2-4. International Cooperation in the Field of Social Education and Cultural Activities in Thailand

Non-formal education in Thailand, despite of relatively new field for the Ministry of Education, has been considerably developed by aid of a number of assistance and cooperation from other countries and international organizations, and which are particularily concentrated in elimination of illiteracy, adult education and educational reform.

Also, international cooperation in the field of cultural activities has been actively done for long time; while receiving music drama teams and fine arts display, Thailand has been sending its own music drama teams to the various countries.

Field	Project Title and Duration	Type of Co-operation	External Agencies involved
Non-Formal education for the hill areas	Hill areas education: a model of community-based education system (1980-1985)	bilateral grant for research and tryouts; development of educational materials.	USAID
Non-Formal education delivery system	Development of Innovative Non-Formal education delivery system for a network at village levels (1980-1983)	annual grant for workshops and training	Asian and South Pacific Bureau of Adult Education (ASPBAE)
Functional education	Minicourse for functional education for Teacher training project 1982	financial assistance for planning group meeting and workshop	UNESCO
	Manual and Media for Trainers 1982	financial assistance for seminar	UNESCO
	Curriculum and Material Development 1981	financial assistance	UNESCO
Social reintegration of drug users	Survey, field operation, and curriculum development	financial assistance	UNFDAC and UNESCO
Literacy	Training and campaign against illiteracy 1982, planning and management of literacy programme; development of materials for new literates; study of policy and plans; preparation of materials for rural poow 1983	financial assistance for campaign, workshops, research, printing, seminar, evaluation	UNESCO, UNICEF
Distance Education	Radio correspondence project 1980-1983/1981	financial assistance and equipment	UNDP Japan
Population Education	Training and material development for population education project	financial assistance	UNFPA
Vocational Training	Training and development of vocation centre for Thai people along the Thai-Kampuchea Border areas	financial and technical assistance	Japan
Women Education	Regional Workshop for those in charge of Women's Education in Rural Areas (1982)	financial assistance	UNESCO

CHAPTER 3. OUTLINE OF THE PROJECT

3-1. Objectives of the Project

The Government of Thailand has been implementing the various programmes by declaring preservation of traditional culture, cultural creation and educational development as one of important policies. Especially in 5th 5-Year Economic and Social Development Plan which was started in October, 1981, the government has been making a great effort to improve education, culture and technology in order to raise social intellectual level of all classes and thereby to upgrade quality of the population as human resource. Neverthless, facilities for social education and cultural activities which are essential to implement the above policies are not sufficiently available, and in many cases such activities are done by using temples and private hotels where facilities are not fully provided. Moreover, as a result of drastic social change and rapid population growth in recent years those facilities have become unable to deal with social education and cultural activities in terms of both quantity and quality, to constitute a large bottleneck in promoting social education and cultural activities.

Under this circumstance, the Government of Thailand has realized the need for multi-purpose complex facility to promote social education, cultural activities and creative activities, and planned to establish 'Social Education and Cultural Centre' which has the following objectives.

Objectives of the Centre;

1) To serve as a centre for social education and cultural activities where the general public, particulary children and youths, can receive selected aspects of social education and enrich themselves with the various aspects of Thai culture as well as those of other countries.

2) To serve as venue for the general public, particulary children and youths, to participate in cultural expressions through artcstic creation. It will also serve as centre for cultural exchanges at the sub-regional, regional and international levels.

3-2. Function of the Centre

As people's desire for learning has a great variety, social education activity includes a wide range of activities, such as enhancing of education level, attainment of knowledge and technology, cultivation of artistic sentiments, learning and meeting on daily life, recreational activities, fostering of international mind and widening of artistic sense.

It is generally said that in developing countries like Thailand need for 'futher education' in the sense of continuous education and life-long education is hightened with the change of life style and value judgement which accompany rapid advancement of science and technology and large growth of the economy. At the same time, these countries are characterized by very high degree of need for 'supplemetal education' which aims for attaining and improving knowledges and technologies for work, in reflection of existing condition of school education in which enrollement rate in school above secondary education level is low.

On the other hand, development of arts and culture is one of important objectives of social education when potential desire for participation and appreciation of artistic and cultural activities are high among general public, need to promote (1) development of culture and (2) preservation and succession of traditional culture by providing such opportunities to public and by assisting creative activities of artists to highten the level of culture becomes high. Simultaneously need for widening international view of public through cultural exchanges becomes hightened.
Under this circumstance, the Centre which is planned as a core of social education activities, will be required to have the following functions.

■ A place to provide learning opportunity
The various training courses will be conducted and special educational equipments and materials will be provided for the benefit of attaining knowledge and technology as well as enhancing the level of culture. Also, as a key point to expand learning opportunities, assistance to individual study by providing educational materials will be required. The activities include the various training courses, meeting and volunteer service.

■ A place to provide information service

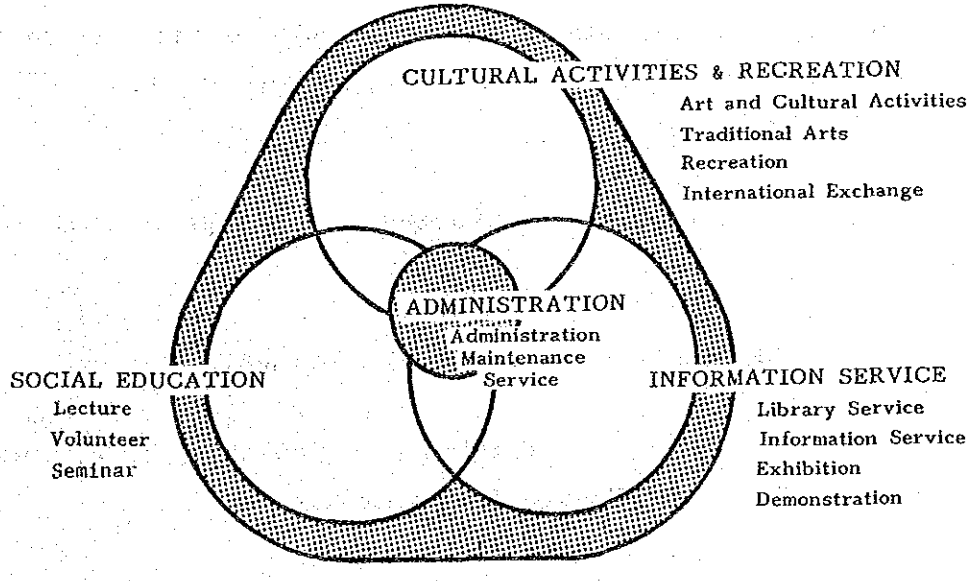
Furnishing books and displaying references will be needed to become a place where public has an access to references on Thai history and culture as well as latest knowledge and technological information of the world. At the same time, information and counseling service will be required to provide information in accordance of level of users. The activities include library service, display and collection of references and information service.

■ A place to provide culture and recreation

A place for creative recreational activities to allow participation and appreciation of artistic and cultural activities will be provided. Such activities include theatrical performance, music, fine arts and literature, along with traditional performing arts and cultural exchange with foreign countries.

The Centre is defined as a place for raising social intellectual level of Thai people and as a place for cultural communication. Because of this, much outcome could not be expected from the Centre unless there is a conscious management on the basis of long term vision and incessant effort of participating public. Therefore, it is important for designing the facilities of the Centre to provide flexibility to deal with a variety of usage and change in objective of use in the long run.

Concept of SOCIAL EDUCATION AND CULTURAL CENTRE



3-3. Objective and Scope of Activities at the Centre

1) Activities of the Centre

The following activities will be provided at the Centre;

a) Exhibition

i) Permanent exhibitions of the history of Thai people, their life styles and cultural identify as developed through the ages. These will be shown through authentic reproductions of various aspects of Thai life in different periods. The exhibitions will be categorized as follows:

- History and culture: 60 exhibits
- Ethnology: 1,000 exhibits
- Anthropology: 300 exhibits
- Various branches of art: 100 exhibits

ii) Changing exhibitions on special aspects of Thai archaeology, history and art as well as part of international culture.

b) Hall of Fame showing portraits or busts of approximately 20 personalities in the field of art and culture.

c) Theatrical and musical performances in auditorium.

d) Presentation of folk performances in amphitheatre.

e) Lectures and demonstrations on art and culture, customs and traditions so that the young generation would appreciate their valuable cultural heritage.

f) Courses for cultural and social education and foreign language education.

g) Movies and slide shows by using visual equipment.

h) Library services with emphasis on art and culture, including collections of books, audio-visual equipment.

i) Activities relating to international cultural exchanges.

j) Organization of local and international meetings and conferences on art and culture.

k) Competitions on artistic works of both traditional and applied art.

l) Creative education for children.

m) Provision of recreational facilities for 1,000-4,000 people.

2) Demarcation of Activities between the Centre and National Theatre

Intending to provide activities described above, the Centre is considered to be a social educational facility in a narrow sense (so called social education centre) and cultural complex facility. On the other hand, as mentioned in Chapter 3-3, National Theatre is carrying out vigorous activities in the city of Bangkok. As they may become similar cultural facililties, their definitions and demarcation of activities should be clarified. In basic concept, the demarcation will be stated as 'Performance of Thai classic music and drama will be principally done at National Theatre, whereas domestic and international cultural exchanges for general public will be done at the Centre.'

	The Centre	National Theater
Guests and Users	General public especially children and youth	General public
Type of Programs and activities	Performing arts, Culture Events International Culture exchange Local culture exchange Contests International Conference	Mainly, performing traditional musics Dramas

3-4. Outline of the Centre

Room/capacity	Activities	Frequency
Main Hall (2,000 seats)	- Theatre (traditional, contemporary) - Opera - Symphony (western and Thai traditional) - Film festival - Cultural conference - Student/youth activities and exchanges	20-30 times/year
Small Hall (400 seats)	- Perfoming arts - Thai stringal orchestra - Cinema - Meeting/training/demonstration - Contest - Multi-puroposed area for such activities as experimental theatre, etc. - Exhibition - Reception	150 times/year
Library	- Book/non-book collection - Music/poetry/play - Audio-visual materials collection	Constant
Permanent Exhibition	- Popularization of Thai history and archaeology - Demonstration of Thai life styles in different regions - Presentation of Thai arts as a part of social life - Hall of Fame 20 personalities	Contstant
Changing Exhibition Hall	- Exhibits; paintings, handicrafts, sculptures, articrafts, graphic, photographic, housing utensils; large three-dimensional objects	26 weeks per year
Audio-visual Room	- Social and culture education - Art appreciation courses - Briefing and cultural orientation	Constant
Language Lab.	- Language training	Constant
Small Meeting Rooms	- Art lecture - Dance and music workshop - Traditional game demonstration - Poetry reading and poetry singing contest - Cooking demonstration - Handicraft demonstration	Constant

Room/capacity	Activities	Frequency
Creative Education Centre for Children	- Art education - Creativity etc.	Constant especially during school vacations
Recreational Facilities	- Thai village where demonstration Thai life-style and Thai handcraft - Children play ground - Thai pavilion and Japanese pavilion	Constant
Amphitheatre	- Contemporary music concert - Khon drama - Folk performances - Youth festival - Traditional sports demonstration - Band concert	
Office	- Administration for Centre	Constant
Separate site from the Centre		
Support Facilities	- Hostels guest houses for guests and student performers - Parking area (100 cars) - Heavy and garden equipment storage - Living quarters for security and maintenance personnel	Constant

CHAPTER 4. THE PROJECT SITE

4-1. Location

A proposed site for the Centre is located in north-east part of the City of Bangkok, shortly off Rachadapisek Road which is a new artery road.

Location of the project site: Rachadapisek Rd. Huay Kuang District, Bangkok, THAILAND

More precisely, the site is located 6 km east of Democracy Monument in old downtown area, 3 km east of Victory Monument which is landmark of the city, and in proximity to Sukhunvit Road 3 km to the south which is a main artery road in the central city.
Summarily, although not located in a central part of the city, the site is located in north-east end of the built-up area and within 10 km from anyplace in the city, to be easily accessible place.

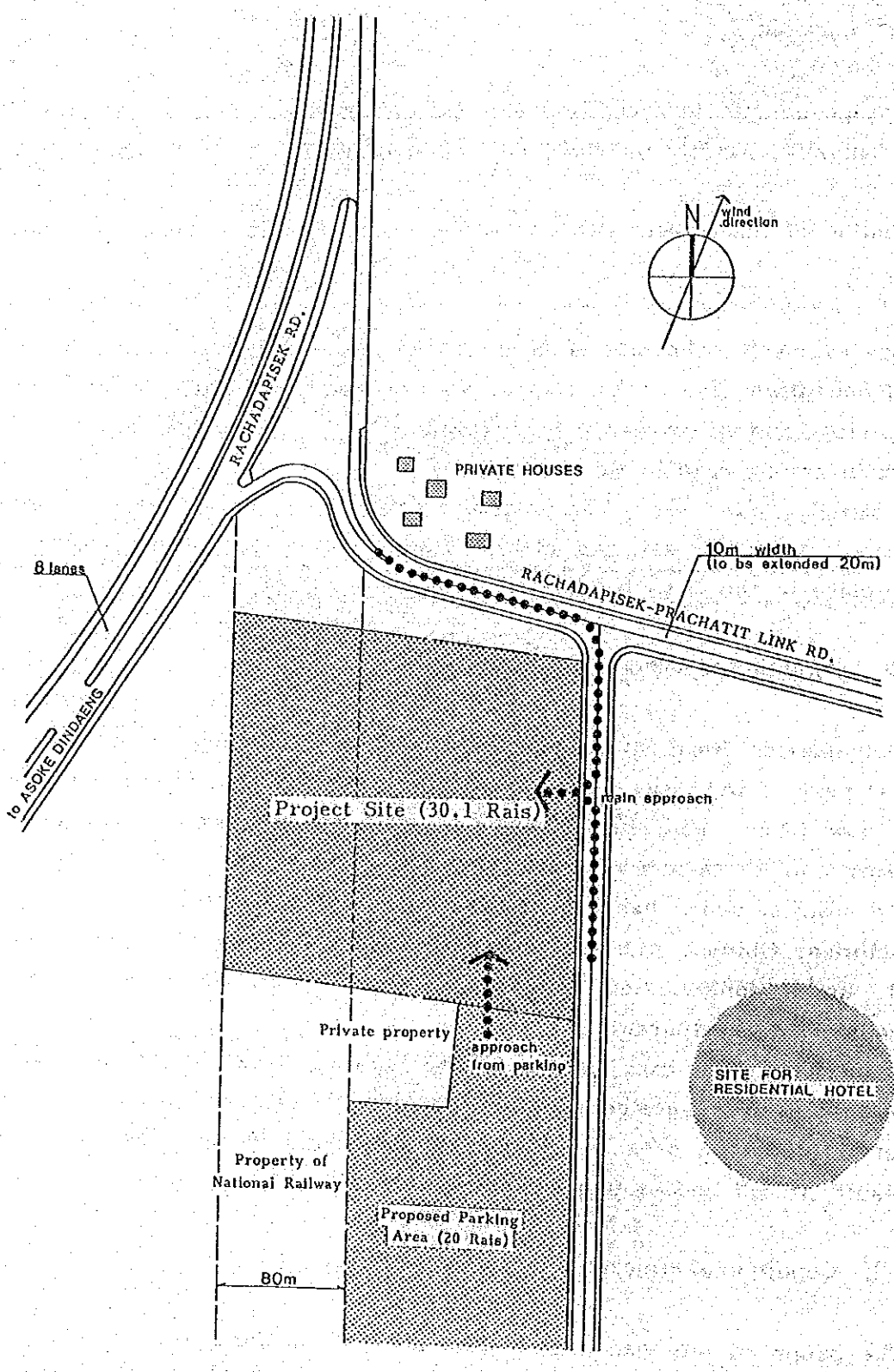
4-2. Condition of Surrounding Area

Rachadapisek Road is a new artery road with 8 lanes located in north-east part of the city, being opened in November, 1981. Much development is now progressing in the wayside area due to recent opening of the road, and there are many development plans, both public and private, and some of which has been completed or under construction. Completed facilities; Chinese Embassy and Mass Comunication Organization (Channel 9), under construction; private office buildings, condominiums, leisure facilites and restuarants.
Being located in easy access to the built-up area and in flat and vast land, the area receive attention as new development area. And it is certain that the area will be widely developed in next few years, as a result, it will become a new built-up area.

