

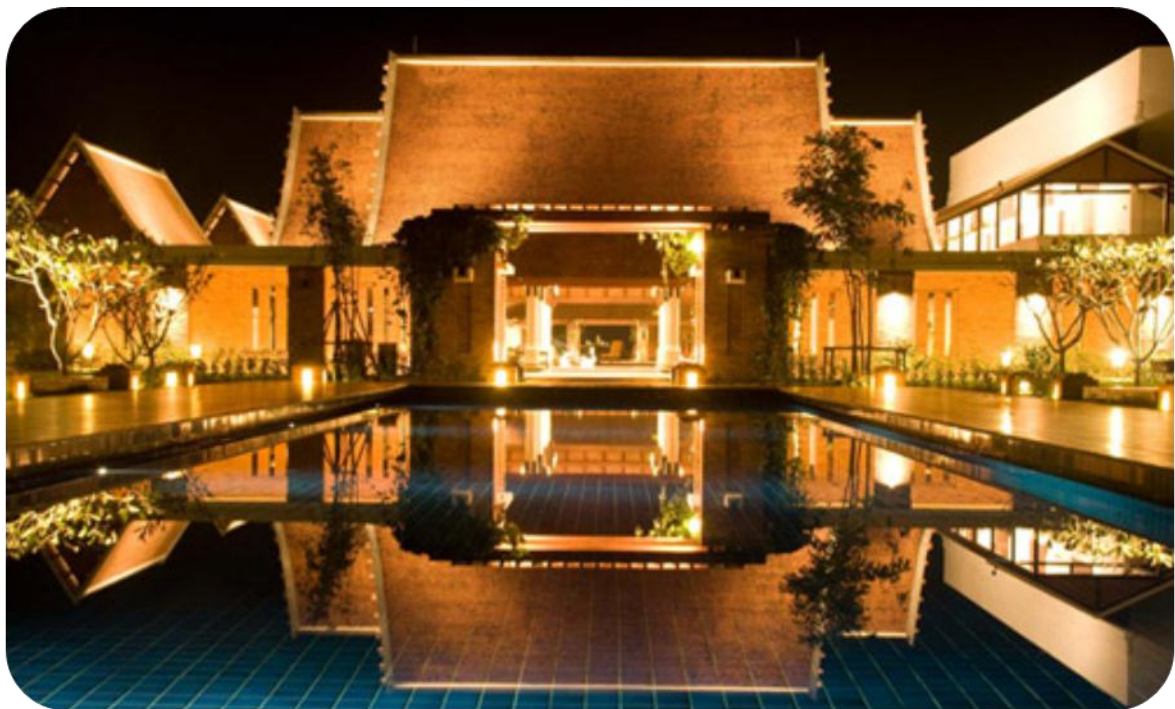


ASEAN Energy Efficiency and Conservation (EE&C)
Best Practice Competition in Buildings
ASEAN Energy Awards – 2013

CATEGORY: TROPICAL BUILDING



Sukhothai Heritage Resort



CERTIFICATION AND COVERING NOTE FROM CONSULTANT


The Sukhothai heritage resort was constructed on 2005 and was finished and open for business on April 17th 2008. Total construction time was 30 months. The resort located within 1600 acre of land of Sukhothai airport. It can be reached within 5 mins from the airport. The airport consist of many interesting places such as organic rice paddies, organic farm, orchid greenhouse and various museums. It is also located within 30 min from world heritage sites of Sukhothai and Sri Satchanalai Historical parks. The resort consist of 68 guest rooms, lobby, restaurant and conference room as well library, bar and two multi propose buildings. Total number of building is 10 buildings.

Project detail


Owner : Sukhothai Property Co., Ltd
 Architect : Mr. Kriasada Roajanakorn HABITA ARCHITECTS
 M&E Engineer : Mr. Somchai Jityai
 C&SEngineer : Mr. Saharat Pimsak
 Projectmanager : Mr. Pramoj Krabuanrat

| ITEM | DATA | COMPLIANCE (PUT CHECK) |
|--|-----------------------------|---------------------------|
| Submission Requirement | | |
| - Certification and Note from Consultants | 1 page | ✓ |
| - Cover of Report | 1 page | ✓ |
| - Overall on-site design | 2 pages | ✓ |
| - Active Design | 2 pages | ✓ |
| - Passive Design | 4 pages | ✓ |
| - Maintenance and Management | 1 page | ✓ |
| - Environmental Impacts | 1 page | ✓ |
| - Building Information | 2 pages | ✓ |
| - Drawings | 4 pages | ✓ |
| Pre-Qualification | | |
| | Data | |
| - Energy Efficiency Index: (150 kWh/m ² /yr based on GFA) | 5.5 kWh/m ² /yr | |
| -Air-conditioning up to 50 percent of total gross floor area (GFA) | 13.8 % | |
| - Temperature and Other Settings: Not less than 21°C but not more than 26°C | 25 °C | |
| - Lighting load (Office – max 15 W/m ² of GFA); (Others – max 25 W/m ² of GFA) | 3.32 W/m ² (GFA) | |
| - Operating hours/yr.: To be based on 2,000 hours/year | 8,760 h/y | |
| - At least 1 full-year of operation prior to nomination in national competition | 5 years | |

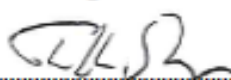
The Sukhothai Heritage Resort hereby agreed to allow the ACE Board of Judges and the Japanese experts to visit the building and verify the authenticity of the data. However, two weeks advance notice is required to allow for necessary arrangements. The undersigned certified that the information given is true and accurate and prepared with the consent of the party/ies involved.



