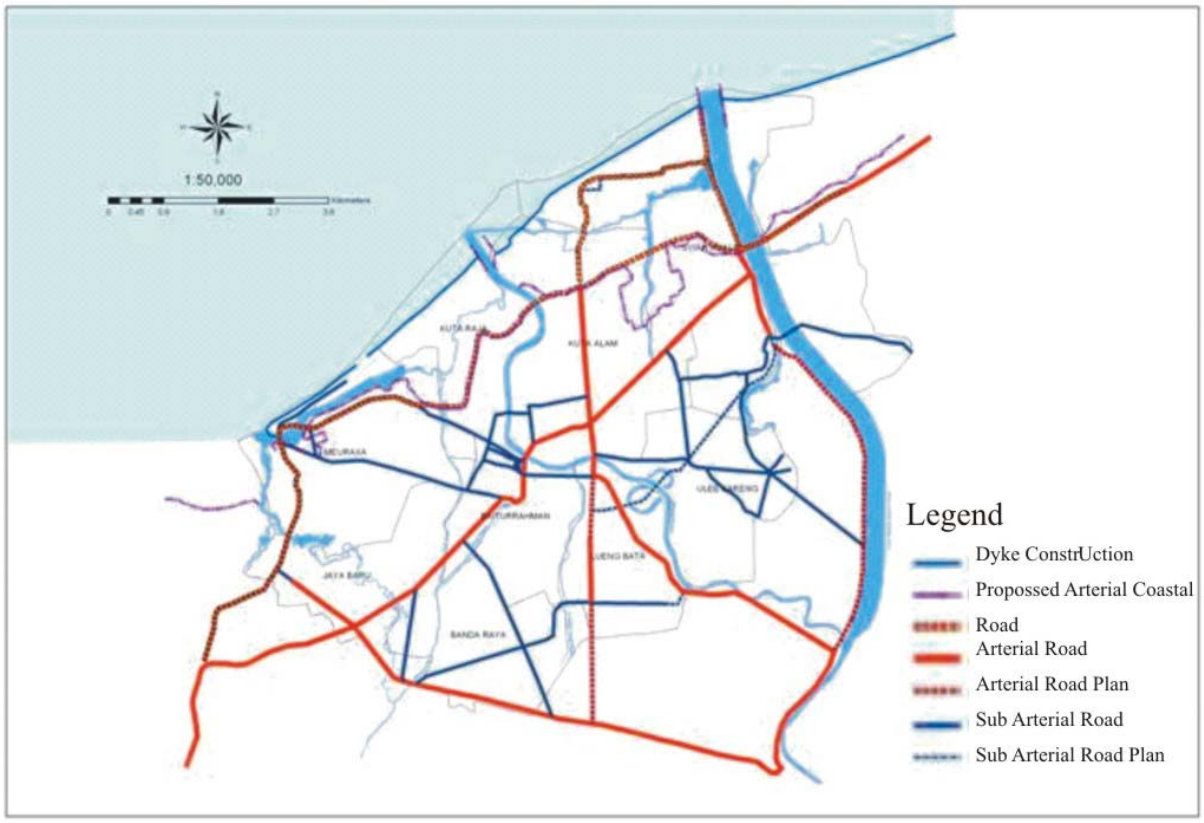
4.5 PROPOSED SPATIAL STRUCTURE PLAN

4.5.1 Proposed Urban Skelton

The urban skeleton in the year 2015 also remains almost the same as that worked out by URRP. There are however a couple of minor modifications which are considered necessary mainly on account of land appropriation issue. The proposed minor modifications are alignment of route of (1) coastal road, (2) Baru Street, and (3) Syiah Kuala Street. Figure 4.5.1 presents the proposed urban skeleton in 2015.



Source: The Additional Stud Team

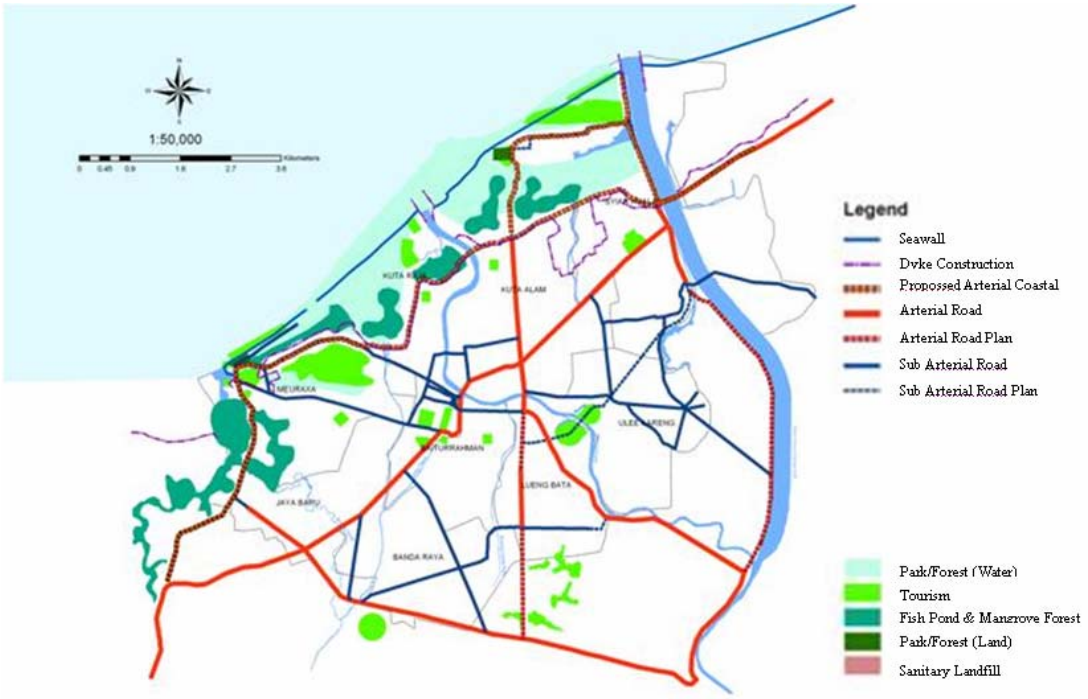
Figure 4.5.1 Proposed Urban Skeleton in 2015

4.5.2 Specific Spatial Structure Plan

A spatial structure plan is to be established in order to meet a long term vision and development concept. BAC is broadly planned to be divided into two (2) zones, Zone of Preservation and Conservation and Zone of Development.

(1) Zone of Preservation and Conservation

This zone mainly consists of park, forest, fish ponds and mangrove forest taking into consideration of the concept of Green City, promotion of tourism development present geographic and natural environment. It covers the area of about 11 km^2 as shown in Figure 4.5.2.