4-3. Condition of Project Site

The proposed site has a land area of 30.1 rai (approx. 4.8ha), located at distance of approx 100m off from Rachadapisek Road. The area is a part of the property of National Railway and a part of a land of 55 rai

Project Site



which is donated by private company for government's uses; 22 rai is allocated to the Centre, 13 rai to government offices such as DTEC and TAT, and 20 rai to public parking area.

A whole part of the site is located in marsh land with an elevation lower than roads, to be flooded in rainy seasons.
Because of this, the site is scheduled to be filled and developed to an elevation of 50 cm higher than road level. Yet, the measure should be provided against ground settlement.
As the site is not located along the existing roads, the access road will be constructed by branching from Rachadapisek-Prachatit Link Road. As a large number of citizens are expected to use the Centre, the approach roads should be designed to take into consideration the convenience of users.

4-4. Infrastructure

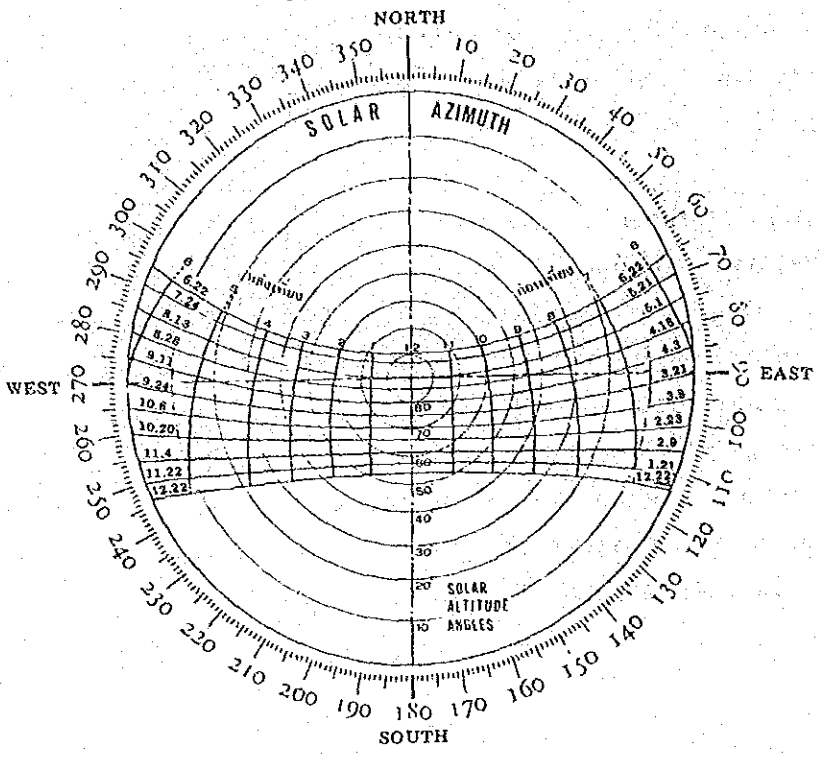
1) Water supply
Water supply main pipe are installed in alongside of Rachadapisek Road, and from which branch lines will be extended to the Centre. As water pressure and amount of supply through the system are not sufficient, care should be taken in planning water supply system in the Centre. On the planning of water reservoir tank, condition of the project site should be considered.

2) Drainage
Public sewage main is installed in alongside of Rachadapisek Road, and to which drainage from the Centre can be connected after primary treatment.

3) Power Supply
MEA main lines (12 kv) are installed in alongside of Rachadapisek Road, and which seem to be sufficient for the Centre.

4) Telephone
Telephone lines are installed in alongside of Rachadapisek Road, and which seem to be sufficient for the Centre.

SUN-PATH DIAGRAM



LATITUDE 14°N

CLIMATOLOGICAL DATA FOR THE PERIOD 1951-1975

Station BANGKOK METROPOLIS
Index Station 48 455
Latitude 13° 44' N.
Longitude 100° 30' E.

Elevation of station above MSL.	2.30 metres
Height of barometer above MSL.	16.37 metres
Height of thermometer above ground	1.50 metres
Height of wind vane above ground	23.38 metres
Height of raingauge	0.70 metres

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Pressure (+1000 or 900 mbs.)													
Mean	12.58	11.05	10.04	08.58	06.95	06.38	06.58	06.60	07.51	09.71	11.52	12.63	09.18
Ext. Max.	26.50	20.96	18.42	17.74	13.62	13.00	14.14	13.50	15.59	16.78	19.98	21.89	26.50
Ext. Min.	04.59	03.87	02.08	00.04	99.40	97.76	98.78	99.36	98.20	98.24	03.68	03.87	97.76
Mean daily range	4.75	4.85	4.87	4.91	4.50	3.81	3.74	3.97	4.38	4.43	4.25	4.46	4.41
Temperature (°C.)													
Mean	25.5	27.1	28.6	29.5	29.0	28.5	28.0	27.8	27.5	27.4	26.6	25.3	27.6
Mean Max.	31.8	32.7	33.8	34.8	34.0	32.9	32.4	32.1	31.7	31.5	31.1	31.1	32.5
Mean Min.	20.4	22.7	24.5	25.6	25.3	25.0	24.8	24.6	24.4	24.3	22.9	20.6	23.7
Ext. Max.	36.0	36.6	39.8	39.0	39.4	36.8	36.0	35.3	35.7	34.5	35.1	35.2	39.8
Ext. Min.	9.9	14.9	16.5	19.9	21.1	21.7	21.9	21.2	21.3	19.8	14.2	10.5	9.9
Relative Humidity (%)													
Mean	73.0	76.0	77.0	77.0	80.0	80.0	81.0	82.0	84.0	83.0	79.0	74.0	79.0
Mean Max.	91.8	93.4	93.0	91.9	93.8	92.9	92.9	94.4	95.7	95.7	94.3	92.2	93.5
Mean Min.	49.5	53.5	55.5	56.6	61.3	63.4	64.4	65.2	67.9	67.7	61.2	53.5	60.0
Ext. Min.	27.0	17.0	25.0	28.0	30.0	46.0	47.0	48.0	49.0	49.0	36.0	31.0	17.0
Dew Point (°C.)													
Mean	19.7	22.0	23.7	24.5	24.9	24.4	24.0	24.1	24.4	24.1	22.4	19.9	23.2
Evaporation (mm.)													
Mean-Pich	98.0	88.8	108.8	105.7	90.2	81.8	78.3	71.2	58.1	58.7	69.3	87.0	995.9
-Pan	132.8	139.2	179.8	182.6	162.6	145.8	141.6	140.3	126.2	120.7	118.3	123.9	1714.3
Cloudiness (0-8)													
Mean	4.6	5.0	5.2	5.8	6.6	7.0	7.1	7.2	7.2	6.6	5.4	4.7	6.0
Visibility (Km.)													
0700 L.S.T.	5.8	5.0	5.8	7.8	8.8	8.7	8.2	7.8	7.8	7.9	8.0	7.6	7.4
Mean	10.5	10.0	9.9	11.5	12.9	13.0	12.5	12.2	12.0	12.2	12.5	12.2	11.8
Wind (Knots)													
Prevailing wind	NE	S	S	S	S	S	SW	S	SW	NE	N	NE	-
Mean Wind Speed	3.8	5.2	5.8	5.7	4.6	4.9	4.6	4.6	3.9	3.5	3.7	3.5	-
Max. Wind Speed	31NNE	37N	48ENE	56E	42W	43S,SW	43SW,W	45WNW	44SSW	40NE	45ENE	31NNE SE	-
Rainfall (mm.)													
Mean	8.9	29.1	28.0	70.0	185.1	150.4	171.3	206.8	402.1	234.2	47.6	10.4	1543.9
Mean rainy days	1.8	2.8	3.6	6.4	15.8	16.5	18.4	20.8	21.6	17.4	6.0	1.6	132.7
Greatest in 24 hr.	39.3	73.0	52.8	133.5	124.2	82.9	108.8	97.8	153.7	123.2	81.2	32.0	153.7
Day/Year	31/61	11/64	24/73	23/51	13/66	6/59	30/55	26/71	23/68	5/60	2/69	8/72	23/68
Number of days with													
Haze	21.5	21.6	22.5	16.6	12.1	12.7	14.0	13.1	12.8	13.2	13.8	18.0	191.9
Fog	5.4	3.6	2.8	1.4	1.6	0.1	0.5	0.1	0.0	0.3	1.0	1.4	18.2
Hail	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Thunderstorm	0.6	1.3	3.6	3.3	15.3	10.1	9.6	10.6	15.2	13.6	3.4	0.7	92.8
Squall	0.0	0.0	0.2	0.2	0.3	0.4	0.4	0.1	0.1	0.0	0.1	0.0	1.8

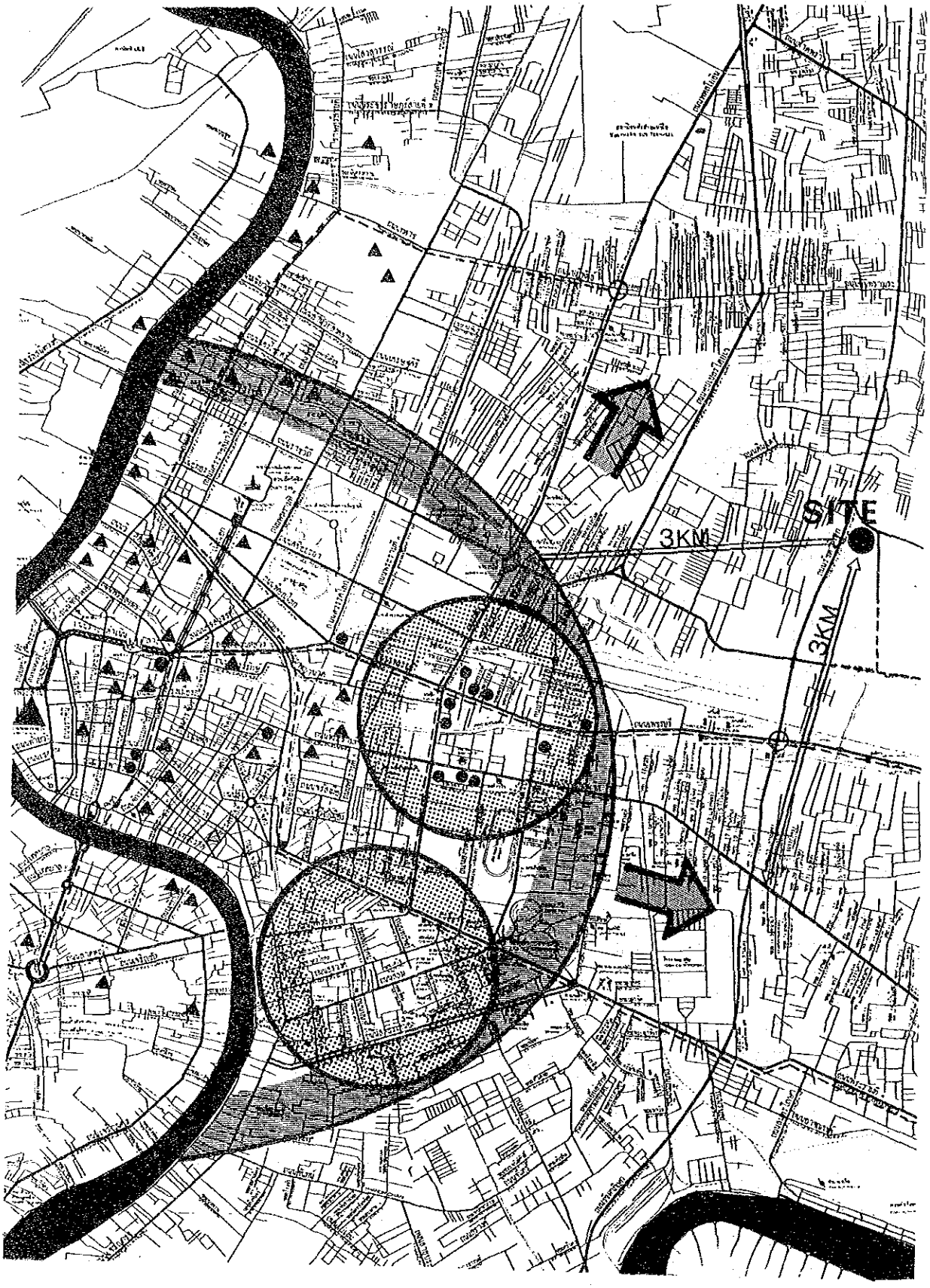
Remark : Evaporation-Pan 1961-1975

4-5. Natural Condition

Among natural conditions in Bangkok, care should be taken in architectural planning for strong sun shine, ventilation and rain shower in rainy seasons.

The area records annual average temperature of 28.5 C and average humidity of 74.7%, with dry season (November - April) and rainy season (May - October) during which rain shower lasts for an hour a day. Dominant wind direction is south from February to September and north-east from October to January, and proposed buildings will be principally aligned on east-west axis, when natural cross-ventilation is employed.

A central part of Thailand forms a delta zone of Chaophraya river, which is characterized as flat marsh land with weak ground condition. The proposed site is located in a part of such land, with ground settlement of 5 - 10 cm annualy. Thus foundation planning should be taken care for settlement and flooding prevention measures.


