr.I	1	5200-20200+2400GP	Graduate with English shorthand speed of 80 words / minute and English typing speed 40 wpm.
23	Lab. Technician	1	5200-20200+2400GP	12 th passed with diploma in lab technology.
24	X-ray Technician	1	5200-20200+2400GP	12 th passed with diploma in radiology.
25	Compounder	1	5200-20200+2400GP	12 th passed with certificate of Vet. Compounder course or equivalent.
26	Deputy Ranger(Security)	2	5200-20200+2400GP	Graduate with knowledge of security management.

27	Library Asstt.	1	5200-20200+2400GP	B.A. or B. Sc. with diploma in library science.
28	UDC	3	5200-20200+2800GP	Graduate from recognized university with 5 years experience of secretarial job or 12 th passed with 8 years experience of secretarial job.
29	Head zoo keeper	2	5200-20200+2100GP	Science Graduate or 12 th passed with experience of 3 years in the field.
30	Computer Operator	2	5200-20200+2100GP	Graduate with knowledge of commonly in use software's and their operation.
31	Store Clerk	1	5200-20200+2100GP	Graduate or 12 th passed with knowledge of computer operation.
32	Audio visual operator	1	5200-20200+2100GP	12 th passed with diploma in audio visual operation.
33	LDC	4	5200-20200+1900GP	Graduate or 12 th passed with knowledge of computer operation.
34	LDC Booking clerk	2	5200-20200+1900GP	Graduate or 12 th passed with knowledge of computer operation.
35	LDC Cashier	1	5200-20200+1900GP	Graduate or 12 th passed with knowledge of computer operation and cash handling.
36	Truck Driver	1	5200-20200+1900GP	12 th passed with license to drive heavy and light

				vehicle. Should be aware of maintenance and minor repairs aspect.
37	Driver	6	5200-20200+1900GP	12 th passed with license to drive heavy and light vehicle. Should be aware of maintenance and minor repairs aspect.
38	Electrician	1	5200-20200+1900GP	12 th passed with certificate course in the field from ITI.
39	Black Smith / welder	1	5200-20200+1900GP	12 th passed with certificate course in the field from ITI.
40	Plumber	1	5200-20200+1900GP	12 th passed with certificate course in the field from ITI.
41	Mason	1	5200-20200+1900GP	12 th passed with certificate course in the field from ITI.
42	Carpenter	1	5200-20200+1900GP	12 th passed with certificate course in the field from ITI.
43	Painter	1	5200-20200+1900GP	12 th passed with certificate course in the field from ITI.
44	Zoo keeper	17	5200-20200+1900GP	10 th passed or middle with 3 years of working experience in the field.
45	Ticket collector	2	5200-20200+1900GP	10 th passed.
46	Cook cum distributor	2	4400 - 7440+1300GP	10 th passed or middle with knowledge of cooking.

47	Pump Driver	1	4400 - 7440+1300GP	10 th passed or middle with knowledge pump deriving
48	Asstt. Zoo Keeper	35	4400 - 7440+1300GP	10 th passed or middle with 3 years working experience in the field
49	Attendant	25	4400 - 7440+1300GP	10 th passed or middle with multi skilled aptitude
50	Field Assistant	2	4400 - 7440+1300GP	10 th passed or middle with multi skilled aptitude
51	Peon	5	4400 - 7440+1300GP	10 th passed or middle with multi skilled aptitude
	Total post.	149		

CHAPTER – 6

Disaster Management:

The disaster management act. 2005 defines it as “means a catastrophe, mishap, calamity or grave occurrence affecting any area, arising from natural or man cause, or by accident or negligence which results in substantial loss of life or human suffering or damage to, and destruction of property, or damage to, or degradation of environment, and is such a nature or magnitudes to be beyond the coping capacity of the community of the different area.

Disaster management involves continuous planning, coordinating and implementation of measures for:-

- (1) Preparation to deal with disaster situation.
- (2) To prevent danger of threat.
- (3) Capacity building.
- (4) Immediate response to calamities.
- (5) Evacuation, rescue, relief and rehabilitation.

The Zoological park and Rescue centre, Mukundpur (Satna) has an area of 100 ha with lots of vegetation, river and Nala. The undergrowth, dry leaves and twigs may pose problem of fire during summer. This park is likely to display over 450 animals and about 2 lakh visitors are expected to visit this park annually.

The potential hazards of this zoo are as under:-

- (1) Fire.
- (2) Flood.
- (3) Earth quakes.
- (4) Thunder storm.
- (5) Law and order problem.

6.1 Disaster management team:-

This should be formed well in advance. They should be well aware of the Zoo topography, its inmates, facilities available and the contact person of other departments.

The team members can be:-

- (1) Director of Zoo – For making plan and taking decision.
- (2) Coordinator – Should hold a responsible position and be able to summon person and resources during emergencies. He has to ensure the implementation of the plan.
- (3) Unit coordinator – The zoo can be divided into different units or sections. Each section will work under the control and direction of unit coordinator as per plan.

- (4) Skilled / unskilled personnel – These include, para-vet staff, animal keepers, mali, guard, sweeper, drivers, cutter, plumber, electricians and labour. The number depends upon the magnitude of the problem.

6.2 Fire:- This could be the common hazard particularly in the summer season due to under growth, dry leaves and grasses. Regular cutting of fire line should be done before the onset of summer. Fire lines should be kept clean of dry leaves and grasses. The gates and road should be so designed that fire brigades can reach the spot without any hindrance. The zoo should acquire necessary fire extinguishing equipments in consultation with the fire services of the state and the staff must know how to operate fire extinguishing equipments. The water bodies and road network will act as a fire barrier.

6.3 Flood:- The zoo is located on the bank of the Beehad River, however the chances of flood cannot be ruled out. In the event of flood, following measures would be taken.

- (1) The animals would be displayed at higher level.
- (2) Keep staff, pumps, fuel and lubricants readily available during rainy season.
- (3) A truck with transport cages would also be kept ready.
- (4) Veterinary staff with medicine and equipments would be kept ready.
- (5) Co-operation of other departments would be sought.
- (6) Keep all drains and sewage lines clean.
- (7) Following equipments would be kept ready.

S. No.	Items	No.
1	Flashlight / Torch light & Spare Batteries	8
2	First-aid Kit	4
3	Shovels	12
4	Axe	10
5	Generator (with sufficient fuel)	1
6	Tranquilizing Gun with drugs	2 sets
7	Welding machine (with sufficient welding rods)	1 sets
8	Ropes & Net	As per demand
9	Transport cages (different sizes)	10
10	Electric saw	1
11	Construction & repair material	As per demand

12	Gas cutter	1
13	Earth moving equipments	1
14	Ambulance	1
15	Truck	1
16	Diesal pump-portable (This should be periodically checked)	1
17	Folding ladder	2
18	Adequate stock of consumables	As per demands
19	Fixed & portable water jets	As per demands

The department shall keep the contact no. of the persons dealing / supplying the following items:-

- (1) Transport company
- (2) Crane supplier
- (3) JCB supplier
- (4) Construction material supplier
- (5) Electrical item supplier

Telephone numbers of all above would be made handy at more than one location.

6.4 Earth quake:- It can destroy and settle the building and its foundation in few seconds. To check this type of disaster, (1) earth quake resistant buildings will be constructed with the suggestion from a technical team. (2) The drawing of all the buildings, service lines will be readily available. (3) The telephone no. of technical officer like structural engineer will be handy (4) The contact number of different items suppliers will be made handy as mentioned above.

6.5 Thunder storm:- April and May be the month of incidence of thunder storm. The thunder storm may be associated with violent squalls, accompanied by heavy rain. This may result in the uprooting of large number of trees which may fall on road and buildings. Immediate action to remove the fallen / uprooted trees will be undertaken. For this, implements as mentioned above table will be made available.

6.6 Law and order problem:- If the law and order problem arises with in zoo employees, assistance from the police would be sought. The security section would also monitor the situation. The law and order problem will be tackled by taking the following measures:-

- (1) Adequate storage facilities will be available to store feed items at least for 7 days

- (2) A deep freezer will be available to store beef for 2-3 days
- (3) The cleaning of enclosures and distribution of feed items will be got done by contract labour under the guidance of supervisors
- (4) In case the law and order problem arises in the city, it will be difficult for staff to reach the zoo so the essential staff like veterinarian, animal keepers, para-vet and sweeper will be provided residential accommodation near the zoo premises

6.7 Precautionary measures:-

(1) Siren (alarm) system:- An alarm (siren) system will be fixed in the zoo premises with adequate range. It will be under the control of RO (security) and is located in the security office. The siren will be used when unpredicted incident happens in the zoo premises.

(2) Evacuation of the visitors:- The zoo shall have a detailed written protocol for evacuating visitors in hour of every crisis. There will be provision of emergency exits and a public address system to communicate to the visitors the routes to be followed to get out of the zoo in the event of any disaster / crisis. Directional boards will be fixed at appropriate locations leading to exit point for safely evacuation.

(3) Staff training and mock drill:- The zoo will arrange staff training of each category to have a clear idea of emergency protocols. Head of each section will be responsible for training of persons of his department. The park will also conduct unscheduled mock drill to assess capability viz-

a. Preparation of various departments.

b. Response time.

c. Coordination.

d. Time taken to resolve the issue.

Director will closely monitor the response.

CHAPTER – 7

Contingency plan

The zoo and rescue center, Mukundpur is likely to display over 450 animals in 100 ha and the number of visitors may be 2 lakh per year. The problems are bound to arise due to one reason or other so it necessary to have a contingency plan to attend such problems. Various problems and their remedial measures are given below:-

7.1 Animal rescued from wild:- There seems non-existence of large carnivores / ungulates in the forest area adjoining the zoo that may pose serious threat to the security of local people. Therefore, the possibilities of zoo staff being required to carry out detailed rescue operation of wild animals are minimal. However local forest division has a good trained rescue squad which can help to rescue the animals. This squad has all the possible equipments with them at present. A separate set of equipments along with staff will always be available in the zoo.

The veterinary officer will be the incharge for the rescue squad and its operation. The other team members shall be as under:-

- (1) Assistant Veterinary officer.
- (2) Range officer (animal).
- (3) Security officer.
- (4) Compounder.
- (5) Head keeper.
- (6) Zoo keepers.
- (7) Attendant.

The ambulance with the veterinary section will be used for transportation of manpower, material and rescued animal.

7.2 Escape of animal from enclosures:- In case of escape of animals from enclosures is noted, the same cages & tranquilizing equipments meant for rescuing animal will be used to capture the animals. This action is to be taken with quickest possible time. The best way to check the escape of animal is to ensure that doors, shutter, locks are closed. The chain link fence is not broken, the trees are regularly pruned. Any weak point or gap identified during the inspection should be repaired and replaced immediately.

The following action will be taken immediately:-

- (1) Announcement will be made to alert the security, staff and visitors.
- (2) Public address system and siren will be used .
- (3) Entry of visitors will be stop when dangerous animal escapes.

Reporting of escape: Any staff seeing an animal outside the enclosure should immediately report to the following officers:-

- (1) Director.
- (2) Deputy Director.
- (3) Veterinary officer.
- (4) Curator animal.
- (5) Security officer.
- (6) Range officer (Animal).
- (7) Curator Education.

7.3 Monkey and dog menace:- The park has a free living population of grey langur and rhesus monkeys. They are thriving on the forest produce. They are likely to stay for longer duration due to good vegetation and natural food availability in the area. All efforts will have to be taken to feed all the zoo inmates in the feeding cells and covered kraals. The garbage and left over food will be put in the covered dustbins. The visitors shall not be allowed to eat outside restaurant / kiosk. Further visitors will not be allowed to carry food items in open and will be allowed to consume them in the prescribed area i.e. cafeteria and kiosk.

Monkey population, if become menace, they would be captured, vasectomised / tubectomised and treated for tuberculosis. Once these are infection free, they will be released in the nearby forests.

Dog menace:- This shall require proper boundary wall and its maintenance around the park. If any breach or hole is noted, it would be immediately repaired. Strict vigilance shall be kept at all the entry points by security staff to prevent entry of dogs and other stray animals. If any dog is sighted in side zoo premises, it would be captured on priority and handed over to the municipal corporation.

7.4 Arrangement of food in case of strike (non supply by contractor):- This problem arises when there is a general strike in the city or by the non cooperation of contractor due to one reason or the other. The food in such cases will be made available by the following ways:

- (1) To maintain buffer stock of non perishable food items adequate for 7-10 days.
- (2) To maintain buffer stock of perishable food items for 2-3 days in deep freezer.
- (3) A well designed slaughter house is also proposed in plan to fight with such situations.
- (4) To authorize Assistant Curator (store) to procure the food supply from open market against cash.