Source: The Additional Study Team

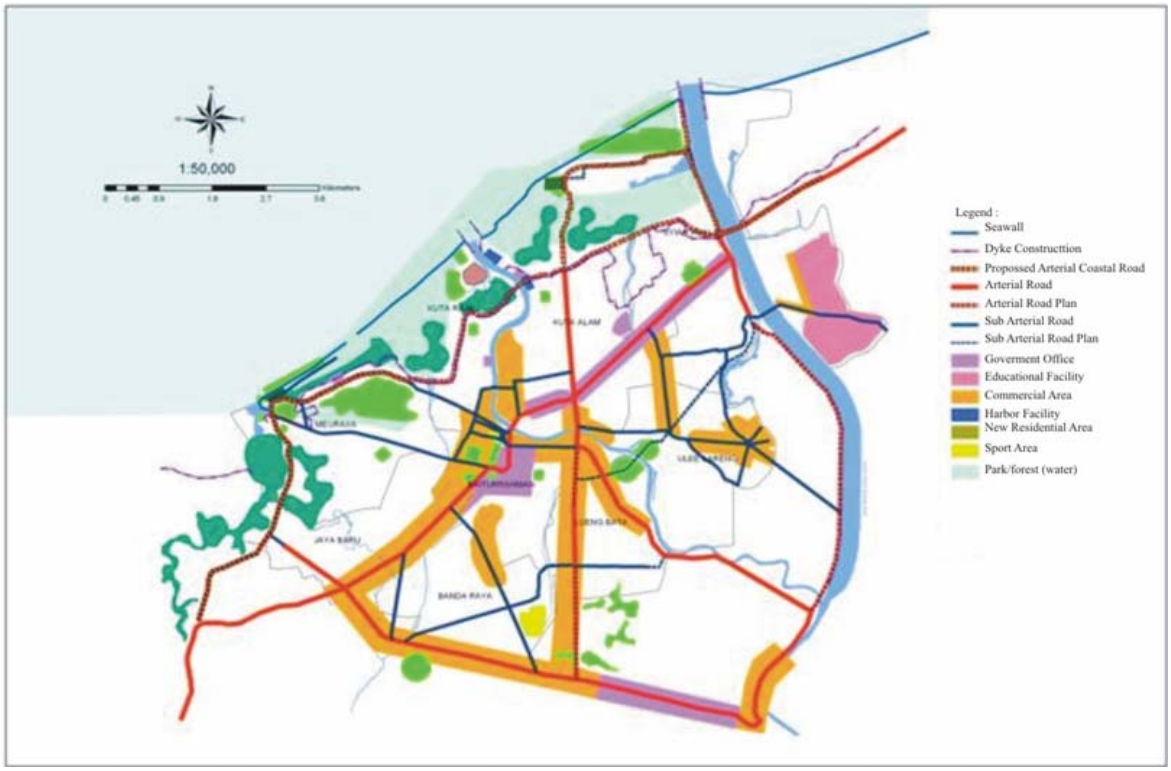
Figure 4.5.2 Zone of Preservation and Conservation

The green area are proposed to be located in many places in the city. Re-plantation of mangrove is proposed in the areas such as Kuta Raja, Kuta Alam, Jaya Baru, which will contribute to revival of aqua ecology and mitigation of potential tsunami in future as barrier.

The rivers and drainages are proposed to be protected to secure proper drainage and flood control. Coastal area will mainly be developed for fish ponds, which is one of major economic activities in BAC, keeping harmony with conservation of vegetation and other natural environmental aspects.

(2) Zone of Development

Zone of development comprises commercial, government office, sport center, harbor, bus station, education, tourism, and solid waste landfill sub-zones as shown in Figure 4.5.3.



Source: The Additional Study Team

Figure 4.5.3 Specific Spatial Structure Plan

4.5.3 Primary Land Use Plan

Based on the specific spatial structure plan, pre-studied development concepts and pre-and post disaster land use conditions, a primary land use plan in 2015 is worked out as given in Figure 4.5.4. The land use is basically divided into 10 categories as given in Table 4.5.1.

Source: The Additional Study Team

Figure 4.5.4 Primary Land Use Plan

Table 4.5.1 Primary Land Use Plan

Zone	Land Use	Area (ha)	Proportion (%)
Preservation and conservation	(1) Park and forest	740	12.1
	(2) Fishpond and mangrove	352	5.8
	Sub-total	1,092	17.9
Development	(1) Commercial and industry	1,038	17.0
	(2) Education and culture	153	2.5
	(3) Sport center	23	0.4
	(4) Tourism	300	4.9
	(5) Residential	3,190	52.3
	(6) Government offices	275	4.5
	(7) Solid waste landfill	10	0.2
	(8) Harbor	19	0.3
	Sub-total	5,008	82.1
Total		6,100	100

Source: The Additional Study Team

4.6 INFRASTRUCTURE DEVELOPMENT PLAN

4.6.1 Approach to Planning

The URRP infrastructure development plan is reviewed in the light of the latest situation and it is concluded that there is no need of change/amendment for the most of sectors. However where necessary, the plan is extended up to the year 2015 or updated to absorb the changes in the situation. Table 4.6.1 summarizes the approach to the infrastructure development planning in the Additional Study.

Table 4.6.1 Infrastructure Development Planning

Infrastructure Development Planning under Additional Study		Sector/Project
1	Full use of URRP Plan	Water supply, health, education, flood control, ferry terminal, disaster preparedness
2	Supplementary report to URRP Plan	Solid waste management, waste water treatment, housing
3	Modification of URRP Plan	Roads, urban drainage
4	Additional Plan	Electric power supply, tel-communication

Source: The Additional Study Team

The Additional Study therefore presents only (i) Supplementary report to the URRP Plan, (ii) Modification of the URRP Plan, and (iii) Additional Plan.

4.6.2 Supplementary Report to the URRP Plan

(1) Wastewater Treatment and Disposal

According to the URRP Plan, septage generation is estimated to amount 144 m^3/day in 2009 and 204m^3/day in 2015, whereas the present treatment capacity is limited to 50m^3/day. It is reported that UNICEF has committed to construct new septage treatment plant with a daily treatment capacity of 60m^3/day adjacent to the existing one. It is recommended that DPK puts forward appropriate action for realization of additional plant in order to avoid any adverse effect on public hygiene and environment.

(2) Solid Waste Management

It is reported by DKP that the existing site at Gampong Jawa is foreseen to be no longer usable owing to a huge amount of debris and other waste generated after the disaster.

Under assistance of GTZ, the solid waste management study is in progress including selection of landfill sites.

(3) Housing

Construction of houses is one of top priority in the rehabilitation and reconstruction activities in BAC, as internally dislocated people have lost their houses. According to BRR plan, new houses of 17,269 are to be built in total, of which 14,161 houses have been committed by

donors, NGOs and government. As of February 2006, 2,498 houses completed and 3,383 are houses in progress. Out of the completed houses, 414 houses have already occupied.

4.6.3 Modification of the URRP Plan

(1) Roads

URRP has elaborated road development plan and hierarchy. According to GOI, there is a plan to conduct a pre-feasibility study in 2007 under the assistance of the Chinese government. The road development would be required to be adjusted depending on the result of the study and subsequent implementation program by the government. At this stage it is not possible to predict how road development plan would be affected.

The road network in URRP is reviewed and adjusted for the target year 2015. It is found necessary to modify the alignment of the coastal road, Syah Kuala road and Baru Street owing to land constraint.