SITE
3KM
3KM

CHAPTER 5. DEVELOPMENTAL PLAN FOR SURROUNDING AREA

5-1. Development Pattern of Urban Area in Bangkok

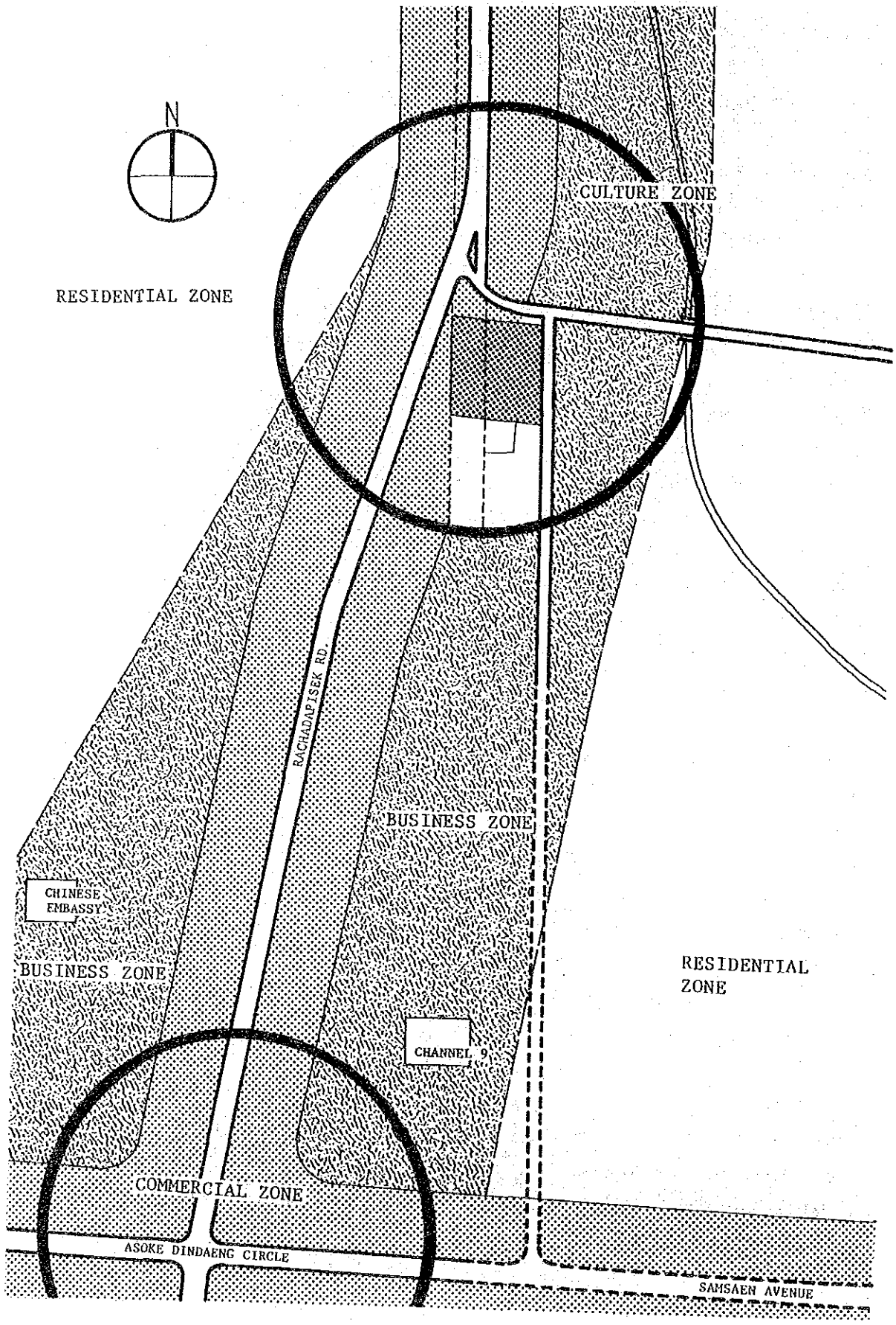
Bangkok urban area, located in the basin of Chaorhraya River at its bending part, has been expanding both eastward and northward, and it is estimated that the population with reach 8 million in 1990.

The center of the city has shifted from old downtown area along Chaophraya River to the east side while forming half-circle pattern. At the same time the urban area has been sprawling in south-east and north direction, along artery roads which extend to suburbs.

The proposed site, located in the east side of the central part of the city, has been left as a valley in urban sprawl process, partly because of delay in construction of artery roads through the area and partly because of marsh land which covers the area. Neverthless, as the area is located in proximity to various key places in the city, 3 km to Victory Monument and 3 km to the main artery Sukhunvit Road, to become the objective of attention as a key place for development of the area.

Development pattern of Bangkok urben area is characterized as linear commercial zones along main artery roads behind which residential area has been sprawling. In wayside area of Rachadapisek Road which has been recently completed and extends to the proposed site, development of private commercial facilities has been started. Because of its proximity to the city centre, various new facilities such as Chinese Embassy, Mass Comunication Organization (Channel 9) and new condominium apartment buildings have been moved into this area. Also, MTS formulates a plan to construct a line which connects Makasan and Lard Prao.

Under this circumstance, it is proposed that the construction project of the Centre will be looked as a key place for development of the area and a centre of the area so as to constitute new environment in Bangkok urban area.

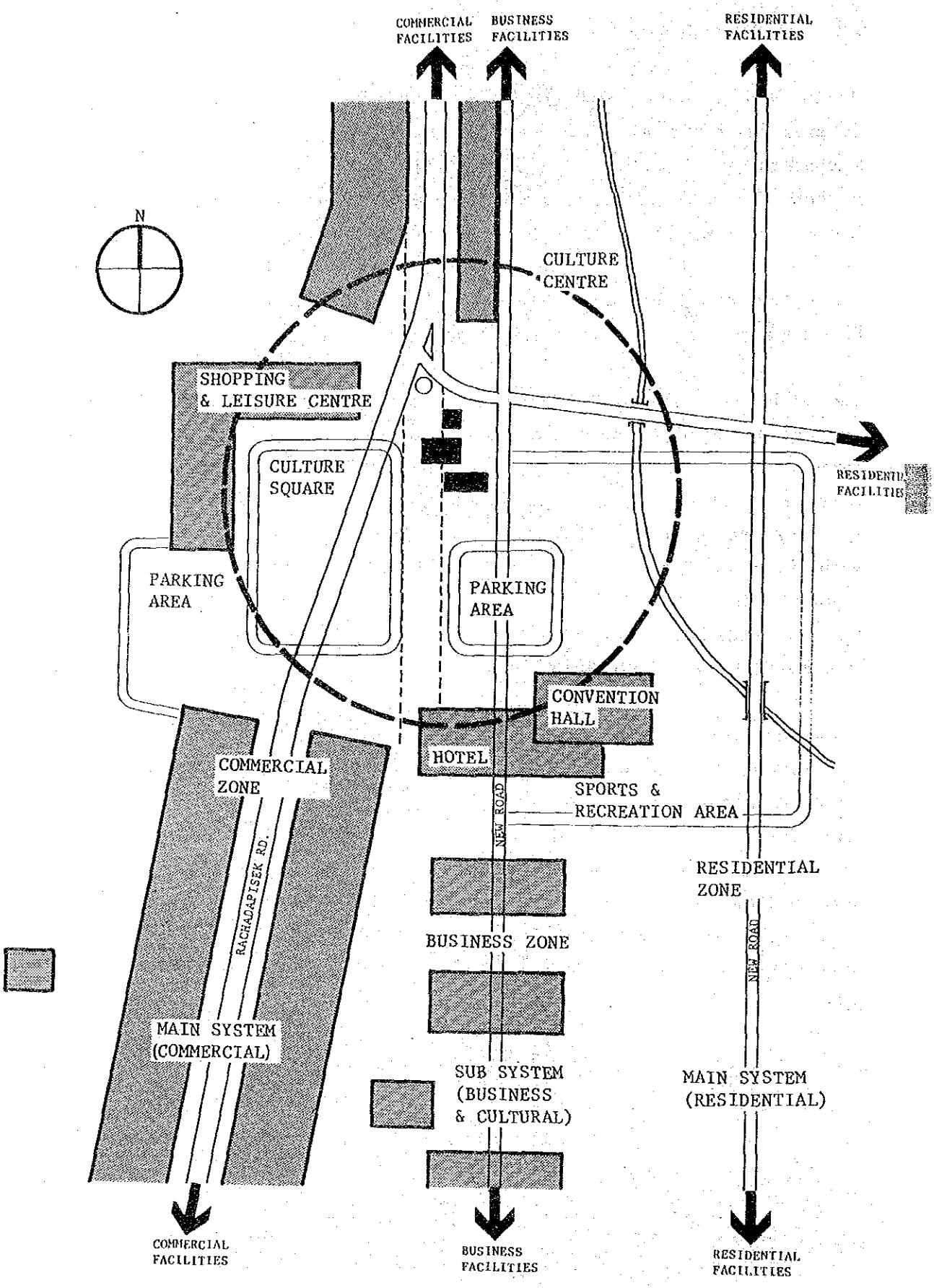

N
RESIDENTIAL ZONE
CULTURE ZONE
RACHADAPISEK RD.
BUSINESS ZONE
CHINESE EMBASSY
BUSINESS ZONE
RESIDENTIAL ZONE
CHANNEL 9
COMMERCIAL ZONE
ASOKE DINDAENG CIRCLE
SAMSAEN AVENUE

5-2. Developmental Plan for Surrounding Site

Urban development is progressed in wayside area of Samsen Road which extends from Victory Monument to the east, and is terminated at Rachadapisek Road. In the future, the development is likely to go beyond the intersection and to expand along Rachadapisek Road and Samsen road which is currently constructed on the east side. And the development pattern is expected to consist of commercial zone immediately along the road, business zone behind of it, and residential area in hinterland.

By looking at a location of the Centre as a contact point of above zones and by establishing educational and cultural facilities, the area will be formed to a central area of education, culture and recreation. At present, shortage of such public facilities in the city is considerable as the city has been expanded mainly by private development to keep pace with the population growth. In the city center, educational and cultural square is formed around only Phra Mane Ground area which is surrounded by National Theater, Museum, Thammasat University and Wat Pharkeao, to constitute an important district.

Under similar concept, it is considered to be appropriate for the future of the city that a new educational and cultural square is proposed to establish around the Centre.
Therefore, it is proposed that park and square for cultural and recreational activities will be established around the Centre along with international conference facility, information center, office building and hotel, and shopping and leisure center will be constructed along Rachadapisek Road and thereby to create a new centre for total cultural life.


COMMERCIAL FACILITIES
BUSINESS FACILITIES
RESIDENTIAL FACILITIES
N
CULTURE CENTRE
SHOPPING & LEISURE CENTRE
CULTURE SQUARE
RESIDENTIAL FACILITIES
PARKING AREA
PARKING AREA
CONVENTION HALL
HOTEL
COMMERCIAL ZONE
SPORTS & RECREATION AREA
NEW ROAD
RACHADAPISEK RD.
RESIDENTIAL ZONE
BUSINESS ZONE
NEW ROAD
MAIN SYSTEM (COMMERCIAL)
SUB SYSTEM (BUSINESS & CULTURAL)
MAIN SYSTEM (RESIDENTIAL)
COMMERCIAL FACILITIES
BUSINESS FACILITIES
RESIDENTIAL FACILITIES

CHAPTER 6. BASIC DESIGN

6-1. Design Policy

It is understood that the Centre is social education and cultural complex facility as the place for Thai people to enhance their social intellectual levels and for communication of international culture.

Centre shall be easy for people to use, and to operate. Easy maintenance of facility is important to minimize operation cost of the Centre. Therefore, plans, materials and air conditioning system shall be planned considering on easy maintenance.

Also, it is required to produce the space which will harmonize with the locality and climate of Thailand and be loved and fully used by Thai people.

■ Consideration on locality of Thailand

It is very high temperature and humid of tropical climate, and rainy and dry seasons are very distinguished in Thailand. In such local climate, consideration on sun shine, wind ventilation, and rainfall is indispensable in architectural design to create comfortable interior environment. It is also important to harmonize the facility to surrounding environment as social education centre with self composed atmosphere.

• Sun Shine

To design axis of building layouts, eaves, balcony, etc., to shut strong sun shine, and to use materials for exterior wall which are effective to reduce the heat load of interior space.

• Wind and Ventilation

To consider wind circulation and natural ventilation at maximum in planning. Auditoriums are exception because they requires isolated interior space without windows because of their functions.

• Energy Saving

To save energy by natural ventilation and natural lighting: To choose durable materials easy to clean for easy maintenance. Air-conditioning system shall be also easy to maintain and operate. In addition, the system shall be zoned in accordance with the utilization of facilities to save energy in rooms not being used.

Electrical systems, in the same manner, shall be zoned by on-off circuits to avoid wasteful lighting. In addition, kinds of lighting fixtures will be limited to allow easy exchange of lamps and minimum stock of them.

• Rainfall

Drainage system shall be planned on consideration of drainage capacity of buildings and external spaces in case of strong and concentrated rainfall in rainy season.

• External Appearance of Buildings

As the symbol of social education and cultural facility, the Centre should be designed with sense of cleanliness and high standings. The Centre shall have an appearance with sense of development for the future as the place of development and succession of culture.

The external appearance of the Centre shall be designed in consideration of locality and climate of Thailand.