 Mr. Roannayutt Oan-Oon
 ResortManager



 Mr. Boonlerd Bunhæ
 Regional Chief Engineer



 (Dr. Twarath Sutabutr)
 Deputy Director General
 Department of Alternative Energy Development and Efficiency, Thailand
 Tel : 662-223-0021-9 ext. 1230
 Fax : 662-226-4213
 e-mail : twarath@dede.go.th

COVER OF REPORT



Sukhothai Heritage Resort



999 Moo 2, T. Klongkrajong, A. Sawankaloke, Sukhothai Thailand

Tel: + 66 (0) 5564 7567 | Fax: + 66 (0) 5564 7575

E-mail: engr@sukhothaiheritage.com | www.sukhothaiheritage.com

OVERALL ON-SITE DESIGN

The resort welcomed its first guests in October 2007, and was later honoured by Her Royal Highness Princess Maha Chakri Sirindhorn who graciously presided over the official opening of the resort on April 17, 2008.

The resort is located adjacent to Sukhothai Airport in the Sawankhalok district. Visitors can travel conveniently to Sukhothai with Bangkok Airways which operate 2 daily flights. While the resort is within close proximity to tourist attractions such as the Sukhothai Historical Park and Sri Satchanalai Park, there are plenty of



cultural and agricultural activities within the resort itself. Sukhothai Heritage Resort provides visitors with an opportunity to experience the simple rural way of life in Thailand and ensuring a perfect Sukhothai getaway.

Under the Classic Collection banner, The Unique Collection of Hotels and Resorts was selected to manage and successfully market the resort to become known as one of the best facilities within the Sukhothai region.



Conveniently located within proximity of the ancient temples of the Sukhothai Historical Park and the natural wonders of the Si Satchanalai Historical and National Park



OVERALL ON-SITE DESIGN

The building design of Sukhothai Heritage Resort was based on ancient architect design of Sukhothai era. Cluster of buildings were located in the middle of green rice paddies and design to hamonized with the local surrounding. Buildings were design and build with terracotta, clay brick and teak wood. Building design also incorporates the concept of tropical building with the use of open roof, open wall and hopper light. The whole cluster of buildings were also build facing north and south instead of east and west to reduce the heat effect.



Organic Farm Experience

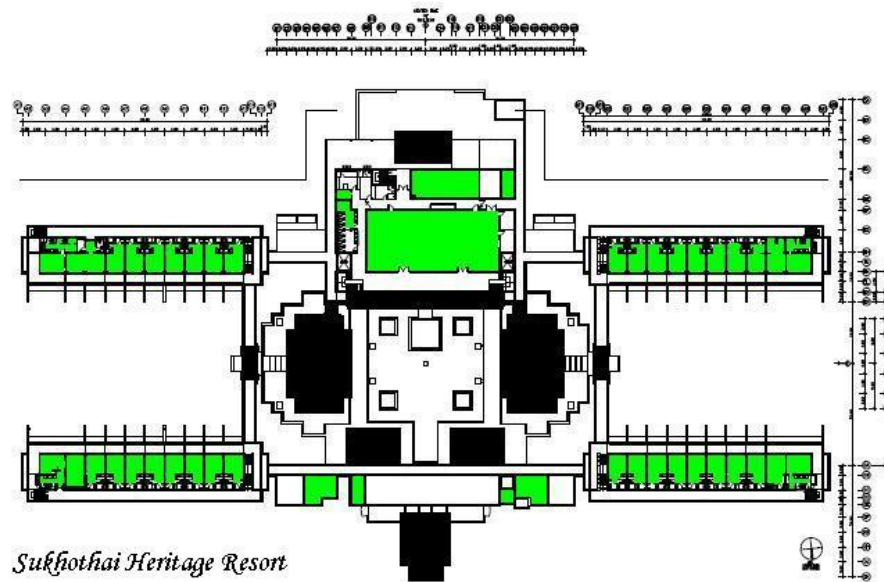


Organic Rice Farming

ACTIVE DESIGN

The Sukhothai Heritage Resort buildings were constructed with open-air high ceiling to let light and air flow through. Guest accommodation buildings, restaurant and conference room have open-air corridor to reduce heat effect. There are several ponds within and around the resort with evergreen tree to reduce the heat.

The resort design was architect style of ancient Sukhothai era to replicate the historical site located within the province with low wall and ivy cover parts of the building similar to ruin of temples and palaces. Each building incorporate material used since ancient time to emphasis the design such as terracotta roof tile and floor tile, clay brick and teak wood. There is a lotus pond in the middle of the resort and various ponds around the resort also the replica of ancient layout of the historical site that bring out the feeling and atmosphere of ancient city.