(2) Urban Drainage

The URRP Plan has been prepared based on the review of a master plan prepared by PU Dinas. BRR meantime in cooperation with PU Dinas launched to establish a new drainage planning scheme and its study is in progress from August 2005 for due completion on March 2006. Through technical comparison of the two studies, a couple of differences in planning fundamental are identified as follows:

(a) The URRP plan is based on premise that submerged lands would be reinstated to their original state, whereas the ongoing plan is based on the prevailing geographic conditions after the disaster.

(b) Under the ongoing plan it is pre-determined that the submerged land is excluded from the drainage area. This subsequently results in reduction of drainage area. In fact the URRP plan has a total drainage area of 6,070 ha, while the ongoing plan is limited to 4,910 ha.

(c) As a part of the structure plan of BAC, URRP has proposed to construct coastal road but circumstance after the URRP study revealed that it is probably difficult to align the road along with URRP proposal. Re-alignment is required accordingly, which also affects zoning of drainage area.

There are a lot of differences in many planning and design items between the URRP plan and the ongoing plan. The ongoing plans involves more number of pumps and more pumping capacity compared to the URRP plan, though those data is still of interim output and subject to further update. It is expressed by BRR and PU Dinas that the drainage program would be implemented based on the outputs of the ongoing plans, though those outputs are required to

be scrutinized from technical and economic point of views.

4.6.4 Tentative Construction Time Schedule

The URRP construction time schedule is updated based on assessment of urgency of the proposed projects in the light of the present situations and the modification of the plan of a couple of infrastructure development project. The updated construction time schedule is as shown in Figure 4.6.1.

4.6.5 Preliminary Cost Estimate

The URRP preliminary cost estimate is also updated for a couple of the projects of which development plan has been modified after URRP. The conditions of the cost estimate are the same as those adopted in the URRP Plan. The following points should however be noted:

(1) Although the reconstruction of urban drainage system is in progress, the same amount as stated in the URRP Plan is tentatively adopted in the Additional Study, since the cost estimate is yet completed.

(2) The cost of health and education includes not only cost of the rehabilitation and reconstruction works but also cost for the periodical supply of materials and other requisites.

In the URRP Plan the total rehabilitation and reconstruction cost is estimated at Rp. 9,292 billion, while it is updated to Rp. 8,249 billion in the Additional Study.

CHAPTER 5 PLANNING ON THREE RECONSTRUCTION MODELS

5.1. SELECTION OF MODEL AREAS

At the first it was necessary to select three (3) areas to be suitable for reconstruction model development. Ulee Lheue, Peunayong and Lueng Bata areas have been selected based on 5 selection criteria and in consultation to the BAC government and BRR.. Their locations are as shown in Figure 5.1.1.

Source: BAC Aerial Photography

Figure 5.1.1 Location of 3 Reconstruction Model Areas

5.2 ULEE LHEUE MODEL AREA

5.2.1 Development Need and Constraint

Since the proposed area has been devastated completely, every infrastructure, housing, social and community facilities are required to be re-built. Especially construction of houses should be implemented at first track to allow the dislocated families back to their original land as earlier as possible. In addition it is important to install appropriate disaster forecasting and warning system and construct well organized evacuation roads to minimize effect of the potential disaster in future. Further it is also important to furnish the inhabitants adequate facilities to sustain their livelihood.

5.2.2 Preliminary Development Plan and Cost Estimate

(1) Preliminary Development Plan

In principle Ulee Lheue area is proposed to be re-developed with a concept of beach front area with disaster preparedness, green area concept and appropriate facilities to sustain the in habitats including tourism facilities. This area will therefore have a mixed function as noted below:

(a) Historic Tourism Theme: (i) tsunami victim mass grave; (ii) historical mosque; (iii) tsunami museum area; (iv) tsunami sculpture park.

(b) Water Tourism Theme: (i) fishing area /leisure fishing; (ii) water tourism area

(c) Residential: (i) mix use of residential and commercial; (ii) medium – high rise (Hotel) residential.

(d) Waterfront Green Theme: (i) waterfront park/forest; (ii) waterfront plaza; (iii)

(e) Harbor: (i) fish market; (ii) domestic harbor.

(f) Escape Areas: (i) community hall with disaster warning facilities, (ii) evacuation road

Figure 5.2.1 shows a reconstruction concept. On a basis of this concept, a preliminary reconstruction development plan is deliberated as given in Figure 5.2.2. Further as a part of disaster mitigation plan, a detailed plan of community road which will be part ofevacuation roads is prepared as shown in Figure 5.2.3.

(2) Outlines of Reconstruction Works

The proposed development plan would include the following construction works: As of February 2006 some works have already been in place, and therefore it is necessary to catch up exactly the rehabilitation works in progress and/or planned already prior to actual implementation.

(a) Houses for affected peoples

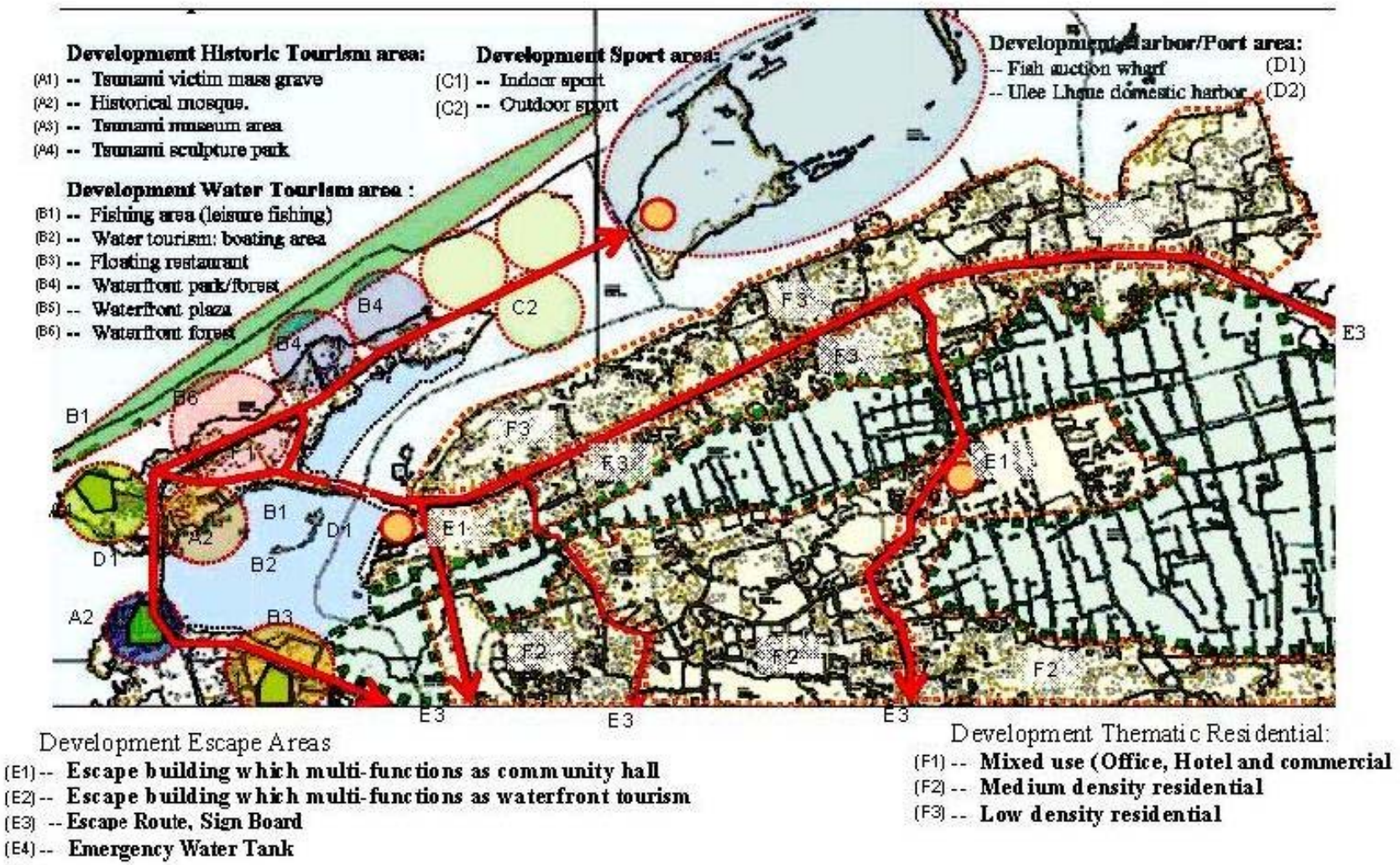
(b) Infrastructure such as (i) seawall/break water, (ii) water tide dike, (iii) water and power supply, (iv) community roads, (v) storm water drainage