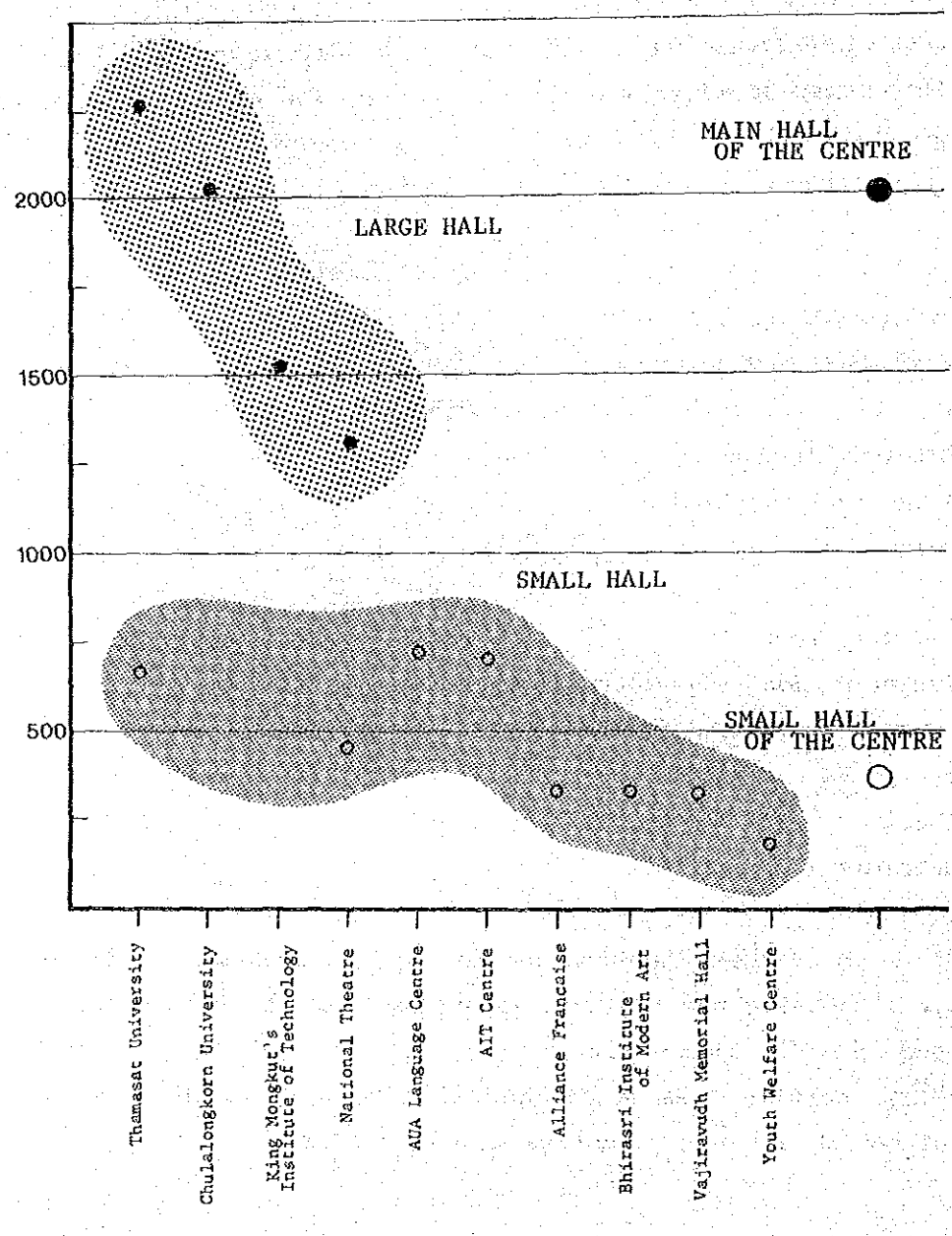
6-2. Outline of Facilities

As mentioned in Chapter 3 Article 1 'Objectives of the Project', social education and cultural facilities in Thailand are not provided at satisfactory level in terms of quantity and quality for sufficient activities. For instance, a shortage of such facilities could be inferred from use rate of Thai National Theatre, 600 performances per year, which far exceeds that of provincial public halls in Japan of 30% on annual average.

To eliminate such inbalance and thereby to upgrade social intellectual level and cultural activities of the people of Thailand, a facility which combines social education facility and cultural facility is required, and at the same time a center which functions as a place for providing learning opportunity, information, and culture and recreation is required. To fullfil the above requirements the Centre should consists of the following facilities.

1) Main hall (2,000 seats)
2) Small hall (400 seats)
3) Library
4) Permanent exhibition hall
5) Changing exhibition hall
6) A/V rooms
7) L/L
8) Small meeting rooms
9) Creative education centre for children
10) Outdoor social education facility (incl. Thai village, pavillion and canteen)
11) Amphitheatre
12) Administration office

In addition, such auxillary facilities as parking area, hostel, guest house and employees' housing are required to support the above facilities. As the proposed site for the Centre is not large enough to accommodate such facilities, parking area is planned in a land of 20 rai adjacent to the site but hostel and other facilities in a land near the site.


MAIN HALL
OF THE CENTRE
LARGE HALL
SMALL HALL
SMALL HALL
OF THE CENTRE
2000
1500
1000
500
Thamasat University
Chulalongkorn University
King Mongkut's
Institute of Technology
National Theatre
AUA Language Centre
AIT Centre
Alliance Francaise
Bhirasri Institute
of Modern Art
Vajiravudh Memorial Hall
Youth Welfare Centre

6-3. Facility Planning

On setting up scale of facilities of the Centre, expected usage of facilities, purpose of use and frequency of use should be analyzed.

As to main hall, on the basis of analysis of existing cultural facilities in the country, it is desirable to plan the hall as multipurpose hall to allow a great variety of performances such as music, opera, ballet, movie, drama, traditional performing arts, lecture and ceremony, rather than limiting its function to single purpose such as concert hall, theater or opera house; a multi-purpose hall which could deal with any types of performances to a resonable extent by taking look at stage size and acoustical characterestics in terms of average requirements for all types of performances. Seating capacity of 2,000 seats appears to be appropriate as this will give sufficient visibility for all seats while providing a maximum number of audiences with an opportunity to enjoy cultural information.

On the other hand, small hall is planned as multi-purpose hall of flat floor type by taking into account a result of analysis on similar facilities in the country as well as peculiar characteristics and seating capacity of main hall, small hall and amphitheatre. Small hall will be equipped with movable seats and roll-back-chair stand to make it to flexible facility to permit the various seating arrangement and thereby to increase the use rate.

As to exhibition and education related rooms, a volume of 25,000 books and references will be required to maintain library activity estimated from similar facilities in the country, 800 users per day with 20,000 books in AUA Center and 300 users per day with 28,000 books in British Council.

1) Main Hall

It should be recognized that the main hall of the Centre is not only a full scale large hall but also a large impact on improvement and change of cultural awareness in the country as well as fostering and trend of traditional performing arts and culture.
Thus, the main hall planning should be done to cover, in detail, setting up of performances, forecast of use rate, capacity, setting up of acoustical and stage equipments and fire protection and evacation planning.

The main hall should provide a stage which has adequate size and equipments to be able to show the various stage arts at international level, and audience seats with a large capacity to provide a maximum number of people to appreciate such performances. Such size, equipment and capacity will be determined at a certain level and extent which are appropriate to the various condition, and theatrical space design is defined as such determining process.

On the base of existing situation in the country as mentioned to this point, appropriate size and characteristic of the main hall appear to be a balcony type of audience seats with 2,000 capacity and to be a multi-purpose hall to facilitate full-scale concert, being equivalent to public halls in Japan. Furthermore, the hall should be equipped with wide back stage to allow theatrical performance as well as electrical and sound equipment to facilitate modern music and show, being a multi-purpose hall in addition to a full-scale concert hall.

The Centre is a centre for social education and cultural activities, and should be used for international cultural exchange. So, simultaneous interpretation system is required to be equipped in the Centre, and international cultural exchange should be extend by the system.

MAIN HALL

Room Name	Basis of Setting Up	Set-up Floor Area(m^2)
Auditorium	$0.8m^2$/seat x 2,000seats (National Theater approx. $0.8m^2$/seat)	1,600
Stage	Proscenium Width: 19m Stage Depth: 19m Stage Width: Min. 44m	879
Trap Cellar	Elevator Stage 14m x 3m Set-up minimum space Corresponding to Elevator Stage	
Orchestra Pit	Full orchestra: 110person $1.2m^2$x110person	132
Foyer & Lobby	Space Standard 0.7-$1.0m^2$/person	1,400
Dressing Rm.	Small Rm.: 4-$10m^2$/person Large Rm.: 3- $4m^2$/person Average: $4m^2$x100person	400
Rehearsal Rm.	Space Standard 150-$300m^2$	200
Scenery Storage	Similar Facility 100-$1,000m^2$	more than 100
Side-Spot Lighting	Space Standard 30-$40m^2$ $40m^2$x2Rms	80
Sound Control Rm.	Space Standard 30-$40m^2$	40
Lighting Control Rm.	Space Standard 30-$40m^2$	40
Projection Rm.	Space Standard 15-$20m^2$	20
Interpretation Booth	3mx2.5mx4booths	30
Coffee Shop	Kitchen $50m^2$ $2.0m^2$x50seats	150
Ticket Office	Similar Facility 5-$20m^2$ $20m^2$+Ticket booth	25
Back Office	Similar Facility 10-$100m^2$ 6 personx$4.5m^2$/person	27
First Aid	1 bed and examination space	20
Green Rm.	Stage technician's Rm.	30
Storage (in total)	Space Standard 50-$200m^2$	more than 100
Lavatories (guest)	Set-up on Standard in Tokyo: 86 units	
Corridor & Stairs	Similar Facility 18-23% Setting Up 20%	1,730
Mechanical Rm.	Similar Facility 6-8% Setting Up 7%	600

2) Small Hall

As compared with Main Hall, Small Hall will be used by general public especially. So appropriate scale of Small Hall should be considered on operation and maintenance, and to allow audience to understand human's voice (direct sound) and action (visible distance). In light of popular use of amphitheatre in the country probably because of its locality and climate, it is more appropriate that the Centre will consist of a main hall, a small hall and an amphitheatre. The Centre is planned to have a main hall with 2,000 seats, an amphitheatre with 1,000 seats and a small hall with 400 seats.

Moreover, in order to fully take advantage of usability of the hall, a multi-purpose space of flat floor type will be provided by installing movable stage and movable seats along with various stage, sound and lighting equipment, rather than being a small hall of theatre type with fixed stage and fixed seats; to be made to a super multi-purpose hall of so-called event type to accommodate music, drama, dance, ceremony, lecture, movie, exhibition, meeting, show, reception, dance party and conference so as to satisfy needs of people and to keep pace with social change.

SMALL HALL

Room Name	Basis of Setting Up	Set-up Floor Area(m^2)
Hall (Flat Floor)	Movable Chair $0.7m^2 x400=280m^2$ Rool-Back-Chair Stand+Movable Chair=400seats	280
Stage	Movable Stage $14^m x8^m$+Side Stage	150
Foyer & Lobby	Space Standard $0.7-1.0m^2$/person $0.7m^2$/person x 400person	280
Gallery	Instrument Operation Space for Multi-purpose Hall and used for Standees	200
Dressing Rm.	Space Standard $4-10m^2$/person $4m^2$/person x 15person	60
Operating Rm.	To operate movable stage mechanism	30
Lighting/Projector Rm.	Space Standard: $15-20m^2$	20
Pantry	To add a function for party and reception	40
Office	$4.5m^2$/person x 4person	18
Lavatories(guests)	30units Set-up by the standard of Tokyo	
Lavatories for Amphitheater	15 units	
Storage	for movable chair etc.	20
Corridor & Stairs	Similar Facility: 18-23% Setting Up 20%	350
Mechanical Rm.	Similar Facility: 6-8% Setting Up 8%	140

3) Exhibition and Education Related Rooms

This is a building to be composed as combined facility and most regularly used. Thus, the design should be considered to deal with highest degree of activities.

■ Library

The library of the Centre has a role to become a facility to satisfy a great variety of demand for information and to provide material and reference for the various educational courses, and thereby to provide service which is fully accessible to general public.

Also, considering that the library is contained in the social education and culture centre, i.e., there will be type of different uses from independent library such as drop-by uses after visiting the other assembly facility of the Centre, the library should have a content to be freely used by anyone. Furthermore, a network to facilitate interaction with other library facilities should be considered, so as to make the library have specialized sections such as music, drama and cultural history in accordance with a characteristic of the Centre as a core of cultural facilities.

■ Exhibition room

As the Centre will be regularly used by a great number of people as social education and culture facility, it appears to be effective to have exhibition space which could be regularly used. In this case two types of spaces, (i) permanent exhibition space and (ii) changing exhibition space will be needed.

Permanent exhibition hall will be mainly for display of materials on Thai history and culture, while changing exhibition room will function as a gallery for paintings, sculptures, handicrafts, photographs etc. In addition, Foyer of two halls and small hall along with external space will be used for some exhibitions.

EXHIBITION, EDUCATION AND ETC.

Room Name	Basis of Setting Up	Set-up Floor Area(m^2)
Library	Open stack system Setting Up 25,000 volumes (reference: AUA 20,000Volumes British Council 28,080 Volumes 25,000÷100Volume/m^2=250m^2 Reading Area 60seats x 1.8m^2/seats=108m^2 Book store 40m^2 Printing Shop 40m^2 A/V Booth 10booths x 2.3m^2/booth=23m^2 Work Space 40m^2	501
Changing Exhibition	Exhibition 400m^2 Storage 100m^2	500
Permanent Exhibition		1,000
A/V Rm. Class Rm.	30person x 2.0m^2/person=60m^2 60m^2 x 3Rms	180
L/L	30 booth x 2.3m^2/booth=69	69
Small Meeting Rm.	50person x 2.0m^2/person=100 100person x 2.0m^2/person + Storage40m^2=240m^2 100m^2 x 3Rms + 240m^2=540	540
Creative Education Centre	3table x 6seat/table=18seats and work space (reference:Science Musium 40seats 140m^2)	80
Administration Office	Director 30m^2x1Rms Asst. Director 16m^2x1Rms Office 4.5m^2/person x 98person=441m^2 Pantry 13m^2	500
Corridor & Stairs	Similar Facility as Culture Centre: 40 - 45% Setting Up 42%	2,250

CANTEEN

Room Name	Basis of Setting Up	Set-up Floor Area(m^2)
Canteen	1.5m^2/person x 200 Kitchen 60m^2	360

■ A/V room, L/L and Small meeting room

When properly managed, these facilities are expected to be effectively used at highest frequency. As programmes for social education activities, these facilities are expected to be used for adult school, cultural education, meeting, circle and organization's activities and their office, with a variety of scale. Thus, A/V room and small meeting room are planned to be flexible with A/V equipment.

4). The Other Faclities

■ Thai Pavilion and Japanese Pavilion

Thai Pavilion, to symbolize Thai culture, tradition, and art, and Japanese Pavilion and Japanese garden, to exhibit Japanese life style, are located in the Centre. So that, both Thai and Japanese culture will be more understandable, and the Center will be impressed as the place of cultural exchange by both countries.

■ Thai Village

Thai village, planned to be constructed by Thai side, shall be located near the canteen easy to access and use. The village is designed as a shop where Thai traditional arts and crafts are sold to get some profits for the Center.

6-4. Setting Up of Facility Grade

The Centre is required to have the various functions as complex facility composed of various sections. Each section, then, is expected to be used in a wide range of level from general public to expert. For instance, activities at multi-purpose halls will include drama and other performances by artists and international cultural exchange, to require very high level of technical performance. Thus the facilities should have a high quality of design as a core facility while being not away from technical condition in the country, with consideration of operation and maintenance of the facilities.

Grade of the Centre as a whole appears to be appropriate when established at a level which takes into account balance and complementarity to similar facilities such as National Theatre and characteristic of the Centre itself which will be ranked at national level, i.e., main facilities will be designed to have high grade of performance which could not be expected from existing facilities in the country.

■ Main Hall

As the Hall will become a main facility of the Centre, its grade should be aimed at high level. Particularly to modify acoustical deficiency of existing facilities such as National Theatre, design consideration will be given to such area as air-conditioning system which takes in sound absorptive function, so as to aim at higher grade. At the same time, finishing grage of lobby in the main hall and others will be established in accordance with that in the National Theatre.

■ Small Hall

It appears to be rational to design the hall to deal with a variety of use rather than to have high grade as in the case of the main hall. Grade of the facility will be set at medium level while providing sufficient stage equipments to allow multi-purpose uses.