Sukhothai Heritage Resort

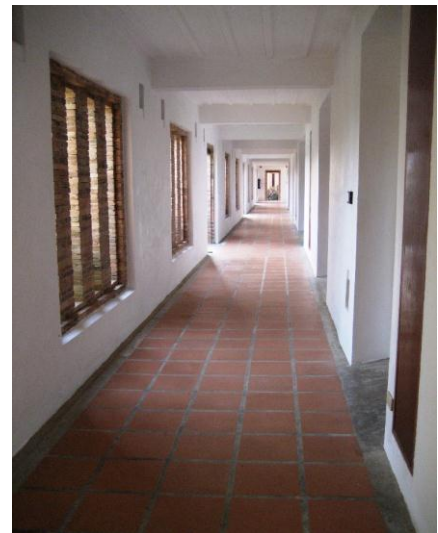
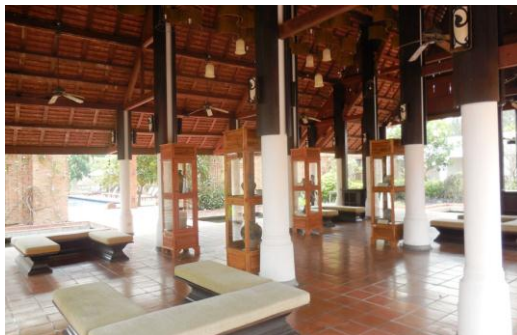
Air Condition area
 Non Air Condition



ACTIVE DESIGN

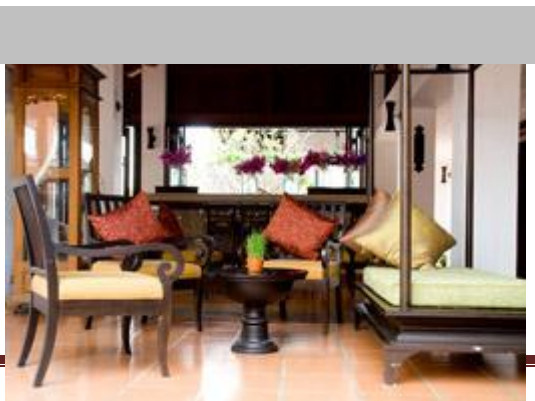
- Air condition area are guest accommodation, part of restaurant, office and conference room total 3,304 sqm with 1.077 kW/ton average
- Resort is located in the middle of organic rice paddies and organic farm with natural air flow through most parts of the resort. Guest accommodations can also be opened to let air flow through. The air quality is exceptional here at Sukhothai Heritage due to burning of rice field and sugar cane field are not allowed in the vicinity of the airport.
- Lighting system use energy saving light in normal area and LED light in the area such as lobby & entrance.
- **Natural light system**

All buildings are design to received indirect sunlight from north and south with high and narrow window incorporate into the building wall. The resort can use natural light and save usage of electric light in all of day time use.



- **Natural air transfer**

Buildings are design with high open roof, open roof corridor and cluster of building so natural breeze can flow through the buildings bringing in cooler air from several ponds surrounding the resorts.



PASSIVE DESIGN

- **Resort layout**

The Resort cluster of buildings are design so that 90% are facing north and south so there is no direct sun light. The end of the building is design with plant wall, open air corridor and tree plant on the ground to protect the building from direct sunlight in the morning and the afternoon. Lobby, restaurant and multipurpose buildings are design surrounding the pond with high open roof and limited the use of air conditioning. Other than big pond in the middle of the resort, there are several ponds surrounding the resort in all direction.



- **Building surface design**

90% of buildings are made with clay brick unfinished and unpainted so the surface is not collecting heat. In addition there are several cut in to the wall to let air flow in and out.

- **Building heat transfer design**

All building are design with high open roof surrounded by ponds with installed ceiling fan. This design allows heat and air to circulate freely without the use of air conditioning. Guest accommodation building also design with corridor or balcony on all side topped by open roof. This design helps reducing the heat during the day as well as protecting building surface in the raining season.

PASSIVE DESIGN

- **Resort wall**

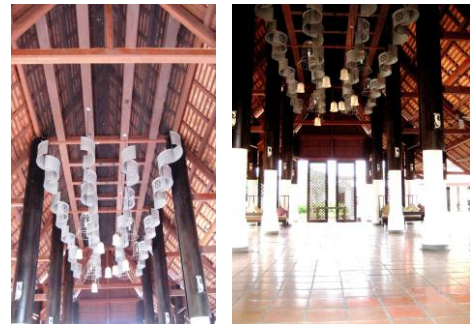
Resort walls are made of brick in two styles. First very low style duplicate the ruin wall of ancient Sukhothai and able to let the air flow through.

Secondly high wall with high and narrow window design to let both air and light flow through a swell.