(c) Public and social facilities for district scale and neighborhood scale

(d) Disaster mitigation facilities such as (i) escape roads, (ii) escape building with warning system at 3 locations

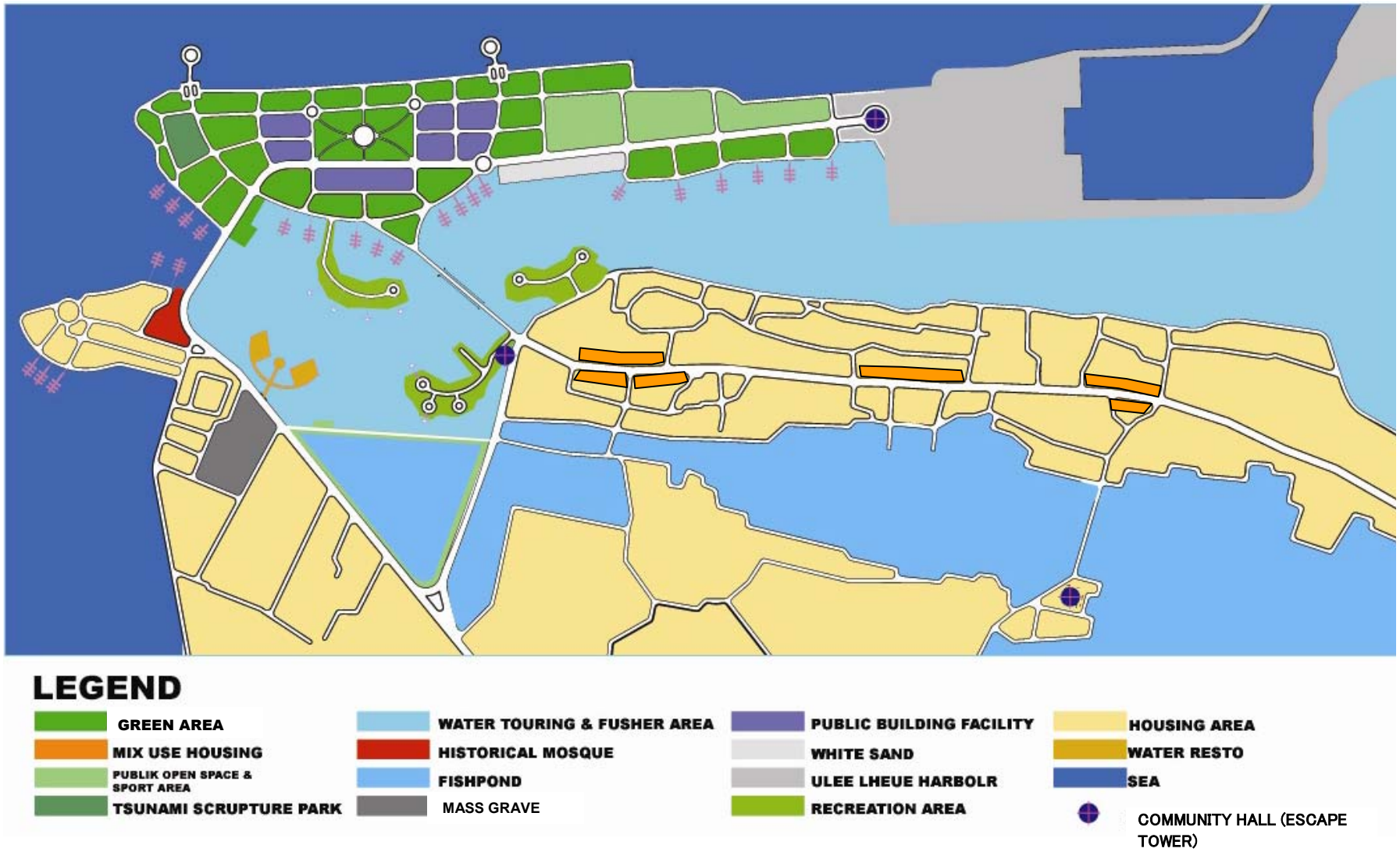
(e) Formation of waterfront area such as (i) historic tourism area, (ii) water tourism area, (iii) thematic residential, (iv) waterfront green area, (v) harbor area