■ Exhibition/Education facility (Exhibition Hall, Library, A/V Rooms, L/L and Small Meeting Rooms)

As these are expected to be most regularily used, operation and maintenance aspect will be given higher priority on layout of facilities to provide good air circulation, with standard grade common in the Thailand.

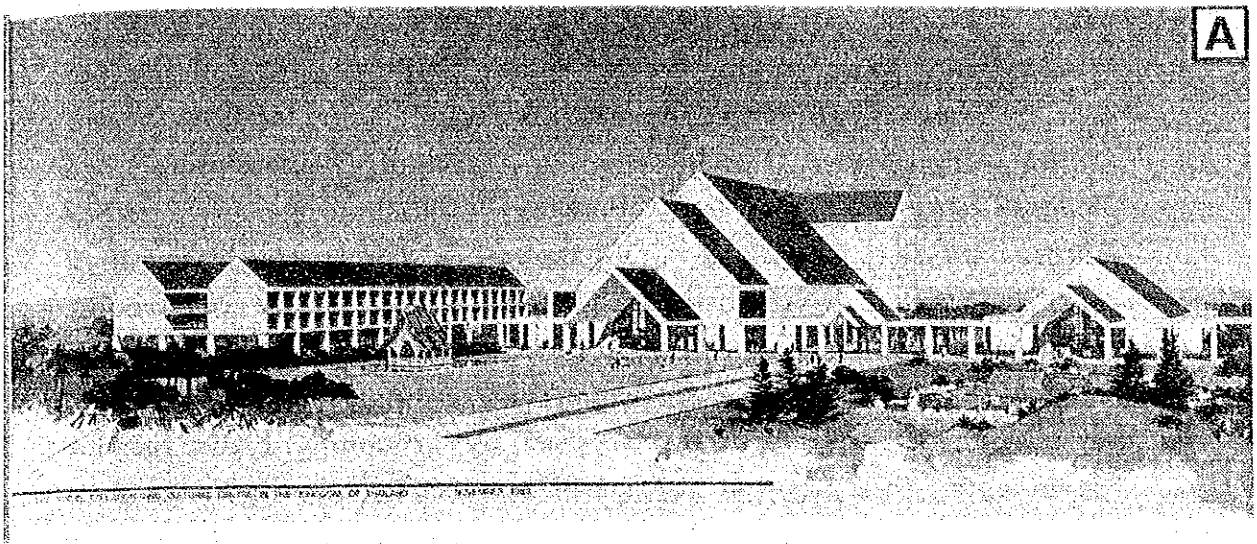
6-5. Design Process

Orginal request by Thai side included as a social education and culture facility, main hall with 2,000 seats, 2 small halls of 300 seats each, permanent and changing exhibition space of 3,000 m^2 each, space for Fames' busts of 600 m^2 and 5 small meeting rooms of 100 seats each. In response, advises were made that designed flexibility of each facility and efficient use of facilities at operational level would be essential on operation and maintenance of this type of facilities to result in reduction of operation and maintenance cost and in keeping perpetuity of the facilities as a whole. As a result, the planning was made to reduce the scale of the facilities and to allow a variety of use of each facility to a possible extent.

Also, strong request was made from Thai side on discussion that Thai charactaristic design and expression should be introduced to external appearance of the Centre. Upon examination, it was concluded that 'slope roof' is a peculiar characteristic of Thai architecture, and the idea was taken into composition of the roofs. At the same time, as the Centre is designed to be a social education and cultural centre looking toward the future, basic design concept was established as having an expression of a facility toward 21st century, not as a replication of traditional Thai architecture. Under this concept, three alternative external designs A, B and C were proposed, and alternative A was selected as this has most Thai atmosphere, fits into the locality and has symbolic image.

On the final stage of the basic design study, shape of the site and location of access road were changed. Censequently, about 30.1 Rais of land was secured and confirmed as the project site for the construction of the Centre. (The site area includes about 10.9 Rais from the property of National Railway.) The width of access road is 20 meter along the east boundary of the site.

The site plan of the Centre was modified slightly from the original plan according to the above changes, and it was presented and confirmed by Thai side as the final of the basic design.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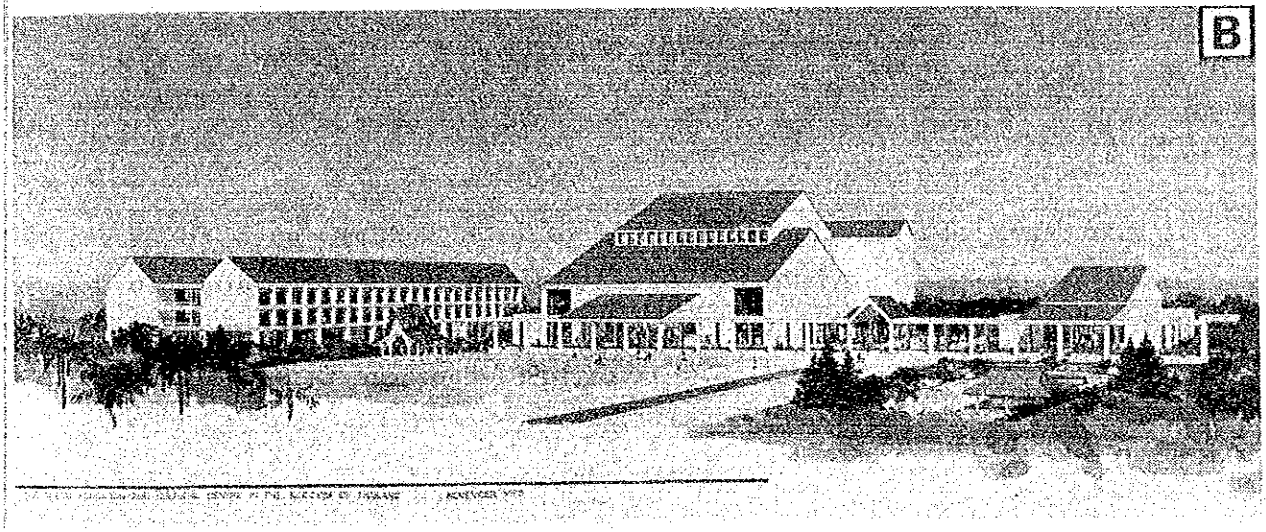
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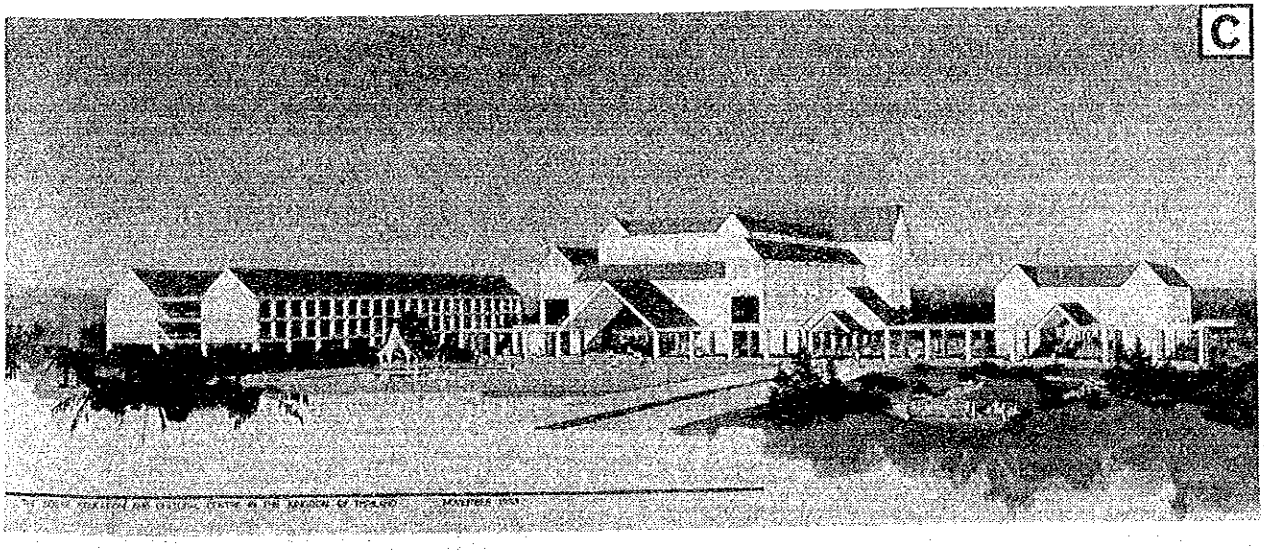
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6-6. Site Planning

It is important to arrange and recompose the facilities and functions of the Centre, prior to study its site plan. Because, the facilities of the Centre are very different each other in terms of their contents and functions, therefore, usage frequency, usage form, and operation method of facilities are very different. On the other hand, classification of acoustical grades and air-conditioning grades of facilities are required as a technical matter for the planning. Considering these technical matter, convenience of uses, and easy operation and maintenance, it is recommended that the Centre shall be composed by grouping of the complex facility contents. For example, Main hall and Small hall will be used as the facilities in accordance with planning events, entertainments, and/or meetings, on the other hand, Library and Exhibition hall will be used as the facilities used every day, therefore, these facilities shall be divided from Main and Small halls in terms of effective operation and easy maintenance.

As the result of studying on contents of each facility, such as usage, frequency of use, division for each administration, classification by acoustic grade, individual use and zoning by air-conditioning grade, it was concluded that most desirable configuration of the Centre is made of the following three main buildings;

1) Main Hall Building
2) Small Hall Building
3) Exhibition and Education Building
   Library, Exhibition Hall, A/V Room, L/L, Small Meeting Room, Creative Education Centre for Children and Adm. Office

The site plans of the Centre were studied by compositions of the above three major buildings, considering the following basic subjects.

- To establish alignment of buildings by taking into consideration natural ventilation and sun shine, and to secure spacing between buildings

- To lay out Main Hall building in quiet environment with maximum distance from roads so as not to be disturbed by traffic noise and vibration, and at the same time to lay out it at an appropriate location as a core facility of the Centre

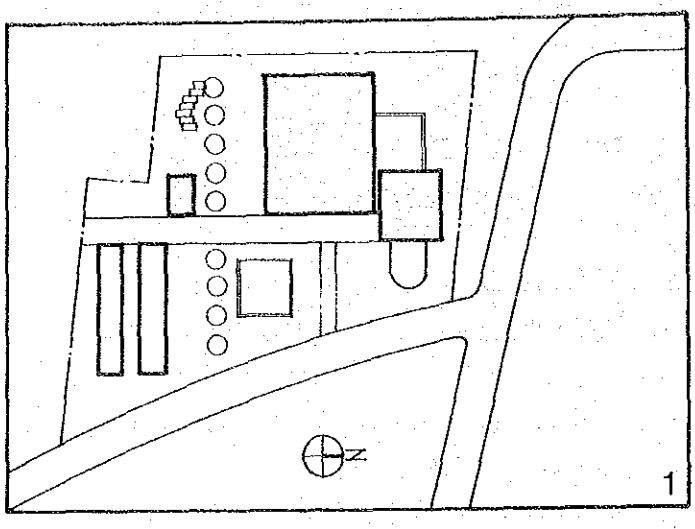
- To achieve effective use of the site in terms of shape and to form extrnal space reflecting purpose and function of each building

- To facilitate easy approach from main roads and parking areas, and to secure potential access directly from Rachadapisek - Prachatit Link Road

- To lay out Thai Pavillion and Japanese Pavillion at locations which are instantly visible from main approaches to the Centre

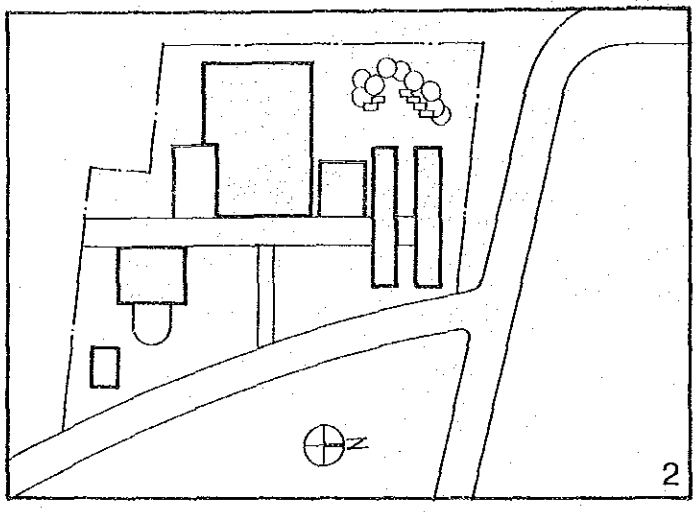
- To secure access to each facility by service roads

Alternative facility layout plans



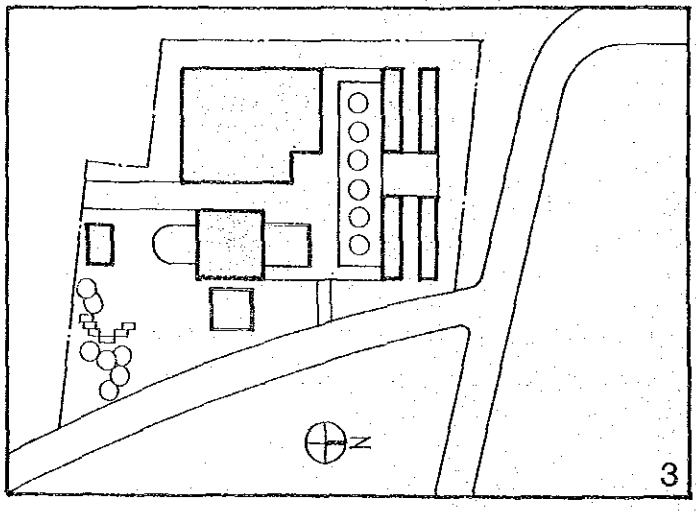
Location of Japanese Pavillion is far back