7.5 Snake bite:- The park has dense forest and is home for poisonous snakes like Cobra, Viper and Russell. There is a proposal to construct a reptile house which will keep poisonous snakes. There are chances that visitors as well as animal keepers can be bitten by these snakes. In order to meet such incidents, following arrangements are likely to be made:

- (1) To maintain enough stock of anti snake venom at the zoo hospital.
- (2) To carry the patient to the hospital without loss of time.
- (3) To keep first aid kits at important locations of the zoo i.e. security office, office, field office, safari entrance, veterinary hospital and reptiles house.

7.6 Visitors getting injured / visitors falling inside enclosure:- The zoo is likely to receive 2 lakh visitors annually. There are chances that visitors may get injured by the animals if prod their hand in the exhibit or by fall while walking and running in the zoo. The following arrangements will be made to check these incidents:-

- (1) To put warning signages on all enclosures to keep away from the enclosures.
- (2) To provide appropriate and effective standoff barriers.
- (3) To keep the first aid kits available at important locations as mentioned above.
- (4) To take the injured visitors to nearby hospital, if required.

There may be chances that visitors may fall in the moat or jump in the enclosures. In such cases, the keepers will take the animal inside the cell immediately. If it does not materialize, chemical immobilization of the animal would be done by the veterinarian.

In the mean while, attempt would be made to keep the animal away from the visitor by shouting, pocking with bamboo stick and throwing stones. Visitor would be taken out of the enclosure with the help of ladder / ropes. The Curator (animal) would be physically present at the site during such rescue operation.

7.7 Fighting among animals:- This is a very common problem which is bound to occur in the enclosures where large number of animals are kept. This type of problem is more profound in deer, antelopes and monkeys. The older males show preference for females and attack the younger ones if they come close to the females. Monkeys also fight to show dominance or preference for food or females. As a result of this behavior, fights among the animals occur which result in getting the animals injured. The following arrangements will be made to check this problem:

- (1) The zoo has proposed to have adequate cells and kraals to keep the fighter males separate .
- (2) The veterinarian would provide them treatment from time to time.
- (3) Adequate crackers and bombs would be available with keeper of enclosure of tiger, panther and lion.
- (4) Bamboo sticks would be available with the animal keepers to control the fight.

7.8 Epidemics:- The zoo shall follow the vaccination schedule strictly. A well equipped veterinary hospital has been proposed which will have the required vaccines. The vaccines for ungulates and carnivores will be required to be injected as per the schedule. Besides the above, following measures will be taken:

- (1) Extensive disinfection measures like spraying of disinfectants will be undertaken.
- (2) To remove the infected animal from the group and keep in isolation ward for treatment.
- (3) To seek advice and guidance from the experts or veterinary institute.

7.9 Breakdown of power supply etc:- The zoo will keep backup generator at zoo hospital, office building and water pumping station to meet the crisis. The maintenance section would keep liaison with power supply authorities.

7.10 Free ranging / feral animal menace:- The park has a number of free ranging animals like grey langur, rhesus monkeys, mongoose, rats and snakes. They are likely to prey upon the food given to animals or they can even bite. In order to check this menace, following actions will be taken:

- (1) To make the chain link fence rodent and snakes proof.
- (2) To feed the animal in the cells and covered kraals.
- (3) To scare the free ranging animals with bamboo or crackers.

CHAPTER – 8

Capacity Building

Zoo management is a complex subject which involves regular interaction between staff, experts and institutes to upgrade the skills required for the upkeep of the zoo. The CZA arranges seminar, symposia and short term training programmes for all zoo staff to upgrade their skills and promote interactions between them.

8.1 Training sponsored by CZA: The Central Zoo Authority sponsors various training programmes. The notable training programmes are:-

- i. Training for middle level officers. (On alternate year)
- ii. Training for zoo keepers. (Yearly)
- iii. Zoo educator training.(On alternate year)

(i) Training for middle level: - The duration of this training is usually 2 weeks. The middle level officers from different zoos of India participate in it. The faculty includes the experienced and retired zoo personnel. Every aspect of zoo management is covered in this training.

Zoological Park, Mukundpur will like to avail this opportunity when the different sections start working.

(ii) Training for Zoo Keeper: - This training is usually of one week. All the aspects of animal keeping, house cleaning, reporting, feeding and handling are covered. Again experienced and retired staff are involved for lecture and presentation

This Zoological Park will avail the benefit by sending its keepers when the animal section starts functioning.

(iii) Zoo educator training: - This CZA started this training in 2010. The first training was held at Patna. Director Sanjay Gandhi Zoological Park, Patna was the coordinator. This will be a yearly event. The Mukundpur zoo will avail this opportunity when its education center starts functioning.

8.2 In House Training:- When this park becomes fully functional with staff and infrastructure, it will plan a in - house training for the animal keepers. The park will invite animal keepers form other zoos of India for this training. This training will be planned for the duration of one week and module is given below:-

A one - week training module for animal keepers is given as under:-

Number of trainees – 20.

Duration of training – 1 week.

Date and Time – As per convenience.

Day	Time	Subject
One	10:00 - 10:30 am	Registration.
	10:30 – 11:00 am	Welcome address.
	11:00 – 11:30 am	About the program and its objectives.
	11:30 – 12:00 am	Tea break.
	12:00 – 01:00 pm	Wild life protection Act, 1972, its history and role of keepers in its implementation.
	01:00 – 02:00 pm	Lunch.
	02:00 – 03:00 pm	Animal welfare and ethics and prevention of cruelty to animals.
		Tea break.
	03:00 – 03:30 pm	
	03:30 – 05:00pm	Duties and responsibilities of keepers, hygienic aspects and discussion.

Two & Three	09:00 am – 05:00 pm	Visit to a Zoological Park or wild life sanctuary or National Park.
Four	10:00 – 11: 15 am	Caring of birds, their welfare in captivity. Tea break.
	11:15 – 11:30 am	
	11:30 – 01:00 pm	Enrichment of animal enclosures and their care. Lunch.
	01:00 – 02:00 pm	
	02:00 – 03:15 pm	Animal feed, its importance and distribution system. Tea break.
	03:15 – 03:30pm	Role of keepers in Disaster management.
Fifth	03:30 – 05:00pm	
	10:00 – 11:15 am	Role of keepers in animal care and treatment.
	11:15 – 11:30am	Tea break
	11:30 – 01:00 pm	Emergency attendance during accident and first aid. Lunch.
	01:00 – 02:00	Visit to Veterinary Hospital and

02:00 – 03:15pm

discussion.

Tea break.

03:15 – 03:30pm

Certificate distribution and conclusion.

03:30 – 05:00pm

Note The staff, working and retired zoo personnel may be taken as resource person when this programme starts.

8.3 Training abroad:-

CZA also arranges short term training for zoo staff of this country in abroad. Every year one Director / Curator of zoo is sent for training at jersey, UK. This zoo can avail this opportunity as and when occasion arises.

CHAPTER – 9

E-Governance

E-governance is an important tool for bringing efficiency, transparency and reliability in the zoo management. All sections will be interlinked with software. This will enable them to exchange information in house and outside. The Director, Deputy Director, Veterinarian, Curators and Research officer will have computers, which will be networked with a LAN, and internet and the data in the entire computer would be accessible to every officer.

Uses:-

- (1) To maintain the profile of each employee.
- (2) To store inventory data of animal and feed schedule.
- (3) To store details of house facilities.
- (4) To record birth and deaths with causes.
- (5) To record behavior and breeding biological aspect.
- (6) To record the hand rearing technique of babies.
- (7) To store the visitor data.
- (8) To record the ongoing research projects.
- (9) To record the ongoing educational programme.
- (10) To store stud book information.
- (11) To store animal history card information.
- (12) To record treatment of individual.

E-Ticketing:-

The visitors will have the facility of booking their tickets at home through this facility

CHAPTER – 10

Budget Analysis

The budget has been prepared by taking into consideration of CSR rates. The budget has been envisaged for 10 years which will be reviewed there after along with master plan.

10.1 Construction and development:

Budget Analysis												
S no.	Description	Estimated Budget (Rs. in lacs)										
		2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	Total
1	Stone MAS. Boundary wall	250	454	47								751
2	Internal service lines											
	(1) Sewage (zoo & residential)		20	10	4	4	2					40
	(2) Water distribution (potable-zoo & residential)		25	10	10	10						55
	(3) Electricity supply (zoo & residential)		50	20	20	5	5					100
	(4) Drainage (zoo & residential)- River and Nalla training, cheek dame, stop dams,Gally plngging, drainage system		20	50	50	10	5					135
	(5) River water distribution (zoo & residential)		50	20								70
	(6) Solar or wind energy pump			15	10							25
3	Water works											
	(1) Digging of bore wells (4)	2	2	2	2							8
	(2) Over head tank (50000 ltr capacity)		15	5								20
	(3) Sump Well-2 nos. for 1.0 LAC Capacity		12	12								24
	(4) Water treatment plant		25									25
	(5) STP (for Recycling of Water in RZTS)		5	10	5	2	2					24
4	Electricity supply system											
	(1) Installation of substations (11 KV)	-	100		-							100
	(2) Stand by generator (40 KV)			15								15
	(3) Road side lightings		10	10	5	3	2					30
	(4) Service road lighting		10	10	5	3	2					30
	Total	252	798	236	111	37	18					1452

	(5) Parking & front gate lighting		20	10	3	2							35
	(6) Residential lighting		5	5	2								12
	(7) Patrol road lighting		20	5	5	3	2						35
	(8) All buildings		10	5	5	3	2						25
5	Main roads	50	150	50	50								300
6	Service roads	85	60	15									160
7	Secondary roads				10	10							20
8	Visitor paths		10	10									20
8 (i)	Culverts etc.		60	10	10	10							90
8 (ii)	Bridges at Murjuva nala		150	40	20								210
9	Construction of office buildings with rain water harvesting provision. Approval of design and sanction to be obtained												
	(1) Director, Deputy Director & Adm. Block		40	20									60
	(2) Supervisory staff		5	10									15
	(3) Field staff		10	5									15
	(4) Procurement section		10	5									15
	(5) Construction and maintenance		5	5									10
	(6) Entry gate with security office booking windows		20	10									30
	(7) Service gate		6	4									10
10	Construction of animal enclosures with rain water harvesting provision.												
	(1) Getting of approval of design, clearances & sanction		10										10
	(2) Tiger		20	10	5								35
	(3) White tiger		20	10	5								35
	(4) Lion		20	10	5								35
	(5) Jaguar		20	10	5								35
	(6) Panther		20	10	5								35
	(7) Sloth bear		20	10	5								35
	(8) All cats (5 species)		15	5	5								25
	(9) Small carnivores (5 species)				20	5							25
	(10) Sambar				10	10	5						25
	(11) Chital				10	10	5						25
	(12) Barking				10	10	5						25
	(13) Gaur				10	10	5						25
	(14) Hog deer				10	10	5						25
	(15) White tiger safari/c bridge	20	60	50	10								140
	(16) Black buck			10	10	5							25
	(17) Chinkara			10	10	5							25
	Total	407	1584	580	351	130	47						3099

	(18) Barasingha			10	10	5						25
	(19) Neelgai			10	10	5						25
	(20) Wild bore					10	5					15
	(21) Thamin deer					10	10	5				25
	(22) Porcupine					5	5					10
	(23) Hedge hog					5	2					7
	(24) Bird aviary					30	10	10				50
	(25) Emu						10	5				15
	(26) Ostrich						10	5				15
	(27) Monkey islands (4 species)					70	10					80
	(28) Reptile house					20	20					40
	(29) Gharial			5	10	5						20
	(30) Crocodile			5	10	5						20
	(31) Turtle			5	5	5						15
	(32) Wet Land Development -2 Nos.		20	20	20							60
	(33) Butterfly park		10	5	2	2	2	1	1	1	1	25
11	Veterinary hospital											
	(1) Main hospital with rain water harvesting provision.		30	20								50
	(2) Rescue center		13	12								25
	(3) Quarantine wards		10	5								15
	(4) Postmortem room		10									10
	(5) Slaughter house		6	2								8
12	Horticulture & landscaping		15	10	10	10	10	5	5	3	2	70
12 (i)	Pasture & fodder development		10	5	5	5	5					30
13	Development of nursery		20	5	5	5	5					40
14	Visitor amenities											
	(1) Parking		10	5								15
	(2) Toilets		15	10	15							40
	(3) Water points		5	5	10							20
	(4) Shelter			10	2	3						15
	(5) Benches			2	2	1						5
	(6) Cafeteria / kiosk			20	5	5						30
	(7) Trolley stand			5	5							10
15	Interpretation center with rain water harvesting provision.			50	25							75
	(1) Exhibit gallery				15	10						25
	(2) Auditorium				25	25						50
	(3) Class room				10	5						15
	(4) Library				10	5						15
	(5) Office of education officer & staff				10	5						15
	(6) Store				5							5
	Total	407	1758	806	577	386	151	31	6	4	3	4129