(f) Production facilities such as (i) fish pond, (ii) fish market



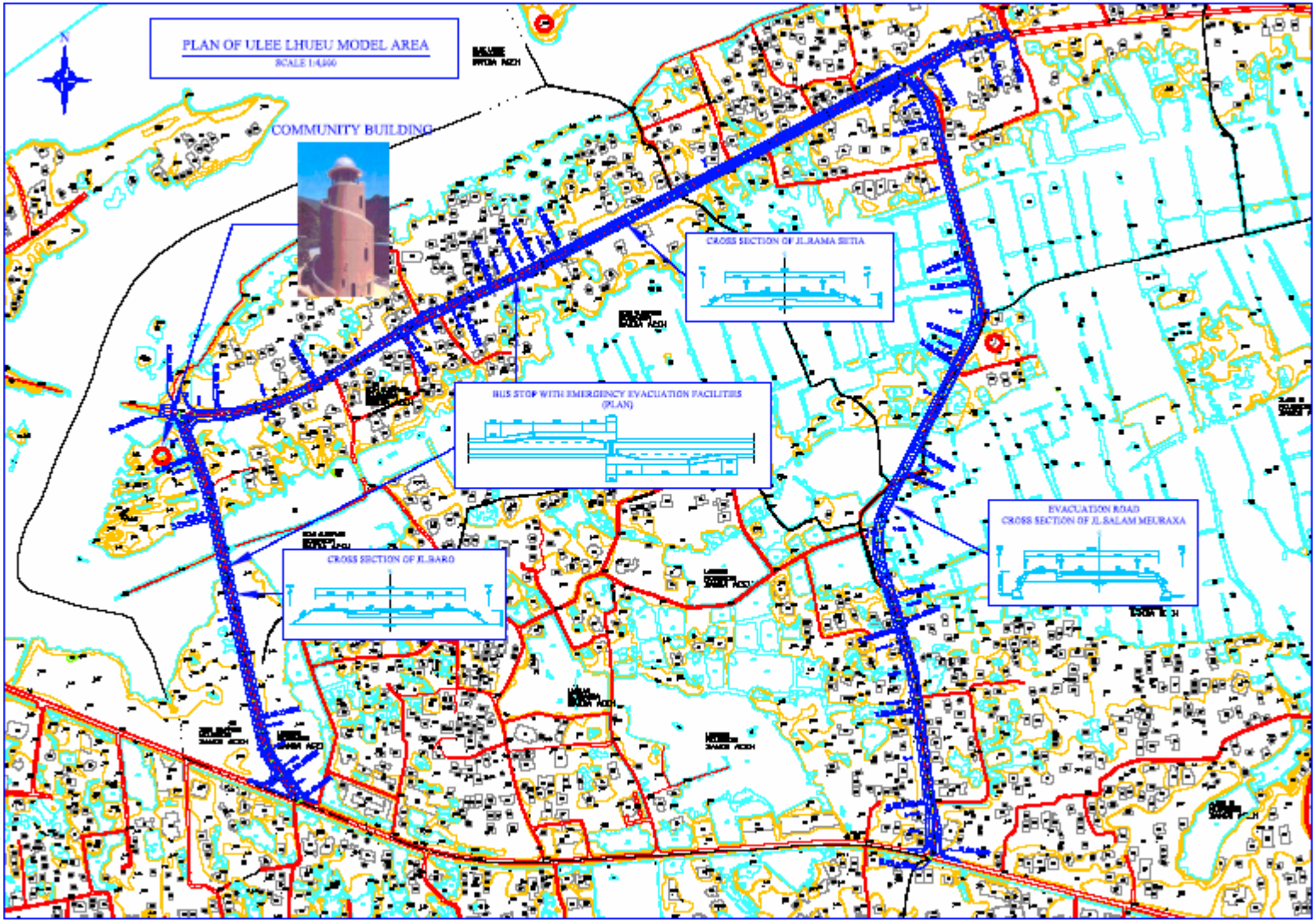
Source: The Additional Study Team

Figure 5.2.1 Development Concept for Ulee Lheue



Source: The Additional Study Team

Figure 5.2.2 Preliminary Development Plan of Ulee Lheue



Source : the Additional Study Team

Figure 5.2.3 Preliminary Alignment of Design of Community Road (Evacuation Road) in Ulee Lheue Area

(3) Cost estimate

The construction cost for the proposed development is roughly estimated at Rp. 191.09 billion.

The above cost is estimated under the following condition:

(a) The development work will involve the ones to be realized and implemented by private sector. For such no cost is estimated
(b) The estimated cost is only for the public work which would be realized by the government, donors, and NGOs
(c) No cost of the ongoing works is taken into account.

5.3. PEUNAYONG MODEL AREA

5.3.1 Development Need and Constraint

In principle, need of rehabilitation and reconstruction is common with the Ulee Lheue area. There is however a couple of issues specific in this area. That is need in provision of operating capital, tools and equipment for retail business and fishing related people. Construction of houses and rehabilitation of fishing piers and market are matter of urgent to sustain the livelihood of the vulnerable people.

The area shows of fully built-up state and therefore land resources appear to be constraint for construction of facilities necessary for disaster mitigation and other new infrastructure. It would be necessary to provide a special program such as micro financing scheme to support the people who are in need of financial support in order to make their business more vital.

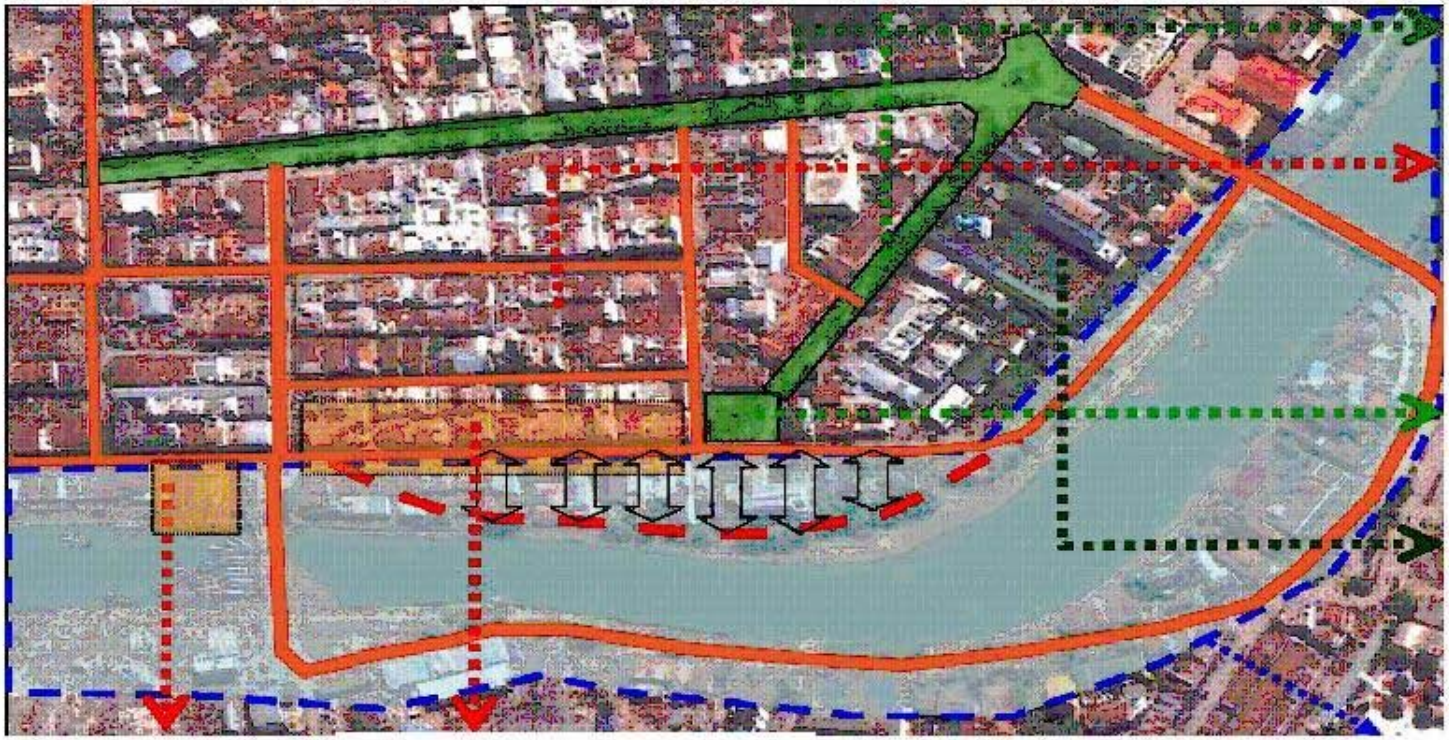
5.3.2 Preliminary Development Plan and Cost Estimate