No potential access from Rachadapisek - Prachatit Link Road



Difficulty to provide natural ventilation for exhibition/ education building

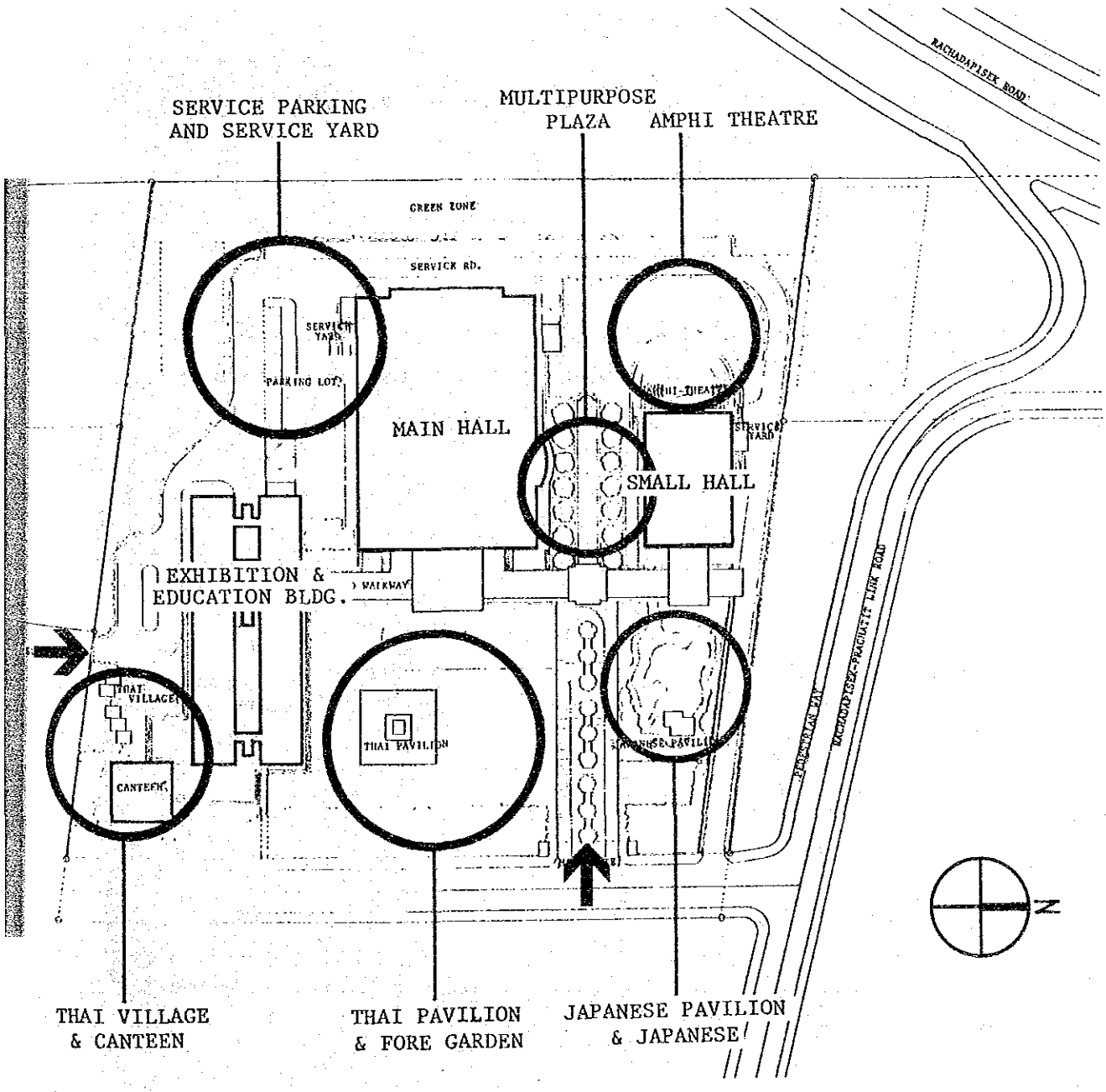
Giving an impression that both pavillions are on back side



Main halls are concentrated in one section and do not face main approaches

Difficulty to provide natural ventilation for exhibition/ education building

After studying above alternative plans, it was decided that the final site plan, as shown below, which was revised on the basis of plan "1" is to satisfy all basic criteria previously given. Accordingly external space for each building was secured in accordance with each purpose and function.



6-7. Architectural Planning

■Main Hall Building

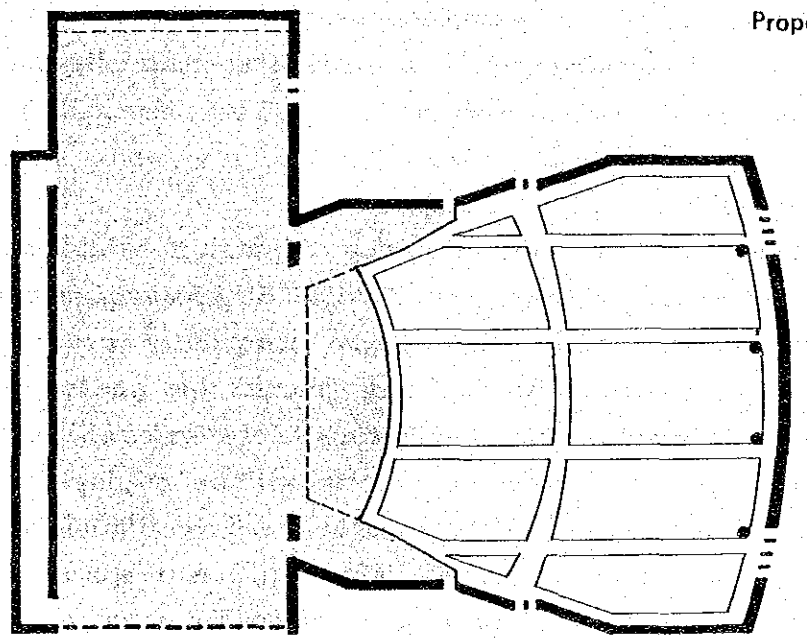
The main hall of the Centre should be made to a full scale hall with enough acoustic functions and be equipped with neccessary functions as multi-purpose hall so as to deal with international cultural exchange and various other events. Neccessary stage equipment and acoustical and lighting equipment will be installed for possible types of performances which were established after examining those at National Theatre, along with enough stage size and accompanied rooms.

Types of performance at main hall

a) Symphony, chamber music, solo recital and ensemble
b) Opera, musical and ballet
c) Popular music, jazz and rock music
d) Traditional performing arts and drama
e) Theatrical performance
f) Movie
g) Music and film festival
h) Lecture, conference, assembly, ceremony, entertainment and etc

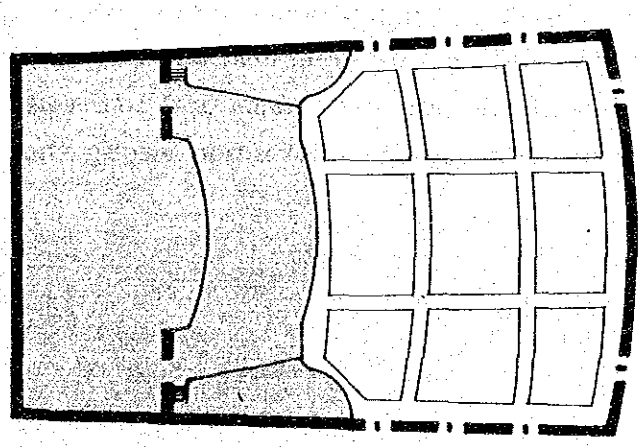
Spectator's seat will be composed of one slope and 2 level balcony type to secure the good view and sound. One slope section close to ground level will accomodate a majority of 2,000 seats so as to facilitate easy evacuation on emergency. Also, wide space will be provided for foyer and lobby which are used as a place for people's communication at intermissions and before opening, along with coffee shop planned adjacent to it so as to intend a function of the place of relaxation.

Comparison of Thai National Theatre and Main Hall of the Centre



Proposed Main Hall of the Centre

Stage
Proscenium
width 19.0m
height 10.5m
Orchestra pit
depth 6.0m
Stage width 45.0m
Seats 2,000 seats



Thai National Theatre

Stage
Proscenium
width 14.4m
height 11.5m
Front stage
depth 7.3m
Stage width 26.0m
Seats 1,350 seats

■ Small Hall Building

For the small hall expected to have high use rate, it is desirable to make it as multi-purpose hall to deal with a variety of needs by users; in addition to general types of performances at the hall, such as mini-concert, ensemble, popular music, jazz, rock music, traditional performing arts and drama, movie, lecture, conference, assembly, ceremony and entertainment, the hall will be equipped with pantry and stage equipments to allow show, demonstration, reception with foods and drinks, and dance party.

Also, roll-back-chair stand and movable stage will be installed to be convertible to general small hall with fixed seats and stage. Furthermore, by being constructed next to outdoor theatre, efficient use of facilities, such as interchangeable use of acoustical and lighting equipment are planned.

■ Exhibition/Education Building

The building will consist of permanent exhibition, changing exhibition, library, A/V room, L/L, meeting room, administration office and creative education center for children, and will be most frequently used on regular basis. For this reason, the building should be plotted at convenient location for access, while facilitating close relation with administrative section. Open corridors and pilotis will be employed in the building to ensure a maximum extent of natural cross ventilation and thereby to save energy for air-conditioning. Also, sufficient space will be secured for pilotis to provide flow space to be used for a variety of purposes.

As to vertical configuration of the building, exhibition sections which are closely related to exterior space and creative education center for childred will be planned on the first floor, and A/V room and L/L will be planned in adjacent to library to provide organic interaction among them.

Other Facilities

■ Covered Walkway

Covered walkway with sufficient space and shelter from strong rain and sun shine will be provided to serve as an instrument to organically connect three main buildings. The covered walkway is not only for users' convenience but to express an integrity of the facilities as a whole. For approach to the Centre by cars, the walkway will be in adjacent to porches from front road, parking area and service road.

■ Thai Pavillion and Japanese Pavillion

Both pavillions are constructed to be a symbolic element of the Centre. Thai Pavillion is planned on the pond and Japanese Pavillion at a corner of Japanese garden, to provide harmony with surrounding environment while showing a contrast between them.

■ Canteen Building

The seperate building will be provided for Canteen space which is open air type and easily used by visitors, in proximity to parking area. Also, the building will be plotted in adjacent to Thai village, which will be constructed by Thai side, so as to create vilid atmoshere.

6-8. Scale of Facilities

1). Main Hall

Room Name	Capacity	Floor Area (m^2)	Breakdown	Remarks
Auditorium	2000 seats	1,652		include Royal box 0.83m^2/person
Stage	Proscenium arch W=19m	951	Acting Area 323m^2	Stage Trap Elevator Stage
Trap Cellar		432		Elevator Stage
Orchestra Pit	for full orchestra 100 musicians	133		1.2m^2/person
Foyer & Lobby		1,442		0.7m^2/person
Dressing Rm. & Training Rm.		370		
Rehearsal Rm.		209		
Side Spot Lighting		56	28m^2x2 Rms	
Sound Control		40		
Lighting Control		40		
Projection Rm.		22		
Interpretation Booth		30	7.5m^2x4 Booths	
Coffee Shop	50 seats	177	Kitchen 50m^2	2.1m^2/person
Ticket Office		34		
Back Office		36		
First Aid	1 bed	27		
Lavatories, Corridor & Stairs etc.		2,226		
Sub-total		7,877		
Machine Rm.		806		
Total		8,683		

2). Small Hall

Room Name	Capacity	Floor Area (m^2)	Breakdown	Remarks
Hall (flat floor)		306		max. 400 seats
Stage		125		Movable stage
Foyer & Lobby		335		$0.7m^2$/person
Gallery		140		
Dressing Rm.		44		
Lighting & Projection		41		
Pantry		38		
Office	for 4 staff	24		$6m^2$/person
Dressing Rm. for Amphitheatre		38		
Lavatories, Corridor & stairs		429		
Sub-total		1,520		
Machine Rm.		121		
Total		1,641		

3). Exhibition & Education Bldg.

Room Name	Capacity	Floor Area (m^2)	Breakdown	Remarks
Library	- book stacks for 25,000 volumes - reading seats for 60 persons - A/V booths : 10 booths	521		include space for Book-store & Printing Rm.
Changing Exhibition		520	Exhibition $400m^2$ Storage $120m^2$	
Permanent Exhibition		1,080		include Space for 20 Fames Bust

Room Name	Capacity	Floor Area (m^2)	Breakdown	Remarks
A/V Rm.		240	$80m^2$x3 Rms	
L/L	30 booths	80		
Small Meeting Rm.		560	$240m^2$x1 Rm $120m^2$x2 Rms $80m^2$x1 Rm	$2.0m^2$/person
Creative Education Centre for Children		80		
Administration Office		504	$80m^2$x1 Rm $434m^2$x1 Rm	
Lavatories, Corridor & Stairs		3,256		include Space fo sub-station 120m
Total		6,320		

4). Canteen

Room Name	Capacity	Floor Area (m^2)	Breakdown	Remarks
Canteen	200 seats Kitchen: $60m^2$	324		
5). Covered Walkway		1,617		
GRAND TOTAL (1) - 5))		18,585		

6). Others

THAI PAVILION	60
JAPANESE PAVILION	60
LAVATORIES (Outside of Building)	36
GUARD HOUSE	30

6-9. Building Element Planning

On building element planning, care should be taken into considreation of locality and climate of Thailand, to devise a way to minimize operation and maintenance costs after comopletion, and to suit local construction method.

1) Roof

Roof is subject to a great impact of rain and sun shine under high temperature and humidity in Thailand. The roof of the Centre will be of slope with Thai made tiles as expression of Thai characteristics on external appearance. Particularily the roofs of main hall building and small hall building, which require high sound insulation effect, will be of double structure consisting of sound insulation roof and tile roof with air layer between them so as to increase insulation effect.
Also, as above two halls will be of large span frame structure, roof plan will be made to increase economy of the structure by reducing load to maximum extent while improving sound insulation effect.

2) External wall

External wall of two halls, which require sound insulation effect, will be principally of concrete, and windows of exhibition and education building will be installed on south-north side while the building will be aligned in east-west direction on its long axis, by taking into account natural ventilation and sun shine condition. Eaves and open corridors will be installed on opening part on the north and south side so as to avoid direct sun light. Finishing materials for external wall will be principally of washed terrazzo which is common material in Thailand.

3) Floor

Open corridor will be subject to blow-in of rain on squall, details of entrance to rooms should be made not to bring in rain water with finishing material of less slippery when being wet. Ground floor level will be planned at height not subject to flooding.

6-10. Material Planning

1) Basic Principle

As the Centre will be used by a large number of public people as social education and culture facility, strong, hard-to-smear and durable materials will be selected to reduce operation and maintenance cost, while taking into consideration construction cost, method and construction period.

2) Criteria for selection of material and construction method

Durability:	Materials durable to long time use without stress, deformation, discoloration and deterioration
Use of local material:	Materials easily obtainable for maintenance, regular used by local craftman and helpful to promote local production
Safety:	Materials with fire resistance, water resistance and water proof

3) Material planning

a) Structural material (main structure)

Pillar, beam, floor and staircase:	Reinforced concrete, Steel beam in part
Wall:	Reinforced concrete, Concrete block and brick

b) Exterior finish material

Roof:	Thai made tile and water proof paint on a part of flat roof
External wall:	Washed terrazzo and Thai made porcelin tile
Door and Window:	Stainless steel, aluminum and Steel
Floor:	Washed aggrigate, combination concrete block in a part

c) Interior finish of principal rooms

Main Hall

	(Floor)	(Wall)	(Ceiling)
Auditorium	Carpet	Teak Plywood Wainscot-Marble	Paint on GRC
Foyer & Lobby	Marble partly Carpet	Marble partly Plaster EP	Paint on GRC
Dressing Rm.	Carpet	Plaster EP	Rock-wool Acoustic Bd.