	(7) Office of research officer & staff				10	5						15
	(8) Laboratory				10	5						15
	(9) Exhibition For White Tiger			10	10							20
16	Installation of CCTV & PA system			15	10							25
16 (i)	Wireless System			10	10							20
17	Installation of intercom lines					5	5					10
18	Vehicle											
	(1) Rescue squad vehicle (ambulance)				25							25
	(2) 4-wheelars (6)		20	10								30
	(3) 2-wheelars (4)		0.90	0.90								1.80
	(4) Rickshaw -2			0.10								0.10
	(5) Tractor with trolley & tanker			10								10
	(6) School Bus		15									15
	(7) Bicycle (2)			0.06								0.06
19	Animal crates (5 Nos)		1	1	0.50							2.50
20	Animal procurement (all expensis)		30	20	20	10	10					90
21	Furniture & stationary		20	15	15	5						55
22	Equipments for all sections		10	10	5							25
23	Medicines, reagents, glass wares, tranquilization equipment & drugs for Vet. Hospital		5	5	5	5	2	2	2	2	2	30
24	Disaster management & contingency plan equipments		10	5	5	5						25
25	Development of all types of signages, published material		5	5	5							15
26	Books, periodical & news paper	0.5	1	1	1							3.5
27	Store containers		5	3	2							10
28	Incinerator						10					10
29	Residential complex for staff, include staff qutr, shoping area, recreation, dispensery, Garden , Drainage, Roads, Fencing, etc.	100	200	100	100	100						600
	Total	507.5	2080.9	1027.06	810.5	526	178	33	8	6	5	5181.96

30	Miscellaneous expenditure	10	25	10	10	15	15	15	5	5	5	115
31	Planning, architecture, engineering & zoo professional fees (2.5 % of Total construction & Planning , excluding salaries etc.)	24.60	24.60	24.60	24.60	24.624	0	0	0	0	0	125.549
32	Contingency (1 % of Total construction & Planning, excluding salaries etc.)		6.20	8	6	6	6	6	6	5		50.21
	Total	542.10	2136.70	1069.66	851.10	571.64	199	54	19	16	10	5469.20

Remark- Change in few items on per CZA, experts observation.

Total of non recurring expenditure (construction and development):-5469.20 Lakhs

10.2 Day to day maintenance:

S no.	Description	Estimated Budget (Rs. in lacs)										Total
		2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	
1	Salaries	3.55	203.4	227.4	251.4	275.4	302	332	365	401	441	2802.15
2	Out sourced payment		42	46	51	56	61	67	74	82	90	569
3	Contract man power		10	11	12	13.2	14.5	16	17.5	19	21	134.2
4	Feed		10	15	25	25	35	35	40	40	45	270
5	Medicines		2	2	2	2.5	2.5	2.5	3	3	3	22.5
6	Telephone		1	1	1	1.1	1.1	1.1	1.2	1.2	1.2	9.9
7	Water		2	2	2	2	2	2	2	2	2	18
8	Electricity		12	12	12	12	12	12	12	12	12	108
9	Local taxes		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	4.5
10	Consumable items		1	1	1	2	5	5	5	5	5	30
11	Miscellaneous		5	5	5	5	6	6	6	6	6	50
	Total (F)	3.55	288.9	322.9	362.9	394.7	441.6	479.1	526.2	571.7	626.7	4018.25

Total of recurring expenditure = 4018.25

Grand total of recurring and non recurring expenditure = 4018.25+5469.20 =

Rs 9487.45 Lakhs or say Rs. 95.00 crores

10.3 Estimated expected revenue:

S no.	Description	Estimated Budget (Rs. in lacs)										Total
		2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	
1	Gate money		3.5	3.5	4	5	6	7	7	7	7	50
2	White tiger safari		3.5	3.5	4	5	6	7	7	7	7	50
3	Cafeteria & kiosk		1	1	1.5	2	2.5	3	3	3	3	20
4	Trolley		0.5	1	1	1.5	2	2.5	3	3	3	17.5
5	Parking		1	1.5	2	2	2.5	3	3	3	3	21
6	Add. on toilets & water points		0	0	0	0	0	0	0	0	0	0
	Total	0	9.5	10.5	12.5	15.5	19	22.5	23	23	23	158.5

ANNEXURES

Compliance report of the comments made by members of expert group

(F. No. 20-8/2009-CZA (M)/869 Date: 24-10-2011)

S. No	Comments made	Compliance
1	Location of the entrance to the Zoo should be marked at the middle of road / highways curve as explained at site. It should be at least 30 meters inside the boundary of the park (kindly correct marking of location technically)	Incorporated in the layout plan. Main gate of the zoo is proposed 30 mts inside the Zoo boundary from highway road. Marking has been corrected in layout plan.
2	Parking area should be outside the main Zoo area and may be expanded keeping in view the additional requirement in the future.	Incorporated in the layout plan. Parking area is proposed outside zoo area. Area is about 8500 sqm and additional space is also available for future expansion on other side of road.
3	Water management was discussed in detail. It was suggested to assess the water requirement first. Thereafter the availability of water to meet the requirement may be explored. It may be from existing river or tube well(s). The quality of water may also be got examined.	Water requirement is calculated and is mentioned at page 15 to 18. There is separate calculation for potable water used by wild life as well as visitors and staff. The water requirement for cleaning, gardening and for other purposes is separate. Water samples of Zoo area were sent to public health engineering department Rewa for tasting there quality. The water sample test report is at annexure – 9 . Treatment plant has been proposed to treat the water before its consumption.
4	Management of waste water may also be explored; it may be through STP. The waste water of zoo is not to be released directly in the river.	Incorporated in the layout plan. The waste water of zoo will be treated in sewage treatment plant. And treated outflow will not be released in the Nala or River. It will be utilized for gardening as mentioned at page – 18.
5	The solid waste, comprising of leftover food, excreta, leaves and grass, be disposed off away from zoo premises. This may be	Incorporated in the layout plan. Provision has been made for disposal of solid waste outside the zoo premises. This work will be

	outsourced.	outsourced as mentioned at page - 15.
6	The Contour plan does not appear to be accurate and may be reviewed	The Contour plan has been checked and corrected. It is shown in Layout plan.
7	It was also explained how to make visitors, service paths by avoiding going across contour, align path along the contour or on gentle slopes not exceeding 1:20.	Incorporated in the layout plan. The visitors and service path will be made within prescribed specifications. Desire slopes of road will be maintained by cutting and filling
8	The visitor's paths are required to plan first with sub loops. Thereafter, the enclosures may be located as per the groupings discussed at site.	Incorporated in the layout plan. The enclosures are located in group. Visitor's path and loops have been finalized and shown in layout plan
9	After visitors paths are finalized, service lines may be laid as per standard engineering practice.	Incorporated in the layout plan. The service line will be laid as per standard engineering practice.
10	The theme of display of animals was discussed and it was decided to exhibit the animals group wise like ungulates, carnivores (large, small and felid), primates, birds (cage, open marshland and flightless) and reptiles.	Incorporated in the layout plan. The theme of display of animals will be group wise as shown in layout plan and in text at page -6
11	The proposed collection plan and the population size were discussed and prepared. It was suggested that the source of procurement may also be explored in advance.	The proposed collection plan has been prepared with the advice of experts and in the prescribed proforma The procurement of animals will be by gift from existing zoo's of M.P. as well as from Zoo's of all over India and rescued animals.
12	It was stressed to plant local plant species in the future and minimizes reliance on exotics.	The area has very good vegetation but area is already dense forest with site quality III. Our plan is to plant local shade and flower bearing trees along the visitor path and proved good sitting places with a luxuriant herbs and shrub. Other than paths, we are planning to plant bushes to hide management area / service area to give a natural look to the area.
13	CZA's prescribed color code is required to be followed in marking the enclosures, road and	Incorporated in the layout plan.

paths.

- | | | |
|----|---|---|
| 14 | Veterinary hospital, its location, location of quarantine wards (200-300 meter away from veterinary hospital and zoo animals), PM room, carcass disposal and rescue center were also discussed and their location in relation to other enclosures was explained. | Incorporated in the layout plan. The quarantine wards is more than 200 mts from zoo animals as well as from veterinary hospital. Other building like PM room carcass disposal, rescue center is located as discussed. |
| 15 | There is a need to relook at the disaster management plan, contingency plan and e-governance etc as explained during discussions. | The disaster management plan, contingency plan and E-governance has been redrafted as per expert advice. |
| 16 | The requirement of the power may also be assessed as also its availability and its availability and modalities for distribution. | The requirement of the power and its distribution as assessed by electricity department is given at page -20 |
| 17 | There is a need to prepare education and awareness plan. The education center should have an auditorium. A classroom, exhibit gallery and library. Store, Office and W/C facilities. A professionally qualified person should handle the education program. The authorities may get information from Vandalur Zoo, Chennai or NZP Delhi | An education and awareness plan has been prepared. The education center will have all these facilities. This section will be headed by a qualified person. The description of this section is given at page-46 – 48 |
| 18 | A separate wing of research should be created with professionally qualified workers. They will be responsible for creating a database and involving other institutes in research activities. | The separated research section has been created which will have professionally qualified staff. The detail of this section is given at page-48 – 49 |
| 19 | List of visitor's amenities be prepared and placed at equal distance. | Incorporated in the layout plan and in the text which can seen at page -56 – 58 |
| 20 | The directors office may be located near the entrance. An office complex may also be planned in the field, where officers/supervisors of various section will be located. A workshop will also be required | Incorporated in the layout plan. An Office complex for supervisor and field staff has been proposed. Area for workshop has also been ear marked in the layout plan |
| 21 | A security office at the gate with effective communication system should be planned. | Incorporated in the layout plan at the gate. The security office will have effective communication system which will be |

spread through of the zoo premises.

- 22 The food store should be constructed near veterinary hospital with adequate infrastructure, equipment and vehicle(s) incorporated in the layout plan. Incorporated in the layout plan and text
- 23 Check dams across small seasonal channels may also be planned to make natural water bodies and for control of erosion. The observation has been incorporated in the master plan at page- 14
- 24 The authorities were advised to involve a qualified architect, engineer, experienced zoo personnel and veterinarians to plan the park Shri A.S. Dogra PCCF Retd. (Punjab) and his expert Team is already involved during the preparation of master plan Shri Mukesh Dubey of Aashraya Consultancy, Bhopal is preparing the plan. Also local Govt. Officials of PHE / Electrical and other departments having expertise in their fields are giving their services on request.

Annexure --2

Compliance report of the comments made on layout plan

S. No	Comments made	Compliance
1	The entry road to the zoo and rescue centre should be marked by using the arrows	This has been done and indicated in the layout plan
2	The name of the approach road to the zoo should be indicated	This has been indicated
3	The vehicular road for the visitors should be realigned, so the visitors who are coming by walk may not need to the get down to view the animals	This will be taken care while constructing the exhibits.
4	The name earmarked for felids to be changed to small carnivores	This has been changed
5	The area proposed for workshop to be kept away from animal area	This has been done
6	The quarantine to be located near to the hospital area	This has been done

7	The roundabout shows near Gharial and Crocodile enclosure to be realigned as a loop	The roundabout has been deleted and realigned as a loop
8	The rescue centre area to be increased and should be located away from the reptile house	The area has been increase to 1200 sqm and is located away from the reptiles house
9	The zoo should have White Tiger Safari instead of having Tiger Safari	This has been complied
10	The road alignment should properly follow the contours	This has been complied
11	The road should avoid sharp corners / turns	This has been complied
12	The safari should have a provision of scattered water bodies laid following the contour	This will be taken care while creating water bodies in the safari

Note:- The above comments were complied and a revised layout plan was submitted. This revised layout plan was approved by zoo designing committee in its 34th meeting.

S U P R E M E C O U R T O F I N D I A
R E C O R D O F P R O C E E D I N G S

ANNEXURE

3

MM-9A : I.A. NO..... OF 2011 IN I.A. NO.2079 OF 2007 IN W.P.(C)
NO.202 OF 1995

301.I.A.NO.19 IN W.P.(C) NO.47 OF 1998

T.N. GODAVARMAN THIRUMULPAD

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VERSUS

UNION OF INDIA & ORS.