(1) Preliminary development plan

In compliance to RTRW and structure plan of URRP, it is intended to maintain the present urban function of the area, being commercial center within BAC. This model area is proposed to be re-vitalized with the following themes:

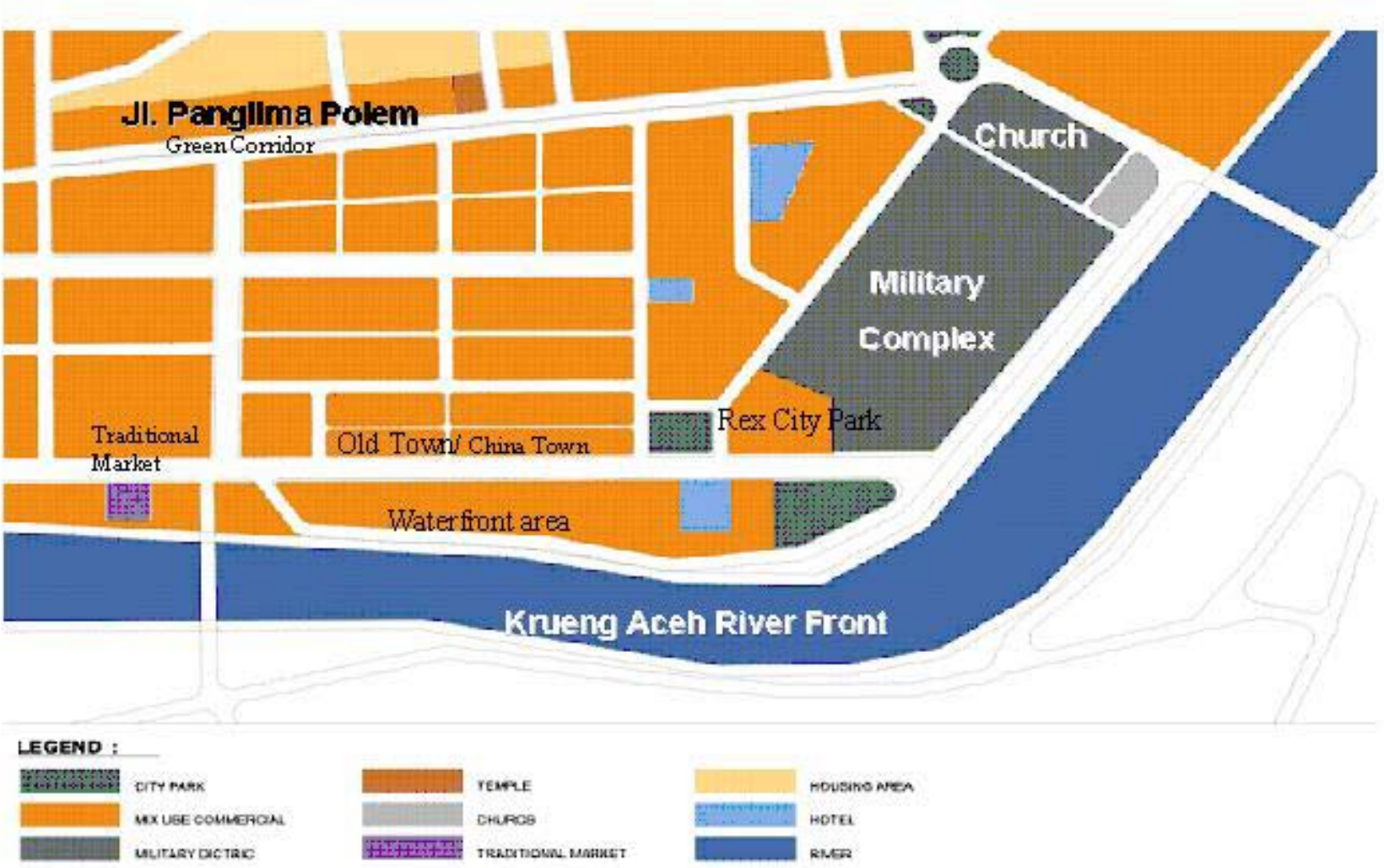
(1) Riverfront area
(2) China town area (old town)
(3) Military complex (existing)
(4) City park (to be used as emergency relief/evacuation area)
(5) Business district (hotel, office, retail and traditional commercial area)
(6) Residential area (combined with shop)

Given the above development themes, a development concept is draw down as shown in Figure 5.3.1, and then a preliminary development plan is elaborated as given in Figure 5.3.2. Also a detailed plan of evacuation road system is prepared to facilitate the BAC government for its prompt implementation as shown in Figure 5.3.3, subject to further review and study prior to implementation in due consideration of the latest circumstances.