Small Hall

	(Floor)	(Wall)	(Ceiling)
Hall	Parquet Flooring	Paint Spray on Concrete Block	Metal Mesh
Gallery	Carpet	Plaster EP	Metal Mesh
Foyer & Lobby	Marble	Marble	Paint on GRC

Exhibition/Education Bldg.

	(Floor)	(Wall)	(Ceiling)
Exhibiton Hall	PVC Sheet	Plaster EP	Rock-wool Acoustic Bd.
Library	Carpet	Plaster EP	Rock-wool Acoustic Bd.
A/V Room	PVC Sheet	Perforated Bd. w/glass wool	Rock-wool Acoustic Bd.
Small Meeting Rm.	PVC Sheet	Plaster EP	Rock-wool Acoustic Bd.

4) Colour Scheme

Colours of the Centre will be composed of high grade and calm tone with touch of culture to be suitable as social education and cultural facility, while using material and colour without discoloration by strong sun shine and strong-rain and high humidity.

6-11. Fire Protection Planning

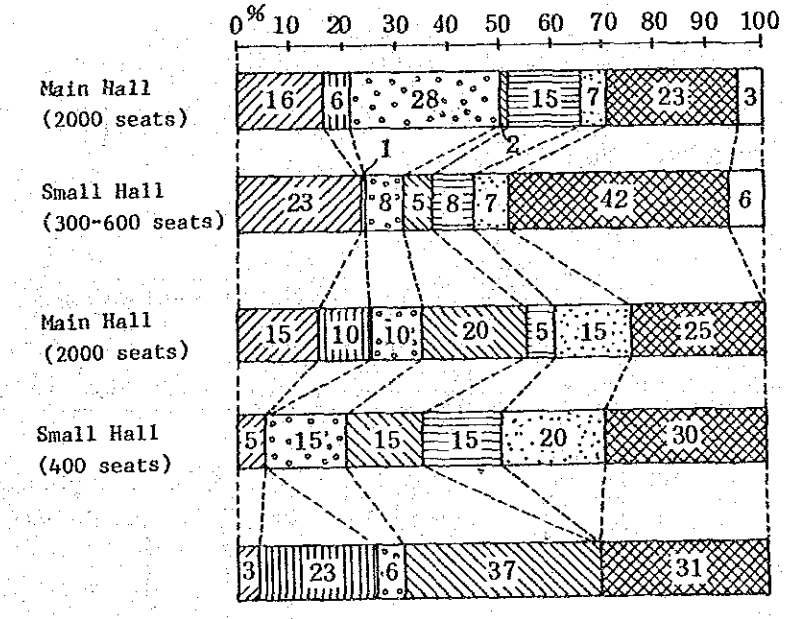
The Centre which is used by a great number of people should be planned with a device to minimize the degree of disaster and to facilitate smooth evacuation on emergency such as fire. Such facilities and equipments will include sprinkler system above of a main hall stage, emergency lighting system, fire alarming system and fire extinguishers. On evacuation planning on main hall which is expected to receive a great number of people, its main level will be located near ground floor, and will accomodate a majority of 2,000 seats, so as to facilitate easy evacuation on emergency.

Also, evacuation in more than two directions will be planned for all buildings.

6-12. Stage Mechanism Planning

1) Setting up of use rate of a hall by type of performance is important basic criteria for planning and determining profile of the hall, stage mechanism as well as stage sound and stage lighting equipment.
Type of performances was set up by combining request by Thai side and generally expected performances. Use rate by type of performance was set up from analysis of events with more than 1,000 audiences at Thai National Theatre in past three months and use rate of similar halls in Japan, with complementarity to National Theatre.

1. Symphony, chamber music, solo, chorus
2. Opera, ballet, musical
3. Popular music, jazz, rock music
4. Traditional performances, dance
5. Drama
6. Movie
7. Lecture, conference, meeting, ceremony, entertainment
8. Others



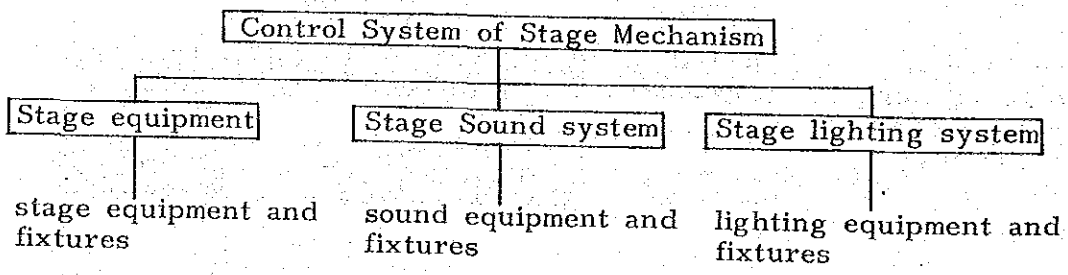
Main Hall

Stage Equipment	Performance
Sound reflector	Symphony, chamber music, chorus
Movie Screen	Opera, ballet, musical
Front cloth	Popular music, jazz, rock music
Battens	Traditional performances, Dance
Elevating Stage for Orchestra	Drama, musical
Big and small elevating Stages	Cinema
Side spaces on both side of stage for musicians	Lecture, conference, meeting, ceremony, entertainment
Stage depth over 18m	Relay television broadcasting
Simaltaneous interpretation system	

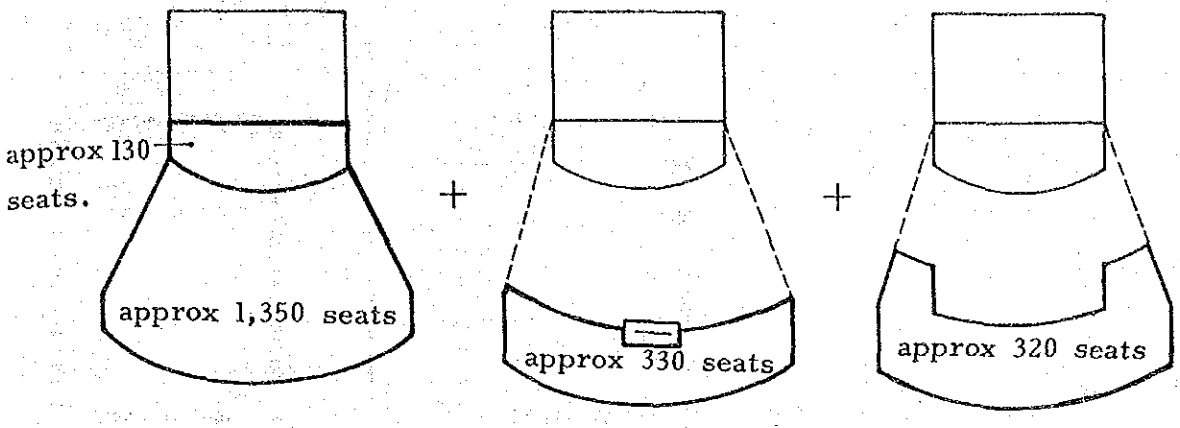
Small Hall

Stage Equipment	Performance
Portable sound reflector	Mini concert, chorus
Movie screen	Popular music, jazz, rock music
Movable battens	Traditional performances, dance
Elevating stage	Drama
Movable stage	Cinema
	Lecture, conference, meeting, ceremony, entertainment
	Show, reception, dance-party
	Contests, demonstration, Exhibition

The control system for produce of performances is composed of those stage equipment and its fixtures, stage sound system, and stage lighting system.

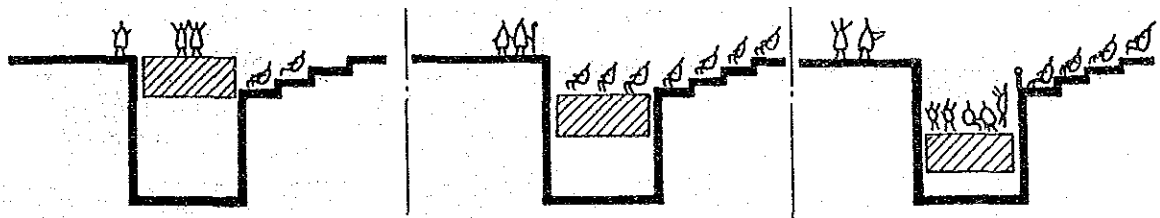


3) Proposed seats allocation



fixed seats : 1,350 + 330 + 320 = 2,000 seats
movable seats: 130 seats
total approx 2,130 seats

4) Usages of elevating stage for orchestra

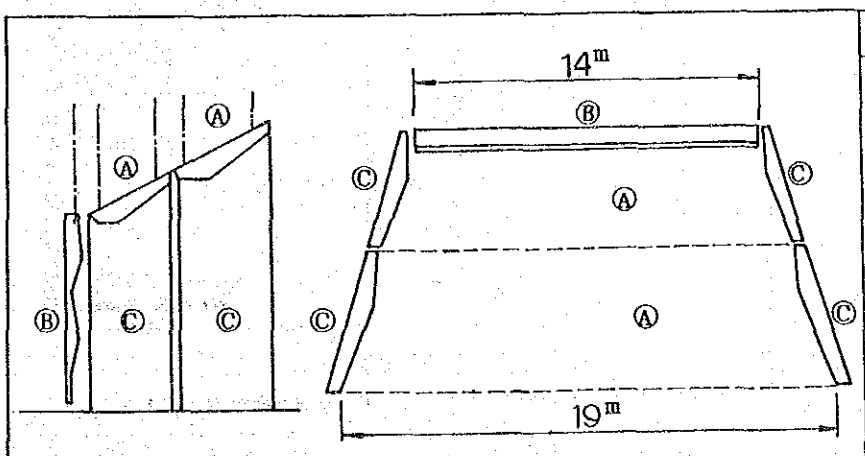


○ Apron stage
(for show, dance)
○ Moving space for TV camera
○ Space for big conference stage

○ For seats

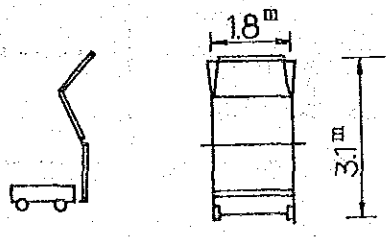
○ For orchestra pit

5) Sound Reflector



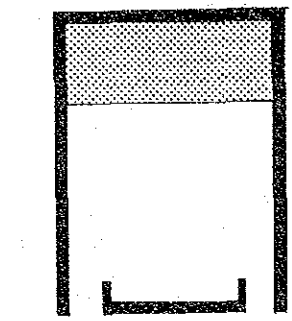
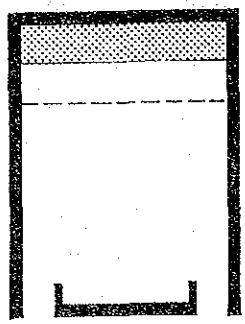
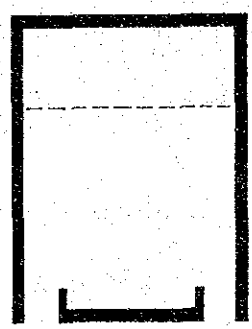
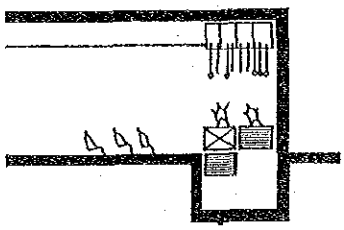
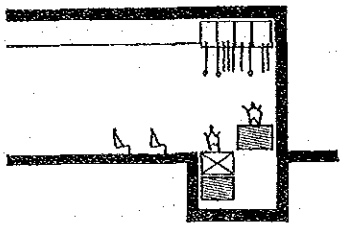
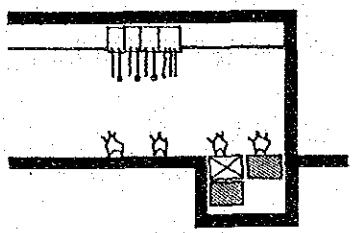
Main Hall

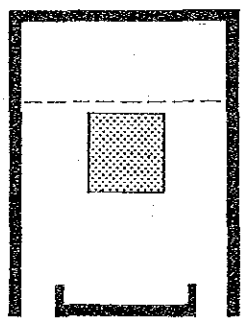
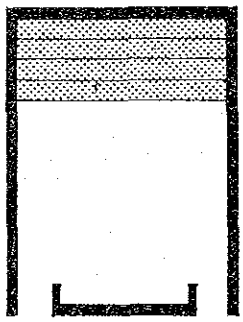
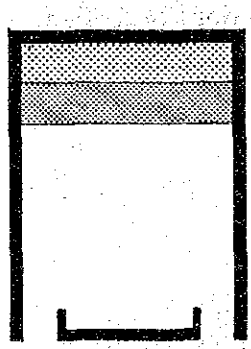
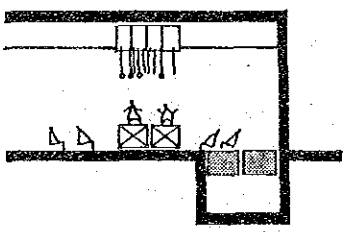
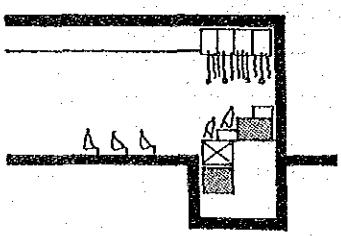
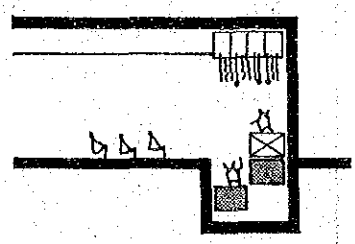
Ⓐ Ceiling sound reflector
Ⓑ Bank reflector
Ⓒ Side Reflector



Small Hall

Movable sound reflector
(ready-made type)

CASE 1 DOUBLE STAGE	CASE 2 SINGLE STAGE	CASE 3 FLAT FLOOR
Drama, Concert, Dance	Lecture, Training, Dance Partin	Movie, Reception, Exhibition
		
		

CASE 4 CENTRE STAGE	CASE 5 STEP FLOOR	CASE 6 PIT FOR MUSICIANS
Show	Conference	Musical
		
		

6-13. Structural Planning

Since this Centre will be used by large numbers of the public, the building structure should be economically designed yet strong enough to withstand various stresses. In particular, the roof, designed to be inclined for good appearance, will have to be so structured as to let load and weight flow smoothly to the foundation.

Thailand is out of the main seismic zones of the world and has rarely experienced sensible earthquakes. There have been no records of damage to buildings and structures either due to earthquakes or to gusty winds such as typhoons. In view of these facts, the structure may be allowed some freedom in design against horizontal external forces.