RESPONDENT(S)

(GRANTING PERMISSION TO ESTABLISH-A-NEW-ZOO)

302. I.A. NO.2968-2970 IN W.P.(C) NO.202 OF 1995
(FOR IMPEADMENT, DIRECTION AND EXEMPTION FROM FILING O.T.)

~~300~~ I.A. NO.2981 AND 2982 IN I.A. NO.2439 IN W.P.(C) NO.202 OF
1995

(FOR IMPEADMENT AND DIRECTIONS)

304. I.A. NOS. 3020-3021 AND 3022 IN W.P.(C) NO.202 OF 1995
(FOR IMPEADMENT, DIRECTIONS AND EXEMPTION FROM FILING O.T.)

305. I.A. NOS.3028-3029 IN W.P.(C) NO. 202 OF 1995
(FOR IMPEADMENT/DIRECTIONS AND EXEMPTION FROM FILING O.T.)

306. I.A. NO.2881 AND 3026-3027 IN W.P.(C) NO.202 OF 1995
(FOR RECOMMENDATION OF THE CEC IN APPLN. NO. 1228 AND 1229 AND
INTERVENTION AND EXEMPTION FROM FILING O.T.)

307. I.A. NO.2774 IN W.P.(C) NO. 202 OF 1995
(FOR PERMISSION)

308. I.A. NOS.3034-3036 IN W.P.(C) NO.202 OF 1995
(FOR IMPEADMENT/DIRECTION, EXEMPTION FROM FILING O.T. AND AD-
INTERIM EX-PARTE STAY)

309. I.A. NO.100 IN W.P.(C) NO.337 OF 1995
(FOR INTERVENTIN)

310. I.A. NO.490-492 IN W.P.(C) NO.13381 OF 1984
(FOR IMPEADMENT, DIRECTION AND EXEMPTION FROM FILING O/T)

PART-B LIST FOR FINAL DISPOSAL

311. PENCH (PART HEARD)
I.A.NOS. 2647 IN APPLN. 1124, 2687-2688, 2689-2690, 2696-2697,
2703-2704, 2709 AND 2718 IN W.P.(C) NO.202 OF 1995
(RECOMMENDATION OF CEC IN APPLN. NO.1124, FOR INTERVENTION,
EXEMPTION FROM FILING O.T. IMPEADMENT AND DIRECTIONS)

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(सहायक न्यायाधीश)

सहायक न्यायाधीश

312. (MATTERS PERTAINING TO DEFENCE)

I.A. NOS. 2790-2791, 2794, 2626, 2642 AND 2914 IN W.P.(C) NO.202 OF 1995
(FOR PERMISSION, EXEMPTION FROM FILING O.T. EXEMPTION FROM REQUIREMENT OF CLEARANCE UNDER THE FCA 1980 AND DIRECTINS)

313. SANDALWOOD MATTERS (PART HEARD)

PART HEARD I.A. NOS. 1287, 1570-1571, 1624-1625, 1978, 2395, 2795-2796 IN W.P.(C) NO. 202 OF 1995
(REPORT OF CEC, IMPEADMENT, DIRECTION AND EXEMPTION)

WITH I.A. NOS. 2470-2471, 2472-2473, 2474-2475, 2476-2477, 2966-2967 IN 1287 IN W.P.(C) NO.202 OF 1995
(FOR IMPEADMENT AND DIRECTIONS)

314. MOUNT ABU

I.A. NOS. 972 IN I.A. 757 WITH 789-790, 962, 986, 1042-1045, 1271-1219, 1536-1538, 2660-2661, 2064, 2255-2256 AND 2949 IN 757 AND I.A. NO..... IN I.A. NO.757 IN W.P.(C) 202 OF 1995
(DIRECTION, IMPEADMENT, STAY, EXEMPTION FROM FILING O/T AND RECOMMENDATION OF CEC AND PERMISSION TO FILE OBJECTINS TO THE FINAL NOTIFICATION DATED 25.6.2009)

315. MAHARASHTRA-GREAT INDIAN BUSTARD WILDLIFE SANCTUARY

I.A. NO.2882 IN I.A. 2342 IN I.A. NO.2119, 1483, 1997, 2023, 2923-2925 IN W.P.(C) NO.202 OF 1995
(FOR DIRECTIONS, IMPEADMENT, PERMISSION, MODIFICATION AND EXEMPTION FROM FILING O.T.)

316. PANCHMARHI MATTERS (TIGER RESERVE ETC.)

I.A.NOS. 2202-2203, I.A.NOS.2601 AND 2915-2917 IN I.A.NOS.2202-2203, 2602, 2929-2931 WITH 1606, 2002-2004, 2011, 2062-2063 IN 1220 IN 548 IN W.P.(C) 202 OF 1995
(FOR DIRECTIONS, EXEMPTION FROM FILING O.T., PERMISSION AND CLARIFICATION/MODIFICATION OF RECOMMENDATION OF C.E.C. DATED 16.9.2009, INTERVENTION AND IMPEADMENT)

317. ASKOT MUSK DEER SANCTUARY

I.A.NO. 1791-1792 IN W.P.(C) NO.202 OF 1995
(FOR PERMISSION TO DEMARCATTE BOUNDARIES OF ASKOT MUSK DEER WILDLIFE SANCTUARY AND EXEMPTION FROM FILING O.T.)

WITH

I.A.NO.139 IN W.P.(C) NO.337 OF 1995
(FOR PERMISSION REGARDING PROPOSED RATIONALISATION OF BOUNDARIES OF PROTECTED AREA IN HIMACHAL PRADESH)

1. I.A. NOS. 1308, 1323, 1455, 1468, 1478 IN W.P. (C) NO.202 OF 1998
FOR DIRECTIONS, INTERVENTION AND EXEMPTION FROM FILING O.T.)

Date: 14/03/2011 These applications/petitions were called on for hearing today.

JUDGES :
HON'BLE MR. JUSTICE B. SUDERSHAN REDDY
HON'BLE MR. JUSTICE R.M. LODHA
HON'BLE MR. JUSTICE SURINDER SINGH NIJJAR

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Ms. Sumita Hazarika, Adv.

Item No. 316 (MM)

I.A. No. 1697 to be listed along with I.A. No. 2002-2004.

Item No. 301

The Interlocutory Application No. 19 has been submitted on behalf of the State of Madhya Pradesh for granting permission to establish a new Zoo and Rescue Centre in Reserved Forest at Mukundpur, District Satna (M.P.).

Heard learned counsel for the applicant as well as learned Amicus Curiae.

This interlocutory application is allowed in terms of prayer (a) of the application.

Item No. 302

We have heard learned counsel for the applicant as well as learned Amicus Curiae.

In view of the recommendations of C.E.C. dated 7.9.2010 and in the light of our earlier order, these applications are ordered directing the respondents herein to consider the applications of the applicant for relocation of saw mills and other wood based industries in

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(सतना जल संरक्षण)

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Park will be obtained from the Standing Committee of the National Board for Wildlife;

ii) approval under the Forest (Conservation) Act, 1980 for the use of forest land for the construction of the two Out Posts will be obtained; and

iii) the conditions stipulated by the Chief wildlife Warden, Uttarakhand will be strictly complied with.

The interlocutory applications are accordingly, ordered.

I.A. No. 2794

This interlocutory application is ordered in terms of the prayer made in the application.

Item Nos. 313-315 & 317, 318

Not taken up.

(Sukhbir Paul Kaur)
Court Master

(Renuka Sadana)
Court Master

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(सहाय वन संरक्षक)
संलग्नाधिकारी
वन संरक्षण, सतना (अ०प्र०)



जहाँ है हरियाली।
वहाँ है खुशहाली।।



GOVERNMENT OF INDIA
MINISTRY OF ENVIRONMENT & FORESTS
Central Zoo Authority

ANNEXURE-4



F. No. 20-8/2009-CZA(M)

DATE: 05.07.2010

To

The Principal Chief Conservator of Forests (WL)
Government of Madhya Pradesh,
B. D. A. Complex, 3rd Floor,
Pragati Bhawan, M. P. Nagar,
Zone - 1,
Bhopal -- 462 011 (Madhya Pradesh).

**Sub:- Establishment of a Zoo & Rescue Centre at Mukundpur, Distt. Satna,
Madhya Pradesh – Regarding.**

Ref:- (i) Your office letter No. 6129 dated 15.11.2009.
(ii) This office letter of even number dated 09.02.2010 & 28.05.2010.
(iii) Your office letter No. 2028 dated 21st April, 2010.

Sir,

Reference is invited to the above cited correspondence.

The proposal for establishment of a Zoo & Rescue Centre at Mukundpur, Distt. Satna, Madhya Pradesh on an area of 104 hectares has been scrutinized by the Expert Group on Zoo Designing of the Central Zoo Authority and the same was placed before the 24th Meeting of the Central Zoo Authority held on 10th June, 2010 for its approval.

The Central Zoo Authority conveys its approval under Section 38H (1A) of the Wild Life (Protection) Act, 1972 to establish a Zoo & Rescue Centre at Mukundpur, Distt. Satna of Madhya Pradesh subject to the orders from the Hon'ble Supreme Court of India and the fulfillment of the following conditions:-

- (i) The Forest Department of Madhya Pradesh should submit an undertaking that requisite number of experts of various disciplines including a competent Officer-in-charge, Animal Curator, Biologist, Veterinary Officer would be posted for the execution of the said project.
- (ii) The Forest Department of Madhya Pradesh shall ensure that the animal enclosure design and the display area shall be as per the prescribed Rules and guidelines of the Central Zoo Authority.
- (iii) The Forest Department of Madhya Pradesh shall make provision on their own for necessary funds for creation of the proposed zoo & rescue centre as well as for the future maintenance of its establishment on professional grounds.

...2/-

Flora of Zoo, Mukundpur

Sr. no.	Common / English Name	Scientific Name	Family	Habit
(1)	Rosary Pea	<i>Abrus precatorius</i>	Fabaceae	Climber
(2)	Indian Mallow	<i>Abutilon indicum</i>	Malvaceae	Shrub
(3)	Heartwood or Babul	<i>Acacia catechu</i>	Mimosaceae	Tree
(4)	Reonja or Safed babu	<i>Acacia leucophloea</i>	Mimosaceae	Tree
(5)	Babul or Gum arabic tree	<i>Acacia nilotica</i>	Mimosaceae	Tree
(6)	Burkina Faso	<i>Acalypha ciliata forssk</i>	Euphorbiaceae	Herb
(7)	Prickly Chaff Flower	<i>Achyranthes aspera</i>	Amaranthaceae	Herb
(8)	Malabar Nut tree	<i>Adhatoda zelanica medic</i>	Acanthaceae	Shrub
(9)	Bel or Beli fruit	<i>Aegle marmelos</i>	Rutaceae	Tree
(10)	Mountain Knot Grass	<i>Aerva lanata</i>	Amaranthaceae	Herb
(11)	Goat Weed	<i>Ageratum conyzoides</i>	Asteraceae	Herb
(12)	Ankol	<i>Alangium salviyzoides</i>	Cornaceae	Tree
(13)	Sessile Joy Weed	<i>Alternanthera sessilis</i>	Amaranthaceae	Herb
(14)	Not Found	<i>Alysicarpus monilifer</i>	Fabaceae	Herb
(15)	Spiny Amaranth	<i>Amaranthus spinosus</i>	Amaranthaceae	Herb
(16)	Not Found	<i>Ampelocissus latifolia</i>	Vitaceae	Climber
(17)	Not Found	<i>Ampelocissus tomentosa</i>	Vitaceae	Climber
(18)	Indian Catmint	<i>Anisomeles indica</i>	Lamiaceae	Herb
(19)	Axle Wood	<i>Anogeissus latifolia</i>	Combretaceae	Tree
(20)	Mauritian Grass	<i>Apluda mutica</i>	Poaceae	Herb
(21)	Mexican Poppy	<i>Argemone Mexicana</i>	Papaveraceae	Herb
(22)	Whipcord Cobra Lily	<i>Arisaema tortuosum</i>	Araceae	Herb
(23)	Needle Grass	<i>Aristida adscensionis</i>	Poaceae	Herb
(24)	Indian Birthwort	<i>Aristolochia indica</i>	Aristolochiaceae	Climber
(25)	Hairy Joint grass	<i>Arthraxon lancifolius</i>	Poaceae	Herb
(26)	Prickly or Scandent Shrub	<i>Asparagus racemosus</i>	Lilaceae	Climber
(27)	Wild Kulthi (India)	<i>tylosia scarabaeoides</i>	Fabaceae	Herb
(28)	Danti	<i>Baliospermum montanum</i>	Euphorbiaceae	Herb
(29)	Blue Bell	<i>Barleria cristata</i>	Acanthaceae	Herb
(30)	Mountain Ebony	<i>Bauhinia racemosa</i>	Caesalpiniaceae	Tree