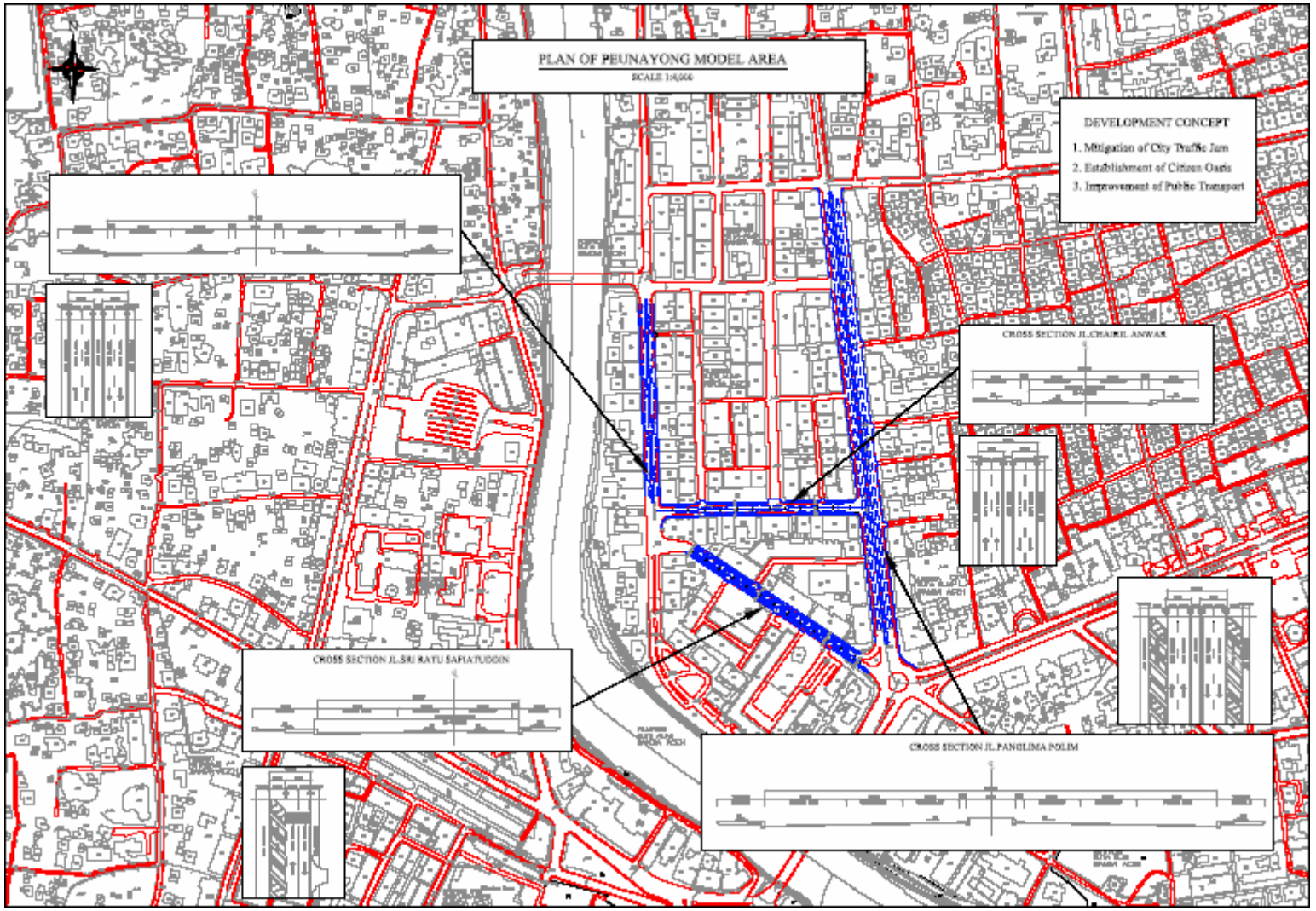
Source: The Additional Study Team

Figure 5.3.1 Development Concept for Puenyong Area



Source: The Additional Study Team

Figure 5.3.2 Preliminary Development Plan of Puenayong Area



Source : The Additional Study Team

Figure 5.3.3 Preliminary Alignment Design of Evacuation Road in Peunayong Area

(2) Outlines of reconstruction works

The preliminary development plan will include the following proposed reconstruction works:

(a) Houses for affected peoples

(b) Improvement of infrastructure such as road, pipe water supply, storm water drainage

(b) Landscaping including city park, emergency supply facility, disaster warning system

(c) Formation of riverfront

(3) Cost estimate

Cost for construction of various works has been roughly estimated at Rp. 12.39 billion, under the same condition as those of the Ulee Lheue area.

5.4 LUENG BATA MODEL AREA

5.4.1 Development Need and Constraint

This contemplated area is quite different from the other two areas in terms of development need. The Ulee Lheue and Peunayong areas had been devastated by the 2004 disaster and therefore there are serious needs of the rehabilitation and reconstruction for many sectors, including support to the vulnerable and affected people. And in fact there have been established a number of programs in the Ulee Lheue and Peunayong Areas and many rehabilitation works have been completed and/or in progress as afore-mentioned. During the immediate relief stage the Lueng Bata area had acted as relief services area and thereafter a housing scheme was launched to receive the dislocated people who wish not to return to their original land and new comers.

The area is still blessed with rich vegetation and is supposed to be one of the sources of food supply. Uncontrolled development of the area would result in causing serious natural and social environment impacts in future. It is not constraints but future development of the area be implemented under the proper control and regulation.

5.4.2 Preliminary Design and Cost Estimate

(1) Preliminary Development Plan

As aforementioned the Lueng Bata area will act as a receptacle of influx of population from BAC, probably resulting in causing burden on housing demand in future and land resources. In addition it is expected that some government offices would move there in future. The area is proposed to be developed with the following themes, subject to further study in due time:

(a) Main green corridor

(b) Forest and city park

(c) Green belt

(d) Low density residential area

(e) Green central business district

(f) Government office and public services

The above development concept is plotted on the aerial photograph as shown in Figure 5.4.1, which is then developed into the plan as shown in Figure 5.4.2.

(2) Outlines of Construction Works

The development of the Lueng Bata area would require construction of various new facilities as outlined here below:

(a) Development of residential area

(b) Construction of infrastructure such as roads, pipe water supply, electric power supply, storm water drainage, etc.

(c) Formation of water front area

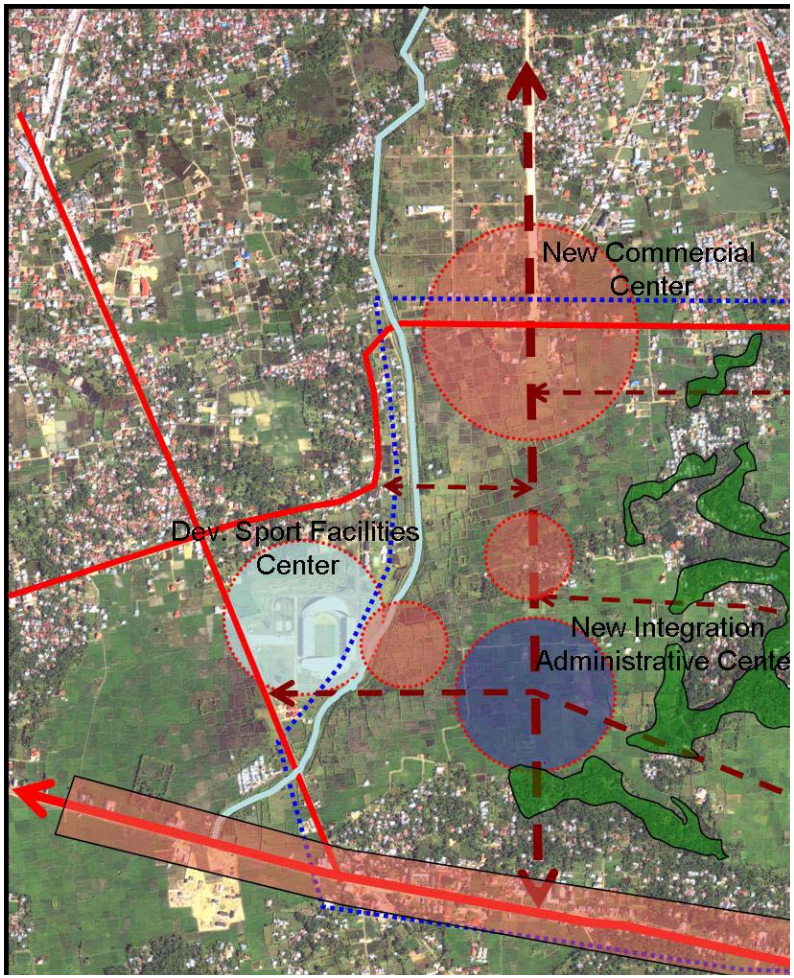
(d) Landscaping including parks and greenbelt

(e) Government office and other public facilities as required

(f) Provision of disaster mitigation and emergency facilities such as water supply tank, disaster warning system

(3) Cost Estimate

The construction cost for the proposed development is roughly estimated at Rp. 147.18 billion, under the same conditions as those of the Ulee Lheue area.