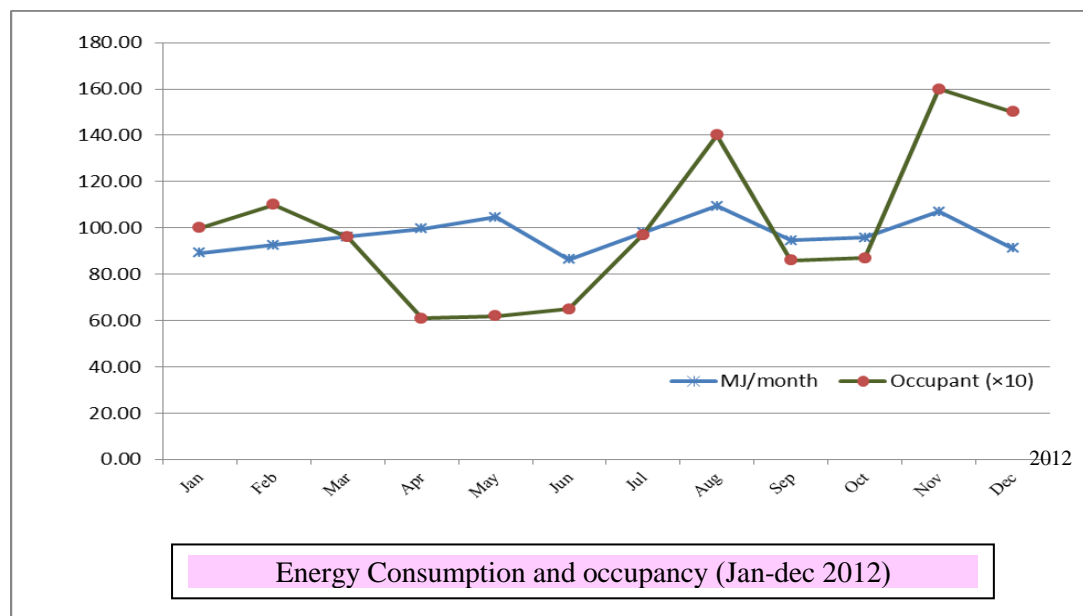


- **The Roof design**

Terracotta material was used for roof material designed in gable shape and also in covering open corridor to prevent heat, direct sunlight and rain. At the end of the building on the building on east and west side, the building was design with open corridor and using plant to protect the building from direct sunlight. Ivy was used to cover transparent roof top on the connecting pathway.



- **Overall energy consumption**



PASSIVE DESIGN

Cluster of Buildings in Sukhothai Heritage resort were designed in rectangular shape separate into 3 sections, Public area in the middle and two wings of guest's accommodation.

The open air lobby was located in front of the pond with open air corridors and walkway connecting to 4 of the guest accommodation buildings.

LOBBY AREA



LIBRARY

VANDA BAR



Sukhothai Heritage Resort Facilities:

- 24 hour reception
- The Library
- 2 Swimming Pools
- Excursion and onward
- Travel Booking Service
- Function room / Ballroom
- Massage Service

PASSIVE DESIGN

The Resort cluster of buildings are design so that 90% are facing north and south so there is no direct sun light. The end of the building is design with plant wall, open air corridor and tree plant to protect the building from direct sunlight in the morning and the afternoon. Lobby, restaurant and multipurpose buildings are design surrounding the pond with high open roof and limited the use of air conditioning. Other than big pond in the middle of the resort, there are several ponds surrounding the resort in all direction.



The resort entrance was designed with half elephant sculptures decorate both left and right side. This design replicates ancient temple from world heritage site. The open air parking space was covered with trees to give shade to car park area.

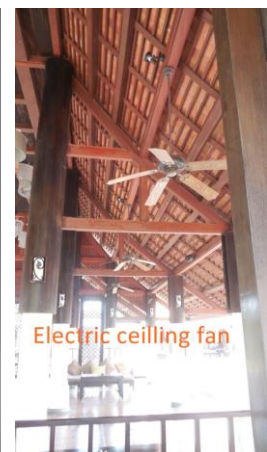
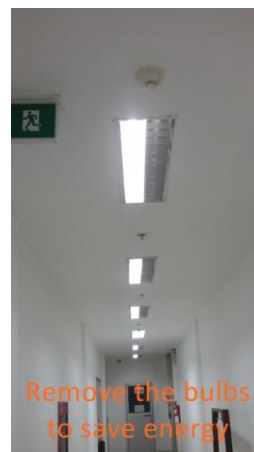


MAINTENANCE AND MANAGEMENT

- All electric equipments is subject to scheduled and daily maintenance check up, for example condenser coil every 3 months



- Daily log sheets is filled and monitor by resort team as preventive plan as well as reducing enegy usage.



Sukhothai Heritage resort implements aircondition tempurture setting at 25 °C in all of the guest rooms and office as well as promote and train all our employees energy saving theme. All office will turn on air conditional only when needed and there will be at least 1 to 2 hour break during regular office hour.

Resort management as well as regular staffs help turn off unuse light and other electric equipments when not using.

Resort also using left over cooking oil for oil lamp during the night time in open area along the walkway and surrounding areas.

ENVIRONMENTAL IMPACTS

Resort emphasis in protecting the environment as it is the policy of owner as well as policy of Sukhothai Airport complex in which the resort was located. We have sustainable water usage system, garbage recycle as well the use of organic fertilizers.

Sukhothai Heritage Resort also implements the following plans to help with the environmental impact