(31)	Bell <i>Bauhinia</i>	<i>Bauhinia vahlii</i>	Caesalpiniaceae	Climber
(32)	Black Jack	<i>Bidens biternata</i>	Asteraceae	Herb
(33)	Chaff Flower	<i>Biophtum reinwardtii</i>	Oxalidaceae	Herb
(34)	Creeping Blepharis	<i>Blepharis maderaspatensis</i>	Acanthaceae	Herb
(35)	Wild Rambai	<i>Blumea lacera</i>	Asteraceae	Herb
(36)	Buddhist Bauhinia	<i>Bombax ceiba</i>	Bombacaceae	Tree
(37)	Almondette	<i>Buchanania lanzan</i>	Anacardiaceae	Tree
(38)	Flame of the Forest	<i>Butea monosperma</i>	Fabaceae	Tree
(39)	Caesulia	<i>Caesulia axilaris</i>	Asteraceae	Herb
(40)	Redwood	<i>Calotropis gigantean</i>	Asclepiadaceae	Shrub
(41)	Rubber Bush	<i>Calotropis procera</i>	Asclepiadaceae	Shrub
(42)	Broad Bean	<i>Canavalia gladiate</i>	Fabaceae	Climber
(43)	Canavalia Gladiatex	<i>Capparis sepiaria</i>	Capparaceae	Shrub
(44)	Caperbush	<i>Capparis zeylanica</i>	Capparaceae	Climber
(45)	Balloon Vine	<i>Cardiospermum halicacabum</i>	Sapindaceae	Climber
(46)	Van Karonda or Khatta Nibu	<i>Carissa opaca</i>	Apocynaceae	Shrub
(47)	Not Found	<i>Casearia elliptica</i>	Falcourtiaceae	Tree
(48)	Cutch Tree	<i>Casearia graveolens</i>	Falcourtiaceae	Tree
(49)	Pig's Senna	<i>Cassia absus</i>	Cacesalpiniaceae	Herb
(50)	Golden Shower	<i>Cassia fistula</i>	Cacesalpiniaceae	Tree
(51)	Feather Leaved Cassia	<i>Cassia mimosoides</i>	Cacesalpiniaceae	Herb
(52)	Coffee Senna	<i>Cassia occidentalis</i>	Cacesalpiniaceae	Shrub
(53)	Not Found	<i>Cassia pumila</i>	Cacesalpiniaceae	Herb
(54)	Wild Senna	<i>Cassia tora</i>	Cacesalpiniaceae	Herb
(55)	Not Found	<i>Catunaregam nilotica</i>	Rubiaceae	Tree
(56)	Mountain Pomegranate	<i>Catunaregam spinos</i>	Rubiaceae	Shrub
(57)	Bush Grape	<i>Cayratia trifolia</i>	Vitaceae	Climber
(58)	Cocks Comb	<i>Celosia argentea</i>	Amaranthaceae	Herb
(59)	Sweet Grass	<i>Chloris virgata</i>	Poaceae	Herb
(60)	Edible Chlorophytum	<i>Chlorophytum tuberosum</i>	Lilaceae	Herb
(61)	Abuta	<i>Cissampelos pareira</i>	Menispermaceae	Climber
(62)	Sticky Spider-Flower	<i>Cleome viscosa</i>	Capparaceae	Herb
(63)	Hill Glory Bower	<i>Clerodendrum viscosum</i>	Verbenaceae	Shrub
(64)	Ivy Gourd	<i>Coccinia grandis</i>	Cucurbitaceae	Climber
(65)	Broom Creeper	<i>Cocculus hirsutus</i>	Menispermaceae	Climber
(66)	Job's Tears	<i>Coix lacryma</i>	Poaceae	Herb
(67)	Long-Leaf Dayflower	<i>Commelina longifolia</i>	Commelinaceae	Herb
(68)	Morning Glory	<i>Convolvulus arvensis</i>	Commelinaceae	Climber

(69)	Bindweed	<i>Convolvulus prostrates</i>	Commelinaceae	Herb
		3		
(70)	East Indian Mallow	<i>Corchorus estuans</i>	Tillaceae	Herb
(71)	White Jute	<i>Corchorus capsularis</i>	Tillaceae	Herb
(72)	Not Found	<i>Corchorus fascicularis</i>	Tillaceae	Herb
(73)	Glue Berry	<i>Cordia dichotoma</i>	Boraginaceae	Tree
(74)	Spider Tree	<i>Crateva unilocularis</i>	Capparaceae	Tree
(75)	Not Found	<i>Crinum pretense</i>	Amaryllidaceae	Herb
(76)	Rattle Pod	<i>Crotalaria acicularis</i>	Fabaceae	Herb
(77)	Rattle Pod Or Rattlebox	<i>Crotalaria mysorensis</i>	Fabaceae	Herb
(78)	Rattle Pod Or Rattlebox	<i>Crotalaria orixensis</i>	Fabaceae	Herb
(79)	Prostrate Rattle Pod	<i>Crotalaria prostrate</i>	Fabaceae	Herb
(80)	Wax Leaved Climber	<i>Cryptolepis buchamani</i>	Asclepiadaceae	Climber
(81)	Melon	<i>Cucumis melo</i>	Cucurbitaceae	Herb
(82)	Golden Eye-Grass	<i>Curculigo orchioides</i>	Hypoxidaceae	Herb
(83)	Giant Dodder	<i>Cuscuta reflexa</i>	Convolvulaceae	Herb
(84)	Crested Cat Ears	<i>Cyanotisa cristata</i>	Commelinaceae	Herb
(85)	Devil Grass	<i>Cynodon dactylon</i>	Poaceae	Herb
(86)	Nut Grass or Coco Grass	<i>Cyperus esculentus</i>	Cyperaceae	Herb
(87)	Not Found	<i>Cyperus exaltatus</i>	Cyperaceae	Herb
(88)	Nut Grass	<i>Cyperus rotundus</i>	Cyperaceae	Herb
(89)	Hairy Thorn Apple (Moonflower)	<i>Datura innoxia</i>	Solanceae	Shrub
(90)	Devil's Trumpet	<i>Datura metel</i>	Solanceae	Shrub
(91)	Indian Long Pepper	<i>Desmodium gangeticum</i>	Fabaceae	Herb
(92)	Not Found	<i>Desmodium velutinum</i>	Fabaceae	Shrub
(93)	Halfa Grass	<i>Desmostachya bipinnata</i>	Poaceae	Herb
(94)	Aerial Yam Or Potato Yam	<i>Dioscorea bulbifera</i>	Dioscoreaceae	Climber
(95)	Mountain yam or Wild yam	<i>Dioscorea pentaphylla</i>	Dioscoreaceae	Climber
(96)	Coromandel Ebony or Black Ebony	<i>Diospyros melanoxyton</i>	Ebenaceae	Tree
(97)	Striped Cucumber	<i>Diplocyclos palmatus</i>	Cucurbitaceae	Climber
(98)	Prostrate Wild Petunia	<i>Dipteracanthus prostrates</i>	Acanthaceae	Herb
(99)	Shama Millet	<i>Echinochloa colonum</i>	Poaceae	Herb
(100)	Camel Thorn	<i>Echinops echintus</i>	Asteraceae	Herb
(101)	False Daisy	<i>Eclipta prostrate</i>	Asteraceae	Herb
(102)	Elephant's Foot	<i>Elephantopus scaber</i>	Asteraceae	Herb
(103)	Goose Grass	<i>Eleusine indica</i>	Poaceae	Herb
(104)	Asian Scalystem	<i>Elytraria acaulis</i>	Acanthaceae	Herb
(105)	Lilac Tasselflower	<i>Emilia sonchifolia</i>	Asteraceae	Herb
(106)	Indian Whitehead	<i>Enicostema axillare</i>	Gentianaceae	Herb
(107)	Woolly Love Grass	<i>Eragrostis ciliaris</i>	Poaceae	Herb
(108)	Little Love Grass	<i>Eragrostis poaeoides</i>	Poaceae	Herb

(109)	Not Found	<i>Eranthemum purpurascens</i>	Acanthaceae	Herb
(110)	Mole Plant or asthma plant	<i>Euphorbia heterophylla</i>	Euphorbiaceae	Herb
(111)	Asthma Weed	<i>Euphorbia hirta</i>	Euphorbiaceae	Herb
(112)	Not Found	<i>Euphorbia hypericifolia</i>	Euphorbiaceae	Herb
(113)	Chicken Weed	<i>Euphorbia thymifolia</i>	Euphorbiaceae	Herb
(114)	Dwarf Morning Glory	<i>Evolvulus alsinoides</i>	Convolvulaceae	Herb
(115)	Roundleaf Bindweed	<i>Evolvulus nummularius</i>	Convolvulaceae	Herb
(116)	Banyan Tree	<i>Ficus benghalensis</i>	Moraceae	Tree
(117)	Hairy Fig	<i>Ficus hispida</i>	Moraceae	Tree
(118)	Cluster Fig or Indian Fig	<i>Ficus racemosa</i>	Moraceae	Tree
(119)	Bo tree or Beepul Tree	<i>Ficus religiosa</i>	Moraceae	Tree
(120)	Two-Leaved Fimbristylus	<i>Fimbristylis dichotoma</i>	Cyperaceae	Herb
(121)	Governor's Plum	<i>Flacourtia india</i>	Courtiaceae	Tree
(122)	Indian Boxwood	<i>Gardenia latifolia</i>	Rubiaceae	Tree
(123)	Not Found	<i>Gardenia turgid</i>	Rubiaceae	Tree
(124)	Flame Lily, Or Glory	<i>Lily Gloriosa superb</i>	Lilaceae	Climber
(125)	Gomphrena Weed	<i>Gomphrena celosioides</i>	Amaranthaceae	Herb
(126)	Not Found	<i>Goniogyna hirta</i>	Fabaceae	Herb
(127)	Madras Carpet	<i>Grangea maderaspatana</i>	Asteraceae	Herb
(128)	Not Found	<i>Grewia hirsuta</i>	Tiliaceae	Shrub
(129)	Not Found	<i>Grewia rothii</i>	Tiliaceae	Shrub
(130)	Thadasu palam	<i>Grewia tiliifolia</i>	Tiliaceae	Tree
(131)	Gurmar Booti	<i>Gymnema sylvestre</i>	Asclepiadaceae	Climber
(132)	Yellow Teak	<i>Haldina cordifolia</i>	Rubiaceae	Tree
(133)	East-Indian Screw Tree	<i>Hlicteres isora</i>	Sterculiaceae	Shrub
(134)	Indian Sarsaparilla	<i>Hemidesmus indicus</i>	Asclepiadaceae	Climber
(135)	Assegai Grass	<i>Heteropogon contortus</i>	Poaceae	Herb
(136)	Jasmine-Tree	<i>Holarrhena pubescens</i>	Apocynaceae	Tree
(137)	Temple Plant	<i>Hygrophila auriculata</i>	Acanthaceae	Herb
(138)	Mint Weed	<i>Hyptis suaveolens</i>	Lamiaceae	Herb
(139)	Black Creeper	<i>Ichnocarpus frutescens</i>	Apocynaceae	Climber
(140)	Silky Indigo	<i>Indigofera astragalina</i>	Fabacrae	Herb
(141)	Heart-Leaf Indigo	<i>Indigofera cordifolia</i>	Fabacrae	Herb
(142)	True Indigo	<i>Indigofera linifolia</i>	Fabacrae	Herb
(143)	Not Found	<i>Indigofera linnaei</i>	Fabacrae	Herb
(144)	Three-Leaved Indigo	<i>Indigofera trita</i>	Fabacrae	Herb
(145)	Water Spinach Or River Spinach	<i>Ipomoea aquatic</i>	Convolvulaceae	Herb
(146)	Scarlet Morning Glory	<i>Ipomoea hederifolia</i>	Convolvulaceae	Climber
(147)	A Morning Glory	<i>Ipomoea nil</i>	Convolvulaceae	Climber