Source: The Additional Study team

Figure 5.4.1 Development Concept for Lueng Bata

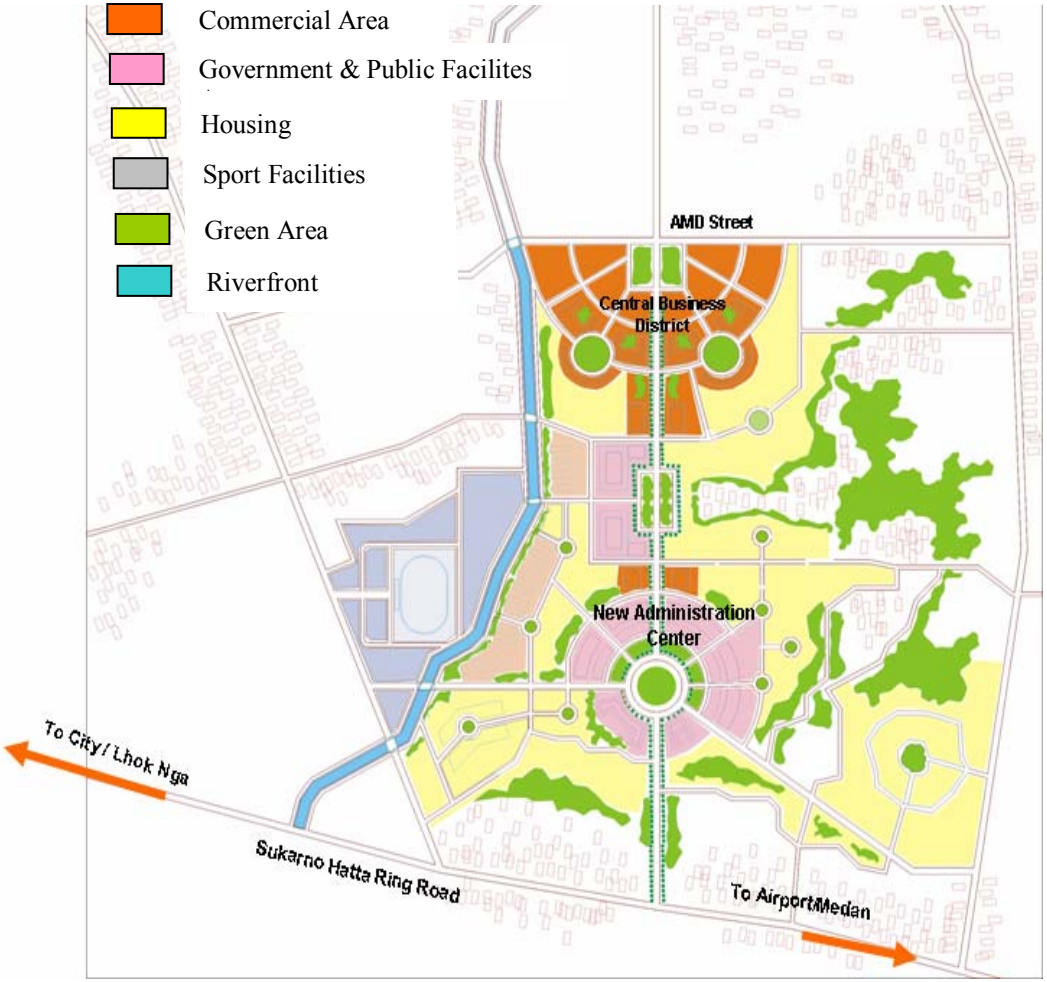


Figure 5.4.2 Preliminary Development Plan of Lueng Bata

CHAPTER 6 SHORT, MEDIUM AND LONG TERM PROGRAMS FOR REHABILITATION AND RECONSTRUCTION WORK IN BAC

The Final Report (1) of URRP provides the overall implementation plan for rehabilitation and reconstruction works in BAC. This plan actually categorizes all the rehabilitation and reconstruction work into (i) rehabilitation stage (2005-2006), (ii) reconstruction stage (2007-2009) and long term plan stage (2010-2015).

Under the Additional Study, the infrastructure development plan of BAC is updated and extended up to the target year 2015. The construction cost is reviewed to absorb the modification and the latest situation, and implemented plan is also updated in the light of the prevailing situation and degree of urgency. And it is defined that the short term, medium and long term programs cover a two-year period from 2005 to 2006, a three-year period from 2007 to 2009 and a 5-year period from 2010 to 2015 respectively.

The annual fund requirement is then worked out on the basis of the preliminary cost estimate and tentative construction time schedule as presented

The fund requirement is estimated to be approximately Rp. 3,141billion during the short term program, Rp. 3,074 billion during the medium term program and Rp. 2,034 billion during the long term program.

CHAPTER 7 CONSULTATION AND ASSISTANCE TO BAC GOVERNMENT

One of the important objectives of the Additional Study on URRP is to provide the Banda Aceh City government with consultation and assistance to expedite the process of the rehabilitation and reconstruction program which will include the structure plan with a long term vision. In compliance with this objective a team of the Additional Study has organized a meeting with the city government and the other government offices concerned over 6 times in the course of the study. The outlines of these meetings are summarized in Table 7.1.

Table 7.1 Outlines of Meeting with the City Government

	Date	Venue	Counterpart	Main Subjects
1	Oct 19, 2005	Bappeda, Province	BRR, PU Jakarta and Dinas, Mayor of BAC, Bappeda Province, Dinas Tata Kota, JICA Study Team	➢ Presentation of Inception Report for Additional Study
2	Nov. 9, 2005	Bappeda, City	PU Jakarta and Dinas, Bappeda city, Dinas Tata Kota	➢ Spatial plan ➢ Integration of Additional Study with micro plan being prepared by PU Jakarat
3	Dec. 20, 2005	Governor's Office	BRR, JICA Indonesia, Embassy of Japan, JICS, Mayor of BAC, City Bappeda, Dinas staff of city govn., Other organizations	➢ Presentation of progress of and interim results of the Additional Study
4	Jan. 18, 2006	Mayor's Office	BRR, Bappeda City, PU dinas, Dinas Tata Kota, Mayor of BAC	➢ BAC metropolitan concept ➢ BAC development concept and structure plan ➢ Concept on 3 reconstruction models
5	Jan. 20, 2006	Bappeda Province	MOE, BRR, BAC Parliament, Bappeda Province, Mayor of BAC, PU Dinas, Bappeda City, Dinas Tata Kota	➢ 3 reconstruction model planning ➢ Structure plan and development concept
6	Feb. 9, 2006	Bappeda City	PU Jakarta and Dinas, Bappeda City, Dinas tata Kota,	➢ Outlines of draft final report ➢ Spatial plan in context of national standard ➢ Legal aspect of BAC master plan being assisted by PU Jakarta
6	Feb. 16, 2006	Pendopo	BRR, DPR, DPRD, governor	➢ Tourism development of Ulee Lheue