The soil of Metropolitan Bangkok area consists of alluviums. According to the soil investigation report of the proposed site for this Centre, a soft clay layer lies about 24 meters below the surface. The building will be supported by pile foundations laid on the sand layer immediately below this clay layer. Because of the considerable land subsidence in this area (5.0 - 10.0 cm from 1978 to 1979), expansion joints will have to be provided appropriately against ununiform subsidence of the ground. At the same time, the ground floor slab will be elevated from the ground surface and be supported by beam frame, and the portions of the external walls contacting the surrounding ground will be provided with descending walls to allow for subsidence.

1). Principles of Structural Design

Thailand has By-Laws of the Bangkok Metropolis (BLBM) on structural design and the Thailand Industrial Standards (TIS) on materials.

In design of the Centre, wind loads and live loads will be dealt with in accordance with BLBM. The stress analysis and design of cross-section of structural members will be performed according to Architectural Institute of Japan Standards. Judging from the results of material tests in the past undertakings, the qualities of the materials have no problems. The allowable unit stresses will be determined as per the Building Standard Law of Japan.

2). External Forces and Loads

Seismic force is not considered in the calculation.

a) Wind Load

The wind load is calculated by multiplying the velocity pressure with the wind pressure coefficient. The BLBM the velocity pressure listed below in the BLBM will be used. The wind pressure coefficients will be those stipulated by the Building Standards Law of Japan.

Height above ground	Velocity pressure
from 0 m to 10 m	50 kg/m^2
Over 10 m, to 20 m	80 kg/m^2
Over 20 m, to 40 m	120 kg/m^2
Over 40 m	160 kg/m^2

b) Dead Load

The weight of finishing materials, structural members and other fixtures to the building will be calculated in accordance with actual conditions.

c) Live Load

Live load values indicated in the BLBM will be generally used. In particular, the live load of rooms not stipulated by BLBM will be calculated on actual condition, supplemented by the Building Standards Law of Japan where needed. Listed below are the typical live loads applicable to the Centre.

Room	Live load (kg/m^2)
Roof	50
Office	250
Auditorium	500
Meeting room	400

And, axial forces on columns and foundations will be calculated in accordance with the BLBM in which the live loads will be reduced by the number of supported floors.

3). Structural Materials and Construction Methods

Structural materials to be used will be determined according to the purpose, scale and shape of the buildings; the levels of difficulty, costs and schedule of construction; and the quality and prices of the materials. In Thailand, ordinary structural materials are available, but steel materials are more expensive than in Japan because the raw materials are imported. The major structural materials for use in this project are as follows.

a) Concrete

The ready-mixed concrete produced in Thailand or the concrete mixed at the site will be used. For production and execution under high temperatures, appropriate measures will have to be taken to provide for the selection of materials, mixing, transportation, placing and curing of concrete. The specifications of concrete are as follows:

Type	: Ordinary concrete
Strength	: 210 kg/cm^2 (compressive strength of concrete at 28 days)
Slump	: 10 cm or less
Cement	: Normal Portland cement
Fine agregate	: River sand (salt content to be less than 0.02%)
Coarse asgregate	: Crushed stone or river gravel (up to 25 mm across)
Admixture	: Water reducing agent

b) Reinforcing Steel Bar

The reinforcing steel bar produced in Thailand in accordance with ASTM and JIS will be used.

Round bars, SR24	: 6 and 9 mm
Deformed bars, SD30	: 10 and 12 mm
Deformed bars, SD40	: 16, 20, 25 and 28 mm

c) Structural Steel

Both material procurement for and production of structural steel could be made in Thailand. In view of local technical levels and fabrication schedule, however, the main structural steel frames will be produced in

Japan. And as for light gauge steel framework, material procurement and production will be made in Thailand.

d) Piles

Of the various shapes of prestressed concrete piles manufactured in Thailand square piles and double half-moon piles (DH piles) will be adopted. The bearing capacity of piles will be checked by pile driving tests. The pile driving formula recommended by the basic structural design standards of EIT (Engineering Institute of Thailand) is as follows:

$$Q_u = \frac{1}{F_s} \times \frac{eWH}{S + \frac{1}{2} \times \sqrt{\frac{2eWHL}{AE}}}$$

Q_u : Ultimate bearing capacity of pile
F_s : Safety factor
e : Efficiency of Pile driving
W : Weight of hammer
H : Height of hammer
S : Penectration value of Pile
L : Pile length
A : Area of Pile section
E : Modulus of elasticity of Pile considered effect of circumferential soil

e) Concrete Block, Brick

The walls except for those of concrete around the main hall will consist of concrete blocks or bricks made in Thailand. Both concrete block and brick walls will be arranged by reinforced concrete lintels, horizontally and vertically, at intervals of 4 meters or less.

4). Sub-structural Design

A soil survey based on boring at 4 locations at the proposed site of the Centre revealed a sand layer of approximately 50 in N-value at a level of about GL-28m. The result of survey requires that square piles, higher in bearing capacity, will be used for the foundations which support large axial force and DH piles for other foundations, both types of piles to be laid on the above-mentioned supporting soil layer. In calculating the bearing capacity of the piles, the negative friction of the upper soft clay layer will have to be taken into account.

5). Super-structural Design

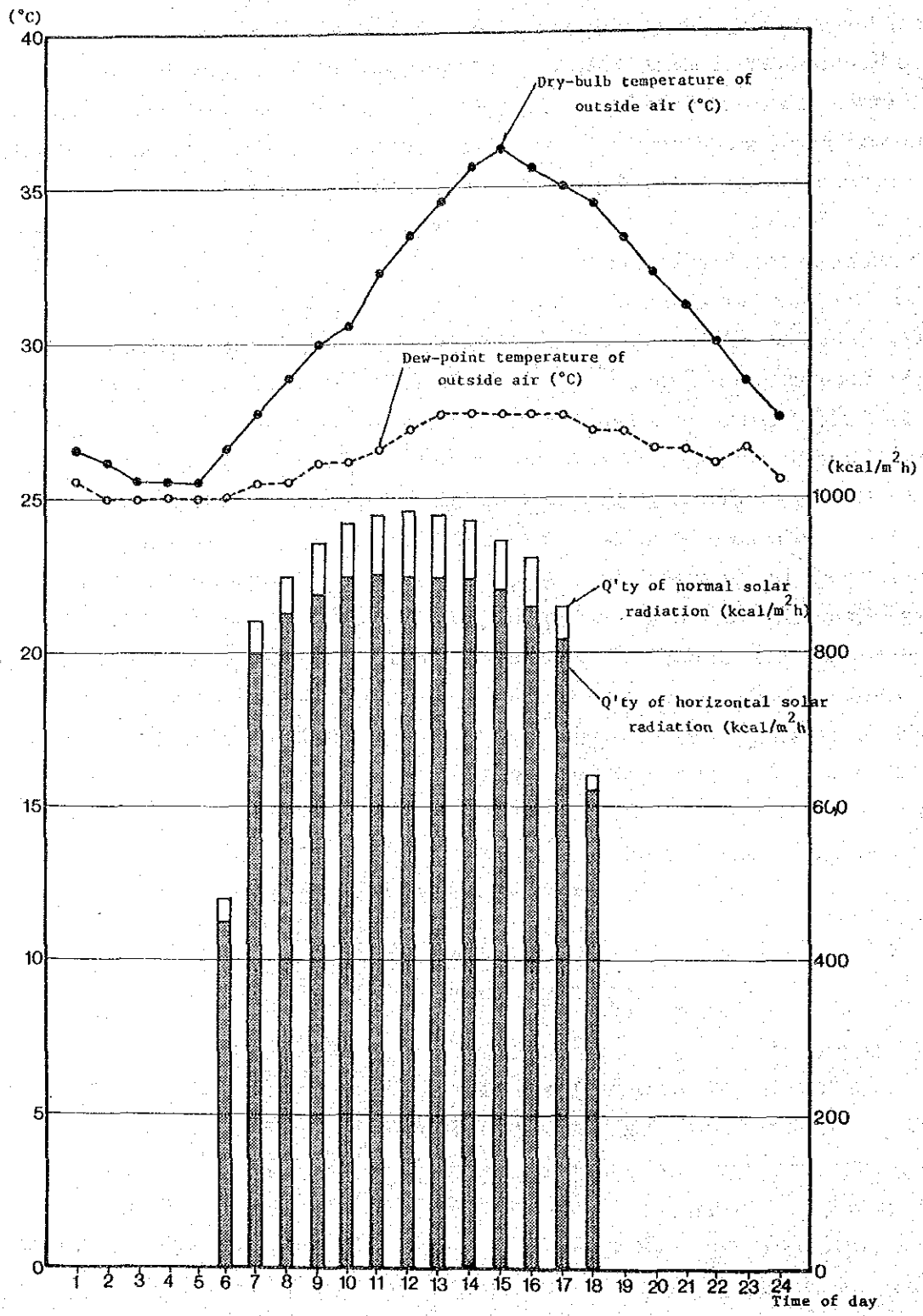
Of the frames supporting the sloped roofs, that of the auditorium roof is of a large span, increasing the stress. This requires steel truss of high rigidity compared with their self weight, and to allow for thrust.
Other beams, columns and slabs will be made of the reinforced concrete generally employed in Thailand. The walls will consist of concrete blocks or bricks except for of high sound-proof requirements.

References for Structural Planning

(1) Contours of Ground Surface Elevation in the Bangkok Area
(2) Zones of the Surface Subsidence Rate in the Bangkok Area
(3) Locations for Subsidence Observation Station in the Bangkok Area
(4) Field Instruments Monitoring Results in Upper 10 m Zone
(5) Field Instruments Monitoring Results in Deep Zone
(6) Geologic column at boring location B-1 of the proposed site
(7) Geologic column at boring location B-2 of the proposed site
(8) Geologic column at boring location B-3 of the proposed site
(9) Geologic column at boring location B-4 of the proposed site

References (1) though (5) above are from Final Report of "Investigation of land subsidence caused by deep well pumping in the Bangkok Area" and (6) through (9) from the report on soil survey conducted in October 1983.

Meteorological data for construction in Bangkok



6-14. Air-conditioning and Ventilation System

1). Outline of Planning

The purpose of installing the air-conditioning and ventilation system is to keep the room environment at a constant level with minimal maintenance efforts and with the least possible energy requirements. The planning will also take into account the current use status of air-conditioning equipment and the level of maintenance expertise in Thailand.

The Centre will consist of the Main Hall building, Small Hall building, and Exhibition and Education building. Because the three buildings differ from one another in application objective and usage time distribution, the planning will devide the system into three parts so that individual control may be available in each building including individual compensations for the loss in heat conduction.

The Main Hall building will be equipped with a high-grade air-dondition-ing and ventilation system to provide for the hall's specific functioned conditions, amount of air-conditioning loads, and indoor sound pressure level which should be minimized. Small hall is expected to be used more frequently, than Main Hall. This will require installing in the small hall building an efficient, easy-to-operate, direct expansion package unit with appropriate acoustic insulation provided. The Exhibition and Education building will have another system that will allow for its specific applications and usage time distribution under independent control.

2). Design Conditions

a) Outside Conditions

Meteorological data for construction in Bangkok

Time of day	Dry-bulb temperature(°C)	Dew-point temperature(°C)	Relative Humidity(%)	Q'ty of normal solar radiation ($kcal/m^2h$)	Q'ty of horizontal solar radiation ($kcal/m^2h$)
1	26.7	25.6	91.7		
2	26.1	25.0**	91.6		
3	25.6	25.0**	95.3*		
4	25.6	25.0**	95.3*		
5	25.6	25.0**	95.3*		
6	26.7	25.0**	87.3	463**	18**
7	27.8	25.6	84.0	800	42
8	28.9	25.6	77.0	854	58
9	30.0	26.1	73.7	878	70
10	30.6	26.1	70.3	890	78
11	32.2	26.7	65.4	897	83
12	33.3	27.2	62.7	899*	85*
13	34.4	27.8	60.8	897	84
14	35.6	27.8	55.5	892	80
15	36.1*	27.8	53.5**	881	72
16	35.6	27.8	55.5	861	61
17	35.0	27.8	58.1	816	45
18	34.4	27.2	57.7	629	24
19	33.3	27.2	62.7		
20	32.2	26.7	65.4		
21	31.1	26.7	71.2		
22	30.0	26.1	73.7		
23	28.9	26.7	84.4		
24	27.8	25.6	84.0		

b) Indoor conditions

Main hall auditorium	: 26°C±2°C, RH 50%±10%
Small hall auditorium	: 26°C±2°C, RH 50%±15%
Others	: 26°C±2°C, RH 55%±15%

3). Outline of System

a) Main Hall Building

■ Heat sources

Two heat sources are required: cold heat source for cooling, and hot heat source for dehumidifying the main hall. As the cold heat source, a water-cooled turbo-compressor refrigerator will be adopted for its large capacity, controllability and efficiency. As part of the energy-saving efforts, the hot heat source will be implemented using waste heat recovered from the turbocompressor refrigerator condenser. The accompanying Figure (on left page) shows a heat source system diagram.

■ Air-conditioning system

The air-conditioning system will consist of the following subsystems:

i) For the front section of the main hall auditorium: Single duct zone control and reheating system
ii) For the rear section of the main hall auditorium: Single duct zone control and reheating system
iii) For the stage of the main hall auditorium: Single duct sytem
iv) For the foyer: Single duct system
v) For the auxilliary rooms of main hall: Multi-zone system
vi) For the dressing room: Unit cooler sytem
vii) For the rehearsal room: Unit cooler system
viii) For coffee shop: Single duct system

To provide for the large capacity of the auditorium with minimal running cost, a set of fans will be controlled in their operating number.

■ Ventilation system

Type 1 (air intake and exhaust by fan): Main mechanical room, electrical room, kitchen, generator room

Type 3 (exhaust by fan): Lavatories, pantry

■ Automatic control system

i) Control method: Electrical or electronic

ii) Central control system: A CRT-equipped central control console with built-in microcomputers will be installed.

b) Small Hall Building

■ Air-conditioning system

The air-conditioning system will consist of the following subsystems:

i)	For the auditorium	: Air-cooled package system
ii)	For the stage	: Air-cooled package system
iii)	For the lobby	: Air-cooled package system
iv)	For the dressing room and office	: Unit cooler system

■ Ventilation system

i)	Control method	: Electric or electronic
ii)	Central control system	: An air-conditioning on-off panel will be installed in the office.

c) Exhibition and Education Building

■ Air-conditioning system

The air-conditioning system will consist of the following subsystems:

i)	For the exhibition hall	: Air-cooled package system
ii)	For the meeting rooms	: Unit cooler system
iii)	For the office	: Unit cooler system
iv)	For the audio-visual room	: Unit cooler system
v)	For the library	: Air-cooled package system

■ Ventilation system

Type 3 (exhaust by fan): Lavatories, storage

■ Automatic control system

i)	Control method	: Electric
ii)	Central control system	: Air-conditioning on off panel will be installed in the office.