(148)	Obscure Morning-Glory	<i>Ipomoea obscura</i>	Convolvulaceae	Climber
(149)	Crepe Flower	<i>lagerstroemia parviflora</i>	Lythraceae	Tree
(150)	Indian Ash Tree	<i>lannea coromandelica</i>	Anacardiaceae	Tree
(151)	Buffalo beans	<i>Mucuna pruriens</i>	Fabaceae	Climber
(152)	Doveweed	<i>Murdannia nudiflora</i>	Commelinaceae	Herb
(153)	Blue Pussyleaf	<i>Nelsonia canescens</i>	Acanthaceae	Herb
(154)	Silver-Fir	<i>Nothosaerva brachiata</i>	Amaranthaceae	Herb
(155)	Coral Jasmine	<i>Nyctanthes arbor</i>	Oleaceae	Shrub
(156)	Hairy Basil	<i>Ocimum canum sims</i>	Lamiaceae	Herb
(157)	Not Found	<i>Oldenlandia affinis</i>	Rubiaceae	Herb
(158)	Indian Jalap	<i>Operculina turpethum</i>	Convolvulaceae	Climber
(159)	Yellow Sorrel	<i>Oxalis corniculata</i>	Oxalidaceae	Herb
(160)	Sonkadi	<i>Pentanema indicum</i>	Asteraceae	Herb
(161)	Trellis-Vine	<i>Pergularia daemia</i>	Asclepiadaceae	Climber
(162)	King Of Bitters	<i>Peristrophe paniculata</i>	Acanthaceae	Herb
(163)	Stalked Wild Petunia	<i>Petalidium barlerioides</i>	Acanthaceae	Shrub
(164)	Wild Date Palm	<i>Phoenix sylvestris</i>	Arecaceae	Palm
(165)	Not Found	<i>Phyllanthus amarus</i>	Euphorbiaceae	Herb
(166)	Indian Gooseberry	<i>Phyllanthus emblica</i>	Euphorbiaceae	Tree
(167)	Madras Leaf-Flower	<i>Phyllanthus maderaspatensis</i>	Euphorbiaceae	Herb
(168)	Stone Breaker	<i>Phyllanthus urinaria</i>	Euphorbiaceae	Herb
(169)	Star Gooseberry	<i>Phyllanthus virgatus</i>	Euphorbiaceae	Herb
(170)	Ground Cherry or Sunberry	<i>Physalis minima</i>	Solanceae	Herb
(171)	Field Milkwort	<i>Polygala arvensis</i>	Polygalaceae	Herb
(172)	Not Found	<i>Polygala chinensis</i>	Polygalaceae	Herb
(173)	Heath Milkwort	<i>Polygala furcata</i>	Polygalaceae	Herb
(174)	Joint Weed	<i>Polygonum barbatum</i>	Polygalaceae	Herb
(175)	Marsh Buckwheat	<i>Polygonum glabrum</i>	Polygalaceae	Herb
(176)	Not Found	<i>Polygonum plebium</i>	Polygalaceae	Herb
(177)	Indian Beech or Poongam Oil Tree	<i>Pongamia pinnata</i>	Fabaceae	Tree
(178)	Babchi	<i>Psoralea corylifolia</i>	Fabaceae	Herb
(179)	Not Found	<i>Rhynchosia capitata</i>	Fabaceae	Herb
(180)	Jumby-Bean	<i>Rhynchosia minima</i>	Fabaceae	Herb
(181)	Indian Toothcup	<i>Rotala Indica</i>	Lythraceae	Herb
(182)	Comb Rungia	<i>Rungia pectinata</i>	Acanthaceae	Herb
(183)	Creeping Rungia	<i>Rungia repens</i>	Acanthaceae	Herb
(184)	Kans Grass Or Wild Cane	<i>Saccharum spontaneum</i>	Poaceae	Herb
(185)	Indian Voodo Lily	<i>Sauromatum venosum</i>	Araceae	Herb

(186)	Not Found	<i>Scheleichera oleosa,</i>	Sapindaceae	Tree
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(187)	Not Found	<i>Scirpus articulatus</i>	Cyperaceae	Herb
(188)	Hard stem bulrush	<i>Scirpus juncooides</i>	Cyperaceae	Herb
(189)	Macao Tea	<i>Scoparia dulcis</i>	Scrophulariaceae	Herb
(190)	Snake's Tongue, or Creeping <i>Sebastiania</i>	<i>Sebastiania chamaelea</i>	<i>Euphorbiaceae</i>	Herb
(191)	White Berry-Bush	<i>Securinega virosa</i>	Fabaceae	Shrub
(192)	Sesbania Pea or Prickly Sesban	<i>Sesbania bispinosa</i>	Poaceae	Herb
(193)	Yellow Foxtail Or Golden Foxtail	<i>Setaria glauca</i>	Poaceae	Herb
(194)	Whorled Pigeon Grass	<i>Setaria verticillata</i>	Malvaceae	Herb
(195)	Common Wire Weed	<i>Sida acuta</i>	Malvaceae	Herb
(196)	Not Found	<i>Sida alba</i>	Malvaceae	Herb
(197)	Not Found	<i>Sida cordata</i>	Malvaceae	Herb
(198)	Flannel Weed	<i>Sida cordifolia</i>	Malvaceae	Herb
(199)	Cuban Jute	<i>Sida rhombifolia</i>	<i>Smilacaceae</i>	Herb
(200)	Indian Smilax	<i>Smilax zeylanica</i>	Fabaceae	Climber
(201)	Paired Flower	<i>Smithia conferta</i>	Solanceae	Herb
(202)	Black Night Shade	<i>Solanum nigrum</i>	Solanceae	Herb
(203)	Yellow-Berried Nightshade	<i>Solanum virginianum</i>	Scrophulariaceae	Herb
(204)	Common Sopubia	<i>Sopubia delphinifolia</i>	Scrophulariaceae	Herb
(205)	Shaggy Button Weed	<i>Spermacoce hispida</i>	Rubiaceae	Herb
(206)	Tiny False Button Weed	<i>Spermacoce pusilla</i>	Rubiaceae	Herb
(207)	East Indian Globe Thistle	<i>Sphaeranthus indicus</i>	Asteraceae	Herb
(208)	Gold Button	<i>Spilanthes paniculata</i>	Asteraceae	Herb
(209)	Indian Tragacanth	<i>Sterculia urens</i>	Sterculiaceae	Tree
(210)	Clearing Nut Tree	<i>Strychnos potatorum</i>	Loganiaceae	Tree
(211)	Java Plum Or Jamun	<i>Syzygium cumini</i>	Myrtaceae	Tree
(212)	Kath Jamun	<i>Syzygium heyneanum</i>	Myrtaceae	Tree
(213)	Tamarind or Indian Date	<i>Tamarindus indica</i>	Caesalpiniaceae	Tree
(214)	Teak	<i>Tectona grandis</i>	Verbenaceae	Tree
(215)	Fish Poison	<i>Tephrosia purpurea</i>	Fabaceae	Herb
(216)	Blue Wiss or Rabbit Vine	<i>Teramnus labialis</i>	Fabaceae	Climber
(217)	Arjuna. Or White Marudah	<i>Terminalia arjuna</i>	Combretaceae	Tree
(218)	Behada or Belliric Myrobalan	<i>Terminalia bellirica</i>	Combretaceae	Tree
(219)	Ban Kapas or Common Mallow	<i>Thespesia lampas</i>	Malvaceae	Shrub
(220)	Gulbel or Indian	<i>Tinospora cordifolia</i>	Menispermaceae	Climber
(221)	Indian Borage	<i>Trichodesma indicum</i>	Boraginaceae	Herb
(222)	Not Found	<i>Trichosanthes bracteata</i>	Cucurbitaceae	Herb
(223)	Pinwheel Jasmine	<i>Tridax procumbens</i>	Asteraceae	Herb
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(224)	Five stamen Burrbark	<i>Triumfetta pentandra</i>	<i>Tiliaceae</i>	<i>Herb</i>
(225)	Dabra	<i>Uraria picta</i>	Fabaceae	<i>Shrub</i>

(226)	Caesar Weed	<i>Urena lobata</i>	Malvaceae	<i>Shrub</i>
(227)	Indian Squill	<i>Urginea indica</i>	Malvaceae	Herb
(228)	Not Found	<i>Ventilago denticulate</i>	Rhamnaceae	<i>Climber</i>
(229)	Little Ironweed	<i>Vernonia cinerea</i>	Asteraceae	Herb
(230)	Khas-Khas Grass	<i>Vetiveria zizanioides</i>	Poaceae	Herb
(231)	Wild Gram	<i>Vigna trilobata</i>	<i>Fabaceae</i>	<i>Climber</i>
(232)	Five-Leaved Chaste Tree	<i>Vitex negunda</i>	<i>Verbenaceae</i>	<i>Shrub</i>
(233)	Velvet Leaf	<i>Waltheria indica</i>	Sterculiaceae	<i>Herb</i>
(234)	Fire Flame Bush	<i>Woodfordia fruticosa</i>	Lythraceae	Shrub
(235)	Sweet Indrajao	<i>Wrightia tinctoria</i>	Apocynaceae	Tree
(236)	Common Cocklebur	<i>Xanthium indicum</i>	<i>Asteraceae</i>	<i>Herb</i>
(237)	Desert Apple	<i>Ziziphus mauritiana</i>	Rhamnaceae	Tree
(238)	Jhar Beri	<i>Ziziphus nummularia</i>	<i>Rhamnaceae</i>	<i>Shrub</i>
(239)	Jackal Jujube	<i>Ziziphus oenoplia</i>	Rhamnaceae	Shrub

Fauna of Zoo, Mukundpur

Mammals:

- (1) Greyheaded flying squirrel (*Petaurista elegans*)
- (2) Common Indian hare (*Lepus nigricollis*)
- (3) The threestriped palm squirrel (*Funambulus palmarum*)
- (4) The Five striped (*Funambulus pennanti*)
- (5) Jackal (*Canis aurus*)
- (6) Shortnosed Fruit Bat (*Cynopterus sphinx*)
- (7) Field Rat (*Bandicota bengalensis*)
- (8) Indian Bush rat (*Golunda ellioti*)
- (9) Indian Field Mouse (*Mus booduga*)
- (10) Spiny Field Mouse (*Mus platythrix*)
- (11) Common House Rat (*Rattus rattus*)
- (12) Jungle Cat (*Felis chaus*)
- (13) Common Mongoose (*Herpestes edwardsi*)
- (14) Hedgehog (*Hemiechinus auritus*)
- (15) Rhesus Macaque (*Macaca mulatta*)
- (16) Common langur (*Presbytis antellus*)
- (17) Indian porcupine (*Hystrix indica*)
- (18) Indian pangolin (*Manis crassicaudata*)

Birds:

- (1) Rufoustailed Finch lark (*Ammomanes phoenicurus*)
- (2) Pied myna (*Sturnus contra*)
- (3) Common Swallow (*Hirundo rustica*)
- (4) Redwinged bush lark (*Mirafra erythroptera*)
- (5) Coot (*Fulica atra*)
- (6) Brown fish owl (*Bubo zeyloesis*)
- (7) Pond heron (*Ardeola grayii*)
- (8) Golden backed wood pecker (*Dinopium benghalense*)
- (9) Wryneck (*Jynx torquilla*)
- (10) Chestnut bellied (*Sitta castanea*)
- (11) Velvetfronted Nuthatch (*Sitta frontalis*)
- (12) Yellow fronted pied or Martha wood pecker (*Picoiaes mahrattensis*)
- (13) Blue Rock pigeon (*Columba livia*)