1. Waste water management

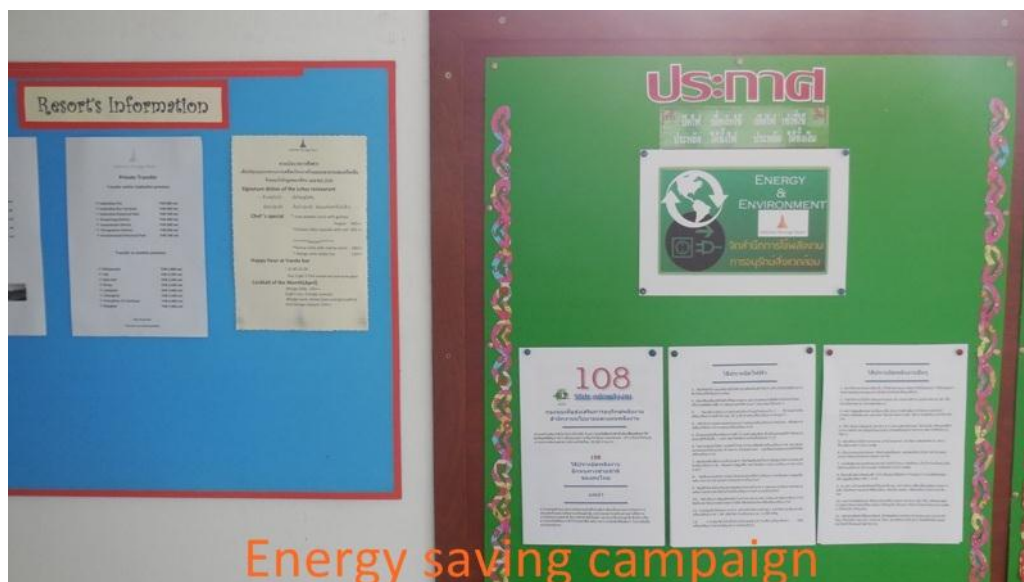
Waste water is treated then release into natural ponds surround the resort. Water then use in farming and rice paddies.

2. Bio degradable fertilizer

Leaf and other organic left over are use in making bio degradable fertilizer

3. Garbage recycle

Garbages are separated and recycled including used cooking oil, beer bottle and can.



BUILDING INFORMATION

A. General Information

1. Sukhothai Heritage Resort
2. Sukhothai Property Co.,Ltd.
3. Address: 999 Moo 2 Klongkrajong Sawankaloke Sukhothai Thailand 64110
4. Tel. +66 55 647 567 Fax. +66 55 647 575
5. E-mail address: engr@sukhothaiheritage.com

B. Building Physical Information

6. Physical building background

- Brief history

The resort welcomed its first guests in October 2007, and was later honoured by Her Royal Highness Princess Maha Chakri Sirindhorn who graciously presided over the official opening of the resort on April 17, 2008. The resort is located adjacent to Sukhothai Airport in the Sawankhalok district. Visitors can travel conveniently to Sukhothai with Bangkok Airways which operate 2 daily flights. While the resort is within close proximity to tourist attractions such as the Sukhothai Historical Park and Sri Satchanalai Park, there are plenty of cultural and agricultural activities within the resort itself to provide visitors with an opportunity to experience the simple rural way of life in Thailand and ensuring a perfect Sukhothai getaway. Under the Classic Collection banner, The Unique Collection of Hotels and Resorts was selected to manage and successfully market the resort to become known as one of the best facilities within the Sukhothai region

- Single function usage or mix function usage (specify)

- Guestroom 4 building
- Office
- Open Air Pavilion
- Conference room : 1 room
- Restaurant : 1 room
- Lobby and Service area
- Swimming Pool : 2 swimming pools
- Lotus Pond : 3 Ponds
- Garden

7. Period since the building was open for business 7 years
8. Any retrofit done : no
9. Total number of storeys 2 stories
10. Total number of basement floor : none
11. Total gross floor area 23,920 Sqm.
12. Car park area 3,000 Sqm.
13. Gross lettable area 23,920 Sqm.
14. Air-conditioned area 3,304 Sqm.

BUILDING INFORMATION (FILL UP DETAILS MAX 2 PAGES)

15. Non-air conditioned area 20,616 Sqm

C. Building Design and Practice Information

16. Facade and shading design:

- Type of façade brick
- Color of façade the exterior wall
- Use of shading devices trees were planted in front and behind the building.

17. Lighting load* ...3.32..... W/m² (gross floor area)

18. Cooling Load ...20..... W/m² (air-conditioned area)

D. Operation Information

19. Occupancy rate (year 2012) : Minimum ...34.00..... % of total area

20. Ownership of building (occupied by owner (s), renter (s), etc.)

- Occupied by owner

31. Building operating schedule

- weekdays _____ 24 hrs _____
- Saturday _____ 24 hrs _____
- Sunday _____ 24 hrs _____
- Operating hours/ yr 8,760 hrs _____

32. Building indoor environment: Indoor air quality setting: temperature and RH

- Air-Conditioning emperature setting 25 °C

E. Energy Consumption Information

32. Peak demand (monthly) : 230.40 kW.

33. Energy used (monthly) : 48501.66 kW.

34. Typical Load curve (weekdays, weekends) : 48,501.60 kW.

35. Energy efficiency index*: air-conditioned area __40.22__ kWh/m²/yr
(based on 2,000 operational hours/yr)

36. Energy consumption: Electricity 5.55_ kWh/m²/yr
(based on 2,000 operational hours/yr)

- Fuel ___-___ Liters/yr (not for electricity generation)

G. Maintenance Information

39. Maintenance programme

- Manpower: ___3___ man-hr/yr
- Training of maintenance workers: ___180___ cumulative hours/yr.