- (14) White spotted fantail flycatcher (*Rhipidura albicollis*)
- (15) Large Cuckoo Shrike (*Coracina novaehollandiae*)
- (16) Courser-indian (*Cursorius coromandelicus*)
- (17) Rufous backed Shrike (*Lanius schach*)
- (18) Shrike-common wood (*Tephrodornis pondicerianus*)
- (19) Black Winged Kite (*Elanus caeruleus*)
- (20) Black winged Stilt (*Himantopus himantopus*)
- (21) White backed or Bengal Vulture (*Gyps bengalensis*)
- (22) Grey partridge (*Francolinus pondicerianus*)
- (23) Pied Bushchat (*Saxicola caprata*)
- (24) Black Ibis (*Pseudibis papillosa*)
- (25) White Breasted kingfisher (*Halcyon smyrnensis*)
- (26) Pied Kingfisher (*Ceryle rudis*)
- (27) Large Green Barbet (*Megalaima zeylanica*)
- (28) Common Sandgrouse (*Pterocles exustus*)
- (29) Koel (*Eudynamys scolopacea*)
- (30) Kestrel (*Falco tinnunculus*)
- (31) House Crow (*Corvus splendens*)
- (32) Little Ringed Plover (*Charadrius dubius*)
- (33) Collared Bushchat (*Saxicola torquata*)
- (34) Cattle Egret (*Bubulcus ibis*)
- (35) House Sparrow (*Passer domesticus*)
- (36) Baybacked Shrike (*Lanius vittatus*)
- (37) Great Horned owl (*Bubo bubo*)
- (38) Brahmy Duck (*Tadorna feruginea*)
- (39) Common grey hornbill (*Tockus birostris*)
- (40) Common Snipe (*Gallinago gallinago*)
- (41) Pied Crested cuckoo (*Clamator jacobinus*)
- (42) Spotted Doe (*Streptopelia chinensis*)
- (43) Indian Robin (*Saxicoloides fulicata*)
- (44) Common Pariah Kite (*Milvus migrans*)
- (45) Spotted Owlet (*Athene brama*)
- (46) Common Indian Night jar (*Caprimulgus asiaticus*)
- (47) Small blue Kingfisher (*Alcedo atthis*)
- (48) Small minivet (*Pericrocotus cinnamomeus*)
- (49) Little Egret (*Egretta garzetta*)
- (50) Crimson breasted Barbet (*Megalaima haemacephala*)
- (51) Brown Crowned Pinyon (*Picoides nanus*)
- (52) Red Supur fowl (*Gallopedix spadicea*)

- (53) Yellow Wattled Lapwing (*Vanellus malabaricus*)
- (54) Indian Moorhen (*Gallinula chloropus*)
- (55) Jungle Crow (*Glaucidium radiatum*)
- (56) Sirkeer Cuckoo (*Taccocua leschenaultii*)
- (57) Grey jungle fowl (*Gallus sonneratii*)
- (58) Redwattled Lapwing (*Vanellus indicus*)
- (59) Blossomheaded (*Psittacula cyanocephala*)
- (60) Spotted Munia (*Lonchura punctulata*)
- (61) Indian ring dove (*Streptopelia decaocto*)
- (62) Ashy Swallow Shrike (*Artamus fuscus*)
- (63) Roseringed Parakeet (*Psittacula krameri*)
- (64) Black Redstart (*Phoenicurus ochruros*)
- (65) Slatyheaded Scimitar (*Pomatorhinus scisticeps*)
- (66) Tailor Bird (*Orthobomus sutorius*)
- (67) Black bellied Finch lark (*Ermopterix grisea*)
- (68) Indian Myna (*Acridotheres tristis*)
- (69) White Wagtail (*Motacilla alba*)
- (70) Wagtail yellow (*Motacilla flava*)
- (71) Indian Cliff Swallow (*Hirundo fluvicola*)
- (72) Scarlet minivet (*Pericrocotus flammeus*)
- (73) Indian Roller or Blue Jay (*Coracias benghalensis*)
- (74) Tickell's Blue Flycatcher (*Muscicapa ticklliae*)
- (75) Crested Bunting (*Melophus lathami*)
- (76) Small green Bee eater (*Merops orientalis*)
- (77) Little Grebe or Dabchick (*Podiceps ruficollis*)
- (78) Common Hawk Cuckoo (*cuculus varius*)
- (79) Redwhiskered Bulbul (*Pycnonotus jocosus*)
- (80) White bellied Drongo (*Dicrurus caerulescens*)
- (81) Blue headed rock thrush (*Monticola cinclorhynchus*)
- (82) Black headed oriole (*Oriolus xanthornus*)
- (83) Golden oriole (*Oriolus oriolus*)
- (84) Grey Wagtail (*Motacilla caspica*)
- (85) Yellow cheeked tit (*Parus xnthogenys*)
- (86) Cormorant little (*Phalacrocorax niger*)
- (87) Ashy Wren-warbler (*Prinia socialis*)
- (88) Grey Quail (*Coturnix coturnix*)
- (89) Indian button Quail (*Turnix tanki*)
- (90) Common weaver Bird (*Ploceus philippinus*)
- (91) Stone Curlew (*Burhinus oedicnemus*)

- (92) Large Green Bee-eater (*Merops superciliosus*)
- (93) Alpine Swift (*Apus melba*)
- (94) Grey headed Myna (*Sturnus malabaricus*)
- (95) Redvented bulbul (*Pycnonotus cafer*)
- (96) Spot bill duck (*Anas poecilorhyncha*)
- (97) King Crow, Black Drongo (*Dicrurus adsimilis*)
- (98) Racket tailed Drongo (*Dicrurus paradiseus*)
- (99) Little Brown Dove (*Streptopelia senegalensis*)
- (100) Large pied Wagtail (*Motacilla maderaspatensis*)
- (101) Indian tree pie (*Dendrocitta vagabunda*)
- (102) Crow pheasant (*Centropus sinensis*)
- (103) Common pea fowl (*Pavo cristatus*)
- (104) Grey tit (*Parus major*)
- (105) King Vulture (*sarcogyps calvus*)
- (106) Large Indian parakeet (*Psittacula eupatria*)
- (107) Parakeet blue winged (*Psittacula columboides*)
- (108) Lorikeet-Indian (*Loriculus vernalis*)
- (109) Painted Sandgrouse (*Pterocles indicus*)
- (110) Wiretailed Swallow (*Hirundo smithii*)
- (111) Red munia (*Estrilda amandava*)
- (112) Jungle Bush Quail (*Perdicula asiatica*)
- (113) Black Breasted Quail (*Coturnix coromandelica*)
- (114) Purple Sunbird (*Nectarinia asiatica*)
- (115) Magpie robin (*Copsychus saularis*)
- (116) Crested Hawk Eagle (*Spizaetus cirrhatus*)
- (117) Shikra (*Accipiter badius*)
- (118) White Throated ground Thrush (*Zoothera citrina*)
- (119) White eye-Indian (*Zosterops Palpebrosa*)
- (120) White backed munia (*Lonchura striata*)
- (121) Paradise fly catcher (*Terpsiphone paradisi*)
- (122) White Scavenger vulture (*Neophron percnopterus*)
- (123) Common Babbler (*Turdoides caudatus*)
- (124) Jungle Babbler (*Turdoides striatus*)
- (125) Stork-openbilled (*Anastomus oscitans*)
- (126) Stork-white necked (*Ciconia episcopus*)
- (127) Lora (*Aegithina tiphia*)
- (128) Common Green Pigeon (*Treron phoenicopera*)
- (129) Goldmantled squirrel (*Chloropsis cochinchinensis*)
- (130) Hoopoe (*Upupa epops*)

Reptiles:

- (1) Python (*Python molurus*)
- (2) Russell's viper (*Vipera russelli*)
- (3) Indian star tortoise (*Testudo geochelone*)
- (4) Common krait (*Bungarus caeruleus*)
- (5) Common frog (*Rana tigrina*)
- (6) Banded Krait (*Bungarus fasciatus*)
- (7) Chameleon (*Chamaeleon vulgaris*)
- (8) Monitor lizard (*Varanus bengalensis*)
- (9) House lizard (*Hemidactylus brooki*)
- (10) Lizard (*Hemidactylus flaviviridis*)
- (11) Dhaman or ratsnake (*Ptyas mucosus*)
- (12) Cobra (*Naja naja*)
- (13) Sand boa (*Eryx johnii*)
- (14) Toad (*Bufo melanostictus*)
- (15) Tree frog (*Hyla hyla*)
- (16) Garden lizard (*Calotes versicolor*)
- (17) Common pond snake (*Tropidnotus piscator*)

Fishes:

- (1) The reba (*Cirrhinus reba*)
- (2) The Catla (*Catla catla*)
- (3) The Calbasa (*Labeo calbasu*)
- (4) The common Carp (*Cyprinus carpio*)
- (5) The Fringe-lipped carp (*Labeo fimbriatus*)
- (6) Ambassia (*Mustus aor*)
- (7) Kangi (*Ambassis ranga*)
- (8) Kangi (*Ambassis nama*)
- (9) Kharpata (*Barbus sarana*)
- (10) The Large Murrel (*Ophicephalus marulius*)
- (11) Chal (*Chela bacela*)
- (12) The carp (*Tilipya massibeia*)
- (13) The Mrigal (*Cirrhinus mrigala*)
- (14) The Freshwater Shark (*Wallago attu*)
- (15) Patola (*Notopeterus notopeterus*)
- (16) Pabda (*Chena pabda*)
- (17) Bam (*Mastacem belus armatus*)
- (18) The Bata (*Labeo bata*)

- (19) Mahasheer (Tortor)
- (20) Magur (Clarius magur)
- (21) The Rohu (Labeo rohita)
- (22) Labeo frimbriatus (Fringe lipped)
- (23) The Common Murrel (Ophicephalus striatus)
- (24) Singhi (Heteronopterns singhi) not known
- (25) Catfish (Mystus seenghala)

**Extract of the minutes of 34th meeting of the expert group on zoo designing
of**

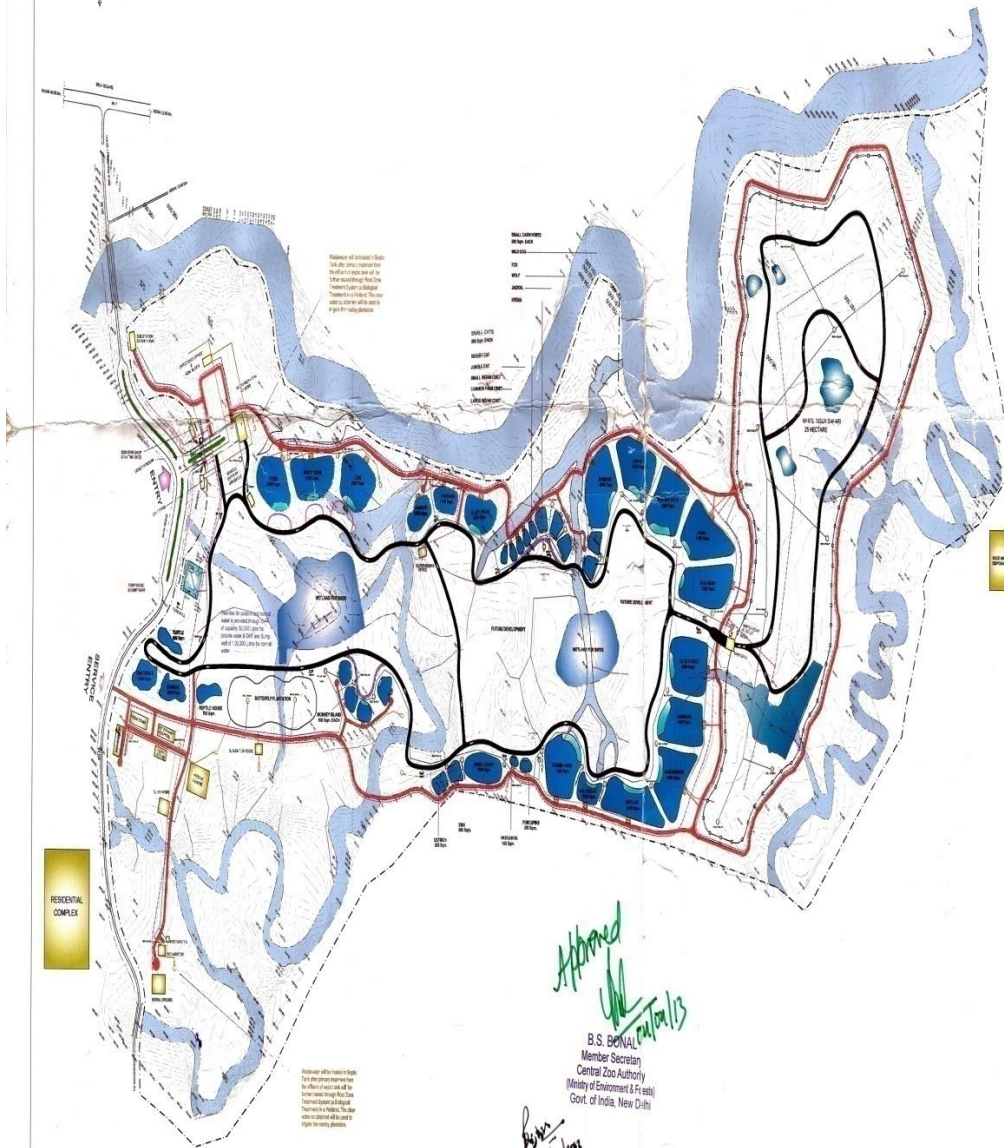
CZA- regarding approval of layout plan

Item no. IX – Rescue center and zoo, Mukundpur, Satna (MP).

The amended copy of the master (Layout) plan was scrutinized by members and recommended for approval.

LAYOUT PLAN FOR ZOO & RESCUE CENTRE AT MUKUNDPUR, DISTRICT- SATNA M.P.

SCALE: 1:2000



LEGEND:-

IN. ROAD	1200.00 SQM
WATER SUPPLY (PUMP LINE)	3700.00 SQM
WATER SUPPLY (PUMP)	
RES. BUILDINGS	
DIRECTOR'S OFFICE & ADM. BLOCK	1900.00 SQM
SUPERVISOR'S OFFICE	1500.00 SQM
RECEPTION	4000.00 SQM
VETERINARY CLINICAL	4500.00 SQM
FOOD STORE	2700.00 SQM
WATER SHED	4500.00 SQM
RESCUE CENTRE	1200.00 SQM
QUARANTINE	300.00 SQM
SLAUGHTER HOUSE	1800.00 SQM
BATTERY OPERATED VEHICLE	120.00 SQM
SECURITY ROOM	200.00 SQM
TOILET BLOCK	200.00 SQM
INFORMATION CENTRE	4000.00 SQM
ROADWAY SHOP	120.00 SQM
CANTINE	1200.00 SQM
KIOSK	100.00 SQM
WATER POINT & TOILET	2500.00 SQM
CONCRETE STRUCTURE FOR WEATHERS	2000.00 SQM
POST OFFICE	400.00 SQM
RE. ENCLOSURES	
DEER	30000.00 SQM
WHITE TIGER	34000.00 SQM
LEOP	30000.00 SQM
ARABIAN	12000.00 SQM
PANHER	15000.00 SQM
BUTTERFLY	2000.00 SQM
DESERY CAT	3000.00 SQM
JAVELI CAT	300.00 SQM
SMALL MAMMUCHET	2000.00 SQM
COMMON PALM CHET	200.00 SQM
LARGE MAMMUCHET	200.00 SQM
MALDIVE	800.00 SQM
FOX	800.00 SQM
JACKAL	800.00 SQM
WOLF	800.00 SQM
HENNA	800.00 SQM
SAMBAR	4000.00 SQM
CORAL	4000.00 SQM
BAMBINI DEER	4000.00 SQM
GAUR	4000.00 SQM
HORSE	4000.00 SQM
BLACK BUCK	4000.00 SQM
CHIMPA	4000.00 SQM
BHARANGHA	4000.00 SQM
WEL. GAU	4000.00 SQM
WEL. BANG	4000.00 SQM
THAM DEER	4000.00 SQM
PORCUPINE	2000.00 SQM
HEDGEHOG	1000.00 SQM
BRICE BARRY	2000.00 SQM
DOG	1000.00 SQM
CORVID	100.00 SQM
MONKEY	100.00 SQM
ROTTLE HOUSE	7000.00 SQM
CHIMPAN	15000.00 SQM
ORANGUTAN	12000.00 SQM
GORILLA	600.00 SQM
BUNNY	600.00 SQM
WATER SUPPLY (PUMP LINE)	3700.00 SQM
WATER SUPPLY (PUMP)	3700.00 SQM
ELECTRIC SUBSTATION	2000.00 SQM
WATER STORAGE SHED	1800.00 SQM
SPORTS FIELD (NET LAINE)	8000.00 SQM
PARKING	8000.00 SQM
FIRE HYDRANT	0

PROJECT
ZOO & RESCUE CENTRE
MUKUNDPUR, DISTRICT- SATNA M.P.

DRAWING TITLE-
MASTER (LAYOUT) PLAN
SERVICES

DATE:- **SCALE:-** **DRAWING No.**
1 1 ZRCMP/2

CLIENT-
DIVISIONAL FOREST OFFICE
SATNA M.P.

Signature: _____	Signature: _____	Signature: _____
------------------	------------------	------------------

CONSULTANT-
AASHRAYA CONSULTANCY

Approved
Ull
PATIL/S
B.S. BONAL
Member Secretary
Central Zoo Authority
(Ministry of Environment & Forests)
Govt. of India, New Delhi
Rizvi
enka/10/13



AASHRAYA CONSULTANCY
7A, Sector-8, Charakpuri, Chunarhatti, Bhopal M.P.
Phone:-0661256004, Email:-aashrayacon@gmail.com

This drawing is the property of consultant and shall not be reproduced in any manner without their written permission.
All dimensions shall be checked and correlated with the relevant architectural, structural and other service drawings. Any ambiguity, discrepancy or omission shall be brought to the notice of the consultant immediately before commencing the work.

कार्यालय सहायक यंत्री लोक स्वास्थ्य यांत्रिकीय उपखण्ड रीवा (म0प्र0)

क्रमांक (329) लेबो./स.यं./2012

रीवा दिनांक... (9/7/12)

प्रति,

मुख्य वन संरक्षक
रीवा वृत्त रीवा (म.प्र.)

विषय :- पानी में पाए जाने वाले तत्वों की जांच बावत्।

संदर्भ :- आपका पत्र क्रमांक 5312 दिनांक 16.07.2012

उपरोक्त विषय में लैख है कि आपके द्वारा भेजे गए जल नमूने को प्रयोगशाला में जल परीक्षण करने पर क्रमांक 1,4,5 में फिल्टरेशन की जरूरत है। क्रमांक 5 में आयरन रिमूव करने की जरूरत है। क्रमांक 4, 5 में फ्लोराइड रिमूव करने की जरूरत है। एवं सभी में क्लोरीनेशन की जरूरत है तभी पीने योग्य पानी बनेगा।

उक्त जल परीक्षण कर संलग्न में सम्प्रेषित है, अस्तु सूचनार्थ।

सहायक यंत्री
लोक स्वास्थ्य यांत्रिकीय
उपखण्ड रीवा (म.प्र.)

पृ.क्र. /लेबो./स.यं./2012

रीवा दिनांक.....

प्रतिलिपि :-

कार्यपालन यंत्री नगर पालिक निगम रीवा की ओर सूचनार्थ प्रेषित।

सहायक यंत्री
लोक स्वास्थ्य यांत्रिकीय
उपखण्ड रीवा (म.प्र.)

PUBLIC HEALTH ENGINEERING DEPARTMENT
LABORATORY OF WATER WORKS, DIVISION REWA (M.P.)

Sample from :- **बन विभाग रीवा (मुकुन्दपुर)**

DATE OF RECEIPT AT LAB **16.7.12**

Particulars of Sample :-

Date of Collection :- **16.7.12**

Date of Analysis :- **16.7.12**

Reference :-

S. No.	Characteristics	Units	Appendix-23(a) As per Manual on water Supply treatment prepared published by CPHEEO New Delhi 1975		①	②	③	④	⑤	⑥	⑦
			Acceptable	Cause for rejection							
1.	Temperature	OC	-	-	29c	29c	29c	29c	29c	29c	29c
2.	Turbidity	NTU	2.5	10	200	15	10	60	120	<5	<5
3.	Colour	PL Cobolt Scale	5.0	25	Muddy	C.L	C.L	Muddy	Muddy	C.L	C.L
4.	Teste and odour		unobjectionable	unobjectionable	-	-	-	HN	SD	-	-
CHEMICAL											
5.	pH	pH Scale	7 to 8.5	6.5 to 9.5	7.6	7.6	7.6	6.8	6.8	7.5	7.5
6.	Conductivity	Micromohs/cm	-	-	70	70	100	160	150	200	180
7.	Alkaliity	-	-	-	-	-	-	-	-	-	-
a.	Phenophthaline	Mg/L	-	-	-	-	-	-	-	-	-
b.	Total	-	-	-	-	-	-	-	-	-	-
8.	Chloride	-	200	1000	10	10	20	35	35	25	25
9.	Nitrite	Mg/L	-	-	-	-	-	-	-	-	-
10.	Nitrates	-	20	45	pre	pre	pre	NIL	NIL	pre	NIL
11.	Total Hardness	-	200 as	600 as	80	100	150	1560	160	260	200
12.	Calcium Hardness	-	C ₂ CO ₃	CaCO ₃	-	-	-	-	-	-	-
13.	Magnesium Hardness	-	75 as	200 as	60	70	120	1300	1400	200	160
14.	Total Solids	-	30 as	150 as	-	-	-	-	-	-	-
a.	Dissolved Solid	-	CaCO ₃	CaCO ₃	20	30	30	260	220	60	40
b.	Suspended Solid	-	500	1500	-	-	-	-	-	-	-
15.	Iron	-	500	1500	-	-	-	-	-	-	-
16.	Magnanese	Mg/L	0.1	1.0	NIL	0.3	NIL	NIL	0.5	NIL	NIL
17.	Fluorides	-	0.05	0.5	-	-	-	-	-	-	-
18.	Sulphate	-	1.0	1.5	0.3	0.3	0.3	1.2	1.2	1.0	1.0
19.	Dissolvee	-	200	400	-	-	-	-	-	-	-
20.	Oxygen	-	-	-	-	-	-	-	-	-	-
21.	C.O.D	-	10	-	-	-	-	-	-	-	-
22.	B.O.D	-	6	-	-	-	-	-	-	-	-
23.	Residual Chlorine	-	0.2	1.0	NIL	NIL	NIL	NIL	NIL	NIL	NIL
24.	Coagulant Dose	-	-	-	-	-	-	-	-	-	-
25.	Jar Test	-	-	-	-	-	-	-	-	-	-
26.	Free Co ₂	Mg/L	-	-	-	-	-	-	-	-	-
27.	PHOPHATE	-	-	-	-	-	-	-	-	-	-
28.	D.O	-	-	-	-	-	-	-	-	-	-
29.	Collection rganism	-	-	-	-	-	-	-	-	-	-
30.	M.P.N/100ml.	-	-	-	9	2400	9	NIL	93	23	NIL

Remark:- **Dis Infection is Necessary by bleaching powder**

CHEMIST
WATER WORKS, REWA (M.P.)

Note :- * The Figures indicated under the column "acceptable" are the limits upto which the water is generally acceptable to the consumers.
 * Figures in excess of those mentioned under "acceptable" render the water not acceptable but still may be tolerated in absence of alternative and better source but up to the limits indicated under "cause of rejection" above which the supply will have to be rejected.

Annexure – 15

Compliance report of the observations made in the 39th meeting on master plan by expert group (F. No. 20-8/2009-CZA(511)M) Dated: 04-03-2013)

SN	Observations	Compliance report
1	At the time of construction, sufficient distance/ buffer may be ensured between the sambhar and wild dog enclosures.	A buffer of about 10 to 20 mt will be created between enclosures of sambhar and wild dog at the time of constructions (page - 25). This has also been incorporated at page - 60 in master plan, so that development unit remains aware of this point at the time of construction.
2	At the time of construction, the formation level/ plinth level of structures must be decided keeping in view likely flood level during monsoons.	All structures will be planned at higher altitudes in the zoo premises. The plinth level / formation level will be 60 cm higher. This will be taken care at the time of construction and has been incorporated at page- 60, so that development unit remains aware of this point
3	Disposal of waste water should be done in an environmentally sustainable manner.	The waste water is proposed to be treated in septic tanks, whose effluent will be further treated through root zone treatment system in horizontal flow constructed wetland. The clear water so obtained will be used to irrigate nearby plantation. Hence entire process is environmentally sustainable.
4	The supply of water to animal enclosure would be from bore well. Appropriate treatment plant should be provided to ensure good potable quality of water	The potable water for animal enclosures will be supplied through bore well water after giving proper treatment like disinfection through online dosing of chlorine. A water treatment plant is proposed near reservoirs for treatment. (page-15).

5	The river water could be used for horticulture purpose only for which no treatment plant is required.	Complied. The river water will directly be supplied to water bodies, crocodile and gharial ponds and for horticulture purpose through pipe lines (page-15).
6	Proper measure for soil, water and rain water harvesting should be made.	<p>For Soil:- Plantation and grassing will be provided on bank of moats and nallahs.</p> <p>For Water:- The surface runoff will be drained through properly designed drainage system.</p> <p>For Rain Water Harvesting:- The rain water on the roof of the structures will be collected and carried through properly designed pipe to a percolation pit. The filter media of percolation pit will be designed on the basis of discharge collected from roofs. This has been incorporated at page – 60, so that development unit remains aware of these points.</p>
7	Only 11 KVA transformer is enough.	Complied vide page 19-20.
8	It is presumed that appropriate provision for composite pits at different parts of zoo are being made for waste material leaves etc.	Composite pits will be provided behind white tiger safari area.