H. Environmental Impacts

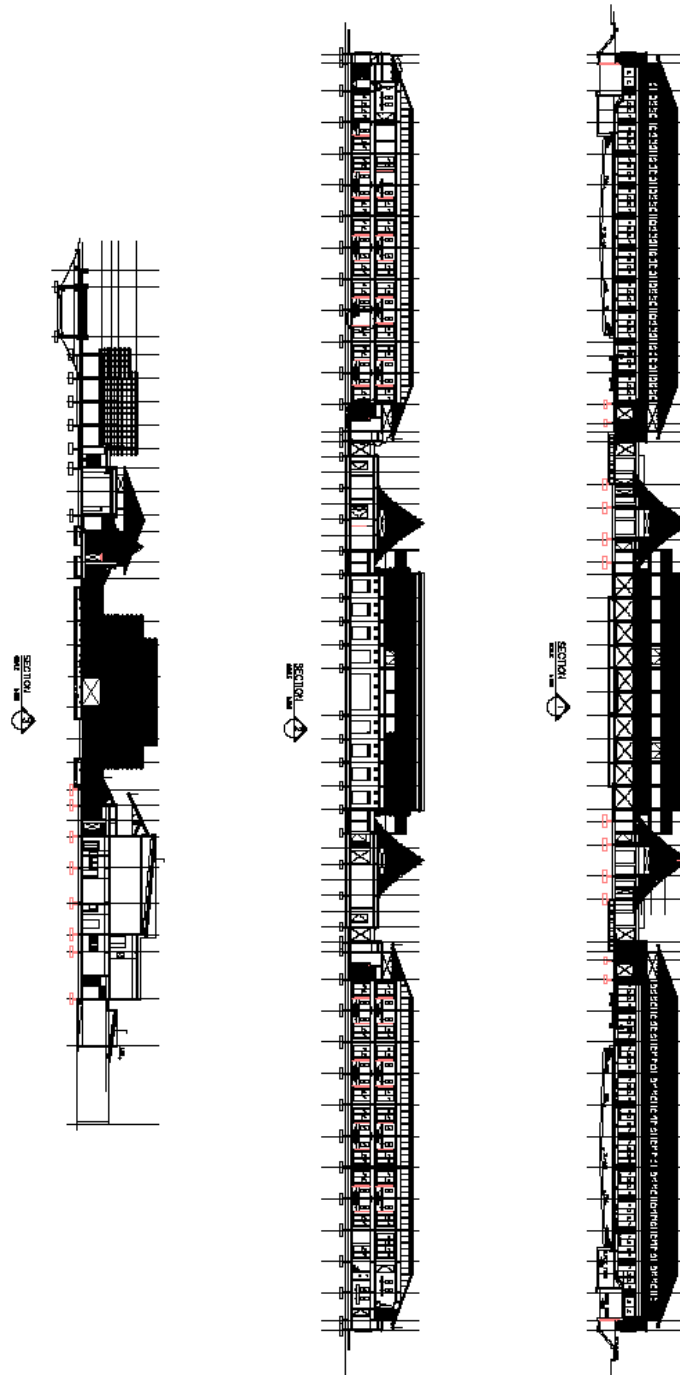
40. Impacts of waste

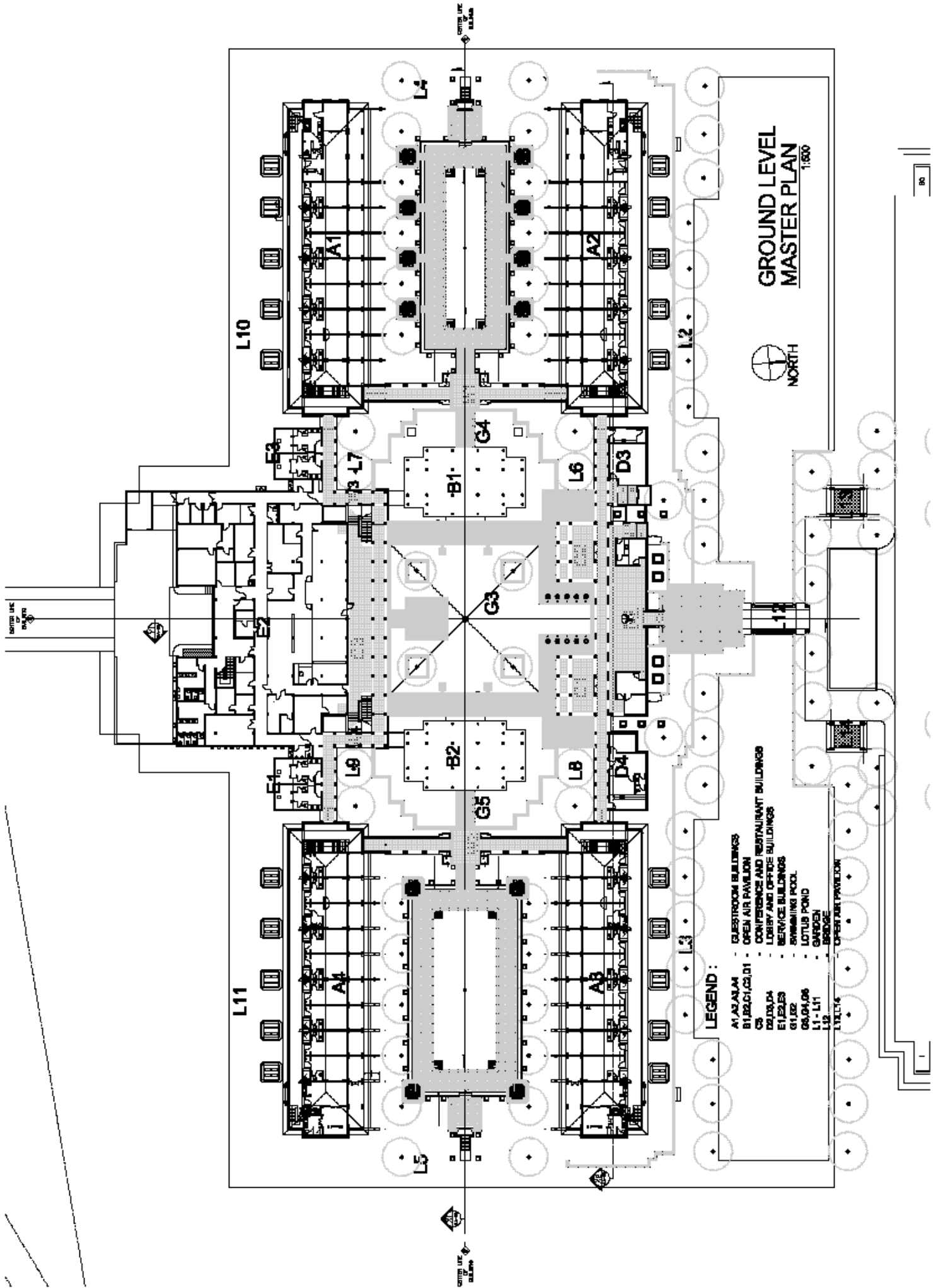
- Separation Dry Garbage and wet garbage
- Grease trap
- Separate Garbage recycle and Hazardous waste

41. Impacts of pollution (air, noise, visual, exhaust, etc.)

- Non pollution of air ,noise,visual,exhaust because the area around the hotel is a field and housing.

DRAWINGS (A4/A3 SIZE: TYPICAL FLOOR PLAN, SITE LAYOUT, ROOF PLAN, AND VERTICAL CROSS SECTION - MAX 4 PAGES)



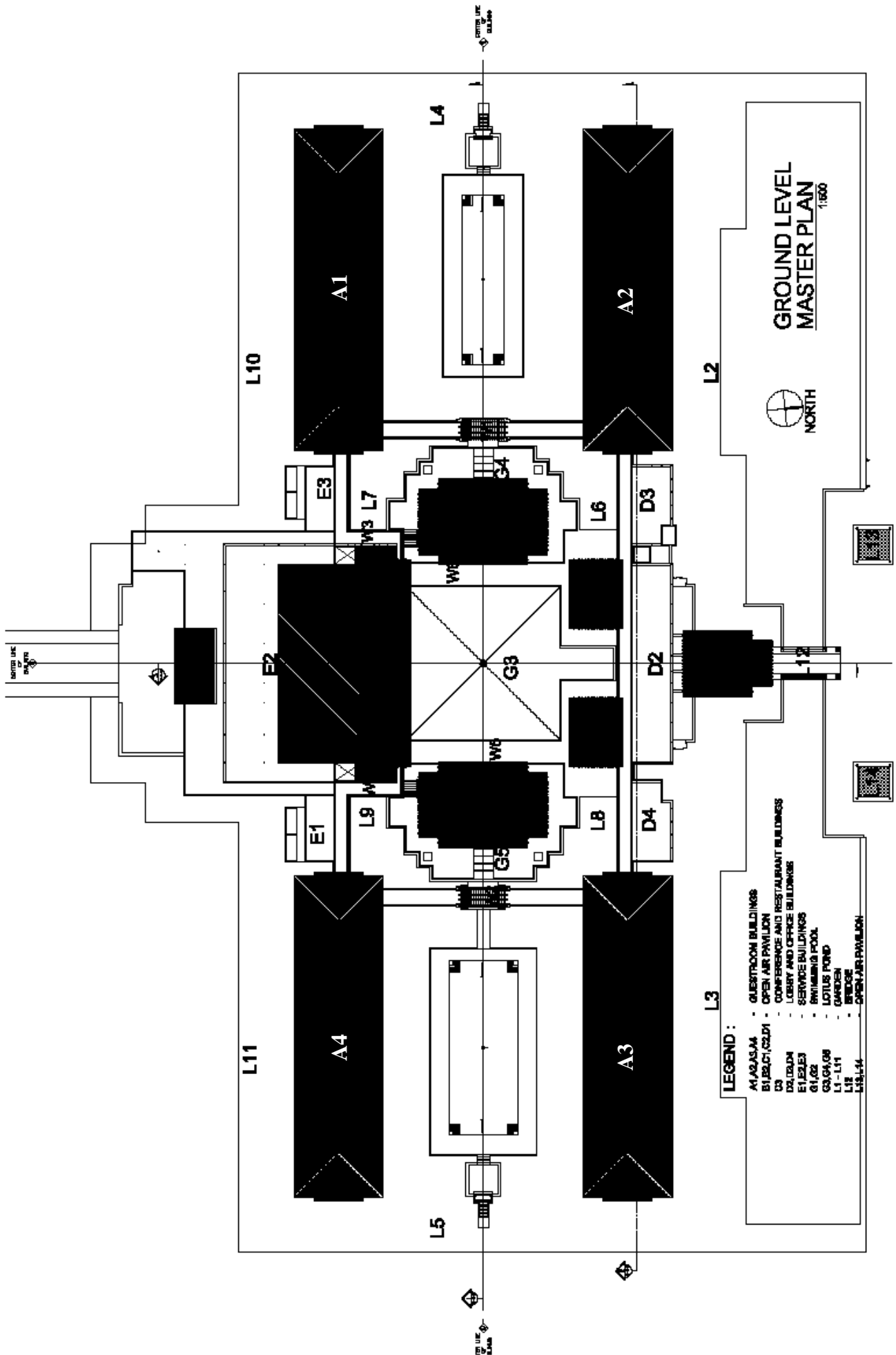


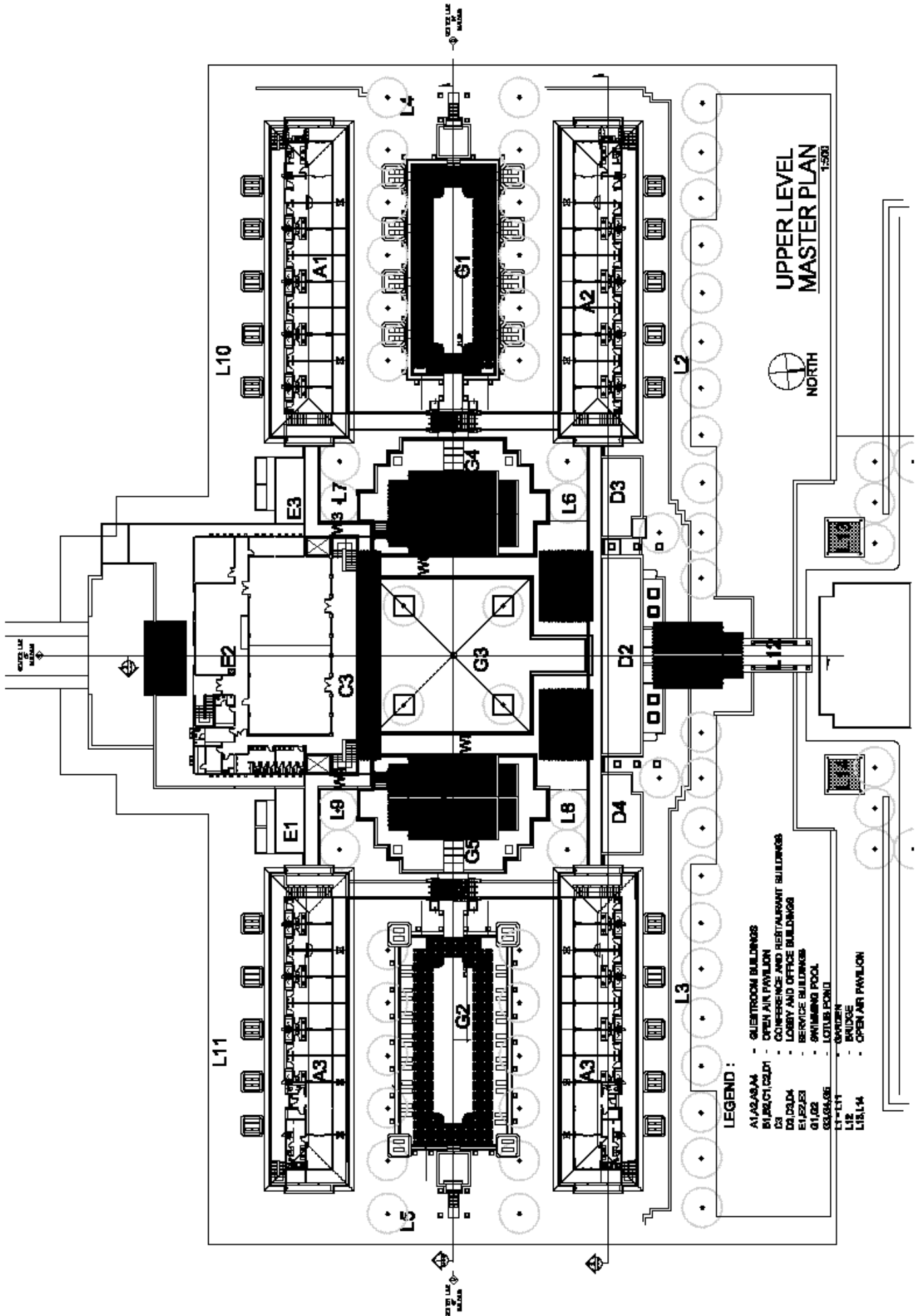
**GROUND LEVEL
MASTER PLAN**
1:500



LEGEND :

- A1-A2-A3-A4 - GUESTROOM BUILDINGS
- B1-B2-B3-B4-B5 - OPEN AIR PAVILION
- C1 - CONFERENCE AND RESTAURANT BUILDINGS
- D1-D2-D3-D4 - LOBBY AND OFFICE BUILDINGS
- E1-E2-E3 - SERVICE BUILDINGS
- G1-G2 - SWIMMING POOL
- G3-G4-G5 - LOTUS POND
- L1 - L11 - GARDEN
- L12 - BRIDGE
- L13-L14 - OPERA PAVILION





**UPPER LEVEL
MASTER PLAN**
1:500



LEGEND :

- A1, A2, A3 - GUESTROOM BUILDINGS
- E1, E2, E3, D1 - OPEN AIR PAVILION
- C1, C2, C3 - CONFERENCE AND RESTAURANT BUILDINGS
- D1, D2, D4 - LOBBY AND OFFICE BUILDINGS
- E1, E2, E3 - SERVICE BUILDINGS
- G1, G2 - SWIMMING POOL
- G3, G4, G5 - LOTUS POND
- L1 - GARDEN
- L12 - BRIDGE
- L1, L2, L3, L4, L5, L6, L7, L8, L9, L10, L11 - OPEN AIR PAVILION

